

**NANT Y CAWS
PHASE 1
CLOSED LANDFILL**

**ENVIRONMENTAL
PERMIT EA WML 34183**

**2015 Annual Environmental
Monitoring Report**
Report Number 1459r1v1d0316

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1 INTRODUCTION

Carmarthenshire County Council (CCC) maintains Nant y Caws (NYC) Phase I Landfill which is located east of Carmarthen and west of Cross Hands (see Figure 1). The landfill is in Aftercare and has not accepted waste since March 1997. The landfill has been partially restored, with a full FML (Flexible Membrane Liner) placed over the capped area. The site is regulated by Natural Resources Wales (NRW) through Permit No. EA WML 34183.

The Permit requires routine environmental monitoring to be undertaken. Geotechnology Ltd (Geotechnology) has been commissioned by CCC to undertake the monitoring since April 2013 and to report the results. This annual review of the monitoring data is based on data gathered up to December 2015.

This report includes data provided to Geotechnology by third parties.

2 OVERVIEW OF SITE ACTIVITY

Key dates relating to the operation, closure, capping and regulatory control of the landfill are provided in Table 2-1. A detailed site plan showing surface topography and monitoring infrastructure is provided in Figure 2.

Table 2-1 Summary of Key Dates

Date	Activity
1984	Phase 1 Landfill designed
12 Dec 1985	Waste Disposal Plan (WDP) issued by Carmarthen District Council
1 May 1994	WDP converted to a Waste Management Licence (WML)
1997	Cessation of landfilling operations
1998	Installation of gas and groundwater monitoring infrastructure
Dec 1999	Final FML capping completed
1 January 2002	Modification to WML by Environment Agency
2002/2003	Geotechnology undertakes hydrogeological risk assessment and prepare monitoring action plans based on limited data set
2009	Leachate Breakout on Southern Bund – Remedial measures implemented
6 April 2010	WML automatically became an Environmental Permit in accordance with the Environmental Permitting Regulations (England and Wales) 2010
2010	Leachate treatment system undergoing improvements
20 Jan 2015	Landfill formally taken into Aftercare by NRW

During 2016, Geotechnology anticipates that the Phase I leachate treatment system will be issued with a Permit Variation.

2.1 Landfilling

The landfill was designed in 1984 by W.S. Atkins and Partners and was based on a containment principle. However, there are no details available to demonstrate that any form of engineered containment was adopted. Instead, the design is considered to rely on the in-situ glacial till to provide an impermeable base. A series of leachate interceptor drains are shown on the original site plans. The design drawings also show that Phase 1 was divided into a series of working cells with a total of 25 shown on the plan.

This original plan also describes the working method, which involved vertical layering with working faces of 2 to 2.5m which are then capped with 300mm of inert fill. Subsequent working faces were pushed over each completed layer to form four layers, giving a total landfill thickness of between approximately 8 and 10m. This data was broadly confirmed in subsequent drilling for internal gas wells in 1998, though a maximum waste thickness of 14m was obtained. It is known that over-tipping and further waste layering was undertaken at the site in late 1994 and early 1995 which may account for the increased thickness observed. The original design also shows that at the site boundary a cut-off ditch was constructed which is further isolated from the refuse by a clay bund.

Landfilling ceased in March 1997 and the landfill has not received any wastes since then.

2.2 Capping

During the operational period measures were undertaken to reduce the leachate yield from the site in the form of FML applications to the flanks. Initially, a 0.5mm polypropylene membrane was used on the southwestern flank though this has been replaced by a 2mm double textured HDPE. All the flanks of the landfill now have a 2mm textured HDPE cover, which in turn is welded to a 1mm smooth HDPE liner on the plateau cap. Prior to the final

capping work being completed in December 1999, an intermediate layer of 0.5m of clay soil cover was placed, though it is locally thicker in hollows.

The Phase 1 landfill has therefore been capped since December 1999.

2.3 Restoration

The agricultural restoration of the Phase 1 landfill continued from 1999 up until 2003, although there are no precise records. The restoration process involved the importation of sub-soils from a number of extraneous sources. Geotechnology undertook a soil audit of the areas completed up till November 2002. This is documented in Geotechnology report 237/0/1102 issued in November 2002. Geotechnology was not involved in the final stages of restoration at the landfill.

Agricultural post and wire fencing was placed and the surface seeded to encourage surface soil stabilisation on the restored cap. The fields created by the fences are present today. The vegetation within the fields is, however, overgrown and does not appear to be being grazed or managed in accordance with the intention of the Post Closure Working Plan.

2.4 Leachate Management

The leachate at the site is collected by a gravity fed under waste drainage system comprising a 225mm diameter spine drain receiving inflows from 150mm diameter spur drains. The drainage system is accessed from the landfill surface by leachate inspection chambers, which rise through the waste. The chambers allow inspection of the leachate system and permit access for routine maintenance, leachate level measurement and cleaning. The position of each chamber has recently been re-surveyed by Geotechnology and is shown on Figure 2. Leachate inspection chambers 9 and 16 could not be found during the survey.

In addition to the under drainage works undertaken during the infilling, further leachate drains were installed at the toe of the flanks to intercept perched leachate which was historically observed to break out along the flanks. This work was completed during the capping period of the restoration in 1999. Both the toe drain and under drain system flow under gravity to the pumping sump from where the leachate is pumped, either to the nearby concrete lined leachate lagoon or the treatment plant. Following treatment, the leachate is discharged to the Afon Bantwen under discharge consent.

3 REGULATORY FRAMEWORK

The Aftercare Management Plan sets out the relevant regulatory framework against which the environmental protection measures should be evaluated. These criteria are summarised in the following sections.

3.1 Leachate Level Limit

The maximum level of leachate that should be observed from a leachate inspection chamber is 0.5m as measured from the base of the chamber.

3.2 Leachate Chemistry Control Levels

Control levels for assessing leachate chemistry are provided in Table 3-1.

Table 3-1 Leachate Control Levels

	Ammoniacal Nitrogen	Chloride	Potassium
	mg l ⁻¹	mg l ⁻¹	mg l ⁻¹
Current Discharge Consent from Effluent Treatment Plant	4		
Leachate Quarterly Control Level for L1	70	250	140
Daily Leachate Control Levels	4		

3.3 Groundwater Compliance Levels

Current groundwater trigger and control levels are summarised in Table 3-2.

Table 3-2 Trigger Levels for Emissions to Groundwater

	Ammoniacal Nitrogen	Chloride	Potassium
	mg l ⁻¹	mg l ⁻¹	mg l ⁻¹
Groundwater Trigger Level BH101, 103, 104, 105 and 117	10	250	40
Groundwater Control level BH101, 103, 104, 105 and 117	4	150	30

3.4 Surface Water Control Levels

Current surface water control levels are summarised in Table 3-3.

Table 3-3 Control Levels for Emissions to Surface Water

	Ammoniacal Nitrogen	Chloride	Suspended Solids
Location	mg l ⁻¹	mg l ⁻¹	mg l ⁻¹
SW1	0.6	150	
Cap run-off discharge			50 mg/l
French Drain Discharge	4		

3.5 Perimeter Gas Compliance Levels

Currently applicable emission limits for the perimeter gas wells are summarised in Table 3-4.

Table 3-4 Landfill Gas in External Monitoring Boreholes Emission Limits

Perimeter gas position	Carbon Dioxide Action Level (% v/v)	Methane Compliance Limit (% v/v)
All positions	3	1

Action levels are for internal use by CCC while methane compliance limits are a Permit requirement.

4 MONITORING NETWORK PERFORMANCE

To demonstrate that the site is functioning as designed, a monitoring programme is being implemented. The current programme is managed by CCC with the monitoring of leachate, downgradient groundwater, surface water and external landfill gas now undertaken by Geotechnology. Upgradient groundwater wells are sampled by the current operators of the adjacent operational landfill, CWM Environmental. The available monitoring infrastructure is shown on Figure 2.

A summary of the current monitoring programme is provided in Table 4-1.

Table 4-1 Current Monitoring Programme

Item	Monitoring Point	Type of Monitoring	Monitoring Frequency	Relevant Working Plan	Party Responsible
A	Landfill leachate level	Level and Conditional Observations	Monthly for 12 months starting 2014 and then quarterly	See WP10	WEBS
B	Landfill leachate – L1	Composition	Six monthly	See WP10	Geo
C	Leachate Breakout - Phase 1 flanks (including toe drain)	Visual	Quarterly	See WP10	Geo
D	Upgradient Groundwater – BH203, BH205	Composition		Data provided by CWM Environmental	CCC / CWM
E	Downgradient Groundwater – BH101, 103, 104, 105, 117	Level	Quarterly	See WP11	Geo
F	Downgradient Surface Water – SW1, SW4	Composition	Quarterly	See WP12	Geo
G	Internal landfill gas	Composition	Monthly	See WP13	Infinis
H	French Drain	On-site measurement of composition	When observed to be flowing during inspections by WEBS	See WP12	WEBS
I	Run-off Discharge	Composition	Quarterly	See WP12	Geo
J	Leachate Discharge	Composition	Monthly	See WP10	WEBS
K	Contingency Surface Water Sample Points	Composition		See WP12	Geo
L	Perimeter landfill gas - BH102, 106, 107, 109, 110, 111, 113, 114, 115, 118, 119, 120	Composition	Quarterly	See WP14	Geo
M	Monitoring infrastructure integrity	Observational	Inspect each point when sampling	See WP10 – WP14	Geo
N	Topographic Survey and Settlement Assessment	Topographic Survey	Every 5 years starting 2015	See WP15	Geo

4.1 Monitoring Network

Each time Geotechnology undertakes the monitoring, an inspection of the monitoring infrastructure is also completed. Since 2013, clearance of vegetation along the northwestern edge of the landfill had taken place. Routine control of the vegetation significantly aids the safe collection of samples.

Other minor repairs have been undertaken as required to the headworks of several wells with further work to be completed.

4.2 Sample Analysis & Laboratory Performance

Samples collected for laboratory testing were submitted to UKAS registered Chemtest laboratories in cooler boxes. The results from the laboratory analysis have been compiled as follows:

- Appendix 1: Laboratory Certificates
- Appendix 2: Leachate Chemistry
- Appendix 3: Groundwater Chemistry
- Appendix 4: Surface water Chemistry

4.3 Site Observations

During the first round of sampling in April 2013 an oil sheen was noticed on the surface of the sample taken from BH104. This has not been observed since.

The restored landfill cap is largely covered by good vegetative cover and appears largely visibly stable. On the eastern flanks and the majority of the plateau, the landfill is parcelled into grassed fields. In some areas, drainage appears to be poor with reeds developing.

The western and northern portions of the landfill are no longer covered by grass as the area was, until recently, used by the adjacent site operators for storage of soil, compost and construction and demolition wastes. Plans are being prepared to improve this area in accordance with the Aftercare Management Plan.

The majority of the flanks in the northern and western boundary of the landfill have self-seeded, resulting in the proliferation of a number of dwarf trees (mainly willow), gorse, broom and other flora. Whilst this is not in accordance with the species proposed in the Post Closure Working Plan, they have had the desired effect of stabilising the slopes, especially the near surface restoration soils. No evidence of instability or failure was observed in the walkovers undertaken in 2015.

Leachate breakout has previously occurred on the southern bund of the landfill. Measures to collect and treat excess leachate have been implemented by CCC. In the same corner, the capping membrane HDPE is exposed and damaged over an area of approximately 1m². Based on visible vehicle tracks, Geotechnology suspects that trafficking has primarily caused the damage rather than any failure of the soil cover. In the southeastern corner of the landfill, Geotechnology suspects perching of leachate within the waste as the ground surface is soft and fully saturated.

The access road down to the leachate treatment plant is tarmacadam and is in good condition.

4.4 Topographic Survey

The landform at Phase 1 has been surveyed on a number of occasions. The most recent of which was in 2015 by Geotechnology. To ensure that consistent, repeatable settlement surveys of the site is possible, Geotechnology also previously installed 15 fixed position Settlement Monitoring points across the landfill cap in 2010. Once the reprofiling works are complete this aspect of the monitoring programme will be considered in more detail.

5 MONITORING RESULTS

5.1 Leachate Levels

Leachate levels have recently been monitored each month at the accessible leachate chambers. This data is summarised in Table 5-1.

Table 5-1 Monthly Leachate Level Monitoring

	09/02/2015	30/03/2015	29/04/2015	12/05/2015	10/06/2015	10/07/2015	10/08/2015	23/10/2015
LC01	108.3	104.4	107.7	108.2	108.2	108.2	108.4	108.4
LC02	108.9	109.1	109.0	108.8	109.2	109.3		
LC03	110.9	106.8	109.4	111.2	112.2	110.5	112.7	112.5
LC04	113.3	113.8	113.3	112.6	112.9	112.9	112.4	112.4
LC05	116.4	116.4	116.1	115.8	115.6	116.0	115.6	115.9
LC06	118.9	118.8	118.7	118.9	118.5	118.7	118.5	118.8
LC07	123.9	121.6	122.6	123.4				
LC08	131.1	131.1	131.0	131.1	130.2	130.0	129.5	129.6
LC10	109.8	109.9	109.9	109.8	109.8	110.0	109.6	110.0
LC11	114.3	113.7	113.6	113.5	113.3	113.6	113.5	113.2
LC12	116.2	116.5	116.3	116.1	116.6	116.6	116.3	116.1
LC14	122.2	122.0	121.7	121.3				
LC15	124.3	124.3	124.3	123.9	124.0	124.1	123.5	123.3
LC17	112.4	112.1	114.1	115.0	114.7	114.8	114.6	114.4
LC19	101.1	101.1		111.1	111.2	111.5	111.2	111.0
LC20	121.5	121.3	121.5	122.3	121.2	121.2	121.0	120.9
LC22	126.8	126.0	126.7	126.9	127.0	127.2	126.9	127.0

At this stage, the data suggests that many chambers do not show significant variation from one month to the next. This indicates that the planned reduction from monthly to quarterly monitoring should not significantly detract from understanding leachate variations.

5.2 Leachate

Leachate chemistry has been monitored between 1998 and 2002 and from December 2007 to the present day. The results are graphically illustrated in Appendix 2. The data presented includes data gathered by Geotechnology and more frequent monitoring undertaken by WEBS who operate the leachate treatment plant.

The leachate is moderately mineralised with electrical conductivity of approximately 1500 microS/cm. The dominant contaminants within the leachate are ammonia and potassium. The concentration of these parameters and others is variable but appears to be declining with time. The spot sampling undertaken by Geotechnology during 2015 indicates ammonia and potassium to be typically less than 50 mg/l. Trace metals within the leachate are at low concentrations and no trace organics were detected during 2015 apart from low level (<0.5 microg/l) PAH compounds and 2 microg/l mecoprop.

The leachate currently has BOD values of <20 mg/l and total organic carbon (TOC) content of <40 mg/l suggesting that the biodegradable component is now low.

5.3 Groundwater Chemistry

All of the groundwater results are provided in Appendix 3.

To assist with describing the hydrochemistry of groundwater within the vicinity of Phase I, several borehole groupings have been created. The groupings are summarised below and are based on the position of each monitoring position relative to Phase I (see Figure 2).

- BH203 and BH205 – Up-gradient of Phase 1
- BH117 – across gradient from Phase 1 on Eastern side
- BH108 – across gradient from Phase 1 on Western side
- BH101, BH103, BH104 and BH105 – Down-gradient of Phase 1

Results for BH108 and BH117 are only available since 2008, whereas downgradient monitoring records are available since 1998.

The relatively low electrical conductivity of downgradient groundwater indicates that groundwater is of relatively good quality despite the proximity of the monitoring positions to the unlined landfill. Groundwater is less mineralised than leachate but does become locally, slightly more mineralised in the wells along the southern edge of the landfill. The concentration of ammonia did not exceed 0.4 mg/l in any samples collected during 2014 and 2015 and potassium was less than 40 mg/l on all occasions. During this time, however, the mineralised content has increased predominantly due to higher alkalinity.

Trace elements and oxidised species of nitrogen, such as nitrate, are detected in groundwater around the edge of the landfill but at relatively low concentrations (<4 mg/l nitrate) and below Environmental Quality Standards. This data suggests that either the landfill is not releasing such potential pollutants or that natural attenuation is occurring.

Hazardous substance cadmium has previously been detected in groundwater upgradient and downgradient of the landfill but at a concentration lower than the freshwater EQS. Cadmium was not detected during the last year of monitoring.

Given the low TOC content of leachate, all groundwater samples have previously been found to contain <25 mg/l TOC, suggesting that the landfill is not a significant source of organic contaminants. During 2014, trace levels of polyaromatic hydrocarbons were detected at BH101 but below the detection limit at all other locations. In 2015, similar levels were observed but at BH103, BH104 and BH117. Other trace organics were not detected apart from 1.57 microg/l isophorone at BH105.

The groundwater chemistry observed in 2015 was similar to that observed previously, although slightly more mineralised and no breaches of the control and trigger levels occurred.

5.4 Surface Water Chemistry

All of the surface water results are presented in Appendix 4.

Sample points SW1, SW2, SW3 and SW4 monitor the stream that runs west to east along the southern boundary of the landfill. The location of the surface water sample points is shown on Figure 2.

Surface water quality is primarily influenced by input from the CWM treatment lagoons west of the site and the level of leachate treatment achieved at the Phase I treatment plant. Surface water quality observed during 2015 is similar to that observed previously. All waters are moderately mineralised with typically low chloride but variable levels of ammonia. During 2015 ammonia did not exceed 0.25 mg/l at either SW1 or SW4 apart from one occasion in April 2015 when 16.3 mg/l was detected at SW4. This sample point is just downstream of the discharge from the CWM settlement ponds. Such elevated levels did not persist in the catchment as 0.2 mg/l was detected at SW1.

5.5 Perimeter Gas Chemistry

During the quarterly monitoring undertaken since April 2013, all methane concentrations have been below the Permit threshold. Methane has been below 0.3% at all monitoring positions during 2014 and 2015. Carbon dioxide (CO₂) has been detected at several positions along the eastern boundary (BH114, BH115, BH116 & BH118). Throughout 2014 and 2015 the concentration of carbon dioxide rarely exceeded 1%.

6 SUMMARY AND RECOMMENDATIONS

6.1 Environmental Protection

Groundwater and surface water monitoring completed in support of the Permit at Phase I has shown that the landfill is currently having limited impact. The available information shows that the quality of groundwater has not significantly deteriorated since the start of monitoring in 1998.

Upgradient groundwater already contains a series of low level trace elements including List 1 substance cadmium. Passage of this water below the landfill reveals that the landfill is not significantly impacting groundwater as several trace elements remain at the levels observed upgradient. Potassium is a key contaminant within leachate and despite the mobility of this element it is not significantly elevated in downgradient groundwater. The reason that the landfill is not having a significant impact on groundwater is suspected to be because groundwater has a higher piezometric surface than the basal drainage system of the landfill. The basal drainage system therefore intercepts any leachate and groundwater. As a consequence, the landfill is largely considered to be hydraulically isolated. The inward groundwater flow may not, however, prevent some outward diffusive transport, as contaminants move from an area of higher concentration to a lower one i.e. from the leachate to the aquifer. This process does not appear to be having a significant impact.

This model is further confirmed by the surrounding groundwater quality which shows little obvious impact from the landfill.

The quality of surface water within the vicinity of the landfill appears to be variable but generally good and is governed by inputs from the CWM surface water treatment lagoons and the discharge from the Phase I leachate treatment plant.

Along the southern flank of the landfill leachate breakout is known to have previously occurred but this situation is now being actively managed and controlled by CCC. Leachate breakout is the visible consequence of elevated leachate levels within the landfill.

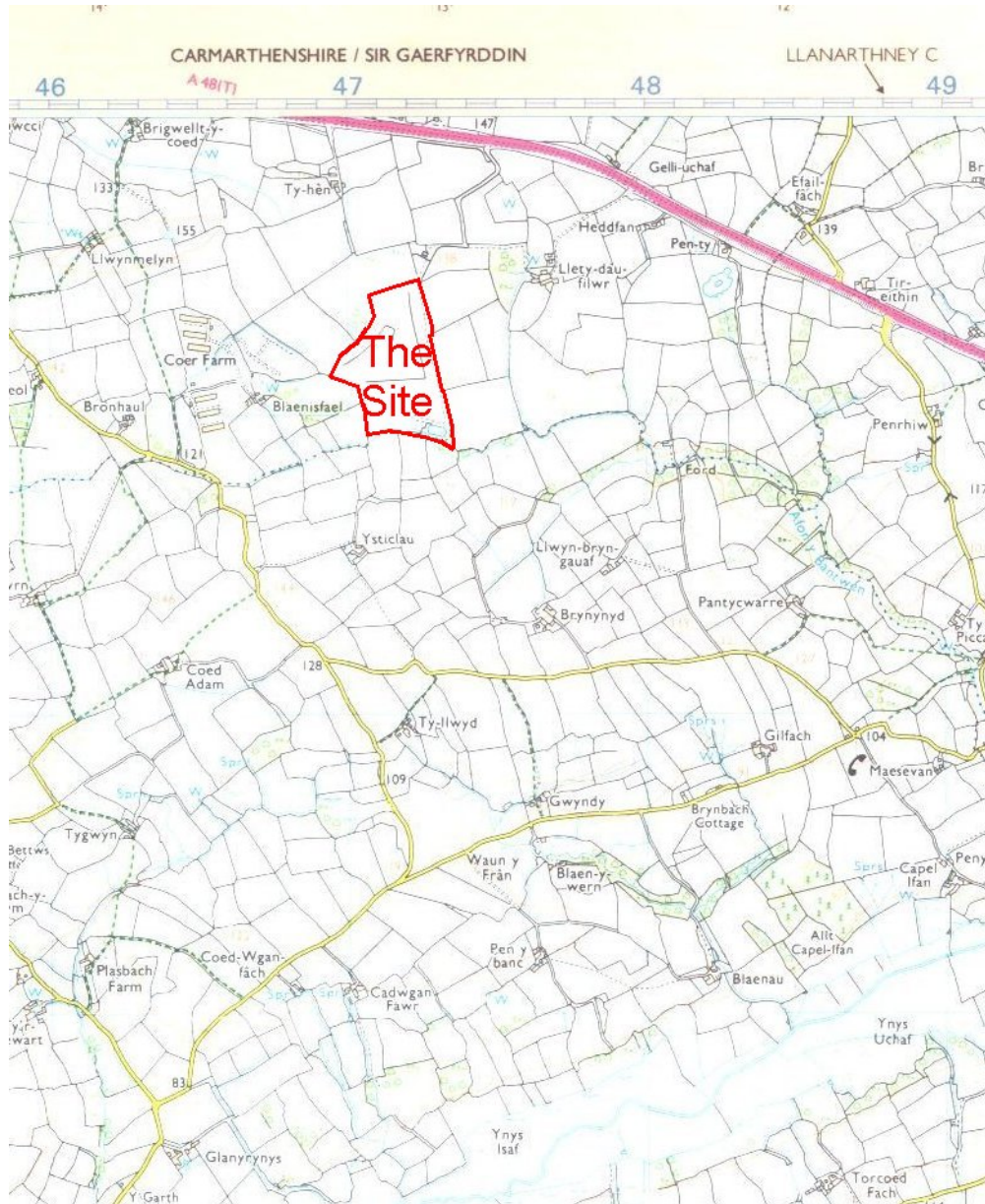
6.2 Monitoring Programme

Now that the site has been formally taken into Aftercare, the monitoring programme agreed in the Aftercare Management Plan has started to be implemented. As part of this Plan an increased range of chemical parameters were analysed in leachate and groundwater samples as these media had not previously been assessed for the presence of hazardous substances and trace organics. Based on the data gathered during 2015, where most of these substances were not found above detection limits, Geotechnology suggests that the monitoring programme should continue to be implemented as summarised in Table 4-1 but that the analytical suites should be reduced to those summarised in Table 6-1.

