

**PALLEG LANDFILL
LOWER CWMTWRCH**

PERMIT BT19081X

**Review of 2016
Landfill Monitoring**

Report Number 1553r1v1d0117

Prepared by

Geotechnology Ltd

Ty Coed

Cefn-yr-Allt

Aberdulais

SA10 8HE

Commissioned by

JLA Disposal Limited

Tir Canol Farm

Palleg Road

Cwmtwrch

SA9 2UT



JANUARY 2017

Table of Contents

1	INTRODUCTION	1
1.1	Reporting	1
2	SITE LOCATION	3
2.1	Environmental Setting	3
2.2	Geology	3
2.3	Groundwater	4
2.4	Surface Water	5
2.5	Meteorology	5
3	OVERVIEW OF SITE ACTIVITIES	6
3.1	PNHL Operation	6
3.1.1	Cell Construction	6
3.1.2	Waste Deposition	8
3.1.3	Leachate Management	8
3.1.4	Cell Construction	9
4	REGULATORY FRAMEWORK	10
4.1	Emissions to Air	10
4.2	Leachate Control Levels	10
4.3	Groundwater Trigger Levels	10
4.4	Surface Water Emission Limits	11
4.5	Perimeter Gas Compliance Levels	12
4.6	Identification and Management of Permit Breaches	12
4.7	Hydrogeological Risk Assessment Review	12
5	MONITORING ACTIVITIES	14
5.1	Available Monitoring Network	14
5.2	Monitoring Responsibilities	14
5.3	Monitoring Network Integrity	14
5.4	Sample Analysis and Measurement	16
5.5	Action required	16
6	ANNUAL TOPOGRAPHIC SURVEY	17
6.1	Waste Settlement	17
6.2	Remaining Landfill Volume	17
7	LEACHATE AND IN-WASTE GAS EVALUATION	18
7.1	Leachate Level	18
7.2	Leachate Chemistry	18
7.3	Comparison with HRA Leachate Inventory	21
7.4	In-waste gas Chemistry	21
8	GROUNDWATER EVALUATION	23
8.1	Groundwater Level	23
8.2	Groundwater Quality	23
8.3	Assessment against Permit Trigger Level	25

9 SURFACE WATER EVALUATION	26
9.1 Sampling Points	26
9.2 Other Inputs to Surface Water	27
10 PERIMETER GAS EVALUATION	28
10.1 In-waste Gas Monitoring	28
10.2 Perimeter Gas Monitoring	28
11 ODOUR	29
12 SUMMARY AND RECOMMENDATIONS	30
12.1 Review of Permit Breaches	30
12.2 Actions	30

List of Tables

Table 3-1 Landfill Cell Construction and Operation Timeline	7
Table 4-1 Particulate matter emission limits into air	10
Table 4-2 Leachate Control Levels	10
Table 4-3 Trigger Levels for Emissions into Groundwater	11
Table 4-4 Trigger level for phenols (mg/l)	11
Table 4-5 Surface Water Monitoring Control Levels	11
Table 4-6 Surface Water Monitoring Control Levels in Permit Variation	12
Table 4-7 Previous Landfill Gas Limits for External Gas Wells	12
Table 4-8 Peripheral Gas Assessment and Emission Limits	12
Table 4-9 Summary of 2015 HRA leachate inventory (mg/l)	13
Table 6-1 Estimated Landfill Capacity	17
Table 7-1 Summary of Inorganic Parameters Detected in Leachate	19
Table 7-2 Organic compounds detected in Leachate in 2015 and 2016	20
Table 7-3 Comparison of Leachate Chemistry to Landsim Model Inputs	21
Table 8-1 Comparison of Groundwater Data with Trigger Levels	25
Table 9-1 Comparison of Surface Water Quality with Control Levels	27

List of Figures

1. Site Location Plan
2. Detailed Site Plan
3. Proposed Monitoring Network
4. Current Monitoring Network
5. Topographic Survey of Landfill December 2015
6. Topographic Survey of Landfill November 2016

List of Appendices

1. List of Reports
2. Digital Laboratory Certificates
3. Summary of Leachate Levels and Chemistry
4. Summary of Groundwater Monitoring Data
5. Summary of Surface Water Monitoring Data
6. Summary of Gas Monitoring Data

1 INTRODUCTION

JLA Disposal (JLA) operates the Palleg Landfill Phase II Non-Hazardous Landfill (PNHL). The site started to accept wastes on 1 November 2008 and now comprises four approved sub-cells draining to a single common leachate collection infrastructure. The site is situated at Palleg Road, Cwmtwrch at OS Grid Reference SN 7739 1136 (see Figure 1). The active site is situated immediately adjacent to an existing landfill known as Palleg Phase I as well as a closed local authority landfill known as Tir Canol.

The active site occupies an area of approximately 2.73 hectares and is situated in a remote setting on the watershed between the Tawe and Gwys valleys to the north of Swansea, South Wales. In accordance with the Landfill Regulations, the site is regulated through an Environmental Permit issued by Natural Resources Wales (NRW). The applicable Permit number is BT19081X which was issued on 26 July 2005. The Permit has undergone three variations, two during 2007 (XP3230MQ and DP3039XM) and more recently on 21 February 2013 (EPR/BT19081X/V004).

In accordance with Permit condition 4.2.1 a summary review of all monitoring data is required on an annual basis. This report is the tenth annual monitoring report for PNHL and has been independently compiled by Geotechnology Limited (Geotechnology) to provide a review of the monitoring data collected up to December 2016.

1.1 Reporting

Previous annual review reports have also been prepared by Geotechnology and are referenced as follows:

- *2007 Annual Monitoring Review (Geotechnology report reference 518.1/0/1207)*
- *2008 Annual Monitoring Review (Geotechnology report reference 644r1v1d0109)*
- *2009 Annual Monitoring Review (Geotechnology report reference 786r1v1d0310)*
- *2010 Annual Monitoring Review (Geotechnology report reference 941r1d1d0111)*
- *2011 Annual Monitoring Review (Geotechnology report reference 1071r1v1d0212)*
- *2012 Annual Monitoring Review (Geotechnology report reference 1164r1v1d0313)*
- *2013 Annual Monitoring Review (Geotechnology report reference 1213r1v1d0114)*
- *2014 Annual Monitoring Review (Geotechnology report reference 1344r1v1d0115)*
- *2015 Annual Monitoring Review (Geotechnology report reference 1429r1v1d0116)*

A series of Construction Quality Assurance (CQA) documents have also been prepared by Geotechnology to document the construction of each cell. Separate technical reports have also been prepared by Geotechnology at the request of JLA to address specific site development aspects. All of these reports are listed in Appendix 1. On behalf of JLA, Geotechnology is currently preparing a CQA Validation report for Sub-cell 5, which is likely to become operational during 2017.

At this stage, key aspects of site development include the proposed construction of a new surface water management scheme including a new sedimentation and balancing lagoon (Geotechnology report 1141r2v1d1211), valley Infilling Proposals and SRA review (report 1141r4v1d1211 SRA Review) and a capping and restoration plan for the site (Geotechnology report no. 1176r1v1d0312 Capping and Restoration CQA Plan). JLA has started to implement both schemes although revisions to the surface water management techniques are being considered by JLA.

Despite the landfill only accepting waste since November 2008, 2009 was the four-year anniversary of the Permit. As a consequence, the four year review of the original HRA was submitted to the Agency on 4 February 2009 and accepted by the Agency on 13 November 2009 (see NRW CAR 02977). More recently, the six year review of the HRA was completed in 2015 (see Geotechnology report 1458r1v1d0515). The next HRA review is therefore scheduled for 2021.

2 SITE LOCATION

2.1 Environmental Setting

The landfill is located at National Grid Reference SN773 114, as shown on Figures 1 and 2. Land to the immediate north of the landfill is occupied by a former coal processing plant and also an unclassified road that leads from Cwmtwrch Isaf to opencast coal workings and forestry. The unclassified road also forms the eastern boundary of the site. The southern boundary to the proposed landfill is a surface water drain and a stock proof fence which encloses the adjacent field which is used for sheep grazing. Beyond this field to the south is Palleg Minor Golf Club.

The site occupies an area of 2.734 hectares comprising grade three agricultural land. The site is generally flat although the southwestern area falls from east to west, dropping from 180m to 172m AOD.

Prior to landfill development, the site had no previous development history, but is adjacent to land developed for mineral processing and waste disposal. Shot blasting activities occur ~1km to the east.

The site was traversed by two water mains; a 50mm diameter alcatheene pipe and a 150mm cast iron main. These were diverted around the perimeter of the site prior to the construction of Sub-cell 4. An 11kV overhead electricity line traverses the eastern perimeter, though this will not be affected by the proposed operations. No other services are known to cross the site.

The landfill is situated on high ground between the Tawe Valley and the Gwys valley. As the watershed between the valleys is situated only 30m to the east of the landfill the site does not lie in proximity to any significant watercourses. The terrain in the vicinity slopes gently westward to a very shallow valley occupied by an unnamed tributary of Afon Twrch. Land on the opposite side of the shallow valley rises only 3m over a distance of 150m before dropping sharply into the steep valley of Nant Gwys.

NRW undertakes routine monitoring of several water quality indicators downstream of the landfill in Nant Gwys close to its confluence with Afon Twrch. Both chemical and biological indicators are used to classify the quality of the river water and Geotechnology understands that the water course is currently classified as Grade B. NRW also monitors surface water quality closer to the site in a small stream that passes through the golf course.

2.2 Geology

As part of the original Permit application, 119 boreholes and trial pits were drilled and excavated in the immediate vicinity of the proposed development (see Geotechnology report 249.1 August 2003). Combined with information reviewed as part of a desk study, it was determined that PNHL would be located in an area underlain by a thick sequence of Glacial Till which is in turn underlain by mudstones and thin coal seams belonging to the Coal Measures. Sandstone has not been found beneath the site, and available geological information suggests it is likely to be present at significant depth.

At the time, information collated from desk study and site investigation showed that the Glacial Till thickness varied from 12m to 18m. As part of the expansion of the groundwater and gas monitoring network in 2008, Geotechnology noted that the glacial till was found to be significantly thicker than previously encountered (see Geotechnology report 650.1/0/0308). During the installation of GW2 and GW7, 23m of glacial till was encountered before coal

measures bedrock was encountered. This indicates that the till is of variable thickness across the site and thicker, in parts, than originally observed. This variation in thickness was also confirmed during the installation of GW8 in late 2011 (see Geotechnology report 1149r2v1d0312).

Development of the landfill sub-cells to date has required excavation of four metres to the Glacial Till. This has enabled the base of the landfill to be in stiff grey un-weathered clays rather than the overlying weathered brown clays. This is entirely consistent with adjacent Phase 1 closed landfill, where the side slopes were excavated into weathered brown till (ablation till). The floor of Phase 1 comprised a stiff grey clay (lodgement till) which was used to construct the mineral lining system. However, the excavation undertaken in Sub-cell 1 of Phase 2 PNHL revealed that the interface between the ablation till and the lodgement till was not as uniform as was the case in Phase 1. Rather, rapid changes in this interface elevation of 1m or so were found. This is not inconsistent with the earlier site investigation findings, as similar changes were observed in the interface elevation between adjacent trial pits. Current evidence suggests that the thickness of the ablation till is thicker than the maximum encountered in the investigation.

2.3 Groundwater

Groundwater beneath the site occurs principally in the Coal Measures bedrock, which is classified as a minor aquifer. Groundwater does not lie within a source protection zone. NRW has previously recognised, as part of their review of HRAs, that the site is not in a particularly sensitive location from a groundwater perspective.

In-situ permeability tests conducted as part of the original Permit application revealed a fracture flow (secondary) permeability of typically $1 \times 10^{-7} \text{ms}^{-1}$ in the mudstone bedrock. The stiff grey lodgment till comprises much lower permeability and does not transmit water as an aquifer. The overlying weathered ablation till is also of low permeability, though several localized lenses have been identified where the sandy clay grades into a clayey sand. A small amount of perched water has also been encountered in these sandy lenses, sitting directly above the underlying clay. Recent construction of the landfill cells under CQA supervision has included nine laboratory measurements of the hydraulic conductivity of the placed mineral liner. As the mineral liner comprises the same grey clay that underlies the landfill, the mineral liner laboratory test data provides a useful indication of the likely in-situ permeability of the clay layer below the landfill. This approach is considered to be justified because the in-situ glacial material will have been over-consolidated and therefore at least equivalent to the laboratory achieved density. This analysis has revealed the hydraulic conductivity to have a minimum value of $2.6\text{e}^{-11} \text{m/s}$, most likely value of $3.4\text{e}^{-10} \text{m/s}$ and maximum value of $1.7\text{e}^{-08} \text{m/s}$. This latter value was previously measured by an in-situ rising head test whilst the minimum and most likely values are based on the measurement of the mineral liner. During the extensive site investigations completed to date, fissures in the glacial deposits have not been observed

The many trial pits and boreholes drilled at the site have not intersected a static groundwater surface at shallow or moderate depth, with only localised seepages from shallow sandy lenses reported. On every occasion that the Glacial Till has been pierced by a borehole, groundwater has flowed slowly in and reached a standing level within ~2 metres of the ground surface. The underlying Coal Measures aquifer is therefore confined by the overlying low permeability clay. This means that groundwaters are sub-artesian which is likely to limit advective contaminant transport.

Groundwater quality has been monitored at the site for many years. Since January 2007 routine monitoring has been undertaken in accordance with the Permit. Groundwater flow and quality is discussed further in Section 4.

2.4 Surface Water

The only surface water feature of note within immediate vicinity of the site is a small unnamed stream that intermittently flows westwards along the southern boundary of the landfill. The stream receives surface run-off from the site, the adjacent field used for grazing and the adjacent Phase 1 landfill. The stream flows through a series of lagoons and then towards Palleg Golf Club, some 200m west and ultimately drains to the Afon Twrch.

2.5 Meteorology

The prevailing weather direction is from the southwest and the hills, which the landfill is situated on, are the first areas of high ground that weather systems meet as they pass up the Swansea Valley. Accordingly, the site experiences high rainfall, typically in excess of 1220mm of rainfall per annum. Evapo-transpiration reduces the effective rainfall to an annual average of 940mm per annum. Wind direction is predominantly dominated by southwesterly and westerly weather systems.

3 OVERVIEW OF SITE ACTIVITIES

Before describing the monitoring completed and reviewing the available results, this section provides a brief overview of the activities that have occurred since the start of the monitoring programme in January 2007.

3.1 PNHL Operation

3.1.1 Cell Construction

PNHL is designed upon the containment principle. Pollutants are kept within the wastes by surrounding the wastes with barriers that are virtually impermeable to water, liquids and gases.

The landfill is being constructed as a series of cells. The design presented in the original Permit application (Geotechnology report 249) was based upon achieving containment through the use of a 1m thick clay monoliner comprising recompacted site won grey clay. However, during initial earthworks it was noted that the grey clay which was proposed to be used as a mineral monoliner at the site was more undulating than anticipated. The undulating nature of the clay resulted in the grey clay being at variable depths below ground surface across the site. As a consequence, additional excavation of over 1m would be required, which in turn would lead to a considerably greater thickness of re-compacted material being placed in lieu.

In response, Geotechnology reviewed the design with JLA and determined that the original 1m thick clay monoliner could be replaced with a composite Engineered Barrier System (EBS). The composite EBS would comprise a 250mm clay substrate overlain by 2mm HDPE geomembrane liner. The 250mm clay substrate would be constructed to meet the same design specifications as the original monoliner. The composite EBS would replace the re-compacted clay monoliner as the artificial sealing layer for the landfill. Additionally, in order to promote recycled material usage and to offset the increased construction costs, it was proposed to construct the drainage blanket from shredded tyres rather than stone. These design modifications were presented by Geotechnology in April 2007 (see Geotechnology report 560) and subsequently accepted by the Environment Agency.

In August 2007, attempts were made to initiate lining in the void created in 2006. This work was abandoned during October 2007. Consequently, there was no waste deposited in 2007. Construction of Cell 1 re-commenced in 2008 and was completed to the satisfaction of the Environment Agency by 22 September 2008. Construction of the cell comprised excavation of the void space (primarily completed during the Autumn 2007) followed by the installation of a lining system under CQA supervision (see Geotechnology report 671). The cell lining system installed comprised the following top down sequence:

- Thermally bonded non-woven polypropylene -polyethylene geotextile separator manufactured from virgin materials.
- Shredded tyre drainage layer in excess of 725mm thick.
- Leachate drainage blinding aggregate comprising a free draining gritstone gravel which was placed in a single layer to a thickness of at least 100mm.
- Non-woven polypropylene needle punched geotextile protector layer.
- High Density Polyethylene (HDPE) 2mm thick geomembrane on the base and flanks of the cell.
- Mineral liner comprising re-compacted site won clay from the lower grey clay placed over the low permeability natural geological barrier present across the site.

Construction of Sub-cell 2 during September 2010 followed the same design used for the construction of Sub-cell 1 apart from the drainage layer. Instead of using shredded tyres in the drainage layer a proprietary limestone 20/40mm aggregate was used, again with a 100mm blinding limestone aggregate. All sub-cells are therefore connected by a continuous leachate drainage system with the landfill base lying at an elevation of circa. 168–170m AOD. This drainage blanket configuration has been extended into Sub-cell 3 and Sub-cell 4 and most recently sub-cell 5. The construction of these latter cells is documented in separate CQA Validation reports.

Key dates relating to cell construction and operation are summarised in Table 3-1.

Table 3-1 Landfill Cell Construction and Operation Timeline

Date	Activity
2007	In August 2007, attempts were made to initiate lining of Cell 1 in the void created in 2006. This work was abandoned during October 2007 due to poor weather. Consequently, there was no waste deposited in 2007.
2008	Construction of Cell 1 recommenced in 2008 and was completed to the satisfaction of the Agency by October 2008.
2009	No cell construction activities
2010	Cell 1 ceased operation in September. Cell 2 construction commenced in August with the sub-cell operational on 23 October 2010
2012	Part of Sub-cell 3 opened in May 2012.
2013	Sub-cell 3 completed. Initial vegetation strip for Cell 4 commenced
2014	Sub-cell 4 constructed
2015	Sub-cell 4 operational after CQA approval by NRW
2016	Sub-cell 5 constructed at end of year
2017	Sub-cell 5 likely to become operational subject to NRW approval Progression of other site works

As part of the landfill earthworks completed to date, a roadway has been built from loose tipped material to enable access to each operational cell. Photographs of selected key aspects of the site are provided in Plates 1 and 2.



Plate 1. View south towards active landfill (PNHL) and monitoring points GW4 and GW8



Plate 2. View southeast towards PNHL

3.1.2 Waste Deposition

Waste deposition commenced on 1 November 2008 in Cell 1. Until 2012, all of the waste deposited was classified as non-hazardous waste from the mechanical treatment of wastes (EWC code 19 12 12) and soil and stone waste from gardens and parks (EWC 20 02 02). During the first two quarters of 2012, some 1500 tonnes of street cleaning residues (EWC code 20 03 03) were also deposited. During 2014, 2980 tonnes of 19 12 12 waste was landfilled and 2816 tonnes in 2015.

Visual inspection of the waste in the active cell reveals that it is dominated by hard and soft plastic (thermosetting and thermoplastic plastic) in various sizes and forms. This is set in a matrix which typically comprises plastic packaging, various grades of rubber, foam, textiles and small fragments of glass and wood, paper and cardboard. During 2012, JLA started to use a shredder that shreds the waste into small particles so that when the waste surface is rolled with a compactor, a greater volume reduction is achieved. Following rolling, the waste is covered with a range of cover materials. Cover materials have included soil and stone, dried street cleaning residues, fines from the processing of building materials and insulation.

3.1.3 Leachate Management

Within the drainage layer a leachate extraction system has been installed. This comprises two 315mm external diameter HDPE upslope risers, one of which acts as a failsafe should the first become blocked, connected to a network of HDPE pipework installed within the drainage stone and connected to the rock fill leachate sump. One of the risers is fitted with a 150mm diameter G-clamp suction hose, which is used for extraction purposes.

The monitoring of leachate levels is the responsibility of JLA. Leachate levels are monitored and reported directly to NRW by JLA. Appendix 3 contains a data summary.

Maintaining the leachate level below the Permit level is critical for several reasons. This is because the depth of leachate influences the environmental protection offered by the leachate drainage and lining system. Based on site observations, JLA personnel also recognise that odour associated with the landfill is less detectable when leachate levels are maintained at very low levels.

3.1.4 Cell Construction

When disposal activities are complete, the entire site will be restored to agricultural use. The landfill cap will comprise a low permeability cover subsoil overlain by topsoil which will be seeded. The cap is aimed at ensuring that long-term volumes of leachate will be small and easily dealt with. A gas extraction pipework system will be incorporated into the cap. The cap will also incorporate a drainage system to ensure long-term rapid surface water dispersion, preventing ponding on the clay cap.

Although Cells 1 and 2 no longer receive waste, they are not yet permanently capped as re-profiling of side slopes and removal of over-tipped waste is ongoing.

4 REGULATORY FRAMEWORK

The Permit defines the regulatory emission limits and control and trigger levels for PNHL. Each of the relevant criteria is reproduced in this section.

4.1 Emissions to Air

The limits for emission to air provided in the Permit are reproduced in Table 4-1.

Table 4-1 Particulate matter emission limits into air

Emission point Ref. & Location	Parameter	Source	Limit (including unit)	Reference Period	Monitoring Frequency	Monitoring Standard or Method
Flare	Nitrogen Oxides (Nox)	Landfill waste mass	150mg/m ³	Hourly mean	Annually	ISO10849
Flare	Carbon Monoxide (CO)	Landfill waste mass	50mg/m ³	Hourly mean	Annually	ISO12039
Flare	Total Volatile Organic Compounds (VOCs)	Landfill waste mass	10mg/m ³	Hourly mean	Annually	BS EN 13526
Flare	Non methane volatile organic compounds (SVOCs)	Landfill waste mass	5mg/m ³	Hourly mean	Annually	BS EN 13649:2002

These limits will apply when gas collection commences.

4.2 Leachate Control Levels

Leachate level limits are summarised in Table 4-2.

Table 4-2 Leachate Control Levels

Monitoring point reference/Description	Limit	Monitoring frequency
L1	1.5 meters above the base of the abstraction sump	Monthly
L2 to L6	1 meter above the basal lining	Monthly

4.3 Groundwater Trigger Levels

Improvement Condition 4 of the Permit required JLA to establish location specific trigger levels for groundwater. As part of the 2008 annual monitoring report this condition was reviewed. At the time it was determined that the site-wide trigger levels specified in the Permit would not be modified apart from the trigger level for phenols. This was because of similarities in the groundwater hydrochemistry at each point, except for the occurrence of phenols in upgradient groundwater which needed to be accounted for.

Current groundwater trigger levels are summarised in Table 4-3.

Table 4-3 Trigger Levels for Emissions into Groundwater

Monitoring point reference	Parameter	Limit (including unit)	Reference Period
Downstream Monitoring Points GW2, GW4 and GW8*	Ammoniacal Nitrogen	2.5mg/l	Spot Sample
	Chloride	200 mg/l	Spot Sample
	Zinc	0.1mg/l	Spot Sample
	Cadmium	0.005mg/l	Spot Sample
	Mercury	0.001mg/l	Spot Sample
	Mecoprop	0.0004mg/l	Spot Sample
	Toluene	0.004mg/l	Spot Sample
*Permit variation EPR/BT1908IX/V004 states that Trigger levels apply at GW2 to GW5 and GW8. However, GW3 and GW5 are hydraulically upgradient of the landfill.			

The original Permit also specified a trigger level for Phenols of 0.0005mg/l applicable at the same positions identified in Table 4-3. However, groundwater monitoring completed during 2007/2008 revealed the presence of phenols within background groundwater. Consequently, a new site specific trigger level was established for phenols as part of the 2008 annual monitoring review as summarised in Table 4-4 (see Geotechnology report *644r1v1d0109* for full details).

Table 4-4 Trigger level for phenols (mg/l)

Level	Concentration
Control Level 1	0.00913
Control Level 2	0.00996
Trigger Level	0.01079

As “phenols” is a collective term for several compounds, Geotechnology recommends prudence is taken in applying these control and trigger levels and that the speciated compounds may need to be evaluated individually where necessary.

4.4 Surface Water Emission Limits

Surface water emission limits provided in the Permit prior to Permit Variation EPR/BT1908IX/V004 are summarised in Table 4-5. In the new Permit Variation (EPR/BT1908IX/V004) these emission limits are no longer referenced and are superseded by those in Table 4-6.

Table 4-5 Surface Water Monitoring Control Levels

Emission point	Parameter	Source	Limit (incl. unit)	Reference Period
S1, S2, S3, and S4	Suspended Solids	Surface water drainage from the installation	75mg/l	Spot Sample
S1, S2, S3, and S4	Ph	Surface water drainage from the installation	5.5 to 9.5	Spot Sample
S1, S2, S3, and S4	Electrical Conductivity	Surface water drainage from the installation	800 uS/cm	Spot Sample
S1, S2, S3, and S4	COD	Surface water drainage from the installation	600 mg/l	Spot Sample
S1, S2, S3, and S4	Ammoniacal Nitrogen	Surface water drainage from the installation	0.75mg/l	Spot Sample
S1, S2, S3, and S4	Chloride	Surface water drainage from the installation	100mg/l	Spot Sample

The new emission level only applies to surface water monitoring location S5, as shown on Figure 3. However, as the new surface water management infrastructure is not yet fully constructed, this discharge location is not yet fully operational.

Table 4-6 Surface Water Monitoring Control Levels in Permit Variation

Emission point	Parameter	Source	Limit (incl. unit)	Reference Period
S5	Suspended Solids	Surface water drainage from the installation	50mg/l	Spot Sample
S5	pH	Surface water drainage from the installation	5.5 to 9.5	Spot Sample
S5	Visible oil	Surface water drainage from the installation	None visible to sampler	Spot Sample
S5	COD	Surface water drainage from the installation	600 mg/l	Spot Sample
S5	Ammoniacal Nitrogen	Surface water drainage from the installation	0.75mg/l	Spot Sample
S5	Chloride	Surface water drainage from the installation	200mg/l	Spot Sample

4.5 Perimeter Gas Compliance Levels

In the original Permit the landfill gas trigger levels for external gas monitoring wells were those summarised in Table 4-7.

Table 4-7 Previous Landfill Gas Limits for External Gas Wells

Monitoring point Ref. /description	Parameter	Limit (including units)*	Monitoring frequency
Peripheral landfill gas monitoring boreholes GA7 to GA10	Carbon dioxide	1.5% Vol in air *	Monthly
Peripheral landfill gas monitoring boreholes GA7 to GA10	Methane	1.0% Vol in air *	Monthly
* NB. The limits specified may need to be altered to take account of the background concentrations.			

In the 2011 annual review report, Geotechnology derived new assessment and compliance levels for carbon dioxide and methane based on current industry guidance. The new levels are summarised in Table 4-8.

In Permit Variation EPR/BT1908IX/V004 the peripheral methane emission limit is 1% and no limit is specified for Carbon dioxide. The carbon dioxide assessment levels in Table 4-8 are for internal use by JLA and provide a framework against which to evaluate peripheral gas measurements.

Table 4-8 Peripheral Gas Assessment and Emission Limits

Perimeter gas position	Carbon Dioxide Assessment Level	Methane Emission Limit
GA7	4.6% v/v	1% v/v
GA8	4.8% v/v	1% v/v
GA9	4.7% v/v	1% v/v

4.6 Identification and Management of Permit Breaches

JLA continually review all data gathered to ensure Permit compliance. Any breaches identified are documented, reported and contingency actions taken where necessary. Where necessary, Geotechnology is requested to undertake additional monitoring.

4.7 Hydrogeological Risk Assessment Review

The 2015 HRA review established new leachate inventory in the Landsim computer simulations. Comparison of the latest leachate monitoring data to the inventory, summarised in Table 4-9, provides a useful and rapid means for assessing the potential risk leachate potentially poses to the environment.

Table 4-9 Summary of 2015 HRA leachate inventory (mg/l)

		Cadmium	Ammonia	Chloride	Chromium	Phenols
2015 HRA Inputs	Minimum	0.0002	0.2	17	0.002	0.001
	Most Likely	0.0003	430	490	0.12	0.6
	Maximum	0.0005	2600	1120	0.25	6.4
Note Statistical summary used to derive values ignored measurements where analytical detection limit was not breached.						

The next review of the HRA is scheduled for 2021.

5 MONITORING ACTIVITIES

To demonstrate that the site is functioning as designed, a rigorous monitoring strategy is being actioned. Geotechnology is commissioned by JLA to undertake parts of the monitoring programme. The monitoring programme covers ground and surface water monitoring, dust and noise emission, landfill gas production.

5.1 Available Monitoring Network

In March 2008, a series of groundwater wells (GW2, GW4 and GW7) and a single gas monitoring well (GA7) were installed at the site. Due to access difficulties, two further gas wells (GA8 and GA9) were not installed until 11 September 2008. All installations have been previously reported as part of the Construction Quality Assurance demanded by the Permit (see Geotechnology reports 650).

During 2011, the headworks of groundwater monitoring position GW7 was accidentally damaged by a leachate tanker. Inspections undertaken by JLA revealed that the piezometer pipe had been bent as a result of the collision and surface run-off appeared to have entered the damaged well head. In response to the damage of the well head and the potential compromise of the seals, JLA arranged for the monitoring well to be decommissioned and a new well (GW8) installed. This work was completed in November 2011, a new dedicated sampling pump was purchased and the well subsequently purged prior to the first round of sampling. All of the groundwater wells and leachate sump are provided with dedicated Waterra pumps to avoid cross contamination during sampling.

As part of the construction of Cells 1 and 2, leachate monitoring points L1 and L2 and in-waste gas monitoring points GA1 and GA2 have been installed.

A plan of the currently available monitoring network is provided in Figure 4.

5.2 Monitoring Responsibilities

Geotechnology is commissioned by JLA to undertake groundwater, surface water, gas and leachate sample collection. JLA undertakes all other aspects of the monitoring programme including dust, odour and leachate level.

5.3 Monitoring Network Integrity

The integrity of the monitoring network is inspected on each sampling occasion.

Due to measures aimed at controlling the release of odour from leachate, in-waste leachate monitoring location L1 is not always readily directly accessible. As a consequence, leachate samples are recovered from the spare upslope leachate riser. This situation provides an alternate mechanism for recovering leachate but JLA need to ensure that these upslope risers cannot become blocked. The pump and pipework installed at this position needs to be maintained to ensure that samples of leachate are not collected from elsewhere.

The groundwater, surface water and external gas monitoring network is generally in good condition. JLA should continue to inspect each position to ensure the headworks are protected from damage and run-off and that vegetation is routinely cleared. JLA has installed dedicated pumps into each groundwater well and positioned signs adjacent to each surface water sample

point. This minimises the opportunity for cross contamination and ensures samples are collected from the same position.

During 2016 the headworks at GW4 and GW8 were raised as part of the landraising works (see Plate 3).



Plate 3. Raised ground level around GW8



Plate 4. Landforms immediately upgradient of GW8

5.4 Sample Analysis and Measurement

During 2007 and 2008, AlcontrolGeochem based in Chester was the laboratory used for the analysis of all water samples. At the start of 2009, JLA changed laboratories and started to use Scientifics (formerly TES Bretby) based in Burton-on-Trent. At the start of 2011, JLA changed to use ACS Testing. From April 2015, Alcontrol Laboratories has been commissioned by JLA to undertake the analyses.

All laboratories used are registered under the UKAS and MCERTS accreditation schemes where applicable. Sample bottles and dedicated cooler boxes are provided by the laboratory directly to the JLA office. Following sample collection by Geotechnology, the samples are despatched to the laboratory in labelled cooler boxes within 24 hours by JLA. Digital laboratory data certificates for the monitoring completed during 2016 are provided in Appendix 2. Each laboratory uses very similar techniques and is accredited by the same organisation.

Following the last round of sampling in December 2016, some of the bottles collected from L1 were damaged during transit to the laboratory and the full analytical schedule could not be fulfilled.

5.5 Action required

All in-waste monitoring positions need to be carefully protected to avoid damage. Leachate samples have proved impossible to recover on several occasions, potentially due to partial blockage of the pipework and this should be evaluated.

As vegetation starts to grow, JLA should undertake routine ground clearance, particularly within the vicinity of GW3 and GW5.

JLA should ensure that the headworks at all positions are protected from damage and that surface run-off cannot directly enter the wells, particularly at GW4 and GW8 where there is a possibility of perched leachate.

6 ANNUAL TOPOGRAPHIC SURVEY

6.1 Waste Settlement

Topographic surveys are completed each year. The two most recent topographic surveys of the landfill, completed in December 2015 and November 2016 are provided in Figures 5 and 6.

Once cells are permanently capped, settlement markers will be installed and these will then form the basis for measuring settlement in combination with visual observation.

6.2 Remaining Landfill Volume

By subtracting the digital terrain model of the leachate drainage layer from the latest digital terrain model of the landfill surface, the amount of waste deposited to date can be calculated. Subtracting this from the total landfill capacity then allows the remaining capacity to be estimated. This calculation is summarized in Table 6-1.

Table 6-1 Estimated Landfill Capacity

	Dec 2013	Jan 2015	Dec 2015	Nov 2016
Total Capacity (m ³)	138607	135009*	135009	135009
Waste Volume Landfilled (m ³)	67478	85380	106662	119560
Total Remaining Capacity (m ³)	71129	49629	28347	15449
% Available	51.3	36.76	21.00	11.44

7 LEACHATE AND IN-WASTE GAS EVALUATION

7.1 Leachate Level

The monitoring of leachate levels is the responsibility of JLA. Leachate levels are monitored and reported directly to NRW by JLA.

Maintaining the leachate level below the Permit level is critical. This is because the depth of leachate significantly influences the environmental protection offered by the landfill drainage and lining system. The depth of leachate is also likely to affect the leachate and gas chemistry and also the generation of odorous compounds.

7.2 Leachate Chemistry

Waste deposition commenced in November 2008. Since this time leachate chemistry has shown a wide range of short-term variations, most probably as a result of leachate extraction and dilution by infiltration (see Appendix 3).

Monitoring of leachate quality has revealed 'cyclical' trends in the overall mineralisation; from a low point at the start of the year (when there is probably most dilution) to a peak (when there is lower dilution and greater evaporation) before returning to lower levels. These trends are most clearly seen in the major ion chemistry (Ca, Mg, Na, alkalinity, sulphate and K). Bicarbonate alkalinity is the dominant ion in solution, most likely as a consequence of bacterial activity releasing carbon dioxide. Such trends were less distinct in the most recent 12 months with the EC more stable and the leachate more dilute than in recent years.

Non-hazardous trace metals remained at very low levels during 2016 but unlike 2015, low levels of hazardous substance cadmium were detected (0.0002 mg/l). This is the first time an inorganic has been detected since 2010. This data suggests that the waste is not a significant source of metals, most likely because they are being bound into the waste through adsorption and secondary precipitation i.e. the landfill is a 'sink' for the metals. If such precipitates are sulphides, this mechanism would also provide an explanation for the low sulphate levels observed (typically <300 mg/l). A summary of the inorganic parameters detected in leachate to date is provided in Table 7-1 alongside Environmental Assessment Levels (EAL's) for freshwater quality. Time series plots of key parameters is provided in Appendix 3.

By comparing the leachate quality against EAL's, Contaminants of Potential Concern (COPC) can be more easily identified as the EAL's help place the leachate quality within a regulatory framework. Key COPC are highlighted in Table 7-1.

Table 7-1 Summary of Inorganic Parameters Detected in Leachate

		Max 2014	Max 2015	2016	EQS
Chloride	mg/l	687	462	281	250
Sulphate (soluble)	mg/l	126	189	273	400
Total Alkalinity as CaCO ₃	mg/l	5300	3200	1790	
Potassium Dissolved	mg/l	207	158	131	
Sodium Dissolved	mg/l	503	504	326	170
Calcium Dissolved	mg/l	253	231	177	
Magnesium Dissolved	mg/l	89.3	66.2	77.4	
BOD	mg/l	203	161	26.7	
COD	mg/l	2000	910	499	
Total Organic Carbon	mg/l	710	327	159	
Total Oxidised Nitrogen as N	mg/l	67.8	0	<0.1	
Ammoniacal Nitrogen as N	mg/l	900	531	274	<2.5
Nitrate as NO ₃	mg/l	300	0.362	<0.3	
Nitrite as NO ₂	mg/l	0.15	0	<0.05	
Arsenic Dissolved	ug/l	358	512	197	50
Boron Dissolved	ug/l	11400	10100	6500	2000
Cadmium Dissolved	ug/l	0	0	0.201	<0.25
Chromium Dissolved	ug/l	421	110	76.4	4.7
Copper Dissolved	ug/l	13	2.37	1.21	1 (bio)
Iron Dissolved	ug/l	2650	0.136	0.398	1000
Lead Dissolved	ug/l	42	0.611	0.822	7.2
Manganese Dissolved	ug/l	454	361	93.8	123
Nickel Dissolved	ug/l	237	51.4	26.7	20
Zinc Dissolved	ug/l	61	10.8	3.95	10.9 (bio)
Mercury Dissolved	ug/l	0	0	<0.01	0.05

In recent years, the BOD/COD ratio has remained below 0.1 suggesting that the leachate contains a small component of active biodegradable matter. Ammonia detected in 2016 was consistent with levels detected recently with 274 mg/l detected in June. These levels are well below the highest ever concentration (2600 mg/l) detected in April 2013. Nitrate was detected at 300mg/l in April 2014, but in the last two years has been detected at less than 1 mg/l. At the pH and alkalinity of the leachate, ammonia will likely be present in its most toxic form as un-ionised ammonia and sulphide (<1 mg/l mg/l in 2016) is likely to be dominated by the ionised anion HS⁻. However, Geotechnology suspects there are micro-environments within the landfill where pH is less than 7, as hydrogen sulphide gas is being produced and released.

Recent screening of the leachate for organic compounds has typically revealed a small number of compounds to be present, typically at low levels. A summary of the compounds detected in the last two years is provided in Table 7-2. Phenol and mecoprop are considered the principle organic COPC as they have been detected in leachate at concentrations higher than average EAL's and/or Groundwater Trigger Levels, where present. Several compounds detected in 2016 have not been detected previously and their occurrence will continue to be scrutinised.

Several of the compounds detected are likely to be present as a result of leaching and degradation of the synthetic materials (plastic and rubber) within the waste. Low levels of

phenoxy herbicide mecoprop continue to be detected (<27 microg/l since 2013). Dichlorprop and Dichlorvos, two other insecticides and herbicides respectively, were also detected in 2014 but also at trace levels (<5 microg/l). These compounds were not detected during 2015 and 2016.

Table 7-2 Organic compounds detected in Leachate in 2015 and 2016

	Units	L1	L1	L1	L1 (incomplete analysis)
		22/04/2015	16/12/2015	27/06/2016	02/12/2016
2-Methylphenol	mg/l	<1	1.85	<1	-
3-Nitroaniline	ug/l	2.26	<1		
4-Methylphenol	ug/l	<1	154	<1	
Acenaphthylene	ug/l	0.0576	<0.55		
Benzene	ug/l	4.23	2.3	1.67	3.28
Benzothiazolone	µg/l	692	246		
bis(2-Ethylhexyl)phthalate	ug/l	<2	9.23	<2	-
Carbon Disulphide	ug/l	10.2	5.08	<1	<1
Cresols	mg/l	<0.006	0.47	0.17	
Cyclic octaatomic sulfur	µg/l		4580		
Dichloromethane	ug/l	4.34	<3		
Ditertbutylhydroxyphenylpropionic acid	µg/l			109	
EPH Range >C10 - C40	ug/l	2150	1690		
Total EPH (C6-C40)	ug/l	2150	1690		
Ethylbenzene	ug/l	3.69	<1		
Fluorene	ug/l	0.0335	<0.7		
GRO (C4-C10)	ug/l	92	211	102	74
Hexadecanoic acid	µg/l			26.7	
Hexanoic acid, -trimethyl-	µg/l		85.8		
MCPP	ug/l	26.7	17	12.8	-
Naphthalene	ug/l	0.366	<5		
Methyl tertiary butyl ether (MTBE)	µg/l			1.83	<1
m,p-Xylene	µg/l			1.59	<1
mixed hydrocarbons	µg/l			30	
o-Xylene	ug/l	2.09	<1	1.49	1.49
Oxybisethoxyethane	µg/l			23.2	
Phenanthrene	ug/l	0.071	<1.1		
Phenol SVOCS mg/l	mg/l	0.02	0.21	<0.01	
Phenol PHEHPLC mg/l	mg/l	0.02	0.21		
Phenol	ug/l	40	68		
Pyrene	ug/l	0.149	<0.75		
Terbutryn	µg/l			0.049	-
Toluene	ug/l	5.96	2.3	1.17	<1
Triisopropylphosphate	µg/l		248		
Triisopropylphosphate	µg/l			388	
Trimethylbenzoic acid	µg/l			16.9	
trimethylhexanoic acid	µg/l			48.7	
Xylenols & Ethyl Phenols	mg/l	0.02	<0.04		

7.3 Comparison with HRA Leachate Inventory

As Landsim is used to help design the landfill and then evaluate the potential risks the landfill may pose to the hydrosphere, a comparison of current leachate chemistry with the HRA model input parameters provides a simple framework for understanding the risks the landfill may be posing. Such a comparison is provided in Table 7-3. This reveals that the concentration of the selected parameters modelled using Landsim falls within the Probability Density Function used to describe and simulate the leachate inventory. This indicates that the predictions made in the modelling are still valid.

Table 7-3 Comparison of Leachate Chemistry to Landsim Model Inputs

	Ammoniacal Nitrogen as N	Chloride	Cadmium (diss.filt)	Chromium (diss.filt)	Phenols, Total Detected monohydric
	mg/l	mg/l	mg/l	mg/l	mg/l
Minimum	0.2	17	0.2	2	0.001
Most Likely	430	490	0.3	120	0.6
Maximum	2600	1120	0.5	250	6.4
Leachate concentration					
22/04/2015	531	428	<0.0001	0.1	0.04
16/12/2015	365	462	<0.0001	0.087	0.68
27/06/2016	274	281	0.000201	0.0764	0.17
16/12/2015	365	462	<0.0001	0.0874	0.68

7.4 In-waste gas Chemistry

In-waste gas monitoring has been undertaken since December 2008. Since this time the gas chemistry has become increasingly anaerobic, with negligible oxygen detected since mid-2009. The gas is currently consistently dominated by methane (50-60%), carbon dioxide (40-45%), hydrogen sulphide (>200 ppm) and carbon monoxide. These results are obtained from the gas wells either after they have been prevented from gassing to the environment or after several hours of passive venting. Walkover surveys previously completed over the landfill using the GA2000, indicate the air 1m above the waste to be aerated with low/undetectable levels of H₂S.

