Gwynedd Council

Ffridd Rasus Landfill

Environmental Monitoring Report October-December 2014 – Final Report

25 March 2015

Amec Foster Wheeler Environment
& Infrastructure UK Limited

Report for

Medwyn Williams
Gwynedd Council
Waste Treatment Service
Siambrau Banc Barclays
5 7 Stryd Bangor
Caernarfon
Gwynedd LL55 1AE

Main contributors

Joseph Sadowski
Ana Braid

Issued by

.....
Ana Braid

Approved by

.....
Julian Bromhead

Amec Foster Wheeler

Canon Court
Abbey Lawn
Abbey Foregate
Shrewsbury SY2 5DE
United Kingdom
Tel +44 (0) 1743 342 000

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Management systems

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Document revisions

No.	Details	Date
1	Draft for Client Comment	19/03/2015
2	Final report	25/03/2015

Executive summary

This report has been produced for the purpose of presenting the results of environmental monitoring that has continued at Ffridd Rasus Landfill during this latest reported monitoring period, October to December 2014. Area 2 (unlined closed landfill & civic amenity area) and Area 3 (engineered landfill) are regulated under the conditions of Environmental Permit (EP) ref: PP3294FJ/V008 (dated 21 April 2013) and EP ref: GP3330BY (Variation Notice number QP3134LY/V004 dated 21 March 2013), respectively. Area 3 closed to the receipt of wastes in January 2014 and Cell 4 was capped and restored in March 2014. The closure plan for Area 3 was submitted in December 2014.

Leachate monitoring in Area 3 showed levels below the EP limit of 1.5 m above base and quality within the range of previous data throughout the reporting period except for ammoniacal-nitrogen and chloride concentrations in Cell 4A, which exceeded the previous maximum. This is consistent with Cell 4A having the most recently deposited waste. Leachate monitoring points in Area 2 continued to be recorded as dry during this quarter.

All of the groundwater boreholes showed an upward trend in water levels consistent with increased recharge over the winter months. Groundwater monitoring data continue to show contamination by leachate from the unlined Area 2 landfill. Chloride and ammoniacal nitrogen concentrations along the downgradient boundary of Area 2 (and upgradient of Area 3) continue to increase southwards towards BH27 but concentrations show a downward trend. Elevated concentrations, sometimes exceeding those at BH27, continue to be recorded about 200 m downgradient of Area 2 indicating downgradient movement of the leachate plume from Area 2. Chloride concentrations in boreholes BH18A and BH18B (cross-gradient) continue to be slightly elevated above baseline and reflect the westward passage of water affected by saline runoff which infiltrated the ground via the adjacent surface water lagoon. Over time this effect is diminishing.

The groundwater quality trigger levels specified in the EP (ref GP3330BY) for Areas 1 and 3 were exceeded for chloride in boreholes BH19A, BH19B, BH19C, BH20A and BH21A and for ammoniacal-nitrogen in boreholes BH19C, BH20A, BH21A and BH21B. The trigger levels specified in EP (ref PP3294FJ) for Area 2 and Civic Amenity were exceeded for chloride in boreholes BH19B and BH19C and for ammoniacal-nitrogen in boreholes BH19C and BH20A. These exceedances reflect variability in the data associated with contaminant migration from the Area 2. The trigger levels will be reviewed in the site's Hydrogeological Risk Assessment Update due in 2015.

Ammoniacal nitrogen and chloride concentrations at the surface water monitoring locations varied as follows in the latest quarter: concentrations at SW1 (Area 1 permitted discharge) and the pipe adjacent to SW1 continue to show variability but remained within historical data; concentrations at SW2 (ditch flowing south along downstream boundary of Area 3) continue to show elevated peaks exceeding the baseline (possible reasons for the increased levels are under investigation); and concentrations at SW3 (ditch exiting the downstream boundary of Area 3) showed an overall decline but remained within the range recorded previously.

Landfill gas monitoring for the latest quarter was consistent with previous data and show no evidence of off-site landfill gas migration. None of the trigger levels for methane or carbon dioxide have been exceeded in the perimeter monitoring boreholes during the monitoring period. Wastes in Area 3 are continuing to produce landfill gas with methane and carbon dioxide concentrations within historical ranges for all locations and parameters.

Contents

1. Introduction

Ffridd Rasus Landfill Site is located approximately 3 km north of Harlech and received predominantly municipal waste up to closure in January 2014. The site is operated by Gwynedd Council. Area 2 of the landfill received waste between 1981 and 2007 and is capped and in its aftercare phase. Area 2 is regulated under the conditions of EP ref PP3294FJ/V008 (dated 21 May 2013). Area 3 commenced accepting waste in April 2007 and is regulated under the conditions of EP ref GP3330BY (latest Variation Notice number QP3134LY/V004 dated 21 March 2013). A variation application for the closure of Area 3 was submitted to NRW in December 2014. The periods of filling and capping in Area 3 were as follows:

- Cells 1 and 2: filled between 2007 and 2011, with capping works completed in June 2011;
- Cell 3: filled between January 2011 and June 2012 with capping works completed in February 2013; and
- Cell 4A and Cell 4B filled between June 2012 and January 2014 and capped in February to March 2014.

This report presents the results of environmental monitoring carried out at Ffridd Rasus Landfill site during the period October to December 2014, together with earlier data in order to present data trends. Surface water, groundwater, leachate and gas monitoring have been undertaken by Gwynedd Council. Leachate, surface water and groundwater samples are sent to ALS Environmental Ltd in Coventry for analysis.

1.1 Leachate Monitoring

When conditions allow, leachate quality and level are monitored six-monthly at locations LW4a, LW5a, LW6a and LW13 in Area 2 as required by the EP ref: PP3294FJ/V008. For a long period, these points have been dry and there have been no samples from these monitoring points. In Area 3, leachate level measurements are monitored weekly and leachate quality monthly as required by the EP ref: GP3330BY. The leachate sampling regime at Ffridd Rasus is shown in Table 1.1. Monitoring locations are shown on Figure 1.1.

Table 1.1 Leachate Monitoring Regime

Monitoring Location	Frequency	Parameter
Area 2 LW4a, LW5a, LW6a, LW13.	Six monthly	Level, Temperature, Cl, pH, EC, NH4, Ca, Mg, K, Na, Alkalinity, TOC, SO4, TON, phenol, COD, BOD.
	Annually	As six-monthly plus Cd, Cr, Cu, Fe, Pb, Mn, Ni, Zn and hazardous substances.
Area 3 LM1/1, LM1/2, LM2/1, LM2/2, LM3/1, LM3/2*	Monthly	Temperature, leachate level, pH, EC, NH4 and Cl.
	Quarterly	As monthly plus Ca, Mg, K, Na, Alkalinity, TOC, SO4, TON, phenol, COD, BOD and Cd.
	Annually	As quarterly plus Cr, Cu, Fe, Pb, Mn, Ni, Zn and hazardous substances.

Note: * Leachate quality samples were generally taken from the leachate collection tank, with the cell source identified. As of January 2013, samples of leachate are collected individually from each of the four cells. Wells LM1/1, LM1/2, LM2/1, LM2/2, LM3/1, LM3/2 were connected to the gas extraction system in August 2013 and are no longer monitored. Leachate levels have been monitored at LCP1, LCP2, LCP3, LCP4/2 and LCP4/B since August 2013.

1.2 Groundwater Monitoring

Groundwater quality and level are monitored quarterly in Area 2 and monthly in Area 3 as required by EP ref PP3294FJ/V008 and EP ref GP3330BY, respectively. The groundwater sampling regime is presented in Table 1.2.

Three additional boreholes (BH34-BH36) were installed in March 2012 along the western margin of Area 2 as replacements for lost boreholes BH7, BH26 and NRA2 (see Figure 1.1). Sampling of these boreholes began in April 2012.

Table 1.2 Groundwater Monitoring Regime

Monitoring Location	Frequency	Parameter
Area 2 BH1, BH15, BH18A, BH18B, BH19A, BH19B, BH19C, BH20A, BH20B, BH21A, BH21B, BH23, BH24, BH27-BH36 and NRA3	Quarterly	Water level, DO, pH, EC, NH_4, Cl, Ca, Mg, K, Na, Alkalinity, TOC, SO_4, TON, phenol and Cd
	Annually	As quarterly plus Cr, Cu, Fe, Pb, Mn, Ni and Zn.
Area 3 BH1, BH15, BH18A, BH18B, BH19A, BH19B, BH19C, BH20A, BH20B, BH21A, BH21B, BH23, BH24, BH27-BH36 and NRA3	Monthly	Level, Temperature, pH, EC, NH_4, Cl and DO.
	Quarterly	As monthly plus Ca, Mg, K, Na, Alkalinity, TOC, SO_4, TON, phenol and Cd.
	Annually	As quarterly plus Cr, Cu, Fe, Pb, Mn, Ni and Zn.

1.3 Surface Water Monitoring

Surface water quality is monitored six-monthly in Area 2 and monthly in Area 3 at locations SW1, SW2 and SW3 as required by EP ref: PP3294FJ/V008 and EP ref: GP3330BY, respectively. The surface water sampling regime is identified in Table 1.3. Weekly observations of the appearance of the water are also made at locations SW1 and SW3. Sampling of the discharge from a pipe near to location SW1 has also been included in the monitoring regime since October 2011. Since the installation of the new interceptor, both sampling points SW1 and SW1 (pipe) have been relocated westwards, to the discharge point of the new operational interceptor (see Figure 1.1). Sampling at this new location began in December 2012.

Table 1.3 Surface Water Monitoring Regime

Monitoring Location	Frequency	Parameter
Area 2 **SW1, SW2 and SW3**	Six-monthly	Cl, COD, DO, EC, NH_4, pH and Temperature.
Area 3 **SW1*, SW2 and SW3**	Monthly	Cl, COD, DO, EC, NH_4, pH and Temperature.

*Discharge from pipe adjacent to SW1 also sampled if flowing.

1.4 Landfill Gas Monitoring

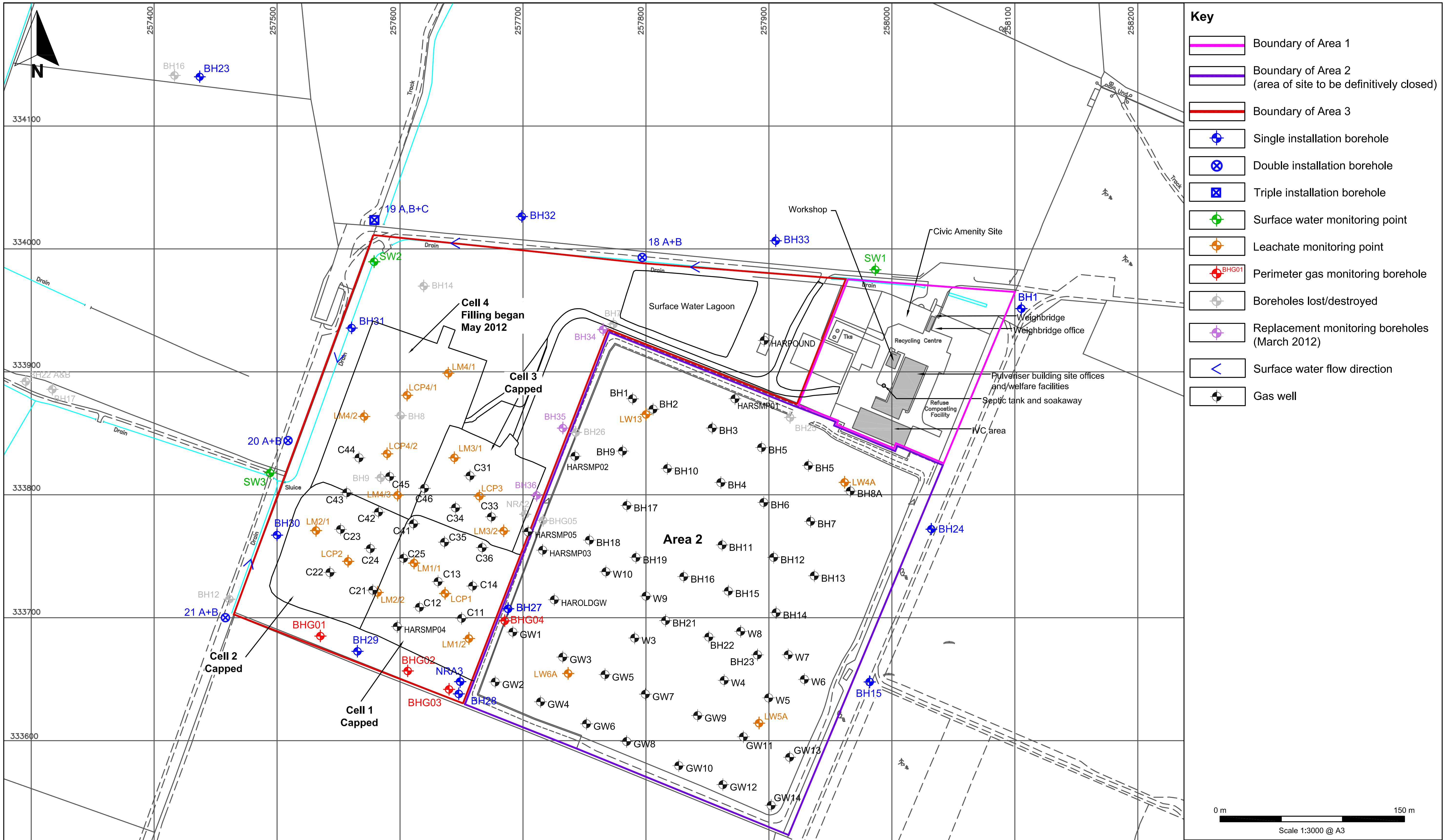
Landfill gas is monitored in boreholes located around the site perimeter: two locations for Area 2 and five locations for Area 3 as required by EP ref PP3294FJ/V008 and EP ref GP3330BY, respectively. The gas monitoring regime is shown in Table 1.4.

Table 1.4 Gas Monitoring Regime

Monitoring Location	Frequency	Parameter
Area 2 BHG03 and BHG04	Six-monthly	Methane and carbon dioxide.
Area 3 BHG01 to BHG05	Monthly	Methane and carbon dioxide.

Note: Borehole BHG05 has been destroyed.

The locations of all monitoring points are shown on Figure 1.1. In addition, records of meteorological data for the site are kept, which include temperature, rainfall and wind speed. These are included in Appendix H.


N
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333700
333600
333500
333400
BH16
BH23
Track
19 A,B+C
BH32
18 A+B
BH33
Workshop
Civic Amenity Site
SW1
SW2
Drain
BH14
Cell 4
Filling began
May 2012
BH31
Surface Water Lagoon
BH7
BH34
HARPOUND
Recycling Centre
BH1
Weighbridge
Weighbridge office
Cell 3
Capped
LM4/1
LCP4/1
BH22 A&B
BH17
LM4/2
BH8
BH35
BH26
BH1
BH2
LW13
HARSMP01
BH25
Pulveriser building site offices
and welfare facilities
Septic tank and soakaway
Refuse Composting Facility
IVC area
20 A+B
C44
LCP4/2
LM3/1
BH9
HARSMP02
BH3
BH5
BH10
BH5
SW3
Sluice
BH9
C45
C31
BH36
LW4A
BH8A
BH4
C43
LM4/3
C46
LCP3
C33
NRA2
BH17
BH6
C42
C34
BHG05
BH7
BH30
LM2/1
C23
C41
LM3/2
HARSMP05
BH18
Area 2
BH11
C35
C25
C24
C36
HARSMP03
BH19
BH12
LCP2
LM1/1
C22
C13
W10
BH16
BH13
C14
C21
BH15
BH12
LM2/2
LCP1
C12
HAROLDGW
W9
BH27
21 A+B
C11
BHG04
BH21
BH14
BHG01
HARSMP04
GW1
W3
W8
BH29
LM1/2
BH22
Cell 2
Capped
BHG02
GW3
BH23
W7
NRA3
LW6A
GW5
W4
W6
BH24
BH15
GW2
BH28
GW7
W5
BHG03
GW4
Cell 1
Capped
GW9
LW5A
GW6
GW8
GW11
GW13
GW10
GW12
GW14
Key
Boundary of Area 1
Boundary of Area 2
(area of site to be definitively closed)
Boundary of Area 3
Single installation borehole
Double installation borehole
Triple installation borehole
Surface water monitoring point
Leachate monitoring point
BHG01
Perimeter gas monitoring borehole
Boreholes lost/destroyed
Replacement monitoring boreholes
(March 2012)
Surface water flow direction
Gas well
0 m
150 m
Scale 1:3000 @ A3

Gwynedd Council
Ffridd Rasus Landfill Quarterly Monitoring Report

Figure 1
Monitoring Locations

March 2015
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2. Leachate and Groundwater Levels

2.1 Leachate Levels

Area 2

Monitoring points LW4A, LW5A, LW6A or LW13 have been dry for a long period and continued to be dry in this reporting period.

Area 3

Time-series plots for weekly leachate levels since January 2011 are shown in Appendix A. A summary of the leachate levels measured during the period October to December 2014 is presented in Table 2.1. The data show:

- Cell 1: levels increased from 0.95 in October to 1.11 m above base by the end of December;
- Cell 2: levels increased from 0.96 in October to 1.14 m above base by the end of December;
- Cell 3: levels increased from 0.93 in October to 1.15 m above base by the end of December;
- Cell 4A: levels showed some variability with an overall increase from 0.93 in October to 1.23 m above base by the end of December;
- Cell 4B: levels showed some variability but generally increased from 0.79 in mid-October to 1.04 m above base by the end of December.

Leachate levels in this reporting period show a small increase but remained within the range of values measured in previous monitoring and were below the EP leachate head limit of 1.5 m. We understand that there was no leachate pumping from Cells 1 to 3 in November and December and from Cells 4A and 4B in November which is consistent with the small rise in leachate levels.

Table 2.1 Leachate Head Measurements for October to December 2014

Date	Leachate Head (m above base)				
	Cell 1	**Cell 2**	**Cell 3**	**Cell 4A**	**Cell 4B**
	LCP1	**LCP2**	**LCP3**	**LCP4/2**	**LCP4/B**
06/10/2014	0.95	0.96	0.93	0.93	0.82
13/10/2014	0.99	0.97	0.94	1.03	0.79
20/10/2014	1.05	0.97	0.96	0.96	0.87
27/10/2014	1.06	1.00	0.98	1.09	0.89
03/11/2014	1.06	1.02	1.00	1.10	0.94
10/11/2014	1.08	1.06	1.04	1.07	0.95
17/11/2014	1.09	1.08	1.08	1.07	0.91
24/11/2014	1.09	1.10	1.10	1.09	0.93
01/12/2014	1.09	1.11	1.11	1.11	0.95
08/12/2014	1.10	1.12	1.12	1.12	0.95
15/12/2014	1.10	1.12	1.13	1.15	0.95
29/12/2014	1.11	1.14	1.15	1.23	1.04
Historical Range (min-max)	*0.88 – 1.35*	*0.7 – 1.48*	*0.51 – 1.49*	*0.12 – 1.46*	*0.53 – 1.42*

2.2 Groundwater Levels

Table 2.2 shows the range of groundwater levels recorded during the period October to December 2014. Groundwater level data since February 2000 is presented graphically in Appendix B. The groundwater hydrographs have been split into three groups for ease of presentation as follows:

- Boreholes drilled prior to 2004;
- Boreholes drilled during 2004; and
- Boreholes drilled during 2006 and 2012.

Table 2.2 Summary of Groundwater Level Data October to December 2014

Borehole	Groundwater Level (m AOD)[a]			Groundwater Level Historical Range (m AOD)[a, b]	
	October	November	December	Min	Max
BH1	5.5	5.69	5.74	5.35	7.30
BH15	5.74	5.85	5.86	5.19	7.65
BH18A	4.34	4.93	4.54	4.29	5.88
BH18B	4.98	5.57	5.14	4.63	5.87
BH19A	4.16	4.58	4.28	3.48	5.02
BH19B	4.19	4.61	4.27	4.07	5.17
BH19C	4.12	4.57	4.28	3.98	5.12
BH20A	4.10	4.25	4.09	3.28	5.07
BH20B	4.08	4.20	4.05	3.00	5.07
BH21A	4.21	4.39	4.10	3.46	4.87
BH21B	4.07	4.43	4.08	3.79	4.9
BH23	3.06	3.47	3.07	2.87	4.47
BH24	4.99	5.17	5.30	4.77	6.86
BH27	4.42	4.51	4.60	4.19	5.46
BH28	4.54	4.69	4.78	4.33	5.76
BH29	4.33	4.37	4.52	4.03	5.59
BH30	3.84	4.04	3.90	3.73	4.54
BH31	4.02	4.24	4.07	3.81	4.51
BH32	4.02	4.56	4.19	3.85	5.78
BH33	4.82	5.26	5.16	4.76	6.71
NRA3	4.55	4.64	4.75	4.32	6.26
BH34	5.37	5.43	5.64	5.01	6.25
BH35	5.29	5.58	5.50	5.02	6.22
BH36	5.17	5.30	5.42	4.93	6.16

Note: a) Monthly monitoring data; b) Data for February 2000 to September 2014.

During the latest monitoring period, groundwater levels generally recorded increasing levels, with some recording falling levels in December. The seasonal behaviour in groundwater levels is consistent with previous data and is likely to reflect increased recharge over the winter months. Rainfall records from the site rain gauge show several periods of high rainfall during latest monitoring period compared to the previous quarter (Appendix H). Rainfall monthly totals for July, August and September were 20.8, 73.4 and 12.7 mm, respectively, compared to 167, 116 and 121 mm, in October, November and December, respectively.

3. Leachate Quality

3.1 Area 2

Monitoring points LW4A, LW5A, LW6A and LW13 in Area 2 were dry in the latest quarter and therefore samples could not be obtained. Data collected during the period 2006-2008 indicated an improving trend in leachate quality in this area of the site, as shown on the data plots in Appendix A. More recent data have not been collected since the monitoring points have been dry for a long period following capping of Area 2.

3.2 Area 3

Representative analytical results of the leachate quality monitoring during the latest quarter are presented in Table 3.1 and graphically in Appendix A, where they are included with long term leachate quality data. Laboratory analytical data sheets are included in Appendix D. Ammoniacal-nitrogen and chloride concentrations remained within the range of historical data except in Cell 4A where ammoniacal-nitrogen (2130 mg/l in October and 2230 mg/l in December) and chloride (2230 mg/l in October and 2340 mg/l in December) exceeded the previous maximum (1890 mg/l and 2170 mg/l in July 2014, respectively). This is consistent with Cell 4A having the most recently deposited waste.

Table 3.1 Selected Leachate Quality Results October to December 2014

Cell	Date	pH	Temperature (°C)	Electrical Conductivity (µS/cm)	Ammoniacal-Nitrogen (mg/l)	Chloride (mg/l)
Cell 1 (LCP1)	Oct 2014	7.7	18.6	9540	742	988
	Nov 2014	n.m.	n.m.	n.m.	n.m.	n.m.
	Dec 2014	7.8	19.3	9390	800	988
Cell 2 (LCP2)	Oct 2014	7.8	21.4	15900	1600	1660
	Nov 2014	n.m.	n.m.	n.m.	n.m.	n.m.
	Dec 2014	7.8	21.1	15400	1460	1620
Cell 3 (LCP3)	Oct 2014	7.6	22.4	12500	1200	1310
	Nov 2014	n.m.	n.m.	n.m.	n.m.	n.m.
	Dec 2014	7.8	24.2	12900	1160	1360
Cell 4A (LCP4)	Oct 2014	7.9	24.2	20000	2130	2230
	Nov 2014	n.m.	n.m.	n.m.	n.m.	n.m.
	Dec 2014	8	25.3	20700	2230	2340

Note: n.m. not measured.

4. Groundwater Quality

4.1 Monitoring Regime

Analytical results of the groundwater quality monitoring (ammoniacal nitrogen, chloride, cadmium and temperature) during the latest quarter are summarised in Table 4.1 and shown graphically in Appendix C, where they are included with long term groundwater quality data. Laboratory analytical data sheets are included as Appendix D. The groundwater monitoring boreholes have been split into three groups for ease of presentation as follows:

- Boreholes drilled prior to 2004 - BH1, BH15 and NRA3;
- Boreholes drilled during 2004 - BH18A, BH18B, BH19A, BH19B and BH19C, BH20A, BH20B, BH21A, BH21B, BH23 and BH24. Ammoniacal nitrogen concentrations for boreholes BH20A, BH20B, BH21A and BH21B have been graphed separately as concentrations are higher than in other boreholes within this group; and
- Boreholes drilled during 2006 (BH27 to BH33) and 2012 (BH34 to BH36).

Table 4.1 Selected Groundwater Quality Data October to December 2014

Borehole	Ammoniacal Nitrogen (mg/l)			Chloride (mg/l)			Cadmium (mg/l)			Temperature (°C)		
	Oct	Nov	Dec	Oct	Nov	Dec	Oct	Nov	Dec	Oct	Nov	Dec
Upgradient of Areas 2 and 3												
BH1	<0.27	<0.27	<0.27	28.3	30.5	35.8	<0.0006	-	-	13.1	12	11.8
BH15	<0.27	<0.27	<0.27	24.2	20.1	18.3	<0.0006	-	-	12.8	11.8	11.8
BH24	<0.27	<0.27	<0.27	30.7	30.0	30.2	<0.0006	-	-	10.9	10.4	11
Downgradient of Area 2 and Upgradient of Area 3												
BH27	172	173	168	273	268	253	0.0025	-	-	16	15.4	16.3
BH34	0.45	0.89	0.5	38.9	51.0	49.8	0.0018	-	-	12.3	11.4	12.1
BH35	12.8	22.9	1.79	103	168	62.4	0.0007	-	-	14.8	13.4	12.9
BH36	122	86.8	99.8	193	174	174	0.0015	-	-	15.5	14.2	15.1
NRA3	1.05	2.92	5.36	25.2	23.8	38	<0.0006	-	-	13.1	11.8	12.6
Lateral to Groundwater Flow												
BH18A	<0.27	<0.27	<0.27	37.5	41.1	42.1	0.0008	-	-	11.9	12.2	11.8
BH18B	<0.27	5.88	<0.27	41.7	47.7	39.8	<0.0006	-	-	12.8	12.9	12.2
BH28	<0.27	<0.27	<0.27	25.6	18.3	18.7	<0.0006	-	-	12.1	11.5	11.7
BH29	0.93	1.89	0.83	16.0	17.8	13.8	<0.0006	-	-	14.5	11.4	11.9

Borehole	Ammoniacal Nitrogen (mg/l)			Chloride (mg/l)			Cadmium(mg/l)			Temperature (°C)		
	Oct	Nov	Dec	Oct	Nov	Dec	Oct	Nov	Dec	Oct	Nov	Dec
Lateral to Groundwater Flow												
BH32	<0.27	<0.27	<0.27	21.4	17.4	36.2	0.0007	-	-	13.1	12.5	12.4
BH33	<0.27	<0.27	<0.27	13.8	14.7	15.2	<0.0006	-	-	12.8	12.8	12.5
Downgradient of Areas 2 and 3												
BH19A	0.88	0.31	<0.27	23.2	17.0	38.8	0.0012	-	-	11.5	11.5	10.9
BH19B	0.59	<0.27	<0.27	213	87.4	85.1	<0.0006	-	-	12.8	12.1	11.5
BH19C	3.25	1.08	<0.27	200	252	209	0.0007	-	-	12.7	13	12.4
BH20A	76.6	77.2	26.9	439	486	134	0.0015	-	-	12	12.2	11.8
BH20B	196	197	59.8	390	363	154	0.0015	-	-	12.5	12.7	12.5
BH21A	36.3	21.9	71.8	109	108	447	0.0008	-	-	10.7	10.5	10.1
BH21B	24.9	41.3	207	120	141	367	0.0012	-	-	10.6	10.9	10.2
BH23	<0.27	0.53	<0.27	16.8	16.6	15.9	0.0008	-	-	11.6	11.9	11.8
BH30	176	172	175	292	302	300	0.0023	-	-	16.9	16.7	16.6
BH31	84.2	77.2	69.3	55.2	51.3	46.6	0.0019	-	-	13.1	13.2	12.8

Notes: Monthly monitoring for ammoniacal-nitrogen, chloride and temperature and quarterly monitoring for cadmium. n.m.- not measured.

4.2 Upgradient Boreholes

Boreholes BH1, BH15 and BH24 are upgradient of Areas 2 and 3 and provide an indication of background groundwater quality. Boreholes BH27, BH34 to BH36 and NRA3 are downgradient of Area 2 and upgradient of Area 3 and provide an indication of potential impact from Area 2 (Figure 1.1). Data for ammoniacal nitrogen, chloride and cadmium at the upgradient boreholes for the latest quarter show that (Table 4.1):

- Local background groundwater quality (BH1, BH15 and BH24):
  - Ammoniacal nitrogen concentrations continue to be below the laboratory detection limit (<0.27 mg/l);
  - Chloride concentrations continue to be low and broadly consistent with previous measurements. Borehole BH15 continues to show lower concentrations than boreholes BH1 and BH24;
  - Cadmium concentrations continue to be below the laboratory detection limit (<0.0006 mg/l).
- Groundwater quality downgradient of Area 2 and upgradient of Area 3 (BH27, BH34 to BH36 and NRA3):
  - Concentrations of ammoniacal nitrogen, chloride and cadmium continue to be above local background concentrations at boreholes BH27, BH35 and BH36 within the central part of the downgradient boundary of Area 2. This represents migration of contaminated groundwater from Area 2.
  - The most elevated ammoniacal nitrogen and chloride concentrations continue to be recorded at BH27 but show a downward trend;
  - Ammoniacal nitrogen and chloride concentrations continue to show increasing concentrations southwards from boreholes BH34, BH35 and BH36 towards borehole BH27.

4.3 Boreholes Situated Lateral to the Groundwater Flow Direction

Boreholes BH18A and BH18B, BH28, BH29, BH32 and BH33 are situated lateral to the groundwater flow direction (Figure 1.1). Data for ammoniacal nitrogen, chloride and cadmium at these boreholes for the latest quarter show that (Table 4.1):

- Concentrations continue to be generally consistent with the results of previous monitoring;
- There is little or no evidence of contamination except for the slightly elevated-above-baseline chloride concentrations (37.5-47.7 mg/l above typical baseline of about 25 mg/l) which continue to be measured in boreholes BH18A and BH18B. These are associated with leaching from marine dredgings used as part of the engineered cap to Area 2 (dredgings produced a saline runoff during wet periods, with the discharge to the surface water lagoon resulting in an impact on groundwater quality as measured in the nearby boreholes BH18A and BH18B). Over time this effect is diminishing;
- Ammoniacal-nitrogen concentrations continue to be within local background levels except for BH29, on the southern edge of Area 3, which continues to show slightly higher concentrations (0.83-1.89 mg/l) consistent with historical data. Concentrations at BH18B showed an isolated peak of 5.88 mg/l in November.

4.4 Downgradient Boreholes

Boreholes BH19 (A, B and C), BH20 (A and B), BH21 (A and B), BH30 and BH31 are downgradient of Areas 2 and 3. Data for ammoniacal nitrogen, chloride and cadmium at these boreholes for the latest quarter show that (Table 4.1) all of the boreholes downgradient of Areas 2 and 3 are contaminated to some

degree by leachate from the unlined Area 2 landfill. The highest ammoniacal-nitrogen and chloride concentrations on the downgradient edge of Area 2 (and upgradient of Area 3) continue to be recorded at BH27 but concentrations show a downward trend. Boreholes BH20A, BH20B and BH30, located about 200 m downgradient of BH27, continue to record elevated concentrations, sometimes exceeding those at BH27, indicating downgradient movement of the leachate plume from Area 2. There were significant increases in both ammoniacal nitrogen and chloride concentrations in both BH21A and BH21B in December 2014.

4.5 Groundwater Trigger Levels

The groundwater trigger levels (Table 4.2) for ammoniacal-nitrogen and chloride specified in the EP (ref GP3330BY) for Areas 1 and 3 were exceeded in the reporting period as follows (monthly reporting):

- BH19A – chloride trigger level (29 mg/l) in December (38.8 mg/l);
- BH19B – chloride trigger level (28 mg/l) in October (213 mg/l), November (87.4 mg/l) and December (85.1 mg/l);
- BH19C – ammoniacal-nitrogen trigger level (3 mg/l) in October (3.25 mg/l). Chloride trigger level (30 mg/l) in October (200 mg/l), November (252 mg/l) and December (209 mg/l);
- BH20A – ammoniacal-nitrogen trigger level (5 mg/l) in October (76.6 mg/l), November (77.2 mg/l) and December (26.9 mg/l). Chloride trigger level (310 mg/l) in October (439 mg/l) and November (486 mg/l); and
- BH21A – ammoniacal-nitrogen trigger level (5.1 mg/l) in October (36.3 mg/l), November (21.9 mg/l) and December (71.8 mg/l). Chloride trigger level (270 mg/l) in December (447 mg/l);
- BH21B – ammoniacal-nitrogen trigger level (69.7 mg/l) in December (207 mg/l).

The groundwater trigger levels (Table 4.2) for ammoniacal-nitrogen and chloride specified in the EP (ref PP3294FJ) for Area 2 and Civic Amenity, were exceeded in the reporting period as follows (6-monthly reporting):

- BH19B - chloride trigger level (34 mg/l) in October (213 mg/l);
- BH19C - chloride trigger level (34 mg/l) in October (200 mg/l) and ammoniacal-nitrogen trigger level (3 mg/l) in October (3.25 mg/l);
- BH20A - ammoniacal-nitrogen trigger level (5 mg/l) in October (76.6 mg/l).

Cadmium concentrations in the reporting period continue to be below the trigger level (5.5 µg/l) specified in the EP for Area 2 and Civic Amenity (ref PP3294FJ) and for Areas 1 and 3 (ref GP3330BY).

Table 4.2 EP Trigger Levels for Groundwater Quality

Borehole	**EP (ref PP3294FJ) Trigger Levels for Area 2 and Civic Amenity**			**EP (ref GP3330BY) Trigger Levels for Areas 1 & 3**		
	Chloride (mg/l)	Ammoniacal Nitrogen (mg/l)	Cadmium (µg/l)	Chloride (mg/l)	Ammoniacal Nitrogen (mg/l)	Cadmium (µg/l)
Reporting Frequency	6 Monthly	6 Monthly	6 Monthly	Monthly	Monthly	Quarterly
BH19A	250	3.6	5.5	29	3.6	5.5
BH19B	34	3.0	5.5	28	3.0	5.5
BH19C	34	3.0	5.5	30	3.0	5.5
BH20A	504	5.0	5.5	310	5.0	5.5

Borehole	EP (ref PP3294FJ) Trigger Levels for Area 2 and Civic Amenity			EP (ref GP3330BY) Trigger Levels for Areas 1 & 3		
	Chloride (mg/l)	Ammoniacal Nitrogen (mg/l)	Cadmium (μg/l)	Chloride (mg/l)	Ammoniacal Nitrogen (mg/l)	Cadmium (μg/l)
BH20B	504	230	5.5	424	230	5.5
BH21A	387	266	5.5	270	5.10	5.5
BH21B	215	69.7	5.5	411	69.7	5.5
BH29	19.8	19.8	5.5	-	-	-
BH30	504	266	5.5	-	-	-
BH31	179	102	5.5	-	-	-

The Groundwater Contingency Action Plan for the site (AMEC report reference: 04602N1857) details measures to be taken in the event that trigger levels are exceeded. Notices of the EP trigger levels exceedances were provided to the NRW by the submission of Schedule 6 notifications. Copies of these are included in Appendix E. These exceedances continue to reflect variability in the data associated with contaminant migration from the unlined landfill Area 2 as discussed below:

- EP trigger levels for chloride continue to be exceeded at boreholes BH19A, BH19B and BH19C (EP ref GP3330BY), in the northwest corner of Area 3, which monitor the sand aquifer at different depths. These elevated concentrations, above typical baseline values and the EP trigger levels, reflect the downgradient migration of a leachate plume derived from the unlined Area 2. Review of the monitoring data for the latest quarter indicates that:
  - Chloride and ammoniacal-nitrogen concentrations at the shallowest installation BH19C increased to 252 mg/l in November and 3.25 mg/l in October, respectively, in exceedance of the EP trigger levels (30 mg/l and 3 mg/l, respectively, EP ref GP3330BY);
  - Chloride concentrations at the mid-depth installation BH19B (85.1-213 mg/l) continue to exceed the EP trigger level (28 mg/l in EP ref GP3330BY) but remained within historical data (16-227 mg/l). Ammoniacal-nitrogen concentrations continue to be low (<0.27-0.59 mg/l); and
  - Chloride concentrations at the deepest installation BH19A increased to 38.8 mg/l in December exceeding the trigger level (29 mg/l in EP ref GP3330BY) and typical baseline (about 15 mg/l). Ammoniacal-nitrogen concentrations at this borehole remained below the trigger level (3.6 mg/l ref GP3330BY) and decreased to below detection limit (<0.27 mg/l) in December;
- Ammoniacal-nitrogen (26.9-77.2 mg/l) and chloride (134-486 mg/l) concentrations at BH20A continue to show an upward trend and exceed the trigger levels (5.0 mg/l and 310 mg/l, respectively in EP ref GP3330BY). This is associated with the downgradient migration of a leachate plume originating from Area 2;
- Ammoniacal-nitrogen and chloride concentrations at BH21A increased to 71.8 mg/l and 447 mg/l, respectively, in December and exceed the trigger levels of 5.1 mg/l and 270 mg/l, respectively (EP ref GP3330BY). This reflects the downgradient migration of a leachate plume originating from Area 2.

Overall, the leachate plume derived from Area 2 is having an impact on groundwater quality downgradient of Areas 2 and 3. The development of the site, including capping and associated drainage of completed areas is likely to also be affecting groundwater quality. However, the overall effect on groundwater quality is expected to be a continued improvement due to a combination of the following:

- Reduced leachate generation due to restricted infiltration following capping of Area 2;

- Reduction in leachate concentration as a result of waste stabilisation; and
- Dilution by groundwater migrating beneath the landfill from the east.

Leachate and groundwater quality will continue to be monitored. The Contingency Action Plan for the site (Table 4.1 in Closure Report, May 2007) identifies a number of actions subject to the number of exceedances of groundwater control and trigger limits, including review of monitoring information, review of conceptual model assumptions and review of existing control and trigger limits. The trigger levels will be reviewed in the site's Hydrogeological Risk Assessment Update due in 2015.

4.6 Temperature Measurements

Temperature measurements for this quarter are consistent with seasonal trends, recording deceasing values in all monitoring locations (Appendix C). There is no major variability in temperature measurements between upgradient/lateral boreholes and downgradient boreholes with the following exceptions:

- Borehole BH27 (downgradient of Area 2 only), which has consistently recorded temperatures up to 5ºC higher than most of the other monitoring locations, possibly reflecting ongoing waste degradation activity in Area 2 of the landfill;
- Borehole BH30, on the western edge of Area 3, which also records temperatures 3-6°C higher than most other locations. This borehole is downgradient of borehole BH27; and
- Boreholes BH35 and BH36 (downgradient of Area 2 only), the more southerly of the boreholes on the downgradient edge of Area 2, have continued to record temperatures that are slightly higher than most other locations (except boreholes BH27 and BH30).

5. Surface Water Quality

Surface water monitoring is a requirement of the EP for Areas 2 and 3 at monitoring locations SW1, SW2 and SW3 (Section 1.3). SW1 is located in the vicinity of the site's permitted discharge and SW2 and SW3 are located in the ditch to the west (downstream) of Area 3, as shown on Figure 1.1. As a consequence of some contamination identified in this part of the site in late 2010, in addition to the regular sampling at location SW1, samples are also taken whenever possible from the pipe which discharges to the drain near this point. The pipe discharges surface water runoff from hardstanding around the site buildings in Area 1 after it has passed through an oil water separator.

