PALLEG LANDFILL
LOWER CWMTWRCH

PERMIT BT19081X

Review of 2015 Landfill Monitoring

Report Number 1429r1v1d0116

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Table of Contents

List of Tables

List of Figures

List of Appendices

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 sub-cells in the same leachate infrastructure.

The site is situated at Palleg Road, Cwmtwrch at OS Grid Reference SN 7739 1136 (see Figure 1). The 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/BT1908IX/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 eighth 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 2015.

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)*

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 Plan for Sub-cell 5, which is likely to be required during 2016.

At this stage, key aspects of site development include the construction of a new surface water management scheme including a new sedimentation and balancing lagoon (Geotechnology reports 1141r2v1d1211 Infilling Proposals and 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. Geotechnology is not aware of any NRW feedback on the most recent HRA.

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 alcathene 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 I closed landfill, where the side slopes were excavated into weathered brown till (ablation till). The floor of Phase I 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 x $10^{-7}ms^{-1}$ 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 2.6e-^{11}m/s, most likely value of 3.4e-^{10}m/s and maximum value of 1.7e-^{08}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 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 with the current layout shown in Figure 3. 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	CQA Plan for Sub-cell 5 to be submitted to NRW

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.

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 (see Figure 3). 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. A graphical assessment of the monthly leachate levels measured by JLA and provided to Geotechnology during the compilation of this report is shown in Figure 4.

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

Progressive Restoration and Capping

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 top soil 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 5. However, as the new surface water management infrastructure is not yet fully constructed, this discharge location is not yet 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 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 6.

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.

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 2009, monitoring at GA1, the in-waste gas monitoring borehole, revealed levels of H_2S and CO beyond the calibrated limit of the GA2000 instrument currently used by Geotechnology. As a result, Tedlar gas bag samples were collected for a short period. All gas monitoring is now undertaken using a GA5000 instrument, purchased by Geotechnology, which has higher detection levels.

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.

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 is once again undertaking 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 2015 are provided in Appendix 2. Each laboratory uses very similar techniques and is accredited by the same organisation.

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.

Plans are in place to extend the headworks at GW4 and GW8 to enable filling of the valley between the active Phase II landfill and the closed Phase I landfill with inert materials. Ahead of these works, JLA should ensure that the headworks are protected from damage and that surface run-off cannot directly enter the wells.

6 ANNUAL TOPOGRAPHIC SURVEY

6.1 Waste Settlement

Topographic surveys are completed each year. The two most recent topographic surveys of the landfill, completed on 22 January 2015 and 06 December 2015 are provided in Figures 7 and 8. The January 2015 survey was undertaken by Geotechnology using a GPS survey instrument with triple constellation receiver (Topcon model GR-3). The more recent survey has been completed using an unmanned aerial vehicle (UAV) with survey control established using the GPS system. The UAV data was then used together with ground control points to create a digital terrain model. This method of surveying collects data points at significantly closer intervals than methods previously used and is therefore able to create a more detailed topographic model, as shown in Figure 8. The technique also provides detailed aerial imagery with the latest aerial image of the site presented in Figure 9.

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
Total Capacity (m^3)	138607	135009*	135009
Waste Volume Landfilled (m^3)	67478	85380	106662
Total Remaining Capacity (m^3)	71129	49629	28347
% Available	51.3	36.76	21.00
* Since 2013 Sub-cell 4 has been completed. The as-built profile of this sub-cell differs slightly from the design as the base is at a slightly higher elevation. As a consequence the total landfill capacity is slightly reduced compared to the capacity calculated in 2013.			

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. A graphical assessment of the monthly leachate levels measured by JLA and provided to Geotechnology is shown in Figure 4. The data provided to Geotechnology reveals that leachate levels have been maintained at low levels for several years.

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 more dilute than in recent years.

Non-hazardous trace metals remained at very low levels during 2015 and no hazardous trace metals, such as cadmium and mercury, have been detected above the level of analytical detection since 2010. This data suggests the landfill leachate is not a significant source of metals, most likely because they are being bound into the waste through adsorption and secondary precipitation. If such precipitates are sulphides, this mechanism would also provide an explanation for the low sulphate levels observed. 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

		Min	Max	Average	Max 2014	Max 2015	EQS
pH		5.04	7.64	7.0	7.6		6.5-8.5
Conductivity	microS/cm	12	13100	5469.0	5840		
Chloride	mg/l	17	1116	493.1	687	462	250
Sulphate (soluble)	mg/l	8.26	955	144.9	126	189	400
Total Alkalinity as CaCO3	mg/l	137	6400	3409.6	5300	3200	
Potassium Dissolved	mg/l	2.76	462	161.4	207	158	
Sodium Dissolved	mg/l	8.5	766	282.8	503	504	170
Calcium Dissolved	mg/l	28	620	216.4	253	231	
Magnesium Dissolved	mg/l	3	89.3	54.1	89.3	66.2	
BOD	mg/l	4	2600	246.4	203	161	
COD	mg/l	15	6150	943.7	2000	910	
Total Organic Carbon	mg/l	6.91	1830	531.2	710	327	
Total Oxidised Nitrogen as N	mg/l	0.085	412	75.2	67.8	0	
Ammoniacal Nitrogen as N	mg/l	0.02	2600	431.0	900	531	<2.5
Nitrate as NO3	mg/l	0.04	300	31.5	300	0.362	
Nitrite as NO2	mg/l	0.03	0.17	0.1	0.15	0	
Arsenic Dissolved	ug/l	2	358	84.0	358	512	50
Boron Dissolved	ug/l	6.11	14100	5548.5	11400	10100	2000
Cadmium Dissolved	ug/l	0.2	0.5	0.3	0	0	<0.25
Chromium Dissolved	ug/l	2	425	117.9	421	110	4.7
Copper Dissolved	ug/l	1	111	14.9	13	2.37	1 (bio)
Iron Dissolved	ug/l	10	160000	16203.5	2650	0.136	1000
Lead Dissolved	ug/l	2	42	9.9	42	0.611	7.2
Manganese Dissolved	ug/l	53	11000	1065.0	454	361	123
Nickel Dissolved	ug/l	3	276	60.6	237	51.4	20
Zinc Dissolved	ug/l	4	302	48.3	61	10.8	10.9 (bio)
Mercury Dissolved	ug/l	0.1	0.4	0.2	0	0	0.05

The BOD/COD ratio has remained below 0.1 for the past few years suggesting that the leachate contains a small component of active biodegradable matter, although a small increase was detected in the latter part of 2015. Ammonia was also slightly more variable than recent years with 531 mg/l detected in the sample collected in April and 365 mg/l in December 2015. 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 since this time was below 12 mg/l in the other samples collected in 2014 and less than 1 mg/l in 2015. At the pH and alkalinity of the leachate, ammonia will likely be present in its most toxic form as un-ionised ammonia and the sulphide detected (52 mg/l in December 2015) 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 analysis of leachate for organic compounds has typically revealed a small number to be present at low levels. In 2014, the leachate was found to contain 2-Nitroaniline, phenol, BTEX compounds (benzene, toluene, ethylbenzene, xylene) styrene, PAH's and phthalate, as shown in Table 4-2. In 2015, a wider number of compounds were detected as summarised in Table 7-2. Several of these compounds may be present as a result of leaching and degradation of the

plastic and rubber materials within the waste and possibly as part of the drainage blanket degrade.

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

A summary of the organic compounds recently detected in leachate is provided in Table 7-2 and by the graphical time series plots in Appendix 3. 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. The concentrations detected in leachate are, however, low and below the Maximum Allowable Concentration allowed in freshwater indicated in parenthesis in the column containing the EAL's. Several of the compounds have not been detected previously and their occurrence will continue to be scrutinised.

Table 7-2 Organic compounds detected in Leachate in 2014 and 2015

	Units	L1	L1	L1	L1	L1	L1
		16/01/2014	28/04/2014	25/07/2014	01/11/2014	22/04/2015	16/12/2015
2,4-D	ug/l	1.8					
2-Methylphenol	mg/l					<1	1.85
2-Nitroaniline	ug/l	6.7			6.89		
3-Nitroaniline	ug/l					2.26	<1
4-Methylphenol	ug/l					<1	154
Acenaphthylene	ug/l					0.0576	<0.55
Benzene	ug/l	1.53	1.15			4.23	2.3
Benzothiazolone	µg/l					692	246
bis(2-Chloroisopropyl)ether	mg/l		3200				
bis(2-Ethylhexyl)phthalate	ug/l					<2	9.23
Carbon Disulphide	ug/l					10.2	5.08
Cresols	mg/l					<0.006	0.47
Cyclic octaatomic sulfur	µg/l						4580
Dichloromethane	ug/l					4.34	<3
Dichlorprop	ug/l	3.8	1.4				
Dichlorvos	ug/l			0.51			
Diethylphthalate	ug/l		2300	3.94			
EPH Range >C10 - C40	ug/l					2150	1690
Total EPH (C6-C40)	ug/l					2150	1690
Ethylbenzene	ug/l			1.72		3.69	<1
Fluorene	ug/l					0.0335	<0.7
GRO (C4-C10)	ug/l					92	211
Hexanoic acid, -trimethyl-	µg/l						85.8
MCPP	ug/l	15		7.8		26.7	17
Naphthalene	ug/l		7.42	2.36		0.366	<5
o-Xylene	ug/l			1		2.09	<1
Phenanthrene	ug/l					0.071	<1.1
Phenol SVOCS mg/l	mg/l					0.02	0.21
Phenol PHEHPLC mg/l	mg/l					0.02	0.21
Phenol	ug/l	175	200	210	174	40	68
Pyrene	ug/l					0.149	<0.75
Styrene	ug/l	20.3	32.1				
Toluene	ug/l	1.49	1.25	8.59	1.31	5.96	2.3
Triisopropylphosphate	µg/l						248
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

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 H_2S.

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 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 and degree of saturation. 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 (0.0012m^3/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.

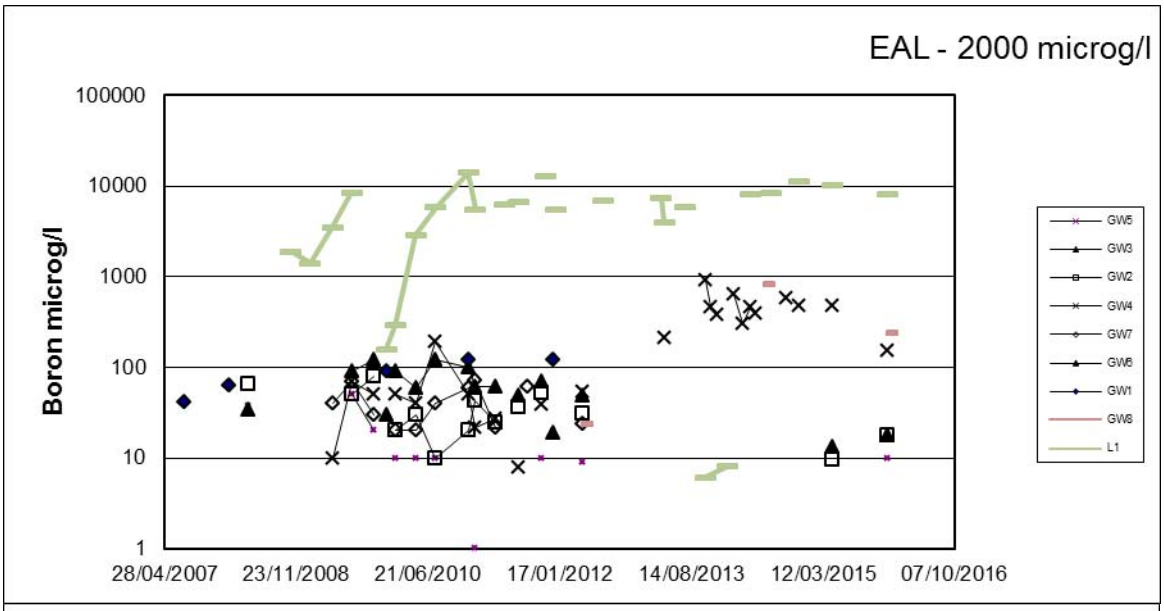
At this stage of landfill development, GW2 is not yet located hydraulically downgradient of PNHL.

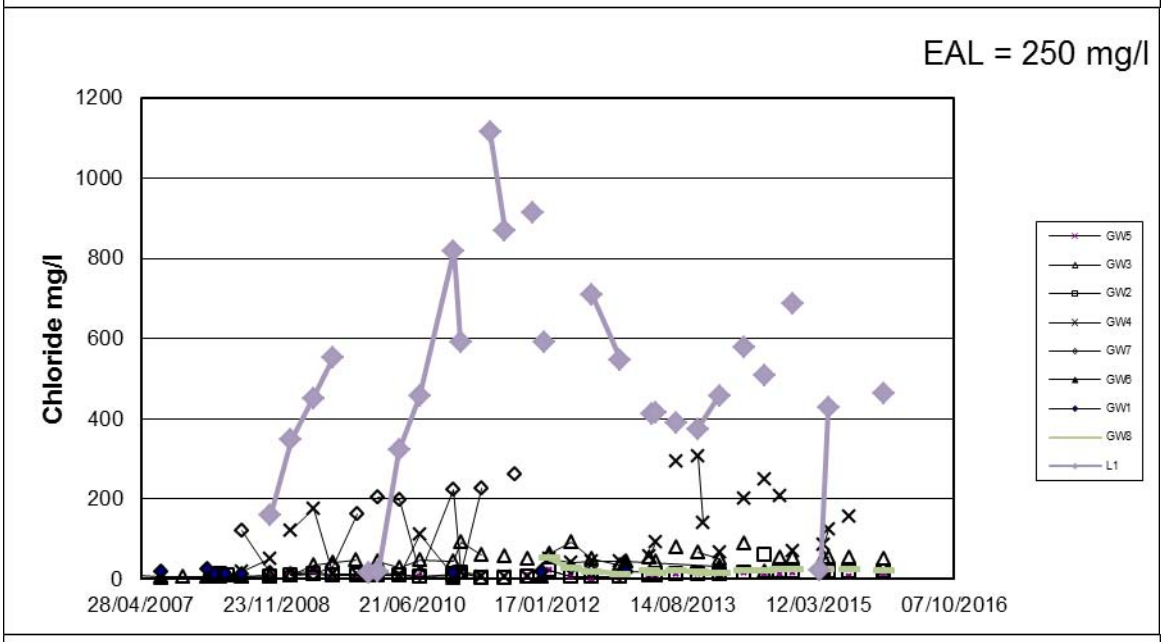
8.2 Groundwater Quality

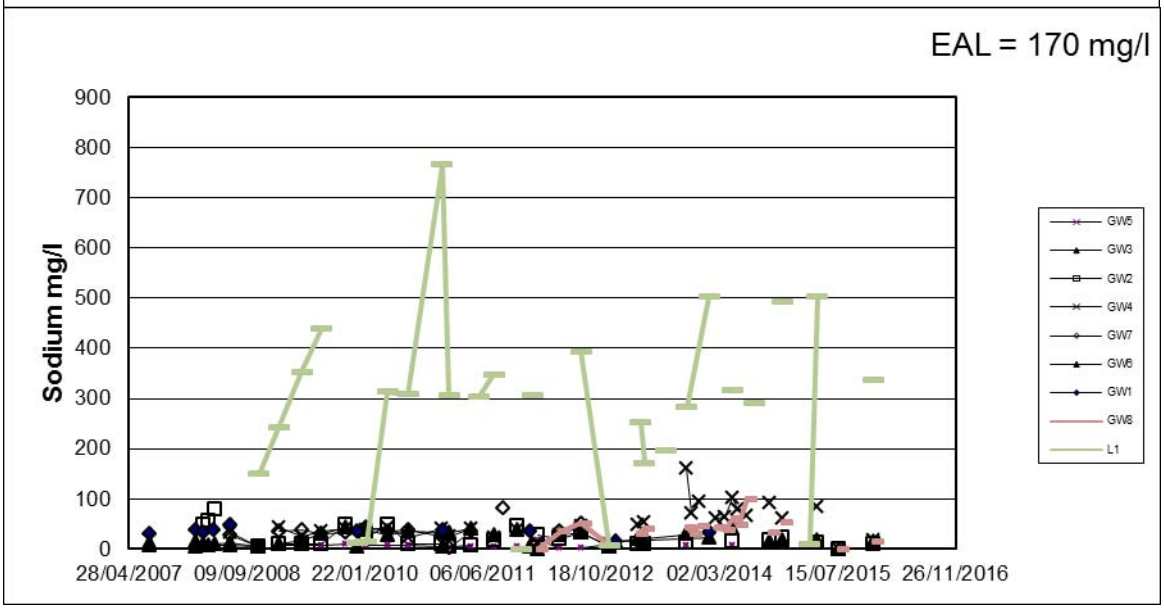
Groundwater within the vicinity of PNHL is circumneutral and of variable mineralisation. Prior to landfilling, mineralisation increased down the catchment with the wells located downgradient of the landfill revealing higher EC than those upgradient. At other times, this pattern has reversed. Most previous 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.

Since 2013, however, several parameters have been detected at increased concentration downgradient of the landfill and this pattern continued in 2015. 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 and at the end of Appendix 4. 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 the variations.


EAL - 2000 microg/l
Boron microg/l
100000
10000
1000
100
10
1
28/04/2007
23/11/2008
21/06/2010
17/01/2012
14/08/2013
12/03/2015
07/10/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8
L1


EAL = 250 mg/l
Chloride mg/l
1200
1000
800
600
400
200
0
28/04/2007
23/11/2008
21/06/2010
17/01/2012
14/08/2013
12/03/2015
07/10/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8
L1


EAL = 170 mg/l
Sodium mg/l
900
800
700
600
500
400
300
200
100
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8
L1

8.3 Assessment against Permit Trigger Level

The only position where the inorganic trigger levels were exceeded during 2014 and 2015 was 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. The trigger levels for zinc, cadmium and mercury were never breached in any of the downgradient wells during 2014 and 2015.

A similar pattern is also evident when the organic trigger levels for mecoprop, toluene and phenols is evaluated. No breaches were 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 but never above 1 microg/l and never consistently. At GW8, 1 microg/l was detected in June 2014 and 0.05 microg/l in December 2015. At both positions, mecoprop was not above the detection limit at any other time.

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 5 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 stagnant ponds, the surface water encountered to date is oxygenated. During 2009, surface water pH started to progressively become slightly more acidic. This trend appears to have stabilised with all values above 6.5 during 2014 and 7.5 in 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 2015 are largely comparable to those observed previously. 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. The sample was found to contain detectable but low levels of cadmium (0.308 microg/l) and increased ammonia, BOD, sulphate and chloride.

Ammonia has not historically followed the same pattern revealed by many of the other non-hazardous substances. Rather than show a gradual increasing trend, the occurrence of ammonia is characterised by sudden, apparently unpredictable, wide variations in concentration over consecutive months. At some points in time the relative concentrations between the upgradient

and downgradient monitoring locations suggests that drainage from the small ditch issuing between SW2 and SW3 was the most likely source of the ammonia. However, at other times this has not been the case and other sources must be present 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. In 2014, the situation was similar but the highest ammonia levels were lower than the peaks previously observed. During 2015, ammonia was elevated in the samples collected in April and December but below 0.3 mg/l at all other times.

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 2015 was below 1000ppm. 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 one set of gas readings at GA7 and GA9 exceeded the new carbon dioxide action levels or methane compliance level. This occurred at GA7 in May 2015 where the carbon monoxide control level was slightly exceeded although the monitoring completed since this time has revealed lower levels. At GA8 however, gas concentration and flow significantly increased in the latter part of 2013. During 2014, the concentrations fell in the first part of the year but rose once again during the latter months. Interestingly, the gas flow rate did not correspondingly increase during 2014. More recently, the concentration of carbon dioxide increased during 2015 to levels not previously observed at this position (almost 30% carbon dioxide) alongside increased flow concentration (up to 1.8 l/h).

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 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 during 2014 and 2015. 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 inspect the headworks at GW4 and consider raising ground levels. This would 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.

12.3 Regulatory Framework and Monitoring

The annual review typically offers an opportunity to assess the currently applicable regulatory limits. However, as the HRA was completed in 2015, Geotechnology made recommendations regarding the monitoring programme in that document.