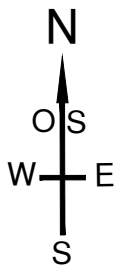
Table 6-1 Analytical Testing Schedule

Media	Lab Testing Required					Field Readings	WEBS	WEBS
	Groundwater		Surface Water	Leachate	Runoff Discharge	Perimeter Gas	Leachate Discharge	French Drain
	Suite ID	NYC1	NYC2	NYC3	NYC4	NYC5		
Time of Year	Q1, Q3	Q2, Q4	Q1, Q2, Q3, Q4	Q1, Q3	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Monthly	When flowing
Sampling locations	BH101, 103, 104, 105, 117		SW1 and SW4	L1	End of pipe discharge point	BH102, 106, 107, 109, 110, 111, 113, 114, 115, 117, 118, 119, 120	End of pipe discharge point	
No. of samples / year	10	10	8	2	4			
On-site measurements								
Carbon dioxide, methane, hydrogen sulphide, carbon monoxide, differential pressure, air temperature, atmospheric pressure, balance gas	✓		✓		✓	✓	✓	✓
Ammonia, pH, temperature	✓		✓		✓	✓	✓	✓
Laboratory Measured Parameters								
pH	✓	✓	✓	✓				
Electrical Conductivity	✓	✓	✓	✓				
Dissolved Oxygen	✓	✓	✓	✓				
Alkalinity	✓	✓	✓	✓	✓	✓	✓	✓
Hardness	✓	✓	✓	✓	✓	✓	✓	✓
BOD	✓	✓	✓	✓	✓	✓	✓	✓
COD	✓	✓	✓	✓	✓	✓	✓	✓
Total Organic Carbon	✓	✓	✓	✓	✓	✓	✓	✓
Total Oxidised Nitrogen	✓	✓	✓	✓	✓	✓	✓	✓
Calcium	✓	✓	✓	✓	✓	✓	✓	✓
Magnesium	✓	✓	✓	✓	✓	✓	✓	✓
Chloride	✓	✓	✓	✓	✓	✓	✓	✓
Potassium	✓	✓	✓	✓	✓	✓	✓	✓
Sodium	✓	✓	✓	✓	✓	✓	✓	✓
Sulphate	✓	✓	✓	✓	✓	✓	✓	✓
Phosphate	✓	✓	✓	✓	✓	✓	✓	✓
Phosphorous	✓	✓	✓	✓	✓	✓	✓	✓
Ammoniacal Nitrogen	✓	✓	✓	✓	✓	✓	✓	✓
Arsenic	✓	✓	✓	✓	✓	✓	✓	✓
Barium	✓	✓	✓	✓	✓	✓	✓	✓
Beryllium	✓	✓	✓	✓	✓	✓	✓	✓
Boron	✓	✓	✓	✓	✓	✓	✓	✓
Cadmium	✓	✓	✓	✓	✓	✓	✓	✓
Chromium	✓	✓	✓	✓	✓	✓	✓	✓
Copper	✓	✓	✓	✓	✓	✓	✓	✓
Iron	✓	✓	✓	✓	✓	✓	✓	✓
Lead	✓	✓	✓	✓	✓	✓	✓	✓
Manganese	✓	✓	✓	✓	✓	✓	✓	✓
Mercury	✓	✓	✓	✓	✓	✓	✓	✓
Nickel	✓	✓	✓	✓	✓	✓	✓	✓
Zinc	✓	✓	✓	✓	✓	✓	✓	✓
Mecoprop		✓		✓	✓	✓	✓	✓
Total PAH		✓		✓	✓	✓	✓	✓
Suspended Solids		✓	✓	✓	✓	✓	✓	✓

Figure 1 Site Location Plan



Reproduced from the Ordnance Survey Land Ranger Map
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- LEGEND
- BH203 Groundwater Monitoring Location
 - BH204 External Gas Monitoring Location
 - SW1 Surface Water Monitoring Location
 - L1 Leachate Monitoring Location
 - LC-8 Leachate Inspection Chamber
CL - Chamber Level
IL - Invert Level

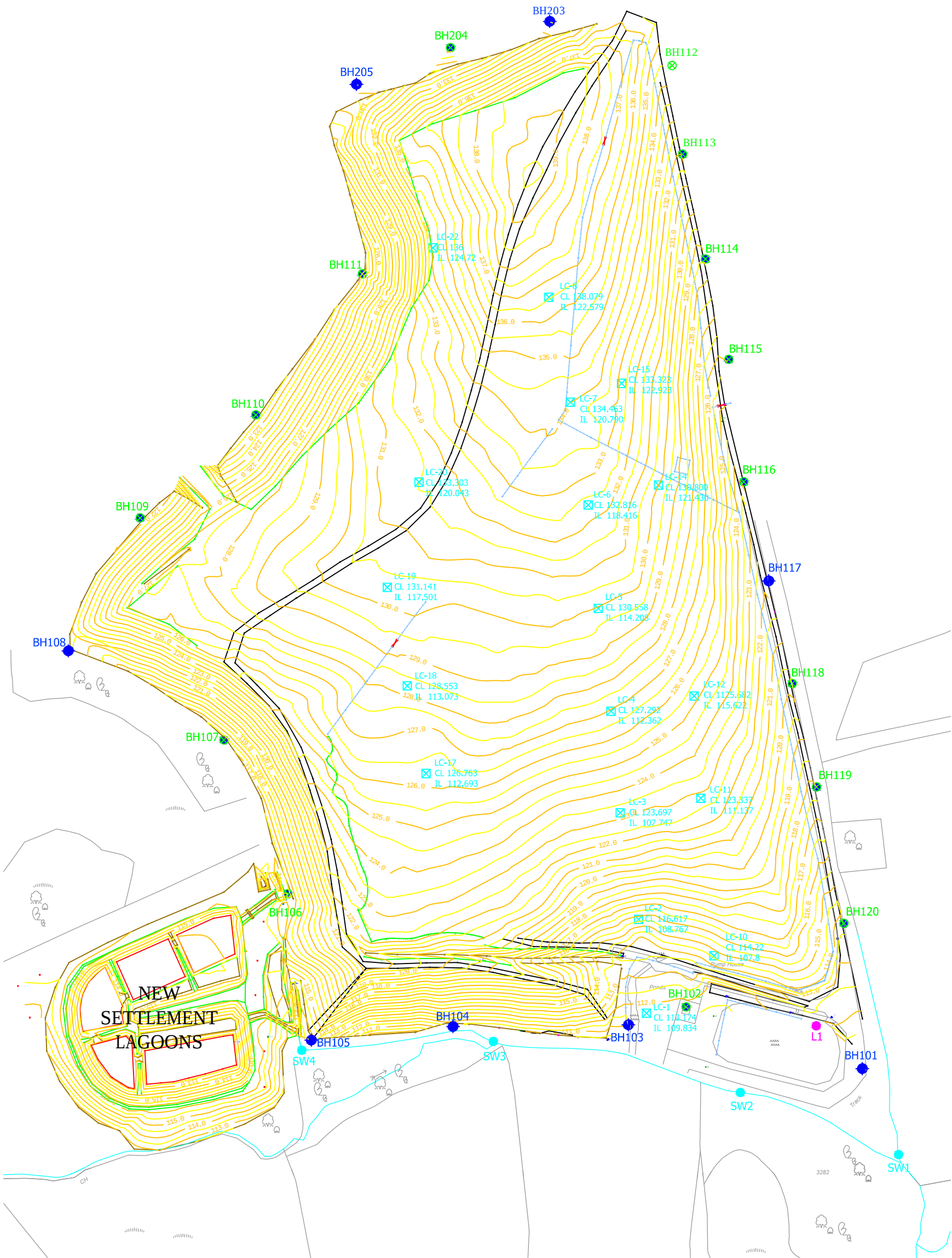


Figure 2 Site Plan and Available Monitoring Network

**NANT Y CAWS
PHASE 1
CLOSED LANDFILL**

**ENVIRONMENTAL
PERMIT EA
WML 34183**

**2015 Annual Environmental
Monitoring Report**

**Appendix 1
Laboratory Certificates**
Report Number 1459r1v1d0316



Geotechnology
5 Cefn-yr-Allt
Aberdulais
Neath
West Glamorgan
SA10 8HE

Attention: Ben Rees

CERTIFICATE OF ANALYSIS

Date: 07 May 2015
Customer: H_GETCNO_NAH
Sample Delivery Group (SDG): 150430-94
Your Reference:
Location: Wernddu Landfill
Report No: 311969

We received 1 sample on Wednesday April 29, 2015 and 1 of these samples were scheduled for analysis which was completed on Thursday May 07, 2015. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	150430-94	Location:	Wernddu Landfill	Order Number:	1256/1460
Job:	H_GETCNO_NAH-12	Customer:	Geotechnology	Report Number:	311969
Client Reference:		Attention:	Ben Rees	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
11284091	SW4			27/04/2015

Only received samples which have had analysis scheduled will be shown on the following pages.



SDG: 150430-94
Job: H_GETCNO_NAH-12
Client Reference:

Location: Werddu Landfill
Customer: Geotechnology
Attention: Ben Rees

Order Number: 1256/1460
Report Number: 311969
Superseded Report:

LIQUID Results Legend X Test N No Determination Possible	Lab Sample No(s)		11294091	
	Customer Sample Reference		SW4	
	AGS Reference			
	Depth (m)			
	Container		HNO3 Filtered (ALE) H2SO4 (ALE244) 11plastic (ALE221)	
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 1	X	
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X	
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 1		X

SDG: 150430-94
Job: H_GETCNO_NAH-12
Client Reference:

Location: Wernddu Landfill
Customer: Geotechnology
Attention: Ben Rees

Order Number: 1256/1460
Report Number: 311969
Superseded Report:

[illegible]



SDG:	150430-94	Location:	Wernddu Landfill	Order Number:	1256/1460
Job:	H_GETCNO_NAH-12	Customer:	Geotechnology	Report Number:	311969
Client Reference:		Attention:	Ben Rees	Superseded Report:	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES		

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.



SDG:	150430-94	Location:	Wernddu Landfill	Order Number:	1256/1460
Job:	H_GETCNO_NAH-12	Customer:	Geotechnology	Report Number:	311969
Client Reference:		Attention:	Ben Rees	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	11284091
Customer Sample Ref.	SW4
AGS Ref.	
Depth	
Type	LIQUID
Ammoniacal Nitrogen	07-May-2015
Anions by Kone (w)	05-May-2015
Metals by iCap-OES Dissolved (W)	01-May-2015



CERTIFICATE OF ANALYSIS

SDG:	150430-94	Location:	Werddu Landfill	Order Number:	1256/1460
Job:	H_GETCNO_NAH-12	Customer:	Geotechnology	Report Number:	311969
Client Reference:		Attention:	Ben Rees	Superseded Report:	

Appendix
General

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.
7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP -No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.
11. Results relate only to the items tested.
12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.
13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%, they are generally wider for volatiles analysis, 50-150%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.
14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).
17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill /made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

Sample Deviations

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Holding time exceeded before sample received
5	Samples exceeded holding time before preservation was performed
\$	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
&	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than :
- Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Geotechnology
5 Cefn-yr-Allt
Aberdulais
Neath
West Glamorgan
SA10 8HE

Attention: Ben Rees

CERTIFICATE OF ANALYSIS

Date: 14 May 2015
Customer: H_GETCNO_NAH
Sample Delivery Group (SDG): 150430-86
Your Reference:
Location: Nantycaws Landfill
Report No: 312930

We received 8 samples on Wednesday April 29, 2015 and 8 of these samples were scheduled for analysis which was completed on Thursday May 14, 2015. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:

Sonia McWhan

Operations Manager





SDG:	150430-86	Location:	Nantycaws Landfill	Order Number:	1255/1459
Job:	H_GETCNO_NAH-11	Customer:	Geotechnology	Report Number:	312930
Client Reference:		Attention:	Ben Rees	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
11283681	BH101			27/04/2015
11283683	BH103			27/04/2015
11283684	BH104			27/04/2015
11283685	BH105			27/04/2015
11283686	BH117			27/04/2015
11283688	L1			27/04/2015
11283678	SW1			27/04/2015
11283680	SW4			27/04/2015

Only received samples which have had analysis scheduled will be shown on the following pages.

Order Number: 1255/1459
Report Number: 312930
Superseded Report:

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CERTIFICATE OF ANALYSIS

Validated

SDG: 150430-86
Job: H_GETCNO_NAH-11
Client Reference:

Location: Nantycaws Landfill
Customer: Geotechnology
Attention: Ben Rees

Order Number: 1255/1459
Report Number: 312930
Superseded Report:

LIQUID**Results Legend**

Test

No Determination
Possible**Lab Sample No(s)**

11283680

**Customer
Sample Reference**

SW4

AGS Reference**Depth (m)****Container**

H2SO4 (ALE244)

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 8



CERTIFICATE OF ANALYSIS

SDG: 150430-86
Job: H_GETCNO_NAH-11
Client Reference:

Location: Nantycaws Landfill
Customer: Geotechnology
Attention: Ben Rees

Order Number: 1255/1459
Report Number: 312930
Superseded Report:

Results Legend		Customer Sample R	BH101	BH103	BH104	BH105	BH117	L1	
#	ISO17025 accredited.		Water(GW/SW) 27/04/2015	Water(GW/SW) 27/04/2015	Water(GW/SW) 27/04/2015	Water(GW/SW) 27/04/2015	Water(GW/SW) 27/04/2015	Water(GW/SW) 27/04/2015	
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
diss.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted test.								
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F)	Trigger breach confirmed								
1-5&*\$@	Sample deviation (see appendix)	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
Component		LOD/Units	Method	225	215	260	285	643	641
Alkalinity, Total as CaCO3		<2 mg/l	TM043	#	#	#	#	#	#
BOD, unfiltered		<1 mg/l	TM045	<1	<1	<1	<1	5.95	
				♦ #	♦ #	♦ #	♦ #	♦ #	
Organic Carbon, Total		<3 mg/l	TM090	<3	<3	6.1	<3	<3	
				♦ #	♦ #	♦ #	♦ #	♦ #	
Ammoniacal Nitrogen as N		<0.2 mg/l	TM099	<0.2	<0.2	<0.2	0.205	0.346	57.7
				#	#	#	#	#	#
COD, unfiltered		<7 mg/l	TM107	<7	7.01	386	56.4	954	
				#	#	#	#	#	
Arsenic (diss.filt)		<0.12 µg/l	TM152	0.302	0.525	0.726	0.513	0.799	
				#	#	#	#	#	
Barium (diss.filt)		<0.03 µg/l	TM152	120	50	13.3	60.9	93	
				#	#	#	#	#	
Beryllium (diss.filt)		<0.07 µg/l	TM152	<0.07	<0.07	<0.07	<0.07	<0.07	
				#	#	#	#	#	
Boron (diss.filt)		<9.4 µg/l	TM152	<9.4	<9.4	<9.4	<9.4	<9.4	
				#	#	#	#	#	
Cadmium (diss.filt)		<0.1 µg/l	TM152	<0.1	<0.1	<0.1	<0.1	<0.1	
				#	#	#	#	#	
Chromium (diss.filt)		<0.22 µg/l	TM152	3.66	3.15	4.34	4.42	4.45	
				#	#	#	#	#	
Copper (diss.filt)		<0.85 µg/l	TM152	<0.85	<0.85	1.99	<0.85	<0.85	
				#	#	#	#	#	
Lead (diss.filt)		<0.02 µg/l	TM152	<0.02	<0.02	<0.02	<0.02	<0.02	
				#	#	#	#	#	
Manganese (diss.filt)		<0.04 µg/l	TM152	0.221	<0.04	1.89	6.65	6.74	
				#	#	#	#	#	
Nickel (diss.filt)		<0.15 µg/l	TM152	1.09	1.14	2.03	1.58	1.98	
				#	#	#	#	#	
Phosphorus (diss.filt)		<6.3 µg/l	TM152	11	44.1	19.6	22.9	25	
				#	#	#	#	#	
Zinc (diss.filt)		<0.41 µg/l	TM152	<0.41	0.551	0.449	0.416	0.555	
				#	#	#	#	#	
Mineral oil >C10 C40 (aq)		<10 µg/l	TM172	<10	<10	145	<10	215	
Mercury (diss.filt)		<0.01 µg/l	TM183	<0.01	<0.01	<0.01	<0.01	<0.01	
				#	#	#	#	#	
Sulphate		<2 mg/l	TM184	8.6	5.3	18.2	4.9	16.3	
				#	#	#	#	#	
Chloride		<2 mg/l	TM184	15	13.7	12.2	10.4	23.2	142
				#	#	#	#	#	#
Phosphate (ortho) as PO4		<0.05 mg/l	TM184	0.053	0.08	<0.05	0.06	<0.05	
				#	#	#	#	#	
Total Oxidised Nitrogen as N		<0.1 mg/l	TM184	2.41	1.78	0.35	1.12	0.53	
				#	#	#	#	#	
Cyanide, Total		<0.05 mg/l	TM227	<0.05	<0.05	<0.05	<0.05	<0.05	
				♦ #	♦ #	♦ #	♦ #	♦ #	
Cyanide, Free		<0.05 mg/l	TM227	<0.05	<0.05	<0.05	<0.05	<0.05	
				♦ #	♦ #	♦ #	♦ #	♦ #	
Calcium (diss.filt)		<0.012 mg/l	TM228	69	68	90.6	89.8	95.9	
				#	#	#	#	#	
Sodium (diss.filt)		<0.076 mg/l	TM228	15.5	13.9	10.3	12.2	12	
				#	#	#	#	#	
Magnesium (diss.filt)		<0.036 mg/l	TM228	12.3	8.22	10.5	9.98	7.18	
				#	#	#	#	#	
Potassium (diss.filt)		<1 mg/l	TM228	1.08	<1	1.02	1.1	<1	46.2
				#	#	#	#	#	#
Iron (diss.filt)		<0.019 mg/l	TM228	<0.019	<0.019	0.0721	<0.019	<0.019	
				#	#	#	#	#	
Hardness, Total as CaCO3 unfiltered		<0.35 mg/l	TM228	268	247	445	353	1330	
Etridiazole		<0.01 µg/l	TM314	<0.01	<0.01	<0.01	<0.01	<0.01	

Order Number: 1255/1459
Report Number: 312930
Superseded Report:

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Order Number: 1255/1459
Report Number: 312930
Superseded Report:

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CERTIFICATE OF ANALYSIS

SDG: 150430-86
Job: H_GETCNO_NAH-11
Client Reference:

Location: Nantycaws Landfill
Customer: Geotechnology
Attention: Ben Rees

Order Number: 1255/1459
Report Number: 312930
Superseded Report:

OC, OP Pesticides and Triazine Herb

Results Legend			Customer Sample R		BH101	BH103	BH104	BH105	BH117	
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		Water(GW/SW) 27/04/2015	Water(GW/SW) 27/04/2015	Water(GW/SW) 27/04/2015	Water(GW/SW) 27/04/2015	Water(GW/SW) 27/04/2015	
M	mCERTS accredited.									
aq	Aqueous / settled sample.									
diss.filt	Dissolved / filtered sample.									
tot.unfilt	Total / unfiltered sample.									
*	Subcontracted test.									
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery				29/04/2015 150430-86 11283681	29/04/2015 150430-86 11283683	29/04/2015 150430-86 11283684	29/04/2015 150430-86 11283685	29/04/2015 150430-86 11283686	
(F)	Trigger breach confirmed									
1-5&\$@	Sample deviation (see appendix)									
Component	LOD/Units	Method								
Dichlorvos	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
Mevinphos	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
Tecnazene	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
Hexachlorobenzene	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
Trifluralin	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
alpha-Hexachlorocyclohexane (HCH / Lindane)	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
Quintozene (PCNB)	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
Diazinon	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
Triallate	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
Etrimphos	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
gamma-Hexachlorocyclohexane (HCH / Lindane)	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
Disulfoton	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
Propetamphos	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
Heptachlor	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
Chlorpyrifos methyl	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
Dimethoate	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
Aldrin	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
Chlorothalonil	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
Pirimiphos-methyl	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
beta-Hexachlorocyclohexane (HCH / Lindane)	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
Chlorpyrifos	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
Telodrin	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
Methyl parathion	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
Isodrin	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
Malathion	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
Fenthion	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
Fenitrothion	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
Heptachlor epoxide	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
Triadimefon	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
Pendimethalin	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
Parathion	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	
o,p-DDE	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01	<0.01	

Order Number: 1255/1459
Report Number: 312930
Superseded Report:

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Order Number: 1255/1459
Report Number: 312930
Superseded Report:

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CERTIFICATE OF ANALYSIS

SDG: 150430-86
Job: H_GETCNO_NAH-11
Client Reference:

Location: Nantycaws Landfill
Customer: Geotechnology
Attention: Ben Rees

Order Number: 1255/1459
Report Number: 312930
Superseded Report:

SVOC MS (W) - Aqueous

Results Legend			Customer Sample R		BH101	BH103	BH104	BH105	BH117	
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		Water(GW/SW) 27/04/2015	Water(GW/SW) 27/04/2015	Water(GW/SW) 27/04/2015	Water(GW/SW) 27/04/2015	Water(GW/SW) 27/04/2015	
M	mCERTS accredited.									
aq	Aqueous / settled sample.									
diss.filt	Dissolved / filtered sample.									
tot.unfilt	Total / unfiltered sample.									
*	Subcontracted test.									
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery									
(F)	Trigger breach confirmed									
1-5	@	Sample deviation (see appendix)									
Component	LOD/Units	Method								
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	
2,4-Dichlorophenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	
2,4-Dimethylphenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	
2-Chloronaphthalene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	
2-Chlorophenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	
2-Methylnaphthalene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	
2-Methylphenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	
2-Nitroaniline (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	
2-Nitrophenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	
3-Nitroaniline (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	
4-Bromophenylphenylether (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	
4-Chloroaniline (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	
4-Methylphenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	
4-Nitroaniline (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	
4-Nitrophenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
Azobenzene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176			<2	<2	<2	<2	<2	
					#	#	#	#	#	
Butylbenzyl phthalate (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	
Carbazole (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	
Dibenzofuran (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					#	#	#	#	#	

SDG: 150430-86
Job: H_GETCNO_NAH-11
Client Reference:

Location: Nantycaws Landfill
Customer: Geotechnology
Attention: Ben Rees

Order Number: 1255/1459
Report Number: 312930
Superseded Report:

SVOC MS (W) - Aqueous

[illegible]



CERTIFICATE OF ANALYSIS

SDG: 150430-86
Job: H_GETCNO_NAH-11
Client Reference:

Location: Nantycaws Landfill
Customer: Geotechnology
Attention: Ben Rees

Order Number: 1255/1459
Report Number: 312930
Superseded Report:

VOC MS (W)

Results Legend		Customer Sample R	BH101	BH103	BH104	BH105	BH117	
#	ISO17025 accredited.							
M	mCERTS accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water(GW/SW) 27/04/2015 29/04/2015 150430-86 11283681	Water(GW/SW) 27/04/2015 29/04/2015 150430-86 11283683	Water(GW/SW) 27/04/2015 29/04/2015 150430-86 11283684	Water(GW/SW) 27/04/2015 29/04/2015 150430-86 11283685	Water(GW/SW) 27/04/2015 29/04/2015 150430-86 11283686	
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-55*5@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM208	116	116	119	118	113	
Toluene-d8**	%	TM208	98.8	98.5	97.6	98.7	98.4	
4-Bromofluorobenzene**	%	TM208	94.9	92.9	90.5	93.8	92.2	
Dichlorodifluoromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Chloromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Vinyl chloride	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Bromomethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Chloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Trichlorofluoromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	
1,1-Dichloroethene	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Carbon disulphide	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Dichloromethane	<3 µg/l	TM208	<3	<3	<3	<3	<3	
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1	<1	<1	<1	<1	
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	<1	<1	<1	
1,1-Dichloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	<1	<1	<1	
2,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Bromochloromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Chloroform	<1 µg/l	TM208	<1	<1	<1	<1	<1	
1,1,1-Trichloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	
1,1-Dichloropropene	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Carbontetrachloride	<1 µg/l	TM208	<1	<1	<1	<1	<1	
1,2-Dichloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Benzene	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Trichloroethene	<1 µg/l	TM208	<1	<1	<1	<1	<1	
1,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Dibromomethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Bromodichloromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Toluene	<1 µg/l	TM208	<1	<1	<1	<1	<1	
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1	<1	<1	
1,1,2-Trichloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	



CERTIFICATE OF ANALYSIS

SDG: 150430-86
Job: H_GETCNO_NAH-11
Client Reference:

Location: Nantycaws Landfill
Customer: Geotechnology
Attention: Ben Rees

Order Number: 1255/1459
Report Number: 312930
Superseded Report:

VOC MS (W)

Results Legend			Customer Sample R		BH101	BH103	BH104	BH105	BH117	
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	
M	mCERTS accredited.				27/04/2015	27/04/2015	27/04/2015	27/04/2015	27/04/2015	
aq	Aqueous / settled sample.									
dis.filt	Dissolved / filtered sample.									
tot.unfilt	Total / unfiltered sample.									
*	Subcontracted test.									
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery				29/04/2015	29/04/2015	29/04/2015	29/04/2015	29/04/2015	
(F)	Trigger breach confirmed				150430-86	150430-86	150430-86	150430-86	150430-86	
1-5&+5@	Sample deviation (see appendix)				11283681	11283683	11283684	11283685	11283686	
Component	LOD/Units	Method								
1,3-Dichloropropane	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
Tetrachloroethene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
Dibromochloromethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
1,2-Dibromoethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
Chlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
Ethylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
m,p-Xylene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
o-Xylene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
Styrene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
Bromoform	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
Isopropylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	
1,2,3-Trichloropropane	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
Bromobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
Propylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
2-Chlorotoluene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
1,3,5-Trimethylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
4-Chlorotoluene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
tert-Butylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
1,2,4-Trimethylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
sec-Butylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
4-iso-Propyltoluene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
1,3-Dichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
1,4-Dichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
n-Butylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
1,2-Dichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
1,2-Dibromo-3-chloroprop ane	<1 µg/l	TM208			<1	<1	<1	<1	<1	
1,2,4-Trichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
Hexachlorobutadiene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
Naphthalene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	

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CERTIFICATE OF ANALYSIS

SDG: 150430-86
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Client Reference:

Location: Nantycaws Landfill
Customer: Geotechnology
Attention: Ben Rees

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Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters		
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples		
TM045	MEWAM BOD5 2nd Ed.HMSO 1988 / Method 5210B, AWWA/APHA, 20th Ed., 1999; SCA Blue Book 130	Determination of BOD5 (ATU) Filtered by Oxygen Meter on liquids		
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water		
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser		
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters		
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS		
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM191	Standard Methods for the examination of waters and wastewaters 16th Edition, ALPHA, Washington DC, USA. ISBN 0-87553-131-8.	Determination of Unfiltered Metals in Water Matrices by ICP-MS		
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters		
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate		
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES		
TM231	Agilent 6890 Gas Chromatograph system using an Agilent 5973 Mass Selective Detector (MSD)	Determination of Organochlorine and Organophosphorus Pesticides and Triazine Herbicides by GCMS		
TM314		Analysis of Organochlorine Pesticides in Aqueous sample by GCMS		
TM315		Analysis of Organophosphorus Pesticides in Aqueous samples by GCMS		
TM324		Analysis of Acid Herbicides in Aqueous Sample by LCQQQ		
TM328				

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.



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Location: Nantycaws Landfill
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Order Number: 1255/1459
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Superseded Report:

Test Completion Dates

Lab Sample No(s)	11283681	11283683	11283684	11283685	11283686	11283688	11283678	11283680
Customer Sample Ref.	BH101	BH103	BH104	BH105	BH117	L1	SW1	SW4
AGS Ref.								
Depth								
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
Acid Herbicides by LCQQQ (aq)	06-May-2015	06-May-2015	06-May-2015	12-May-2015	06-May-2015			
Alkalinity as CaCO ₃	09-May-2015	09-May-2015	12-May-2015	09-May-2015	12-May-2015	12-May-2015	09-May-2015	07-May-2015
Ammoniacal Nitrogen	08-May-2015	09-May-2015	08-May-2015	08-May-2015	08-May-2015	08-May-2015	08-May-2015	08-May-2015
Anions by Kone (w)	06-May-2015	06-May-2015	06-May-2015	06-May-2015	06-May-2015	07-May-2015	06-May-2015	06-May-2015
BOD True Total	06-May-2015	06-May-2015	06-May-2015	06-May-2015	06-May-2015			
COD Unfiltered	08-May-2015	08-May-2015	08-May-2015	08-May-2015	08-May-2015			
Cyanide Comp/Free/Total/Thiocyanate	12-May-2015	12-May-2015	12-May-2015	12-May-2015	09-May-2015			
Dissolved Metals by ICP-MS	11-May-2015	11-May-2015	11-May-2015	11-May-2015	11-May-2015			
Mercury Dissolved	06-May-2015	06-May-2015	06-May-2015	06-May-2015	06-May-2015			
Metals by iCap-OES Dissolved (W)	08-May-2015	08-May-2015	08-May-2015	08-May-2015	08-May-2015	11-May-2015	11-May-2015	12-May-2015
Metals by iCap-OES Unfiltered (W)	11-May-2015	11-May-2015	11-May-2015	11-May-2015	12-May-2015			
Mineral Oil C10-40 Aqueous (W)	12-May-2015	12-May-2015	12-May-2015	12-May-2015	12-May-2015			
OC, OP Pesticides and Triazine Herb	11-May-2015	07-May-2015	07-May-2015	07-May-2015	07-May-2015			
Organochlorine Pesticides (Aq)	08-May-2015	08-May-2015	08-May-2015	08-May-2015	08-May-2015			
Organophosphorus Pesticides (Aq)	08-May-2015	08-May-2015	08-May-2015	08-May-2015	08-May-2015			
Organotins in Aqueous Samples	14-May-2015	14-May-2015	14-May-2015	14-May-2015	14-May-2015			
PAH Spec MS - Aqueous (W)	12-May-2015	12-May-2015	13-May-2015	12-May-2015	13-May-2015			
Suspended Solids							08-May-2015	08-May-2015
SVOC MS (W) - Aqueous	08-May-2015	08-May-2015	08-May-2015	08-May-2015	08-May-2015			
Total Organic and Inorganic Carbon	08-May-2015	08-May-2015	08-May-2015	08-May-2015	08-May-2015			
VOC MS (W)	12-May-2015	12-May-2015	12-May-2015	12-May-2015	12-May-2015			



SDG: 150430-86
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Superseded Report:

Appendix General

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICS and SVOC TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%, they are generally wider for volatiles analysis, 50-150%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill /made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

Sample Deviations

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Holding time exceeded before sample received
5	Samples exceeded holding time before preservation was performed
\$	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
&	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than :
 - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Geotechnology
5 Cefn-yr-Allt
Aberdulais
Neath
West Glamorgan
SA10 8HE

Attention: Ben Rees

CERTIFICATE OF ANALYSIS

Date: 21 August 2015
Customer: H_GETCNO_NAH
Sample Delivery Group (SDG): 150808-98
Your Reference:
Location: Carmarthen
Report No: 326520

This report has been revised and directly supersedes 326239 in its entirety.

We received 11 samples on Saturday August 01, 2015 and 10 of these samples were scheduled for analysis which was completed on Wednesday August 19, 2015. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:

Sonia McWhan

Operations Manager





SDG:	150808-98	Location:	Carmarthen	Order Number:	1255/1459
Job:	H_GETCNO_NAH-15	Customer:	Geotechnology	Report Number:	326520
Client Reference:		Attention:	Ben Rees	Superseded Report:	326239

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
11862041	BH11			30/07/2015
11862042	BH14			30/07/2015
11862034	BH101			30/07/2015
11862033	BH103			30/07/2015
11862031	BH104			30/07/2015
11862036	BH105			30/07/2015
11862035	BH117			30/07/2015
11862037	SW1			30/07/2015
11862038	SW4			30/07/2015
11862039	WERN SW2			30/07/2015
11862040	WERN SW4			30/07/2015

Only received samples which have had analysis scheduled will be shown on the following pages.



SDG: 150808-98
Job: H_GETCNO_NAH-15
Client Reference:

Location: Carmarthen
Customer: Geotechnology
Attention: Ben Rees

Order Number: 1255/1459
Report Number: 326520
Superseded Report: 326239

LIQUID Results Legend X Test N No Determination Possible	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container	
	11862040		WERN SW4						H2SO4 (AL E244)	
	11862038		SW4						500ml Plastic (AL E208)	
	11862037		SW1						H2SO4 (AL E244)	
	11862035		BH117						500ml Plastic (AL E208)	
Acid Herbicides (W)	11862036		BH105						H2SO4 (AL E244)	
Alkalinity as CaCO3	11862031		BH104						0.5l glass bottle	
Ammoniacal Nitrogen	11862033		BH103						H2SO4 (AL E244)	
Anions by Kone (w)	11862034		BH101						1l plastic (AL E221)	
Dissolved Metals by ICP-MS	11862042		BH14						H2SO4 (AL E244)	
Mercury Dissolved	11862041		BH11						1l plastic (AL E221)	
Metals by iCap-OES Dissolved (W)									H2SO4 (AL E244)	
PAH Spec MS - Aqueous (W)									Dissolved Metals	
Suspended Solids									Vial (AL E297)	
VOC MS (W)									1000ml glass bottle	
									500ml Plastic (AL E208)	
									1000ml glass bottle	

Order Number: 1255/1459
Report Number: 326520
Superseded Report: 326239

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Order Number: 1255/1459
Report Number: 326520
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Order Number: 1255/1459
Report Number: 326520
Superseded Report: 326239

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SDG: 150808-98
Job: H_GETCNO_NAH-15
Client Reference:

Location: Carmarthen
Customer: Geotechnology
Attention: Ben Rees

Order Number: 1255/1459
Report Number: 326520
Superseded Report: 326239

PAH Spec MS - Aqueous (W)

[illegible]

Order Number: 1255/1459
Report Number: 326520
Superseded Report: 326239

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SDG: 150808-98
Job: H_GETCNO_NAH-15
Client Reference:

Location: Carmarthen
Customer: Geotechnology
Attention: Ben Rees

Order Number: 1255/1459
Report Number: 326520
Superseded Report: 326239

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters		
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples		
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM186	Determination of Acidic Herbicides in Groundwater and Potable Water by LC/MSD Using Selective Ion Monitoring. Agilent Technologies Inc. Application Note 5988-5882EN.	The Determination of Acid Herbicides in Environmental Water Samples and Leachates by LC/MS QQQ.		
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters		
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES		
TM324		Analysis of Acid Herbicides in Aqueous Sample by LCQQQ		

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.



SDG:	150808-98	Location:	Carmarthen	Order Number:	1255/1459
Job:	H_GETCNO_NAH-15	Customer:	Geotechnology	Report Number:	326520
Client Reference:		Attention:	Ben Rees	Superseded Report:	326239

Test Completion Dates

Lab Sample No(s)	11862041	11862042	11862034	11862033	11862031	11862036	11862035	11862037	11862038	11862040
Customer Sample Ref.	BH11	BH14	BH101	BH103	BH104	BH105	BH117	SW1	SW4	WERN SW4
AGS Ref.										
Depth										
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
Acid Herbicides (W)	17-Aug-2015	17-Aug-2015								
Alkalinity as CaCO3			18-Aug-2015	18-Aug-2015	18-Aug-2015	18-Aug-2015	18-Aug-2015	18-Aug-2015	18-Aug-2015	
Ammoniacal Nitrogen	18-Aug-2015	17-Aug-2015	17-Aug-2015	18-Aug-2015	18-Aug-2015	18-Aug-2015	17-Aug-2015	18-Aug-2015	17-Aug-2015	17-Aug-2015
Anions by Kone (w)	17-Aug-2015	18-Aug-2015	17-Aug-2015	17-Aug-2015	17-Aug-2015	17-Aug-2015	17-Aug-2015	17-Aug-2015	17-Aug-2015	17-Aug-2015
Dissolved Metals by ICP-MS	19-Aug-2015	18-Aug-2015								
Mercury Dissolved	13-Aug-2015	13-Aug-2015								
Metals by iCap-OES Dissolved (W)	14-Aug-2015	14-Aug-2015	14-Aug-2015	14-Aug-2015	14-Aug-2015	14-Aug-2015	14-Aug-2015	14-Aug-2015	14-Aug-2015	14-Aug-2015
PAH Spec MS - Aqueous (W)	19-Aug-2015	18-Aug-2015								
Suspended Solids								19-Aug-2015	19-Aug-2015	
VOC MS (W)	19-Aug-2015	19-Aug-2015								



SDG: 150808-98
Job: H_GETCNO_NAH-15
Client Reference:

Location: Carmarthen
Customer: Geotechnology
Attention: Ben Rees

Order Number: 1255/1459
Report Number: 326520
Superseded Report: 326239

Appendix General

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICS and SVOC TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%, they are generally wider for volatiles analysis, 50-150%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5 -C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

Sample Deviations

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Holding time exceeded before sample received
5	Samples exceeded holding time before preservation was performed
\$	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
&	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Geotechnology
5 Cefn-yr-Allt
Aberdulais
Neath
West Glamorgan
SA10 8HE

Attention: Ben Rees

CERTIFICATE OF ANALYSIS

Date: 07 January 2016
Customer: H_GETCNO_NAH
Sample Delivery Group (SDG): 151222-32
Your Reference:
Location: Carmarthen
Report No: 344420

This report has been revised and directly supersedes 344355 in its entirety.

We received 12 samples on Tuesday December 22, 2015 and 12 of these samples were scheduled for analysis which was completed on Wednesday January 06, 2016. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:

Sonia McWhan

Operations Manager





SDG:	151222-32	Location:	Carmarthen	Order Number:	1255/1459
Job:	H_GETCNO_NAH-15	Customer:	Geotechnology	Report Number:	344420
Client Reference:		Attention:	Ben Rees	Superseded Report:	344355

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
12689145	BH10			18/12/2015
12689144	BH14			18/12/2015
12689136	BH101			18/12/2015
12689137	BH103			18/12/2015
12689139	BH104			18/12/2015
12689140	BH105			18/12/2015
12689143	BH117			18/12/2015
12689135	RUNOFF			18/12/2015
12689141	SW1			18/12/2015
12689142	SW4			18/12/2015
12689147	WERN SW2			18/12/2015
12689146	WERN SW4			18/12/2015

Only received samples which have had analysis scheduled will be shown on the following pages.



SDG: 151222-32
Job: H_GETCNO_NAH-15
Client Reference:

Location: Carmarthen
Customer: Geotechnology
Attention: Ben Rees

Order Number: 1255/1459
Report Number: 344420
Superseded Report: 344355

LIQUID Results Legend X Test N No Determination Possible	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container	
	12689147		WERN SW2						H2SO4 (AL E244)	
	12689142		SW4						500ml Plastic (AL E208)	
	12689141		SW1						HNO3 Filtered	
	12689143		RUNOFF BH117						H2SO4 (AL E244)	
Acid Herbicides (W)	All	NDPs: 0 Tests: 5							1ipilastic (AL E221)	
Alkalinity as CaCO3	All	NDPs: 0 Tests: 7							H2SO4 (AL E244)	
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 11							1ipilastic (AL E221)	
Anions by Kone (w)	All	NDPs: 0 Tests: 11							H2SO4 (AL E244)	
COD Unfiltered	All	NDPs: 0 Tests: 5							1000ml glass bottle	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 5							H2SO4 (AL E244)	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 5							1000ml glass bottle	
Mercury Dissolved	All	NDPs: 0 Tests: 5							H2SO4 (AL E244)	
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 11							1000ml glass bottle	
Metals by iCap-OES Unfiltered (W)	All	NDPs: 0 Tests: 5							H2SO4 (AL E244)	
Mineral Oil C10-40 Aqueous (W)	All	NDPs: 0 Tests: 5							1000ml glass bottle	
OC, OP Pesticides and Triazine Herb	All	NDPs: 0 Tests: 5							H2SO4 (AL E244)	
Organochlorine Pesticides (Aq)	All	NDPs: 0 Tests: 5							1000ml glass bottle	
Organophosphorus Pesticides (Aq)	All	NDPs: 0 Tests: 5							H2SO4 (AL E244)	
Organotins in Aqueous Samples	All	NDPs: 0 Tests: 5							1000ml glass bottle	

Order Number: 1255/1459
Report Number: 344420
Superseded Report: 344355

No Determination Possible

Container

12689147		WERN SW2				500ml Plastic (AL.E208)	H2SO4 (AL.E24)
12689142		SM4				HNO3 Filtered	H2SO4 (AL.E24)
12689141		SW1				1lplastic (AL.E221)	H2SO4 (AL.E24)
12689135		RUNOFF				H2SO4 (AL.E24)	H2SO4 (AL.E24)
12689143		BH117				1lplastic (AL.E221)	1lplastic (AL.E221)
						500ml Plastic (AL.E208)	Vial (AL.E297)
12689140		BH105				H2SO4 (AL.E24)	H2SO4 (AL.E24)
						Dissolved Metals	250ml BOD (AL.E212)
						1lplastic (AL.E221)	1lplastic (AL.E221)
						1000ml glass bottle	Vial (AL.E297)
						H2SO4 (AL.E24)	H2SO4 (AL.E24)
						Dissolved Metals	250ml BOD (AL.E212)
						1lplastic (AL.E221)	1lplastic (AL.E221)
						1000ml glass bottle	Vial (AL.E297)
12689139		BH104				H2SO4 (AL.E24)	H2SO4 (AL.E24)
						Dissolved Metals	250ml BOD (AL.E212)
						1lplastic (AL.E221)	1lplastic (AL.E221)
						1000ml glass bottle	Vial (AL.E297)
12689137		BH103				H2SO4 (AL.E24)	H2SO4 (AL.E24)
						Dissolved Metals	250ml BOD (AL.E212)
						1lplastic (AL.E221)	1lplastic (AL.E221)
						1000ml glass bottle	Vial (AL.E297)
						H2SO4 (AL.E24)	H2SO4 (AL.E24)
12689136		BH101				Dissolved Metals	250ml BOD (AL.E212)
						1lplastic (AL.E221)	1lplastic (AL.E221)
						1000ml glass bottle	Vial (AL.E297)
						Dissolved Metals	250ml BOD (AL.E212)
						1lplastic (AL.E221)	1lplastic (AL.E221)
						1000ml glass bottle	Vial (AL.E297)
12689144		BH14				H2SO4 (AL.E24)	H2SO4 (AL.E24)
						Dissolved Metals	250ml BOD (AL.E212)
						1lplastic (AL.E221)	1lplastic (AL.E221)
						1000ml glass bottle	Vial (AL.E297)
12689145		BH10				H2SO4 (AL.E24)	H2SO4 (AL.E24)
						Dissolved Metals	250ml BOD (AL.E212)
						1lplastic (AL.E221)	1lplastic (AL.E221)
						1000ml glass bottle	Vial (AL.E297)