Analytical results for ammoniacal nitrogen, chloride, electrical conductivity (EC) and temperature in the last quarter are summarised in Table 5.1 and presented (excluding EC but including chemical oxygen demand (COD)) graphically combined with long term water quality data in Appendix F. The data for the latest quarter show that:

- Ammoniacal-nitrogen concentrations at SW1 decreased from 11.6 mg/l in October to 3.52 mg/l in November before increasing again to 6.47 mg/l in December. Chloride measurements show a similar trend and ranged between 20.4 and 22.2 mg/l. In general concentrations remained within historical data. Similar concentrations were measured at the adjacent pipe discharge;
- Ammoniacal-nitrogen and chloride concentrations at SW2 continue to show elevated peaks (6.52 mg/l in November and 148 mg/l in October, respectively) exceeding baseline (average concentrations of <0.3 mg/l for ammoniacal-nitrogen in 2005 to 2012 and 23 mg/l for chloride in 2005-2009). There are a number of possible explanations for the increased concentrations at SW2 which are under investigation including:
  - Former storage of compost taken from the IVC facility which ceased operation in 2013 (some site derived compost has been applied to the Cell 4 final capped soil profile);
  - Sludge spraying and muck spreading on adjacent agricultural land;
  - Saline groundwater baseflow contribution to the perimeter ditch during periods of high groundwater levels: groundwater quality in the northern part of the site (cross-gradient to the landfill) has been affected, particularly during 2011 to 2013, by the passage of a saline "slug" associated with runoff from the marine dredgings used as part of the engineered cap to Area 2. The elevated chloride peaks recorded at SW2 since 2012 are likely to reflect baseflow of saline groundwater (time-series charts in Appendix F). The occasional ammoniacal-nitrogen peaks in SW2 in 2013-2014 (24.6 mg/l in August 2013, 15.3 mg/l in December 2013, 6.4 mg/l in July 2014 and 6.52 mg/l in November 2014) may be associated with desorption of ammoniacal-nitrogen from the sand aquifer by potassium (ion exchange) associated with the saline "slug";
- Ammoniacal nitrogen at SW3 show variability but remained within historical range. Concentrations decreased from the elevated peak of 3.7 mg/l recorded in July to 1.15 mg/l in October and then increased to 3.85 mg/l in November before falling again in December to below detection limit (<0.27 mg/l). Chloride concentrations decreased from the elevated peak of 223 mg/l recorded in August to 50.1 mg/l in December;
- Temperature measurements are consistent with seasonal trends, showing a downward trend during the winter in all monitoring locations. There is little difference between the values measured across monitoring locations except for SW1 which shows slightly higher values since July 2014; and
- Observations of the state of the water at locations SW1 (Area 1 discharge) and SW3 (site discharge near sluice) are made on a weekly basis, as specified in Table S4.3 of the EP. Site records of these observations are included with the surface water quality plots in Appendix F.

Table 5.1 Summary of Surface Water Quality October to December 2014

Determinand	**SW1**			**Pipe Adjacent to SW1**			**SW2**			**SW3**		
	Oct	**Nov**	**Dec**	**Oct**	**Nov**	**Dec**	**Oct**	**Nov**	**Dec**	**Oct**	**Nov**	**Dec**
Ammoniacal Nitrogen (mg/ l)	11.6	3.52	6.47	11.0	3.35	dry	0.41	6.52	<0.27	1.15	3.85	<0.27
Chloride (mg/l)	22.2	20.4	21.9	21.9	19.6	dry	72.6	148	3.13	149	63.0	50.1
Electrical Conductivity (µS/cm)	292	246	307	292	243	dry	641	1060	45.6	1320	733	637
Temperature (°C)	14.4	12.3	10.0	14.1	12.1	dry	8.7	11.3	7.2	11.5	11.8	6.7

6. Landfill Gas

6.1 Perimeter Gas Monitoring

Landfill gas monitoring in the perimeter boreholes is a requirement of the EP for Area 3 to identify any off site migration. Monitoring results for Boreholes BG01 to BG04 for the latest monitoring quarter are presented in Table 6.1 together with trigger limits for methane and carbon dioxide. These show levels consistent with previous monitoring and show no evidence of off-site landfill gas migration. None of the trigger limits were exceeded during the reporting period.

Table 6.1 Results of Perimeter Landfill Gas Monitoring October to December 2014

Date	**BHG01**			**BHG02**			**BHG03**			**BHG04**		
	CH4 (%v/v)	**CO2 (%v/v)**	**O2 (%v/v)**	**CH4 (%v/v)**	**CO2 (%v/v)**	**O2 (%v/v)**	**CH4 (%v/v)**	**CO2 (%v/v)**	**O2 (%v/v)**	**CH4 (%v/v)**	**CO2 (%v/v)**	**O2 (%v/v)**
16/10/2014	0	0.6	20.6	0	0.4	20.8	0.1	1.3	20	0.1	0.1	21.1
18/11/2014	0.2	0.7	21	0.2	0.6	20.8	0.2	2.6	19.1	0.2	0.1	21.1
09/12/2014	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.
Trigger Limits	*1*	*1.5*	*-*	*1*	*1.6*	*-*	*1*	*5.1*	*-*	*14.8*	*11.1*	*-*

n.m.- not measured

6.2 In-Waste Gas Monitoring (Area 3)

Gas monitoring has also been carried out within Area 3 in accordance with the site EP. Monitoring during this reporting period was from combined leachate and gas monitoring wells (LM1/1 and LM1/2 in Cell 1, LM2/1 and LM2/2 in Cell 2 and LM3/1 in Cell 3, LM4/2 in Cell4A, leachate manholes (LCP1, LCP2, LCP3, LCP4A and LCP4B in Cells 1, 2, 3, 4A and 4B, respectively) and gas wells (C11 to C14 in Cell 1, C21 to C25 in Cell 2, C31 to C36 in Cell 3, C41 to C46 in Cell 4A and C51 to C57 in Cell 4B).

The results of the gas monitoring undertaken during the latest monitoring period are presented in Tables 6.2 to 6.6. The data show that wastes in Cells 1, 2, 3, 4A and 4B are continuing to produce landfill gas with methane and carbon dioxide concentrations recently up to 70.5% v/v and 25.9% v/v respectively in Cell 1, 66.7% v/v and 36.5% v/v respectively in Cell 2, 63.4% v/v and 41.5% v/v respectively in Cell 3, 64.6% v/v and 42.4% v/v respectively in Cell 4A and 64.2% v/v and 42.5% v/v respectively in Cell 4B. Concentrations were generally within historical ranges for all locations and parameters. The gas balancing data is provided in Appendix G.

Table 6.2 Cell 1 In-Waste Landfill Gas Monitoring Results October to December 2014

Date	**AP (mb)**	**LCP01**				**LM1/1**				**LM1/2**			
		CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO
16/10/2014	1008 – 1012	37	21	0.7	1.0	10.7	20.9	0.2	1.0	0.1	2.8	18.3	0
10/11/2014	997 - 1006	70.5	25.9	0.1	1.0	12.9	20.9	0.5	4.0	0.2	7.9	11.7	0
09/12/2014	1018	6.9	17.3	0.6	1.0	2.2	15	4.3	5.0	0	3.3	15.8	1.0

Date	**AP (mb)**	**C11**				**C12**				**C13**				**C14**			
		CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO
16/10/2014	1008-1014	37.5	23.3	0	2.0	35.9	22.4	0	3.0	41.5	23.4	0	2.0	23.8	20.5	0.9	7.0
10/11/2014	1000 - 1002	29.6	22.5	0	4.0	25.6	22.1	0	4	40.3	25.4	0.1	4	33.1	23.1	0.3	8
09/12/2014	1018	20.9	20.8	0.4	4.0	11.3	19.6	0.1	8.0	18.8	20.3	0.6	4.0	12.1	15.5	3.8	13

Notes: AP- Atmospheric Pressure.
CH4, CO2 and O2 in %v/v and CO in ppm.

Table 6.3 Cell 2 In-Waste Landfill Gas Monitoring Results October to December 2014

Date	AP (mb)	LCP02				LM2/1				LM2/2				C21			
		CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO
16/10/2014	1008-1012	51.3	34.3	1.1	3.0	16.4	21.6	0.3	2.0	7.7	16.3	5.2	1.0	66.7	32.5	0.2	5.0
10/11/2014	997 - 1006	49.3	34.3	1.3	5.0	64.7	39.2	0.1	6.0	3.6	13.4	6.9	3.0	25.4	25.3	0.2	4.0
09/12/2014	1014-1018	32.7	27.9	1.4	3.0	18.2	23.2	0.7	8.0	45.2	31.7	0.1	6.0	65.5	31.2	0.6	4.0
Date	**AP (mb)**	**C22**				**C23**				**C24**				**C25**			
		CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO
16/10/2014	1008-1014	60.7	36.2	0.7	4.0	35.9	32.5	0	11	35.7	23.1	8.1	4.0	51.8	32.8	0.2	6.0
10/11/2014	999 - 1005	38.0	30.8	1.4	4.0	53.3	36.5	0	12	28.2	17.9	11.5	3.0	38.7	30.6	0.1	5.0
09/12/2014	1014-1018	61.2	35.8	0.7	3.0	19.3	25	0	4.0	39	29.4	3.1	6.0	14.9	21.8	0.3	5.0

Notes: AP- Atmospheric Pressure.
CH4, CO2 and O2 in %v/v and CO in ppm

Table 6.4 Cell 3 In-Waste Landfill Gas Monitoring Results October to December 2014

Date	AP (mb)	LCP03				LM3/1				C31				C32			
		CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO
16/10/2014	1007-1009	53.1	34.9	2.8	2.0	6.6	14.3	7.6	8.0	51.4	37.7	0	19	0.6	0.8	21.2	3.0
10/11/2014	997 - 1003	53.8	36.3	2.7	3.0	63.4	41.2	0	5.0	54.5	37.8	0	17	16.9	11.3	12.8	6.0
09/12/2014	1013-1020	36.1	30.8	0.8	3	41.7	33.3	1.1	7.0	36.2	31.5	0.1	10	0.6	0.7	21.2	1.0
Date	**AP (mb)**	**C33**				**C34**				**C35**				**C36**			
		CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO
16/10/2014	1007-1009	21.8	26.9	0.3	5.0	37.4	32.9	0	8	33.8	29.1	0.3	5.0	12.4	2.0	0.4	6
10/11/2014	996 - 1003	58.9	38	0.3	7.0	62.9	39.6	0	31	61.2	41.5	0.2	6.0	61.6	40.7	0	4.0
09/12/2014	1013-1020	26.4	27.8	0.4	4.0	48.5	35.9	0.1	15	25.4	26.8	0.1	5.0	11.7	21.1	1.1	4

Notes: AP- Atmospheric Pressure.
CH4, CO2 and O2 in %v/v and CO in ppm

Table 6.5 Cell 4A In-Waste Landfill Gas Monitoring Results October to December 2014

Date	AP (mb)	LCP4A				LM4/2				C0041				C0042			
		CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO
16/10/2014	1008-1015	60.1	41.6	0	11	59	40.9	0	14	60.2	40.5	0	23	61.1	38.5	0	9
10/11/2014	1000 - 1002	51.4	36.2	3.1	13	62.9	42.4	0	10	64.2	40.3	0	18	62.6	39.6	0	12
09/12/2014	1013-1014	60.6	40.9	0.1	9	60.9	40.7	0	12	63.3	39.1	0	15	42.8	33.4	0	7
Date	**AP (mb)**	**C0043**				**C0044**				**C0045**				**C0046**			
		CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO
16/10/2014	1008-1011	64.6	36.4	0	14	61	40.4	0	16	60.8	40.2	0	16	59.3	39.8	0	26
10/11/2014	997 - 1001	63.8	40.1	1.0	15	63.1	40.9	0	15	63.1	41	0	18	62.8	40.7	0	29
09/12/2014	1013-1014	64.3	39.5	0.1	5	54.3	38.1	0	7	63.2	40.5	0.2	8	58.1	38.8	0	14

Notes: AP- Atmospheric Pressure.
CH4, CO2 and O2 in %v/v and CO in ppm

Table 6.6 Cell 4B In-Waste Landfill Gas Monitoring Results October to December 2014

Date	AP (mb)	LCP4B				C51				C52				C53			
		CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO
16/10/2014	1009-1012	59.6	41.5	0	39	61.3	40.4	0	9.0	59.9	41.1	0	28	59.6	41.6	0	41
10/11/2014	999 - 1001	53.2	37.2	2.5	12	61.7	41.3	0	34	61.9	41.5	0	25	62.5	42.4	0	36
09/12/2014	1013-1014	62.5	42.1	0	10	62.8	41.1	0	18	62.6	41.5	0	20	60	41	0.1	14
Date	**AP (mb)**	**C54**				**C55**				**C56**				**C57**			
		CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO
16/10/2014	1007-1015	59.4	42.1	0	16	59.6	41.2	0	4.0	59.6	40.5	0	71	59.6	41.5	0	17
10/11/2014	998 - 1000	62.2	42.5	0	19	63.6	41.4	0	16	63.5	41.3	0	37	63.5	41.8	0	53
09/12/2014	1013-1014	62.4	42.4	0	14	63.4	40.5	0.1	9.0	64.2	40.6	0	15	62.7	40	0	23

Notes: AP- Atmospheric Pressure.
CH4, CO2 and O2 in %v/v and CO in ppm

7. Meteorological Data

Measurements of rainfall, temperature and wind speed are recorded daily at Ffridd Rasus. Monitoring data for the months October, November and December 2014 are presented in Appendix H.

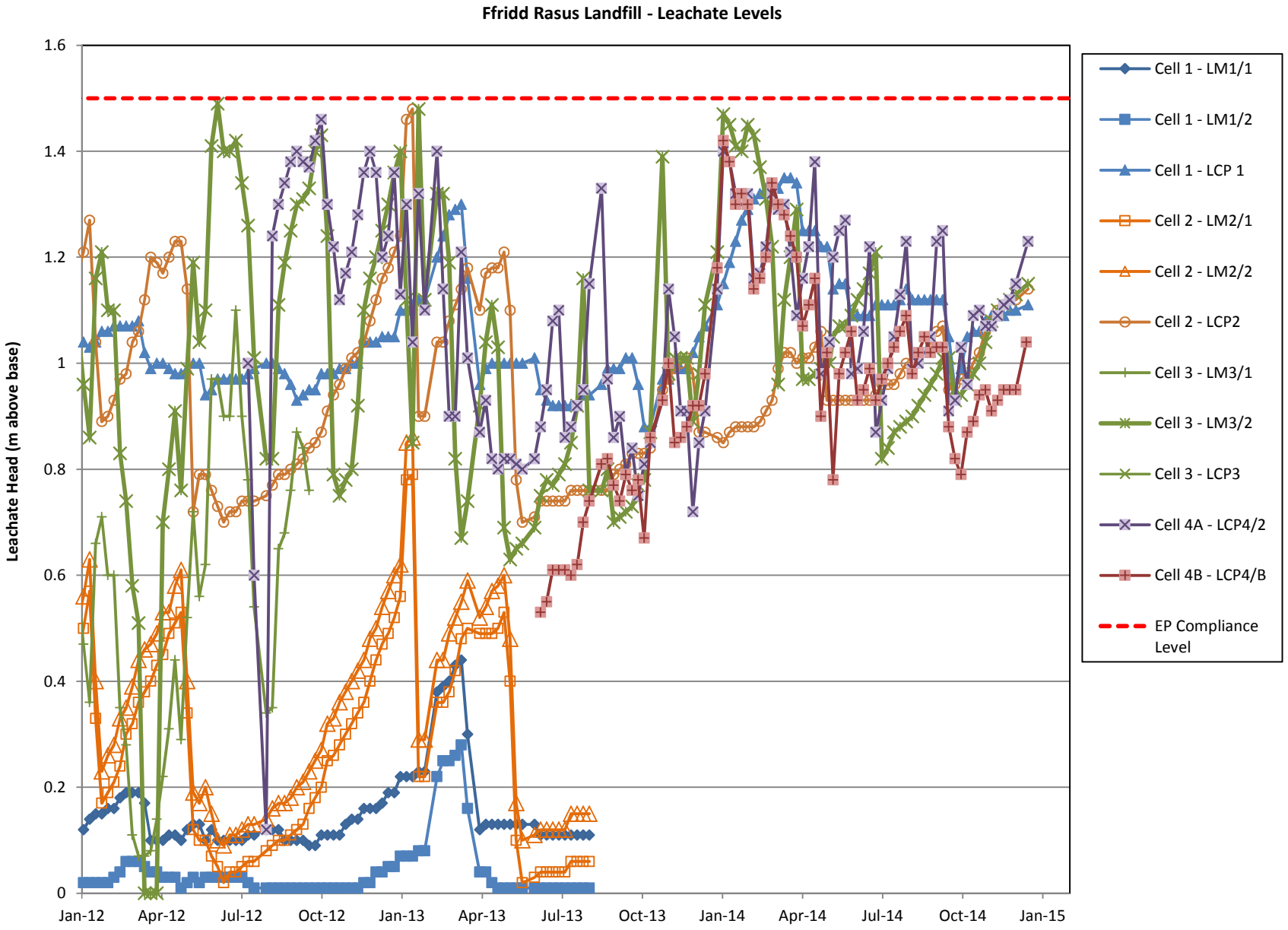
8. Summary

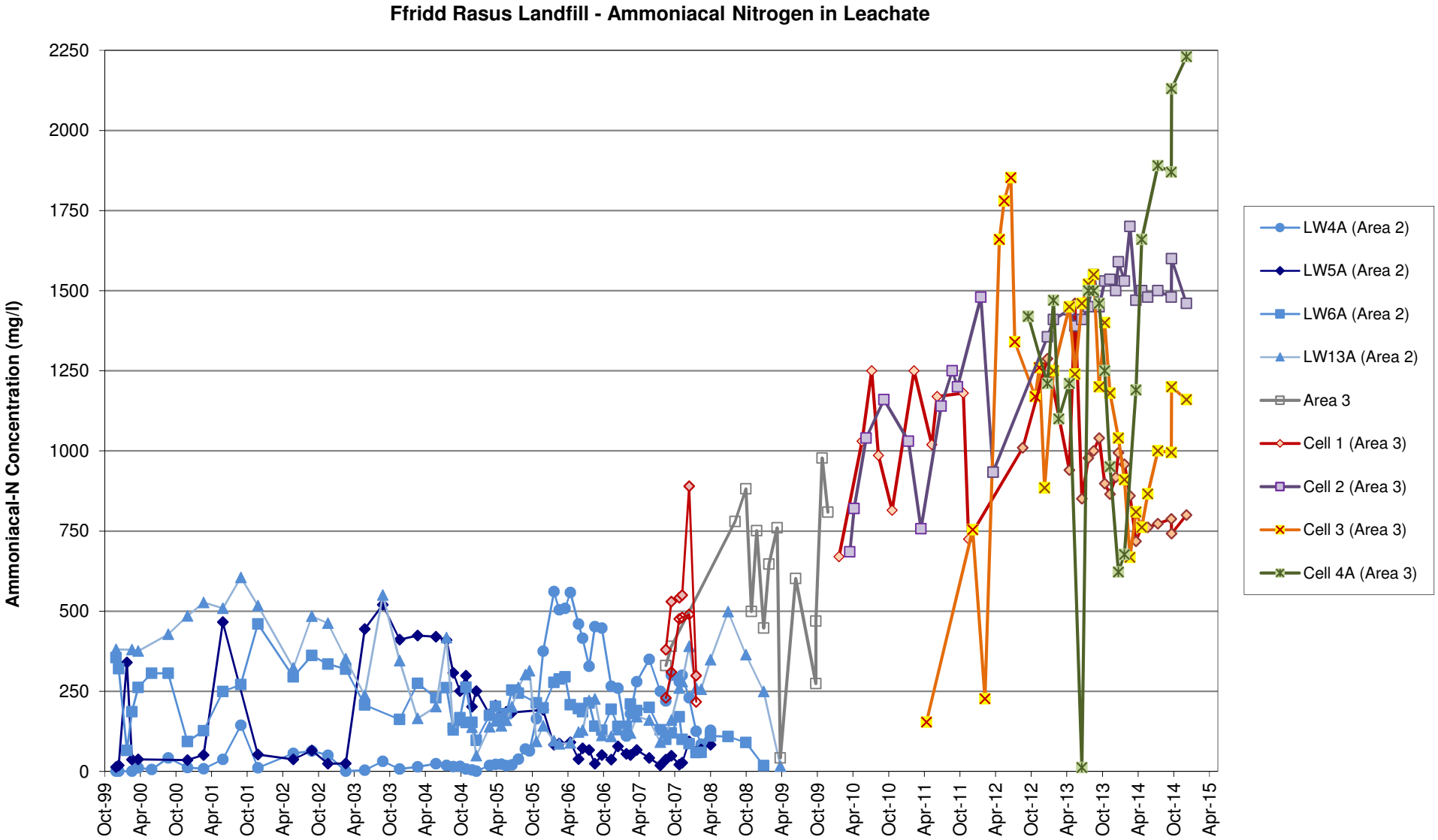
The results of environmental monitoring carried out during the period October to December 2014 are broadly consistent with the results of previous monitoring; however there continues to be some variability in the data obtained.

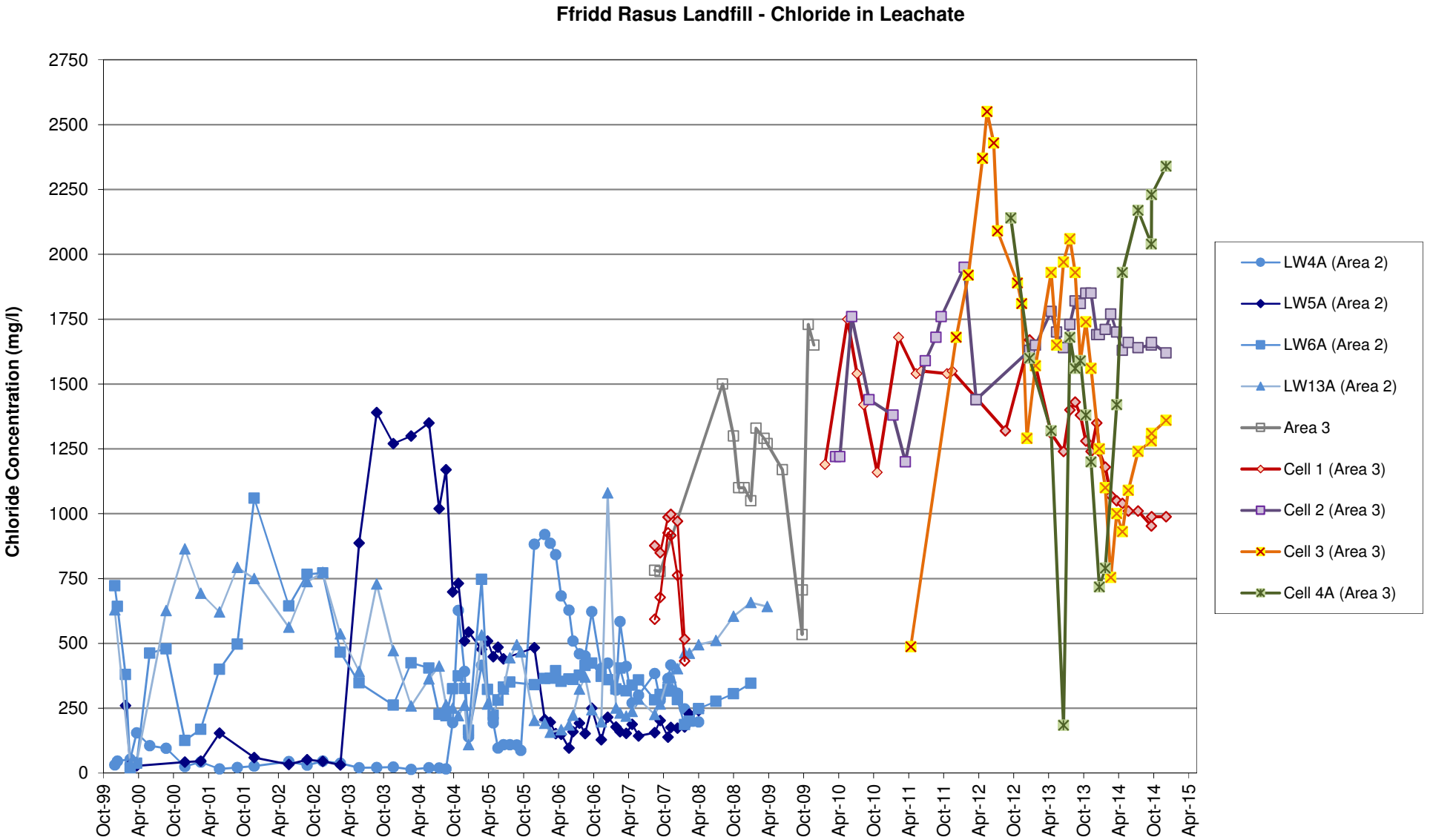
The latest results can be summarised as follows:

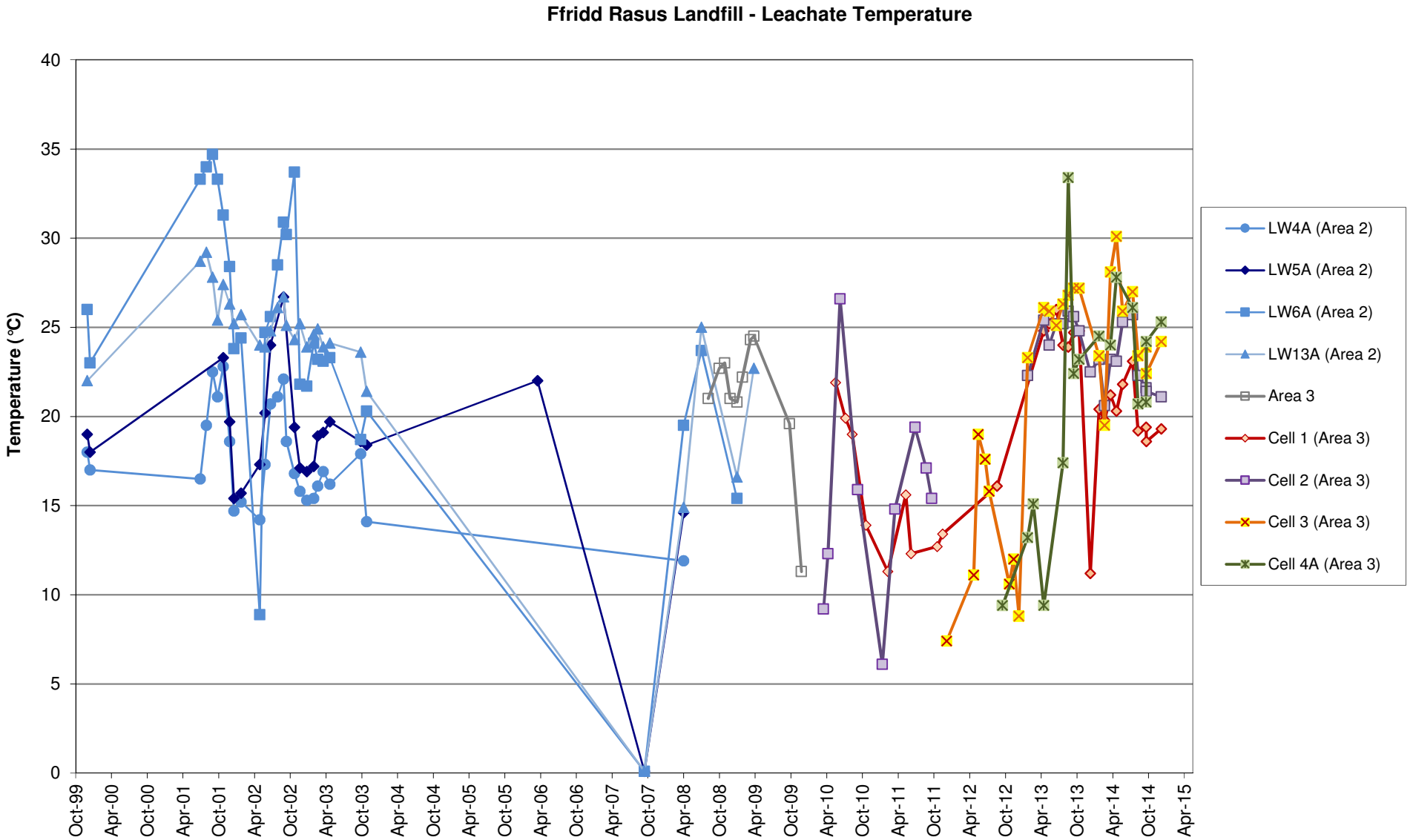
- Leachate levels in Area 3 have been controlled below the leachate head limit of 1.5 m, with leachate extraction carried out as necessary;
- All of the groundwater boreholes recorded increasing water levels as a result of increased recharge over the winter months;
- Leachate monitoring points in Area 2 continued to be dry during this quarter. Chloride and ammoniacal-nitrogen concentrations in leachate from Area 3 remained within the range of previous data except for ammoniacal-nitrogen and chloride in Cell 4A which exceeded the previous maximum. This is consistent with Cell 4A having the most recently deposited waste and having been capped earlier in 2014;
- Downgradient groundwater monitoring boreholes continue to indicate contamination by leachate from the unlined Area 2 landfill. Chloride and ammoniacal-nitrogen concentrations along the downgradient boundary of Area 2 (and upgradient of Area 3) increase southwards towards BH27 but continue to show a downward trend. Elevated concentrations, sometimes exceeding those at BH27, continue to be recorded about 200 m downgradient of Area 2 indicating downgradient movement of the leachate plume from Area 2.
- The groundwater quality trigger levels specified in the EP (ref GP3330BY) for Areas 1 and 3 were exceeded for chloride in BH19A, BH19B, BH19C, BH20A and BH21A and for ammoniacal-nitrogen in BH19C, BH20A, BH21A and BH21B. The trigger levels specified in EP (ref PP3294FJ) for Area 2 and the civic amenity area were exceeded for chloride in BH19B and BH19C and for ammoniacal-nitrogen in BH19C and BH20A. These exceedances reflect variability in the data associated with contaminant migration from the unlined Area 2 landfill;
- Chloride concentrations in boreholes BH18A and BH18B continue to be slightly elevated above baseline and are attributed to a “slug” of saline water from the surface water lagoon migrating westwards. Over time this effect is diminishing as chloride is dispersed and diluted;
- SW1 (Area 1 permitted discharge) and pipe adjacent to SW1 monitoring locations continue to show variability but remained within historical data;
- Ammoniacal-nitrogen and chloride concentrations at SW2 (ditch flowing south along downstream boundary of Area 3) continue to show elevated peaks exceeding the typical baseline for these boreholes. Possible reasons for the increased levels are under investigation and include muck spreading on adjacent agricultural land and saline groundwater baseflow contribution;
- Ammoniacal-nitrogen and chloride concentrations at SW3 (ditch exiting the downstream boundary of Area 3) remained within the range recorded previously and showed an overall decline; and
- Gas monitoring boreholes showed no evidence of off-site landfill gas migration. None of the trigger levels for methane or carbon dioxide have been exceeded in the perimeter monitoring boreholes during the monitoring period. Wastes in Area 3 are continuing to produce landfill gas with methane and carbon dioxide concentrations within historical ranges for all locations and parameters.

Appendix A
Leachate Level and Quality Plots

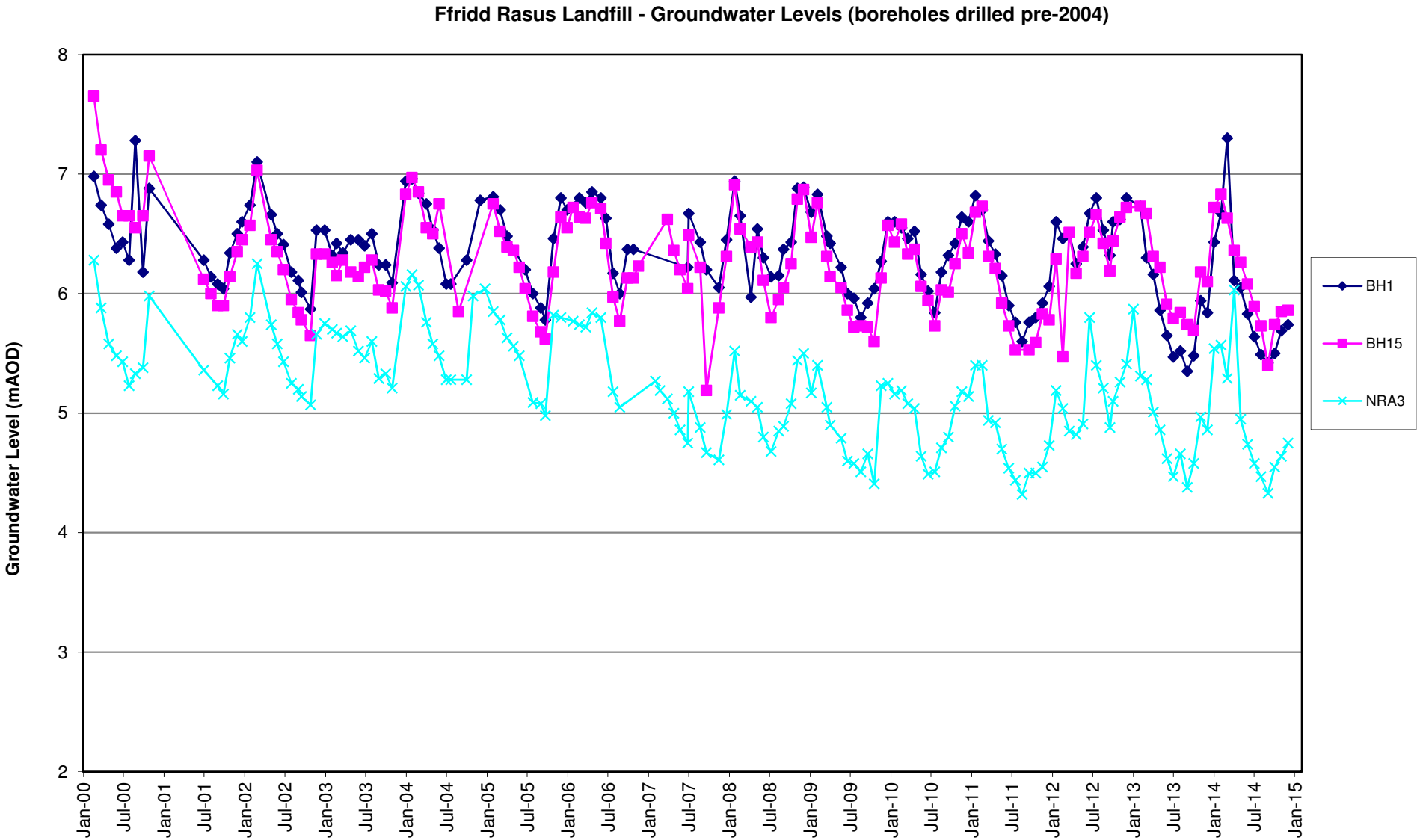

Ffridd Rasus Landfill - Leachate Levels
Leachate Head (m above base)
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Jan-12
Apr-12
Jul-12
Oct-12
Jan-13
Apr-13
Jul-13
Oct-13
Jan-14
Apr-14
Jul-14
Oct-14
Jan-15
Cell 1 - LM1/1
Cell 1 - LM1/2
Cell 1 - LCP 1
Cell 2 - LM2/1
Cell 2 - LM2/2
Cell 2 - LCP2
Cell 3 - LM3/1
Cell 3 - LM3/2
Cell 3 - LCP3
Cell 4A - LCP4/2
Cell 4B - LCP4/B
EP Compliance Level


Ffridd Rasus Landfill - Ammoniacal Nitrogen in Leachate
Ammoniacal-N Concentration (mg/l)
2250
2000
1750
1500
1250
1000
750
500
250
0
Oct-99
Apr-00
Oct-00
Apr-01
Oct-01
Apr-02
Oct-02
Apr-03
Oct-03
Apr-04
Oct-04
Apr-05
Oct-05
Apr-06
Oct-06
Apr-07
Oct-07
Apr-08
Oct-08
Apr-09
Oct-09
Apr-10
Oct-10
Apr-11
Oct-11
Apr-12
Oct-12
Apr-13
Oct-13
Apr-14
Oct-14
Apr-15
LW4A (Area 2)
LW5A (Area 2)
LW6A (Area 2)
LW13A (Area 2)
Area 3
Cell 1 (Area 3)
Cell 2 (Area 3)
Cell 3 (Area 3)
Cell 4A (Area 3)

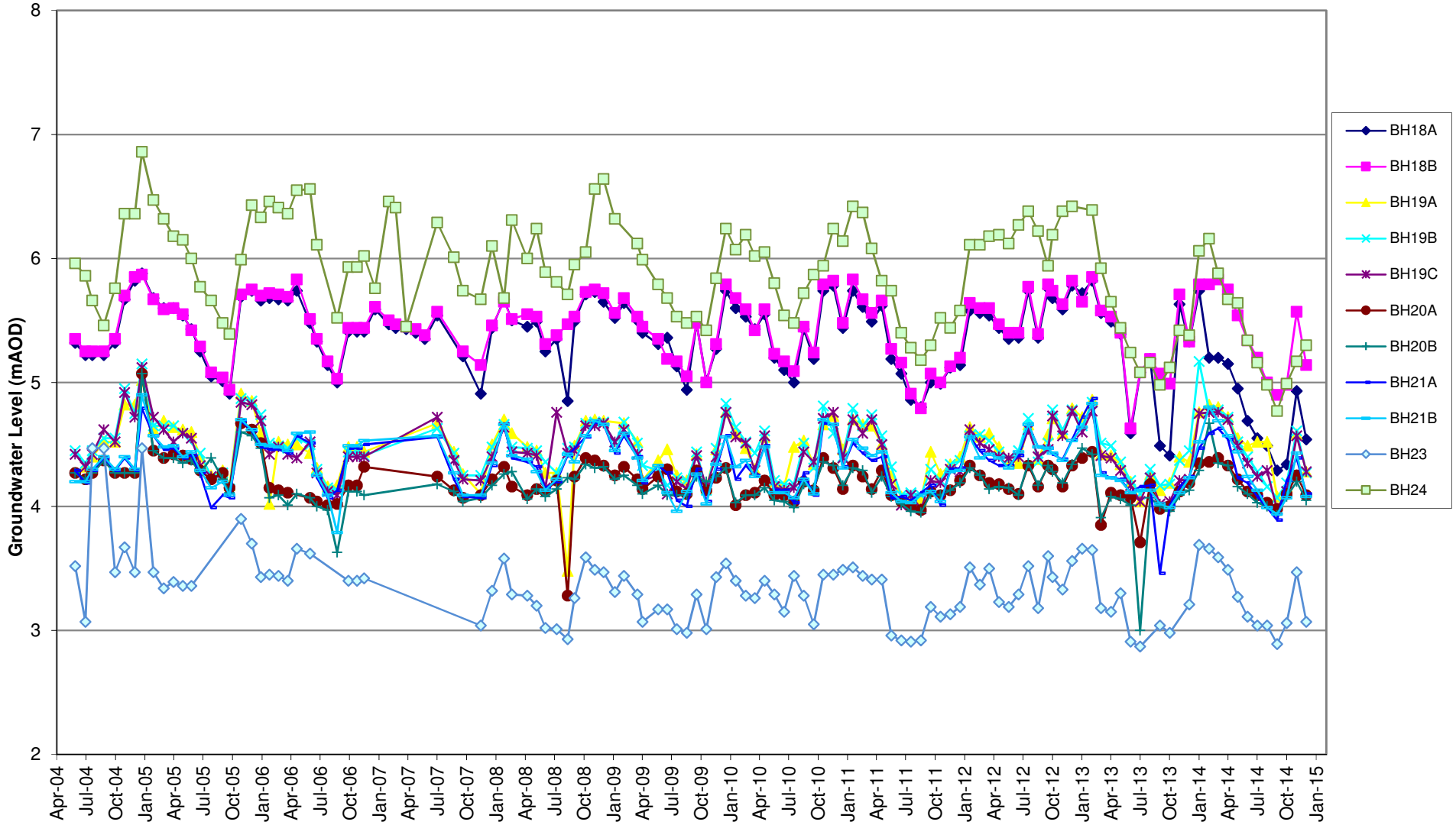

Ffridd Rasus Landfill - Chloride in Leachate
Chloride Concentration (mg/l)
2750
2500
2250
2000
1750
1500
1250
1000
750
500
250
0
Oct-99
Apr-00
Oct-00
Apr-01
Oct-01
Apr-02
Oct-02
Apr-03
Oct-03
Apr-04
Oct-04
Apr-05
Oct-05
Apr-06
Oct-06
Apr-07
Oct-07
Apr-08
Oct-08
Apr-09
Oct-09
Apr-10
Oct-10
Apr-11
Oct-11
Apr-12
Oct-12
Apr-13
Oct-13
Apr-14
Oct-14
Apr-15
LW4A (Area 2)
LW5A (Area 2)
LW6A (Area 2)
LW13A (Area 2)
Area 3
Cell 1 (Area 3)
Cell 2 (Area 3)
Cell 3 (Area 3)
Cell 4A (Area 3)