Figure 1 Site Location Plan

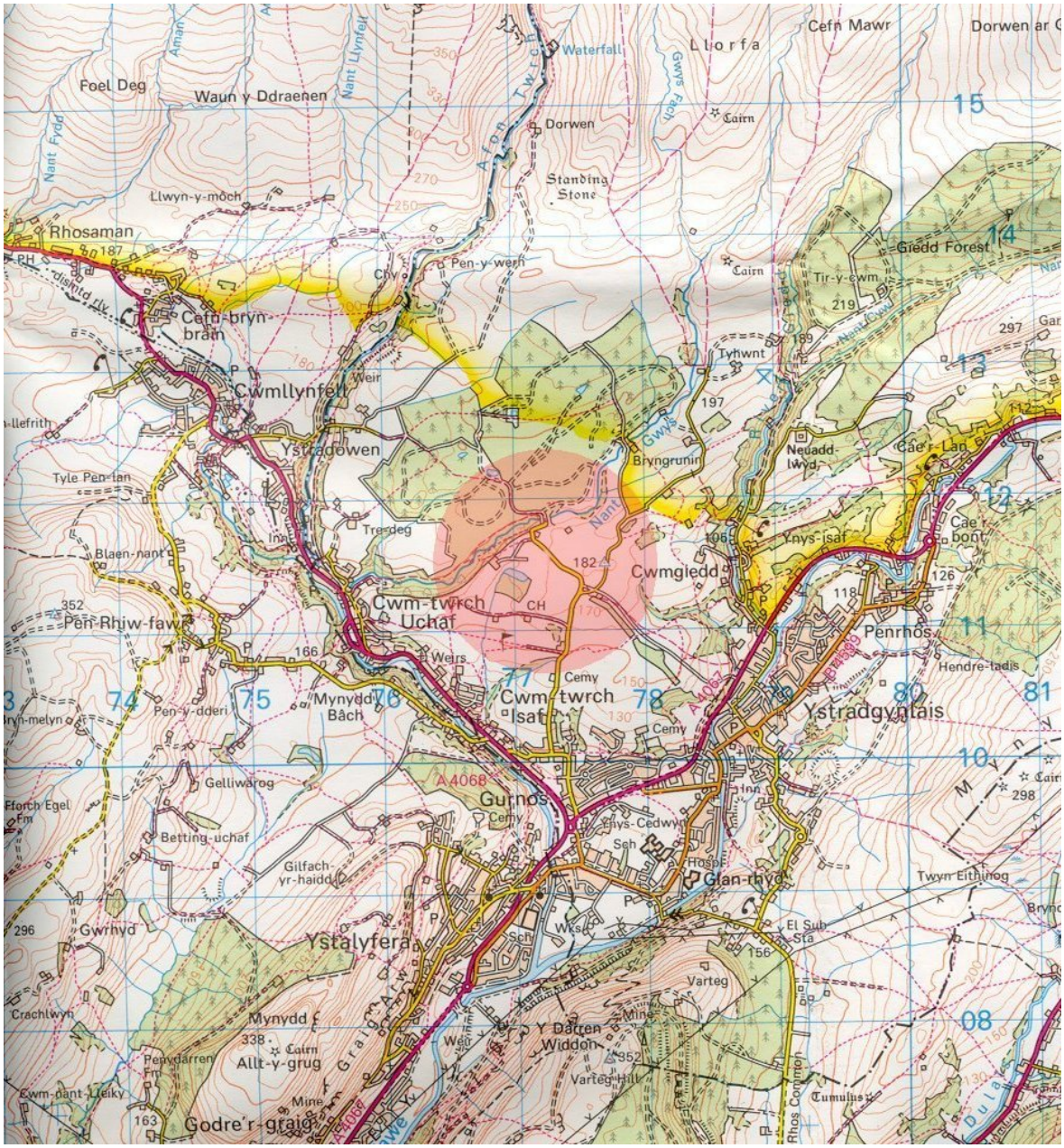


Figure 2 Detailed Site Plan

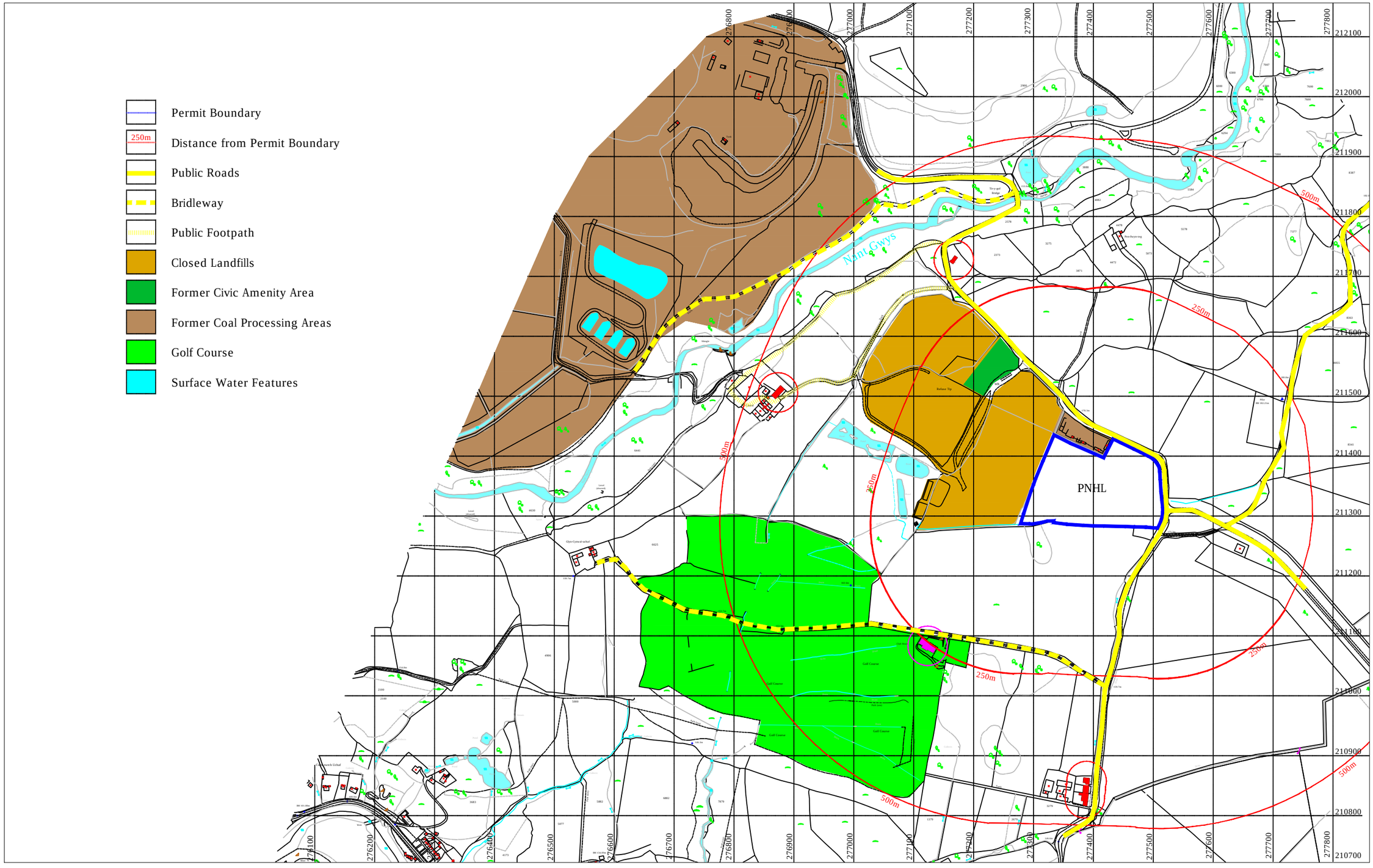
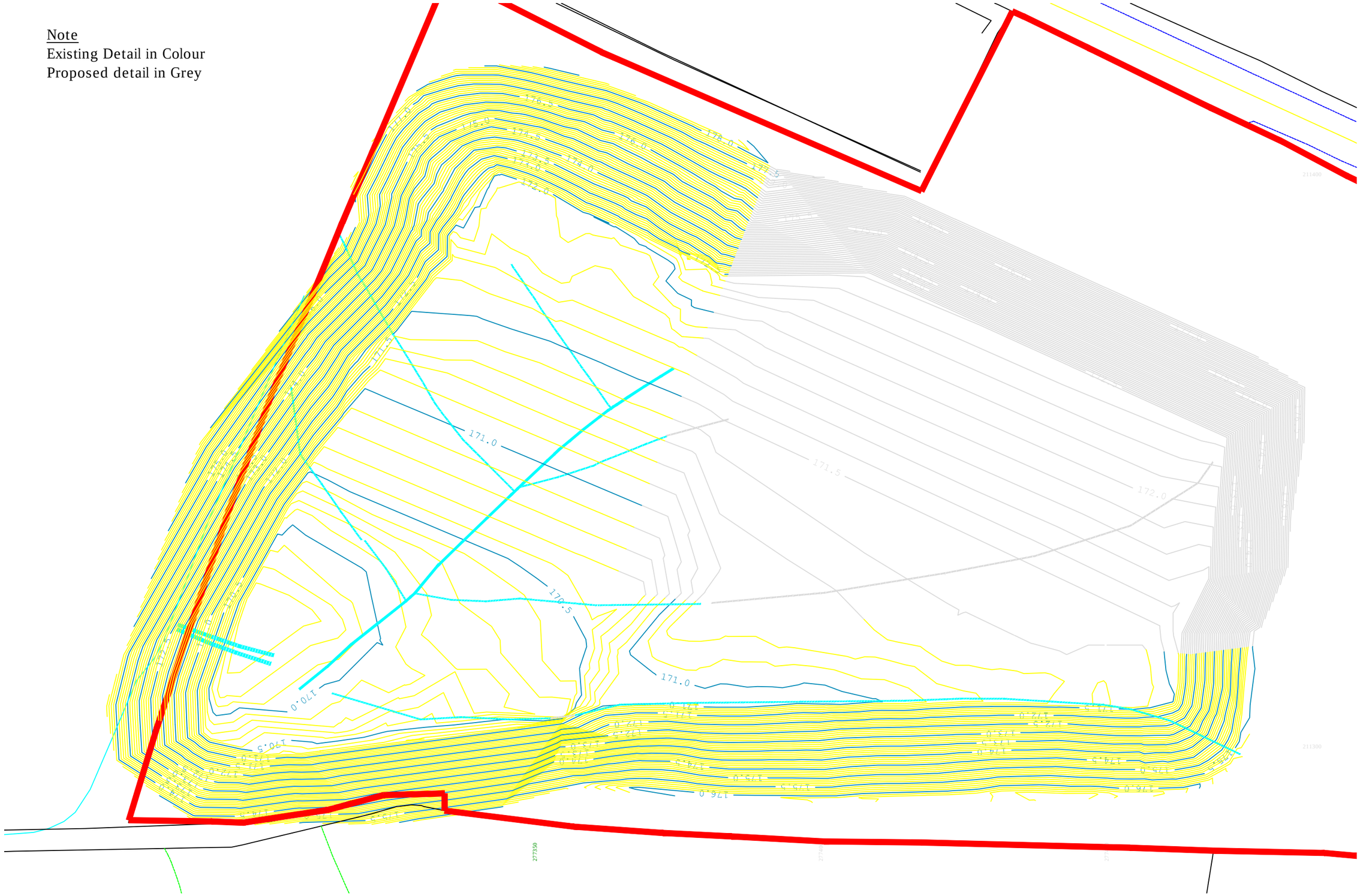


Figure 3 Leachate Drainage Network

Note
Existing Detail in Colour
Proposed detail in Grey



Revision 0

1429r1v1d0116 Figure 3

Scale 1:400

Figure 4 Variation in Leachate Levels

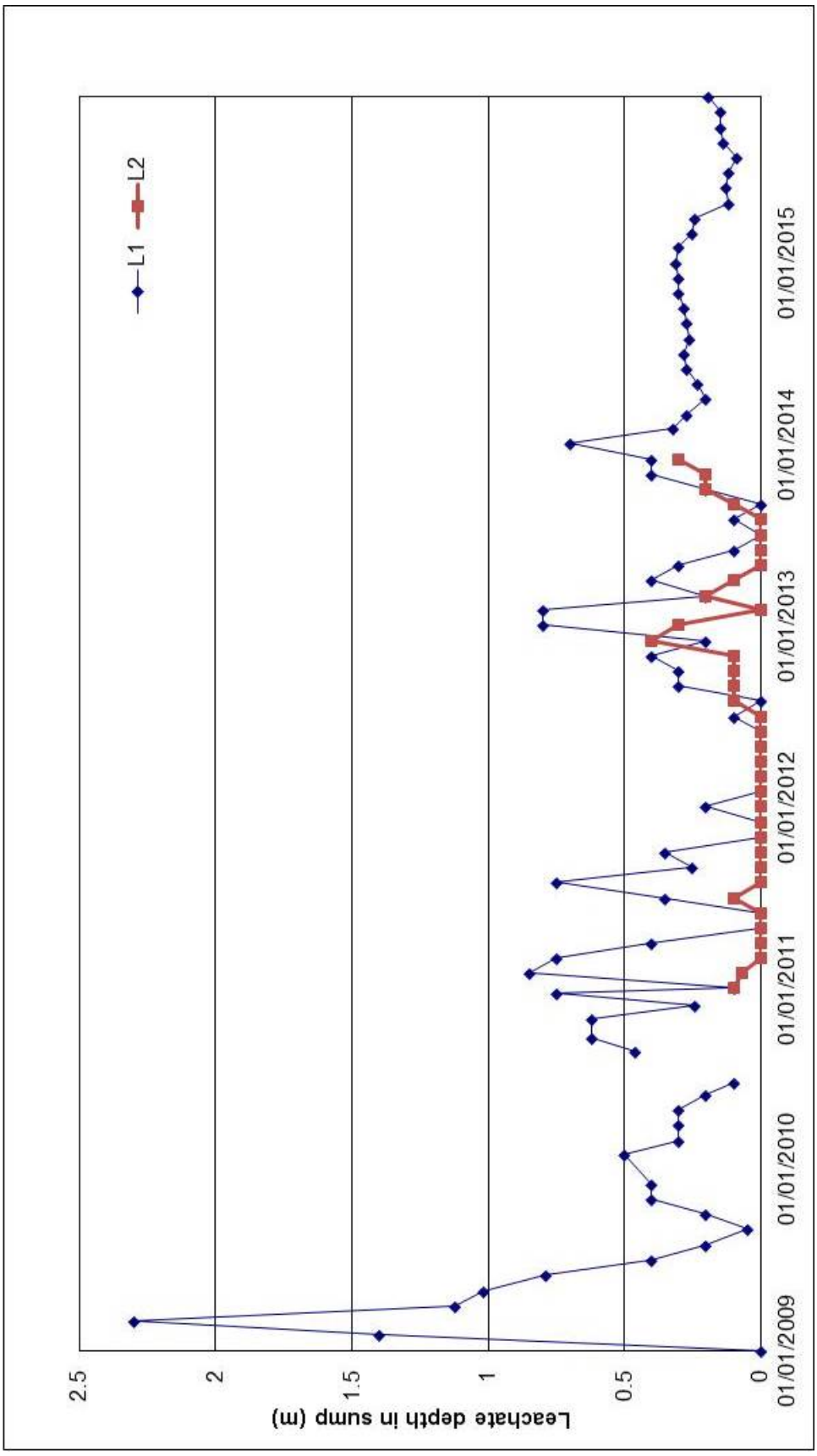


Figure 5 Proposed Monitoring Network

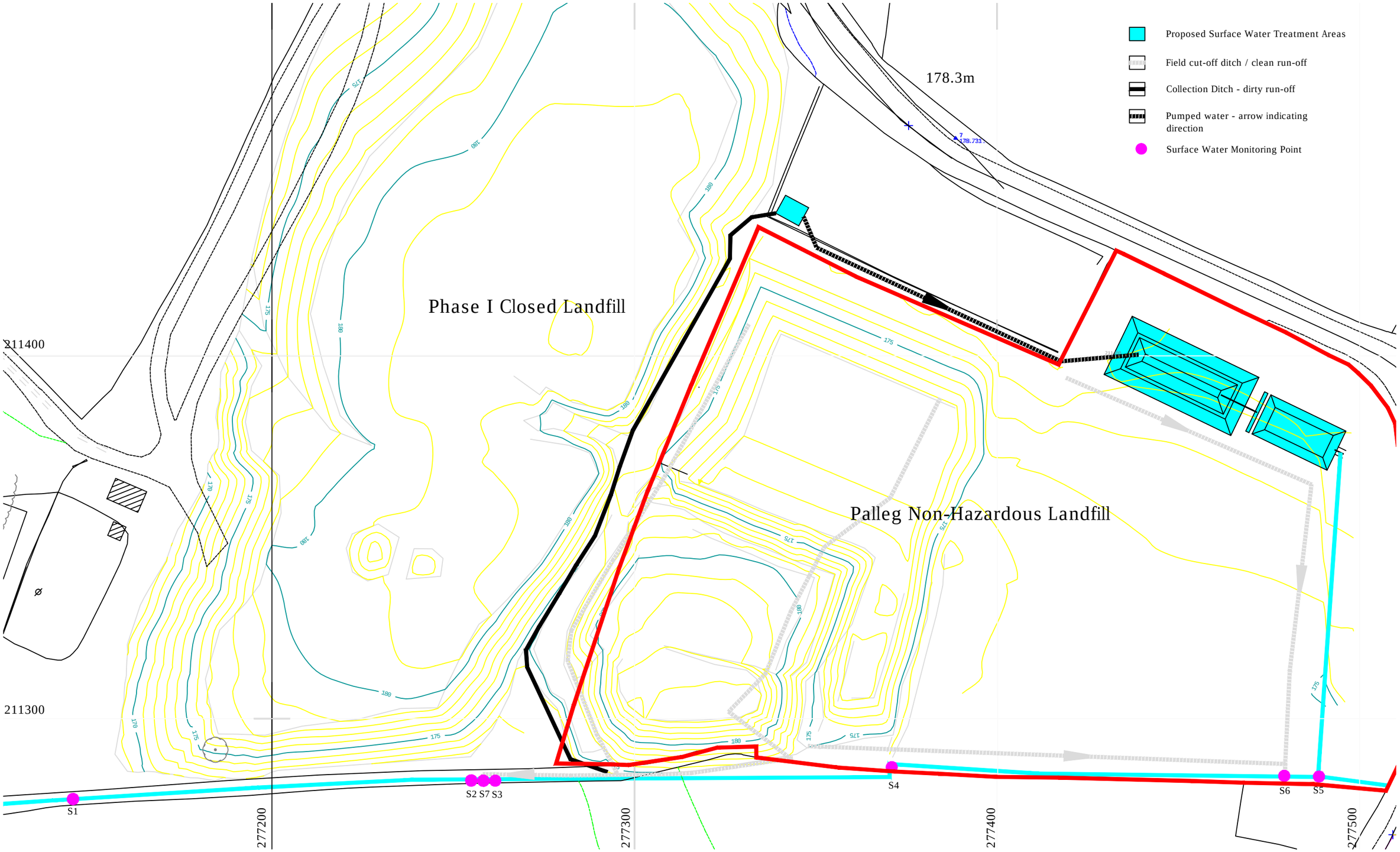
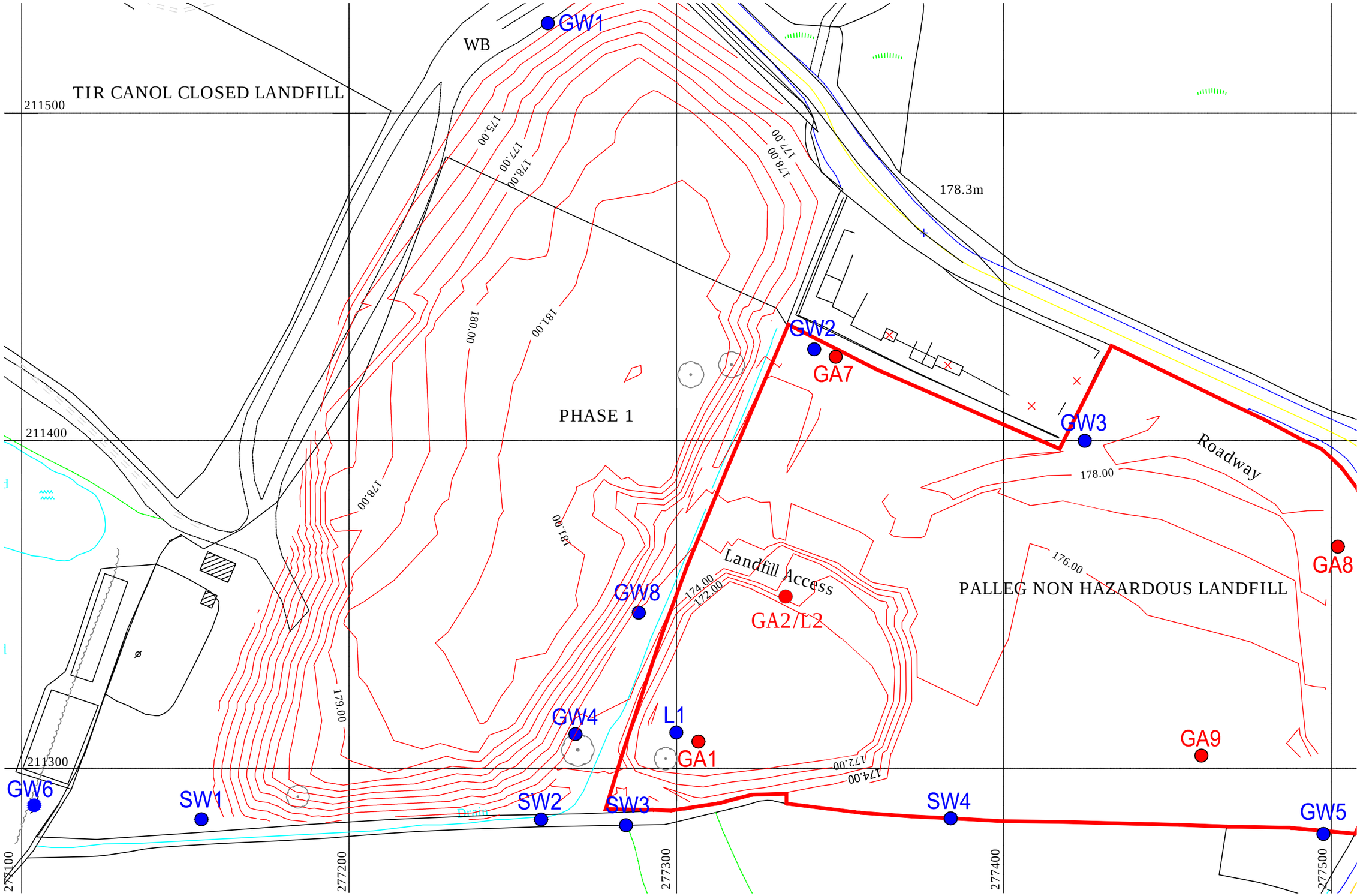


