

Gwynedd Council

# Llwyn Isaf Landfill

Environmental Monitoring Report July 2014-January 2015 – Final Report



20 April 2015

Amec Foster Wheeler Environment  
& Infrastructure UK Limited




## Report for

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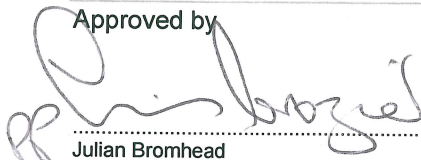
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## Document revisions

No.	Details	Date
1	Draft for Client Comment	01/04/15
2	Final Report	20/04/15

## Executive summary

Environmental monitoring at Llwyn Isaf Landfill has continued during this latest reporting period July to January 2015. The site comprises Area 1 (Anaerobic Digestion facility operated by Biogen), disused pulveriser building, site offices, weighbridge and storage bays), Area 2 (unlined closed landfill) and Area 3 (engineered landfill which closed in March 2012). The closure plan for Area 3 prepared by AMEC in October 2013 was approved by NRW on 18 July 2014. The site is now in 'definitive closure' and regulated under the conditions of the Environmental Permit (EP) variation issued on 18 July 2014 (reference EPR/YP3138UJ/V006). This resulted in a reduction in the scope and frequency of monitoring at the site.

Leachate levels and quality are currently monitored in Cells 1, 2 and 3 of Area 3. During this reporting period the EP compliance level of 1.5 m above base has not been exceeded. Ammoniacal-nitrogen and chloride leachate concentrations showed little variability and remained within the historical range.

Groundwater levels are consistent with previous data and showed seasonal variation, falling in July and then increasing to a maximum in September-October before falling again between October and January.

Groundwater quality data downgradient of Area 3 continue to show no impact from Area 3. EP groundwater quality trigger levels for ammoniacal-nitrogen, chloride, mecoprop and zinc have not been exceeded except for chloride concentration at borehole GW4 in January 2015 (16.6 mg/l) which exceeded marginally the trigger level (16 mg/l). Dissolved mercury concentrations were below detection limit (<0.1 µg/l) but this is higher than the trigger level (0.05 µg/l). The trigger levels will be reviewed in 2015 as part of the hydrogeological risk assessment (HRA) review for the site.

Low contaminant concentrations continue to be recorded at most surface water monitoring locations and show no impact from Area 3. The highest and most variable chloride concentrations continue to be noted at sample point D2 (lake to the north of the site) and are considered likely to represent a slight impact from the nearby closed landfill (Area 2). The elevated BOD (19 mg/l) recorded sample point D2 in July is an isolated peak as concentrations dropped to within historical levels in January 2015.

The EP emission limits for pH, ammoniacal-nitrogen, suspended solids and biological oxygen demand at surface water sample point D (discharge from the attenuation lagoon into the Afon Desach) have not been exceeded. No dissolved oxygen field measurements were undertaken for comparison with the emission limit.

Gas data are collected from perimeter wells around Area 3 and between Areas 2 and 3. In waste gas wells are located in Cells 1, 2 and 3 of Area 3.

Landfill gas monitoring at the perimeter boreholes during this reporting period has shown that methane and carbon dioxide concentrations are generally consistent with previous data and show no evidence of off-site landfill gas migration from Area 3. Methane and carbon dioxide concentrations have not exceeded their revised trigger levels.

Wastes in Cells 1, 2 and 3 are continuing to produce landfill gas with concentrations within historical ranges for all locations and parameters.



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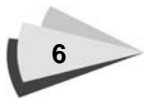


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# 1. Introduction

Llwyn Isaf Landfill site ('the site') is located approximately 17 km southwest of Caernarfon and operated by Gwynedd Council. Area 1 comprises the now disused pulveriser building, site offices, weighbridge and storage bays. Part of Area 1 was subject to a partial surrender application in 2012/2013 and the area now houses the Anaerobic Digestion (AD) facility operated by Biogen UK Limited. Area 2 received waste between 1986 and 2000 and is closed and capped. Landfilling in Area 3 commenced in January 2009 until March 2012 and is now capped. The periods of filling in Area 3 are as follows:

- ▶ Cell 1: filled between January 2009 and end of 2009;
- ▶ Cell 2: filled between January 2010 and March 2011; and
- ▶ Cell 3: filled between March 2011 and March 2012.

A closure plan for Area 3 was submitted to Natural Resources Wales (NRW) in October 2013 and accepted on 18 July 2014. The site is now in 'definitive closure' and regulated under the conditions of the new Environmental Permit (EP) variation issued on 18 July 2014 (reference EPR/YP3138UJ/V006). The environmental monitoring requirements under the site's EP are summarised in Sections 1.1 to 1.4 below and take account of the reduced monitoring requirements resulting from the site moving into definitive closure.

Until recently, the site was also regulated under the conditions of Waste Management Licence (WML) 37307, and although the WML has been superseded by the previous versions of the EP (EPR/YP3138UJ/V002 and EPR/YP3138UJ/S004), the structure of previous reports was based on requirements of the WML and the EP, considered separately. For consistency the current report structure remains the same, even though some of the monitoring locations may not intuitively belong in the operational areas under which they are being discussed.

This report presents the results of environmental monitoring carried out at the site from July 2014 to January 2015 in accordance with the site's EP. Surface water, groundwater, leachate and gas monitoring and sampling were undertaken by Gwynedd Council during this monitoring period. Leachate, surface water and groundwater samples were sent to ALS Environmental Ltd for analysis.

For the purpose of this report which covers the monitoring period July 2014 to January 2015, monitoring undertaken before 18 July 2014 is in accordance with the EP for the operational phase (EPR/YP3138UJ/V002 and EPR/YP3138UJ/S004) and from 18 July 2014 is in accordance with the EP for definitive closure (EPR/YP3138UJ/V006). The environmental monitoring requirements under the site's EP are summarised in Sections 1.1 to 1.4 below and take account of the changes resulting from the site moving into definitive closure.

## 1.1 Leachate Monitoring

Leachate quality and levels are monitored in Cells 1, 2 and 3 of Area 3. The leachate sampling regime for both the operational phase and definitive closure is identified in Tables 1.1 and 1.2, respectively. Monitoring locations are shown on Figure 1.1.

Table 1.1 Leachate Monitoring Regime - Operational Phase

Frequency	Monitoring Location	Measurement/determinands
<b>Area 3 requirements</b>		
Monthly	All leachate monitoring points	Level
Monthly monitoring for 12 months and thereafter quarterly*	All leachate wells /abstraction wells/ sumps identified on drawing ESID 7 of the permit application documents	Electrical conductivity (EC), Cl, NH <sub>4</sub> -N,pH, mecoprop, toluene, Chemical oxygen demand (COD), Biological oxygen demand (BOD), Ca, Mg, K, Na, Cd, Alk, Total organic carbon (TOC), SO <sub>4</sub> , total organic nitrogen (TON) and phenol.
Annually	All leachate wells /abstraction wells/ sumps identified on drawing ESID 7 of the permit application documents	As Monthly/quarterly plus: Cr, Cu, Fe, Pb, Mn, Ni, Zn and List 1 Suite

Note: \* Monitoring frequency was reduced from monthly to quarterly in March 2013

Table 1.2 Leachate Monitoring Regime - Definitive Closure

Frequency	Monitoring Location	Measurement/determinands
<b>Area 3 requirements</b>		
Quarterly unless a reduced frequency is agreed in with NRW. Not less than six monthly.	All leachate monitoring points	Level
Six Monthly	All leachate wells /abstraction wells/ sumps identified on drawing ESID 7 of the permit application documents	Electrical conductivity (EC), Cl, NH <sub>4</sub> -N,pH, mecoprop, toluene, Chemical oxygen demand (COD), Biological oxygen demand (BOD), Ca, Mg, K, Na, Cd, Alk, Total organic carbon (TOC), SO <sub>4</sub> , total organic nitrogen (TON) and phenol.
Annually	All leachate wells /abstraction wells/ sumps identified on drawing ESID 7 of the permit application documents	As Monthly/quarterly plus: Cr, Cu, Fe, Pb, Mn, Ni, Zn and Hazardous substances

## 1.2 Groundwater Monitoring

Groundwater quality and levels are monitored in both Areas 2 and 3. The groundwater monitoring regime for both the operational phase and definitive closure is identified in Tables 1.3 and 1.4, respectively. Monitoring locations are shown on Figure 1.1.



Table 1.3 Groundwater Monitoring Regime – Operational Phase

Frequency	Monitoring Location	Measurement/Determinand
<b>Area 2 requirements</b>		
Monthly	M10, BH1 <sup>a</sup> , M18, M19, M20, M21, M22, M30, M31 <sup>b</sup> , M33, M34, M35 and soakaway NS <sup>c</sup>	Level, Temperature, pH, Cl, EC, NH <sub>4</sub> -N, Dissolved oxygen (DO)
Quarterly	M10, BH1 <sup>a</sup> , M18, M19, M20, M21, M22, M30, M31 <sup>b</sup> , M33, M34, M35 and soakaway NS <sup>c</sup>	As monthly plus: Alkalinity, Ca, Cd, Cr, Ni, Pb, K, Mg, Na, SO <sub>4</sub> , Fe, Mn, Zn, Cu, TOC and TON.
<b>Area 3 requirements</b>		
Monthly	M17, M36, M47, DAS, GW2, GW3 and GW4.	Level.
Quarterly	M17, M36, M47, DAS, GW2, GW3 and GW4.	EC, DO, Cl, NH <sub>4</sub> -N, Hg, Zn, mecoprop Ca, Mg, K, Na, Cd, Alk, TOC, SO <sub>4</sub> , TON and phenol.
Annually	GW2, GW3, GW4, GW5, M17, M36, M47 and DAS.	As quarterly plus: Cr, Cu, Fe, Pb, Mn, Ni, Zn, hazardous (List I) suite (as for leachate, or selected parameters) – not required if hazardous (List I) substances are absent in leachate.

Notes: a BH1 is a replacement for M13, which was lost to construction work for the new anaerobic digestion (AD) plant in July 2012.

b Borehole M31 has been reinstated and has been monitored since November 2011.

c Soakaway SS was decommissioned in August 2012 following the implementation of a new surface water drainage system.

Table 1.4 Groundwater Monitoring Regime - Definitive Closure

Frequency	Monitoring Location	Measurement/Determinand
<b>Area 2 requirements</b>		
Monthly	M10, BH1 <sup>a</sup> , M18, M19, M20, M21, M22, M30, M31 <sup>b</sup> , M33, M34, M35 and soakaway NS <sup>c</sup>	Level, Temperature, pH, Cl, EC, NH <sub>4</sub> -N, Dissolved oxygen (DO)
Quarterly	M10, BH1 <sup>a</sup> , M18, M19, M20, M21, M22, M30, M31 <sup>b</sup> , M33, M34, M35 and soakaway NS <sup>c</sup>	As monthly plus: Alkalinity, Ca, Cd, Cr, Ni, Pb, K, Mg, Na, SO <sub>4</sub> , Fe, Mn, Zn, Cu, TOC and TON.
<b>Area 3 requirements</b>		
Six Monthly	M17, M36, M47, DAS, GW2, GW3, GW4 and GW5	Level.
Six Monthly	M17, M36, M47, DAS, GW2, GW3, GW4 and GW5	EC, DO, Cl, NH <sub>4</sub> -N, Hg, Zn, mecoprop Ca, Mg, K, Na, Cd, Alk, TOC, SO <sub>4</sub> , TON and phenol.
Annually	GW2, GW3, GW4, GW5, M17, M36, M47 and DAS.	As quarterly plus: Cr, Cu, Fe, Pb, Mn, Ni, Zn, hazardous substances suite

Notes: a BH1 is a replacement for M13, which was lost to construction work for the new anaerobic digestion (AD) plant in July 2012.

b Borehole M31 has been reinstated and has been monitored since November 2011.

c Soakaway SS was decommissioned in August 2012 following the implementation of a new surface water drainage system.

## 1.3 Surface Water Monitoring

The surface water management system comprises surface water drainage pipework and an interceptor connected to an attenuation lagoon which discharges into the Afon Desach. Surface water collected from

the Area 3 landfill drains to both the attenuation lagoon and the infiltration basin (soakaway located to the east of the site boundary). Most of Area 2 drains to the attenuation lagoon, with the exception of the northernmost part, which drains to the soakaway NS.

The surface water sampling regime for both the operational phase and definitive closure is identified in Tables 1.5 and 1.6, respectively. Monitoring locations are shown on Figure 1.1.

Table 1.5 Surface Water Monitoring Regime - Operational Phase

Frequency	Monitoring Location	Measurement/Determinand
Monthly	Infiltration Basin	EC, pH, Cl, NH <sub>4</sub> -N, Cd.
Monthly	SWW and SWY (upstream) SWB, SWC, SWD2 and SWE (downstream) SWD (discharge from the new attenuation lagoon)	EC, pH, Alk, Cl, NH <sub>4</sub> -N, TOC, BOD, COD, DO. Plus suspended solids for SWD.
Quarterly	SWW and SWY (upstream) SWB, SWC, SWD2 and SWE (downstream) SWD (discharge from the new attenuation lagoon)	As monthly plus: Ca, Mg, K, Na, SO <sub>4</sub> , NO <sub>3</sub> , NO <sub>2</sub> , TON, Cd, Cu, Fe, Pb, Mn, Ni and Zn.

Table 1.6 Surface Water Monitoring Regime - Definitive Closure

Frequency	Monitoring Location	Measurement/Determinand
Every 2 months	SWD (discharge from the new attenuation lagoon)	NH <sub>4</sub> -N, DO, BOD, suspended solids, pH
Six Monthly		As above plus EC, Alk, Cl
Six Monthly	Infiltration Basin	EC, pH, Cl, NH <sub>4</sub> -N, Cd.
Six Monthly	SWW and SWY (upstream) SWB, SWC, SWD2 and SWE (downstream)	EC, pH, Alk, Cl, NH <sub>4</sub> -N, TOC, BOD, COD, DO.
Annually	SWW and SWY (upstream) SWB, SWC, SWD2 and SWE (downstream) SWD (discharge from the new attenuation lagoon)	As six-monthly plus: Ca, Mg, K, Na, SO <sub>4</sub> , NO <sub>3</sub> , NO <sub>2</sub> , TON, Cd, Cu, Fe, Pb, Mn, Ni and Zn.

## 1.4 Gas Monitoring

Landfill gas is monitored in perimeter and in-waste boreholes in Area 3. The gas sampling regime for both the operational phase and definitive closure is identified in Tables 1.7 and 1.8, respectively.

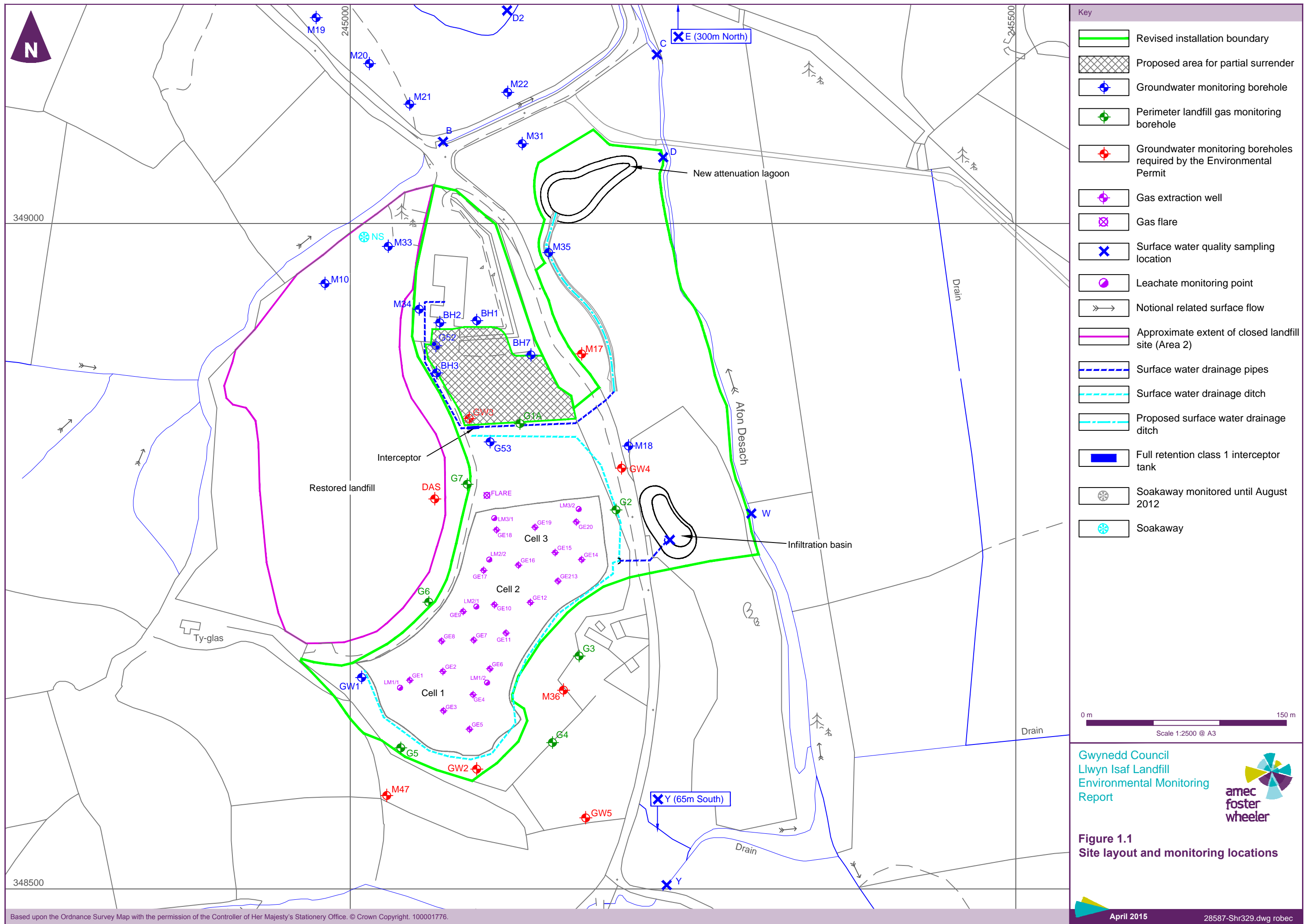
Table 1.7 Gas monitoring Area 3 - Operational Phase

Frequency	Monitoring Location	Measurement/Determinand
Monthly	Peripheral gas monitoring boreholes G1A*, G2, G3, G4, G5, G6 and G7	Methane, carbon dioxide, oxygen, atmospheric pressure, differential pressure, temperature and meteorological data.
	In-waste monitoring boreholes (at least two monitoring wells within each cell)	Methane, carbon dioxide, oxygen, carbon monoxide, atmospheric pressure, differential pressure and meteorological data.

Table 1.8 Gas Monitoring Area 3 - Definitive Closure

Frequency	Monitoring Location	Measurement/Determinand
Six Monthly	Peripheral gas monitoring boreholes G1A*, G2, G3, G4, G5, G6 and G7	Methane, carbon dioxide, oxygen, atmospheric pressure, differential pressure, temperature and meteorological data.
	In-waste monitoring boreholes (at least two monitoring wells within each cell)	Methane, carbon dioxide, oxygen, carbon monoxide, atmospheric pressure, differential pressure and meteorological data.





## 2. Leachate Levels and Quality

During the reporting period July 2014 to January 2015 leachate levels in Area 3 were measured in July 2014 (monthly frequency before 18 July 2014) and October 2014 and January 2015 (quarterly frequency after 18 July 2014). Time-series plots for leachate levels monitored since January 2010 are shown in Appendix A. The data for this reporting period is summarised in Table 2.1 and show that:

- ▶ Cell 1: leachate levels in LM1/1 showed little variability and remained low (0.05-0.07 m above base). LM1/2 was dry;
- ▶ Cell 2: leachate levels in LM2/1 showed little variability (0.11-0.13 m above base). Levels LM2/2 increased from 0.79 m in June to 0.98-1.02 m above base in this reporting period; and
- ▶ Cell 3: leachate levels LM3/1 increased from 0.46 m in June to 1.25 m above base in January. Levels in LM3/2 also increased from 0.16 m in June to 0.90 m in January and exceeded the previous maximum (0.51 m above base in February 2014).

All leachate levels measured during the latest monitoring period were consistent with measurements during previous monitoring periods (except for LM3/2 which exceeded the previous maximum) and were below the EP compliance level of 1.5 m above base.

Table 2.1 Leachate Level Data for July 2014 to January 2015

Date	Leachate Level (m above base)					
	Cell 1 (LM1/1)	Cell 1 (LM1/2)	Cell 2 (LM2/1)	Cell 2 (LM2/2)	Cell 3 (LM3/1)	Cell 3 (LM3/2)
17/07/2014	0.07	Dry	0.11	0.91	0.77	0.57
17/10/2014	0.05	Dry	0.12	1.02	0.92	0.56
19/01/2015	0.07	Dry	0.13	0.98	1.25	0.90
<b>Historical data (min-max)</b>	0-1.26	0.06-0.38	0.12-0.49	0-1.90	0-1.50	0.11-0.51

Notes: Monthly monitoring before 18 July 2014 reducing to quarterly monitoring after 18 July 2014. Historical data is for period January 2010 to June 2014.

During the reporting period July 2014 to January 2015 leachate levels in Area 3 were measured in January (monitoring frequency was reduced from quarterly to six-monthly in 18 July 2014). The results are summarised in Table 2.2 and graphically in Appendix A for the key leachate indicators ammoniacal-nitrogen and chloride, where they are included with long term leachate quality data. Laboratory analytical reports are included in Appendix B. Ammoniacal-nitrogen and chloride concentrations showed little variability and remained within the historical range.

Table 2.2 Selected Leachate Quality Data for July 2014 to January 2015

Cell	pH	Electrical Conductivity (µS/cm)	Ammoniacal-Nitrogen (mg/l)	Chloride (mg/l)
1	7.8	7150	632	696
2	7.7	6170	515	605
3	8.2	6490	573	672

Note: Six-monthly monitoring data.



### 3. Groundwater Levels

In the reporting period July 2014 to January 2015 groundwater levels were measured monthly in Area 2 and in July 2014 and January 2015 in Area 3 (monthly frequency before 18 July 2014 reducing to six-monthly after 18 July 2014). The data recorded during the reporting period is summarised in Table 3.1.

Table 3.1 Summary of Groundwater Levels Recorded in July 2014 to January 2015

Groundwater Monitoring Borehole	Groundwater Levels (m AOD)						
	July	Aug	Sept	Oct	Nov	Dec	Jan
<b>GW3</b>	127.44	-	-	-	-	-	128.07
<b>GW4</b>	127.55	-	-	-	-	-	128.30
<b>GW5</b>	129.21	-	-	-	-	-	130.17
<b>M10</b>	126.05	125.68	127.16	127.26	127.13	126.15	125.48
<b>BH1</b>	125.97	125.80	125.89	125.78	126.17	126.06	125.70
<b>M17</b>	126.64	-	-	-	-	-	127.37
<b>M18</b>	128.12	128.10	128.68	128.76	128.74	128.29	127.99
<b>M19</b>	122.76	122.80	123.20	123.37	123.36	123.08	122.78
<b>M20</b>	122.94	122.95	123.33	123.46	123.45	123.17	122.91
<b>M21</b>	123.13	123.12	123.52	123.65	123.63	123.32	123.06
<b>M22</b>	122.98	122.95	123.32	123.43	123.41	123.12	122.88
<b>M33</b>	127.39	126.69	128.28	127.93	127.74	126.96	126.23
<b>M34</b>	125.30	125.29	126.17	126.37	126.31	125.69	125.19
<b>M35</b>	124.62	124.52	125.31	125.53	125.50	124.87	124.36
<b>M36</b>	128.57	-	-	-	-	-	n.m.
<b>M47</b>	129.17	-	-	-	-	-	130.20
<b>DAS</b>	n.m.	-	-	-	-	-	135.91

Note: Borehole M31 gauged but no datum available. n.m.- not measured.

Groundwater hydrographs between April 2008 and January 2015 are shown in Appendix C. The data are separated into the boreholes formerly required under the EP and the WML. The hydrographs show that the water table fluctuates within a range of around 1.5 to 2.5 m annually and that there are no long term rising or falling trends. Groundwater levels show a seasonal variation, with slightly higher levels recorded in winter compared to summer. Boreholes M19, M20, M21, M22 and DAS tend to show a lesser degree of fluctuation than other boreholes. Groundwater levels are generally higher at borehole DAS due to its location within waste of Area 2 suggesting that levels are likely to represent perched leachate within the waste.

During the reporting period groundwater levels fell in July and then increased to a maximum in September-October before falling again between October and January.





## 4. Groundwater Quality

Groundwater quality in the reporting period July 2014 to January 2015 was measured monthly in Area 2 and in July 2014 and January 2015 in Area 3 (quarterly frequency before 18 July 2014 reducing to six-monthly after 18 July 2014). Locations of the groundwater monitoring boreholes are shown on Figure 1.1. Analytical results for ammoniacal-nitrogen and chloride (key leachate indicators) since April 2008 are presented graphically in Appendix D. Laboratory analytical reports are included in Appendix B.

### 4.1 Area 3 Monitoring

#### Upgradient Boreholes

Boreholes GW2, GW5 and M47 are situated to the south of, and are upgradient of, Area 3 and therefore provide an indication of background groundwater quality. A summary of the results of this monitoring period is presented in Table 4.1. Borehole GW2 continues to be dry. Ammoniacal-nitrogen concentrations continue to be below the laboratory detection limit (<0.27 mg/l) except for the January 2015 measurement at borehole M47 (0.56 mg/l) whilst chloride concentrations continue to be relatively low (7.83-18.1 mg/l) at boreholes GW5 and M47.

Table 4.1 Selected Groundwater Quality Data for Area 3 Upgradient Boreholes for July 2014 to January 2015

Borehole	pH	Electrical Conductivity (µS/cm)	Ammoniacal Nitrogen (mg/l)	Chloride (mg/l)
GW5	6.5 - 6.8	80.9-174	<0.27	7.83 - 18.1
M47	6.4 - 7.5	84.1 - 291	<0.27 - 0.56	12.1 - 12.5

Note: Data is for July 2014 and January 2015 (quarterly monitoring before 18 July 2014 reducing to six-monthly monitoring after 18 July 2014 in Area 3).

#### Downgradient Boreholes

Boreholes GW3, GW4, M17 and M36 are located downgradient of Area 3. Trigger levels for mercury, zinc, ammoniacal-nitrogen, chloride and mecoprop are set in the EP for boreholes GW3, GW4 and M36 and are presented in Table 4.2. The EP trigger level for mercury of 0.05 µg/l does not specify if it refers to total or dissolved forms. Total mercury concentrations in groundwater have occasionally exceeded the EP trigger level. A review of mercury groundwater concentrations by AMEC in June 2013 (Llwyn Isaf Landfill – Review of Groundwater Trigger Levels for Mercury, report ref N745i1) recommended that the EP trigger level of 0.05 µg/l refers specifically to the dissolved (most mobile) form of mercury as this is the most relevant for assessing the risks to controlled waters. The trigger levels will be reviewed in 2015 as part of the hydrogeological risk assessment (HRA) review for the site.

Table 4.2 Area 3 Downgradient Groundwater Trigger Levels Set in the EP

Borehole	Trigger Levels				
	Ammoniacal Nitrogen (mg/l)	Chloride (mg/l)	Mecoprop (µg/l)	Mercury (µg/l)	Zinc (mg/l)
GW3	6.8	17.4	0.04	0.05	41
GW4	2.6	16.0	0.04	0.05	24
M36	3.1	21.2	0.04	0.05	34

A summary of the results for this monitoring period is presented in Table 4.3. Groundwater concentrations of ammoniacal-nitrogen, chloride, mecoprop and zinc were consistent with previous data and below the EP trigger levels except for chloride concentration at borehole GW4 in January 2015 (16.6 mg/l) which exceeded marginally the trigger level (16 mg/l). Notice of the EP chloride trigger level exceedance was provided to the NRW by the submission of a Schedule 6 notification (Appendix E). Dissolved mercury concentrations were below detection limit (<0.1 µg/l) but this is higher than the trigger level (0.05 µg/l).

Table 4.3 Selected Groundwater Quality Data for Area 3 Downgradient Boreholes for July 2014 to January 2015

Borehole	pH	Electrical Conductivity (µS/cm)	Ammoniacal Nitrogen (mg/l)	Chloride (mg/l)	Mecoprop (µg/l)	Mercury diss (µg/l)	Zinc (µg/l)
GW3	7.2 - 7.3	321 - 324	<0.27	13.7 - 15.3	<0.04	<0.10	<18.0
GW4	6.5 - 6.7	153 - 176	<0.27 - 0.44	13.8 - 16.6	<0.04	<0.10	19 - 30.5
M17	6.8	208 - 209	<0.27	21.4 - 24.0	<0.04	<0.10	<18.0
M36	6.9	183 - 196	<0.27	16.6 - 19.7	<0.04	<0.10	<18.0

Note: Data is for July 2014 and January 2015 (quarterly monitoring before 18 July 2014 reducing to six-monthly monitoring after 18 July 2014 in Area 3).

## Other Boreholes

Borehole DAS is situated within and close to the perimeter of Area 2. The results during the latest monitoring period are summarised in Table 4.4. Ammoniacal nitrogen and chloride concentrations are generally elevated and very variable at borehole DAS compared to other boreholes at the site. Contamination at this location is most likely to be the result of the borehole being located within waste deposits in the unlined closed landfill (Area 2). Ammoniacal-nitrogen concentrations continued to increase from 0.38 mg/l in January 2014 to 20.1 mg/l in July 2014 before falling to below detection limit (<0.27 mg/l) in January 2015. Chloride concentrations decreased from 25.5 mg/l in July to 10.8 mg/l in January. Overall ammoniacal-nitrogen and chloride concentrations remained within historical data.

Table 4.4 Selected Groundwater Quality Data for Borehole DAS for July 2014 to January 2015

Borehole	pH	Electrical Conductivity (µS/cm)	Ammoniacal Nitrogen (mg/l)	Chloride (mg/l)
DAS	7.1 - 7.5	494 - 838	<0.27 - 20.1	10.8 - 25.5

Note: Data is for July 2014 and January 2015 (quarterly monitoring before 18 July 2014 reducing to six-monthly monitoring after 18 July 2014 in Area 3).

## 4.2 Area 2 Monitoring

### Downgradient Boreholes

Boreholes M13, M18, M19, M20, M21, M22, M30, M31, M34 and M35 are downgradient of the unlined landfill Area 2. Selected results of the monitoring undertaken during the latest reporting period are presented in Table 4.5.

Ammoniacal nitrogen concentrations at boreholes BH1, M18, M19, M31, M34 and M35 were below the laboratory detection limit of 0.27 mg/l during this reporting period except for two isolated peaks (2.64 mg/l in August at M19 and 0.3 mg/l in December at M35). Slightly elevated concentrations continue to be detected at boreholes M20 (up to 4.22 mg/l), M21 (up to 1.15 mg/l) and M22 (up to 0.50 mg/l). Concentrations

increased at borehole M20 and show no apparent trend at boreholes M21 and M22. The highest and most variable concentrations continue to be recorded at borehole M20.

Chloride concentrations were generally low ( $\leq 46.4$  mg/l) and consistent with previous monitoring data with the highest levels recorded at borehole M35.

Overall, groundwater quality at the boreholes downgradient of Area 2 is variable, but with the majority of the monitoring data indicating little or no contamination by landfill leachate.

Table 4.5 Selected Groundwater Quality Data for Area 2 Downgradient Boreholes for July 2014 to January 2015

Borehole	pH	Electrical Conductivity ( $\mu\text{S/cm}$ )	Ammoniacal Nitrogen (mg/l)	Chloride (mg/l)
BH1	6.7-7.7	77.9-413	<0.27	7.7-24.3
M18	6.7-7.2	209-237	<0.27	9.11-16.5
M19	6.0-7.8	85-514	<0.27-2.64	7.95-15.6
M20	6.1-8.0	88.9-476	<0.27-4.22	8.44-14.4
M21	7.5-7.9	532-555	0.72-1.15	21.7-24.1
M22	6.9-7.5	279-295	<0.27-0.50	16.1-18.6
M31	6.7-7.3	208-250	<0.27	12.1-16.4
M34	7.0-7.4	333-378	<0.27	14.2-17.8
M35	6.1-6.5	145-225	<0.27-0.3	16.3-46.4

Notes: Monthly monitoring data for Area 2.

### Other Boreholes

Boreholes M10 and M33 are located within the northern part of Area 2. A summary of the monitoring results for these boreholes during the reporting period is presented in Table 4.6. Ammoniacal-nitrogen concentrations were below the detection limit of 0.27 mg/l. Chloride concentrations continue to be low ( $\leq 17.5$  mg/l) and within the range recorded previously at both boreholes.

The results therefore indicate no evidence of contamination by leachate.

Table 4.6 Selected Groundwater Quality Data for Boreholes M10 and M33 for July 2014 to January 2015

Borehole	pH	Electrical Conductivity ( $\mu\text{S/cm}$ )	Ammoniacal Nitrogen (mg/l)	Chloride (mg/l)
M10	6.8-7.6	178-195	<0.27	8.74-17.5
M33	6.7-7.3	118-151	<0.27	8.57-13.3

Note: Monthly monitoring data for Area 2.

### Soakaway

A summary of the monitoring results for soakaway NS during the reporting period are presented in Table 4.7. Ammoniacal-nitrogen concentrations were below the laboratory detection limit of 0.06 mg/l. Chloride concentrations were low ( $\leq 12.9$  mg/l) and consistent with previous data. An anomalously high value of EC (12400  $\mu\text{S/cm}$ ) was recorded in October but fell to 107-153  $\mu\text{S/cm}$  in November-January. In summary, the available results continue to indicate no evidence of contamination of surface water runoff.

Table 4.7 Selected Quality Data for Soakaway NS for July 2014 to January 2015

Location	pH	Electrical Conductivity ( $\mu\text{S/cm}$ )	Ammoniacal Nitrogen (mg/l)	Chloride (mg/l)
NS	7.6-8.0	107-12400	<0.06	7.37-12.9

Note: Monthly monitoring. No data for July, August and September as sampling point was dry.

### Infiltration Basin

The infiltration basin sampling location replaces the soakaway SS and has been monitored since November 2012. During this reporting period the infiltration basin was monitored in July 2014 and January 2015 (monthly frequency before 18 July 2014 reducing to six-monthly after 18 July 2014).

The results during the latest monitoring period are summarised in Table 4.8. Ammoniacal-nitrogen concentrations continue to be below the detection limit of 0.06 mg/l. Chloride concentrations continued to decrease from the peak (30.7 mg/l) recorded in January 2014 to 8.7 mg/l in January 2015. In summary, the available results indicate no evidence of contamination of surface water runoff.

Table 4.8 Selected Quality Data for Infiltration Basin for July 2014 to January 2015

Location	pH	Electrical Conductivity ( $\mu\text{S/cm}$ )	Ammoniacal Nitrogen (mg/l)	Chloride (mg/l)
Infiltration Basin	8.1	182	<0.06	8.7

Note: Data is for July 2014 and January 2015 (quarterly monitoring before 18 July 2014 reducing to six-monthly monitoring after 18 July 2014 in Area 3). The sampling point was dry in July.

## 5. Surface Water Quality

Surface water quality monitoring is undertaken in Area 3 at a number of locations shown on Figure 1.1 and described below:

- ▶ Sample point B is located to the north of the site on a small tributary which feeds into the Afon Desach;
- ▶ Sample point C is located to the north east of the site in the Afon Desach and is the downstream sample point;
- ▶ Sample point D is the permitted discharge from the new surface water attenuation lagoon into the Afon Desach. Sampling commenced in September 2012 following commissioning of the attenuation lagoon;
- ▶ Sample point D2 is located in a lake to the north of the site;
- ▶ Sample point E is located approximately 300 m downstream from sample point C on Afon Desach (off the site plan Figure 1.1);
- ▶ Sample point W is located to the east of the site on the Afon Desach downgradient of the infiltration basin;
- ▶ Sample point Y is situated to the south east of the site in Afon Desach and is the upstream sample point.

During the reporting period July 2014 to January 2015 the sample points B, C, D2, E, W and Y were monitored in July 2014 and January 2015 (monthly frequency before 18 July 2014 reducing to six-monthly after 18 July 2014). The permitted discharge into the Afon Desach (sample point D) was monitored in July, September, November and January (monthly frequency before 18 July 2014 reducing to every two months after 18 July 2014). A summary of the monitoring results is presented in Table 5.1 (full results in Appendix B and time-series plots in Appendix F).

Low ammoniacal nitrogen and chloride concentrations continue to be recorded at most monitored locations, and generally show no impact from Area 3. The highest chloride (24.4 mg/l) and ammoniacal-nitrogen (0.11 mg/l) concentrations continue to be detected at sample point D2 and are likely to represent a slight impact from the nearby unlined closed landfill (Area 2). The elevated Biological Oxygen Demand (BOD) at sample point D2 recorded in July (19 mg/l) is an isolated peak as concentrations dropped to 2 mg/l in January 2015.

The EP sets emission limits for sample point D as detailed on Table 5.1. Data for this reporting period indicate that the EP emission limits for pH, ammoniacal-nitrogen, suspended solids and BOD have not been exceeded. No dissolved oxygen content (DOC) field measurements were undertaken for comparison against the emission limit.

Table 5.1 Selected Surface Water Quality Data for July 2014 to January 2015

Monitoring Point	pH	Electrical Conductivity (µS/cm)	Ammoniacal Nitrogen (mg/l)	Chloride (mg/l)	Dissolved Oxygen (lab in mg/l and field in %)	Suspended Solids (mg/l) <sup>a</sup>	Biological Oxygen Demand (mg/l)
B	6.6 - 6.7	55.8 - 85.3	<0.06	8.61 - 11.7	7.9 - 9 (92.2%)	-	<1
C	7.1	70 - 132	<0.06	8.45 - 11.7	7.1 - 10.1 (93.8%)	-	<1 - 2
D2	7.4 - 8	276 - 351	0.1 - 0.11	20.3 - 24.4	4.4 - 5.6 (71.4%)	-	2 - 19
E	7.0 - 7.3	147 - 209	<0.06	12.8 - 14.7	9.5 - 10.7 (87.6%)	-	<1
W	6.8 - 7.5	77.4 - 99.1	<0.06	9.22 - 9.24	7.2 - 7.4 (82.3%)	-	<1
Y	6.8	55.6 - 85.8	<0.06	8.4 - 10.9	8.4 (92.2%)	-	<1
D	7.8-7.9	168	<0.06	12.3	4.7-8.2 (n.m.)	2	<1
<b>EP Emission Limits for D</b>	6.0 - 9.0	-	<0.3	-	>80%	<25	<4

Notes: Data is for July 2014 and January 2015 for sample points B, C, D2, E, W and Y (monthly monitoring before 18 July 2014 reducing to six-monthly monitoring after 18 July 2014). Sample point D was monitored in July, September and November 2014 and January 2015 (monthly frequency before 18 July 2014 reducing to every two months after 18 July 2014). No data for sampling point D in July and September as it was dry.

a) Suspended solids measurements for sampling point D only, as per the requirements of the EP.