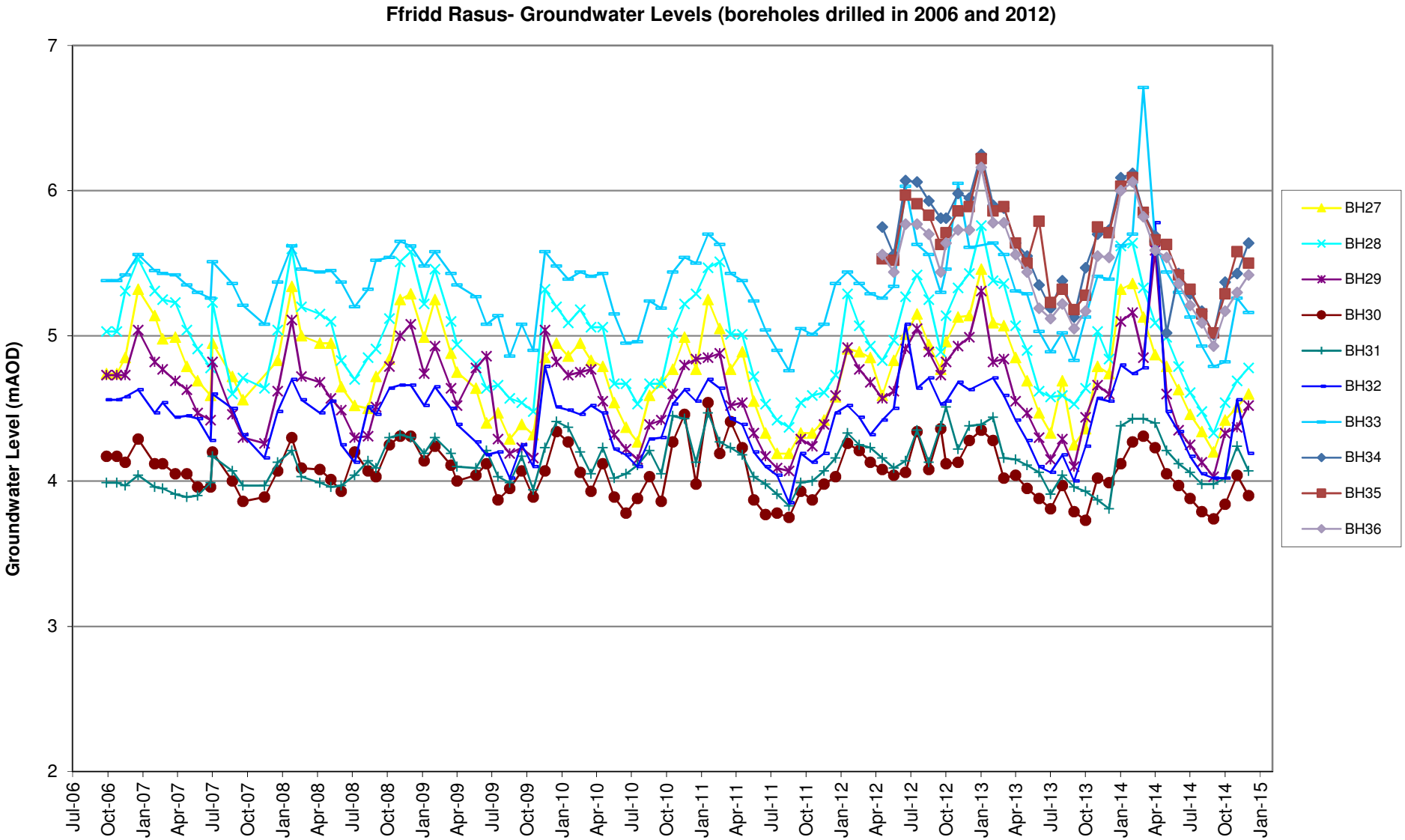

Ffridd Rasus Landfill - Leachate Temperature
Temperature (°C)
40
35
30
25
20
15
10
5
0
Oct-99
Apr-00
Oct-00
Apr-01
Oct-01
Apr-02
Oct-02
Apr-03
Oct-03
Apr-04
Oct-04
Apr-05
Oct-05
Apr-06
Oct-06
Apr-07
Oct-07
Apr-08
Oct-08
Apr-09
Oct-09
Apr-10
Oct-10
Apr-11
Oct-11
Apr-12
Oct-12
Apr-13
Oct-13
Apr-14
Oct-14
Apr-15
LW4A (Area 2)
LW5A (Area 2)
LW6A (Area 2)
LW13A (Area 2)
Area 3
Cell 1 (Area 3)
Cell 2 (Area 3)
Cell 3 (Area 3)
Cell 4A (Area 3)

Appendix B
Groundwater Level Plots


Ffridd Rasus Landfill - Groundwater Levels (boreholes drilled pre-2004)
Groundwater Level (mAOD)
8
7
6
5
4
3
2
Jan-00
Jul-00
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
Jul-07
Jan-08
Jul-08
Jan-09
Jul-09
Jan-10
Jul-10
Jan-11
Jul-11
Jan-12
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
BH1
BH15
NRA3

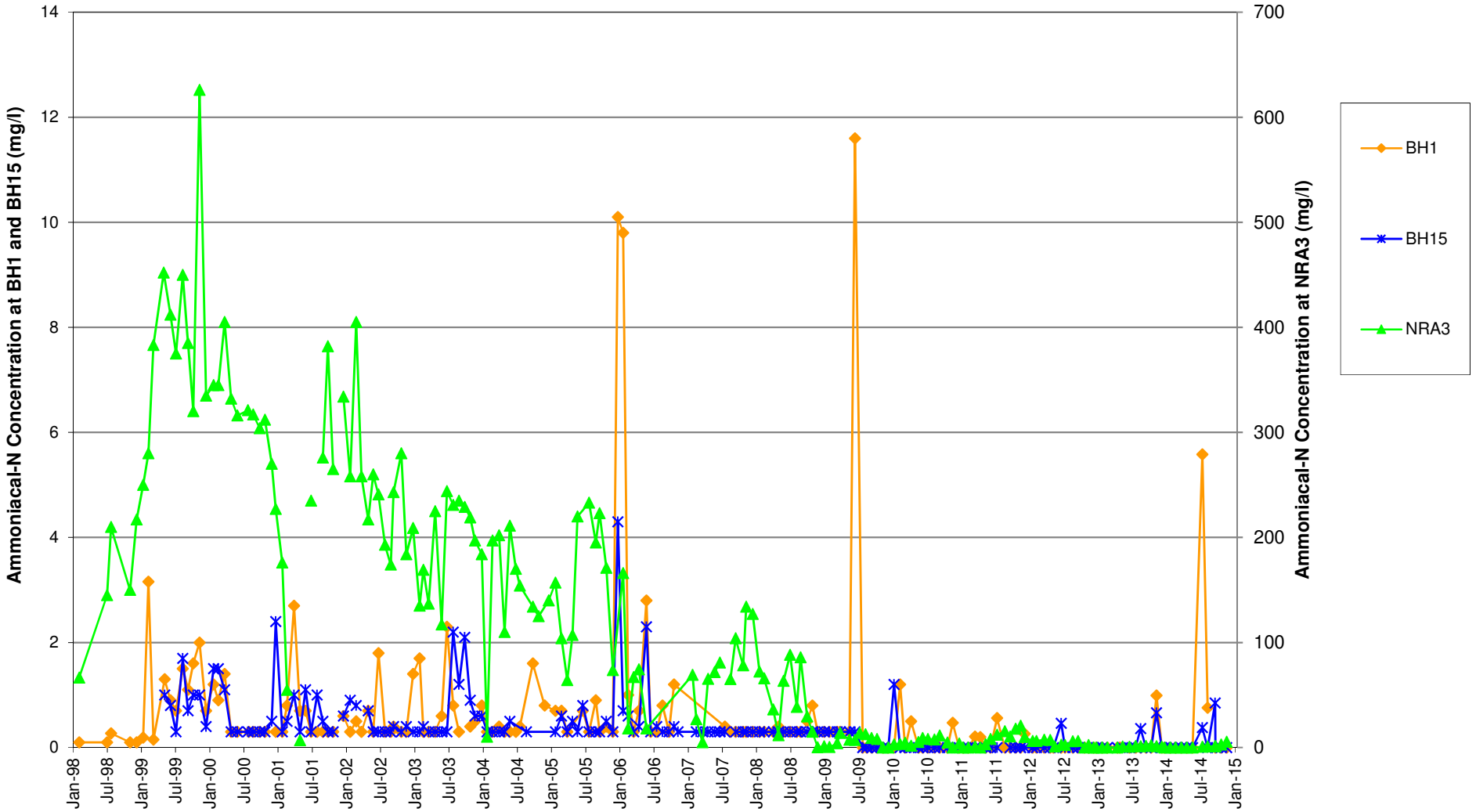
Ffridd Rasus Landfill - Groundwater Levels (boreholes drilled in 2004)

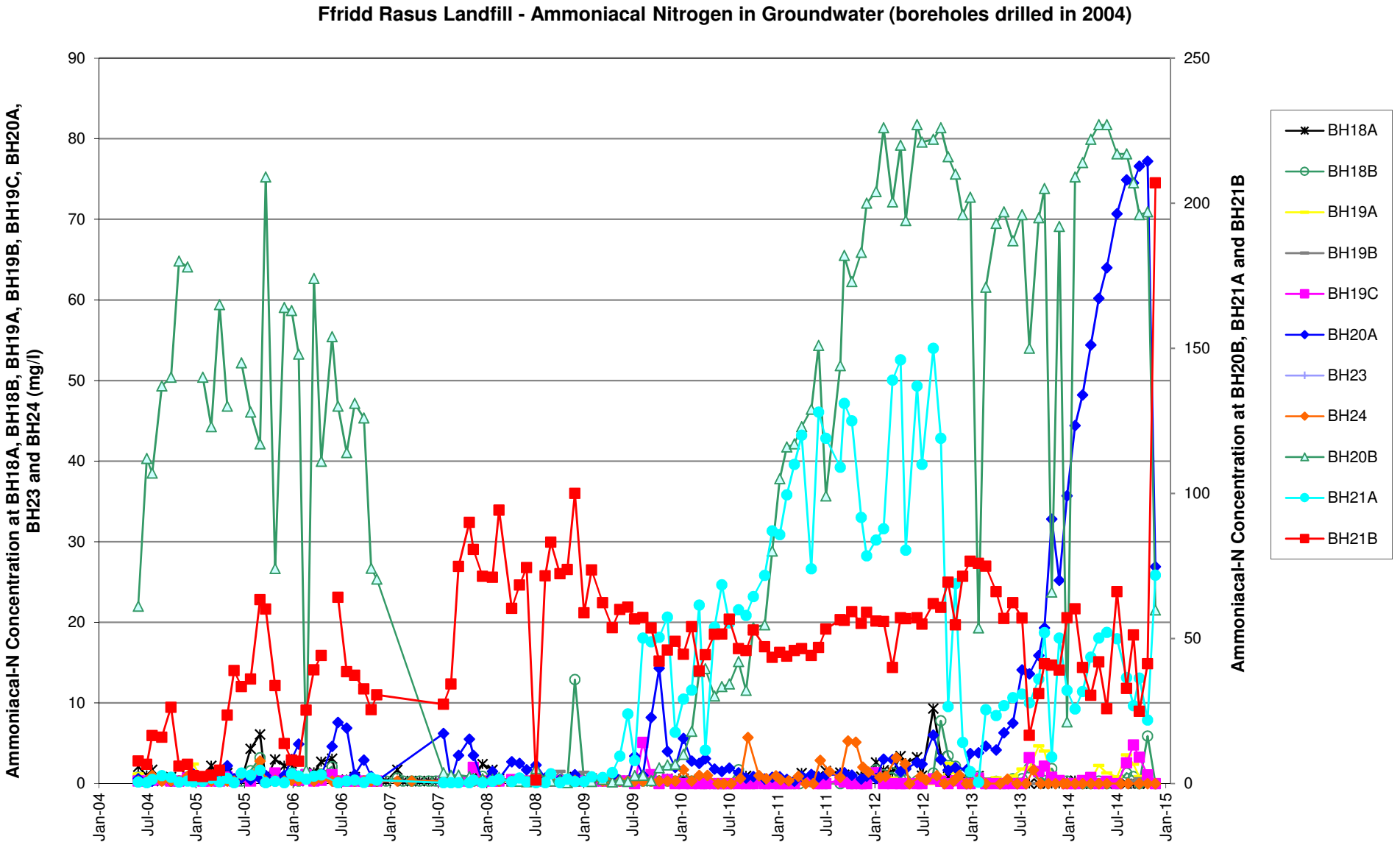



Ffridd Rasus- Groundwater Levels (boreholes drilled in 2006 and 2012)
Groundwater Level (mAOD)
7
6
5
4
3
2
Jul-06
Oct-06
Jan-07
Apr-07
Jul-07
Oct-07
Jan-08
Apr-08
Jul-08
Oct-08
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Apr-11
Jul-11
Oct-11
Jan-12
Apr-12
Jul-12
Oct-12
Jan-13
Apr-13
Jul-13
Oct-13
Jan-14
Apr-14
Jul-14
Oct-14
Jan-15
BH27
BH28
BH29
BH30
BH31
BH32
BH33
BH34
BH35
BH36

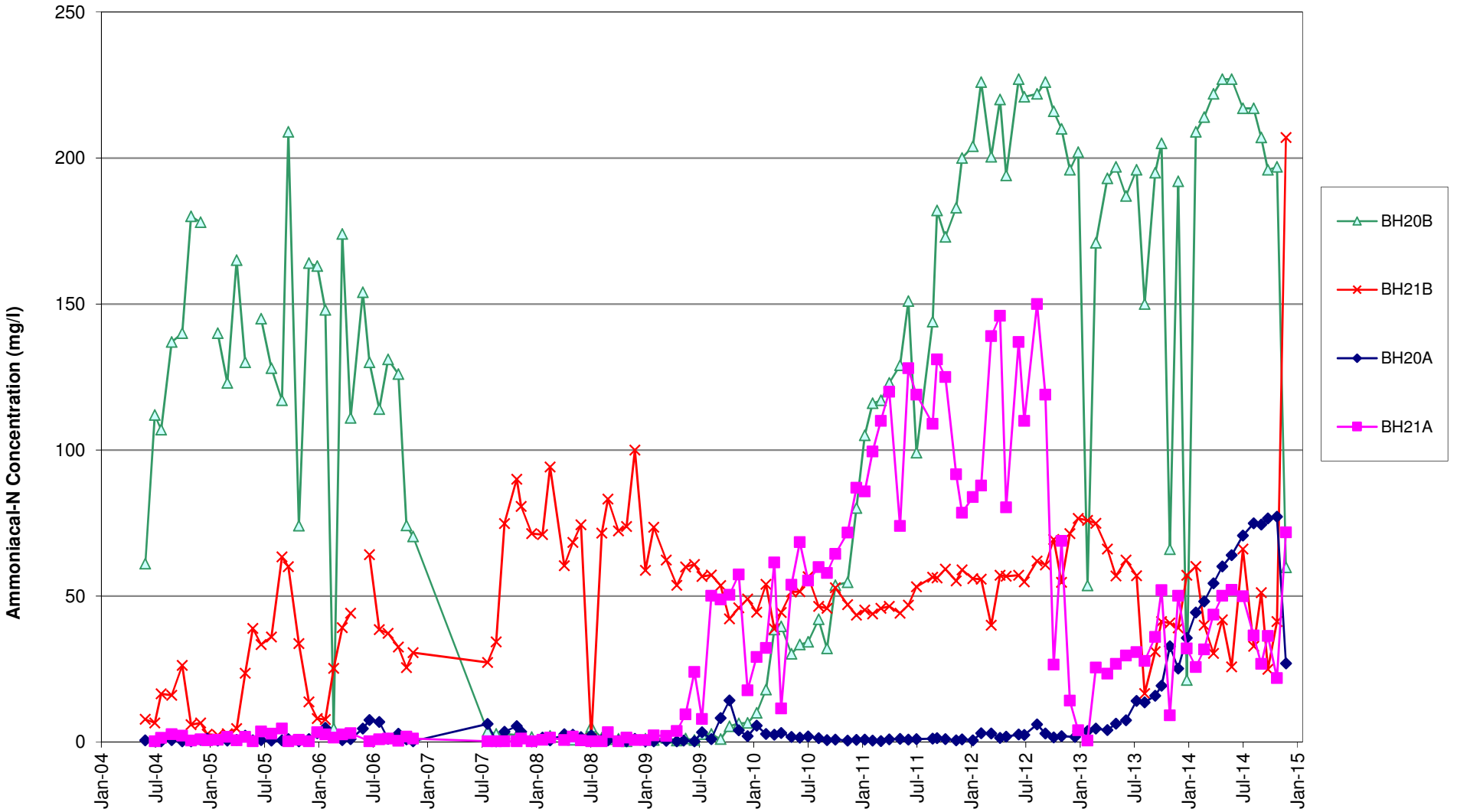
Appendix C
Groundwater Quality Plots

Ffridd Rasus Landfill - Ammoniacal Nitrogen in Groundwater (Boreholes drilled pre-2004)

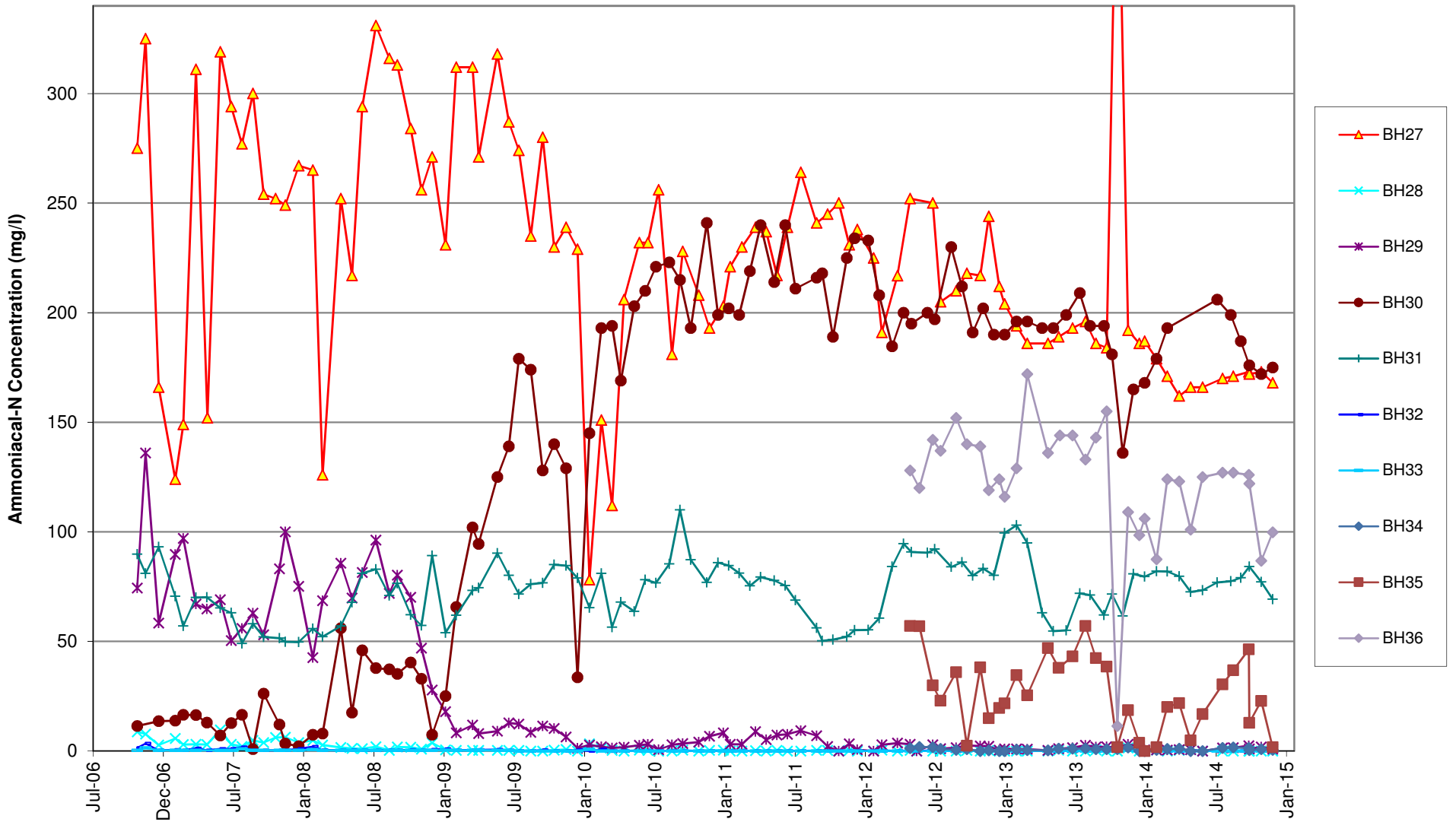



Ffridd Rasus Landfill - Ammoniacal Nitrogen in Groundwater (boreholes drilled in 2004)
Ammoniacal-N Concentration at BH18A, BH18B, BH19A, BH19B, BH19C, BH20A, BH23 and BH24 (mg/l)
Ammoniacal-N Concentration at BH20B, BH21A and BH21B
0
10
20
30
40
50
60
70
80
90
0
50
100
150
200
250
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
Jul-07
Jan-08
Jul-08
Jan-09
Jul-09
Jan-10
Jul-10
Jan-11
Jul-11
Jan-12
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
BH18A
BH18B
BH19A
BH19B
BH19C
BH20A
BH23
BH24
BH20B
BH21A
BH21B

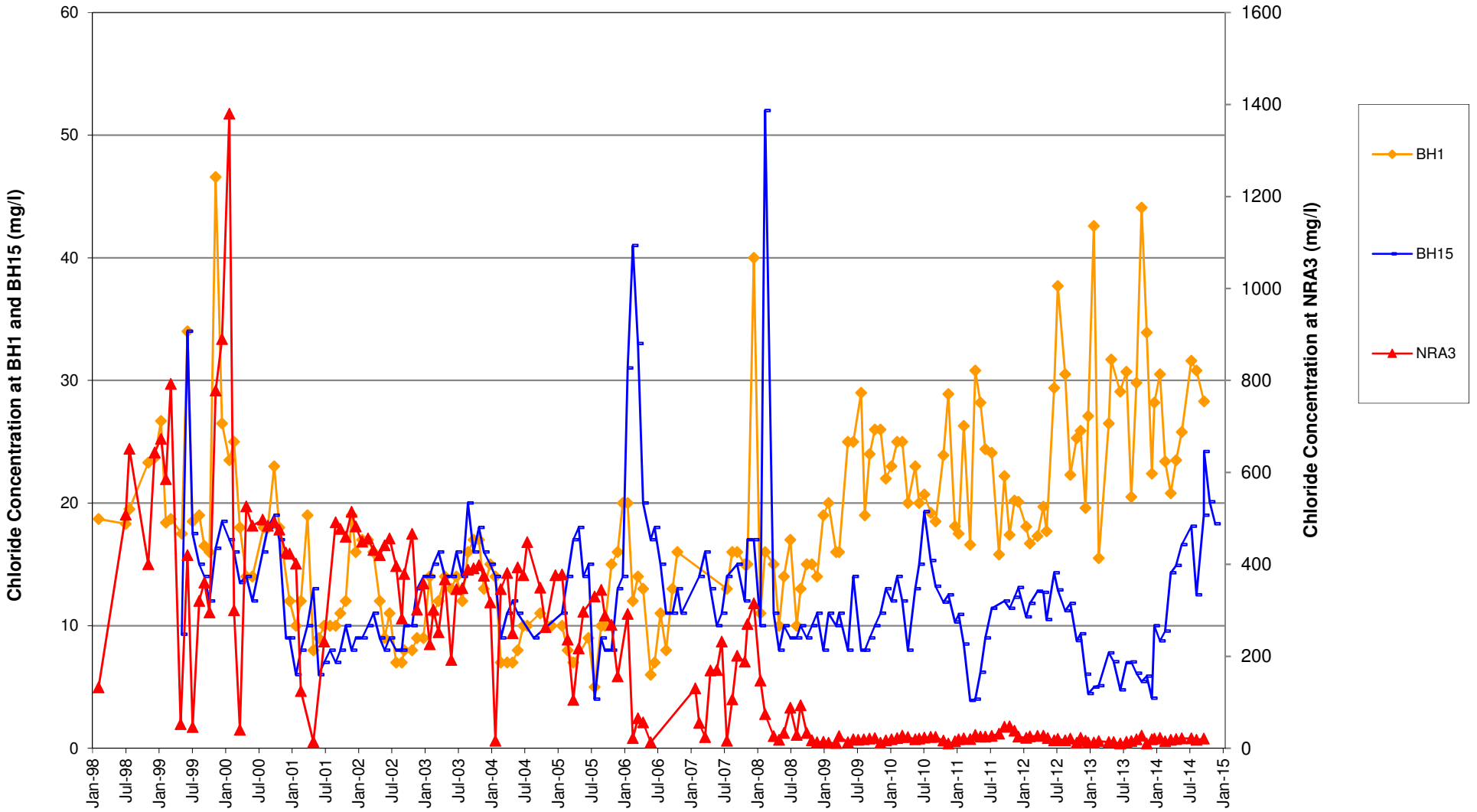
Ffridd Rasus Landfill - Ammoniacal Nitrogen in Groundwater (boreholes 20A, 20B 21A & 21B)



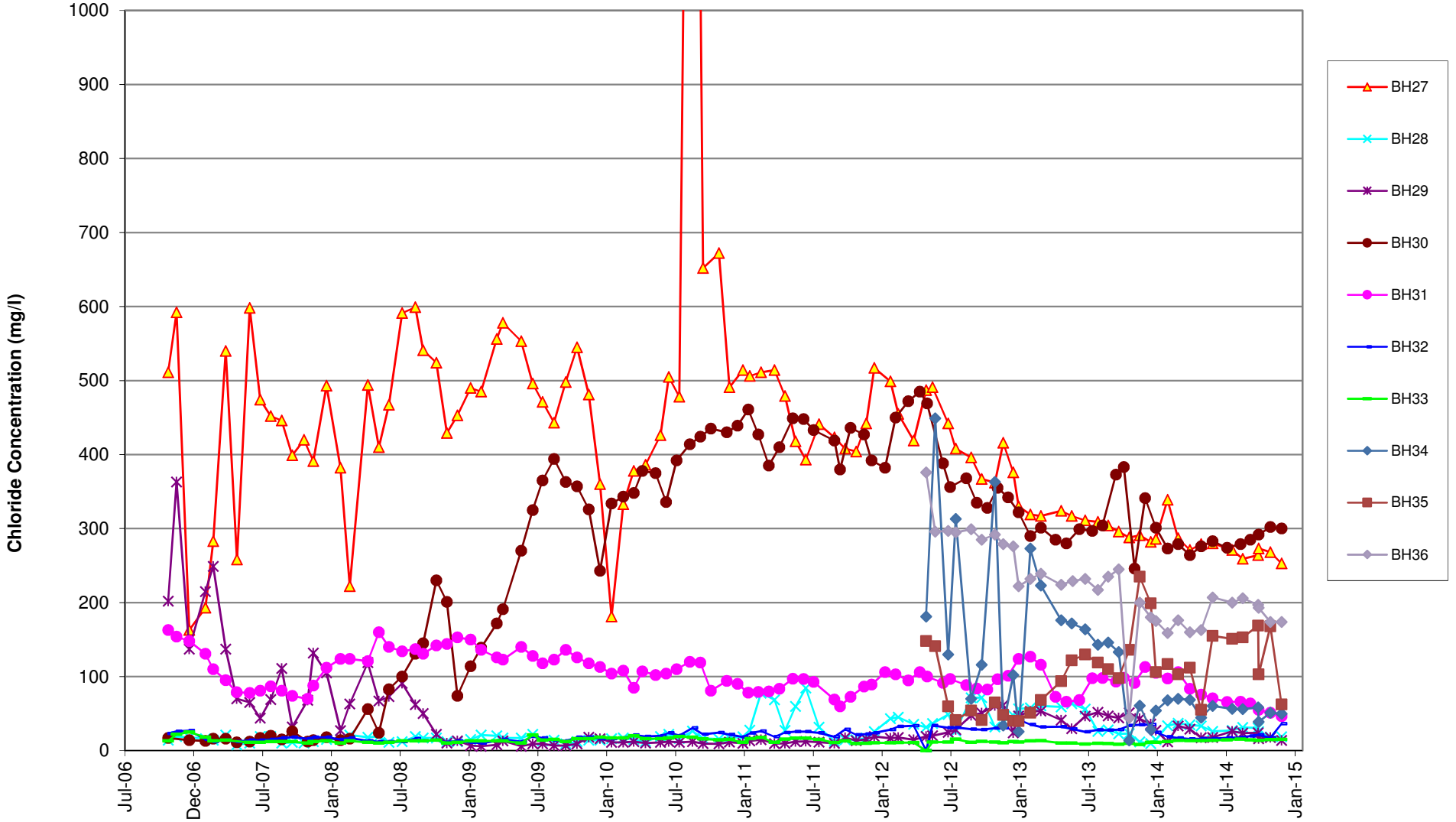
Ffridd Rasus Landfill - Ammoniacal Nitrogen in groundwater (boreholes drilled in 2006 and 2012)



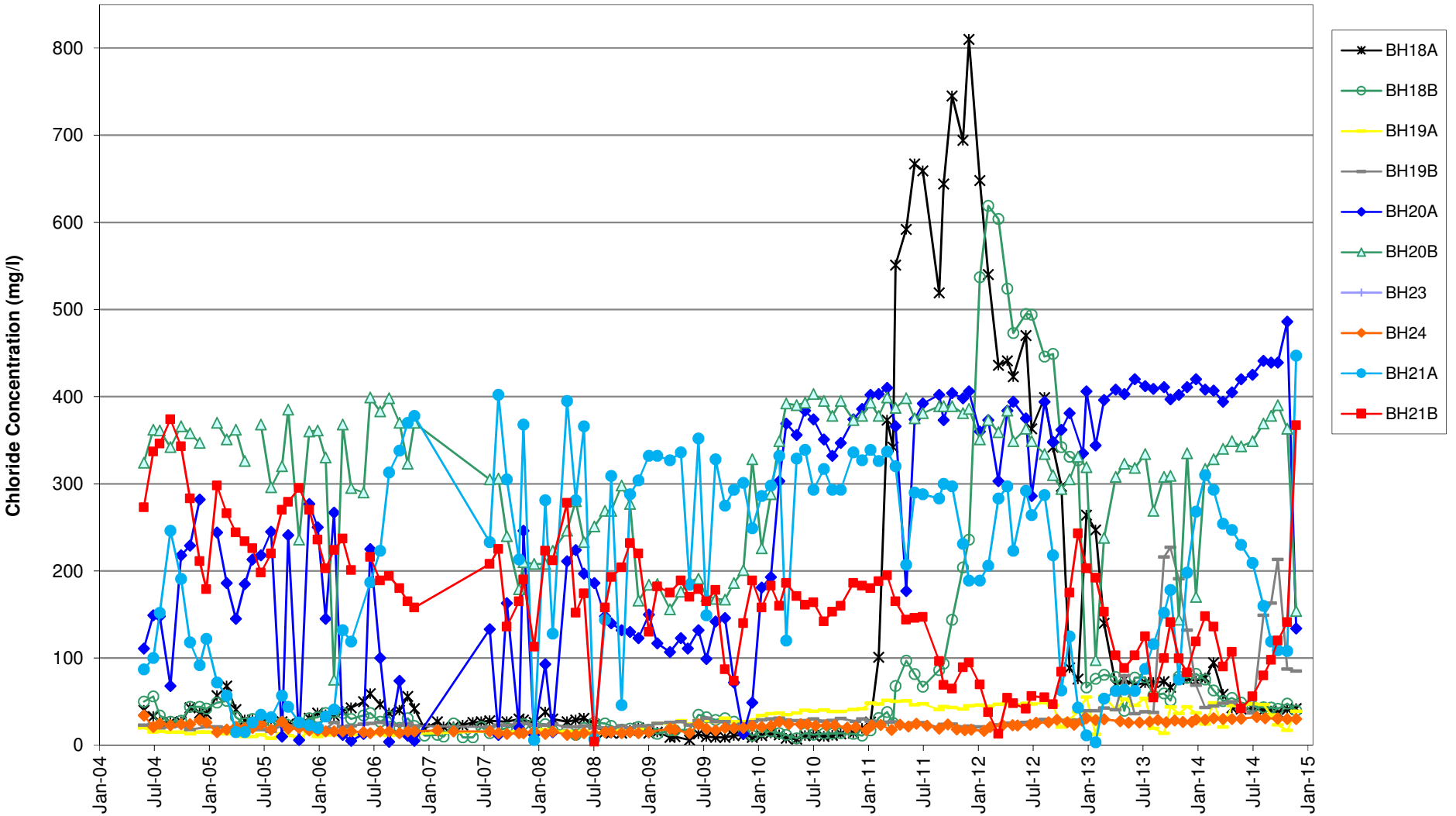
Chloride in Groundwater - boreholes drilled pre 2004



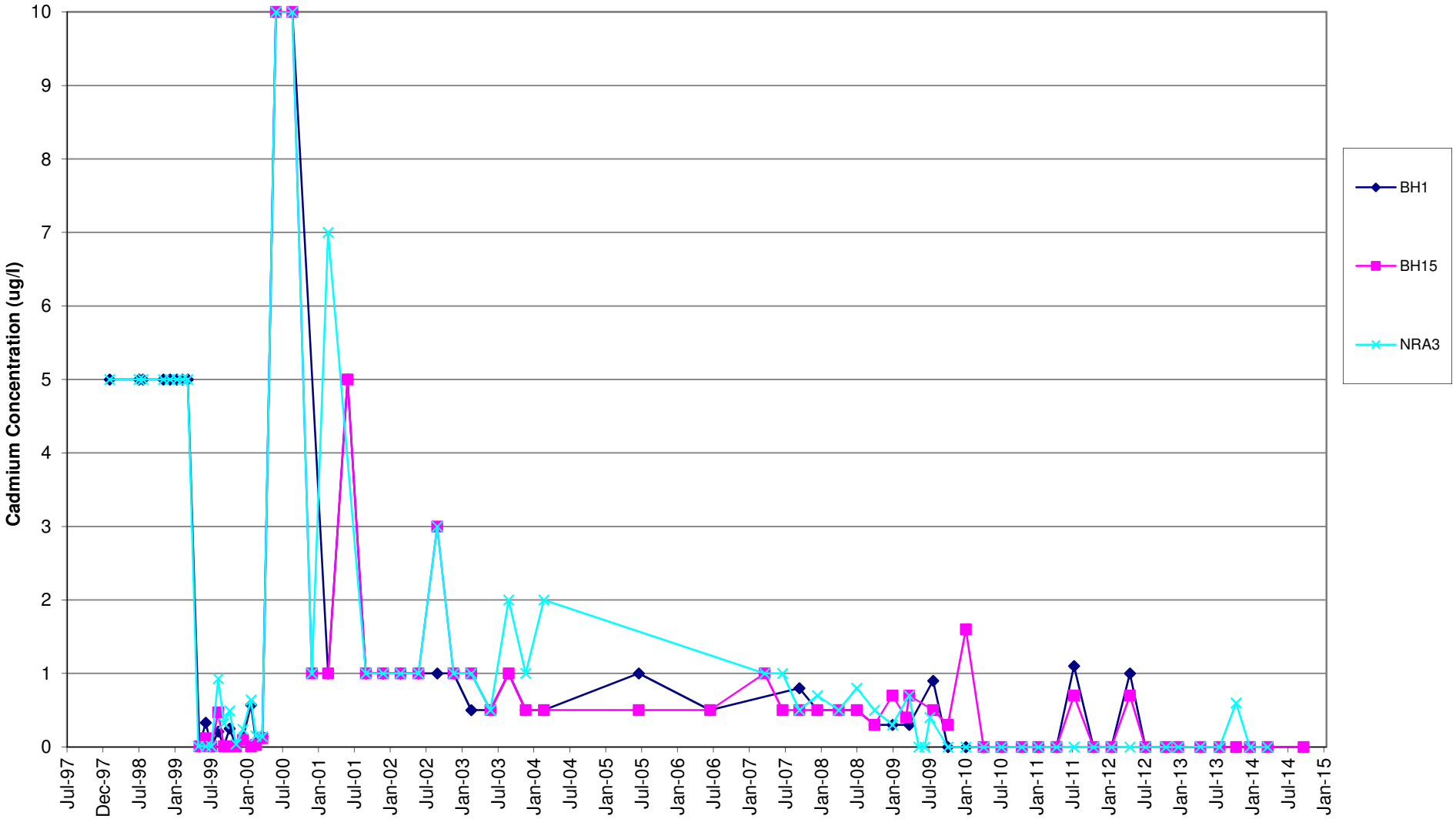
Ffridd Rasus Landfill - Chloride in Groundwater (boreholes drilled in 2006 and 2012)



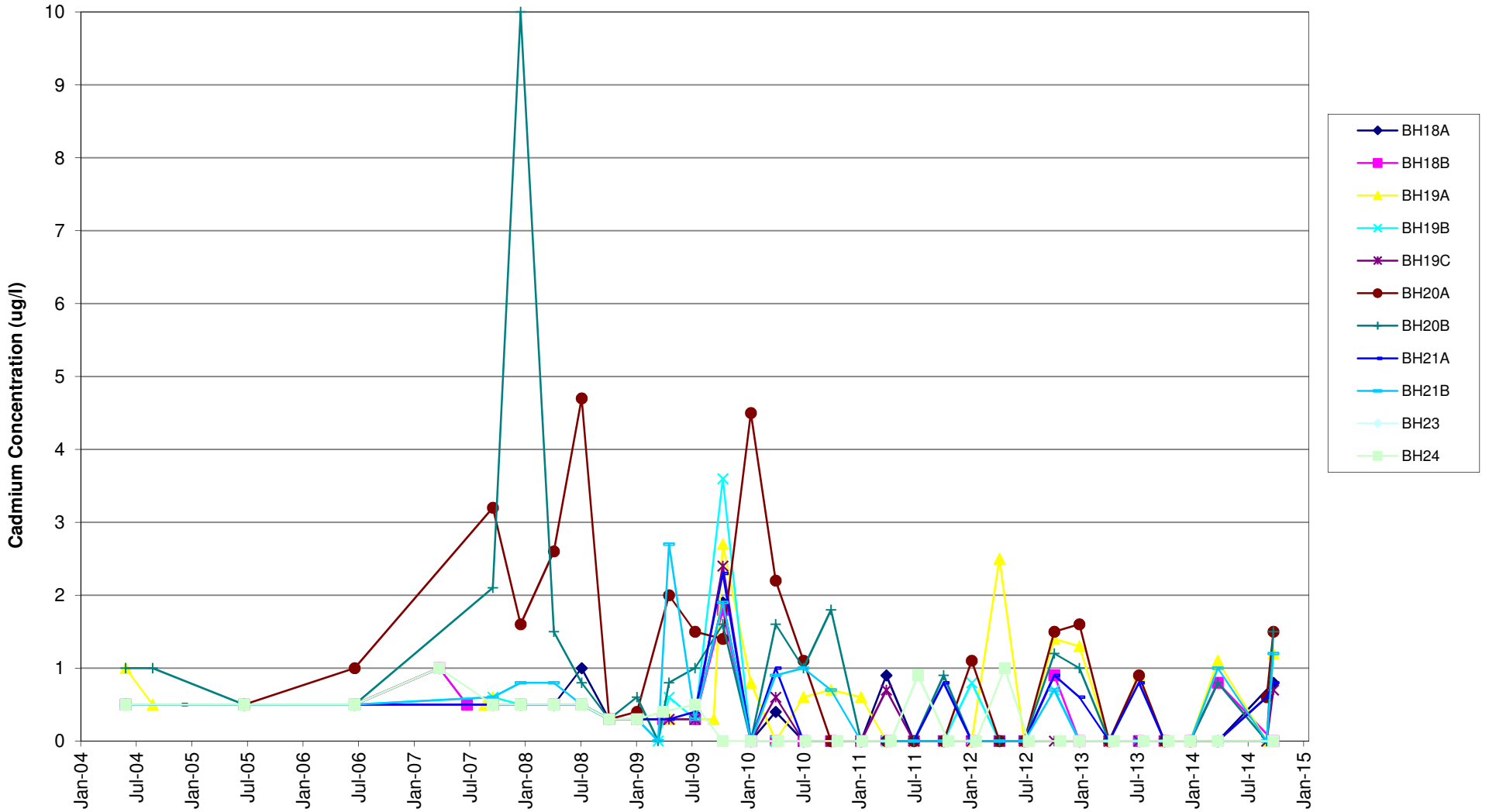
Ffridd Rasus Landfill - Chloride in Groundwater (boreholes drilled in 2004)