Figure 6 Current Monitoring Network



Revision 0 1429r1v1d0116 Figure 6 Scale 1:1000

Figure 7 Topographic Survey of Landfill on 22 January 2015

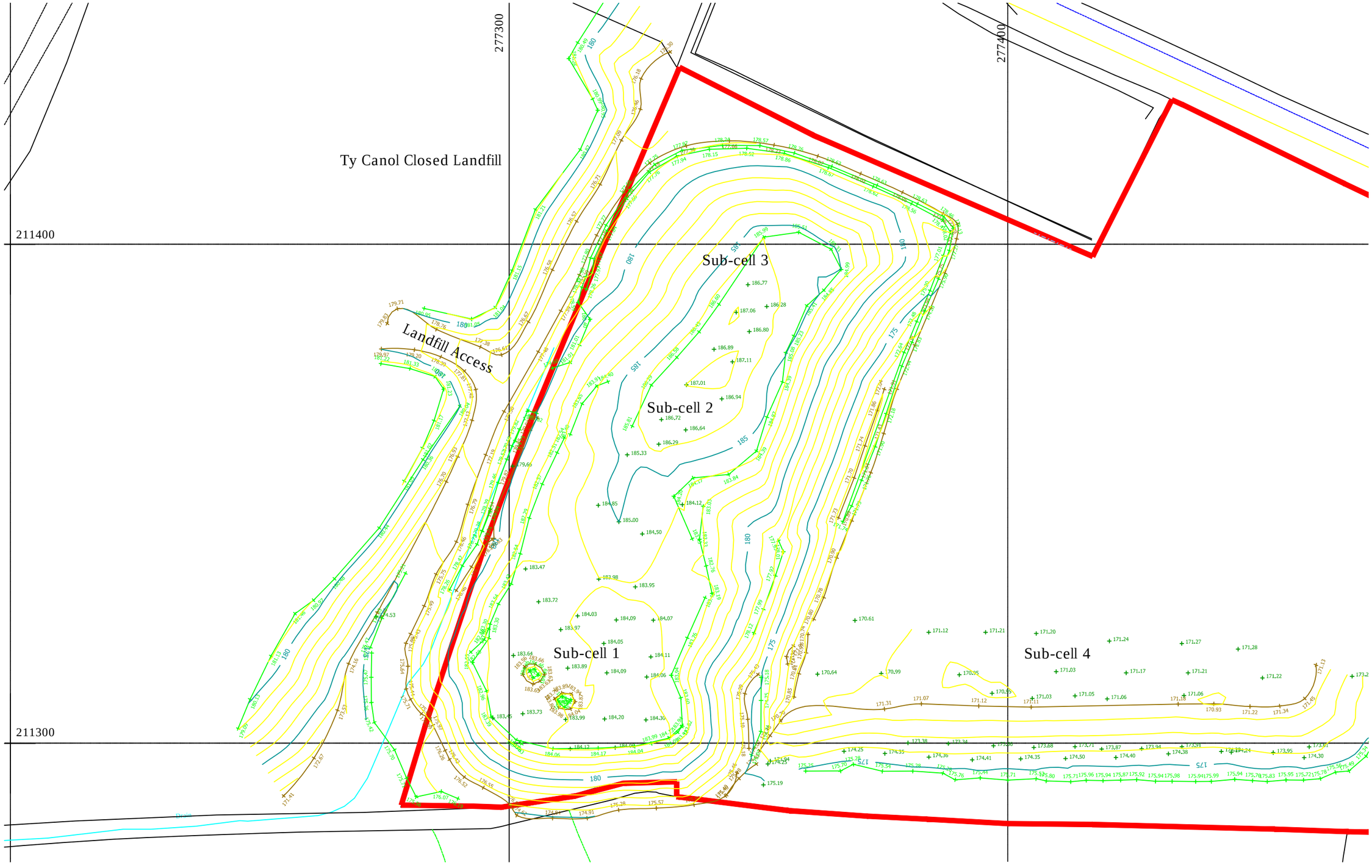
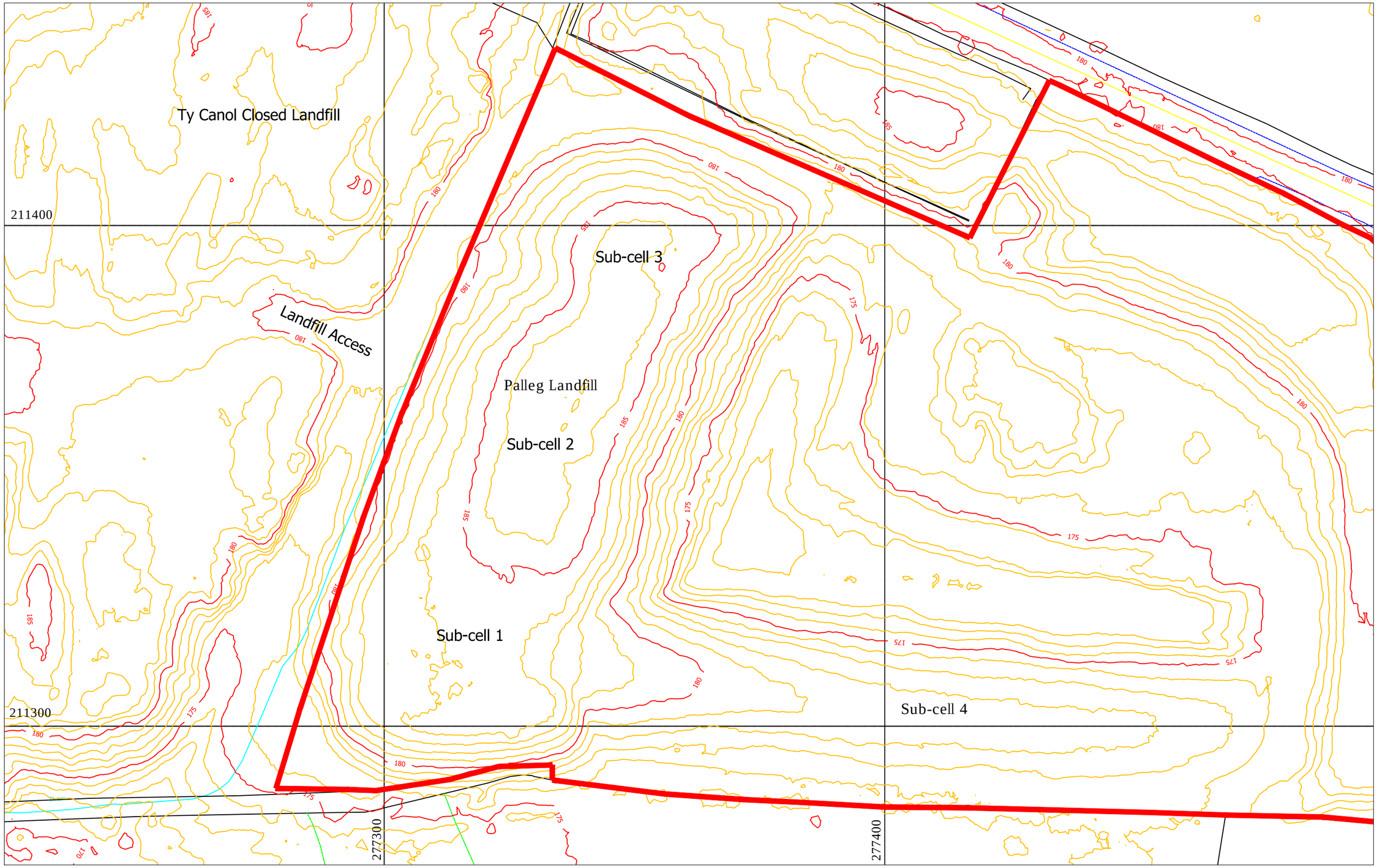


Figure 8 Topographic Survey of Landfill on 6 December 2015



Revision 0

1429r1v1d0116 Figure 8

Scale 1:750

Figure 9 Topographic Survey of Landfill on 6 December 2015 with Aerial Image

PALLEG LANDFILL
LOWER CWMTWRCH

PERMIT BT19081X

Review of 2015
Landfill Monitoring

Appendix 1
List of Reports

Report Number 1429r1v1d0116

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
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
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 2015 Landfill Monitoring

Appendix 2
Digital Laboratory Certificates

Report Number 1429r1v1d0116

ALcontrol Laboratories

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

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

Attention: Keir Thomas

CERTIFICATE OF ANALYSIS

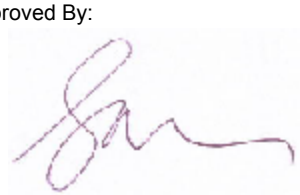
Date:	09 May 2015
Customer:	H_GETCNO_NAH
Sample Delivery Group (SDG):	150424-103
Your Reference:	
Location:	Palleg
Report No:	312161

We received 5 samples on Friday April 24, 2015 and 5 of these samples were scheduled for analysis which was completed on Saturday May 09, 2015. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	150424-103	**Location:**	Palleg	**Order Number:**	
Job:	H_GETCNO_NAH-10	**Customer:**	Geotechnology	**Report Number:**	312161
Client Reference:		**Attention:**	Keir Thomas	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
11250411	GW2			22/04/2015
11250412	GW3			22/04/2015
11250413	GW4			22/04/2015
11250414	GW5			22/04/2015
11250415	L1			22/04/2015

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

CERTIFICATE OF ANALYSIS

SDG:	150424-103	**Location:**	Palleg	**Order Number:**	
Job:	H_GETCNO_NAH-10	**Customer:**	Geotechnology	**Report Number:**	312161
Client Reference:		**Attention:**	Keir Thomas	**Superseded Report:**	

LIQUID

Results Legend

X Test

N No Determination Possible

Lab Sample No(s)	11250411	11250412	11250413	11250414	11250415
Customer Sample Reference	GW2	GW3	GW4	GW5	L1
AGS Reference					
Depth (m)					
Container	1000ml glass bottle	1000ml glass bottle	1000ml glass bottle	1000ml glass bottle	1000ml glass bottle
	1lplastic (ALE221)	1lplastic (ALE221)	1lplastic (ALE221)	1lplastic (ALE221)	1lplastic (ALE221)
	250ml BOD (ALE21	250ml BOD (ALE21	250ml BOD (ALE21	250ml BOD (ALE21	250ml BOD (ALE21
	Dissolved Metals Pr	Dissolved Metals Pr	Dissolved Metals Pr	Dissolved Metals Pr	Dissolved Metals Pr
	H2SO4 (ALE244)	H2SO4 (ALE244)	H2SO4 (ALE244)	H2SO4 (ALE244)	H2SO4 (ALE244)
	HNO3 Filtered (ALE	HNO3 Filtered (ALE	HNO3 Filtered (ALE	HNO3 Filtered (ALE	HNO3 Filtered (ALE
	INV VIAL	INV VIAL	Vial (ALE297)	INV VIAL	INV VIAL
					NaOH (ALE245)
					ZnAc (ALE246)

Acid Herbicides by LCQQQ (aq)	All	NDPs: 0 Tests: 5	X						X						X						X						X					
Alkalinity as CaCO3	All	NDPs: 0 Tests: 4		X						X						X						X										
Alkalinity Filtered as CaCO3	All	NDPs: 0 Tests: 1																										X				
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 5				X						X						X						X						X		
Anions by Kone (w)	All	NDPs: 0 Tests: 5		X						X						X						X						X				
BOD True Total	All	NDPs: 0 Tests: 5			X						X						X						X						X			
COD Unfiltered	All	NDPs: 0 Tests: 5			X						X						X						X						X			
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1																														X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 5					X						X						X		X								X			
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 0 Tests: 1																						X								
GRO by GC-FID (W)	All	NDPs: 0 Tests: 1																													X	
Mercury Dissolved	All	NDPs: 0 Tests: 5				X						X						X						X						X		
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 5					X						X						X		X								X			
Mineral Oil C10-40 Aqueous (W)	All	NDPs: 0 Tests: 1																						X								
Nitrite by Kone (w)	All	NDPs: 0 Tests: 1																														X

CERTIFICATE OF ANALYSIS

SDG:	150424-103	**Location:**	Palleg	**Order Number:**	
Job:	H_GETCNO_NAH-10	**Customer:**	Geotechnology	**Report Number:**	312161
Client Reference:		**Attention:**	Keir Thomas	**Superseded Report:**	

LIQUID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			11250411	GW2			1000ml glass bottle
							1plastic (ALE221)
							250ml BOD (ALE21
							Dissolved Metals Pr
							H2SO4 (ALE244)
							HNO3 Filtered (ALE
							INV VIAL
			11250412	GW3			1000ml glass bottle
							1plastic (ALE221)
							250ml BOD (ALE21
							Dissolved Metals Pr
							H2SO4 (ALE244)
							HNO3 Filtered (ALE
							INV VIAL
			11250413	GW4			1000ml glass bottle
							1plastic (ALE221)
							250ml BOD (ALE21
							Dissolved Metals Pr
							H2SO4 (ALE244)
							HNO3 Filtered (ALE
							Vial (ALE297)
			11250414	GW5			1000ml glass bottle
							1plastic (ALE221)
							250ml BOD (ALE21
							Dissolved Metals Pr
							H2SO4 (ALE244)
							INV VIAL
			11250415	L1			1000ml glass bottle
							1plastic (ALE221)
							250ml BOD (ALE21
							Dissolved Metals Pr
							H2SO4 (ALE244)
							HNO3 Filtered (ALE
							INV VIAL
							NaOH (ALE245)
							ZnAc (ALE246)
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
Organotins 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: 5				X	X X X X
Sulphide	All	NDPs: 0 Tests: 1					X
Total EPH (aq)	All	NDPs: 0 Tests: 1					X
Total Organic and Inorganic Carbon	All	NDPs: 0 Tests: 5	X		X	X	X
VOC MS (W)	All	NDPs: 0 Tests: 5			X	X	X X

CERTIFICATE OF ANALYSIS

SDG:	150424-103	**Location:**	Palleg	**Order Number:**	
Job:	H_GETCNO_NAH-10	**Customer:**	Geotechnology	**Report Number:**	312161
Client Reference:		**Attention:**	Keir Thomas	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS 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	Customer Sample R	GW2	GW3	GW4	GW5	L1
			Depth (m)	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	22/04/2015	22/04/2015	22/04/2015	22/04/2015	22/04/2015
			Sample Time	.	.	.	.	.
			Date Received	24/04/2015	24/04/2015	24/04/2015	24/04/2015	24/04/2015
			SDG Ref	150424-103	150424-103	150424-103	150424-103	150424-103
			Lab Sample No.(s)	11250411	11250412	11250413	11250414	11250415
			AGS Reference					
Alkalinity, Total as CaCO3	<2 mg/l	TM043		344 #	376 #	490 #	184 #	
Alkalinity,Total as CaCO3 (diss.filt)	<2 mg/l	TM043						3200
BOD, unfiltered	<1 mg/l	TM045		<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #	43.5 ♦ #
Organic Carbon, Total	<3 mg/l	TM090		3.06 ♦ #	6.18 ♦ #	10.4 ♦ #	14.9 ♦ #	308 ♦ #
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099		<0.2 #	0.201 #	4.61 #	0.396 #	531 #
Sulphide	<0.01 mg/l	TM101						19.3 #
COD, unfiltered	<7 mg/l	TM107		9.92 #	34.5 #	53.2 #	108 #	890 #
Arsenic (diss.filt)	<0.12 µg/l	TM152		0.24 #	6.36 #	13.9 #	1.92 #	459 #
Boron (diss.filt)	<9.4 µg/l	TM152		9.75 #	13.3 #	484 #	<9.4 #	10100 #
Cadmium (diss.filt)	<0.1 µg/l	TM152		<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #
Chromium (diss.filt)	<0.22 µg/l	TM152		5.2 #	2.78 #	0.699 #	8.6 #	110 #
Copper (diss.filt)	<0.85 µg/l	TM152		<0.85 #	4.39 #	<0.85 #	3.42 #	1.78 #
Lead (diss.filt)	<0.02 µg/l	TM152		0.095 #	0.021 #	0.031 #	0.303 #	0.352 #
Manganese (diss.filt)	<0.04 µg/l	TM152		797 #	3040 #	4300 #	285 #	361 #
Nickel (diss.filt)	<0.15 µg/l	TM152		3.11 #	3.68 #	4.89 #	4.78 #	51.4 #
Zinc (diss.filt)	<0.41 µg/l	TM152		2.06 #	1.98 #	2.92 #	5.26 #	10.1 #
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172						2150 #
Mineral oil >C10 C40 (aq)	<10 µg/l	TM172						<10
Total EPH (C6-C40) (aq)	<100 µg/l	TM172						2150
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #
Nitrite as NO2	<0.05 mg/l	TM184						<0.5 #
Sulphate	<2 mg/l	TM184		233 #	88 #	239 #	14.8 #	189 #
Chloride	<2 mg/l	TM184		19.2 #	54.6 #	125 #	9.7 #	428 #
Nitrate as NO3	<0.3 mg/l	TM184						<3 #
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184		<0.1 #	<0.1 #	<0.1 #	<0.1 #	<1 #
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		212 #	182 #	217 #	69.2 #	231 #
Sodium (diss.filt)	<0.076 mg/l	TM228		12.3 #	17.4 #	83.8 #	6.34 #	504 #
Magnesium (diss.filt)	<0.036 mg/l	TM228		10.5 #	11.5 #	29.4 #	5.09 #	66.2 ♦ #
Potassium (diss.filt)	<1 mg/l	TM228		1.91 #	2.71 #	10.2 #	1.24 #	158 #
Iron (diss.filt)	<0.019 mg/l	TM228		<0.019 #	3.32 #	19.6 #	0.212 #	0.136 #

CERTIFICATE OF ANALYSIS

SDG:	150424-103	**Location:**	Palleg	**Order Number:**	
Job:	H_GETCNO_NAH-10	**Customer:**	Geotechnology	**Report Number:**	312161
Client Reference:		**Attention:**	Keir Thomas	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS 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	Customer Sample R	GW2	GW3	GW4	GW5	L1
			Depth (m)	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	22/04/2015	22/04/2015	22/04/2015	22/04/2015	22/04/2015
			Sample Time	.	.	.	.	.
			Date Received	24/04/2015	24/04/2015	24/04/2015	24/04/2015	24/04/2015
			SDG Ref	150424-103	150424-103	150424-103	150424-103	150424-103
			Lab Sample No.(s)	11250411	11250412	11250413	11250414	11250415
			AGS Reference					
Phenol	<0.002 mg/l	TM259		<0.002 #	<0.002 #	<0.002 #	<0.002 #	0.02 #
Cresols	<0.006 mg/l	TM259		<0.006 #	<0.006 #	<0.006 #	<0.006 #	<0.006 #
Xylenols	<0.008 mg/l	TM259		<0.008 #	<0.008 #	<0.008 #	<0.008 #	0.02 #
Phenols, Total Detected monohydric	<0.016 mg/l	TM259		<0.016 #	<0.016 #	<0.016 #	<0.016 #	0.04 #
Etridiazole	<0.01 µg/l	TM314						<0.01
Propachlor	<0.01 µg/l	TM314						<0.01
Trifluralin	<0.01 µg/l	TM314						<0.01
Simazine	<0.01 µg/l	TM315						<0.01
Atrazine	<0.01 µg/l	TM315						<0.01
Propazine	<0.01 µg/l	TM315						<0.01
Alachlor	<0.01 µg/l	TM315						<0.01
Chlorpyriphos-Ethyl	<0.01 µg/l	TM315						<0.01
Terbutryn	<0.01 µg/l	TM315						<0.01
Prometryn	<0.01 µg/l	TM315						<0.01
MCPP (Mecoprop)	<0.04 µg/l	TM324		<0.04	<0.04	0.503	<0.04	26.7
Dibutyl tin	<5 ng/l	TM328						<30
Tributyl tin	<1 ng/l	TM328						<6
Tetrabutyl tin	<2 ng/l	TM328						<12
Triphenyl tin	<1 ng/l	TM328						<6
Surrogate	%	TM328						57.7

CERTIFICATE OF ANALYSIS

SDG:	150424-103	**Location:**	Palleg	**Order Number:**	
Job:	H_GETCNO_NAH-10	**Customer:**	Geotechnology	**Report Number:**	312161
Client Reference:		**Attention:**	Keir Thomas	**Superseded Report:**	

GRO by GC-FID (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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)

Customer Sample R			L1
Depth (m)			.
Sample Type			Water(GW/SW)
Date Sampled			22/04/2015
Sample Time			.
Date Received			24/04/2015
SDG Ref			150424-103
Lab Sample No.(s)			11250415
AGS Reference			
Component	**LOD/Units**	**Method**	
Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245	<3 1 #
Benzene	<7 µg/l	TM245	<7 1 #
Toluene	<4 µg/l	TM245	<4 1 #
Ethylbenzene	<5 µg/l	TM245	<5 1 #
m,p-Xylene	<8 µg/l	TM245	<8 1 #
o-Xylene	<3 µg/l	TM245	<3 1 #
Sum of detected BTEX	<28 µg/l	TM245	<28 1
GRO >C5-C10	<10 µg/l	TM245	92 1
EPH (C6-C10)	<100 µg/l	TM245	<100 1

CERTIFICATE OF ANALYSIS

SDG:	150424-103	**Location:**	Palleg	**Order Number:**	
Job:	H_GETCNO_NAH-10	**Customer:**	Geotechnology	**Report Number:**	312161
Client Reference:		**Attention:**	Keir Thomas	**Superseded Report:**	

OC, OP Pesticides and Triazine Herb

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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)

Customer Sample R	L1
Depth (m)	.
Sample Type	Water(GW/SW)
Date Sampled	22/04/2015
Sample Time	.
Date Received	24/04/2015
SDG Ref	150424-103
Lab Sample No.(s)	11250415
AGS Reference	

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
Chlorpyriphos 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	<0.05
Pirimiphos-methyl	<0.01 µg/l	TM231	<0.01
beta-Hexachlorocyclohexane (HCH / Lindane)	<0.01 µg/l	TM231	<0.01
Chlorpyriphos	<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

SDG:	150424-103	**Location:**	Palleg	**Order Number:**	
Job:	H_GETCNO_NAH-10	**Customer:**	Geotechnology	**Report Number:**	312161
Client Reference:		**Attention:**	Keir Thomas	**Superseded Report:**	

OC, OP Pesticides and Triazine Herb

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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)

Customer Sample R	L1
Depth (m)	.
Sample Type	Water(GW/SW)
Date Sampled	22/04/2015
Sample Time	.
Date Received	24/04/2015
SDG Ref	150424-103
Lab Sample No.(s)	11250415
AGS Reference	

Component	LOD/Units	Method	
Chlorfenvinphos	<0.01 µg/l	TM231	<0.01
Endosulphan I	<0.01 µg/l	TM231	<0.01
Trans-chlordane	<0.01 µg/l	TM231	<0.01
cis-Chlordane	<0.01 µg/l	TM231	<0.01
p,p-DDE	<0.01 µg/l	TM231	<0.01
Dieldrin	<0.01 µg/l	TM231	<0.01
o,p-TDE (DDD)	<0.01 µg/l	TM231	<0.01
Endrin	<0.01 µg/l	TM231	<0.01
o,p-DDT	<0.01 µg/l	TM231	<0.01
p,p-TDE (DDD)	<0.01 µg/l	TM231	<0.01
Ethion	<0.01 µg/l	TM231	<0.01
Endosulphan II	<0.01 µg/l	TM231	<0.01
p,p-DDT	<0.01 µg/l	TM231	<0.01
Carbophenothion	<0.01 µg/l	TM231	<0.01
o,p-Methoxychlor	<0.01 µg/l	TM231	<0.01
Triazophos	<0.01 µg/l	TM231	<0.01
p,p-Methoxychlor	<0.01 µg/l	TM231	<0.01
Endosulphan sulphate	<0.01 µg/l	TM231	<0.01
Permethrin I	<0.01 µg/l	TM231	<0.01
Phosalone	<0.01 µg/l	TM231	<0.01
Permethrin II	<0.01 µg/l	TM231	<0.01
Azinphos-methyl	<0.01 µg/l	TM231	<0.02
Azinphos-ethyl	<0.01 µg/l	TM231	<0.01

CERTIFICATE OF ANALYSIS

SDG:	150424-103	**Location:**	Palleg	**Order Number:**	
Job:	H_GETCNO_NAH-10	**Customer:**	Geotechnology	**Report Number:**	312161
Client Reference:		**Attention:**	Keir Thomas	**Superseded Report:**	

PAH Spec MS - Aqueous (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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)

	Customer Sample R	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
	L1	.	Water(GW/SW)	22/04/2015	.	24/04/2015	150424-103	11250415	

Component	LOD/Units	Method	
Naphthalene (aq)	<0.1 µg/l	TM178	0.366 ♦ #
Acenaphthene (aq)	<0.015 µg/l	TM178	<0.03 ♦ #
Acenaphthylene (aq)	<0.011 µg/l	TM178	0.0576 ♦ #
Fluoranthene (aq)	<0.017 µg/l	TM178	<0.034 ♦ #
Anthracene (aq)	<0.015 µg/l	TM178	<0.03 ♦ #
Phenanthrene (aq)	<0.022 µg/l	TM178	0.071 ♦ #
Fluorene (aq)	<0.014 µg/l	TM178	0.0335 ♦ #
Chrysene (aq)	<0.013 µg/l	TM178	<0.026 ♦ #
Pyrene (aq)	<0.015 µg/l	TM178	0.149 ♦ #
Benzo(a)anthracene (aq)	<0.017 µg/l	TM178	<0.034 ♦ #
Benzo(b)fluoranthene (aq)	<0.023 µg/l	TM178	<0.046 ♦ #
Benzo(k)fluoranthene (aq)	<0.027 µg/l	TM178	<0.054 ♦ #
Benzo(a)pyrene (aq)	<0.009 µg/l	TM178	<0.018 ♦ #
Dibenzo(a,h)anthracene (aq)	<0.016 µg/l	TM178	<0.032 ♦ #
Benzo(g,h,i)perylene (aq)	<0.016 µg/l	TM178	<0.032 ♦ #
Indeno(1,2,3-cd)pyrene (aq)	<0.014 µg/l	TM178	<0.028 ♦ #
PAH, Total Detected USEPA 16 (aq)	<0.344 µg/l	TM178	<0.688 ♦