## 6. Landfill Gas

### 6.1 Perimeter Gas Monitoring

Landfill gas monitoring during the reporting period July 2014 to January 2015 was carried out in July and January (monthly frequency before 18 July 2014 reducing to six-monthly after 18 July 2014) at perimeter gas boreholes G1A and G2 to G7. Borehole G1A is a replacement for G1 which was removed in July 2012 during construction works associated with the new AD plant. Sampling of borehole G1A started in June 2013. The locations of the gas monitoring boreholes - current and former - are shown on Figure 1.1.

The original control and trigger limits for methane and carbon dioxide were based on a limited number of pre-operational monitoring results. The limits were revised and agreed with the NRW based on the results of fourteen monitoring rounds undertaken between 7 October 2008 and 25 June 2009. The revised limits are presented in Table 6.1 together with the results of the monitoring undertaken in this reporting period. It is noted that the trigger levels for methane and carbon dioxide have recently (18 July 2014) been revised to 1% (v/v) above background concentrations and 1.5% (v/v), respectively. Background concentrations will be calculated and agreed with NRW before the next six-monthly landfill gas monitoring with a view to provide action levels and compliance limits for methane and carbon dioxide.

The measurements for gas balance are summarised in Appendix G. Meteorological data (daily measurements of rainfall, temperature and wind speed) for the months of July 2014 to December 2014 are presented in Appendix H. We understand that there is no longer a requirement to collect meteorological data as the site is now closed.

Methane and carbon dioxide concentrations during this reporting period were consistent with previous data and have not exceeded their revised trigger levels. The data for this reporting period show that:

- ▶ Methane was not detected in boreholes G1A and G2 to G5 and measurements of carbon dioxide were below the revised trigger levels; and
- ▶ Methane (up to 9.5%v/v) and/or carbon dioxide (up to 2.5%v/v) continue to be detected at boreholes G6 and G7. These boreholes are located between the permitted area (Area 3) and the unlined closed landfill (Area 2) which suggests that any methane and carbon dioxide detected are likely to be derived from Area 2.



Table 6.1 Monitoring Results from Perimeter Landfill Gas Boreholes for July 2014 to January 2015

Date	Atmospheric Pressure [Differential Pressure] (mb)	G1A <sup>a</sup>			G2			G3			G4		
		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)
17/07/14	1006 [-0.08 to 1.62]	0	7.9	7.4	0	0	19.7	0	1.7	17.8	0	0	19.9
15/01/15	964 – 965 [-0.04 to 0.00]	0	2.1	7	0	0.1	21.3	0	3.7	16.5	0	1.8	17.6
Revised Control Levels % v/v		0.8	4.7	-	0.8	1.9	-	0.8	4.5	-	0.8	2.0	-
Revised Trigger Levels % v/v		1.0	5.9	-	1.0	2.3	-	1.0	5.7	-	1.0	2.5	-
Date	Atmospheric Pressure [Differential Pressure] (mb)	G5			G6			G7					
		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)			
17/07/14	1006 [-0.02 to 3.34]	0	0	19.8	8.8	2.5	0.1	0	0.2	19.5			
15/01/15	964 – 965 [-0.02 to 2.20]	0	3.2	10.3	9.5	2.0	0.2	5.2	2.4	0.4			
Revised Control Levels % v/v		2.1	5.0	-	b	b	-	b	b	-			
Revised Trigger Levels % v/v		2.6	6.2	-	b	b	-	b	b	-			

Notes: Data for July 2014 and January 2015 (monthly frequency before 18 July 2014 reducing to six-monthly after 18 July 2014). a) Borehole G1A is a replacement for G1 which was removed in July 2012 during construction works associated with the new AD plant. Sampling of borehole G1A started in June 2013. b) Control and trigger levels for boreholes G6 and G7 have not been set as monitoring data suggest that they are being affected by landfill gas derived from the closed unlined landfill (Area 2).

## 6.2 In-Waste Gas Monitoring (Area 3)

Landfill gas within the wastes during the reporting period July 2014 to January 2015 was monitored in July 2014 and January 2015 (monthly frequency before 18 July 2014 reducing to six-monthly after 18 July 2014). The monitoring locations included combined leachate and gas monitoring wells (LM1/3 in Cell 1, LM2/1 and LM2/2 in Cell2) and gas extraction wells (GE1 and GE2 in Cell 1, GE10 and GE11 in Cell 2 and GE18 and GE20 in Cell 3). The existing wells are shown on Figure 1.1.

The results of the monitoring undertaken are presented in Table 6.2. The data show that wastes in Cells 1, 2 and 3 continue to produce landfill gas with methane and carbon dioxide concentrations recently up to 66.6% v/v and 38.0% v/v respectively in Cell 1, 66.7% v/v and 40.0% v/v respectively in Cell 2 and 64.8% v/v and 38.8% v/v respectively in Cell 3. Concentrations were within historical ranges for all locations and parameters.

Table 6.2 Monitoring Results for In-Waste Landfill Gas Monitoring Boreholes for July 2014 to January 2015

Date	Atmospheric Pressure [Differential Pressure] (mb)	CH <sub>4</sub> (%v/v)	CO <sub>2</sub> (%v/v)	O <sub>2</sub> (%v/v)	CO (ppm)	CH <sub>4</sub> (%v/v)	CO <sub>2</sub> (%v/v)	O <sub>2</sub> (%v/v)	CO (ppm)
Cell 1 (GE1)					Cell 1 (GE2)				
22/07/14	1009 [-21.52 to -21.45]	60.0	37.1	0	14	63.8	35.3	0	13
13/01/15	982 [-23.93 to -23.9]	49.7	31.8	0.1	8	66.6	34.1	0.1	7
Cell 1 (LM1/3)					Cell 2 (GE10)				
22/07/14	1009 [-23.1 to -22.96]	64.2	37.0	0	16	63.4	35.5	0.3	16
13/01/15	982 [-27.38 to 5.16]	66.1	38.0	0.1	12	63.5	34.1	1.1	13
Cell 2 (GE11)					Cell 2 (LM2/1)				
22/07/14	1009 [-23.12 to -1.36]	61.6	38.0	0.3	21	56.5	32.3	1.7	15
13/01/15	982 [-27.31 to 0.12]	66.7	37.9	0.1	13	45.8	27.7	4.6	8
Cell 2 (LM2/2)					Cell 3 (GE18)				
22/07/14	1009 [-25.04 to 0.11]	61.7	40.0	0	12	62.6	38.8	0	11
13/01/15	982 [-24.61 to -1.02]	63.1	40.1	0.1	10	64.8	38.3	0.1	7
Cell 3 (GE20)									
22/07/14	1009 [-24.01]	57.6	36.7	0	14				
13/01/15	982 [-13.12]	34.1	28.3	0.2	8				

Note: Data for July 2014 and January 2015 (monthly frequency before 18 July 2014 reducing to six-monthly after 18 July 2014).



## 7. Summary

The results of environmental monitoring carried out during the period July 2014 to January 2015 are consistent with the results of previous monitoring. The closure plan for Area 3 of the site prepared by AMEC in October 2013 was approved by NRW on 18 July 2014 which resulted in a reduction in the scope and frequency of monitoring at the site.

The monitoring results for the reporting period July to January 2015 can be summarised as follows:

- ▶ Leachate levels have not exceeded the EP compliance level of 1.5 m above base Ammoniacal-nitrogen and chloride leachate concentrations showed little variability and remained within the historical range;
- ▶ The latest groundwater levels were consistent with previous data and showed seasonal variation;
- ▶ Groundwater quality data downgradient of Area 3 continue to show no evidence of impact from Area 3;
- ▶ EP trigger levels for ammoniacal-nitrogen, chloride, mecoprop and zinc in groundwater downgradient of Area 3 have not been exceeded except for chloride concentration at borehole GW4 which exceeded marginally the trigger level in January 2014. Dissolved mercury concentrations were below detection limit ( $<0.1 \mu\text{g/l}$ ) but this is higher than the trigger level ( $0.05 \mu\text{g/l}$ ).
- ▶ Surface water monitoring locations continue to show no evidence of impact from Area 3. The highest and most variable chloride concentrations continue to be noted at sample point D2 and are considered likely to represent a slight impact from the nearby closed landfill (Area 2). The elevated BOD ( $19 \text{ mg/l}$ ) recorded at sample point D2 in July is an isolated peak as concentrations dropped to  $2 \text{ mg/l}$  in January 2015;
- ▶ The EP emission limits for pH, ammoniacal-nitrogen, suspended solids and BOD at surface water sample point D (discharge from the attenuation lagoon into the Afon Desach) have not been exceeded. No DOC field measurements were undertaken for comparison against the emission limit.
- ▶ Monitoring at perimeter boreholes show no evidence of off-site landfill gas migration from Area 3. Methane and carbon dioxide concentrations have not exceeded their revised trigger levels; and
- ▶ Wastes in Cells 1, 2 and 3 are continuing to produce landfill gas and recent concentrations were within historical ranges for all locations and parameters.



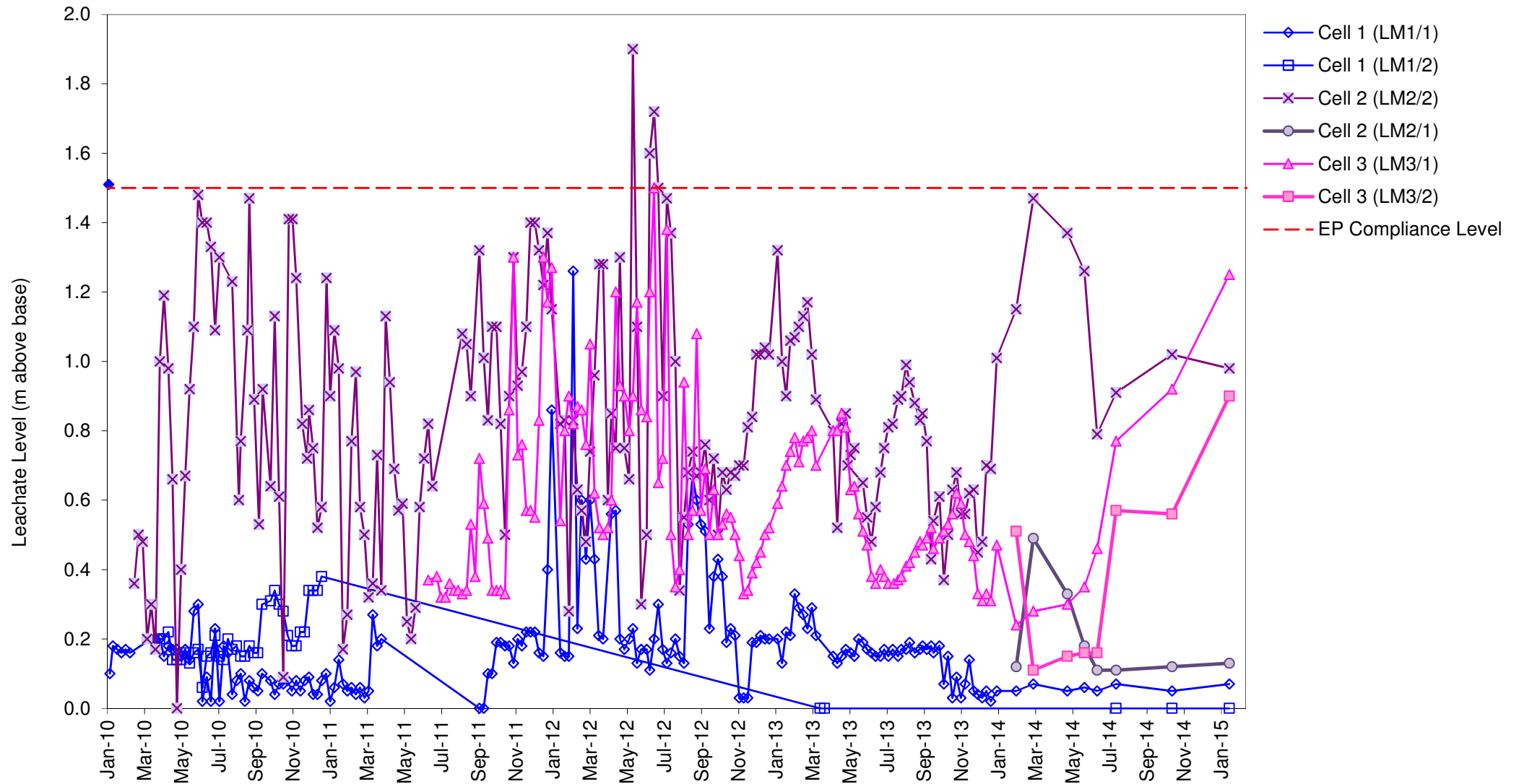


# Appendix A

## Leachate Levels and Quality Plots

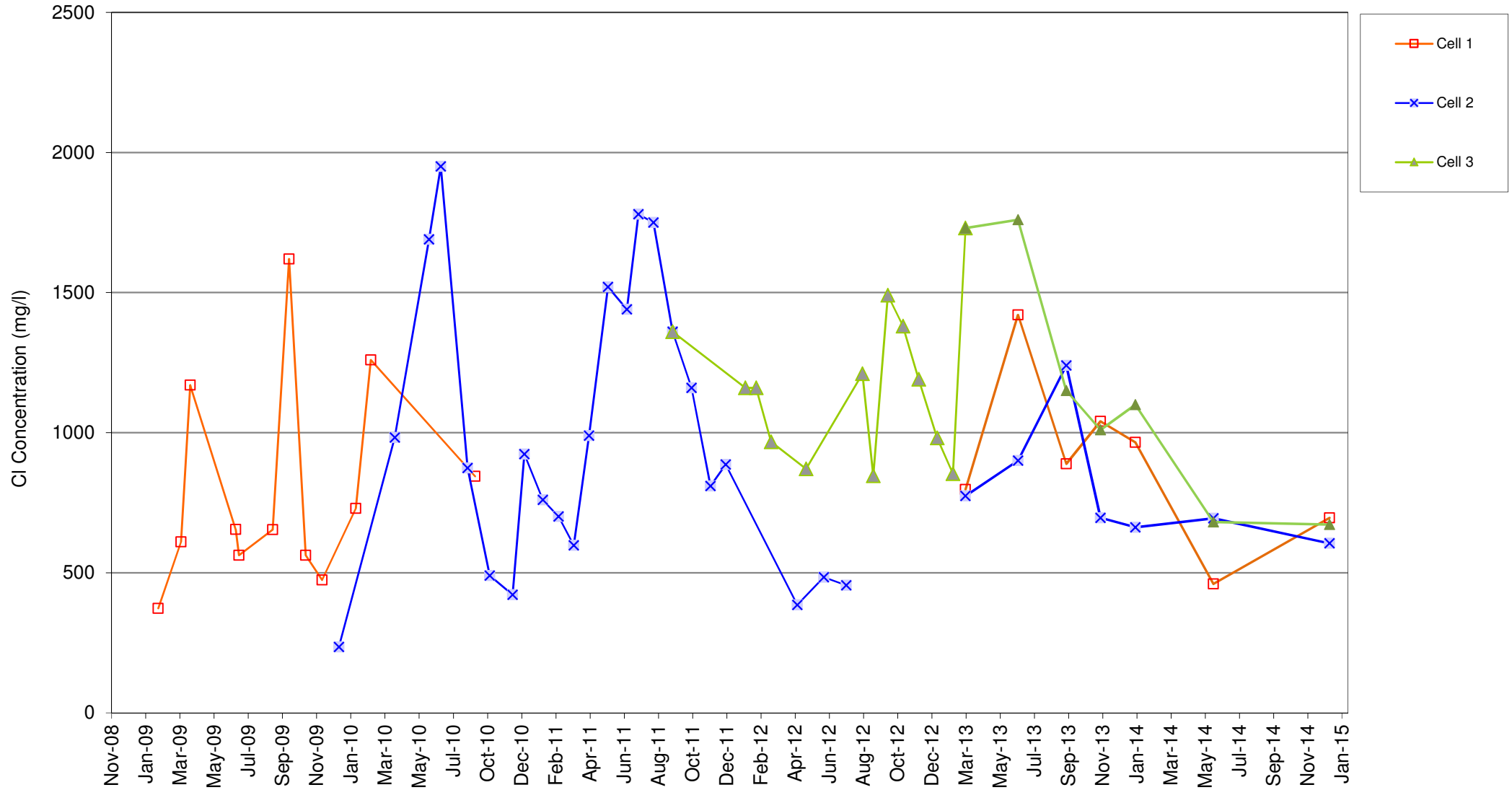


# Llwyn Isaf Landfill - Leachate Levels

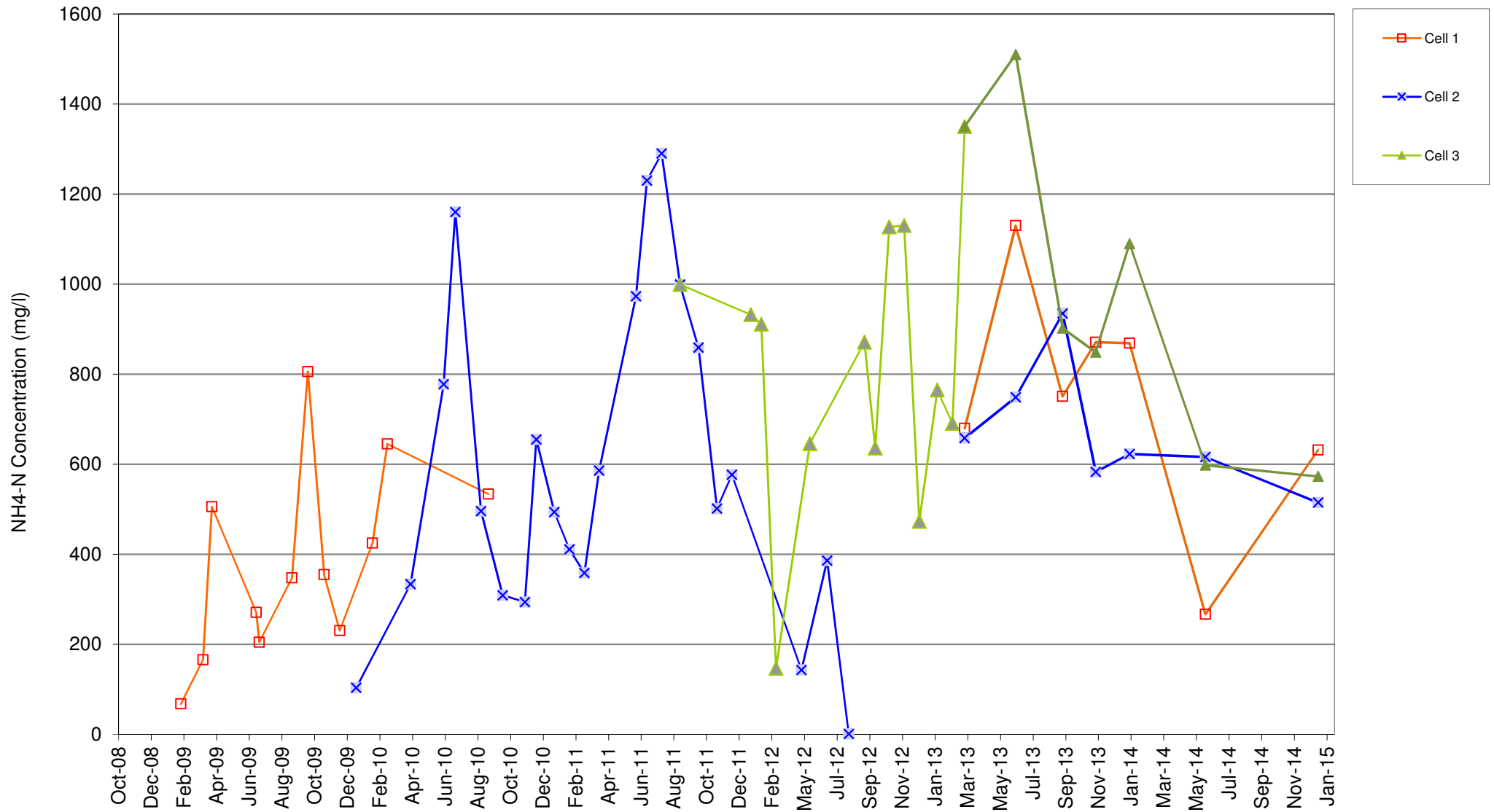




Llwyn Isaf Landfill - Chloride Concentrations in Landfill Leachate



Llwyn Isaf Landfill - Ammoniacal-Nitrogen Concentrations in Landfill Leachate





# Appendix B

## Laboratory Data Sheets



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

25 July 2014

**Test Report: COV/1120781/2014**

Dear Ms Francis

Analysis of your sample(s) submitted on 02 July 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,

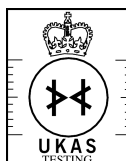
Signed: 

Name: C. Law

Title: Inorganics Operations Manager



# Report Summary



1314  
0897  
4409



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

Date of Issue: **25 July 2014**

Report Number: **COV/1120781/2014**

Issue **1**

**Job Description:** Llwyn Isaf

**Job Location:** July - Llwyn Isaf

Number of Samples  
included in this report **26**

Job Received: **02 July 2014**

Number of Test Results  
included in this report **576**

Analysis Commenced: **03 July 2014**

Signed:

Name: **C. Law**

Date: **25 July 2014**

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.

This communication has been sent to you by ALS Environmental Ltd. Registered in England and Wales. Registration No. 02148934. Registered Office: ALS Environmental Limited, Torrington Avenue, Coventry, CV4 9GU.

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# Certificate of Analysis



Report Number: **COV/1120781/2014**

Issue **1**

Laboratory Number: **14120168**

Sample **1** of **26**

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

Sample Point Description:

Sample Description: **SW W**

Sample Matrix: **Surface waters**

Sample Date/Time: **01 July 2014**

Sample Received: **02 July 2014**

Analysis Complete: **17 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	08/07/2014	Y Cov	WAS049
Calcium , Total as Ca	9.65	mg/l	08/07/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	08/07/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	08/07/2014	Y Cov	WAS049
Iron, Total as Fe	1200	ug/l	08/07/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	08/07/2014	Y Cov	WAS049
Magnesium, Total as Mg	3.1	mg/l	08/07/2014	Y Cov	WAS049
Manganese , Total as Mn	413	ug/l	08/07/2014	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	08/07/2014	Y Cov	WAS049
Potassium , Total as K	0.21	mg/l	08/07/2014	Y Cov	WAS049
Sodium , Total as Na	4.87	mg/l	08/07/2014	Y Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	08/07/2014	Y Cov	WAS049
pH	6.8	pH units	04/07/2014	Y Cov	WAS039
Conductivity- Electrical 20C	99.1	uS/cm	04/07/2014	Y Cov	WAS039
Alkalinity as CaCO3	36.9	mg/l	10/07/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N (LL)	<0.06	mg/l	04/07/2014	Y Cov	WAS067
Chloride as Cl	9.22	mg/l	04/07/2014	Y Cov	WAS036
Nitrate as N	0.5	mg/l	04/07/2014	Y Cov	WAS036
Nitrate as NO3	2.0	mg/l	04/07/2014	N Cov	WAS067
Nitrogen, Total Oxidised as N	0.45	mg/l	04/07/2014	Y Cov	WAS036
Sulphate as SO4	2.2	mg/l	04/07/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	7.2	mg/l	04/07/2014	Y Cov	WAS052
BOD + ATU (5 day)	<1	mg/l	08/07/2014	Y Cov	WAS001
COD (Total)	12.0	mg/l	07/07/2014	Y Cov	WAS040
TOC (Filtered)	2.6	mg/l	07/07/2014	Y Cov	WAS005

## Analyst Comments for 14120168:

Integrity Breach between TON and Nitrate, results within 10%.

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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Signed:



Name: **C. Law**

Date: **25 July 2014**

Title: **Inorganics Operations Manager**



# Certificate of Analysis



Report Number: **COV/1120781/2014**

Issue **1**

Laboratory Number: **14120169**

Sample **2** of **26**

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

Sample Point Description:

Sample Description: **SW Y (upstream)**

Sample Matrix: **Surface waters**

Sample Date/Time: **01 July 2014**

Sample Received: **02 July 2014**

Analysis Complete: **17 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	08/07/2014	Y Cov	WAS049
Calcium , Total as Ca	7.09	mg/l	08/07/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	08/07/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	08/07/2014	Y Cov	WAS049
Iron, Total as Fe	<230	ug/l	08/07/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	08/07/2014	Y Cov	WAS049
Magnesium, Total as Mg	3.0	mg/l	08/07/2014	Y Cov	WAS049
Manganese , Total as Mn	15.6	ug/l	08/07/2014	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	08/07/2014	Y Cov	WAS049
Potassium , Total as K	<0.18	mg/l	08/07/2014	Y Cov	WAS049
Sodium , Total as Na	5.13	mg/l	08/07/2014	Y Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	08/07/2014	Y Cov	WAS049
pH	6.8	pH units	04/07/2014	Y Cov	WAS039
Conductivity- Electrical 20C	85.8	uS/cm	04/07/2014	Y Cov	WAS039
Alkalinity as CaCO3	25.2	mg/l	10/07/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N (LL)	<0.06	mg/l	04/07/2014	Y Cov	WAS067
Chloride as Cl	10.9	mg/l	04/07/2014	Y Cov	WAS036
Nitrate as N	<0.4	mg/l	04/07/2014	Y Cov	WAS036
Nitrate as NO3	2.5	mg/l	04/07/2014	N Cov	WAS067
Nitrogen, Total Oxidised as N	<0.42	mg/l	04/07/2014	Y Cov	WAS036
Sulphate as SO4	3.7	mg/l	04/07/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	8.4	mg/l	04/07/2014	Y Cov	WAS052
BOD + ATU (5 day)	<1	mg/l	08/07/2014	Y Cov	WAS001
COD (Total)	<11.0	mg/l	07/07/2014	Y Cov	WAS040
TOC (Filtered)	2.2	mg/l	07/07/2014	Y Cov	WAS005

Analyst Comments for 14120169:

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.

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Name: **C. Law**

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Title: **Inorganics Operations Manager**

# Certificate of Analysis



Report Number: **COV/1120781/2014**

Issue **1**

Laboratory Number: **14120170**

Sample **3** of **26**

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

Sample Point Description:

Sample Description: **SWB**

Sample Matrix: **Surface waters**

Sample Date/Time: **01 July 2014**

Sample Received: **02 July 2014**

Analysis Complete: **17 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	08/07/2014	Y Cov	WAS049
Calcium , Total as Ca	5.25	mg/l	08/07/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	08/07/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	08/07/2014	Y Cov	WAS049
Iron, Total as Fe	<230	ug/l	08/07/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	08/07/2014	Y Cov	WAS049
Magnesium, Total as Mg	3.2	mg/l	08/07/2014	Y Cov	WAS049
Manganese , Total as Mn	8.60	ug/l	08/07/2014	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	08/07/2014	Y Cov	WAS049
Potassium , Total as K	0.45	mg/l	08/07/2014	Y Cov	WAS049
Sodium , Total as Na	5.53	mg/l	08/07/2014	Y Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	08/07/2014	Y Cov	WAS049
pH	6.7	pH units	04/07/2014	Y Cov	WAS039
Conductivity- Electrical 20C	85.3	uS/cm	04/07/2014	Y Cov	WAS039
Alkalinity as CaCO3	19.0	mg/l	10/07/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N (LL)	<0.06	mg/l	04/07/2014	Y Cov	WAS067
Chloride as Cl	11.7	mg/l	04/07/2014	Y Cov	WAS036
Nitrate as N	1.1	mg/l	04/07/2014	Y Cov	WAS036
Nitrate as NO3	5.2	mg/l	04/07/2014	N Cov	WAS067
Nitrogen, Total Oxidised as N	1.09	mg/l	04/07/2014	Y Cov	WAS036
Sulphate as SO4	3.4	mg/l	04/07/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	9.0	mg/l	04/07/2014	Y Cov	WAS052
BOD + ATU (5 day)	<1	mg/l	08/07/2014	Y Cov	WAS001
COD (Total)	<11.0	mg/l	07/07/2014	Y Cov	WAS040
TOC (Filtered)	2.3	mg/l	07/07/2014	Y Cov	WAS005

## Analyst Comments for 14120170:

Integrity Breach between TON and Nitrate, results within 10%.

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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# Certificate of Analysis



Report Number: **COV/1120781/2014**

Issue **1**

Laboratory Number: **14120171**

Sample **4** of **26**

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

Sample Point Description:

Sample Description: **SWC**

Sample Matrix: **Surface waters**

Sample Date/Time: **01 July 2014**

Sample Received: **02 July 2014**

Analysis Complete: **17 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	08/07/2014	Y Cov	WAS049
Calcium , Total as Ca	18.0	mg/l	08/07/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	08/07/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	08/07/2014	Y Cov	WAS049
Iron, Total as Fe	646	ug/l	08/07/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	08/07/2014	Y Cov	WAS049
Magnesium, Total as Mg	3.3	mg/l	08/07/2014	Y Cov	WAS049
Manganese , Total as Mn	333	ug/l	08/07/2014	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	08/07/2014	Y Cov	WAS049
Potassium , Total as K	0.44	mg/l	08/07/2014	Y Cov	WAS049
Sodium , Total as Na	5.91	mg/l	08/07/2014	Y Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	08/07/2014	Y Cov	WAS049
pH	7.1	pH units	04/07/2014	Y Cov	WAS039
Conductivity- Electrical 20C	132	uS/cm	04/07/2014	Y Cov	WAS039
Alkalinity as CaCO3	51.5	mg/l	10/07/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N (LL)	<0.06	mg/l	04/07/2014	Y Cov	WAS067
Chloride as Cl	11.7	mg/l	04/07/2014	Y Cov	WAS036
Nitrate as N	0.5	mg/l	04/07/2014	Y Cov	WAS036
Nitrate as NO3	2.0	mg/l	04/07/2014	N Cov	WAS067
Nitrogen, Total Oxidised as N	0.53	mg/l	04/07/2014	Y Cov	WAS036
Sulphate as SO4	3.0	mg/l	04/07/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	7.1	mg/l	04/07/2014	Y Cov	WAS052
BOD + ATU (5 day)	<1	mg/l	08/07/2014	Y Cov	WAS001
COD (Total)	13.0	mg/l	07/07/2014	Y Cov	WAS040
TOC (Filtered)	2.7	mg/l	07/07/2014	Y Cov	WAS005

Analyst Comments for 14120171:

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.

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Name: **C. Law**

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# Certificate of Analysis



Report Number: **COV/1120781/2014**

Issue **1**

Laboratory Number: **14120172**

Sample **5** of **26**

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

Sample Point Description:

Sample Description: **SWE(downstream)**

Sample Matrix: **Surface waters**

Sample Date/Time: **01 July 2014**

Sample Received: **02 July 2014**

Analysis Complete: **17 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	08/07/2014	Y Cov	WAS049
Calcium , Total as Ca	31.6	mg/l	08/07/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	08/07/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	08/07/2014	Y Cov	WAS049
Iron, Total as Fe	<230	ug/l	08/07/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	08/07/2014	Y Cov	WAS049
Magnesium, Total as Mg	4.3	mg/l	08/07/2014	Y Cov	WAS049
Manganese , Total as Mn	18.5	ug/l	08/07/2014	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	08/07/2014	Y Cov	WAS049
Potassium , Total as K	1.22	mg/l	08/07/2014	Y Cov	WAS049
Sodium , Total as Na	6.80	mg/l	08/07/2014	Y Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	08/07/2014	Y Cov	WAS049
pH	7.0	pH units	04/07/2014	Y Cov	WAS039
Conductivity- Electrical 20C	209	uS/cm	04/07/2014	Y Cov	WAS039
Alkalinity as CaCO3	91.3	mg/l	10/07/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N (LL)	<0.06	mg/l	04/07/2014	Y Cov	WAS067
Chloride as Cl	14.7	mg/l	04/07/2014	Y Cov	WAS036
Nitrate as N	1.5	mg/l	04/07/2014	Y Cov	WAS036
Nitrate as NO3	6.2	mg/l	04/07/2014	N Cov	WAS067
Nitrogen, Total Oxidised as N	1.54	mg/l	04/07/2014	Y Cov	WAS036
Sulphate as SO4	4.8	mg/l	04/07/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	9.5	mg/l	04/07/2014	Y Cov	WAS052
BOD + ATU (5 day)	<1	mg/l	08/07/2014	Y Cov	WAS001
COD (Total)	<11.0	mg/l	07/07/2014	Y Cov	WAS040
TOC (Filtered)	1.1	mg/l	07/07/2014	Y Cov	WAS005

Analyst Comments for 14120172:

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.

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Signed:



Name: **C. Law**

Date: **25 July 2014**

Title: **Inorganics Operations Manager**



# Certificate of Analysis



Report Number: **COV/1120781/2014**

Issue **1**

Laboratory Number: **14120173**

Sample **6** of **26**

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

Sample Point Description:

Sample Description: **SWD2**

Sample Matrix: **Surface waters**

Sample Date/Time: **01 July 2014**

Sample Received: **02 July 2014**

Analysis Complete: **17 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	08/07/2014	Y Cov	WAS049
Calcium , Total as Ca	68.2	mg/l	08/07/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	08/07/2014	Y Cov	WAS049
Copper , Total as Cu	10.8	ug/l	08/07/2014	Y Cov	WAS049
Iron, Total as Fe	7300	ug/l	08/07/2014	Y Cov	WAS049
Lead , Total as Pb	6.40	ug/l	08/07/2014	Y Cov	WAS049
Magnesium, Total as Mg	7.3	mg/l	08/07/2014	Y Cov	WAS049
Manganese , Total as Mn	15900	ug/l	08/07/2014	Y Cov	WAS049
Nickel , Total as Ni	4.80	ug/l	08/07/2014	Y Cov	WAS049
Potassium , Total as K	5.19	mg/l	08/07/2014	Y Cov	WAS049
Sodium , Total as Na	13.0	mg/l	08/07/2014	Y Cov	WAS049
Zinc , Total as Zn	50.2	ug/l	08/07/2014	Y Cov	WAS049
pH	7.4	pH units	04/07/2014	Y Cov	WAS039
Conductivity- Electrical 20C	351	uS/cm	04/07/2014	Y Cov	WAS039
Alkalinity as CaCO3	176	mg/l	10/07/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N (LL)	0.11	mg/l	04/07/2014	Y Cov	WAS067
Chloride as Cl	24.4	mg/l	04/07/2014	Y Cov	WAS036
Nitrate as N	0.5	mg/l	04/07/2014	Y Cov	WAS036
Nitrate as NO3	<1.3	mg/l	04/07/2014	N Cov	WAS067
Nitrogen, Total Oxidised as N	0.46	mg/l	04/07/2014	Y Cov	WAS036
Sulphate as SO4	3.3	mg/l	04/07/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	4.4	mg/l	04/07/2014	Y Cov	WAS052
BOD + ATU (5 day)	19	mg/l	08/07/2014	Y Cov	WAS001
COD (Total)	619	mg/l	07/07/2014	Y Cov	WAS040
TOC (Filtered)	3.5	mg/l	07/07/2014	Y Cov	WAS005
Dissolved Oxygen (Saturation)	36.7	%	04/07/2014	N Cov	None

## Analyst Comments for 14120173:

Integrity Breach between TON and Nitrate, results within 10%.

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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# Certificate of Analysis



Report Number: **COV/1120781/2014**

Issue **1**

Laboratory Number: **14120174**

Sample **7** of **26**

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

Sample Point Description:

Sample Description: **DAS**

Sample Matrix: **Ground waters**

Sample Date/Time: **01 July 2014**

Sample Received: **02 July 2014**

Analysis Complete: **17 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	08/07/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	08/07/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	08/07/2014	Y Cov	WAS049
Iron, Total as Fe	6800	ug/l	08/07/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	08/07/2014	Y Cov	WAS049
Magnesium, Total as Mg	9.9	mg/l	08/07/2014	Y Cov	WAS049
Manganese , Total as Mn	1460	ug/l	08/07/2014	Y Cov	WAS049
Mercury, Filtered as Hg	<0.10	ug/l	16/07/2014	Y Cov	WAS013
Nickel , Total as Ni	4.40	ug/l	08/07/2014	Y Cov	WAS049
Potassium , Total as K	13.4	mg/l	08/07/2014	Y Cov	WAS049
Sodium , Total as Na	20.5	mg/l	08/07/2014	Y Cov	WAS049
Zinc , Total as Zn	60.4	ug/l	08/07/2014	Y Cov	WAS049
pH	7.1	pH units	04/07/2014	Y Cov	WAS039
Conductivity- Electrical 20C	838	uS/cm	04/07/2014	Y Cov	WAS039
Alkalinity as CaCO3	477	mg/l	10/07/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	20.1	mg/l	04/07/2014	Y Cov	WAS036
Chloride as Cl	25.5	mg/l	04/07/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	04/07/2014	Y Cov	WAS036
Sulphate as SO4	<1.3	mg/l	04/07/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	04/07/2014	Y Cov	WAS052
TOC (Filtered)	7.4	mg/l	07/07/2014	Y Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	08/07/2014	Y Cov	WAS019
Mecoprop	2.65	ug/l	17/07/2014	Y Cov	GEO49
Benzene	<0.10	ug/l	04/07/2014	Y Cov	GEO56
Ethyl Benzene	<0.10	ug/l	04/07/2014	Y Cov	GEO56
Toluene	<0.10	ug/l	04/07/2014	Y Cov	GEO56
m&p Xylene	<0.20	ug/l	04/07/2014	Y Cov	GEO56
o-Xylene	<0.10	ug/l	04/07/2014	Y Cov	GEO56
Total Xylenes	<0.20	ug/l	04/07/2014	N Cov	GEO56

## Analyst Comments for 14120174:

GEO56 BTEX Waters: The sample container received was not filled in accordance with our container filling instructions (headspace present in vial). It is therefore possible that the results provided may be compromised.