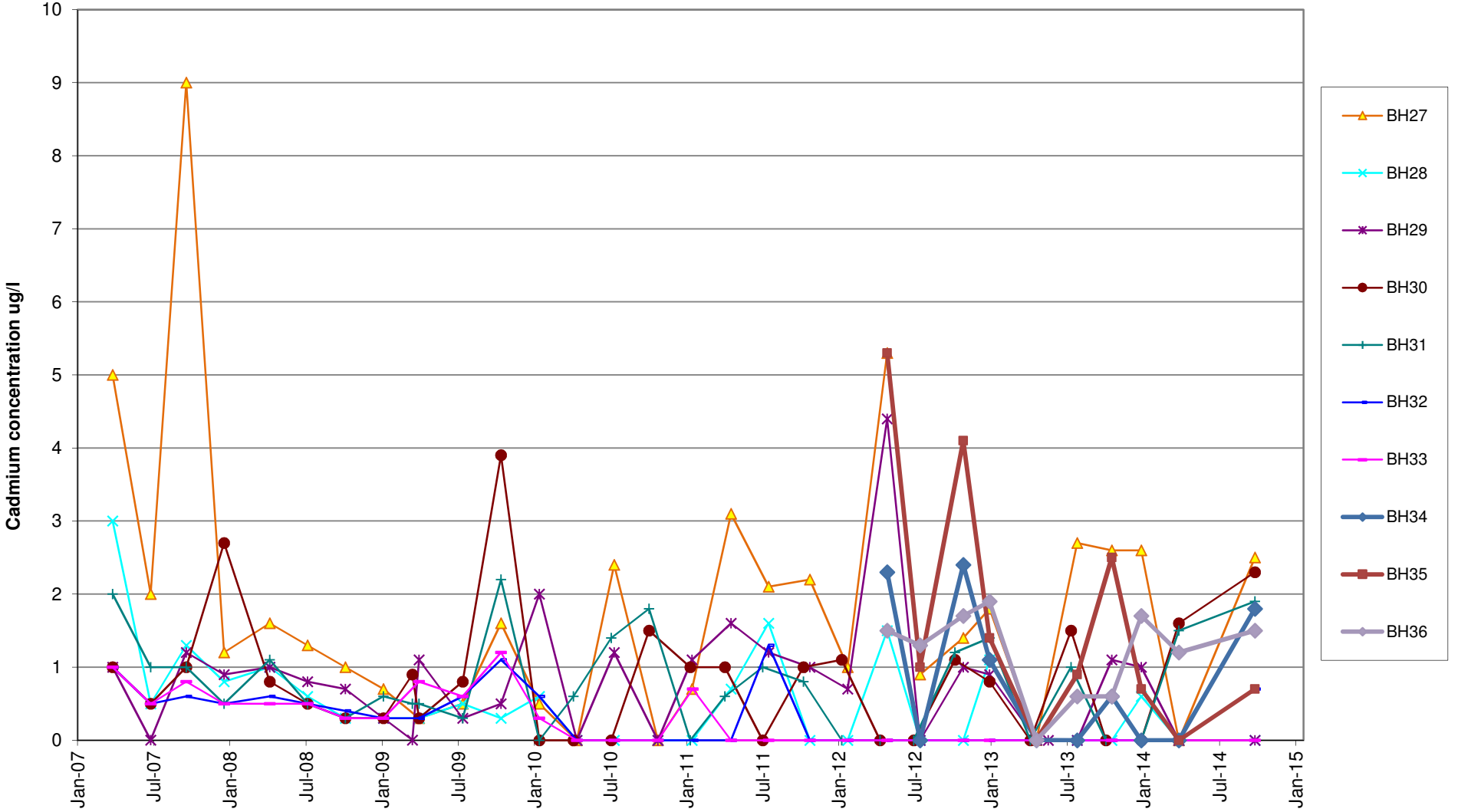
Ffridd Rasus Landfill - Cadmium in Groundwater (boreholes drilled pre 2004)



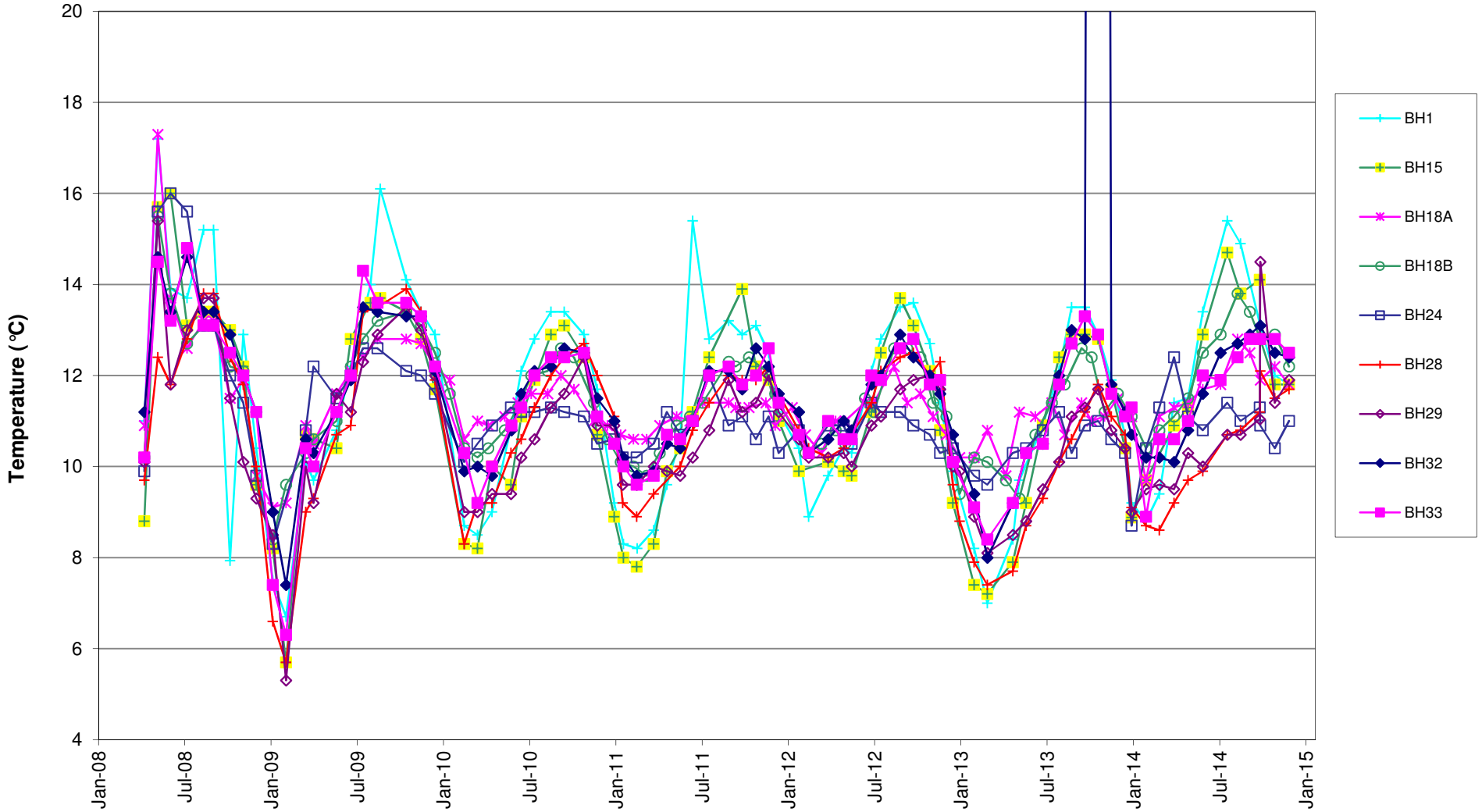
Ffridd Rasus Landfill - Cadmium in Groundwater (boreholes drilled in 2004)



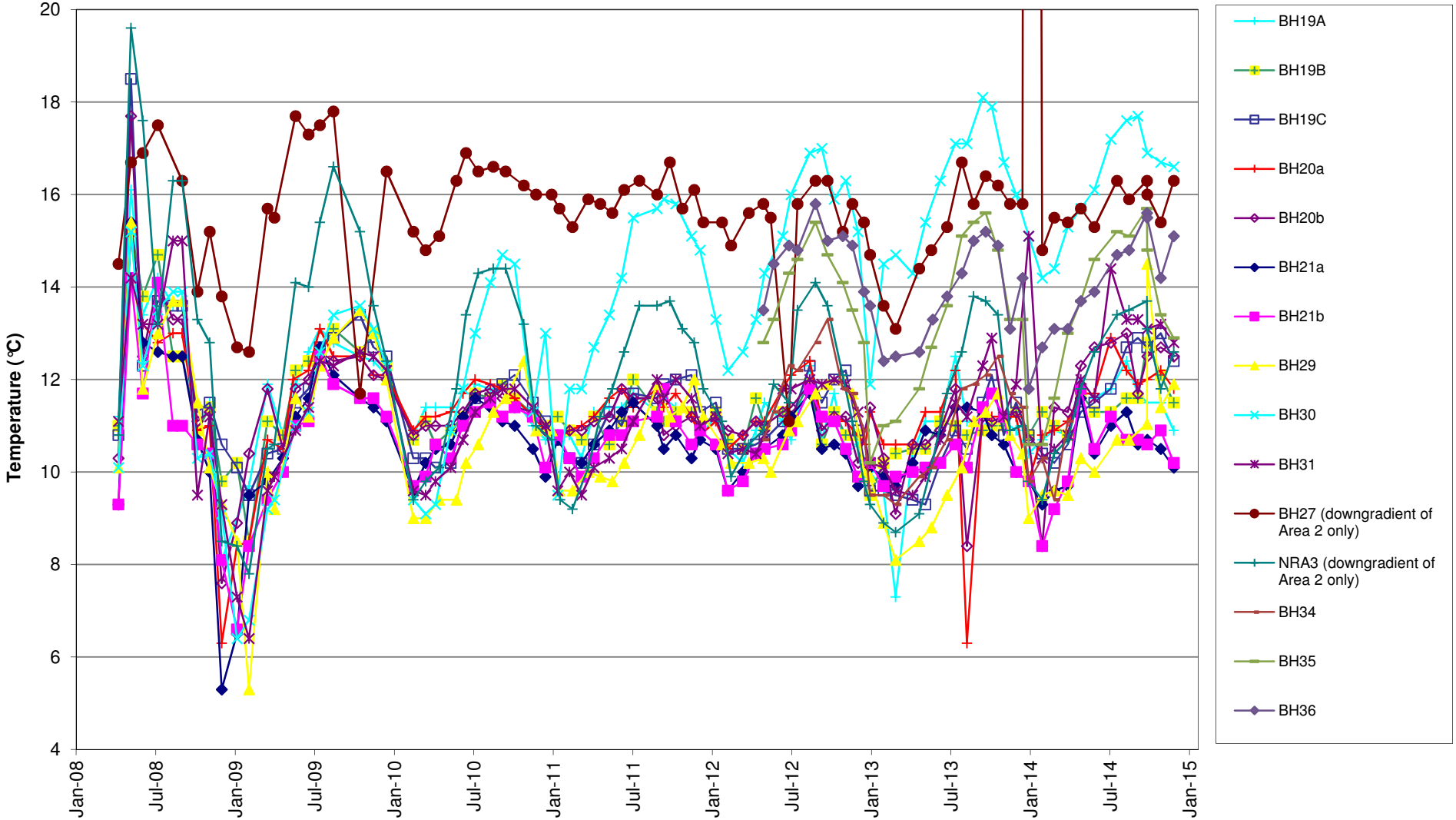
Ffridd Rasus Landfill - Cadmium in Groundwater (boreholes drilled in 2006)



Ffridd Rasus Landfill - Groundwater Temperature (Upgradient/Lateral to Groundwater Flow Boreholes)



Ffridd Rasus Landfill - Groundwater Temperature (Downgradient Boreholes)



Appendix D
Laboratory Analytical Data

ALS Environmental Ltd
Torrington Avenue
Coventry
CV4 9GU

T: +44 (0)24 7642 1213
F: +44 (0)24 7685 6575
www.alsenvironmental.co.uk

Ms Francis
Gwynedd Council (UDG)
Gwynedd Council (UDG)
Waste Treatment Services
5-7 Bangor Street
Caernarfon LL55 1AT
Gwynedd

16 October 2014

Test Report: COV/1140414/2014

Dear Ms Francis

Analysis of your sample(s) submitted on 08 October 2014 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out will be sent under separate cover.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7642 1213 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using ALS Environmental Ltd and we look forward to receiving your next samples.

Yours Sincerely,

Signed: A I Horobin

Name: A. Horobin

Title: Organic Operations Manager

Report Summary

UKAS TESTING
1314
0897
4409

ALS Environmental

Ms Susan Francis
Gwynedd Council (UDG)
Gwynedd Council (UDG)
Waste Treatment Services
5-7 Bangor Street
Caernarfon
Gwynedd
LL55 1AT

Date of Issue: **16 October 2014**

Report Number: **COV/1140414/2014** Issue **1**

Job Description: Ffridd Rasus

Job Location: October - Ffridd Rasus

Number of Samples included in this report **18**

Job Received: **08 October 2014**

Number of Test Results included in this report **332**

Analysis Commenced: **09 October 2014**

Signed: A I Horobin

Name: **A. Horobin** Date: **16 October 2014**

Title: **Organic Operations Manager**

ALS Environmental Ltd was not responsible for sampling unless otherwise stated. Sampling is not covered by our UKAS accreditation.

Information on the methods of analysis and performance characteristics are available on request.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. The results relate only to the items tested.
Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory.

Certificate of Analysis

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ALS Environmental

Report Number: **COV/1140414/2014** Issue **1**
Laboratory Number: **14273615** Sample **1** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH18A**
Sample Matrix: **Ground waters**
Sample Date/Time: **07 October 2014**
Sample Received: **08 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Cadmium , Total as Cd	0.0008	mg/l	15/10/2014	Y	Cov	WAS049
Calcium , Total as Ca	129	mg/l	15/10/2014	Y	Cov	WAS049
Chromium , Total as Cr	<0.002	mg/l	15/10/2014	Y	Cov	WAS049
Copper, Total as Cu	<0.009	mg/l	15/10/2014	Y	Cov	WAS049
Iron , Total as Fe	2.51	mg/l	15/10/2014	Y	Cov	WAS049
Lead , Total as Pb	<0.006	mg/l	15/10/2014	Y	Cov	WAS049
Magnesium, Total as Mg	34.7	mg/l	15/10/2014	Y	Cov	WAS049
Manganese , Total as Mn	0.557	mg/l	15/10/2014	Y	Cov	WAS049
Nickel, Total as Ni	<0.003	mg/l	15/10/2014	Y	Cov	WAS049
Potassium , Total as K	20.8	mg/l	15/10/2014	Y	Cov	WAS049
Sodium , Total as Na	56.2	mg/l	15/10/2014	Y	Cov	WAS049
Zinc, Total as Zn	<0.018	mg/l	15/10/2014	Y	Cov	WAS049
pH	8.2	pH units	10/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1020	uS/cm	10/10/2014	Y	Cov	WAS039
Alkalinity as CaCO3	191	mg/l	11/10/2014	Y	Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	09/10/2014	Y	Cov	WAS036
Chloride as Cl	37.5	mg/l	09/10/2014	Y	Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	09/10/2014	Y	Cov	WAS036
Sulphate as SO4	375	mg/l	09/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	3.6	mg/l	10/10/2014	Y	Cov	WAS052
TOC (Filtered)	5.3	mg/l	10/10/2014	Y	Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	15/10/2014	Y	Cov	WAS019

Analyst Comments for 14273615: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **16 October 2014**

Title: **Organic Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

Certificate of Analysis

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ALS Environmental

Report Number: **COV/1140414/2014** Issue **1**
Laboratory Number: **14273616** Sample **2** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH18B**
Sample Matrix: **Ground waters**
Sample Date/Time: **07 October 2014**
Sample Received: **08 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Cadmium , Total as Cd	<0.0006	mg/l	15/10/2014	Y	Cov	WAS049
Calcium , Total as Ca	110	mg/l	15/10/2014	Y	Cov	WAS049
Chromium , Total as Cr	0.009	mg/l	15/10/2014	Y	Cov	WAS049
Copper, Total as Cu	<0.009	mg/l	15/10/2014	Y	Cov	WAS049
Iron , Total as Fe	8.63	mg/l	15/10/2014	Y	Cov	WAS049
Lead , Total as Pb	0.009	mg/l	15/10/2014	Y	Cov	WAS049
Magnesium, Total as Mg	32.1	mg/l	15/10/2014	Y	Cov	WAS049
Manganese , Total as Mn	1.09	mg/l	15/10/2014	Y	Cov	WAS049
Nickel, Total as Ni	0.008	mg/l	15/10/2014	Y	Cov	WAS049
Potassium , Total as K	17.5	mg/l	15/10/2014	Y	Cov	WAS049
Sodium , Total as Na	57.7	mg/l	15/10/2014	Y	Cov	WAS049
Zinc, Total as Zn	0.03	mg/l	15/10/2014	Y	Cov	WAS049
pH	8.0	pH units	10/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	950	uS/cm	10/10/2014	Y	Cov	WAS039
Alkalinity as CaCO3	186	mg/l	11/10/2014	Y	Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	09/10/2014	Y	Cov	WAS036
Chloride as Cl	41.7	mg/l	09/10/2014	Y	Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	09/10/2014	Y	Cov	WAS036
Sulphate as SO4	312	mg/l	09/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	1.3	mg/l	10/10/2014	Y	Cov	WAS052
TOC (Filtered)	4.0	mg/l	10/10/2014	Y	Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	15/10/2014	Y	Cov	WAS019

Analyst Comments for 14273616: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **16 October 2014**

Title: **Organic Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

Certificate of Analysis

1314
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Report Number: **COV/1140414/2014** Issue **1**
Laboratory Number: **14273617** Sample **3** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH19A**
Sample Matrix: **Ground waters**
Sample Date/Time: **07 October 2014**
Sample Received: **08 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	0.0012	mg/l	15/10/2014	Y Cov	WAS049
Calcium , Total as Ca	21.7	mg/l	15/10/2014	Y Cov	WAS049
Chromium , Total as Cr	0.004	mg/l	15/10/2014	Y Cov	WAS049
Copper, Total as Cu	0.017	mg/l	15/10/2014	Y Cov	WAS049
Iron , Total as Fe	8.69	mg/l	15/10/2014	Y Cov	WAS049
Lead , Total as Pb	0.047	mg/l	15/10/2014	Y Cov	WAS049
Magnesium, Total as Mg	4.2	mg/l	15/10/2014	Y Cov	WAS049
Manganese , Total as Mn	4.30	mg/l	15/10/2014	Y Cov	WAS049
Nickel, Total as Ni	0.010	mg/l	15/10/2014	Y Cov	WAS049
Potassium , Total as K	5.20	mg/l	15/10/2014	Y Cov	WAS049
Sodium , Total as Na	7.01	mg/l	15/10/2014	Y Cov	WAS049
Zinc, Total as Zn	0.129	mg/l	15/10/2014	Y Cov	WAS049
pH	7.6	pH units	10/10/2014	Y Cov	WAS039
Conductivity- Electrical 20C	199	uS/cm	10/10/2014	Y Cov	WAS039
Alkalinity as CaCO3	62.0	mg/l	11/10/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	0.88	mg/l	09/10/2014	Y Cov	WAS036
Chloride as Cl	23.2	mg/l	09/10/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	09/10/2014	Y Cov	WAS036
Sulphate as SO4	9.7	mg/l	09/10/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	2.8	mg/l	10/10/2014	Y Cov	WAS052
TOC (Filtered)	2.8	mg/l	10/10/2014	Y Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	15/10/2014	Y Cov	WAS019

Analyst Comments for 14273617: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **16 October 2014**

Title: **Organic Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

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Report Number: **COV/1140414/2014** Issue **1**
Laboratory Number: **14273618** Sample **4** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH19B**
Sample Matrix: **Ground waters**
Sample Date/Time: **07 October 2014**
Sample Received: **08 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Cadmium , Total as Cd	<0.0006	mg/l	15/10/2014	Y	Cov	WAS049
Calcium , Total as Ca	149	mg/l	15/10/2014	Y	Cov	WAS049
Chromium , Total as Cr	0.011	mg/l	15/10/2014	Y	Cov	WAS049
Copper, Total as Cu	<0.009	mg/l	15/10/2014	Y	Cov	WAS049
Iron , Total as Fe	10.8	mg/l	15/10/2014	Y	Cov	WAS049
Lead , Total as Pb	0.007	mg/l	15/10/2014	Y	Cov	WAS049
Magnesium, Total as Mg	27.3	mg/l	15/10/2014	Y	Cov	WAS049
Manganese , Total as Mn	1.08	mg/l	15/10/2014	Y	Cov	WAS049
Nickel, Total as Ni	0.009	mg/l	15/10/2014	Y	Cov	WAS049
Potassium , Total as K	3.29	mg/l	15/10/2014	Y	Cov	WAS049
Sodium , Total as Na	154	mg/l	15/10/2014	Y	Cov	WAS049
Zinc, Total as Zn	0.03	mg/l	15/10/2014	Y	Cov	WAS049
pH	8.0	pH units	10/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1410	uS/cm	10/10/2014	Y	Cov	WAS039
Alkalinity as CaCO3	144	mg/l	11/10/2014	Y	Cov	WAS025
Ammoniacal Nitrogen as N	0.59	mg/l	09/10/2014	Y	Cov	WAS036
Chloride as Cl	213	mg/l	09/10/2014	Y	Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	09/10/2014	Y	Cov	WAS036
Sulphate as SO4	386	mg/l	09/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	2.0	mg/l	10/10/2014	Y	Cov	WAS052
TOC (Filtered)	1.7	mg/l	10/10/2014	Y	Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	15/10/2014	Y	Cov	WAS019

Analyst Comments for 14273618: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **16 October 2014**

Title: **Organic Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

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Report Number: **COV/1140414/2014** Issue **1**
Laboratory Number: **14273619** Sample **5** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH19C**
Sample Matrix: **Ground waters**
Sample Date/Time: **07 October 2014**
Sample Received: **08 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Cadmium , Total as Cd	0.0007	mg/l	15/10/2014	Y	Cov	WAS049
Calcium , Total as Ca	126	mg/l	15/10/2014	Y	Cov	WAS049
Chromium , Total as Cr	<0.002	mg/l	15/10/2014	Y	Cov	WAS049
Copper, Total as Cu	<0.009	mg/l	15/10/2014	Y	Cov	WAS049
Iron , Total as Fe	12.5	mg/l	15/10/2014	Y	Cov	WAS049
Lead , Total as Pb	0.010	mg/l	15/10/2014	Y	Cov	WAS049
Magnesium, Total as Mg	21.0	mg/l	15/10/2014	Y	Cov	WAS049
Manganese , Total as Mn	1.46	mg/l	15/10/2014	Y	Cov	WAS049
Nickel, Total as Ni	0.003	mg/l	15/10/2014	Y	Cov	WAS049
Potassium , Total as K	4.82	mg/l	15/10/2014	Y	Cov	WAS049
Sodium , Total as Na	77.7	mg/l	15/10/2014	Y	Cov	WAS049
Zinc, Total as Zn	0.03	mg/l	15/10/2014	Y	Cov	WAS049
pH	7.8	pH units	10/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1100	uS/cm	10/10/2014	Y	Cov	WAS039
Alkalinity as CaCO3	145	mg/l	11/10/2014	Y	Cov	WAS025
Ammoniacal Nitrogen as N	3.25	mg/l	09/10/2014	Y	Cov	WAS036
Chloride as Cl	200	mg/l	09/10/2014	Y	Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	09/10/2014	Y	Cov	WAS036
Sulphate as SO4	176	mg/l	09/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	10/10/2014	Y	Cov	WAS052
TOC (Filtered)	2.6	mg/l	13/10/2014	Y	Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	15/10/2014	Y	Cov	WAS019

Analyst Comments for 14273619: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **16 October 2014**

Title: **Organic Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

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Report Number: **COV/1140414/2014** Issue **1**
Laboratory Number: **14273620** Sample **6** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH20A**
Sample Matrix: **Ground waters**
Sample Date/Time: **07 October 2014**
Sample Received: **08 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	0.0015	mg/l	15/10/2014	Y Cov	WAS049
Calcium , Total as Ca	160	mg/l	15/10/2014	Y Cov	WAS049
Chromium , Total as Cr	0.012	mg/l	15/10/2014	Y Cov	WAS049
Copper, Total as Cu	0.073	mg/l	15/10/2014	Y Cov	WAS049
Iron , Total as Fe	20.7	mg/l	15/10/2014	Y Cov	WAS049
Lead , Total as Pb	0.064	mg/l	15/10/2014	Y Cov	WAS049
Magnesium, Total as Mg	47.9	mg/l	15/10/2014	Y Cov	WAS049
Manganese , Total as Mn	1.15	mg/l	15/10/2014	Y Cov	WAS049
Nickel, Total as Ni	0.015	mg/l	15/10/2014	Y Cov	WAS049
Potassium , Total as K	26.2	mg/l	15/10/2014	Y Cov	WAS049
Sodium , Total as Na	260	mg/l	15/10/2014	Y Cov	WAS049
Zinc, Total as Zn	0.299	mg/l	15/10/2014	Y Cov	WAS049
pH	7.7	pH units	10/10/2014	Y Cov	WAS039
Conductivity- Electrical 20C	2620	uS/cm	10/10/2014	Y Cov	WAS039
Alkalinity as CaCO3	999	mg/l	11/10/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	76.6	mg/l	09/10/2014	Y Cov	WAS036
Chloride as Cl	439	mg/l	09/10/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	09/10/2014	Y Cov	WAS036
Sulphate, total as SO4 by I.C.	<5.00	mg/l	13/10/2014	Y Cov	CON27
Dissolved Oxygen, Fixed	<0.5	mg/l	10/10/2014	Y Cov	WAS052
TOC (Filtered)	47.0	mg/l	10/10/2014	Y Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	15/10/2014	Y Cov	WAS019

Analyst Comments for 14273620: {/*}Sulphate analysed by ion chromatography due to interference with turbidmetric determination{*/}

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **16 October 2014**

Title: **Organic Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

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Report Number: **COV/1140414/2014** Issue **1**
Laboratory Number: **14273621** Sample **7** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH20B**
Sample Matrix: **Ground waters**
Sample Date/Time: **07 October 2014**
Sample Received: **08 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Cadmium , Total as Cd	0.0015	mg/l	15/10/2014	Y	Cov	WAS049
Calcium , Total as Ca	52.5	mg/l	15/10/2014	Y	Cov	WAS049
Chromium , Total as Cr	0.031	mg/l	15/10/2014	Y	Cov	WAS049
Copper, Total as Cu	0.033	mg/l	15/10/2014	Y	Cov	WAS049
Iron , Total as Fe	22.4	mg/l	15/10/2014	Y	Cov	WAS049
Lead , Total as Pb	0.046	mg/l	15/10/2014	Y	Cov	WAS049
Magnesium, Total as Mg	44.1	mg/l	15/10/2014	Y	Cov	WAS049
Manganese , Total as Mn	0.835	mg/l	15/10/2014	Y	Cov	WAS049
Nickel, Total as Ni	0.018	mg/l	15/10/2014	Y	Cov	WAS049
Potassium , Total as K	127	mg/l	15/10/2014	Y	Cov	WAS049
Sodium , Total as Na	241	mg/l	15/10/2014	Y	Cov	WAS049
Zinc, Total as Zn	0.169	mg/l	15/10/2014	Y	Cov	WAS049
pH	8.0	pH units	10/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	3100	uS/cm	10/10/2014	Y	Cov	WAS039
Alkalinity as CaCO3	1280	mg/l	11/10/2014	Y	Cov	WAS025
Ammoniacal Nitrogen as N	196	mg/l	10/10/2014	Y	Cov	WAS055
Chloride as Cl	390	mg/l	09/10/2014	Y	Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	09/10/2014	Y	Cov	WAS036
Sulphate as SO4	28.2	mg/l	09/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	10/10/2014	Y	Cov	WAS052
TOC (Filtered)	52.0	mg/l	10/10/2014	Y	Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	15/10/2014	Y	Cov	WAS019

Analyst Comments for 14273621: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **16 October 2014**

Title: **Organic Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

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Report Number: **COV/1140414/2014** Issue **1**
Laboratory Number: **14273622** Sample **8** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH21A**
Sample Matrix: **Ground waters**
Sample Date/Time: **07 October 2014**
Sample Received: **08 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Cadmium , Total as Cd	0.0008	mg/l	15/10/2014	Y	Cov	WAS049
Calcium , Total as Ca	46.1	mg/l	15/10/2014	Y	Cov	WAS049
Chromium , Total as Cr	0.007	mg/l	15/10/2014	Y	Cov	WAS049
Copper, Total as Cu	0.015	mg/l	15/10/2014	Y	Cov	WAS049
Iron , Total as Fe	7.07	mg/l	15/10/2014	Y	Cov	WAS049
Lead , Total as Pb	0.019	mg/l	15/10/2014	Y	Cov	WAS049
Magnesium, Total as Mg	9.8	mg/l	15/10/2014	Y	Cov	WAS049
Manganese , Total as Mn	0.324	mg/l	15/10/2014	Y	Cov	WAS049
Nickel, Total as Ni	0.005	mg/l	15/10/2014	Y	Cov	WAS049
Potassium , Total as K	30.8	mg/l	15/10/2014	Y	Cov	WAS049
Sodium , Total as Na	33.2	mg/l	15/10/2014	Y	Cov	WAS049
Zinc, Total as Zn	0.08	mg/l	15/10/2014	Y	Cov	WAS049
pH	8.0	pH units	10/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	808	uS/cm	10/10/2014	Y	Cov	WAS039
Alkalinity as CaCO3	253	mg/l	11/10/2014	Y	Cov	WAS025
Ammoniacal Nitrogen as N	36.3	mg/l	09/10/2014	Y	Cov	WAS036
Chloride as Cl	109	mg/l	09/10/2014	Y	Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	09/10/2014	Y	Cov	WAS036
Sulphate as SO4	39.9	mg/l	09/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	10/10/2014	Y	Cov	WAS052
TOC (Filtered)	6.2	mg/l	10/10/2014	Y	Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	15/10/2014	Y	Cov	WAS019

Analyst Comments for 14273622: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **16 October 2014**

Title: **Organic Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

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Report Number: **COV/1140414/2014** Issue **1**
Laboratory Number: **14273623** Sample **9** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH21B**
Sample Matrix: **Ground waters**
Sample Date/Time: **07 October 2014**
Sample Received: **08 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Cadmium , Total as Cd	0.0012	mg/l	15/10/2014	Y	Cov	WAS049
Calcium , Total as Ca	87.0	mg/l	15/10/2014	Y	Cov	WAS049
Chromium , Total as Cr	0.025	mg/l	15/10/2014	Y	Cov	WAS049
Copper, Total as Cu	0.025	mg/l	15/10/2014	Y	Cov	WAS049
Iron , Total as Fe	24.0	mg/l	15/10/2014	Y	Cov	WAS049
Lead , Total as Pb	0.057	mg/l	15/10/2014	Y	Cov	WAS049
Magnesium, Total as Mg	17.9	mg/l	15/10/2014	Y	Cov	WAS049
Manganese , Total as Mn	0.957	mg/l	15/10/2014	Y	Cov	WAS049
Nickel, Total as Ni	0.014	mg/l	15/10/2014	Y	Cov	WAS049
Potassium , Total as K	12.0	mg/l	15/10/2014	Y	Cov	WAS049
Sodium , Total as Na	104	mg/l	15/10/2014	Y	Cov	WAS049
Zinc, Total as Zn	0.168	mg/l	15/10/2014	Y	Cov	WAS049
pH	8.0	pH units	10/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1100	uS/cm	10/10/2014	Y	Cov	WAS039
Alkalinity as CaCO3	468	mg/l	11/10/2014	Y	Cov	WAS025
Ammoniacal Nitrogen as N	24.9	mg/l	09/10/2014	Y	Cov	WAS036
Chloride as Cl	120	mg/l	09/10/2014	Y	Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	09/10/2014	Y	Cov	WAS036
Sulphate as SO4	9.0	mg/l	09/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	1.8	mg/l	10/10/2014	Y	Cov	WAS052
TOC (Filtered)	15.0	mg/l	10/10/2014	Y	Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	15/10/2014	Y	Cov	WAS019

Analyst Comments for 14273623: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **16 October 2014**

Title: **Organic Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

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Report Number: **COV/1140414/2014** Issue **1**
Laboratory Number: **14273624** Sample **10** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH23**
Sample Matrix: **Ground waters**
Sample Date/Time: **07 October 2014**
Sample Received: **08 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	0.0008	mg/l	15/10/2014	Y Cov	WAS049
Calcium , Total as Ca	65.2	mg/l	15/10/2014	Y Cov	WAS049
Chromium , Total as Cr	0.009	mg/l	15/10/2014	Y Cov	WAS049
Copper, Total as Cu	<0.009	mg/l	15/10/2014	Y Cov	WAS049
Iron , Total as Fe	24.9	mg/l	15/10/2014	Y Cov	WAS049
Lead , Total as Pb	0.011	mg/l	15/10/2014	Y Cov	WAS049
Magnesium, Total as Mg	7.3	mg/l	15/10/2014	Y Cov	WAS049
Manganese , Total as Mn	0.889	mg/l	15/10/2014	Y Cov	WAS049
Nickel, Total as Ni	0.010	mg/l	15/10/2014	Y Cov	WAS049
Potassium , Total as K	1.23	mg/l	15/10/2014	Y Cov	WAS049
Sodium , Total as Na	9.18	mg/l	15/10/2014	Y Cov	WAS049
Zinc, Total as Zn	0.04	mg/l	15/10/2014	Y Cov	WAS049
pH	8.2	pH units	10/10/2014	Y Cov	WAS039
Conductivity- Electrical 20C	291	uS/cm	10/10/2014	Y Cov	WAS039
Alkalinity as CaCO3	179	mg/l	11/10/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	09/10/2014	Y Cov	WAS036
Chloride as Cl	16.8	mg/l	09/10/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	09/10/2014	Y Cov	WAS036
Sulphate as SO4	<1.3	mg/l	09/10/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	4.0	mg/l	10/10/2014	Y Cov	WAS052
TOC (Filtered)	4.1	mg/l	10/10/2014	Y Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	15/10/2014	Y Cov	WAS019

Analyst Comments for 14273624: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **16 October 2014**

Title: **Organic Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

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Report Number: **COV/1140414/2014** Issue **1**
Laboratory Number: **14273625** Sample **11** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH32**
Sample Matrix: **Ground waters**
Sample Date/Time: **07 October 2014**
Sample Received: **08 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	0.0007	mg/l	15/10/2014	Y Cov	WAS049
Calcium , Total as Ca	50.6	mg/l	15/10/2014	Y Cov	WAS049
Chromium , Total as Cr	0.003	mg/l	15/10/2014	Y Cov	WAS049
Copper, Total as Cu	<0.009	mg/l	15/10/2014	Y Cov	WAS049
Iron , Total as Fe	4.60	mg/l	15/10/2014	Y Cov	WAS049
Lead , Total as Pb	<0.006	mg/l	15/10/2014	Y Cov	WAS049
Magnesium, Total as Mg	6.5	mg/l	15/10/2014	Y Cov	WAS049
Manganese , Total as Mn	0.423	mg/l	15/10/2014	Y Cov	WAS049
Nickel, Total as Ni	0.006	mg/l	15/10/2014	Y Cov	WAS049
Potassium , Total as K	3.52	mg/l	15/10/2014	Y Cov	WAS049
Sodium , Total as Na	14.2	mg/l	15/10/2014	Y Cov	WAS049
Zinc, Total as Zn	<0.018	mg/l	15/10/2014	Y Cov	WAS049
pH	8.2	pH units	10/10/2014	Y Cov	WAS039
Conductivity- Electrical 20C	316	uS/cm	10/10/2014	Y Cov	WAS039
Alkalinity as CaCO3	126	mg/l	11/10/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	09/10/2014	Y Cov	WAS036
Chloride as Cl	21.4	mg/l	09/10/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	09/10/2014	Y Cov	WAS036
Sulphate as SO4	25.9	mg/l	09/10/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	2.5	mg/l	10/10/2014	Y Cov	WAS052
TOC (Filtered)	2.1	mg/l	10/10/2014	Y Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	15/10/2014	Y Cov	WAS019

Analyst Comments for 14273625: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **16 October 2014**

Title: **Organic Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

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Report Number: **COV/1140414/2014** Issue **1**
Laboratory Number: **14273626** Sample **12** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH33**
Sample Matrix: **Ground waters**
Sample Date/Time: **07 October 2014**
Sample Received: **08 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Cadmium , Total as Cd	<0.0006	mg/l	15/10/2014	Y	Cov	WAS049
Calcium , Total as Ca	29.5	mg/l	15/10/2014	Y	Cov	WAS049
Chromium , Total as Cr	<0.002	mg/l	15/10/2014	Y	Cov	WAS049
Copper, Total as Cu	<0.009	mg/l	15/10/2014	Y	Cov	WAS049
Iron , Total as Fe	0.93	mg/l	15/10/2014	Y	Cov	WAS049
Lead , Total as Pb	<0.006	mg/l	15/10/2014	Y	Cov	WAS049
Magnesium, Total as Mg	3.8	mg/l	15/10/2014	Y	Cov	WAS049
Manganese , Total as Mn	0.069	mg/l	15/10/2014	Y	Cov	WAS049
Nickel, Total as Ni	<0.003	mg/l	15/10/2014	Y	Cov	WAS049
Potassium , Total as K	1.17	mg/l	15/10/2014	Y	Cov	WAS049
Sodium , Total as Na	7.06	mg/l	15/10/2014	Y	Cov	WAS049
Zinc, Total as Zn	<0.018	mg/l	15/10/2014	Y	Cov	WAS049
pH	8.2	pH units	10/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	190	uS/cm	10/10/2014	Y	Cov	WAS039
Alkalinity as CaCO3	78.0	mg/l	11/10/2014	Y	Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	09/10/2014	Y	Cov	WAS036
Chloride as Cl	13.8	mg/l	09/10/2014	Y	Cov	WAS036
Nitrogen, Total Oxidised as N	1.24	mg/l	09/10/2014	Y	Cov	WAS036
Sulphate as SO4	<1.3	mg/l	09/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	2.6	mg/l	10/10/2014	Y	Cov	WAS052
TOC (Filtered)	1.3	mg/l	10/10/2014	Y	Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	15/10/2014	Y	Cov	WAS019

Analyst Comments for 14273626: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **16 October 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1140414/2014** Issue **1**
Laboratory Number: **14273627** Sample **13** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH30**
Sample Matrix: **Ground waters**
Sample Date/Time: **07 October 2014**
Sample Received: **08 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Cadmium , Total as Cd	0.0023	mg/l	15/10/2014	Y	Cov	WAS049
Calcium , Total as Ca	31.0	mg/l	15/10/2014	Y	Cov	WAS049
Chromium , Total as Cr	0.004	mg/l	15/10/2014	Y	Cov	WAS049
Copper, Total as Cu	<0.009	mg/l	15/10/2014	Y	Cov	WAS049
Iron , Total as Fe	11.3	mg/l	15/10/2014	Y	Cov	WAS049
Lead , Total as Pb	<0.006	mg/l	15/10/2014	Y	Cov	WAS049
Magnesium, Total as Mg	48.2	mg/l	15/10/2014	Y	Cov	WAS049
Manganese , Total as Mn	0.193	mg/l	15/10/2014	Y	Cov	WAS049
Nickel, Total as Ni	0.013	mg/l	15/10/2014	Y	Cov	WAS049
Potassium , Total as K	122	mg/l	15/10/2014	Y	Cov	WAS049
Sodium , Total as Na	233	mg/l	15/10/2014	Y	Cov	WAS049
Zinc, Total as Zn	0.02	mg/l	15/10/2014	Y	Cov	WAS049
pH	7.9	pH units	10/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	2690	uS/cm	10/10/2014	Y	Cov	WAS039
Alkalinity as CaCO3	1200	mg/l	11/10/2014	Y	Cov	WAS025
Ammoniacal Nitrogen as N	176	mg/l	10/10/2014	Y	Cov	WAS055
Chloride as Cl	292	mg/l	09/10/2014	Y	Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	09/10/2014	Y	Cov	WAS036
Sulphate as SO4	<1.3	mg/l	09/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	0.5	mg/l	10/10/2014	Y	Cov	WAS052
TOC (Filtered)	53.2	mg/l	10/10/2014	Y	Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	15/10/2014	Y	Cov	WAS019