The gas chemistry has evolved since mid-2011. The ratio between methane and carbon dioxide has increased during this period due to increased methane and lower carbon dioxide. At monitoring well GA1, in the oldest part of the landfill, the gas has typically had a higher and increasing methane/carbon dioxide ratio compared to that recorded at GA2. More recently, however, monitoring of the gas at GA2, which is surrounded by younger waste, has started to reveal an increasing ratio surrounding GA2 and now has a very similar ratio to that observed at GA1. At both positions, the average concentration of hydrogen sulphide has fallen in recent years.

The dominance of methane suggests that there are regions of the landfill that are strongly anaerobic. The whole waste mass is not, however, going to be homogeneous, due to many variables including the different ages of the waste, the size and type of the waste fragments, proximity to waste surface, degree of saturation and extent of compaction. The occurrence of variable anaerobic conditions is supported by the detection of hydrogen sulphide alongside methane and also low levels of carbon monoxide.

Historical experience from the adjacent Phase 1 landfill and the larger Ty Canol landfill has shown that such small sites, with limited putrescible input, are not capable of sustaining a flare unless fuelled (i.e. incineration rather than flaring). At PNHL, JLA has trialled the use of a flarestack at GA1. JLA found that a flame could not be sustained for more than a few seconds due to very low rates of gas flow. The very low rates of gassing have been confirmed by measurement using two techniques. JLA purchased a Testo 405-V1 Velocity Stick which is a thermal anemometer designed to measure air velocity, volume flow and temperature. Despite attempting to measure the flow rate on several occasions, the minimum detection limit was never exceeded. Geotechnology also measures gas flow rate at the time of sampling with the gas analyser. This has recorded a range of readings (some negative due to atmospheric conditions) with a maximum flow rate of approximately 1.2 l/hr (0.0012m³/hr) through the sampling gas tap fitted to GA1. Measurements of landfill gas flow rate show little difference upon immediately opening the gas tap and after several hours of passive venting.

8 GROUNDWATER EVALUATION

Laboratory certificates are provided in Appendix 2.

8.1 Groundwater Level

Sub-artesian groundwater is found below the site. Based on an analysis of piezometric surface elevation the following borehole groupings are used for hydrochemical discussions:

- GW3 and GW5 – Up-hydraulic gradient of PNHL.
- GW2, GW4 and GW7 (now GW8) – Located down hydraulic gradient of PNHL.

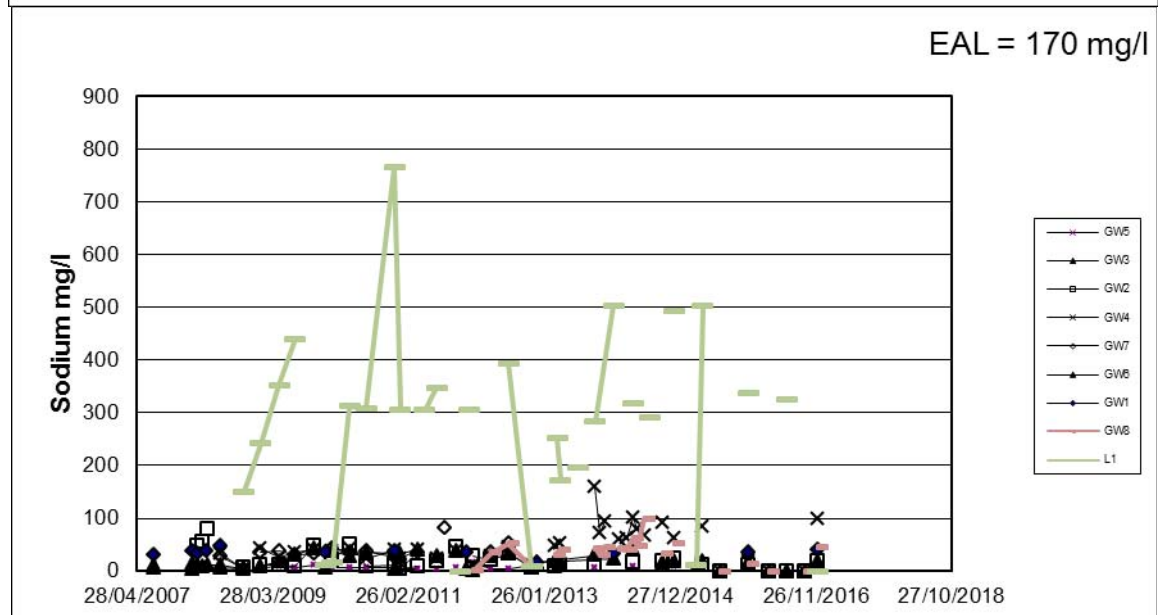
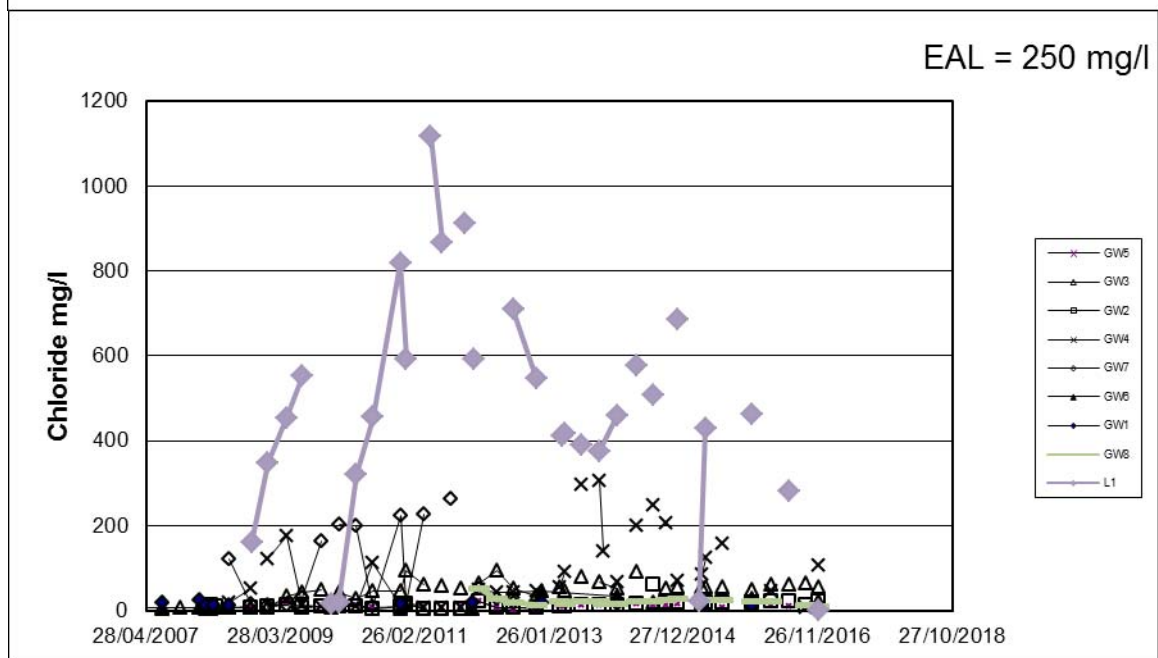
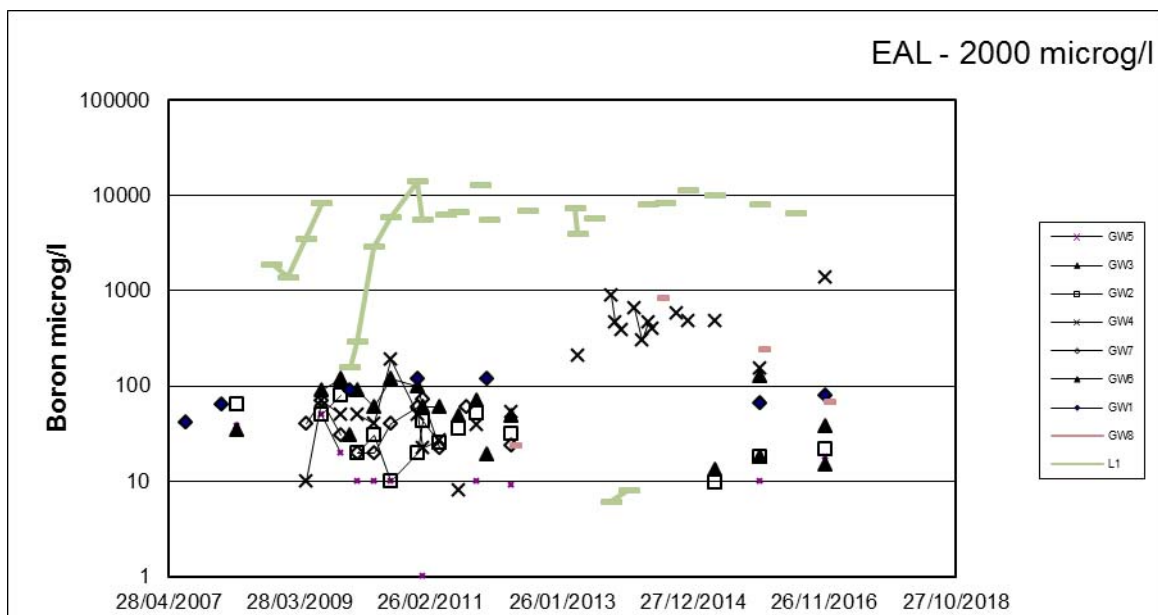
At this stage of landfill development, GW2 is not yet located hydraulically downgradient of PNHL.

8.2 Groundwater Quality

Groundwater within the vicinity of PNHL is circumneutral and of variable mineralisation. Prior to landfilling, mineralisation increased down the catchment with the wells located downgradient of the landfill revealing higher EC than those upgradient. At other times, this pattern was reversed. Most previous changes observed in the groundwater mineralisation are due to changes in the concentration of alkalinity, calcium and sulphate. Much of the variation observed to date has been suspected to be due to the earthworks required as part of the landfill construction. This has locally altered recharge patterns and exposed new areas to infiltration, oxidation and flushing.

Increases in mineralisation noted at upgradient monitoring positions complicates the interpretation of downgradient groundwater chemistry, as increased concentrations downgradient of the landfill may not be indicative of leakage or spillage from the landfill. This has been noted previously and was observed in 2014, particularly for calcium, alkalinity and sulphate. Similarly, COPC contaminants of concern such as ammonia, mecoprop and phenols have been detected in upgradient groundwater. Other organic compounds have also been detected in groundwater during 2016 including PAHs. Interestingly, the concentration of PAHs detected in groundwater is higher than the concentration detected in leachate with the highest concentrations typically detected at GW4 and GW8.

Since 2013, however, several parameters have been detected at increased concentration downgradient of the landfill and this pattern continued in 2015 and 2016. The most notable trends are at GW4. The parameters which show this process clearest include mecoprop, chloride, boron, potassium and sodium. Such trends are highlighted in the time series graphs overleaf. At this stage, the observations noted at GW4 are not as persistent at any of the other downgradient monitoring positions. Also, changes in upgradient groundwater chemistry may be contributing to some of the variations.



8.3 Assessment against Permit Trigger Level

The only position where the inorganic trigger levels have been exceeded since 2014 are at GW4. In 2014, groundwater samples recovered from this monitoring position revealed levels of ammonia and chloride which at times exceeded the trigger level and which at other times were either not detectable in the case of ammonia or below 70 mg/l in the case of chloride. During 2015, the chloride concentration was below 158 mg/l but the ammonia detected slightly exceeded the trigger level on two occasions (late April and July). Either side of these monitoring events (early April and December) the ammonia was <1mg/l. In 2016, elevated ammonia was only detected in December (see Table 8-1). The trigger levels for zinc, cadmium and mercury have not been breached in any of the downgradient wells since 2014.

Table 8-1 Comparison of Groundwater Data with Trigger Levels

	Date	Chloride	Ammoniacal Nitrogen as N	Cadmium (diss.filt)	Zinc (diss.filt)	Mercury (diss.filt)	Toluene	Mecoprop (MCP)	Phenol
		mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
	Trigger Levels	200	2.5	5	100	1	4	0.4	91.3–107.9
GW2	16/12/2015	19.3	<0.2	<0.1	2.06	<0.01	-	<0.04	-
GW2	29/03/2016	23.3	<0.2	-	2.93	-	-	-	-
GW2	27/06/2016	22.9	<0.2	-	1.11	-	-	-	-
GW2	27/09/2016	13.8	<0.2	-	<1.3	-	<1	-	<2
GW2	02/12/2016	21.3	<0.2	<0.08	<1.3	<0.01	-	<0.04	-
GW4	16/12/2015	22.7	0.838	<0.1	2	<0.01	-	0.098	-
GW4	29/03/2016	45.2	0.405	-	1.82	-	<1	-	<2
GW4	27/09/2016	5.6	0.31	-	1.97	-	-	-	-
GW4	02/12/2016	106	6.79	<0.08	2.04	<0.01	-	0.765	-
GW8	16/12/2015	22.1	1.28	<0.1	15.5	<0.01	<1	0.055	<2
GW8	29/03/2016	20.5	<0.2	-	151	-	-	-	-
GW8	27/09/2016	12.9	<0.2	-	<1.3	-	-	-	-
GW8	02/12/2016	11.1	<0.2	<0.08	3.3	<0.01	-	0.091	-

A similar pattern is also evident when the organic trigger levels for mecoprop, toluene and phenols are considered. No breaches have been noted for toluene or phenols at any position but at GW4, mecoprop has been detected above the very low trigger level (0.4 microg/l) on several occasions during 2014 and 2015 and once during 2016 (see Table 8-1). At GW8, 1 microg/l of mecoprop was detected in June 2014, 0.05 microg/l in December 2015 and 0.091 microg/l in 2016.

9 SURFACE WATER EVALUATION

The surface water sample points are to be modified once the new surface water management systems are implemented. Once the system is fully operational the surface water quality will be compared against the current Permit requirements.

9.1 Sampling Points

Surface water infrequently flows in the ditch to the south of the landfill. As a consequence, small stagnant pools of surface water are found which are subsequently flushed when sufficient run-off occurs. These stagnant pools are not sampled.

Sample points SW3 and SW4 shown on Figure 3 were, until 2011, typically solely fed by undeveloped areas of the landfill and surface run-off from the adjacent livestock field which is used for sheep grazing. However, during 2011 this situation changed with JLA adopting a different surface water management strategy, which, although not yet complete, should ultimately improve the current situation. The new strategy will involve passing surface run-off through a series of retention ponds before the decant water over-flows to the stream just upstream of current sample point SW4. As a consequence, there is no 'upstream' sampling point and SW4 is closest to the point at which surface water currently issues from the site.

Moving downgradient, the stream is overgrown with vegetation and is not easily accessible. Directly below SW3 a small ditch enters from the north. This drainage ditch previously contained several ponds excavated to allow suspended solids to settle. These ponds were backfilled during 2011 although surface run-off over the bare fill still occurs. Immediately upstream of the confluence with the small drainage ditch is sample point SW3 and immediately downstream is sample point SW2. This latter sample point is typically dominated by flow from upgradient SW3. Moving further downstream towards SW1, the stream remains overgrown with vegetation and difficult to access until sample point SW1. Along its whole length the stream receives lateral overland flow from the adjacent livestock field.

As sampling is aimed at characterising flowing surface water rather than the small stagnant pools, the surface water encountered to date is oxygenated. During 2009, surface water pH started to progressively become slightly more acidic. Since then, this trend stabilised and reversed with all values above 7.5 since 2015. At the same time, EC has been more variable with a spikey time series graph. The EC tends to be higher in surface water further down the catchment at SW1 (as shown in Appendix 5), although this is not always the case. The EC levels observed in 2016 are comparable to those observed in recent years. The major ions contributing to the main hydrochemical characteristics are calcium and alkalinity at all sample points but other parameters also show upward trends, albeit for sometimes short periods.

A wide range of non-hazardous and hazardous pollutants have been historically detected in surface water. Parameters detected include As, B, Cd, Cr, Cu, Fe, Pb, Mn, Ni, Se, Zn and ammonia. Some of these parameters have been present at concentrations that exceed the freshwater EQS. Hazardous substances Cd and Hg have been rarely detected. During 2013 and 2014, Cd and Hg were not detected and non-hazardous substances were detectable at low concentrations. In 2015, this situation was largely unchanged apart from the water quality encountered at SW1 on 16 December (see Table 9-1). The sample collected was found to contain detectable but low levels of cadmium (0.308 microg/l) and increased ammonia, BOD, sulphate and chloride. The data from 2016 is very similar with low levels of most non-hazardous substances although cadmium was detected on two occasions; 0.113 microg/l in June and 0.09 microg/l in December.

Table 9-1 Comparison of Surface Water Quality with Control Levels

	Date	Suspended Solids	Chloride	Ammoniacal Nitrogen as N
		mg/l	mg/l	mg/l
	Assessment Level	50	200	0.75
S1	26/10/2015	360	11.9	<0.2
S1	26/11/2015	51	20.5	0.3
S1	16/12/2015	13.3	30.1	4.4
S1	19/01/2016	5.5	31.7	5.34
S1	19/02/2016	3.5	27.6	2.53
S1	29/03/2016	207	15.1	0.547
S1	23/05/2016	573	11.9	0.817
S1	27/06/2016	2	12.8	<0.2
S1	28/07/2016	26.5	13	<0.2
S1	30/08/2016	7	11.7	<0.2
S1	27/09/2016	6840	11.8	0.542
S1	13/10/2016	15.5	17.1	<0.2
S1	23/11/2016	7.5	12.6	<0.2
S1	02/12/2016	5.5	15.1	<0.2

Ammonia and suspended solids have not historically followed the same pattern revealed by many of the other non-hazardous substances. Rather than show a gradual increasing trend, their occurrence is characterised by sudden, apparently unpredictable, wide variations in concentration over consecutive months. At some points in time the relative concentrations in ammonia between the upgradient and downgradient monitoring locations suggests that drainage upgradient of SW3 was the most likely source of the ammonia rather than the drainage ditch issuing between SW2 and SW3. This is not always the case with suspended solids. On occasions, the data has suggested alternate sources of ammonia e.g. off-site sources, run-off from faeces/animal feeding area, stagnation in surface water pools, breakdown of vegetation. Analysis of the data is complicated by the fact that ammonia is susceptible to natural degradation within an oxygenated surface water environment. The highest levels of ammonia appear to be found during the period October to March and 2016 was no exception (see Table 9-1).

9.2 Other Inputs to Surface Water

Further downstream of SW1 there are other inputs that are influencing surface water quality. These include run-off from farmland and the adjacent closed landfills.

Monitoring of surface water by NRW at the Golf Club, some 200m downgradient, has revealed elevated ammonia (>10 mg/l) on many occasions over recent years. Clearly, surface run-off from PNHL is not the source of this ammonia.

10 PERIMETER GAS EVALUATION

All of the gas data is presented in Appendix 6.

10.1 In-waste Gas Monitoring

In-waste gas monitoring has been undertaken since December 2008. Since this time the gas chemistry has become increasingly anaerobic with negligible oxygen detected since mid-2009. The gas is currently consistently dominated by methane (50-60%) and carbon dioxide (40-45%). Since 2010, the concentration of hydrogen sulphide has declined and during 2016 was still elevated but below 1300ppm. Carbon monoxide was below 10 ppm.

10.2 Perimeter Gas Monitoring

Perimeter gas monitoring at Palleg commenced on 29 May 2008 at GA7 and 29 October 2008 at GA8 and GA9. Waste started to be placed into Cell 1 on 24 September 2008 after the liner was installed in August 2008. Methanogenesis in Cell 1 appears to have started by June 2009.

The results from the perimeter gas wells are variable but have historically been characterised by carbon dioxide between 0% - 4% v/v and methane 0% - 0.4% v/v.

Since 2013, only two sets of gas readings at GA7 and GA9 have exceeded the new carbon dioxide action levels or methane compliance levels; once at GA7 in May 2015 and once in January 2016. On both occasions the carbon dioxide control level was slightly breached. At GA8 however, gas concentration and flow has significantly (but impersistently) increased since 2013 with 60% methane and 30% carbon dioxide detected at the end of 2016 (see Appendix 6).

The adjacent lined landfill is not considered a plausible source of the variations observed at GA8 as the landfill is free to vent to the atmosphere. At this stage, more localised sources appear to offer a more plausible explanation than landfill gas migrating from a freely venting landfill through low permeability glacial deposits. The most obvious cause appears to be related to earthworks around GA8 which started during the summer of 2013. Soil and stone material was placed close to the monitoring point following excavation for Cell 4. It therefore appears that the placement of this material has resulted in strong anaerobic conditions developing. This could occur where the material has covered vegetation or made ground and/or altered drainage patterns.

11 ODOUR

There is a long list of trace gases associated with landfills which can give rise to odour complaints. According to EA guidance LFTGN03, landfill gas emissions can, under certain meteorological conditions, give rise to odours extending over several kilometres. The emissions of landfill gas may need to be diluted several million times in order to render its odour undetectable. Still, calm conditions, during cold periods are more likely to give rise to poor dilution. Such conditions generally prevail for about 9.4 percent of each year in the UK.

During the latter part of 2009, Geotechnology understands that JLA started to receive complaints from a number of residents within several kilometres regarding suspected malodours from the landfill. In accordance with the Permit, JLA managed and recorded these complaints in accordance with the existing contingency action plans. Since this time, the level of odour and complaints has reduced.

Following receipt of a complaint, JLA adopts a proactive approach to try and identify and reduce the odours considered to be associated with the landfill. JLA also has open dialogue with the Environment Agency and Powys County Council.

12 SUMMARY AND RECOMMENDATIONS

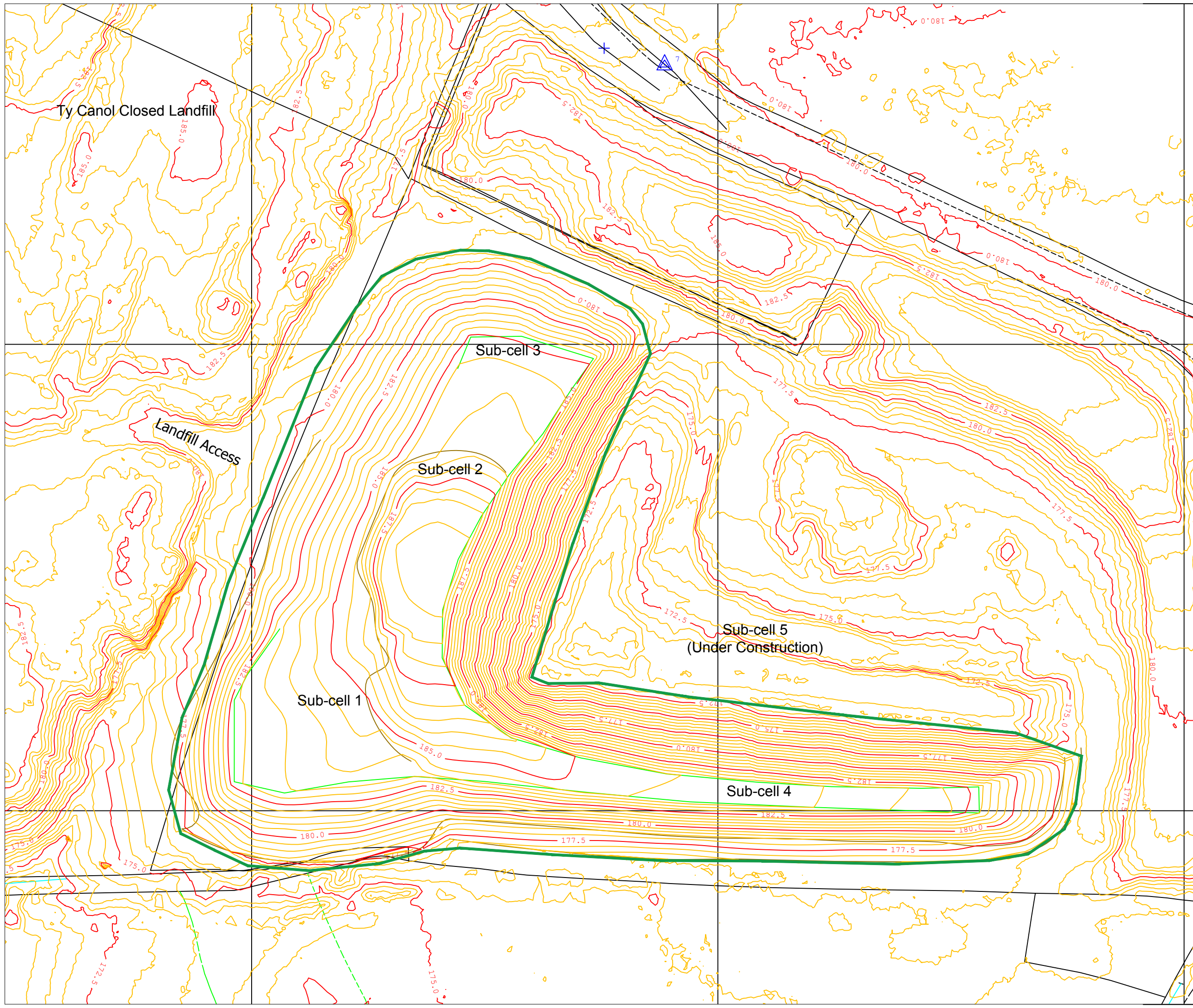
12.1 Review of Permit Breaches

At this stage, the most significant aspect of the monitoring programme found to be outside the Permit requirements remains the quality of downgradient surface water and groundwater quality at GW4. Ground gas detected at GA8 is not considered to be indicative of lateral migration from the landfill.

- Surface water has been found to exceed the Permit emission limit for suspended solids and ammonia on a small number of occasions. Based on the available evidence, it appears that the catchment within which Cell 1 sits is contributing to this exceedance, although this contribution is not continuous and run-off from the adjacent field and Phase I landfill may also be contributory factors. Geotechnology is aware that JLA has started to implement the new surface water management strategy and this should ultimately improve surface run-off control within the catchment.
- The detection of several parameters at increased concentration at GW4 needs to continue to be closely scrutinised.

12.2 Actions

- At this stage, the cause of the changes observed at GW4 is unclear. As this monitoring position is downgradient of the landfill and leachate apron, JLA should regularly inspect the new headworks at GW4 and prevent surface run-off moving towards GW4. JLA should also ensure that any perched leachate observed in the waste is able to infiltrate back into the leachate collection system.
- JLA should continue to routinely inspect the leachate monitoring and recovery infrastructure. Partial blockage of the leachate sample point has been previously noted.
- JLA should continue to implement a proactive maintenance programme to ensure the monitoring network is secure and accessible.
- JLA should evaluate leachate levels within the landfill and the adjacent closed landfill and ensure they are being precisely monitored in accordance with current guidance.



Drawing Number 1553lt1/1			
Legend  Normal Contour (0.5m)  Prominent Contour (2.5m)  Top of Bank  Bottom of Bank  Extent of 2016 Survey			
Notes			
Rev	Date	Status/Ammendments	
CLIENT			
JLA Recycling Ltd			
PROJECT			
Palleg Landfill 2016 Monitoring			
TITLE			
Palleg 2016 Topographic Survey			
DRAWING NUMBER		REVISION	
1553lt1/1		0	
DATE	DRAWN	CHECKED	SCALE AT A3
12.16	KT		1:750

Figure 2 Detailed Site Plan

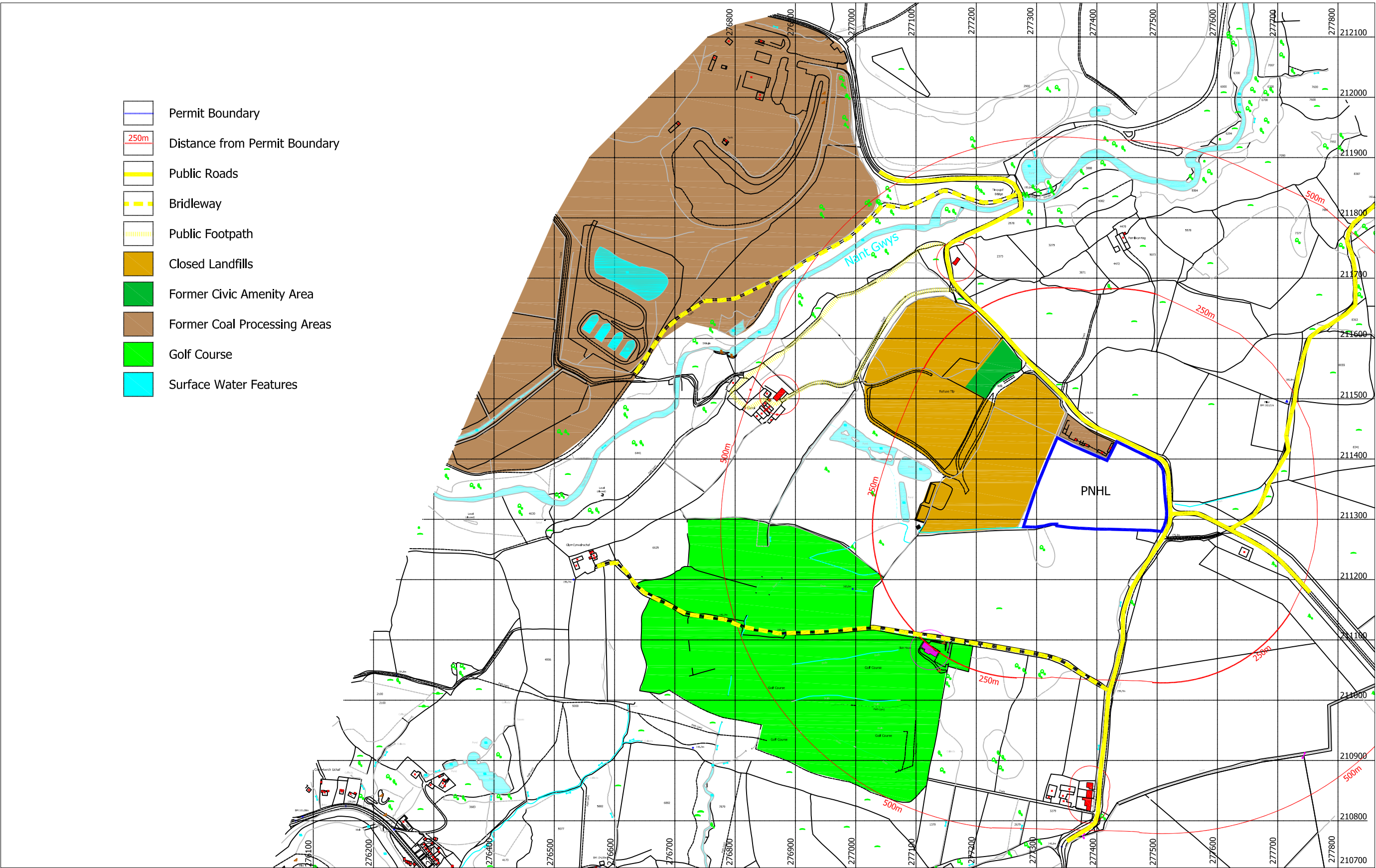


Figure 3 Proposed Monitoring Network

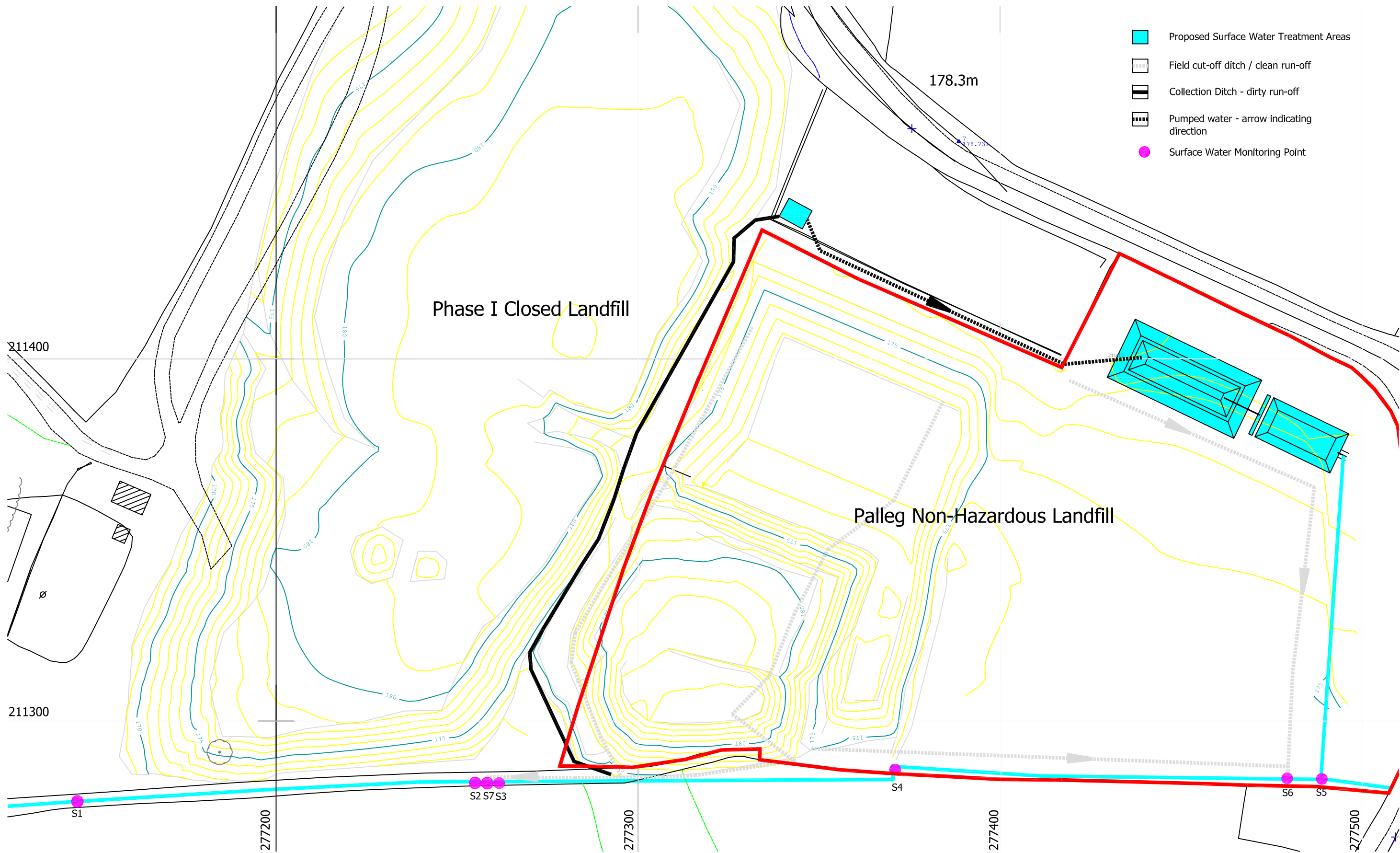


Figure 4 Current Monitoring Network

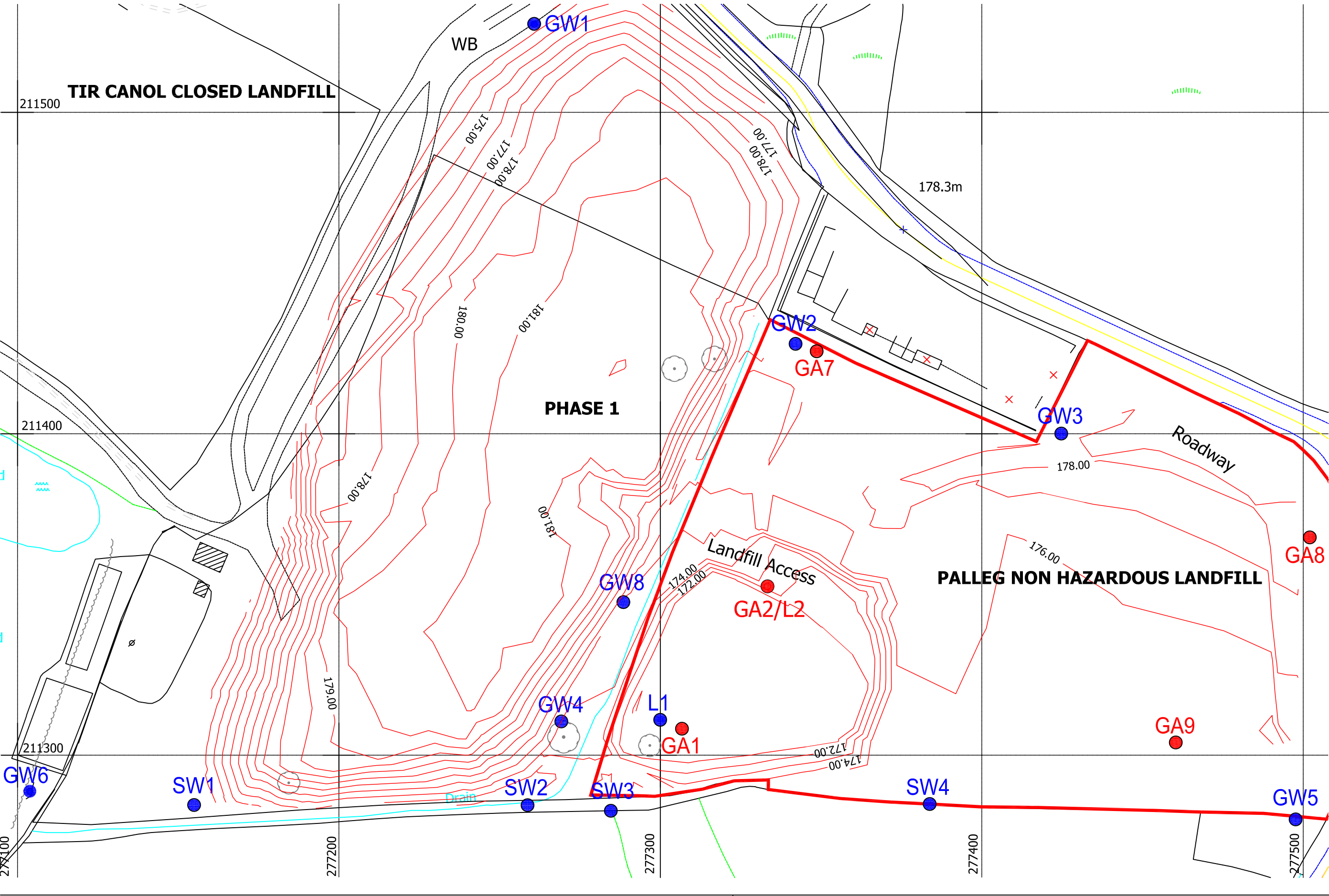


Figure 5 Topographic Survey of Landfill December 2015

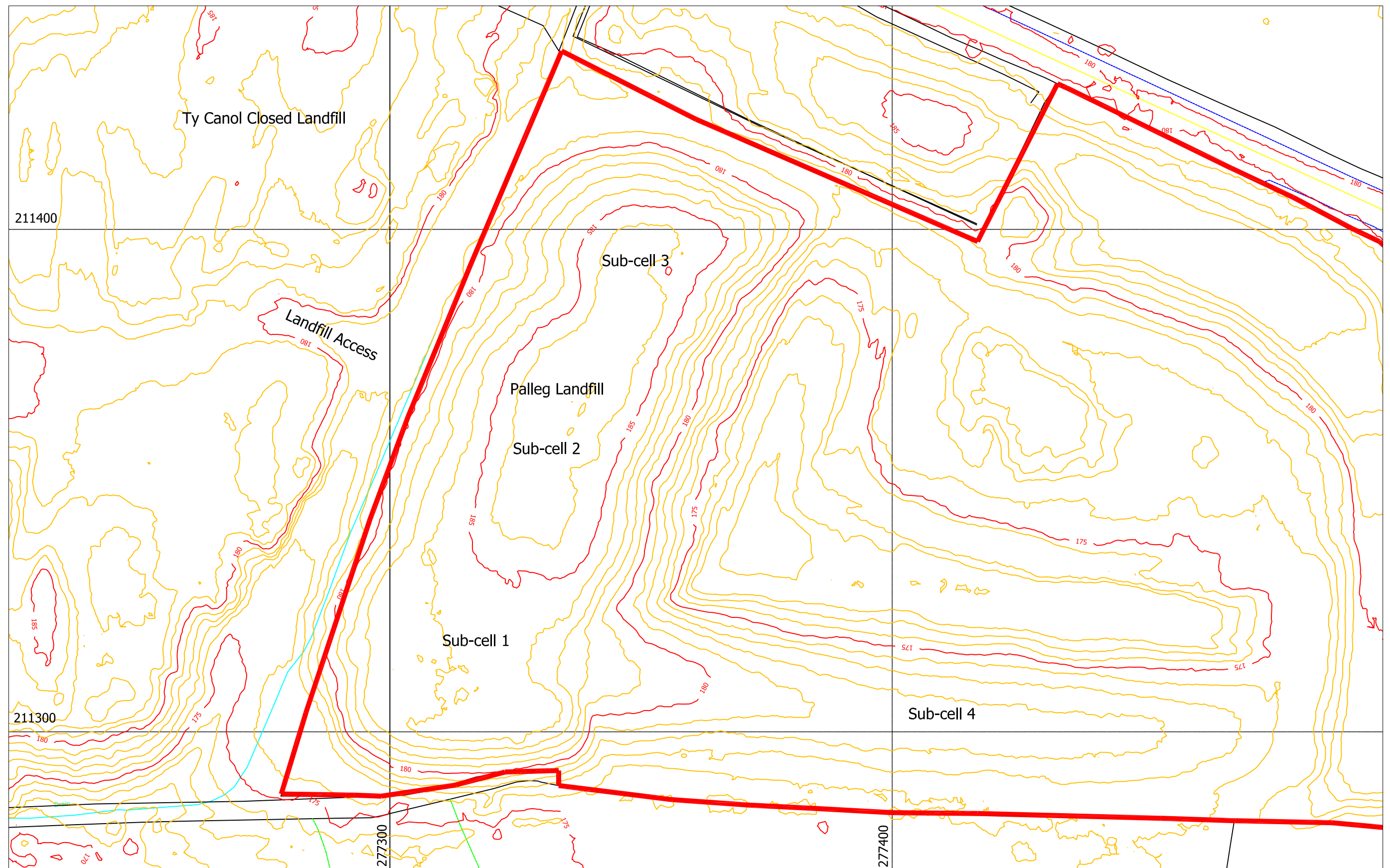
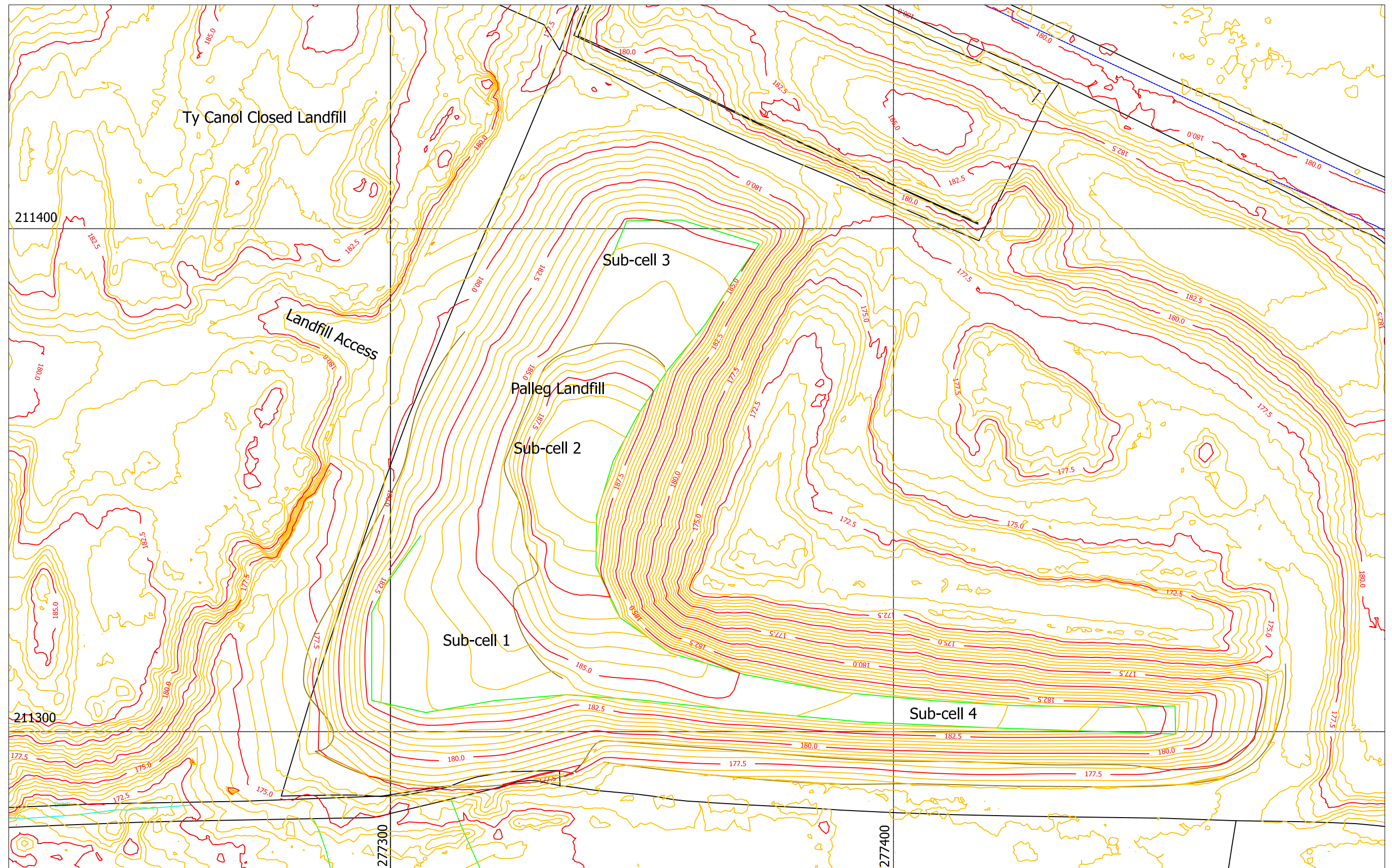