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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: **25 July 2014**

Title: **Inorganics Operations Manager**

# Certificate of Analysis



Report Number: **COV/1120781/2014**

Issue **1**

Laboratory Number: **14120175**

Sample **8** of **26**

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

Sample Point Description:

Sample Description: **M10**

Sample Matrix: **Ground waters**

Sample Date/Time: **01 July 2014**

Sample Received: **02 July 2014**

Analysis Complete: **17 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	08/07/2014	Y Cov	WAS049
Calcium , Total as Ca	28.4	mg/l	08/07/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	08/07/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	08/07/2014	Y Cov	WAS049
Iron, Total as Fe	930	ug/l	08/07/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	08/07/2014	Y Cov	WAS049
Magnesium, Total as Mg	2.7	mg/l	08/07/2014	Y Cov	WAS049
Manganese , Total as Mn	7940	ug/l	08/07/2014	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	08/07/2014	Y Cov	WAS049
Potassium , Total as K	2.17	mg/l	08/07/2014	Y Cov	WAS049
Sodium , Total as Na	4.12	mg/l	08/07/2014	Y Cov	WAS049
pH	7.2	pH units	04/07/2014	Y Cov	WAS039
Conductivity- Electrical 20C	191	uS/cm	04/07/2014	Y Cov	WAS039
Alkalinity as CaCO3	85.6	mg/l	10/07/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	04/07/2014	Y Cov	WAS036
Chloride as Cl	16.4	mg/l	04/07/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	04/07/2014	Y Cov	WAS036
Sulphate as SO4	2.1	mg/l	04/07/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	3.3	mg/l	04/07/2014	Y Cov	WAS052
TOC (Filtered)	1.1	mg/l	07/07/2014	Y Cov	WAS005

Analyst Comments for 14120175:

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: **25 July 2014**

Title: **Inorganics Operations Manager**

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# Certificate of Analysis



Report Number: **COV/1120781/2014**

Issue **1**

Laboratory Number: **14120176**

Sample **9** of **26**

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

Sample Point Description:

Sample Description: **BL BH1**

Sample Matrix: **Ground waters**

Sample Date/Time: **01 July 2014**

Sample Received: **02 July 2014**

Analysis Complete: **17 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	08/07/2014	Y Cov	WAS049
Calcium , Total as Ca	59.3	mg/l	08/07/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	08/07/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	08/07/2014	Y Cov	WAS049
Iron, Total as Fe	1600	ug/l	08/07/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	08/07/2014	Y Cov	WAS049
Magnesium, Total as Mg	7.3	mg/l	08/07/2014	Y Cov	WAS049
Manganese , Total as Mn	307	ug/l	08/07/2014	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	08/07/2014	Y Cov	WAS049
Potassium , Total as K	2.03	mg/l	08/07/2014	Y Cov	WAS049
Sodium , Total as Na	8.20	mg/l	08/07/2014	Y Cov	WAS049
pH	7.5	pH units	04/07/2014	Y Cov	WAS039
Conductivity- Electrical 20C	342	uS/cm	04/07/2014	Y Cov	WAS039
Alkalinity as CaCO3	181	mg/l	10/07/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	04/07/2014	Y Cov	WAS036
Chloride as Cl	10.7	mg/l	04/07/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	1.30	mg/l	04/07/2014	Y Cov	WAS036
Sulphate as SO4	7.7	mg/l	04/07/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	9.1	mg/l	04/07/2014	Y Cov	WAS052
TOC (Filtered)	<0.7	mg/l	07/07/2014	Y Cov	WAS005

Analyst Comments for 14120176:

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: **25 July 2014**

Title: **Inorganics Operations Manager**

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# Certificate of Analysis



Report Number: **COV/1120781/2014**

Issue **1**

Laboratory Number: **14120177**

Sample **10** of **26**

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

Sample Point Description:

Sample Description: **M18**

Sample Matrix: **Ground waters**

Sample Date/Time: **01 July 2014**

Sample Received: **02 July 2014**

Analysis Complete: **17 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	08/07/2014	Y Cov	WAS049
Calcium , Total as Ca	35.7	mg/l	08/07/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	08/07/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	08/07/2014	Y Cov	WAS049
Iron, Total as Fe	<230	ug/l	08/07/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	08/07/2014	Y Cov	WAS049
Magnesium, Total as Mg	2.7	mg/l	08/07/2014	Y Cov	WAS049
Manganese , Total as Mn	59.4	ug/l	08/07/2014	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	08/07/2014	Y Cov	WAS049
Potassium , Total as K	1.23	mg/l	08/07/2014	Y Cov	WAS049
Sodium , Total as Na	7.97	mg/l	08/07/2014	Y Cov	WAS049
pH	6.8	pH units	04/07/2014	Y Cov	WAS039
Conductivity- Electrical 20C	209	uS/cm	04/07/2014	Y Cov	WAS039
Alkalinity as CaCO3	95.8	mg/l	10/07/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	04/07/2014	Y Cov	WAS036
Chloride as Cl	13.0	mg/l	04/07/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	0.86	mg/l	04/07/2014	Y Cov	WAS036
Sulphate as SO4	3.4	mg/l	04/07/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	5.5	mg/l	04/07/2014	Y Cov	WAS052
TOC (Filtered)	0.8	mg/l	07/07/2014	Y Cov	WAS005

Analyst Comments for 14120177:

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: **25 July 2014**

Title: **Inorganics Operations Manager**

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# Certificate of Analysis



Report Number: **COV/1120781/2014**

Issue **1**

Laboratory Number: **14120178**

Sample **11** of **26**

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

Sample Point Description:

Sample Description: **M33**

Sample Matrix: **Ground waters**

Sample Date/Time: **01 July 2014**

Sample Received: **02 July 2014**

Analysis Complete: **17 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	08/07/2014	Y Cov	WAS049
Calcium , Total as Ca	20.4	mg/l	08/07/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	08/07/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	08/07/2014	Y Cov	WAS049
Iron, Total as Fe	<230	ug/l	08/07/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	08/07/2014	Y Cov	WAS049
Magnesium, Total as Mg	2.2	mg/l	08/07/2014	Y Cov	WAS049
Manganese , Total as Mn	41.4	ug/l	08/07/2014	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	08/07/2014	Y Cov	WAS049
Potassium , Total as K	1.51	mg/l	08/07/2014	Y Cov	WAS049
Sodium , Total as Na	5.47	mg/l	08/07/2014	Y Cov	WAS049
pH	6.8	pH units	04/07/2014	Y Cov	WAS039
Conductivity- Electrical 20C	141	uS/cm	04/07/2014	Y Cov	WAS039
Alkalinity as CaCO3	63.1	mg/l	10/07/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	04/07/2014	Y Cov	WAS036
Chloride as Cl	9.21	mg/l	04/07/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	04/07/2014	Y Cov	WAS036
Sulphate as SO4	3.7	mg/l	04/07/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	6.1	mg/l	04/07/2014	Y Cov	WAS052
TOC (Filtered)	1.1	mg/l	07/07/2014	Y Cov	WAS005

Analyst Comments for 14120178:

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: **25 July 2014**

Title: **Inorganics Operations Manager**

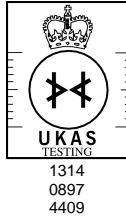
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# Certificate of Analysis



Report Number: **COV/1120781/2014**

Issue **1**

Laboratory Number: **14120179**

Sample **12** of **26**

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

Sample Point Description:

Sample Description: **M34**

Sample Matrix: **Ground waters**

Sample Date/Time: **01 July 2014**

Sample Received: **02 July 2014**

Analysis Complete: **17 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	08/07/2014	Y Cov	WAS049
Calcium , Total as Ca	57.3	mg/l	08/07/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	08/07/2014	Y Cov	WAS049
Copper , Total as Cu	11.8	ug/l	08/07/2014	Y Cov	WAS049
Iron, Total as Fe	1800	ug/l	08/07/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	08/07/2014	Y Cov	WAS049
Magnesium, Total as Mg	5.9	mg/l	08/07/2014	Y Cov	WAS049
Manganese , Total as Mn	4930	ug/l	08/07/2014	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	08/07/2014	Y Cov	WAS049
Potassium , Total as K	2.01	mg/l	08/07/2014	Y Cov	WAS049
Sodium , Total as Na	9.25	mg/l	08/07/2014	Y Cov	WAS049
pH	7.1	pH units	04/07/2014	Y Cov	WAS039
Conductivity- Electrical 20C	333	uS/cm	04/07/2014	Y Cov	WAS039
Alkalinity as CaCO3	189	mg/l	10/07/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	04/07/2014	Y Cov	WAS036
Chloride as Cl	15.0	mg/l	04/07/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	04/07/2014	Y Cov	WAS036
Sulphate as SO4	7.6	mg/l	04/07/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	2.9	mg/l	04/07/2014	Y Cov	WAS052
TOC (Filtered)	0.9	mg/l	07/07/2014	Y Cov	WAS005

Analyst Comments for 14120179:

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: **25 July 2014**

Title: **Inorganics Operations Manager**

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# Certificate of Analysis



Report Number: **COV/1120781/2014**

Issue **1**

Laboratory Number: **14120180**

Sample **13** of **26**

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

Sample Point Description:

Sample Description: **M19**

Sample Matrix: **Ground waters**

Sample Date/Time: **01 July 2014**

Sample Received: **02 July 2014**

Analysis Complete: **17 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	08/07/2014	Y Cov	WAS049
Calcium , Total as Ca	5.99	mg/l	08/07/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	08/07/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	08/07/2014	Y Cov	WAS049
Iron, Total as Fe	<230	ug/l	08/07/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	08/07/2014	Y Cov	WAS049
Magnesium, Total as Mg	2.9	mg/l	08/07/2014	Y Cov	WAS049
Manganese , Total as Mn	7.50	ug/l	08/07/2014	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	08/07/2014	Y Cov	WAS049
Potassium , Total as K	0.29	mg/l	08/07/2014	Y Cov	WAS049
Sodium , Total as Na	5.04	mg/l	08/07/2014	Y Cov	WAS049
pH	6.2	pH units	04/07/2014	Y Cov	WAS039
Conductivity- Electrical 20C	85.0	uS/cm	04/07/2014	Y Cov	WAS039
Alkalinity as CaCO3	22.8	mg/l	10/07/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	04/07/2014	Y Cov	WAS036
Chloride as Cl	8.91	mg/l	04/07/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	1.64	mg/l	04/07/2014	Y Cov	WAS036
Sulphate as SO4	5.9	mg/l	04/07/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	9.8	mg/l	04/07/2014	Y Cov	WAS052
TOC (Filtered)	<0.7	mg/l	07/07/2014	Y Cov	WAS005

Analyst Comments for 14120180:

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**

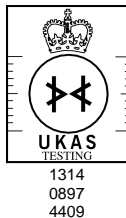
Date: **25 July 2014**

Title: **Inorganics Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1120781/2014**

Issue **1**

Laboratory Number: **14120181**

Sample **14** of **26**

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

Sample Point Description:

Sample Description: **M20**

Sample Matrix: **Ground waters**

Sample Date/Time: **01 July 2014**

Sample Received: **02 July 2014**

Analysis Complete: **17 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	08/07/2014	Y Cov	WAS049
Calcium , Total as Ca	82.6	mg/l	08/07/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	08/07/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	08/07/2014	Y Cov	WAS049
Iron, Total as Fe	<230	ug/l	08/07/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	08/07/2014	Y Cov	WAS049
Magnesium, Total as Mg	9.3	mg/l	08/07/2014	Y Cov	WAS049
Manganese , Total as Mn	22.9	ug/l	08/07/2014	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	08/07/2014	Y Cov	WAS049
Potassium , Total as K	6.98	mg/l	08/07/2014	Y Cov	WAS049
Sodium , Total as Na	8.16	mg/l	08/07/2014	Y Cov	WAS049
pH	7.9	pH units	04/07/2014	Y Cov	WAS039
Conductivity- Electrical 20C	467	uS/cm	04/07/2014	Y Cov	WAS039
Alkalinity as CaCO3	263	mg/l	10/07/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	2.98	mg/l	04/07/2014	Y Cov	WAS036
Chloride as Cl	12.7	mg/l	04/07/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	04/07/2014	Y Cov	WAS036
Sulphate as SO4	5.4	mg/l	04/07/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	8.8	mg/l	04/07/2014	Y Cov	WAS052
TOC (Filtered)	1.0	mg/l	07/07/2014	Y Cov	WAS005

Analyst Comments for 14120181:

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: **25 July 2014**

Title: **Inorganics Operations Manager**

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# Certificate of Analysis



Report Number: **COV/1120781/2014**

Issue **1**

Laboratory Number: **14120182**

Sample **15** of **26**

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

Sample Point Description:

Sample Description: **M21**

Sample Matrix: **Ground waters**

Sample Date/Time: **01 July 2014**

Sample Received: **02 July 2014**

Analysis Complete: **17 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	08/07/2014	Y Cov	WAS049
Calcium , Total as Ca	98.2	mg/l	08/07/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	08/07/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	08/07/2014	Y Cov	WAS049
Iron, Total as Fe	<230	ug/l	08/07/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	08/07/2014	Y Cov	WAS049
Magnesium, Total as Mg	9.6	mg/l	08/07/2014	Y Cov	WAS049
Manganese , Total as Mn	1560	ug/l	08/07/2014	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	08/07/2014	Y Cov	WAS049
Potassium , Total as K	7.84	mg/l	08/07/2014	Y Cov	WAS049
Sodium , Total as Na	12.2	mg/l	08/07/2014	Y Cov	WAS049
pH	7.6	pH units	04/07/2014	Y Cov	WAS039
Conductivity- Electrical 20C	532	uS/cm	04/07/2014	Y Cov	WAS039
Alkalinity as CaCO3	277	mg/l	10/07/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	1.15	mg/l	04/07/2014	Y Cov	WAS036
Chloride as Cl	21.7	mg/l	04/07/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	04/07/2014	Y Cov	WAS036
Sulphate as SO4	10.4	mg/l	04/07/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	10.3	mg/l	04/07/2014	Y Cov	WAS052
TOC (Filtered)	1.1	mg/l	07/07/2014	Y Cov	WAS005

Analyst Comments for 14120182:

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: **25 July 2014**

Title: **Inorganics Operations Manager**

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# Certificate of Analysis



Report Number: **COV/1120781/2014**

Issue **1**

Laboratory Number: **14120183**

Sample **16** of **26**

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

Sample Point Description:

Sample Description: **M22**

Sample Matrix: **Ground waters**

Sample Date/Time: **01 July 2014**

Sample Received: **02 July 2014**

Analysis Complete: **17 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	08/07/2014	Y Cov	WAS049
Calcium , Total as Ca	43.6	mg/l	08/07/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	08/07/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	08/07/2014	Y Cov	WAS049
Iron, Total as Fe	<230	ug/l	08/07/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	08/07/2014	Y Cov	WAS049
Magnesium, Total as Mg	5.5	mg/l	08/07/2014	Y Cov	WAS049
Manganese , Total as Mn	56.7	ug/l	08/07/2014	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	08/07/2014	Y Cov	WAS049
Potassium , Total as K	4.30	mg/l	08/07/2014	Y Cov	WAS049
Sodium , Total as Na	8.45	mg/l	08/07/2014	Y Cov	WAS049
pH	7.1	pH units	04/07/2014	Y Cov	WAS039
Conductivity- Electrical 20C	282	uS/cm	04/07/2014	Y Cov	WAS039
Alkalinity as CaCO3	131	mg/l	10/07/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	0.50	mg/l	04/07/2014	Y Cov	WAS036
Chloride as Cl	16.3	mg/l	04/07/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	0.77	mg/l	04/07/2014	Y Cov	WAS036
Sulphate as SO4	6.0	mg/l	04/07/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	5.5	mg/l	04/07/2014	Y Cov	WAS052
TOC (Filtered)	<0.7	mg/l	07/07/2014	Y Cov	WAS005

Analyst Comments for 14120183:

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: **25 July 2014**

Title: **Inorganics Operations Manager**

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# Certificate of Analysis



Report Number: **COV/1120781/2014**

Issue **1**

Laboratory Number: **14120184**

Sample **17** of **26**

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

Sample Point Description:

Sample Description: **M31**

Sample Matrix: **Ground waters**

Sample Date/Time: **01 July 2014**

Sample Received: **02 July 2014**

Analysis Complete: **17 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	08/07/2014	Y Cov	WAS049
Calcium , Total as Ca	30.8	mg/l	08/07/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	08/07/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	08/07/2014	Y Cov	WAS049
Iron, Total as Fe	<230	ug/l	08/07/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	08/07/2014	Y Cov	WAS049
Magnesium, Total as Mg	3.8	mg/l	08/07/2014	Y Cov	WAS049
Manganese , Total as Mn	21.2	ug/l	08/07/2014	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	08/07/2014	Y Cov	WAS049
Potassium , Total as K	2.57	mg/l	08/07/2014	Y Cov	WAS049
Sodium , Total as Na	7.70	mg/l	08/07/2014	Y Cov	WAS049
pH	6.8	pH units	04/07/2014	Y Cov	WAS039
Conductivity- Electrical 20C	208	uS/cm	04/07/2014	Y Cov	WAS039
Alkalinity as CaCO3	95.8	mg/l	11/07/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	04/07/2014	Y Cov	WAS036
Chloride as Cl	12.8	mg/l	04/07/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	0.68	mg/l	04/07/2014	Y Cov	WAS036
Sulphate as SO4	6.5	mg/l	04/07/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	4.6	mg/l	04/07/2014	Y Cov	WAS052
TOC (Filtered)	<0.7	mg/l	07/07/2014	Y Cov	WAS005

Analyst Comments for 14120184:

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: **25 July 2014**

Title: **Inorganics Operations Manager**

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# Certificate of Analysis



Report Number: **COV/1120781/2014**

Issue **1**

Laboratory Number: **14120185**

Sample **18** of **26**

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

Sample Point Description:

Sample Description: **M35**

Sample Matrix: **Ground waters**

Sample Date/Time: **01 July 2014**

Sample Received: **02 July 2014**

Analysis Complete: **17 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	08/07/2014	Y Cov	WAS049
Calcium , Total as Ca	13.8	mg/l	08/07/2014	Y Cov	WAS049
Chromium , Total as Cr	2.70	ug/l	08/07/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	08/07/2014	Y Cov	WAS049
Iron, Total as Fe	22200	ug/l	08/07/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	08/07/2014	Y Cov	WAS049
Magnesium, Total as Mg	2.2	mg/l	08/07/2014	Y Cov	WAS049
Manganese , Total as Mn	605	ug/l	08/07/2014	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	08/07/2014	Y Cov	WAS049
Potassium , Total as K	0.31	mg/l	08/07/2014	Y Cov	WAS049
Sodium , Total as Na	19.0	mg/l	08/07/2014	Y Cov	WAS049
pH	6.1	pH units	04/07/2014	Y Cov	WAS039
Conductivity- Electrical 20C	225	uS/cm	04/07/2014	Y Cov	WAS039
Alkalinity as CaCO3	36.7	mg/l	11/07/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	04/07/2014	Y Cov	WAS036
Chloride as Cl	46.4	mg/l	04/07/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	04/07/2014	Y Cov	WAS036
Sulphate as SO4	2.7	mg/l	04/07/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	0.8	mg/l	04/07/2014	Y Cov	WAS052
TOC (Filtered)	2.9	mg/l	08/07/2014	Y Cov	WAS005

Analyst Comments for 14120185:

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: **25 July 2014**

Title: **Inorganics Operations Manager**

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# Certificate of Analysis



Report Number: **COV/1120781/2014**

Issue **1**

Laboratory Number: **14120186**

Sample **19** of **26**

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

Sample Point Description:

Sample Description: **GW1**

Sample Matrix: **Ground waters**

Sample Date/Time:

Sample Received: **02 July 2014**

Analysis Complete: **17 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Sample Received	'Empty'		03/07/2014	N Cov	N/A

Analyst Comments for 14120186: 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: **25 July 2014**

Title: **Inorganics Operations Manager**



# Certificate of Analysis



Report Number: **COV/1120781/2014**

Issue **1**

Laboratory Number: **14120187**

Sample **20** of **26**

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

Sample Point Description:

Sample Description: **GW2**

Sample Matrix: **Ground waters**

Sample Date/Time:

Sample Received: **02 July 2014**

Analysis Complete: **17 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Sample Received	'Empty'		03/07/2014	N Cov	N/A

Analyst Comments for 14120187: 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: **25 July 2014**

Title: **Inorganics Operations Manager**

# Certificate of Analysis



Report Number: **COV/1120781/2014**

Issue **1**

Laboratory Number: **14120188**

Sample **21** of **26**

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

Sample Point Description:

Sample Description: **GW3**

Sample Matrix: **Ground waters**

Sample Date/Time: **01 July 2014**

Sample Received: **02 July 2014**

Analysis Complete: **17 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	08/07/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	08/07/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	08/07/2014	Y Cov	WAS049
Iron, Total as Fe	1400	ug/l	08/07/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	08/07/2014	Y Cov	WAS049
Magnesium, Total as Mg	7.6	mg/l	08/07/2014	Y Cov	WAS049
Manganese , Total as Mn	1620	ug/l	08/07/2014	Y Cov	WAS049
Mercury, Filtered as Hg	<0.10	ug/l	16/07/2014	Y Cov	WAS013
Nickel , Total as Ni	3.30	ug/l	08/07/2014	Y Cov	WAS049
Potassium , Total as K	0.88	mg/l	08/07/2014	Y Cov	WAS049
Sodium , Total as Na	8.67	mg/l	08/07/2014	Y Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	08/07/2014	Y Cov	WAS049
pH	7.2	pH units	04/07/2014	Y Cov	WAS039
Conductivity- Electrical 20C	321	uS/cm	04/07/2014	Y Cov	WAS039
Alkalinity as CaCO3	166	mg/l	11/07/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	04/07/2014	Y Cov	WAS036
Chloride as Cl	13.7	mg/l	04/07/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	04/07/2014	Y Cov	WAS036
Sulphate as SO4	6.4	mg/l	04/07/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	3.5	mg/l	04/07/2014	Y Cov	WAS052
TOC (Filtered)	<0.7	mg/l	07/07/2014	Y Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	08/07/2014	Y Cov	WAS019
Mecoprop	<0.04	ug/l	17/07/2014	Y Cov	GEO49
Benzene	<0.10	ug/l	04/07/2014	Y Cov	GEO56
Ethyl Benzene	<0.10	ug/l	04/07/2014	Y Cov	GEO56
Toluene	<0.10	ug/l	04/07/2014	Y Cov	GEO56
m&p Xylene	<0.20	ug/l	04/07/2014	Y Cov	GEO56
o-Xylene	<0.10	ug/l	04/07/2014	Y Cov	GEO56
Total Xylenes	<0.20	ug/l	04/07/2014	N Cov	GEO56

Analyst Comments for 14120188:

No Analyst Comment

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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: **25 July 2014**

Title: **Inorganics Operations Manager**

# Certificate of Analysis



Report Number: **COV/1120781/2014**

Issue **1**

Laboratory Number: **14120189**

Sample **22** of **26**

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

Sample Point Description:

Sample Description: **GW4**

Sample Matrix: **Ground waters**

Sample Date/Time: **01 July 2014**

Sample Received: **02 July 2014**

Analysis Complete: **17 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	08/07/2014	Y Cov	WAS049
Chromium , Total as Cr	2.70	ug/l	08/07/2014	Y Cov	WAS049
Copper , Total as Cu	11.3	ug/l	08/07/2014	Y Cov	WAS049
Iron, Total as Fe	1800	ug/l	08/07/2014	Y Cov	WAS049
Lead , Total as Pb	7.60	ug/l	08/07/2014	Y Cov	WAS049
Magnesium, Total as Mg	2.6	mg/l	08/07/2014	Y Cov	WAS049
Manganese , Total as Mn	223	ug/l	08/07/2014	Y Cov	WAS049
Mercury, Filtered as Hg	<0.10	ug/l	16/07/2014	Y Cov	WAS013
Nickel , Total as Ni	<3.00	ug/l	08/07/2014	Y Cov	WAS049
Potassium , Total as K	0.73	mg/l	08/07/2014	Y Cov	WAS049
Sodium , Total as Na	6.63	mg/l	08/07/2014	Y Cov	WAS049
Zinc , Total as Zn	19.0	ug/l	08/07/2014	Y Cov	WAS049
pH	6.5	pH units	04/07/2014	Y Cov	WAS039
Conductivity- Electrical 20C	153	uS/cm	04/07/2014	Y Cov	WAS039
Alkalinity as CaCO3	61.1	mg/l	11/07/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	04/07/2014	Y Cov	WAS036
Chloride as Cl	13.8	mg/l	04/07/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	0.96	mg/l	04/07/2014	Y Cov	WAS036
Sulphate as SO4	4.0	mg/l	04/07/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	6.3	mg/l	04/07/2014	Y Cov	WAS052
TOC (Filtered)	<0.7	mg/l	07/07/2014	Y Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	08/07/2014	Y Cov	WAS019
Mecoprop	<0.04	ug/l	17/07/2014	Y Cov	GEO49
Benzene	<0.10	ug/l	04/07/2014	Y Cov	GEO56
Ethyl Benzene	<0.10	ug/l	04/07/2014	Y Cov	GEO56
Toluene	<0.10	ug/l	04/07/2014	Y Cov	GEO56
m&p Xylene	<0.20	ug/l	04/07/2014	Y Cov	GEO56
o-Xylene	<0.10	ug/l	04/07/2014	Y Cov	GEO56
Total Xylenes	<0.20	ug/l	04/07/2014	N Cov	GEO56

Analyst Comments for 14120189:

No Analyst Comment

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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: **25 July 2014**

Title: **Inorganics Operations Manager**

# Certificate of Analysis



Report Number: **COV/1120781/2014**

Issue **1**

Laboratory Number: **14120190**

Sample **23** of **26**

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

Sample Point Description:

Sample Description: **GW5**

Sample Matrix: **Ground waters**

Sample Date/Time: **01 July 2014**

Sample Received: **02 July 2014**

Analysis Complete: **17 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	1.70	ug/l	08/07/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	08/07/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	08/07/2014	Y Cov	WAS049
Iron, Total as Fe	34000	ug/l	08/07/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	08/07/2014	Y Cov	WAS049
Magnesium, Total as Mg	3.5	mg/l	08/07/2014	Y Cov	WAS049
Manganese , Total as Mn	1580	ug/l	08/07/2014	Y Cov	WAS049
Mercury, Filtered as Hg	<0.10	ug/l	16/07/2014	Y Cov	WAS013
Nickel , Total as Ni	<3.00	ug/l	08/07/2014	Y Cov	WAS049
Potassium , Total as K	0.31	mg/l	08/07/2014	Y Cov	WAS049
Sodium , Total as Na	5.04	mg/l	08/07/2014	Y Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	08/07/2014	Y Cov	WAS049
pH	6.8	pH units	04/07/2014	Y Cov	WAS039
Conductivity- Electrical 20C	174	uS/cm	04/07/2014	Y Cov	WAS039
Alkalinity as CaCO3	84.0	mg/l	11/07/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	04/07/2014	Y Cov	WAS036
Chloride as Cl	7.83	mg/l	04/07/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	04/07/2014	Y Cov	WAS036
Sulphate as SO4	4.4	mg/l	04/07/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	2.1	mg/l	04/07/2014	Y Cov	WAS052
TOC (Filtered)	<0.7	mg/l	07/07/2014	Y Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	08/07/2014	Y Cov	WAS019
Mecoprop	<0.04	ug/l	17/07/2014	Y Cov	GEO49
Benzene	<0.10	ug/l	04/07/2014	Y Cov	GEO56
Ethyl Benzene	<0.10	ug/l	04/07/2014	Y Cov	GEO56
Toluene	0.13	ug/l	04/07/2014	Y Cov	GEO56
m&p Xylene	<0.20	ug/l	04/07/2014	Y Cov	GEO56
o-Xylene	<0.10	ug/l	04/07/2014	Y Cov	GEO56
Total Xylenes	<0.20	ug/l	04/07/2014	N Cov	GEO56

Analyst Comments for 14120190:

No Analyst Comment

**ALS Environmental Ltd**

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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: **25 July 2014**

Title: **Inorganics Operations Manager**

# Certificate of Analysis



Report Number: **COV/1120781/2014**

Issue **1**

Laboratory Number: **14120191**

Sample **24** of **26**

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

Sample Point Description:

Sample Description: **M17**

Sample Matrix: **Ground waters**

Sample Date/Time: **01 July 2014**

Sample Received: **02 July 2014**

Analysis Complete: **17 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	08/07/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	08/07/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	08/07/2014	Y Cov	WAS049
Iron, Total as Fe	<230	ug/l	08/07/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	08/07/2014	Y Cov	WAS049
Magnesium, Total as Mg	3.4	mg/l	08/07/2014	Y Cov	WAS049
Manganese , Total as Mn	141	ug/l	08/07/2014	Y Cov	WAS049
Mercury, Filtered as Hg	<0.10	ug/l	16/07/2014	Y Cov	WAS013
Nickel , Total as Ni	<3.00	ug/l	08/07/2014	Y Cov	WAS049
Potassium , Total as K	1.10	mg/l	08/07/2014	Y Cov	WAS049
Sodium , Total as Na	10.9	mg/l	08/07/2014	Y Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	08/07/2014	Y Cov	WAS049
pH	6.8	pH units	04/07/2014	Y Cov	WAS039
Conductivity- Electrical 20C	208	uS/cm	04/07/2014	Y Cov	WAS039
Alkalinity as CaCO3	62.8	mg/l	11/07/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	04/07/2014	Y Cov	WAS036
Chloride as Cl	24.0	mg/l	04/07/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	1.07	mg/l	04/07/2014	Y Cov	WAS036
Sulphate as SO4	7.6	mg/l	04/07/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	4.9	mg/l	04/07/2014	Y Cov	WAS052
TOC (Filtered)	<0.7	mg/l	07/07/2014	Y Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	08/07/2014	Y Cov	WAS019
Mecoprop	<0.04	ug/l	17/07/2014	Y Cov	GEO49
Benzene	<0.10	ug/l	04/07/2014	Y Cov	GEO56
Ethyl Benzene	<0.10	ug/l	04/07/2014	Y Cov	GEO56
Toluene	<0.10	ug/l	04/07/2014	Y Cov	GEO56
m&p Xylene	<0.20	ug/l	04/07/2014	Y Cov	GEO56
o-Xylene	<0.10	ug/l	04/07/2014	Y Cov	GEO56
Total Xylenes	<0.20	ug/l	04/07/2014	N Cov	GEO56

Analyst Comments for 14120191:

No Analyst Comment

**ALS Environmental Ltd**

Torrington Avenue, Coventry, CV4 9GU  
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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: **25 July 2014**

Title: **Inorganics Operations Manager**

# Certificate of Analysis



Report Number: **COV/1120781/2014**

Issue **1**

Laboratory Number: **14120192**

Sample **25** of **26**

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

Sample Point Description:

Sample Description: **M36**

Sample Matrix: **Ground waters**

Sample Date/Time: **01 July 2014**

Sample Received: **02 July 2014**

Analysis Complete: **17 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	08/07/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	08/07/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	08/07/2014	Y Cov	WAS049
Iron, Total as Fe	1700	ug/l	08/07/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	08/07/2014	Y Cov	WAS049
Magnesium, Total as Mg	3.4	mg/l	08/07/2014	Y Cov	WAS049
Manganese , Total as Mn	155	ug/l	08/07/2014	Y Cov	WAS049
Mercury, Filtered as Hg	<0.10	ug/l	16/07/2014	Y Cov	WAS013
Nickel , Total as Ni	3.00	ug/l	08/07/2014	Y Cov	WAS049
Potassium , Total as K	0.40	mg/l	08/07/2014	Y Cov	WAS049
Sodium , Total as Na	6.78	mg/l	08/07/2014	Y Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	08/07/2014	Y Cov	WAS049
pH	6.9	pH units	04/07/2014	Y Cov	WAS039
Conductivity- Electrical 20C	196	uS/cm	04/07/2014	Y Cov	WAS039
Alkalinity as CaCO3	71.2	mg/l	11/07/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	04/07/2014	Y Cov	WAS036
Chloride as Cl	19.7	mg/l	04/07/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	1.57	mg/l	04/07/2014	Y Cov	WAS036
Sulphate as SO4	4.5	mg/l	04/07/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	7.8	mg/l	04/07/2014	Y Cov	WAS052
TOC (Filtered)	<0.7	mg/l	07/07/2014	Y Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	08/07/2014	Y Cov	WAS019
Mecoprop	<0.04	ug/l	17/07/2014	Y Cov	GEO49
Benzene	<0.10	ug/l	04/07/2014	Y Cov	GEO56
Ethyl Benzene	<0.10	ug/l	04/07/2014	Y Cov	GEO56
Toluene	<0.10	ug/l	04/07/2014	Y Cov	GEO56
m&p Xylene	<0.20	ug/l	04/07/2014	Y Cov	GEO56
o-Xylene	<0.10	ug/l	04/07/2014	Y Cov	GEO56
Total Xylenes	<0.20	ug/l	04/07/2014	N Cov	GEO56

Analyst Comments for 14120192:

No Analyst Comment

**ALS Environmental Ltd**

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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: **25 July 2014**

Title: **Inorganics Operations Manager**

# Certificate of Analysis



Report Number: **COV/1120781/2014**

Issue **1**

Laboratory Number: **14120193**

Sample **26** of **26**

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

Sample Point Description:

Sample Description: **M47**

Sample Matrix: **Ground waters**

Sample Date/Time: **01 July 2014**

Sample Received: **02 July 2014**

Analysis Complete: **17 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	08/07/2014	Y Cov	WAS049
Chromium , Total as Cr	3.90	ug/l	08/07/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	08/07/2014	Y Cov	WAS049
Iron, Total as Fe	1100	ug/l	08/07/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	08/07/2014	Y Cov	WAS049
Magnesium, Total as Mg	8.2	mg/l	08/07/2014	Y Cov	WAS049
Manganese , Total as Mn	182	ug/l	08/07/2014	Y Cov	WAS049
Mercury, Filtered as Hg	<0.10	ug/l	16/07/2014	Y Cov	WAS013
Nickel , Total as Ni	<3.00	ug/l	08/07/2014	Y Cov	WAS049
Potassium , Total as K	0.51	mg/l	08/07/2014	Y Cov	WAS049
Sodium , Total as Na	6.67	mg/l	08/07/2014	Y Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	08/07/2014	Y Cov	WAS049
pH	7.5	pH units	04/07/2014	Y Cov	WAS039
Conductivity- Electrical 20C	291	uS/cm	04/07/2014	Y Cov	WAS039
Alkalinity as CaCO3	154	mg/l	11/07/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	04/07/2014	Y Cov	WAS036
Chloride as Cl	12.1	mg/l	04/07/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	0.64	mg/l	04/07/2014	Y Cov	WAS036
Sulphate as SO4	4.8	mg/l	04/07/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	2.0	mg/l	04/07/2014	Y Cov	WAS052
TOC (Filtered)	<0.7	mg/l	07/07/2014	Y Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	08/07/2014	Y Cov	WAS019
Mecoprop	<0.04	ug/l	17/07/2014	Y Cov	GEO49
Benzene	<0.10	ug/l	04/07/2014	Y Cov	GEO56
Ethyl Benzene	<0.10	ug/l	04/07/2014	Y Cov	GEO56
Toluene	<0.10	ug/l	04/07/2014	Y Cov	GEO56
m&p Xylene	<0.20	ug/l	04/07/2014	Y Cov	GEO56
o-Xylene	<0.10	ug/l	04/07/2014	Y Cov	GEO56
Total Xylenes	<0.20	ug/l	04/07/2014	N Cov	GEO56

Analyst Comments for 14120193:

No Analyst Comment

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I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:



Name: **C. Law**

Date: **25 July 2014**

Title: **Inorganics Operations Manager**

## ANALYST COMMENTS FOR REPORT

COV/1120781/2014

Issue 1

Date of Issue: 25 July 2014

Sample No	Analysis Comments
14120168	Integrity Breach between TON and Nitrate, results within 10%.
14120169	
14120170	
14120171	Integrity Breach between TON and Nitrate, results within 10%.
14120172	
14120173	
14120174	GEO56 BTEX Waters: The sample container received was not filled in accordance with our container filling instructions (headspace present in vial). It is therefore possible that the results provided may be compromised.
14120175	
14120176	
14120177	
14120178	
14120179	
14120180	
14120181	
14120182	
14120183	
14120184	
14120185	
14120186	
14120187	
14120188	
14120189	
14120190	
14120191	
14120192	
14120193	

Signed:



Name: **C. Law**

Date: **25 July 2014**


Title: **Inorganics Operations Manager**

## DETERMINAND COMMENTS FOR REPORT COV/1120781/2014

ISSUE 1

Date of Issue : 25 July 2014

Sample No	Description	Determinand	Comments

Signed: 	Name: <b>C. Law</b>	Date: <b>25 July 2014</b>
	Title: <b>Inorganics Operations Manager</b>	

**ALS Environmental Ltd**  
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Coventry  
CV4 9GU

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[www.alsenvironmental.co.uk](http://www.alsenvironmental.co.uk)

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

22 August 2014

**Test Report: COV/1129264/2014**

Dear Ms Francis

Analysis of your sample(s) submitted on 14 August 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: 

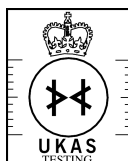
Name: C. Law

Title: Inorganics Operations Manager





# Report Summary



1314  
0897  
4409



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

Date of Issue: **22 August 2014**

Report Number: **COV/1129264/2014**

Issue **1**

**Job Description:** Llwyn Isaf

**Job Location:** Llwyn Isaf Monthly

Number of Samples  
included in this report **20**

Job Received: **14 August 2014**

Number of Test Results  
included in this report **64**

Analysis Commenced: **15 August 2014**

Signed:

Name: **C. Law**

Date: **22 August 2014**

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.

This communication has been sent to you by ALS Environmental Ltd. Registered in England and Wales. Registration No. 02148934. Registered Office: ALS Environmental Limited, Torrington Avenue, Coventry, CV4 9GU.