CERTIFICATE OF ANALYSIS

SDG:	150424-103	**Location:**	Palleg	**Order Number:**	
Job:	H_GETCNO_NAH-10	**Customer:**	Geotechnology	**Report Number:**	312161
Client Reference:		**Attention:**	Keir Thomas	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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)

Customer Sample R	L1
Depth (m)	.
Sample Type	Water(GW/SW)
Date Sampled	22/04/2015
Sample Time	.
Date Received	24/04/2015
SDG Ref	150424-103
Lab Sample No.(s)	11250415
AGS Reference	

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	2.26 ♦ #
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 ♦ #

CERTIFICATE OF ANALYSIS

SDG:	150424-103	**Location:**	Palleg	**Order Number:**	
Job:	H_GETCNO_NAH-10	**Customer:**	Geotechnology	**Report Number:**	312161
Client Reference:		**Attention:**	Keir Thomas	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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)

Customer Sample R	L1
Depth (m)	.
Sample Type	Water(GW/SW)
Date Sampled	22/04/2015
Sample Time	.
Date Received	24/04/2015
SDG Ref	150424-103
Lab Sample No.(s)	11250415
AGS Reference	

Component	LOD/Units	Method	
n-Dibutyl phthalate (aq)	<1 µg/l	TM176	<1 ♦ #
Diethyl phthalate (aq)	<1 µg/l	TM176	<1 ♦ #
Dimethyl phthalate (aq)	<1 µg/l	TM176	<1 ♦ #
n-Dioctyl phthalate (aq)	<5 µg/l	TM176	<5 ♦ #
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 ♦ #
Isophorone (aq)	<1 µg/l	TM176	<1 ♦ #
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176	<1
SVOC TIC (aq)	-	TM176	Detected ♦
SVOC Derivatised (aq)	-	TM176	Not Detected ♦
Benzothiazolone	µg/l	TM176	692
bis(methylthio)methylene-phrenyl- methyl- penten-	µg/l	TM176	291
ethoxy -methoxy -dimethylchromanone	µg/l	TM176	27.8
Phenol, -(methylethylidene)bis-	µg/l	TM176	63.6
Propanol, chloro-, phosphate (3:1)	µg/l	TM176	46.3
Sulfur	µg/l	TM176	130
Triisopropylphosphate	µg/l	TM176	487
Trimethylbenzoic acid	µg/l	TM176	40.7
Unknown	µg/l	TM176	56.3

CERTIFICATE OF ANALYSIS

SDG:	150424-103	**Location:**	Palleg	**Order Number:**	
Job:	H_GETCNO_NAH-10	**Customer:**	Geotechnology	**Report Number:**	312161
Client Reference:		**Attention:**	Keir Thomas	**Superseded Report:**	

VOC MS (W)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS 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	Customer Sample R	GW2	GW3	GW4	GW5	L1
			Depth (m)	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	22/04/2015	22/04/2015	22/04/2015	22/04/2015	22/04/2015
			Sample Time	.	.	.	.	.
			Date Received	24/04/2015	24/04/2015	24/04/2015	24/04/2015	24/04/2015
			SDG Ref	150424-103	150424-103	150424-103	150424-103	150424-103
			Lab Sample No.(s)	11250411	11250412	11250413	11250414	11250415
			AGS Reference					
Dibromofluoromethane**	%	TM208						104 1
Toluene-d8**	%	TM208		99.3 1	99.2 1	99.4	98.6 1	102 1
4-Bromofluorobenzene**	%	TM208						96.1 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						10.2 1 #
Dichloromethane	<3 µg/l	TM208						4.34 1 #
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208		<1 1 #	<1 1 #	<1 #	<1 1 #	1.11 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 1 #	<1 1 #	<1 #	<1 1 #	4.23 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 1 #	<1 1 #	<1 #	<1 1 #	5.96 1 #
trans-1,3-Dichloropropene	<1 µg/l	TM208						<1 1 #
1,1,2-Trichloroethane	<1 µg/l	TM208						<1 1 #

CERTIFICATE OF ANALYSIS

SDG:	150424-103	**Location:**	Palleg	**Order Number:**	
Job:	H_GETCNO_NAH-10	**Customer:**	Geotechnology	**Report Number:**	312161
Client Reference:		**Attention:**	Keir Thomas	**Superseded Report:**	

VOC MS (W)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS 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	Customer Sample R	GW2	GW3	GW4	GW5	L1	
			Depth (m)	.	.	.	.	.	
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	
			Date Sampled	22/04/2015	22/04/2015	22/04/2015	22/04/2015	22/04/2015	
			Sample Time	.	.	.	.	.	
			Date Received	24/04/2015	24/04/2015	24/04/2015	24/04/2015	24/04/2015	
			SDG Ref	150424-103	150424-103	150424-103	150424-103	150424-103	
			Lab Sample No.(s)	11250411	11250412	11250413	11250414	11250415	
			AGS Reference						
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 1 #	<1 1 #	<1 #	<1 1 #	3.69 1 #	
m,p-Xylene	<1 µg/l	TM208		<1 1 #	<1 1 #	<1 #	<1 1 #	2.92 1 #	
o-Xylene	<1 µg/l	TM208		<1 1 #	<1 1 #	<1 #	<1 1 #	2.09 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-chloropropane	<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 #	

CERTIFICATE OF ANALYSIS

SDG:	150424-103	**Location:**	Palleg	**Order Number:**	
Job:	H_GETCNO_NAH-10	**Customer:**	Geotechnology	**Report Number:**	312161
Client Reference:		**Attention:**	Keir Thomas	**Superseded Report:**	

VOC MS (W)

Results Legend		Customer Sample R	GW2	GW3	GW4	GW5	L1	
#	ISO17025 accredited.							
M	*m*CERTS accredited.							
aq	Aqueous / settled sample.	Depth (m)	.	.	.	.	.	
diss.filt	Dissolved / filtered sample.	Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	
tot.unfilt	Total / unfiltered sample.	Date Sampled	22/04/2015	22/04/2015	22/04/2015	22/04/2015	22/04/2015	
*	Subcontracted test.	Sample Time	.	.	.	.	.	
**	% 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	Date Received	24/04/2015	24/04/2015	24/04/2015	24/04/2015	24/04/2015	
		SDG Ref	150424-103	150424-103	150424-103	150424-103	150424-103	
(F)	Trigger breach confirmed	Lab Sample No.(s)	11250411	11250412	11250413	11250414	11250415	
1-5&+§@	Sample deviation (see appendix)	AGS Reference						
Component	**LOD/Units**	**Method**						
1,2,3-Trichlorobenzene	<1 µg/l	TM208					<1 1 #	
1,3,5-Trichlorobenzene	<1 µg/l	TM208					<1 1	

CERTIFICATE OF ANALYSIS

SDG:	150424-103	**Location:**	Palleg	**Order Number:**	
Job:	H_GETCNO_NAH-10	**Customer:**	Geotechnology	**Report Number:**	312161
Client Reference:		**Attention:**	Keir Thomas	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
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		
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.

CERTIFICATE OF ANALYSIS

SDG:	150424-103	**Location:**	Palleg	**Order Number:**	
Job:	H_GETCNO_NAH-10	**Customer:**	Geotechnology	**Report Number:**	312161
Client Reference:		**Attention:**	Keir Thomas	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	11250411	11250412	11250413	11250414	11250415
Customer Sample Ref.	GW2	GW3	GW4	GW5	L1
AGS Ref.					
Depth					
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
Acid Herbicides by LCQQQ (aq)	05-May-2015	05-May-2015	05-May-2015	05-May-2015	06-May-2015
Alkalinity as CaCO3	07-May-2015	07-May-2015	07-May-2015	07-May-2015	
Alkalinity Filtered as CaCO3					07-May-2015
Ammoniacal Nitrogen	05-May-2015	06-May-2015	06-May-2015	06-May-2015	28-Apr-2015
Anions by Kone (w)	01-May-2015	01-May-2015	01-May-2015	01-May-2015	05-May-2015
BOD True Total	30-Apr-2015	30-Apr-2015	30-Apr-2015	30-Apr-2015	30-Apr-2015
COD Unfiltered	29-Apr-2015	29-Apr-2015	29-Apr-2015	29-Apr-2015	29-Apr-2015
Cyanide Comp/Free/Total/Thiocyanate					09-May-2015
Dissolved Metals by ICP-MS	05-May-2015	07-May-2015	07-May-2015	05-May-2015	07-May-2015
EPH (DRO) (C10-C40) Aqueous (W)					07-May-2015
GRO by GC-FID (W)					01-May-2015
Mercury Dissolved	30-Apr-2015	30-Apr-2015	30-Apr-2015	30-Apr-2015	30-Apr-2015
Metals by iCap-OES Dissolved (W)	29-Apr-2015	30-Apr-2015	30-Apr-2015	29-Apr-2015	01-May-2015
Mineral Oil C10-40 Aqueous (W)					07-May-2015
Nitrite by Kone (w)					27-Apr-2015
OC, OP Pesticides and Triazine Herb					01-May-2015
Organochlorine Pesticides (Aq)					01-May-2015
Organophosphorus Pesticides (Aq)					01-May-2015
Organotins in Aqueous Samples					28-Apr-2015
PAH Spec MS - Aqueous (W)					06-May-2015
Phenols by HPLC (W)	05-May-2015	05-May-2015	05-May-2015	05-May-2015	05-May-2015
Sulphide					06-May-2015
SVOC MS (W) - Aqueous					07-May-2015
Total EPH (aq)					07-May-2015
Total Organic and Inorganic Carbon	01-May-2015	01-May-2015	01-May-2015	01-May-2015	01-May-2015
VOC MS (W)	03-May-2015	03-May-2015	07-May-2015	03-May-2015	05-May-2015

SDG:	150424-103	**Location:**	Palleg	**Order Number:**	
Job:	H_GETCNO_NAH-10	**Customer:**	Geotechnology	**Report Number:**	312161
Client Reference:		**Attention:**	Keir Thomas	**Superseded Report:**	

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) 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 Dimethyphenol, 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 presevation 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.

ALcontrol Laboratories

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email: mkt@alcontrol.com
Website: www.alcontrol.com

JLA Disposal Ltd
Glyncynwal Uchaf Farm
Lower Cwmtwrch
SA9 2QQ

Attention: John Adams

CERTIFICATE OF ANALYSIS

Date:	04 August 2015
Customer:	H_JLADISP_SWA
Sample Delivery Group (SDG):	150722-118
Your Reference:	JLA Recycling Ltd.
Location:	JLA Recycling Ltd.
Report No:	323868

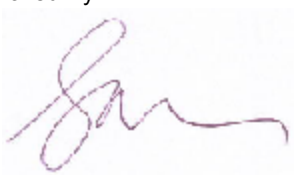
This report has been revised and directly supersedes 323867 in its entirety.

We received 5 samples on Wednesday July 22, 2015 and 5 of these samples were scheduled for analysis which was completed on Friday July 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

CERTIFICATE OF ANALYSIS

SDG:	150722-118	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	323868
Client Reference:	JLA Recycling Ltd.	**Attention:**	John Adams	**Superseded Report:**	323867

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
11759689	GW2			20/07/2015
11759690	GW3			20/07/2015
11759691	GW4			20/07/2015
11759693	GW5			20/07/2015
11759692	GW8			20/07/2015

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

CERTIFICATE OF ANALYSIS

SDG:	150722-118	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	323868
Client Reference:	JLA Recycling Ltd.	**Attention:**	John Adams	**Superseded Report:**	323867

LIQUID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			11759689	GW2			1lplastic (ALE221)
			11759689	GW2			H2SO4 (ALE244)
			11759690	GW3			1lplastic (ALE221)
			11759690	GW3			H2SO4 (ALE244)
			11759691	GW4			1lplastic (ALE221)
			11759691	GW4			H2SO4 (ALE244)
			11759693	GW5			1lplastic (ALE221)
			11759693	GW5			H2SO4 (ALE244)
			11759692	GW8			1lplastic (ALE221)
			11759692	GW8			H2SO4 (ALE244)
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 5		X		X	X	X	X	X		X
Anions by Kone (w)	All	NDPs: 0 Tests: 5	X		X		X		X		X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 5	X		X		X		X		X	

CERTIFICATE OF ANALYSIS

SDG:	150722-118	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	323868
Client Reference:	JLA Recycling Ltd.	**Attention:**	John Adams	**Superseded Report:**	323867

Results Legend

#	ISO17025 accredited.
M	*m*CERTS 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	Customer Sample Ref.	GW2	GW3	GW4	GW5	GW8
			Depth (m)	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	20/07/2015	20/07/2015	20/07/2015	20/07/2015	20/07/2015
			Sample Time	.	.	.	.	.
			Date Received	22/07/2015	22/07/2015	22/07/2015	22/07/2015	22/07/2015
			SDG Ref	150722-118	150722-118	150722-118	150722-118	150722-118
			Lab Sample No.(s)	11759689	11759690	11759691	11759693	11759692
			AGS Reference					
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099		<0.2 #	0.287 #	5.08 #	0.625 #	0.461 #
Zinc (diss.filt)	<0.41 µg/l	TM152		0.847 #	0.861 #	1.37 #	2.63 #	<0.41 #
Chloride	<2 mg/l	TM184		19.4 #	53.6 #	158 #	6.6 #	24.3 #

CERTIFICATE OF ANALYSIS

SDG:	150722-118	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	323868
Client Reference:	JLA Recycling Ltd.	**Attention:**	John Adams	**Superseded Report:**	323867

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
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.

CERTIFICATE OF ANALYSIS

SDG:	150722-118	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	323868
Client Reference:	JLA Recycling Ltd.	**Attention:**	John Adams	**Superseded Report:**	323867

Test Completion Dates

Lab Sample No(s)	11759689	11759690	11759691	11759693	11759692
Customer Sample Ref.	GW2	GW3	GW4	GW5	GW8
AGS Ref.					
Depth					
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
Ammoniacal Nitrogen	29-Jul-2015	29-Jul-2015	29-Jul-2015	29-Jul-2015	29-Jul-2015
Anions by Kone (w)	28-Jul-2015	28-Jul-2015	29-Jul-2015	28-Jul-2015	28-Jul-2015
Dissolved Metals by ICP-MS	31-Jul-2015	31-Jul-2015	31-Jul-2015	31-Jul-2015	31-Jul-2015

SDG:	150722-118	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	323868
Client Reference:	JLA Recycling Ltd.	**Attention:**	John Adams	**Superseded Report:**	323867

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) 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 Dimethyphenol, 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 presevation 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.

ALcontrol Laboratories

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email: mkt@alcontrol.com
Website: www.alcontrol.com

JLA Disposal Ltd
Glyncynwal Uchaf Farm
Lower Cwmtwrch
SA9 2QQ

Attention: John Adams

CERTIFICATE OF ANALYSIS

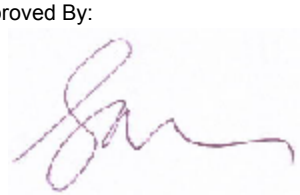
Date:	11 August 2015
Customer:	H_JLADISP_SWA
Sample Delivery Group (SDG):	150801-43
Your Reference:	JLA Recycling Ltd.
Location:	JLA Recycling Ltd.
Report No:	324964

We received 1 sample on Saturday August 01, 2015 and 1 of these samples were scheduled for analysis which was completed on Tuesday August 11, 2015. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	150801-43	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	324964
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
11820426	S1			20/07/2015

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

CERTIFICATE OF ANALYSIS

SDG:	150801-43	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	324964
Client Reference:	JLA Recycling Ltd.	**Attention:**	John Adams	**Superseded Report:**	

LIQUID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			11820426	S1			1plastic (ALE221) / 250ml BOD (ALE21 / Dissolved Metals Pr / H2SO4 (ALE244) / HNO3 Filtered (ALE
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				

CERTIFICATE OF ANALYSIS

SDG:	150801-43	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	324964
Client Reference:	JLA Recycling Ltd.	**Attention:**	John Adams	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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)

Customer Sample R	S1
Depth (m)	.
Sample Type	Water(GW/SW)
Date Sampled	20/07/2015
Sample Time	.
Date Received	01/08/2015
SDG Ref	150801-43
Lab Sample No.(s)	11820426
AGS Reference	

Component	LOD/Units	Method	
Suspended solids, Total	<2 mg/l	TM022	7 @ #
Alkalinity, Total as CaCO3	<2 mg/l	TM043	210 #
BOD, unfiltered	<1 mg/l	TM045	<5 @ #
Organic Carbon, Total	<3 mg/l	TM090	9.79 @ #
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	<0.2 #
COD, unfiltered	<7 mg/l	TM107	20.2 @ #
Arsenic (diss.filt)	<0.12 µg/l	TM152	0.961 #
Boron (diss.filt)	<9.4 µg/l	TM152	141 #
Cadmium (diss.filt)	<0.1 µg/l	TM152	<0.1 #
Chromium (diss.filt)	<0.22 µg/l	TM152	1.12 #
Copper (diss.filt)	<0.85 µg/l	TM152	3.66 #
Lead (diss.filt)	<0.02 µg/l	TM152	0.18 #
Manganese (diss.filt)	<0.04 µg/l	TM152	14.9 #
Nickel (diss.filt)	<0.15 µg/l	TM152	2.41 #
Zinc (diss.filt)	<0.41 µg/l	TM152	2.84 #
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01 @ #
Sulphate	<2 mg/l	TM184	33.5 #
Chloride	<2 mg/l	TM184	11.8 #
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184	0.221 #
Calcium (diss.filt)	<0.012 mg/l	TM228	78.3 #
Sodium (diss.filt)	<0.076 mg/l	TM228	9.35 #
Magnesium (diss.filt)	<0.036 mg/l	TM228	4.45 #
Potassium (diss.filt)	<1 mg/l	TM228	1.9 #
Iron (diss.filt)	<0.019 mg/l	TM228	0.0191 #

CERTIFICATE OF ANALYSIS

SDG:	150801-43	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	324964
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		
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.

CERTIFICATE OF ANALYSIS

SDG:	150801-43	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	324964
Client Reference:	JLA Recycling Ltd.	**Attention:**	John Adams	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	11820426
Customer Sample Ref.	S1
AGS Ref.	
Depth	
Type	LIQUID
Alkalinity as CaCO3	07-Aug-2015
Ammoniacal Nitrogen	10-Aug-2015
Anions by Kone (w)	07-Aug-2015
BOD True Total	08-Aug-2015
COD Unfiltered	07-Aug-2015
Dissolved Metals by ICP-MS	10-Aug-2015
Mercury Dissolved	06-Aug-2015
Metals by iCap-OES Dissolved (W)	04-Aug-2015
Suspended Solids	11-Aug-2015
Total Organic and Inorganic Carbon	11-Aug-2015

SDG:	150801-43	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	324964
Client Reference:	JLA Recycling Ltd.	**Attention:**	John Adams	**Superseded Report:**	

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) 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 Dimethyphenol, 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 presevation 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.

ALcontrol Laboratories

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JLA Disposal Ltd
Glyncynwal Uchaf Farm
Lower Cwmtwrch
SA9 2QQ

Attention: John Adams

CERTIFICATE OF ANALYSIS

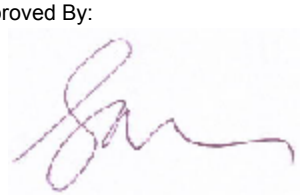
Date:	20 August 2015
Customer:	H_JLADISP_SWA
Sample Delivery Group (SDG):	150813-48
Your Reference:	JLA Recycling Ltd.
Location:	JLA Recycling Ltd.
Report No:	326374

We received 1 sample on Thursday August 13, 2015 and 1 of these samples were scheduled for analysis which was completed on Thursday August 20, 2015. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	150813-48	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	326374
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
11886298	SW1			11/08/2015

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

CERTIFICATE OF ANALYSIS

SDG:	150813-48	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	326374
Client Reference:	JLA Recycling Ltd.	**Attention:**	John Adams	**Superseded Report:**	

LIQUID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container		
			11886298	SW1			1lplastic (ALE221)	250ml BOD (ALE21	H2SO4 (ALE244)
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	
Suspended Solids	All	NDPs: 0 Tests: 1					X		

CERTIFICATE OF ANALYSIS

SDG:	150813-48	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	326374
Client Reference:	JLA Recycling Ltd.	**Attention:**	John Adams	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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)

Customer Sample R			SW1
Depth (m)			.
Sample Type			Water(GW/SW)
Date Sampled			11/08/2015
Sample Time			.
Date Received			13/08/2015
SDG Ref			150813-48
Lab Sample No.(s)			11886298
AGS Reference			
Component	**LOD/Units**	**Method**	
Suspended solids, Total	<2 mg/l	TM022	<2 #
BOD, unfiltered	<1 mg/l	TM045	<1 ♦ #
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	<0.2 #
COD, unfiltered	<7 mg/l	TM107	27.5 #
Chloride	<2 mg/l	TM184	13.5 #

CERTIFICATE OF ANALYSIS

SDG:	150813-48	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	326374
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.

CERTIFICATE OF ANALYSIS

SDG:	150813-48	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	326374
Client Reference:	JLA Recycling Ltd.	**Attention:**	John Adams	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	11886298
Customer Sample Ref.	SW1
AGS Ref.	
Depth	
Type	LIQUID
Ammoniacal Nitrogen	18-Aug-2015
Anions by Kone (w)	18-Aug-2015
BOD True Total	19-Aug-2015
COD Unfiltered	14-Aug-2015
Suspended Solids	20-Aug-2015

SDG:	150813-48	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	326374
Client Reference:	JLA Recycling Ltd.	**Attention:**	John Adams	**Superseded Report:**	

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) 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 Dimethyphenol, 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 presevation 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.

ALcontrol Laboratories

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Glyncynwal Uchaf Farm
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SA9 2QQ

Attention: John Adams

CERTIFICATE OF ANALYSIS

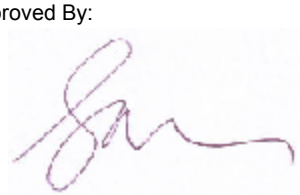
Date:	07 October 2015
Customer:	H_JLADISP_SWA
Sample Delivery Group (SDG):	151001-19
Your Reference:	JLA Recycling Ltd.
Location:	JLA Recycling Ltd.
Report No:	332539

We received 3 samples on Thursday October 01, 2015 and 2 of these samples were scheduled for analysis which was completed on Wednesday October 07, 2015. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	151001-19	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	332539
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
12157385	BOX IN		0.00 - 0.00	30/09/2015
12157387	BOX OUT		0.00 - 0.00	30/09/2015
12157388	SOURCE		0.00 - 0.00	

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

CERTIFICATE OF ANALYSIS

SDG:	151001-19	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	332539
Client Reference:	JLA Recycling Ltd.	**Attention:**	John Adams	**Superseded Report:**	

LIQUID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	12157385	12157387
			Customer Sample Reference	BOX IN	BOX OUT
			AGS Reference		
			Depth (m)	0.00 - 0.00	0.00 - 0.00
			Container	250ml BOD (ALE21	250ml BOD (ALE21
Suspended Solids	All	NDPs: 0 Tests: 2		X	X

CERTIFICATE OF ANALYSIS

SDG:	151001-19	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	332539
Client Reference:	JLA Recycling Ltd.	**Attention:**	John Adams	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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	Customer Sample R	BOX IN	BOX OUT
			Depth (m)	0.00 - 0.00	0.00 - 0.00
			Sample Type	Water(GW/SW)	Water(GW/SW)
			Date Sampled	30/09/2015	30/09/2015
			Sample Time	.	.
			Date Received	01/10/2015	01/10/2015
			SDG Ref	151001-19	151001-19
			Lab Sample No.(s)	12157385	12157387
			AGS Reference		
Suspended solids, Total	<2 mg/l	TM022		62.5 #	70.5 #

CERTIFICATE OF ANALYSIS

SDG:	151001-19	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	332539
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		

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

CERTIFICATE OF ANALYSIS

SDG:	151001-19	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	332539
Client Reference:	JLA Recycling Ltd.	**Attention:**	John Adams	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	12157385	12157387
Customer Sample Ref.	BOX IN	BOX OUT
AGS Ref.		
Depth	0.00 - 0.00	0.00 - 0.00
Type	LIQUID	LIQUID
Suspended Solids	07-Oct-2015	07-Oct-2015

SDG:	151001-19	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	332539
Client Reference:	JLA Recycling Ltd.	**Attention:**	John Adams	**Superseded Report:**	

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) 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 Dimethyphenol, 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 presevation 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.