NDPs: 0
Tests: 5

✖



SDG: 151222-32
Job: H_GETCNO_NAH-15
Client Reference:

Location: Carmarthen
Customer: Geotechnology
Attention: Ben Rees

Order Number: 1255/1459
Report Number: 344420
Superseded Report: 344355

LIQUID Results Legend X Test N No Determination Possible	Lab Sample No(s)		12689146
	Customer Sample Reference		WERN SW4
	AGS Reference		
	Depth (m)		
	Container		H2SO4 (ALE24) 500ml Plastic (ALE208)
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 11	X
Anions by Kone (w)	All	NDPs: 0 Tests: 11	X
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 11	X



SDG: 151222-32
Job: H_GETCNO_NAH-15
Client Reference:

Location: Carmarthen
Customer: Geotechnology
Attention: Ben Rees

Order Number: 1255/1459
Report Number: 344420
Superseded Report: 344355

Results Legend			Customer Sample Ref.		BH10	BH14	BH101	BH103	BH104	BH105
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		Water(GW/SW) 18/12/2015	Water(GW/SW) 18/12/2015	Water(GW/SW) 18/12/2015	Water(GW/SW) 18/12/2015	Water(GW/SW) 18/12/2015	Water(GW/SW) 18/12/2015
M	mCERTS accredited.									
aq	Aqueous / settled sample.									
diss.filt	Dissolved / filtered sample.									
tot.unfilt	Total / unfiltered sample.									
*	Subcontracted test.									
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery				22/12/2015 151222-32 12689145	22/12/2015 151222-32 12689144	22/12/2015 151222-32 12689136	22/12/2015 151222-32 12689137	22/12/2015 151222-32 12689139	22/12/2015 151222-32 12689140
(F)	Trigger breach confirmed									
1-5&*\$@	Sample deviation (see appendix)									
Component	LOD/Units	Method								
Alkalinity, Total as CaCO3	<2 mg/l	TM043					220	225	375	260
							#	#	#	#
Organic Carbon, Total	<3 mg/l	TM090					<3	<3	6.32	<3
							@ #	@ #	#	@ #
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099			142	28.9	<0.2	0.242	<0.2	<0.2
					#	#	#	#	#	#
COD, unfiltered	<7 mg/l	TM107					<7	<7	315	55.2
							@ #	@ #	@ #	@ #
Arsenic (diss.filt)	<0.12 µg/l	TM152					0.201	0.469	0.722	0.334
							#	#	#	#
Barium (diss.filt)	<0.03 µg/l	TM152					124	59.5	18.2	63.5
							#	#	#	#
Beryllium (diss.filt)	<0.07 µg/l	TM152					<0.07	<0.07	<0.07	<0.07
							#	#	#	#
Boron (diss.filt)	<9.4 µg/l	TM152					<9.4	<9.4	11.7	15.7
							#	#	#	#
Cadmium (diss.filt)	<0.1 µg/l	TM152					<0.1	<0.1	<0.1	<0.1
							#	#	#	#
Chromium (diss.filt)	<0.22 µg/l	TM152					3.48	3.27	4.59	4.08
							#	#	#	#
Copper (diss.filt)	<0.85 µg/l	TM152					<0.85	<0.85	2.55	<0.85
							#	#	#	#
Lead (diss.filt)	<0.02 µg/l	TM152					0.044	0.025	0.092	0.022
							#	#	#	#
Manganese (diss.filt)	<0.04 µg/l	TM152					0.058	0.326	68.5	10.2
							#	#	#	#
Nickel (diss.filt)	<0.15 µg/l	TM152					0.952	0.998	2.2	1.11
							#	#	#	#
Phosphorus (diss.filt)	<6.3 µg/l	TM152					<6.3	34.2	46	157
							#	#	#	#
Zinc (diss.filt)	<0.41 µg/l	TM152					5.12	1.7	1.02	1.85
							#	#	#	#
Mineral oil >C10 C40 (aq)	<10 µg/l	TM172					<10	<10	302	<10
Mercury (diss.filt)	<0.01 µg/l	TM183					<0.01	<0.01	<0.01	<0.01
							#	#	#	#
Sulphate	<2 mg/l	TM184					8.5	3.6	16.8	2.8
							#	#	#	#
Chloride	<2 mg/l	TM184			232	66.7	15.6	14.5	10.8	10.8
					#	#	#	#	#	#
Phosphate (ortho) as PO4	<0.05 mg/l	TM184					<0.05	0.088	<0.05	0.063
							#	#	#	#
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184					2.45	1.73	0.369	1.09
							#	#	#	#
Cyanide, Total	<0.05 mg/l	TM227					<0.05	<0.05	<0.05	<0.05
							#	#	#	#
Cyanide, Free	<0.05 mg/l	TM227					<0.05	<0.05	<0.05	<0.05
							#	#	#	#
Calcium (diss.filt)	<0.012 mg/l	TM228					61.8	63.1	93.5	76.3
							#	#	#	#
Sodium (diss.filt)	<0.076 mg/l	TM228					149	128	97.1	108
							#	#	#	#
Magnesium (diss.filt)	<0.036 mg/l	TM228					11.2	7.41	10.4	8.4
							#	#	#	#
Potassium (diss.filt)	<1 mg/l	TM228			67.7	13.7	<1	<1	<1	1.31
					#	#	#	#	#	#
Iron (diss.filt)	<0.019 mg/l	TM228					<0.019	<0.019	0.162	<0.019
							#	#	#	#
Hardness, Total as CaCO3 unfiltered	<0.35 mg/l	TM228					217	185	530	293
Etridiazole	<0.01 µg/l	TM314					<0.01	<0.01	<0.01	<0.01
Propachlor	<0.01 µg/l	TM314					<0.01	<0.01	<0.01	<0.01

Order Number: 1255/1459
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SDG: 151222-32
Job: H_GETCNO_NAH-15
Client Reference:

Location: Carmarthen
Customer: Geotechnology
Attention: Ben Rees

Order Number: 1255/1459
Report Number: 344420
Superseded Report: 344355

Results Legend		Customer Sample Ref.	BH117	RUNOFF	SW1	SW4	WERN SW2	WERN SW4
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
M	mCERTS accredited.		18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		22/12/2015	22/12/2015	22/12/2015	22/12/2015	22/12/2015	22/12/2015
(F)	Trigger breach confirmed		151222-32	151222-32	151222-32	151222-32	151222-32	151222-32
1-5&*\$@	Sample deviation (see appendix)		12689143	12689135	12689141	12689142	12689147	12689146
Component	LOD/Units	Method						
Suspended solids, Total	<2 mg/l	TM022		22	16.5	18.5		
				#	#	#		
Alkalinity, Total as CaCO3	<2 mg/l	TM043	265		135	220		
			#		#	#		
Organic Carbon, Total	<3 mg/l	TM090	<3					
			@ #					
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	<0.2		<0.2	0.253	1.33	0.527
			#		#	#	#	#
COD, unfiltered	<7 mg/l	TM107	104					
			@ #					
Arsenic (diss.filt)	<0.12 µg/l	TM152	0.878					
			#					
Barium (diss.filt)	<0.03 µg/l	TM152	75.1					
			#					
Beryllium (diss.filt)	<0.07 µg/l	TM152	<0.07					
			#					
Boron (diss.filt)	<9.4 µg/l	TM152	<9.4					
			#					
Cadmium (diss.filt)	<0.1 µg/l	TM152	<0.1					
			#					
Chromium (diss.filt)	<0.22 µg/l	TM152	4.19					
			#					
Copper (diss.filt)	<0.85 µg/l	TM152	<0.85					
			#					
Lead (diss.filt)	<0.02 µg/l	TM152	<0.02					
			#					
Manganese (diss.filt)	<0.04 µg/l	TM152	0.195					
			#					
Nickel (diss.filt)	<0.15 µg/l	TM152	1.12					
			#					
Phosphorus (diss.filt)	<6.3 µg/l	TM152	20.9					
			#					
Zinc (diss.filt)	<0.41 µg/l	TM152	0.942					
			#					
Mineral oil >C10 C40 (aq)	<10 µg/l	TM172	98.3					
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01					
			#					
Sulphate	<2 mg/l	TM184	14.1					
			#					
Chloride	<2 mg/l	TM184	25.4		33.8	44.3	24.3	19.4
			#		#	#	#	#
Phosphate (ortho) as PO4	<0.05 mg/l	TM184	0.053					
			#					
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184	0.503					
			#					
Cyanide, Total	<0.05 mg/l	TM227	<0.05					
			#					
Cyanide, Free	<0.05 mg/l	TM227	<0.05					
			#					
Calcium (diss.filt)	<0.012 mg/l	TM228	85.2					
			#					
Sodium (diss.filt)	<0.076 mg/l	TM228	10.5					
			#					
Magnesium (diss.filt)	<0.036 mg/l	TM228	6.55					
			#					
Potassium (diss.filt)	<1 mg/l	TM228	<1		13.1	19.5	7.26	1.72
			#		#	#	#	#
Iron (diss.filt)	<0.019 mg/l	TM228	<0.019					
			#					
Hardness, Total as CaCO3 unfiltered	<0.35 mg/l	TM228	331					
Etridiazole	<0.01 µg/l	TM314	<0.01					

SDG: 151222-32
Job: H_GETCNO_NAH-15
Client Reference:

Location: Carmarthen
Customer: Geotechnology
Attention: Ben Rees

Order Number: 1255/1459
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SDG: 151222-32
Job: H_GETCNO_NAH-15
Client Reference:

Location: Carmarthen
Customer: Geotechnology
Attention: Ben Rees

Order Number: 1255/1459
Report Number: 344420
Superseded Report: 344355

OC, OP Pesticides and Triazine Herb

Results Legend			Customer Sample Ref.	BH101	BH103	BH104	BH105	BH117	
#	ISO17025 accredited.								
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
diss.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted test.								
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F)	Trigger breach confirmed								
1-5&*\$@	Sample deviation (see appendix)								
Component	LOD/Units	Method	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water(GW/SW) 18/12/2015 22/12/2015 151222-32 12689136	Water(GW/SW) 18/12/2015 22/12/2015 151222-32 12689137	Water(GW/SW) 18/12/2015 22/12/2015 151222-32 12689139	Water(GW/SW) 18/12/2015 22/12/2015 151222-32 12689140	Water(GW/SW) 18/12/2015 22/12/2015 151222-32 12689143	
Dichlorvos	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
Mevinphos	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
Tecnazene	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
Hexachlorobenzene	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
Trifluralin	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
alpha-Hexachlorocyclohexane (HCH / Lindane)	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
Quintozene (PCNB)	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
Diazinon	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
Triallate	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
Etrimphos	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
gamma-Hexachlorocyclohexane (HCH / Lindane)	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
Disulfoton	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
Propetamphos	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
Heptachlor	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
Chlorpyrifos methyl	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
Dimethoate	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
Aldrin	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
Chlorothalonil	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
Pirimiphos-methyl	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
beta-Hexachlorocyclohexane (HCH / Lindane)	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
Chlorpyrifos	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
Telodrin	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
Methyl parathion	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
Isodrin	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
Malathion	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
Fenthion	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
Fenitrothion	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
Heptachlor epoxide	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
Triadimefon	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
Pendimethalin	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
Parathion	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	
o,p-DDE	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	

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SDG: 151222-32
Job: H_GETCNO_NAH-15
Client Reference:

Location: Carmarthen
Customer: Geotechnology
Attention: Ben Rees

Order Number: 1255/1459
Report Number: 344420
Superseded Report: 344355

SVOC MS (W) - Aqueous

Results Legend			Customer Sample Ref.		BH101	BH103	BH104	BH105	BH117	
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		Water(GW/SW) 18/12/2015	Water(GW/SW) 18/12/2015	Water(GW/SW) 18/12/2015	Water(GW/SW) 18/12/2015	Water(GW/SW) 18/12/2015	
M	mCERTS accredited.									
aq	Aqueous / settled sample.									
diss.filt	Dissolved / filtered sample.									
tot.unfilt	Total / unfiltered sample.									
*	Subcontracted test.									
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery									
(F)	Trigger breach confirmed									
1-5&*\$@	Sample deviation (see appendix)									
Component	LOD/Units	Method								
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@	@	@	@	@	
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	
2,4-Dichlorophenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	
2,4-Dimethylphenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	
2-Chloronaphthalene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	
2-Chlorophenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	
2-Methylnaphthalene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	
2-Methylphenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	
2-Nitroaniline (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	
2-Nitrophenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	
3-Nitroaniline (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	
4-Bromophenylphenylether (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	
4-Chloroaniline (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	
4-Methylphenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	
4-Nitroaniline (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	
4-Nitrophenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
Azobenzene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176			<2	<2	<2	<2	<2	
					@ #	@ #	@ #	@ #	@ #	
Butylbenzyl phthalate (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	
Carbazole (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	
Dibenzofuran (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	
					@ #	@ #	@ #	@ #	@ #	

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SDG: 151222-32
Job: H_GETCNO_NAH-15
Client Reference:

Location: Carmarthen
Customer: Geotechnology
Attention: Ben Rees

Order Number: 1255/1459
Report Number: 344420
Superseded Report: 344355

VOC MS (W)

Results Legend		Customer Sample Ref.	BH101	BH103	BH104	BH105	BH117	
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water(GW/SW) 18/12/2015	Water(GW/SW) 18/12/2015	Water(GW/SW) 18/12/2015	Water(GW/SW) 18/12/2015	Water(GW/SW) 18/12/2015	
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-5&*\$@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM208	109	109	111	110	108	
Toluene-d8**	%	TM208	99.1	98.6	98.4	97.9	97.4	
4-Bromofluorobenzene**	%	TM208	97.3	96.4	95.5	94.8	93.3	
Dichlorodifluoromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Chloromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Vinyl chloride	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Bromomethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Chloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Trichlorofluoromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	
1,1-Dichloroethene	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Carbon disulphide	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Dichloromethane	<3 µg/l	TM208	<3	<3	<3	<3	<3	
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1	<1	<1	<1	<1	
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	<1	<1	<1	
1,1-Dichloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	<1	<1	<1	
2,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Bromochloromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Chloroform	<1 µg/l	TM208	<1	<1	<1	<1	<1	
1,1,1-Trichloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	
1,1-Dichloropropene	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Carbontetrachloride	<1 µg/l	TM208	<1	<1	<1	<1	<1	
1,2-Dichloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Benzene	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Trichloroethene	<1 µg/l	TM208	<1	<1	<1	<1	<1	
1,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Dibromomethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Bromodichloromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1	<1	<1	
Toluene	<1 µg/l	TM208	<1	<1	<1	<1	<1	
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1	<1	<1	
1,1,2-Trichloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	



SDG: 151222-32
Job: H_GETCNO_NAH-15
Client Reference:

Location: Carmarthen
Customer: Geotechnology
Attention: Ben Rees

Order Number: 1255/1459
Report Number: 344420
Superseded Report: 344355

VOC MS (W)

Results Legend			Customer Sample Ref.		BH101	BH103	BH104	BH105	BH117	
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		Water(GW/SW) 18/12/2015	Water(GW/SW) 18/12/2015	Water(GW/SW) 18/12/2015	Water(GW/SW) 18/12/2015	Water(GW/SW) 18/12/2015	
M	mCERTS accredited.									
aq	Aqueous / settled sample.									
diss.filt	Dissolved / filtered sample.									
tot.unfilt	Total / unfiltered sample.									
*	Subcontracted test.									
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery				22/12/2015 151222-32 12689136	22/12/2015 151222-32 12689137	22/12/2015 151222-32 12689139	22/12/2015 151222-32 12689140	22/12/2015 151222-32 12689143	
(F)	Trigger breach confirmed									
1-5&#s@	Sample deviation (see appendix)									
Component	LOD/Units	Method								
1,3-Dichloropropane	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
Tetrachloroethene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
Dibromochloromethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
1,2-Dibromoethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
Chlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
Ethylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
m,p-Xylene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
o-Xylene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
Styrene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
Bromoform	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
Isopropylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	
1,2,3-Trichloropropane	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
Bromobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
Propylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
2-Chlorotoluene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
1,3,5-Trimethylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
4-Chlorotoluene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
tert-Butylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
1,2,4-Trimethylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
sec-Butylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
4-iso-Propyltoluene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
1,3-Dichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
1,4-Dichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
n-Butylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
1,2-Dichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208			<1	<1	<1	<1	<1	
1,2,4-Trichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
Hexachlorobutadiene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	
Naphthalene	<1 µg/l	TM208			<1	<1	<1	<1	<1	
					#	#	#	#	#	

Order Number: 1255/1459
Report Number: 344420
Superseded Report: 344355

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SDG: 151222-32
Job: H_GETCNO_NAH-15
Client Reference:

Location: Carmarthen
Customer: Geotechnology
Attention: Ben Rees

Order Number: 1255/1459
Report Number: 344420
Superseded Report: 344355

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters		
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples		
TM045	MEWAM BOD5 2nd Ed.HMSO 1988 / Method 5210B, AWWA/APHA, 20th Ed., 1999; SCA Blue Book 130	Determination of BOD5 (ATU) Filtered by Oxygen Meter on liquids		
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water		
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser		
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters		
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS		
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM186	Determination of Acidic Herbicides in Groundwater and Potable Water by LC/MSD Using Selective Ion Monitoring. Agilent Technologies Inc. Application Note 5988-5882EN.	The Determination of Acid Herbicides in Environmental Water Samples and Leachates by LC/MS QQQ.		
TM191	Standard Methods for the examination of waters and wastewaters 16th Edition, ALPHA, Washington DC, USA. ISBN 0-87553-131-8.	Determination of Unfiltered Metals in Water Matrices by ICP-MS		
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters		
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate		
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES		
TM231	Agilent 6890 Gas Chromatograph system using an Agilent 5973 Mass Selective Detector (MSD)	Determination of Organochlorine and Organophosphorus Pesticides and Triazine Herbicides by GCMS		
TM314		Analysis of Organochlorine Pesticides in Aqueous sample by GCMS		
TM315		Analysis of Organophosphorus Pesticides in Aqueous samples by GCMS		
TM324		Analysis of Acid Herbicides in Aqueous Sample by LCQQQ		
TM328				

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.



SDG: 151222-32
Job: H_GETCNO_NAH-15
Client Reference:

Location: Carmarthen
Customer: Geotechnology
Attention: Ben Rees

Order Number: 1255/1459
Report Number: 344420
Superseded Report: 344355

Test Completion Dates

Lab Sample No(s) Customer Sample Ref.	12689145	12689144	12689136	12689137	12689139	12689140	12689143	12689135	12689141	12689142
	BH10	BH14	BH101	BH103	BH104	BH105	BH117	RUNOFF	SW1	SW4
AGS Ref.										
Depth										
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
Acid Herbicides (W)			31-Dec-2015	31-Dec-2015	31-Dec-2015	31-Dec-2015	31-Dec-2015			
Alkalinity as CaCO ₃			31-Dec-2015	31-Dec-2015	31-Dec-2015	31-Dec-2015	04-Jan-2016		31-Dec-2015	31-Dec-2015
Ammoniacal Nitrogen	04-Jan-2016	04-Jan-2016	04-Jan-2016	04-Jan-2016	04-Jan-2016	04-Jan-2016	04-Jan-2016		04-Jan-2016	04-Jan-2016
Anions by Kone (w)	30-Dec-2015	30-Dec-2015	04-Jan-2016	04-Jan-2016	04-Jan-2016	04-Jan-2016	04-Jan-2016		30-Dec-2015	30-Dec-2015
COD Unfiltered			02-Jan-2016	02-Jan-2016	02-Jan-2016	02-Jan-2016	02-Jan-2016			
Cyanide Comp/Free/Total/Thiocyanate			30-Dec-2015	30-Dec-2015	30-Dec-2015	30-Dec-2015	30-Dec-2015			
Dissolved Metals by ICP-MS			29-Dec-2015	29-Dec-2015	29-Dec-2015	29-Dec-2015	30-Dec-2015			
Mercury Dissolved			29-Dec-2015	29-Dec-2015	29-Dec-2015	29-Dec-2015	29-Dec-2015			
Metals by iCap-OES Dissolved (W)	06-Jan-2016	06-Jan-2016	24-Dec-2015	24-Dec-2015	24-Dec-2015	24-Dec-2015	06-Jan-2016		24-Dec-2015	06-Jan-2016
Metals by iCap-OES Unfiltered (W)			31-Dec-2015	31-Dec-2015	31-Dec-2015	31-Dec-2015	06-Jan-2016			
Mineral Oil C10-40 Aqueous (W)			06-Jan-2016	06-Jan-2016	06-Jan-2016	06-Jan-2016	06-Jan-2016			
OC, OP Pesticides and Triazine Herb			06-Jan-2016	06-Jan-2016	06-Jan-2016	06-Jan-2016	06-Jan-2016			
Organochlorine Pesticides (Aq)			06-Jan-2016	06-Jan-2016	06-Jan-2016	06-Jan-2016	06-Jan-2016			
Organophosphorus Pesticides (Aq)			06-Jan-2016	06-Jan-2016	06-Jan-2016	06-Jan-2016	06-Jan-2016			
Organotins in Aqueous Samples			30-Dec-2015	30-Dec-2015	30-Dec-2015	30-Dec-2015	30-Dec-2015			
PAH Spec MS - Aqueous (W)			06-Jan-2016	06-Jan-2016	06-Jan-2016	31-Dec-2015	31-Dec-2015			
Suspended Solids								30-Dec-2015	30-Dec-2015	30-Dec-2015
SVOC MS (W) - Aqueous			05-Jan-2016	05-Jan-2016	05-Jan-2016	05-Jan-2016	05-Jan-2016			
Total Organic and Inorganic Carbon			30-Dec-2015	30-Dec-2015	24-Dec-2015	30-Dec-2015	30-Dec-2015			
VOC MS (W)			29-Dec-2015	29-Dec-2015	29-Dec-2015	29-Dec-2015	29-Dec-2015			

Lab Sample No(s) Customer Sample Ref.	12689147	12689146
	WERN SW2	WERN SW4
AGS Ref.		
Depth		
Type	LIQUID	LIQUID
Ammoniacal Nitrogen	04-Jan-2016	04-Jan-2016
Anions by Kone (w)	30-Dec-2015	30-Dec-2015
Metals by iCap-OES Dissolved (W)	24-Dec-2015	23-Dec-2015



SDG: 151222-32
Job: H_GETCNO_NAH-15
Client Reference:

Location: Carmarthen
Customer: Geotechnology
Attention: Ben Rees

Order Number: 1255/1459
Report Number: 344420
Superseded Report: 344355

Appendix General

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICS and SVOC TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%, they are generally wider for volatiles analysis, 50-150%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5 -C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

Sample Deviations

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Holding time exceeded before sample received
5	Samples exceeded holding time before pre-separation was performed
\$	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
&	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Geotechnology
5 Cefn-yr-Allt
Aberdulais
Neath
West Glamorgan
SA10 8HE

Attention: Ben Rees

CERTIFICATE OF ANALYSIS

Date: 19 January 2016
Customer: H_GETCNO_NAH
Sample Delivery Group (SDG): 160109-56
Your Reference:
Location: Carmarthen
Report No: 345642

We received 11 samples on Saturday January 09, 2016 and 10 of these samples were scheduled for analysis which was completed on Tuesday January 19, 2016. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:

Sonia McWhan

Operations Manager





SDG:	160109-56	Location:	Carmarthen	Order Number:	
Job:	H_GETCNO_NAH-15	Customer:	Geotechnology	Report Number:	345642
Client Reference:		Attention:	Ben Rees	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
12728620	BH101			07/01/2016
12728621	BH103			07/01/2016
12728622	BH104			07/01/2016
12728623	BH105			07/01/2016
12728624	BH117			07/01/2016
12728619	L1			07/01/2016
12728625	NYC RUNOFF			07/01/2016
12728615	NYC SW1			07/01/2016
12728616	NYC SW4			07/01/2016
12728617	WERN SW2			07/01/2016
12728618	WERN SW4			07/01/2016

Only received samples which have had analysis scheduled will be shown on the following pages.