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# Certificate of Analysis



Report Number: **COV/1129264/2014**

Issue **1**

Laboratory Number: **14185589**

Sample **1** of **20**

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

Sample Point Description:

Sample Description: **SW W**

Sample Matrix: **Surface waters**

Sample Date/Time:

Sample Received: **14 August 2014**

Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Sample Received	'Empty'		15/08/2014	N Cov	N/A

Analyst Comments for 14185589: 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: **22 August 2014**

Title: **Inorganics Operations Manager**

# Certificate of Analysis



Report Number: **COV/1129264/2014**

Issue **1**

Laboratory Number: **14185590**

Sample **2** of **20**

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

Sample Point Description:

Sample Description: **SW Y (upstream)**

Sample Matrix: **Surface waters**

Sample Date/Time:

Sample Received: **14 August 2014**

Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Sample Received	'Empty'		15/08/2014	N Cov	N/A

Analyst Comments for 14185590: 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: **22 August 2014**

Title: **Inorganics Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1129264/2014**

Issue **1**

Laboratory Number: **14185591**

Sample **3** of **20**

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

Sample Point Description:

Sample Description: **SWB**

Sample Matrix: **Surface waters**

Sample Date/Time:

Sample Received: **14 August 2014**

Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Sample Received	'Empty'		15/08/2014	N Cov	N/A

Analyst Comments for 14185591: 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: **22 August 2014**

Title: **Inorganics Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1129264/2014**

Issue **1**

Laboratory Number: **14185592**

Sample **4** of **20**

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

Sample Point Description:

Sample Description: **SWC**

Sample Matrix: **Surface waters**

Sample Date/Time:

Sample Received: **14 August 2014**

Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Sample Received	'Empty'		15/08/2014	N Cov	N/A

Analyst Comments for 14185592: 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: **22 August 2014**

Title: **Inorganics Operations Manager**

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# Certificate of Analysis



Report Number: **COV/1129264/2014**

Issue **1**

Laboratory Number: **14185593**

Sample **5** of **20**

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

Sample Point Description:

Sample Description: **SWD2**

Sample Matrix: **Surface waters**

Sample Date/Time:

Sample Received: **14 August 2014**

Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Sample Received	'Empty'		15/08/2014	N Cov	N/A

Analyst Comments for 14185593: 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: **22 August 2014**

Title: **Inorganics Operations Manager**

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# Certificate of Analysis



Report Number: **COV/1129264/2014**

Issue **1**

Laboratory Number: **14185594**

Sample **6** of **20**

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

Sample Point Description:

Sample Description: **SWE (downstream)**

Sample Matrix: **Surface waters**

Sample Date/Time:

Sample Received: **14 August 2014**

Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Sample Received	'Empty'		15/08/2014	N Cov	N/A

Analyst Comments for 14185594: 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: **22 August 2014**

Title: **Inorganics Operations Manager**

**ALS Environmental Ltd**

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Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

# Certificate of Analysis



Report Number: **COV/1129264/2014**

Issue **1**

Laboratory Number: **14185595**

Sample **7** of **20**

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

Sample Point Description:

Sample Description: **SWD (discharge)**

Sample Matrix: **Surface waters**

Sample Date/Time:

Sample Received: **14 August 2014**

Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Sample Received	'Empty'		15/08/2014	N Cov	N/A

Analyst Comments for 14185595:

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: **22 August 2014**

Title: **Inorganics Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1129264/2014**

Issue **1**

Laboratory Number: **14185596**

Sample **8** of **20**

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

Sample Point Description:

Sample Description: **Infiltration Basin**

Sample Matrix: **Surface waters**

Sample Date/Time:

Sample Received: **14 August 2014**

Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Sample Received	'Empty'		15/08/2014	N Cov	N/A

Analyst Comments for 14185596:

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: **22 August 2014**

Title: **Inorganics Operations Manager**

**ALS Environmental Ltd**

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Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

# Certificate of Analysis



Report Number: **COV/1129264/2014**

Issue **1**

Laboratory Number: **14185597**

Sample **9** of **20**

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

Sample Point Description:

Sample Description: **M10**

Sample Matrix: **Ground waters**

Sample Date/Time: **13 August 2014**

Sample Received: **14 August 2014**

Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	6.8	pH units	16/08/2014	Y Cov	WAS039
Conductivity- Electrical 20C	191	uS/cm	16/08/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	16/08/2014	Y Cov	WAS036
Chloride as Cl	17.5	mg/l	16/08/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	4.8	mg/l	15/08/2014	Y Cov	WAS052

Analyst Comments for 14185597:

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: **22 August 2014**

Title: **Inorganics Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1129264/2014**

Issue **1**

Laboratory Number: **14185598**

Sample **10** of **20**

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

Sample Point Description:

Sample Description: **BL BH1**

Sample Matrix: **Ground waters**

Sample Date/Time: **13 August 2014**

Sample Received: **14 August 2014**

Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.0	pH units	16/08/2014	Y Cov	WAS039
Conductivity- Electrical 20C	256	uS/cm	16/08/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	16/08/2014	Y Cov	WAS036
Chloride as Cl	7.70	mg/l	16/08/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	7.1	mg/l	15/08/2014	Y Cov	WAS052

Analyst Comments for 14185598:

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: **22 August 2014**

Title: **Inorganics Operations Manager**

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# Certificate of Analysis



Report Number: **COV/1129264/2014**

Issue **1**

Laboratory Number: **14185599**

Sample **11** of **20**

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

Sample Point Description:

Sample Description: **M18**

Sample Matrix: **Ground waters**

Sample Date/Time: **13 August 2014**

Sample Received: **14 August 2014**

Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	6.7	pH units	16/08/2014	Y Cov	WAS039
Conductivity- Electrical 20C	218	uS/cm	16/08/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	16/08/2014	Y Cov	WAS036
Chloride as Cl	14.9	mg/l	16/08/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	4.0	mg/l	15/08/2014	Y Cov	WAS052

Analyst Comments for 14185599:

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: **22 August 2014**

Title: **Inorganics Operations Manager**

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# Certificate of Analysis



Report Number: **COV/1129264/2014**

Issue **1**

Laboratory Number: **14185600**

Sample **12** of **20**

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

Sample Point Description:

Sample Description: **M33**

Sample Matrix: **Ground waters**

Sample Date/Time: **13 August 2014**

Sample Received: **14 August 2014**

Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	6.7	pH units	16/08/2014	Y Cov	WAS039
Conductivity- Electrical 20C	151	uS/cm	16/08/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	16/08/2014	Y Cov	WAS036
Chloride as Cl	9.79	mg/l	16/08/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	2.9	mg/l	15/08/2014	Y Cov	WAS052

Analyst Comments for 14185600:

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: **22 August 2014**

Title: **Inorganics Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1129264/2014**

Issue **1**

Laboratory Number: **14185601**

Sample **13** of **20**

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

Sample Point Description:

Sample Description: **M34**

Sample Matrix: **Ground waters**

Sample Date/Time: **13 August 2014**

Sample Received: **14 August 2014**

Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.0	pH units	16/08/2014	Y Cov	WAS039
Conductivity- Electrical 20C	334	uS/cm	16/08/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	16/08/2014	Y Cov	WAS036
Chloride as Cl	17.0	mg/l	16/08/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	1.6	mg/l	15/08/2014	Y Cov	WAS052

Analyst Comments for 14185601:

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: **22 August 2014**

Title: **Inorganics Operations Manager**

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# Certificate of Analysis



Report Number: **COV/1129264/2014**

Issue **1**

Laboratory Number: **14185602**

Sample **14** of **20**

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

Sample Point Description:

Sample Description: **M19**

Sample Matrix: **Ground waters**

Sample Date/Time: **13 August 2014**

Sample Received: **14 August 2014**

Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.8	pH units	16/08/2014	Y Cov	WAS039
Conductivity- Electrical 20C	514	uS/cm	16/08/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	2.64	mg/l	16/08/2014	Y Cov	WAS036
Chloride as Cl	15.6	mg/l	16/08/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	7.3	mg/l	15/08/2014	Y Cov	WAS052

Analyst Comments for 14185602:

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: **22 August 2014**

Title: **Inorganics Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1129264/2014**

Issue **1**

Laboratory Number: **14185603**

Sample **15** of **20**

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

Sample Point Description:

Sample Description: **M20**

Sample Matrix: **Ground waters**

Sample Date/Time: **13 August 2014**

Sample Received: **14 August 2014**

Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	6.1	pH units	16/08/2014	Y Cov	WAS039
Conductivity- Electrical 20C	88.9	uS/cm	16/08/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	16/08/2014	Y Cov	WAS036
Chloride as Cl	8.44	mg/l	16/08/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	3.3	mg/l	15/08/2014	Y Cov	WAS052

Analyst Comments for 14185603:

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: **22 August 2014**

Title: **Inorganics Operations Manager**

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# Certificate of Analysis



Report Number: **COV/1129264/2014**

Issue **1**

Laboratory Number: **14185604**

Sample **16** of **20**

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

Sample Point Description:

Sample Description: **M21**

Sample Matrix: **Ground waters**

Sample Date/Time: **13 August 2014**

Sample Received: **14 August 2014**

Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.5	pH units	16/08/2014	Y Cov	WAS039
Conductivity- Electrical 20C	537	uS/cm	16/08/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	0.82	mg/l	16/08/2014	Y Cov	WAS036
Chloride as Cl	22.7	mg/l	16/08/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	1.6	mg/l	15/08/2014	Y Cov	WAS052

Analyst Comments for 14185604:

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: **22 August 2014**

Title: **Inorganics Operations Manager**

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# Certificate of Analysis



Report Number: **COV/1129264/2014**

Issue **1**

Laboratory Number: **14185605**

Sample **17** of **20**

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

Sample Point Description:

Sample Description: **M22**

Sample Matrix: **Ground waters**

Sample Date/Time: **13 August 2014**

Sample Received: **14 August 2014**

Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	6.9	pH units	16/08/2014	Y Cov	WAS039
Conductivity- Electrical 20C	279	uS/cm	16/08/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	0.38	mg/l	16/08/2014	Y Cov	WAS036
Chloride as Cl	16.9	mg/l	16/08/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	4.4	mg/l	15/08/2014	Y Cov	WAS052

Analyst Comments for 14185605:

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: **22 August 2014**

Title: **Inorganics Operations Manager**

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# Certificate of Analysis



Report Number: **COV/1129264/2014**

Issue **1**

Laboratory Number: **14185606**

Sample **18** of **20**

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

Sample Point Description:

Sample Description: **M31**

Sample Matrix: **Ground waters**

Sample Date/Time: **13 August 2014**

Sample Received: **14 August 2014**

Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	6.7	pH units	16/08/2014	Y Cov	WAS039
Conductivity- Electrical 20C	234	uS/cm	16/08/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	16/08/2014	Y Cov	WAS036
Chloride as Cl	15.1	mg/l	16/08/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	2.1	mg/l	15/08/2014	Y Cov	WAS052

Analyst Comments for 14185606:

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: **22 August 2014**

Title: **Inorganics Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1129264/2014**

Issue **1**

Laboratory Number: **14185607**

Sample **19** of **20**

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

Sample Point Description:

Sample Description: **M35**

Sample Matrix: **Ground waters**

Sample Date/Time: **13 August 2014**

Sample Received: **14 August 2014**

Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	6.1	pH units	16/08/2014	Y Cov	WAS039
Conductivity- Electrical 20C	196	uS/cm	16/08/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	16/08/2014	Y Cov	WAS036
Chloride as Cl	41.9	mg/l	16/08/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	15/08/2014	Y Cov	WAS052

Analyst Comments for 14185607:

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: **22 August 2014**

Title: **Inorganics Operations Manager**

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# Certificate of Analysis



Report Number: **COV/1129264/2014**

Issue **1**

Laboratory Number: **14185608**

Sample **20** of **20**

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

Sample Point Description:

Sample Description: **GW1**

Sample Matrix: **Ground waters**

Sample Date/Time:

Sample Received: **14 August 2014**

Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Sample Received	'Empty'		15/08/2014	N Cov	N/A

Analyst Comments for 14185608: 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: **22 August 2014**

Title: **Inorganics Operations Manager**

**ALS Environmental Ltd**

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**ANALYST COMMENTS FOR REPORT**

**COV/1129264/2014**

**Issue 1**

Date of Issue: **22 August 2014**

Sample No	Analysis Comments
14185589	
14185590	
14185591	
14185592	
14185593	
14185594	
14185595	
14185596	
14185597	
14185598	
14185599	
14185600	
14185601	
14185602	
14185603	
14185604	
14185605	
14185606	
14185607	
14185608	

Signed:



Name: **C. Law**

Date: **22 August 2014**

Title: **Inorganics Operations Manager**

## DETERMINAND COMMENTS FOR REPORT COV/1129264/2014

ISSUE 1

Date of Issue : 22 August 2014

Sample No	Description	Determinand	Comments

Signed:



Name: C. Law

Date: 22 August 2014

Title: Inorganics Operations Manager

**ALS Environmental Ltd**  
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[www.alsenvironmental.co.uk](http://www.alsenvironmental.co.uk)

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

16 September 2014

**Test Report: COV/1134761/2014**

Dear Ms Francis

Analysis of your sample(s) submitted on 10 September 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: 

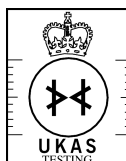
Name: A. Horobin

Title: Organic Operations Manager





# Report Summary



1314  
0897  
4409



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

Date of Issue: **16 September 2014**

Report Number: **COV/1134761/2014**

Issue **1**

**Job Description:** Llwyn Isaf

**Job Location:** September - Llwyn Isaf

Number of Samples  
included in this report **11**

Job Received: **10 September 2014**

Number of Test Results  
included in this report **55**

Analysis Commenced: **11 September 2014**

Signed: *A I Horobin*

Name: **A. Horobin**

Date: **16 September 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.

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# Certificate of Analysis



Report Number: **COV/1134761/2014**

Issue **1**

Laboratory Number: **14228844**

Sample **1** of **11**

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

Sample Point Description:

Sample Description: **M10**

Sample Matrix: **Ground waters**

Sample Date/Time: **09 September 2014**

Sample Received: **10 September 2014**

Analysis Complete: **16 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.5	pH units	12/09/2014	Y Cov	WAS039
Conductivity- Electrical 20C	190	uS/cm	12/09/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	12/09/2014	Y Cov	WAS036
Chloride as Cl	16.6	mg/l	15/09/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	8.3	mg/l	15/09/2014	Y Cov	WAS052

**Analyst Comments for 14228844:**

This sample has been analysed for Dissolved Oxygen, Fixed 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: *A I Horobin*

Name: **A. Horobin**

Date: **16 September 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



Report Number: **COV/1134761/2014**

Issue **1**

Laboratory Number: **14228845**

Sample **2** of **11**

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

Sample Point Description:

Sample Description: **BL BH1**

Sample Matrix: **Ground waters**

Sample Date/Time: **09 September 2014**

Sample Received: **10 September 2014**

Analysis Complete: **16 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.7	pH units	12/09/2014	Y Cov	WAS039
Conductivity- Electrical 20C	413	uS/cm	12/09/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	12/09/2014	Y Cov	WAS036
Chloride as Cl	13.9	mg/l	15/09/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	8.9	mg/l	15/09/2014	Y Cov	WAS052

## Analyst Comments for 14228845:

This sample has been analysed for Dissolved Oxygen, Fixed 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: *A I Horobin*

Name: **A. Horobin**

Date: **16 September 2014**

Title: **Organic Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1134761/2014**

Issue **1**

Laboratory Number: **14228846**

Sample **3** of **11**

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

Sample Point Description:

Sample Description: **M18**

Sample Matrix: **Ground waters**

Sample Date/Time: **09 September 2014**

Sample Received: **10 September 2014**

Analysis Complete: **16 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.0	pH units	12/09/2014	Y Cov	WAS039
Conductivity- Electrical 20C	228	uS/cm	12/09/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	12/09/2014	Y Cov	WAS036
Chloride as Cl	16.1	mg/l	15/09/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	12.8	mg/l	15/09/2014	Y Cov	WAS052

## Analyst Comments for 14228846:

This sample has been analysed for Dissolved Oxygen, Fixed 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: *A I Horobin*

Name: **A. Horobin**

Date: **16 September 2014**

Title: **Organic Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1134761/2014**

Issue **1**

Laboratory Number: **14228847**

Sample **4** of **11**

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

Sample Point Description:

Sample Description: **M33**

Sample Matrix: **Ground waters**

Sample Date/Time: **09 September 2014**

Sample Received: **10 September 2014**

Analysis Complete: **16 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.2	pH units	12/09/2014	Y Cov	WAS039
Conductivity- Electrical 20C	148	uS/cm	12/09/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	12/09/2014	Y Cov	WAS036
Chloride as Cl	10.9	mg/l	15/09/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	12.9	mg/l	15/09/2014	Y Cov	WAS052

## Analyst Comments for 14228847:

This sample has been analysed for Dissolved Oxygen, Fixed 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: *A I Horobin*

Name: **A. Horobin**

Date: **16 September 2014**

Title: **Organic Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1134761/2014**

Issue **1**

Laboratory Number: **14228848**

Sample **5** of **11**

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

Sample Point Description:

Sample Description: **M34**

Sample Matrix: **Ground waters**

Sample Date/Time: **09 September 2014**

Sample Received: **10 September 2014**

Analysis Complete: **16 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.4	pH units	12/09/2014	Y Cov	WAS039
Conductivity- Electrical 20C	360	uS/cm	12/09/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	12/09/2014	Y Cov	WAS036
Chloride as Cl	16.2	mg/l	15/09/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	4.7	mg/l	15/09/2014	Y Cov	WAS052

## Analyst Comments for 14228848:

This sample has been analysed for Dissolved Oxygen, Fixed 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: *A I Horobin*

Name: **A. Horobin**

Date: **16 September 2014**

Title: **Organic Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1134761/2014**

Issue **1**

Laboratory Number: **14228849**

Sample **6** of **11**

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

Sample Point Description:

Sample Description: **M19**

Sample Matrix: **Ground waters**

Sample Date/Time: **09 September 2014**

Sample Received: **10 September 2014**

Analysis Complete: **16 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	6.4	pH units	12/09/2014	Y Cov	WAS039
Conductivity- Electrical 20C	91.1	uS/cm	12/09/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	12/09/2014	Y Cov	WAS036
Chloride as Cl	8.76	mg/l	15/09/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	10.0	mg/l	15/09/2014	Y Cov	WAS052

## Analyst Comments for 14228849:

This sample has been analysed for Dissolved Oxygen, Fixed 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: *A I Horobin*

Name: **A. Horobin**

Date: **16 September 2014**

Title: **Organic Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1134761/2014**

Issue **1**

Laboratory Number: **14228850**

Sample **7** of **11**

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

Sample Point Description:

Sample Description: **M20**

Sample Matrix: **Ground waters**

Sample Date/Time: **09 September 2014**

Sample Received: **10 September 2014**

Analysis Complete: **16 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	8.0	pH units	12/09/2014	Y Cov	WAS039
Conductivity- Electrical 20C	476	uS/cm	12/09/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	2.54	mg/l	12/09/2014	Y Cov	WAS036
Chloride as Cl	12.7	mg/l	15/09/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	>14.5	mg/l	15/09/2014	Y Cov	WAS052

**Analyst Comments for 14228850:**

This sample has been analysed for Dissolved Oxygen, Fixed 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: *A I Horobin*

Name: **A. Horobin**

Date: **16 September 2014**

Title: **Organic Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1134761/2014**

Issue **1**

Laboratory Number: **14228851**

Sample **8** of **11**

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

Sample Point Description:

Sample Description: **M21**

Sample Matrix: **Ground waters**

Sample Date/Time: **09 September 2014**

Sample Received: **10 September 2014**

Analysis Complete: **16 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.9	pH units	12/09/2014	Y Cov	WAS039
Conductivity- Electrical 20C	550	uS/cm	12/09/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	0.72	mg/l	12/09/2014	Y Cov	WAS036
Chloride as Cl	22.7	mg/l	15/09/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	11.2	mg/l	15/09/2014	Y Cov	WAS052

## Analyst Comments for 14228851:

This sample has been analysed for Dissolved Oxygen, Fixed 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: *A I Horobin*

Name: **A. Horobin**

Date: **16 September 2014**

Title: **Organic Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1134761/2014**

Issue **1**

Laboratory Number: **14228852**

Sample **9** of **11**

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

Sample Point Description:

Sample Description: **M22**

Sample Matrix: **Ground waters**

Sample Date/Time: **09 September 2014**

Sample Received: **10 September 2014**

Analysis Complete: **16 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.5	pH units	12/09/2014	Y Cov	WAS039
Conductivity- Electrical 20C	295	uS/cm	12/09/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	0.35	mg/l	12/09/2014	Y Cov	WAS036
Chloride as Cl	18.5	mg/l	15/09/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	8.3	mg/l	15/09/2014	Y Cov	WAS052

## Analyst Comments for 14228852:

This sample has been analysed for Dissolved Oxygen, Fixed 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: *A I Horobin*

Name: **A. Horobin**

Date: **16 September 2014**

Title: **Organic Operations Manager**

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# Certificate of Analysis



Report Number: **COV/1134761/2014**

Issue **1**

Laboratory Number: **14228853**

Sample **10** of **11**

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

Sample Point Description:

Sample Description: **M31**

Sample Matrix: **Ground waters**

Sample Date/Time: **09 September 2014**

Sample Received: **10 September 2014**

Analysis Complete: **16 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.3	pH units	12/09/2014	Y Cov	WAS039
Conductivity- Electrical 20C	250	uS/cm	12/09/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	12/09/2014	Y Cov	WAS036
Chloride as Cl	16.4	mg/l	15/09/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	9.3	mg/l	15/09/2014	Y Cov	WAS052

## Analyst Comments for 14228853:

This sample has been analysed for Dissolved Oxygen, Fixed 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: *A I Horobin*

Name: **A. Horobin**

Date: **16 September 2014**

Title: **Organic Operations Manager**

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# Certificate of Analysis



Report Number: **COV/1134761/2014**

Issue **1**

Laboratory Number: **14228854**

Sample **11** of **11**

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

Sample Point Description:

Sample Description: **M35**

Sample Matrix: **Ground waters**

Sample Date/Time: **09 September 2014**

Sample Received: **10 September 2014**

Analysis Complete: **16 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	6.5	pH units	12/09/2014	Y Cov	WAS039
Conductivity- Electrical 20C	145	uS/cm	12/09/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	12/09/2014	Y Cov	WAS036
Chloride as Cl	25.8	mg/l	15/09/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	3.3	mg/l	15/09/2014	Y Cov	WAS052

#### Analyst Comments for 14228854:

This sample has been analysed for Dissolved Oxygen, Fixed 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: *A I Horobin*

Name: **A. Horobin**

Date: **16 September 2014**

Title: **Organic Operations Manager**

**ALS Environmental Ltd**

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**ANALYST COMMENTS FOR REPORT**
**COV/1134761/2014**
**Issue 1**
**Date of Issue: 16 September 2014**

Sample No	Analysis Comments
14228844	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14228845	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14228846	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14228847	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14228848	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14228849	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14228850	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14228851	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14228852	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14228853	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14228854	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.

Signed: *A I Horobin*

Name: **A. Horobin**

Date: **16 September 2014**

Title: **Organic Operations Manager**

DETERMINAND COMMENTS FOR REPORT COV/1134761/2014

ISSUE 1

Date of Issue : 16 September 2014

Sample No	Description	Determinand	Comments

Signed:

A I Horobin

Name: A. Horobin

Date: 16 September 2014

Title: Organic Operations Manager

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[www.alsenvironmental.co.uk](http://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/1140407/2014**

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,

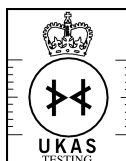
Signed: 

Name: A. Horobin

Title: Organic Operations Manager



# Report Summary



1314  
0897  
4409



**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/1140407/2014**

Issue **1**

**Job Description:** Llwyn Isaf

**Job Location:** October - Llwyn Isaf

Number of Samples  
included in this report **12**

Job Received: **08 October 2014**

Number of Test Results  
included in this report **241**

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.

This communication has been sent to you by ALS Environmental Ltd. Registered in England and Wales. Registration No. 02148934. Registered Office: ALS Environmental Limited, Torrington Avenue, Coventry, CV4 9GU.

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**Page 1 of 15**



# Certificate of Analysis



Report Number: **COV/1140407/2014**

Issue **1**

Laboratory Number: **14273540**

Sample **1** of **12**

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

Sample Point Description:

Sample Description: **M10**

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	0.700	ug/l	15/10/2014	Y Cov	WAS049
Calcium , Total as Ca	27.1	mg/l	15/10/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	15/10/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	15/10/2014	Y Cov	WAS049
Iron, Total as Fe	2300	ug/l	15/10/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	15/10/2014	Y Cov	WAS049
Magnesium, Total as Mg	2.8	mg/l	15/10/2014	Y Cov	WAS049
Manganese , Total as Mn	8770	ug/l	15/10/2014	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	15/10/2014	Y Cov	WAS049
Potassium , Total as K	2.45	mg/l	15/10/2014	Y Cov	WAS049
Sodium , Total as Na	4.31	mg/l	15/10/2014	Y Cov	WAS049
pH	7.4	pH units	09/10/2014	Y Cov	WAS039
Conductivity- Electrical 20C	189	uS/cm	09/10/2014	Y Cov	WAS039
Alkalinity as CaCO3	85.0	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	15.1	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	2.2	mg/l	09/10/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	6.1	mg/l	09/10/2014	Y Cov	WAS052
TOC (Filtered)	1.6	mg/l	10/10/2014	Y Cov	WAS005

Analyst Comments for 14273540:

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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# Certificate of Analysis



Report Number: **COV/1140407/2014**

Issue **1**

Laboratory Number: **14273541**

Sample **2** of **12**

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

Sample Point Description:

Sample Description: **BL BH1**

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	0.600	ug/l	15/10/2014	Y Cov	WAS049
Calcium , Total as Ca	26.6	mg/l	15/10/2014	Y Cov	WAS049
Chromium , Total as Cr	14.3	ug/l	15/10/2014	Y Cov	WAS049
Copper , Total as Cu	18.7	ug/l	15/10/2014	Y Cov	WAS049
Iron, Total as Fe	10700	ug/l	15/10/2014	Y Cov	WAS049
Lead , Total as Pb	13.7	ug/l	15/10/2014	Y Cov	WAS049
Magnesium, Total as Mg	4.6	mg/l	15/10/2014	Y Cov	WAS049
Manganese , Total as Mn	1380	ug/l	15/10/2014	Y Cov	WAS049
Nickel , Total as Ni	30.1	ug/l	15/10/2014	Y Cov	WAS049
Potassium , Total as K	1.81	mg/l	15/10/2014	Y Cov	WAS049
Sodium , Total as Na	4.41	mg/l	15/10/2014	Y Cov	WAS049
pH	7.2	pH units	09/10/2014	Y Cov	WAS039
Conductivity- Electrical 20C	165	uS/cm	09/10/2014	Y Cov	WAS039
Alkalinity as CaCO3	151	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	19.0	mg/l	09/10/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	0.46	mg/l	09/10/2014	Y Cov	WAS036
Sulphate as SO4	7.2	mg/l	09/10/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	7.2	mg/l	09/10/2014	Y Cov	WAS052
TOC (Filtered)	<0.7	mg/l	10/10/2014	Y Cov	WAS005

Analyst Comments for 14273541:

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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# Certificate of Analysis



Report Number: **COV/1140407/2014**

Issue **1**

Laboratory Number: **14273542**

Sample **3** of **12**

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

Sample Point Description:

Sample Description: **M18**

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	0.700	ug/l	15/10/2014	Y Cov	WAS049
Calcium , Total as Ca	37.0	mg/l	15/10/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	15/10/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	15/10/2014	Y Cov	WAS049
Iron, Total as Fe	1700	ug/l	15/10/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	15/10/2014	Y Cov	WAS049
Magnesium, Total as Mg	3.0	mg/l	15/10/2014	Y Cov	WAS049
Manganese , Total as Mn	490	ug/l	15/10/2014	Y Cov	WAS049
Nickel , Total as Ni	3.60	ug/l	15/10/2014	Y Cov	WAS049
Potassium , Total as K	1.58	mg/l	15/10/2014	Y Cov	WAS049
Sodium , Total as Na	8.51	mg/l	15/10/2014	Y Cov	WAS049
pH	6.7	pH units	09/10/2014	Y Cov	WAS039
Conductivity- Electrical 20C	227	uS/cm	09/10/2014	Y Cov	WAS039
Alkalinity as CaCO3	104	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	16.5	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	3.9	mg/l	09/10/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	5.3	mg/l	09/10/2014	Y Cov	WAS052
TOC (Filtered)	<0.7	mg/l	10/10/2014	Y Cov	WAS005

Analyst Comments for 14273542:

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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# Certificate of Analysis



Report Number: **COV/1140407/2014**

Issue **1**

Laboratory Number: **14273543**

Sample **4** of **12**

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

Sample Point Description:

Sample Description: **M33**

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	<0.600	ug/l	15/10/2014	Y Cov	WAS049
Calcium , Total as Ca	18.3	mg/l	15/10/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	15/10/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	15/10/2014	Y Cov	WAS049
Iron, Total as Fe	316	ug/l	15/10/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	15/10/2014	Y Cov	WAS049
Magnesium, Total as Mg	2.2	mg/l	15/10/2014	Y Cov	WAS049
Manganese , Total as Mn	47.2	ug/l	15/10/2014	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	15/10/2014	Y Cov	WAS049
Potassium , Total as K	2.05	mg/l	15/10/2014	Y Cov	WAS049
Sodium , Total as Na	6.80	mg/l	15/10/2014	Y Cov	WAS049
pH	7.0	pH units	09/10/2014	Y Cov	WAS039
Conductivity- Electrical 20C	135	uS/cm	09/10/2014	Y Cov	WAS039
Alkalinity as CaCO3	54.0	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	9.71	mg/l	09/10/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	0.91	mg/l	09/10/2014	Y Cov	WAS036
Sulphate as SO4	1.4	mg/l	09/10/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	8.7	mg/l	09/10/2014	Y Cov	WAS052
TOC (Filtered)	1.7	mg/l	10/10/2014	Y Cov	WAS005

Analyst Comments for 14273543:

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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# Certificate of Analysis



Report Number: **COV/1140407/2014**

Issue **1**

Laboratory Number: **14273544**

Sample **5** of **12**

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

Sample Point Description:

Sample Description: **M34**

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	<0.600	ug/l	15/10/2014	Y Cov	WAS049
Calcium , Total as Ca	62.6	mg/l	15/10/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	15/10/2014	Y Cov	WAS049
Copper , Total as Cu	28.6	ug/l	15/10/2014	Y Cov	WAS049
Iron, Total as Fe	4100	ug/l	15/10/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	15/10/2014	Y Cov	WAS049
Magnesium, Total as Mg	6.7	mg/l	15/10/2014	Y Cov	WAS049
Manganese , Total as Mn	5360	ug/l	15/10/2014	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	15/10/2014	Y Cov	WAS049
Potassium , Total as K	2.49	mg/l	15/10/2014	Y Cov	WAS049
Sodium , Total as Na	10.1	mg/l	15/10/2014	Y Cov	WAS049
pH	7.0	pH units	09/10/2014	Y Cov	WAS039
Conductivity- Electrical 20C	366	uS/cm	09/10/2014	Y Cov	WAS039
Alkalinity as CaCO3	190	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	16.2	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	8.5	mg/l	09/10/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	6.2	mg/l	09/10/2014	Y Cov	WAS052
TOC (Filtered)	1.1	mg/l	10/10/2014	Y Cov	WAS005

Analyst Comments for 14273544:

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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# Certificate of Analysis



Report Number: **COV/1140407/2014**

Issue **1**

Laboratory Number: **14273545**

Sample **6** of **12**

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

Sample Point Description:

Sample Description: **M19**

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	<0.600	ug/l	15/10/2014	Y Cov	WAS049
Calcium , Total as Ca	7.00	mg/l	15/10/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	15/10/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	15/10/2014	Y Cov	WAS049
Iron, Total as Fe	<230	ug/l	15/10/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	15/10/2014	Y Cov	WAS049
Magnesium, Total as Mg	3.6	mg/l	15/10/2014	Y Cov	WAS049
Manganese , Total as Mn	17.0	ug/l	15/10/2014	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	15/10/2014	Y Cov	WAS049
Potassium , Total as K	0.39	mg/l	15/10/2014	Y Cov	WAS049
Sodium , Total as Na	5.92	mg/l	15/10/2014	Y Cov	WAS049
pH	6.0	pH units	09/10/2014	Y Cov	WAS039
Conductivity- Electrical 20C	92.4	uS/cm	09/10/2014	Y Cov	WAS039
Alkalinity as CaCO3	24.0	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	8.04	mg/l	09/10/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	1.33	mg/l	09/10/2014	Y Cov	WAS036
Sulphate as SO4	6.6	mg/l	09/10/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	7.5	mg/l	09/10/2014	Y Cov	WAS052
TOC (Filtered)	<0.7	mg/l	10/10/2014	Y Cov	WAS005

Analyst Comments for 14273545:

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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**Page 7 of 15**



# Certificate of Analysis



Report Number: **COV/1140407/2014**

Issue **1**

Laboratory Number: **14273546**

Sample **7** of **12**

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

Sample Point Description:

Sample Description: **M20**

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	<0.600	ug/l	15/10/2014	Y Cov	WAS049
Calcium , Total as Ca	75.7	mg/l	15/10/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	15/10/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	15/10/2014	Y Cov	WAS049
Iron, Total as Fe	<230	ug/l	15/10/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	15/10/2014	Y Cov	WAS049
Magnesium, Total as Mg	8.6	mg/l	15/10/2014	Y Cov	WAS049
Manganese , Total as Mn	24.5	ug/l	15/10/2014	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	15/10/2014	Y Cov	WAS049
Potassium , Total as K	7.85	mg/l	15/10/2014	Y Cov	WAS049
Sodium , Total as Na	11.3	mg/l	15/10/2014	Y Cov	WAS049
pH	7.7	pH units	09/10/2014	Y Cov	WAS039
Conductivity- Electrical 20C	440	uS/cm	09/10/2014	Y Cov	WAS039
Alkalinity as CaCO3	244	mg/l	10/10/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	2.81	mg/l	09/10/2014	Y Cov	WAS036
Chloride as Cl	12.2	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	5.1	mg/l	09/10/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	4.6	mg/l	09/10/2014	Y Cov	WAS052
TOC (Filtered)	0.9	mg/l	10/10/2014	Y Cov	WAS005

Analyst Comments for 14273546:

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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# Certificate of Analysis



Report Number: **COV/1140407/2014**

Issue **1**

Laboratory Number: **14273547**

Sample **8** of **12**

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

Sample Point Description:

Sample Description: **M21**

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	<0.600	ug/l	15/10/2014	Y Cov	WAS049
Calcium , Total as Ca	101	mg/l	15/10/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	15/10/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	15/10/2014	Y Cov	WAS049
Iron, Total as Fe	<230	ug/l	15/10/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	15/10/2014	Y Cov	WAS049
Magnesium, Total as Mg	10.0	mg/l	15/10/2014	Y Cov	WAS049
Manganese , Total as Mn	1570	ug/l	15/10/2014	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	15/10/2014	Y Cov	WAS049
Potassium , Total as K	8.62	mg/l	15/10/2014	Y Cov	WAS049
Sodium , Total as Na	13.9	mg/l	15/10/2014	Y Cov	WAS049
pH	7.6	pH units	09/10/2014	Y Cov	WAS039
Conductivity- Electrical 20C	555	uS/cm	09/10/2014	Y Cov	WAS039
Alkalinity as CaCO3	293	mg/l	10/10/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	0.85	mg/l	09/10/2014	Y Cov	WAS036
Chloride as Cl	23.1	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	10.2	mg/l	09/10/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	5.4	mg/l	09/10/2014	Y Cov	WAS052
TOC (Filtered)	1.4	mg/l	10/10/2014	Y Cov	WAS005

Analyst Comments for 14273547:

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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# Certificate of Analysis



Report Number: **COV/1140407/2014**

Issue **1**

Laboratory Number: **14273548**

Sample **9** of **12**

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

Sample Point Description:

Sample Description: **M22**

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	<0.600	ug/l	15/10/2014	Y Cov	WAS049
Calcium , Total as Ca	46.6	mg/l	15/10/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	15/10/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	15/10/2014	Y Cov	WAS049
Iron, Total as Fe	775	ug/l	15/10/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	15/10/2014	Y Cov	WAS049
Magnesium, Total as Mg	6.1	mg/l	15/10/2014	Y Cov	WAS049
Manganese , Total as Mn	168	ug/l	15/10/2014	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	15/10/2014	Y Cov	WAS049
Potassium , Total as K	5.09	mg/l	15/10/2014	Y Cov	WAS049
Sodium , Total as Na	9.70	mg/l	15/10/2014	Y Cov	WAS049
pH	7.0	pH units	09/10/2014	Y Cov	WAS039
Conductivity- Electrical 20C	292	uS/cm	09/10/2014	Y Cov	WAS039
Alkalinity as CaCO3	139	mg/l	10/10/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	0.47	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	0.82	mg/l	09/10/2014	Y Cov	WAS036
Sulphate as SO4	5.9	mg/l	09/10/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	7.7	mg/l	09/10/2014	Y Cov	WAS052
TOC (Filtered)	0.8	mg/l	10/10/2014	Y Cov	WAS005

Analyst Comments for 14273548:

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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# Certificate of Analysis



Report Number: **COV/1140407/2014**

Issue **1**

Laboratory Number: **14273549**

Sample **10** of **12**

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

Sample Point Description:

Sample Description: **M31**

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	<0.600	ug/l	15/10/2014	Y Cov	WAS049
Calcium , Total as Ca	35.2	mg/l	15/10/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	15/10/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	15/10/2014	Y Cov	WAS049
Iron, Total as Fe	<230	ug/l	15/10/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	15/10/2014	Y Cov	WAS049
Magnesium, Total as Mg	4.4	mg/l	15/10/2014	Y Cov	WAS049
Manganese , Total as Mn	14.5	ug/l	15/10/2014	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	15/10/2014	Y Cov	WAS049
Potassium , Total as K	5.35	mg/l	15/10/2014	Y Cov	WAS049
Sodium , Total as Na	8.83	mg/l	15/10/2014	Y Cov	WAS049
pH	6.9	pH units	09/10/2014	Y Cov	WAS039
Conductivity- Electrical 20C	242	uS/cm	09/10/2014	Y Cov	WAS039
Alkalinity as CaCO3	108	mg/l	10/10/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	09/10/2014	Y Cov	WAS036
Chloride as Cl	13.0	mg/l	09/10/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	0.55	mg/l	09/10/2014	Y Cov	WAS036
Sulphate as SO4	5.1	mg/l	09/10/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	3.5	mg/l	09/10/2014	Y Cov	WAS052
TOC (Filtered)	2.5	mg/l	10/10/2014	Y Cov	WAS005

Analyst Comments for 14273549:

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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# Certificate of Analysis



Report Number: **COV/1140407/2014**

Issue **1**

Laboratory Number: **14273550**

Sample **11** of **12**

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

Sample Point Description:

Sample Description: **M35**

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	<0.600	ug/l	15/10/2014	Y Cov	WAS049
Calcium , Total as Ca	10.1	mg/l	15/10/2014	Y Cov	WAS049
Chromium , Total as Cr	3.20	ug/l	15/10/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	15/10/2014	Y Cov	WAS049
Iron, Total as Fe	15900	ug/l	15/10/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	15/10/2014	Y Cov	WAS049
Magnesium, Total as Mg	1.4	mg/l	15/10/2014	Y Cov	WAS049
Manganese , Total as Mn	396	ug/l	15/10/2014	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	15/10/2014	Y Cov	WAS049
Potassium , Total as K	0.29	mg/l	15/10/2014	Y Cov	WAS049
Sodium , Total as Na	12.4	mg/l	15/10/2014	Y Cov	WAS049
pH	6.2	pH units	09/10/2014	Y Cov	WAS039
Conductivity- Electrical 20C	153	uS/cm	09/10/2014	Y Cov	WAS039
Alkalinity as CaCO3	37.4	mg/l	10/10/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	09/10/2014	Y Cov	WAS036
Chloride as Cl	22.5	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	1.6	mg/l	09/10/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	0.8	mg/l	09/10/2014	Y Cov	WAS052
TOC (Filtered)	5.1	mg/l	13/10/2014	Y Cov	WAS005

Analyst Comments for 14273550:

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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# Certificate of Analysis



Report Number: **COV/1140407/2014**

Issue **1**

Laboratory Number: **14273551**

Sample **12** of **12**

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

Sample Point Description:

Sample Description: **Soakaway NS**

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
Cadmium , Total as Cd	<0.600	ug/l	15/10/2014	Y Cov	WAS049
Calcium , Total as Ca	10.4	mg/l	15/10/2014	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	15/10/2014	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	15/10/2014	Y Cov	WAS049
Iron, Total as Fe	<230	ug/l	15/10/2014	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	15/10/2014	Y Cov	WAS049
Magnesium, Total as Mg	1.3	mg/l	15/10/2014	Y Cov	WAS049
Manganese , Total as Mn	7.50	ug/l	15/10/2014	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	15/10/2014	Y Cov	WAS049
Potassium , Total as K	1.02	mg/l	15/10/2014	Y Cov	WAS049
Sodium , Total as Na	5.30	mg/l	15/10/2014	Y Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	15/10/2014	Y Cov	WAS049
pH	8.0	pH units	09/10/2014	Y Cov	WAS039
Conductivity- Electrical 20C	12400	uS/cm	09/10/2014	Y Cov	WAS039
Alkalinity as CaCO3	27.8	mg/l	10/10/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N (LL)	<0.06	mg/l	10/10/2014	Y Cov	WAS067
Chloride as Cl	11.9	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	2.1	mg/l	09/10/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	6.6	mg/l	09/10/2014	Y Cov	WAS052
TOC (Filtered)	10.6	mg/l	10/10/2014	Y Cov	WAS005

Analyst Comments for 14273551:

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**

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Page 13 of 15

**ANALYST COMMENTS FOR REPORT**

**COV/1140407/2014**

**Issue 1**

**Date of Issue: 16 October 2014**

Sample No	Analysis Comments
14273540	
14273541	
14273542	
14273543	
14273544	
14273545	
14273546	
14273547	
14273548	
14273549	
14273550	
14273551	

Signed: *A. Horobin*

Name: **A. Horobin**

Date: **16 October 2014**

Title: **Organic Operations Manager**

DETERMINAND COMMENTS FOR REPORT COV/1140407/2014

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

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

17 November 2014

**Test Report: COV/1146609/2014**

Dear Ms Francis

Analysis of your sample(s) submitted on 05 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: 

Name: A. Horobin

Title: Organic Operations Manager



Certificate No. GB97/10269  
Environmental Management Systems



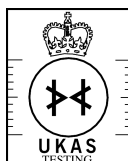
OHS 542058



FS 67435



# Report Summary



1314  
0897  
4409



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

Date of Issue: **17 November 2014**

Report Number: **COV/1146609/2014**

Issue **1**

**Job Description:** Llwyn Isaf

**Job Location:** Llwyn Isaf - Monthly

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

Job Received: **05 November 2014**

Number of Test Results  
included in this report **79**

Analysis Commenced: **06 November 2014**

Signed: *A I Horobin*

Name: **A. Horobin**

Date: **17 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.