ALcontrol Laboratories

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Fax: (01244) 528701
email: mkt@alcontrol.com
Website: www.alcontrol.com

JLA Disposal Ltd
Glyncynwal Uchaf Farm
Lower Cwmtwrch
SA9 2QQ

Attention: John Adams

CERTIFICATE OF ANALYSIS

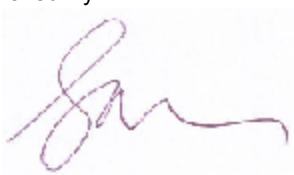
Date:	03 November 2015
Customer:	H_JLADISP_SWA
Sample Delivery Group (SDG):	151028-52
Your Reference:	JLA Recycling Ltd.
Location:	JLA Recycling Ltd.
Report No:	336390

We received 1 sample on Wednesday October 28, 2015 and 1 of these samples were scheduled for analysis which was completed on Tuesday November 03, 2015. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

Approved By:



Sonia McWhan
Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	151028-52	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	336390
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
12326790	SW1			26/10/2015

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

CERTIFICATE OF ANALYSIS

SDG:	151028-52	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	336390
Client Reference:	JLA Recycling Ltd.	**Attention:**	John Adams	**Superseded Report:**	

LIQUID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container		
			12326790	SW1			1lplastic (ALE221)	250ml BOD	H2SO4 (ALE244)
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	
Suspended Solids	All	NDPs: 0 Tests: 1					X		

CERTIFICATE OF ANALYSIS

SDG:	151028-52	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	336390
Client Reference:	JLA Recycling Ltd.	**Attention:**	John Adams	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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	Customer Sample	SW1
			Depth (m)	.
			Sample Type	Water(GW/SW)
			Date Sampled	26/10/2015
			Sample Time	.
			Date Received	28/10/2015
			SDG Ref	151028-52
			Lab Sample No.(s)	12326790
			AGS Reference	
Suspended solids, Total	<2 mg/l	TM022		360 #
BOD, unfiltered	<1 mg/l	TM045		<1 ♦ #
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099		<0.2 #
COD, unfiltered	<7 mg/l	TM107		41.2 #
Chloride	<2 mg/l	TM184		11.9 #

CERTIFICATE OF ANALYSIS

SDG:	151028-52	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	336390
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.

CERTIFICATE OF ANALYSIS

SDG:	151028-52	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	336390
Client Reference:	JLA Recycling Ltd.	**Attention:**	John Adams	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	12326790
Customer Sample Ref.	SW1
AGS Ref.	
Depth	
Type	LIQUID
Ammoniacal Nitrogen	29-Oct-2015
Anions by Kone (w)	02-Nov-2015
BOD True Total	03-Nov-2015
COD Unfiltered	31-Oct-2015
Suspended Solids	03-Nov-2015

SDG:	151028-52	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	336390
Client Reference:	JLA Recycling Ltd.	**Attention:**	John Adams	**Superseded Report:**	

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) 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 Dimethyphenol, 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 presevation 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.

ALcontrol Laboratories

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email: mkt@alcontrol.com
Website: www.alcontrol.com

JLA Disposal Ltd
Glyncynwal Uchaf Farm
Lower Cwmtwrch
SA9 2QQ

Attention: John Adams

CERTIFICATE OF ANALYSIS

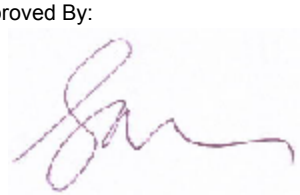
Date:	08 December 2015
Customer:	H_JLADISP_SWA
Sample Delivery Group (SDG):	151128-88
Your Reference:	JLA Recycling Ltd.
Location:	JLA Recycling Ltd.
Report No:	341175

We received 1 sample on Saturday November 28, 2015 and 1 of these samples were scheduled for analysis which was completed on Tuesday December 08, 2015. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	151128-88	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	341175
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
12538805	SW1		0.00 - 0.00	26/11/2015

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

CERTIFICATE OF ANALYSIS

SDG:	151128-88	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	341175
Client Reference:	JLA Recycling Ltd.	**Attention:**	John Adams	**Superseded Report:**	

LIQUID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container		
			12538805	SW1		0.00 - 0.00	1plastic (ALE221)	250ml BOD (ALE21	H2SO4 (ALE244)
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		

CERTIFICATE OF ANALYSIS

SDG:	151128-88	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	341175
Client Reference:	JLA Recycling Ltd.	**Attention:**	John Adams	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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)

	Customer Sample R	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
	SW1	0.00 - 0.00	Water(GW/SW)	26/11/2015	.	28/11/2015	151128-88	12538805	

Component	LOD/Units	Method	
Suspended solids, Total	<2 mg/l	TM022	51 #
BOD, unfiltered	<1 mg/l	TM045	<1 ♦ #
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	0.3 #
COD, unfiltered	<7 mg/l	TM107	43.9 #
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120	0.428 #
Chloride	<2 mg/l	TM184	20.5 #
pH	<1 pH Units	TM256	7.94 #

CERTIFICATE OF ANALYSIS

SDG:	151128-88	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	341175
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		
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.

CERTIFICATE OF ANALYSIS

SDG:	151128-88	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	341175
Client Reference:	JLA Recycling Ltd.	**Attention:**	John Adams	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	12538805
Customer Sample Ref.	SW1
AGS Ref.	
Depth	0.00 - 0.00
Type	LIQUID
Ammoniacal Nitrogen	02-Dec-2015
Anions by Kone (w)	03-Dec-2015
BOD True Total	05-Dec-2015
COD Unfiltered	03-Dec-2015
Conductivity (at 20 deg.C)	04-Dec-2015
pH Value	07-Dec-2015
Suspended Solids	08-Dec-2015

SDG:	151128-88	**Location:**	JLA Recycling Ltd.	**Order Number:**	
Job:	H_JLADISP_SWA-1	**Customer:**	JLA Disposal Ltd	**Report Number:**	341175
Client Reference:	JLA Recycling Ltd.	**Attention:**	John Adams	**Superseded Report:**	

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) 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 Dimethyphenol, 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 presevation 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.

ALcontrol Laboratories

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Website: www.alcontrol.com

JLA Disposal Ltd
Glyncynwal Uchaf Farm
Lower Cwmtwrch
SA9 2QQ

Attention: Ben Rees

CERTIFICATE OF ANALYSIS

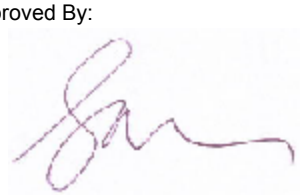
Date:	31 December 2015
Customer:	H_JLADISP_SWA
Sample Delivery Group (SDG):	151218-81
Your Reference:	
Location:	Palleg
Report No:	344094

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

CERTIFICATE OF ANALYSIS

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)			12672583						12672584						12672591					12672585					12672588					12672582						12672590	12672592			
Customer Sample Reference			GW2						GW3						GW4					GW5					GW8					L1						LAGOON	SW1			
AGS Reference																																								
Depth (m)																																								
Container			1000ml glass bottle	1lplastic (ALE221)	250ml BOD (ALE21	Dissolved Metals Pr	H2SO4 (ALE244)	Vial (ALE297)	1000ml glass bottle	1lplastic (ALE221)	250ml BOD (ALE21	Dissolved Metals Pr	H2SO4 (ALE244)	Vial (ALE297)	1000ml glass bottle	1lplastic (ALE221)	250ml BOD (ALE21	Dissolved Metals Pr	H2SO4 (ALE244)	1000ml glass bottle	1lplastic (ALE221)	250ml BOD (ALE21	Dissolved Metals Pr	H2SO4 (ALE244)	1000ml glass bottle	1lplastic (ALE221)	250ml BOD (ALE21	Dissolved Metals Pr	H2SO4 (ALE244)	1000ml glass bottle	1lplastic (ALE221)	250ml BOD (ALE21	Dissolved Metals Pr	H2SO4 (ALE244)	ZnAc (ALE246)	1000ml glass bottle	1000ml glass bottle	1lplastic (ALE221)	Dissolved Metals Pr	H2SO4 (ALE244)
Acid Herbicides (W)	All	NDPs: 0 Tests: 6	X						X						X					X					X					X										
Alkalinity as CaCO3	All	NDPs: 0 Tests: 6		X						X						X					X					X												X		
Alkalinity Filtered as CaCO3	All	NDPs: 0 Tests: 1																													X									
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 7					X						X						X					X					X					X						X
Anions by Kone (w)	All	NDPs: 0 Tests: 7		X						X						X					X					X					X							X		
BOD True Total	All	NDPs: 0 Tests: 7			X						X						X					X					X					X						X		
COD Unfiltered	All	NDPs: 0 Tests: 7			X						X						X					X					X					X						X		
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 6	X						X						X					X					X					X										
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 7		X						X						X					X					X					X							X		
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 0 Tests: 6	X						X						X					X					X					X										
GRO by GC-FID (W)	All	NDPs: 0 Tests: 6						X						X	X					X						X				X										
Mercury Dissolved	All	NDPs: 0 Tests: 7				X						X						X					X					X					X						X	
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 7		X						X						X					X					X					X							X		
Mineral Oil C10-40 Aqueous (W)	All	NDPs: 0 Tests: 6	X						X						X					X					X					X										
Nitrite by Kone (w)	All	NDPs: 0 Tests: 1																													X									

15:55:46 31/12/2015

CERTIFICATE OF ANALYSIS

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:**	

LIQUID

Results Legend

X — Test

N — No Determination Possible

Lab Sample No(s)	12672583	12672584	12672591	12672585	12672588	12672582	12672590	12672592
Customer Sample Reference	GW2	GW3	GW4	GW5	GW8	LAGOON L1		SW1
AGS Reference								
Depth (m)								
Container	1000ml glass bottle 1plastic (ALE221) 250ml BOD (ALE21 Dissolved Metals Pr H2SO4 (ALE244) Vial (ALE297) 1000ml glass bottle 1plastic (ALE221) 250ml BOD (ALE21 Dissolved Metals Pr H2SO4 (ALE244) Vial (ALE297) 1000ml glass bottle 1plastic (ALE221) 250ml BOD (ALE21 Dissolved Metals Pr H2SO4 (ALE244) 1000ml glass bottle 1plastic (ALE221) 250ml BOD (ALE21 Dissolved Metals Pr H2SO4 (ALE244) 1000ml glass bottle 1plastic (ALE221) 250ml BOD (ALE21 Dissolved Metals Pr H2SO4 (ALE244) ZnAc (ALE246) 1000ml glass bottle 1plastic (ALE221) Dissolved Metals Pr H2SO4 (ALE244)								
OC, OP Pesticides and Triazine Herb	All	NDPs: 0 Tests: 6	X	X	X	X	X	X		
Organochlorine Pesticides (Aq)	All	NDPs: 0 Tests: 6	X	X	X	X	X	X		
Organophosphorus Pesticides (Aq)	All	NDPs: 0 Tests: 6	X	X	X	X	X	X		
Organotins in Aqueous Samples	All	NDPs: 0 Tests: 6	X	X	X	X	X	X		
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 6	X	X	X	X	X	X		
Phenols by HPLC (W)	All	NDPs: 0 Tests: 6	X	X	X	X	X	X		
Sulphide	All	NDPs: 0 Tests: 1						X		
Suspended Solids	All	NDPs: 0 Tests: 2							X	X
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 6	X	X	X	X	X	X		
Total EPH (aq)	All	NDPs: 0 Tests: 6	X	X	X	X	X	X		
Total Organic and Inorganic Carbon	All	NDPs: 0 Tests: 7	X	X	X	X	X	X	X	
VOC MS (W)	All	NDPs: 0 Tests: 6	X	X X	X	X	X	X		

CERTIFICATE OF ANALYSIS

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:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS 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	Customer Sample R	GW2	GW3	GW4	GW5	GW8	L1
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	16/12/2015	16/12/2015	16/12/2015	16/12/2015	16/12/2015	16/12/2015
			Sample Time	.	.	.	.	.	.
			Date Received	18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015
			SDG Ref	151218-81	151218-81	151218-81	151218-81	151218-81	151218-81
			Lab Sample No.(s)	12672583	12672584	12672591	12672585	12672588	12672582
			AGS Reference						
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 #

CERTIFICATE OF ANALYSIS

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:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS 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	Customer Sample R	GW2	GW3	GW4	GW5	GW8	L1
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	16/12/2015	16/12/2015	16/12/2015	16/12/2015	16/12/2015	16/12/2015
			Sample Time	.	.	.	.	.	.
			Date Received	18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015
			SDG Ref	151218-81	151218-81	151218-81	151218-81	151218-81	151218-81
			Lab Sample No.(s)	12672583	12672584	12672591	12672585	12672588	12672582
			AGS Reference						
Phenol	<0.002 mg/l	TM259		<0.002 #	<0.002 #	<0.002 #	<0.002 #	<0.002 #	0.21 #
Cresols	<0.006 mg/l	TM259		<0.006 #	<0.006 #	<0.006 #	<0.006 #	<0.006 #	0.47 #
Xylenols	<0.008 mg/l	TM259		<0.008 #	<0.008 #	<0.008 #	<0.008 #	<0.008 #	<0.04 #
Phenols, Total Detected monohydric	<0.016 mg/l	TM259		<0.016 #	<0.016 #	<0.016 #	<0.016 #	<0.016 #	0.68 #
Etridiazole	<0.01 µg/l	TM314		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Propachlor	<0.01 µg/l	TM314		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Trifluralin	<0.01 µg/l	TM314		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Simazine	<0.01 µg/l	TM315		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Atrazine	<0.01 µg/l	TM315		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Propazine	<0.01 µg/l	TM315		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Alachlor	<0.01 µg/l	TM315		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chlorpyriphos-Ethyl	<0.01 µg/l	TM315		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Terbutryn	<0.01 µg/l	TM315		<0.01	<0.01	0.031	<0.01	0.05	0.174
Prometryn	<0.01 µg/l	TM315		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dibutyl tin	<5 ng/l	TM328		<5	<5	<150	<5	<10	<150
Tributyl tin	<1 ng/l	TM328		1.36	<1	<30	<1	3.81	<30
Tetrabutyl tin	<2 ng/l	TM328		<2	<2	<60	<2	<4	<60
Triphenyl tin	<1 ng/l	TM328		<1	<1	<30	<1	<2	<30
Surrogate	%	TM328		101	105	97	101	97.6	98.7

CERTIFICATE OF ANALYSIS

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:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS 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	Customer Sample R	LAGOON	SW1
			Depth (m)	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)
			Date Sampled	16/12/2015	16/12/2015
			Sample Time	.	.
			Date Received	18/12/2015	18/12/2015
			SDG Ref	151218-81	151218-81
			Lab Sample No.(s)	12672590	12672592
			AGS Reference		
Suspended solids, Total	<2 mg/l	TM022		117 #	13.3 #
Alkalinity, Total as CaCO3	<2 mg/l	TM043			195 #
BOD, unfiltered	<1 mg/l	TM045			55.1 ♦ #
Organic Carbon, Total	<3 mg/l	TM090			26 #
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099			4.4 #
COD, unfiltered	<7 mg/l	TM107			96.6 #
Arsenic (diss.filt)	<0.12 µg/l	TM152			2.64 #
Boron (diss.filt)	<9.4 µg/l	TM152			262 #
Cadmium (diss.filt)	<0.1 µg/l	TM152			0.308 #
Chromium (diss.filt)	<0.22 µg/l	TM152			3.8 #
Copper (diss.filt)	<0.85 µg/l	TM152			8.19 #
Lead (diss.filt)	<0.02 µg/l	TM152			2.36 #
Manganese (diss.filt)	<0.04 µg/l	TM152			86.5 #
Nickel (diss.filt)	<0.15 µg/l	TM152			6.15 #
Zinc (diss.filt)	<0.41 µg/l	TM152			29.2 #
Mercury (diss.filt)	<0.01 µg/l	TM183			<0.01 #
Sulphate	<2 mg/l	TM184			84.7 #
Chloride	<2 mg/l	TM184			30.1 #
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184			1.09 #
Calcium (diss.filt)	<0.012 mg/l	TM228			83.1 #
Sodium (diss.filt)	<0.076 mg/l	TM228			22.2 #
Magnesium (diss.filt)	<0.036 mg/l	TM228			7.85 #
Potassium (diss.filt)	<1 mg/l	TM228			7.39 #
Iron (diss.filt)	<0.019 mg/l	TM228			0.215 #

CERTIFICATE OF ANALYSIS

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:**	

Acid Herbicides (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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	Customer Sample R	GW2	GW3	GW4	GW5	GW8	L1
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	16/12/2015	16/12/2015	16/12/2015	16/12/2015	16/12/2015	16/12/2015
			Sample Time	.	.	.	.	.	.
			Date Received	18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015
			SDG Ref	151218-81	151218-81	151218-81	151218-81	151218-81	151218-81
			Lab Sample No.(s)	12672583	12672584	12672591	12672585	12672588	12672582
			AGS Reference						
Mecoprop (MCPP)	<0.04 µg/l	TM186		<0.04 3	<0.04 3	0.098 3	<0.04 3	0.055 3	17

CERTIFICATE OF ANALYSIS

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:**	

GRO by GC-FID (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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	Customer Sample R	GW2	GW3	GW4	GW5	GW8	L1
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	16/12/2015	16/12/2015	16/12/2015	16/12/2015	16/12/2015	16/12/2015
			Sample Time	.	.	.	.	.	.
			Date Received	18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015
			SDG Ref	151218-81	151218-81	151218-81	151218-81	151218-81	151218-81
			Lab Sample No.(s)	12672583	12672584	12672591	12672585	12672588	12672582
			AGS Reference						
Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245		<3 #	<3 #	<3 1 #	<3 1 #	<3 1 #	<3 1 #
Benzene	<7 µg/l	TM245		<7 #	<7 #	<7 1 #	<7 1 #	<7 1 #	<7 1 #
Toluene	<4 µg/l	TM245		<4 #	<4 #	<4 1 #	<4 1 #	<4 1 #	<4 1 #
Ethylbenzene	<5 µg/l	TM245		<5 #	<5 #	<5 1 #	<5 1 #	<5 1 #	<5 1 #
m,p-Xylene	<8 µg/l	TM245		<8 #	<8 #	<8 1 #	<8 1 #	<8 1 #	<8 1 #
o-Xylene	<3 µg/l	TM245		<3 #	<3 #	<3 1 #	<3 1 #	<3 1 #	<3 1 #
Sum of detected BTEX	<28 µg/l	TM245		<28	<28	<28 1	<28 1	<28 1	<28 1
GRO >C5-C10	<10 µg/l	TM245		<10	<10	<10 1	<10 1	<10 1	211 1
EPH (C6-C10)	<100 µg/l	TM245		<100	<100	<100 1	<100 1	<100 1	<100 1

CERTIFICATE OF ANALYSIS

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:**	

OC, OP Pesticides and Triazine Herb

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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	Customer Sample R	GW2	GW3	GW4	GW5	GW8	L1
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	16/12/2015	16/12/2015	16/12/2015	16/12/2015	16/12/2015	16/12/2015
			Sample Time	.	.	.	.	.	.
			Date Received	18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015
			SDG Ref	151218-81	151218-81	151218-81	151218-81	151218-81	151218-81
			Lab Sample No.(s)	12672583	12672584	12672591	12672585	12672588	12672582
			AGS Reference						
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
Chlorpyriphos 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
Chlorpyriphos	<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

CERTIFICATE OF ANALYSIS

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:**	

OC, OP Pesticides and Triazine Herb

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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	Customer Sample R	GW2	GW3	GW4	GW5	GW8	L1
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	16/12/2015	16/12/2015	16/12/2015	16/12/2015	16/12/2015	16/12/2015
			Sample Time	.	.	.	.	.	.
			Date Received	18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015
			SDG Ref	151218-81	151218-81	151218-81	151218-81	151218-81	151218-81
			Lab Sample No.(s)	12672583	12672584	12672591	12672585	12672588	12672582
			AGS Reference						
Chlorfenvinphos	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulphan I	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Trans-chlordane	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
cis-Chlordane	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
p,p-DDE	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dieldrin	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
o,p-TDE (DDD)	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endrin	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
o,p-DDT	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
p,p-TDE (DDD)	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ethion	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulphan II	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
p,p-DDT	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Carbophenothion	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
o,p-Methoxychlor	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Triazophos	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
p,p-Methoxychlor	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulphan sulphate	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Permethrin I	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phosalone	<0.01 µg/l	TM231		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Permethrin II	<0.01 µg/l	TM231		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Azinphos-methyl	<0.01 µg/l	TM231		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Azinphos-ethyl	<0.01 µg/l	TM231		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