SDG: 160109-56
 Job: H_GETCNO_NAH-15
 Client Reference:

Location: Carmarthen
 Customer: Geotechnology
 Attention: Ben Rees

Order Number:
 Report Number: 345642
 Superseded Report:

LIQUID Results Legend X Test N No Determination Possible	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container	
	12728618		WERN SW4						1l plastic (ALE221)	
	12728617		WERN SW2						1l plastic (ALE221)	
	12728616		NYC SW4						1000ml glass bottle	
	12728615		NYC SW1						1l plastic (ALE221)	
	12728619		L 1						Vial (ALE297)	
Acid Herbicides (W)	All	NDPs: 0 Tests: 1							250ml BOD (ALE21)	
Alkalinity as CaCO3	All	NDPs: 0 Tests: 8							1l plastic (ALE221)	
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 10							1000ml glass bottle	
Anions by Kone (w)	All	NDPs: 0 Tests: 10							1l plastic (ALE221)	
BOD True Total	All	NDPs: 0 Tests: 1							1l plastic (ALE221)	
COD Unfiltered	All	NDPs: 0 Tests: 1							1l plastic (ALE221)	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1							1l plastic (ALE221)	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1							1l plastic (ALE221)	
Mercury Dissolved	All	NDPs: 0 Tests: 1							1l plastic (ALE221)	
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 10							1l plastic (ALE221)	
Metals by iCap-OES Unfiltered (W)	All	NDPs: 0 Tests: 1							1l plastic (ALE221)	
Mineral Oil C10-40 Aqueous (W)	All	NDPs: 0 Tests: 1							1l plastic (ALE221)	
OC, OP Pesticides and Triazine Herb	All	NDPs: 0 Tests: 1							1l plastic (ALE221)	
Organochlorine Pesticides (Aq)	All	NDPs: 0 Tests: 1							1l plastic (ALE221)	
Organophosphorus Pesticides (Aq)	All	NDPs: 0 Tests: 1							1l plastic (ALE221)	

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Attention: Ben Rees

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LIQUID

Results Legend



Test



No Determination Possible

Lab Sample No(s)

**Customer
Sample Reference**

AGS Reference

Depth (m)

Container

12728618	WERN SW4	1iplastic (ALE221)
12728617	WERN SW2	1iplastic (ALE221)
12728616	NYC SW4	1000ml glass bottle
12728615	NYC SW1	1iplastic (ALE221)
12728619	L1	Vial (ALE297)
		Dissolved Metals P
		250ml BOD (ALE27
		1iplastic (ALE221)
		1000ml glass bottle
12728624	BH117	1iplastic (ALE221)
12728623	BH105	1iplastic (ALE221)
12728622	BH104	1iplastic (ALE221)
12728621	BH103	1iplastic (ALE221)
12728620	BH101	1iplastic (ALE221)

Organotins in Aqueous Samples

All

NDPs: 0
Tests: 1

X

PAH Spec MS - Aqueous (W)

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 2

	X	X
--	---	---

X	X
---	---

SVOC MS (W) - Aqueous

All

NDPs: 0
Tests: 1

X

Total Organic and Inorganic Carbon

All

NDPs: 0
Tests: 1

	X
--	---

VOC MS (W)

All

NDPs: 0
Tests: 1

X



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Results Legend		Customer Sample R Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	BH101	BH103	BH104	BH105	BH117	L1
#	ISO17025 accredited.		Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
M	mCERTS accredited.		07/01/2016	07/01/2016	07/01/2016	07/01/2016	07/01/2016	07/01/2016
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		09/01/2016	09/01/2016	09/01/2016	09/01/2016	09/01/2016	09/01/2016
(F)	Trigger breach confirmed		160109-56	160109-56	160109-56	160109-56	160109-56	160109-56
1-5&*\$@	Sample deviation (see appendix)		12728620	12728621	12728622	12728623	12728624	12728619
Component	LOD/Units	Method						
Alkalinity, Total as CaCO3	<2 mg/l	TM043	220	210	270	270	255	430
			#	#	#	#	#	#
BOD, unfiltered	<1 mg/l	TM045						4.58
								◆ #
Organic Carbon, Total	<3 mg/l	TM090						20.1
								#
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	<0.2	0.408	<0.2	<0.2	0.261	31.9
			#	#	#	#	#	#
COD, unfiltered	<7 mg/l	TM107						80.6
								#
Arsenic (diss.filt)	<0.12 µg/l	TM152						1.67
								#
Barium (diss.filt)	<0.03 µg/l	TM152						73.7
								#
Beryllium (diss.filt)	<0.07 µg/l	TM152						<0.07
								#
Boron (diss.filt)	<9.4 µg/l	TM152						143
								#
Cadmium (diss.filt)	<0.1 µg/l	TM152						<0.1
								#
Chromium (diss.filt)	<0.22 µg/l	TM152						4.18
								#
Copper (diss.filt)	<0.85 µg/l	TM152						2.01
								#
Lead (diss.filt)	<0.02 µg/l	TM152						0.443
								#
Manganese (diss.filt)	<0.04 µg/l	TM152						237
								#
Nickel (diss.filt)	<0.15 µg/l	TM152						3.88
								#
Phosphorus (diss.filt)	<6.3 µg/l	TM152						57.7
								#
Zinc (diss.filt)	<0.41 µg/l	TM152						6.43
								#
Mineral oil >C10 C40 (aq)	<10 µg/l	TM172						<10
Mercury (diss.filt)	<0.01 µg/l	TM183						<0.01
								#
Sulphate	<2 mg/l	TM184						14.6
								#
Chloride	<2 mg/l	TM184	14.8	13.9	13.7	10.7	22.3	79.4
			#	#	#	#	#	#
Phosphate (ortho) as PO4	<0.05 mg/l	TM184						<0.05
								#
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184						1.64
								#
Cyanide, Total	<0.05 mg/l	TM227						<0.05
								#
Cyanide, Free	<0.05 mg/l	TM227						<0.05
								#
Calcium (diss.filt)	<0.012 mg/l	TM228						89.8
								#
Sodium (diss.filt)	<0.076 mg/l	TM228						47.4
								#
Magnesium (diss.filt)	<0.036 mg/l	TM228						10.9
								#
Potassium (diss.filt)	<1 mg/l	TM228	<1	<1	<1	<1	<1	37.6
			#	#	#	#	#	#
Iron (diss.filt)	<0.019 mg/l	TM228						0.424
								#
Hardness, Total as CaCO3 unfiltered	<0.35 mg/l	TM228						297
Etridiazole	<0.01 µg/l	TM314						<0.01

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Customer: Geotechnology
Attention: Ben Rees

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OC, OP Pesticides and Triazine Herb

Results Legend		Customer Sample R	L1				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water(GW/SW) 07/01/2016 09/01/2016 160109-56 12728619				
M	mCERTS accredited.						
aq	Aqueous / settled sample.						
diss.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.						
*	Subcontracted test.						
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery						
(F)	Trigger breach confirmed						
1-5&*\$@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Dichlorvos	<0.01 µg/l	TM231	<0.01				
Mevinphos	<0.01 µg/l	TM231	<0.01				
Tecnazene	<0.01 µg/l	TM231	<0.01				
Hexachlorobenzene	<0.01 µg/l	TM231	<0.01				
Trifluralin	<0.01 µg/l	TM231	<0.01				
alpha-Hexachlorocyclohexane (HCH / Lindane)	<0.01 µg/l	TM231	<0.01				
Quintozene (PCNB)	<0.01 µg/l	TM231	<0.01				
Diazinon	<0.01 µg/l	TM231	<0.01				
Triallate	<0.01 µg/l	TM231	<0.01				
Etrimphos	<0.01 µg/l	TM231	<0.01				
gamma-Hexachlorocyclohexane (HCH / Lindane)	<0.01 µg/l	TM231	<0.01				
Disulfoton	<0.01 µg/l	TM231	<0.01				
Propetamphos	<0.01 µg/l	TM231	<0.01				
Heptachlor	<0.01 µg/l	TM231	<0.01				
Chlorpyrifos methyl	<0.01 µg/l	TM231	<0.01				
Dimethoate	<0.01 µg/l	TM231	<0.01				
Aldrin	<0.01 µg/l	TM231	<0.01				
Chlorothalonil	<0.01 µg/l	TM231	<0.01				
Pirimiphos-methyl	<0.01 µg/l	TM231	<0.01				
beta-Hexachlorocyclohexane (HCH / Lindane)	<0.01 µg/l	TM231	<0.01				
Chlorpyrifos	<0.01 µg/l	TM231	<0.01				
Telodrin	<0.01 µg/l	TM231	<0.01				
Methyl parathion	<0.01 µg/l	TM231	<0.01				
Isodrin	<0.01 µg/l	TM231	<0.01				
Malathion	<0.01 µg/l	TM231	<0.01				
Fenthion	<0.01 µg/l	TM231	<0.01				
Fenitrothion	<0.01 µg/l	TM231	<0.01				
Heptachlor epoxide	<0.01 µg/l	TM231	<0.01				
Triadimefon	<0.01 µg/l	TM231	<0.01				
Pendimethalin	<0.01 µg/l	TM231	<0.01				
Parathion	<0.01 µg/l	TM231	<0.01				
o,p-DDE	<0.01 µg/l	TM231	<0.01				

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SVOC MS (W) - Aqueous

Results Legend		Customer Sample R		L1				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water(GW/SW) 07/01/2016 09/01/2016 160109-56 12728619					
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-5&*\$@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176	<2	#				
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<2	#				
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<2	#				
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<2					
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<2	#				
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<2	#				
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<2	#				
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<2	#				
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<2	#				
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<2	#				
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<2	#				
2-Chlorophenol (aq)	<1 µg/l	TM176	<2	#				
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<2	#				
2-Methylphenol (aq)	<1 µg/l	TM176	<2	#				
2-Nitroaniline (aq)	<1 µg/l	TM176	<2	#				
2-Nitrophenol (aq)	<1 µg/l	TM176	<2	#				
3-Nitroaniline (aq)	<1 µg/l	TM176	<2	#				
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	<2	#				
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<2	#				
4-Chloroaniline (aq)	<1 µg/l	TM176	<2					
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<2	#				
4-Methylphenol (aq)	<1 µg/l	TM176	<2	#				
4-Nitroaniline (aq)	<1 µg/l	TM176	<2	#				
4-Nitrophenol (aq)	<1 µg/l	TM176	<2					
Azobenzene (aq)	<1 µg/l	TM176	<2	#				
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	<2	#				
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176	<2	#				
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	<4	#				
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<2	#				
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176	<2	#				
Carbazole (aq)	<1 µg/l	TM176	<2	#				
Dibenzofuran (aq)	<1 µg/l	TM176	<2	#				

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VOC MS (W)

Results Legend		Customer Sample R		L1				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water(GW/SW) 07/01/2016 09/01/2016 160109-56 12728619					
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-5&*\$@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM208	113					
Toluene-d8**	%	TM208	100					
4-Bromofluorobenzene**	%	TM208	98.5					
Dichlorodifluoromethane	<1 µg/l	TM208	<1					
Chloromethane	<1 µg/l	TM208	<1	#				
Vinyl chloride	<1 µg/l	TM208	<1	#				
Bromomethane	<1 µg/l	TM208	<1	#				
Chloroethane	<1 µg/l	TM208	<1	#				
Trichlorofluoromethane	<1 µg/l	TM208	<1	#				
1,1-Dichloroethene	<1 µg/l	TM208	<1	#				
Carbon disulphide	<1 µg/l	TM208	<1	#				
Dichloromethane	<3 µg/l	TM208	<3	#				
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1	#				
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1	#				
1,1-Dichloroethane	<1 µg/l	TM208	<1	#				
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1	#				
2,2-Dichloropropane	<1 µg/l	TM208	<1					
Bromochloromethane	<1 µg/l	TM208	<1	#				
Chloroform	<1 µg/l	TM208	<1	#				
1,1,1-Trichloroethane	<1 µg/l	TM208	<1	#				
1,1-Dichloropropene	<1 µg/l	TM208	<1	#				
Carbontetrachloride	<1 µg/l	TM208	<1	#				
1,2-Dichloroethane	<1 µg/l	TM208	<1					
Benzene	<1 µg/l	TM208	<1	#				
Trichloroethene	<1 µg/l	TM208	<1	#				
1,2-Dichloropropane	<1 µg/l	TM208	<1	#				
Dibromomethane	<1 µg/l	TM208	<1	#				
Bromodichloromethane	<1 µg/l	TM208	<1	#				
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1	#				
Toluene	<1 µg/l	TM208	<1	#				
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	#				
1,1,2-Trichloroethane	<1 µg/l	TM208	<1	#				



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VOC MS (W)

Results Legend		Customer Sample R	L1				
#	ISO17025 accredited.						
M	mCERTS accredited.						
aq	Aqueous / settled sample.						
diss.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.						
*	Subcontracted test.						
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery						
(F)	Trigger breach confirmed						
1-5&5@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
1,3-Dichloropropane	<1 µg/l	TM208	<1	#			
Tetrachloroethene	<1 µg/l	TM208	<1	#			
Dibromochloromethane	<1 µg/l	TM208	<1	#			
1,2-Dibromoethane	<1 µg/l	TM208	<1	#			
Chlorobenzene	<1 µg/l	TM208	<1	#			
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1	#			
Ethylbenzene	<1 µg/l	TM208	<1	#			
m,p-Xylene	<1 µg/l	TM208	<1	#			
o-Xylene	<1 µg/l	TM208	<1	#			
Styrene	<1 µg/l	TM208	<1	#			
Bromoform	<1 µg/l	TM208	<1	#			
Isopropylbenzene	<1 µg/l	TM208	<1	#			
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1				
1,2,3-Trichloropropane	<1 µg/l	TM208	<1	#			
Bromobenzene	<1 µg/l	TM208	<1	#			
Propylbenzene	<1 µg/l	TM208	<1	#			
2-Chlorotoluene	<1 µg/l	TM208	<1	#			
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1	#			
4-Chlorotoluene	<1 µg/l	TM208	<1	#			
tert-Butylbenzene	<1 µg/l	TM208	<1	#			
1,2,4-Trimethylbenzene	<1 µg/l	TM208	<1	#			
sec-Butylbenzene	<1 µg/l	TM208	<1	#			
4-iso-Propyltoluene	<1 µg/l	TM208	<1	#			
1,3-Dichlorobenzene	<1 µg/l	TM208	<1	#			
1,4-Dichlorobenzene	<1 µg/l	TM208	<1	#			
n-Butylbenzene	<1 µg/l	TM208	<1	#			
1,2-Dichlorobenzene	<1 µg/l	TM208	<1				
1,2-Dibromo-3-chloroprop ane	<1 µg/l	TM208	<1				
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1	#			
Hexachlorobutadiene	<1 µg/l	TM208	<1	#			
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1	#			
Naphthalene	<1 µg/l	TM208	<1	#			

SDG: 160109-56
Job: H_GETCNO_NAH-15
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VOC MS (W)

[illegible]



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Location: Carmarthen
Customer: Geotechnology
Attention: Ben Rees

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Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters		
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples		
TM045	MEWAM BOD5 2nd Ed.HMSO 1988 / Method 5210B, AWWA/APHA, 20th Ed., 1999; SCA Blue Book 130	Determination of BOD5 (ATU) Filtered by Oxygen Meter on liquids		
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water		
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser		
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters		
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS		
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM186	Determination of Acidic Herbicides in Groundwater and Potable Water by LC/MSD Using Selective Ion Monitoring. Agilent Technologies Inc. Application Note 5988-5882EN.	The Determination of Acid Herbicides in Environmental Water Samples and Leachates by LC/MS QQQ.		
TM191	Standard Methods for the examination of waters and wastewaters 16th Edition, ALPHA, Washington DC, USA. ISBN 0-87553-131-8.	Determination of Unfiltered Metals in Water Matrices by ICP-MS		
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters		
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate		
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES		
TM231	Agilent 6890 Gas Chromatograph system using an Agilent 5973 Mass Selective Detector (MSD)	Determination of Organochlorine and Organophosphorus Pesticides and Triazine Herbicides by GCMS		
TM314		Analysis of Organochlorine Pesticides in Aqueous sample by GCMS		
TM315		Analysis of Organophosphorus Pesticides in Aqueous samples by GCMS		
TM324		Analysis of Acid Herbicides in Aqueous Sample by LCQQQ		
TM328				

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.



SDG:	160109-56	Location:	Carmarthen	Order Number:	
Job:	H_GETCNO_NAH-15	Customer:	Geotechnology	Report Number:	345642
Client Reference:		Attention:	Ben Rees	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	12728620	12728621	12728622	12728623	12728624	12728619	12728615	12728616	12728617	12728618
Customer Sample Ref.	BH101	BH103	BH104	BH105	BH117	L1	NYC SW1	NYC SW4	WERN SW2	WERN SW4
AGS Ref.										
Depth										
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID

Acid Herbicides (W)						15-Jan-2016				
Alkalinity as CaCO3	14-Jan-2016	14-Jan-2016	18-Jan-2016	18-Jan-2016	18-Jan-2016	14-Jan-2016	13-Jan-2016	18-Jan-2016		
Ammoniacal Nitrogen	14-Jan-2016	14-Jan-2016	12-Jan-2016	12-Jan-2016	12-Jan-2016	14-Jan-2016	12-Jan-2016	12-Jan-2016	12-Jan-2016	12-Jan-2016
Anions by Kone (w)	14-Jan-2016	14-Jan-2016	12-Jan-2016	12-Jan-2016	12-Jan-2016	14-Jan-2016	12-Jan-2016	12-Jan-2016	12-Jan-2016	12-Jan-2016
BOD True Total						15-Jan-2016				
COD Unfiltered						10-Jan-2016				
Cyanide Comp/Free/Total/Thiocyanate						15-Jan-2016				
Dissolved Metals by ICP-MS						18-Jan-2016				
Mercury Dissolved						15-Jan-2016				
Metals by iCap-OES Dissolved (W)	15-Jan-2016	15-Jan-2016	12-Jan-2016	12-Jan-2016	12-Jan-2016	15-Jan-2016	12-Jan-2016	12-Jan-2016	12-Jan-2016	12-Jan-2016
Metals by iCap-OES Unfiltered (W)						15-Jan-2016				
Mineral Oil C10-40 Aqueous (W)						15-Jan-2016				
OC, OP Pesticides and Triazine Herb						19-Jan-2016				
Organochlorine Pesticides (Aq)						18-Jan-2016				
Organophosphorus Pesticides (Aq)						18-Jan-2016				
Organotins in Aqueous Samples						19-Jan-2016				
PAH Spec MS - Aqueous (W)						18-Jan-2016				
Suspended Solids							14-Jan-2016	14-Jan-2016		
SVOC MS (W) - Aqueous						18-Jan-2016				
Total Organic and Inorganic Carbon						14-Jan-2016				
VOC MS (W)						12-Jan-2016				



SDG: 160109-56
Job: H_GETCNO_NAH-15
Client Reference:

Location: Carmarthen
Customer: Geotechnology
Attention: Ben Rees

Order Number:
Report Number: 345642
Superseded Report:

Appendix General

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICS and SVOC TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%, they are generally wider for volatiles analysis, 50-150%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill /made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5 -C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

Sample Deviations

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Holding time exceeded before sample received
5	Samples exceeded holding time before preservation was performed
\$	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
&	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than :
 - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