This communication has been sent to you by ALS Environmental Ltd. Registered in England and Wales. Registration No. 02148934. Registered Office: ALS Environmental Limited, Torrington Avenue, Coventry, CV4 9GU.

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# Certificate of Analysis



Report Number: **COV/1146609/2014**

Issue **1**

Laboratory Number: **14321951**

Sample **1** of **14**

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

Sample Point Description:

Sample Description: **SWD (discharge)**

Sample Matrix: **Surface waters**

Sample Date/Time: **04 November 2014**

Sample Received: **05 November 2014**

Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.8	pH units	06/11/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N (LL)	<0.06	mg/l	07/11/2014	Y Cov	WAS067
Total Suspended Solids	2.00	mg/l	07/11/2014	Y Cov	WAS006
Dissolved Oxygen, Fixed	4.7	mg/l	10/11/2014	Y Cov	WAS052
BOD + ATU (5 day)	<1	mg/l	14/11/2014	Y Cov	WAS001
Dissolved Oxygen (Saturation)	39.2	%	10/11/2014	N Cov	None

## Analyst Comments for 14321951:

This sample has been analysed for Dissolved Oxygen, Fixed 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: *A I Horobin*

Name: **A. Horobin**

Date: **17 November 2014**

Title: **Organic Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1146609/2014**

Issue **1**

Laboratory Number: **14321952**

Sample **2** of **14**

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

Sample Point Description:

Sample Description: **M10**

Sample Matrix: **Ground waters**

Sample Date/Time: **04 November 2014**

Sample Received: **05 November 2014**

Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.4	pH units	06/11/2014	Y Cov	WAS039
Conductivity- Electrical 20C	178	uS/cm	06/11/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	06/11/2014	Y Cov	WAS036
Chloride as Cl	11.6	mg/l	06/11/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	7.4	mg/l	10/11/2014	Y Cov	WAS052

## Analyst Comments for 14321952:

This sample has been analysed for Dissolved Oxygen, Fixed 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: *A I Horobin*

Name: **A. Horobin**

Date: **17 November 2014**

Title: **Organic Operations Manager**

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# Certificate of Analysis



Report Number: **COV/1146609/2014**

Issue **1**

Laboratory Number: **14321953**

Sample **3** of **14**

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

Sample Point Description:

Sample Description: **BL BH1**

Sample Matrix: **Ground waters**

Sample Date/Time: **04 November 2014**

Sample Received: **05 November 2014**

Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	6.7	pH units	06/11/2014	Y Cov	WAS039
Conductivity- Electrical 20C	77.9	uS/cm	06/11/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	06/11/2014	Y Cov	WAS036
Chloride as Cl	24.3	mg/l	06/11/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	11.0	mg/l	10/11/2014	Y Cov	WAS052

## Analyst Comments for 14321953:

This sample has been analysed for Dissolved Oxygen, Fixed 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: *A I Horobin*

Name: **A. Horobin**

Date: **17 November 2014**

Title: **Organic Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1146609/2014**

Issue **1**

Laboratory Number: **14321954**

Sample **4** of **14**

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

Sample Point Description:

Sample Description: **M18**

Sample Matrix: **Ground waters**

Sample Date/Time: **04 November 2014**

Sample Received: **05 November 2014**

Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	6.8	pH units	06/11/2014	Y Cov	WAS039
Conductivity- Electrical 20C	229	uS/cm	06/11/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	06/11/2014	Y Cov	WAS036
Chloride as Cl	10.0	mg/l	06/11/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	3.3	mg/l	10/11/2014	Y Cov	WAS052

## Analyst Comments for 14321954:

This sample has been analysed for Dissolved Oxygen, Fixed 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: *A I Horobin*

Name: **A. Horobin**

Date: **17 November 2014**

Title: **Organic Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1146609/2014**

Issue **1**

Laboratory Number: **14321955**

Sample **5** of **14**

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

Sample Point Description:

Sample Description: **M33**

Sample Matrix: **Ground waters**

Sample Date/Time: **04 November 2014**

Sample Received: **05 November 2014**

Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.0	pH units	06/11/2014	Y Cov	WAS039
Conductivity- Electrical 20C	129	uS/cm	06/11/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	06/11/2014	Y Cov	WAS036
Chloride as Cl	13.3	mg/l	06/11/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	8.6	mg/l	10/11/2014	Y Cov	WAS052

## Analyst Comments for 14321955:

This sample has been analysed for Dissolved Oxygen, Fixed 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: *A I Horobin*

Name: **A. Horobin**

Date: **17 November 2014**

Title: **Organic Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1146609/2014**

Issue **1**

Laboratory Number: **14321956**

Sample **6** of **14**

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

Sample Point Description:

Sample Description: **M34**

Sample Matrix: **Ground waters**

Sample Date/Time: **04 November 2014**

Sample Received: **05 November 2014**

Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.0	pH units	06/11/2014	Y Cov	WAS039
Conductivity- Electrical 20C	378	uS/cm	06/11/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	06/11/2014	Y Cov	WAS036
Chloride as Cl	17.8	mg/l	06/11/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	2.1	mg/l	10/11/2014	Y Cov	WAS052

## Analyst Comments for 14321956:

This sample has been analysed for Dissolved Oxygen, Fixed 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: *A I Horobin*

Name: **A. Horobin**

Date: **17 November 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



Report Number: **COV/1146609/2014**

Issue **1**

Laboratory Number: **14321957**

Sample **7** of **14**

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

Sample Point Description:

Sample Description: **M19**

Sample Matrix: **Ground waters**

Sample Date/Time: **04 November 2014**

Sample Received: **05 November 2014**

Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	6.2	pH units	06/11/2014	Y Cov	WAS039
Conductivity- Electrical 20C	91.1	uS/cm	06/11/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	06/11/2014	Y Cov	WAS036
Chloride as Cl	8.70	mg/l	06/11/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	7.6	mg/l	10/11/2014	Y Cov	WAS052

## Analyst Comments for 14321957:

This sample has been analysed for Dissolved Oxygen, Fixed 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: *A I Horobin*

Name: **A. Horobin**

Date: **17 November 2014**

Title: **Organic Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1146609/2014**

Issue **1**

Laboratory Number: **14321958**

Sample **8** of **14**

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

Sample Point Description:

Sample Description: **M20**

Sample Matrix: **Ground waters**

Sample Date/Time: **04 November 2014**

Sample Received: **05 November 2014**

Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.8	pH units	06/11/2014	Y Cov	WAS039
Conductivity- Electrical 20C	398	uS/cm	06/11/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	3.30	mg/l	06/11/2014	Y Cov	WAS036
Chloride as Cl	12.4	mg/l	06/11/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	5.3	mg/l	10/11/2014	Y Cov	WAS052

## Analyst Comments for 14321958:

This sample has been analysed for Dissolved Oxygen, Fixed 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: *A I Horobin*

Name: **A. Horobin**

Date: **17 November 2014**

Title: **Organic Operations Manager**

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# Certificate of Analysis



Report Number: **COV/1146609/2014**

Issue **1**

Laboratory Number: **14321959**

Sample **9** of **14**

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

Sample Point Description:

Sample Description: **M21**

Sample Matrix: **Ground waters**

Sample Date/Time: **04 November 2014**

Sample Received: **05 November 2014**

Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.7	pH units	06/11/2014	Y Cov	WAS039
Conductivity- Electrical 20C	544	uS/cm	06/11/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	0.95	mg/l	06/11/2014	Y Cov	WAS036
Chloride as Cl	22.6	mg/l	06/11/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	7.5	mg/l	10/11/2014	Y Cov	WAS052

## Analyst Comments for 14321959:

This sample has been analysed for Dissolved Oxygen, Fixed 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: *A I Horobin*

Name: **A. Horobin**

Date: **17 November 2014**

Title: **Organic Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1146609/2014**

Issue **1**

Laboratory Number: **14321960**

Sample **10** of **14**

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

Sample Point Description:

Sample Description: **M22**

Sample Matrix: **Ground waters**

Sample Date/Time: **04 November 2014**

Sample Received: **05 November 2014**

Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.2	pH units	06/11/2014	Y Cov	WAS039
Conductivity- Electrical 20C	294	uS/cm	06/11/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	0.31	mg/l	06/11/2014	Y Cov	WAS036
Chloride as Cl	18.6	mg/l	06/11/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	4.5	mg/l	10/11/2014	Y Cov	WAS052

## Analyst Comments for 14321960:

This sample has been analysed for Dissolved Oxygen, Fixed 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: *A I Horobin*

Name: **A. Horobin**

Date: **17 November 2014**

Title: **Organic Operations Manager**

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# Certificate of Analysis



Report Number: **COV/1146609/2014**

Issue **1**

Laboratory Number: **14321961**

Sample **11** of **14**

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

Sample Point Description:

Sample Description: **M31**

Sample Matrix: **Ground waters**

Sample Date/Time: **04 November 2014**

Sample Received: **05 November 2014**

Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	6.9	pH units	06/11/2014	Y Cov	WAS039
Conductivity- Electrical 20C	239	uS/cm	06/11/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	06/11/2014	Y Cov	WAS036
Chloride as Cl	13.9	mg/l	06/11/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	4.8	mg/l	10/11/2014	Y Cov	WAS052

## Analyst Comments for 14321961:

This sample has been analysed for Dissolved Oxygen, Fixed 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: *A I Horobin*

Name: **A. Horobin**

Date: **17 November 2014**

Title: **Organic Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1146609/2014**

Issue **1**

Laboratory Number: **14321962**

Sample **12** of **14**

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

Sample Point Description:

Sample Description: **M35**

Sample Matrix: **Ground waters**

Sample Date/Time: **04 November 2014**

Sample Received: **05 November 2014**

Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	6.4	pH units	06/11/2014	Y Cov	WAS039
Conductivity- Electrical 20C	148	uS/cm	06/11/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	06/11/2014	Y Cov	WAS036
Chloride as Cl	16.3	mg/l	06/11/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	1.6	mg/l	10/11/2014	Y Cov	WAS052

## Analyst Comments for 14321962:

This sample has been analysed for Dissolved Oxygen, Fixed 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: *A I Horobin*

Name: **A. Horobin**

Date: **17 November 2014**

Title: **Organic Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1146609/2014**

Issue **1**

Laboratory Number: **14321963**

Sample **13** of **14**

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

Sample Point Description:

Sample Description: **Soakaway NS**

Sample Matrix: **Surface waters**

Sample Date/Time: **04 November 2014**

Sample Received: **05 November 2014**

Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.6	pH units	06/11/2014	Y Cov	WAS039
Conductivity- Electrical 20C	109	uS/cm	06/11/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N (LL)	<0.06	mg/l	07/11/2014	Y Cov	WAS067
Chloride as Cl	9.98	mg/l	06/11/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	7.4	mg/l	10/11/2014	Y Cov	WAS052

## Analyst Comments for 14321963:

This sample has been analysed for Dissolved Oxygen, Fixed 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: *A I Horobin*

Name: **A. Horobin**

Date: **17 November 2014**

Title: **Organic Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1146609/2014**

Issue **1**

Laboratory Number: **14321964**

Sample **14** of **14**

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

Sample Point Description:

Sample Description: **Biogen**

Sample Matrix: **Not Specified**

Sample Date/Time: **04 November 2014**

Sample Received: **05 November 2014**

Analysis Complete: **17 November 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.7	pH units	06/11/2014	Y Cov	WAS039
Conductivity- Electrical 20C	70.1	uS/cm	06/11/2014	Y Cov	WAS039
Alkalinity as CaCO3	32.1	mg/l	11/11/2014	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	06/11/2014	Y Cov	WAS036
Chloride as Cl	4.30	mg/l	06/11/2014	Y Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	08/11/2014	Y Cov	WAS036
Phosphorus, Total as P	<0.12	mg/l	13/11/2014	Y Cov	WAS049
Sulphate as SO4	<1.3	mg/l	08/11/2014	Y Cov	WAS036
Total Suspended Solids	5.00	mg/l	08/11/2014	Y Cov	WAS006
Dissolved Oxygen, Fixed	10.3	mg/l	10/11/2014	Y Cov	WAS052
BOD + ATU (5 day)	<1	mg/l	13/11/2014	Y Cov	WAS001
COD (Total)	<11.0	mg/l	07/11/2014	Y Cov	WAS040
TOC (Filtered)	<0.7	mg/l	12/11/2014	Y Cov	WAS005

## Analyst Comments for 14321964:

This sample has been analysed for Dissolved Oxygen, Fixed, BOD + ATU (5 day) 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: *A I Horobin*

Name: **A. Horobin**

Date: **17 November 2014**

Title: **Organic Operations Manager**

**ALS Environmental Ltd**

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# ANALYST COMMENTS FOR REPORT

COV/1146609/2014

Issue 1

Date of Issue: 17 November 2014

Sample No	Analysis Comments
14321951	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14321952	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14321953	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14321954	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14321955	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14321956	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14321957	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14321958	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14321959	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14321960	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14321961	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14321962	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14321963	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14321964	This sample has been analysed for Dissolved Oxygen, Fixed, BOD + ATU (5 day) outside recommended stability times. It is therefore possible that the results provided may be compromised.

Signed: A I Horobin

Name: **A. Horobin**

Date: **17 November 2014**

Title: **Organic Operations Manager**

## DETERMINAND COMMENTS FOR REPORT COV/1146609/2014

ISSUE 1

Date of Issue : 17 November 2014

Sample No	Description	Determinand	Comments

Signed:

A I Horobin

Name: A. Horobin

Date: 17 November 2014

Title: Organic Operations Manager



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

14 January 2015

**Test Report: COV/1153002/2014**

Dear Ms Francis

Analysis of your sample(s) submitted on 04 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,

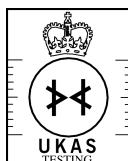
Signed: 

Name: C. Law

Title: Inorganics Operations Manager



# Report Summary



1314  
0897  
4409



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

Date of Issue: **14 January 2015**

Report Number: **COV/1153002/2014**

Issue **1**

**Job Description:** Llwyn Isaf

**Job Location:** December - Llwyn Isaf

Number of Samples  
included in this report **11**

Job Received: **04 December 2014**

Number of Test Results  
included in this report **55**

Analysis Commenced: **04 December 2014**

Signed:

Name: **C. Law**

Date: **14 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.

This communication has been sent to you by ALS Environmental Ltd. Registered in England and Wales. Registration No. 02148934. Registered Office: ALS Environmental Limited, Torrington Avenue, Coventry, CV4 9GU.

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**Page 1 of 14**

# Certificate of Analysis



Report Number: **COV/1153002/2014**

Issue **1**

Laboratory Number: **14371819**

Sample **1** of **11**

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

Sample Point Description:

Sample Description: **M10**

Sample Matrix: **Ground Water**

Sample Date/Time: **02 December 2014**

Sample Received: **04 December 2014**

Analysis Complete: **05 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.5	pH units	05/12/2014	Y Cov	WAS039
Conductivity- Electrical 20C	187	uS/cm	05/12/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	05/12/2014	Y Cov	WAS036
Chloride as Cl	9.45	mg/l	05/12/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	3.5	mg/l	05/12/2014	Y Cov	WAS052

Analyst Comments for 14371819:

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: **14 January 2015**

Title: **Inorganics Operations Manager**

**ALS Environmental Ltd**

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Page 2 of 14

# Certificate of Analysis



Report Number: **COV/1153002/2014**

Issue **1**

Laboratory Number: **14371820**

Sample **2** of **11**

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

Sample Point Description:

Sample Description: **BL BH1**

Sample Matrix: **Ground Water**

Sample Date/Time: **02 December 2014**

Sample Received: **04 December 2014**

Analysis Complete: **05 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.0	pH units	05/12/2014	Y Cov	WAS039
Conductivity- Electrical 20C	245	uS/cm	05/12/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	05/12/2014	Y Cov	WAS036
Chloride as Cl	12.8	mg/l	05/12/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	9.8	mg/l	05/12/2014	Y Cov	WAS052

Analyst Comments for 14371820:

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: **14 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

# Certificate of Analysis



Report Number: **COV/1153002/2014**

Issue **1**

Laboratory Number: **14371821**

Sample **3** of **11**

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

Sample Point Description:

Sample Description: **M18**

Sample Matrix: **Ground Water**

Sample Date/Time: **02 December 2014**

Sample Received: **04 December 2014**

Analysis Complete: **05 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	6.8	pH units	05/12/2014	Y Cov	WAS039
Conductivity- Electrical 20C	211	uS/cm	05/12/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	05/12/2014	Y Cov	WAS036
Chloride as Cl	9.11	mg/l	05/12/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	2.8	mg/l	05/12/2014	Y Cov	WAS052

Analyst Comments for 14371821:

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: **14 January 2015**

Title: **Inorganics Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1153002/2014**

Issue **1**

Laboratory Number: **14371822**

Sample **4** of **11**

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

Sample Point Description:

Sample Description: **M33**

Sample Matrix: **Ground Water**

Sample Date/Time: **02 December 2014**

Sample Received: **04 December 2014**

Analysis Complete: **05 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.2	pH units	05/12/2014	Y Cov	WAS039
Conductivity- Electrical 20C	119	uS/cm	05/12/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	05/12/2014	Y Cov	WAS036
Chloride as Cl	8.57	mg/l	05/12/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	7.8	mg/l	05/12/2014	Y Cov	WAS052

Analyst Comments for 14371822:

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: **14 January 2015**

Title: **Inorganics Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1153002/2014**

Issue **1**

Laboratory Number: **14371823**

Sample **5** of **11**

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

Sample Point Description:

Sample Description: **M34**

Sample Matrix: **Ground Water**

Sample Date/Time: **02 December 2014**

Sample Received: **04 December 2014**

Analysis Complete: **05 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.1	pH units	05/12/2014	Y Cov	WAS039
Conductivity- Electrical 20C	370	uS/cm	05/12/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	05/12/2014	Y Cov	WAS036
Chloride as Cl	14.2	mg/l	05/12/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	2.3	mg/l	05/12/2014	Y Cov	WAS052

Analyst Comments for 14371823:

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: **14 January 2015**

Title: **Inorganics Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1153002/2014**

Issue **1**

Laboratory Number: **14371824**

Sample **6** of **11**

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

Sample Point Description:

Sample Description: **M19**

Sample Matrix: **Ground Water**

Sample Date/Time: **02 December 2014**

Sample Received: **04 December 2014**

Analysis Complete: **05 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	6.1	pH units	05/12/2014	Y Cov	WAS039
Conductivity- Electrical 20C	88.2	uS/cm	05/12/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	05/12/2014	Y Cov	WAS036
Chloride as Cl	8.35	mg/l	05/12/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	6.1	mg/l	05/12/2014	Y Cov	WAS052

Analyst Comments for 14371824:

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: **14 January 2015**

Title: **Inorganics Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1153002/2014**

Issue **1**

Laboratory Number: **14371825**

Sample **7** of **11**

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

Sample Point Description:

Sample Description: **M20**

Sample Matrix: **Ground Water**

Sample Date/Time: **02 December 2014**

Sample Received: **04 December 2014**

Analysis Complete: **05 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.8	pH units	05/12/2014	Y Cov	WAS039
Conductivity- Electrical 20C	422	uS/cm	05/12/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	4.09	mg/l	05/12/2014	Y Cov	WAS036
Chloride as Cl	13.1	mg/l	05/12/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	3.3	mg/l	05/12/2014	Y Cov	WAS052

Analyst Comments for 14371825:

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: **14 January 2015**

Title: **Inorganics Operations Manager**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1153002/2014**

Issue **1**

Laboratory Number: **14371826**

Sample **8** of **11**

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

Sample Point Description:

Sample Description: **M21**

Sample Matrix: **Ground Water**

Sample Date/Time: **02 December 2014**

Sample Received: **04 December 2014**

Analysis Complete: **05 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.6	pH units	05/12/2014	Y Cov	WAS039
Conductivity- Electrical 20C	546	uS/cm	05/12/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	0.87	mg/l	05/12/2014	Y Cov	WAS036
Chloride as Cl	23.5	mg/l	05/12/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	3.3	mg/l	05/12/2014	Y Cov	WAS052

Analyst Comments for 14371826:

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: **14 January 2015**

Title: **Inorganics Operations Manager**

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# Certificate of Analysis



Report Number: **COV/1153002/2014**

Issue **1**

Laboratory Number: **14371827**

Sample **9** of **11**

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

Sample Point Description:

Sample Description: **M22**

Sample Matrix: **Ground Water**

Sample Date/Time: **02 December 2014**

Sample Received: **04 December 2014**

Analysis Complete: **05 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.1	pH units	05/12/2014	Y Cov	WAS039
Conductivity- Electrical 20C	288	uS/cm	05/12/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	0.35	mg/l	05/12/2014	Y Cov	WAS036
Chloride as Cl	16.1	mg/l	05/12/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	3.2	mg/l	05/12/2014	Y Cov	WAS052

Analyst Comments for 14371827:

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: **14 January 2015**

Title: **Inorganics Operations Manager**

**ALS Environmental Ltd**

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Page 10 of 14

# Certificate of Analysis



Report Number: **COV/1153002/2014**

Issue **1**

Laboratory Number: **14371828**

Sample **10** of **11**

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

Sample Point Description:

Sample Description: **M31**

Sample Matrix: **Ground Water**

Sample Date/Time: **02 December 2014**

Sample Received: **04 December 2014**

Analysis Complete: **05 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	7.1	pH units	05/12/2014	Y Cov	WAS039
Conductivity- Electrical 20C	239	uS/cm	05/12/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	05/12/2014	Y Cov	WAS036
Chloride as Cl	12.1	mg/l	05/12/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	3.9	mg/l	05/12/2014	Y Cov	WAS052

Analyst Comments for 14371828:

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: **14 January 2015**

Title: **Inorganics Operations Manager**

**ALS Environmental Ltd**

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Page 11 of 14

# Certificate of Analysis



Report Number: **COV/1153002/2014**

Issue **1**

Laboratory Number: **14371829**

Sample **11** of **11**

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

Sample Point Description:

Sample Description: **M35**

Sample Matrix: **Ground Water**

Sample Date/Time: **02 December 2014**

Sample Received: **04 December 2014**

Analysis Complete: **05 December 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
pH	6.3	pH units	05/12/2014	Y Cov	WAS039
Conductivity- Electrical 20C	185	uS/cm	05/12/2014	Y Cov	WAS039
Ammoniacal Nitrogen as N	0.30	mg/l	05/12/2014	Y Cov	WAS036
Chloride as Cl	22.4	mg/l	05/12/2014	Y Cov	WAS036
Dissolved Oxygen, Fixed	0.5	mg/l	05/12/2014	Y Cov	WAS052

Analyst Comments for 14371829:

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: **14 January 2015**

Title: **Inorganics Operations Manager**

**ALS Environmental Ltd**

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Page 12 of 14

**ANALYST COMMENTS FOR REPORT**

**COV/1153002/2014**

**Issue 1**

**Date of Issue: 14 January 2015**

Sample No	Analysis Comments
14371819	
14371820	
14371821	
14371822	
14371823	
14371824	
14371825	
14371826	
14371827	
14371828	
14371829	

Signed:



Name: **C. Law**

Date: **14 January 2015**

Title: **Inorganics Operations Manager**

DETERMINAND COMMENTS FOR REPORT COV/1153002/2014

ISSUE 1

Date of Issue : 14 January 2015

Sample No	Description	Determinand	Comments

Signed:



Name: C. Law

Date: 14 January 2015

Title: Inorganics Operations Manager

**ALS Environmental Ltd**  
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[www.alsenvironmental.co.uk](http://www.alsenvironmental.co.uk)

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

21 January 2015

**Test Report: COV/1158889/2015**

Dear Ms Francis

Analysis of your sample(s) submitted on 07 January 2015 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: 

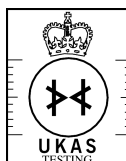
Name: P. Pepper

Title: Organic Team Leader





# Report Summary



1314  
0897  
4409



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

Date of Issue: **21 January 2015**

Report Number: **COV/1158889/2015**

Issue **1**

**Job Description:** Llwyn Isaf

**Job Location:** Llwyn Isaf - January

Number of Samples  
included in this report **32**

Job Received: **07 January 2015**

Number of Test Results  
included in this report **497**

Analysis Commenced: **08 January 2015**

Signed:

Name: **P. Pepper**

Date: **21 January 2015**

Title: **Organic Team Leader**

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.

This communication has been sent to you by ALS Environmental Ltd. Registered in England and Wales. Registration No. 02148934. Registered Office: ALS Environmental Limited, Torrington Avenue, Coventry, CV4 9GU.

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**Page 1 of 36**

# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415484**

Sample **1** of **32**

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

Sample Point Description:

Sample Description: **SW W**

Sample Matrix: **Surface Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.5	pH units	09/01/2015	N	Cov	WAS039
Conductivity- Electrical 20C	77.4	uS/cm	09/01/2015	N	Cov	WAS039
Alkalinity as CaCO3	14.7	mg/l	08/01/2015	N	Cov	WAS025
Ammoniacal Nitrogen as N (LL)	<0.06	mg/l	09/01/2015	N	Cov	WAS067
Chloride as Cl	9.24	mg/l	12/01/2015	Y	Cov	WAS036
Dissolved Oxygen, Fixed	7.4	mg/l	09/01/2015	N	Cov	WAS052
BOD + ATU (5 day)	<1	mg/l	13/01/2015	N	Cov	WAS001
COD (Total)	17.0	mg/l	08/01/2015	N	Cov	WAS040
TOC (Filtered)	7.6	mg/l	12/01/2015	N	Cov	WAS005

Analyst Comments for 14415484:

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: **P. Pepper**

Date: **21 January 2015**

Title: **Organic Team Leader**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415485**

Sample **2** of **32**

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

Sample Point Description:

Sample Description: **SW Y (upstream)**

Sample Matrix: **Surface Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	6.8	pH units	09/01/2015	N	Cov	WAS039
Conductivity- Electrical 20C	55.6	uS/cm	09/01/2015	N	Cov	WAS039
Alkalinity as CaCO3	7.2	mg/l	08/01/2015	N	Cov	WAS025
Ammoniacal Nitrogen as N (LL)	<0.06	mg/l	09/01/2015	N	Cov	WAS067
Chloride as Cl	8.40	mg/l	12/01/2015	Y	Cov	WAS036
Dissolved Oxygen, Fixed	8.2	mg/l	09/01/2015	N	Cov	WAS052
BOD + ATU (5 day)	<1	mg/l	13/01/2015	N	Cov	WAS001
COD (Total)	21.0	mg/l	08/01/2015	N	Cov	WAS040
TOC (Filtered)	7.7	mg/l	12/01/2015	N	Cov	WAS005

Analyst Comments for 14415485:

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: **P. Pepper**

Date: **21 January 2015**

Title: **Organic Team Leader**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415486**

Sample **3** of **32**

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

Sample Point Description:

Sample Description: **SWB**

Sample Matrix: **Surface Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	6.6	pH units	09/01/2015	N	Cov	WAS039
Conductivity- Electrical 20C	55.8	uS/cm	09/01/2015	N	Cov	WAS039
Alkalinity as CaCO3	4.7	mg/l	08/01/2015	N	Cov	WAS025
Ammoniacal Nitrogen as N (LL)	<0.06	mg/l	09/01/2015	N	Cov	WAS067
Chloride as Cl	8.61	mg/l	12/01/2015	Y	Cov	WAS036
Dissolved Oxygen, Fixed	7.9	mg/l	09/01/2015	N	Cov	WAS052
BOD + ATU (5 day)	<1	mg/l	13/01/2015	N	Cov	WAS001
COD (Total)	38.0	mg/l	08/01/2015	N	Cov	WAS040
TOC (Filtered)	8.7	mg/l	12/01/2015	N	Cov	WAS005

Analyst Comments for 14415486:

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: **P. Pepper**

Date: **21 January 2015**

Title: **Organic Team Leader**

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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415487**

Sample **4** of **32**

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

Sample Point Description:

Sample Description: **SWC**

Sample Matrix: **Surface Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.1	pH units	09/01/2015	N	Cov	WAS039
Conductivity- Electrical 20C	70.0	uS/cm	09/01/2015	N	Cov	WAS039
Alkalinity as CaCO3	15.0	mg/l	08/01/2015	N	Cov	WAS025
Ammoniacal Nitrogen as N (LL)	<0.06	mg/l	09/01/2015	N	Cov	WAS067
Chloride as Cl	8.45	mg/l	12/01/2015	Y	Cov	WAS036
Dissolved Oxygen, Fixed	10.1	mg/l	09/01/2015	N	Cov	WAS052
BOD + ATU (5 day)	2	mg/l	13/01/2015	N	Cov	WAS001
COD (Total)	20.0	mg/l	08/01/2015	N	Cov	WAS040
TOC (Filtered)	7.3	mg/l	12/01/2015	N	Cov	WAS005

Analyst Comments for 14415487:

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: **P. Pepper**

Date: **21 January 2015**

Title: **Organic Team Leader**

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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415488**

Sample **5** of **32**

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

Sample Point Description:

Sample Description: **SWD2**

Sample Matrix: **Surface Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.0	pH units	09/01/2015	N	Cov	WAS039
Conductivity- Electrical 20C	276	uS/cm	09/01/2015	N	Cov	WAS039
Alkalinity as CaCO3	124	mg/l	08/01/2015	N	Cov	WAS025
Ammoniacal Nitrogen as N (LL)	0.10	mg/l	09/01/2015	N	Cov	WAS067
Chloride as Cl	20.3	mg/l	12/01/2015	Y	Cov	WAS036
Dissolved Oxygen, Fixed	5.6	mg/l	09/01/2015	N	Cov	WAS052
BOD + ATU (5 day)	2	mg/l	13/01/2015	N	Cov	WAS001
COD (Total)	<11.0	mg/l	08/01/2015	N	Cov	WAS040
TOC (Filtered)	3.4	mg/l	12/01/2015	N	Cov	WAS005

Analyst Comments for 14415488:

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: **P. Pepper**

Date: **21 January 2015**

Title: **Organic Team Leader**

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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415489**

Sample **6** of **32**

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

Sample Point Description:

Sample Description: **SWE (downstream)**

Sample Matrix: **Surface Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.3	pH units	09/01/2015	N	Cov	WAS039
Conductivity- Electrical 20C	147	uS/cm	09/01/2015	N	Cov	WAS039
Alkalinity as CaCO3	54.6	mg/l	08/01/2015	N	Cov	WAS025
Ammoniacal Nitrogen as N (LL)	<0.06	mg/l	09/01/2015	N	Cov	WAS067
Chloride as Cl	12.8	mg/l	12/01/2015	Y	Cov	WAS036
Dissolved Oxygen, Fixed	10.7	mg/l	09/01/2015	N	Cov	WAS052
BOD + ATU (5 day)	<1	mg/l	13/01/2015	N	Cov	WAS001
COD (Total)	25.0	mg/l	08/01/2015	N	Cov	WAS040
TOC (Filtered)	4.1	mg/l	12/01/2015	N	Cov	WAS005

Analyst Comments for 14415489:

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: **P. Pepper**

Date: **21 January 2015**

Title: **Organic Team Leader**

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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415490**

Sample **7** of **32**

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

Sample Point Description:

Sample Description: **SWD (discharge)**

Sample Matrix: **Surface Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.9	pH units	09/01/2015	N	Cov	WAS039
Conductivity- Electrical 20C	168	uS/cm	09/01/2015	N	Cov	WAS039
Alkalinity as CaCO3	69.4	mg/l	08/01/2015	N	Cov	WAS025
Ammoniacal Nitrogen as N (LL)	<0.06	mg/l	09/01/2015	N	Cov	WAS067
Chloride as Cl	12.3	mg/l	12/01/2015	Y	Cov	WAS036
Dissolved Oxygen, Fixed	8.2	mg/l	09/01/2015	N	Cov	WAS052
BOD + ATU (5 day)	<1	mg/l	13/01/2015	N	Cov	WAS001
COD (Total)	20.0	mg/l	08/01/2015	N	Cov	WAS040
TOC (Filtered)	3.2	mg/l	12/01/2015	N	Cov	WAS005

Analyst Comments for 14415490:

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: **P. Pepper**

Date: **21 January 2015**

Title: **Organic Team Leader**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415491**

Sample **8** of **32**

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

Sample Point Description:

Sample Description: **Infiltration Basin**

Sample Matrix: **Surface Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	13/01/2015	N Cov	WAS049
pH	8.1	pH units	09/01/2015	N Cov	WAS039
Conductivity- Electrical 20C	182	uS/cm	09/01/2015	N Cov	WAS039
Ammoniacal Nitrogen as N (LL)	<0.06	mg/l	09/01/2015	N Cov	WAS067
Chloride as Cl	8.70	mg/l	12/01/2015	Y Cov	WAS036
Dissolved Oxygen, Fixed	7.8	mg/l	09/01/2015	N Cov	WAS052
Dissolved Oxygen (Saturation)	65.0	%	09/01/2015	N Cov	None

Analyst Comments for 14415491:

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: **P. Pepper**

Date: **21 January 2015**

Title: **Organic Team Leader**

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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415492**

Sample **9** of **32**

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

Sample Point Description:

Sample Description: **Soakaway NS**

Sample Matrix: **Surface Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	13/01/2015	N Cov	WAS049
Calcium , Total as Ca	14.6	mg/l	13/01/2015	N Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	13/01/2015	N Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	13/01/2015	N Cov	WAS049
Iron, Total as Fe	<230	ug/l	13/01/2015	N Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	13/01/2015	N Cov	WAS049
Magnesium, Total as Mg	1.7	mg/l	13/01/2015	N Cov	WAS049
Manganese , Total as Mn	15.1	ug/l	13/01/2015	N Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	13/01/2015	N Cov	WAS049
Potassium , Total as K	1.53	mg/l	13/01/2015	N Cov	WAS049
Sodium , Total as Na	4.76	mg/l	21/01/2015	N Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	13/01/2015	N Cov	WAS049
pH	7.9	pH units	09/01/2015	N Cov	WAS039
Conductivity- Electrical 20C	107	uS/cm	09/01/2015	N Cov	WAS039
Alkalinity as CaCO3	40.1	mg/l	08/01/2015	N Cov	WAS025
Ammoniacal Nitrogen as N (LL)	<0.06	mg/l	09/01/2015	N Cov	WAS067
Chloride as Cl	7.37	mg/l	09/01/2015	Y Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	09/01/2015	Y Cov	WAS036
Sulphate as SO4	<1.3	mg/l	09/01/2015	Y Cov	WAS036
Dissolved Oxygen, Fixed	7.1	mg/l	09/01/2015	N Cov	WAS052
TOC (Filtered)	4.4	mg/l	12/01/2015	N Cov	WAS005

## Analyst Comments for 14415492:

This sample has been analysed for Sodium Total as Na 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:

Name: **P. Pepper**

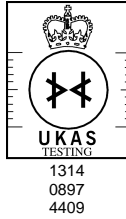
Date: **21 January 2015**

Title: **Organic Team Leader**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415493**

Sample **10** of **32**

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

Sample Point Description:

Sample Description: **DAS**

Sample Matrix: **Ground Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	13/01/2015	Y Cov	WAS049
Magnesium, Total as Mg	4.2	mg/l	13/01/2015	Y Cov	WAS049
Mercury, Filtered as Hg	<0.10	ug/l	09/01/2015	N Cov	WAS013
Potassium , Total as K	2.63	mg/l	13/01/2015	Y Cov	WAS049
Sodium , Total as Na	6.81	mg/l	21/01/2015	Y Cov	WAS049
Zinc , Total as Zn	177	ug/l	13/01/2015	Y Cov	WAS049
pH	7.5	pH units	09/01/2015	Y Cov	WAS039
Conductivity- Electrical 20C	494	uS/cm	09/01/2015	Y Cov	WAS039
Alkalinity as CaCO3	225	mg/l	08/01/2015	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	09/01/2015	N Cov	WAS036
Chloride as Cl	10.8	mg/l	09/01/2015	N Cov	WAS036
Nitrogen, Total Oxidised as N	1.93	mg/l	09/01/2015	N Cov	WAS036
Sulphate as SO4	51.4	mg/l	09/01/2015	N Cov	WAS036
Dissolved Oxygen, Fixed	6.3	mg/l	09/01/2015	Y Cov	WAS052
TOC (Filtered)	3.4	mg/l	12/01/2015	Y Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	12/01/2015	Y Cov	WAS019
Mecoprop	0.06	ug/l	16/01/2015	Y Cov	GEO49