Figure 6 Topographic Survey of Landfill November 2016



**PALLEG LANDFILL
LOWER CWMTWRCH**

PERMIT BT19081X

**Review of 2016
Landfill Monitoring**

**Appendix 1
List of Reports**
Report Number 1553r1v1d0117

List of Relevant Reports

Report Number	Report Title
Annual Reviews	
518.1/0/1207	2007 Annual Monitoring Review
644r1v1d0109	2008 Annual Monitoring Review
786r1v1d0310	2009 Annual Monitoring Review
941r1d1d0111	2010 Annual Monitoring Review
1127r1v1d0911	2011 Annual Monitoring Review
1164r1v1d0313	2012 Annual Monitoring Review
1213r1v1d0114	2013 Annual Monitoring Review
1344r1v1d0115	2014 Annual Monitoring Review
1429r1v1d0116	2015 Annual Monitoring Review
Landfill Construction /CQA	
249.1 Issue 0 Aug 2003	Palleg Landfill Phase 2 PPC Permit Application
402.1 Issue 3 June 2006	Palleg Landfill Phase 2 CQA Plan
402/Spec/Rev.2 June 2006	Palleg Landfill Phase 2 Design and Specification
453	Closure Report
483	CQA Supervision
650.2/0/1107	Additional Groundwater and Gas Well Installation
671.3/0/0708	Construction Specification for Cell 1
974r1v2d0710	Non-Hazardous Waste Cell 2 Design and Spec
974r2v2d0710	Phase 2 Construction Quality Assurance Plan
974r3v1d0910	Phase 2 Construction Quality Assurance Validation Report
1176r1v1d0312	Capping and Restoration Design and Specification
1176r2v1d0312	Capping and Restoration CQA Plan
1094r1v2d0611	Construction Specification for Sub-Cell 3
1094r2v1d0611	Construction Quality Assurance Plan for Sub-Cell 3
1094r3v1d0412	Construction Quality Assurance Validation Report for Sub-Cell 3
1141r4v1d1211	Construction Quality Assurance Plan and Specification
1235r1v1d0313	Non-Hazardous Waste Sub-Cell 4 Construction Specification
1235r2v1d0313	Non-Hazardous Waste Sub-Cell 4 Construction Quality Assurance Plan
1235r3v1d1214	Construction Quality Assurance Validation Report sub-cell 4
Other Technical Reports	
1069r1v1d0111	Review of Gas Risk Assessment
1141r1v1d1211	Infilling Proposals
1141r2v1d1211	SRA Review
1141r3v1d1211	Surface Water Management Plan
1141r4v1d1211	CQA Plan and Specification
1149r2v1d0312	Validation Report for Replacement Well
1176r2v1d0312	Capping and Restoration CQA Plan
1253r1v1d0613	Environmental Management and Monitoring Plan Signposting Document
1315 Palleg Volumes 2013	Palleg Volumes

**PALLEG LANDFILL
LOWER CWMTWRCH**

PERMIT BT19081X

**Review of 2016
Landfill Monitoring**

**Appendix 2
Digital Laboratory
Certificates**

Report Number 1553r1v1d0117



JLA Disposal Ltd
Glyncynwal Uchaf Farm
Lower Cwmtwrch
SA9 2QQ

Attention: Ben Rees

CERTIFICATE OF ANALYSIS

Date: 31 December 2015
Customer: H_JLADISP_SWA
Sample Delivery Group (SDG): 151218-81
Your Reference:
Location: Palleg
Report No: 344094

We received 8 samples on Friday December 18, 2015 and 8 of these samples were scheduled for analysis which was completed on Thursday December 31, 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:	151218-81	Location:	Palleg	Order Number:	
Job:	H_JLADISP_SWA-2	Customer:	JLA Disposal Ltd	Report Number:	344094
Client Reference:		Attention:	Ben Rees	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
12672583	GW2			16/12/2015
12672584	GW3			16/12/2015
12672591	GW4			16/12/2015
12672585	GW5			16/12/2015
12672588	GW8			16/12/2015
12672582	L1			16/12/2015
12672590	LAGOON			16/12/2015
12672592	SW1			16/12/2015

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



SDG: 151218-81
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Ben Rees

Order Number:
Report Number: 344094
Superseded Report:

LIQUID Results Legend X Test N No Determination Possible	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container	
	12672592		SW1						H2SO4 (ALE244)	
	12672590		LAGOON						Disolved Metals Pr	
	12672582	L1							1000ml glass bottle	
									1000ml glass bottle	
Acid Herbicides (W)	All	NDPs: 0 Tests: 6								
Alkalinity as CaCO3	All	NDPs: 0 Tests: 6								
Alkalinity Filtered as CaCO3	All	NDPs: 0 Tests: 1								
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 7								
Anions by Kone (w)	All	NDPs: 0 Tests: 7								
BOD True Total	All	NDPs: 0 Tests: 7								
COD Unfiltered	All	NDPs: 0 Tests: 7								
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 6								
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 7								
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 0 Tests: 6								
GRO by GC-FID (W)	All	NDPs: 0 Tests: 6								
Mercury Dissolved	All	NDPs: 0 Tests: 7								
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 7								
Mineral Oil C10-40 Aqueous (W)	All	NDPs: 0 Tests: 6								
Nitrite by Kone (w)	All	NDPs: 0 Tests: 1								



SDG: 151218-81
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Ben Rees

Order Number:
Report Number: 344094
Superseded Report:

LIQUID Results Legend X Test N No Determination Possible	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container	
	12672592		SW1						H2SO4 (ALE244)	
	12672590		LAGOON						Disolved Metals Pr	
	12672582	L1							11plastic (ALE221)	
									1000ml glass bottle	
OC, OP Pesticides and Triazine Herb	All	NDPs: 0 Tests: 6							1000ml glass bottle	
Organochlorine Pesticides (Aq)	All	NDPs: 0 Tests: 6							H2SO4 (ALE244)	
Organophosphorus Pesticides (Aq)	All	NDPs: 0 Tests: 6							Disolved Metals Pr	
Organotins in Aqueous Samples	All	NDPs: 0 Tests: 6							11plastic (ALE221)	
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 6							1000ml glass bottle	
Phenols by HPLC (W)	All	NDPs: 0 Tests: 6							H2SO4 (ALE244)	
Sulphide	All	NDPs: 0 Tests: 1							Disolved Metals Pr	
Suspended Solids	All	NDPs: 0 Tests: 2							250ml BOD (ALE21)	
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 6							11plastic (ALE221)	
Total EPH (aq)	All	NDPs: 0 Tests: 6							1000ml glass bottle	
Total Organic and Inorganic Carbon	All	NDPs: 0 Tests: 7							H2SO4 (ALE244)	
VOC MS (W)	All	NDPs: 0 Tests: 6							Disolved Metals Pr	



CERTIFICATE OF ANALYSIS

SDG: 151218-81
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Ben Rees

Order Number:
Report Number: 344094
Superseded Report:

Results Legend		Customer Sample R	GW2	GW3	GW4	GW5	GW8	L1	
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water(GW/SW) 16/12/2015 18/12/2015 151218-81 12672583	Water(GW/SW) 16/12/2015 18/12/2015 151218-81 12672584	Water(GW/SW) 16/12/2015 18/12/2015 151218-81 12672591	Water(GW/SW) 16/12/2015 18/12/2015 151218-81 12672585	Water(GW/SW) 16/12/2015 18/12/2015 151218-81 12672588	Water(GW/SW) 16/12/2015 18/12/2015 151218-81 12672582
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							
Alkalinity, Total as CaCO3	<2 mg/l	TM043	325	385	260	205	360		
			#	#	#	#	#		
Alkalinity, Total as CaCO3 (diss.filt)	<2 mg/l	TM043						2350	
BOD, unfiltered	<1 mg/l	TM045	<1	<1	<1	<1	2.29	161	
			◆ #	◆ #	◆ #	◆ #	◆ #	◆ #	
Organic Carbon, Total	<3 mg/l	TM090	3.3	5.42	4.85	11.9	8.94	327	
			#	#	#	#	#	#	
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	<0.2	<0.2	0.838	<0.2	1.28	365	
			#	#	#	#	#	#	
Sulphide	<0.01 mg/l	TM101						52.6	
								#	
COD, unfiltered	<7 mg/l	TM107	22.8	61.8	53	81.2	83.6	910	
			#	#	#	#	#	#	
Arsenic (diss.filt)	<0.12 µg/l	TM152	2.22	2.77	1.04	1.65	3.32	512	
			#	#	#	#	#	#	
Boron (diss.filt)	<9.4 µg/l	TM152	18.1	18	152	10	244	8170	
			#	#	#	#	#	#	
Cadmium (diss.filt)	<0.1 µg/l	TM152	<0.1	<0.1	<0.1	0.102	<0.1	<0.1	
			#	#	#	#	#	#	
Chromium (diss.filt)	<0.22 µg/l	TM152	6.24	6.96	2.38	3.76	4	87.4	
			#	#	#	#	#	#	
Copper (diss.filt)	<0.85 µg/l	TM152	0.874	0.891	7.08	3.27	9.26	2.37	
			#	#	#	#	#	#	
Lead (diss.filt)	<0.02 µg/l	TM152	<0.02	0.053	<0.02	0.214	0.068	0.611	
			#	#	#	#	#	#	
Manganese (diss.filt)	<0.04 µg/l	TM152	6.31	2010	5.99	106	4.02	349	
			#	#	#	#	#	#	
Nickel (diss.filt)	<0.15 µg/l	TM152	2.33	3.36	1.33	3.05	5.84	49.7	
			#	#	#	#	#	#	
Zinc (diss.filt)	<0.41 µg/l	TM152	2.06	5.05	2	7.1	15.5	10.8	
			#	#	#	#	#	#	
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172	364	65.9	130	83.5	264	1690	
			#	#	#	#	#	#	
Mineral oil >C10 C40 (aq)	<10 µg/l	TM172	1070	<10	18.9	<10	12.5	<10	
Total EPH (C6-C40) (aq)	<100 µg/l	TM172	364	<100	130	<100	264	1690	
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
			#	#	#	#	#	#	
Nitrite as NO2	<0.05 mg/l	TM184						<0.05	
								2 #	
Sulphate	<2 mg/l	TM184	186	73.4	63.1	<2	238	35.1	
			#	#	#	#	#	#	
Chloride	<2 mg/l	TM184	19.3	50.4	22.7	13.4	22.1	462	
			#	#	#	#	#	#	
Nitrate as NO3	<0.3 mg/l	TM184						0.362	
								◆ #	
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184	0.179	<0.1	0.574	0.232	2.56	<0.1	
			#	#	#	#	#	#	
Cyanide, Total	<0.05 mg/l	TM227	<0.05	<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	<0.05	
			#	#	#	#	#	#	
Calcium (diss.filt)	<0.012 mg/l	TM228	178	165	66.7	70	192	230	
			#	#	#	#	#	#	
Sodium (diss.filt)	<0.076 mg/l	TM228	10.6	15.5	17.6	5.88	14.1	337	
			#	#	#	#	#	#	
Magnesium (diss.filt)	<0.036 mg/l	TM228	8.82	10.8	6.4	4.59	9.46	59.6	
			#	#	#	#	#	#	
Potassium (diss.filt)	<1 mg/l	TM228	2.29	1.85	4.07	1.32	10.1	142	
			#	#	#	#	#	#	
Iron (diss.filt)	<0.019 mg/l	TM228	<0.019	0.032	<0.019	0.126	<0.019	0.0632	
			#	#	#	#	#		

Order Number:
Report Number: 344094
Superseded Report:

Page 6 of 20

Order Number:
Report Number: 344094
Superseded Report:

Page 7 of 20

Order Number:
Report Number: 344094
Superseded Report:

Page 8 of 20

Order Number:
Report Number: 344094
Superseded Report:

Page 9 of 20



CERTIFICATE OF ANALYSIS

SDG: 151218-81
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Ben Rees

Order Number:
Report Number: 344094
Superseded Report:

OC, OP Pesticides and Triazine Herb

Results Legend			Customer Sample R	GW2	GW3	GW4	GW5	GW8	L1
#	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) 16/12/2015 18/12/2015 151218-81 12672583	Water(GW/SW) 16/12/2015 18/12/2015 151218-81 12672584	Water(GW/SW) 16/12/2015 18/12/2015 151218-81 12672591	Water(GW/SW) 16/12/2015 18/12/2015 151218-81 12672585	Water(GW/SW) 16/12/2015 18/12/2015 151218-81 12672588	Water(GW/SW) 16/12/2015 18/12/2015 151218-81 12672582
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	<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	<0.01
Tecnazene	<0.01 µg/l	TM231		<0.01	<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	<0.01
Trifluralin	<0.01 µg/l	TM231		<0.01	<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	<0.01
Quintozene (PCNB)	<0.01 µg/l	TM231		<0.01	<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	<0.01
Triallate	<0.01 µg/l	TM231		<0.01	<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	<0.01
gamma-Hexachlorocyclohexane (HCH / Lindane)	<0.01 µg/l	TM231		<0.01	<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	<0.01
Propetamphos	<0.01 µg/l	TM231		<0.01	<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	<0.01
Chlorpyrifos methyl	<0.01 µg/l	TM231		<0.01	<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	<0.01
Aldrin	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chlorothalonil	<0.01 µg/l	TM231		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Pirimiphos-methyl	<0.01 µg/l	TM231		<0.01	<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	<0.01
Chlorpyrifos	<0.01 µg/l	TM231		<0.01	<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	<0.01
Methyl parathion	<0.01 µg/l	TM231		<0.01	<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	<0.01
Malathion	<0.01 µg/l	TM231		<0.01	<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	<0.01
Fenitrothion	<0.01 µg/l	TM231		<0.01	<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	<0.01
Triadimefon	<0.01 µg/l	TM231		<0.01	<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	<0.01
Parathion	<0.01 µg/l	TM231		<0.01	<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	<0.01

Order Number:
Report Number: 344094
Superseded Report:

Page 11 of 20

Order Number:
Report Number: 344094
Superseded Report:

Page 12 of 20



CERTIFICATE OF ANALYSIS

SDG: 151218-81
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Ben Rees

Order Number:
Report Number: 344094
Superseded Report:

SVOC MS (W) - Aqueous

Results Legend			Customer Sample R		GW2	GW3	GW4	GW5	GW8	L1
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		Water(GW/SW) 16/12/2015	Water(GW/SW) 16/12/2015	Water(GW/SW) 16/12/2015	Water(GW/SW) 16/12/2015	Water(GW/SW) 16/12/2015	Water(GW/SW) 16/12/2015
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				18/12/2015 151218-81 12672583	18/12/2015 151218-81 12672584	18/12/2015 151218-81 12672591	18/12/2015 151218-81 12672585	18/12/2015 151218-81 12672588	18/12/2015 151218-81 12672582
(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
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
					◆	◆	◆	◆	◆	◆
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
2,4-Dichlorophenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
2,4-Dimethylphenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
2-Chloronaphthalene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
2-Chlorophenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
2-Methylnaphthalene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
2-Methylphenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	1.85
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
2-Nitroaniline (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
2-Nitrophenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
3-Nitroaniline (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
4-Bromophenylphenylethe r (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
4-Chloroaniline (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
4-Chlorophenylphenylethe r (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
4-Methylphenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	154
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
4-Nitroaniline (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
4-Nitrophenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
Azobenzene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
bis(2-Chloroethoxy)metha ne (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176			<2	<2	<2	<2	<2	9.23
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
Butylbenzyl phthalate (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
Carbazole (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
Dibenzofuran (aq)	<1 µg/l	TM176			<1	<1	<1	<1	<1	<1
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #

Order Number:
Report Number: 344094
Superseded Report:

Page 14 of 20



CERTIFICATE OF ANALYSIS

SDG: 151218-81
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Ben Rees

Order Number:
Report Number: 344094
Superseded Report:

VOC MS (W)

Results Legend		Customer Sample R	GW2	GW3	GW4	GW5	GW8	L1
#	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) 16/12/2015 18/12/2015 151218-81 12672583	Water(GW/SW) 16/12/2015 18/12/2015 151218-81 12672584	Water(GW/SW) 16/12/2015 18/12/2015 151218-81 12672591	Water(GW/SW) 16/12/2015 18/12/2015 151218-81 12672585	Water(GW/SW) 16/12/2015 18/12/2015 151218-81 12672588	Water(GW/SW) 16/12/2015 18/12/2015 151218-81 12672582
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	117	119	122	125	119	112
					2	1	1	1
Toluene-d8**	%	TM208	101	101	99.7	101	99.2	101
					2	1	1	1
4-Bromofluorobenzene**	%	TM208	99.2	98.9	96.4	98.5	94.8	97.2
					2	1	1	1
Dichlorodifluoromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
					2	1	1	1
Chloromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	2 #	1 #	1 #	1 #
Vinyl chloride	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	2 #	1 #	1 #	1 #
Bromomethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	2 #	1 #	1 #	1 #
Chloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	2 #	1 #	1 #	1 #
Trichlorofluoromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	2 #	1 #	1 #	1 #
1,1-Dichloroethene	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	2 #	1 #	1 #	1 #
Carbon disulphide	<1 µg/l	TM208	<1	<1	<1	<1	<1	5.08
			#	#	2 #	1 #	1 #	1 #
Dichloromethane	<3 µg/l	TM208	<3	<3	<3	<3	<3	<3
			#	#	2 #	1 #	1 #	1 #
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	2 #	1 #	1 #	1 #
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	2 #	1 #	1 #	1 #
1,1-Dichloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	2 #	1 #	1 #	1 #
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	2 #	1 #	1 #	1 #
2,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
					2	1	1	1
Bromochloromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	2 #	1 #	1 #	1 #
Chloroform	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	2 #	1 #	1 #	1 #
1,1,1-Trichloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	2 #	1 #	1 #	1 #
1,1-Dichloropropene	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	2 #	1 #	1 #	1 #
Carbontetrachloride	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	2 #	1 #	1 #	1 #
1,2-Dichloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
					2	1	1	1
Benzene	<1 µg/l	TM208	<1	<1	<1	<1	<1	2.3
			#	#	2 #	1 #	1 #	1 #
Trichloroethene	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	2 #	1 #	1 #	1 #
1,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	2 #	1 #	1 #	1 #
Dibromomethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	2 #	1 #	1 #	1 #
Bromodichloromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	2 #	1 #	1 #	1 #
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	2 #	1 #	1 #	1 #
Toluene	<1 µg/l	TM208	<1	<1	<1	<1	<1	2.3
			#	#	2 #	1 #	1 #	1 #
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	2 #	1 #	1 #	1 #
1,1,2-Trichloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	2 #	1 #	1 #	1 #



CERTIFICATE OF ANALYSIS

SDG: 151218-81
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Ben Rees

Order Number:
Report Number: 344094
Superseded Report:

VOC MS (W)

Results Legend			Customer Sample R		GW2	GW3	GW4	GW5	GW8	L1
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference		Water(GW/SW) 16/12/2015	Water(GW/SW) 16/12/2015	Water(GW/SW) 16/12/2015	Water(GW/SW) 16/12/2015	Water(GW/SW) 16/12/2015	Water(GW/SW) 16/12/2015
M	mCERTS accredited.									
aq	Aqueous / settled sample.									
dis.filt	Dissolved / filtered sample.									
tot.unfilt	Total / unfiltered sample.									
*	Subcontracted test.				18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015
**	% 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				151218-81	151218-81	151218-81	151218-81	151218-81	151218-81
(F)	Trigger breach confirmed				12672583	12672584	12672591	12672585	12672588	12672582
1-5&+5@	Sample deviation (see appendix)									
Component	LOD/Units	Method								
1,3-Dichloropropane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
Tetrachloroethene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
Dibromochloromethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
1,2-Dibromoethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
Chlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
Ethylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
m,p-Xylene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
o-Xylene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
Styrene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
Bromoform	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
Isopropylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
							2	1	1	1
1,2,3-Trichloropropane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
Bromobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
Propylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
2-Chlorotoluene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
1,3,5-Trimethylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
4-Chlorotoluene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
tert-Butylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
1,2,4-Trimethylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
sec-Butylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
4-iso-Propyltoluene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
1,3-Dichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
1,4-Dichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
n-Butylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
1,2-Dichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
							2	1	1	1
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
							2	1	1	1
1,2,4-Trichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
Hexachlorobutadiene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #
Naphthalene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	2 #	1 #	1 #	1 #

SDG: 151218-81
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Ben Rees

Order Number:
Report Number: 344094
Superseded Report:

VOC MS (W)

[illegible]



SDG: 151218-81
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Ben Rees

Order Number:
Report Number: 344094
Superseded Report:

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		
TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and 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.		
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		
TM245	By GC-FID	Determination of GRO by Headspace in waters		
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC		
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: 151218-81
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Ben Rees

Order Number:
Report Number: 344094
Superseded Report:

Test Completion Dates

Lab Sample No(s)	12672583	12672584	12672591	12672585	12672588	12672582	12672590	12672592
Customer Sample Ref.	GW2	GW3	GW4	GW5	GW8	L1	LAGOON	SW1
AGS Ref.								
Depth								
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
Acid Herbicides (W)	30-Dec-2015	30-Dec-2015	30-Dec-2015	30-Dec-2015	30-Dec-2015	30-Dec-2015		
Alkalinity as CaCO3	30-Dec-2015	30-Dec-2015	30-Dec-2015	30-Dec-2015	30-Dec-2015			30-Dec-2015
Alkalinity Filtered as CaCO3						24-Dec-2015		
Ammoniacal Nitrogen	23-Dec-2015	29-Dec-2015	29-Dec-2015	29-Dec-2015	29-Dec-2015	29-Dec-2015		29-Dec-2015
Anions by Kone (w)	30-Dec-2015	30-Dec-2015	30-Dec-2015	30-Dec-2015	30-Dec-2015	30-Dec-2015		30-Dec-2015
BOD True Total	24-Dec-2015	24-Dec-2015	24-Dec-2015	24-Dec-2015	24-Dec-2015	24-Dec-2015		24-Dec-2015
COD Unfiltered	30-Dec-2015	30-Dec-2015	30-Dec-2015	30-Dec-2015	30-Dec-2015	30-Dec-2015		30-Dec-2015
Cyanide Comp/Free/Total/Thiocyanate	22-Dec-2015	22-Dec-2015	22-Dec-2015	22-Dec-2015	22-Dec-2015	23-Dec-2015		
Dissolved Metals by ICP-MS	24-Dec-2015	24-Dec-2015	30-Dec-2015	29-Dec-2015	29-Dec-2015	30-Dec-2015		24-Dec-2015
EPH (DRO) (C10-C40) Aqueous (W)	29-Dec-2015	29-Dec-2015	29-Dec-2015	29-Dec-2015	29-Dec-2015	29-Dec-2015		
GRO by GC-FID (W)	22-Dec-2015	22-Dec-2015	22-Dec-2015	22-Dec-2015	22-Dec-2015	22-Dec-2015		
Mercury Dissolved	22-Dec-2015	22-Dec-2015	22-Dec-2015	22-Dec-2015	22-Dec-2015	22-Dec-2015		22-Dec-2015
Metals by iCap-OES Dissolved (W)	22-Dec-2015	22-Dec-2015	31-Dec-2015	22-Dec-2015	22-Dec-2015	22-Dec-2015		22-Dec-2015
Mineral Oil C10-40 Aqueous (W)	30-Dec-2015	30-Dec-2015	30-Dec-2015	30-Dec-2015	30-Dec-2015	30-Dec-2015		
Nitrite by Kone (w)						29-Dec-2015		
OC, OP Pesticides and Triazine Herb	29-Dec-2015	29-Dec-2015	29-Dec-2015	29-Dec-2015	29-Dec-2015	29-Dec-2015		
Organochlorine Pesticides (Aq)	23-Dec-2015	29-Dec-2015	29-Dec-2015	29-Dec-2015	29-Dec-2015	29-Dec-2015		
Organophosphorus Pesticides (Aq)	23-Dec-2015	29-Dec-2015	29-Dec-2015	29-Dec-2015	29-Dec-2015	29-Dec-2015		
Organotins in Aqueous Samples	29-Dec-2015	29-Dec-2015	29-Dec-2015	29-Dec-2015	29-Dec-2015	30-Dec-2015		
PAH Spec MS - Aqueous (W)	30-Dec-2015	30-Dec-2015	30-Dec-2015	30-Dec-2015	30-Dec-2015	30-Dec-2015		
Phenols by HPLC (W)	22-Dec-2015	21-Dec-2015	22-Dec-2015	22-Dec-2015	21-Dec-2015	29-Dec-2015		
Sulphide						30-Dec-2015		
Suspended Solids							24-Dec-2015	28-Dec-2015
SVOC MS (W) - Aqueous	30-Dec-2015	30-Dec-2015	30-Dec-2015	30-Dec-2015	30-Dec-2015	30-Dec-2015		
Total EPH (aq)	30-Dec-2015	30-Dec-2015	30-Dec-2015	30-Dec-2015	30-Dec-2015	29-Dec-2015		
Total Organic and Inorganic Carbon	22-Dec-2015	23-Dec-2015	23-Dec-2015	23-Dec-2015	22-Dec-2015	23-Dec-2015		24-Dec-2015
VOC MS (W)	22-Dec-2015	22-Dec-2015	22-Dec-2015	22-Dec-2015	22-Dec-2015	22-Dec-2015		



SDG:	151218-81	Location:	Palleg	Order Number:	
Job:	H_JLADISP_SWA-2	Customer:	JLA Disposal Ltd	Report Number:	344094
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.



JLA Disposal Ltd
Glyncynwal Uchaf Farm
Lower Cwmtwrch
SA9 2QQ

Attention: John Adams

CERTIFICATE OF ANALYSIS

Date:	27 January 2016
Customer:	H_JLADISP_SWA
Sample Delivery Group (SDG):	160120-30
Your Reference:	JLA Recycling Ltd.
Location:	JLA Recycling Ltd.
Report No:	346676

We received 1 sample on Wednesday January 20, 2016 and 1 of these samples were scheduled for analysis which was completed on Wednesday January 27, 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:	160120-30	Location:	JLA Recycling Ltd.	Order Number:	
Job:	H_JLADISP_SWA-1	Customer:	JLA Disposal Ltd	Report Number:	346676
Client Reference:	JLA Recycling Ltd.	Attention:	John Adams	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
12777039	S1			19/01/2016

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



SDG: 160120-30
Job: H_JLADISP_SWA-1
Client Reference: JLA Recycling Ltd.

Location: JLA Recycling Ltd.
Customer: JLA Disposal Ltd
Attention: John Adams

Order Number:
Report Number: 346676
Superseded Report:

LIQUID**Results Legend**

Test

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

12777039

**Customer
Sample Reference**

S1

AGS Reference**Depth (m)****Container**H2SO4 (ALE244)
250ml BOD (ALE21
11 plastic (ALE221)

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

Anions by Kone (w)

All

NDPs: 0
Tests: 1

BOD True Total

All

NDPs: 0
Tests: 1

COD Unfiltered

All

NDPs: 0
Tests: 1

Suspended Solids

All

NDPs: 0
Tests: 1

Order Number:
Report Number: 346676
Superseded Report:

Page 4 of 7



SDG:	160120-30	Location:	JLA Recycling Ltd.	Order Number:	
Job:	H_JLADISP_SWA-1	Customer:	JLA Disposal Ltd	Report Number:	346676
Client Reference:	JLA Recycling Ltd.	Attention:	John Adams	Superseded Report:	

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		
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		
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		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		

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



SDG:	160120-30	Location:	JLA Recycling Ltd.	Order Number:	
Job:	H_JLADISP_SWA-1	Customer:	JLA Disposal Ltd	Report Number:	346676
Client Reference:	JLA Recycling Ltd.	Attention:	John Adams	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	12777039
Customer Sample Ref.	S1
AGS Ref.	
Depth	
Type	LIQUID

Ammoniacal Nitrogen	27-Jan-2016
Anions by Kone (w)	27-Jan-2016
BOD True Total	26-Jan-2016
COD Unfiltered	21-Jan-2016
Suspended Solids	27-Jan-2016



CERTIFICATE OF ANALYSIS

SDG:	160120-30	Location:	JLA Recycling Ltd.	Order Number:	
Job:	H_JLADISP_SWA-1	Customer:	JLA Disposal Ltd	Report Number:	346676
Client Reference:	JLA Recycling Ltd.	Attention:	John Adams	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.



JLA Disposal Ltd
Glyncynwal Uchaf Farm
Lower Cwmtwrch
SA9 2QQ

Attention: Ben Rees

CERTIFICATE OF ANALYSIS

Date: 08 March 2016
Customer: H_JLADISP_SWA
Sample Delivery Group (SDG): 160220-39
Your Reference:
Location: Palleg
Report No: 352545

This report has been revised and directly supersedes 351026 in its entirety.

We received 1 sample on Saturday February 20, 2016 and 1 of these samples were scheduled for analysis which was completed on Tuesday March 08, 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:	160220-39	Location:	Palleg	Order Number:	
Job:	H_JLADISP_SWA-2	Customer:	JLA Disposal Ltd	Report Number:	352545
Client Reference:		Attention:	Ben Rees	Superseded Report:	351026

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
12963039	S1			19/02/2016

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



SDG:	160220-39	Location:	Palleg	Order Number:	
Job:	H_JLADISP_SWA-2	Customer:	JLA Disposal Ltd	Report Number:	352545
Client Reference:		Attention:	Ben Rees	Superseded Report:	351026

LIQUID Results Legend X Test N No Determination Possible	Lab Sample No(s)		12963039
	Customer Sample Reference		S1
	AGS Reference		
	Depth (m)		
	Container		H2SO4 (ALE244) 250ml BOD (ALE21) 11 plastic (ALE221)
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 1	X
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X
BOD True Total	All	NDPs: 0 Tests: 1	X
COD Unfiltered	All	NDPs: 0 Tests: 1	X
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 1	X
pH Value	All	NDPs: 0 Tests: 1	X
Suspended Solids	All	NDPs: 0 Tests: 1	X

SDG: 160220-39
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Ben Rees

Order Number:
Report Number: 352545
Superseded Report: 351026

[illegible]



SDG:	160220-39	Location:	Palleg	Order Number:	
Job:	H_JLADISP_SWA-2	Customer:	JLA Disposal Ltd	Report Number:	352545
Client Reference:		Attention:	Ben Rees	Superseded Report:	351026

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		
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		
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		
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		

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



SDG:	160220-39	Location:	Palleg	Order Number:	
Job:	H_JLADISP_SWA-2	Customer:	JLA Disposal Ltd	Report Number:	352545
Client Reference:		Attention:	Ben Rees	Superseded Report:	351026

Test Completion Dates

Lab Sample No(s)	12963039
Customer Sample Ref.	S1
AGS Ref.	
Depth	
Type	LIQUID

Ammoniacal Nitrogen	08-Mar-2016
Anions by Kone (w)	08-Mar-2016
BOD True Total	25-Feb-2016
COD Unfiltered	24-Feb-2016
Conductivity (at 20 deg.C)	07-Mar-2016
pH Value	04-Mar-2016
Suspended Solids	08-Mar-2016



SDG: 160220-39
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Ben Rees

Order Number:
Report Number: 352545
Superseded Report: 351026

Appendix

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 (NDP). 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 (Limit of Detection) 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.

General

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 leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

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 (BTX). 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.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

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 Almandine	-
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.



JLA Disposal Ltd
Glyncynwal Uchaf Farm
Lower Cwmtwrch
SA9 2QQ

Attention: Heidi Mair

CERTIFICATE OF ANALYSIS

Date: 06 April 2016
Customer: H_JLADISP_SWA
Sample Delivery Group (SDG): 160331-88
Your Reference:
Location: Palleg
Report No: 355947

We received 6 samples on Thursday March 31, 2016 and 6 of these samples were scheduled for analysis which was completed on Wednesday April 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:	160331-88	Location:	Palleg	Order Number:	
Job:	H_JLADISP_SWA-2	Customer:	JLA Disposal Ltd	Report Number:	355947
Client Reference:		Attention:	Heidi Mair	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
13178093	GW2			29/03/2016
13178094	GW3			29/03/2016
13178095	GW4			29/03/2016
13178096	GW5			29/03/2016
13178097	GW8			29/03/2016
13178092	SW1			29/03/2016

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



SDG: 160331-88
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Heidi Mair

Order Number:
Report Number: 355947
Superseded Report:

LIQUID Results Legend X Test N No Determination Possible	Lab Sample No(s)		13178093	13178094	13178095	13178096	13178097	13178092
	Customer Sample Reference		GW2	GW3	GW4	GW6	GW8	SW1
	AGS Reference							
	Depth (m)							
	Container		11plastic (ALE221)	11plastic (ALE221)	11plastic (ALE221)	11plastic (ALE221)	11plastic (ALE221)	H2SO4 (ALE244) Dissolved Metals Pr 1000ml glass bottle
Alkalinity as CaCO3	All	NDPs: 0 Tests: 1					X	
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
Anions by Kone (w)	All	NDPs: 0 Tests: 6	X	X	X	X	X	
BOD True Total	All	NDPs: 0 Tests: 1					X	
COD Unfiltered	All	NDPs: 0 Tests: 1					X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 6	X	X	X	X	X	
Mercury Dissolved	All	NDPs: 0 Tests: 1						X
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 1					X	
Suspended Solids	All	NDPs: 0 Tests: 1					X	
Total Organic and Inorganic Carbon	All	NDPs: 0 Tests: 1					X	

Order Number:
Report Number: 355947
Superseded Report:

Page 4 of 7



SDG:	160331-88	Location:	Palleg	Order Number:	
Job:	H_JLADISP_SWA-2	Customer:	JLA Disposal Ltd	Report Number:	355947
Client Reference:		Attention:	Heidi Mair	Superseded Report:	

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		
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		
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		
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:	160331-88	Location:	Palleg	Order Number:	
Job:	H_JLADISP_SWA-2	Customer:	JLA Disposal Ltd	Report Number:	355947
Client Reference:		Attention:	Heidi Mair	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	13178093	13178094	13178095	13178096	13178097	13178092
Customer Sample Ref.	GW2	GW3	GW4	GW5	GW8	SW1
AGS Ref.						
Depth						
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
Alkalinity as CaCO3						06-Apr-2016
Ammoniacal Nitrogen	01-Apr-2016	01-Apr-2016	01-Apr-2016	01-Apr-2016	01-Apr-2016	01-Apr-2016
Anions by Kone (w)	06-Apr-2016	06-Apr-2016	06-Apr-2016	06-Apr-2016	06-Apr-2016	01-Apr-2016
BOD True Total						06-Apr-2016
COD Unfiltered						01-Apr-2016
Dissolved Metals by ICP-MS	04-Apr-2016	04-Apr-2016	04-Apr-2016	04-Apr-2016	04-Apr-2016	04-Apr-2016
Mercury Dissolved						05-Apr-2016
Metals by iCap-OES Dissolved (W)						04-Apr-2016
Suspended Solids						05-Apr-2016
Total Organic and Inorganic Carbon						01-Apr-2016



SDG: 160331-88
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Heidi Mair

Order Number:
Report Number: 355947
Superseded Report:

Appendix

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 (NDP). 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 (Limit of Detection) 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.

General

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 leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

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 (BTX). 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.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

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.



JLA Disposal Ltd
Glyncynwal Uchaf Farm
Lower Cwmtwrch
SA9 2QQ

Attention: Heidi Mair

CERTIFICATE OF ANALYSIS

Date: 31 May 2016
Customer: H_JLADISP_SWA
Sample Delivery Group (SDG): 160525-30
Your Reference:
Location: Palleg
Report No: 362899

We received 2 samples on Tuesday May 24, 2016 and 2 of these samples were scheduled for analysis which was completed on Tuesday May 31, 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:	160525-30	Location:	Palleg	Order Number:	
Job:	H_JLADISP_SWA-2	Customer:	JLA Disposal Ltd	Report Number:	362899
Client Reference:		Attention:	Heidi Mair	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
13485991	S1			23/05/2016
13485992	S5			23/05/2016

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



SDG:160525-30

Job:H_JLADISP_SWA-2

Client Reference:

Location:Palleg

Customer:JLA Disposal Ltd

Attention:Heidi Mair

Order Number:

Report Number:362899

Superseded Report:

LIQUID

Results Legend

X

Test

N

No Determination Possible

Lab Sample No(s)

Customer Sample Reference

AGS Reference

Depth (m)

Container

13485992
13485991
S5
S1

1000ml glass bottle
11plastic (ALE221)

Ammoniacal Nitrogen	All	NDPs: 0 Tests: 2	X X
Anions by Kone (w)	All	NDPs: 0 Tests: 2	X X
BOD True Total	All	NDPs: 0 Tests: 2	X X
COD Unfiltered	All	NDPs: 0 Tests: 2	X X
Suspended Solids	All	NDPs: 0 Tests: 2	X X

Order Number:
Report Number: 362899
Superseded Report:

Page 4 of 7



SDG:	160525-30	Location:	Palleg	Order Number:	
Job:	H_JLADISP_SWA-2	Customer:	JLA Disposal Ltd	Report Number:	362899
Client Reference:		Attention:	Heidi Mair	Superseded Report:	

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		
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		
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		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		

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



SDG:	160525-30	Location:	Palleg	Order Number:	
Job:	H_JLADISP_SWA-2	Customer:	JLA Disposal Ltd	Report Number:	362899
Client Reference:		Attention:	Heidi Mair	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	13485991	13485992
Customer Sample Ref.	S1	S5
AGS Ref.		
Depth		
Type	LIQUID	LIQUID
Ammoniacal Nitrogen	26-May-2016	26-May-2016
Anions by Kone (w)	26-May-2016	26-May-2016
BOD True Total	31-May-2016	31-May-2016
COD Unfiltered	31-May-2016	31-May-2016
Suspended Solids	27-May-2016	27-May-2016



SDG: 160525-30
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Heidi Mair

Order Number:
Report Number: 362899
Superseded Report:

Appendix

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 (NDP). 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 (Limit of Detection) 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.

General

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 leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

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 (BTX). 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.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

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 Almandine	-
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.