Analyst Comments for 14273627: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **16 October 2014**

Title: **Organic Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

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Report Number: **COV/1140414/2014** Issue **1**
Laboratory Number: **14273628** Sample **14** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH31**
Sample Matrix: **Ground waters**
Sample Date/Time: **07 October 2014**
Sample Received: **08 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	0.0019	mg/l	15/10/2014	Y Cov	WAS049
Calcium , Total as Ca	60.5	mg/l	15/10/2014	Y Cov	WAS049
Chromium , Total as Cr	0.003	mg/l	15/10/2014	Y Cov	WAS049
Copper, Total as Cu	<0.009	mg/l	15/10/2014	Y Cov	WAS049
Iron , Total as Fe	15.4	mg/l	15/10/2014	Y Cov	WAS049
Lead , Total as Pb	<0.006	mg/l	15/10/2014	Y Cov	WAS049
Magnesium, Total as Mg	21.2	mg/l	15/10/2014	Y Cov	WAS049
Manganese , Total as Mn	0.233	mg/l	15/10/2014	Y Cov	WAS049
Nickel, Total as Ni	0.011	mg/l	15/10/2014	Y Cov	WAS049
Potassium , Total as K	71.7	mg/l	15/10/2014	Y Cov	WAS049
Sodium , Total as Na	66.5	mg/l	15/10/2014	Y Cov	WAS049
Zinc, Total as Zn	0.03	mg/l	15/10/2014	Y Cov	WAS049
pH	7.8	pH units	10/10/2014	Y Cov	WAS039
Conductivity- Electrical 20C	1390	uS/cm	10/10/2014	Y Cov	WAS039
Alkalinity as CaCO3	644	mg/l	11/10/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	84.2	mg/l	09/10/2014	Y Cov	WAS036
Chloride as Cl	55.2	mg/l	09/10/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	09/10/2014	Y Cov	WAS036
Sulphate as SO4	114	mg/l	09/10/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	10/10/2014	Y Cov	WAS052
TOC (Filtered)	17.5	mg/l	10/10/2014	Y Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	15/10/2014	Y Cov	WAS019

Analyst Comments for 14273628: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **16 October 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1140414/2014** Issue **1**
Laboratory Number: **14273629** Sample **15** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **SW1**
Sample Matrix: **Surface waters**
Sample Date/Time: **07 October 2014**
Sample Received: **08 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.1	pH units	10/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	292	uS/cm	10/10/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	11.6	mg/l	09/10/2014	Y	Cov	WAS036
Chloride as Cl	22.2	mg/l	09/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	10/10/2014	Y	Cov	WAS052
COD (Total)	157	mg/l	09/10/2014	Y	Cov	WAS040

Analyst Comments for 14273629: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **16 October 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1140414/2014** Issue **1**

Laboratory Number: **14273630** Sample **16** of **18**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **SW1 (pipe)**

Sample Matrix: **Surface waters**

Sample Date/Time: **07 October 2014**

Sample Received: **08 October 2014**

Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.2	pH units	10/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	292	uS/cm	10/10/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	11.0	mg/l	09/10/2014	Y	Cov	WAS036
Chloride as Cl	21.9	mg/l	09/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	1.1	mg/l	10/10/2014	Y	Cov	WAS052
COD (Total)	109	mg/l	09/10/2014	Y	Cov	WAS040

Analyst Comments for 14273630: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **16 October 2014**

Title: **Organic Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

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Report Number: **COV/1140414/2014** Issue **1**
Laboratory Number: **14273631** Sample **17** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **SW2**
Sample Matrix: **Surface waters**
Sample Date/Time: **07 October 2014**
Sample Received: **08 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.2	pH units	10/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	45.6	uS/cm	10/10/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	09/10/2014	Y	Cov	WAS036
Chloride as Cl	3.13	mg/l	09/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	8.8	mg/l	10/10/2014	Y	Cov	WAS052
COD (Total)	29.0	mg/l	09/10/2014	Y	Cov	WAS040

Analyst Comments for 14273631: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **16 October 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1140414/2014** Issue **1**
Laboratory Number: **14273632** Sample **18** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **SW3**
Sample Matrix: **Surface waters**
Sample Date/Time: **07 October 2014**
Sample Received: **08 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	6.9	pH units	10/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1320	uS/cm	10/10/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	1.15	mg/l	09/10/2014	Y	Cov	WAS036
Chloride as Cl	149	mg/l	09/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	3.1	mg/l	10/10/2014	Y	Cov	WAS052
COD (Total)	91.0	mg/l	09/10/2014	Y	Cov	WAS040

Analyst Comments for 14273632: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **16 October 2014**

Title: **Organic Operations Manager**

ANALYST COMMENTS FOR REPORT COV/1140414/2014 Issue 1

Date of Issue: **16 October 2014**

Sample No	Analysis Comments
14273615	
14273616	
14273617	
14273618	
14273619	
14273620	{/*}Sulphate analysed by ion chromatography due to interference with turbidmetric determination{*/}
14273621	
14273622	
14273623	
14273624	
14273625	
14273626	
14273627	
14273628	
14273629	
14273630	
14273631	
14273632	

Signed: A I Horobin

Name: **A. Horobin** Date: **16 October 2014**

Title: **Organic Operations Manager**

DETERMINAND COMMENTS FOR REPORT COV/1140414/2014 ISSUE 1

Date of Issue : 16 October 2014

Sample No	Description	Determinand	Comments

Signed: A I Horobin

Name: **A. Horobin** Date: **16 October 2014**

Title: **Organic Operations Manager**

ALS Environmental Ltd
Torrington Avenue
Coventry
CV4 9GU

T: +44 (0)24 7642 1213
F: +44 (0)24 7685 6575
www.alsenvironmental.co.uk

Ms Francis
Gwynedd Council (UDG)
Gwynedd Council (UDG)
Waste Treatment Services
5-7 Bangor Street
Caernarfon LL55 1AT
Gwynedd

30 October 2014

Test Report: COV/1143582/2014

Dear Ms Francis

Analysis of your sample(s) submitted on 22 October 2014 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out will be sent under separate cover.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7642 1213 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using ALS Environmental Ltd and we look forward to receiving your next samples.

Yours Sincerely,

Signed:

Name: G. Coiley

Title: Coventry Operations Manager

Report Summary

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Ms Susan Francis
Gwynedd Council (UDG)
Gwynedd Council (UDG)
Waste Treatment Services
5-7 Bangor Street
Caernarfon
Gwynedd
LL55 1AT

Date of Issue: **30 October 2014**

Report Number: **COV/1143582/2014** Issue **1**

Job Description: Ffridd Rasus

Job Location: October - Ffridd Rasus

Number of Samples included in this report **14**

Job Received: **22 October 2014**

Number of Test Results included in this report **240**

Analysis Commenced: **23 October 2014**

Signed: CACoiley

Name: **G. Coiley** Date: **30 October 2014**

Title: **Coventry Operations Manager**

ALS Environmental Ltd was not responsible for sampling unless otherwise stated. Sampling is not covered by our UKAS accreditation.

Information on the methods of analysis and performance characteristics are available on request.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. The results relate only to the items tested.
Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory.

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Report Number: **COV/1143582/2014** Issue **1**
Laboratory Number: **14297126** Sample **1** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH34**
Sample Matrix: **Ground waters**
Sample Date/Time: **21 October 2014**
Sample Received: **22 October 2014**
Analysis Complete: **30 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	0.0018	mg/l	27/10/2014	Y Cov	WAS049
Calcium , Total as Ca	105	mg/l	27/10/2014	Y Cov	WAS049
Chromium , Total as Cr	0.005	mg/l	27/10/2014	Y Cov	WAS049
Copper, Total as Cu	<0.009	mg/l	27/10/2014	Y Cov	WAS049
Iron , Total as Fe	57.0	mg/l	27/10/2014	Y Cov	WAS049
Lead , Total as Pb	0.007	mg/l	27/10/2014	Y Cov	WAS049
Magnesium, Total as Mg	18.7	mg/l	27/10/2014	Y Cov	WAS049
Manganese , Total as Mn	1.54	mg/l	27/10/2014	Y Cov	WAS049
Nickel, Total as Ni	0.006	mg/l	27/10/2014	Y Cov	WAS049
Potassium , Total as K	3.68	mg/l	27/10/2014	Y Cov	WAS049
Sodium , Total as Na	19.8	mg/l	27/10/2014	Y Cov	WAS049
Zinc, Total as Zn	<0.018	mg/l	27/10/2014	Y Cov	WAS049
pH	7.2	pH units	24/10/2014	Y Cov	WAS039
Conductivity- Electrical 20C	728	uS/cm	24/10/2014	Y Cov	WAS039
Alkalinity as CaCO3	264	mg/l	25/10/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	0.45	mg/l	24/10/2014	Y Cov	WAS036
Chloride as Cl	38.9	mg/l	24/10/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	24/10/2014	Y Cov	WAS036
Sulphate as SO4	136	mg/l	24/10/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	1.4	mg/l	24/10/2014	Y Cov	WAS052
TOC (Filtered)	5.9	mg/l	25/10/2014	Y Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	30/10/2014	Y Cov	WAS019

Analyst Comments for 14297126: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: CACoiley

Name: **G. Coiley** Date: **30 October 2014**

Title: **Coventry Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

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Report Number: **COV/1143582/2014** Issue **1**
Laboratory Number: **14297127** Sample **2** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH35**
Sample Matrix: **Ground waters**
Sample Date/Time: **21 October 2014**
Sample Received: **22 October 2014**
Analysis Complete: **30 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	0.0007	mg/l	27/10/2014	Y Cov	WAS049
Calcium , Total as Ca	71.9	mg/l	27/10/2014	Y Cov	WAS049
Chromium , Total as Cr	0.006	mg/l	27/10/2014	Y Cov	WAS049
Copper, Total as Cu	0.014	mg/l	27/10/2014	Y Cov	WAS049
Iron , Total as Fe	14.3	mg/l	27/10/2014	Y Cov	WAS049
Lead , Total as Pb	0.015	mg/l	27/10/2014	Y Cov	WAS049
Magnesium, Total as Mg	9.1	mg/l	27/10/2014	Y Cov	WAS049
Manganese , Total as Mn	0.670	mg/l	27/10/2014	Y Cov	WAS049
Nickel, Total as Ni	0.011	mg/l	27/10/2014	Y Cov	WAS049
Potassium , Total as K	20.1	mg/l	27/10/2014	Y Cov	WAS049
Sodium , Total as Na	44.1	mg/l	27/10/2014	Y Cov	WAS049
Zinc, Total as Zn	0.03	mg/l	27/10/2014	Y Cov	WAS049
pH	7.4	pH units	24/10/2014	Y Cov	WAS039
Conductivity- Electrical 20C	869	uS/cm	24/10/2014	Y Cov	WAS039
Alkalinity as CaCO3	258	mg/l	25/10/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	12.8	mg/l	24/10/2014	Y Cov	WAS036
Chloride as Cl	103	mg/l	24/10/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	1.21	mg/l	24/10/2014	Y Cov	WAS036
Sulphate as SO4	70.4	mg/l	24/10/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	2.9	mg/l	24/10/2014	Y Cov	WAS052
TOC (Filtered)	14.3	mg/l	25/10/2014	Y Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	30/10/2014	Y Cov	WAS019

Analyst Comments for 14297127: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: CACoiley

Name: **G. Coiley** Date: **30 October 2014**
Title: **Coventry Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

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Report Number: **COV/1143582/2014** Issue **1**
Laboratory Number: **14297128** Sample **3** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH36**
Sample Matrix: **Ground waters**
Sample Date/Time: **21 October 2014**
Sample Received: **22 October 2014**
Analysis Complete: **30 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	0.0015	mg/l	27/10/2014	Y Cov	WAS049
Calcium , Total as Ca	76.8	mg/l	27/10/2014	Y Cov	WAS049
Chromium , Total as Cr	0.015	mg/l	27/10/2014	Y Cov	WAS049
Copper, Total as Cu	0.016	mg/l	27/10/2014	Y Cov	WAS049
Iron , Total as Fe	27.1	mg/l	27/10/2014	Y Cov	WAS049
Lead , Total as Pb	0.017	mg/l	27/10/2014	Y Cov	WAS049
Magnesium, Total as Mg	18.1	mg/l	27/10/2014	Y Cov	WAS049
Manganese , Total as Mn	1.000	mg/l	27/10/2014	Y Cov	WAS049
Nickel, Total as Ni	0.023	mg/l	27/10/2014	Y Cov	WAS049
Potassium , Total as K	71.0	mg/l	27/10/2014	Y Cov	WAS049
Sodium , Total as Na	116	mg/l	27/10/2014	Y Cov	WAS049
Zinc, Total as Zn	0.03	mg/l	27/10/2014	Y Cov	WAS049
pH	7.4	pH units	24/10/2014	Y Cov	WAS039
Conductivity- Electrical 20C	1970	uS/cm	24/10/2014	Y Cov	WAS039
Alkalinity as CaCO3	902	mg/l	25/10/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	122	mg/l	25/10/2014	Y Cov	WAS036
Chloride as Cl	193	mg/l	24/10/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	24/10/2014	Y Cov	WAS036
Sulphate, total as SO4 by I.C.	11.98	mg/l	29/10/2014	Y Cov	CON27
Dissolved Oxygen, Fixed	1.0	mg/l	24/10/2014	Y Cov	WAS052
TOC (Filtered)	36.2	mg/l	25/10/2014	Y Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	30/10/2014	Y Cov	WAS019

Analyst Comments for 14297128: This sample has been analysed for Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised. Sulphate analysed by ion chromatography due to interference with turbidimetric determination.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: C A Coiley

Name: **G. Coiley** Date: **30 October 2014**

Title: **Coventry Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

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Report Number: **COV/1143582/2014** Issue **1**
Laboratory Number: **14297129** Sample **4** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH27**
Sample Matrix: **Ground waters**
Sample Date/Time: **21 October 2014**
Sample Received: **22 October 2014**
Analysis Complete: **30 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Cadmium , Total as Cd	0.0025	mg/l	27/10/2014	Y	Cov	WAS049
Calcium , Total as Ca	73.4	mg/l	27/10/2014	Y	Cov	WAS049
Chromium , Total as Cr	0.016	mg/l	27/10/2014	Y	Cov	WAS049
Copper, Total as Cu	<0.009	mg/l	27/10/2014	Y	Cov	WAS049
Iron , Total as Fe	20.3	mg/l	27/10/2014	Y	Cov	WAS049
Lead , Total as Pb	<0.006	mg/l	27/10/2014	Y	Cov	WAS049
Magnesium, Total as Mg	33.3	mg/l	27/10/2014	Y	Cov	WAS049
Manganese , Total as Mn	0.191	mg/l	27/10/2014	Y	Cov	WAS049
Nickel, Total as Ni	0.048	mg/l	27/10/2014	Y	Cov	WAS049
Potassium , Total as K	122	mg/l	27/10/2014	Y	Cov	WAS049
Sodium , Total as Na	202	mg/l	27/10/2014	Y	Cov	WAS049
Zinc, Total as Zn	<0.018	mg/l	27/10/2014	Y	Cov	WAS049
pH	7.3	pH units	24/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	2760	uS/cm	24/10/2014	Y	Cov	WAS039
Alkalinity as CaCO3	1200	mg/l	25/10/2014	Y	Cov	WAS025
Ammoniacal Nitrogen as N	172	mg/l	26/10/2014	Y	Cov	WAS055
Chloride as Cl	273	mg/l	24/10/2014	Y	Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	24/10/2014	Y	Cov	WAS036
Sulphate, total as SO4 by I.C.	<5.00	mg/l	29/10/2014	Y	Cov	CON27
Dissolved Oxygen, Fixed	0.5	mg/l	24/10/2014	Y	Cov	WAS052
TOC (Filtered)	48.8	mg/l	25/10/2014	Y	Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	30/10/2014	Y	Cov	WAS019

Analyst Comments for 14297129: This sample has been analysed for Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised. Sulphate analysed by ion chromatography due to interference with turbidimetric determination.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: C A Coiley
Name: **G. Coiley** Date: **30 October 2014**
Title: **Coventry Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
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Report Number: **COV/1143582/2014** Issue **1**
Laboratory Number: **14297130** Sample **5** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH28**
Sample Matrix: **Ground waters**
Sample Date/Time: **21 October 2014**
Sample Received: **22 October 2014**
Analysis Complete: **30 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Cadmium , Total as Cd	<0.0006	mg/l	27/10/2014	Y	Cov	WAS049
Calcium , Total as Ca	67.0	mg/l	27/10/2014	Y	Cov	WAS049
Chromium , Total as Cr	0.014	mg/l	27/10/2014	Y	Cov	WAS049
Copper, Total as Cu	<0.009	mg/l	27/10/2014	Y	Cov	WAS049
Iron , Total as Fe	11.7	mg/l	27/10/2014	Y	Cov	WAS049
Lead , Total as Pb	<0.006	mg/l	27/10/2014	Y	Cov	WAS049
Magnesium, Total as Mg	8.7	mg/l	27/10/2014	Y	Cov	WAS049
Manganese , Total as Mn	0.513	mg/l	27/10/2014	Y	Cov	WAS049
Nickel, Total as Ni	0.054	mg/l	27/10/2014	Y	Cov	WAS049
Potassium , Total as K	2.94	mg/l	27/10/2014	Y	Cov	WAS049
Sodium , Total as Na	9.39	mg/l	27/10/2014	Y	Cov	WAS049
Zinc, Total as Zn	<0.018	mg/l	27/10/2014	Y	Cov	WAS049
pH	7.6	pH units	24/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	437	uS/cm	24/10/2014	Y	Cov	WAS039
Alkalinity as CaCO3	157	mg/l	25/10/2014	Y	Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	24/10/2014	Y	Cov	WAS036
Chloride as Cl	25.6	mg/l	24/10/2014	Y	Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	24/10/2014	Y	Cov	WAS036
Sulphate as SO4	57.8	mg/l	24/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	2.0	mg/l	24/10/2014	Y	Cov	WAS052
TOC (Filtered)	2.8	mg/l	25/10/2014	Y	Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	30/10/2014	Y	Cov	WAS019

Analyst Comments for 14297130: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: CACoiley

Name: **G. Coiley** Date: **30 October 2014**

Title: **Coventry Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

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Report Number: **COV/1143582/2014** Issue **1**
Laboratory Number: **14297131** Sample **6** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH29**
Sample Matrix: **Ground waters**
Sample Date/Time: **21 October 2014**
Sample Received: **22 October 2014**
Analysis Complete: **30 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Cadmium , Total as Cd	<0.0006	mg/l	27/10/2014	Y	Cov	WAS049
Calcium , Total as Ca	80.7	mg/l	27/10/2014	Y	Cov	WAS049
Chromium , Total as Cr	<0.002	mg/l	27/10/2014	Y	Cov	WAS049
Copper, Total as Cu	<0.009	mg/l	27/10/2014	Y	Cov	WAS049
Iron , Total as Fe	6.98	mg/l	27/10/2014	Y	Cov	WAS049
Lead , Total as Pb	<0.006	mg/l	27/10/2014	Y	Cov	WAS049
Magnesium, Total as Mg	6.3	mg/l	27/10/2014	Y	Cov	WAS049
Manganese , Total as Mn	0.208	mg/l	27/10/2014	Y	Cov	WAS049
Nickel, Total as Ni	<0.003	mg/l	27/10/2014	Y	Cov	WAS049
Potassium , Total as K	3.69	mg/l	27/10/2014	Y	Cov	WAS049
Sodium , Total as Na	11.0	mg/l	27/10/2014	Y	Cov	WAS049
Zinc, Total as Zn	0.02	mg/l	27/10/2014	Y	Cov	WAS049
pH	7.8	pH units	24/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	464	uS/cm	24/10/2014	Y	Cov	WAS039
Alkalinity as CaCO3	248	mg/l	25/10/2014	Y	Cov	WAS025
Ammoniacal Nitrogen as N	0.93	mg/l	24/10/2014	Y	Cov	WAS036
Chloride as Cl	16.0	mg/l	24/10/2014	Y	Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	24/10/2014	Y	Cov	WAS036
Sulphate as SO4	4.6	mg/l	24/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	20.5	mg/l	24/10/2014	Y	Cov	WAS052
TOC (Filtered)	3.5	mg/l	25/10/2014	Y	Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	30/10/2014	Y	Cov	WAS019

Analyst Comments for 14297131: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: CAColley

Name: **G. Coiley** Date: **30 October 2014**
Title: **Coventry Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

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Report Number: **COV/1143582/2014** Issue **1**
Laboratory Number: **14297132** Sample **7** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **NRA3**
Sample Matrix: **Ground waters**
Sample Date/Time: **21 October 2014**
Sample Received: **22 October 2014**
Analysis Complete: **30 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Cadmium , Total as Cd	<0.0006	mg/l	27/10/2014	Y	Cov	WAS049
Calcium , Total as Ca	78.3	mg/l	27/10/2014	Y	Cov	WAS049
Chromium , Total as Cr	<0.002	mg/l	27/10/2014	Y	Cov	WAS049
Copper, Total as Cu	<0.009	mg/l	27/10/2014	Y	Cov	WAS049
Iron , Total as Fe	12.5	mg/l	27/10/2014	Y	Cov	WAS049
Lead , Total as Pb	<0.006	mg/l	27/10/2014	Y	Cov	WAS049
Magnesium, Total as Mg	6.1	mg/l	27/10/2014	Y	Cov	WAS049
Manganese , Total as Mn	0.610	mg/l	27/10/2014	Y	Cov	WAS049
Nickel, Total as Ni	0.005	mg/l	27/10/2014	Y	Cov	WAS049
Potassium , Total as K	7.21	mg/l	27/10/2014	Y	Cov	WAS049
Sodium , Total as Na	10.8	mg/l	27/10/2014	Y	Cov	WAS049
Zinc, Total as Zn	<0.018	mg/l	27/10/2014	Y	Cov	WAS049
pH	7.0	pH units	24/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	509	uS/cm	24/10/2014	Y	Cov	WAS039
Alkalinity as CaCO3	181	mg/l	25/10/2014	Y	Cov	WAS025
Ammoniacal Nitrogen as N	1.05	mg/l	24/10/2014	Y	Cov	WAS036
Chloride as Cl	25.2	mg/l	24/10/2014	Y	Cov	WAS036
Nitrogen, Total Oxidised as N	7.54	mg/l	24/10/2014	Y	Cov	WAS036
Sulphate as SO4	45.9	mg/l	24/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	3.1	mg/l	24/10/2014	Y	Cov	WAS052
TOC (Filtered)	4.3	mg/l	25/10/2014	Y	Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	30/10/2014	Y	Cov	WAS019

Analyst Comments for 14297132: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: CACoiley

Name: **G. Coiley** Date: **30 October 2014**

Title: **Coventry Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

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Report Number: **COV/1143582/2014** Issue **1**
Laboratory Number: **14297133** Sample **8** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH1**
Sample Matrix: **Ground waters**
Sample Date/Time: **21 October 2014**
Sample Received: **22 October 2014**
Analysis Complete: **30 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.0006	mg/l	27/10/2014	Y Cov	WAS049
Calcium , Total as Ca	20.7	mg/l	27/10/2014	Y Cov	WAS049
Chromium , Total as Cr	<0.002	mg/l	27/10/2014	Y Cov	WAS049
Copper, Total as Cu	<0.009	mg/l	27/10/2014	Y Cov	WAS049
Iron , Total as Fe	0.71	mg/l	27/10/2014	Y Cov	WAS049
Lead , Total as Pb	<0.006	mg/l	27/10/2014	Y Cov	WAS049
Magnesium, Total as Mg	2.8	mg/l	27/10/2014	Y Cov	WAS049
Manganese , Total as Mn	0.122	mg/l	27/10/2014	Y Cov	WAS049
Nickel, Total as Ni	0.004	mg/l	27/10/2014	Y Cov	WAS049
Potassium , Total as K	1.82	mg/l	27/10/2014	Y Cov	WAS049
Sodium , Total as Na	11.2	mg/l	27/10/2014	Y Cov	WAS049
Zinc, Total as Zn	<0.018	mg/l	27/10/2014	Y Cov	WAS049
pH	7.6	pH units	24/10/2014	Y Cov	WAS039
Conductivity- Electrical 20C	215	uS/cm	24/10/2014	Y Cov	WAS039
Alkalinity as CaCO3	48.7	mg/l	25/10/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	24/10/2014	Y Cov	WAS036
Chloride as Cl	28.3	mg/l	24/10/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	3.86	mg/l	24/10/2014	Y Cov	WAS036
Sulphate as SO4	<1.3	mg/l	24/10/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	8.8	mg/l	24/10/2014	Y Cov	WAS052
TOC (Filtered)	1.5	mg/l	25/10/2014	Y Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	30/10/2014	Y Cov	WAS019

Analyst Comments for 14297133: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: CACoiley

Name: **G. Coiley** Date: **30 October 2014**

Title: **Coventry Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

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Report Number: **COV/1143582/2014** Issue **1**
Laboratory Number: **14297134** Sample **9** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH15**
Sample Matrix: **Ground waters**
Sample Date/Time: **21 October 2014**
Sample Received: **22 October 2014**
Analysis Complete: **30 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.0006	mg/l	27/10/2014	Y Cov	WAS049
Calcium , Total as Ca	37.9	mg/l	27/10/2014	Y Cov	WAS049
Chromium , Total as Cr	<0.002	mg/l	27/10/2014	Y Cov	WAS049
Copper, Total as Cu	<0.009	mg/l	27/10/2014	Y Cov	WAS049
Iron , Total as Fe	0.63	mg/l	27/10/2014	Y Cov	WAS049
Lead , Total as Pb	<0.006	mg/l	27/10/2014	Y Cov	WAS049
Magnesium, Total as Mg	2.6	mg/l	27/10/2014	Y Cov	WAS049
Manganese , Total as Mn	0.10	mg/l	27/10/2014	Y Cov	WAS049
Nickel, Total as Ni	<0.003	mg/l	27/10/2014	Y Cov	WAS049
Potassium , Total as K	0.92	mg/l	27/10/2014	Y Cov	WAS049
Sodium , Total as Na	8.38	mg/l	27/10/2014	Y Cov	WAS049
Zinc, Total as Zn	<0.018	mg/l	27/10/2014	Y Cov	WAS049
pH	7.9	pH units	24/10/2014	Y Cov	WAS039
Conductivity- Electrical 20C	253	uS/cm	24/10/2014	Y Cov	WAS039
Alkalinity as CaCO3	96.0	mg/l	25/10/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	24/10/2014	Y Cov	WAS036
Chloride as Cl	24.2	mg/l	24/10/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	0.80	mg/l	24/10/2014	Y Cov	WAS036
Sulphate as SO4	<1.3	mg/l	24/10/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	6.1	mg/l	24/10/2014	Y Cov	WAS052
TOC (Filtered)	1.2	mg/l	25/10/2014	Y Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	30/10/2014	Y Cov	WAS019

Analyst Comments for 14297134: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: CACoiley

Name: **G. Coiley** Date: **30 October 2014**

Title: **Coventry Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

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Report Number: **COV/1143582/2014** Issue **1**
Laboratory Number: **14297135** Sample **10** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH24**
Sample Matrix: **Ground waters**
Sample Date/Time: **21 October 2014**
Sample Received: **22 October 2014**
Analysis Complete: **30 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Cadmium , Total as Cd	<0.0006	mg/l	27/10/2014	Y	Cov	WAS049
Calcium , Total as Ca	70.7	mg/l	27/10/2014	Y	Cov	WAS049
Chromium , Total as Cr	<0.002	mg/l	27/10/2014	Y	Cov	WAS049
Copper, Total as Cu	<0.009	mg/l	27/10/2014	Y	Cov	WAS049
Iron , Total as Fe	1.98	mg/l	27/10/2014	Y	Cov	WAS049
Lead , Total as Pb	0.007	mg/l	27/10/2014	Y	Cov	WAS049
Magnesium, Total as Mg	9.1	mg/l	27/10/2014	Y	Cov	WAS049
Manganese , Total as Mn	1.47	mg/l	27/10/2014	Y	Cov	WAS049
Nickel, Total as Ni	0.003	mg/l	27/10/2014	Y	Cov	WAS049
Potassium , Total as K	0.84	mg/l	27/10/2014	Y	Cov	WAS049
Sodium , Total as Na	10.5	mg/l	27/10/2014	Y	Cov	WAS049
Zinc, Total as Zn	<0.018	mg/l	27/10/2014	Y	Cov	WAS049
pH	8.1	pH units	24/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	424	uS/cm	24/10/2014	Y	Cov	WAS039
Alkalinity as CaCO3	201	mg/l	25/10/2014	Y	Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	24/10/2014	Y	Cov	WAS036
Chloride as Cl	30.7	mg/l	24/10/2014	Y	Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	24/10/2014	Y	Cov	WAS036
Sulphate as SO4	<1.3	mg/l	24/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	2.1	mg/l	24/10/2014	Y	Cov	WAS052
TOC (Filtered)	3.4	mg/l	25/10/2014	Y	Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	30/10/2014	Y	Cov	WAS019

Analyst Comments for 14297135: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: CAColley

Name: **G. Coiley** Date: **30 October 2014**
Title: **Coventry Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

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Report Number: **COV/1143582/2014** Issue **1**

Laboratory Number: **14297136** Sample **11** of **14**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **LCP1**

Sample Matrix: **Land Leachate**

Sample Date/Time: **21 October 2014**

Sample Received: **22 October 2014**

Analysis Complete: **30 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.7	pH units	24/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	9540	uS/cm	24/10/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	742	mg/l	26/10/2014	Y	Cov	WAS055
Chloride as Cl	988	mg/l	24/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	24/10/2014	Y	Cov	WAS052

Analyst Comments for 14297136: This sample has been analysed for Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: C A Coiley

Name: **G. Coiley** Date: **30 October 2014**

Title: **Coventry Operations Manager**

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Report Number: **COV/1143582/2014** Issue **1**

Laboratory Number: **14297137** Sample **12** of **14**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **LCP2**

Sample Matrix: **Land Leachate**

Sample Date/Time: **21 October 2014**

Sample Received: **22 October 2014**

Analysis Complete: **30 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.8	pH units	24/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	15900	uS/cm	24/10/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	1600	mg/l	26/10/2014	Y	Cov	WAS055
Chloride as Cl	1660	mg/l	24/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	24/10/2014	Y	Cov	WAS052

Analyst Comments for 14297137: This sample has been analysed for Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: CAColley

Name: **G. Coiley** Date: **30 October 2014**

Title: **Coventry Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

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Report Number: **COV/1143582/2014** Issue **1**

Laboratory Number: **14297138** Sample **13** of **14**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **LCP3**

Sample Matrix: **Land Leachate**

Sample Date/Time: **21 October 2014**

Sample Received: **22 October 2014**

Analysis Complete: **30 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.6	pH units	24/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	12500	uS/cm	24/10/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	1200	mg/l	26/10/2014	Y	Cov	WAS055
Chloride as Cl	1310	mg/l	24/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	24/10/2014	Y	Cov	WAS052

Analyst Comments for 14297138: This sample has been analysed for Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: CAColley

Name: **G. Coiley** Date: **30 October 2014**

Title: **Coventry Operations Manager**

Certificate of Analysis

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Report Number: **COV/1143582/2014** Issue **1**

Laboratory Number: **14297139** Sample **14** of **14**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **LCP4A**

Sample Matrix: **Land Leachate**

Sample Date/Time: **21 October 2014**

Sample Received: **22 October 2014**

Analysis Complete: **30 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.9	pH units	24/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	20000	uS/cm	24/10/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	2130	mg/l	26/10/2014	Y	Cov	WAS055
Chloride as Cl	2230	mg/l	24/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	24/10/2014	Y	Cov	WAS052

Analyst Comments for 14297139: This sample has been analysed for Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: C A Coiley

Name: **G. Coiley** Date: **30 October 2014**

Title: **Coventry Operations Manager**

ANALYST COMMENTS FOR REPORT COV/1143582/2014 Issue 1

Date of Issue: **30 October 2014**

Sample No	Analysis Comments
14297126	
14297127	
14297128	This sample has been analysed for Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised. Sulphate analysed by ion chromatography due to interference with turbidimetric determination.
14297129	This sample has been analysed for Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised. Sulphate analysed by ion chromatography due to interference with turbidimetric determination.
14297130	
14297131	
14297132	
14297133	
14297134	
14297135	
14297136	This sample has been analysed for Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised.
14297137	This sample has been analysed for Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised.
14297138	This sample has been analysed for Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised.
14297139	This sample has been analysed for Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised.

Signed: 

Name: **G. Coiley** Date: **30 October 2014**

Title: **Coventry Operations Manager**

DETERMINAND COMMENTS FOR REPORT COV/1143582/2014 ISSUE 1

Date of Issue : 30 October 2014

Sample No	Description	Determinand	Comments

Signed: 

Name: **G. Coiley** Date: **30 October 2014**

Title: **Coventry Operations Manager**

ALS Environmental Ltd
Torrington Avenue
Coventry
CV4 9GU

T: +44 (0)24 7642 1213
F: +44 (0)24 7685 6575
www.alsenvironmental.co.uk

Ms Francis
Gwynedd Council (UDG)
Gwynedd Council (UDG)
Waste Treatment Services
5-7 Bangor Street
Caernarfon LL55 1AT
Gwynedd

21 November 2014

Test Report: COV/1148173/2014

Dear Ms Francis

Analysis of your sample(s) submitted on 12 November 2014 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out will be sent under separate cover.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7642 1213 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using ALS Environmental Ltd and we look forward to receiving your next samples.

Yours Sincerely,

Signed: A I Horobin

Name: A. Horobin

Title: Organic Operations Manager

Report Summary

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Ms Susan Francis
Gwynedd Council (UDG)
Gwynedd Council (UDG)
Waste Treatment Services
5-7 Bangor Street
Caernarfon
Gwynedd
LL55 1AT

Date of Issue: **21 November 2014**

Report Number: **COV/1148173/2014** Issue **1**

Job Description: Ffridd Rasus

Job Location: November - Ffridd Rasus

Number of Samples included in this report **18**

Job Received: **12 November 2014**

Number of Test Results included in this report **94**

Analysis Commenced: **13 November 2014**

Signed: A I Horobin

Name: **A. Horobin** Date: **21 November 2014**

Title: **Organic Operations Manager**

ALS Environmental Ltd was not responsible for sampling unless otherwise stated. Sampling is not covered by our UKAS accreditation.

Information on the methods of analysis and performance characteristics are available on request.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. The results relate only to the items tested.
Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory.

Certificate of Analysis

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Report Number: **COV/1148173/2014** Issue **1**

Laboratory Number: **14335229** Sample **1** of **18**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH18A**

Sample Matrix: **Ground waters**

Sample Date/Time: **11 November 2014**

Sample Received: **12 November 2014**

Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.1	pH units	14/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1230	uS/cm	14/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	14/11/2014	Y	Cov	WAS036
Chloride as Cl	41.1	mg/l	14/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	4.3	mg/l	13/11/2014	Y	Cov	WAS052

Analyst Comments for 14335229: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **21 November 2014**

Title: **Organic Operations Manager**

Certificate of Analysis

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Report Number: **COV/1148173/2014** Issue **1**

Laboratory Number: **14335230** Sample **2** of **18**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH18B**

Sample Matrix: **Ground waters**

Sample Date/Time: **11 November 2014**

Sample Received: **12 November 2014**

Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.0	pH units	14/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	955	uS/cm	14/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	5.88	mg/l	14/11/2014	Y	Cov	WAS036
Chloride as Cl	47.7	mg/l	14/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	13/11/2014	Y	Cov	WAS052

Analyst Comments for 14335230: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **21 November 2014**

Title: **Organic Operations Manager**

Certificate of Analysis

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Report Number: **COV/1148173/2014** Issue **1**
Laboratory Number: **14335231** Sample **3** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH19A**
Sample Matrix: **Ground waters**
Sample Date/Time: **11 November 2014**
Sample Received: **12 November 2014**
Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.2	pH units	14/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	167	uS/cm	14/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	0.31	mg/l	14/11/2014	Y	Cov	WAS036
Chloride as Cl	17.0	mg/l	14/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	2.7	mg/l	13/11/2014	Y	Cov	WAS052

Analyst Comments for 14335231: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **21 November 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1148173/2014** Issue **1**

Laboratory Number: **14335232** Sample **4** of **18**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH19B**

Sample Matrix: **Ground waters**

Sample Date/Time: **11 November 2014**

Sample Received: **12 November 2014**

Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.9	pH units	14/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	676	uS/cm	14/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	14/11/2014	Y	Cov	WAS036
Chloride as Cl	87.4	mg/l	14/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	3.4	mg/l	13/11/2014	Y	Cov	WAS052

Analyst Comments for 14335232: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **21 November 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1148173/2014** Issue **1**
Laboratory Number: **14335233** Sample **5** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH19C**
Sample Matrix: **Ground waters**
Sample Date/Time: **11 November 2014**
Sample Received: **12 November 2014**
Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.4	pH units	14/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1350	uS/cm	14/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	1.08	mg/l	14/11/2014	Y	Cov	WAS036
Chloride as Cl	252	mg/l	14/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	13/11/2014	Y	Cov	WAS052

Analyst Comments for 14335233: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin
Name: **A. Horobin** Date: **21 November 2014**
Title: **Organic Operations Manager**

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Report Number: **COV/1148173/2014** Issue **1**
Laboratory Number: **14335234** Sample **6** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH20A**
Sample Matrix: **Ground waters**
Sample Date/Time: **11 November 2014**
Sample Received: **12 November 2014**
Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.9	pH units	14/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	2490	uS/cm	14/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	77.2	mg/l	14/11/2014	Y	Cov	WAS036
Chloride as Cl	486	mg/l	14/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	13/11/2014	Y	Cov	WAS052

Analyst Comments for 14335234: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **21 November 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1148173/2014** Issue **1**
Laboratory Number: **14335235** Sample **7** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH20B**
Sample Matrix: **Ground waters**
Sample Date/Time: **11 November 2014**
Sample Received: **12 November 2014**
Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.0	pH units	14/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	3060	uS/cm	14/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	197	mg/l	15/11/2014	Y	Cov	WAS055
Chloride as Cl	363	mg/l	14/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	0.5	mg/l	13/11/2014	Y	Cov	WAS052

Analyst Comments for 14335235: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **21 November 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1148173/2014** Issue **1**
Laboratory Number: **14335236** Sample **8** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH21A**
Sample Matrix: **Ground waters**
Sample Date/Time: **11 November 2014**
Sample Received: **12 November 2014**
Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.9	pH units	14/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	959	uS/cm	14/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	21.9	mg/l	14/11/2014	Y	Cov	WAS036
Chloride as Cl	108	mg/l	14/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	13/11/2014	Y	Cov	WAS052

Analyst Comments for 14335236: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **21 November 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1148173/2014** Issue **1**

Laboratory Number: **14335237** Sample **9** of **18**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH21B**

Sample Matrix: **Ground waters**

Sample Date/Time: **11 November 2014**

Sample Received: **12 November 2014**

Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.8	pH units	14/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	859	uS/cm	14/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	41.3	mg/l	14/11/2014	Y	Cov	WAS036
Chloride as Cl	141	mg/l	14/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	13/11/2014	Y	Cov	WAS052

Analyst Comments for 14335237: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **21 November 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1148173/2014** Issue **1**

Laboratory Number: **14335238** Sample **10** of **18**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH23**

Sample Matrix: **Ground waters**

Sample Date/Time: **11 November 2014**

Sample Received: **12 November 2014**

Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.9	pH units	14/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	285	uS/cm	14/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	0.53	mg/l	14/11/2014	Y	Cov	WAS036
Chloride as Cl	16.6	mg/l	14/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	4.1	mg/l	13/11/2014	Y	Cov	WAS052

Analyst Comments for 14335238: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **21 November 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1148173/2014** Issue **1**

Laboratory Number: **14335239** Sample **11** of **18**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH32**

Sample Matrix: **Ground waters**

Sample Date/Time: **11 November 2014**

Sample Received: **12 November 2014**

Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.7	pH units	14/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	240	uS/cm	14/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	14/11/2014	Y	Cov	WAS036
Chloride as Cl	17.4	mg/l	14/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	5.3	mg/l	13/11/2014	Y	Cov	WAS052

Analyst Comments for 14335239: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **21 November 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1148173/2014** Issue **1**
Laboratory Number: **14335240** Sample **12** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH33**
Sample Matrix: **Ground waters**
Sample Date/Time: **11 November 2014**
Sample Received: **12 November 2014**
Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.5	pH units	14/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	195	uS/cm	14/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	14/11/2014	Y	Cov	WAS036
Chloride as Cl	14.7	mg/l	14/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	4.9	mg/l	13/11/2014	Y	Cov	WAS052

Analyst Comments for 14335240: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **21 November 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1148173/2014** Issue **1**
Laboratory Number: **14335241** Sample **13** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH30**
Sample Matrix: **Ground waters**
Sample Date/Time: **11 November 2014**
Sample Received: **12 November 2014**
Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.9	pH units	14/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	2740	uS/cm	14/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	172	mg/l	15/11/2014	Y	Cov	WAS055
Chloride as Cl	302	mg/l	14/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	13/11/2014	Y	Cov	WAS052

Analyst Comments for 14335241: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **21 November 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1148173/2014** Issue **1**

Laboratory Number: **14335242** Sample **14** of **18**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH31**

Sample Matrix: **Ground waters**

Sample Date/Time: **11 November 2014**

Sample Received: **12 November 2014**

Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.9	pH units	14/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1320	uS/cm	14/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	77.2	mg/l	14/11/2014	Y	Cov	WAS036
Chloride as Cl	51.3	mg/l	14/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	1.0	mg/l	13/11/2014	Y	Cov	WAS052

Analyst Comments for 14335242: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **21 November 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1148173/2014** Issue **1**
Laboratory Number: **14335243** Sample **15** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **SW1**
Sample Matrix: **Surface waters**
Sample Date/Time: **11 November 2014**
Sample Received: **12 November 2014**
Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.0	pH units	14/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	246	uS/cm	14/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	3.52	mg/l	14/11/2014	Y	Cov	WAS036
Chloride as Cl	20.4	mg/l	14/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	13/11/2014	Y	Cov	WAS052
COD (Total)	200	mg/l	15/11/2014	Y	Cov	WAS040

Analyst Comments for 14335243: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **21 November 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1148173/2014** Issue **1**
Laboratory Number: **14335244** Sample **16** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **SW1 (pipe)**
Sample Matrix: **Surface waters**
Sample Date/Time: **11 November 2014**
Sample Received: **12 November 2014**
Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.1	pH units	14/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	243	uS/cm	14/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	3.35	mg/l	14/11/2014	Y	Cov	WAS036
Chloride as Cl	19.6	mg/l	14/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	13/11/2014	Y	Cov	WAS052
COD (Total)	118	mg/l	14/11/2014	Y	Cov	WAS040

Analyst Comments for 14335244: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **21 November 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1148173/2014** Issue **1**
Laboratory Number: **14335245** Sample **17** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **SW2**
Sample Matrix: **Surface waters**
Sample Date/Time: **11 November 2014**
Sample Received: **12 November 2014**
Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.5	pH units	14/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	641	uS/cm	14/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	0.41	mg/l	14/11/2014	Y	Cov	WAS036
Chloride as Cl	72.6	mg/l	14/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	4.6	mg/l	13/11/2014	Y	Cov	WAS052
COD (Total)	65.0	mg/l	14/11/2014	Y	Cov	WAS040

Analyst Comments for 14335245: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **21 November 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1148173/2014** Issue **1**
Laboratory Number: **14335246** Sample **18** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **SW3**
Sample Matrix: **Surface waters**
Sample Date/Time: **11 November 2014**
Sample Received: **12 November 2014**
Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.5	pH units	14/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	733	uS/cm	14/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	3.85	mg/l	14/11/2014	Y	Cov	WAS036
Chloride as Cl	63.0	mg/l	14/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	3.8	mg/l	13/11/2014	Y	Cov	WAS052
COD (Total)	90.0	mg/l	14/11/2014	Y	Cov	WAS040

Analyst Comments for 14335246: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **21 November 2014**

Title: **Organic Operations Manager**

ANALYST COMMENTS FOR REPORT COV/1148173/2014 Issue 1

Date of Issue: **21 November 2014**

Sample No	Analysis Comments
14335229	
14335230	
14335231	
14335232	
14335233	
14335234	
14335235	
14335236	
14335237	
14335238	
14335239	
14335240	
14335241	
14335242	
14335243	
14335244	
14335245	
14335246	

Signed: A I Horobin

Name: **A. Horobin** Date: **21 November 2014**

Title: **Organic Operations Manager**

DETERMINAND COMMENTS FOR REPORT COV/1148173/2014 ISSUE 1

Date of Issue : 21 November 2014

Sample No	Description	Determinand	Comments

Signed: A I Horobin

Name: **A. Horobin** Date: **21 November 2014**

Title: **Organic Operations Manager**

ALS Environmental Ltd
Torrington Avenue
Coventry
CV4 9GU

T: +44 (0)24 7642 1213
F: +44 (0)24 7685 6575
www.alsenvironmental.co.uk

Ms Francis
Gwynedd Council (UDG)
Gwynedd Council (UDG)
Waste Treatment Services
5-7 Bangor Street
Caernarfon LL55 1AT
Gwynedd

08 January 2015

Test Report: COV/1151618/2014

Dear Ms Francis

Analysis of your sample(s) submitted on 27 November 2014 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out will be sent under separate cover.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7642 1213 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using ALS Environmental Ltd and we look forward to receiving your next samples.