## Analyst Comments for 14415493:

This sample has been analysed for Sodium Total as Na 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:

Name: **P. Pepper**

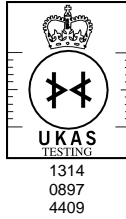
Date: **21 January 2015**

Title: **Organic Team Leader**

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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415494**

Sample **11** of **32**

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

Sample Point Description:

Sample Description: **M10**

Sample Matrix: **Ground Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	13/01/2015	Y Cov	WAS049
Calcium , Total as Ca	28.4	mg/l	13/01/2015	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	13/01/2015	Y Cov	WAS049
Copper , Total as Cu	9.80	ug/l	13/01/2015	Y Cov	WAS049
Iron, Total as Fe	1300	ug/l	13/01/2015	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	13/01/2015	Y Cov	WAS049
Magnesium, Total as Mg	2.6	mg/l	13/01/2015	Y Cov	WAS049
Manganese , Total as Mn	7850	ug/l	13/01/2015	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	13/01/2015	Y Cov	WAS049
Potassium , Total as K	2.34	mg/l	13/01/2015	Y Cov	WAS049
Sodium , Total as Na	6.35	mg/l	21/01/2015	Y Cov	WAS049
Zinc , Total as Zn	22.7	ug/l	13/01/2015	Y Cov	WAS049
pH	7.6	pH units	09/01/2015	Y Cov	WAS039
Conductivity- Electrical 20C	195	uS/cm	09/01/2015	Y Cov	WAS039
Alkalinity as CaCO3	96.9	mg/l	08/01/2015	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	09/01/2015	N Cov	WAS036
Chloride as Cl	8.74	mg/l	09/01/2015	N Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	09/01/2015	N Cov	WAS036
Sulphate as SO4	3.9	mg/l	09/01/2015	N Cov	WAS036
Dissolved Oxygen, Fixed	4.6	mg/l	09/01/2015	Y Cov	WAS052
TOC (Filtered)	1.0	mg/l	12/01/2015	Y Cov	WAS005

## Analyst Comments for 14415494:

This sample has been analysed for Sodium Total as Na 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:

Name: **P. Pepper**

Date: **21 January 2015**

Title: **Organic Team Leader**

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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415495**

Sample **12** of **32**

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

Sample Point Description:

Sample Description: **BL BH1**

Sample Matrix: **Ground Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	13/01/2015	Y Cov	WAS049
Calcium , Total as Ca	16.4	mg/l	13/01/2015	Y Cov	WAS049
Chromium , Total as Cr	30.1	ug/l	13/01/2015	Y Cov	WAS049
Copper , Total as Cu	32.7	ug/l	13/01/2015	Y Cov	WAS049
Iron, Total as Fe	9900	ug/l	13/01/2015	Y Cov	WAS049
Lead , Total as Pb	28.3	ug/l	13/01/2015	Y Cov	WAS049
Magnesium, Total as Mg	2.9	mg/l	13/01/2015	Y Cov	WAS049
Manganese , Total as Mn	2200	ug/l	13/01/2015	Y Cov	WAS049
Nickel , Total as Ni	20.7	ug/l	13/01/2015	Y Cov	WAS049
Potassium , Total as K	1.17	mg/l	13/01/2015	Y Cov	WAS049
Sodium , Total as Na	4.21	mg/l	21/01/2015	Y Cov	WAS049
Zinc , Total as Zn	129	ug/l	13/01/2015	Y Cov	WAS049
pH	7.0	pH units	09/01/2015	Y Cov	WAS039
Conductivity- Electrical 20C	113	uS/cm	09/01/2015	Y Cov	WAS039
Alkalinity as CaCO3	38.9	mg/l	08/01/2015	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	09/01/2015	N Cov	WAS036
Chloride as Cl	9.91	mg/l	09/01/2015	N Cov	WAS036
Nitrogen, Total Oxidised as N	0.84	mg/l	09/01/2015	N Cov	WAS036
Sulphate as SO4	5.0	mg/l	09/01/2015	N Cov	WAS036
Dissolved Oxygen, Fixed	11.5	mg/l	09/01/2015	Y Cov	WAS052
TOC (Filtered)	<0.7	mg/l	12/01/2015	Y Cov	WAS005

## Analyst Comments for 14415495:

This sample has been analysed for Sodium Total as Na 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:

Name: **P. Pepper**

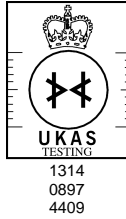
Date: **21 January 2015**

Title: **Organic Team Leader**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415496**

Sample **13** of **32**

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

Sample Point Description:

Sample Description: **M18**

Sample Matrix: **Ground Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	13/01/2015	Y Cov	WAS049
Calcium , Total as Ca	41.3	mg/l	13/01/2015	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	13/01/2015	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	13/01/2015	Y Cov	WAS049
Iron, Total as Fe	470	ug/l	13/01/2015	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	13/01/2015	Y Cov	WAS049
Magnesium, Total as Mg	3.0	mg/l	13/01/2015	Y Cov	WAS049
Manganese , Total as Mn	119	ug/l	13/01/2015	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	13/01/2015	Y Cov	WAS049
Potassium , Total as K	1.53	mg/l	13/01/2015	Y Cov	WAS049
Sodium , Total as Na	7.08	mg/l	21/01/2015	Y Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	13/01/2015	Y Cov	WAS049
pH	7.2	pH units	09/01/2015	Y Cov	WAS039
Conductivity- Electrical 20C	237	uS/cm	09/01/2015	Y Cov	WAS039
Alkalinity as CaCO3	112	mg/l	08/01/2015	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	09/01/2015	N Cov	WAS036
Chloride as Cl	11.3	mg/l	09/01/2015	N Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	09/01/2015	N Cov	WAS036
Sulphate as SO4	4.5	mg/l	09/01/2015	N Cov	WAS036
Dissolved Oxygen, Fixed	3.6	mg/l	09/01/2015	Y Cov	WAS052
TOC (Filtered)	1.3	mg/l	12/01/2015	Y Cov	WAS005

## Analyst Comments for 14415496:

This sample has been analysed for Sodium Total as Na 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:

Name: **P. Pepper**

Date: **21 January 2015**

Title: **Organic Team Leader**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415497**

Sample **14** of **32**

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

Sample Point Description:

Sample Description: **M33**

Sample Matrix: **Ground Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	13/01/2015	Y Cov	WAS049
Calcium , Total as Ca	15.6	mg/l	13/01/2015	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	13/01/2015	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	13/01/2015	Y Cov	WAS049
Iron, Total as Fe	<230	ug/l	13/01/2015	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	13/01/2015	Y Cov	WAS049
Magnesium, Total as Mg	1.6	mg/l	13/01/2015	Y Cov	WAS049
Manganese , Total as Mn	<7.00	ug/l	13/01/2015	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	13/01/2015	Y Cov	WAS049
Potassium , Total as K	1.20	mg/l	13/01/2015	Y Cov	WAS049
Sodium , Total as Na	5.37	mg/l	21/01/2015	Y Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	13/01/2015	Y Cov	WAS049
pH	7.3	pH units	09/01/2015	Y Cov	WAS039
Conductivity- Electrical 20C	118	uS/cm	09/01/2015	Y Cov	WAS039
Alkalinity as CaCO3	77.3	mg/l	09/01/2015	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	09/01/2015	N Cov	WAS036
Chloride as Cl	11.5	mg/l	09/01/2015	N Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	09/01/2015	N Cov	WAS036
Sulphate as SO4	1.4	mg/l	09/01/2015	N Cov	WAS036
Dissolved Oxygen, Fixed	8.3	mg/l	09/01/2015	Y Cov	WAS052
TOC (Filtered)	1.1	mg/l	12/01/2015	Y Cov	WAS005

## Analyst Comments for 14415497:

This sample has been analysed for Sodium Total as Na 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:

Name: **P. Pepper**

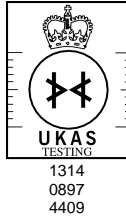
Date: **21 January 2015**

Title: **Organic Team Leader**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415498**

Sample **15** of **32**

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

Sample Point Description:

Sample Description: **M34**

Sample Matrix: **Ground Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	13/01/2015	Y Cov	WAS049
Calcium , Total as Ca	56.9	mg/l	13/01/2015	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	13/01/2015	Y Cov	WAS049
Copper , Total as Cu	14.8	ug/l	13/01/2015	Y Cov	WAS049
Iron, Total as Fe	3800	ug/l	13/01/2015	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	13/01/2015	Y Cov	WAS049
Magnesium, Total as Mg	5.9	mg/l	13/01/2015	Y Cov	WAS049
Manganese , Total as Mn	5810	ug/l	13/01/2015	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	13/01/2015	Y Cov	WAS049
Potassium , Total as K	2.28	mg/l	13/01/2015	Y Cov	WAS049
Sodium , Total as Na	9.90	mg/l	21/01/2015	Y Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	13/01/2015	Y Cov	WAS049
pH	7.2	pH units	09/01/2015	Y Cov	WAS039
Conductivity- Electrical 20C	338	uS/cm	09/01/2015	Y Cov	WAS039
Alkalinity as CaCO3	168	mg/l	09/01/2015	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	09/01/2015	N Cov	WAS036
Chloride as Cl	16.3	mg/l	09/01/2015	N Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	09/01/2015	N Cov	WAS036
Sulphate as SO4	12.1	mg/l	09/01/2015	N Cov	WAS036
Dissolved Oxygen, Fixed	2.7	mg/l	09/01/2015	Y Cov	WAS052
TOC (Filtered)	1.2	mg/l	12/01/2015	Y Cov	WAS005

## Analyst Comments for 14415498:

This sample has been analysed for Sodium Total as Na 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:

Name: **P. Pepper**

Date: **21 January 2015**

Title: **Organic Team Leader**

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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415499**

Sample **16** of **32**

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

Sample Point Description:

Sample Description: **M19**

Sample Matrix: **Ground Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	13/01/2015	Y Cov	WAS049
Calcium , Total as Ca	6.38	mg/l	13/01/2015	Y Cov	WAS049
Chromium , Total as Cr	2.20	ug/l	13/01/2015	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	13/01/2015	Y Cov	WAS049
Iron, Total as Fe	<230	ug/l	13/01/2015	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	13/01/2015	Y Cov	WAS049
Magnesium, Total as Mg	3.0	mg/l	13/01/2015	Y Cov	WAS049
Manganese , Total as Mn	<7.00	ug/l	13/01/2015	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	13/01/2015	Y Cov	WAS049
Potassium , Total as K	0.33	mg/l	13/01/2015	Y Cov	WAS049
Sodium , Total as Na	5.42	mg/l	21/01/2015	Y Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	13/01/2015	Y Cov	WAS049
pH	6.3	pH units	09/01/2015	Y Cov	WAS039
Conductivity- Electrical 20C	87.8	uS/cm	09/01/2015	Y Cov	WAS039
Alkalinity as CaCO3	15.5	mg/l	09/01/2015	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	09/01/2015	N Cov	WAS036
Chloride as Cl	7.95	mg/l	09/01/2015	N Cov	WAS036
Nitrogen, Total Oxidised as N	1.54	mg/l	09/01/2015	N Cov	WAS036
Sulphate as SO4	5.6	mg/l	09/01/2015	N Cov	WAS036
Dissolved Oxygen, Fixed	8.0	mg/l	09/01/2015	Y Cov	WAS052
TOC (Filtered)	<0.7	mg/l	12/01/2015	Y Cov	WAS005

## Analyst Comments for 14415499:

This sample has been analysed for Sodium Total as Na 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:

Name: **P. Pepper**

Date: **21 January 2015**

Title: **Organic Team Leader**

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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415500**

Sample **17** of **32**

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

Sample Point Description:

Sample Description: **M20**

Sample Matrix: **Ground Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	13/01/2015	Y Cov	WAS049
Calcium , Total as Ca	80.9	mg/l	13/01/2015	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	13/01/2015	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	13/01/2015	Y Cov	WAS049
Iron, Total as Fe	<230	ug/l	13/01/2015	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	13/01/2015	Y Cov	WAS049
Magnesium, Total as Mg	8.8	mg/l	13/01/2015	Y Cov	WAS049
Manganese , Total as Mn	21.9	ug/l	13/01/2015	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	13/01/2015	Y Cov	WAS049
Potassium , Total as K	8.17	mg/l	13/01/2015	Y Cov	WAS049
Sodium , Total as Na	9.64	mg/l	21/01/2015	Y Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	13/01/2015	Y Cov	WAS049
pH	7.9	pH units	09/01/2015	Y Cov	WAS039
Conductivity- Electrical 20C	462	uS/cm	09/01/2015	Y Cov	WAS039
Alkalinity as CaCO3	248	mg/l	09/01/2015	Y Cov	WAS025
Ammoniacal Nitrogen as N	4.22	mg/l	09/01/2015	N Cov	WAS036
Chloride as Cl	14.4	mg/l	09/01/2015	N Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	09/01/2015	N Cov	WAS036
Sulphate as SO4	5.6	mg/l	09/01/2015	N Cov	WAS036
Dissolved Oxygen, Fixed	2.1	mg/l	09/01/2015	Y Cov	WAS052
TOC (Filtered)	<0.7	mg/l	13/01/2015	Y Cov	WAS005

## Analyst Comments for 14415500:

This sample has been analysed for Sodium Total as Na 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:

Name: **P. Pepper**

Date: **21 January 2015**

Title: **Organic Team Leader**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415501**

Sample **18** of **32**

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

Sample Point Description:

Sample Description: **M21**

Sample Matrix: **Ground Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	13/01/2015	Y Cov	WAS049
Calcium , Total as Ca	96.9	mg/l	13/01/2015	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	13/01/2015	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	13/01/2015	Y Cov	WAS049
Iron, Total as Fe	<230	ug/l	13/01/2015	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	13/01/2015	Y Cov	WAS049
Magnesium, Total as Mg	9.0	mg/l	13/01/2015	Y Cov	WAS049
Manganese , Total as Mn	1340	ug/l	13/01/2015	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	13/01/2015	Y Cov	WAS049
Potassium , Total as K	7.52	mg/l	13/01/2015	Y Cov	WAS049
Sodium , Total as Na	14.8	mg/l	21/01/2015	Y Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	13/01/2015	Y Cov	WAS049
pH	7.7	pH units	09/01/2015	Y Cov	WAS039
Conductivity- Electrical 20C	534	uS/cm	09/01/2015	Y Cov	WAS039
Alkalinity as CaCO3	274	mg/l	09/01/2015	Y Cov	WAS025
Ammoniacal Nitrogen as N	0.83	mg/l	09/01/2015	N Cov	WAS036
Chloride as Cl	24.1	mg/l	09/01/2015	N Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	09/01/2015	N Cov	WAS036
Sulphate as SO4	10.5	mg/l	09/01/2015	N Cov	WAS036
Dissolved Oxygen, Fixed	4.2	mg/l	09/01/2015	Y Cov	WAS052
TOC (Filtered)	0.9	mg/l	13/01/2015	Y Cov	WAS005

## Analyst Comments for 14415501:

This sample has been analysed for Sodium Total as Na 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:

Name: **P. Pepper**

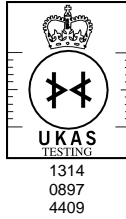
Date: **21 January 2015**

Title: **Organic Team Leader**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415502**

Sample **19** of **32**

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

Sample Point Description:

Sample Description: **M22**

Sample Matrix: **Ground Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	13/01/2015	Y Cov	WAS049
Calcium , Total as Ca	41.8	mg/l	13/01/2015	Y Cov	WAS049
Chromium , Total as Cr	3.20	ug/l	13/01/2015	Y Cov	WAS049
Copper , Total as Cu	11.7	ug/l	13/01/2015	Y Cov	WAS049
Iron, Total as Fe	2200	ug/l	13/01/2015	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	13/01/2015	Y Cov	WAS049
Magnesium, Total as Mg	5.6	mg/l	13/01/2015	Y Cov	WAS049
Manganese , Total as Mn	354	ug/l	13/01/2015	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	13/01/2015	Y Cov	WAS049
Potassium , Total as K	4.59	mg/l	13/01/2015	Y Cov	WAS049
Sodium , Total as Na	12.1	mg/l	21/01/2015	Y Cov	WAS049
Zinc , Total as Zn	18.7	ug/l	13/01/2015	Y Cov	WAS049
pH	7.4	pH units	09/01/2015	Y Cov	WAS039
Conductivity- Electrical 20C	287	uS/cm	09/01/2015	Y Cov	WAS039
Alkalinity as CaCO3	131	mg/l	09/01/2015	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	09/01/2015	N Cov	WAS036
Chloride as Cl	16.6	mg/l	09/01/2015	N Cov	WAS036
Nitrogen, Total Oxidised as N	0.88	mg/l	09/01/2015	N Cov	WAS036
Sulphate as SO4	6.3	mg/l	09/01/2015	N Cov	WAS036
Dissolved Oxygen, Fixed	7.1	mg/l	09/01/2015	Y Cov	WAS052
TOC (Filtered)	<0.7	mg/l	13/01/2015	Y Cov	WAS005

## Analyst Comments for 14415502:

This sample has been analysed for Sodium Total as Na 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:

Name: **P. Pepper**

Date: **21 January 2015**

Title: **Organic Team Leader**

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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415503**

Sample **20** of **32**

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

Sample Point Description:

Sample Description: **M31**

Sample Matrix: **Ground Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	13/01/2015	Y Cov	WAS049
Calcium , Total as Ca	33.2	mg/l	13/01/2015	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	13/01/2015	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	13/01/2015	Y Cov	WAS049
Iron, Total as Fe	<230	ug/l	13/01/2015	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	13/01/2015	Y Cov	WAS049
Magnesium, Total as Mg	4.0	mg/l	13/01/2015	Y Cov	WAS049
Manganese , Total as Mn	17.4	ug/l	13/01/2015	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	13/01/2015	Y Cov	WAS049
Potassium , Total as K	2.89	mg/l	13/01/2015	Y Cov	WAS049
Sodium , Total as Na	8.38	mg/l	21/01/2015	Y Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	13/01/2015	Y Cov	WAS049
pH	7.1	pH units	09/01/2015	Y Cov	WAS039
Conductivity- Electrical 20C	221	uS/cm	09/01/2015	Y Cov	WAS039
Alkalinity as CaCO3	98.6	mg/l	09/01/2015	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	09/01/2015	N Cov	WAS036
Chloride as Cl	14.2	mg/l	09/01/2015	N Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	09/01/2015	N Cov	WAS036
Sulphate as SO4	5.9	mg/l	09/01/2015	N Cov	WAS036
Dissolved Oxygen, Fixed	4.3	mg/l	09/01/2015	Y Cov	WAS052
TOC (Filtered)	<0.7	mg/l	13/01/2015	Y Cov	WAS005

## Analyst Comments for 14415503:

This sample has been analysed for Sodium Total as Na 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:

Name: **P. Pepper**

Date: **21 January 2015**

Title: **Organic Team Leader**

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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415504**

Sample **21** of **32**

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

Sample Point Description:

Sample Description: **M35**

Sample Matrix: **Ground Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	13/01/2015	Y Cov	WAS049
Calcium , Total as Ca	11.2	mg/l	13/01/2015	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	13/01/2015	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	13/01/2015	Y Cov	WAS049
Iron, Total as Fe	14500	ug/l	13/01/2015	Y Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	13/01/2015	Y Cov	WAS049
Magnesium, Total as Mg	1.3	mg/l	13/01/2015	Y Cov	WAS049
Manganese , Total as Mn	344	ug/l	13/01/2015	Y Cov	WAS049
Nickel , Total as Ni	<3.00	ug/l	13/01/2015	Y Cov	WAS049
Potassium , Total as K	0.28	mg/l	13/01/2015	Y Cov	WAS049
Sodium , Total as Na	14.6	mg/l	21/01/2015	Y Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	13/01/2015	Y Cov	WAS049
pH	6.3	pH units	09/01/2015	Y Cov	WAS039
Conductivity- Electrical 20C	154	uS/cm	09/01/2015	Y Cov	WAS039
Alkalinity as CaCO3	36.7	mg/l	09/01/2015	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	09/01/2015	N Cov	WAS036
Chloride as Cl	24.2	mg/l	09/01/2015	N Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	09/01/2015	N Cov	WAS036
Sulphate as SO4	4.2	mg/l	09/01/2015	N Cov	WAS036
Dissolved Oxygen, Fixed	1.0	mg/l	09/01/2015	Y Cov	WAS052
TOC (Filtered)	3.3	mg/l	13/01/2015	Y Cov	WAS005

## Analyst Comments for 14415504:

This sample has been analysed for Sodium Total as Na 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:

Name: **P. Pepper**

Date: **21 January 2015**

Title: **Organic Team Leader**

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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415505**

Sample **22** of **32**

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

Sample Point Description:

Sample Description: **GW1**

Sample Matrix: **Ground Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Sample Received	'Empty'		08/01/2015	N Cov	N/A

Analyst Comments for 14415505: 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: **P. Pepper**

Date: **21 January 2015**

Title: **Organic Team Leader**



# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415506**

Sample **23** of **32**

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

Sample Point Description:

Sample Description: **GW2**

Sample Matrix: **Ground Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Sample Received	'Empty'		08/01/2015	N Cov	N/A

Analyst Comments for 14415506: 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: **P. Pepper**

Date: **21 January 2015**

Title: **Organic Team Leader**



# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415507**

Sample **24** of **32**

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

Sample Point Description:

Sample Description: **GW3**

Sample Matrix: **Ground Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	13/01/2015	Y Cov	WAS049
Magnesium, Total as Mg	7.8	mg/l	13/01/2015	Y Cov	WAS049
Mercury, Filtered as Hg	<0.10	ug/l	09/01/2015	N Cov	WAS013
Potassium , Total as K	0.94	mg/l	13/01/2015	Y Cov	WAS049
Sodium , Total as Na	9.00	mg/l	21/01/2015	Y Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	13/01/2015	Y Cov	WAS049
pH	7.3	pH units	09/01/2015	Y Cov	WAS039
Conductivity- Electrical 20C	324	uS/cm	09/01/2015	Y Cov	WAS039
Alkalinity as CaCO3	167	mg/l	09/01/2015	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	09/01/2015	N Cov	WAS036
Chloride as Cl	15.3	mg/l	09/01/2015	N Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	09/01/2015	N Cov	WAS036
Sulphate as SO4	6.8	mg/l	09/01/2015	N Cov	WAS036
Dissolved Oxygen, Fixed	4.8	mg/l	09/01/2015	Y Cov	WAS052
TOC (Filtered)	<0.7	mg/l	13/01/2015	Y Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	12/01/2015	Y Cov	WAS019
Mecoprop	<0.04	ug/l	16/01/2015	Y Cov	GEO49

## Analyst Comments for 14415507:

This sample has been analysed for Sodium Total as Na 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:

Name: **P. Pepper**

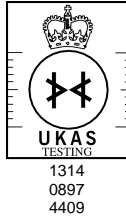
Date: **21 January 2015**

Title: **Organic Team Leader**

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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415508**

Sample **25** of **32**

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

Sample Point Description:

Sample Description: **GW4**

Sample Matrix: **Ground Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	13/01/2015	Y Cov	WAS049
Magnesium, Total as Mg	3.1	mg/l	13/01/2015	Y Cov	WAS049
Mercury, Filtered as Hg	<0.10	ug/l	09/01/2015	N Cov	WAS013
Potassium , Total as K	0.99	mg/l	13/01/2015	Y Cov	WAS049
Sodium , Total as Na	7.96	mg/l	21/01/2015	Y Cov	WAS049
Zinc , Total as Zn	30.5	ug/l	13/01/2015	Y Cov	WAS049
pH	6.7	pH units	09/01/2015	Y Cov	WAS039
Conductivity- Electrical 20C	176	uS/cm	09/01/2015	Y Cov	WAS039
Alkalinity as CaCO3	61.2	mg/l	09/01/2015	Y Cov	WAS025
Ammoniacal Nitrogen as N	0.44	mg/l	09/01/2015	N Cov	WAS036
Chloride as Cl	16.6	mg/l	09/01/2015	N Cov	WAS036
Nitrogen, Total Oxidised as N	1.48	mg/l	09/01/2015	N Cov	WAS036
Sulphate as SO4	4.3	mg/l	09/01/2015	N Cov	WAS036
Dissolved Oxygen, Fixed	6.1	mg/l	09/01/2015	Y Cov	WAS052
TOC (Filtered)	<0.7	mg/l	13/01/2015	Y Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	12/01/2015	Y Cov	WAS019
Mecoprop	<0.04	ug/l	16/01/2015	Y Cov	GEO49

## Analyst Comments for 14415508:

This sample has been analysed for Sodium Total as Na 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:

Name: **P. Pepper**

Date: **21 January 2015**

Title: **Organic Team Leader**

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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415509**

Sample **26** of **32**

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

Sample Point Description:

Sample Description: **GW5**

Sample Matrix: **Ground Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	2.00	ug/l	13/01/2015	Y Cov	WAS049
Magnesium, Total as Mg	0.9	mg/l	13/01/2015	Y Cov	WAS049
Mercury, Filtered as Hg	<0.10	ug/l	09/01/2015	N Cov	WAS013
Potassium , Total as K	0.62	mg/l	13/01/2015	Y Cov	WAS049
Sodium , Total as Na	7.56	mg/l	21/01/2015	Y Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	13/01/2015	Y Cov	WAS049
pH	6.5	pH units	09/01/2015	Y Cov	WAS039
Conductivity- Electrical 20C	80.9	uS/cm	09/01/2015	Y Cov	WAS039
Alkalinity as CaCO3	11.2	mg/l	09/01/2015	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	09/01/2015	N Cov	WAS036
Chloride as Cl	18.1	mg/l	09/01/2015	N Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	09/01/2015	N Cov	WAS036
Sulphate as SO4	2.1	mg/l	09/01/2015	N Cov	WAS036
Dissolved Oxygen, Fixed	10.3	mg/l	09/01/2015	Y Cov	WAS052
TOC (Filtered)	1.3	mg/l	13/01/2015	Y Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	12/01/2015	Y Cov	WAS019
Mecoprop	<0.04	ug/l	16/01/2015	Y Cov	GEO49

## Analyst Comments for 14415509:

This sample has been analysed for Sodium Total as Na 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:

Name: **P. Pepper**

Date: **21 January 2015**

Title: **Organic Team Leader**

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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415510**

Sample **27** of **32**

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

Sample Point Description:

Sample Description: **M17**

Sample Matrix: **Ground Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	13/01/2015	Y Cov	WAS049
Magnesium, Total as Mg	3.7	mg/l	13/01/2015	Y Cov	WAS049
Mercury, Filtered as Hg	<0.10	ug/l	09/01/2015	N Cov	WAS013
Potassium , Total as K	1.42	mg/l	13/01/2015	Y Cov	WAS049
Sodium , Total as Na	12.3	mg/l	21/01/2015	Y Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	13/01/2015	Y Cov	WAS049
pH	6.8	pH units	09/01/2015	Y Cov	WAS039
Conductivity- Electrical 20C	209	uS/cm	09/01/2015	Y Cov	WAS039
Alkalinity as CaCO3	72.7	mg/l	09/01/2015	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	09/01/2015	N Cov	WAS036
Chloride as Cl	21.4	mg/l	09/01/2015	N Cov	WAS036
Nitrogen, Total Oxidised as N	1.12	mg/l	09/01/2015	N Cov	WAS036
Sulphate as SO4	7.0	mg/l	09/01/2015	N Cov	WAS036
Dissolved Oxygen, Fixed	4.2	mg/l	09/01/2015	Y Cov	WAS052
TOC (Filtered)	<0.7	mg/l	13/01/2015	Y Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	12/01/2015	Y Cov	WAS019
Mecoprop	<0.04	ug/l	16/01/2015	Y Cov	GEO49

## Analyst Comments for 14415510:

This sample has been analysed for Sodium Total as Na 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:

Name: **P. Pepper**

Date: **21 January 2015**

Title: **Organic Team Leader**

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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415511**

Sample **28** of **32**

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

Sample Point Description:

Sample Description: **M36**

Sample Matrix: **Ground Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	13/01/2015	Y Cov	WAS049
Magnesium, Total as Mg	3.9	mg/l	13/01/2015	Y Cov	WAS049
Mercury, Filtered as Hg	<0.10	ug/l	09/01/2015	N Cov	WAS013
Potassium , Total as K	0.36	mg/l	13/01/2015	Y Cov	WAS049
Sodium , Total as Na	7.35	mg/l	21/01/2015	Y Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	13/01/2015	Y Cov	WAS049
pH	6.9	pH units	09/01/2015	Y Cov	WAS039
Conductivity- Electrical 20C	183	uS/cm	09/01/2015	Y Cov	WAS039
Alkalinity as CaCO3	69.6	mg/l	09/01/2015	Y Cov	WAS025
Ammoniacal Nitrogen as N	<0.27	mg/l	09/01/2015	N Cov	WAS036
Chloride as Cl	16.6	mg/l	09/01/2015	N Cov	WAS036
Nitrogen, Total Oxidised as N	0.86	mg/l	09/01/2015	N Cov	WAS036
Sulphate as SO4	5.3	mg/l	09/01/2015	N Cov	WAS036
Dissolved Oxygen, Fixed	7.2	mg/l	09/01/2015	Y Cov	WAS052
TOC (Filtered)	<0.7	mg/l	13/01/2015	Y Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	12/01/2015	Y Cov	WAS019
Mecoprop	<0.04	ug/l	16/01/2015	Y Cov	GEO49

## Analyst Comments for 14415511:

This sample has been analysed for Sodium Total as Na 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:

Name: **P. Pepper**

Date: **21 January 2015**

Title: **Organic Team Leader**

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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415512**

Sample **29** of **32**

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

Sample Point Description:

Sample Description: **M47**

Sample Matrix: **Ground Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.600	ug/l	13/01/2015	Y Cov	WAS049
Magnesium, Total as Mg	1.0	mg/l	13/01/2015	Y Cov	WAS049
Mercury, Filtered as Hg	<0.10	ug/l	09/01/2015	N Cov	WAS013
Potassium , Total as K	0.27	mg/l	13/01/2015	Y Cov	WAS049
Sodium , Total as Na	5.37	mg/l	21/01/2015	Y Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	13/01/2015	Y Cov	WAS049
pH	6.4	pH units	09/01/2015	Y Cov	WAS039
Conductivity- Electrical 20C	84.1	uS/cm	09/01/2015	Y Cov	WAS039
Alkalinity as CaCO3	19.0	mg/l	09/01/2015	Y Cov	WAS025
Ammoniacal Nitrogen as N	0.56	mg/l	09/01/2015	N Cov	WAS036
Chloride as Cl	12.5	mg/l	09/01/2015	N Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	09/01/2015	N Cov	WAS036
Sulphate as SO4	<1.3	mg/l	09/01/2015	N Cov	WAS036
Dissolved Oxygen, Fixed	11.3	mg/l	09/01/2015	Y Cov	WAS052
TOC (Filtered)	<0.7	mg/l	13/01/2015	Y Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	12/01/2015	Y Cov	WAS019
Mecoprop	<0.04	ug/l	16/01/2015	Y Cov	GEO49

## Analyst Comments for 14415512:

This sample has been analysed for Sodium Total as Na 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:

Name: **P. Pepper**

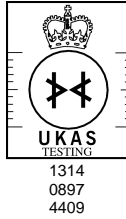
Date: **21 January 2015**

Title: **Organic Team Leader**

**ALS Environmental Ltd**

Torrington Avenue, Coventry, CV4 9GU  
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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415513**

Sample **30** of **32**

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

Sample Point Description:

Sample Description: **Cell 1**

Sample Matrix: **Ground Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	0.700	ug/l	13/01/2015	Y Cov	WAS049
Calcium , Total as Ca	87.2	mg/l	13/01/2015	Y Cov	WAS049
Magnesium, Total as Mg	36.9	mg/l	13/01/2015	Y Cov	WAS049
Potassium , Total as K	272	mg/l	13/01/2015	Y Cov	WAS049
Sodium , Total as Na	626	mg/l	21/01/2015	Y Cov	WAS049
pH	7.8	pH units	09/01/2015	Y Cov	WAS039
Conductivity- Electrical 20C	7150	uS/cm	09/01/2015	Y Cov	WAS039
Alkalinity as CaCO3	3100	mg/l	09/01/2015	Y Cov	WAS025
Ammoniacal Nitrogen as N	632	mg/l	09/01/2015	Y Cov	WAS055
Chloride as Cl	696	mg/l	09/01/2015	N Cov	WAS036
Nitrogen, Total Oxidised as N	0.44	mg/l	09/01/2015	N Cov	WAS036
Sulphate as SO4	31.9	mg/l	09/01/2015	N Cov	WAS036
BOD + ATU (5 day)	16	mg/l	13/01/2015	Y Cov	WAS001
COD (Total)	447	mg/l	08/01/2015	Y Cov	WAS040
TOC (Filtered)	131	mg/l	13/01/2015	Y Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	12/01/2015	Y Cov	WAS019
Mecoprop	13.0	ug/l	16/01/2015	Y Cov	GEO49
Toluene	0.49	ug/l	15/01/2015	Y Cov	GEO56

## Analyst Comments for 14415513:

This sample has been analysed for Sodium Total as Na 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:

Name: **P. Pepper**

Date: **21 January 2015**

Title: **Organic Team Leader**

**ALS Environmental Ltd**

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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415514**

Sample **31** of **32**

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

Sample Point Description:

Sample Description: **Cell 2**

Sample Matrix: **Ground Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	1.10	ug/l	13/01/2015	Y Cov	WAS049
Calcium , Total as Ca	99.8	mg/l	13/01/2015	Y Cov	WAS049
Magnesium, Total as Mg	32.1	mg/l	13/01/2015	Y Cov	WAS049
Potassium , Total as K	228	mg/l	13/01/2015	Y Cov	WAS049
Sodium , Total as Na	523	mg/l	21/01/2015	Y Cov	WAS049
pH	7.7	pH units	09/01/2015	Y Cov	WAS039
Conductivity- Electrical 20C	6170	uS/cm	09/01/2015	Y Cov	WAS039
Alkalinity as CaCO3	2680	mg/l	09/01/2015	Y Cov	WAS025
Ammoniacal Nitrogen as N	515	mg/l	09/01/2015	Y Cov	WAS055
Chloride as Cl	605	mg/l	09/01/2015	N Cov	WAS036
Nitrogen, Total Oxidised as N	0.45	mg/l	09/01/2015	N Cov	WAS036
Sulphate as SO4	41.8	mg/l	09/01/2015	N Cov	WAS036
BOD + ATU (5 day)	33	mg/l	13/01/2015	Y Cov	WAS001
COD (Total)	460	mg/l	08/01/2015	Y Cov	WAS040
TOC (Filtered)	97.0	mg/l	13/01/2015	Y Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	12/01/2015	Y Cov	WAS019
Mecoprop	10.6	ug/l	16/01/2015	Y Cov	GEO49
Toluene	0.66	ug/l	14/01/2015	Y Cov	GEO56

## Analyst Comments for 14415514:

This sample has been analysed for Sodium Total as Na 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:

Name: **P. Pepper**

Date: **21 January 2015**

Title: **Organic Team Leader**

**ALS Environmental Ltd**

Torrington Avenue, Coventry, CV4 9GU  
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# Certificate of Analysis



Report Number: **COV/1158889/2015**

Issue **1**

Laboratory Number: **14415515**

Sample **32** of **32**

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

Sample Point Description:

Sample Description: **Cell 3**

Sample Matrix: **Ground Water**

Sample Date/Time: **06 January 2015**

Sample Received: **07 January 2015**

Analysis Complete: **21 January 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	0.600	ug/l	13/01/2015	Y Cov	WAS049
Calcium , Total as Ca	100	mg/l	13/01/2015	Y Cov	WAS049
Magnesium, Total as Mg	35.8	mg/l	13/01/2015	Y Cov	WAS049
Potassium , Total as K	255	mg/l	13/01/2015	Y Cov	WAS049
Sodium , Total as Na	583	mg/l	21/01/2015	Y Cov	WAS049
pH	8.2	pH units	09/01/2015	Y Cov	WAS039
Conductivity- Electrical 20C	6490	uS/cm	09/01/2015	Y Cov	WAS039
Alkalinity as CaCO3	2750	mg/l	09/01/2015	Y Cov	WAS025
Ammoniacal Nitrogen as N	573	mg/l	09/01/2015	Y Cov	WAS055
Chloride as Cl	672	mg/l	09/01/2015	N Cov	WAS036
Nitrogen, Total Oxidised as N	0.54	mg/l	09/01/2015	N Cov	WAS036
Sulphate as SO4	40.4	mg/l	09/01/2015	N Cov	WAS036
BOD + ATU (5 day)	11	mg/l	13/01/2015	Y Cov	WAS001
COD (Total)	405	mg/l	08/01/2015	Y Cov	WAS040
TOC (Filtered)	107	mg/l	13/01/2015	Y Cov	WAS005
Phenols Mono (Phenol Index)	<0.15	mg/l	12/01/2015	Y Cov	WAS019
Mecoprop	11.4	ug/l	16/01/2015	Y Cov	GEO49
Toluene	1.15	ug/l	14/01/2015	Y Cov	GEO56

## Analyst Comments for 14415515:

This sample has been analysed for Sodium Total as Na 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:

Name: **P. Pepper**

Date: **21 January 2015**

Title: **Organic Team Leader**

**ALS Environmental Ltd**

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# ANALYST COMMENTS FOR REPORT

COV/1158889/2015

Issue 1

Date of Issue: 21 January 2015

Sample No	Analysis Comments
14415484	
14415485	
14415486	
14415487	
14415488	
14415489	
14415490	
14415491	
14415492	This sample has been analysed for Sodium Total as Na outside recommended stability times. It is therefore possible that the results provided may be compromised.
14415493	This sample has been analysed for Sodium Total as Na outside recommended stability times. It is therefore possible that the results provided may be compromised.
14415494	This sample has been analysed for Sodium Total as Na outside recommended stability times. It is therefore possible that the results provided may be compromised.
14415495	This sample has been analysed for Sodium Total as Na outside recommended stability times. It is therefore possible that the results provided may be compromised.
14415496	This sample has been analysed for Sodium Total as Na outside recommended stability times. It is therefore possible that the results provided may be compromised.
14415497	This sample has been analysed for Sodium Total as Na outside recommended stability times. It is therefore possible that the results provided may be compromised.
14415498	This sample has been analysed for Sodium Total as Na outside recommended stability times. It is therefore possible that the results provided may be compromised.
14415499	This sample has been analysed for Sodium Total as Na outside recommended stability times. It is therefore possible that the results provided may be compromised.
14415500	This sample has been analysed for Sodium Total as Na outside recommended stability times. It is therefore possible that the results provided may be compromised.
14415501	This sample has been analysed for Sodium Total as Na outside recommended stability times. It is therefore possible that the results provided may be compromised.
14415502	This sample has been analysed for Sodium Total as Na outside recommended stability times. It is therefore possible that the results provided may be compromised.
14415503	This sample has been analysed for Sodium Total as Na outside recommended stability times. It is therefore possible that the results provided may be compromised.
14415504	This sample has been analysed for Sodium Total as Na outside recommended stability times. It is therefore possible that the results provided may be compromised.
14415505	
14415506	
14415507	This sample has been analysed for Sodium Total as Na outside recommended stability times. It is therefore possible that the results provided may be compromised.
14415508	This sample has been analysed for Sodium Total as Na outside recommended stability times. It is therefore possible that the results provided may be compromised.
14415509	This sample has been analysed for Sodium Total as Na outside recommended stability times. It is therefore possible that the results provided may be compromised.
14415510	This sample has been analysed for Sodium Total as Na outside recommended stability times. It is therefore possible that the results provided may be compromised.
14415511	This sample has been analysed for Sodium Total as Na outside recommended stability times. It is therefore possible that the results provided may be compromised.
14415512	This sample has been analysed for Sodium Total as Na outside recommended stability times. It is therefore possible that the results provided may be compromised.
14415513	This sample has been analysed for Sodium Total as Na outside recommended stability times. It is therefore possible that the results provided may be compromised.
14415514	This sample has been analysed for Sodium Total as Na outside recommended stability times. It is therefore possible that the results provided may be compromised.