JLA Disposal Ltd
Glyncynwal Uchaf Farm
Lower Cwmtwrch
SA9 2QQ

Attention: Heidi Mair

CERTIFICATE OF ANALYSIS

Date: 08 July 2016
Customer: H_JLADISP_SWA
Sample Delivery Group (SDG): 160629-33
Your Reference:
Location: Palleg
Report No: 368224

We received 5 samples on Wednesday June 29, 2016 and 5 of these samples were scheduled for analysis which was completed on Friday July 08, 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:	160629-33	Location:	Palleg	Order Number:	
Job:	H_JLADISP_SWA-2	Customer:	JLA Disposal Ltd	Report Number:	368224
Client Reference:		Attention:	Heidi Mair	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
13673537	GW 2			27/06/2016
13673538	GW 3			27/06/2016
13673539	GW 5			27/06/2016
13673540	L 1.			27/06/2016
13673536	SW 1			27/06/2016

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



SDG: 160629-33
 Job: H_JLADISP_SWA-2
 Client Reference:

Location: Palleg
 Customer: JLA Disposal Ltd
 Attention: Heidi Mair

Order Number:
 Report Number: 368224
 Superseded Report:

LIQUID Results Legend X Test N No Determination Possible	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container	
	13673536		SW 1						H2SO4 (ALE244)	
	13673540		L 1.						Disolved Metals Pr 250ml BOD (ALE21 11plastic (ALE221) 1000ml glass bottle INV VIAL	
	13673539		GW 5						H2SO4 (ALE244)	
	13673538		GW 3						Disolved Metals Pr 11plastic (ALE221) 1000ml glass bottle H2SO4 (ALE244)	
	13673537		GW 2						11plastic (ALE221) H2SO4 (ALE244)	
Acid Herbicides (W)	All	NDPs: 0 Tests: 1								
Alkalinity as CaCO3	All	NDPs: 0 Tests: 1								
Alkalinity Filtered as CaCO3	All	NDPs: 0 Tests: 1								
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 5								
Anions by Kone (w)	All	NDPs: 0 Tests: 5								
BOD True Total	All	NDPs: 0 Tests: 2								
COD Unfiltered	All	NDPs: 0 Tests: 2								
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1								
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 5								
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 0 Tests: 1								
GRO by GC-FID (W)	All	NDPs: 0 Tests: 1								
Mercury Dissolved	All	NDPs: 0 Tests: 2								
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 2								
Mineral Oil C10-40 Aqueous (W)	All	NDPs: 0 Tests: 1								
Nitrite by Kone (w)	All	NDPs: 0 Tests: 1								



SDG: 160629-33
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Heidi Mair

Order Number:
Report Number: 368224
Superseded Report:

LIQUID Results Legend X Test N No Determination Possible	Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
	13673536	SW 1			H2SO4 (ALE244)
	13673540	L 1.			Dissolved Metals Pr 250ml BOD (ALE21 11plastic (ALE221) 1000ml glass bottle INV VIAL
	13673539	GW 5			H2SO4 (ALE244)
	13673538	GW 3			Dissolved Metals Pr 11plastic (ALE221) 1000ml glass bottle H2SO4 (ALE244)
	13673537	GW 2			11plastic (ALE221) H2SO4 (ALE244)
OC, OP Pesticides and Triazine Herb	All	NDPs: 0 Tests: 1			X
Organochlorine Pesticides (Aq)	All	NDPs: 0 Tests: 1			X
Organophosphorus Pesticides (Aq)	All	NDPs: 0 Tests: 1			X
Organotin in Aqueous Samples	All	NDPs: 0 Tests: 1			X
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 1			X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1			X
Sulphide	All	NDPs: 0 Tests: 1			X
Suspended Solids	All	NDPs: 0 Tests: 1			X
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 1			X
Total EPH (aq)	All	NDPs: 0 Tests: 1			X
Total Organic and Inorganic Carbon	All	NDPs: 0 Tests: 2			X
VOC MS (W)	All	NDPs: 0 Tests: 1			X



CERTIFICATE OF ANALYSIS

SDG: 160629-33
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Heidi Mair

Order Number:
Report Number: 368224
Superseded Report:

Results Legend		Customer Sample R Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	GW 2	GW 3	GW 5	L 1.	SW 1	
#	ISO17025 accredited.		Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	
M	mCERTS accredited.		27/06/2016	27/06/2016	27/06/2016	27/06/2016	27/06/2016	
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							
(F)	Trigger breach confirmed							
1-5&*\$@	Sample deviation (see appendix)							
Component	LOD/Units	Method					2	
Suspended solids, Total	<2 mg/l	TM022					#	
Alkalinity, Total as CaCO3	<2 mg/l	TM043					205	
							#	
Alkalinity, Total as CaCO3 (diss.filt)	<2 mg/l	TM043				1790		
BOD, unfiltered	<1 mg/l	TM045				26.7	<1	
						& #	& #	
Organic Carbon, Total	<3 mg/l	TM090				159	12.9	
						& #	& #	
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	<0.2	<0.2	0.332	274	<0.2	
			#	#	#	#	#	
Sulphide	<0.01 mg/l	TM101				0.045		
						#		
COD, unfiltered	<7 mg/l	TM107				499	31.1	
						#	#	
Arsenic (diss.filt)	<0.12 µg/l	TM152				197	2.06	
						#	#	
Boron (diss.filt)	<9.4 µg/l	TM152				6500	113	
						#	#	
Cadmium (diss.filt)	<0.1 µg/l	TM152				0.201	0.113	
						#	#	
Chromium (diss.filt)	<0.22 µg/l	TM152				76.4	4.91	
						#	#	
Copper (diss.filt)	<0.85 µg/l	TM152				1.21	3.35	
						#	#	
Lead (diss.filt)	<0.02 µg/l	TM152				0.822	0.282	
						#	#	
Manganese (diss.filt)	<0.04 µg/l	TM152				93.8	205	
						#	#	
Nickel (diss.filt)	<0.15 µg/l	TM152				26.7	3.94	
						#	#	
Zinc (diss.filt)	<0.41 µg/l	TM152	1.11	1.43	7.59	3.95	3.14	
			#	#	#	#	#	
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172				1390		
						#		
Mineral oil >C10 C40 (aq)	<10 µg/l	TM172				<10		
Total EPH (C6-C40) (aq)	<100 µg/l	TM172				1390		
Mercury (diss.filt)	<0.01 µg/l	TM183				<0.01	<0.01	
						#	#	
Nitrite as NO2	<0.05 mg/l	TM184				<0.05		
						2 #		
Sulphate	<2 mg/l	TM184				273	42.9	
						#	#	
Chloride	<2 mg/l	TM184	22.9	60.6	10.3	281	12.8	
			#	#	#	#	#	
Nitrate as NO3	<0.3 mg/l	TM184				<0.3		
						& #		
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184				<0.1	0.602	
						#	#	
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				177	91.1	
						#	#	
Sodium (diss.filt)	<0.076 mg/l	TM228				326	10.2	
						#	#	
Magnesium (diss.filt)	<0.036 mg/l	TM228				77.4	4.68	
						#	#	
Potassium (diss.filt)	<1 mg/l	TM228				131	3.19	
						#	#	

Order Number:
Report Number: 368224
Superseded Report:

Page 6 of 19

Order Number:
Report Number: 368224
Superseded Report:

Page 7 of 19

Order Number:
Report Number: 368224
Superseded Report:

Page 8 of 19



SDG: 160629-33
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Heidi Mair

Order Number:
Report Number: 368224
Superseded Report:

OC, OP Pesticides and Triazine Herb

Results Legend		Customer Sample R	L 1.				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water(GW/SW) 27/06/2016 29/06/2016 160629-33 13673540				
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				

Order Number:
Report Number: 368224
Superseded Report:

[illegible]

SDG: 160629-33
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Heidi Mair

Order Number:
Report Number: 368224
Superseded Report:

PAH Spec MS - Aqueous (W)

[illegible]



SDG: 160629-33
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Heidi Mair

Order Number:
Report Number: 368224
Superseded Report:

SVOC MS (W) - Aqueous

Results Legend		Customer Sample R	L 1.				
#	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					
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176	<1	#			
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	#			
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	#			
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<1				
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<1	#			
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<1	#			
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<1	#			
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<1	#			
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	#			
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	#			
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<1	#			
2-Chlorophenol (aq)	<1 µg/l	TM176	<1	#			
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<1	#			
2-Methylphenol (aq)	<1 µg/l	TM176	<1	#			
2-Nitroaniline (aq)	<1 µg/l	TM176	<1	#			
2-Nitrophenol (aq)	<1 µg/l	TM176	<1	#			
3-Nitroaniline (aq)	<1 µg/l	TM176	<1	#			
4-Bromophenylphenylethe r (aq)	<1 µg/l	TM176	<1	#			
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<1	#			
4-Chloroaniline (aq)	<1 µg/l	TM176	<1				
4-Chlorophenylphenylethe r (aq)	<1 µg/l	TM176	<1	#			
4-Methylphenol (aq)	<1 µg/l	TM176	<1	#			
4-Nitroaniline (aq)	<1 µg/l	TM176	<1	#			
4-Nitrophenol (aq)	<1 µg/l	TM176	<1				
Azobenzene (aq)	<1 µg/l	TM176	<1	#			
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	<1	#			
bis(2-Chloroethoxy)metha ne (aq)	<1 µg/l	TM176	<1	#			
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	<2	#			
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<1	#			
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176	<1	#			
Carbazole (aq)	<1 µg/l	TM176	<1	#			
Dibenzofuran (aq)	<1 µg/l	TM176	<1	#			

Order Number:
Report Number: 368224
Superseded Report:

Page 13 of 19



SDG: 160629-33
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Heidi Mair

Order Number:
Report Number: 368224
Superseded Report:

VOC MS (W)

Results Legend		Customer Sample R		L 1.			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water(GW/SW) 27/06/2016 29/06/2016 160629-33 13673540				
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	100	1			
Toluene-d8**	%	TM208	95.5	1			
4-Bromofluorobenzene**	%	TM208	94.6	1			
Dichlorodifluoromethane	<1 µg/l	TM208	<1	1			
Chloromethane	<1 µg/l	TM208	<1	1 #			
Vinyl chloride	<1 µg/l	TM208	<1	1 #			
Bromomethane	<1 µg/l	TM208	<1	1 #			
Chloroethane	<1 µg/l	TM208	<1	1 #			
Trichlorofluoromethane	<1 µg/l	TM208	<1	1 #			
1,1-Dichloroethene	<1 µg/l	TM208	<1	1 #			
Carbon disulphide	<1 µg/l	TM208	<1	1 #			
Dichloromethane	<3 µg/l	TM208	<3	1 #			
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	1.83	1 #			
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1	1 #			
1,1-Dichloroethane	<1 µg/l	TM208	<1	1 #			
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1	1 #			
2,2-Dichloropropane	<1 µg/l	TM208	<1	1			
Bromochloromethane	<1 µg/l	TM208	<1	1 #			
Chloroform	<1 µg/l	TM208	<1	1 #			
1,1,1-Trichloroethane	<1 µg/l	TM208	<1	1 #			
1,1-Dichloropropene	<1 µg/l	TM208	<1	1 #			
Carbontetrachloride	<1 µg/l	TM208	<1	1 #			
1,2-Dichloroethane	<1 µg/l	TM208	<1	1			
Benzene	<1 µg/l	TM208	1.67	1 #			
Trichloroethene	<1 µg/l	TM208	<1	1 #			
1,2-Dichloropropane	<1 µg/l	TM208	<1	1 #			
Dibromomethane	<1 µg/l	TM208	<1	1 #			
Bromodichloromethane	<1 µg/l	TM208	<1	1 #			
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1	1 #			
Toluene	<1 µg/l	TM208	1.17	1 #			
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	1 #			
1,1,2-Trichloroethane	<1 µg/l	TM208	<1	1 #			



SDG: 160629-33
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Heidi Mair

Order Number:
Report Number: 368224
Superseded Report:

VOC MS (W)

Results Legend		Customer Sample R		L 1.			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water(GW/SW) 27/06/2016 29/06/2016 160629-33 13673540				
M	mCERTS accredited.						
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						
(F)	Trigger breach confirmed						
1-5&#pound;	Sample deviation (see appendix)						
Component	LOD/Units	Method					
1,3-Dichloropropane	<1 µg/l	TM208	<1	1 #			
Tetrachloroethene	<1 µg/l	TM208	<1	1 #			
Dibromochloromethane	<1 µg/l	TM208	<1	1 #			
1,2-Dibromoethane	<1 µg/l	TM208	<1	1 #			
Chlorobenzene	<1 µg/l	TM208	<1	1 #			
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1	1 #			
Ethylbenzene	<1 µg/l	TM208	1.01	1 #			
m,p-Xylene	<1 µg/l	TM208	1.59	1 #			
o-Xylene	<1 µg/l	TM208	1.49	1 #			
Styrene	<1 µg/l	TM208	<1	1 #			
Bromoform	<1 µg/l	TM208	<1	1 #			
Isopropylbenzene	<1 µg/l	TM208	<1	1 #			
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1	1			
1,2,3-Trichloropropane	<1 µg/l	TM208	<1	1 #			
Bromobenzene	<1 µg/l	TM208	<1	1 #			
Propylbenzene	<1 µg/l	TM208	<1	1 #			
2-Chlorotoluene	<1 µg/l	TM208	<1	1 #			
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1	1 #			
4-Chlorotoluene	<1 µg/l	TM208	<1	1 #			
tert-Butylbenzene	<1 µg/l	TM208	<1	1 #			
1,2,4-Trimethylbenzene	<1 µg/l	TM208	<1	1 #			
sec-Butylbenzene	<1 µg/l	TM208	<1	1 #			
4-iso-Propyltoluene	<1 µg/l	TM208	<1	1 #			
1,3-Dichlorobenzene	<1 µg/l	TM208	<1	1 #			
1,4-Dichlorobenzene	<1 µg/l	TM208	<1	1 #			
n-Butylbenzene	<1 µg/l	TM208	<1	1 #			
1,2-Dichlorobenzene	<1 µg/l	TM208	<1	1			
1,2-Dibromo-3-chloroprop ane	<1 µg/l	TM208	<1	1			
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1	1 #			
Hexachlorobutadiene	<1 µg/l	TM208	<1	1 #			
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1	1 #			
Naphthalene	<1 µg/l	TM208	<1	1 #			

Order Number:
Report Number: 368224
Superseded Report:

[illegible]



SDG: 160629-33
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Heidi Mair

Order Number:
Report Number: 368224
Superseded Report:

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		
TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and 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.		
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		
TM245	By GC-FID	Determination of GRO by Headspace in waters		
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC		
TM314		Analysis of Organochlorine Pesticides in Aqueous sample by GCMS		
TM315		Analysis of Organophosphorus Pesticides in Aqueous samples by GCMS		
TM328				

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



SDG: 160629-33
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Heidi Mair

Order Number:
Report Number: 368224
Superseded Report:

Test Completion Dates

Lab Sample No(s)	13673537	13673538	13673539	13673540	13673536
Customer Sample Ref.	GW 2	GW 3	GW 5	L 1.	SW 1
AGS Ref.					
Depth					
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
Acid Herbicides (W)				06-Jul-2016	
Alkalinity as CaCO ₃					06-Jul-2016
Alkalinity Filtered as CaCO ₃				07-Jul-2016	
Ammoniacal Nitrogen	04-Jul-2016	04-Jul-2016	04-Jul-2016	06-Jul-2016	04-Jul-2016
Anions by Kone (w)	01-Jul-2016	01-Jul-2016	01-Jul-2016	05-Jul-2016	06-Jul-2016
BOD True Total				05-Jul-2016	05-Jul-2016
COD Unfiltered				01-Jul-2016	01-Jul-2016
Cyanide Comp/Free/Total/Thiocyanate				04-Jul-2016	
Dissolved Metals by ICP-MS	08-Jul-2016	08-Jul-2016	08-Jul-2016	08-Jul-2016	08-Jul-2016
EPH (DRO) (C10-C40) Aqueous (W)				05-Jul-2016	
GRO by GC-FID (W)				07-Jul-2016	
Mercury Dissolved				07-Jul-2016	07-Jul-2016
Metals by iCap-OES Dissolved (W)				07-Jul-2016	06-Jul-2016
Mineral Oil C10-40 Aqueous (W)				06-Jul-2016	
Nitrite by Kone (w)				02-Jul-2016	
OC, OP Pesticides and Triazine Herb				07-Jul-2016	
Organochlorine Pesticides (Aq)				07-Jul-2016	
Organophosphorus Pesticides (Aq)				07-Jul-2016	
Organotins in Aqueous Samples				06-Jul-2016	
PAH Spec MS - Aqueous (W)				08-Jul-2016	
Phenols by HPLC (W)				02-Jul-2016	
Sulphide				06-Jul-2016	
Suspended Solids					05-Jul-2016
SVOC MS (W) - Aqueous				06-Jul-2016	
Total EPH (aq)				08-Jul-2016	
Total Organic and Inorganic Carbon				07-Jul-2016	07-Jul-2016
VOC MS (W)				06-Jul-2016	



SDG: 160629-33
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Heidi Mair

Order Number:
Report Number: 368224
Superseded Report:

Appendix

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 (NDP). 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 (Limit of Detection) 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.

General

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 leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

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 (BTX). 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.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

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.



JLA Disposal Ltd
Glyncynwal Uchaf Farm
Lower Cwmtwrch
SA9 2QQ

Attention: Heidi Mair

CERTIFICATE OF ANALYSIS

Date: 08 July 2016
Customer: H_JLADISP_SWA
Sample Delivery Group (SDG): 160629-33
Your Reference:
Location: Palleg
Report No: 368224

We received 5 samples on Wednesday June 29, 2016 and 5 of these samples were scheduled for analysis which was completed on Friday July 08, 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:	160629-33	Location:	Palleg	Order Number:	
Job:	H_JLADISP_SWA-2	Customer:	JLA Disposal Ltd	Report Number:	368224
Client Reference:		Attention:	Heidi Mair	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
13673537	GW 2			27/06/2016
13673538	GW 3			27/06/2016
13673539	GW 5			27/06/2016
13673540	L 1.			27/06/2016
13673536	SW 1			27/06/2016

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



SDG: 160629-33
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Heidi Mair

Order Number:
Report Number: 368224
Superseded Report:

LIQUID Results Legend X Test N No Determination Possible	Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
	13673536	SW 1			H2SO4 (ALE244) Dissolved Metals Pr 250ml BOD (ALE21 11plastic (ALE221) 1000ml glass bottle
	13673540	L 1.			INV VIAL H2SO4 (ALE244) Dissolved Metals Pr 11plastic (ALE221) 1000ml glass bottle
	13673539	GW 5			H2SO4 (ALE244) Dissolved Metals Pr 11plastic (ALE221) 1000ml glass bottle
	13673538	GW 3			H2SO4 (ALE244) Dissolved Metals Pr 11plastic (ALE221) 1000ml glass bottle
	13673537	GW 2			H2SO4 (ALE244) Dissolved Metals Pr 11plastic (ALE221) 1000ml glass bottle
Acid Herbicides (W)	All	NDPs: 0 Tests: 1			
Alkalinity as CaCO3	All	NDPs: 0 Tests: 1			
Alkalinity Filtered as CaCO3	All	NDPs: 0 Tests: 1			
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 5			
Anions by Kone (w)	All	NDPs: 0 Tests: 5			
BOD True Total	All	NDPs: 0 Tests: 2			
COD Unfiltered	All	NDPs: 0 Tests: 2			
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1			
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 5			
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 0 Tests: 1			
GRO by GC-FID (W)	All	NDPs: 0 Tests: 1			
Mercury Dissolved	All	NDPs: 0 Tests: 2			
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 2			
Mineral Oil C10-40 Aqueous (W)	All	NDPs: 0 Tests: 1			
Nitrite by Kone (w)	All	NDPs: 0 Tests: 1			



SDG: 160629-33
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Heidi Mair

Order Number:
Report Number: 368224
Superseded Report:

LIQUID Results Legend X Test N No Determination Possible	Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
	13673536	SW 1			H2SO4 (ALE244)
	13673540	L 1.			Dissolved Metals Pr 250ml BOD (ALE21 11plastic (ALE221) 1000ml glass bottle INV VIAL
	13673539	GW 5			H2SO4 (ALE244)
	13673538	GW 3			Dissolved Metals Pr 11plastic (ALE221) 1000ml glass bottle H2SO4 (ALE244)
	13673537	GW 2			11plastic (ALE221) H2SO4 (ALE244)
OC, OP Pesticides and Triazine Herb	All	NDPs: 0 Tests: 1			X
Organochlorine Pesticides (Aq)	All	NDPs: 0 Tests: 1			X
Organophosphorus Pesticides (Aq)	All	NDPs: 0 Tests: 1			X
Organotin in Aqueous Samples	All	NDPs: 0 Tests: 1			X
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 1			X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1			X
Sulphide	All	NDPs: 0 Tests: 1			X
Suspended Solids	All	NDPs: 0 Tests: 1			X
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 1			X
Total EPH (aq)	All	NDPs: 0 Tests: 1			X
Total Organic and Inorganic Carbon	All	NDPs: 0 Tests: 2			X
VOC MS (W)	All	NDPs: 0 Tests: 1			X



CERTIFICATE OF ANALYSIS

SDG: 160629-33
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Heidi Mair

Order Number:
Report Number: 368224
Superseded Report:

Results Legend		Customer Sample R Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	GW 2	GW 3	GW 5	L 1.	SW 1	
#	ISO17025 accredited.		Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	
M	mCERTS accredited.		27/06/2016	27/06/2016	27/06/2016	27/06/2016	27/06/2016	
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							
(F)	Trigger breach confirmed							
1-5&*\$@	Sample deviation (see appendix)							
Component	LOD/Units	Method					2	
Suspended solids, Total	<2 mg/l	TM022					#	
Alkalinity, Total as CaCO3	<2 mg/l	TM043					205	
							#	
Alkalinity, Total as CaCO3 (diss.filt)	<2 mg/l	TM043				1790		
BOD, unfiltered	<1 mg/l	TM045				26.7	<1	
						& #	& #	
Organic Carbon, Total	<3 mg/l	TM090				159	12.9	
						& #	& #	
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	<0.2	<0.2	0.332	274	<0.2	
			#	#	#	#	#	
Sulphide	<0.01 mg/l	TM101				0.045		
						#		
COD, unfiltered	<7 mg/l	TM107				499	31.1	
						#	#	
Arsenic (diss.filt)	<0.12 µg/l	TM152				197	2.06	
						#	#	
Boron (diss.filt)	<9.4 µg/l	TM152				6500	113	
						#	#	
Cadmium (diss.filt)	<0.1 µg/l	TM152				0.201	0.113	
						#	#	
Chromium (diss.filt)	<0.22 µg/l	TM152				76.4	4.91	
						#	#	
Copper (diss.filt)	<0.85 µg/l	TM152				1.21	3.35	
						#	#	
Lead (diss.filt)	<0.02 µg/l	TM152				0.822	0.282	
						#	#	
Manganese (diss.filt)	<0.04 µg/l	TM152				93.8	205	
						#	#	
Nickel (diss.filt)	<0.15 µg/l	TM152				26.7	3.94	
						#	#	
Zinc (diss.filt)	<0.41 µg/l	TM152	1.11	1.43	7.59	3.95	3.14	
			#	#	#	#	#	
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172				1390		
						#		
Mineral oil >C10 C40 (aq)	<10 µg/l	TM172				<10		
Total EPH (C6-C40) (aq)	<100 µg/l	TM172				1390		
Mercury (diss.filt)	<0.01 µg/l	TM183				<0.01	<0.01	
						#	#	
Nitrite as NO2	<0.05 mg/l	TM184				<0.05		
						2 #		
Sulphate	<2 mg/l	TM184				273	42.9	
						#	#	
Chloride	<2 mg/l	TM184	22.9	60.6	10.3	281	12.8	
			#	#	#	#	#	
Nitrate as NO3	<0.3 mg/l	TM184				<0.3		
						& #		
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184				<0.1	0.602	
						#	#	
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				177	91.1	
						#	#	
Sodium (diss.filt)	<0.076 mg/l	TM228				326	10.2	
						#	#	
Magnesium (diss.filt)	<0.036 mg/l	TM228				77.4	4.68	
						#	#	
Potassium (diss.filt)	<1 mg/l	TM228				131	3.19	
						#	#	

Order Number:
Report Number: 368224
Superseded Report:

Page 6 of 19

Order Number:
Report Number: 368224
Superseded Report:

Page 7 of 19

Order Number:
Report Number: 368224
Superseded Report:

Page 8 of 19



SDG: 160629-33
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Heidi Mair

Order Number:
Report Number: 368224
Superseded Report:

OC, OP Pesticides and Triazine Herb

Results Legend		Customer Sample R	L 1.				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water(GW/SW) 27/06/2016 29/06/2016 160629-33 13673540				
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				

Order Number:
Report Number: 368224
Superseded Report:

[illegible]

Order Number:
Report Number: 368224
Superseded Report:

Page 11 of 19



SDG: 160629-33
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Heidi Mair

Order Number:
Report Number: 368224
Superseded Report:

SVOC MS (W) - Aqueous

Results Legend		Customer Sample R		L 1.			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water(GW/SW) 27/06/2016 29/06/2016 160629-33 13673540				
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	#			
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	#			
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	#			
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<1				
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<1	#			
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<1	#			
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<1	#			
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<1	#			
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	#			
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	#			
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<1	#			
2-Chlorophenol (aq)	<1 µg/l	TM176	<1	#			
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<1	#			
2-Methylphenol (aq)	<1 µg/l	TM176	<1	#			
2-Nitroaniline (aq)	<1 µg/l	TM176	<1	#			
2-Nitrophenol (aq)	<1 µg/l	TM176	<1	#			
3-Nitroaniline (aq)	<1 µg/l	TM176	<1	#			
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	<1	#			
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<1	#			
4-Chloroaniline (aq)	<1 µg/l	TM176	<1				
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<1	#			
4-Methylphenol (aq)	<1 µg/l	TM176	<1	#			
4-Nitroaniline (aq)	<1 µg/l	TM176	<1	#			
4-Nitrophenol (aq)	<1 µg/l	TM176	<1				
Azobenzene (aq)	<1 µg/l	TM176	<1	#			
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	<1	#			
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176	<1	#			
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	<2	#			
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<1	#			
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176	<1	#			
Carbazole (aq)	<1 µg/l	TM176	<1	#			
Dibenzofuran (aq)	<1 µg/l	TM176	<1	#			

Order Number:
Report Number: 368224
Superseded Report:

Page 13 of 19



SDG: 160629-33
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Heidi Mair

Order Number:
Report Number: 368224
Superseded Report:

VOC MS (W)

Results Legend		Customer Sample R		L 1.			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water(GW/SW) 27/06/2016 29/06/2016 160629-33 13673540				
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	100	1			
Toluene-d8**	%	TM208	95.5	1			
4-Bromofluorobenzene**	%	TM208	94.6	1			
Dichlorodifluoromethane	<1 µg/l	TM208	<1	1			
Chloromethane	<1 µg/l	TM208	<1	1 #			
Vinyl chloride	<1 µg/l	TM208	<1	1 #			
Bromomethane	<1 µg/l	TM208	<1	1 #			
Chloroethane	<1 µg/l	TM208	<1	1 #			
Trichlorofluoromethane	<1 µg/l	TM208	<1	1 #			
1,1-Dichloroethene	<1 µg/l	TM208	<1	1 #			
Carbon disulphide	<1 µg/l	TM208	<1	1 #			
Dichloromethane	<3 µg/l	TM208	<3	1 #			
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	1.83	1 #			
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1	1 #			
1,1-Dichloroethane	<1 µg/l	TM208	<1	1 #			
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1	1 #			
2,2-Dichloropropane	<1 µg/l	TM208	<1	1			
Bromochloromethane	<1 µg/l	TM208	<1	1 #			
Chloroform	<1 µg/l	TM208	<1	1 #			
1,1,1-Trichloroethane	<1 µg/l	TM208	<1	1 #			
1,1-Dichloropropene	<1 µg/l	TM208	<1	1 #			
Carbontetrachloride	<1 µg/l	TM208	<1	1 #			
1,2-Dichloroethane	<1 µg/l	TM208	<1	1			
Benzene	<1 µg/l	TM208	1.67	1 #			
Trichloroethene	<1 µg/l	TM208	<1	1 #			
1,2-Dichloropropane	<1 µg/l	TM208	<1	1 #			
Dibromomethane	<1 µg/l	TM208	<1	1 #			
Bromodichloromethane	<1 µg/l	TM208	<1	1 #			
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1	1 #			
Toluene	<1 µg/l	TM208	1.17	1 #			
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	1 #			
1,1,2-Trichloroethane	<1 µg/l	TM208	<1	1 #			



SDG: 160629-33
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Heidi Mair

Order Number:
Report Number: 368224
Superseded Report:

VOC MS (W)

Results Legend		Customer Sample R		L 1.			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water(GW/SW) 27/06/2016 29/06/2016 160629-33 13673540				
M	mCERTS accredited.						
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						
(F)	Trigger breach confirmed						
1-5&#pound;	Sample deviation (see appendix)						
Component	LOD/Units	Method					
1,3-Dichloropropane	<1 µg/l	TM208	<1	1 #			
Tetrachloroethene	<1 µg/l	TM208	<1	1 #			
Dibromochloromethane	<1 µg/l	TM208	<1	1 #			
1,2-Dibromoethane	<1 µg/l	TM208	<1	1 #			
Chlorobenzene	<1 µg/l	TM208	<1	1 #			
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1	1 #			
Ethylbenzene	<1 µg/l	TM208	1.01	1 #			
m,p-Xylene	<1 µg/l	TM208	1.59	1 #			
o-Xylene	<1 µg/l	TM208	1.49	1 #			
Styrene	<1 µg/l	TM208	<1	1 #			
Bromoform	<1 µg/l	TM208	<1	1 #			
Isopropylbenzene	<1 µg/l	TM208	<1	1 #			
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1	1			
1,2,3-Trichloropropane	<1 µg/l	TM208	<1	1 #			
Bromobenzene	<1 µg/l	TM208	<1	1 #			
Propylbenzene	<1 µg/l	TM208	<1	1 #			
2-Chlorotoluene	<1 µg/l	TM208	<1	1 #			
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1	1 #			
4-Chlorotoluene	<1 µg/l	TM208	<1	1 #			
tert-Butylbenzene	<1 µg/l	TM208	<1	1 #			
1,2,4-Trimethylbenzene	<1 µg/l	TM208	<1	1 #			
sec-Butylbenzene	<1 µg/l	TM208	<1	1 #			
4-iso-Propyltoluene	<1 µg/l	TM208	<1	1 #			
1,3-Dichlorobenzene	<1 µg/l	TM208	<1	1 #			
1,4-Dichlorobenzene	<1 µg/l	TM208	<1	1 #			
n-Butylbenzene	<1 µg/l	TM208	<1	1 #			
1,2-Dichlorobenzene	<1 µg/l	TM208	<1	1			
1,2-Dibromo-3-chloroprop ane	<1 µg/l	TM208	<1	1			
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1	1 #			
Hexachlorobutadiene	<1 µg/l	TM208	<1	1 #			
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1	1 #			
Naphthalene	<1 µg/l	TM208	<1	1 #			

Order Number:
Report Number: 368224
Superseded Report:

[illegible]



SDG: 160629-33
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Heidi Mair

Order Number:
Report Number: 368224
Superseded Report:

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		
TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and 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.		
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		
TM245	By GC-FID	Determination of GRO by Headspace in waters		
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC		
TM314		Analysis of Organochlorine Pesticides in Aqueous sample by GCMS		
TM315		Analysis of Organophosphorus Pesticides in Aqueous samples by GCMS		
TM328				

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



SDG: 160629-33
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Heidi Mair

Order Number:
Report Number: 368224
Superseded Report:

Test Completion Dates

Lab Sample No(s)	13673537	13673538	13673539	13673540	13673536
Customer Sample Ref.	GW 2	GW 3	GW 5	L 1.	SW 1
AGS Ref.					
Depth					
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
Acid Herbicides (W)				06-Jul-2016	
Alkalinity as CaCO ₃					06-Jul-2016
Alkalinity Filtered as CaCO ₃				07-Jul-2016	
Ammoniacal Nitrogen	04-Jul-2016	04-Jul-2016	04-Jul-2016	06-Jul-2016	04-Jul-2016
Anions by Kone (w)	01-Jul-2016	01-Jul-2016	01-Jul-2016	05-Jul-2016	06-Jul-2016
BOD True Total				05-Jul-2016	05-Jul-2016
COD Unfiltered				01-Jul-2016	01-Jul-2016
Cyanide Comp/Free/Total/Thiocyanate				04-Jul-2016	
Dissolved Metals by ICP-MS	08-Jul-2016	08-Jul-2016	08-Jul-2016	08-Jul-2016	08-Jul-2016
EPH (DRO) (C10-C40) Aqueous (W)				05-Jul-2016	
GRO by GC-FID (W)				07-Jul-2016	
Mercury Dissolved				07-Jul-2016	07-Jul-2016
Metals by iCap-OES Dissolved (W)				07-Jul-2016	06-Jul-2016
Mineral Oil C10-40 Aqueous (W)				06-Jul-2016	
Nitrite by Kone (w)				02-Jul-2016	
OC, OP Pesticides and Triazine Herb				07-Jul-2016	
Organochlorine Pesticides (Aq)				07-Jul-2016	
Organophosphorus Pesticides (Aq)				07-Jul-2016	
Organotins in Aqueous Samples				06-Jul-2016	
PAH Spec MS - Aqueous (W)				08-Jul-2016	
Phenols by HPLC (W)				02-Jul-2016	
Sulphide				06-Jul-2016	
Suspended Solids					05-Jul-2016
SVOC MS (W) - Aqueous				06-Jul-2016	
Total EPH (aq)				08-Jul-2016	
Total Organic and Inorganic Carbon				07-Jul-2016	07-Jul-2016
VOC MS (W)				06-Jul-2016	



SDG: 160629-33
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: Heidi Mair

Order Number:
Report Number: 368224
Superseded Report:

Appendix

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 (NDP). 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 (Limit of Detection) 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.

General

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 leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

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 (BTX). 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.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

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.



JLA Disposal Ltd
Glyncynwal Uchaf Farm
Lower Cwmtwrch
SA9 2QQ

Attention: John Adams

CERTIFICATE OF ANALYSIS

Date: 11 August 2016
Customer: H_JLADISP_SWA
Sample Delivery Group (SDG): 160731-18
Your Reference:
Location: Palleg
Report No: 372966

We received 1 sample on Saturday July 30, 2016 and 1 of these samples were scheduled for analysis which was completed on Thursday August 11, 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





CERTIFICATE OF ANALYSIS

Validated

SDG:	160731-18	Location:	Palleg	Order Number:	
Job:	H_JLADISP_SWA-2	Customer:	JLA Disposal Ltd	Report Number:	372966
Client Reference:		Attention:	John Adams	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
13882940	SW1			28/07/2016

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



SDG:160731-18

Job:H_JLADISP_SWA-2

Client Reference:

Location:Palleg

Customer:JLA Disposal Ltd

Attention:John Adams

Order Number:

Report Number:372966

Superseded Report:

LIQUID Results Legend X Test N No Determination Possible	Lab Sample No(s)		13882940
	Customer Sample Reference		SW1
	AGS Reference		
	Depth (m)		
	Container		11plastic (ALE221)
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 1	X
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X
BOD True Total	All	NDPs: 0 Tests: 1	X
COD Unfiltered	All	NDPs: 0 Tests: 1	X
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 1	X
pH Value	All	NDPs: 0 Tests: 1	X
Suspended Solids	All	NDPs: 0 Tests: 1	X

Order Number:
Report Number: 372966
Superseded Report:

Page 4 of 7



SDG:	160731-18	Location:	Palleg	Order Number:	
Job:	H_JLADISP_SWA-2	Customer:	JLA Disposal Ltd	Report Number:	372966
Client Reference:		Attention:	John Adams	Superseded Report:	

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		
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		
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		
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		

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



SDG:	160731-18	Location:	Palleg	Order Number:	
Job:	H_JLADISP_SWA-2	Customer:	JLA Disposal Ltd	Report Number:	372966
Client Reference:		Attention:	John Adams	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	13882940
Customer Sample Ref.	SW1
AGS Ref.	
Depth	
Type	LIQUID
Ammoniacal Nitrogen	09-Aug-2016
Anions by Kone (w)	11-Aug-2016
BOD True Total	08-Aug-2016
COD Unfiltered	05-Aug-2016
Conductivity (at 20 deg.C)	09-Aug-2016
pH Value	09-Aug-2016
Suspended Solids	10-Aug-2016



SDG: 160731-18
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: John Adams

Order Number:
Report Number: 372966
Superseded Report:

Appendix

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 (NDP). 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 (Limit of Detection) 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.

General

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 leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

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 (BTX). 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.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

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.



JLA Disposal Ltd
Glyncynwal Uchaf Farm
Lower Cwmtwrch
SA9 2QQ

Attention: John Adams

CERTIFICATE OF ANALYSIS

Date: 15 September 2016
Customer: H_JLADISP_SWA
Sample Delivery Group (SDG): 160901-37
Your Reference:
Location: Palleg
Report No: 378066

We received 1 sample on Thursday September 01, 2016 and 1 of these samples were scheduled for analysis which was completed on Thursday September 15, 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.

Chemical testing (unless subcontracted) performed at ALcontrol Laboratories Hawarden (Method codes TM) or ALcontrol Laboratories Aberdeen (Method codes S).

Approved By:

Sonia McWhan

Operations Manager





SDG:	160901-37	Location:	Palleg	Order Number:	
Job:	H_JLADISP_SWA-2	Customer:	JLA Disposal Ltd	Report Number:	378066
Client Reference:		Attention:	John Adams	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
14075642	SW1			30/08/2016

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



SDG: 160901-37
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: John Adams

Order Number:
Report Number: 378066
Superseded Report:

LIQUID Results Legend X Test N No Determination Possible	Lab Sample No(s)		14075642	
	Customer Sample Reference		SW1	
	AGS Reference			
	Depth (m)			
	Container		H2SO4 (ALE244) Dissolved Metals Preser 250ml BOD (ALE212) 11plastic (ALE221)	
Alkalinity as CaCO3	All	NDPs: 0 Tests: 1	X	
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 1		X
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X	
BOD True Total	All	NDPs: 0 Tests: 1	X	
COD Unfiltered	All	NDPs: 0 Tests: 1	X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X	
Mercury Dissolved	All	NDPs: 0 Tests: 1		X
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 1	X	
Suspended Solids	All	NDPs: 0 Tests: 1	X	
Total Organic and Inorganic Carbon	All	NDPs: 0 Tests: 1	X	

SDG: 160901-37
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: John Adams

Order Number:
Report Number: 378066
Superseded Report:

[illegible]



SDG:	160901-37	Location:	Palleg	Order Number:	
Job:	H_JLADISP_SWA-2	Customer:	JLA Disposal Ltd	Report Number:	378066
Client Reference:		Attention:	John Adams	Superseded Report:	

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		
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		
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		
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.
Chemical testing (unless subcontracted) performed at ALcontrol Laboratories Hawarden (Method codes TM) or ALcontrol Laboratories Aberdeen (Method codes S).



SDG:	160901-37	Location:	Palleg	Order Number:	
Job:	H_JLADISP_SWA-2	Customer:	JLA Disposal Ltd	Report Number:	378066
Client Reference:		Attention:	John Adams	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	14075642
Customer Sample Ref.	SW1
AGS Ref.	
Depth	
Type	LIQUID

Alkalinity as CaCO3	13-Sep-2016
Ammoniacal Nitrogen	10-Sep-2016
Anions by Kone (w)	07-Sep-2016
BOD True Total	12-Sep-2016
COD Unfiltered	08-Sep-2016
Dissolved Metals by ICP-MS	14-Sep-2016
Mercury Dissolved	15-Sep-2016
Metals by iCap-OES Dissolved (W)	12-Sep-2016
Suspended Solids	13-Sep-2016
Total Organic and Inorganic Carbon	08-Sep-2016



SDG: 160901-37
Job: H_JLADISP_SWA-2
Client Reference:

Location: Palleg
Customer: JLA Disposal Ltd
Attention: John Adams

Order Number:
Report Number: 378066
Superseded Report:

Appendix

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 (NDP). 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 (Limit of Detection) 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.

General

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 leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

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 (BTX). 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.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

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: Keir Thomas

CERTIFICATE OF ANALYSIS

Date: 07 October 2016
Customer: H_GETCNO_NAH
Sample Delivery Group (SDG): 160929-115
Your Reference:
Location: Palleg
Report No: 381330

We received 7 samples on Thursday September 29, 2016 and 7 of these samples were scheduled for analysis which was completed on Friday October 07, 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.

Chemical testing (unless subcontracted) performed at ALcontrol Laboratories Hawarden (Method codes TM) or ALcontrol Laboratories Aberdeen (Method codes S).

Approved By:

Sonia McWhan

Operations Manager





SDG:	160929-115	Location:	Palleg	Order Number:	
Job:	H_GETCNO_NAH-10	Customer:	Geotechnology	Report Number:	381330
Client Reference:		Attention:	Keir Thomas	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
14237005	GW2			27/09/2016
14237006	GW3			27/09/2016
14237003	GW4			27/09/2016
14237007	GW5			
14237004	GW8			27/09/2016
14237001	S1			27/09/2016
14237002	S2			27/09/2016

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



SDG: 160929-115
Job: H_GETCNO_NAH-10
Client Reference:

Location: Palleg
Customer: Geotechnology
Attention: Keir Thomas

Order Number:
Report Number: 381330
Superseded Report:

LIQUID Results Legend X Test N No Determination Possible	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container	
	14237005		GW2						H2SO4 (AL E244)	
	14237006		GW3						1iplastic (AL E221)	
	14237003		GW4						H2SO4 (AL E244)	
	14237007		GW5						1iplastic (AL E221)	
	14237004		GW8						H2SO4 (AL E244)	
									1iplastic (AL E221)	
	14237001		S1						Disolved Metals Preser	
									H2SO4 (AL E244)	
	14237002		S2						1iplastic (AL E221)	
Alkalinity as CaCO3	All	NDPs: 0 Tests: 2								
Ammoniacal Nitrogen	All	NDPs: 1 Tests: 6								
Anions by Kone (w)	All	NDPs: 1 Tests: 6								
BOD True Total	All	NDPs: 0 Tests: 2								
COD Unfiltered	All	NDPs: 0 Tests: 2								
Conductivity (at 20 deg.C)	All	NDPs: 1 Tests: 6								
Dissolved Metals by ICP-MS	All	NDPs: 1 Tests: 6								
Mercury Dissolved	All	NDPs: 0 Tests: 2								
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 2								
pH Value	All	NDPs: 1 Tests: 6								
Suspended Solids	All	NDPs: 0 Tests: 2								
Total Organic and Inorganic Carbon	All	NDPs: 0 Tests: 2								

Order Number:
Report Number: 381330
Superseded Report:

Page 4 of 8



SDG:	160929-115	Location:	Palleg	Order Number:	
Job:	H_GETCNO_NAH-10	Customer:	Geotechnology	Report Number:	381330
Client Reference:		Attention:	Keir Thomas	Superseded Report:	

Notification of NDPs (No determination possible)

Date Received : 29/09/2016 19:03:51

Sample No	Customer Sample Ref.	Depth (m)	Test	Comment
14237007	GW5		Conductivity (at 20 deg.C)	No bottle available
14237007	GW5		pH Value	No bottle available
14237007	GW5		Dissolved Metals by ICP-MS	No bottle available
14237007	GW5		Anions by Kone (w)	No bottle available
14237007	GW5		Ammoniacal Nitrogen	No bottle available



SDG: 160929-115
Job: H_GETCNO_NAH-10
Client Reference:

Location: Palleg
Customer: Geotechnology
Attention: Keir Thomas

Order Number:
Report Number: 381330
Superseded Report:

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		
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		
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
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		
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		

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

Chemical testing (unless subcontracted) performed at ALcontrol Laboratories Hawarden (Method codes TM) or ALcontrol Laboratories Aberdeen (Method codes S).