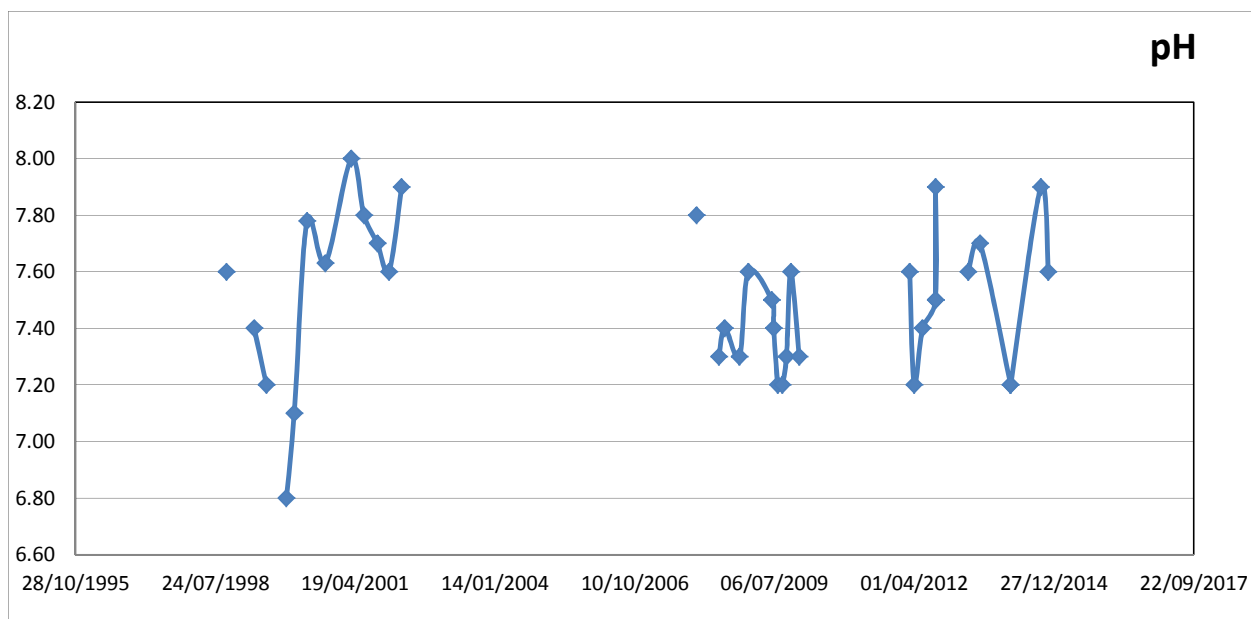
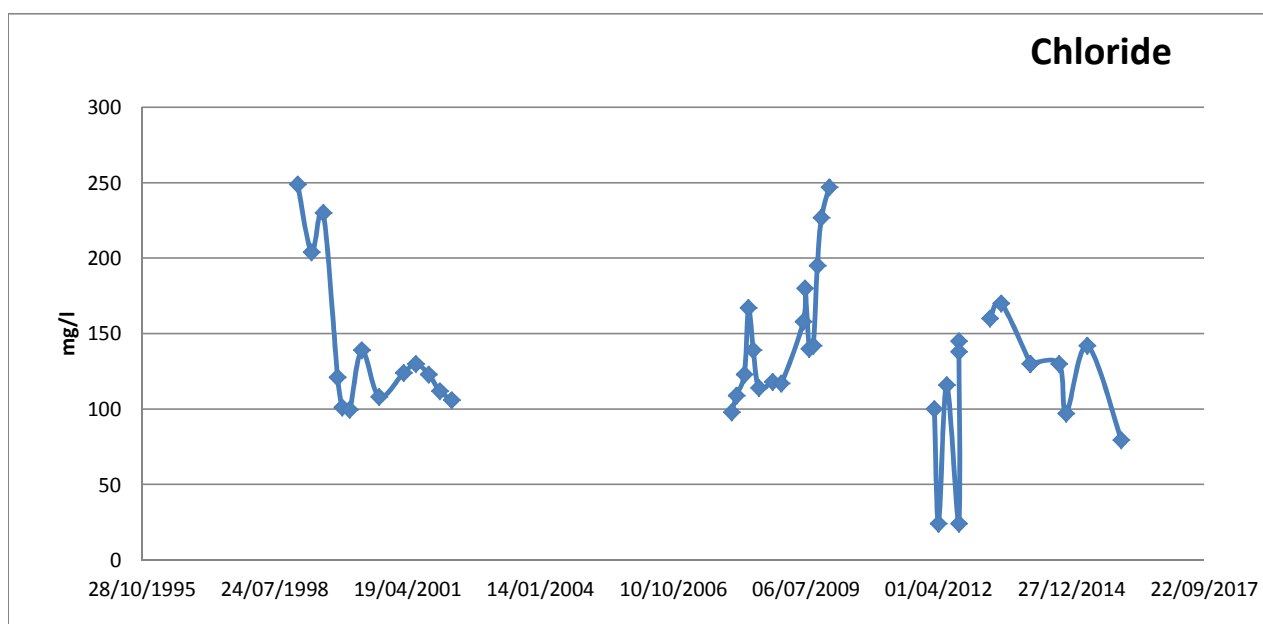
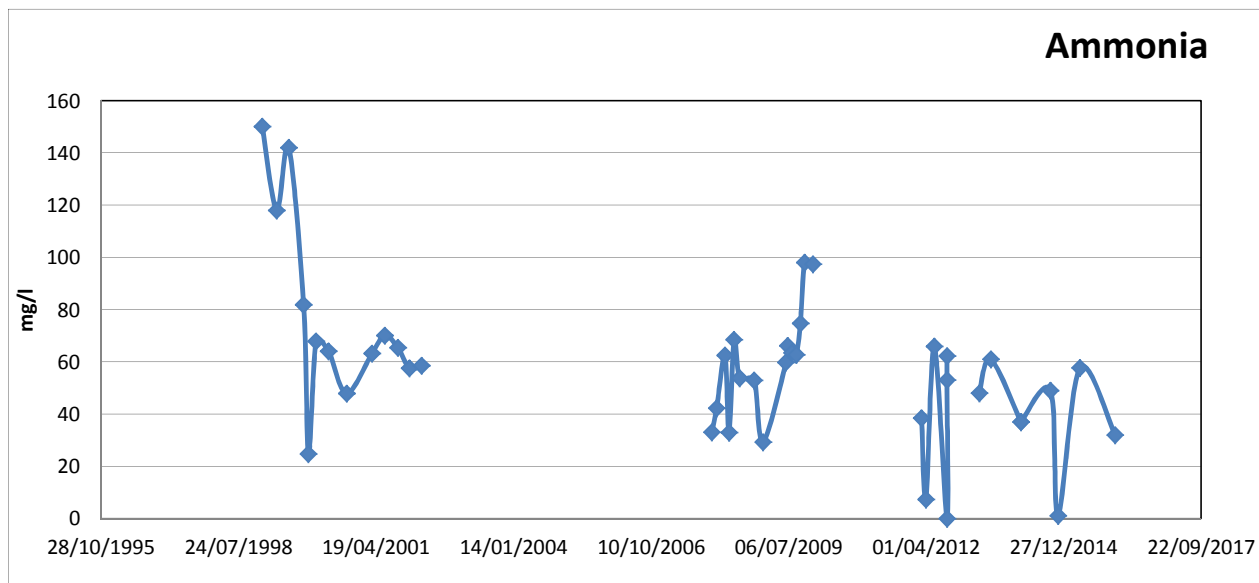
The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

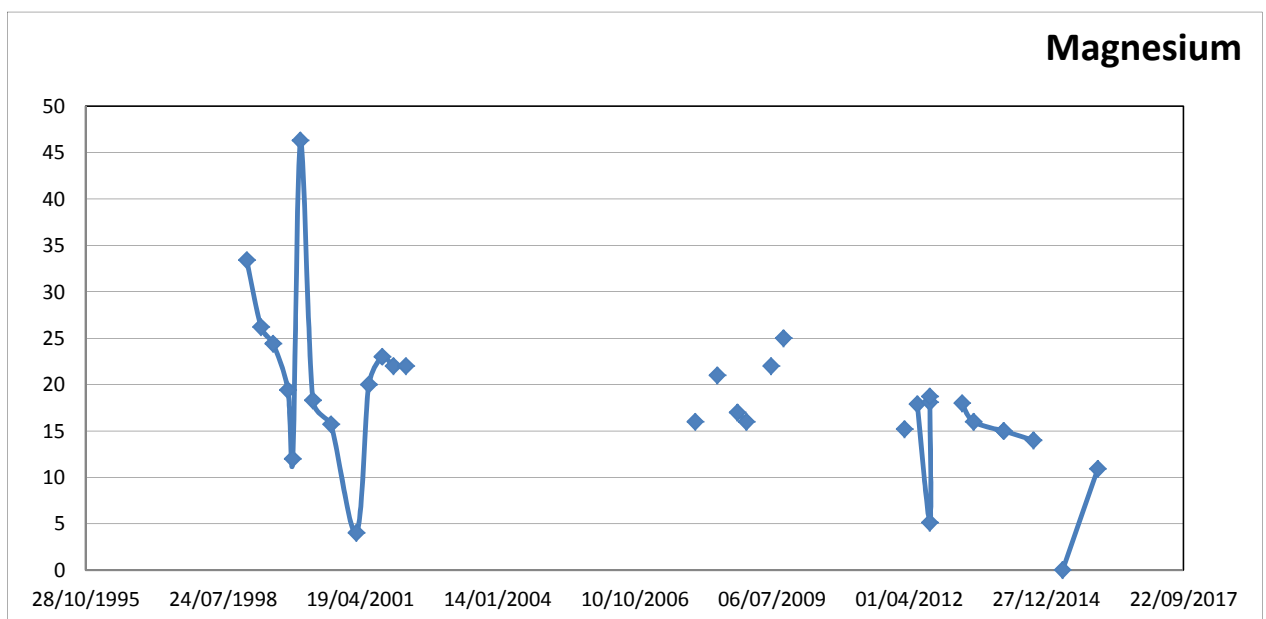
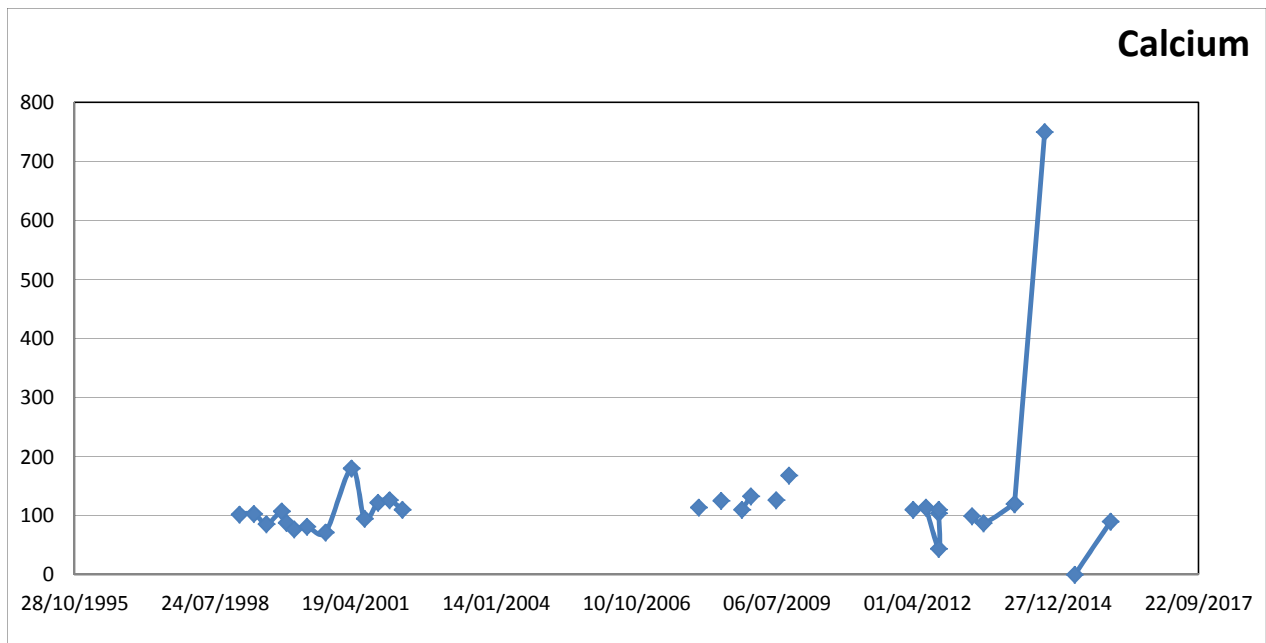
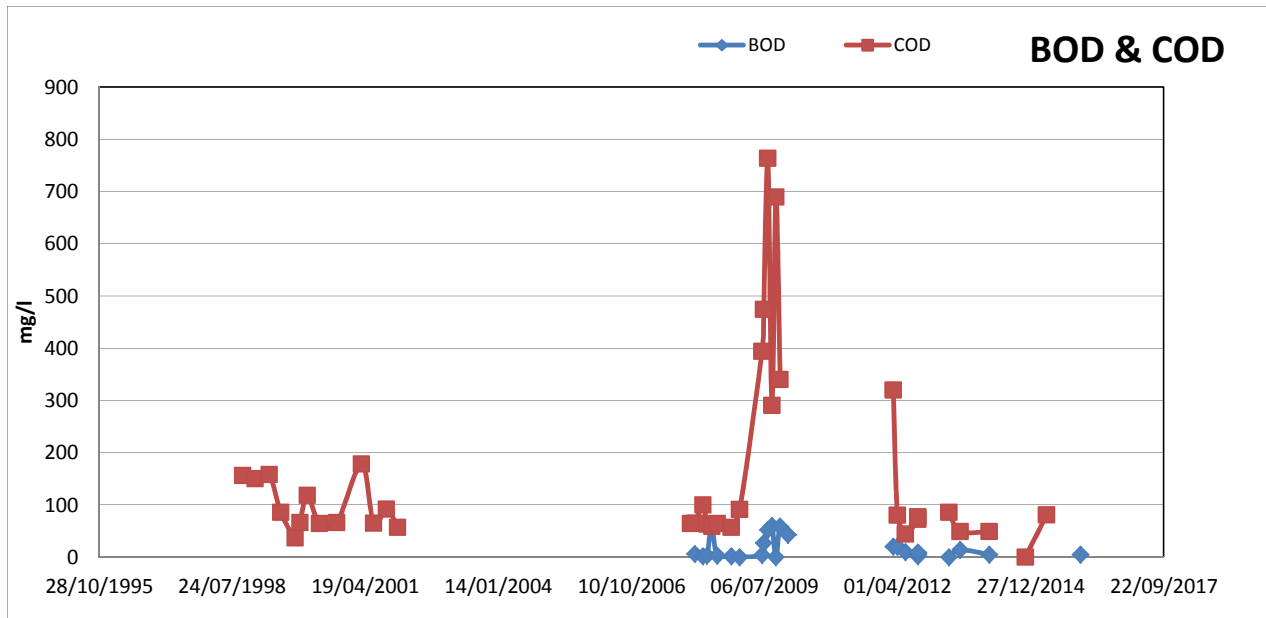
**NANT Y CAWS
PHASE 1
CLOSED LANDFILL**

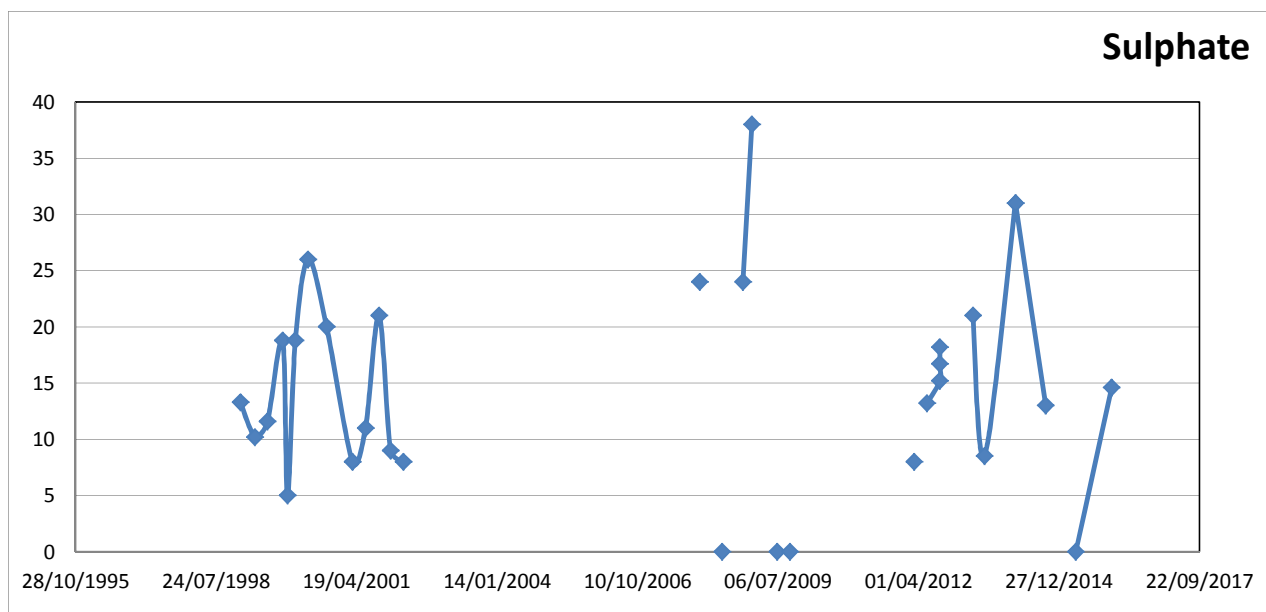
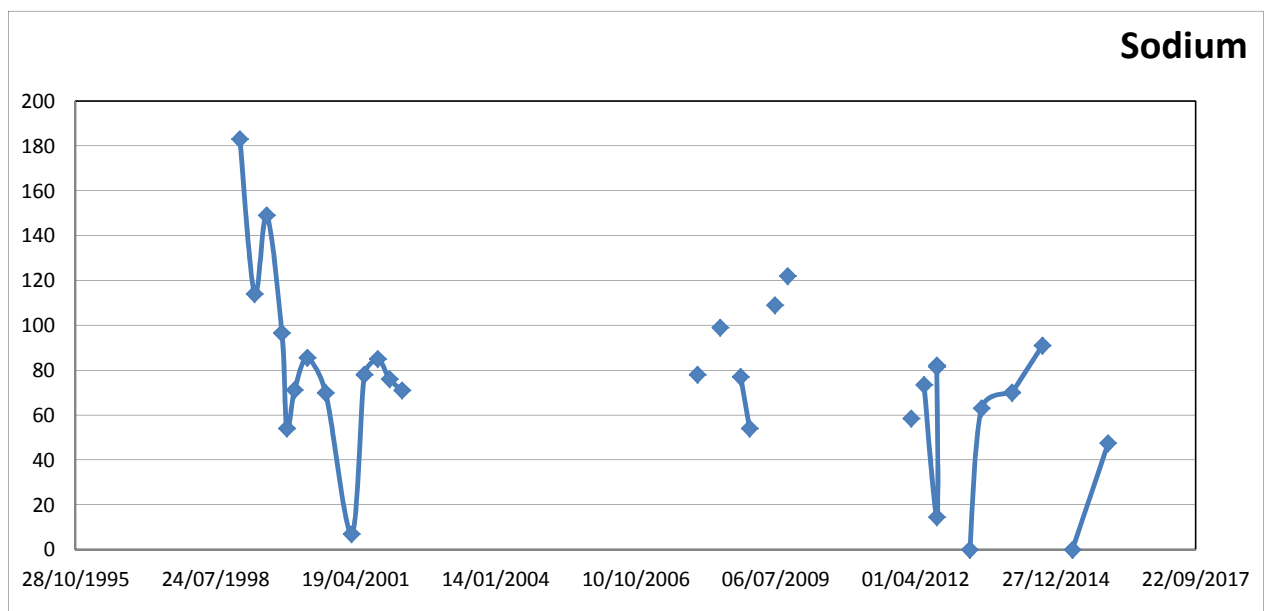
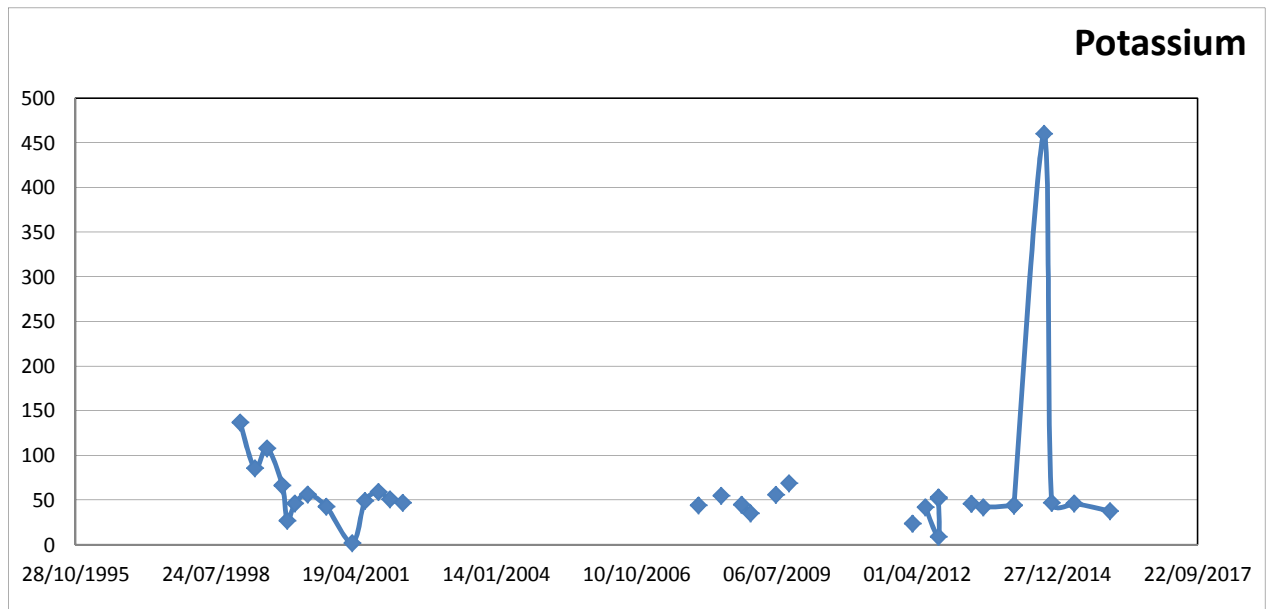
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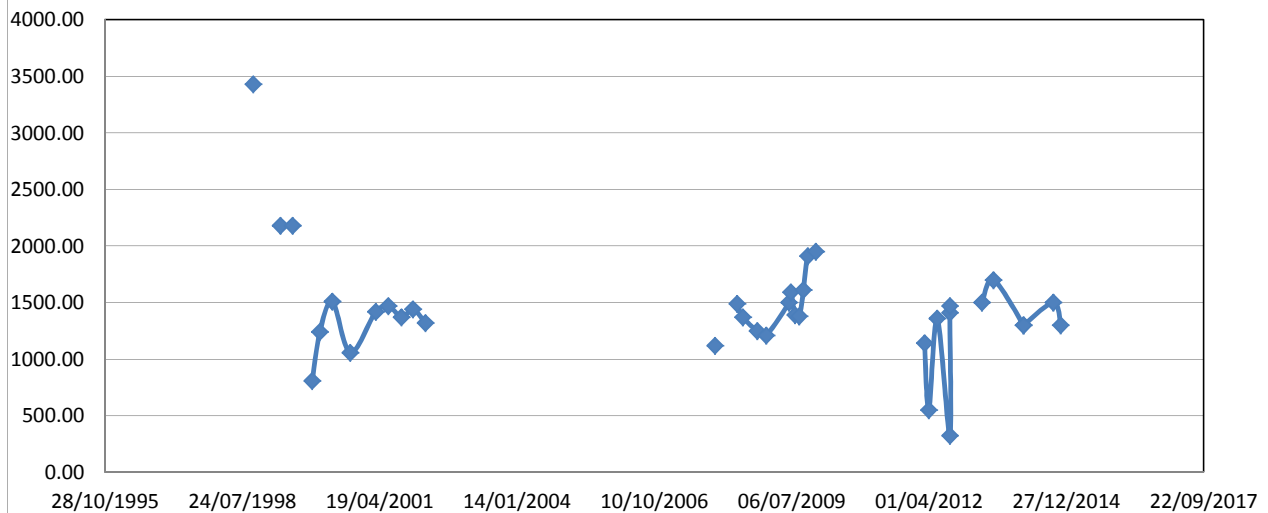
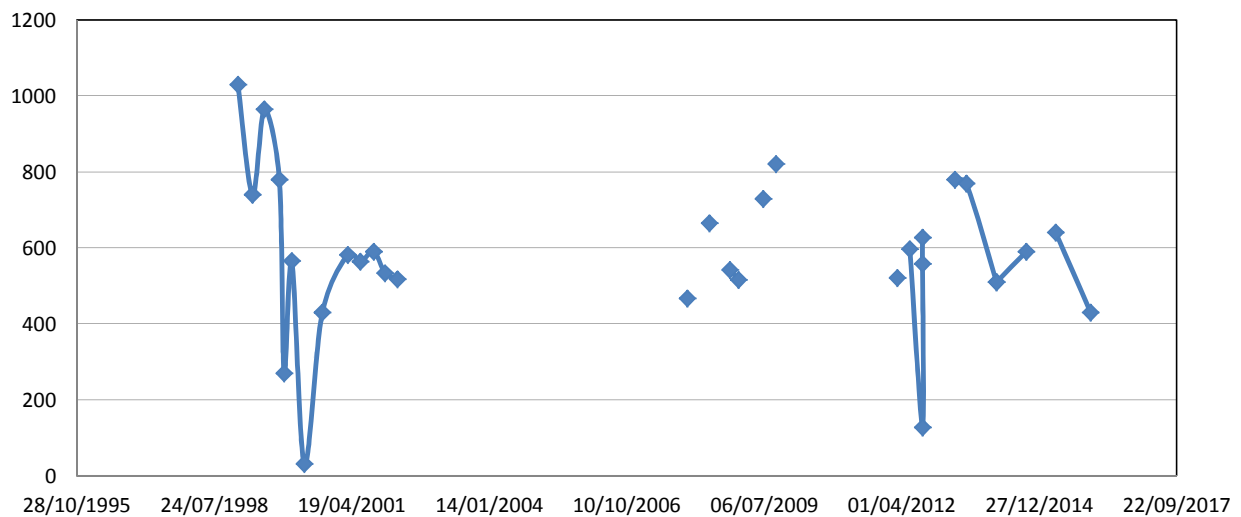
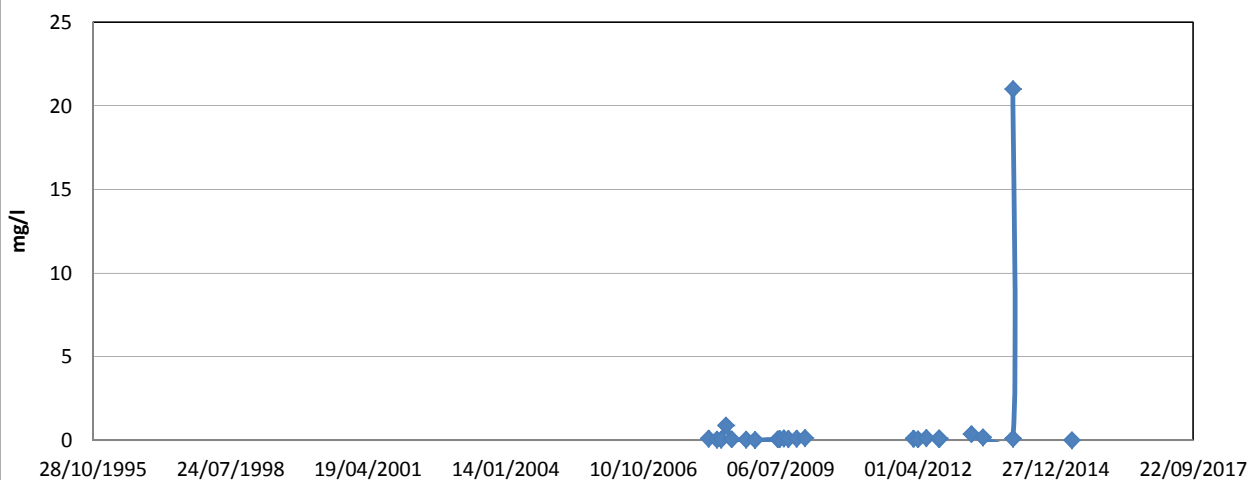
**2015 Annual Environmental
Monitoring Report**