Yours Sincerely,

Signed: A I Horobin

Name: A. Horobin

Title: Organic Operations Manager

Report Summary

UKAS TESTING
1314
0897
4409

ALS Environmental

Ms Susan Francis
Gwynedd Council (UDG)
Gwynedd Council (UDG)
Waste Treatment Services
5-7 Bangor Street
Caernarfon
Gwynedd
LL55 1AT

Date of Issue: **08 January 2015**

Report Number: **COV/1151618/2014** Issue **1**

Job Description: Ffridd Rasus

Job Location: November - Ffridd Rasus

Number of Samples included in this report **10**

Number of Test Results included in this report **50**

Job Received: **27 November 2014**

Analysis Commenced: **28 November 2014**

Signed: A I Horobin

Name: **A. Horobin** Date: **08 January 2015**

Title: **Organic Operations Manager**

ALS Environmental Ltd was not responsible for sampling unless otherwise stated. Sampling is not covered by our UKAS accreditation.

Information on the methods of analysis and performance characteristics are available on request.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. The results relate only to the items tested.
Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory.

Certificate of Analysis

1314
0897
4409

Report Number: **COV/1151618/2014** Issue **1**

Laboratory Number: **14361184** Sample **1** of **10**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH34**

Sample Matrix: **Ground Water**

Sample Date/Time: **26 November 2014**

Sample Received: **27 November 2014**

Analysis Complete: **01 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.6	pH units	29/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	993	uS/cm	29/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	0.89	mg/l	28/11/2014	Y	Cov	WAS036
Chloride as Cl	51.0	mg/l	28/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	28/11/2014	Y	Cov	WAS052

Analyst Comments for 14361184: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **08 January 2015**

Title: **Organic Operations Manager**

Certificate of Analysis

1314
0897
4409

Report Number: **COV/1151618/2014** Issue **1**

Laboratory Number: **14361185** Sample **2** of **10**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH35**

Sample Matrix: **Ground Water**

Sample Date/Time: **26 November 2014**

Sample Received: **27 November 2014**

Analysis Complete: **01 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.6	pH units	29/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1220	uS/cm	29/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	22.9	mg/l	28/11/2014	Y	Cov	WAS036
Chloride as Cl	168	mg/l	28/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	28/11/2014	Y	Cov	WAS052

Analyst Comments for 14361185: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **08 January 2015**

Title: **Organic Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

Certificate of Analysis

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Report Number: **COV/1151618/2014** Issue **1**
Laboratory Number: **14361186** Sample **3** of **10**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH36**
Sample Matrix: **Ground Water**
Sample Date/Time: **26 November 2014**
Sample Received: **27 November 2014**
Analysis Complete: **01 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.8	pH units	29/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1730	uS/cm	29/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	86.8	mg/l	28/11/2014	Y	Cov	WAS036
Chloride as Cl	174	mg/l	28/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	1.5	mg/l	28/11/2014	Y	Cov	WAS052

Analyst Comments for 14361186: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **08 January 2015**

Title: **Organic Operations Manager**

Certificate of Analysis

1314
0897
4409

Report Number: **COV/1151618/2014** Issue **1**
Laboratory Number: **14361187** Sample **4** of **10**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH27**
Sample Matrix: **Ground Water**
Sample Date/Time: **26 November 2014**
Sample Received: **27 November 2014**
Analysis Complete: **01 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.7	pH units	29/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	2630	uS/cm	29/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	173	mg/l	29/11/2014	Y	Cov	WAS055
Chloride as Cl	268	mg/l	28/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	28/11/2014	Y	Cov	WAS052

Analyst Comments for 14361187: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **08 January 2015**

Title: **Organic Operations Manager**

Certificate of Analysis

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Report Number: **COV/1151618/2014** Issue **1**
Laboratory Number: **14361188** Sample **5** of **10**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH28**
Sample Matrix: **Ground Water**
Sample Date/Time: **26 November 2014**
Sample Received: **27 November 2014**
Analysis Complete: **01 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.7	pH units	29/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	436	uS/cm	29/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	28/11/2014	Y	Cov	WAS036
Chloride as Cl	18.3	mg/l	28/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	28/11/2014	Y	Cov	WAS052

Analyst Comments for 14361188: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **08 January 2015**

Title: **Organic Operations Manager**

Certificate of Analysis

1314
0897
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Report Number: **COV/1151618/2014** Issue **1**

Laboratory Number: **14361189** Sample **6** of **10**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH29**

Sample Matrix: **Ground Water**

Sample Date/Time: **26 November 2014**

Sample Received: **27 November 2014**

Analysis Complete: **01 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.9	pH units	29/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	456	uS/cm	29/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	1.89	mg/l	28/11/2014	Y	Cov	WAS036
Chloride as Cl	17.8	mg/l	28/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	1.5	mg/l	28/11/2014	Y	Cov	WAS052

Analyst Comments for 14361189: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **08 January 2015**

Title: **Organic Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

Certificate of Analysis

1314
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Report Number: **COV/1151618/2014** Issue **1**

Laboratory Number: **14361190** Sample **7** of **10**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **NRA3**
Sample Matrix: **Ground Water**
Sample Date/Time: **26 November 2014**
Sample Received: **27 November 2014**
Analysis Complete: **01 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.2	pH units	29/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	521	uS/cm	29/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	2.92	mg/l	28/11/2014	Y	Cov	WAS036
Chloride as Cl	23.8	mg/l	28/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	2.6	mg/l	28/11/2014	Y	Cov	WAS052

Analyst Comments for 14361190: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **08 January 2015**

Title: **Organic Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

Certificate of Analysis

1314
0897
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Report Number: **COV/1151618/2014** Issue **1**

Laboratory Number: **14361191** Sample **8** of **10**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH1**

Sample Matrix: **Ground Water**

Sample Date/Time: **26 November 2014**

Sample Received: **27 November 2014**

Analysis Complete: **01 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.1	pH units	29/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	284	uS/cm	29/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	28/11/2014	Y	Cov	WAS036
Chloride as Cl	30.5	mg/l	28/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	6.0	mg/l	28/11/2014	Y	Cov	WAS052

Analyst Comments for 14361191: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **08 January 2015**

Title: **Organic Operations Manager**

Certificate of Analysis

1314
0897
4409

Report Number: **COV/1151618/2014** Issue **1**
Laboratory Number: **14361192** Sample **9** of **10**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH15**
Sample Matrix: **Ground Water**
Sample Date/Time: **26 November 2014**
Sample Received: **27 November 2014**
Analysis Complete: **01 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.3	pH units	29/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	243	uS/cm	29/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	28/11/2014	Y	Cov	WAS036
Chloride as Cl	20.1	mg/l	28/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	1.7	mg/l	28/11/2014	Y	Cov	WAS052

Analyst Comments for 14361192: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **08 January 2015**

Title: **Organic Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

Certificate of Analysis

1314
0897
4409

Report Number: **COV/1151618/2014** Issue **1**

Laboratory Number: **14361193** Sample **10** of **10**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH24**

Sample Matrix: **Ground Water**

Sample Date/Time: **26 November 2014**

Sample Received: **27 November 2014**

Analysis Complete: **01 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.2	pH units	29/11/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	414	uS/cm	29/11/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	28/11/2014	Y	Cov	WAS036
Chloride as Cl	30.0	mg/l	28/11/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	1.5	mg/l	28/11/2014	Y	Cov	WAS052

Analyst Comments for 14361193: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **08 January 2015**

Title: **Organic Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

ANALYST COMMENTS FOR REPORT COV/1151618/2014 Issue 1

Date of Issue: **08 January 2015**

Sample No	Analysis Comments
14361184	
14361185	
14361186	
14361187	
14361188	
14361189	
14361190	
14361191	
14361192	
14361193	

Signed: A I Horobin

Name: **A. Horobin** Date: **08 January 2015**

Title: **Organic Operations Manager**

DETERMINAND COMMENTS FOR REPORT COV/1151618/2014 ISSUE 1

Date of Issue : 08 January 2015

Sample No	Description	Determinand	Comments

Signed: A I Horobin

Name: **A. Horobin** Date: **08 January 2015**

Title: **Organic Operations Manager**

ALS Environmental Ltd
Torrington Avenue
Coventry
CV4 9GU

T: +44 (0)24 7642 1213
F: +44 (0)24 7685 6575
www.alsenvironmental.co.uk

Ms Francis
Gwynedd Council (UDG)
Gwynedd Council (UDG)
Waste Treatment Services
5-7 Bangor Street
Caernarfon LL55 1AT
Gwynedd

08 January 2015

Test Report: COV/1154635/2014

Dear Ms Francis

Analysis of your sample(s) submitted on 10 December 2014 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out will be sent under separate cover.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7642 1213 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using ALS Environmental Ltd and we look forward to receiving your next samples.

Yours Sincerely,

Signed:

Name: C. Law

Title: Inorganics Operations Manager

Report Summary

UKAS TESTING
1314
0897
4409

ALS Environmental

Ms Susan Francis
Gwynedd Council (UDG)
Gwynedd Council (UDG)
Waste Treatment Services
5-7 Bangor Street
Caernarfon
Gwynedd
LL55 1AT

Date of Issue: **08 January 2015**

Report Number: **COV/1154635/2014** Issue **1**

Job Description: Ffridd Rasus

Job Location: December - Ffridd Rasus

Number of Samples included in this report **17**

Job Received: **10 December 2014**

Number of Test Results included in this report **88**

Analysis Commenced: **12 December 2014**

Signed:

Name: **C. Law** Date: **08 January 2015**

Title: **Inorganics Operations Manager**

ALS Environmental Ltd was not responsible for sampling unless otherwise stated. Sampling is not covered by our UKAS accreditation.

Information on the methods of analysis and performance characteristics are available on request.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. The results relate only to the items tested.
Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory.

Certificate of Analysis

UKAS TESTING
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ALS Environmental

Report Number: **COV/1154635/2014** Issue **1**
Laboratory Number: **14383849** Sample **1** of **17**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH18A**
Sample Matrix: **Ground Water**
Sample Date/Time:
Sample Received: **10 December 2014**
Analysis Complete: **19 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.9	pH units	13/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1200	uS/cm	15/12/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	12/12/2014	Y	Cov	WAS036
Chloride as Cl	42.1	mg/l	12/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	4.1	mg/l	18/12/2014	Y	Cov	WAS052

Analyst Comments for 14383849: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

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Report Number: **COV/1154635/2014** Issue **1**
Laboratory Number: **14383850** Sample **2** of **17**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH18B**
Sample Matrix: **Ground Water**
Sample Date/Time:
Sample Received: **10 December 2014**
Analysis Complete: **19 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.9	pH units	13/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	974	uS/cm	15/12/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	12/12/2014	Y	Cov	WAS036
Chloride as Cl	39.8	mg/l	12/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	2.4	mg/l	18/12/2014	Y	Cov	WAS052

Analyst Comments for 14383850: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

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Report Number: **COV/1154635/2014** Issue **1**
Laboratory Number: **14383851** Sample **3** of **17**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH19A**
Sample Matrix: **Ground Water**
Sample Date/Time:
Sample Received: **10 December 2014**
Analysis Complete: **19 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.0	pH units	13/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	326	uS/cm	15/12/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	12/12/2014	Y	Cov	WAS036
Chloride as Cl	38.8	mg/l	12/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	5.4	mg/l	18/12/2014	Y	Cov	WAS052

Analyst Comments for 14383851: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

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Name: **C. Law** Date: **08 January 2015**

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Report Number: **COV/1154635/2014** Issue **1**
Laboratory Number: **14383852** Sample **4** of **17**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH19B**
Sample Matrix: **Ground Water**
Sample Date/Time:
Sample Received: **10 December 2014**
Analysis Complete: **19 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.9	pH units	13/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	667	uS/cm	15/12/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	12/12/2014	Y	Cov	WAS036
Chloride as Cl	85.1	mg/l	12/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	3.0	mg/l	18/12/2014	Y	Cov	WAS052

Analyst Comments for 14383852: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

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Report Number: **COV/1154635/2014** Issue **1**
Laboratory Number: **14383853** Sample **5** of **17**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH19C**
Sample Matrix: **Ground Water**
Sample Date/Time:
Sample Received: **10 December 2014**
Analysis Complete: **19 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.7	pH units	13/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1190	uS/cm	15/12/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	12/12/2014	Y	Cov	WAS036
Chloride as Cl	209	mg/l	12/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	2.9	mg/l	18/12/2014	Y	Cov	WAS052

Analyst Comments for 14383853: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

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Name: **C. Law** Date: **08 January 2015**
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Report Number: **COV/1154635/2014** Issue **1**
Laboratory Number: **14383854** Sample **6** of **17**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH20A**
Sample Matrix: **Ground Water**
Sample Date/Time:
Sample Received: **10 December 2014**
Analysis Complete: **19 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.7	pH units	13/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1100	uS/cm	15/12/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	26.9	mg/l	12/12/2014	Y	Cov	WAS036
Chloride as Cl	134	mg/l	12/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	3.8	mg/l	18/12/2014	Y	Cov	WAS052

Analyst Comments for 14383854: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

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Report Number: **COV/1154635/2014** Issue **1**
Laboratory Number: **14383855** Sample **7** of **17**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH20B**
Sample Matrix: **Ground Water**
Sample Date/Time:
Sample Received: **10 December 2014**
Analysis Complete: **19 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.7	pH units	13/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1090	uS/cm	15/12/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	59.8	mg/l	12/12/2014	Y	Cov	WAS036
Chloride as Cl	154	mg/l	12/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	3.5	mg/l	18/12/2014	Y	Cov	WAS052

Analyst Comments for 14383855: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

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Name: **C. Law** Date: **08 January 2015**

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Report Number: **COV/1154635/2014** Issue **1**
Laboratory Number: **14383856** Sample **8** of **17**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH21A**
Sample Matrix: **Ground Water**
Sample Date/Time:
Sample Received: **10 December 2014**
Analysis Complete: **19 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.5	pH units	13/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	2500	uS/cm	15/12/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	71.8	mg/l	18/12/2014	Y	Cov	WAS036
Chloride as Cl	447	mg/l	12/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	2.0	mg/l	18/12/2014	Y	Cov	WAS052

Analyst Comments for 14383856: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

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Report Number: **COV/1154635/2014** Issue **1**
Laboratory Number: **14383857** Sample **9** of **17**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH21B**
Sample Matrix: **Ground Water**
Sample Date/Time:
Sample Received: **10 December 2014**
Analysis Complete: **19 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.8	pH units	13/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	3160	uS/cm	15/12/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	207	mg/l	13/12/2014	Y	Cov	WAS055
Chloride as Cl	367	mg/l	12/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	2.0	mg/l	18/12/2014	Y	Cov	WAS052

Analyst Comments for 14383857: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

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Name: **C. Law** Date: **08 January 2015**
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Report Number: **COV/1154635/2014** Issue **1**
Laboratory Number: **14383858** Sample **10** of **17**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH23**
Sample Matrix: **Ground Water**
Sample Date/Time:
Sample Received: **10 December 2014**
Analysis Complete: **19 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.0	pH units	13/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	283	uS/cm	15/12/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	12/12/2014	Y	Cov	WAS036
Chloride as Cl	15.9	mg/l	12/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	2.6	mg/l	18/12/2014	Y	Cov	WAS052

Analyst Comments for 14383858: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

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Name: **C. Law** Date: **08 January 2015**
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Report Number: **COV/1154635/2014** Issue **1**
Laboratory Number: **14383859** Sample **11** of **17**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH32**
Sample Matrix: **Ground Water**
Sample Date/Time:
Sample Received: **10 December 2014**
Analysis Complete: **19 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.0	pH units	13/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	423	uS/cm	15/12/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	12/12/2014	Y	Cov	WAS036
Chloride as Cl	36.2	mg/l	12/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	2.7	mg/l	18/12/2014	Y	Cov	WAS052

Analyst Comments for 14383859: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

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Name: **C. Law** Date: **08 January 2015**
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Report Number: **COV/1154635/2014** Issue **1**
Laboratory Number: **14383860** Sample **12** of **17**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH33**
Sample Matrix: **Ground Water**
Sample Date/Time:
Sample Received: **10 December 2014**
Analysis Complete: **19 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.2	pH units	13/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	204	uS/cm	15/12/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	12/12/2014	Y	Cov	WAS036
Chloride as Cl	15.2	mg/l	12/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	3.0	mg/l	18/12/2014	Y	Cov	WAS052

Analyst Comments for 14383860: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

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Name: **C. Law** Date: **08 January 2015**

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Report Number: **COV/1154635/2014** Issue **1**
Laboratory Number: **14383861** Sample **13** of **17**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH30**
Sample Matrix: **Ground Water**
Sample Date/Time:
Sample Received: **10 December 2014**
Analysis Complete: **19 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.6	pH units	13/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	2730	uS/cm	15/12/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	175	mg/l	13/12/2014	Y	Cov	WAS055
Chloride as Cl	300	mg/l	12/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	0.6	mg/l	18/12/2014	Y	Cov	WAS052

Analyst Comments for 14383861: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **C. Law** Date: **08 January 2015**
Title: **Inorganics Operations Manager**

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Report Number: **COV/1154635/2014** Issue **1**

Laboratory Number: **14383862** Sample **14** of **17**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH31**

Sample Matrix: **Ground Water**

Sample Date/Time:

Sample Received: **10 December 2014**

Analysis Complete: **19 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.5	pH units	13/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1190	uS/cm	15/12/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	69.3	mg/l	18/12/2014	Y	Cov	WAS036
Chloride as Cl	46.6	mg/l	12/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	3.1	mg/l	18/12/2014	Y	Cov	WAS052

Analyst Comments for 14383862: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

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Name: **C. Law** Date: **08 January 2015**

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Report Number: **COV/1154635/2014** Issue **1**
Laboratory Number: **14383863** Sample **15** of **17**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **SW1**
Sample Matrix: **Surface Water**
Sample Date/Time:
Sample Received: **10 December 2014**
Analysis Complete: **19 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.1	pH units	13/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	307	uS/cm	15/12/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	6.47	mg/l	12/12/2014	Y	Cov	WAS036
Chloride as Cl	21.9	mg/l	12/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	18/12/2014	Y	Cov	WAS052
COD (Total)	368	mg/l	19/12/2014	Y	Cov	WAS040

Analyst Comments for 14383863: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **08 January 2015**

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Report Number: **COV/1154635/2014** Issue **1**
Laboratory Number: **14383864** Sample **16** of **17**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **SW2**
Sample Matrix: **Surface Water**
Sample Date/Time:
Sample Received: **10 December 2014**
Analysis Complete: **19 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.5	pH units	13/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1060	uS/cm	15/12/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	6.52	mg/l	12/12/2014	Y	Cov	WAS036
Chloride as Cl	148	mg/l	12/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	18/12/2014	Y	Cov	WAS052
COD (Total)	460	mg/l	19/12/2014	Y	Cov	WAS040

Analyst Comments for 14383864: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: Name: **C. Law** Date: **08 January 2015**
Title: **Inorganics Operations Manager**

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Report Number: **COV/1154635/2014** Issue **1**
Laboratory Number: **14383865** Sample **17** of **17**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **SW3**
Sample Matrix: **Surface Water**
Sample Date/Time:
Sample Received: **10 December 2014**
Analysis Complete: **19 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.1	pH units	13/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	637	uS/cm	15/12/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	12/12/2014	Y	Cov	WAS036
Chloride as Cl	50.1	mg/l	12/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	3.6	mg/l	18/12/2014	Y	Cov	WAS052
COD (Total)	253	mg/l	19/12/2014	Y	Cov	WAS040

Analyst Comments for 14383865: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: Name: **C. Law** Date: **08 January 2015**
Title: **Inorganics Operations Manager**

ANALYST COMMENTS FOR REPORT COV/1154635/2014 Issue 1

Date of Issue: **08 January 2015**

Sample No	Analysis Comments
14383849	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14383850	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14383851	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14383852	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14383853	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14383854	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14383855	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14383856	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14383857	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14383858	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14383859	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14383860	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14383861	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14383862	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14383863	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14383864	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14383865	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Signed:

Name: **C. Law** Date: **08 January 2015**

Title: **Inorganics Operations Manager**

DETERMINAND COMMENTS FOR REPORT COV/1154635/2014 ISSUE 1

Date of Issue : 08 January 2015

Sample No	Description	Determinand	Comments

Signed: 

Name: **C. Law** Date: **08 January 2015**

Title: **Inorganics Operations Manager**

ALS Environmental Ltd
Torrington Avenue
Coventry
CV4 9GU

T: +44 (0)24 7642 1213
F: +44 (0)24 7685 6575
www.alsenvironmental.co.uk

Ms Francis
Gwynedd Council (UDG)
Gwynedd Council (UDG)
Waste Treatment Services
5-7 Bangor Street
Caernarfon LL55 1AT
Gwynedd

08 January 2015

Test Report: COV/1156357/2014

Dear Ms Francis

Analysis of your sample(s) submitted on 17 December 2014 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out will be sent under separate cover.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7642 1213 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using ALS Environmental Ltd and we look forward to receiving your next samples.

Yours Sincerely,

Signed:

Name: C. Law

Title: Inorganics Operations Manager

Report Summary

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Ms Susan Francis
Gwynedd Council (UDG)
Gwynedd Council (UDG)
Waste Treatment Services
5-7 Bangor Street
Caernarfon
Gwynedd
LL55 1AT

Date of Issue: **08 January 2015**

Report Number: **COV/1156357/2014** Issue **1**

Job Description: Ffridd Rasus

Job Location: December - Ffridd Rasus

Number of Samples included in this report **14**

Job Received: **17 December 2014**

Number of Test Results included in this report **118**

Analysis Commenced: **18 December 2014**

Signed:

Name: **C. Law** Date: **08 January 2015**

Title: **Inorganics Operations Manager**

ALS Environmental Ltd was not responsible for sampling unless otherwise stated. Sampling is not covered by our UKAS accreditation.

Information on the methods of analysis and performance characteristics are available on request.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. The results relate only to the items tested.
Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory.

Certificate of Analysis

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ALS Environmental

Report Number: **COV/1156357/2014** Issue **1**
Laboratory Number: **14395657** Sample **1** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH34**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 December 2014**
Sample Received: **17 December 2014**
Analysis Complete: **31 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.4	pH units	19/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	777	uS/cm	19/12/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	0.50	mg/l	18/12/2014	Y	Cov	WAS036
Chloride as Cl	49.8	mg/l	18/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	3.3	mg/l	19/12/2014	Y	Cov	WAS052

Analyst Comments for 14395657: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **08 January 2015**

Title: **Inorganics Operations Manager**

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ALS Environmental

Report Number: **COV/1156357/2014** Issue **1**
Laboratory Number: **14395658** Sample **2** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH35**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 December 2014**
Sample Received: **17 December 2014**
Analysis Complete: **31 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.7	pH units	19/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	649	uS/cm	19/12/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	1.79	mg/l	18/12/2014	Y	Cov	WAS036
Chloride as Cl	62.4	mg/l	18/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	3.1	mg/l	19/12/2014	Y	Cov	WAS052

Analyst Comments for 14395658: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: Name: **C. Law** Date: **08 January 2015**
Title: **Inorganics Operations Manager**

Certificate of Analysis

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ALS Environmental

Report Number: **COV/1156357/2014** Issue **1**
Laboratory Number: **14395659** Sample **3** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH36**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 December 2014**
Sample Received: **17 December 2014**
Analysis Complete: **31 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.6	pH units	19/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1840	uS/cm	19/12/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	99.8	mg/l	18/12/2014	Y	Cov	WAS036
Chloride as Cl	174	mg/l	18/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	2.5	mg/l	19/12/2014	Y	Cov	WAS052

Analyst Comments for 14395659: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **C. Law** Date: **08 January 2015**
Title: **Inorganics Operations Manager**

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Report Number: **COV/1156357/2014** Issue **1**
Laboratory Number: **14395660** Sample **4** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH27**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 December 2014**
Sample Received: **17 December 2014**
Analysis Complete: **31 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.5	pH units	19/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	2640	uS/cm	19/12/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	168	mg/l	19/12/2014	Y	Cov	WAS055
Chloride as Cl	253	mg/l	18/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	3.1	mg/l	19/12/2014	Y	Cov	WAS052

Analyst Comments for 14395660: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **08 January 2015**

Title: **Inorganics Operations Manager**

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Report Number: **COV/1156357/2014** Issue **1**
Laboratory Number: **14395661** Sample **5** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH28**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 December 2014**
Sample Received: **17 December 2014**
Analysis Complete: **31 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.7	pH units	19/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	426	uS/cm	19/12/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	18/12/2014	Y	Cov	WAS036
Chloride as Cl	18.7	mg/l	18/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	3.2	mg/l	19/12/2014	Y	Cov	WAS052

Analyst Comments for 14395661: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **08 January 2015**

Title: **Inorganics Operations Manager**

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Report Number: **COV/1156357/2014** Issue **1**
Laboratory Number: **14395662** Sample **6** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH29**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 December 2014**
Sample Received: **17 December 2014**
Analysis Complete: **31 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.9	pH units	19/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	406	uS/cm	19/12/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	0.83	mg/l	18/12/2014	Y	Cov	WAS036
Chloride as Cl	13.8	mg/l	18/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	3.5	mg/l	19/12/2014	Y	Cov	WAS052

Analyst Comments for 14395662: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **08 January 2015**

Title: **Inorganics Operations Manager**

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Report Number: **COV/1156357/2014** Issue **1**
Laboratory Number: **14395663** Sample **7** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **NRA3**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 December 2014**
Sample Received: **17 December 2014**
Analysis Complete: **31 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.2	pH units	19/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	778	uS/cm	19/12/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	5.36	mg/l	18/12/2014	Y	Cov	WAS036
Chloride as Cl	38.0	mg/l	18/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	5.0	mg/l	19/12/2014	Y	Cov	WAS052

Analyst Comments for 14395663: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **C. Law** Date: **08 January 2015**
Title: **Inorganics Operations Manager**

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Report Number: **COV/1156357/2014** Issue **1**
Laboratory Number: **14395664** Sample **8** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH1**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 December 2014**
Sample Received: **17 December 2014**
Analysis Complete: **31 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.0	pH units	19/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	317	uS/cm	19/12/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	18/12/2014	Y	Cov	WAS036
Chloride as Cl	35.8	mg/l	18/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	4.3	mg/l	19/12/2014	Y	Cov	WAS052

Analyst Comments for 14395664: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **08 January 2015**

Title: **Inorganics Operations Manager**

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ALS Environmental

Report Number: **COV/1156357/2014** Issue **1**
Laboratory Number: **14395665** Sample **9** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH15**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 December 2014**
Sample Received: **17 December 2014**
Analysis Complete: **31 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.3	pH units	19/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	247	uS/cm	19/12/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	18/12/2014	Y	Cov	WAS036
Chloride as Cl	18.3	mg/l	18/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	2.5	mg/l	19/12/2014	Y	Cov	WAS052

Analyst Comments for 14395665: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **08 January 2015**

Title: **Inorganics Operations Manager**

Certificate of Analysis

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Report Number: **COV/1156357/2014** Issue **1**
Laboratory Number: **14395666** Sample **10** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH24**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 December 2014**
Sample Received: **17 December 2014**
Analysis Complete: **31 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.2	pH units	19/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	426	uS/cm	19/12/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	18/12/2014	Y	Cov	WAS036
Chloride as Cl	30.2	mg/l	18/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	19/12/2014	Y	Cov	WAS052

Analyst Comments for 14395666: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **08 January 2015**

Title: **Inorganics Operations Manager**

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Report Number: **COV/1156357/2014** Issue **1**
Laboratory Number: **14395667** Sample **11** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **LCP1**
Sample Matrix: **Land Leachate**
Sample Date/Time: **16 December 2014**
Sample Received: **17 December 2014**
Analysis Complete: **31 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.0006	mg/l	30/12/2014	Y Cov	WAS049
Calcium , Total as Ca	90.5	mg/l	30/12/2014	Y Cov	WAS049
Magnesium, Total as Mg	43.5	mg/l	30/12/2014	Y Cov	WAS049
Potassium , Total as K	396	mg/l	30/12/2014	Y Cov	WAS049
Sodium , Total as Na	788	mg/l	30/12/2014	Y Cov	WAS049
pH	7.8	pH units	19/12/2014	Y Cov	WAS039
Conductivity- Electrical 20C	9390	uS/cm	19/12/2014	Y Cov	WAS039
Alkalinity as CaCO3	4120	mg/l	31/12/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	800	mg/l	19/12/2014	Y Cov	WAS055
Chloride as Cl	988	mg/l	18/12/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	18/12/2014	Y Cov	WAS036
Sulphate as SO4	<1.3	mg/l	18/12/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	19/12/2014	Y Cov	WAS052
BOD + ATU (5 day)	46	mg/l	24/12/2014	Y Cov	WAS001
COD (Total)	1160	mg/l	18/12/2014	Y Cov	WAS040
TOC (Filtered)	340	mg/l	24/12/2014	Y Cov	WAS005
Phenols Mono (Phenol Index)	Analyst Com	mg/l	23/12/2014	Y Cov	WAS019

Analyst Comments for 14395667: {/*}Unable to analyse for Monophenol as excessive reaction upon acidification makes the sample unsuitable for segmented flow analysis.{*/}

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **08 January 2015**

Title: **Inorganics Operations Manager**

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1314
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Report Number: **COV/1156357/2014** Issue **1**
Laboratory Number: **14395668** Sample **12** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **LCP2**
Sample Matrix: **Land Leachate**
Sample Date/Time: **16 December 2014**
Sample Received: **17 December 2014**
Analysis Complete: **31 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Cadmium , Total as Cd	<0.0006	mg/l	30/12/2014	Y	Cov	WAS049
Calcium , Total as Ca	92.8	mg/l	30/12/2014	Y	Cov	WAS049
Magnesium, Total as Mg	71.5	mg/l	30/12/2014	Y	Cov	WAS049
Potassium , Total as K	646	mg/l	30/12/2014	Y	Cov	WAS049
Sodium , Total as Na	1200	mg/l	30/12/2014	Y	Cov	WAS049
pH	7.8	pH units	19/12/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	15400	uS/cm	19/12/2014	Y	Cov	WAS039
Alkalinity as CaCO3	7420	mg/l	31/12/2014	Y	Cov	WAS025
Ammoniacal Nitrogen as N	1460	mg/l	19/12/2014	Y	Cov	WAS055
Chloride as Cl	1620	mg/l	18/12/2014	Y	Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	18/12/2014	Y	Cov	WAS036
Sulphate as SO4	<1.3	mg/l	18/12/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	19/12/2014	Y	Cov	WAS052
BOD + ATU (5 day)	63	mg/l	24/12/2014	Y	Cov	WAS001
COD (Total)	1830	mg/l	18/12/2014	Y	Cov	WAS040
TOC (Filtered)	546	mg/l	27/12/2014	Y	Cov	WAS005
Phenols Mono (Phenol Index)	Analyst Com	mg/l	23/12/2014	Y	Cov	WAS019

Analyst Comments for 14395668: This sample has been analysed for TOC (Filtered) outside recommended stability times. It is therefore possible that the results provided may be compromised. {/*}Unable to analyse for Monophenol as excessive reaction upon acidification makes the sample unsuitable for segmented flow analysis.{*/}

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: Name: **C. Law** Date: **08 January 2015**
Title: **Inorganics Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

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Report Number: **COV/1156357/2014** Issue **1**
Laboratory Number: **14395669** Sample **13** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **LCP3**
Sample Matrix: **Land Leachate**
Sample Date/Time: **16 December 2014**
Sample Received: **17 December 2014**
Analysis Complete: **31 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.0006	mg/l	30/12/2014	Y Cov	WAS049
Calcium , Total as Ca	179	mg/l	30/12/2014	Y Cov	WAS049
Magnesium, Total as Mg	63.0	mg/l	30/12/2014	Y Cov	WAS049
Potassium , Total as K	527	mg/l	30/12/2014	Y Cov	WAS049
Sodium , Total as Na	1080	mg/l	30/12/2014	Y Cov	WAS049
pH	7.8	pH units	19/12/2014	Y Cov	WAS039
Conductivity- Electrical 20C	12900	uS/cm	19/12/2014	Y Cov	WAS039
Alkalinity as CaCO3	6220	mg/l	31/12/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	1160	mg/l	19/12/2014	Y Cov	WAS055
Chloride as Cl	1360	mg/l	18/12/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	18/12/2014	Y Cov	WAS036
Sulphate, total as SO4 by I.C.	11.38	mg/l	30/12/2014	Y Cov	CON27
Dissolved Oxygen, Fixed	<0.5	mg/l	19/12/2014	Y Cov	WAS052
BOD + ATU (5 day)	65	mg/l	24/12/2014	Y Cov	WAS001
COD (Total)	1900	mg/l	18/12/2014	Y Cov	WAS040
TOC (Filtered)	582	mg/l	27/12/2014	Y Cov	WAS005
Phenols Mono (Phenol Index)	Analyst Com	mg/l	23/12/2014	Y Cov	WAS019

Analyst Comments for 14395669:

This sample has been analysed for TOC (Filtered) outside recommended stability times. It is therefore possible that the results provided may be compromised. {/*}Sulphate analysed by ion chromatography due to interference with turbidmetric determination
Unable to analyse for Monophenol as excessive reaction upon acidification makes the sample unsuitable for segmented flow analysis.{*/}

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **C. Law** Date: **08 January 2015**

Title: **Inorganics Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

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Report Number: **COV/1156357/2014** Issue **1**
Laboratory Number: **14395670** Sample **14** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **LCP4A**
Sample Matrix: **Land Leachate**
Sample Date/Time: **16 December 2014**
Sample Received: **17 December 2014**
Analysis Complete: **31 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	0.0016	mg/l	30/12/2014	Y Cov	WAS049
Calcium , Total as Ca	101	mg/l	30/12/2014	Y Cov	WAS049
Magnesium, Total as Mg	62.9	mg/l	30/12/2014	Y Cov	WAS049
Potassium , Total as K	778	mg/l	30/12/2014	Y Cov	WAS049
Sodium , Total as Na	1490	mg/l	30/12/2014	Y Cov	WAS049
pH	8.0	pH units	19/12/2014	Y Cov	WAS039
Conductivity- Electrical 20C	20700	uS/cm	19/12/2014	Y Cov	WAS039
Alkalinity as CaCO3	10700	mg/l	31/12/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	2230	mg/l	19/12/2014	Y Cov	WAS055
Chloride as Cl	2340	mg/l	18/12/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	18/12/2014	Y Cov	WAS036
Sulphate as SO4	31.3	mg/l	18/12/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	19/12/2014	Y Cov	WAS052
BOD + ATU (5 day)	141	mg/l	24/12/2014	Y Cov	WAS001
COD (Total)	4900	mg/l	18/12/2014	Y Cov	WAS040
TOC (Filtered)	1340	mg/l	27/12/2014	Y Cov	WAS005
Phenols Mono (Phenol Index)	Analyst Com	mg/l	23/12/2014	Y Cov	WAS019

Analyst Comments for 14395670: This sample has been analysed for TOC (Filtered) outside recommended stability times. It is therefore possible that the results provided may be compromised. {/*}Unable to analyse for Monophenol as excessive reaction upon acidification makes the sample unsuitable for segmented flow analysis.{*/}

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: Name: **C. Law** Date: **08 January 2015**
Title: **Inorganics Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

ANALYST COMMENTS FOR REPORT COV/1156357/2014 Issue 1

Date of Issue: **08 January 2015**

Sample No	Analysis Comments
14395657	
14395658	
14395659	
14395660	
14395661	
14395662	
14395663	
14395664	
14395665	
14395666	
14395667	{/*}Unable to analyse for Monophenol as excessive reaction upon acidification makes the sample unsuitable for segmented flow analysis.{*/}
14395668	This sample has been analysed for TOC (Filtered) outside recommended stability times. It is therefore possible that the results provided may be compromised. {/*}Unable to analyse for Monophenol as excessive reaction upon acidification makes the sample unsuitable for segmented flow analysis.{*/}
14395669	This sample has been analysed for TOC (Filtered) outside recommended stability times. It is therefore possible that the results provided may be compromised. {/*}Sulphate analysed by ion chromatography due to interference with turbidmetric determination Unable to analyse for Monophenol as excessive reaction upon acidification makes the sample unsuitable for segmented flow analysis.{*/}
14395670	This sample has been analysed for TOC (Filtered) outside recommended stability times. It is therefore possible that the results provided may be compromised. {/*}Unable to analyse for Monophenol as excessive reaction upon acidification makes the sample unsuitable for segmented flow analysis.{*/}

Signed: 

Name: **C. Law** Date: **08 January 2015**

Title: **Inorganics Operations Manager**

DETERMINAND COMMENTS FOR REPORT COV/1156357/2014 ISSUE 1

Date of Issue : 08 January 2015

Sample No	Description	Determinand	Comments

Signed: 

Name: **C. Law** Date: **08 January 2015**

Title: **Inorganics Operations Manager**

Appendix E
Schedule 6 Submissions to NRW

Schedule 6 – Notification

This page outlines the information that the operator must provide.