SDG:	160929-115	Location:	Palleg	Order Number:	
Job:	H_GETCNO_NAH-10	Customer:	Geotechnology	Report Number:	381330
Client Reference:		Attention:	Keir Thomas	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	14237005	14237006	14237003	14237004	14237001	14237002
Customer Sample Ref.	GW2	GW3	GW4	GW8	S1	S2
AGS Ref.						
Depth						
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
Alkalinity as CaCO3					05-Oct-2016	03-Oct-2016
Ammoniacal Nitrogen	06-Oct-2016	06-Oct-2016	06-Oct-2016	06-Oct-2016	06-Oct-2016	06-Oct-2016
Anions by Kone (w)	07-Oct-2016	07-Oct-2016	07-Oct-2016	07-Oct-2016	06-Oct-2016	06-Oct-2016
BOD True Total					06-Oct-2016	06-Oct-2016
COD Unfiltered					03-Oct-2016	03-Oct-2016
Conductivity (at 20 deg.C)	04-Oct-2016	04-Oct-2016	05-Oct-2016	05-Oct-2016	05-Oct-2016	04-Oct-2016
Dissolved Metals by ICP-MS	06-Oct-2016	06-Oct-2016	06-Oct-2016	06-Oct-2016	06-Oct-2016	06-Oct-2016
Mercury Dissolved					06-Oct-2016	06-Oct-2016
Metals by iCap-OES Dissolved (W)					03-Oct-2016	07-Oct-2016
pH Value	06-Oct-2016	06-Oct-2016	06-Oct-2016	06-Oct-2016	06-Oct-2016	06-Oct-2016
Suspended Solids					05-Oct-2016	04-Oct-2016
Total Organic and Inorganic Carbon					06-Oct-2016	04-Oct-2016



SDG: 160929-115
Job: H_GETCNO_NAH-10
Client Reference:

Location: Palleg
Customer: Geotechnology
Attention: Keir Thomas

Order Number:
Report Number: 381330
Superseded Report:

Appendix

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 (NDP). 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 (Limit of Detection) 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.

General

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 leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

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 (BTX). 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.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

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: Keir Thomas

CERTIFICATE OF ANALYSIS

Date: 25 October 2016
Customer: H_GETCNO_NAH
Sample Delivery Group (SDG): 161015-64
Your Reference:
Location: Palleg
Report No: 383598

We received 1 sample on Saturday October 15, 2016 and 1 of these samples were scheduled for analysis which was completed on Tuesday October 25, 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.

Chemical testing (unless subcontracted) performed at ALcontrol Laboratories Hawarden (Method codes TM) or ALcontrol Laboratories Aberdeen (Method codes S).

Approved By:

Sonia McWhan

Operations Manager





SDG:	161015-64	Location:	Palleg	Order Number:	
Job:	H_GETCNO_NAH-10	Customer:	Geotechnology	Report Number:	383598
Client Reference:		Attention:	Keir Thomas	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
14338496	S1			13/10/2016

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



SDG: 161015-64
Job: H_GETCNO_NAH-10
Client Reference:

Location: Palleg
Customer: Geotechnology
Attention: Keir Thomas

Order Number:
Report Number: 383598
Superseded Report:

LIQUID Results Legend X Test N No Determination Possible	Lab Sample No(s)		14338496
	Customer Sample Reference		SI
	AGS Reference		
	Depth (m)		
	Container		H2SO4 (AL E244) 11 plastic (AL E221)
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 1	X
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X
BOD True Total	All	NDPs: 0 Tests: 1	X
COD Unfiltered	All	NDPs: 0 Tests: 1	X
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 1	X
pH Value	All	NDPs: 0 Tests: 1	X
Suspended Solids	All	NDPs: 0 Tests: 1	X

SDG: 161015-64
Job: H_GETCNO_NAH-10
Client Reference:

Location: Palleg
Customer: Geotechnology
Attention: Keir Thomas

Order Number:
Report Number: 383598
Superseded Report:

[illegible]



SDG: 161015-64
Job: H_GETCNO_NAH-10
Client Reference:

Location: Palleg
Customer: Geotechnology
Attention: Keir Thomas

Order Number:
Report Number: 383598
Superseded Report:

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		
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		
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		
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		

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

Chemical testing (unless subcontracted) performed at ALcontrol Laboratories Hawarden (Method codes TM) or ALcontrol Laboratories Aberdeen (Method codes S).



SDG: 161015-64
Job: H_GETCNO_NAH-10
Client Reference:

Location: Palleg
Customer: Geotechnology
Attention: Keir Thomas

Order Number:
Report Number: 383598
Superseded Report:

Test Completion Dates

Lab Sample No(s)	14338496
Customer Sample Ref.	S1
AGS Ref.	
Depth	
Type	LIQUID

Ammoniacal Nitrogen	25-Oct-2016
Anions by Kone (w)	20-Oct-2016
BOD True Total	21-Oct-2016
COD Unfiltered	25-Oct-2016
Conductivity (at 20 deg.C)	21-Oct-2016
pH Value	25-Oct-2016
Suspended Solids	25-Oct-2016



SDG: 161015-64
Job: H_GETCNO_NAH-10
Client Reference:

Location: Palleg
Customer: Geotechnology
Attention: Keir Thomas

Order Number:
Report Number: 383598
Superseded Report:

Appendix

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 (NDP). 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 (Limit of Detection) 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.

General

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 leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

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 (BTX). 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.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

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.



JLA Disposal Ltd
Glyncynwal Uchaf Farm
Lower Cwmtwrch
SA9 2QQ

Attention: John Adams

CERTIFICATE OF ANALYSIS

Date: 04 December 2016
Customer: H_JLADISP_SWA
Sample Delivery Group (SDG): 161127-3
Your Reference: JLA Recycling Ltd.
Location: JLA Recycling Ltd.
Report No: 388895

We received 1 sample on Saturday November 26, 2016 and 1 of these samples were scheduled for analysis which was completed on Sunday December 04, 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.

Chemical testing (unless subcontracted) performed at ALcontrol Laboratories Hawarden (Method codes TM) or ALcontrol Laboratories Aberdeen (Method codes S).

Approved By:

Sonia McWhan

Operations Manager





SDG:	161127-3	Location:	JLA Recycling Ltd.	Order Number:	
Job:	H_JLADISP_SWA-1	Customer:	JLA Disposal Ltd	Report Number:	388895
Client Reference:	JLA Recycling Ltd.	Attention:	John Adams	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
14604182	SW1			23/11/2016

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



SDG:	161127-3	Location:	JLA Recycling Ltd.	Order Number:	
Job:	H_JLADISP_SWA-1	Customer:	JLA Disposal Ltd	Report Number:	388895
Client Reference:	JLA Recycling Ltd.	Attention:	John Adams	Superseded Report:	

LIQUID

Results Legend

X Test

N No Determination Possible

Lab Sample No(s)	14604182
Customer Sample Reference	SW1
AGS Reference	
Depth (m)	
Container	H2SO4 (AL E244) 1000ml glass bottle (AL E
Ammoniacal Nitrogen	AllNDPs: 0 Tests: 1X
Anions by Kone (w)	AllNDPs: 0 Tests: 1X
BOD True Total	AllNDPs: 0 Tests: 1X
COD Unfiltered	AllNDPs: 0 Tests: 1X
Suspended Solids	AllNDPs: 0 Tests: 1X

SDG: 161127-3
Job: H_JLADISP_SWA-1
Client Reference: JLA Recycling Ltd.

Location: JLA Recycling Ltd.
Customer: JLA Disposal Ltd
Attention: John Adams

Order Number:
Report Number: 388895
Superseded Report:

[illegible]



SDG:	161127-3	Location:	JLA Recycling Ltd.	Order Number:	
Job:	H_JLADISP_SWA-1	Customer:	JLA Disposal Ltd	Report Number:	388895
Client Reference:	JLA Recycling Ltd.	Attention:	John Adams	Superseded Report:	

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		
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		
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		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.
Chemical testing (unless subcontracted) performed at ALcontrol Laboratories Hawarden (Method codes TM) or ALcontrol Laboratories Aberdeen (Method codes S).



SDG:	161127-3	Location:	JLA Recycling Ltd.	Order Number:	
Job:	H_JLADISP_SWA-1	Customer:	JLA Disposal Ltd	Report Number:	388895
Client Reference:	JLA Recycling Ltd.	Attention:	John Adams	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	14604182
Customer Sample Ref.	SW1
AGS Ref.	
Depth	
Type	LIQUID

Ammoniacal Nitrogen	03-Dec-2016
Anions by Kone (w)	03-Dec-2016
BOD True Total	04-Dec-2016
COD Unfiltered	02-Dec-2016
Suspended Solids	01-Dec-2016



SDG: 161127-3
Job: H_JLADISP_SWA-1
Client Reference: JLA Recycling Ltd.

Location: JLA Recycling Ltd.
Customer: JLA Disposal Ltd
Attention: John Adams

Order Number:
Report Number: 388895
Superseded Report:

Appendix

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 (NDP). 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 (Limit of Detection) 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.

General

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 leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

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.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

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.



Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: customerservices@alcontrol.com
Website: www.alsenviromental.co.uk

JLA Disposal Ltd
Glyncynwal Uchaf Farm
Lower Cwmtwrch
SA9 2QQ

Attention: John Adams

CERTIFICATE OF ANALYSIS

Date: 18 December 2016
Customer: H_JLADISP_SWA
Sample Delivery Group (SDG): 161205-26
Your Reference:
Location: Palleg
Report No: 390810

We received 8 samples on Saturday December 03, 2016 and 8 of these samples were scheduled for analysis which was completed on Sunday December 18, 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.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Approved By:

Sonia McWhan
Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 161205-26
Location: Palleg

Client Reference:
Order Number:

Report Number: 390810
Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
14648405	CANOL LEACHETE			02/12/2016
14648410	GW1			02/12/2016
14648408	GW2			02/12/2016
14648409	GW3			02/12/2016
14648407	GW4			02/12/2016
14648404	GW6			02/12/2016
14648406	GW8			02/12/2016
14648411	SW1			02/12/2016

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 161205-26
Location: Palleg

Client Reference:
Order Number:

Report Number: 390810
Superseded Report:

LIQUID Results Legend X Test N No Determination Possible	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container	
	14648405		CANOL LEACHEITE						1000ml glass bottle (ALE)	
	14648410		GW1						1000ml glass bottle (ALE)	
	14648408		GW2						1000ml glass bottle (ALE)	
	14648409		GW3						1000ml glass bottle (ALE)	
	14648407		GW4						1000ml glass bottle (ALE)	
	14648404		GW6						1000ml glass bottle (ALE)	
	14648406		GW8						1000ml glass bottle (ALE)	
	14648411		SW1						1000ml glass bottle (ALE)	
Acid Herbicides (W)	All	NDPs: 0 Tests: 7								
Alkalinity as CaCO3	All	NDPs: 0 Tests: 5								
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 8								
Anions by Kone (w)	All	NDPs: 0 Tests: 8								
BOD True Total	All	NDPs: 0 Tests: 8								
COD Unfiltered	All	NDPs: 0 Tests: 8								
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 4								
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 8								
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 0 Tests: 7								
GRO by GC-FID (W)	All	NDPs: 0 Tests: 4								
Mercury Dissolved	All	NDPs: 0 Tests: 8								
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 8								
Mineral Oil C10-40 Aqueous (W)	All	NDPs: 0 Tests: 4								
Nitrite by Kone (w)	All	NDPs: 0 Tests: 3								
OC, OP Pesticides and Triazine Herb	All	NDPs: 0 Tests: 4								



CERTIFICATE OF ANALYSIS

Validated

SDG: 161205-26
Location: Palleg

Client Reference:
Order Number:

Report Number: 390810
Superseded Report:

LIQUID Results Legend X Test N No Determination Possible	Lab Sample No(s)		Customer Sample Reference	AGS Reference	Depth (m)	Container										
	14648405						HS04 (ALE24)	14648406								
	14648410						250ml plastic (ALE212)	14648407								
	14648408						11 plastic (ALE221)	14648409								
	14648409						Vial (ALE297)									
Organochlorine Pesticides (Aq)							HS04 (ALE244)									
							Dissolved Metals Preser									
							250ml plastic (ALE212)									
							11 plastic (ALE221)									
							Vial (ALE297)									
Organophosphorus Pesticides (Aq)							HS04 (ALE244)									
							Dissolved Metals Preser									
							250ml BOD (ALE212)									
							11 plastic (ALE221)									
							1000ml glass bottle (ALE									
Organotins in Aqueous Samples							HS04 (ALE24)									
							Dissolved Metals Preser									
							11 plastic (ALE221)									
							1000ml glass bottle (ALE									
							HS04 (ALE244)									
PAH Spec MS - Aqueous (W)							Dissolved Metals Preser									
							11 plastic (ALE221)									
							1000ml glass bottle (ALE									
							HS04 (ALE244)									
							Dissolved Metals Preser									
Phenols by HPLC (W)							11 plastic (ALE221)									
							1000ml glass bottle (ALE									
							HS04 (ALE244)									
							Dissolved Metals Preser									
							11 plastic (ALE221)									
Suspended Solids							1000ml glass bottle (ALE									
							HS04 (ALE244)									
							Dissolved Metals Preser									
							11 plastic (ALE221)									
							1000ml glass bottle (ALE									
SVOC MS (W) - Aqueous							HS04 (ALE24)									
							Dissolved Metals Preser									
							11 plastic (ALE221)									
							1000ml glass bottle (ALE									
							HS04 (ALE244)									
Total EPH (aq)							Dissolved Metals Preser									
							11 plastic (ALE221)									
							1000ml glass bottle (ALE									
							HS04 (ALE244)									
							Dissolved Metals Preser									
Total Organic and Inorganic Carbon							11 plastic (ALE221)									
							1000ml glass bottle (ALE									
							HS04 (ALE244)									
							Dissolved Metals Preser									
							11 plastic (ALE221)									
VOC MS (W)							1000ml glass bottle (ALE									
							HS04 (ALE244)									
							Dissolved Metals Preser									
							11 plastic (ALE221)									
							1000ml glass bottle (ALE									



CERTIFICATE OF ANALYSIS

Validated

SDG: 161205-26
Location: Palleg

Client Reference:
Order Number:

Report Number: 390810
Superseded Report:

Results Legend			Customer Sample Ref.		CANOL LEACHETE	GW1	GW2	GW3	GW4	GW6
#	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.				02/12/2016	02/12/2016	02/12/2016	02/12/2016	02/12/2016	02/12/2016
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				03/12/2016	03/12/2016	03/12/2016	03/12/2016	03/12/2016	03/12/2016
(F)	Trigger breach confirmed				161205-26	161205-26	161205-26	161205-26	161205-26	161205-26
1-5&5@	Sample deviation (see appendix)				14648405	14648410	14648408	14648409	14648407	14648404
Component	LOD/Units	Method								
Alkalinity, Total as CaCO3	<2 mg/l	TM043					380	485	720	
BOD, unfiltered	<1 mg/l	TM045			12	30	2.03	<1	3.55	2.91
Organic Carbon, Total	<3 mg/l	TM090					3.54	6.19	9.74	
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099			112	24.9	<0.2	0.222	6.79	<0.2
COD, unfiltered	<7 mg/l	TM107			189	892	570	42.6	321	103
Arsenic (diss.filt)	<0.51 µg/l	TM152			2.9	13.5	<0.51	3.96	1.61	1.64
Boron (diss.filt)	<5 µg/l	TM152			2080	78.8	21.7	14.9	1390	38.3
Cadmium (diss.filt)	<0.08 µg/l	TM152			<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Chromium (diss.filt)	<1.2 µg/l	TM152			5.35	<1.2	<1.2	<1.2	<1.2	<1.2
Copper (diss.filt)	<0.85 µg/l	TM152			<0.85	<0.85	<0.85	<0.85	1.15	1.39
Lead (diss.filt)	<0.1 µg/l	TM152			<0.1	<0.1	<0.1	<0.1	<0.1	0.138
Manganese (diss.filt)	<0.76 µg/l	TM152			1140	441	<0.76	3950	2740	406
Nickel (diss.filt)	<0.44 µg/l	TM152			4.37	3.6	<0.44	1.55	2.59	4.76
Zinc (diss.filt)	<1.3 µg/l	TM152			4.22	<1.3	<1.3	2.51	2.04	2.71
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172			486	882	<46	<46	<46	162
Mineral oil >C10 C40 (aq)	<10 µg/l	TM172					<10	<10	<10	
Total EPH (C6-C40) (aq)	<100 µg/l	TM172					<100	<100	<100	
Mercury (diss.filt)	<0.01 µg/l	TM183			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrite as NO2	<0.05 mg/l	TM184			0.476	<0.05				<0.05
Sulphate	<2 mg/l	TM184					197	86.3	62.3	
Chloride	<2 mg/l	TM184			147	13.8	21.3	56.2	106	22.8
Nitrate as NO3	<0.3 mg/l	TM184			30.6	<0.3				<0.3
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184					<0.1	<0.1	<0.1	
Cyanide, Total	<0.05 mg/l	TM227					<0.05	<0.05	<0.05	
Cyanide, Free	<0.05 mg/l	TM227					<0.05	<0.05	<0.05	
Calcium (diss.filt)	<0.012 mg/l	TM228			233	94.7	183	200	201	97.2
Sodium (diss.filt)	<0.076 mg/l	TM228			157	39.7	19.3	18.3	100	13.3
Magnesium (diss.filt)	<0.036 mg/l	TM228			45.8	14.3	9.29	13.4	28.5	6.26
Potassium (diss.filt)	<1 mg/l	TM228			69.6	14.4	3.02	2.63	13.9	1.54
Iron (diss.filt)	<0.019 mg/l	TM228			0.126	0.344	<0.019	<0.019	0.356	0.0504
Phenol	<0.002 mg/l	TM259					<0.002	<0.002	<0.002	
Cresols	<0.006 mg/l	TM259					<0.006	<0.006	<0.006	



CERTIFICATE OF ANALYSIS

Validated

SDG: 161205-26
Location: Palleg

Client Reference:
Order Number:

Report Number: 390810
Superseded Report:

Results Legend			Customer Sample Ref.		GW8	SW1				
#	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)				
M	mCERTS accredited.				02/12/2016	02/12/2016				
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				03/12/2016	03/12/2016				
(F)	Trigger breach confirmed				161205-26	161205-26				
1-5$	Sample deviation (see appendix)				14648406	14648411				
Component	LOD/Units	Method								
Suspended solids, Total	<2 mg/l	TM022				5.5	#			
Alkalinity, Total as CaCO3	<2 mg/l	TM043			360	210	#	#		
BOD, unfiltered	<1 mg/l	TM045			<1	<1	#	#		
Organic Carbon, Total	<3 mg/l	TM090			4.05	7.84	#	#		
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099			<0.2	<0.2	#	#		
COD, unfiltered	<7 mg/l	TM107			15.1	20.9	#	#		
Arsenic (diss.filt)	<0.51 µg/l	TM152			2.82	0.99	#	#		
Boron (diss.filt)	<5 µg/l	TM152			67.7	146	#	#		
Cadmium (diss.filt)	<0.08 µg/l	TM152			<0.08	0.0921	#	#		
Chromium (diss.filt)	<1.2 µg/l	TM152			<1.2	<1.2	#	#		
Copper (diss.filt)	<0.85 µg/l	TM152			<0.85	<0.85	#	#		
Lead (diss.filt)	<0.1 µg/l	TM152			<0.1	<0.1	#	#		
Manganese (diss.filt)	<0.76 µg/l	TM152			3410	31.5	#	#		
Nickel (diss.filt)	<0.44 µg/l	TM152			3.16	1.84	#	#		
Zinc (diss.filt)	<1.3 µg/l	TM152			3.3	<1.3	#	#		
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172			<46		#			
Mineral oil >C10 C40 (aq)	<10 µg/l	TM172			<10					
Total EPH (C6-C40) (aq)	<100 µg/l	TM172			<100					
Mercury (diss.filt)	<0.01 µg/l	TM183			<0.01	<0.01				
Sulphate	<2 mg/l	TM184			47.3	24.6	#	#		
Chloride	<2 mg/l	TM184			11.1	15.1	#	#		
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184			<0.1	0.55	#	#		
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			94.8	78.4	#	#		
Sodium (diss.filt)	<0.076 mg/l	TM228			45.9	10.9	#	#		
Magnesium (diss.filt)	<0.036 mg/l	TM228			18.7	5.09	#	#		
Potassium (diss.filt)	<1 mg/l	TM228			3.76	2.8	#	#		
Iron (diss.filt)	<0.019 mg/l	TM228			0.0227	<0.019	#	#		
Phenol	<0.002 mg/l	TM259			<0.002		#			
Cresols	<0.006 mg/l	TM259			<0.006		#			
Xylenols	<0.008 mg/l	TM259			<0.008		#			



CERTIFICATE OF ANALYSIS

Validated

SDG: 161205-26
Location: Palleg

Client Reference:
Order Number:

Report Number: 390810
Superseded Report:

OC, OP Pesticides and Triazine Herb

Results Legend			Customer Sample Ref.		GW2	GW3	GW4	GW8		
#	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)		
M	mCERTS accredited.				02/12/2016	02/12/2016	02/12/2016	02/12/2016		
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				03/12/2016	03/12/2016	03/12/2016	03/12/2016		
(F)	Trigger breach confirmed				161205-26	161205-26	161205-26	161205-26		
1-5&+@	Sample deviation (see appendix)				14648408	14648409	14648407	14648406		
Component	LOD/Units	Method								
Dichlorvos	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01		
Mevinphos	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01		
Tecnazene	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01		
Hexachlorobenzene	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01		
Trifluralin	<0.01 µg/l	TM231			<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		
Quintozene (PCNB)	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01		
Diazinon	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01		
Triallate	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01		
Etrimphos	<0.01 µg/l	TM231			<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		
Disulfoton	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01		
Propetamphos	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01		
Heptachlor	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01		
Chlorpyrifos methyl	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01		
Dimethoate	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01		
Aldrin	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01		
Chlorothalonil	<0.01 µg/l	TM231			<0.02	<0.01	<0.02	<0.02		
Pirimiphos-methyl	<0.01 µg/l	TM231			<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		
Chlorpyrifos	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01		
Telodrin	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01		
Methyl parathion	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01		
Isodrin	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01		
Malathion	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01		
Fenthion	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01		
Fenitrothion	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01		
Heptachlor epoxide	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01		
Triadimefon	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01		
Pendimethalin	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01		
Parathion	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01		
o,p-DDE	<0.01 µg/l	TM231			<0.01	<0.01	<0.01	<0.01		



CERTIFICATE OF ANALYSIS

Validated

SDG: 161205-26
Location: Palleg

Client Reference:
Order Number:

Report Number: 390810
Superseded Report:

SVOC MS (W) - Aqueous

Results Legend			Customer Sample Ref.		GW2	GW3	GW4	GW8		
#	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)		
M	mCERTS accredited.				02/12/2016	02/12/2016	02/12/2016	02/12/2016		
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				03/12/2016	03/12/2016	03/12/2016	03/12/2016		
(F)	Trigger breach confirmed				161205-26	161205-26	161205-26	161205-26		
1-5ö	Sample deviation (see appendix)				14648408	14648409	14648407	14648406		
Component	LOD/Units	Method								
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		
2,4-Dichlorophenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		
2,4-Dimethylphenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		
2-Chloronaphthalene (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		
2-Chlorophenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		
2-Methylnaphthalene (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		
2-Methylphenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		
2-Nitroaniline (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		
2-Nitrophenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		
3-Nitroaniline (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		
4-Bromophenylphenylether (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		
4-Chloroaniline (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		
4-Methylphenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		
4-Nitroaniline (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		
4-Nitrophenol (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
Azobenzene (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176			<2	<2	<2	<2		
					#	#	#	#		
Butylbenzyl phthalate (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		
Carbazole (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		
Dibenzofuran (aq)	<1 µg/l	TM176			<1	<1	<1	<1		
					#	#	#	#		



CERTIFICATE OF ANALYSIS

Validated

SDG: 161205-26
Location: Palleg

Client Reference:
Order Number:

Report Number: 390810
Superseded Report:

VOC MS (W)

Results Legend			Customer Sample Ref.	GW2	GW3	GW4	GW8		
#	ISO17025 accredited.								
M	mCERTS accredited.								
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								
(F)	Trigger breach confirmed								
1-5ö	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) 02/12/2016 03/12/2016 161205-26 14648408	Water(GW/SW) 02/12/2016 03/12/2016 161205-26 14648409	Water(GW/SW) 02/12/2016 03/12/2016 161205-26 14648407	Water(GW/SW) 02/12/2016 03/12/2016 161205-26 14648406		
Dibromofluoromethane**	%	TM208		115	112	109	108		
Toluene-d8**	%	TM208		98.9	99.3	98.7	99.3		
4-Bromofluorobenzene**	%	TM208		95.7	95.8	96.7	99.1		
Dichlorodifluoromethane	<1 µg/l	TM208		<1	<1	<1	<1		
Chloromethane	<1 µg/l	TM208		<1	<1	<1	<1		
Vinyl chloride	<1 µg/l	TM208		<1	<1	<1	<1		
Bromomethane	<1 µg/l	TM208		<1	<1	<1	<1		
Chloroethane	<1 µg/l	TM208		<1	<1	<1	<1		
Trichlorofluoromethane	<1 µg/l	TM208		<1	<1	<1	<1		
1,1-Dichloroethene	<1 µg/l	TM208		<1	<1	<1	<1		
Carbon disulphide	<1 µg/l	TM208		<1	<1	<1	<1		
Dichloromethane	<3 µg/l	TM208		<3	<3	<3	<3		
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208		<1	<1	<1	<1		
trans-1,2-Dichloroethene	<1 µg/l	TM208		<1	<1	<1	<1		
1,1-Dichloroethane	<1 µg/l	TM208		<1	<1	<1	<1		
cis-1,2-Dichloroethene	<1 µg/l	TM208		<1	<1	<1	<1		
2,2-Dichloropropane	<1 µg/l	TM208		<1	<1	<1	<1		
Bromochloromethane	<1 µg/l	TM208		<1	<1	<1	<1		
Chloroform	<1 µg/l	TM208		<1	<1	<1	<1		
1,1,1-Trichloroethane	<1 µg/l	TM208		<1	<1	<1	<1		
1,1-Dichloropropene	<1 µg/l	TM208		<1	<1	<1	<1		
Carbontetrachloride	<1 µg/l	TM208		<1	<1	<1	<1		
1,2-Dichloroethane	<1 µg/l	TM208		<1	<1	<1	<1		
Benzene	<1 µg/l	TM208		<1	<1	<1	<1		
Trichloroethene	<1 µg/l	TM208		<1	<1	<1	<1		
1,2-Dichloropropane	<1 µg/l	TM208		<1	<1	<1	<1		
Dibromomethane	<1 µg/l	TM208		<1	<1	<1	<1		
Bromodichloromethane	<1 µg/l	TM208		<1	<1	<1	<1		
cis-1,3-Dichloropropene	<1 µg/l	TM208		<1	<1	<1	<1		
Toluene	<1 µg/l	TM208		<1	<1	<1	<1		
trans-1,3-Dichloropropene	<1 µg/l	TM208		<1	<1	<1	<1		
1,1,2-Trichloroethane	<1 µg/l	TM208		<1	<1	<1	<1		



CERTIFICATE OF ANALYSIS

Validated

SDG: 161205-26
Location: Palleg

Client Reference:
Order Number:

Report Number: 390810
Superseded Report:

VOC MS (W)

Results Legend			Customer Sample Ref.		GW2	GW3	GW4	GW8		
#	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)		
M	mCERTS accredited.				02/12/2016	02/12/2016	02/12/2016	02/12/2016		
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				03/12/2016	03/12/2016	03/12/2016	03/12/2016		
(F)	Trigger breach confirmed				161205-26	161205-26	161205-26	161205-26		
1-5&*&@	Sample deviation (see appendix)				14648408	14648409	14648407	14648406		
Component	LOD/Units	Method								
1,3-Dichloropropane	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
Tetrachloroethene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
Dibromochloromethane	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
1,2-Dibromoethane	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
Chlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
Ethylbenzene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
m,p-Xylene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
o-Xylene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
Styrene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
Bromoform	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
Isopropylbenzene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208			<1	<1	<1	<1		
1,2,3-Trichloropropane	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
Bromobenzene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
Propylbenzene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
2-Chlorotoluene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
1,3,5-Trimethylbenzene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
4-Chlorotoluene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
tert-Butylbenzene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
1,2,4-Trimethylbenzene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
sec-Butylbenzene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
4-iso-Propyltoluene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
1,3-Dichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
1,4-Dichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
n-Butylbenzene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
1,2-Dichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1		
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208			<1	<1	<1	<1		
1,2,4-Trichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
Hexachlorobutadiene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
Naphthalene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		



CERTIFICATE OF ANALYSIS

Validated

SDG: 161205-26
Location: Palleg

Client Reference:
Order Number:

Report Number: 390810
Superseded Report:

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.		
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		
TM245	By GC-FID	Determination of GRO by Headspace in waters		
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC		
TM314		Analysis of Organochlorine Pesticides in Aqueous sample by GCMS		
TM315		Analysis of Organophosphorus Pesticides in Aqueous samples by GCMS		
TM328				

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

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).



CERTIFICATE OF ANALYSIS

Validated

SDG: 161205-26
Location: Palleg

Client Reference:
Order Number:

Report Number: 390810
Superseded Report:

Test Completion Dates

Lab Sample No(s)
Customer Sample Ref.

AGS Ref.
Depth
Type

	14648405	14648410	14648408	14648409	14648407	14648404	14648406	14648411
	CANOL LEACHETE	GW1	GW2	GW3	GW4	GW6	GW8	SW1
	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
Acid Herbicides (W)	12-Dec-2016	12-Dec-2016	12-Dec-2016	12-Dec-2016	12-Dec-2016	12-Dec-2016	12-Dec-2016	
Alkalinity as CaCO3			13-Dec-2016	13-Dec-2016	13-Dec-2016		13-Dec-2016	13-Dec-2016
Ammoniacal Nitrogen	13-Dec-2016	12-Dec-2016	12-Dec-2016	12-Dec-2016	13-Dec-2016	13-Dec-2016	13-Dec-2016	13-Dec-2016
Anions by Kone (w)	13-Dec-2016	13-Dec-2016	13-Dec-2016	13-Dec-2016	13-Dec-2016	13-Dec-2016	13-Dec-2016	13-Dec-2016
BOD True Total	12-Dec-2016	12-Dec-2016	12-Dec-2016	12-Dec-2016	12-Dec-2016	12-Dec-2016	12-Dec-2016	18-Dec-2016
COD Unfiltered	13-Dec-2016	13-Dec-2016	13-Dec-2016	13-Dec-2016	10-Dec-2016	13-Dec-2016	10-Dec-2016	13-Dec-2016
Cyanide Comp/Free/Total/Thiocyanate			09-Dec-2016	07-Dec-2016	09-Dec-2016		09-Dec-2016	
Dissolved Metals by ICP-MS	12-Dec-2016	12-Dec-2016	14-Dec-2016	12-Dec-2016	13-Dec-2016	12-Dec-2016	13-Dec-2016	13-Dec-2016
EPH (DRO) (C10-C40) Aqueous (W)	12-Dec-2016	12-Dec-2016	12-Dec-2016	13-Dec-2016	12-Dec-2016	12-Dec-2016	12-Dec-2016	
GRO by GC-FID (W)			13-Dec-2016	13-Dec-2016	13-Dec-2016		13-Dec-2016	
Mercury Dissolved	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	13-Dec-2016
Metals by iCap-OES Dissolved (W)	06-Dec-2016	06-Dec-2016	13-Dec-2016	06-Dec-2016	09-Dec-2016	06-Dec-2016	09-Dec-2016	14-Dec-2016
Mineral Oil C10-40 Aqueous (W)			12-Dec-2016	13-Dec-2016	12-Dec-2016		12-Dec-2016	
Nitrite by Kone (w)	10-Dec-2016	10-Dec-2016				10-Dec-2016		
OC, OP Pesticides and Triazine Herb			13-Dec-2016	08-Dec-2016	13-Dec-2016		13-Dec-2016	
Organochlorine Pesticides (Aq)			13-Dec-2016	13-Dec-2016	13-Dec-2016		13-Dec-2016	
Organophosphorus Pesticides (Aq)			13-Dec-2016	13-Dec-2016	13-Dec-2016		13-Dec-2016	
Organotins in Aqueous Samples			13-Dec-2016	09-Dec-2016	13-Dec-2016		13-Dec-2016	
PAH Spec MS - Aqueous (W)	13-Dec-2016	13-Dec-2016	13-Dec-2016	13-Dec-2016	13-Dec-2016	13-Dec-2016	12-Dec-2016	
Phenols by HPLC (W)			13-Dec-2016	13-Dec-2016	12-Dec-2016		12-Dec-2016	
Suspended Solids								13-Dec-2016
SVOC MS (W) - Aqueous			13-Dec-2016	13-Dec-2016	13-Dec-2016		13-Dec-2016	
Total EPH (aq)			13-Dec-2016	13-Dec-2016	13-Dec-2016		13-Dec-2016	
Total Organic and Inorganic Carbon			13-Dec-2016	12-Dec-2016	13-Dec-2016		12-Dec-2016	13-Dec-2016
VOC MS (W)			13-Dec-2016	13-Dec-2016	13-Dec-2016		13-Dec-2016	



CERTIFICATE OF ANALYSIS

SDG:	161205-26	Client Reference:	Report Number:	390810
Location:	Palleg	Order Number:	Superseded Report:	

Appendix

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. ALS 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 (NDP). 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 (Limit of Detection) 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.

General

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 leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

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.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

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 ALS (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 ALS (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.



Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US

Tel: (01244) 528700

Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com

Website: www.alsenviromental.co.uk

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

Attention: Keir Thomas

CERTIFICATE OF ANALYSIS

Date: 11 January 2017
Customer: H_GETCNO_NAH
Sample Delivery Group (SDG): 161220-14
Your Reference:
Location: Palleg
Report No: 393432

We received 4 samples on Tuesday December 20, 2016 and 3 of these samples were scheduled for analysis which was completed on Wednesday January 11, 2017. 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.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 161220-14
Location: Palleg

Client Reference:
Order Number: John verbal

Report Number: 393432
Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
14745923	GW5			02/12/2016
14745926	L			02/12/2016
14745924	L1			02/12/2016
14745925	SW1			02/12/2016

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 161220-14
Location: Palleg

Client Reference:
Order Number: John verbal

Report Number: 393432
Superseded Report:

LIQUID Results Legend X Test N No Determination Possible	Lab Sample No(s)		14745923		14745924		14745925	
	Customer Sample Reference		GWS		L1		SW1	
	AGS Reference							
	Depth (m)							
	Container		1000ml glass bottle (ALE)		250ml BOD (ALE212)		1000ml glass bottle (ALE)	
Acid Herbicides (W)	All	NDPs: 1 Tests: 1	X		N			
Alkalinity as CaCO3	All	NDPs: 2 Tests: 1	X		N		N	
Ammoniacal Nitrogen	All	NDPs: 1 Tests: 2	X		N			X
Anions by Kone (w)	All	NDPs: 1 Tests: 2	X		N		X	
BOD True Total	All	NDPs: 0 Tests: 3		X	X		X	
COD Unfiltered	All	NDPs: 1 Tests: 2		X	N		X	
Conductivity (at 20 deg.C)	All	NDPs: 1 Tests: 2	X		N		X	
Dissolved Metals by ICP-MS	All	NDPs: 2 Tests: 1	X		N		N	
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 1 Tests: 1	X		N			
GRO by GC-FID (W)	All	NDPs: 0 Tests: 2			X	X		
Mercury Dissolved	All	NDPs: 1 Tests: 2		X		X		N
Metals by iCap-OES Dissolved (W)	All	NDPs: 2 Tests: 1	X		N		N	
Nitrite by Kone (w)	All	NDPs: 1 Tests: 0			N			
OC, OP Pesticides and Triazine Herb	All	NDPs: 2 Tests: 1	X		N		N	
Organotins in Aqueous Samples	All	NDPs: 1 Tests: 1	X		N			



CERTIFICATE OF ANALYSIS

Validated

SDG: 161220-14
Location: Palleg

Client Reference:
Order Number: John verbal

Report Number: 393432
Superseded Report:

LIQUID

Results Legend



Test


No Determination
Possible

Lab Sample No(s)

Customer Sample Reference

AGS Reference

Depth (m)

Container

14745923

14745924

14745925

GW5

L1

SW1

HS04 (ALE24)
250ml BOD (ALE212)
11plastic (ALE221)
ZnAc (ALE246)
INV VIAL
Dissolved Metals Preser.
1000ml glass bottle (ALE
Vial (ALE297)
Dissolved Metals Preser.
250ml BOD (ALE212)
11plastic (ALE221)
1000ml glass bottle (ALE

PAH Spec MS - Aqueous (W)

All

NDPs: 1
Tests: 1

X

N

pH Value

All

NDPs: 1
Tests: 2

X

N

X

Phenols by ms (w)

All

NDPs: 1
Tests: 1

X

N

Sulphide

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X

SVOC MS (W) - Aqueous

All

NDPs: 1
Tests: 1

X

N

Total EPH (aq)

All

NDPs: 0
Tests: 1

X

Total Organic and Inorganic Carbon

All

NDPs: 2
Tests: 1

X

N

N

Triazine Herbicides (W)*

All

NDPs: 0
Tests: 2

X

X

VOC MS (W)

All

NDPs: 0
Tests: 2

X

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 161220-14
Location: Palleg

Client Reference:
Order Number: John verbal

Report Number: 393432
Superseded Report:

Results Legend		Customer Sample Ref.	GW5	L1	SW1			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference						
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						
Atrazine*	<0.02 µg/l	SUB	<0.02	<0.02				
Prometryn*	<0.02 µg/l	SUB	<0.02	<0.02				
Propazine*	<0.02 µg/l	SUB	<0.02	<0.02				
Simazine*	<0.02 µg/l	SUB	<0.02	<0.02				
Terbutylazine*	<0.02 µg/l	SUB	<0.02	<0.02				
Terbutryn*	<0.02 µg/l	SUB	<0.02	1.21				
Trietazine*	<0.02 µg/l	SUB	<0.02	<0.02				
Cyanazine*	<0.02 µg/l	SUB	<0.02	<0.02				
Suspended solids, Total	<2 mg/l	TM022			19.3			
Alkalinity, Total as CaCO3	<2 mg/l	TM043	310			@ #		
BOD, unfiltered	<1 mg/l	TM045	<1	<50	<1	@ #		
Organic Carbon, Total	<3 mg/l	TM090	17.6			@ #		
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	0.437		<0.2	#		
Sulphide	<0.01 mg/l	TM101		0.862		@ #		
COD, unfiltered	<7 mg/l	TM107	214		48.1	@ #		
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120	0.532		0.361	#		
Arsenic (diss.filt)	<0.51 µg/l	TM152	2					
Boron (diss.filt)	<5 µg/l	TM152	17.8					
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08					
Chromium (diss.filt)	<1.2 µg/l	TM152	<1.2					
Copper (diss.filt)	<0.85 µg/l	TM152	3.16					
Lead (diss.filt)	<0.1 µg/l	TM152	0.248					
Manganese (diss.filt)	<0.76 µg/l	TM152	336					
Nickel (diss.filt)	<0.44 µg/l	TM152	3.28					
Zinc (diss.filt)	<1.3 µg/l	TM152	10.3					
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172	<46					
Total EPH (C6-C40) (aq)	<100 µg/l	TM172	<100					
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	<0.01				
Sulphate	<2 mg/l	TM184	13.4					
Chloride	<2 mg/l	TM184	7.6		13.3	@ #		
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184	<0.1		0.77	@ #		
Phenol	<0.5 µg/l	TM205	<0.5					



CERTIFICATE OF ANALYSIS

Validated

SDG: 161220-14
Location: Palleg

Client Reference:
Order Number: John verbal

Report Number: 393432
Superseded Report:

Results Legend			Customer Sample Ref.	GW5	L1	SW1			
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference						
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		Water(GW/SW) 02/12/2016	Water(GW/SW) 02/12/2016	Water(GW/SW) 02/12/2016			
2-methylphenol	<0.5 µg/l	TM205		<0.5					
3-methylphenol	<0.5 µg/l	TM205		<0.5					
4-methylphenol	<0.5 µg/l	TM205		<0.5					
2-chlorophenol	<0.5 µg/l	TM205		<0.5					
2,4-dimethylphenol	<0.5 µg/l	TM205		<0.5					
4-chloro-3-methylphenol	<0.5 µg/l	TM205		<0.5					
2,6-dichlorophenol	<0.5 µg/l	TM205		<0.5					
4-Chlorophenol	<0.5 µg/l	TM205		<0.5					
2,4-dichlorophenol	<0.5 µg/l	TM205		<0.5					
2-nitrophenol	<0.5 µg/l	TM205		<0.5					
2,4,6-trichlorophenol	<0.5 µg/l	TM205		<0.5					
2,4,5-trichlorophenol	<0.5 µg/l	TM205		<0.5					
4-nitrophenol	<0.5 µg/l	TM205		<0.5					
2,3,5,6-tetrachlorophenol	<0.5 µg/l	TM205		<0.5					
2,3,4,6-tetrachlorophenol	<0.5 µg/l	TM205		<0.5					
2,4-dinitrophenol	<2.5 µg/l	TM205		<2.5					
DNOC	<3 µg/l	TM205		<3					
Pentachlorophenol	<2 µg/l	TM205		<2					
Dinoseb	<4 µg/l	TM205		<4					
Calcium (diss.filt)	<0.012 mg/l	TM228		114					
Sodium (diss.filt)	<0.076 mg/l	TM228		7.39					
Magnesium (diss.filt)	<0.036 mg/l	TM228		6.93					
Potassium (diss.filt)	<1 mg/l	TM228		1.72					
Iron (diss.filt)	<0.019 mg/l	TM228		0.213					
pH	<1 pH Units	TM256		6.71		7.63			
Dibutyl tin	<5 ng/l	TM328		<5					
Tributyl tin	<1 ng/l	TM328		<1					
Tetrabutyl tin	<2 ng/l	TM328		<2					
Triphenyl tin	<1 ng/l	TM328		<1					
Surrogate	%	TM328		77.1					



CERTIFICATE OF ANALYSIS

Validated

SDG: 161220-14
Location: Palleg

Client Reference:
Order Number: John verbal

Report Number: 393432
Superseded Report:

OC, OP Pesticides and Triazine Herb

Results Legend		Customer Sample Ref.	GW5				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water(GW/SW) 02/12/2016 20/12/2016 161220-14 14745923				
M	mCERTS accredited.						
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						
(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				



CERTIFICATE OF ANALYSIS

Validated

SDG: 161220-14
Location: Palleg

Client Reference:
Order Number: John verbal

Report Number: 393432
Superseded Report:

SVOC MS (W) - Aqueous

Results Legend		Customer Sample Ref.	GW5				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water(GW/SW) 02/12/2016 20/12/2016 161220-14 14745923				
M	mCERTS accredited.						
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						
(F)	Trigger breach confirmed						
1-5&\$@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176	<1	@ #			
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	@ #			
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	@ #			
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	@			
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<1	@ #			
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<1	@ #			
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<1	@ #			
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<1	@ #			
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	@ #			
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	@ #			
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<1	@ #			
2-Chlorophenol (aq)	<1 µg/l	TM176	<1	@ #			
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<1	@ #			
2-Methylphenol (aq)	<1 µg/l	TM176	<1	@ #			
2-Nitroaniline (aq)	<1 µg/l	TM176	<1	@ #			
2-Nitrophenol (aq)	<1 µg/l	TM176	<1	@ #			
3-Nitroaniline (aq)	<1 µg/l	TM176	<1	@ #			
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	<1	@ #			
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<1	@ #			
4-Chloroaniline (aq)	<1 µg/l	TM176	<1				
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<1	@ #			
4-Methylphenol (aq)	<1 µg/l	TM176	<1	@ #			
4-Nitroaniline (aq)	<1 µg/l	TM176	<1	@ #			
4-Nitrophenol (aq)	<1 µg/l	TM176	<1				
Azobenzene (aq)	<1 µg/l	TM176	<1	@ #			
Acenaphthylene (aq)	<1 µg/l	TM176	<1	@ #			
Acenaphthene (aq)	<1 µg/l	TM176	<1	@ #			
Anthracene (aq)	<1 µg/l	TM176	<1	@ #			
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	<1	@ #			
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176	<1	@ #			
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	<2	@ #			
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<1	@ #			



CERTIFICATE OF ANALYSIS

Validated

SDG: 161220-14
Location: PallegClient Reference:
Order Number: John verbalReport Number: 393432
Superseded Report:

SVOC MS (W) - Aqueous

Results Legend		Customer Sample Ref.	GW5				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water(GW/SW) 02/12/2016 20/12/2016 161220-14 14745923				
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					
Benzo(a)anthracene (aq)	<1 µg/l	TM176	<1	@ #			
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176	<1	@ #			
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176	<1	@ #			
Benzo(a)pyrene (aq)	<1 µg/l	TM176	<1	@ #			
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176	<1	@ #			
Carbazole (aq)	<1 µg/l	TM176	<1	@ #			
Chrysene (aq)	<1 µg/l	TM176	<1	@ #			
Dibenzofuran (aq)	<1 µg/l	TM176	<1	@ #			
n-Dibutyl phthalate (aq)	<1 µg/l	TM176	<1	@ #			
Diethyl phthalate (aq)	<1 µg/l	TM176	<1	@ #			
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176	<1	@ #			
Dimethyl phthalate (aq)	<1 µg/l	TM176	<1	@ #			
n-Dioctyl phthalate (aq)	<5 µg/l	TM176	<5	@ #			
Fluoranthene (aq)	<1 µg/l	TM176	<1	@ #			
Fluorene (aq)	<1 µg/l	TM176	<1	@ #			
Hexachlorobenzene (aq)	<1 µg/l	TM176	<1	@ #			
Hexachlorobutadiene (aq)	<1 µg/l	TM176	<1	@ #			
Pentachlorophenol (aq)	<1 µg/l	TM176	<1				
Phenol (aq)	<1 µg/l	TM176	<1				
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176	<1	@ #			
Hexachloroethane (aq)	<1 µg/l	TM176	<1	@ #			
Nitrobenzene (aq)	<1 µg/l	TM176	<1	@ #			
Naphthalene (aq)	<1 µg/l	TM176	<1	@ #			
Isophorone (aq)	<1 µg/l	TM176	<1	@ #			
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176	<1				
Phenanthrene (aq)	<1 µg/l	TM176	<1	@ #			
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176	<1	@ #			
Pyrene (aq)	<1 µg/l	TM176	<1	@ #			



CERTIFICATE OF ANALYSIS

Validated

SDG: 161220-14
Location: Palleg

Client Reference:
Order Number: John verbal

Report Number: 393432
Superseded Report:

VOC MS (W)

Results Legend		Customer Sample Ref.	GW5	L1				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water(GW/SW) 02/12/2016 20/12/2016 161220-14 14745923	Water(GW/SW) 02/12/2016 20/12/2016 161220-14 14745924				
M	mCERTS accredited.							
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							
(F)	Trigger breach confirmed							
1-5$	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM208	123	119	1			
Toluene-d8**	%	TM208	109	109	1			
4-Bromofluorobenzene**	%	TM208	110	111	1			
Dichlorodifluoromethane	<1 µg/l	TM208	<1	<1	1			
Chloromethane	<1 µg/l	TM208	<1	<1	@ #	1 @ #		
Vinyl chloride	<1 µg/l	TM208	<1	<1	@ #	1 @ #		
Bromomethane	<1 µg/l	TM208	<1	<1	@ #	1 @ #		
Chloroethane	<1 µg/l	TM208	<1	<1	@ #	1 @ #		
Trichlorofluoromethane	<1 µg/l	TM208	<1	<1	@ #	1 @ #		
1,1-Dichloroethene	<1 µg/l	TM208	<1	<1	@ #	1 @ #		
Carbon disulphide	<1 µg/l	TM208	<1	<1	@ #	1 @ #		
Dichloromethane	<3 µg/l	TM208	<3	<3	@ #	1 @ #		
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1	<1	@ #	1 @ #		
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	@ #	1 @ #		
1,1-Dichloroethane	<1 µg/l	TM208	<1	<1	@ #	1 @ #		
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	@ #	1 @ #		
2,2-Dichloropropane	<1 µg/l	TM208	<1	<1	1			
Bromochloromethane	<1 µg/l	TM208	<1	<1	@ #	1 @ #		
Chloroform	<1 µg/l	TM208	<1	<1	@ #	1 @ #		
1,1,1-Trichloroethane	<1 µg/l	TM208	<1	<1	@ #	1 @ #		
1,1-Dichloropropene	<1 µg/l	TM208	<1	<1	@ #	1 @ #		
Carbontetrachloride	<1 µg/l	TM208	<1	<1	@ #	1 @ #		
1,2-Dichloroethane	<1 µg/l	TM208	<1	<1	@ #	1 @ #		
Benzene	<1 µg/l	TM208	<1	3.28	@ #	1 @ #		
Trichloroethene	<1 µg/l	TM208	<1	<1	@ #	1 @ #		
1,2-Dichloropropane	<1 µg/l	TM208	<1	<1	@ #	1 @ #		
Dibromomethane	<1 µg/l	TM208	<1	<1	@ #	1 @ #		
Bromodichloromethane	<1 µg/l	TM208	<1	<1	@ #	1 @ #		
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	@ #	1 @ #		
Toluene	<1 µg/l	TM208	<1	<1	@ #	1 @ #		
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	@ #	1 @ #		
1,1,2-Trichloroethane	<1 µg/l	TM208	<1	<1	@ #	1 @ #		



CERTIFICATE OF ANALYSIS

Validated

SDG: 161220-14
Location: Palleg

Client Reference:
Order Number: John verbal

Report Number: 393432
Superseded Report:

VOC MS (W)

Results Legend		Customer Sample Ref.	GW5	L1				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water(GW/SW) 02/12/2016 20/12/2016 161220-14 14745923	Water(GW/SW) 02/12/2016 20/12/2016 161220-14 14745924				
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						
1,3-Dichloropropane	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				
Tetrachloroethene	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				
Dibromochloromethane	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				
1,2-Dibromoethane	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				
Chlorobenzene	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				
Ethylbenzene	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				
m,p-Xylene	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				
o-Xylene	<1 µg/l	TM208	<1	1.49				
			@ #	1 @ #				
Styrene	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				
Bromoform	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				
Isopropylbenzene	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1				
			@	1 @				
1,2,3-Trichloropropane	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				
Bromobenzene	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				
Propylbenzene	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				
2-Chlorotoluene	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				
4-Chlorotoluene	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				
tert-Butylbenzene	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				
1,2,4-Trimethylbenzene	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				
sec-Butylbenzene	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				
4-iso-Propyltoluene	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				
1,3-Dichlorobenzene	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				
1,4-Dichlorobenzene	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				
n-Butylbenzene	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				
1,2-Dichlorobenzene	<1 µg/l	TM208	<1	<1				
			@	1 @				
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208	<1	<1				
			@	1 @				
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				
Hexachlorobutadiene	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				
Naphthalene	<1 µg/l	TM208	<1	<1				
			@ #	1 @ #				



CERTIFICATE OF ANALYSIS

Validated

SDG: 161220-14
Location: Palleg

Client Reference:
Order Number: John verbal

Report Number: 393432
Superseded Report:

Notification of NDPs (No determination possible)

Date Received : 20/12/2016 08:51:22

Sample No	Customer Sample Ref.	Depth (m)	Test	Comment
14745924	L1		Organotins in Aqueous Samples	Insufficient Sample
14745925	SW1		Mercury Dissolved	Insufficient Sample
14745925	SW1		OC, OP Pesticides and Triazine Herb	Insufficient Sample
14745925	SW1		Dissolved Metals by ICP-MS	Insufficient Sample
14745925	SW1		Metals by iCap-OES Dissolved (W)	Insufficient Sample
14745925	SW1		Alkalinity as CaCO3	Insufficient Sample
14745925	SW1		Total Organic and Inorganic Carbon	Insufficient Sample
14745924	L1		COD Unfiltered	Insufficient Sample
14745924	L1		Anions by Kone (w)	Insufficient Sample
14745924	L1		Ammoniacal Nitrogen	Insufficient Sample
14745924	L1		Conductivity (at 20 deg.C)	Insufficient Sample
14745924	L1		pH Value	Insufficient Sample
14745924	L1		PAH Spec MS - Aqueous (W)	Insufficient Sample
14745924	L1		SVOC MS (W) - Aqueous	Insufficient Sample
14745924	L1		Phenols by ms (w)	Insufficient Sample
14745924	L1		Acid Herbicides (W)	Insufficient Sample
14745924	L1		Organotins in Aqueous Samples	Insufficient Sample
14745924	L1		Dissolved Metals by ICP-MS	Insufficient Sample
14745924	L1		Nitrite by Kone (w)	Insufficient Sample
14745924	L1		Metals by iCap-OES Dissolved (W)	Insufficient Sample
14745924	L1		Alkalinity as CaCO3	Insufficient Sample
14745924	L1		Total Organic and Inorganic Carbon	Insufficient Sample
14745924	L1		EPH (DRO) (C10-C40) Aqueous (W)	Insufficient Sample
14745924	L1		OC, OP Pesticides and Triazine Herb	Insufficient Sample



CERTIFICATE OF ANALYSIS

Validated

SDG: 161220-14
Location: Palleg

Client Reference:
Order Number: John verbal

Report Number: 393432
Superseded Report:

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
SUB		Subcontracted Test		
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		
TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and water samples using the Kone Analyser		
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit		
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter		
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.		
TM205		Determination of Phenols in Waste Waters using Solid Phase Extraction, Acetylation, Gas Chromatography and Mass Selective Detection		
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		
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		
TM245	By GC-FID	Determination of GRO by Headspace in waters		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		
TM328				

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

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).



CERTIFICATE OF ANALYSIS

Validated

SDG: 161220-14
Location: Palleg

Client Reference:
Order Number: John verbal

Report Number: 393432
Superseded Report:

Test Completion Dates

Lab Sample No(s)
Customer Sample Ref.

AGS Ref.
Depth
Type

	14745923	14745924	14745925
	GW5	L1	SW1
	LIQUID	LIQUID	LIQUID
Acid Herbicides (W)	30-Dec-2016		
Alkalinity as CaCO3	30-Dec-2016		
Ammoniacal Nitrogen	30-Dec-2016		30-Dec-2016
Anions by Kone (w)	03-Jan-2017		03-Jan-2017
BOD True Total	28-Dec-2016	28-Dec-2016	28-Dec-2016
COD Unfiltered	28-Dec-2016		28-Dec-2016
Conductivity (at 20 deg.C)	29-Dec-2016		29-Dec-2016
Dissolved Metals by ICP-MS	30-Dec-2016		
EPH (DRO) (C10-C40) Aqueous (W)	30-Dec-2016		
GRO by GC-FID (W)	29-Dec-2016	29-Dec-2016	
Mercury Dissolved	30-Dec-2016	30-Dec-2016	
Metals by iCap-OES Dissolved (W)	30-Dec-2016		
OC, OP Pesticides and Triazine Herb	04-Jan-2017		
Organotins in Aqueous Samples	04-Jan-2017		
PAH Spec MS - Aqueous (W)	30-Dec-2016		
pH Value	29-Dec-2016		29-Dec-2016
Phenols by ms (w)	04-Jan-2017		
Sulphide		04-Jan-2017	
Suspended Solids			29-Dec-2016
SVOC MS (W) - Aqueous	29-Dec-2016		
Total EPH (aq)	30-Dec-2016		
Total Organic and Inorganic Carbon	05-Jan-2017		
Triazine Herbicides (W)*	11-Jan-2017	11-Jan-2017	
VOC MS (W)	29-Dec-2016	29-Dec-2016	



2 Shaftesbury Industrial Centre, Icknield Way, Letchworth Garden City, Hertfordshire, SG6 1HE
T +44 (0)1462 480 400, F +44 (0)1462 480 403, E rpsmh@rpsgroup.com, W rpsgroup.com

Certificate of Analysis

Report No.: 16-58624-1

Issue No.: 1

Date of Issue 11/01/2017

Customer Details: ALS Life Sciences Limited, Unit7-8, Hawarden Business Park, Manor Road,
Hawarden, Deeside, Flintshire, CH5 3US

Customer Contact: Carrie Foster (2)

Customer Order No.: 29495

Customer Reference: 16122-14

Quotation Reference: 161222/01

Description: 2 water samples

Date Received: 22/12/2016

Date Started: 04/01/2017

Date Completed: 11/01/2017

Test Methods: Details available on request (refer to SOP code against relevant result/s)

Notes: None

Approved By: Matthew Hickson, Laboratory Manager

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service.

Observations and interpretations are outside of the scope of UKAS accreditation.

Results reported herein relate only to the items supplied to the laboratory for testing.



2 Shaftesbury Industrial Centre, Icknield Way, Letchworth Garden City, Hertfordshire, SG6 1HE
T +44 (0)1462 480 400, F +44 (0)1462 480 403, E rpsmh@rpsgroup.com, W rpsgroup.com

Results Summary

Report No.: 16-58624-1

Customer Reference: 16122-14

Customer Order No: 29495

Customer Sample No	14754443	14754434
RPS Sample No	318033	318034
Sample Type	WATER	WATER
Sampling Date	10/01/2017	

Determinand	CAS No	Codes	SOP	Units	RL		
atrazine	1912-24-9		in house	ug/l	0.02	< 0.02	< 0.02
cyanazine	21725-46-2		in house	ug/l	0.02	< 0.02	< 0.02
prometryn	7287-19-6		in house	ug/l	0.02	< 0.02	< 0.02
propazine	139-40-2		in house	ug/l	0.02	< 0.02	< 0.02
simazine	122-34-9		in house	ug/l	0.02	< 0.02	< 0.02
terbuthylazine	5915-41-3		in house	ug/l	0.02	< 0.02	< 0.02
terbutryn	886-50-0		in house	ug/l	0.02	< 0.02	1.21
trietazine	1912-26-1		in house	ug/l	0.02	< 0.02	< 0.02



2 Shaftesbury Industrial Centre, Icknield Way, Letchworth Garden City, Hertfordshire, SG6 1HE
T +44 (0)1462 480 400, F +44 (0)1462 480 403, E rpsmh@rpsgroup.com, W rpsgroup.com

Report Information

Key to Report Codes

U	UKAS Accredited
M	MCERTS Accredited
S	Subcontracted to approved laboratory
US	Subcontracted to approved laboratory UKAS Accredited for the test
MS	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
SI	Subcontracted to internal RPS Group laboratory
USI	Subcontracted to internal RPS Group laboratory UKAS Accredited for the test
MSI	Subcontracted to internal RPS Group laboratory MCERTS/UKAS Accredited for the test
I/S (in results)	Insufficient Sample
U/S (in results)	Unsuitable Sample
S/C (in results)	See Comments
ND (in results)	Not Detected
DW (in units)	Results are expressed on a dry weight basis

Sample Retention and Disposal

Samples will generally* be retained for the following times prior to disposal:

Perishables, e.g. foodstuffs	1 month (if frozen) from the issue date of this report
Waters	2 weeks from the issue date of this report
Other Liquids	1 month from the issue date of this report
Solids (including Soils)	1 month from the issue date of this report

*Sample retention may be subject to agreement with the customer for particular projects



CERTIFICATE OF ANALYSIS

SDG:	161220-14	Client Reference:		Report Number:	393432
Location:	Palleg	Order Number:	John verbal	Superseded Report:	

Appendix

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. ALS 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 (NDP). 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 (Limit of Detection) 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.

General

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 leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

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.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

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 ALS (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 ALS (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.

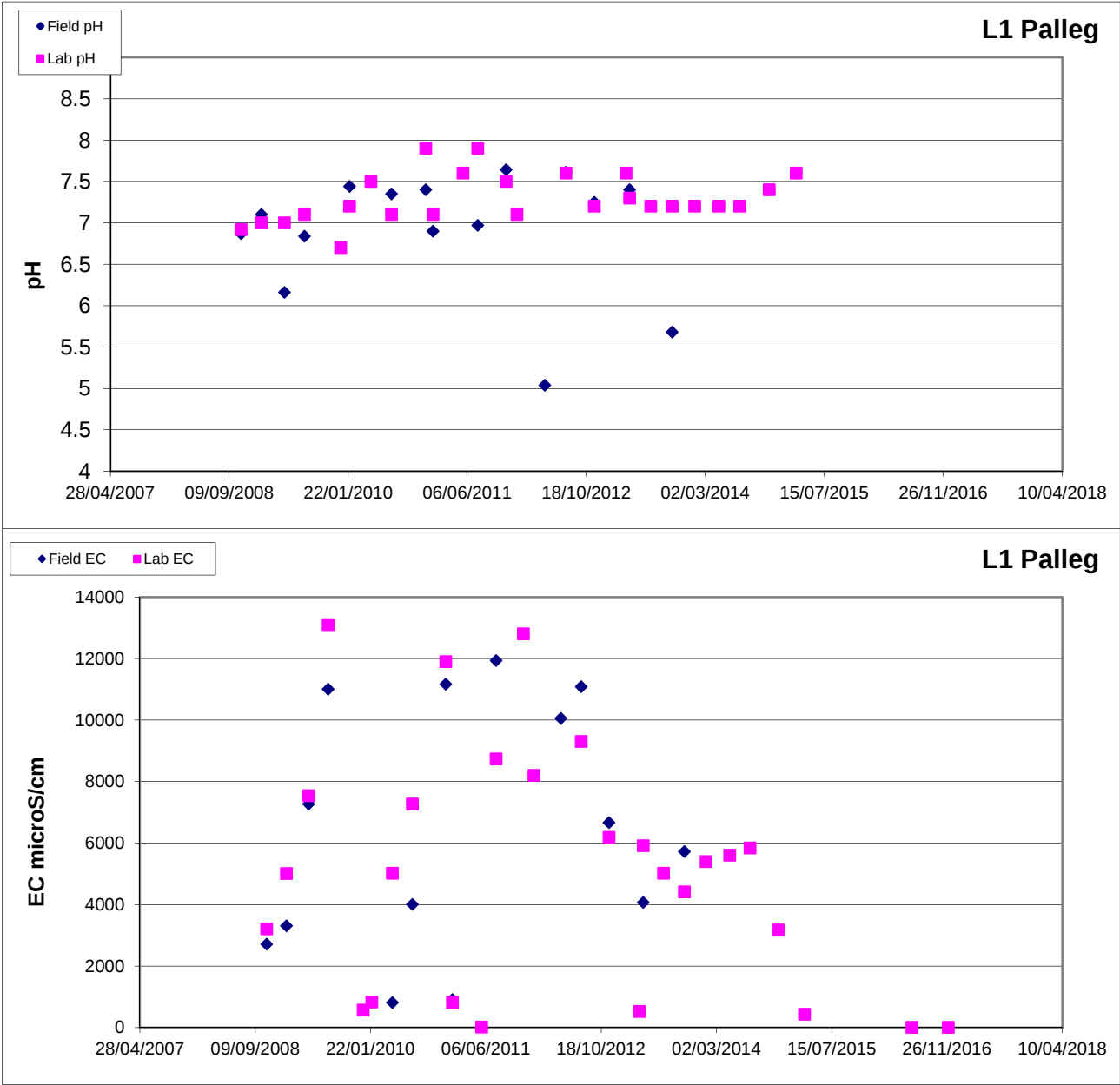
**PALLEG LANDFILL
LOWER CWMTHWRCH**

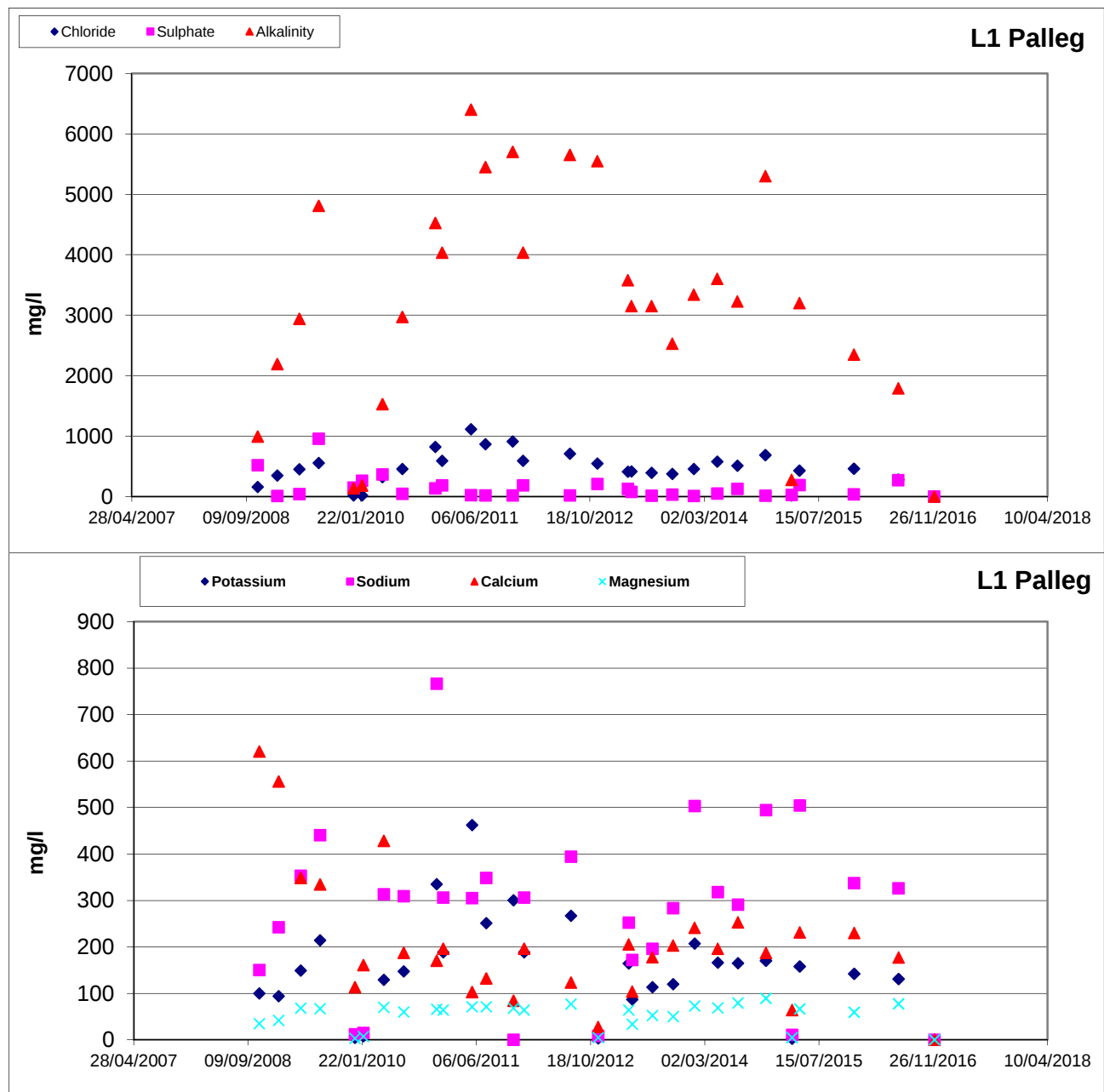
PERMIT BT19081X

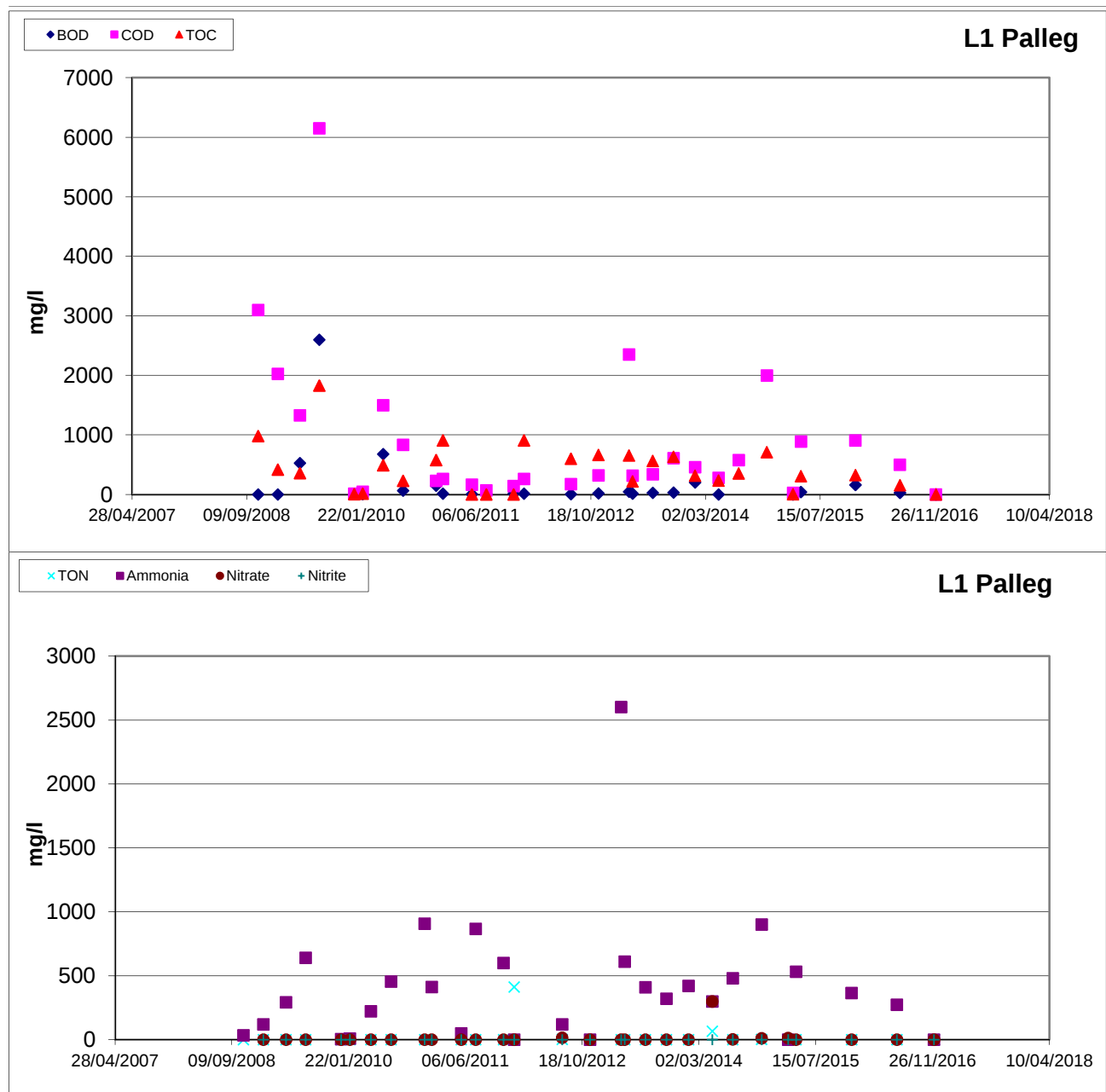
**Review of 2016
Landfill Monitoring**

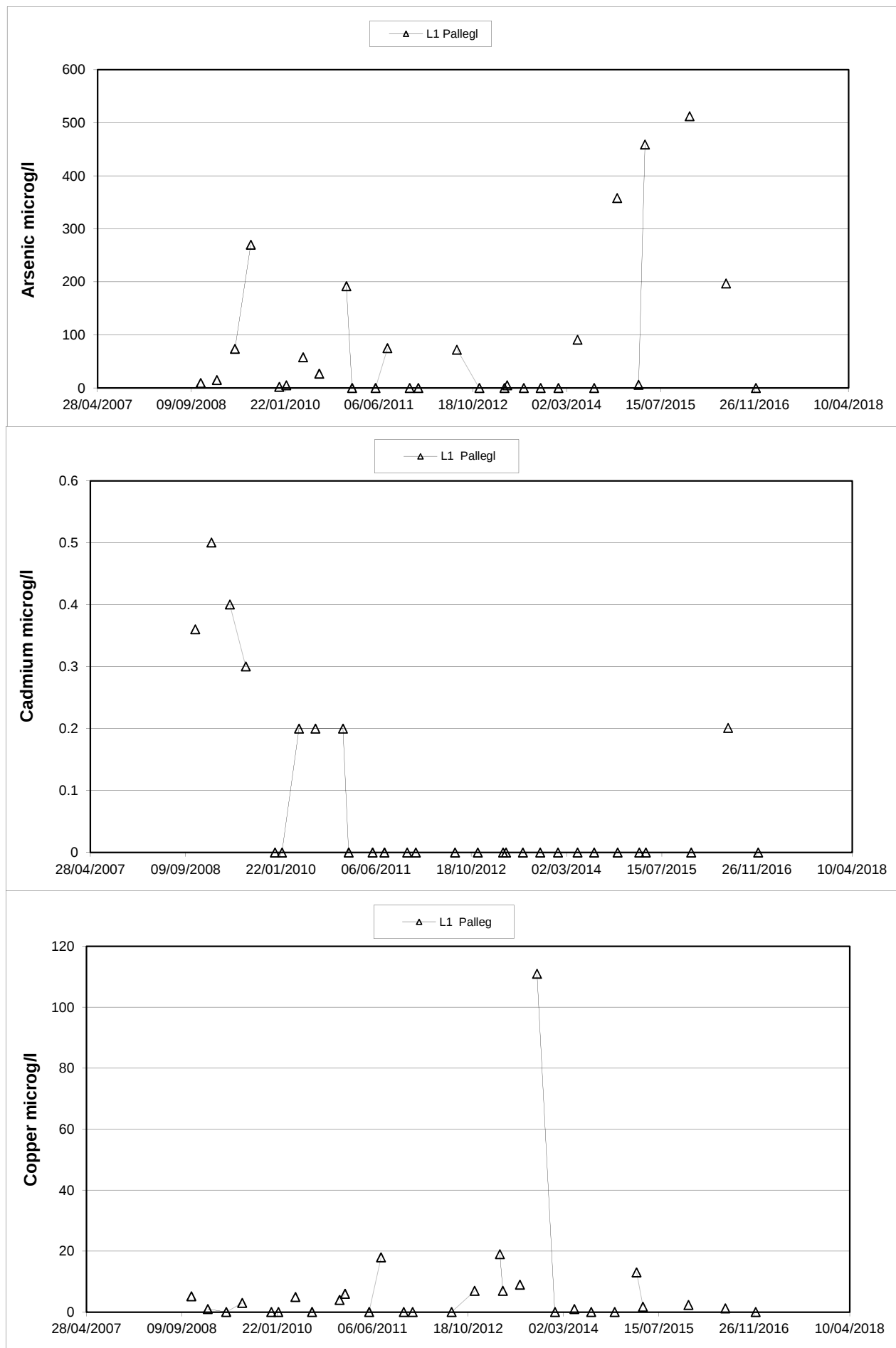
**Appendix 3
Summary of Leachate
Levels and Chemistry**

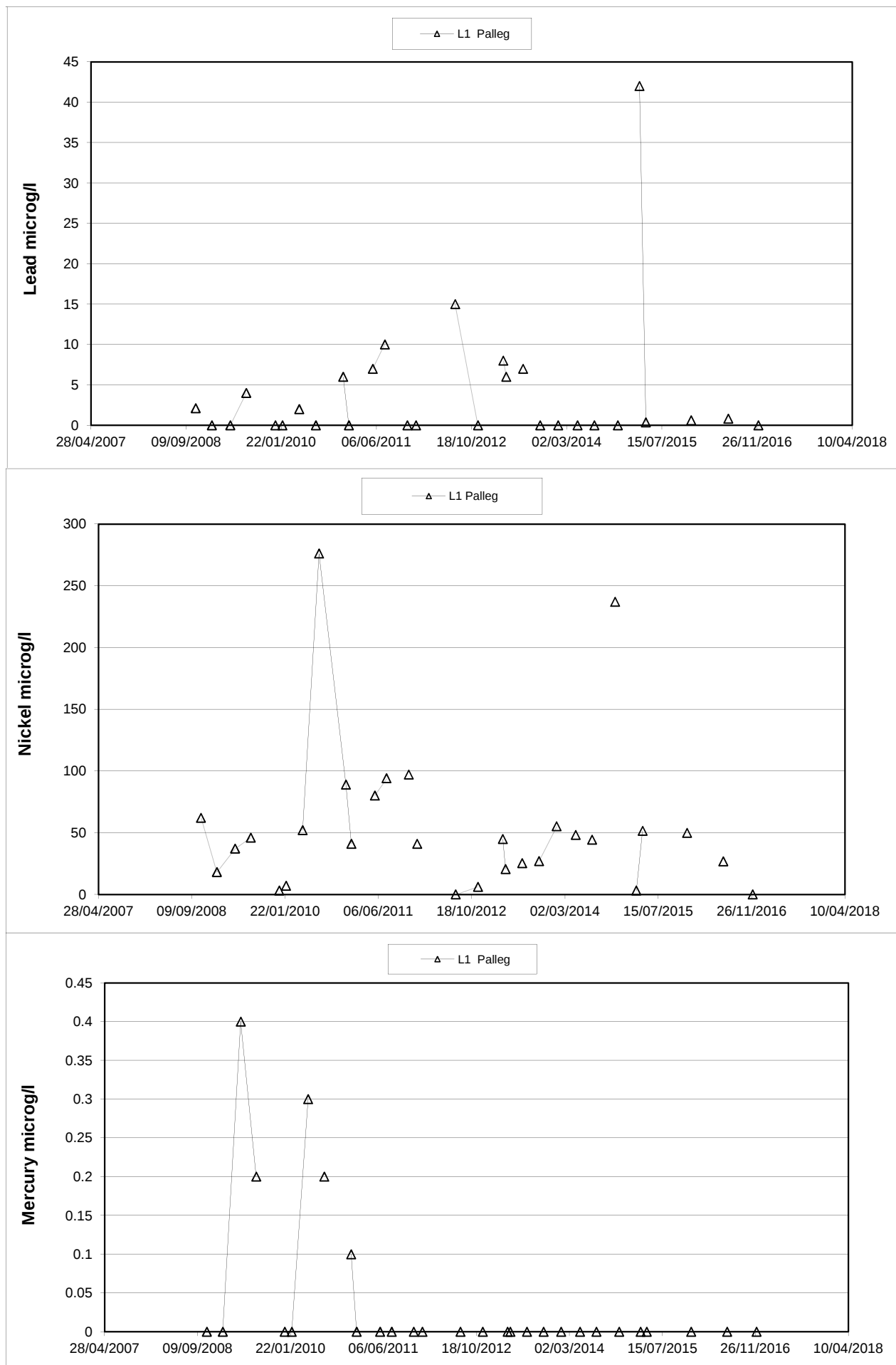
Report Number 1553r1v1d0117

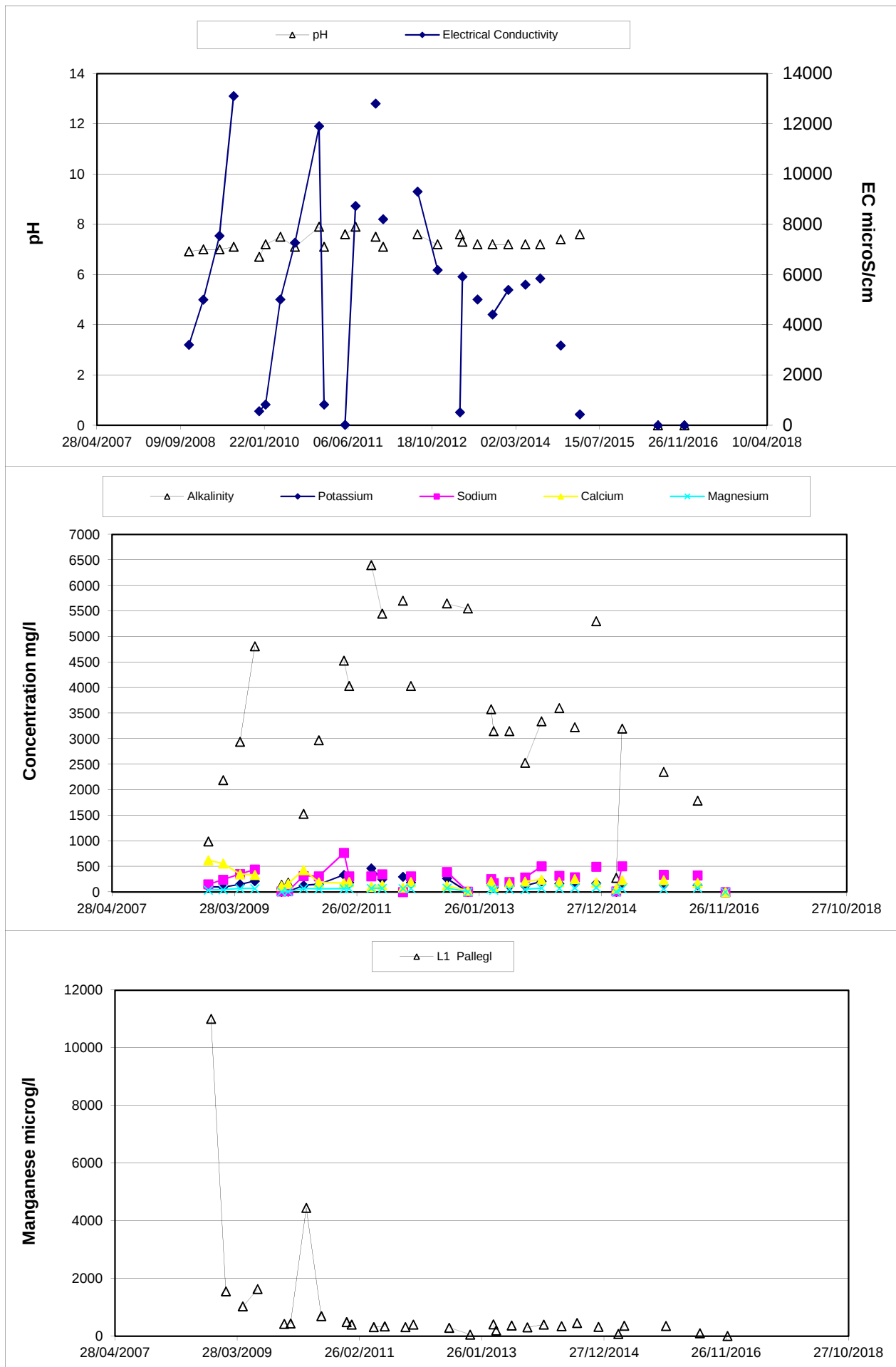


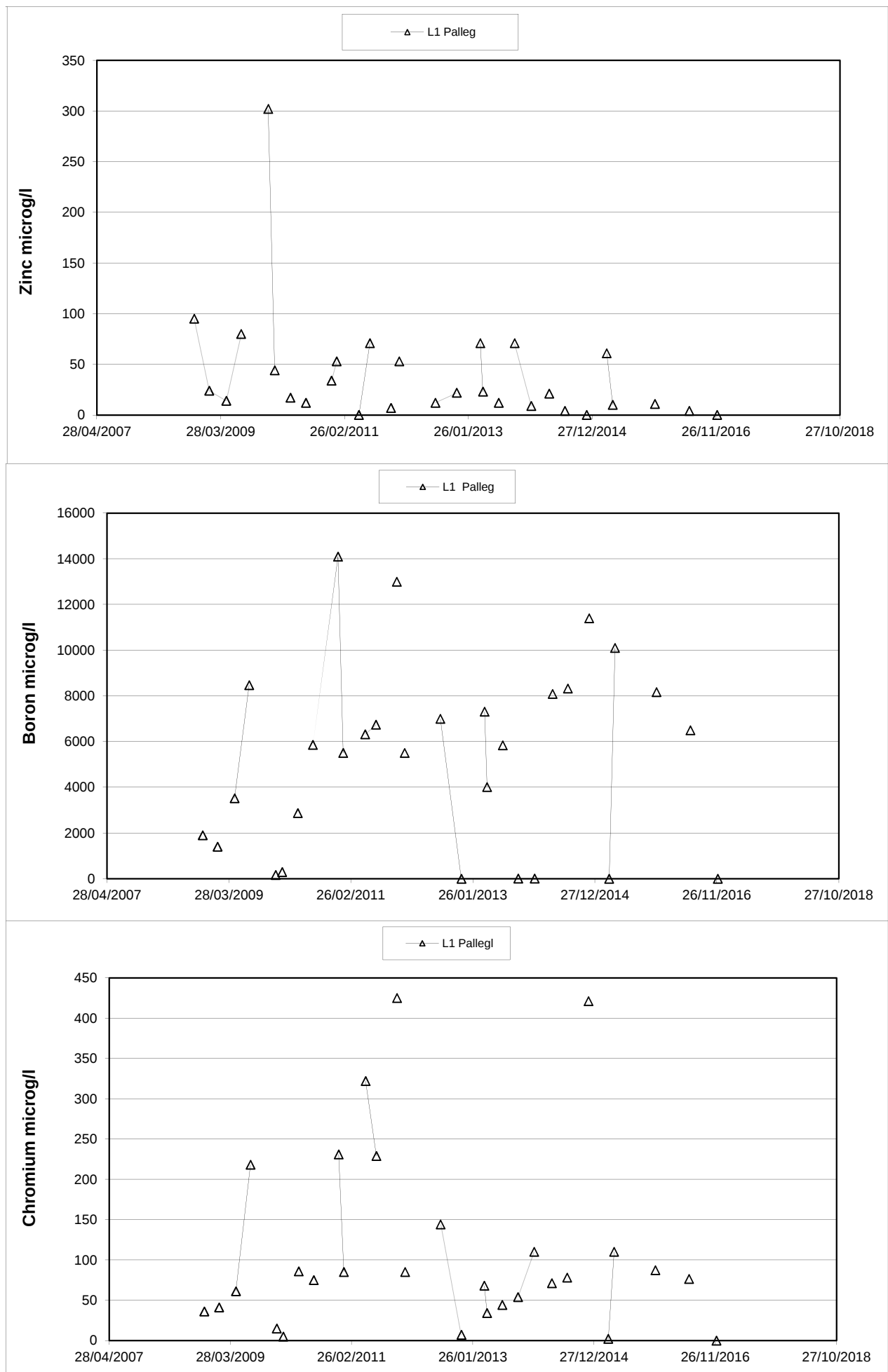


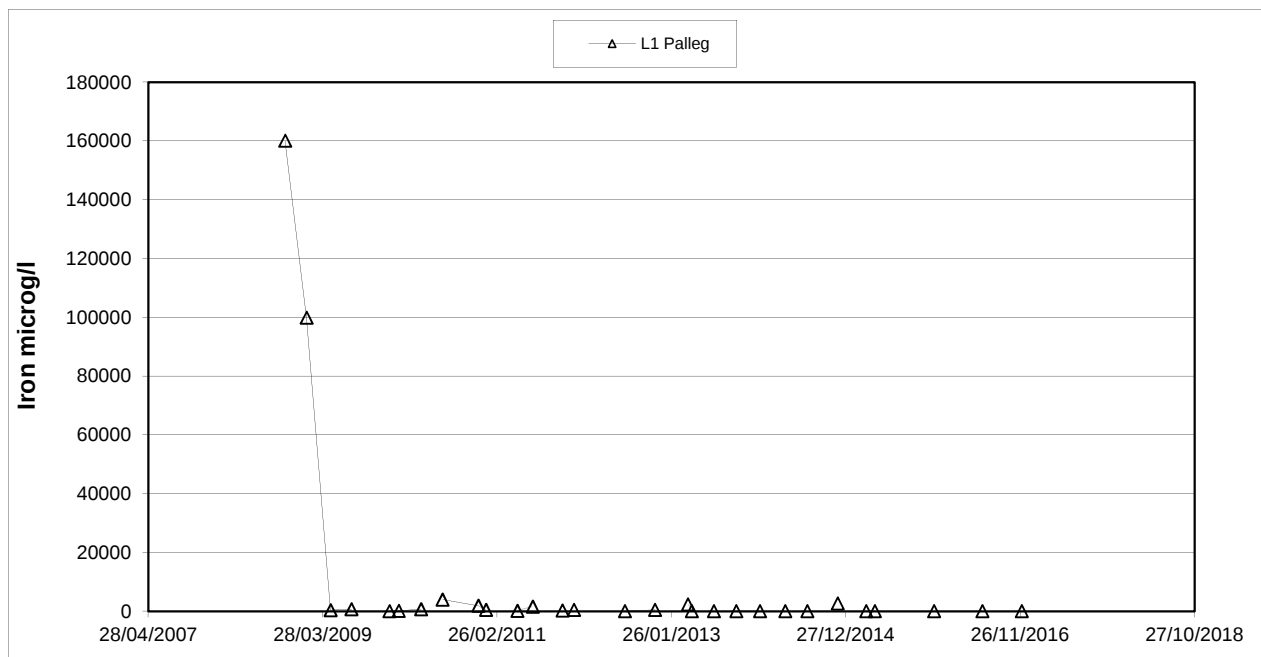












LEACHATE LEVELS

2016												
Level 1												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1		0.20	0.20	0.10		0.10	0.10	0.20	0.10		0.20	0.10
2		0.30	0.00		0.10	0.10		0.20	0.10		0.00	0.10
3		0.20	0.10		0.10	0.10		0.00		0.10	0.10	
4	0.40	0.10	0.10	0.20	0.00		0.10	0.00		0.10	0.10	
5	0.40	0.10		0.20	0.00		0.20	0.10	0.20	0.10		0.10
6	0.10			0.10	0.10	0.10	0.00		0.20	0.20		0.20
7	0.10		0.20	0.10		0.10	0.10		0.10	0.20	0.20	0.20
8	0.20	0.20	0.20	0.10		0.10	0.10	0.20	0.10		0.20	0.20
9		0.30	0.10		0.10	0.10		0.20	0.10		0.00	0.20
10		0.10	0.10		0.10	0.10		0.10		0.30	0.10	
11	0.20	0.10	0.10	0.20	0.10		0.10	0.10		0.30	0.10	
12	0.20	0.20		0.20	0.10		0.10	0.10	0.20	0.10		0.20
13	0.20			0.10	0.20	0.20	0.00		0.20	0.10		0.20
14	0.30		0.20	0.20		0.20	0.00		0.10	0.20	0.20	0.10
15	0.30	0.20	0.20	0.20		0.10	0.10	0.10	0.10	0.20	0.20	0.10
16		0.30	0.10		0.20	0.10		0.20	0.20		0.10	0.10
17		0.10	0.10		0.20	0.10		0.10	0.20		0.10	
18	0.30	0.10	0.20	0.30	0.10		0.10	0.10		0.20	0.10	
19	0.10	0.20		0.30	0.10		0.20	0.10	0.20	0.00		0.10
20	0.10			0.10	0.10	0.20	0.20		0.20	0.10		0.20
21	0.10		0.30	0.10		0.30	0.30		0.10	0.10	0.20	0.10
22	0.10	0.20	0.30	0.10		0.00	0.30	0.10	0.10		0.20	0.10
23		0.30	0.10		0.20	0.10		0.20	0.10		0.10	0.10
24		0.10	0.10		0.20	0.10		0.10		0.10	0.10	
25	0.20	0.10	0.10	0.20	0.00		0.30	0.10		0.20	0.20	
26	0.20	0.10		0.20	0.10		0.30	0.20	0.20	0.10		
27	0.10			0.10	0.10	0.20	0.10		0.20	0.10		
28	0.10		0.20	0.10		0.20	0.10		0.10	0.20	0.20	
29	0.10	0.10	0.20	0.10		0.00	0.10	0.20	0.10		0.20	
30			0.10		0.20	0.00		0.20	0.10		0.10	
31			0.10		0.20					0.10		