CERTIFICATE OF ANALYSIS

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:**	

PAH Spec MS - Aqueous (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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	Customer Sample R	GW2	GW3	GW4	GW5	GW8	L1
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	16/12/2015	16/12/2015	16/12/2015	16/12/2015	16/12/2015	16/12/2015
			Sample Time	.	.	.	.	.	.
			Date Received	18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015
			SDG Ref	151218-81	151218-81	151218-81	151218-81	151218-81	151218-81
			Lab Sample No.(s)	12672583	12672584	12672591	12672585	12672588	12672582
			AGS Reference						
Naphthalene (aq)	<0.1 µg/l	TM178		<0.1 ♦ #	<0.1 ♦ #	<0.1 ♦ #	<0.1 ♦ #	<0.1 ♦ #	<5 ♦ #
Acenaphthene (aq)	<0.015 µg/l	TM178		<0.015 ♦ #	<0.015 ♦ #	<0.015 ♦ #	<0.015 ♦ #	0.0575 ♦ #	<0.75 ♦ #
Acenaphthylene (aq)	<0.011 µg/l	TM178		<0.011 ♦ #	<0.011 ♦ #	<0.011 ♦ #	<0.011 ♦ #	0.021 ♦ #	<0.55 ♦ #
Fluoranthene (aq)	<0.017 µg/l	TM178		0.0935 ♦ #	<0.017 ♦ #	0.0454 ♦ #	0.0232 ♦ #	0.563 ♦ #	<0.85 ♦ #
Anthracene (aq)	<0.015 µg/l	TM178		0.0168 ♦ #	<0.015 ♦ #	<0.015 ♦ #	<0.015 ♦ #	0.134 ♦ #	<0.75 ♦ #
Phenanthrene (aq)	<0.022 µg/l	TM178		0.0694 ♦ #	<0.022 ♦ #	0.0409 ♦ #	<0.022 ♦ #	0.395 ♦ #	<1.1 ♦ #
Fluorene (aq)	<0.014 µg/l	TM178		0.0163 ♦ #	<0.014 ♦ #	<0.014 ♦ #	<0.014 ♦ #	0.106 ♦ #	<0.7 ♦ #
Chrysene (aq)	<0.013 µg/l	TM178		0.065 ♦ #	<0.013 ♦ #	0.0256 ♦ #	0.0152 ♦ #	0.406 ♦ #	<0.65 ♦ #
Pyrene (aq)	<0.015 µg/l	TM178		0.0835 ♦ #	<0.015 ♦ #	0.0393 ♦ #	0.0185 ♦ #	0.451 ♦ #	<0.75 ♦ #
Benzo(a)anthracene (aq)	<0.017 µg/l	TM178		0.074 ♦ #	<0.017 ♦ #	<0.017 ♦ #	<0.017 ♦ #	0.346 ♦ #	<0.85 ♦ #
Benzo(b)fluoranthene (aq)	<0.023 µg/l	TM178		0.13 ♦ #	<0.023 ♦ #	0.0444 ♦ #	0.0254 ♦ #	0.718 ♦ #	<1.15 ♦ #
Benzo(k)fluoranthene (aq)	<0.027 µg/l	TM178		0.0459 ♦ #	<0.027 ♦ #	<0.027 ♦ #	<0.027 ♦ #	0.247 ♦ #	<1.35 ♦ #
Benzo(a)pyrene (aq)	<0.009 µg/l	TM178		0.0726 ♦ #	<0.009 ♦ #	0.0242 ♦ #	0.0157 ♦ #	0.412 ♦ #	<0.45 ♦ #
Dibenzo(a,h)anthracene (aq)	<0.016 µg/l	TM178		0.0207 ♦ #	<0.016 ♦ #	<0.016 ♦ #	<0.016 ♦ #	0.109 ♦ #	<0.8 ♦ #
Benzo(g,h,i)perylene (aq)	<0.016 µg/l	TM178		0.0662 ♦ #	<0.016 ♦ #	0.023 ♦ #	<0.016 ♦ #	0.328 ♦ #	<0.8 ♦ #
Indeno(1,2,3-cd)pyrene (aq)	<0.014 µg/l	TM178		0.0486 ♦ #	<0.014 ♦ #	0.016 ♦ #	<0.014 ♦ #	0.194 ♦ #	<0.7 ♦ #
PAH, Total Detected USEPA 16 (aq)	<0.344 µg/l	TM178		0.803 ♦	<0.344 ♦	<0.344 ♦	<0.344 ♦	4.49 ♦	<17.2 ♦

CERTIFICATE OF ANALYSIS

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:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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	Customer Sample R	GW2	GW3	GW4	GW5	GW8	L1
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	16/12/2015	16/12/2015	16/12/2015	16/12/2015	16/12/2015	16/12/2015
			Sample Time	.	.	.	.	.	.
			Date Received	18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015
			SDG Ref	151218-81	151218-81	151218-81	151218-81	151218-81	151218-81
			Lab Sample No.(s)	12672583	12672584	12672591	12672585	12672588	12672582
			AGS Reference						
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-Bromophenylphenylether (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-Chlorophenylphenylether (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)methane (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 ♦ #

CERTIFICATE OF ANALYSIS

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:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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	Customer Sample R	GW2	GW3	GW4	GW5	GW8	L1
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	16/12/2015	16/12/2015	16/12/2015	16/12/2015	16/12/2015	16/12/2015
			Sample Time	.	.	.	.	.	.
			Date Received	18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015
			SDG Ref	151218-81	151218-81	151218-81	151218-81	151218-81	151218-81
			Lab Sample No.(s)	12672583	12672584	12672591	12672585	12672588	12672582
			AGS Reference						
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #
Diethyl phthalate (aq)	<1 µg/l	TM176		<3 ♦ #	<3 ♦ #	<3 ♦ #	<3 ♦ #	<3 ♦ #	<3 ♦ #
Dimethyl phthalate (aq)	<1 µg/l	TM176		<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<5 ♦ #	<5 ♦ #	<5 ♦ #	<5 ♦ #	<5 ♦ #	<5 ♦ #
Hexachlorobenzene (aq)	<1 µg/l	TM176		<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #
Pentachlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Phenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	35.8
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #
Hexachloroethane (aq)	<1 µg/l	TM176		<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #
Nitrobenzene (aq)	<1 µg/l	TM176		<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #
Isophorone (aq)	<1 µg/l	TM176		<1 ♦ #	<2 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
SVOC TIC (aq)	-	TM176		Not Detected ♦	Not Detected ♦	Not Detected ♦	Not Detected ♦	Detected ♦	Detected ♦
SVOC Derivatised (aq)	-	TM176		Not Detected ♦	Not Detected ♦	Not Detected ♦	Not Detected ♦	Not Detected ♦	Not Detected ♦
Benzothiazolone	µg/l	TM176							246
Cyclic octaatomic sulfur	µg/l	TM176							4580
Hexanoic acid, -trimethyl-	µg/l	TM176							85.8
Triisopropylphosphate	µg/l	TM176						14.8	248
Unknown	µg/l	TM176							99

CERTIFICATE OF ANALYSIS

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:**	

VOC MS (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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	Customer Sample R	GW2	GW3	GW4	GW5	GW8	L1
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	16/12/2015	16/12/2015	16/12/2015	16/12/2015	16/12/2015	16/12/2015
			Sample Time	.	.	.	.	.	.
			Date Received	18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015
			SDG Ref	151218-81	151218-81	151218-81	151218-81	151218-81	151218-81
			Lab Sample No.(s)	12672583	12672584	12672591	12672585	12672588	12672582
			AGS Reference						
Dibromofluoromethane**	%	TM208		117	119	122 2	125 1	119 1	112 1
Toluene-d8**	%	TM208		101	101	99.7 2	101 1	99.2 1	101 1
4-Bromofluorobenzene**	%	TM208		99.2	98.9	96.4 2	98.5 1	94.8 1	97.2 1
Dichlorodifluoromethane	<1 µg/l	TM208		<1	<1	<1 2	<1 1	<1 1	<1 1
Chloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
Vinyl chloride	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
Bromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
Chloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
Trichlorofluoromethane	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
1,1-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
Carbon disulphide	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	5.08 1 #
Dichloromethane	<3 µg/l	TM208		<3 #	<3 #	<3 2 #	<3 1 #	<3 1 #	<3 1 #
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
trans-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
1,1-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
cis-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
2,2-Dichloropropane	<1 µg/l	TM208		<1	<1	<1 2	<1 1	<1 1	<1 1
Bromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
Chloroform	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
1,1,1-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
1,1-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
Carbontetrachloride	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
1,2-Dichloroethane	<1 µg/l	TM208		<1	<1	<1 2	<1 1	<1 1	<1 1
Benzene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	2.3 1 #
Trichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
1,2-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
Dibromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
Bromodichloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
cis-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
Toluene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	2.3 1 #
trans-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
1,1,2-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #

CERTIFICATE OF ANALYSIS

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:**	

VOC MS (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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
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1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	GW2	GW3	GW4	GW5	GW8	L1
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	16/12/2015	16/12/2015	16/12/2015	16/12/2015	16/12/2015	16/12/2015
			Sample Time	.	.	.	.	.	.
			Date Received	18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015
			SDG Ref	151218-81	151218-81	151218-81	151218-81	151218-81	151218-81
			Lab Sample No.(s)	12672583	12672584	12672591	12672585	12672588	12672582
			AGS Reference						
1,3-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
Tetrachloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
Dibromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
1,2-Dibromoethane	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
Chlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
Ethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
m,p-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
o-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
Styrene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
Bromoform	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
Isopropylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208		<1	<1	<1 2	<1 1	<1 1	<1 1
1,2,3-Trichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
Bromobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
Propylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
2-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
1,3,5-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
4-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
tert-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
1,2,4-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
sec-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
4-iso-Propyltoluene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
1,3-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
1,4-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
n-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
1,2-Dichlorobenzene	<1 µg/l	TM208		<1	<1	<1 2	<1 1	<1 1	<1 1
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208		<1	<1	<1 2	<1 1	<1 1	<1 1
1,2,4-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
Hexachlorobutadiene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
Naphthalene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #

CERTIFICATE OF ANALYSIS

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:**	

VOC MS (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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	Customer Sample R	GW2	GW3	GW4	GW5	GW8	L1
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	16/12/2015	16/12/2015	16/12/2015	16/12/2015	16/12/2015	16/12/2015
			Sample Time	.	.	.	.	.	.
			Date Received	18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015	18/12/2015
			SDG Ref	151218-81	151218-81	151218-81	151218-81	151218-81	151218-81
			Lab Sample No.(s)	12672583	12672584	12672591	12672585	12672588	12672582
			AGS Reference						
1,2,3-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 2 #	<1 1 #	<1 1 #	<1 1 #
1,3,5-Trichlorobenzene	<1 µg/l	TM208		<1	<1	<1 2	<1 1	<1 1	<1 1

CERTIFICATE OF ANALYSIS

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:**	

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.

CERTIFICATE OF ANALYSIS

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:**	

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 35ºC) 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 Dimethyphenol, 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 presevation 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
Tir Canol Landfill
Palleg Road
Lower Cwmtwrch
Swansea
SA9 2QQ

Certificate of Analysis

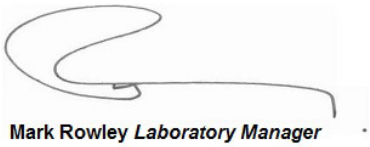
Certificate Number : 15-01972-Issue 1-Page: 1

Report Fao:	Ben Rees
Site Address:	Palleg
Customer Order No:	BEN REES
Date of Sampling:	Data not supplied
Date Received:	26/01/2015
Date of Analysis:	26/01/2015 - 06/02/2015
Report Date:	06/02/2015

Please find your certificates of test attached for your samples received in the laboratory on 26/01/2015 under our laboratory reference 15-01972.

Remarks:

Results authorised by:



Mark Rowley *Laboratory Manager*

Any opinions or interpretations indicated are outside the scope of our UKAS accreditation.
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.
Excel copies of reports are only valid when accompanied by this PDF certificate.

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ACS Environmental Testing Limited
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Quality Testing & Materials Consultancy to the Construction Industry

4150

ACSE Sample Number	**12862**	**12863**	**12864**	**12865**	**12866**
Sample ID	**LAG 1**	**Closed Landfill D**	**GOLF 1**	**GW2**	**GW3**
Clients Sample Ref.	**LAG 1**	**Closed Landfill Dis**	**GOLF 1**	**GW2**	**GW3**
Location / Sample Depth (m)	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Date Sampled	/ /	/ /	/ /	/ /	/ /
Time Sampled					
Sample deviating codes	**a**	**a**	**a**	**a**	**a**
Material Description	**WATER**	**WATER**	**WATER**	**WATER**	**WATER**

Determination	Units	Method		LOD	Result	AS	Result	AS	Result	AS	Result	AS	Result	AS
Anions														
Chloride	mg/l	AE14	AR	3.00	-----		-----		-----		**19.0**	*	**54.0**	*
Nitrate	mg/l	AE14	AR	0.01	-----		-----		-----		-----		-----	
Nitrite	mg/l	AE14	AR	0.01	-----		-----		-----		-----		-----	
Sulphate	mg/l	AE14	AR	3.00	-----		-----		-----		-----		-----	
Cyanide and Sulphide														
Total Sulphide	mg/l	AE37	AR	10.00	-----		-----		-----		-----		-----	
Metals														
Arsenic	mg/l	AE17	AR	0.003	-----		-----		-----		-----		-----	
Boron	mg/l	AE17	AR	0.200	-----		-----		-----		-----		-----	
Calcium	mg/l	AE17	AR	1.000	-----		-----		-----		-----		-----	
Cadmium	mg/l	AE17	AR	0.0003	-----		-----		-----		-----		-----	
Chromium	mg/l	AE17	AR	0.001	-----		-----		-----		-----		-----	
Copper	mg/l	AE17	AR	0.001	-----		-----		-----		-----		-----	
Iron	mg/l	AE17	AR	2.000	-----		-----		-----		-----		-----	
Mercury	mg/l	AE51	AR	0.0001	-----		-----		-----		-----		-----	
Potassium	mg/l	AE17	AR	0.090	-----		-----		-----		-----		-----	
Magnesium	mg/l	AE17	AR	0.400	-----		-----		-----		-----		-----	
Sodium	mg/l	AE17	AR	1.000	-----		-----		-----		-----		-----	
Nickel	mg/l	AE17	AR	0.0003	-----		-----		-----		-----		-----	
Lead	mg/l	AE17	AR	0.004	-----		-----		-----		-----		-----	
Zinc	mg/l	AE17	AR	0.002	-----		-----		-----		**0.014**	*	**0.012**	*
Petroleum Hydrocarbons														
DRO (Diesel Range Organics C10-C25)	mg/l	AE22	AR	25.00	-----		-----		-----		-----		-----	
PRO (Petrol Range Organics C6-C10)	mg/l	AE22	AR	25.00	-----		-----		-----		-----		-----	
pH and Conductivity														
Conductivity	uS/cm	AE07	AR	1.00	-----		-----		-----		**1040**	*	**940**	*
pH	units	AE06	AR	1.0	**7.9**	*	**7.2**	*	**7.8**	*	**7.0**	*	**7.1**	*
Phenols														
Phenol LL	ug/l	AE62	AR	0.50	-----		-----		-----		-----		-----	
Poly Aromatic Hydrocarbons														
Naphthalene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		-----	
Acenaphthylene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		-----	
Acenaphthene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		-----	
Fluorene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		-----	
Phenanthrene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		-----	
Anthracene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		-----	
Fluoranthene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		-----	
Pyrene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		-----	
Chrysene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		-----	
Benzo (b) fluoranthene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		-----	
Benzo (k) fluoranthene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		-----	
Benzo (a) pyrene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		-----	
Indeno (1 2 3-CD) pyrene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		-----	
Dibenzo(a h)anthracene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		-----	

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ACSE Sample Number	**12862**	**12863**	**12864**	**12865**	**12866**
Sample ID	**LAG 1**	**Closed Landfill D**	**GOLF 1**	**GW2**	**GW3**
Clients Sample Ref.	**LAG 1**	**Closed Landfill Dis**	**GOLF 1**	**GW2**	**GW3**
Location / Sample Depth (m)	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Date Sampled	/ /	/ /	/ /	/ /	/ /
Time Sampled					
Sample deviating codes	**a**	**a**	**a**	**a**	**a**
Material Description	**WATER**	**WATER**	**WATER**	**WATER**	**WATER**

Determination	Units	Method		LOD	Result	AS	Result	AS	Result	AS	Result	AS	Result	AS
Benzo(g h i)perylene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		-----	
Benzo (a) anthracene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		-----	
Total PAH	mg/l	AE45	AR	0.20	-----		-----		-----		-----		-----	
Waters and Leachates														
Alkalinity	mg/l	AE25	AR	20.00	-----		-----		-----		-----		-----	
Ammoniacal Nitrogen	mg/l	AE28	AR	0.01	**67.0**	*	**56.0**	*	**106**	*	< 0.01	*	**0.13**	*
BOD (Biochemical Oxygen Demand)	mg/l	AE27	AR	1.00	-----		-----		-----		-----		-----	
COD (Chemical Oxygen Demand)	mg/l	AE26	AR	1.50	-----		-----		-----		-----		-----	
DO (Dissolved Oxygen)	mg/l	AE27	AR	1.00	-----		-----		-----		**8.05**		**7.57**	
Suspended Solids	mg/l	AE20	AR	4.0	-----		-----		-----		-----		-----	

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ACSE Sample Number	**12867**	**12868**	**12869**	**12870**	**12871**
Sample ID	**GW4**	**GW5**	**GW8**	**SW1 Jan**	**Tir Canol Leachate**
Clients Sample Ref.	**GW4**	**GW5**	**GW8**	**SW1 Jan**	**Tir Canol Leachate**
Location / Sample Depth (m)	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Date Sampled	/ /	/ /	/ /	/ /	/ /
Time Sampled					
Material Description	**a WATER**	**a WATER**	**a WATER**	**a WATER**	**a WATER**

Determination	Units	Method		LOD	Result	AS	Result	AS	Result	AS	Result	AS	Result	AS
Anions														
Chloride	mg/l	AE14	AR	3.00	**86.4**	*	**13.5**	*	**24.2**	*	**20.1**	*	**186**	*
Nitrate	mg/l	AE14	AR	0.01	-----		-----		-----		-----		**1.82**	*
Nitrite	mg/l	AE14	AR	0.01	-----		-----		-----		-----		< 0.01	*
Sulphate	mg/l	AE14	AR	3.00	-----		-----		-----		-----		**30.3**	*
Cyanide and Sulphide														
Total Sulphide	mg/l	AE37	AR	10.00	-----		-----		-----		-----		< 10.0	
Metals														
Arsenic	mg/l	AE17	AR	0.003	-----		-----		-----		-----		< 0.003	*
Boron	mg/l	AE17	AR	0.200	-----		-----		-----		-----		**1.65**	
Calcium	mg/l	AE17	AR	1.000	-----		-----		-----		-----		**217**	
Cadmium	mg/l	AE17	AR	0.0003	-----		-----		-----		-----		< 0.0003	*
Chromium	mg/l	AE17	AR	0.001	-----		-----		-----		-----		**0.010**	*
Copper	mg/l	AE17	AR	0.001	-----		-----		-----		-----		< 0.001	*
Iron	mg/l	AE17	AR	2.000	-----		-----		-----		-----		**9.96**	
Mercury	mg/l	AE51	AR	0.0001	-----		-----		-----		-----		**0.0171**	*
Potassium	mg/l	AE17	AR	0.090	-----		-----		-----		-----		**68.2**	
Magnesium	mg/l	AE17	AR	0.400	-----		-----		-----		-----		**42.7**	
Sodium	mg/l	AE17	AR	1.000	-----		-----		-----		-----		**144**	
Nickel	mg/l	AE17	AR	0.0003	-----		-----		-----		-----		< 0.0003	*
Lead	mg/l	AE17	AR	0.004	-----		-----		-----		-----		< 0.004	*
Zinc	mg/l	AE17	AR	0.002	**0.019**	*	**0.063**	*	**0.008**	*	-----		**0.015**	*
Petroleum Hydrocarbons														
DRO (Diesel Range Organics C10-C25)	mg/l	AE22	AR	25.00	-----		-----		-----		-----		< 25.0	
PRO (Petrol Range Organics C6-C10)	mg/l	AE22	AR	25.00	-----		-----		-----		-----		< 25.0	
pH and Conductivity														
Conductivity	uS/cm	AE07	AR	1.00	**1410**	*	**375**	*	**604**	*	**571**	*	**2700**	*
pH	units	AE06	AR	1.0	**6.8**	*	**6.8**	*	**7.3**	*	**7.5**	*	**7.1**	*
Phenols														
Phenol LL	ug/l	AE62	AR	0.50	-----		-----		-----		-----		**44.8**	*
Poly Aromatic Hydrocarbons														
Naphthalene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		< 0.01	
Acenaphthylene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		< 0.01	
Acenaphthene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		< 0.01	
Fluorene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		< 0.01	
Phenanthrene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		< 0.01	
Anthracene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		< 0.01	
Fluoranthene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		< 0.01	
Pyrene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		< 0.01	
Chrysene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		< 0.01	
Benzo (b) fluoranthene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		< 0.01	
Benzo (k) fluoranthene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		< 0.01	
Benzo (a) pyrene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		< 0.01	
Indeno (1 2 3-CD) pyrene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		< 0.01	

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ACSE Sample Number	**12867**	**12868**	**12869**	**12870**	**12871**
Sample ID	**GW4**	**GW5**	**GW8**	**SW1 Jan**	**Tir Canol Leachate**
Clients Sample Ref.	**GW4**	**GW5**	**GW8**	**SW1 Jan**	**Tir Canol Leachate**
Location / Sample Depth (m)	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Date Sampled	/ /	/ /	/ /	/ /	/ /
Time Sampled					
Material Description	**a WATER**	**a WATER**	**a WATER**	**a WATER**	**a WATER**

Determination	Units	Method		LOD	Result	AS	Result	AS	Result	AS	Result	AS	Result	AS
Dibenzo(a h)anthracene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		< 0.01	
Benzo(g h i)perylene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		< 0.01	
Benzo (a) anthracene	mg/l	AE45	AR	0.01	-----		-----		-----		-----		< 0.01	
Total PAH	mg/l	AE45	AR	0.20	-----		-----		-----		-----		< 0.20	
Waters and Leachates														
Alkalinity	mg/l	AE25	AR	20.00	-----		-----		-----		-----		**1650**	
Ammoniacal Nitrogen	mg/l	AE28	AR	0.01	**0.11**	*	**0.05**	*	**0.50**	*	**1.30**	*	**0.06**	*
BOD (Biochemical Oxygen Demand)	mg/l	AE27	AR	1.00	-----		-----		-----		**14.1**	*	-----	
COD (Chemical Oxygen Demand)	mg/l	AE26	AR	1.50	-----		-----		-----		**40.0**	*	-----	
DO (Dissolved Oxygen)	mg/l	AE27	AR	1.00	**7.49**		**7.88**		**7.99**		**8.19**		**3.57**	
Suspended Solids	mg/l	AE20	AR	4.0	-----		-----		-----		**1500**	*	-----	

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ACSE Sample Number	**12872**
Sample ID	**GW6**
Clients Sample Ref.	**GW6**
Location / Sample Depth (m)	**N/A**
Date Sampled	/ /
Time Sampled	
Sample deviating codes	**a**
Material Description	**WATER**

Determination	Units	Method		LOD	Result	AS
Anions						
Chloride	mg/l	AE14	AR	3.00	**17.2**	*
Nitrate	mg/l	AE14	AR	0.01	**2.61**	*
Nitrite	mg/l	AE14	AR	0.01	< 0.01	*
Sulphate	mg/l	AE14	AR	3.00	**13.7**	*
Cyanide and Sulphide						
Total Sulphide	mg/l	AE37	AR	10.00	< 10.0	
Metals						
Arsenic	mg/l	AE17	AR	0.003	< 0.003	*
Boron	mg/l	AE17	AR	0.200	< 0.200	
Calcium	mg/l	AE17	AR	1.000	**125**	
Cadmium	mg/l	AE17	AR	0.0003	< 0.0003	*
Chromium	mg/l	AE17	AR	0.001	**0.003**	*
Copper	mg/l	AE17	AR	0.001	**0.041**	*
Iron	mg/l	AE17	AR	2.000	**19.3**	
Mercury	mg/l	AE51	AR	0.0001	**0.0039**	*
Potassium	mg/l	AE17	AR	0.090	**2.63**	
Magnesium	mg/l	AE17	AR	0.400	**8.87**	
Sodium	mg/l	AE17	AR	1.000	**13.0**	
Nickel	mg/l	AE17	AR	0.0003	**0.0230**	*
Lead	mg/l	AE17	AR	0.004	**0.072**	*
Zinc	mg/l	AE17	AR	0.002	**0.134**	*
Petroleum Hydrocarbons						
DRO (Diesel Range Organics C10-C25)	mg/l	AE22	AR	25.00	< 25.0	
PRO (Petrol Range Organics C6-C10)	mg/l	AE22	AR	25.00	< 25.0	
pH and Conductivity						
Conductivity	uS/cm	AE07	AR	1.00	**408**	*
pH	units	AE06	AR	1.0	**7.5**	*
Phenols						
Phenol LL	ug/l	AE62	AR	0.50	< 0.50	*
Poly Aromatic Hydrocarbons						
Naphthalene	mg/l	AE45	AR	0.01	< 0.01	
Acenaphthylene	mg/l	AE45	AR	0.01	< 0.01	
Acenaphthene	mg/l	AE45	AR	0.01	< 0.01	
Fluorene	mg/l	AE45	AR	0.01	< 0.01	
Phenanthrene	mg/l	AE45	AR	0.01	< 0.01	
Anthracene	mg/l	AE45	AR	0.01	< 0.01	
Fluoranthene	mg/l	AE45	AR	0.01	< 0.01	
Pyrene	mg/l	AE45	AR	0.01	< 0.01	
Chrysene	mg/l	AE45	AR	0.01	< 0.01	
Benzo (b) fluoranthene	mg/l	AE45	AR	0.01	< 0.01	
Benzo (k) fluoranthene	mg/l	AE45	AR	0.01	< 0.01	
Benzo (a) pyrene	mg/l	AE45	AR	0.01	< 0.01	
Indeno (1 2 3-CD) pyrene	mg/l	AE45	AR	0.01	< 0.01	

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ACSE Sample Number	**12872**
Sample ID	**GW6**
Clients Sample Ref.	**GW6**
Location / Sample Depth (m)	**N/A**
Date Sampled	
Time Sampled	/ /
Sample deviating codes	
Material Description	**a** **WATER**

Determination	Units	Method		LOD	Result	AS
Dibenzo(a h)anthracene	mg/l	AE45	AR	0.01	< 0.01	
Benzo(g h i)perylene	mg/l	AE45	AR	0.01	< 0.01	
Benzo (a) anthracene	mg/l	AE45	AR	0.01	< 0.01	
Total PAH	mg/l	AE45	AR	0.20	< 0.20	
Waters and Leachates						
Alkalinity	mg/l	AE25	AR	20.00	**290**	
Ammoniacal Nitrogen	mg/l	AE28	AR	0.01	**0.05**	*
BOD (Biochemical Oxygen Demand)	mg/l	AE27	AR	1.00	**-----**	
COD (Chemical Oxygen Demand)	mg/l	AE26	AR	1.50	**-----**	
DO (Dissolved Oxygen)	mg/l	AE27	AR	1.00	**4.72**	
Suspended Solids	mg/l	AE20	AR	4.0	**-----**	

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Technical Information for Analytical Results

Analysis

* denotes analysis covered by our UKAS accreditation.
# denotes analysis covered by our MCERTS accreditation.
AD = sample tested in air dried condition.
AR = sample tested in as-received condition.
D = sample tested in dry condition.
L = laboratory prepared leachate.
SC = sub contracted.
I/S = Insufficient sample for analysis
U/S = Unsuitable sample for analysis
The results relate only to the items tested.
IHP = In House Procedure / Calculation
All test values reported on a dry weight basis.