Units of measurement in the information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the PPC Regulations.

Part A

Permit number	GP3330BY (Variation number QP3134LY/V003)
Name of operator	Gwynedd Council
Location of installation	Ffridd Rasus Landfill Site Areas 1 and 3, Morfa Road,
	Harlech, Gwynedd, LL46 2UW
Time and date of detection	Results received on 16/10/2014

(a) Notification requirements for any malfunction, breakdown or failure of equipment or technique, accident, or fugitive emission which has caused, is causing or may cause significant pollution
To be notified within 24 hours of detection

Date and Time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substance(s) potentially released	
Best estimate of the quality or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of limit						
To be notified within 24 hours of detection unless otherwise specified below						
Emission point reference/source	BH 19B	BH 19C		BH 20A		BH 21A
Parameter(s)	Cl	Cl	NH4	NH4	Cl	NH4
Limit	28mg/l	30mg/l	3.0mg/l	5 mg/l	310mg/l	5.10mg/l
Measured value and uncertainty	213mg/l	200mg/l	3.25mg/l	76.6mg/l	439mg/l	36.3mg/l
Date and time of monitoring	07/10/14					
Measures taken, or intended to be taken, to stop the emission						

Time periods for notification following detection of a breach of a limit	
Parameter	**Notification period**

(c) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substance(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B to be supplied as soon as practicable

Any more accurate information on the matters for notification under Part A	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the installation in the proceeding 24 months	

Name *	Susan Francis
Post	Assistant Engineer
Signature	
Date	20/01/15

* authorised to sign on behalf of Gwynedd Council

Schedule 6 – Notification

This page outlines the information that the operator must provide.

Units of measurement in the information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the PPC Regulations.

Part A

Permit number	EPR/PP3294FJ
Name of operator	Gwynedd Council
Location of installation	Ffridd Rasus Landfill (Area 2) and Civic Amenity Site
	Harlech, Gwynedd, LL46 2UW
Time and date of detection	Results received on 16/10/14

/

(a) Notification requirements for any malfunction, breakdown or failure of equipment or technique, accident, or fugitive emission which has caused, is causing or may cause significant pollution
To be notified within 24 hours of detection

Date and Time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substance(s) potentially released	
Best estimate of the quality or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of limit				
To be notified within 24 hours of detection unless otherwise specified below				
Emission point reference/source	BH 19B	BH 19C		BH 20A
Parameter(s)	Cl	Cl	NH4	NH4
Limit	34 mg/l	34 mg/l	3 mg/l	5 mg/l
Measured value and uncertainty	213 mg/l	200 mg/l	3.25mg/l	76.6 mg/l
Date and time of monitoring	07/10/14	07/10/14		07/10/14
Measures taken, or intended to be taken, to stop the emission				

Time periods for notification following detection of a breach of a limit	
Parameter	**Notification period**

(c) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substance(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B to be supplied as soon as practicable

Any more accurate information on the matters for notification under Part A	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the installation in the proceeding 24 months	

Name *	Susan Francis
Post	Assistant Engineer
Signature	
Date	20/01/15

* authorised to sign on behalf of Gwynedd Council

Schedule 6 – Notification

This page outlines the information that the operator must provide.

Units of measurement in the information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the PPC Regulations.

Part A

Permit number	GP3330BY (Variation number QP3134LY/V003)
Name of operator	Gwynedd Council
Location of installation	Ffridd Rasus Landfill Site Areas 1 and 3, Morfa Road,
	Harlech, Gwynedd, LL46 2UW
Time and date of detection	Results received on 21/11/2014

(a) Notification requirements for any malfunction, breakdown or failure of equipment or technique, accident, or fugitive emission which has caused, is causing or may cause significant pollution
To be notified within 24 hours of detection

Date and Time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substance(s) potentially released	
Best estimate of the quality or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of limit					
To be notified within 24 hours of detection unless otherwise specified below					
Emission point reference/source	BH 19B	BH 19C	BH 20A		BH 21A
Parameter(s)	Cl	Cl	NH4	Cl	NH4
Limit	28mg/l	30 mg/l	5 mg/l	310 mg/l	5.10mg/l
Measured value and uncertainty	87.4mg/l	252mg/l	77.2 mg/l	486 mg/l	21.9mg/l
Date and time of monitoring	11/11/14				
Measures taken, or intended to be taken, to stop the emission					

Time periods for notification following detection of a breach of a limit	
Parameter	**Notification period**

(c) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substance(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B to be supplied as soon as practicable

Any more accurate information on the matters for notification under Part A	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the installation in the proceeding 24 months	

Name *	Susan Francis
Post	Assistant Engineer
Signature	
Date	20/01/15

* authorised to sign on behalf of Gwynedd Council

Schedule 6 – Notification

This page outlines the information that the operator must provide.

Units of measurement in the information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the PPC Regulations.

Part A

Permit number	GP3330BY (Variation number QP3134LY/V003)
Name of operator	Gwynedd Council
Location of installation	Ffridd Rasus Landfill Site Areas 1 and 3, Morfa Road,
	Harlech, Gwynedd, LL46 2UW
Time and date of detection	Results received on 21/11/2014

(a) Notification requirements for any malfunction, breakdown or failure of equipment or technique, accident, or fugitive emission which has caused, is causing or may cause significant pollution
To be notified within 24 hours of detection

Date and Time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substance(s) potentially released	
Best estimate of the quality or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of limit							
To be notified within 24 hours of detection unless otherwise specified below							
Emission point reference/source	BH 19A	BH 19B	BH 19C	BH 20A	BH 21A		BH 21B
Parameter(s)	Cl	Cl	Cl	NH4	Cl	NH4	NH4
Limit	29mg/l	28mg/l	30mg/l	5 mg/l	270mg	5.10mg/l	69.70mg/l
Measured value and uncertainty	38.8mg/l	85.1mg/l	209mg/l	26.9 mg/l	447mg/l	71.8mg/l	207mg/l
Date and time of monitoring	09/12/14						
Measures taken, or intended to be taken, to stop the emission							

Time periods for notification following detection of a breach of a limit	
Parameter	**Notification period**

(c) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substance(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

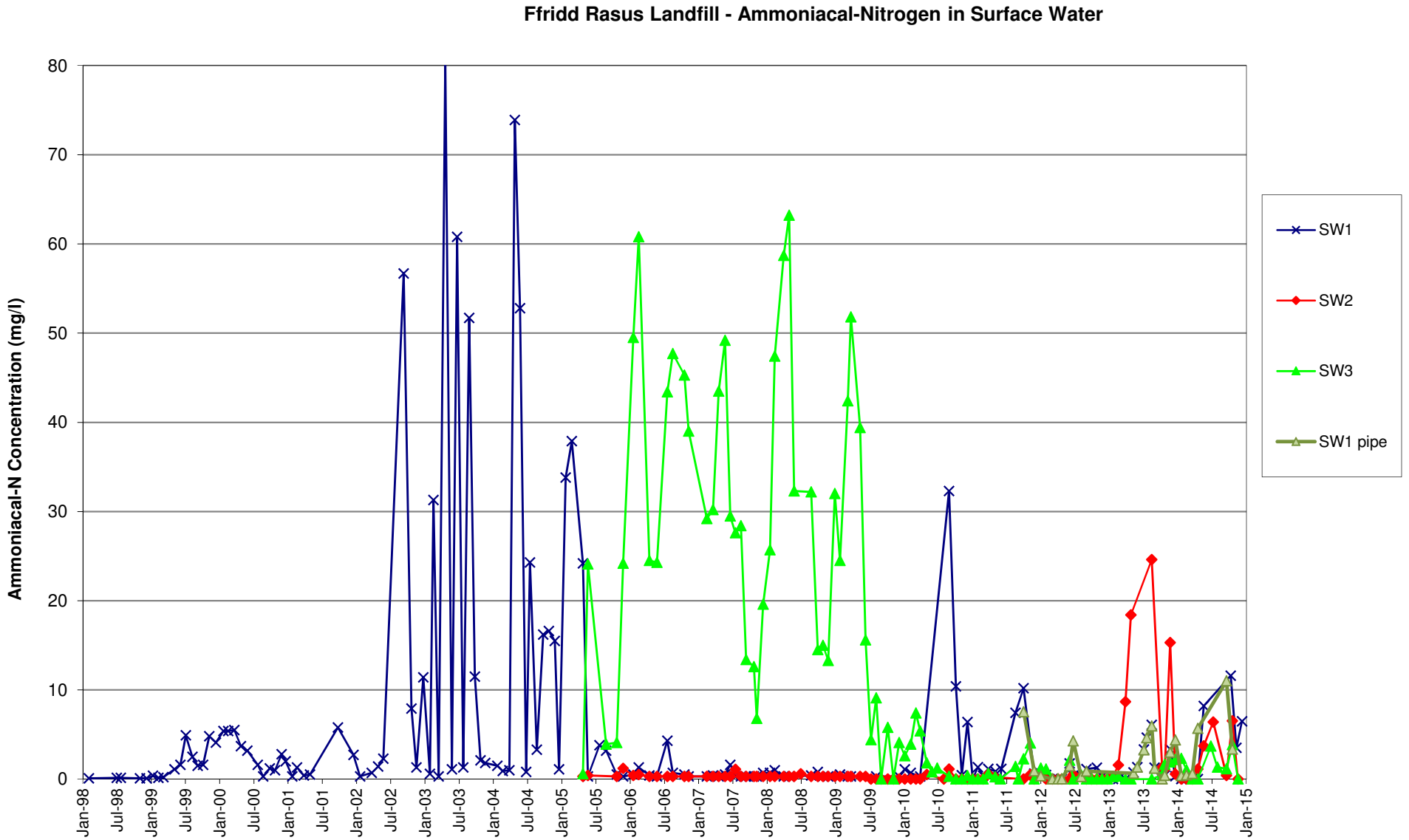
Part B to be supplied as soon as practicable

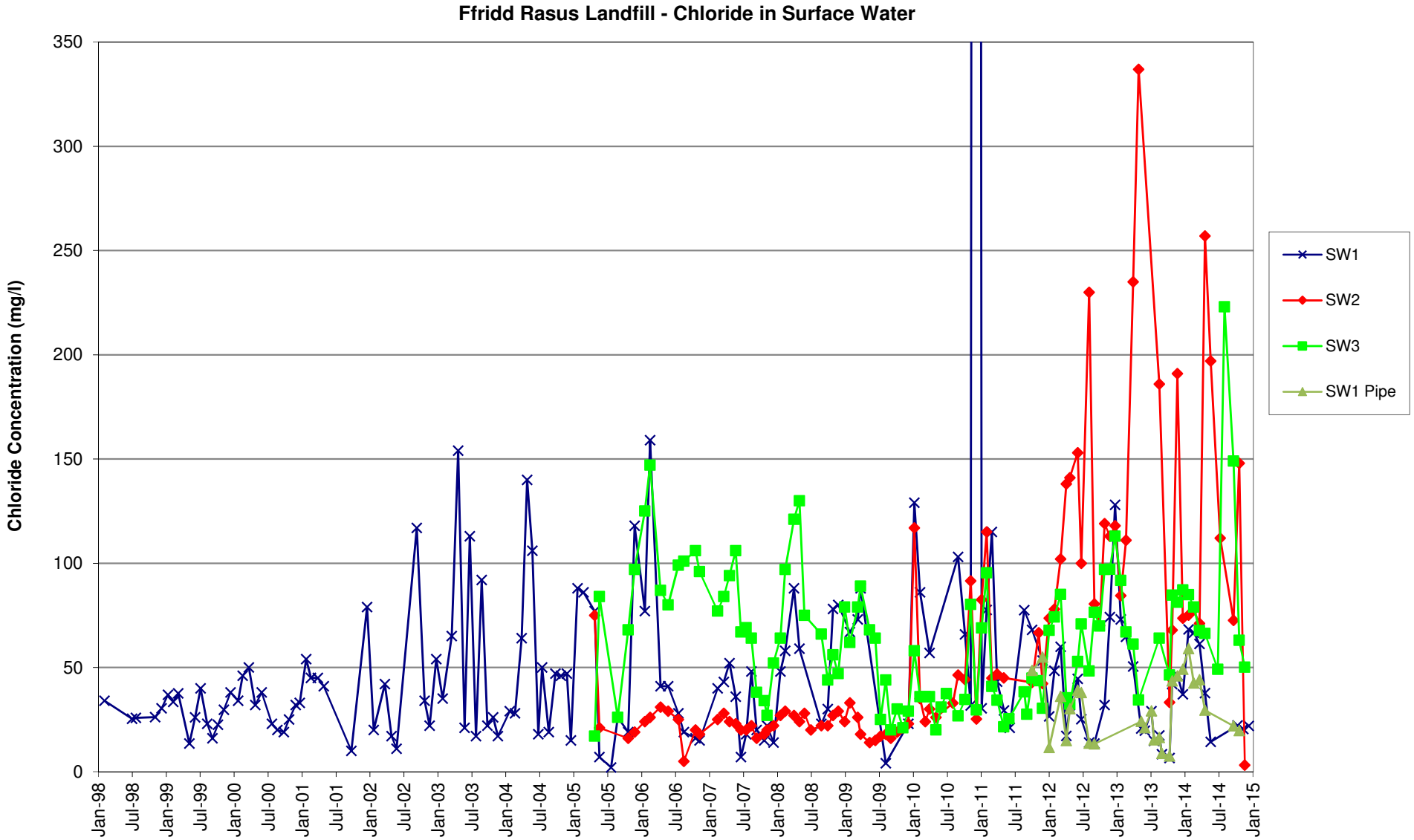
Any more accurate information on the matters for notification under Part A	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the installation in the proceeding 24 months	

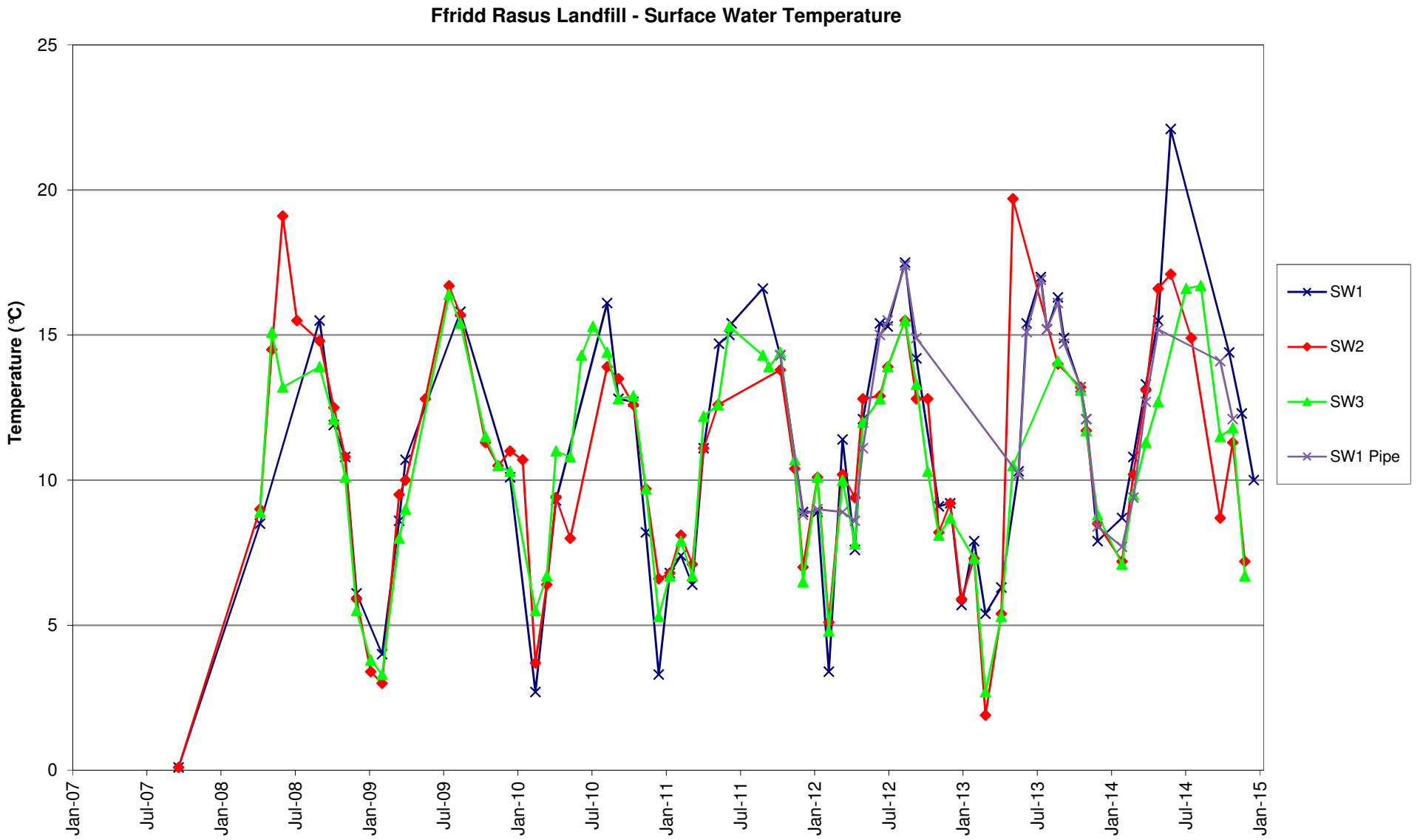
Name *	Susan Francis
Post	Assistant Engineer
Signature	
Date	20/01/15

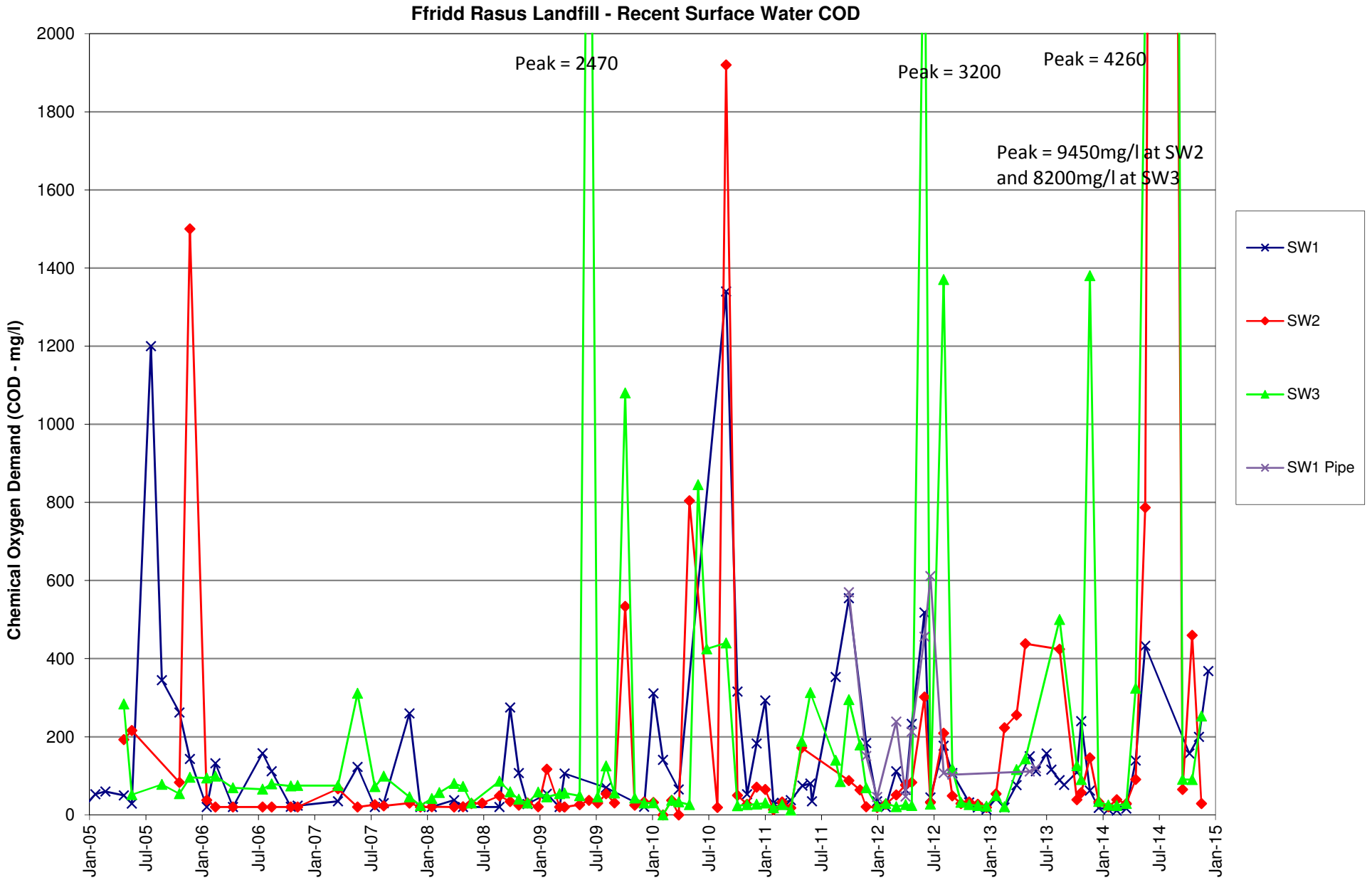
* authorised to sign on behalf of Gwynedd Council

Appendix F
Surface Water Quality Plots and Observations at SW1 and SW3


Ffridd Rasus Landfill - Ammoniacal-Nitrogen in Surface Water
Ammoniacal-N Concentration (mg/l)
80
70
60
50
40
30
20
10
0
Jan-98
Jul-98
Jan-99
Jul-99
Jan-00
Jul-00
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
Jul-07
Jan-08
Jul-08
Jan-09
Jul-09
Jan-10
Jul-10
Jan-11
Jul-11
Jan-12
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
SW1
SW2
SW3
SW1 pipe


Ffridd Rasus Landfill - Chloride in Surface Water
Chloride Concentration (mg/l)
350
300
250
200
150
100
50
0
Jan-98
Jul-98
Jan-99
Jul-99
Jan-00
Jul-00
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
Jul-07
Jan-08
Jul-08
Jan-09
Jul-09
Jan-10
Jul-10
Jan-11
Jul-11
Jan-12
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
SW1
SW2
SW3
SW1 Pipe


Ffridd Rasus Landfill - Surface Water Temperature
Temperature (°C)
25
20
15
10
5
0
Jan-07
Jul-07
Jan-08
Jul-08
Jan-09
Jul-09
Jan-10
Jul-10
Jan-11
Jul-11
Jan-12
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
SW1
SW2
SW3
SW1 Pipe



H:\Projects\28587 Llwyn Isaf & Ffridd Rasus Consultancy Support\Data\Ffridd Rasus\Data for Quarterly Reports\Data October-December 2014\Ffridd Rasus Surface Water 2014 Q4.xlsCOD SW

Ffridd Rasus Landfill Site
Point source emissions to water (table S4.3)

Interceptor drain – location SW 1
Sluice – location SW 3

Date	Location	Description of water		Further comments :-
		Surface film or Oil	Is the SW location dry?	Weather
9/12/14	SW 1	CLEAR	NO	SHOWERS
	SW 3	CLEAR	NO	SHOWERS
16/12/14	SW 1	CLEAR	NO	DRY
	SW 3	CLEAR	NO	DRY
23/12/14	SW 1	CLEAR	NO	HEAVY SHOWERS
	SW 3	CLEAR	NO	HEAVY SHOWERS
6/1/15	SW 1	CLEAR	NO	DRY
	SW 3	CLEAR	NO	DRY
13/1/15	SW 1	CLEAR	NO	DRY/COLD
	SW 3	CLEAR	NO	DRY/COLD
20/1/15	SW 1	CLEAR	NO	DRY/COLD
	SW 3	CLEAR	NO	DRY/COLD
28/1/15	SW 1	CLEAR	NO	DRY/WINDY
	SW 3	CLEAR	NO	DRY/WINDY
3/2/15	SW 1	CLEAR	NO	SUNNY
	SW 3	CLEAR	NO	SUNNY
10/2/15	SW 1	CLEAR	NO	DRY/COLD
	SW 3	CLEAR	NO	DRY/COLD

Ffridd Rasus Landfill Site
Point source emissions to water (table S4.3)

Interceptor drain – location SW 1
Sluice – location SW 3

Date	Location	Description of water		Further comments :-
		Surface film or Oil	Is the SW location dry?	Weather
30/9/14	SW 1	CLEAR	YES	DRY
	SW 3	CLEAR	YES	DRY
7/10/14	SW 1	CLEAR	NO	SHOWERS
	SW 3	CLEAR	NO	SHOWERS
14/10/14	SW 1	CLEAR	YES	SUNNY
	SW 3	CLEAR	YES	SUNNY
20/10/14	SW 1	CLEAR	NO	SHOWERS
	SW 3	CLEAR	NO	SHOWERS
30/10/14	SW 1	CLEAR	NO	DRY
	SW 3	CLEAR	NO	DRY
4/11/14	SW 1	CLEAR	NO	DRY
	SW 3	CLEAR	NO	DRY
14/11/14	SW 1	CLEAR	NO	SUNNY
	SW 3	CLEAR	NO	SUNNY
18/11/14	SW 1	CLEAR	NO	SUNNY
	SW 3	CLEAR	NO	SUNNY
2/12/14	SW 1	CLEAR	NO	DRY/COLD
	SW 3	CLEAR	NO	DRY/COLD

Appendix G
Gas Balancing Data

Date/Time	CH4 %	CO2 %	O2 %	BALANCE %	RESIDUAL NITROGEN %	CO ppm	SUCTION PRESSURE mb	ATMOS - PHERIC PRESSURE mb	VELOCITY	FLOW m3/hr	METHANE FLOW m3/hr
14/01/2014 09:41	46.1	32	0.8	21.1	18.1	1	-31.6	1009		260	
14/01/2014 14:58	49.7	34.3	0.2	15.8	15	0	-26.6	1005			
28/01/2014 09:41	48.4	33.7	0.3	17.6	16.5	1	-29.2	979		250m^3hr to 275m^3hr	
28/01/2014 13:14	61.3	41.7	0	0	0	1	-9.6	977			
28/01/2014 13:15	63	40	0	0	0	0	-9.1	977			
28/01/2014 14:20	55.2	36.9	0.1	7.8	7.4	1	-19.7	979			
11/02/2014 09:32	47.5	33.9	0.5	18.1	16.2	1	-23.9	994		260m^3hr to 270m^3hr	
11/02/2014 14:56	49.1	35.1	0.7	15.1	12.5	3	-20.5	993			
25/02/2014 09:42	45.6	30.7	1.6	22.1	16.1	1	-14.3	994		160m^3hr	
25/02/2014 13:25	52.8	32	0.3	14.9	13.8	1	-10.1	996			
12/03/2014 09:28	39.4	28.7	0.8	31.1	28.08	4	-7.86	1032		180m^3hr reduced to 160m^3hr	
12/03/2014 16:15	42.6	29.2	0.5	27.7	25.81	9	-8.6	1031			
08/04/2014 09:33	51.9	33.4	1.3	13.4	8.49	15	-8.74	1020		350m^3hr	
08/04/2014 15:00	55.7	35	0.4	8.9	7.39	34	-15.9	1024			
22/04/2014 07:40	56.1	35.9	0.3	7.7	6.57	20	-11.37	1019		350m^3hr incresed to 370m^3hr	
22/04/2014 12:57	57.4	36.2	0.2	6.2	5.44	26	-14.27	1011			
06/05/2014 08:45	50.3	34.4	0.5	14.8	12.91	17	-15.52	1016		370m^3hr	
06/05/2014 15:39	53.8	36.4	0.2	9.6	8.84	36	-15.88	1010			
20/05/2014 09:00	58.4	38.2	0.2	3.2	2.44	18	-14.97	1008		370m^3hr	
20/05/2014 14:51	56.6	36.7	0.2	6.5	5.74	30	-14.15	1009			
04/06/2014 09:15	47	35	0.5	17.5	15.61	12	-17.03	1004		375 m^3hr	
04/06/2014 14:04	51.6	36.2	0.1	12.1	11.72	13	-20.63	1003			
18/06/2014 09:23	46.5	34.8	0.3	18.4	17.27	15	-18.61	1028		375 m^3hr	
18/06/2014 14:12	48.5	33.7	0.4	17.4	15.89	17	-20.36	1027			
01/07/2014 10:05	49.8	34.1	0.4	15.7	14.19	20	-24.34	1033		375 m^3hr	
01/07/2014 14:41	50.3	33.6	0.3	15.8	14.67	33	-23.38	1026			
16/07/2014 08:59	48.2	34	0.5	17.3	15.41	18	-18.34	1022		375 m^3hr	
16/07/2014 14:19	51.6	34.9	0.2	13.3	12.54	27	-22.99	1018			
29/07/2014 09:28	52.2	34.8	0.3	12.7	11.57	11	-27.77	1024		360 m^3hr to 375m^hr	
29/07/2014 15:22	52.4	35.4	0	12.2	12.2	19	-25.99	1028			
13/08/2014 11:07	52.4	34.6	0.3	12.7	11.57	14	-31.75	1007		360 m^3hr to 375m^hr	
13/08/2014 15:20	44.9	32.7	0.8	21.6	18.58	20	-24.22	1007			
26/08/2014 09:38	44.6	32.9	1.8	20.7	13.9	7	-22.69	1005		375m^hr	
26/08/2014 14:43	54.9	36.9	0.2	8	7.24	10	-26.12	1009			
18/09/2014 09:19	47.6	34.2	0.3	17.9	16.77	10	-28.47	1017		375m^hr reduced to 350m^hr	
18/09/2014 15:27	48.6	34.5	0.1	16.8	16.42	30	-31.19	1015			
14/10/2014 09:36	45.3	33.4	0.4	20.9	19.39	6	-30.38	1013		reduced flow 350m^hr to 330m^hr	
14/10/2014 15:41	49.9	32.6	0.4	17.1	15.59	12	-35.66	1015			
10/11/2014 10:43	53.1	35.1	0.5	11.3	9.41	7	-32.64	999		increased flow 330m^hr to 340m^hr	
10/11/2014 15:36	57.5	37.1	0.3	5.1	3.97	8	-30.09	1002			
09/12/2014 09:29	39.8	31	0.4	28.8	27.29	7	-35.17	1021		decreased flow 300m^hr to 280m^hr	
09/12/2014 14:58	53.7	35.3	0	11	11	8	-30.67	1012			

GAS FIELD MONITORING SHEET

CH4 Consultants

Site:	**Ffridd Rasus**	**Weather Conditions**	Sunshine
Date:	14/10/2014		
Name:	Steve Hindle	**Temperature ^{O}C**	16 to 18
Equipment Used :	GA5000		
Serial No :	G500196		
Last Calibration Date :	05/06/2014	**Total Flow Setting m^3hr**	reduced flow 350m^hr to 330m^hr
Calibration Due Date :	06/12/2014		

1	2	3	4	5	6	7	8	9	10	12	13	14	15	16
ID	Date/Time	CH4 %	CO2 %	O2 %	BALANCE %	RESIDUAL NITROGEN %	CO ppm	SUCTION PRESSURE mb	ATMOS - PHERIC PRESSURE mb	VELOCITY	FLOW m3/hr	METHANE FLOW m3/hr	COMMENTS	VALVE POSITION %
FR_FLARE	14/10/2014 09:36	45.3	33.4	0.4	20.9	19.39	6	-30.38	1013					34
FR_BH001	14/10/2014 09:47	0.2	3.2	18	78.6	10.56	1	0.53	1012					0
FR_BH002	14/10/2014 09:49	22.4	20.7	0.1	56.8	56.42	1	0.22	1012					0
FR_BH003	14/10/2014 09:51	27.6	20.8	0.1	51.5	51.12	2	-0.44	1004					0
FR_BH004	14/10/2014 09:53	28.7	19.7	0.1	51.5	51.12	1	-0.51	1007					0
FR_BH005	14/10/2014 09:55	30	20.4	0.3	49.3	48.17	1	-0.5	1007					0
FR_BH006	14/10/2014 10:00	37.1	21.5	1.3	40.1	35.19	6	0.1	1008					0
FR_BH007	14/10/2014 10:03	36.1	21.9	2.2	39.8	31.48	1	-1.69	1008					0
FR_BH008	14/10/2014 10:05	39.8	24.3	0.2	35.7	34.94	2	-0.27	1008					2
FR_MAN01	14/10/2014 10:08	44.7	24.1	0.2	31	30.24	2	-13.3	1009					20
FR_BH009	14/10/2014 10:14	0.3	5.4	16.7	77.6	14.47	1	0.97	1010					0
FR_BH010	14/10/2014 10:15	20.8	18.4	0	60.8	60.8	2	0.61	1008					0
FR_BH011	14/10/2014 10:17	47.5	22.7	0	29.8	29.8	3	0.5	1008					25
FR_BH012	14/10/2014 10:18	41.9	23.3	0	34.8	34.8	4	-13.95	1010					25
FR_BH013	14/10/2014 10:20	22	23.4	0.1	54.5	54.12	1	0.91	1010					0
FR_BH014	14/10/2014 10:22	24.7	23.6	0.3	51.4	50.27	2	0.68	1008					0
FR_BH015	14/10/2014 10:24	37.3	23.5	0.1	39.1	38.72	3	0.29	1010					0
FR_BH016	14/10/2014 10:26	41.5	23.3	0	35.2	35.2	4	-1.59	1008					25
FR_BH017	14/10/2014 10:28	20.9	18	0	61.1	61.1	1	1.18	1010					0
FR_BH018	14/10/2014 10:29	18.3	19.9	0.2	61.6	60.84	1	1.16	1010					0
FR_MAN02	14/10/2014 10:31	43.7	23.2	0	33.1	33.1	4	-12.4	1010					25
FR_C0032	14/10/2014 10:36	0.6	0.8	21.2	77.4	0	3	-4.63	1008					0
FR_LCP03	14/10/2014 10:38	53.1	34.9	2.8	9.2	0	2	-9.96	1009					10
FR_C0033	14/10/2014 10:40	21.8	26.9	0.3	51	49.87	5	-7.31	1009					0
FR_C0036	14/10/2014 10:43	12.4	22	0.4	65.2	63.69	6	-7.34	1008					0
FR_LM3/1	14/10/2014 10:46	6.6	14.3	7.6	71.5	42.77	8	-6.56	1008					0
FR_MAN05	14/10/2014 10:54	5.2	12.1	9.7	73	36.33	7	-4.65	1008					0
FR_BH019	14/10/2014 10:58	34.1	21.5	0	44.4	44.4	1	-0.26	1008					0
FR_BH020	14/10/2014 11:00	26	19.9	0.5	53.6	51.71	2	-0.46	1008					0
FR_BH021	14/10/2014 11:02	41	23.7	0.3	35	33.87	1	-0.73	1008					2
FR_BH022	14/10/2014 11:03	44.5	26	0.1	29.4	29.02	2	-8.66	1008					25
FR_BH023	14/10/2014 11:05	22.4	19	1.1	57.5	53.34	2	-1.01	1008					0
FR_MAN03	14/10/2014 11:07	44.1	25.7	0.2	30	29.24	2	-16.14	1010					30
FROLDGWM	14/10/2014 11:08	1.2	3.9	14.7	80.2	24.63	1	-0.19	1010					0
FR_GW001	14/10/2014 11:44	6.7	4.1	10.8	78.4	37.58	2	-1.13	1014					40
FR_GW003	14/10/2014 11:48	0.2	1.7	20.7	77.4	0	0	0.02	1011					40
FR_GW005	14/10/2014 11:50	7.4	7.2	8.6	76.8	44.29	2	0.05	1011					40
FR_GW007	14/10/2014 11:52	17.3	17.1	1.5	64.1	58.43	16	0.03	1012					40
FR_GW009	14/10/2014 11:54	7.1	15.7	4.1	73.1	57.6	6	-0.05	1012					40
FR_GW011	14/10/2014 11:56	26.7	19.3	5.5	48.5	27.71	22	0.73	1005					40
FR_GW013	14/10/2014 11:58	0.2	5.6	16	78.2	17.72	1	0.7	1011					40

GAS FIELD MONITORING SHEET

CH4 Consultants

Site:	**Ffridd Rasus**	**Weather Conditions**	Sunshine
Date:	14/10/2014		
Name:	Steve Hindle	**Temperature ^{O}C**	16 to 18
Equipment Used :	GA5000		
Serial No :	G500196		
Last Calibration Date :	05/06/2014	**Total Flow Setting m^3hr**	reduced flow 350m^hr to 330m^hr
Calibration Due Date :	06/12/2014		