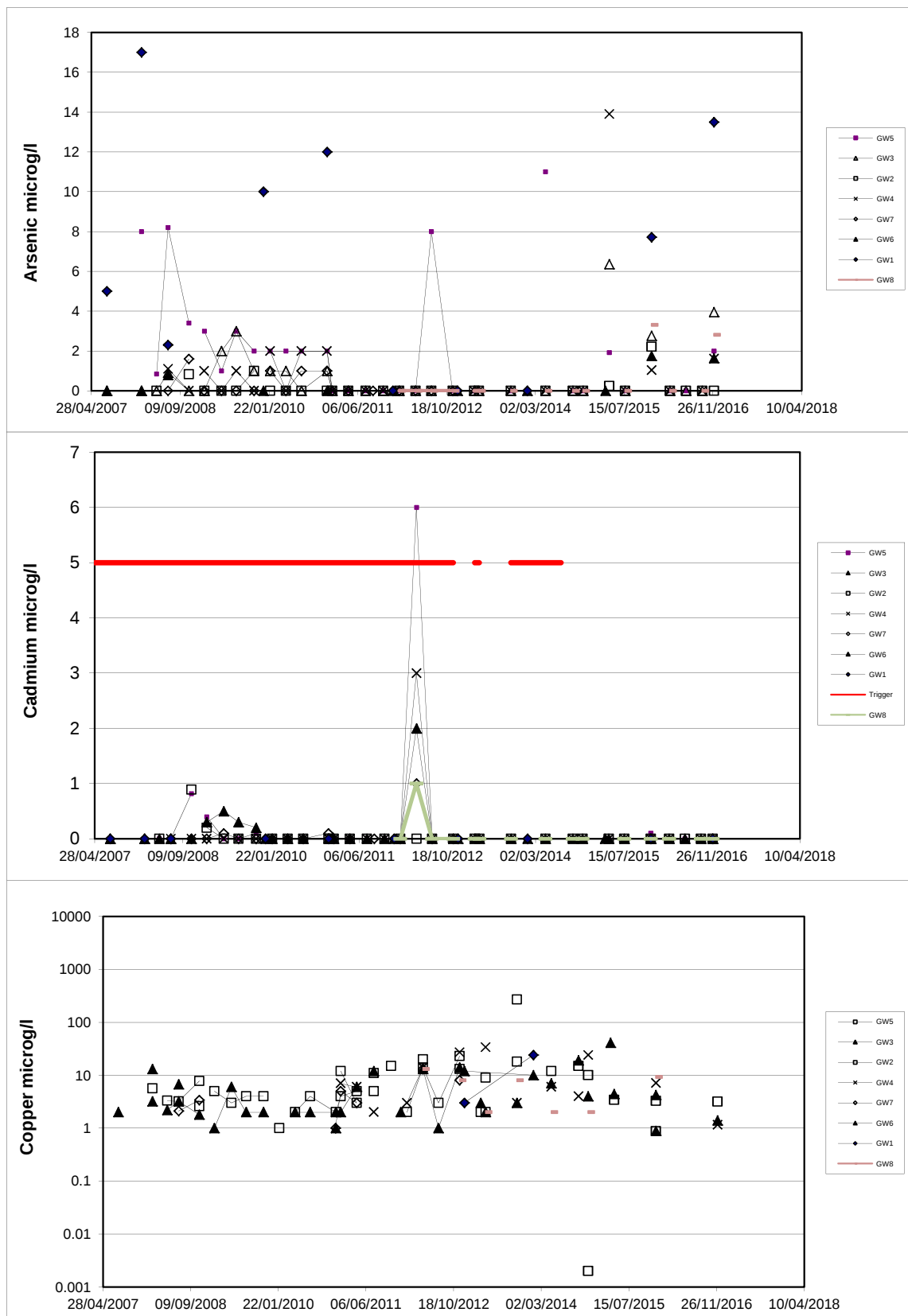
**PALLEG LANDFILL
LOWER CWMTWRCH**

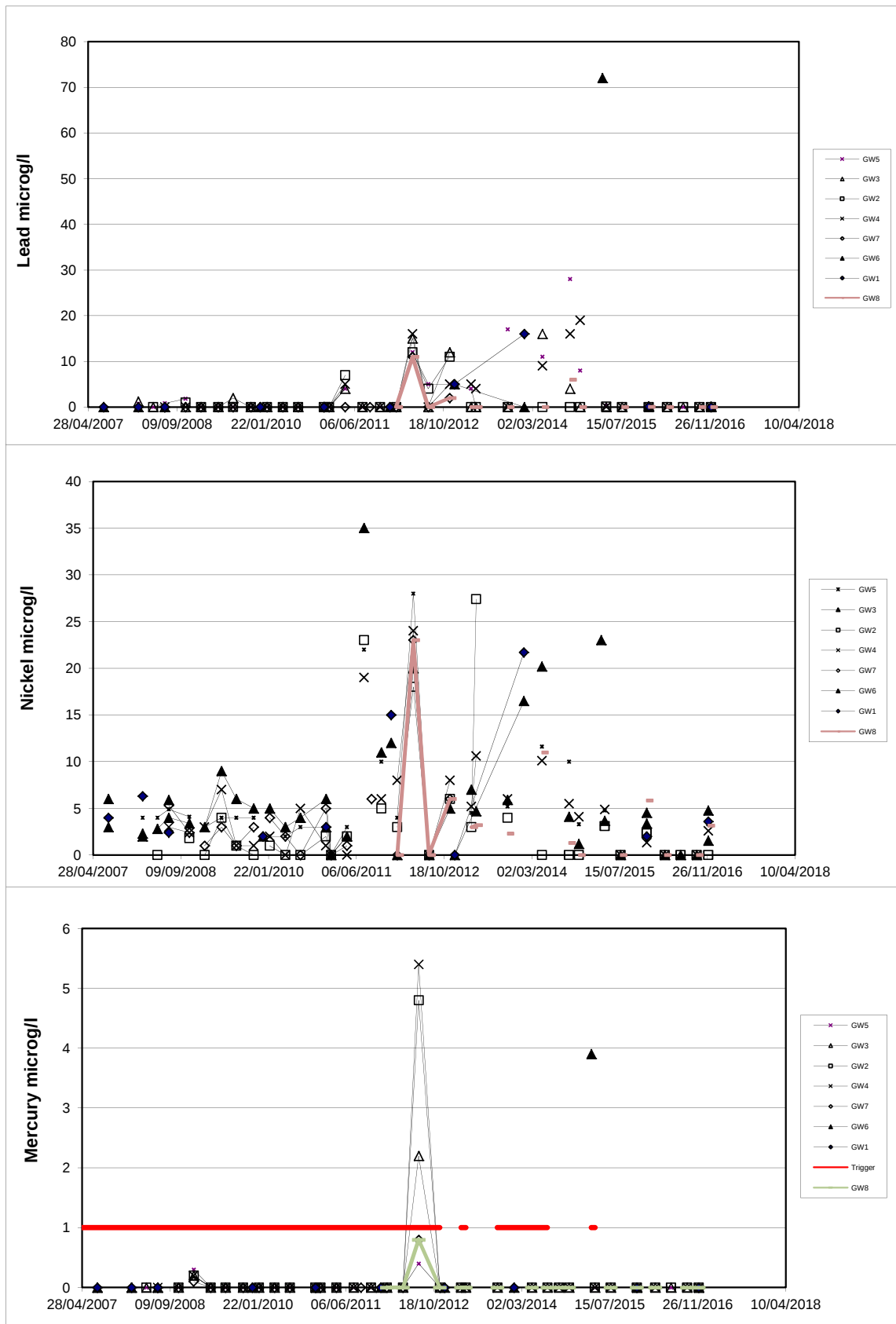
PERMIT BT19081X

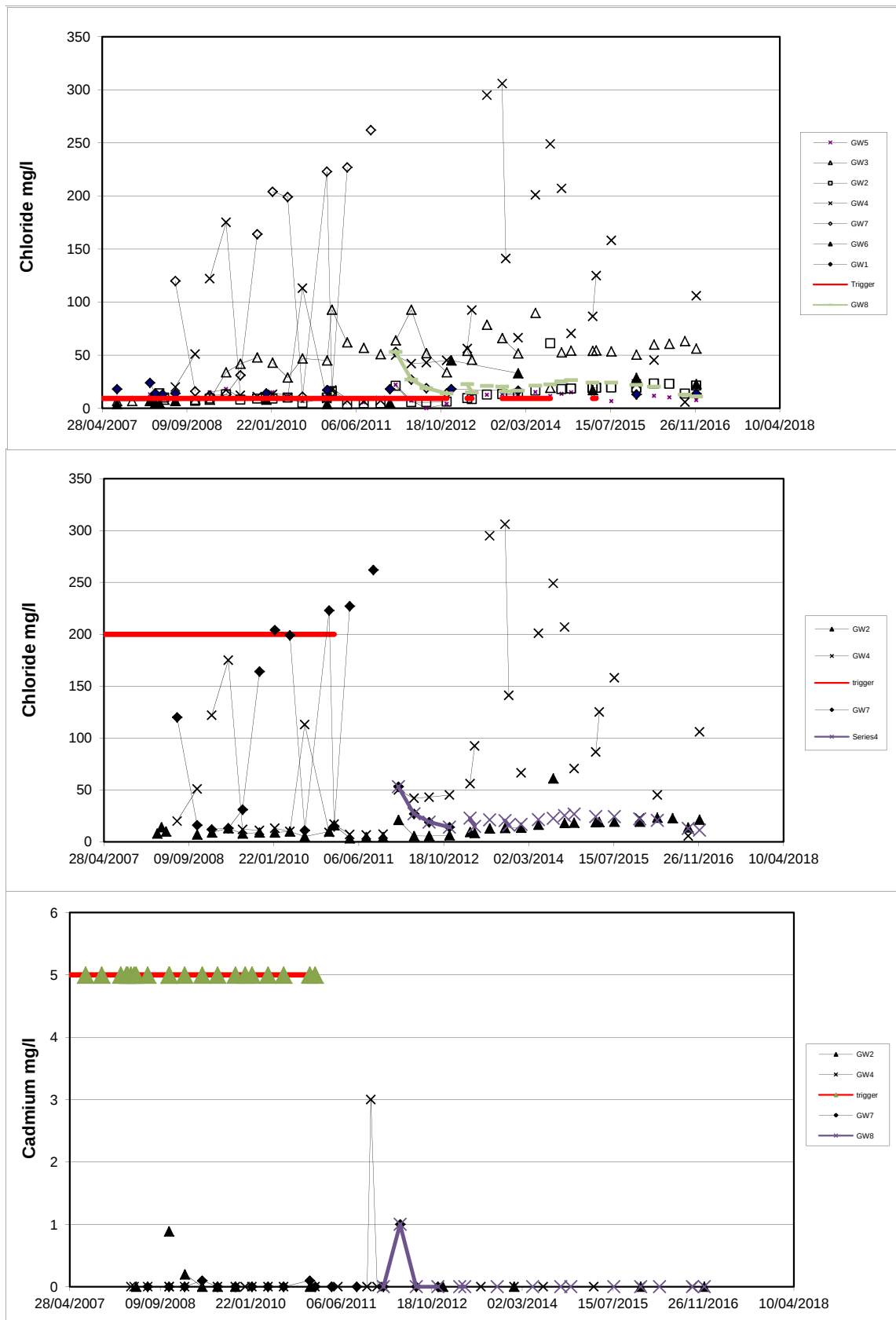
**Review of 2016
Landfill Monitoring**

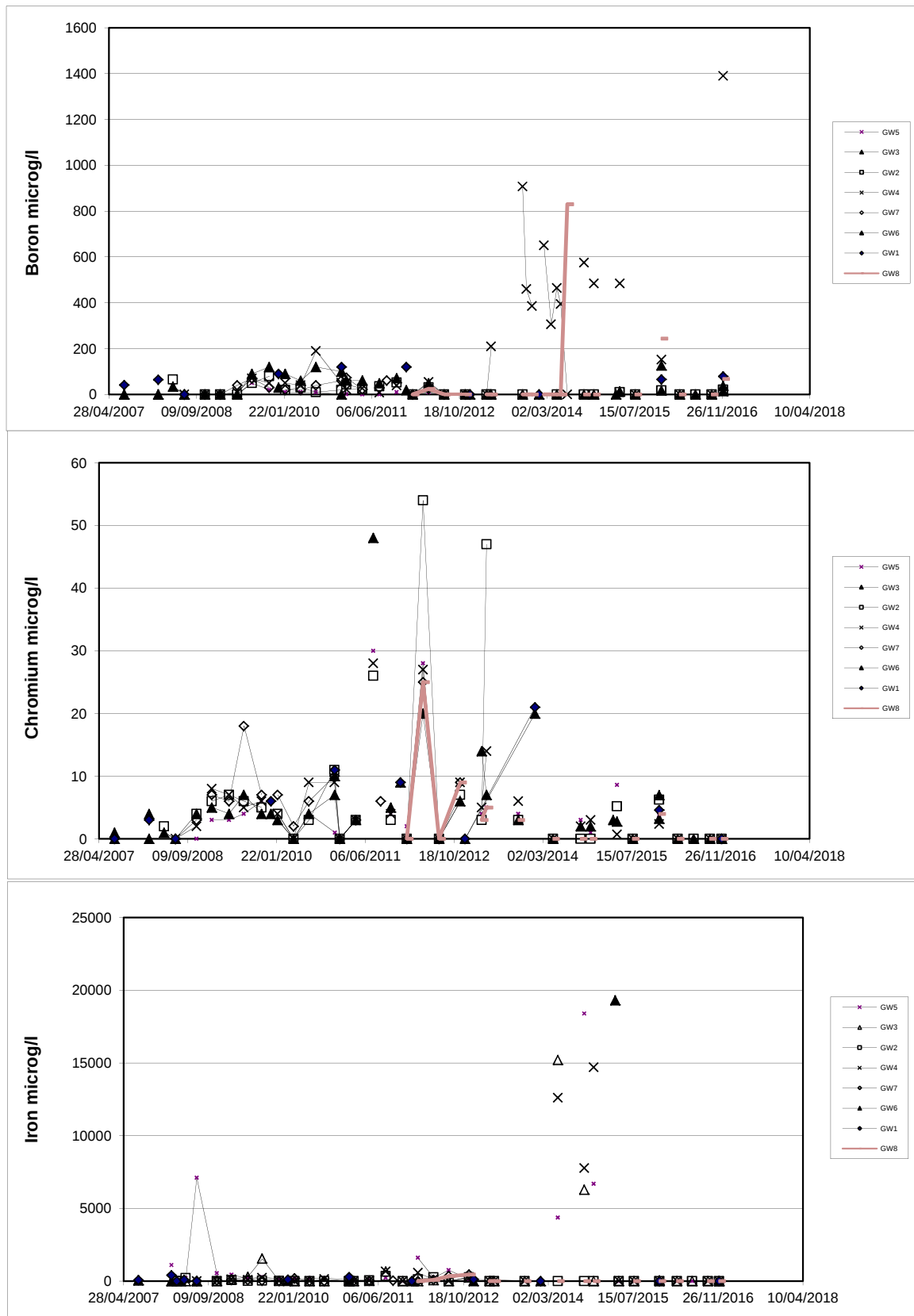
**Appendix 4
Summary of
Groundwater Monitoring
Data**