**Appendix 2
Leachate Chemistry**
Report Number 1459r1v1d0316







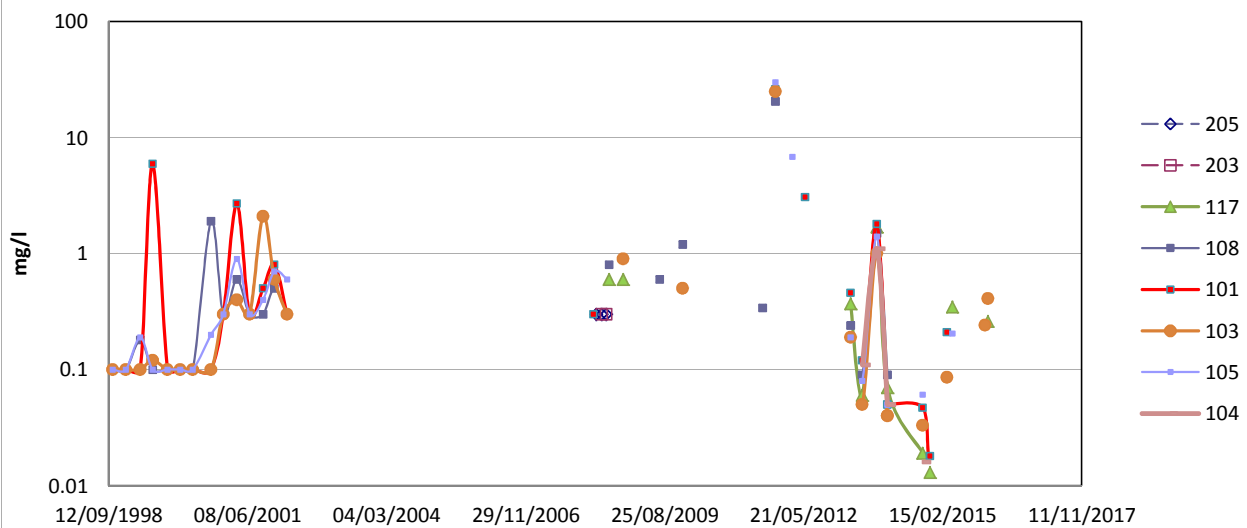
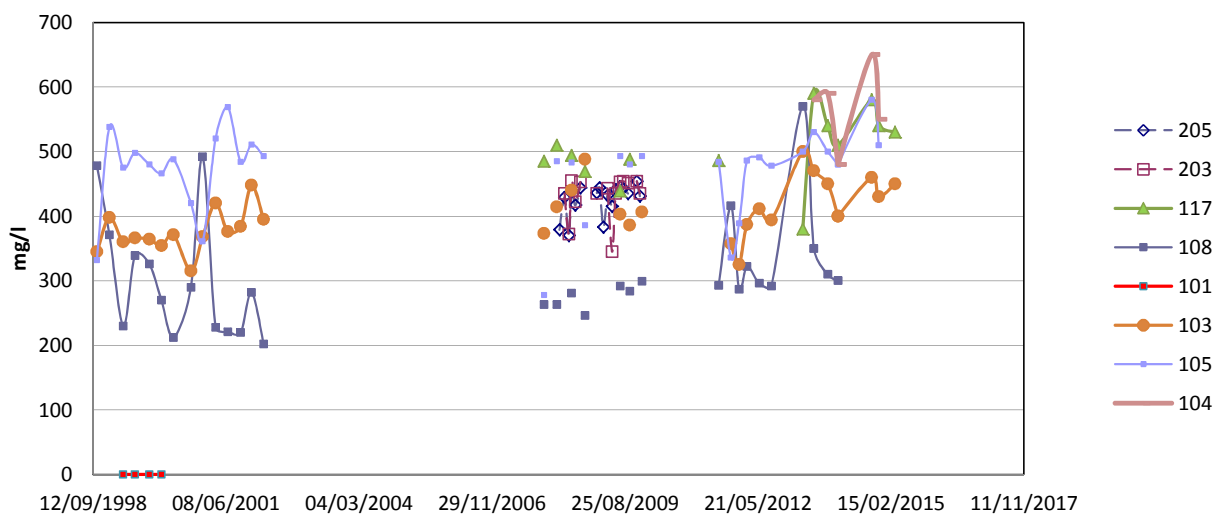
Electrical Conductivity**Alkalinity****BOD / COD**

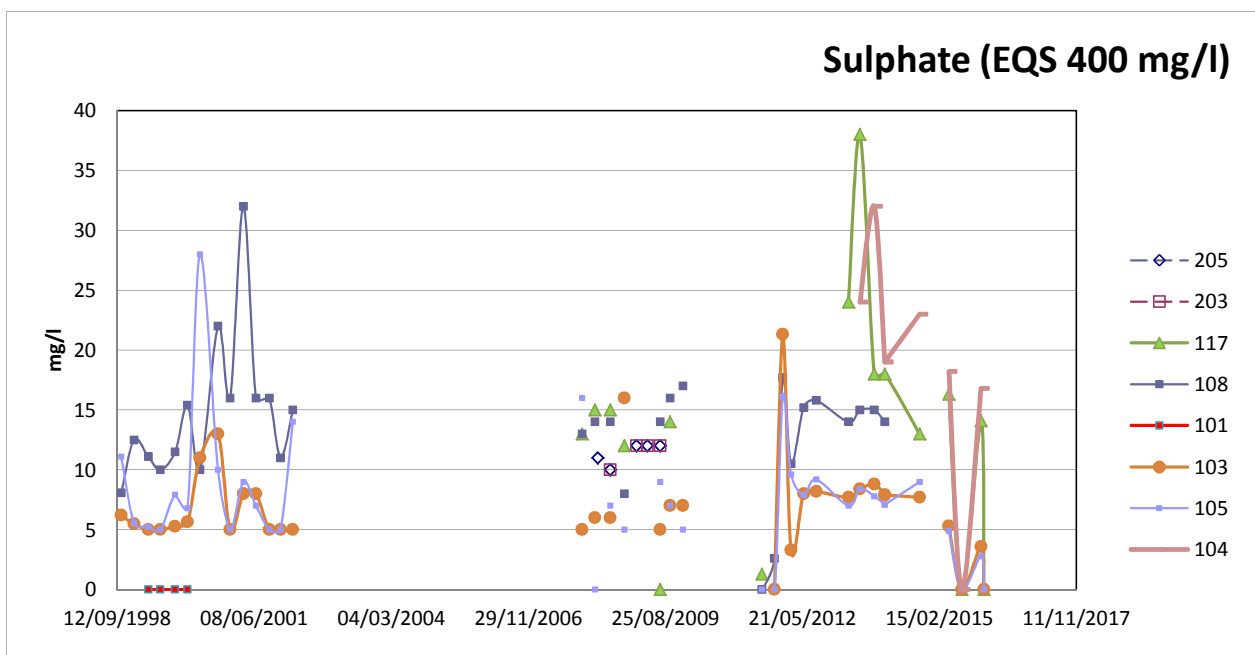
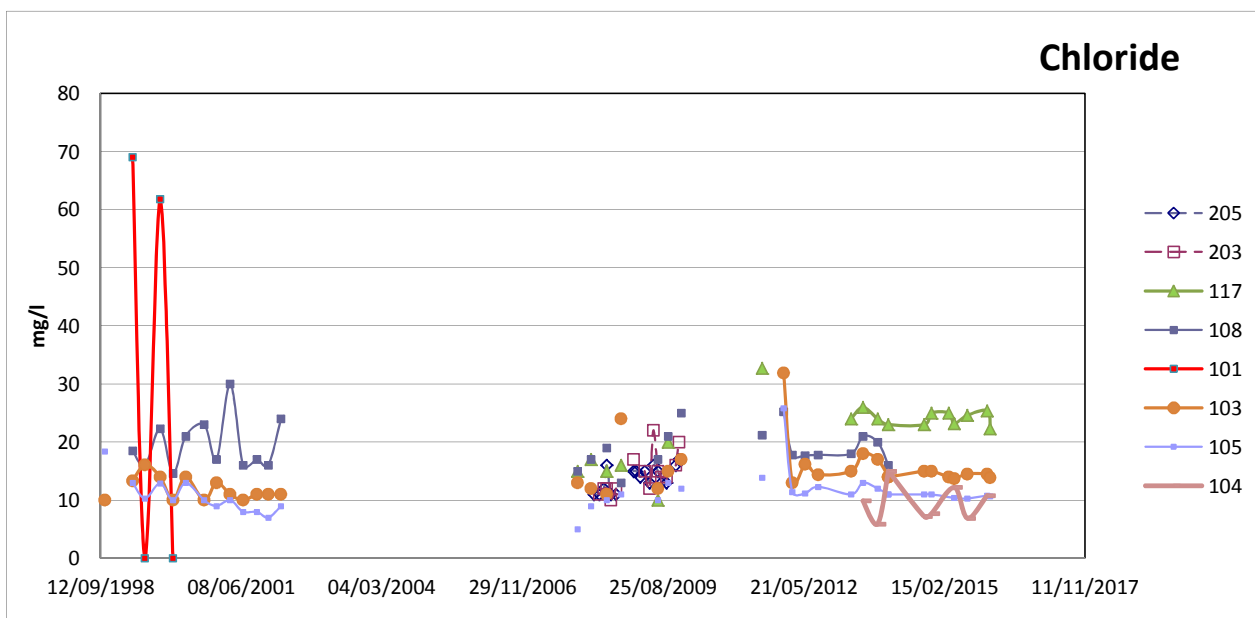
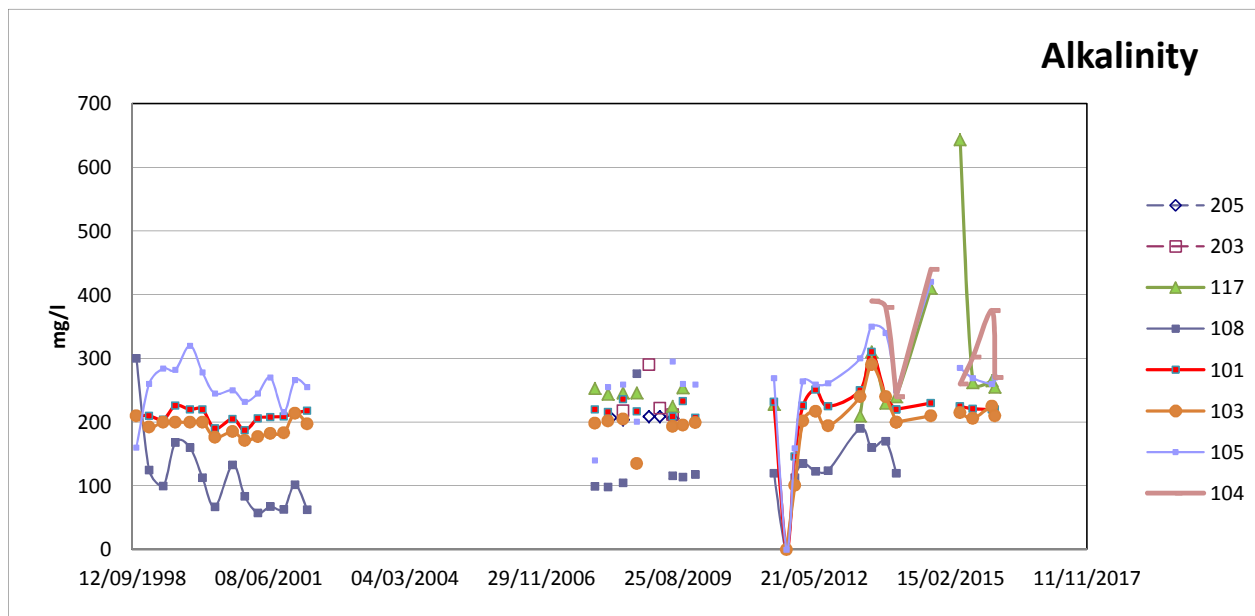
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CLOSED LANDFILL**