1	2	3	4	5	6	7	8	9	10	12	13	14	15	16
ID	Date/Time	CH4 %	CO2 %	O2 %	BALANCE %	RESIDUAL NITROGEN %	CO ppm	SUCTION PRESSURE mb	ATMOS - PHERIC PRESSURE mb	VELOCITY	FLOW m3/hr	METHANE FLOW m3/hr	COMMENTS	VALVE POSITION %
FR_GW014	14/10/2014 12:00	0.2	3.8	16.4	79.6	17.61	0	0.97	1012					40
FR_GW012	14/10/2014 12:02	12.4	16.6	0.6	70.4	68.13	5	-1.55	1012					40
FR_GW010	14/10/2014 12:05	8.5	9.7	11.7	70.1	25.87	5	-0.32	1012					40
FR_GW008	14/10/2014 12:07	8.3	12.3	6.2	73.2	49.76	2	1.61	1012					40
FR_GW006	14/10/2014 12:09	1.4	5	18.8	74.8	3.74	0	1.55	1012					40
FR_GW004	14/10/2014 12:11	23.9	14.4	0.3	61.4	60.27	5	1.14	1011					40
FR_GW002	14/10/2014 12:13	0.5	4.8	19.7	75	0.53	0	1.02	1011					40
FR_LM1/2	14/10/2014 12:16	0.1	2.8	18.3	78.8	9.63	0	-0.02	1011					0
FR_LCP01	14/10/2014 12:19	37	21	0.7	41.3	38.65	1	0.36	1012					0
FR_C0021	14/10/2014 12:23	66.7	32.5	0.2	0.6	0	5	0.09	1012					2
FR_LM1/1	14/10/2014 12:24	10.7	20.9	0.2	68.2	67.44	1	-0.73	1008					0
FR_C0024	14/10/2014 12:27	35.7	23.1	8.1	33.1	2.48	4	-0.44	1008					0
FR_C0025	14/10/2014 12:30	51.8	32.8	0.2	15.2	14.44	6	-0.56	1008					2
FR_C0035	14/10/2014 12:32	33.8	29.1	0.3	36.8	35.67	5	-12.06	1008					25
FR_C0013	14/10/2014 12:34	41.5	23.4	0	35.1	35.1	2	0.65	1008					2
FR_C0014	14/10/2014 12:37	23.8	20.5	0.9	54.8	51.4	7	0.84	1014					0
FR_C0012	14/10/2014 12:40	35.9	22.4	0	41.7	41.7	3	2.56	1011					0
FR_C0011	14/10/2014 12:42	37.5	23.3	0	39.2	39.2	2	0.29	1011					0
FR_MAN04	14/10/2014 12:44	48.3	30.8	0	20.9	20.9	7	-9.79	1011					50
FR_LM2/2	14/10/2014 12:46	7.7	16.3	5.2	70.8	51.14	1	1.09	1015					0
FR_C0022	14/10/2014 13:17	60.7	36.2	0.7	2.4	0	4	-0.07	1012					2
FR_LCP02	14/10/2014 13:19	51.3	34.3	1.1	13.3	9.14	3	-6.95	1012					25
FR_C0023	14/10/2014 13:21	35.9	32.5	0	31.6	31.6	11	-13.48	1009					50
FR_LM2/1	14/10/2014 13:23	16.4	21.6	0.3	61.7	60.57	2	-3.83	1009					0
FR_C0043	14/10/2014 13:29	64.6	36.4	0	0	0	14	-12.14	1011					100
FR_C0044	14/10/2014 13:31	61	40.4	0	0	0	13	-11.96	1008					100
FR_C0042	14/10/2014 13:33	61.1	38.5	0	0.4	0.4	9	-11.92	1008					100
FR_C0045	14/10/2014 13:34	60.8	40.2	0	0	0	16	-11.92	1010					100
FR_LCP4A	14/10/2014 13:36	60.1	41.6	0	0	0	11	-12.23	1009					100
FR_C0053	14/10/2014 13:37	59.6	41.6	0	0	0	41	-12.91	1012					100
FR_C0054	14/10/2014 13:39	59.4	42.1	0	0	0	16	-12.31	1011					100
FR_LM4/2	14/10/2014 13:40	54	39.3	0	6.7	6.7	2	-12.84	1010					100
FR_LM4/2	14/10/2014 13:43	59	40.9	0	0.1	0.1	14	-13.1	1015					100
FR_MAN06	14/10/2014 13:47	60.3	41	0	0	0	9	-22.82	1009					100
FR_C0055	14/10/2014 13:49	59.6	41.2	0	0	0	4	-22.32	1007					100
FR_LCP4B	14/10/2014 13:50	59.6	41.5	0	0	0	39	-22.51	1009					100
FR_C0056	14/10/2014 13:52	59.6	40.5	0	0	0	71	-23.06	1015					100
FR_C0057	14/10/2014 13:55	59.6	41.5	0	0	0	17	-23.14	1010					100
FR_C0052	14/10/2014 13:57	59.9	41.1	0	0	0	28	-22.92	1011					100
FR_C0051	14/10/2014 14:00	61.3	40.4	0	0	0	9	-22.43	1009					100
FR_C0041	14/10/2014 14:03	60.2	40.5	0	0	0	23	-22.34	1009					100

GAS FIELD MONITORING SHEET

CH4 Consultants

Site:	**Ffridd Rasus**	**Weather Conditions**	Sunshine
Date:	14/10/2014		
Name:	Steve Hindle	**Temperature ^{O}C**	16 to 18
Equipment Used :	GA5000		
Serial No :	G500196		
Last Calibration Date :	05/06/2014	**Total Flow Setting m^3hr**	reduced flow 350m^hr to 330m^hr
Calibration Due Date :	06/12/2014		

1	2	3	4	5	6	7	8	9	10	12	13	14	15	16
ID	**Date/Time**	**CH4 %**	**CO2 %**	**O2 %**	**BALANCE %**	**RESIDUAL NITROGEN %**	**CO ppm**	**SUCTION PRESSURE mb**	**ATMOS - PHERIC PRESSURE mb**	**VELOCITY**	**FLOW m3/hr**	**METHANE FLOW m3/hr**	**COMMENTS**	**VALVE POSITION %**
FR_C0046	14/10/2014 14:05	59.3	39.8	0	0.9	0.9	26	-22.78	1007					100
FR_C0034	14/10/2014 14:10	37.4	32.9	0	29.7	29.7	8	-15.49	1007					50
FR_C0031	14/10/2014 14:17	51.4	37.7	0	10.9	10.9	19	-22.73	1008					100
FR_FLARE	14/10/2014 15:41	49.9	32.6	0.4	17.1	15.59	12	-35.66	1015					34

GAS FIELD MONITORING SHEET

CH4 Consultants

Site:	**Ffridd Rasus**	**Weather Conditions**	sunny spells
Date:	10/11/2014		
Name:	Steve Hindle	**Temperature ^{O}C**	11 to 13
Equipment Used :	GA5000		
Serial No :	G500196		
Last Calibration Date :	05/06/2014	**Total Flow Setting m^3hr**	increased flow 330m^hr to 340m^hr
Calibration Due Date :	06/12/2014		

1	2	3	4	5	6	7	8	9	10	12	13	14	15	16
ID	Date/Time	CH4 %	CO2 %	O2 %	BALANCE %	RESIDUAL NITROGEN %	CO ppm	SUCTION PRESSURE mb	ATMOS - PHERIC PRESSURE mb	VELOCITY	FLOW m3/hr	METHANE FLOW m3/hr	COMMENTS	VALVE POSITION %
FR_FLARE	10/11/2014 10:43	53.1	35.1	0.5	11.3	9.41	7	-32.64	999					32
FR_BH001	10/11/2014 10:50	0.2	1.6	19.6	78.6	4.51	1	0.8	999					0
FR_BH002	10/11/2014 10:53	27.1	21.1	0.2	51.6	50.84	1	-0.02	1002					0
FR_BH003	10/11/2014 10:56	35.1	20.9	0.1	43.9	43.52	1	-0.36	1001					0
FR_BH004	10/11/2014 10:59	30.1	20.2	0.2	49.5	48.74	1	-0.94	1001					0
FR_BH005	10/11/2014 11:01	31.5	20.8	0.2	47.5	46.74	1	-0.85	1001					0
FR_BH006	10/11/2014 11:02	58.1	25	0.1	16.8	16.42	3	-0.68	1000					25
FR_BH007	10/11/2014 11:06	42.2	23.4	1.9	32.5	25.32	1	1.42	1000					2
FR_BH008	10/11/2014 11:08	31	22.6	0	46.4	46.4	2	-2.15	1000					0
FR_MAN01	10/11/2014 11:09	56.1	24.6	0	19.3	19.3	3	-14.88	1004					20
FR_BH009	10/11/2014 11:15	0.3	3.1	17.4	79.2	13.43	0	-0.02	1000					0
FR_BH010	10/11/2014 11:16	15.9	18.7	0.1	65.3	64.92	1	0	1005					0
FR_BH011	10/11/2014 11:19	47.8	23.4	0.2	28.6	27.84	2	-3.14	1008					25
FR_BH012	10/11/2014 11:20	42.3	23.2	0.1	34.4	34.02	3	-20.58	1001					25
FR_BH013	10/11/2014 11:22	42.8	26.1	0.1	31	30.62	1	-0.75	1001					2
FR_BH014	10/11/2014 11:25	26	19.1	5.8	49.1	27.18	1	-0.8	1000					0
FR_BH015	10/11/2014 11:27	38.7	20	0	41.3	41.3	2	-1.42	998					0
FR_BH016	10/11/2014 11:29	37	20.6	2.5	39.9	30.45	3	-3.45	1003					0
FR_BH017	10/11/2014 11:31	21.7	18.5	0	59.8	59.8	1	-1.16	1000					0
FR_BH018	10/11/2014 11:32	22.8	20.5	0.4	56.3	54.79	1	-0.43	1000					0
FR_MAN02	10/11/2014 11:34	42.9	23.8	0	33.3	33.3	2	-16.91	1002					25
FR_BH019	10/11/2014 11:37	34.5	20.9	0.2	44.4	43.64	1	0.02	1004					0
FR_BH020	10/11/2014 11:39	30.2	21	0	48.8	48.8	2	-0.29	1004					0
FR_BH021	10/11/2014 11:40	40.8	23.7	0	35.5	35.5	1	-0.75	1004					10
FR_BH022	10/11/2014 11:42	46	26.3	0	27.7	27.7	2	-10.37	1004					25
FR_BH023	10/11/2014 11:44	23.8	20.4	0.9	54.9	51.5	1	-0.32	1004					0
FR_MAN03	10/11/2014 11:46	45.6	26.1	0	28.3	28.3	2	-20.55	1001					30
FROLDGWM	10/11/2014 11:47	0.2	0.1	21.8	77.9	0	0	0	1001					0
FR_GW001	10/11/2014 12:07	9.2	17.8	0.8	72.2	69.18	2	-1.66	1001					40
FR_GW003	10/11/2014 12:09	44.4	15.5	0.9	39.2	35.8	2	0.32	1003					40
FR_GW005	10/11/2014 12:11	0.3	6.4	9.7	83.6	46.93	0	-1.33	1002					40
FR_GW007	10/11/2014 12:13	13.8	18.9	0.8	66.5	63.48	56	-0.67	1002					40
FR_GW009	10/11/2014 12:15	20.3	22.6	0.1	57	56.62	26	-0.12	1002					40
FR_GW011	10/11/2014 12:17	28.5	25.5	0	46	46	13	-2.72	1003					40
FR_GW013	10/11/2014 12:19	1.1	15.1	0.7	83.1	80.45	8	-3.21	1003					40
FR_GW014	10/11/2014 12:21	0.2	10.3	12.2	77.3	31.18	0	-2.13	1004					40
FR_GW012	10/11/2014 12:24	19.3	22.4	1.2	57.1	52.56	7	-2.32	1004					40
FR_GW010	10/11/2014 12:25	23	22.6	0.2	54.2	53.44	3	0.29	1002					40
FR_GW008	10/11/2014 12:28	0.4	14.1	2.6	82.9	73.07	0	0.79	1001					40
FR_GW006	10/11/2014 12:30	0.1	5.3	11	83.6	42.02	0	0.5	1001					40
FR_GW004	10/11/2014 12:31	25.3	18.9	0.3	55.5	54.37	7	1.09	1006					40

GAS FIELD MONITORING SHEET

CH4 Consultants

Site:	**Ffridd Rasus**	**Weather Conditions**	sunny spells
Date:	10/11/2014		
Name:	Steve Hindle	**Temperature ^{O}C**	11 to 13
Equipment Used :	GA5000		
Serial No :	G500196		
Last Calibration Date :	05/06/2014	**Total Flow Setting m^3hr**	increased flow 330m^hr to 340m^hr
Calibration Due Date :	06/12/2014		

1	2	3	4	5	6	7	8	9	10	12	13	14	15	16
ID	Date/Time	CH4 %	CO2 %	O2 %	BALANCE %	RESIDUAL NITROGEN %	CO ppm	SUCTION PRESSURE mb	ATMOS - PHERIC PRESSURE mb	VELOCITY	FLOW m3/hr	METHANE FLOW m3/hr	COMMENTS	VALVE POSITION %
FR_GW002	10/11/2014 12:33	0.2	3.2	15.9	80.7	20.6	0	0.55	1006					40
FR_LM1/2	10/11/2014 12:36	0.2	7.9	11.7	80.2	35.97	0	0.61	1006					0
FR_LCP01	10/11/2014 12:38	70.5	25.9	0.1	3.5	3.12	1	0.44	1003					2
FR_C0021	10/11/2014 12:41	25.4	25.3	0.2	49.1	48.34	4	-7.05	997					0
FR_LM1/1	10/11/2014 12:43	12.9	20.9	0.5	65.7	63.81	4	0.34	997					0
FR_C0024	10/11/2014 12:46	28.2	17.9	11.5	42.4	0	3	0.32	999					0
FR_C0025	10/11/2014 12:47	38.7	30.6	0.1	30.6	30.22	5	-4.58	999					25
FR_C0035	10/11/2014 12:49	61.2	41.5	0.2	0	0	6	-3.74	1003					25
FR_C0013	10/11/2014 12:50	40.3	25.4	0.1	34.2	33.82	4	-2.13	1001					10
FR_C0014	10/11/2014 12:52	33.1	23.1	0.3	43.5	42.37	8	0.48	1001					0
FR_C0012	10/11/2014 12:54	25.6	22.1	0	52.3	52.3	4	-0.17	1002					0
FR_C0011	10/11/2014 12:55	29.6	22.5	0	47.9	47.9	4	-0.7	1000					0
FR_MAN04	10/11/2014 12:57	48	33.8	0	18.2	18.2	6	-18.43	1002					50
FR_LM2/2	10/11/2014 12:59	3.6	13.4	6.9	76.1	50.02	3	-2.07	1001					0
FR_C0022	10/11/2014 13:03	38	30.8	1.4	29.8	24.51	4	-18.21	1003					0
FR_LCP02	10/11/2014 12:09	49.3	34.3	1.3	15.1	10.19	5	-9.44	1006					25
FR_C0023	10/11/2014 12:11	53.3	36.5	0	10.2	10.2	12	-19.27	1005					50
FR_LM2/1	10/11/2014 12:12	64.7	39.2	0.1	0	0	6	-2.56	1005					2
FR_C0043	10/11/2014 12:15	63.8	40.1	0	0	0	15	-19.21	1000					100
FR_C0044	10/11/2014 12:18	63.1	40.9	0	0	0	15	-18.84	997					100
FR_C0042	10/11/2014 12:19	62.6	39.6	0	0	0	12	-17.73	1000					100
FR_C0045	10/11/2014 12:20	63.1	41	0	0	0	18	-17.97	1000					100
FR_LCP4A	10/11/2014 12:35	51.4	36.2	3.1	9.3	0	13	-17.88	1000					100
FR_C0053	10/11/2014 12:36	62.5	42.4	0	0	0	36	-16.91	1000					100
FR_C0054	10/11/2014 12:37	62.2	42.5	0	0	0	19	-15.56	1000					100
FR_LM4/2	10/11/2014 12:40	62.9	42.4	0	0	0	10	-8.22	1000					100
FR_MAN06	10/11/2014 12:45	61	41.1	0.4	0	0	19	-14.98	1001					50
FR_C0055	10/11/2014 12:48	63.6	41.4	0	0	0	16	-20.29	999					100
FR_LCP4B	10/11/2014 12:51	53.2	37.2	2.5	7.1	0	12	5.76	999					0
FR_C0056	10/11/2014 12:53	63.5	41.3	0	0	0	37	-24.37	998					100
FR_C0057	10/11/2014 12:55	63.5	41.8	0	0	0	53	-21.93	999					100
FR_C0052	10/11/2014 12:56	61.9	41.5	0	0	0	25	-21.73	1001					100
FR_C0051	10/11/2014 12:58	61.7	41.3	0	0	0	34	-21.81	1000					100
FR_C0041	10/11/2014 12:59	64.2	40.3	0	0	0	18	-21.52	1002					100
FR_C0046	10/11/2014 13:01	62.8	40.7	0	0	0	29	-21.45	1001					100
FR_C0034	10/11/2014 13:02	62.9	39.6	0	0	0	31	-21.71	1001					100
FR_C0031	10/11/2014 13:03	54.5	37.8	0	7.7	7.7	17	-15	1001					50
FR_MAN07	10/11/2014 13:06	59.3	39.6	0	1.1	1.1	25	-21.74	1001					75
FR_C0032	10/11/2014 14:23	16.9	11.3	12.8	59	10.62	6	-1.96	1003					0
FR_LCP03	10/11/2014 14:28	53.8	36.3	2.7	7.2	0	3	-2.92	1003					2
FR_C0033	10/11/2014 14:30	58.9	38	0.3	2.8	1.67	7	-1.45	996					25

GAS FIELD MONITORING SHEET

CH4 Consultants

Site:	**Ffridd Rasus**	**Weather Conditions**	sunny spells
Date:	10/11/2014		
Name:	Steve Hindle	**Temperature ^{O}C**	11 to 13
Equipment Used :	GA5000		
Serial No :	G500196		
Last Calibration Date :	05/06/2014	**Total Flow Setting m^3hr**	increased flow 330m^hr to 340m^hr
Calibration Due Date :	06/12/2014		

1	2	3	4	5	6	7	8	9	10	12	13	14	15	16
ID	**Date/Time**	**CH4 %**	**CO2 %**	**O2 %**	**BALANCE %**	**RESIDUAL NITROGEN %**	**CO ppm**	**SUCTION PRESSURE mb**	**ATMOS - PHERIC PRESSURE mb**	**VELOCITY**	**FLOW m3/hr**	**METHANE FLOW m3/hr**	**COMMENTS**	**VALVE POSITION %**
FR_C0036	10/11/2014 14:31	61.6	40.7	0	0	0	4	-0.39	996					25
FR_LM3/1	10/11/2014 14:32	63.4	41.2	0	0	0	5	-0.26	997					25
FR_MAN05	10/11/2014 14:34	60.6	39.6	0.5	0	0	5	-15.05	1001					30
FR_FLARE	10/11/2014 15:36	57.5	37.1	0.3	5.1	3.97	8	-30.09	1002					33

GAS FIELD MONITORING SHEET

CH4 Consultants

Site:	**Ffridd Rasus**	**Weather Conditions**	Rain
Date:	09/12/2014		
Name:	Steve Hindle	**Temperature ^{O}C**	5 to 7
Equipment Used :	GA 2000+		
Serial No :	GA11066		
Last Calibration Date :	13/03/2014	**Total Flow Setting m^3hr**	decreased flow 300m^hr to 280m^hr
Calibration Due Date :	16/09/2014		

1	2	3	4	5	6	7	8	9	10	12	13	14	15	16
ID	Date/Time	CH4 %	CO2 %	O2 %	BALANCE %	RESIDUAL NITROGEN %	CO ppm	SUCTION PRESSURE mb	ATMOS - PHERIC PRESSURE mb	VELOCITY	FLOW m3/hr	METHANE FLOW m3/hr	COMMENTS	VALVE POSITION %
FR_FLARE	09/12/2014 09:29	39.8	31	0.4	28.8	27.29	7	-35.17	1021					33
FR_BH001	09/12/2014 09:35	0.4	2	16	81.6	21.12	3	-0.01	1021					0
FR_BH002	09/12/2014 09:38	27.5	21.4	0.1	51	50.62	1	0.36	1021					0
FR_BH003	09/12/2014 09:40	26	18.6	0.2	55.2	54.44	1	0.43	1021					0
FR_BH004	09/12/2014 09:41	31.1	20.7	0.3	47.9	46.77	1	0.63	1021					0
FR_BH005	09/12/2014 09:43	28.5	20.8	0.2	50.5	49.74	1	0.68	1021					0
FR_BH006	09/12/2014 09:44	45.8	24.2	0.1	29.9	29.52	1	0.48	1021					10
FR_BH007	09/12/2014 09:45	48.7	24.2	0.2	26.9	26.14	1	-0.71	1021					2
FR_BH008	09/12/2014 09:46	29.8	21.8	0.2	48.2	47.44	2	0.71	1021					0
FR_MAN01	09/12/2014 09:47	47.7	24.3	0.1	27.9	27.52	2	-10.4	1021					20
FR_BH009	09/12/2014 09:53	0.2	10	7	82.8	56.34	1	0.17	1021					0
FR_BH010	09/12/2014 09:55	14.4	18.7	0	66.9	66.9	1	0.52	1020					0
FR_BH011	09/12/2014 09:56	44.6	22.5	0	32.9	32.9	1	-1.93	1020					10
FR_BH012	09/12/2014 09:57	40.7	23.8	0.1	35.4	35.02	2	-20.14	1020					10
FR_BH013	09/12/2014 09:58	41	28.7	0	30.3	30.3	2	-7.77	1020					10
FR_BH014	09/12/2014 09:59	34.5	25.1	0.1	40.3	39.92	2	0.44	1020					0
FR_BH015	09/12/2014 10:00	36.5	19.3	0.2	44	43.24	2	0.45	1020					0
FR_BH016	09/12/2014 10:03	46.4	21.8	1	30.8	27.02	2	0.39	1021					2
FR_BH017	09/12/2014 10:04	21.2	18.2	0.1	60.5	60.12	2	0.48	1020					0
FR_BH018	09/12/2014 10:05	24.1	20.6	0.2	55.1	54.34	1	0.48	1020					0
FR_MAN02	09/12/2014 10:14	44	23	0	33	33	2	-17.08	1020					25
FR_C0032	09/12/2014 10:18	0.6	0.7	21.2	77.5	0	1	-3.5	1020					0
FR_LCP03	09/12/2014 10:19	36.1	30.8	0.8	32.3	29.28	3	-11.49	1020					10
FR_C0033	09/12/2014 10:20	26.4	27.8	0.4	45.4	43.89	4	-5.16	1020					0
FR_C0036	09/12/2014 10:22	11.7	21.1	1.1	66.1	61.94	4	-3.97	1020					0
FR_LM3/1	09/12/2014 10:23	41.7	33.3	1.1	23.9	19.74	7	-3.44	1020					25
FR_MAN05	09/12/2014 10:27	39.1	32.1	1.2	27.6	23.06	6	-21.17	1020					30
FR_BH019	09/12/2014 10:30	40.6	20.9	0	38.5	38.5	2	1.24	1020					2
FR_BH020	09/12/2014 10:31	29.1	20.6	0.3	50	48.87	2	1.14	1019					0
FR_BH021	09/12/2014 10:32	45	24.3	0	30.7	30.7	2	0.95	1019					10
FR_BH022	09/12/2014 10:33	45.6	24.9	0.1	29.4	29.02	2	-10.04	1019					25
FR_BH023	09/12/2014 10:35	26.5	19.5	2.9	51.1	40.14	1	3.82	1019					0
FR_MAN03	09/12/2014 10:37	44.8	24.5	0.3	30.4	29.27	1	-20.34	1019					30
FROLDGWM	09/12/2014 10:38	2.1	12.2	9.7	76	39.33	1	0.75	1019					0
FR_GW001	09/12/2014 10:40	7.4	16.8	0.8	75	71.98	2	0.74	1019					40
FR_GW003	09/12/2014 10:42	42.8	17.1	0.2	39.9	39.14	3	1.46	1018					40
FR_GW005	09/12/2014 10:43	2.1	12.4	2.7	82.8	72.59	4	1.04	1018					40
FR_GW007	09/12/2014 10:45	10	19.3	0.3	70.4	69.27	7	1.19	1018					40
FR_GW009	09/12/2014 10:46	18.9	21.5	0.1	59.5	59.12	12	0.83	1018					40
FR_GW011	09/12/2014 10:48	21.6	23.5	0	54.9	54.9	9	0.96	1018					40
FR_GW013	09/12/2014 10:49	0.4	14	4.6	81	63.61	3	0.58	1018					40

GAS FIELD MONITORING SHEET

CH4 Consultants

Site:	**Ffridd Rasus**	**Weather Conditions**	Rain
Date:	09/12/2014		
Name:	Steve Hindle	**Temperature ^{O}C**	5 to 7
Equipment Used :	GA 2000+		
Serial No :	GA11066		
Last Calibration Date :	13/03/2014	**Total Flow Setting m^3hr**	decreased flow 300m^hr to 280m^hr
Calibration Due Date :	16/09/2014		

1	2	3	4	5	6	7	8	9	10	12	13	14	15	16
ID	Date/Time	CH4 %	CO2 %	O2 %	BALANCE %	RESIDUAL NITROGEN %	CO ppm	SUCTION PRESSURE mb	ATMOS - PHERIC PRESSURE mb	VELOCITY	FLOW m3/hr	METHANE FLOW m3/hr	COMMENTS	VALVE POSITION %
FR_GW014	09/12/2014 10:51	17.1	22	0.6	60.3	58.03	5	0.59	1018					40
FR_GW012	09/12/2014 10:52	12.7	19.9	0.4	67	65.49	8	-0.99	1018					40
FR_GW010	09/12/2014 10:54	8.5	18.7	0.5	72.3	70.41	11	0.64	1018					40
FR_GW008	09/12/2014 10:55	0.2	14.3	4	81.5	66.38	5	0.79	1018					40
FR_GW006	09/12/2014 10:57	0	7.7	8.1	84.2	53.58	1	0.66	1018					40
FR_GW004	09/12/2014 10:58	22.5	18.6	0.4	58.5	56.99	1	0.72	1018					40
FR_GW002	09/12/2014 11:00	1	14.2	0.8	84	80.98	1	0.31	1018					40
FR_LM1/2	09/12/2014 11:02	0	3.3	15.8	80.9	21.18	1	-0.42	1018					0
FR_LCP01	09/12/2014 11:04	6.9	17.3	0.6	75.2	72.93	1	-4.25	1018					0
FR_C0021	09/12/2014 11:06	65.5	31.2	0.6	2.7	0.43	4	-1.02	1018					2
FR_LM1/1	09/12/2014 11:07	2.2	15	4.3	78.5	62.25	5	-0.55	1018					0
FR_C0024	09/12/2014 11:11	39	29.4	3.1	28.5	16.78	6	-1.85	1018					0
FR_C0025	09/12/2014 11:12	14.9	21.8	0.3	63	61.87	5	-6.22	1018					0
FR_C0035	09/12/2014 11:13	25.4	26.8	0.1	47.7	47.32	5	-5.32	1018					0
FR_C0013	09/12/2014 11:15	18.8	20.3	0.6	60.3	58.03	4	-3.52	1018					0
FR_C0014	09/12/2014 11:17	12.1	15.5	3.8	68.6	54.24	13	-0.85	1018					0
FR_C0012	09/12/2014 11:18	11.3	19.6	0.1	69	68.62	8	-0.55	1018					0
FR_C0011	09/12/2014 11:19	20.9	20.8	0.4	57.9	56.39	4	-1.29	1018					0
FR_MAN04	09/12/2014 11:20	62.8	32.4	0.2	4.6	3.84	6	-21.74	1018					50
FR_LM2/2	09/12/2014 11:21	45.2	31.7	0.1	23	22.62	6	-0.7	1018					0
FR_C0022	09/12/2014 13:16	61.2	35.8	0.7	2.3	0	3	1.25	1014					2
FR_LCP02	09/12/2014 13:18	32.7	27.9	1.4	38	32.71	3	-11.84	1014					0
FR_C0023	09/12/2014 13:19	19.3	25	0	55.7	55.7	4	-22.7	1014					0
FR_LM2/1	09/12/2014 13:21	18.2	23.2	0.7	57.9	55.25	8	-2.31	1014					0
FR_C0043	09/12/2014 13:26	64.3	39.5	0.1	0	0	5	-23.59	1014					100
FR_C0044	09/12/2014 13:27	54.3	38.1	0	7.6	7.6	7	-23.73	1014					100
FR_C0042	09/12/2014 13:28	42.8	33.4	0	23.8	23.8	7	-23.81	1014					50
FR_C0045	09/12/2014 13:29	63.2	40.5	0.2	0	0	8	-23.48	1014					100
FR_LCP4A	09/12/2014 13:30	60.6	40.9	0.1	0	0	9	-23.77	1014					100
FR_C0053	09/12/2014 13:32	60	41	0.1	0	0	14	-23.68	1014					100
FR_C0054	09/12/2014 13:33	62.4	42.4	0	0	0	14	-23.68	1014					100
FR_LM4/2	09/12/2014 13:34	60.9	40.7	0	0	0	12	-0.47	1014					100
FR_MAN06	09/12/2014 13:36	60.3	40.6	0.1	0	0	12	-10.26	1014					100
FR_C0055	09/12/2014 13:43	63.4	40.5	0.1	0	0	9	-19.36	1013					100
FR_LCP4B	09/12/2014 13:44	62.5	42.1	0	0	0	10	2.16	1013					2
FR_C0056	09/12/2014 13:45	64.2	40.6	0	0	0	15	-15.74	1013					100
FR_C0057	09/12/2014 13:47	62.7	40	0	0	0	23	-19.38	1014					100
FR_C0052	09/12/2014 13:48	62.6	41.5	0	0	0	20	-16.89	1014					100
FR_C0051	09/12/2014 13:50	62.8	41.1	0	0	0	18	-18.13	1013					100
FR_C0041	09/12/2014 13:51	63.3	39.1	0	0	0	15	-18.2	1013					100
FR_C0046	09/12/2014 13:52	58.1	38.8	0	3.1	3.1	14	-16.46	1013					100

GAS FIELD MONITORING SHEET

CH4 Consultants

Site:	**Ffridd Rasus**	**Weather Conditions**	Rain
Date:	09/12/2014		
Name:	Steve Hindle	**Temperature ^{O}C**	5 to 7
Equipment Used :	GA 2000+		
Serial No :	GA11066		
Last Calibration Date :	13/03/2014	**Total Flow Setting m^3hr**	decreased flow 300m^hr to 280m^hr
Calibration Due Date :	16/09/2014		

1	2	3	4	5	6	7	8	9	10	12	13	14	15	16
ID	Date/Time	CH4 %	CO2 %	O2 %	BALANCE %	RESIDUAL NITROGEN %	CO ppm	SUCTION PRESSURE mb	ATMOS - PHERIC PRESSURE mb	VELOCITY	FLOW m3/hr	METHANE FLOW m3/hr	COMMENTS	VALVE POSITION %
FR_C0034	09/12/2014 13:53	48.5	35.9	0.1	15.5	15.12	15	-17.6	1013					50
FR_C0031	09/12/2014 13:55	36.2	31.5	0.1	32.2	31.82	10	-12.98	1013					0
FR_MAN07	09/12/2014 13:57	58.5	39.3	0	2.2	2.2	12	-19.03	1013					60
FR_FLARE	09/12/2014 14:52	55.5	36.5	0	8	8	8	-34.28	1012					33
FR_FLARE	09/12/2014 14:58	53.7	35.3	0	11	11	8	-30.67	1012					32

Appendix H
Meteorological Data

CYNGOR GWYNEDD - GWASANAETH TRIN GWASTRAFF

RAINFALL / WEATHER RECORD - FFRIDD RASUS LANDFILL SITE

COPY

OCTOBER 2014			RAINFALL									
DATE	HOUR		DAILY		MONTH TODATE		WIND		CLOUD DESCRIPTION	WEATHER DESCRIPTION	
1	13·30	~~A.M.~~ / P.M.	6	MM.	6	MM.	4	M.P.H.	100% CLOUD	LIGHT SHOWERS	15°
2	14·50	~~A.M.~~ / P.M.	0	MM.	6	MM.	10	M.P.H.	NO CLOUD	SUNNY	17°
3	11·05	A.M. / ~~P.M.~~	0	MM.	6	MM.	6	M.P.H.	100% CLOUD	DRY	18°
4		A.M. / P.M.		MM.		MM.		M.P.H.			
5		A.M. / P.M.		MM.		MM.		M.P.H.			
6	08·00	A.M. / ~~P.M.~~	39	MM.	45	MM.	19°	M.P.H.	100% CLOUD	WIND + RAIN	12°
7	08·00	A.M. / ~~P.M.~~	12	MM.	57	MM.	2	M.P.H.	100% CLOUD	SHOWERS	8°
8	11·30	A.M. / ~~P.M.~~	7	MM.	64	MM.	5	M.P.H.	100% CLOUD	SHOWERS	12°
9	10·20	A.M. / ~~P.M.~~	18	MM.	82	MM.	16	M.P.H.	100% CLOUD	SHOWERS	13°
10		A.M. / P.M.		MM.		MM.		M.P.H.			
11		A.M. / P.M.		MM.		MM.		M.P.H.			
12		A.M. / P.M.		MM.		MM.		M.P.H.			
13	13·30	~~A.M.~~ / P.M.	28	MM.	110	MM.	8	M.P.H.	100%	DRY	13°
14	11·55	A.M. / ~~P.M.~~	0	MM.	110	MM.	6	M.P.H.	60%	SUNNY	13°
15	09·00	A.M. / ~~P.M.~~	0	MM.	110	MM.	11	M.P.H.	80%	DRY	13°
16	14·10	~~A.M.~~ / P.M.	7	MM.	117	MM.	11	M.P.H.	100%	DRY/WARM	17°
17	08·40	A.M. / ~~P.M.~~	12	MM.	129	MM.	15	M.P.H.	100%	DRY	15°
18		A.M. / P.M.		MM.		MM.		M.P.H.			
19		A.M. / P.M.		MM.		MM.		M.P.H.			
20	08·30	A.M. / ~~P.M.~~	6	MM.	135	MM.	8	M.P.H.	100%	RAIN	13°
21	12·30	~~A.M.~~ / P.M.	12	MM.	147	MM.	24	M.P.H.	100%	DRY/WINDY	11°
22		A.M. / P.M.		MM.		MM.		M.P.H.			
23	08·00	A.M. / ~~P.M.~~	2	MM.	149	MM.	9	M.P.H.	100%	DRIZZLE	13°
24	08·00	A.M. / ~~P.M.~~	3	MM.	152	MM.	2	M.P.H.	100%	DRY	12°
25		A.M. / P.M.		MM.		MM.		M.P.H.			
26		A.M. / P.M.		MM.		MM.		M.P.H.			
27		A.M. / P.M.		MM.		MM.		M.P.H.			
28		A.M. / P.M.		MM.		MM.		M.P.H.			
29		A.M. / P.M.		MM.		MM.		M.P.H.			
30	08·10	A.M. / ~~P.M.~~	15	MM.	167	MM.	10	M.P.H.	100%	DRY	15°
31	11·00	A.M. / ~~P.M.~~	0	MM.	167	MM.	5	M.P.H.	PATCHY CLOUD	DRY/WARM	19°

RECEIVED
31 OCT 2014

CYNGOR GWYNEDD - GWASANAETH TRIN GWASTRAFF

RAINFALL / WEATHER RECORD - FFRIDD RASUS LANDFILL SITE

COPY

NOVEMBER 2014		RAINFALL		WIND	CLOUD DESCRIPTION	WEATHER DESCRIPTION
DATE	HOUR	DAILY	MONTH TODATE			
1	A.M. / P.M.	MM.	MM.	M.P.H.		
2	A.M. / P.M.	MM.	MM.	M.P.H.		
3	08·35 A.M. / ~~P.M.~~	41 MM.	41 MM.	6 M.P.H.	100%	DRY/SHOWERS 9°C
4	07·45 A.M. / ~~P.M.~~	8 MM.	49 MM.	2 M.P.H.	100%	COLD 5°C
5	09·25 A.M. / ~~P.M.~~	7 MM.	56 MM.	0 M.P.H.	LITTLE CLOUD	SUNNY/CLOUD 8°C
6	09·00 A.M. / ~~P.M.~~	0 MM.	56 MM.	13 M.P.H.	100%	DRY/CLOUDY 11°C
7	11 20 A.M. ~~/P.M.~~	14 MM.	70 MM.	14 M.P.H.	100%	SHOWERS 10°C
8	A.M. / P.M.	MM.	MM.	M.P.H.		
9	A.M. / P.M.	MM.	MM.	M.P.H.		
10	09·00 A.M. ~~/P.M.~~	16 MM.	86 MM.	1 M.P.H.	80%	DRY 9°C
11	14·20 ~~A.M.~~ / P.M.	8 MM.	94 MM.	8 M.P.H.	100%	LIGHT SHOWERS 13°C
12	A.M. / P.M.	MM.	MM.	M.P.H.		
13	09·00 A.M. / ~~P.M.~~	8 MM.	102 MM.	12 M.P.H.	100%	DRY 13°C
14	11·45 A.M. / ~~P.M.~~	2 MM.	104 MM.	7 M.P.H.	LITTLE CLOUD	DRY/SUNNY 13°C
15	A.M. / P.M.	MM.	MM.	M.P.H.		
16	A.M. / P.M.	MM.	MM.	M.P.H.		
17	08·10 A.M. ~~/P.M.~~	3 MM.	107 MM.	1 M.P.H.	100%	DRY 8°C
18	10·55 A.M. / ~~P.M.~~	0 MM.	107 MM.	2 M.P.H.	PATCHY CLOUD	DRY/SUNNY 11°C
19	08·45 A.M. / P.M.	0 MM.	107 MM.	5 M.P.H.	100% CLOUD	DRY 9°C
20	09·15 A.M. / ~~P.M.~~	4 MM.	111 MM.	1 M.P.H.	100% CLOUD	DRY 10°C
21	13·15 ~~A.M.~~ / P.M.	0 MM.	111 MM.	12 M.P.H.	100% CLOUD	LIGHT RAIN 8°C
22	09·35 ~~A.M.~~ / P.M.	4 MM.	115 MM.	M.P.H.	LITTLE CLOUD	DRY.
23	09·45 A.M. / P.M.	1 MM.	116 MM.	M.P.H.	50% CLOUD	DRY FROSTY
24	A.M. / P.M.	MM.	MM.	M.P.H.		
25	A.M. / P.M.	MM.	MM.	M.P.H.		
26	A.M. / P.M.	MM.	MM.	M.P.H.		
27	11·50 A.M. / P.M.	0 MM.	116 MM.	M.P.H.	LITTLE CLOUD	DRY WARM
28	A.M. / P.M.	MM.	MM.	M.P.H.		
29	A.M. / P.M.	MM.	MM.	M.P.H.		
30	A.M. / P.M.	MM.	MM.	M.P.H.		
31	A.M. / P.M.	MM.	MM.	M.P.H.		

CYNGOR GWYNEDD - GWASANAETH TRIN GWASTRAFF

RAINFALL / WEATHER RECORD - FFRIDD RASUS LANDFILL SITE

DECEMBER 2014		RAINFALL		WIND	CLOUD DESCRIPTION	WEATHER DESCRIPTION
DATE	HOUR	DAILY	MONTH TODATE			
1	12.40 ~~A.M.~~ / P.M.	0 MM.	0 MM.	0 M.P.H.	100%	DRY/COLD 8°
2	08.00 A.M. / ~~P.M.~~	1 MM.	1 MM.	7 M.P.H.	100%	DRY
3	07.45 A.M. / ~~P.M.~~	0 MM.	1 MM.	0 M.P.H.	80%	DRY/COLD 1°
4	11.30 A.M. / P.M.	0 MM.	1 MM.	1 M.P.H.	100%	DRY/COLD 6°
5	A.M. / P.M.	MM.	MM.	M.P.H.		
6	A.M. / P.M.	MM.	MM.	M.P.H.		
7	A.M. / P.M.	MM.	MM.	M.P.H.		
8	09.10 A.M. / ~~P.M.~~	10 MM.	11 MM.	14 M.P.H.	PATCHY CLOUD	COLD 6°
9	15.15 ~~A.M.~~ / P.M.	5 MM.	16 MM.	17 M.P.H.	100%	RAIN 10°
10	10.35 A.M. / P.M.	6 MM.	22 MM.	29 M.P.H.	100%	STRONG WINDS 8°
11	11.45 A.M. / ~~P.M.~~	6 MM.	28 MM.	20 M.P.H.	100%	DRY/WINDY 7°
12	09.05 A.M. / ~~P.M.~~	16 MM.	44 MM.	0 M.P.H.	100%	DRY/COLD 3°
13	A.M. / P.M.	MM.	MM.	M.P.H.		
14	A.M. / P.M.	MM.	MM.	M.P.H.		
15	07.45 A.M. / ~~P.M.~~	14 MM.	58 MM.	5 M.P.H.	100%	DRY/COLD 7°
16	12.40 ~~A.M.~~ / P.M.	1 MM.	59 MM.	4 M.P.H.	100%	DRY 8°
17	09.55 A.M. / ~~P.M.~~	25 MM.	84 MM.	2 M.P.H.	100%	RAIN 11°
18	11.10 A.M. / ~~P.M.~~	3 MM.	87 MM.	6 M.P.H.	100%	DRY 11°
19	10.55 A.M. / ~~P.M.~~	3 MM.	90 MM.	10 M.P.H.	PATCHY CLOUD	DRY 8°
20	A.M. / P.M.	MM.	MM.	M.P.H.		
21	A.M. / P.M.	MM.	MM.	M.P.H.		
22	10.00 A.M. / ~~P.M.~~	1 MM.	91 MM.	10 M.P.H.	100%	DRY 11°
23	08.50 A.M. / ~~P.M.~~	3 MM.	94 MM.	13 M.P.H.	100%	SHOWERS 9°
24	08.40 A.M. / ~~P.M.~~	10 MM.	104 MM.	11 M.P.H.	80%	DRY/COLD 7°
25	A.M. / P.M.	MM.	MM.	M.P.H.		
26	A.M. / P.M.	MM.	MM.	M.P.H.		
27	A.M. / P.M.	MM.	MM.	M.P.H.		
28	A.M. / P.M.	MM.	MM.	M.P.H.		
29	2.00 ~~A.M.~~ / P.M.	17 MM.	121 MM.	M.P.H.	60%	DRY COLD
30	11.20 A.M. / P.M.	0 MM.	121 MM.	M.P.H.	70%	DRY
31	A.M. / P.M.	MM.	MM.	M.P.H.		

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