Deviating Samples

The use of any of the following symbols indicates that the sample was deviating and it is possible therefore that the results provided may be compromised:

a - No sampling date given, unable to confirm if samples are within acceptable holding times.
b - No sampling time given (Waters only), unable to confirm if samples are with acceptable holding times.
c - Sample not received in appropriate containers
d - Sample temperature on receipt outside recommendations of ISO 18512:2007
e - The container has been incorrectly filled
f - Sample age exceeds stability time (sampling to receipt)
g - Sample age exceeds stability time (extraction to analysis)

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JLA Disposal Ltd
Tir Canol Landfill
Palleg Road
Lower Cwmtwrch
Swansea
SA9 2QQ

Certificate of Analysis

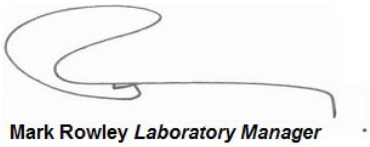
Certificate Number : 15-02066-Issue 1-Page: 1

Report Fao:	Ben Rees
Site Address:	Palleg
Customer Order No:	BEN REES
Date of Sampling:	09/02/2015
Date Received:	10/02/2015
Date of Analysis:	10/02/2015 - 16/02/2015
Report Date:	16/02/2015

Please find your certificates of test attached for your samples received in the laboratory on 10/02/2015 under our laboratory reference 15-02066.

Remarks:

Results authorised by:



Mark Rowley *Laboratory Manager*

Any opinions or interpretations indicated are outside the scope of our UKAS accreditation.
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.
Excel copies of reports are only valid when accompanied by this PDF certificate.

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4150

ACSE Sample Number	**13191**
Sample ID	**SW1**
Clients Sample Ref.	**SW1**
Location / Sample Depth (m)	**n/a**
Date Sampled	**09/02/2015**
Time Sampled	**1000**
Sample deviating codes	**fg**
Material Description	**WATER**

Determination	Units	Method		LOD	Result	AS
Anions						
Chloride	mg/l	AE14	AR	3.00	**17.4**	*
pH and Conductivity						
Conductivity	uS/cm	AE07	AR	1.00	**450**	*fg
pH	units	AE06	AR	1.0	**7.6**	*fg
Waters and Leachates						
Ammoniacal Nitrogen	mg/l	AE28	AR	0.01	< 0.01	*
BOD (Biochemical Oxygen Demand)	mg/l	AE27	AR	1.00	**3.06**	*fg
COD (Chemical Oxygen Demand)	mg/l	AE26	AR	1.50	**26.3**	*
Suspended Solids	mg/l	AE20	AR	4.0	**11**	*g

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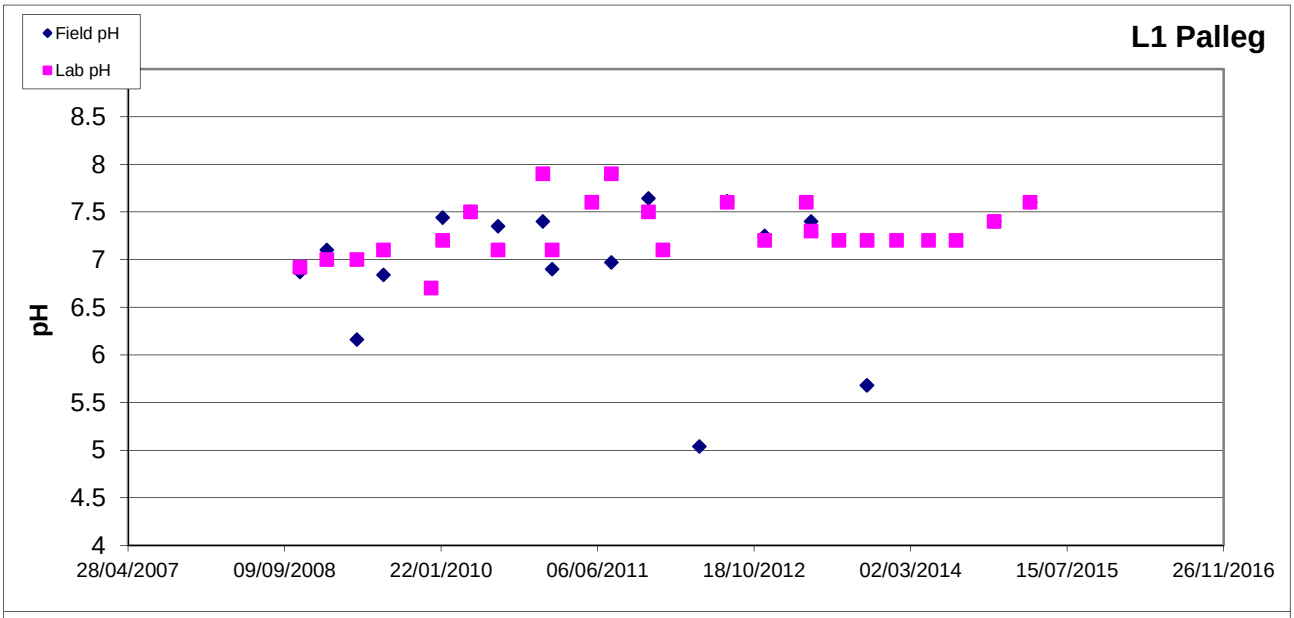
PALLEG LANDFILL
LOWER CWMTWRCH

PERMIT BT19081X

Review of 2015 Landfill Monitoring

Appendix 3
Summary of Leachate Chemistry

Report Number 1429r1v1d0116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8
7.5
7
6.5
6
5.5
5
4.5
4
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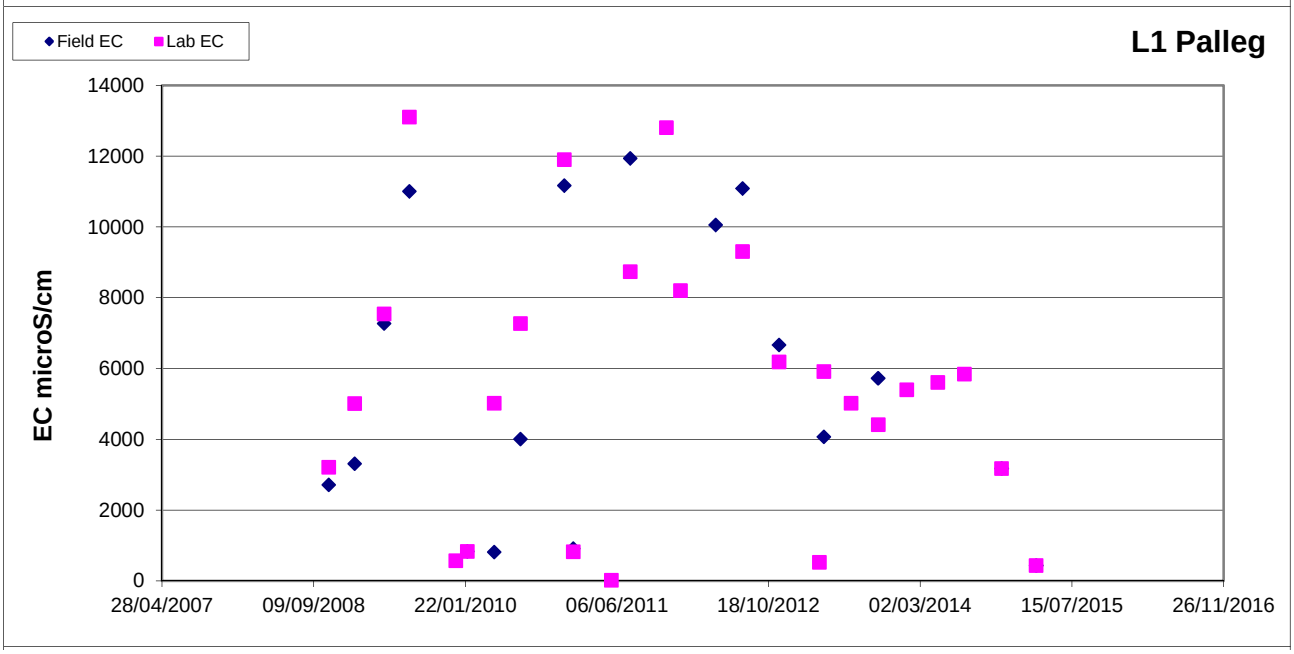
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016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Lab EC
L1 Palleg
EC microS/cm
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12000
10000
8000
6000
4000
2000
0
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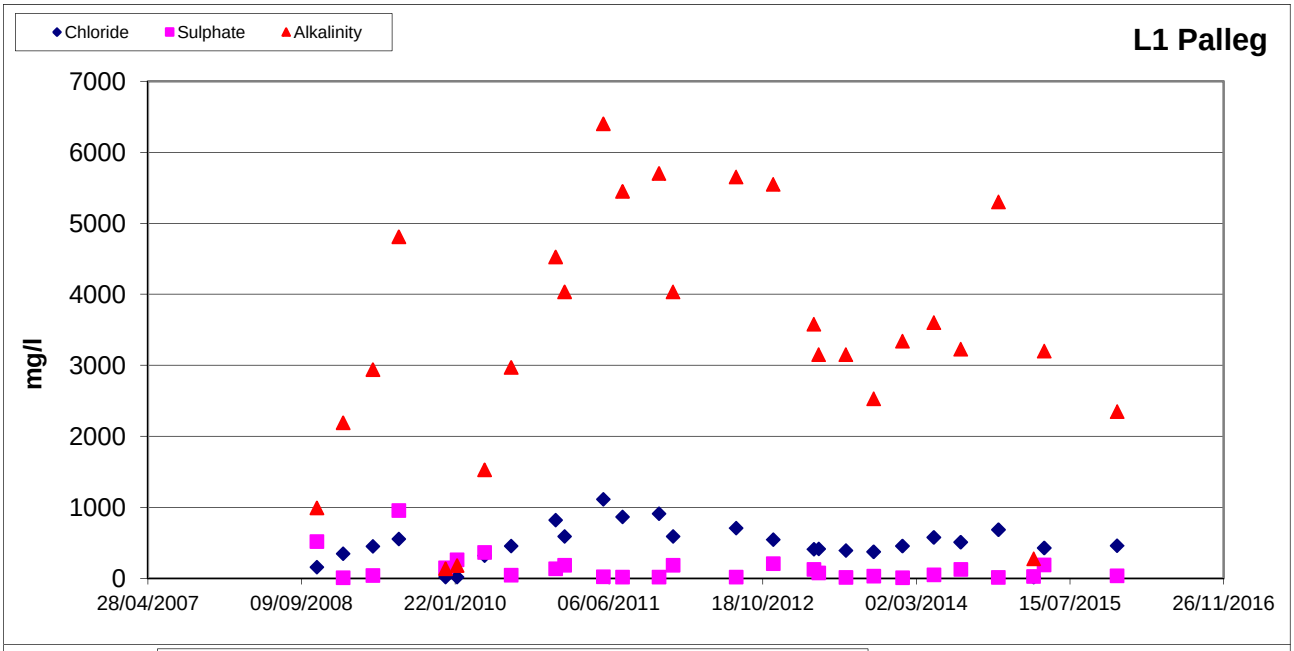
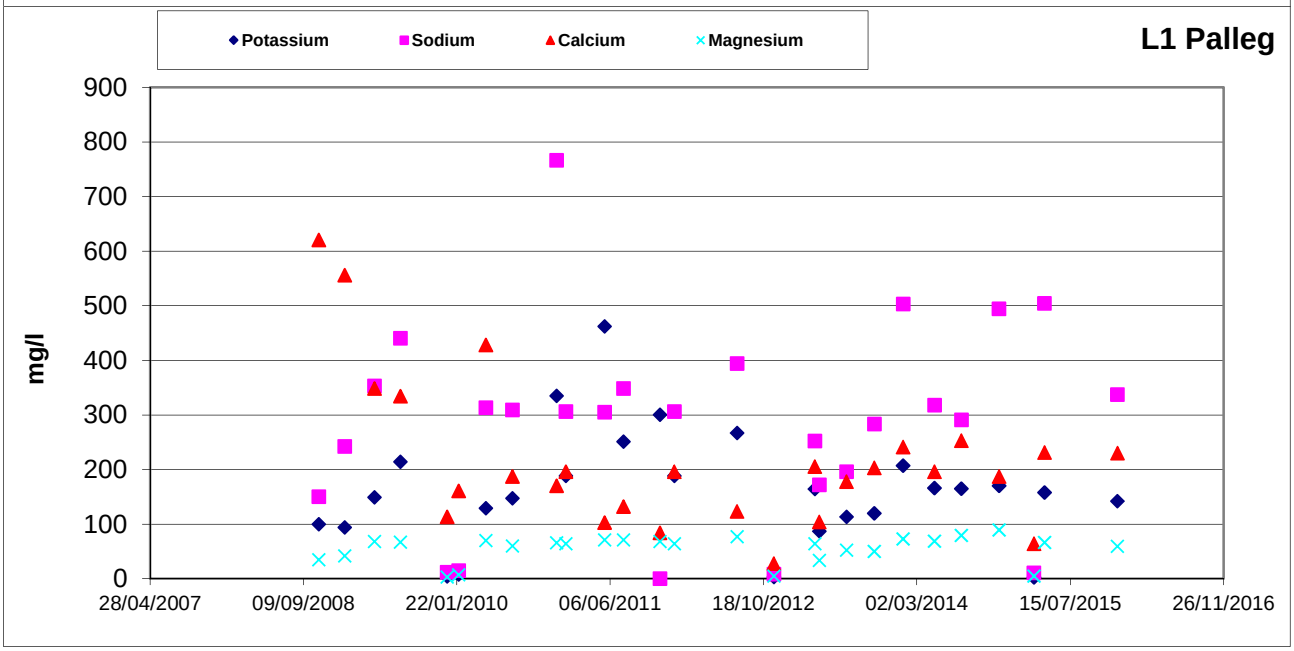
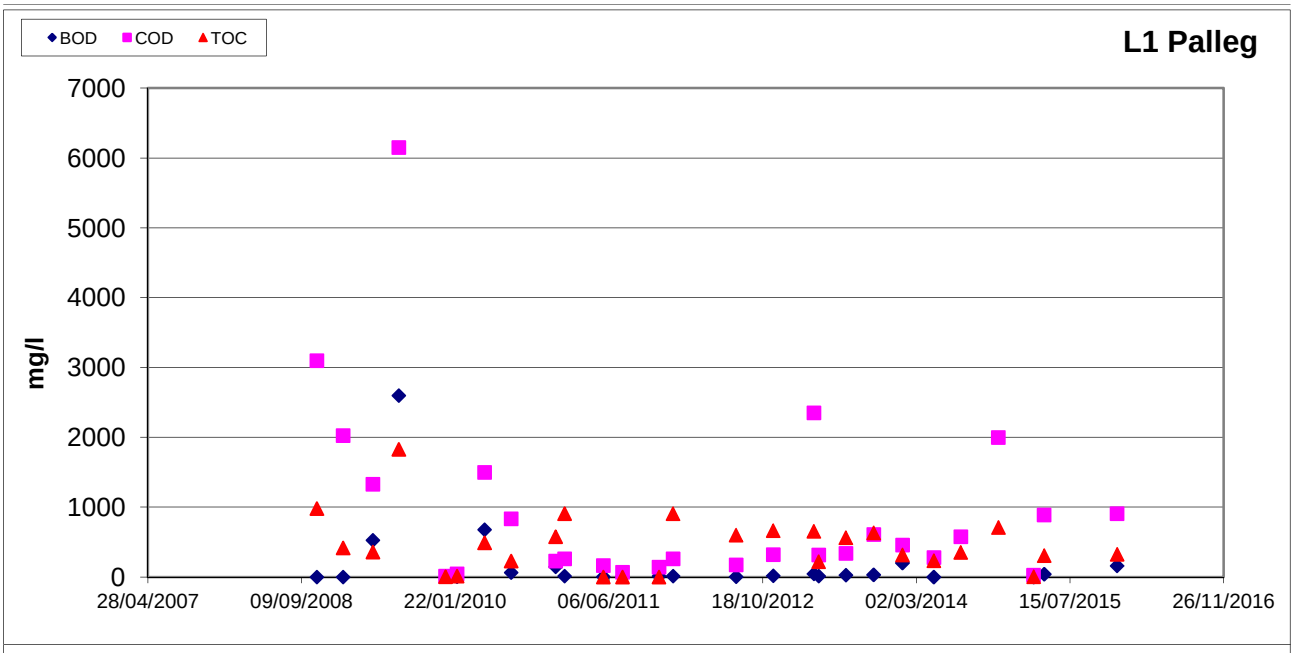
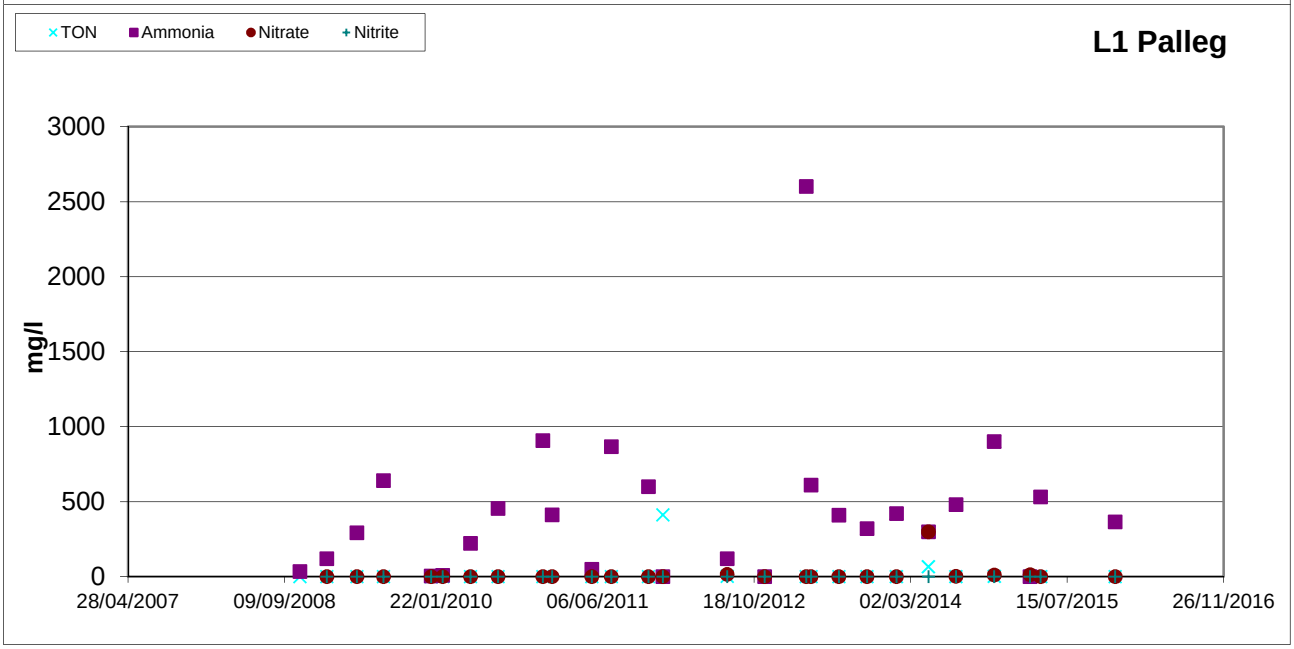
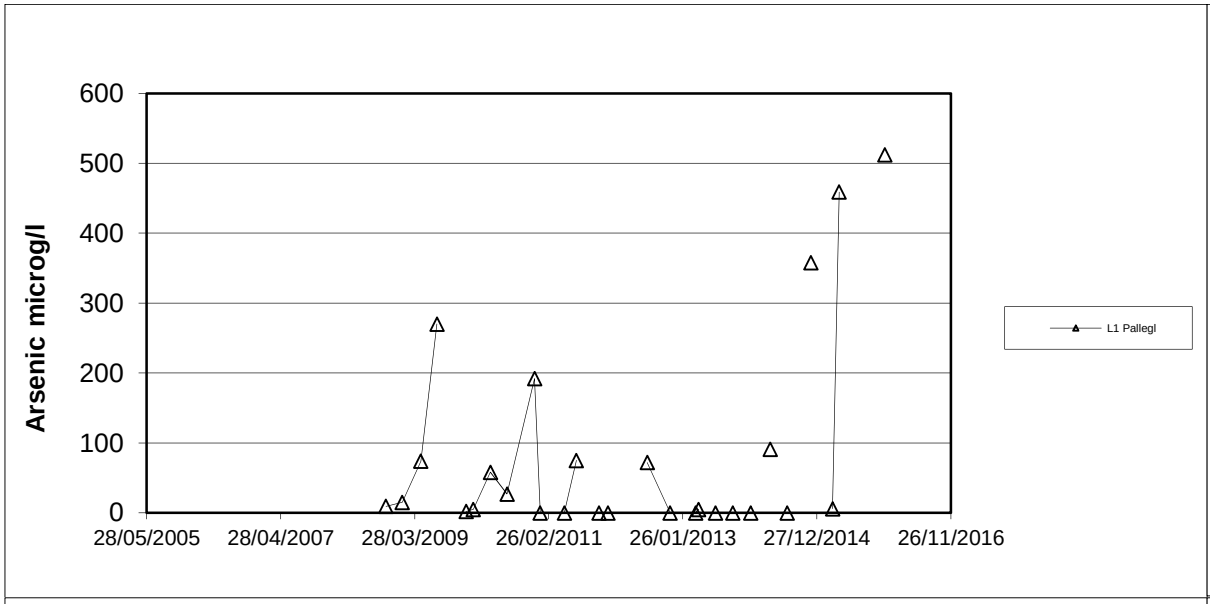
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