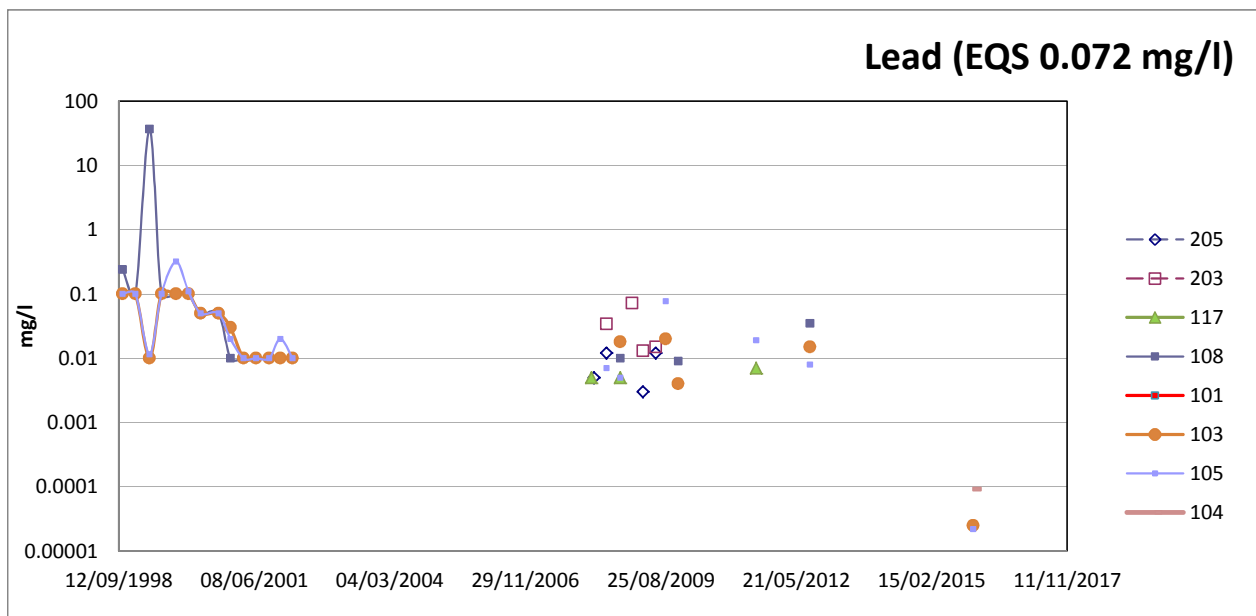
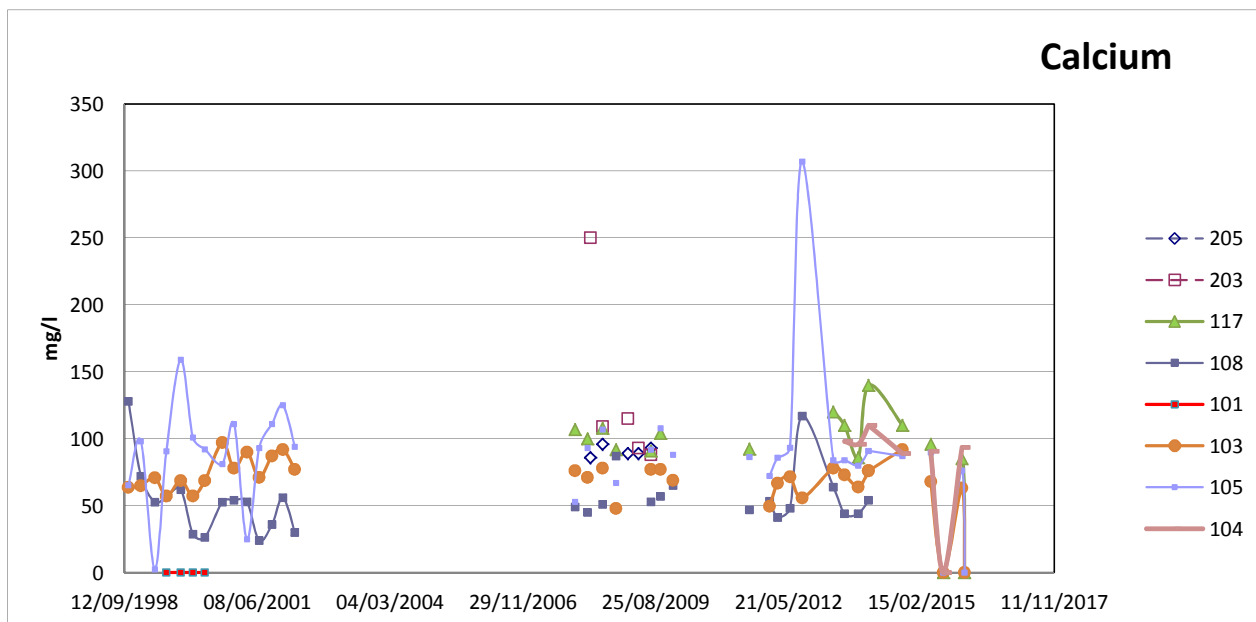
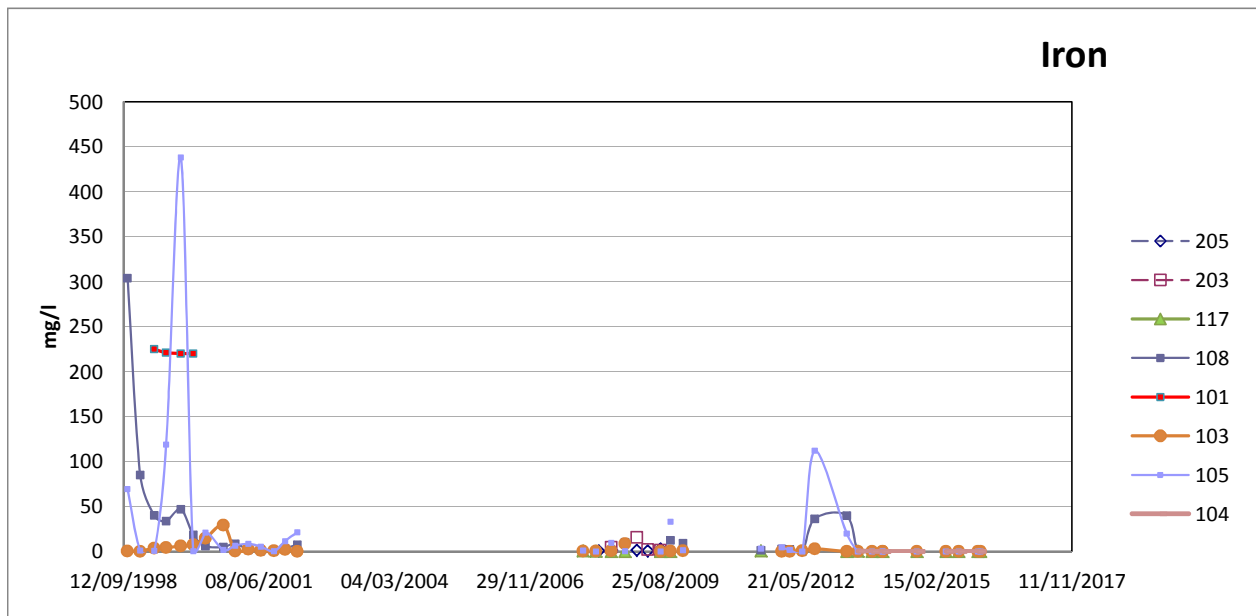
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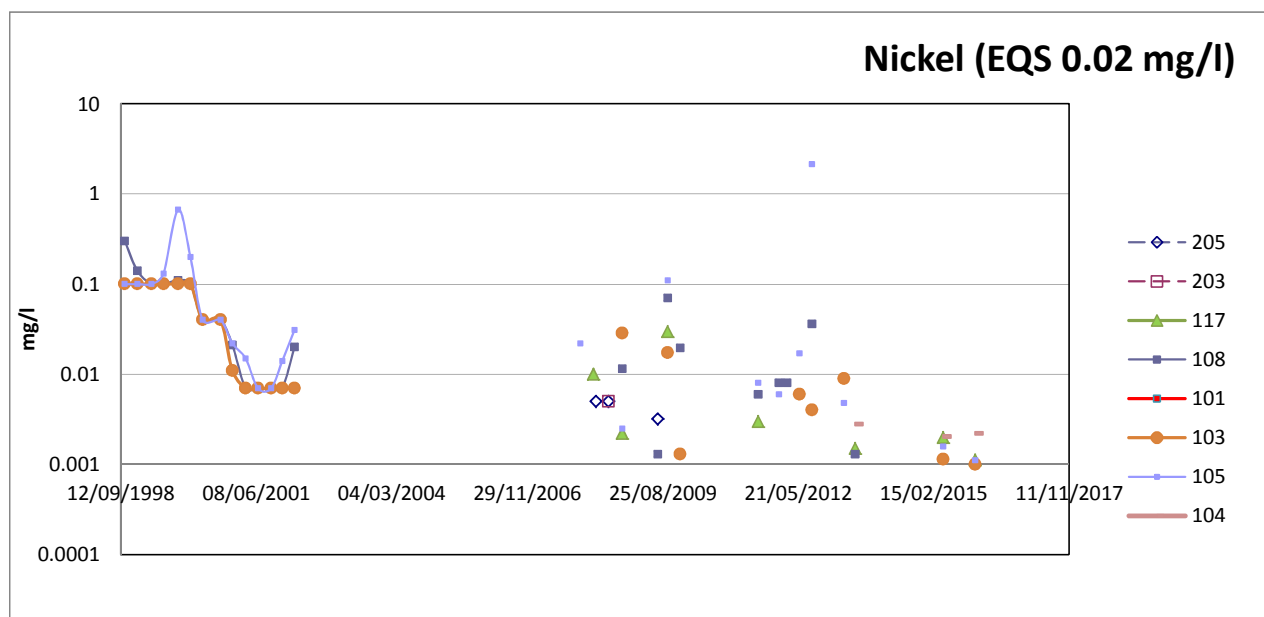
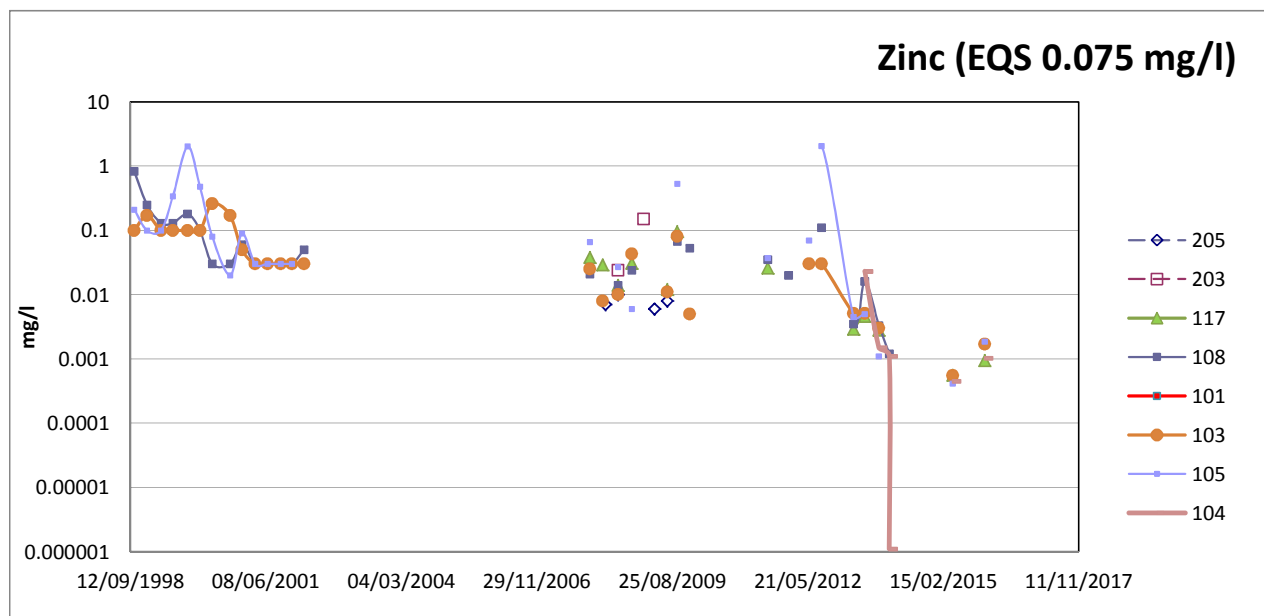
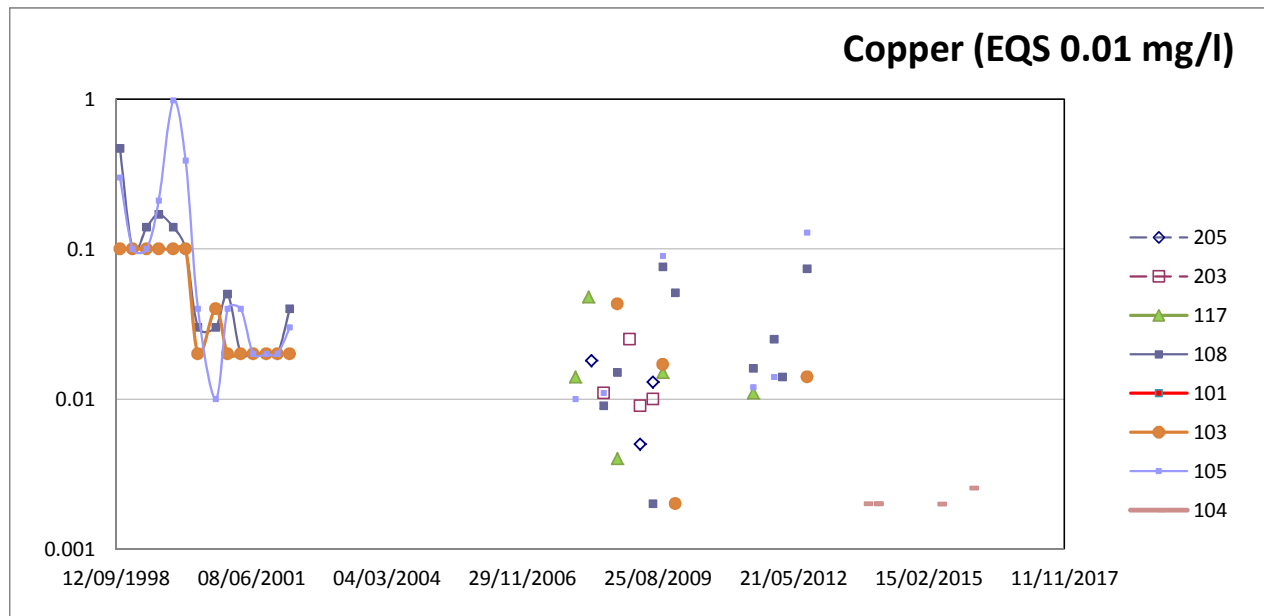
**2015 Annual Environmental
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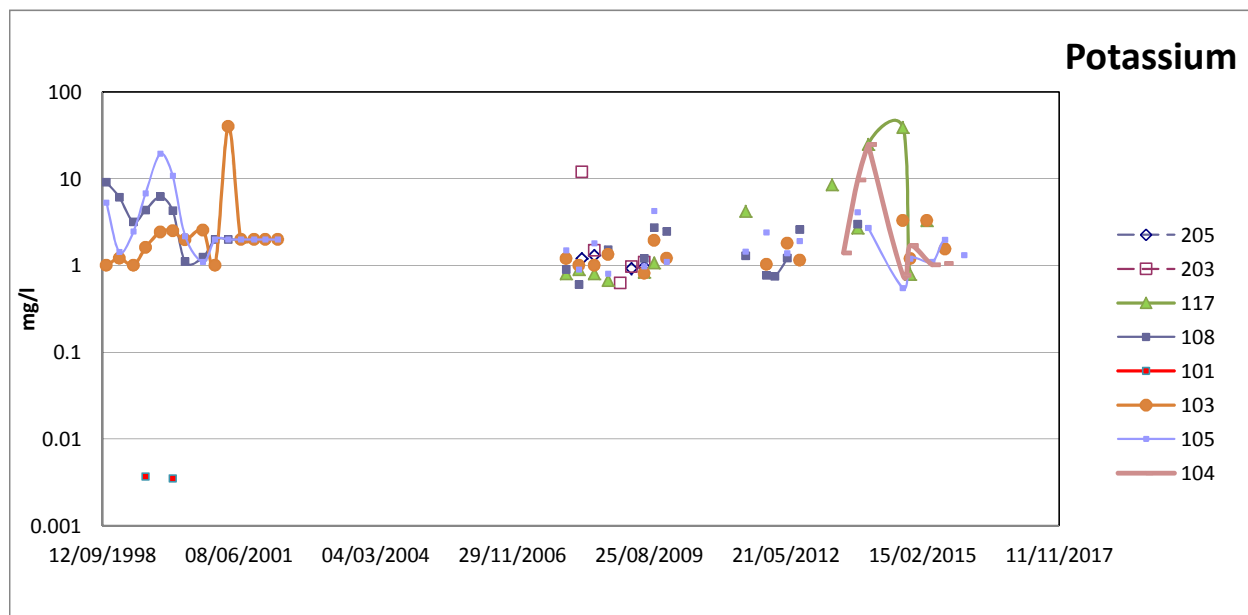
**Appendix 3
Groundwater Chemistry**
Report Number 1459r1v1d0316

pH**Ammonia****Electrical Conductivity**







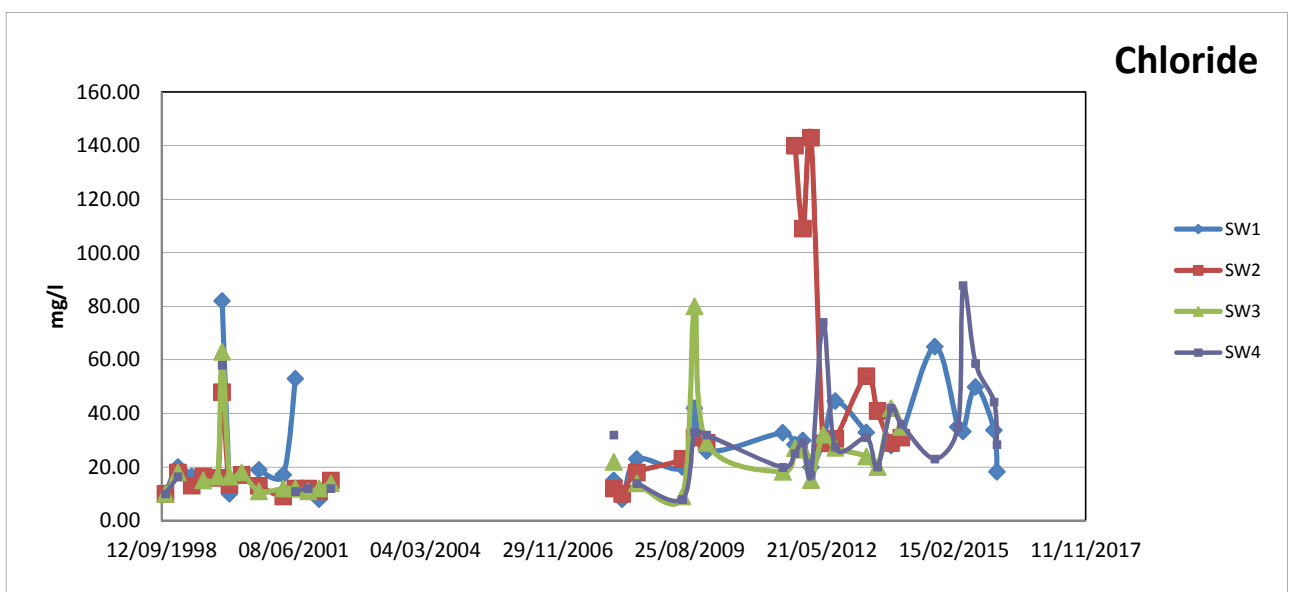
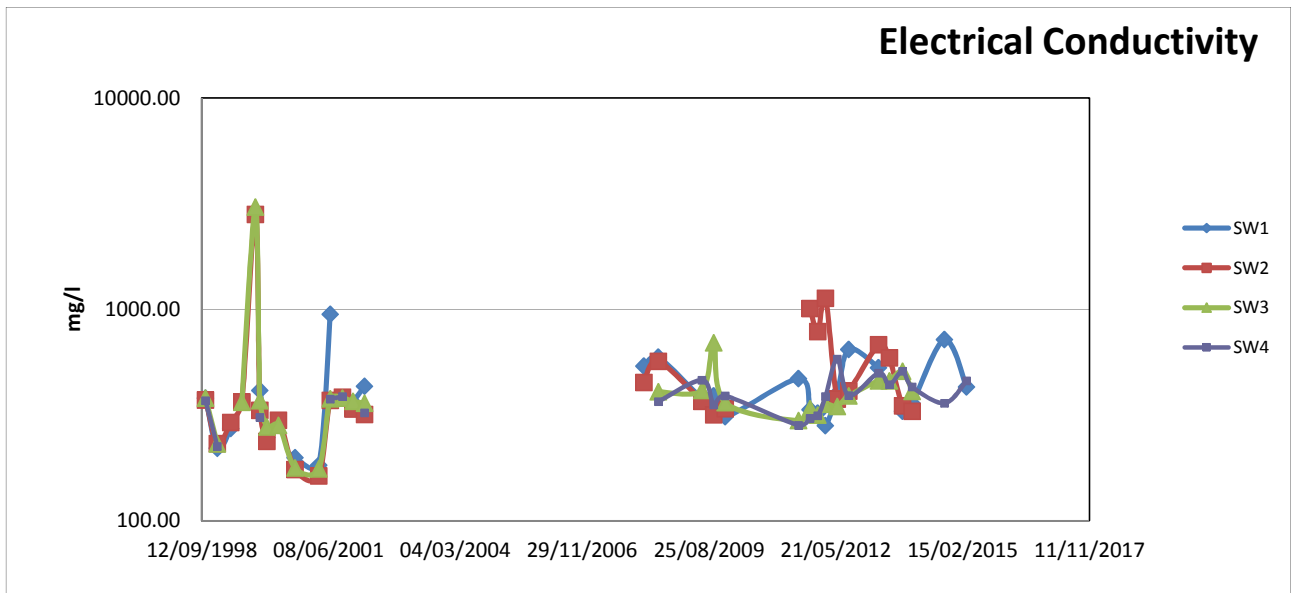
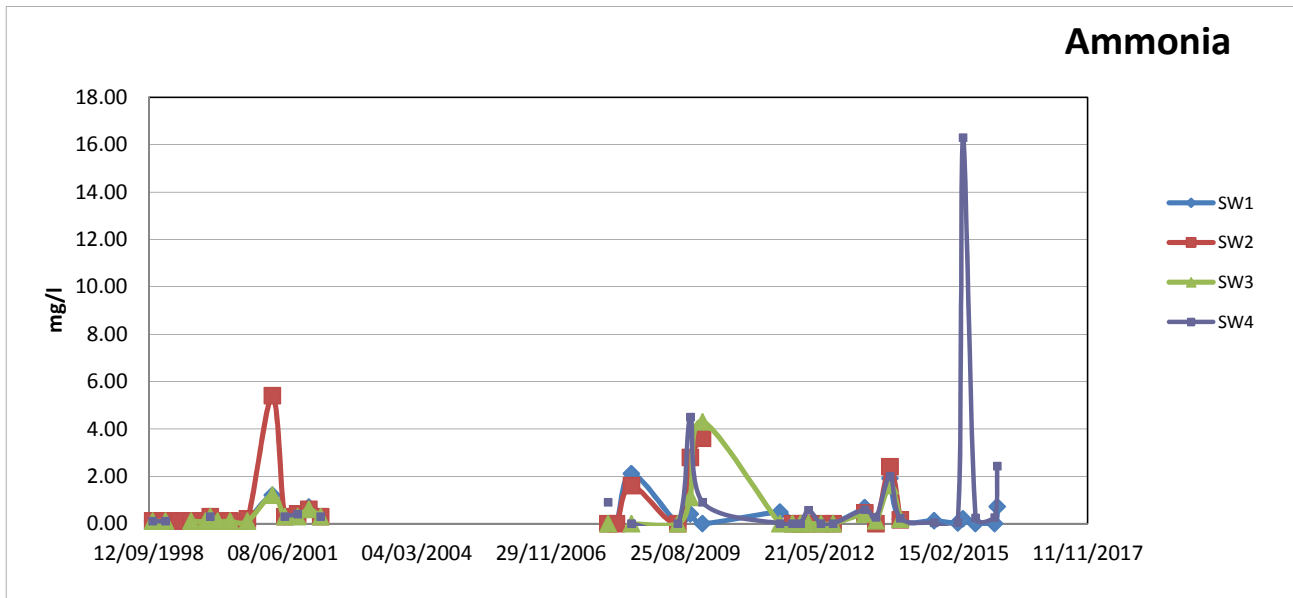


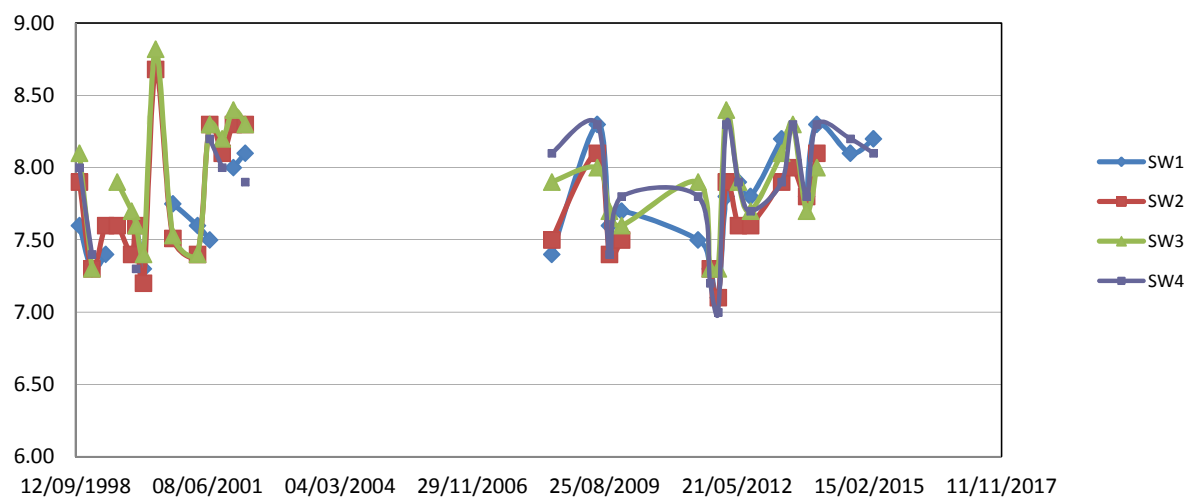
**NANT Y CAWS
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CLOSED LANDFILL**

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**2015 Annual Environmental
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**Appendix 4
Surface Water Chemistry**
Report Number 1459r1v1d0316



pH**COD**