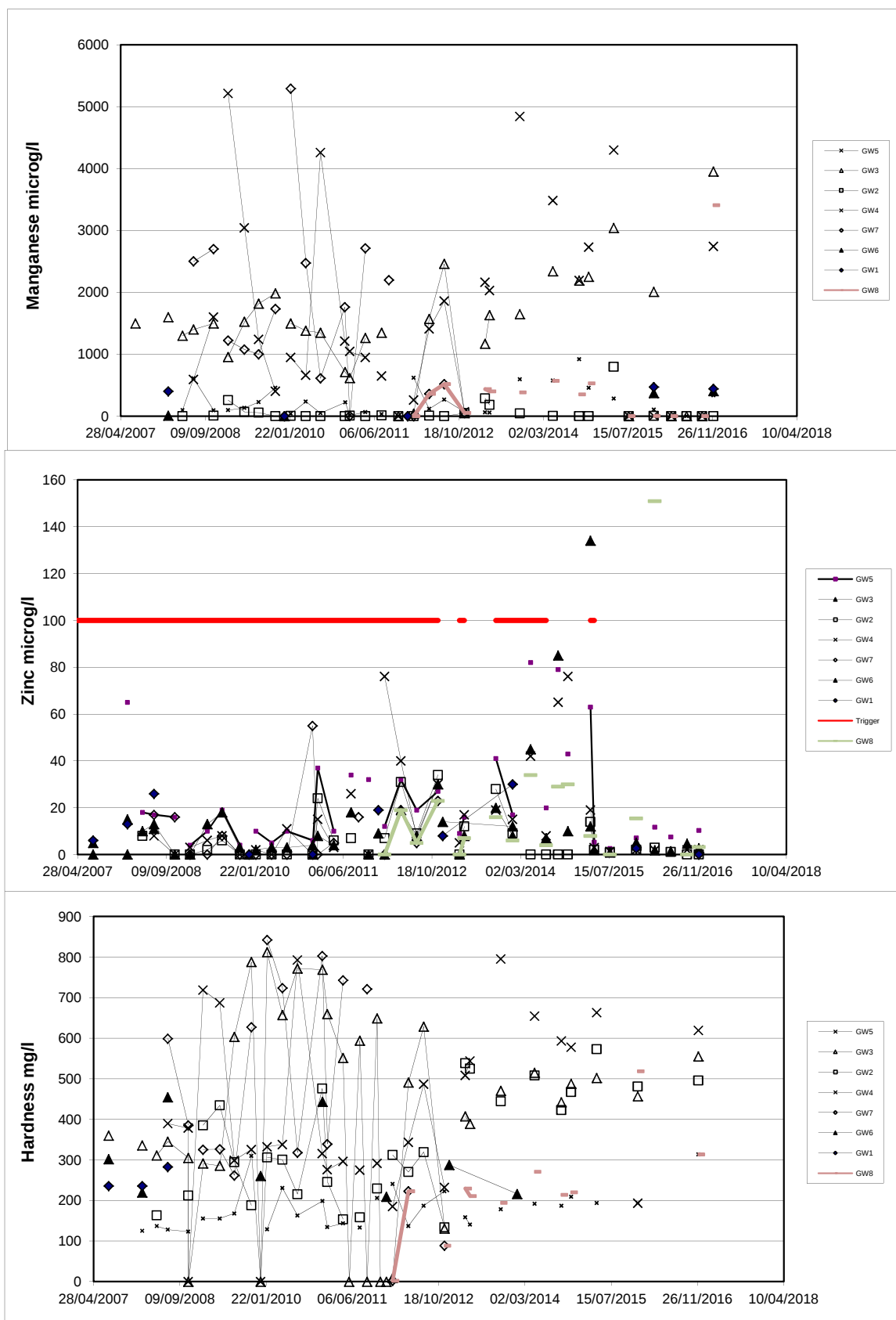
Report Number 1553r1v1d0117

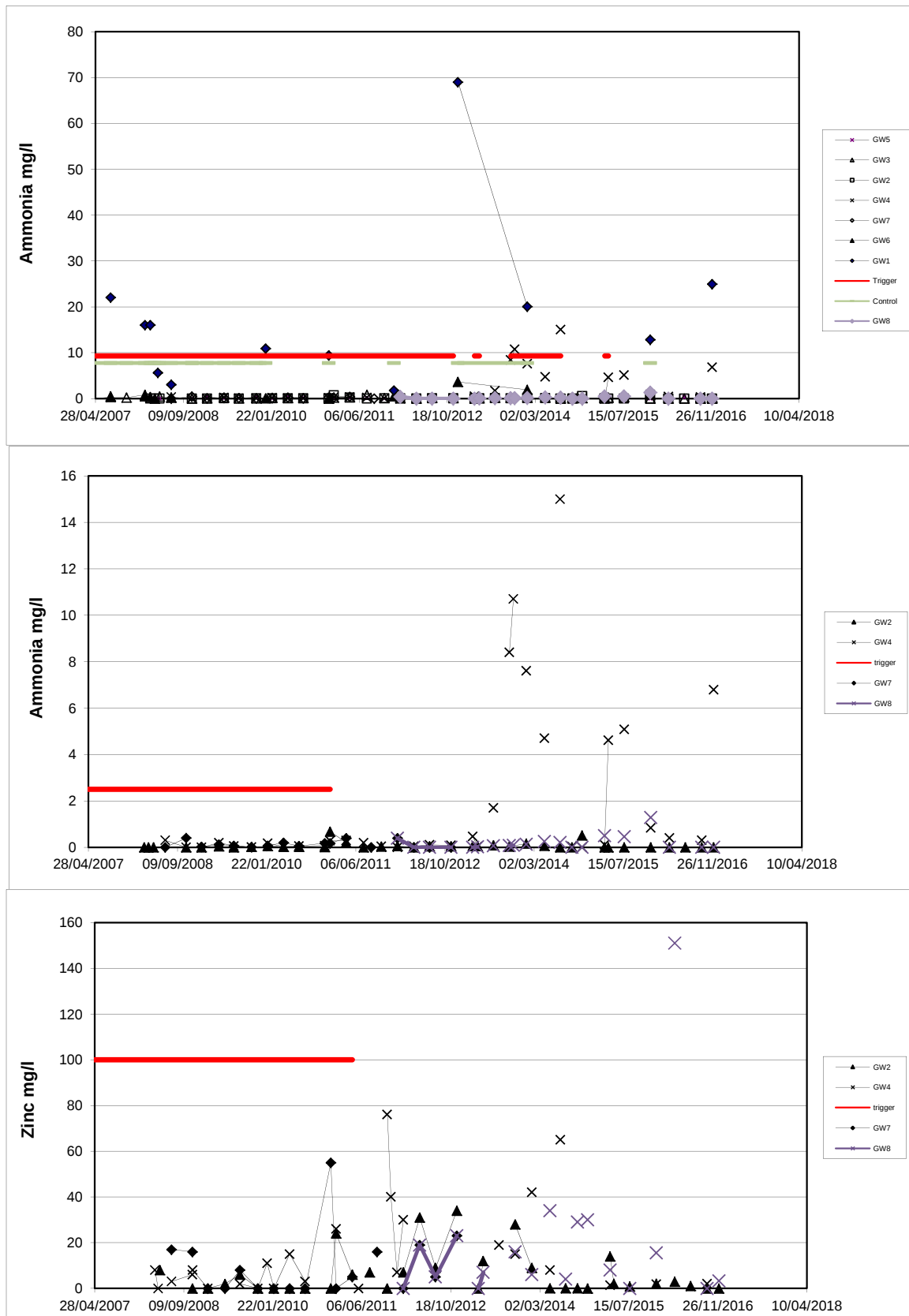


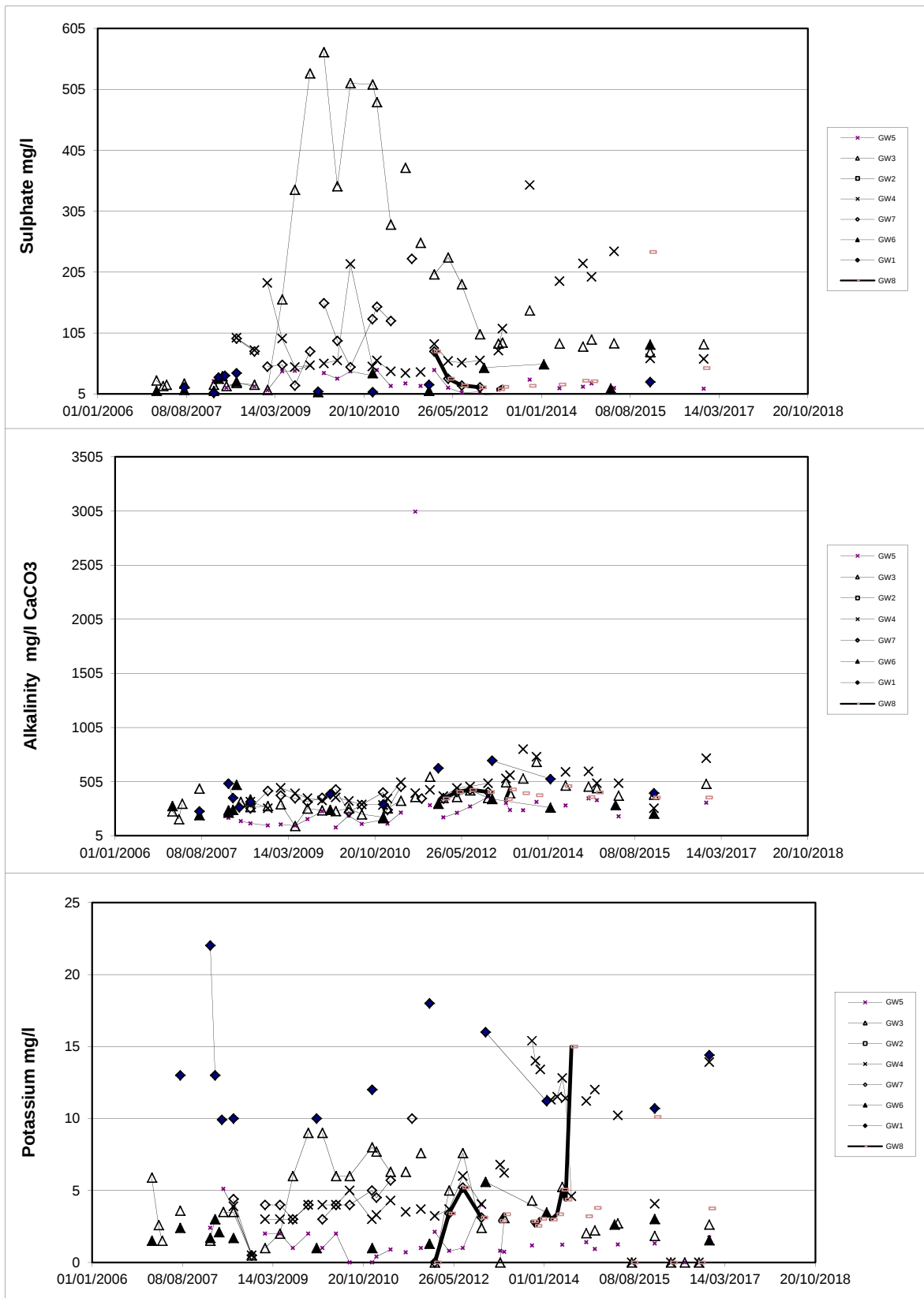


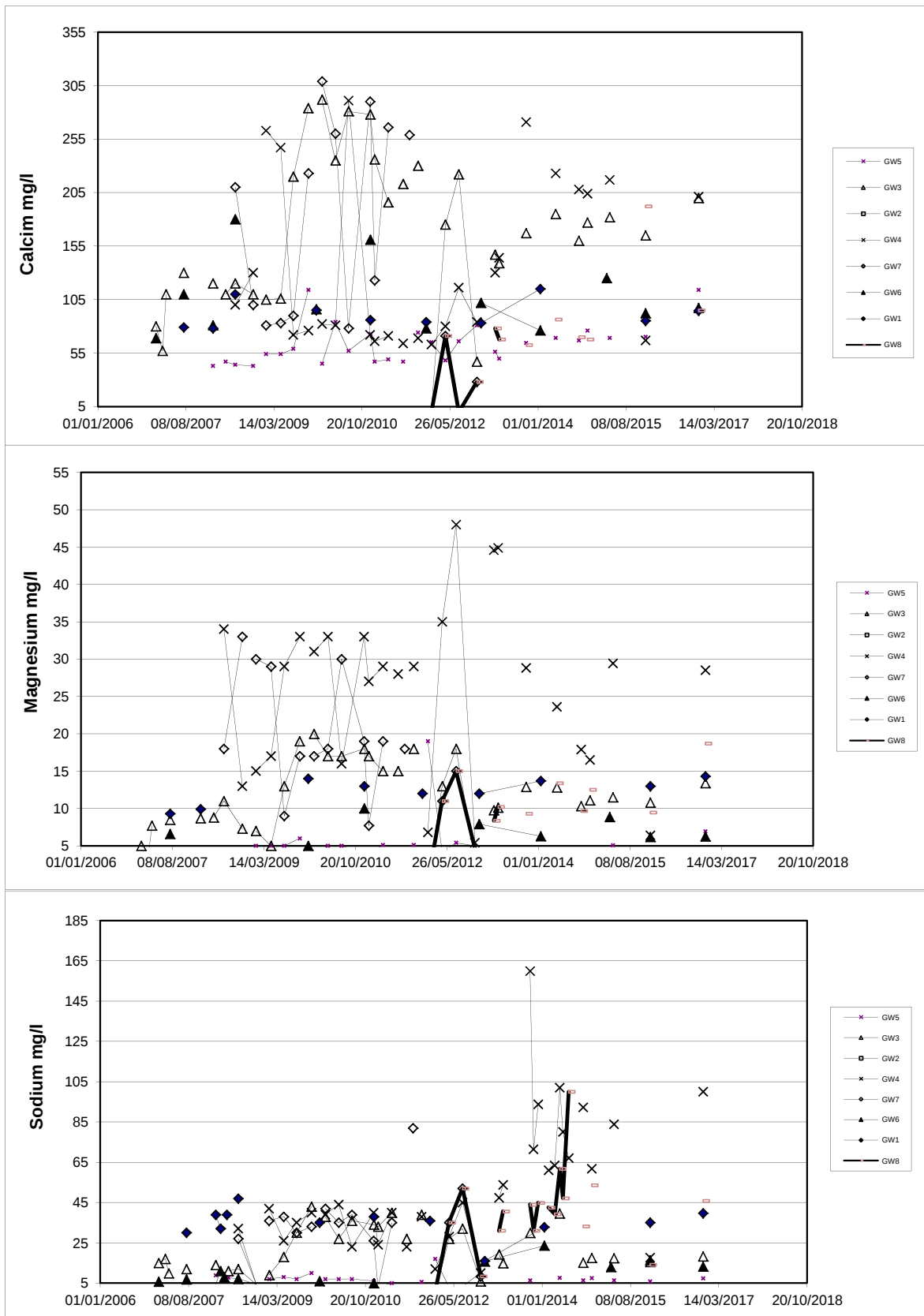


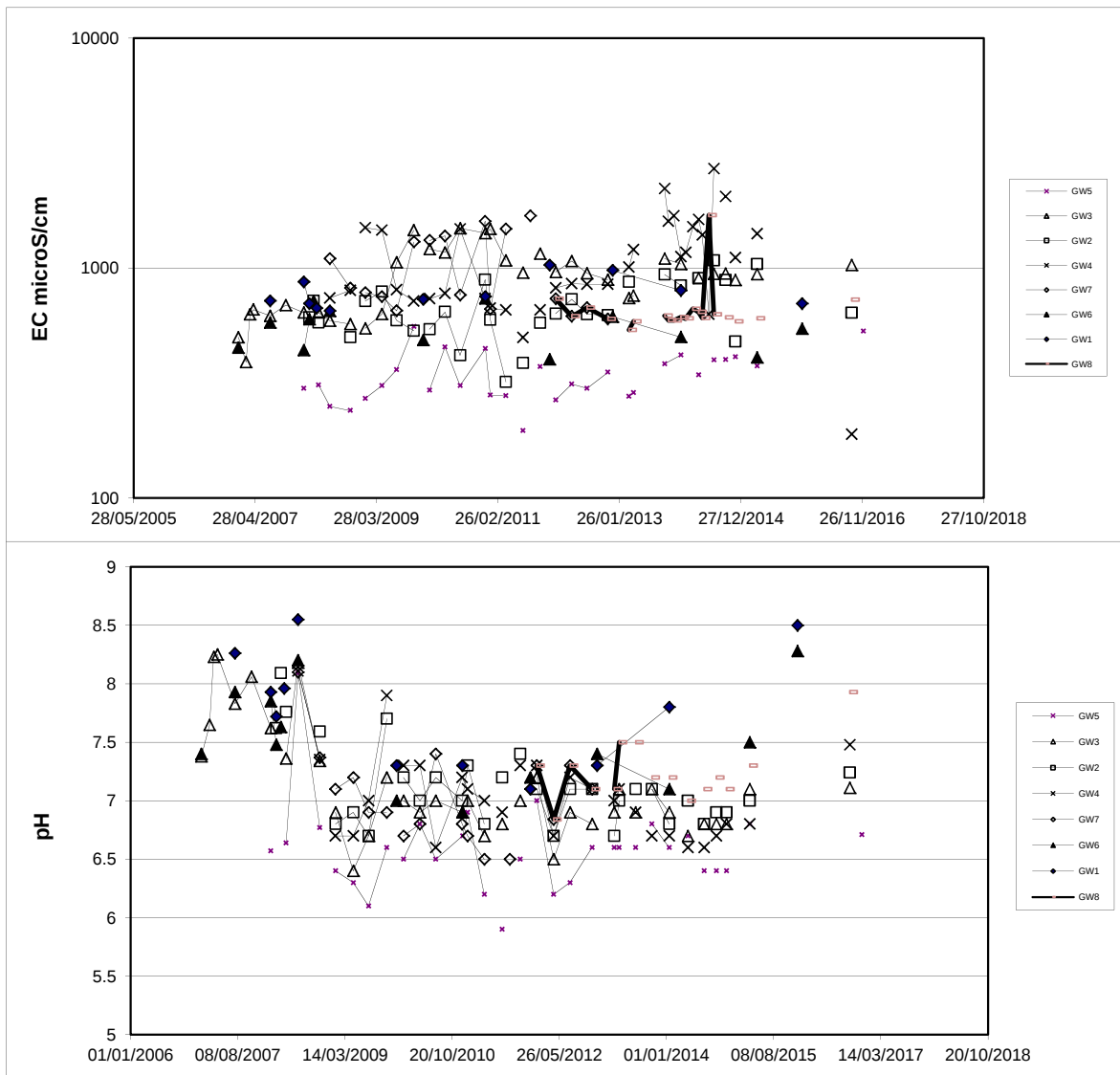












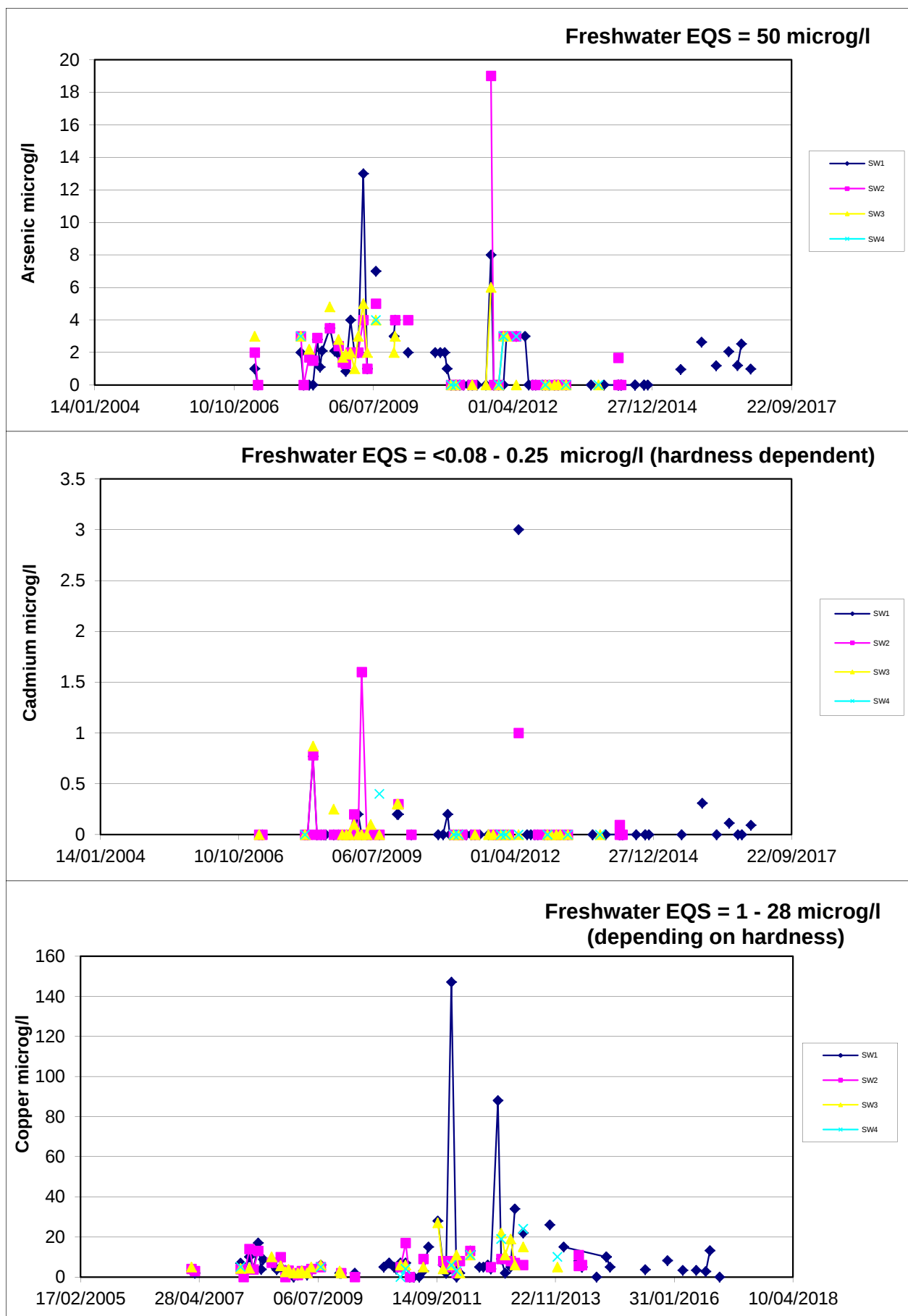
**PALLEG LANDFILL
LOWER CWMWTRCH**

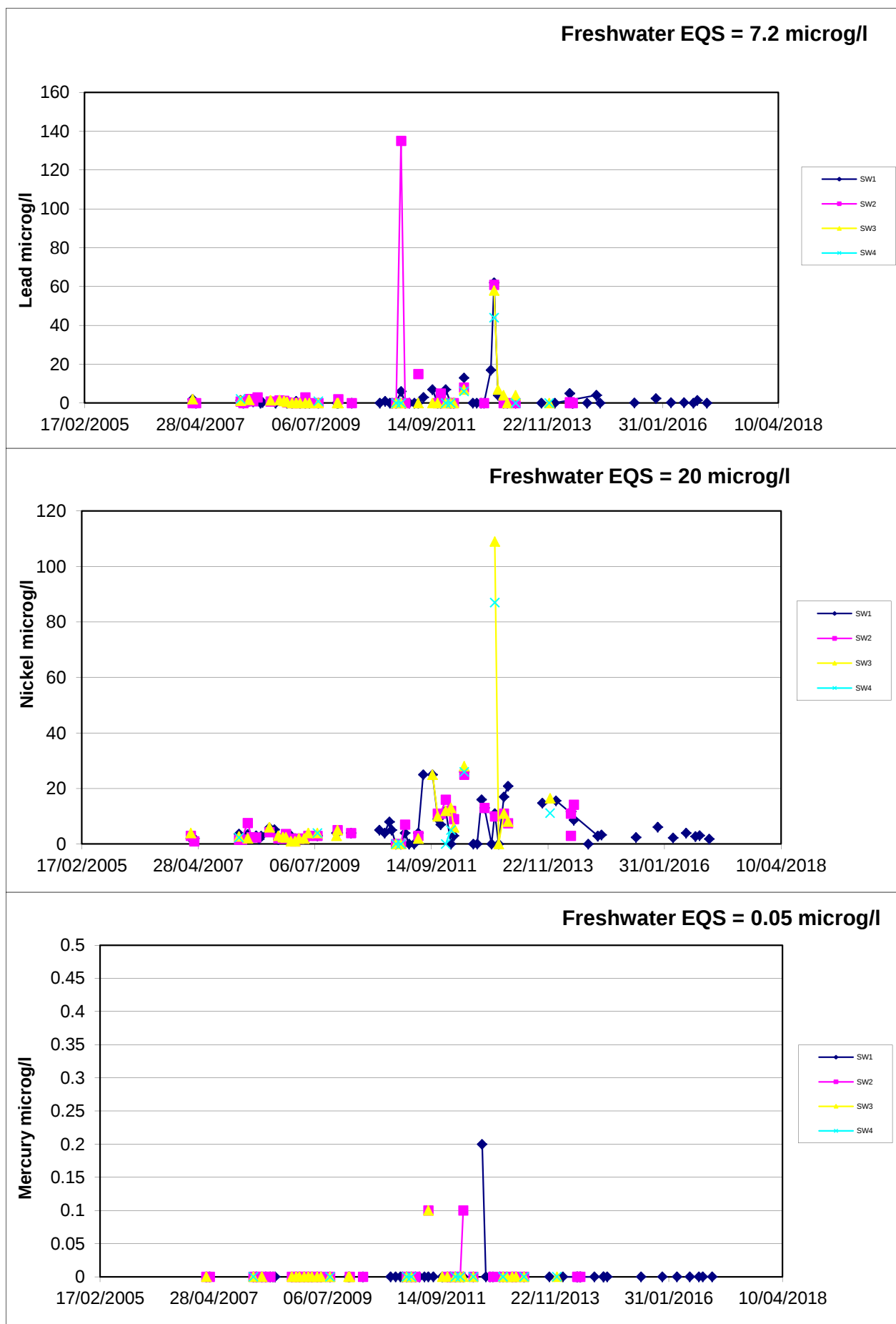
PERMIT BT19081X

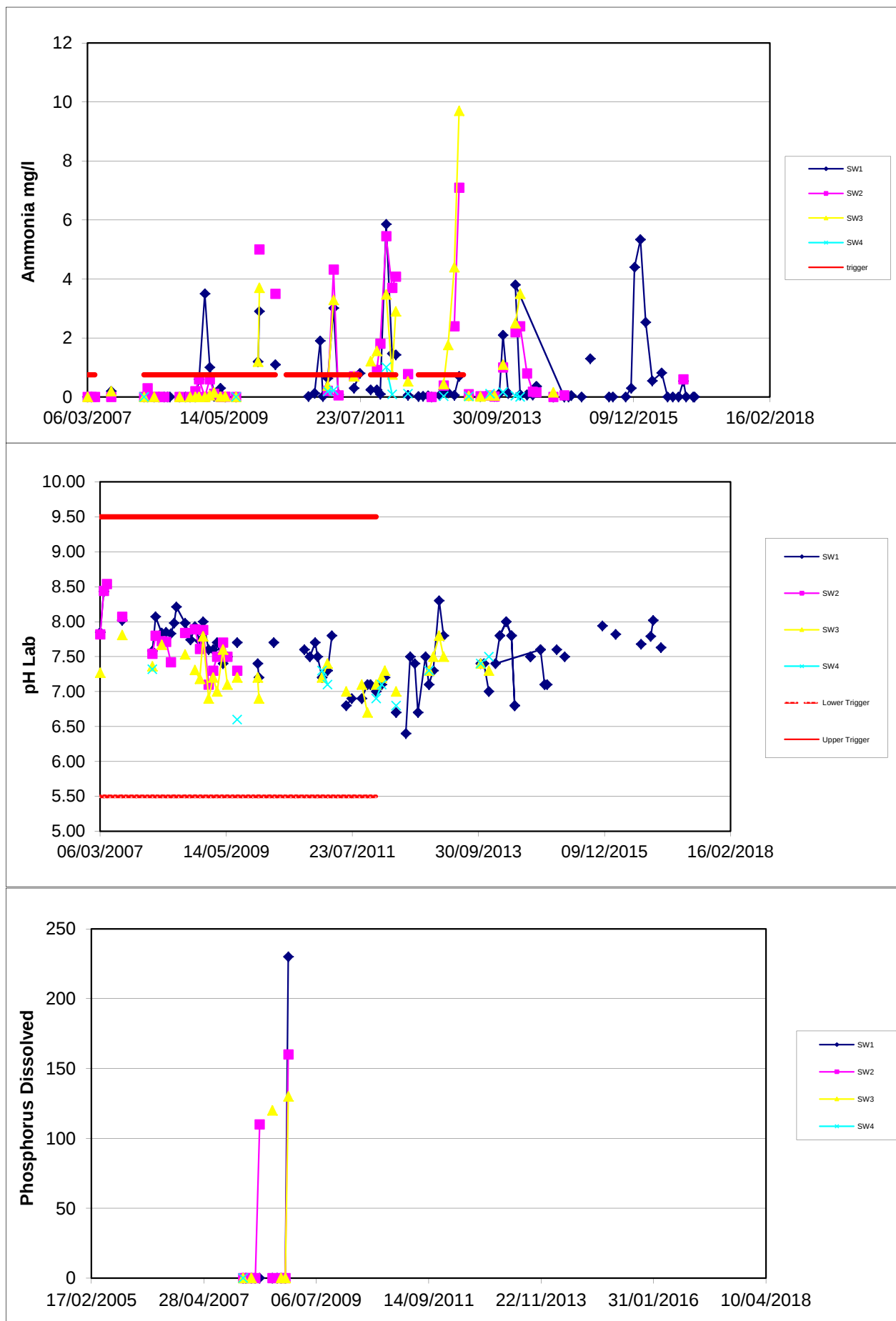
**Review of 2016
Landfill Monitoring**

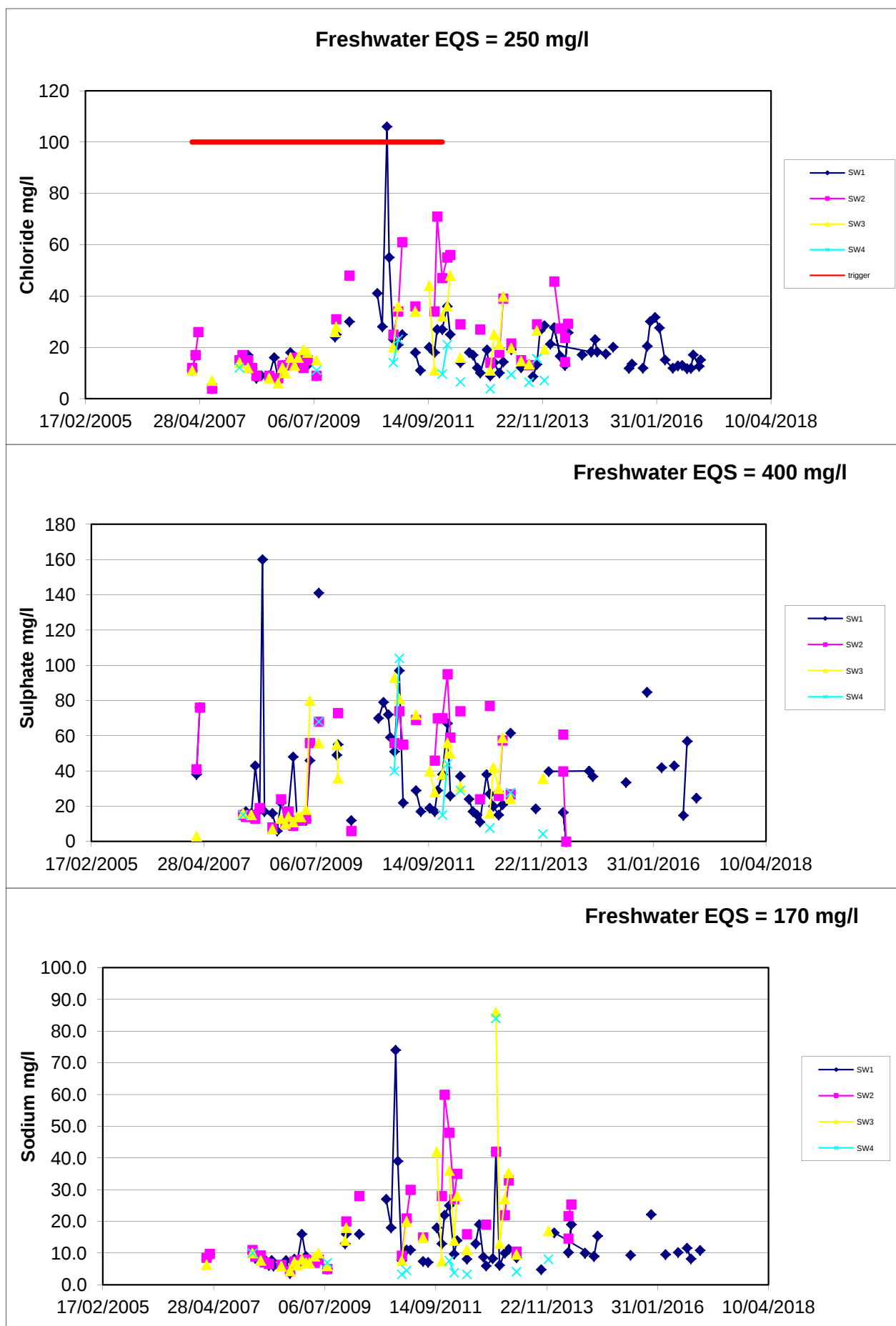
**Appendix 5
Summary of Surface
Water Monitoring Data**

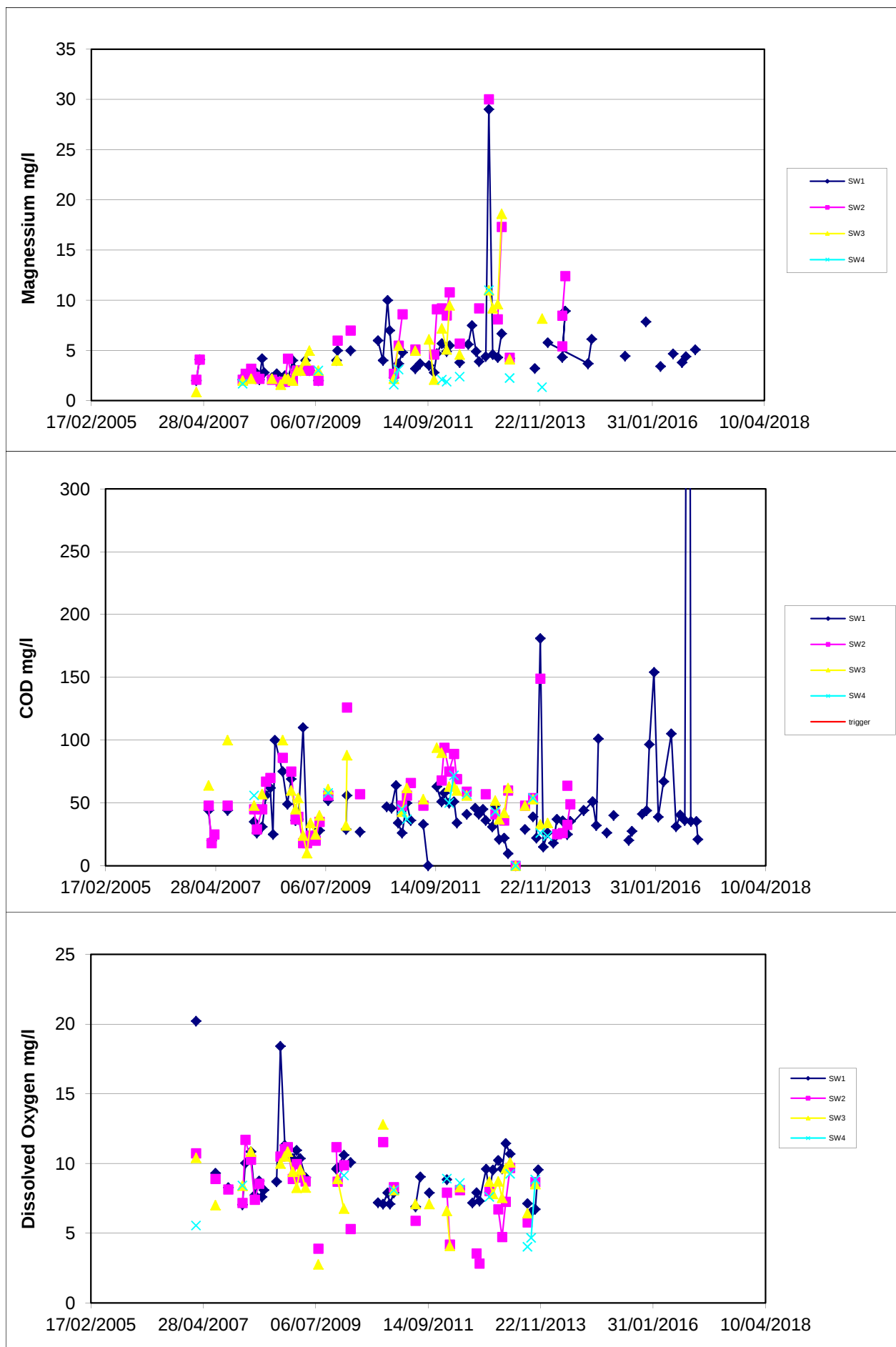
Report Number 1553r1v1d0117

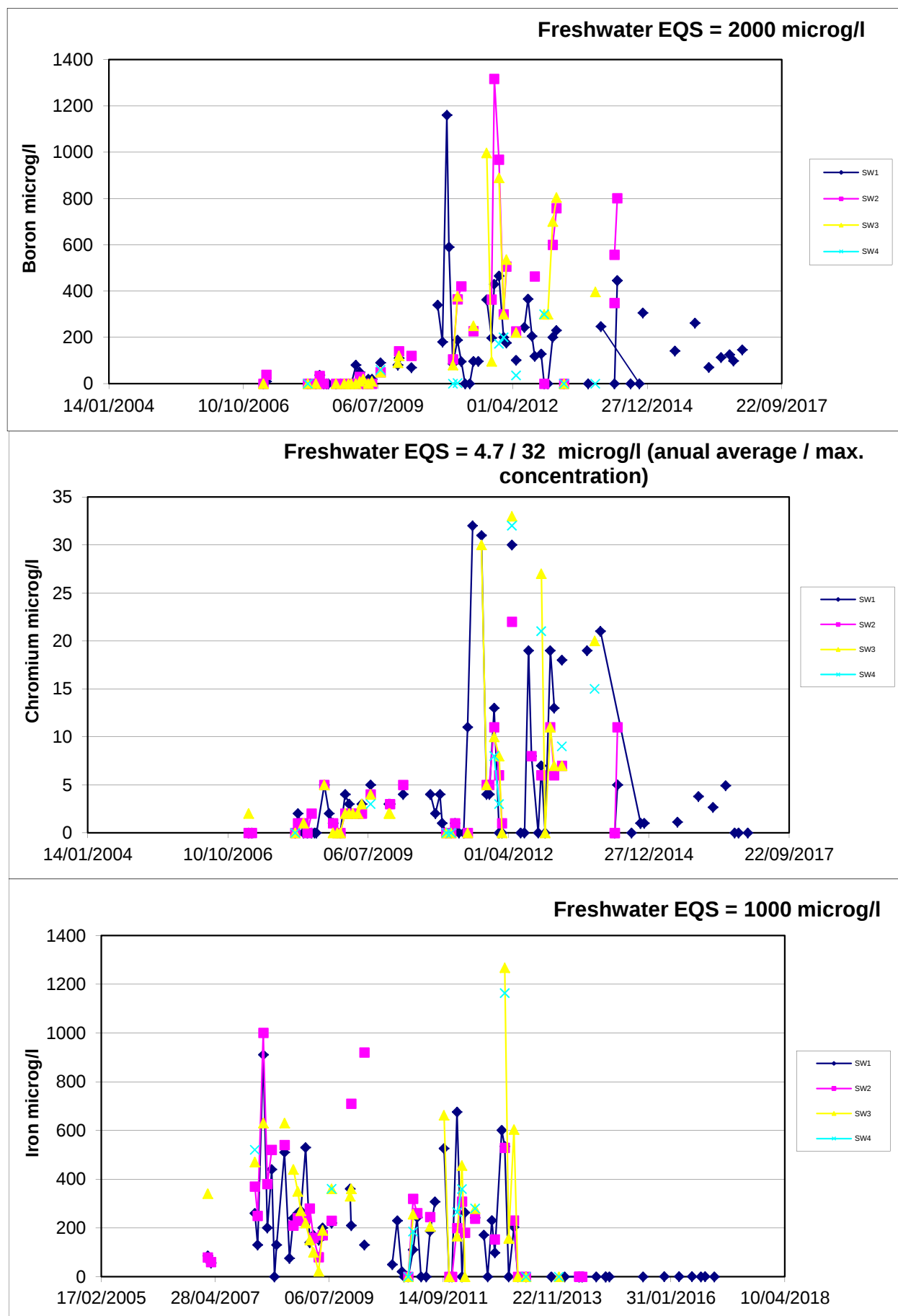


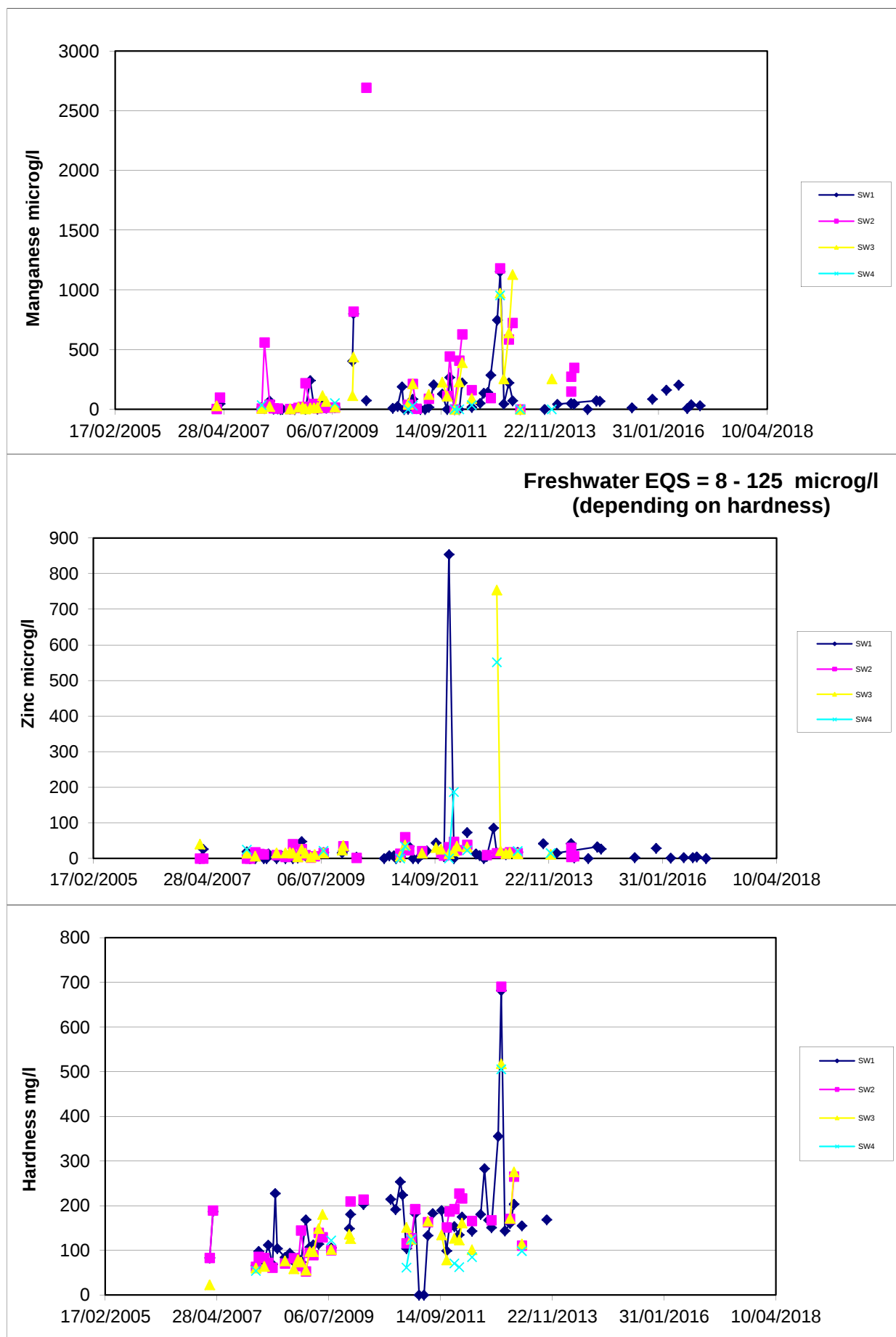


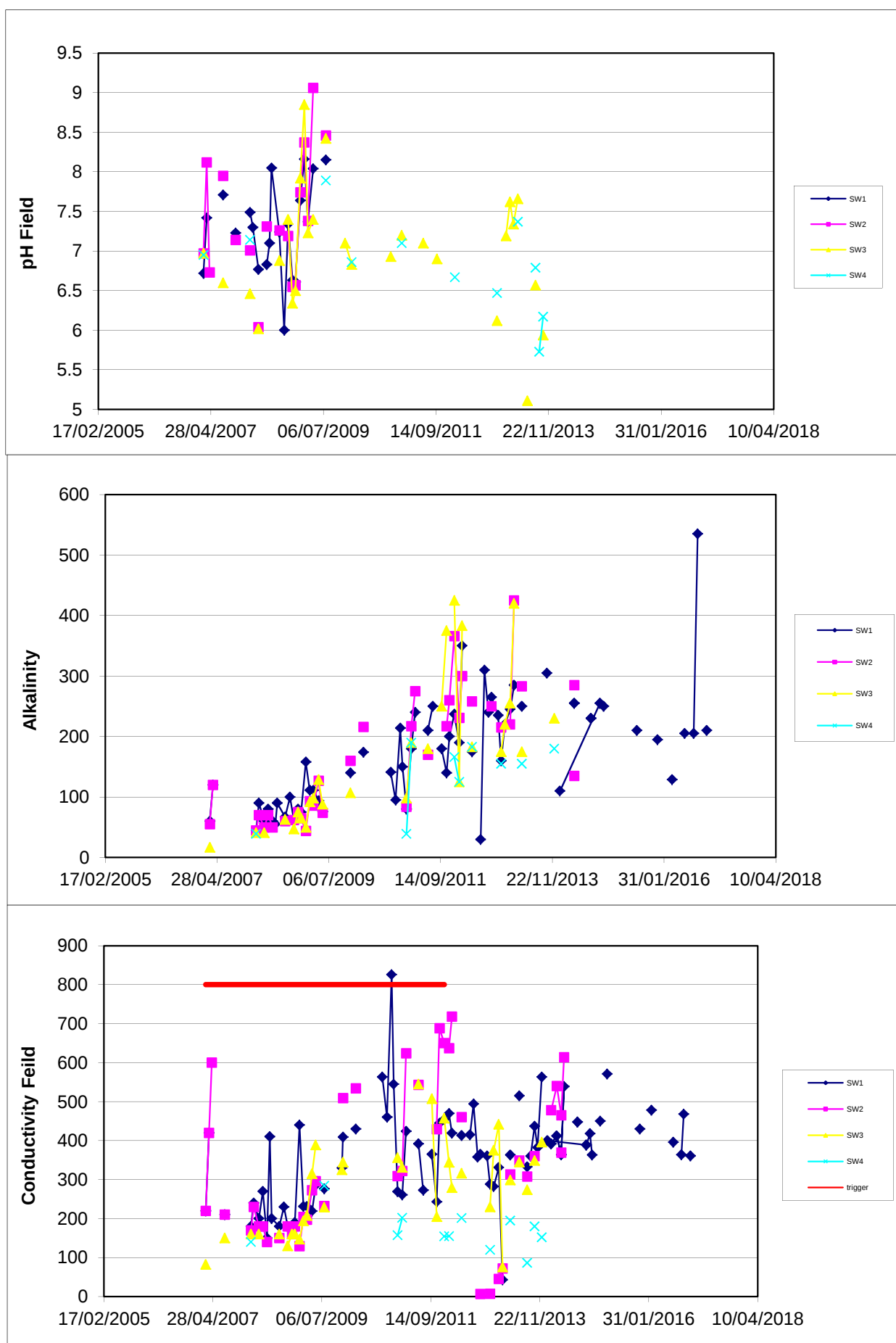


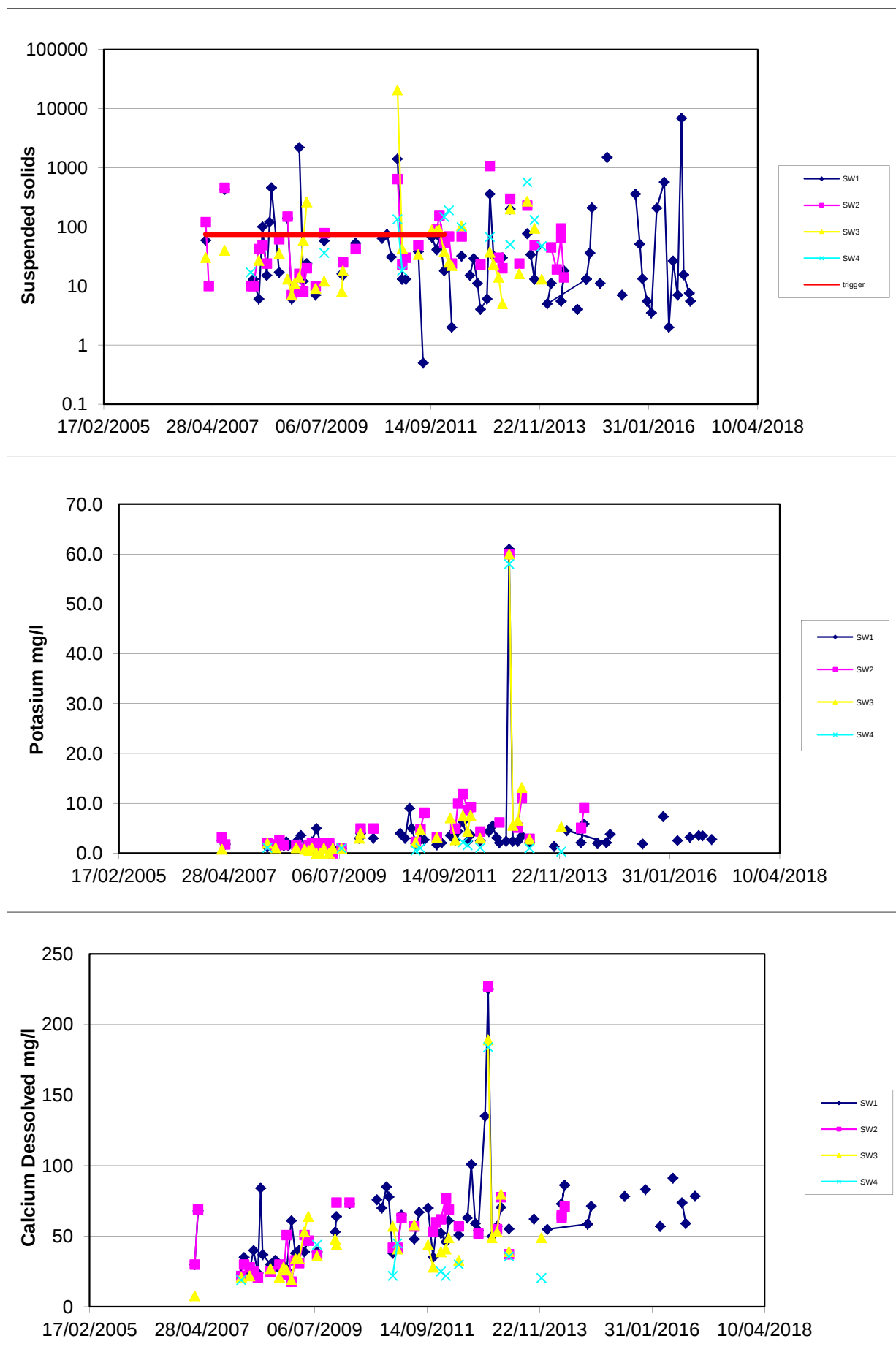


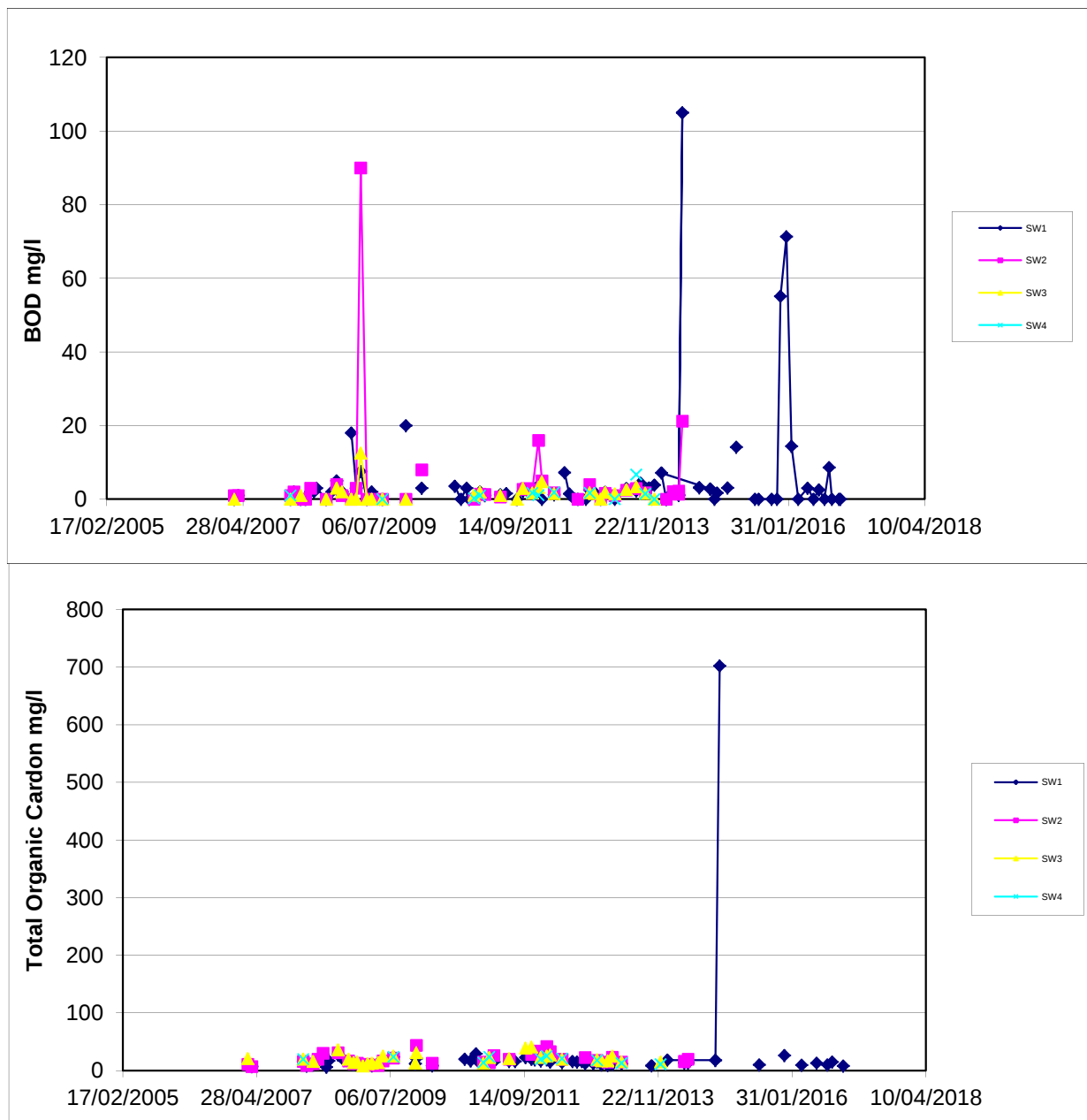












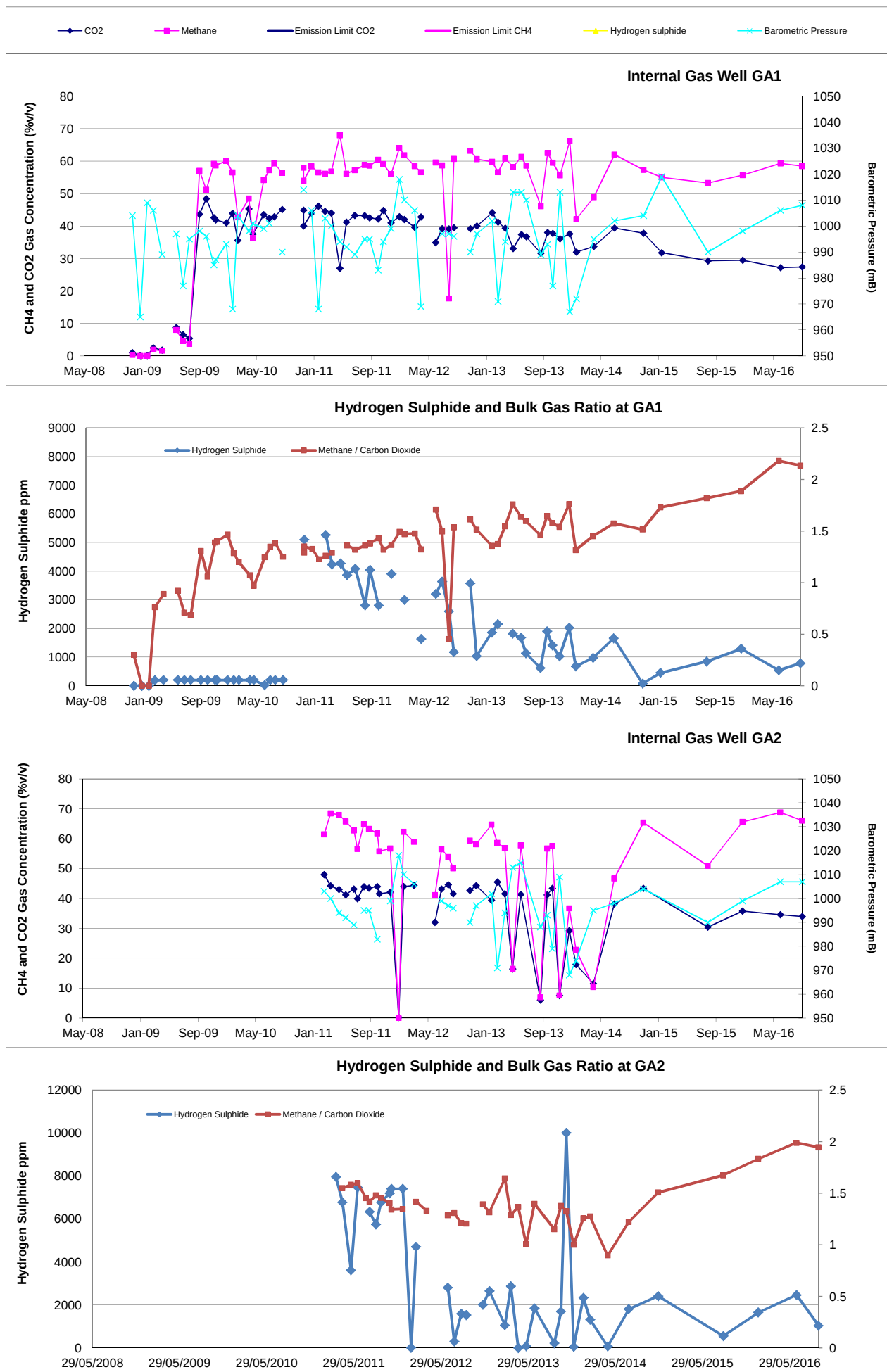
**PALLEG LANDFILL
LOWER CWMWTRCH**

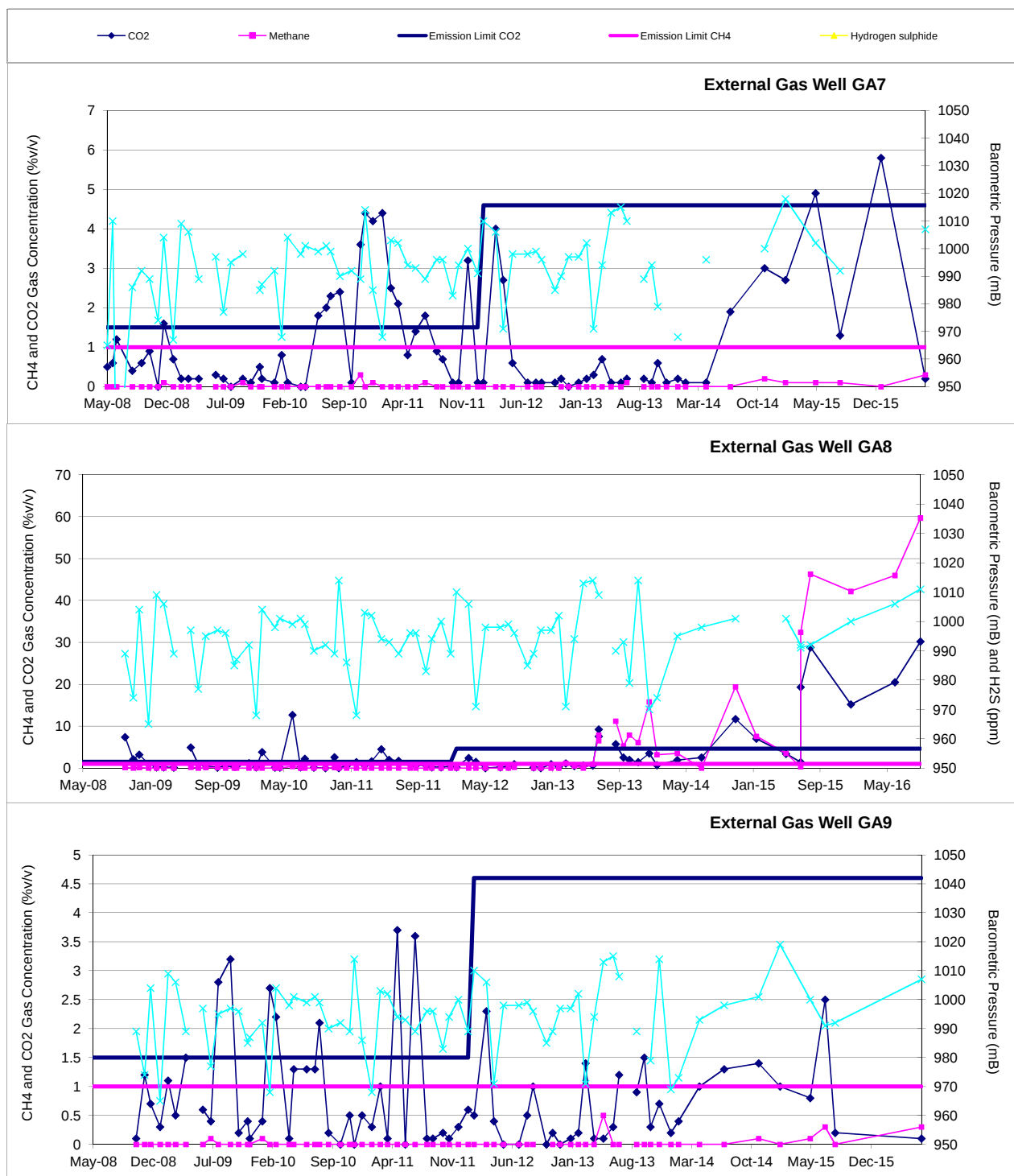
PERMIT BT19081X

**Review of 2016
Landfill Monitoring**

**Appendix 6
Summary of Gas
Monitoring Data**

Report Number 1553r1v1d0117







Geotechnical &
Environmental Services

Ty Coed
Cefn-yr-Allt
Aberdulais
Neath SA10 8HE

T 01639 775293
F 01639 779173

enquiries@geotechnology.net
www.geotechnology.net