# ANALYST COMMENTS FOR REPORT

COV/1158889/2015

Issue 1

Date of Issue: 21 January 2015

Sample No	Analysis Comments
14415515	This sample has been analysed for Sodium Total as Na outside recommended stability times. It is therefore possible that the results provided may be compromised.

Signed:



Name: **P. Pepper**

Date: **21 January 2015**


Title: **Organic Team Leader**

DETERMINAND COMMENTS FOR REPORT COV/1158889/2015

ISSUE 1

Date of Issue : 21 January 2015

Sample No	Description	Determinand	Comments

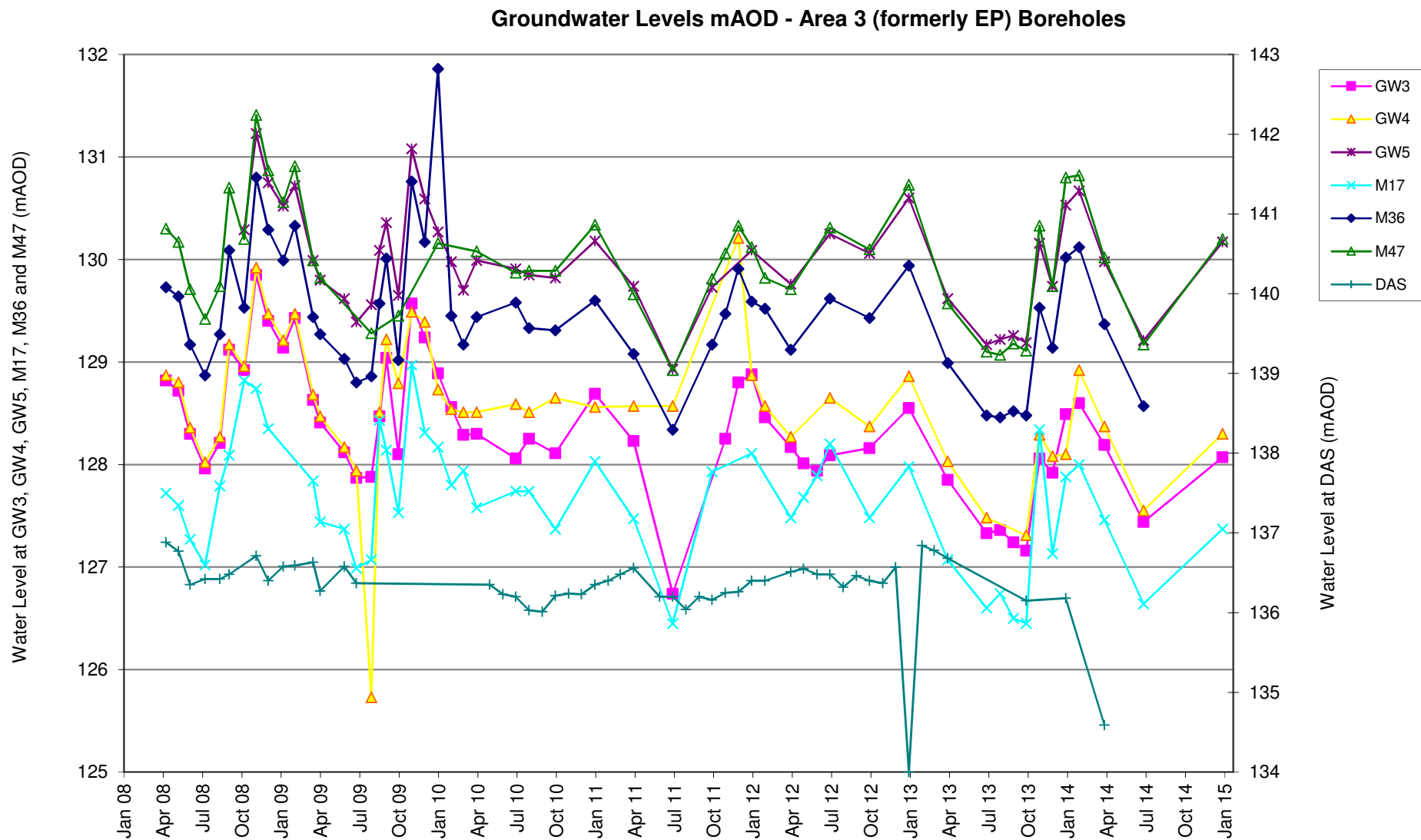
Signed: 	Name: P. Pepper	Date: 21 January 2015
	Title: Organic Team Leader	



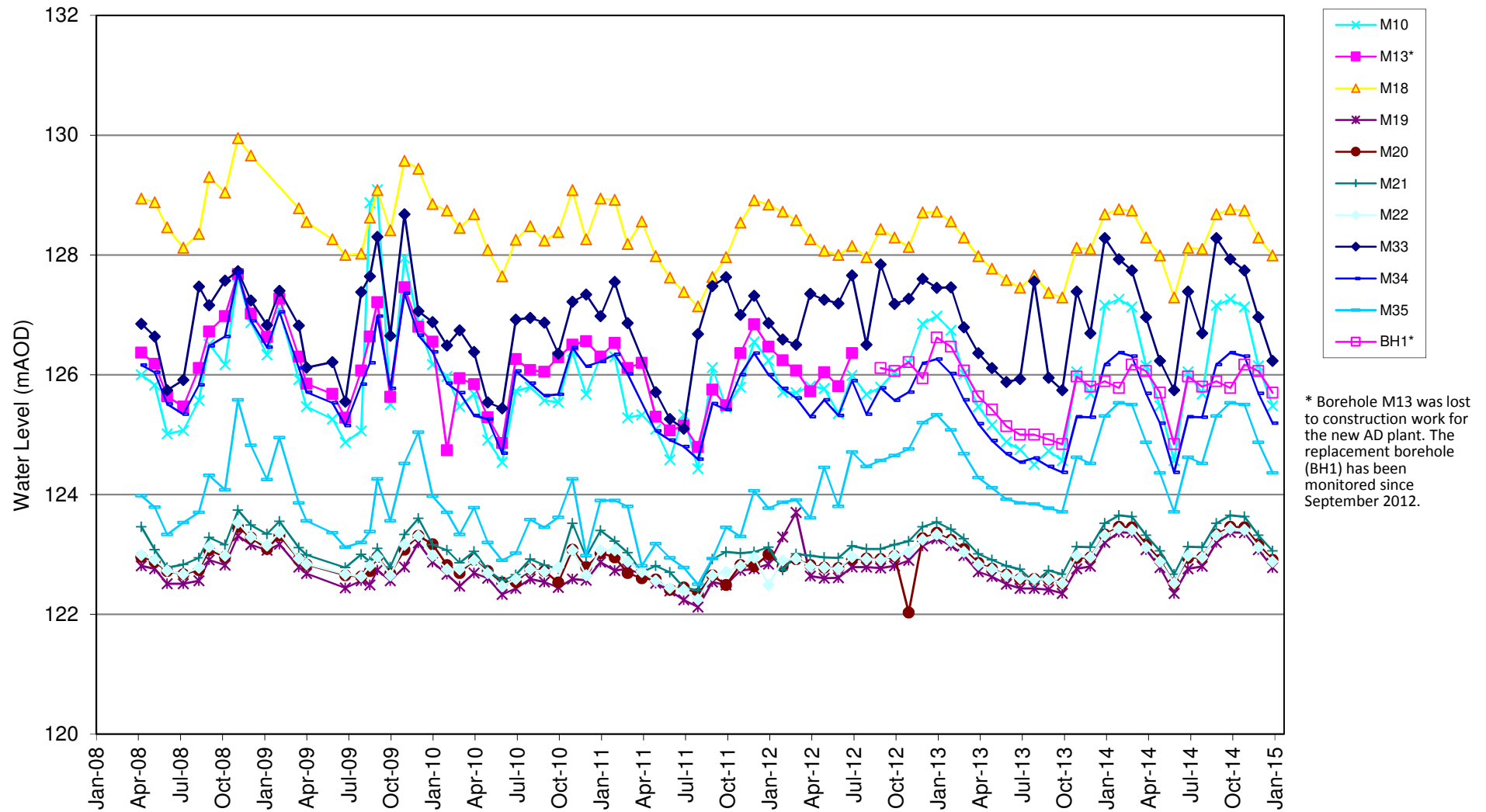
# Appendix C

## Groundwater Level Plots





### Groundwater Levels mAOD - Area 2 (formerly WML) Boreholes





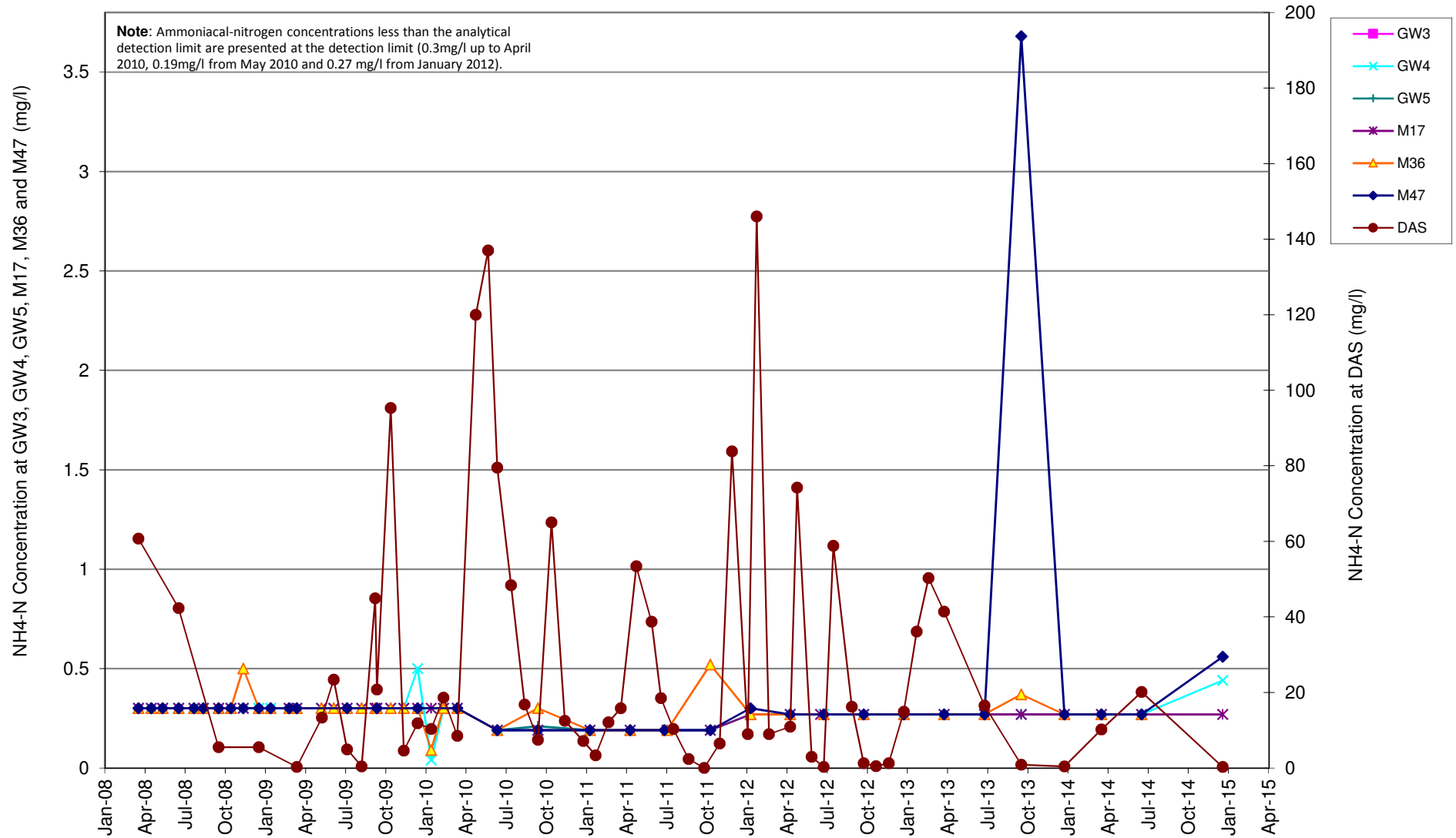


# Appendix D

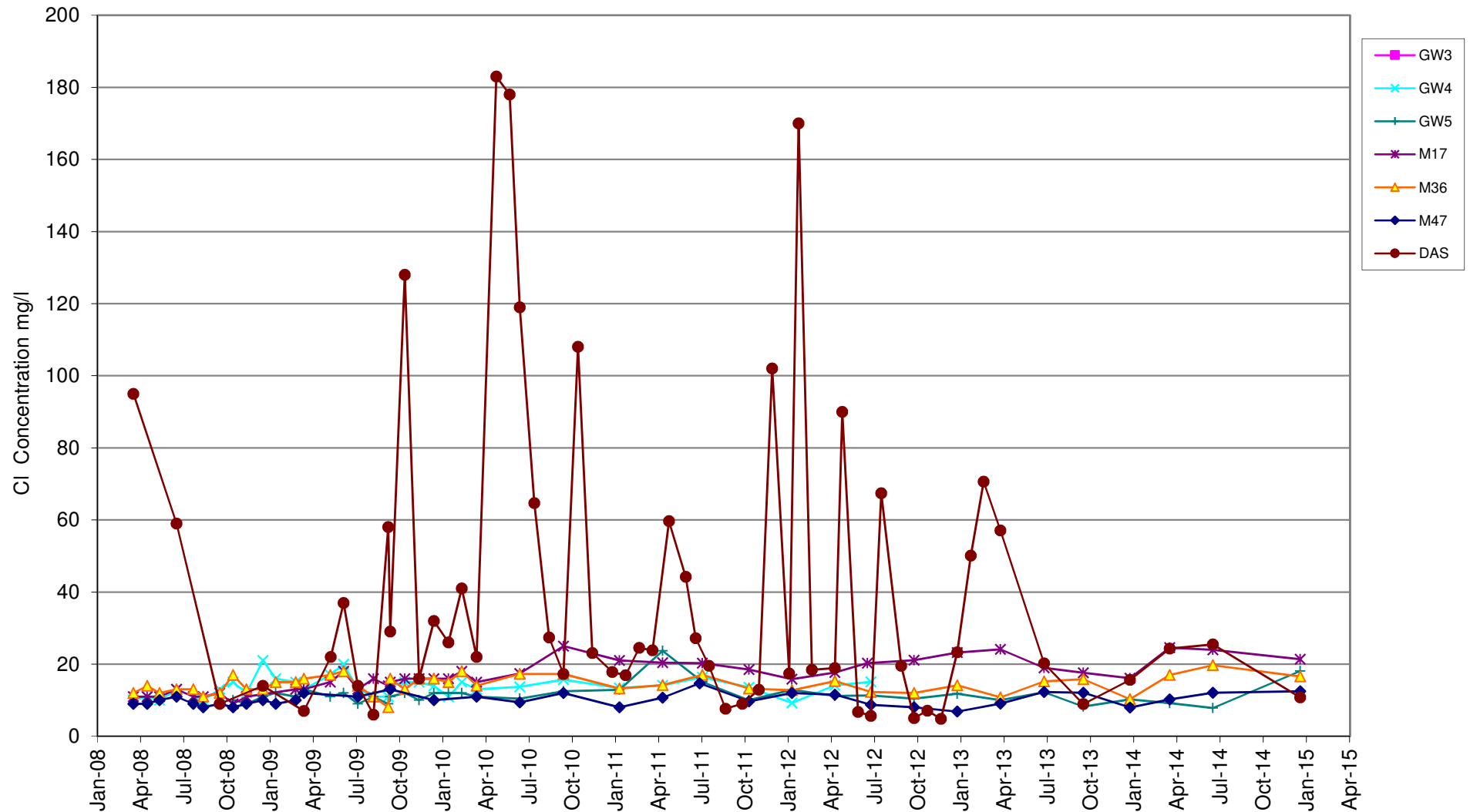
## Groundwater Quality Plots



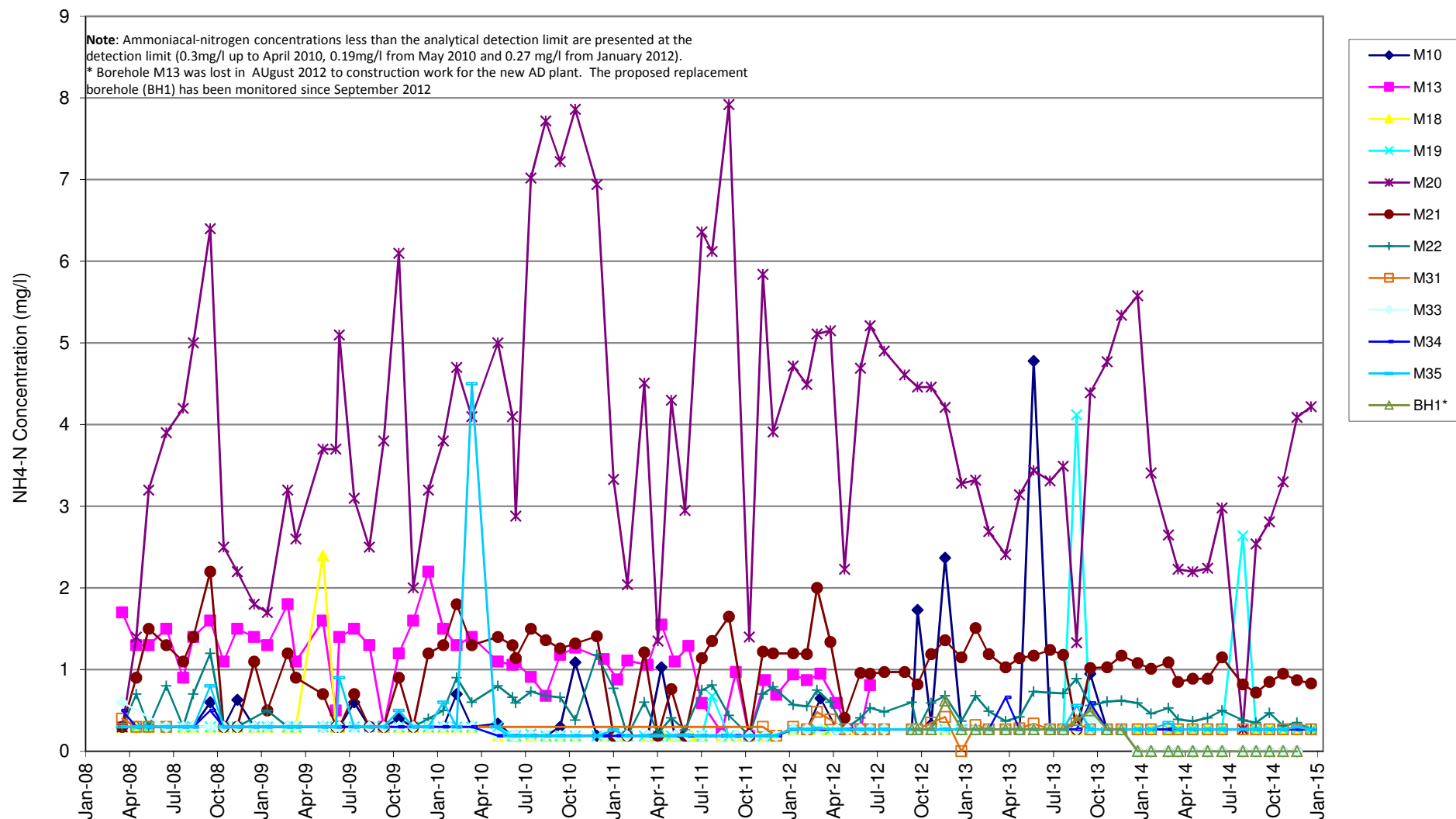
# Llwyn Isaf Landfill - Ammoniacal-Nitrogen Groundwater Concentrations at Area 3 (formerly EP) Boreholes



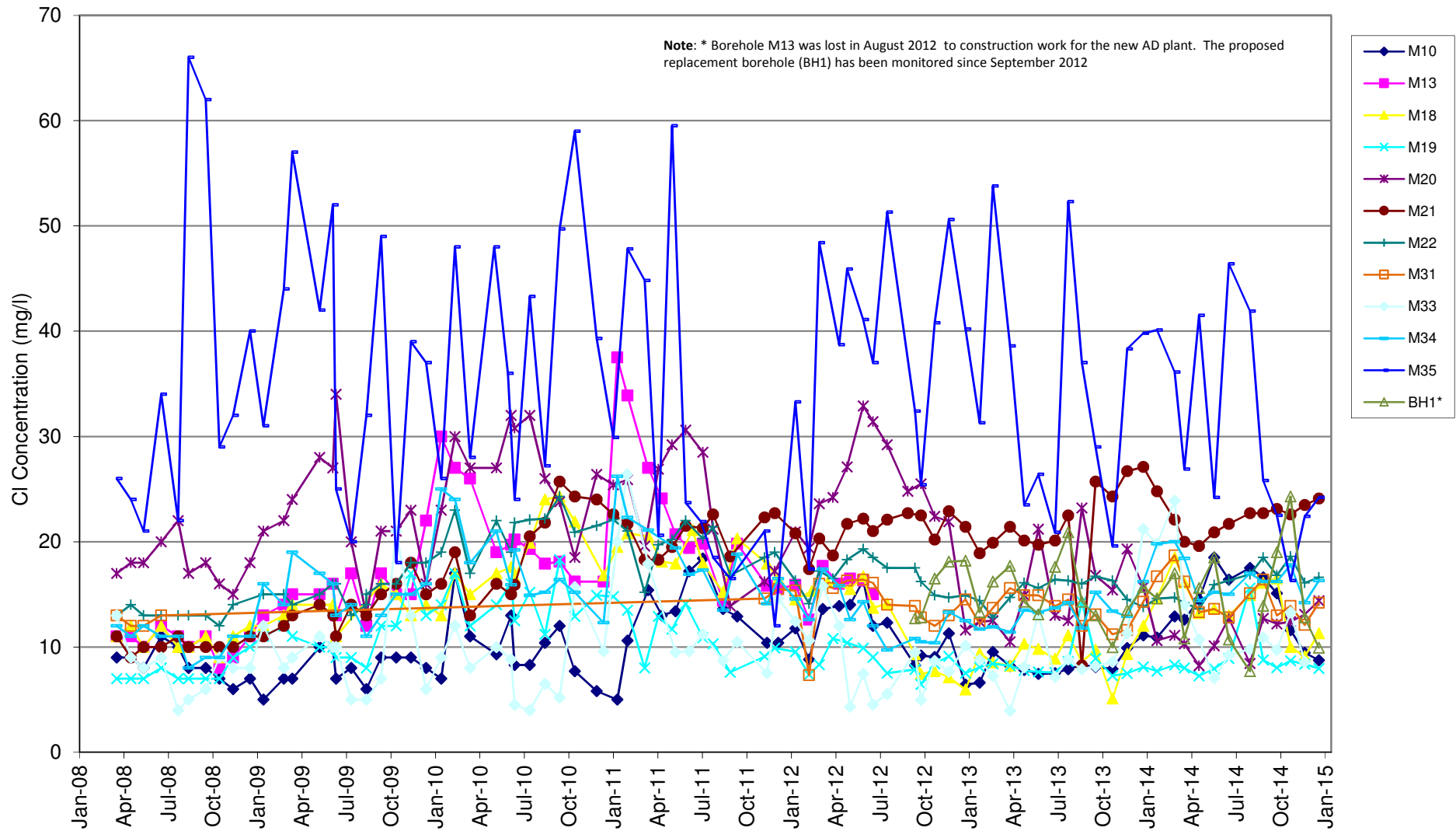
Llwyn Isaf Landfill - Chloride Groundwater Concentrations at Area 3 (formerly EP) Boreholes



## Llwyn Isaf Landfill - Ammoniacal-Nitrogen Groundwater Concentrations at Area 2 (formerly WML) Boreholes



# Llwyn Isaf Landfill - Chloride Groundwater Concentration at Area 2 (formerly WML) Boreholes





# Appendix E

## Schedule 6 Notice





## 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	YP3138UJ
Name of operator	Gwynedd Council
Location of installation	Llwyn Isaf Landfill, Gwynedd Council, Clynnog Fawr, Gwynedd, LL54 5DF
Time and date of detection	GW4 21/01/15

**(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	GW4
Parameter(s)	Cl
Limit	16 mg/l
Measured value and uncertainty	16.6 mg/l
Date and time of monitoring	06/01/15
Measures taken, or intended to be taken, to stop the emission	

<b>Time periods for notification following detection of a breach of a limit</b>	
<b>Parameter</b>	<b>Notification period</b>

<b>(c) Notification requirements for the detection of any significant adverse environmental effect</b>	
<b>To be notified within 24 hours of detection</b>	
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**

<b>Any more accurate information on the matters for notification under Part A</b>	
<b>Measures taken, or intended to be taken, to prevent a recurrence of the incident</b>	
<b>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</b>	Continue to monitor on a monthly basis
<b>The dates of any unauthorised emissions from the installation in the proceeding 24 months</b>	

<b>Name *</b>	Susan Francis
<b>Post</b>	Assistant Engineer
<b>Signature</b>	
<b>Date</b>	18/02/15

\* authorised to sign on behalf of Gwynedd Council

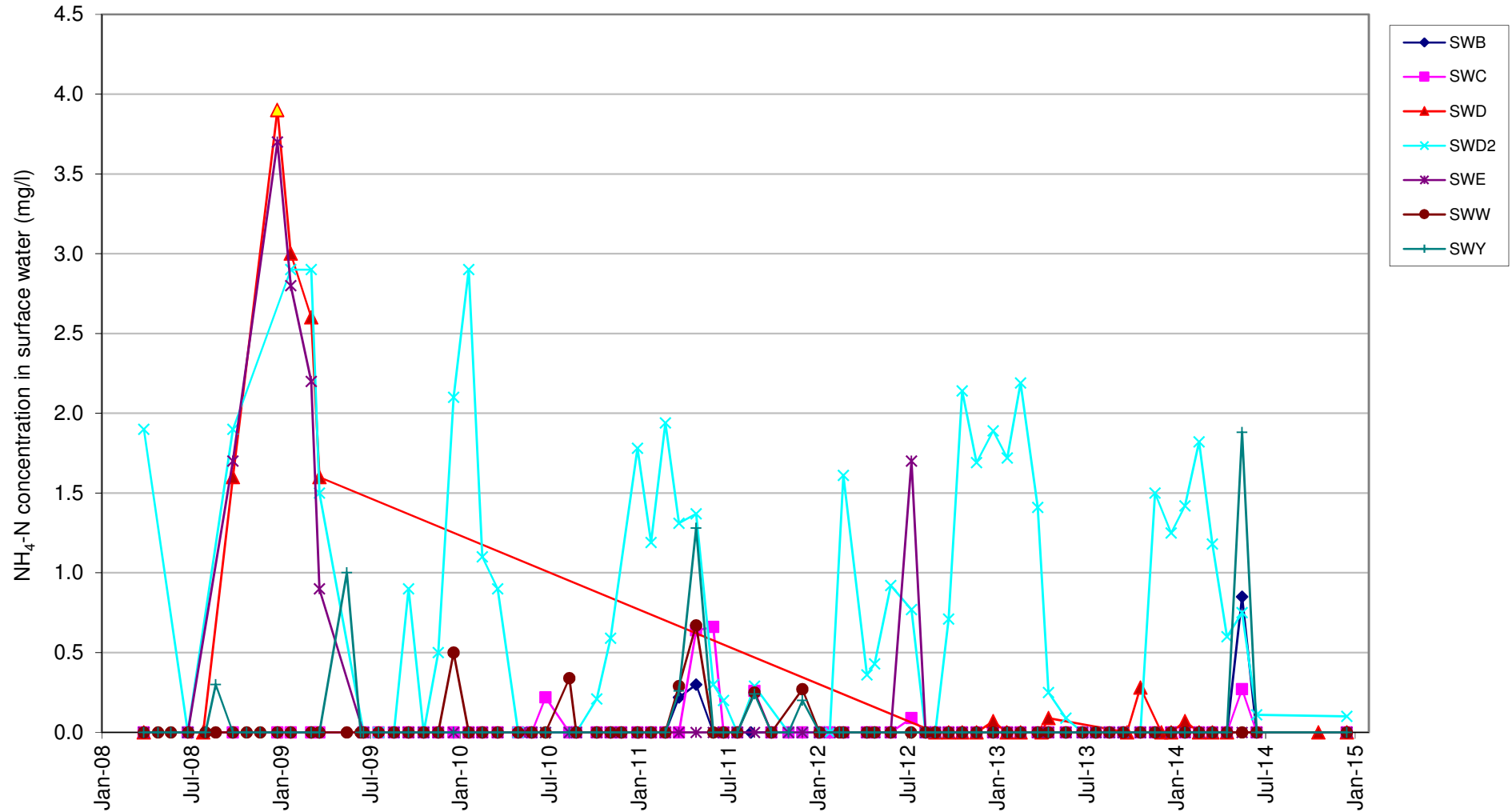


# Appendix F

## Surface Water Quality Plots

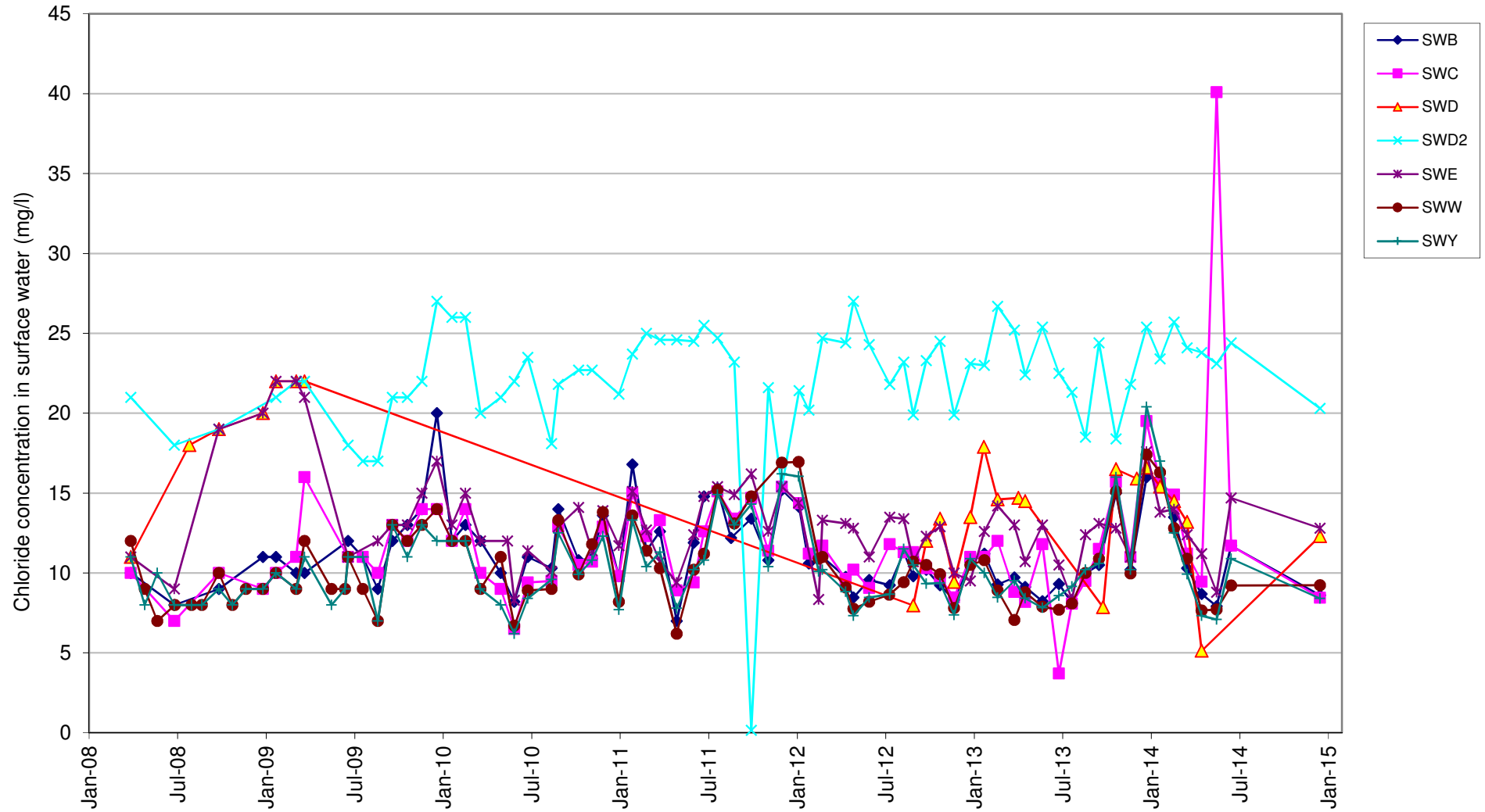


# Llwyn Isaf Landfill: Ammoniacal Nitrogen Concentrations in Surface Water



Note: values at less than method detection limit are plotted at 0

# Llwyn Isaf Landfill: Chloride Concentrations in Surface Water





# Appendix G

## Gas Balancing Data





ID	Date/Time	CH4 %	CO2 %	O2 %	BALANCE %	RESIDUAL NITROGEN %	CO ppm	SUCTION PRESSURE mb	ATMOS - PHERIC PRESSURE mb	total flow m3/hr
LI_FLARE	02/01/2014 09:41	46.1	32.1	1.5	20.3	14.6		-31.4	977	
LI_FLARE	02/01/2014 10:49	51.8	34.7	0.2	13.3	12.5	28	-33.1	977	100
LI_FLARE	15/01/2014 10:57	48.9	33.4	0.3	17.4	16.3	1	-33.7	979	
LI_FLARE	15/01/2014 12:16	55.3	35	0	9.7	9.7	0	-30.6	977	100
LI_FLARE	29/01/2014 10:37	47.3	33.8	0.3	18.6	17.5	2	-36.1	982	
LI_FLARE	29/01/2014 11:31	52.9	35.3	0.1	11.7	11.3	1	-35.7	981	100
LI_FLARE	12/02/2014 11:02	43.7	32	0.1	24.2	23.8	1	-34.6	965	
LI_FLARE	12/02/2014 11:46	54.3	35.3	0.1	10.3	9.9	1	-32.9	960	100
LI_FLARE	26/02/2014 11:08	38.8	30.1	0.3	30.8	29.7	2	-37.6	998	
LI_FLARE	26/02/2014 14:35	46.2	32.3	0.2	21.3	20.5	2	-36.3	998	100 reduced to 70
LI_FLARE	13/03/2014 13:13	49.7	32.2	0.2	17.9	17.14	5	-39.34	1016	
LI_FLARE	13/03/2014 14:10	49.4	31.2	0.5	18.9	17.01	10	-29.15	1014	70 increased to 80
LI_FLARE	20/03/2014 10:18	49	31.7	0.9	18.4	15	9	-28.64	987	
LI_FLARE	20/03/2014 11:22	49.3	33	0.2	17.5	16.74	8	-27.08	986	80 reduced to 70
LI_FLARE	03/04/2014 09:54	53.1	34.4	0.1	12.4	12.02	5	-20.95	985	
LI_FLARE	03/04/2014 11:14	56.6	33.8	0	9.6	9.6	11	-17.69	984	70
LI_FLARE	22/04/2014 14:28	50.6	33.1	0.8	15.5	12.48	6	-19.84	991	
LI_FLARE	22/04/2014 16:06	53.5	34.1	0.1	12.3	11.92	10	-18.84	990	70
LI_FLARE	07/05/2014 09:08	50.1	35	0.2	14.7	13.94	4	-20.22	989	
LI_FLARE	07/05/2014 10:27	56	35.5	0	8.5	8.5	10	-17.79	989	70
LI_FLARE	21/05/2014 09:38	49.5	33	0.2	17.3	16.54	6	-19.77	995	
LI_FLARE	21/05/2014 15:27	54.7	34	0	11.3	11.3	6	-11.46	994	70
monitoring reduced to monthly										
LI_FLARE	17/06/2014 09:23	42.4	31.7	0	25.9	25.9	8	-16.84	1015	
LI_FLARE	17/06/2014 10:23	53.5	33.5	0	13	13	11	-21.71	1014	70
LI_FLARE	22/07/2014 09:43	56.1	35.9	0	8	8	12	-25.25	1009	
LI_FLARE	22/07/2014 10:41	58.5	35.3	0	6.2	6.2	16	-18.44	1009	70
LI_FLARE	19/08/2014 09:48	49	34.3	0	16.7	16.7	9	-20.01	998	
LI_FLARE	19/08/2014 10:27	51.2	34.7	0.2	13.9	13.14	10	-21.04	998	65
LI_FLARE	16/09/2014 13:26	50.4	33.4	0.3	15.9	14.77	7	-20.68	999	
LI_FLARE	16/09/2014 14:09	53.9	35	0	11.1	11.1	13	-17.28	998	65
LI_FLARE	15/10/2014 10:05	44.7	31.7	0.5	23.1	21.21	8	-18.77	986	
LI_FLARE	15/10/2014 11:03	52.8	33.9	0.1	13.2	12.82	8	-20.98	984	65
LI_FLARE	11/11/2014 09:18	49.9	33.1	0.3	16.7	15.57	6	-25.72	974	
LI_FLARE	11/11/2014 10:17	56.1	35	0	8.9	8.9	10	-20.69	973	65
LI_FLARE	08/12/2014 13:43	38.3	29.6	0.7	31.4	28.75	4	-23.94	1005	
LI_FLARE	08/12/2014 14:24	43.6	31.5	0.3	24.6	23.47	6	-27.81	1004	70 reduced to 60

GAS FIELD MONITORING SHEET													CH4 Consultants					
Site:		Llwyn Isaf						Weather Conditions				Sunny						
Date:																		
Name:								Steve Hindle				Temperature °C				20 to 22		
Equipment Used :								GA 2000+										
Serial No :								GA11066				Compressor Hrs						
Last Calibration Date :								13/03/2014				Total Flow Setting m^3hr				70m^3hr		
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 %				
LI_FLARE	22/07/2014 09:43	56.1	35.9	0	8	8	12	-25.25	1009					60				
LI_GE018	22/07/2014 09:46	62.6	38.8	0	0	0	11	-25.04	1009					100				
LI_GE016	22/07/2014 09:51	59.3	36.5	1	3.2	0	13	-25.01	1009					100				
LI_GE019	22/07/2014 09:52	51.3	36.7	0	12	12	22	-24.48	1009					50				
LI_GE020	22/07/2014 09:55	57.6	36.7	0	5.7	5.7	14	-24.01	1009					25				
LI_GE014	22/07/2014 09:56	59.4	37.3	0	3.3	3.3	9	-0.61	1009					2				
LI_GE015	22/07/2014 09:58	59.9	36.7	0	3.4	3.4	11	-23.54	1009					100				
LI_GE013	22/07/2014 10:00	54.4	38	0	7.6	7.6	12	-23.32	1009					100				
LI_GE012	22/07/2014 10:02	63.1	38.8	0	0	0	17	-23.23	1009					100				
LI_GE011	22/07/2014 10:04	61.6	38	0.3	0.1	0	21	-23.12	1009					100				
LI_GE010	22/07/2014 10:06	63.4	35.5	0.3	0.8	0	16	-23.1	1009					25				
LI_LM1/3	22/07/2014 10:07	64.2	37	0	0	0	16	-22.96	1009					10				
LI_GE007	22/07/2014 10:09	63.1	37.2	0	0	0	13	-0.87	1009					2				
LI_GE006	22/07/2014 10:12	28.5	23.9	0.3	47.3	46.17	8	-0.56	1009					0				
LI_GE004	22/07/2014 10:19	54.2	32.1	0.5	13.2	11.31	9	-21.31	1009					50				
LI_GE005	22/07/2014 10:21	55.5	36	0	8.5	8.5	10	-21.18	1009					500				
LI_GE003	22/07/2014 10:23	54.8	34.3	0.2	10.7	9.94	10	-21.28	1009					50				
LI_GE002	22/07/2014 10:25	63.8	35.3	0	0.9	0.9	13	-21.52	1009					100				
LI_GE001	22/07/2014 10:26	60	37.1	0	2.9	2.9	14	-21.45	1009					100				
LI_GE008	22/07/2014 10:29	63.8	37	0	0	0	13	-21.46	1009					100				
LI_GE009	22/07/2014 10:32	65.5	37.4	0	0	0	15	-1.5	1009					2				
LI_LM2/1	22/07/2014 10:34	56.5	32.3	1.7	9.5	3.07	15	-1.36	1009					0				
LI_GE017	22/07/2014 10:36	63.2	37.1	0	0	0	15	0	1009					2				
LI_LM2/2	22/07/2014 10:38	61.7	40	0	0	0	12	0.11	1009					0				
LI_FLARE	22/07/2014 10:41	58.5	35.3	0	6.2	6.2	16	-18.44	1009					100				

GAS FIELD MONITORING SHEET													CH4 Consultants		
Site:		Llwyn Isaf 19/08/2014 Steve Hindle GA 2000+ GA11066 13/03/2014 16/09/2014						Weather Conditions				Sunshine & Showers			
Date:															
Name:								Temperature °C				17 to 19			
Equipment Used :															
Serial No :								Compressor Hrs							
Last Calibration Date :								Total Flow Setting m^3hr				65m^3hr			
Calibration Due Date :															
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 %	
LI_FLARE	19/08/2014 09:48	49	34.3	0	16.7	16.7	9	-20.01	998					60	
LI_GE018	19/08/2014 09:50	63.1	38.7	0	0	0	9	-19.94	998					100	
LI_GE016	19/08/2014 09:51	56.4	35.8	0.2	7.6	6.84	10	-19.82	998					100	
LI_GE019	19/08/2014 09:53	51.6	35.6	0.1	12.7	12.32	19	-19.5	998					50	
LI_GE020	19/08/2014 09:54	45.5	33.4	0	21.1	21.1	17	-19.13	998					25	
LI_GE014	19/08/2014 09:56	43.2	32.4	0	24.4	24.4	9	-6.91	998					15	
LI_GE015	19/08/2014 09:57	55.4	35.8	0	8.8	8.8	8	-19.93	998					100	
LI_GE013	19/08/2014 09:59	63.9	39	0	0	0	14	-19.99	998					100	
LI_GE012	19/08/2014 10:01	62.2	38	0.4	0	0	18	-20.12	998					100	
LI_GE011	19/08/2014 10:03	67.7	35.3	0	0	0	19	-19.94	998					100	
LI_LM1/3	19/08/2014 10:04	54.1	34.8	0	11.1	11.1	20	-20.41	998					10	
LI_GE007	19/08/2014 10:05	41.3	31.3	0.1	27.3	26.92	14	-19.07	998					10	
LI_GE006	19/08/2014 10:08	28.1	23.1	3.5	45.3	32.07	6	-3.89	998					0	
LI_GE004	19/08/2014 10:11	54.1	34.5	0	11.4	11.4	7	-19.5	998					75	
LI_GE005	19/08/2014 10:12	53.4	35.8	0	10.8	10.8	8	-19.48	998					75	
LI_GE003	19/08/2014 10:14	57.3	34.6	0.3	7.8	6.67	9	-19.5	998					100	
LI_GE002	19/08/2014 10:15	63.3	35.7	0	1	1	10	-19.66	998					100	
LI_GE001	19/08/2014 10:16	61.6	37.4	0	1	1	12	-19.72	998					100	
LI_GE008	19/08/2014 10:18	65.2	37.4	0	0	0	11	-19.84	997					100	
LI_GE009	19/08/2014 10:20	33.3	31.6	0.3	34.8	33.67	12	-13.44	998					0	
LI_LM2/1	19/08/2014 10:21	7.4	6.8	15.1	70.7	13.62	7	-0.38	998					0	
LI_GE017	19/08/2014 10:23	40.4	32.7	0.1	26.8	26.42	8	-7.22	998					10	
LI_LM2/2	19/08/2014 10:25	16.2	14.2	11	58.6	17.02	35	-0.96	998					0	
LI_FLARE	19/08/2014 10:27	51.2	34.7	0.2	13.9	13.14	10	-21.04	998					60	

GAS FIELD MONITORING SHEET													CH4 Consultants					
Site:		Llwyn Isaf						Weather Conditions				Sunshine						
Date:																		
Name:								Steve Hindle				Temperature °C				20 to 22		
Equipment Used :								GA 2000+										
Serial No :								GA11066				Compressor Hrs						
Last Calibration Date :								13/03/2014				Total Flow Setting m^3hr				65m^3hr		
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 %				
LI_FLARE	16/09/2014 13:26	50.4	33.4	0.3	15.9	14.77	7	-20.68	999					60				
LI_GE018	16/09/2014 13:28	64.4	39.7	0.1	0	0	9	-20.55	999					100				
LI_GE016	16/09/2014 13:30	59.8	36.6	0.4	3.2	1.69	11	-20.46	999					100				
LI_GE019	16/09/2014 13:31	49.7	35	0	15.3	15.3	20	-20.04	998					100				
LI_GE020	16/09/2014 13:32	44.3	32.4	0	23.3	23.3	18	-19.67	998					25				
LI_GE014	16/09/2014 13:34	37.9	30.6	0.3	31.2	30.07	8	-6.97	998					0				
LI_GE015	16/09/2014 13:35	53.5	35	0	11.5	11.5	8	-20.79	999					100				
LI_GE013	16/09/2014 13:37	50.1	36	0	13.9	13.9	10	-21.16	998					50				
LI_GE012	16/09/2014 13:38	62.9	38.9	0	0	0	15	-21.2	998					100				
LI_GE011	16/09/2014 13:42	58.8	36.6	1	3.6	0	20	-21.24	998					100				
LI_GE010	16/09/2014 13:43	33.1	21.6	7.2	38.1	10.88	14	-21.24	998					100				
LI_LM1/3	16/09/2014 13:44	62.2	36.1	0	1.7	1.7	14	-21.19	998					0				
LI_GE007	16/09/2014 13:46	39.8	30.2	0.1	29.9	29.52	13	-19.77	999					10				
LI_GE006	16/09/2014 13:48	26.3	22.2	3.4	48.1	35.25	8	-3.05	999					0				
LI_GE004	16/09/2014 13:50	47.7	32.1	0	20.2	20.2	8	-21.44	999					50				
LI_GE005	16/09/2014 13:52	46.5	33.2	0	20.3	20.3	9	-21.73	998					50				
LI_GE003	16/09/2014 13:54	46.7	30.7	1.6	21	14.95	10	-21.93	998					100				
LI_GE002	16/09/2014 13:55	60.5	35	0	4.5	4.5	11	-22.02	998					100				
LI_GE001	16/09/2014 13:57	53.6	34.9	0	11.5	11.5	12	-22.14	998					100				
LI_GE008	16/09/2014 13:59	63.6	37	0	0	0	12	-22.09	998					100				
LI_GE009	16/09/2014 14:00	64.1	36.6	0	0	0	14	0.36	998					100				
LI_LM2/1	16/09/2014 14:02	56.6	34.1	1	8.3	4.52	16	-0.05	998					0				
LI_GE017	16/09/2014 14:04	58.6	36.5	0	4.9	4.9	18	-1.47	998					50				
LI_LM2/2	16/09/2014 14:05	37.4	31.4	0.7	30.5	27.85	16	-0.22	998					0				
LI_FLARE	16/09/2014 14:09	53.9	35	0	11.1	11.1	13	-17.28	998					60				

GAS FIELD MONITORING SHEET													CH4 Consultants		
Site:		Llwyn Isaf						Weather Conditions				Sunny Spells			
Date:															
Name:								Temperature °C				15 to 17			
Equipment Used :															
Serial No :								Compressor Hrs							
Last Calibration Date :								Total Flow Setting m^3hr				65m^3hr			
Calibration Due Date :															
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 %	
LI_FLARE	15/10/2014 10:05	44.7	31.7	0.5	23.1	21.21	8	-18.77	986					60	
LI_GE018	15/10/2014 10:09	62.7	38.2	0.1	0	0	10	-18.87	986					100	
LI_GE016	15/10/2014 10:11	55.7	34.8	0.5	9	7.11	11	-18.81	985					100	
LI_GE019	15/10/2014 10:12	46.6	33.1	0.1	20.2	19.82	21	-18.18	985					50	
LI_GE020	15/10/2014 10:14	43.8	31.7	0	24.5	24.5	13	-18.05	985					25	
LI_GE014	15/10/2014 10:17	57.2	37.2	0.1	5.5	5.12	6	-0.3	985					2	
LI_GE015	15/10/2014 10:18	56	34.3	0	9.7	9.7	8	-18.02	985					100	
LI_GE013	15/10/2014 10:21	44.7	33.7	0	21.6	21.6	10	-19.02	985					100	
LI_GE012	15/10/2014 10:23	63	38.6	0	0	0	13	-17.91	985					100	
LI_GE011	15/10/2014 10:26	62.1	37.6	0.4	0	0	18	-19.09	985					100	
LI_GE010	15/10/2014 10:32	67.5	33.1	0.2	0	0	16	-18.52	985					100	
LI_LM1/3	15/10/2014 10:33	64.4	36.4	0	0	0	20	-0.24	985					0	
LI_GE007	15/10/2014 10:35	47.6	31.6	0	20.8	20.8	13	-17.07	985					10	
LI_GE006	15/10/2014 10:37	37.4	25.4	1.7	35.5	29.07	9	-2.7	985					0	
LI_GE004	15/10/2014 10:41	51.6	32.8	0	15.6	15.6	8	-17.85	985					50	
LI_GE005	15/10/2014 10:43	51.8	35	0.1	13.1	12.72	8	-17.43	984					50	
LI_GE003	15/10/2014 10:45	58.9	33.7	0.3	7.1	5.97	9	-18.37	984					100	
LI_GE002	15/10/2014 10:46	64.1	34.8	0	1.1	1.1	11	-17.68	984					100	
LI_GE001	15/10/2014 10:48	57	35.4	0	7.6	7.6	12	-17.65	984					100	
LI_GE008	15/10/2014 10:50	64.9	36.7	0	0	0	11	-17.69	984					100	
LI_GE009	15/10/2014 10:52	31.3	26.5	0.8	41.4	38.38	13	-17.71	984					0	
LI_LM2/1	15/10/2014 10:57	9.4	20.1	1	69.5	65.72	16	-1.29	984					0	
LI_GE017	15/10/2014 10:59	31.2	27.9	0.1	40.8	40.42	7	-12.78	984					0	
LI_LM2/2	15/10/2014 11:01	40.6	29.9	2.3	27.2	18.51	10	-2.45	984					0	
LI_FLARE	15/10/2014 11:03	52.8	33.9	0.1	13.2	12.82	8	-20.98	984					60	

GAS FIELD MONITORING SHEET													CH4 Consultants		
Site:		Llwyn Isaf						Weather Conditions				Heavy rain showers			
Date:															
Name:								Temperature °C				10 to 12			
Equipment Used :															
Serial No :								Compressor Hrs							
Last Calibration Date :								Total Flow Setting m^3hr				65m^3hr			
Calibration Due Date :															
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 %	
LI_FLARE	11/11/2014 09:18	49.9	33.1	0.3	16.7	15.57	6	-25.72	974					60	
LI_GE018	11/11/2014 09:20	63.4	38.6	0.1	0	0	8	-25.56	974					100	
LI_GE016	11/11/2014 09:23	64.1	37.1	0.1	0	0	10	-25.48	974					100	
LI_GE019	11/11/2014 09:25	44.4	32.7	0	22.9	22.9	17	-24.98	973					50	
LI_GE020	11/11/2014 09:27	36.3	30.1	0	33.6	33.6	10	-24.36	973					0	
LI_GE014	11/11/2014 09:28	32.4	29	0	38.6	38.6	5	-0.74	973					0	
LI_GE015	11/11/2014 09:30	53.1	34.4	0	12.5	12.5	8	-26	973					100	
LI_GE013	11/11/2014 09:33	49.4	35.1	<<<<	>>>>	>>>>	8	-26.24	973					50	
LI_GE012	11/11/2014 09:35	63.8	40	0	0	0	14	-26.37	973					100	
LI_GE011	11/11/2014 09:41	37.9	24.4	8.5	29.2	0	11	-26.43	973					0	
LI_GE010	11/11/2014 09:42	65.8	35.4	0.4	0	0	13	-26.61	973					100	
LI_LM1/3	11/11/2014 09:43	65.7	36.2	0.2	0	0	13	6.38	973					2	
LI_GE007	11/11/2014 09:45	54.6	33.5	0	11.9	11.9	12	-24.12	973					10	
LI_GE006	11/11/2014 09:46	62.7	35.6	0	1.7	1.7	11	-6.47	973					2	
LI_GE011	11/11/2014 09:49	56	34.5	2.7	6.8	0	15	-23.36	973					100	
LI_GE004	11/11/2014 09:52	47.3	32.5	0.1	20.1	19.72	10	-23.39	973					0	
LI_GE005	11/11/2014 09:54	43.6	32.2	0	24.2	24.2	8	-23.55	973					50	
LI_GE003	11/11/2014 09:56	52.8	33.7	0	13.5	13.5	8	-23.79	973					100	
LI_GE002	11/11/2014 09:57	64.4	35.4	0	0.2	0.2	9	-23.81	973					100	
LI_GE001	11/11/2014 09:59	48	33.8	0	18.2	18.2	9	-23.88	973					50	
LI_GE008	11/11/2014 10:03	65.7	37.1	0	0	0	9	-23.97	973					100	
LI_GE009	11/11/2014 10:07	64	38.6	0	0	0	11	2.11	973					2	
LI_LM2/1	11/11/2014 10:10	44.7	29	3.6	22.7	9.09	11	0.54	973					0	
LI_GE017	11/11/2014 10:13	62.9	34.9	0	2.2	2.2	16	0.62	973					2	
LI_LM2/2	11/11/2014 10:15	63.2	39.8	0	0	0	13	0.39	973					2	
LI_FLARE	11/11/2014 10:17	56.1	35	0	8.9	8.9	10	-20.69	973					60	

GAS FIELD MONITORING SHEET													CH4 Consultants					
Site:		Llwyn Isaf						Weather Conditions				Overcast						
Date:																		
Name:								Steve Hindle				Temperature °C				6 to 8		
Equipment Used :								GA 2000+										
Serial No :								GA11066				Compressor Hrs						
Last Calibration Date :								13/03/2014				Total Flow Setting m^3hr				decreased flow 70m^hr to 60m^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 %				
LI_FLARE	08/12/2014 13:43	38.3	29.6	0.7	31.4	28.75	4	-23.94	1005					60				
LI_GE018	08/12/2014 13:45	64.7	37.9	0.1	0	0	7	-23.72	1005					100				
LI_GE016	08/12/2014 13:47	48.1	32.4	0.7	18.8	16.15	7	-23.57	1004					50				
LI_GE019	08/12/2014 13:48	37.4	29.4	0	33.2	33.2	11	-22.98	1004					50				
LI_GE020	08/12/2014 13:50	65.2	38.1	0.1	0	0	10	-0.1	1004					2				
LI_GE014	08/12/2014 13:52	40.5	31.9	0	27.6	27.6	4	-1.35	1003					0				
LI_GE015	08/12/2014 13:53	45.8	31.9	0.1	22.2	21.82	5	-22.91	1004					100				
LI_GE013	08/12/2014 13:55	43.5	33.1	0.1	23.3	22.92	6	-22.94	1004					50				
LI_GE012	08/12/2014 13:56	64.9	38.8	0.2	0	0	10	-23.01	1004					100				
LI_GE011	08/12/2014 13:59	63.9	36.9	0.7	0	0	13	-22.97	1004					100				
LI_GE010	08/12/2014 14:00	61.1	33.3	1.1	4.5	0.34	14	-22.96	1004					100				
LI_LM1/3	08/12/2014 14:01	40.3	31.5	0.1	28.1	27.72	13	-22.45	1004					0				
LI_GE007	08/12/2014 14:02	20.6	23.8	0.9	54.7	51.3	10	-23.03	1004					0				
LI_GE006	08/12/2014 14:03	37.2	27.3	2.2	33.3	24.98	8	-20.88	1004					0				
LI_GE004	08/12/2014 14:05	39.1	29.5	0.1	31.3	30.92	6	-24.4	1004					50				
LI_GE005	08/12/2014 14:07	33.5	29.2	0	37.3	37.3	5	-23.85	1004					50				
LI_GE003	08/12/2014 14:10	36.8	28.2	1	34	30.22	5	-24.89	1004					50				
LI_GE002	08/12/2014 14:11	60.3	33.9	0.2	5.6	4.84	6	-24.99	1004					100				
LI_GE001	08/12/2014 14:12	34	29.2	0	36.8	36.8	9	-25.02	1004					50				
LI_GE008	08/12/2014 14:14	66	37.4	0.2	0	0	7	-25.12	1003					100				
LI_GE009	08/12/2014 14:16	18.2	21.7	3.5	56.6	43.37	10	-18.94	1004					0				
LI_LM2/1	08/12/2014 14:18	0.1	0.5	21.2	78.2	0	3	-0.69	1004					0				
LI_GE017	08/12/2014 14:20	30.9	27.8	0.2	41.1	40.34	5	-6.06	1004					0				
LI_LM2/2	08/12/2014 14:22	17.5	14.5	11.2	56.8	14.46	5	-0.22	1004					0				
LI_FLARE	08/12/2014 14:24	43.6	31.5	0.3	24.6	23.47	6	-27.81	1004					60				



# Appendix H

## Meteorological Data





# MONTHLY CLIMATOLOGICAL SUMMARY for JUL. 2014

NAME: LLWYN ISAF CITY: STATE:  
ELEV: LAT: LONG:

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

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	17.3	21.2	18:30	13.1	2:30	1.6	0.5	0.0	0.0	4.0	17:30	WNW
2	16.7	18.8	15:00	14.4	6:00	1.7	0.1	0.0	4.1	22.0	17:00	SSW
3	15.7	17.3	12:30	14.7	00:00	2.6	0.0	0.5	5.7	23.0	15:30	SSW
4	14.9	15.7	15:00	13.2	00:00	3.4	0.0	21.3	6.6	28.0	13:30	S
5	13.6	18.5	17:00	10.2	6:00	4.8	0.0	1.8	0.1	11.0	18:00	WNW
6	13.6	17.7	18:00	8.6	6:30	4.7	0.0	0.8	0.2	10.0	18:30	WNW
7	13.5	16.7	17:00	9.5	00:00	4.8	0.0	0.0	0.1	9.0	16:30	NW
8	13.1	18.3	15:30	7.8	6:00	5.3	0.0	0.3	0.0	7.0	14:00	NW
9	13.5	16.8	18:00	9.9	23:30	4.8	0.0	0.0	0.1	8.0	14:00	NW
10	14.6	19.1	14:30	9.8	5:00	3.7	0.0	0.0	0.0	6.0	14:30	WNW
11	16.4	21.9	16:00	10.2	3:30	2.6	0.7	0.0	0.0	8.0	00:00	WNW
12	15.9	17.3	10:30	14.7	5:30	2.4	0.0	0.0	2.0	18.0	10:30	S
13	14.4	16.8	18:30	11.2	23:00	3.9	0.0	0.5	0.1	8.0	15:00	WNW
14	14.7	16.1	13:30	11.9	1:30	3.6	0.0	0.3	3.9	24.0	13:00	S
15	15.1	18.9	16:00	11.8	22:30	3.2	0.0	0.0	0.0	9.0	17:00	WNW
16	16.0	18.4	16:30	13.6	0:30	2.3	0.0	0.3	4.8	23.0	9:00	SE
17	18.2	21.4	20:30	14.8	6:00	1.1	1.0	0.0	0.9	12.0	7:30	ESE
18	20.8	24.1	13:30	16.6	23:00	0.2	2.6	0.0	2.3	28.0	11:00	SE
19	16.8	18.4	14:30	14.7	23:30	1.6	0.0	0.3	0.0	5.0	22:30	NNW
20	16.3	19.3	18:30	13.3	23:30	2.1	0.1	0.0	0.1	9.0	9:30	NW
21	17.1	21.7	15:00	11.9	5:30	2.0	0.8	0.0	0.2	10.0	15:00	SE
22	18.8	23.8	15:30	15.3	0:30	1.0	1.4	0.3	0.1	11.0	11:30	SSW
23	22.3	28.2	15:30	14.4	1:30	0.3	4.2	0.0	0.4	17.0	10:30	SE
24	23.7	27.9	14:00	19.4	5:30	0.0	5.3	0.0	0.8	17.0	1:00	SE
25	22.4	28.3	14:30	17.9	22:30	0.0	4.1	0.0	0.3	17.0	2:30	SE
26	19.6	23.7	14:00	16.5	00:00	0.4	1.6	0.0	0.2	12.0	11:30	S
27	15.5	19.7	17:00	13.2	3:30	2.9	0.1	0.0	0.1	8.0	14:00	WNW
28	15.9	19.8	16:30	12.8	23:30	2.6	0.2	0.0	0.2	11.0	2:00	WNW
29	14.8	17.7	17:00	11.6	3:00	3.5	0.0	0.0	0.1	6.0	23:00	W
30	16.2	19.9	16:30	13.2	3:00	2.3	0.1	0.0	0.3	13.0	17:30	S
31	16.7	18.4	15:00	14.7	0:30	1.7	0.0	0.0	1.4	17.0	18:00	S
-----												
	16.6	28.3	25	7.8	8	77.1	22.7	26.2	1.1	28.0	4	S

Max >= 32.0: 0

Max <= 0.0: 0

Min <= 0.0: 0

Min <= -18.0: 0

Max Rain: 21.34 ON 04/07/14

Days of Rain: 10 (> .2 mm) 1 (> 2 mm) 1 (> 20 mm)

Heat Base: 18.3 Cool Base: 18.3 Method: Integration

# MONTHLY CLIMATOLOGICAL SUMMARY for AUG. 2014

NAME: LLWYN ISAF CITY: STATE:  
ELEV: LAT: LONG:

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

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	15.7	17.7	16:00	14.3	5:00	2.7	0.0	0.0	0.9	18.0	8:00	SSW
2	14.8	18.1	14:30	12.8	21:30	3.5	0.0	0.0	1.3	20.0	13:00	SE
3	14.8	17.8	17:00	12.1	00:00	3.5	0.0	0.3	4.3	19.0	9:00	SSW
4	15.2	20.0	16:00	10.0	2:00	3.4	0.2	0.0	0.1	10.0	16:30	SSW
5	16.4	19.6	15:30	13.4	0:30	2.0	0.1	0.0	1.5	19.0	13:30	SE
6	17.1	20.8	15:30	14.7	8:30	1.6	0.3	0.0	0.5	14.0	2:30	WNW
7	15.5	19.1	14:00	12.3	21:30	2.8	0.0	0.0	0.0	12.0	15:00	S
8	16.0	19.8	14:00	11.9	1:00	2.4	0.1	0.0	0.0	7.0	8:30	S
9	15.3	18.6	13:00	11.9	5:30	3.1	0.0	0.0	1.6	19.0	13:00	SSW
10	13.5	16.7	10:00	12.3	12:30	4.8	0.0	0.0	3.1	32.0	14:30	WNW
11	14.8	18.1	16:00	12.8	3:30	3.5	0.0	0.0	1.6	22.0	14:00	WNW
12	14.4	17.3	13:00	12.3	4:30	3.9	0.0	0.0	1.7	21.0	16:00	WNW
13	14.1	15.6	19:30	12.8	23:00	4.3	0.0	0.0	0.6	11.0	4:00	NW
14	14.3	16.6	17:30	10.2	00:00	4.1	0.0	0.0	0.0	8.0	1:30	WNW
15	13.1	17.1	16:00	9.8	5:00	5.2	0.0	0.3	0.0	8.0	15:00	NW
16	14.2	16.0	15:30	11.8	4:30	4.1	0.0	0.0	0.8	15.0	16:00	WNW
17	13.8	15.9	14:30	11.8	4:00	4.6	0.0	0.0	2.7	27.0	23:00	WNW
18	13.0	15.8	15:00	11.2	21:30	5.3	0.0	0.0	0.5	23.0	2:00	NW
19	12.2	14.8	15:00	9.1	00:00	6.1	0.0	0.0	0.1	14.0	13:00	NW
20	11.2	14.6	16:30	8.4	4:00	7.2	0.0	0.3	0.0	8.0	10:30	NW
21	13.2	15.5	18:00	11.7	2:00	5.2	0.0	0.0	1.0	20.0	13:30	WNW
22	12.6	14.7	17:30	10.9	2:30	5.8	0.0	0.0	0.0	8.0	00:00	NW
23	11.8	14.8	16:00	9.0	2:30	6.5	0.0	0.0	0.0	11.0	11:00	NW
24	12.1	16.6	15:00	6.8	5:00	6.3	0.0	0.0	1.6	19.0	21:30	SE
25	14.3	17.7	15:30	11.4	1:00	3.9	0.0	0.0	2.8	23.0	5:00	SE
26	15.9	19.6	17:30	13.9	00:00	2.4	0.1	0.3	0.2	22.0	10:00	SE
27	15.3	18.8	14:00	11.6	5:30	3.0	0.0	0.0	4.1	30.0	18:00	SE
28	15.4	17.1	14:00	13.0	10:00	2.9	0.0	0.0	6.0	29.0	16:00	S
29	15.1	16.2	19:30	13.5	1:30	3.3	0.0	0.3	5.6	26.0	11:30	SSW
30	14.4	15.8	16:00	12.8	2:00	3.9	0.0	0.0	0.9	13.0	23:30	NW
31	14.7	17.8	14:00	12.9	7:30	3.6	0.0	0.0	1.4	19.0	16:30	NW
	14.3	20.8	6	6.8	24	124.8	0.8	1.3	1.4	32.0	10	NW

Max >= 32.0: 0

Max <= 0.0: 0

Min <= 0.0: 0

Min <= -18.0: 0

Max Rain: 0.25 ON 03/08/14

Days of Rain: 5 (> .2 mm) 0 (> 2 mm) 0 (> 20 mm)

Heat Base: 18.3 Cool Base: 18.3 Method: Integration

MONTHLY CLIMATOLOGICAL SUMMARY for SEP. 2014

NAME: LLWYN ISAF CITY: STATE:  
ELEV: LAT: LONG:

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

MEAN		HIGH	TIME	LOW	TIME	HEAT	COOL	RAIN	AVG	HIGH	TIME	DOM
DAY	TEMP					DEG	DEG		WIND			
						DAYS	DAYS		SPEED			DIR
1	13.9	16.4	13:30	8.1	00:00	4.4	0.0	0.0	0.1	8.0	3:00	NNW
2	13.7	18.7	15:00	7.7	2:00	4.7	0.0	0.0	0.0	1.0	13:30	NW
3	16.9	22.8	16:00	10.6	2:30	2.2	0.7	0.0	0.2	11.0	14:30	SE
4	18.2	21.8	13:30	14.7	20:30	0.9	0.7	0.0	0.2	8.0	6:00	SE
5	14.7	19.0	12:00	9.7	7:30	3.6	0.0	0.0	0.0	2.0	23:30	S
6	13.2	15.8	14:00	9.7	00:00	5.1	0.0	0.0	0.0	6.0	15:00	NNW
7	12.8	18.6	16:30	7.9	7:00	5.6	0.0	0.0	0.0	0.0	---	---
8	12.2	17.3	13:30	7.8	6:00	6.1	0.0	0.0	0.0	5.0	16:30	NNW
9	12.0	16.3	14:00	7.7	6:30	6.3	0.0	0.0	0.0	6.0	13:30	WNW
10	14.0	21.3	15:00	6.9	7:00	4.6	0.3	0.0	0.2	9.0	12:00	SE
11	15.9	19.9	12:30	13.2	23:30	2.6	0.1	0.0	0.3	10.0	12:00	SE
12	14.5	18.6	16:00	10.0	6:30	3.8	0.0	0.0	0.7	13.0	10:30	SE
13	15.9	20.1	13:00	12.3	21:30	2.6	0.1	0.0	0.0	7.0	11:00	WSW
14	15.9	20.2	15:30	12.9	5:00	2.6	0.1	0.0	0.2	12.0	8:30	SE
15	14.1	20.6	16:00	8.6	7:00	4.3	0.1	0.0	0.0	9.0	0:30	WSW
16	16.0	21.2	12:30	11.7	0:30	1.4	0.2	0.0	0.2	10.0	12:00	SSW
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
-----												
	14.6	22.8	3	6.9	10	60.7	2.3	0.0	0.1	13.0	12	SE

Max >= 32.0: 0  
Max <= 0.0: 0  
Min <= 0.0: 0  
Min <= -18.0: 0  
Max Rain: 0.00 ON 01/09/14  
Days of Rain: 0 (> .2 mm) 0 (> 2 mm) 0 (> 20 mm)  
Heat Base: 18.3 Cool Base: 18.3 Method: Integration

Part September, October and part of November data - please see the manual rainfall readings

## MONTHLY CLIMATOLOGICAL SUMMARY for NOV. 2014

NAME: LLWYN ISAF CITY: STATE:

ELEV: LAT: LONG:

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

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16	7.8	10.1	13:30	3.7	6:00	8.7	0.0	0.0	1.2	10.0	7:00	SSW
17	8.7	10.2	12:30	7.2	19:00	9.7	0.0	0.0	2.3	14.0	6:30	NNW
18	9.1	12.6	13:30	5.6	7:00	9.2	0.0	0.0	3.2	22.0	00:00	ESE
19	9.6	12.2	13:30	8.2	8:00	8.7	0.0	0.0	7.1	22.0	10:30	SSE
20	8.8	11.8	11:00	3.8	18:30	9.6	0.0	0.0	2.8	18.0	22:30	SSE
21	9.5	12.3	20:30	7.2	0:30	8.8	0.0	0.0	8.6	26.0	13:30	SSE
22	10.9	12.8	2:00	8.4	00:00	7.4	0.0	0.0	4.8	23.0	2:30	SSE
23	6.8	9.2	13:00	2.7	22:30	11.5	0.0	0.0	1.1	14.0	13:00	NW
24	6.7	10.0	13:30	2.9	2:30	11.6	0.0	0.0	1.8	10.0	12:00	S
25	7.2	9.9	14:00	5.7	9:00	11.1	0.0	0.0	3.3	14.0	10:30	SSE
26	6.8	8.2	15:30	4.9	5:00	11.6	0.0	0.0	0.8	11.0	1:00	WSW
27	7.1	9.4	13:00	4.8	8:30	11.2	0.0	0.0	4.5	19.0	22:00	S
28	10.9	13.7	14:30	8.3	2:00	7.4	0.0	0.0	4.7	21.0	2:30	SSW
29	9.4	14.3	14:00	4.9	3:30	8.9	0.0	0.0	0.9	14.0	23:30	SSW
30	8.7	11.4	13:00	3.7	00:00	9.6	0.0	0.0	1.4	13.0	4:00	NNW
-----												
	8.5	14.3	29	2.7	23	145.1	0.0	0.0	3.2	26.0	21	SSE

Max >= 32.0: 0

Max <= 0.0: 0

Min <= 0.0: 0

Min <= -18.0: 0

Max Rain: 0.00 ON 01/11/14

Days of Rain: 0 (> .2 mm) 0 (> 2 mm) 0 (> 20 mm)

Heat Base: 18.3 Cool Base: 18.3 Method: Integration

# MONTHLY CLIMATOLOGICAL SUMMARY for DEC. 2014

NAME: LLWYN ISAF CITY: STATE:  
ELEV: LAT: LONG:

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

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	6.2	8.4	14:30	1.8	6:30	12.2	0.0	0.0	1.9	18.0	22:00	SE
2	6.2	8.6	13:30	4.2	00:00	12.1	0.0	0.0	3.7	17.0	6:30	NNW
3	4.8	7.8	14:30	-0.1	00:00	13.6	0.0	0.0	0.3	7.0	3:00	NW
4	3.7	6.1	13:30	0.4	9:30	14.7	0.0	0.0	0.7	10.0	5:30	SSE
5	5.9	7.3	11:00	3.4	0:30	12.4	0.0	0.0	5.3	24.0	12:30	NNW
6	7.1	10.4	00:00	2.5	7:30	11.3	0.0	0.0	3.4	19.0	22:30	SSW
7	7.3	10.7	5:00	5.2	22:30	11.1	0.0	0.0	12.8	31.0	18:30	WNW
8	5.8	6.6	17:00	4.7	23:30	12.6	0.0	0.0	10.6	28.0	1:00	NW
9	8.1	11.9	20:00	3.1	3:30	10.2	0.0	0.0	9.4	38.0	16:00	SSW
10	6.6	7.6	0:30	4.2	2:30	11.8	0.0	0.0	11.6	44.0	4:30	W
11	6.4	7.3	21:30	4.8	5:00	11.9	0.0	0.0	12.8	46.0	1:30	WNW
12	5.0	7.1	0:30	2.3	8:30	13.3	0.0	0.0	7.5	26.0	11:30	NW
13	4.4	7.2	23:30	0.1	6:00	13.9	0.0	0.0	2.5	20.0	23:30	NNW
14	8.1	9.7	15:30	5.7	00:00	10.2	0.0	0.0	8.0	29.0	16:30	SW
15	6.8	7.9	13:30	5.4	1:00	11.5	0.0	0.0	8.8	24.0	0:30	WNW
16	7.6	11.0	23:00	6.3	1:00	10.8	0.0	0.0	8.6	29.0	23:00	NW
17	11.3	12.5	23:00	10.3	0:30	7.0	0.0	0.0	8.1	28.0	0:30	W
18	11.8	12.6	16:00	8.6	00:00	6.6	0.0	0.0	9.9	36.0	13:30	SW
19	7.6	8.7	0:30	6.8	23:00	10.7	0.0	0.0	12.0	30.0	12:00	WNW
20	7.8	8.4	14:00	7.1	2:30	10.5	0.0	0.0	11.1	29.0	4:30	NW
21	10.1	11.9	00:00	7.7	2:30	8.2	0.0	0.0	10.2	37.0	13:00	SW
22	11.6	12.1	11:30	11.2	23:00	6.7	0.0	0.0	11.0	33.0	11:00	SW
23	10.8	11.4	21:30	8.3	00:00	7.6	0.0	0.0	10.3	33.0	9:30	SW
24	7.0	8.3	0:30	6.0	7:00	11.3	0.0	0.0	14.1	30.0	16:00	WNW
25	6.5	7.2	0:30	4.8	00:00	11.8	0.0	0.0	9.3	25.0	1:30	NW
26	3.9	5.7	18:00	1.6	21:00	14.4	0.0	0.0	5.2	27.0	12:00	SSE
27	3.9	5.8	11:00	2.2	20:30	14.4	0.0	0.0	4.7	20.0	7:30	NNW
28	3.2	7.2	14:00	-0.4	9:00	15.1	0.0	0.0	0.9	9.0	2:30	WSW
29	3.3	6.7	12:00	0.4	3:30	15.0	0.0	0.0	1.7	10.0	13:30	SE
30	6.7	8.9	13:00	4.8	0:30	11.6	0.0	0.0	4.1	23.0	00:00	SSW
31	8.0	10.0	00:00	6.1	1:00	10.3	0.0	0.0	10.7	27.0	6:00	SSE
-----												
	6.9	12.6	18	-0.4	28	354.9	0.0	0.0	7.5	46.0	11	NW

Max >= 32.0: 0

Max <= 0.0: 0

Min <= 0.0: 2

Min <= -18.0: 0

Max Rain: 0.00 ON 01/12/14

Days of Rain: 0 (> .2 mm) 0 (> 2 mm) 0 (> 20 mm)

Heat Base: 18.3 Cool Base: 18.3 Method: Integration