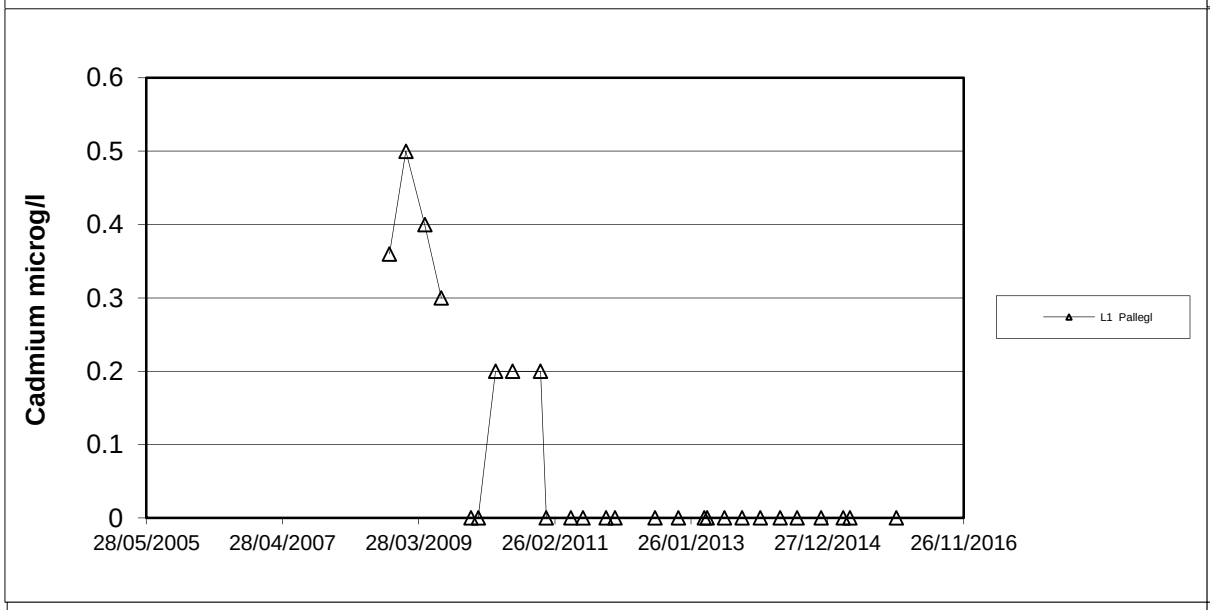

Chloride
Sulphate
Alkalinity
L1 Palleg
mg/l
7000
6000
5000
4000
3000
2000
1000
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

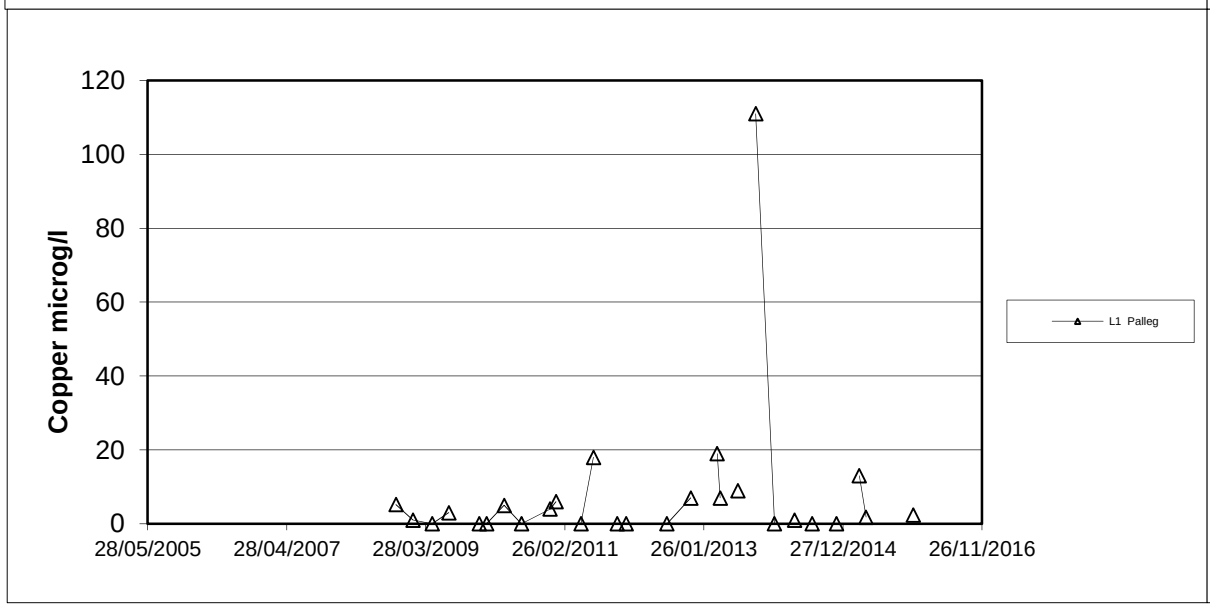

Potassium
Sodium
Calcium
Magnesium
L1 Palleg
mg/l
900
800
700
600
500
400
300
200
100
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

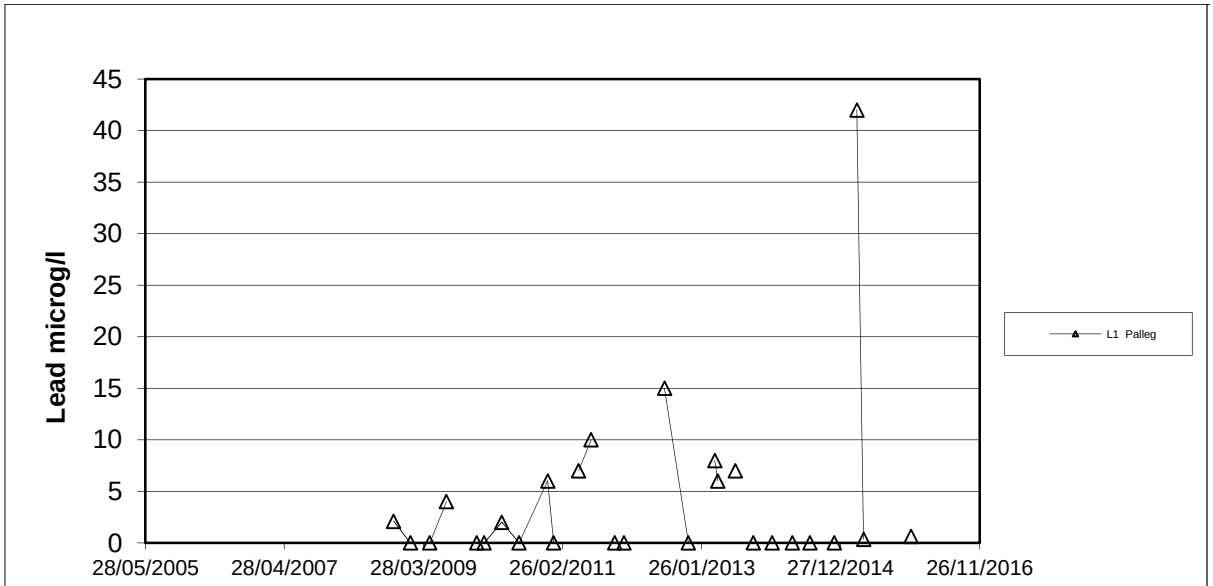

BOD
COD
TOC
L1 Palleg
mg/l
7000
6000
5000
4000
3000
2000
1000
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

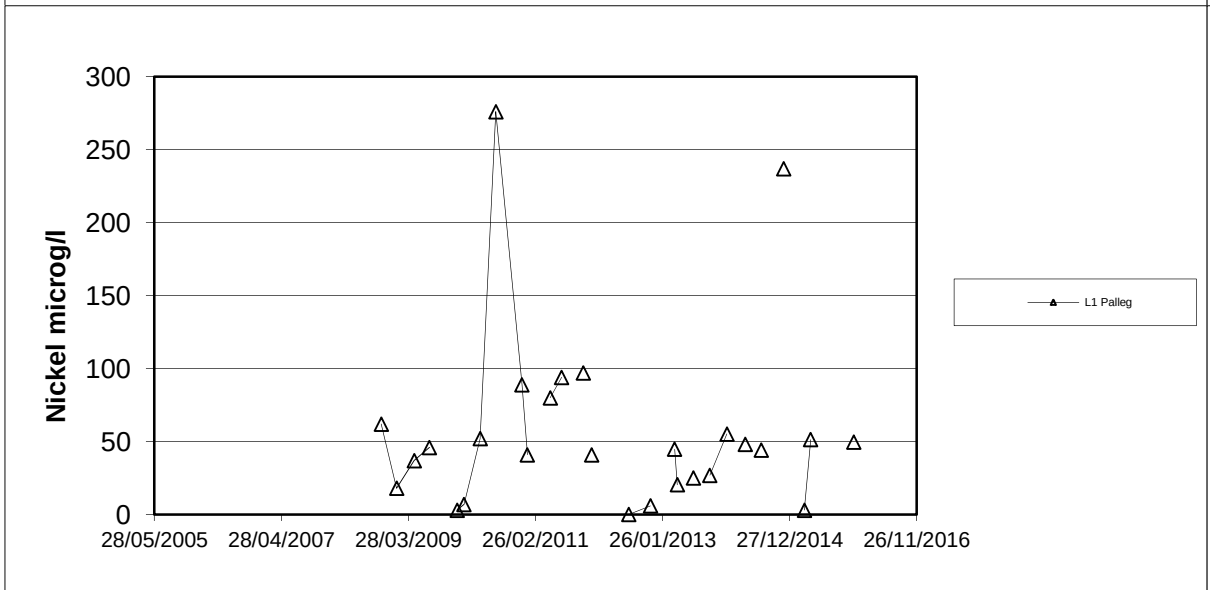

TON
Ammonia
Nitrate
Nitrite
L1 Palleg
mg/l
3000
2500
2000
1500
1000
500
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

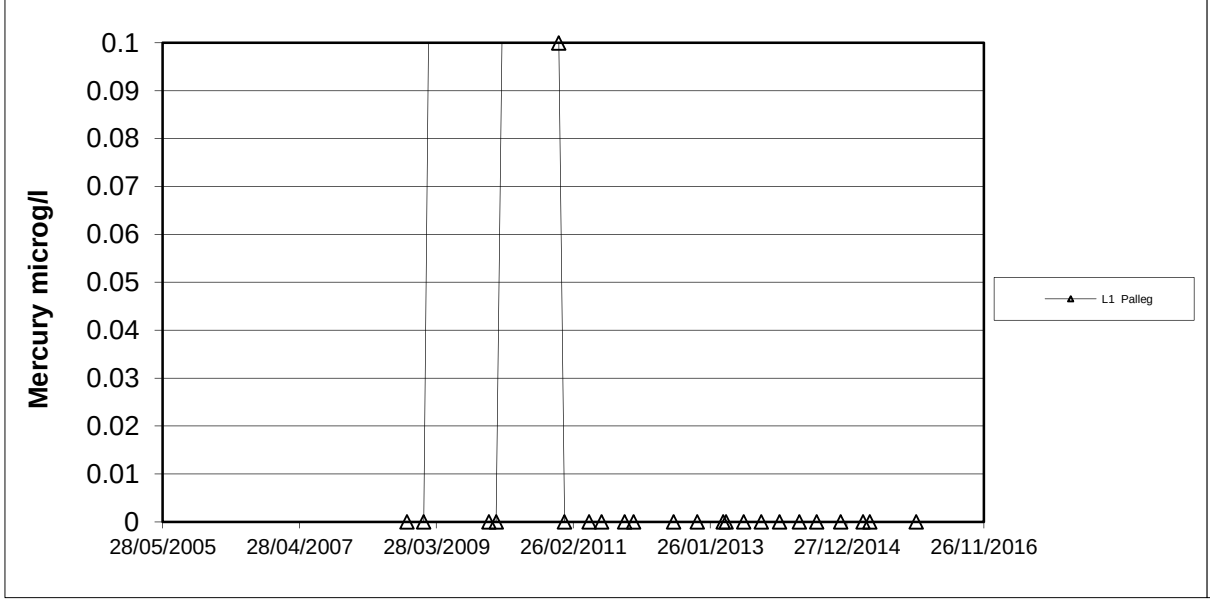

Arsenic microg/l
600
500
400
300
200
100
0
28/05/2005
28/04/2007
28/03/2009
26/02/2011
26/01/2013
27/12/2014
26/11/2016
L1 Pallegl

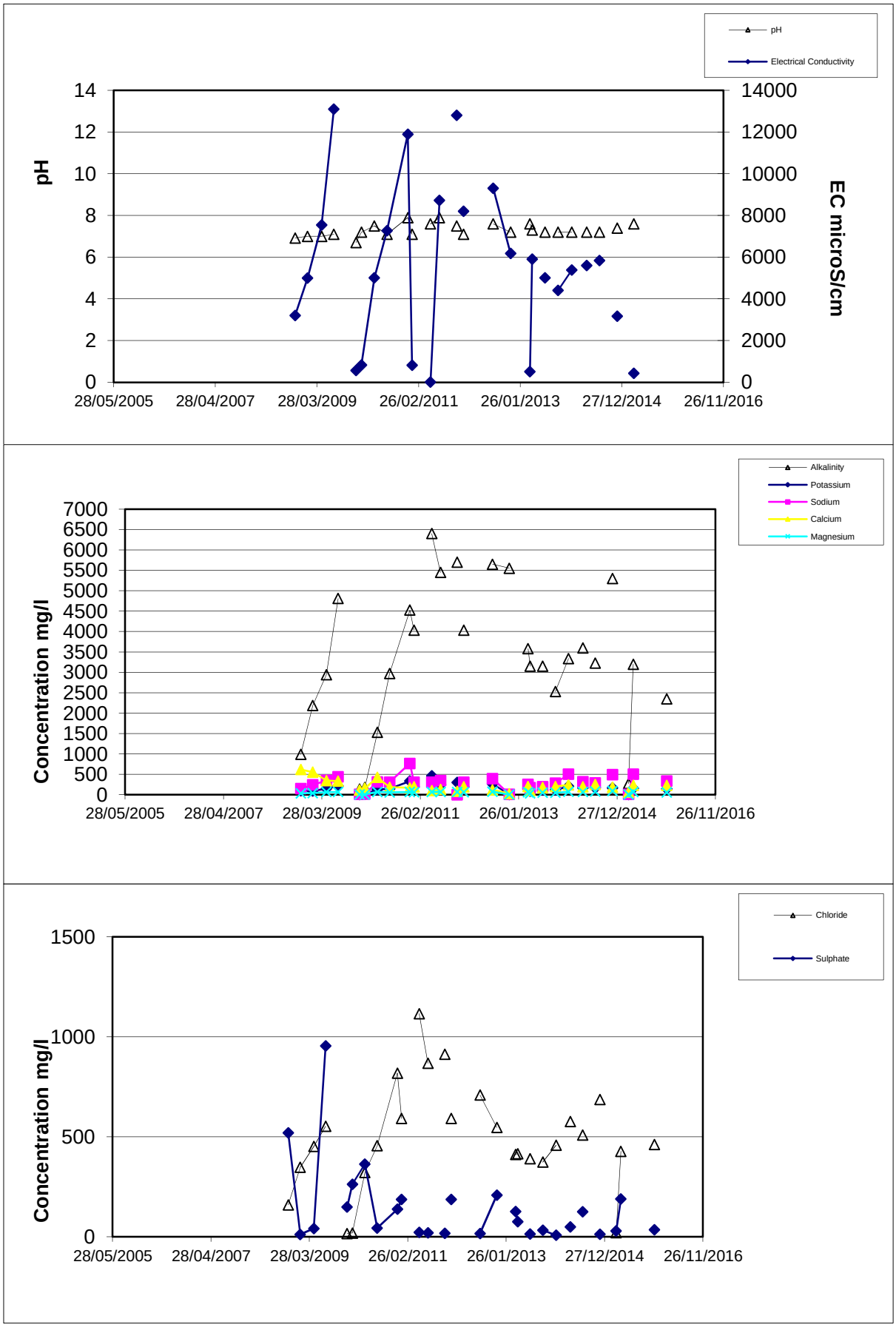

Cadmium microg/l
0.6
0.5
0.4
0.3
0.2
0.1
0
28/05/2005
28/04/2007
28/03/2009
26/02/2011
26/01/2013
27/12/2014
26/11/2016
L1 Pallegl

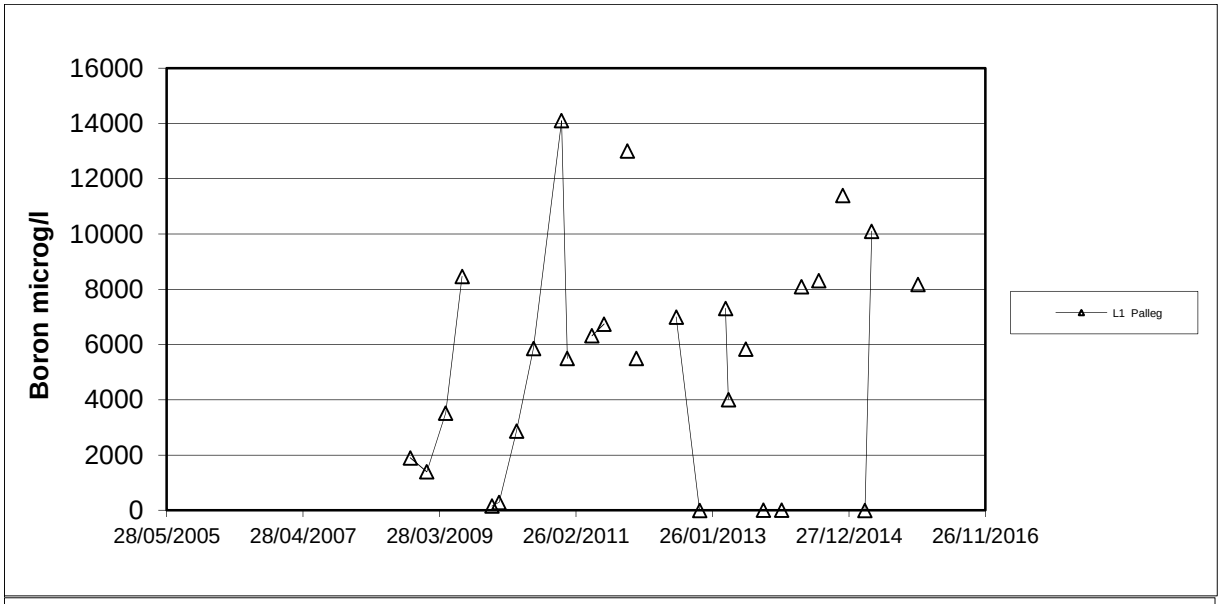

Copper microg/l
120
100
80
60
40
20
0
28/05/2005
28/04/2007
28/03/2009
26/02/2011
26/01/2013
27/12/2014
26/11/2016
L1 Palleg

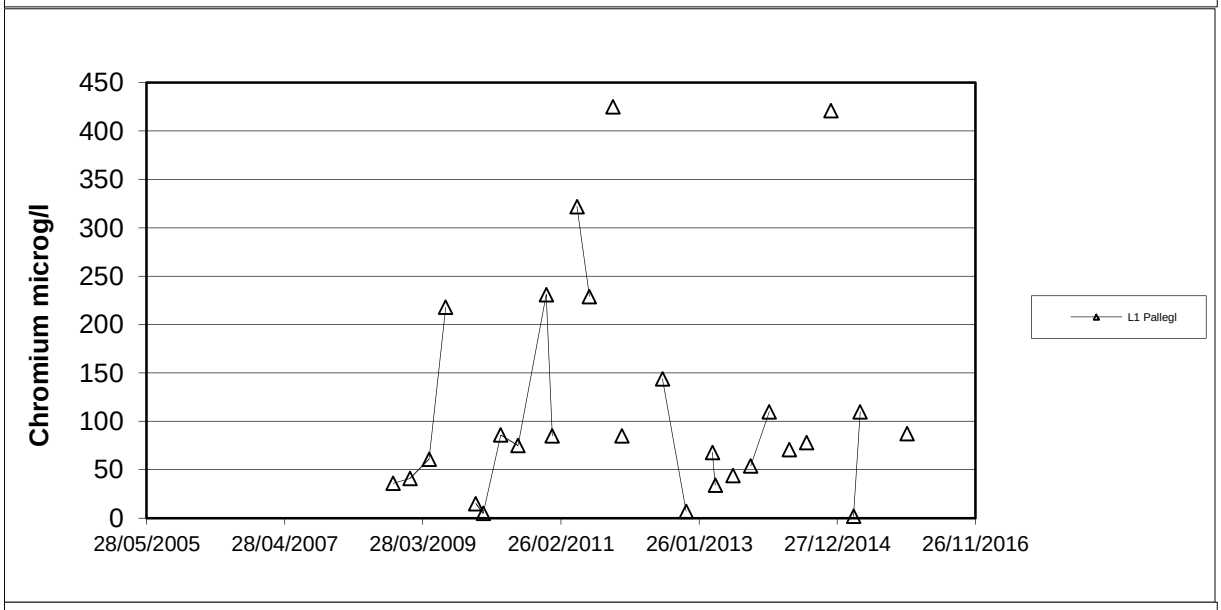

Lead microg/l
45
40
35
30
25
20
15
10
5
0
28/05/2005
28/04/2007
28/03/2009
26/02/2011
26/01/2013
27/12/2014
26/11/2016
L1 Palleg

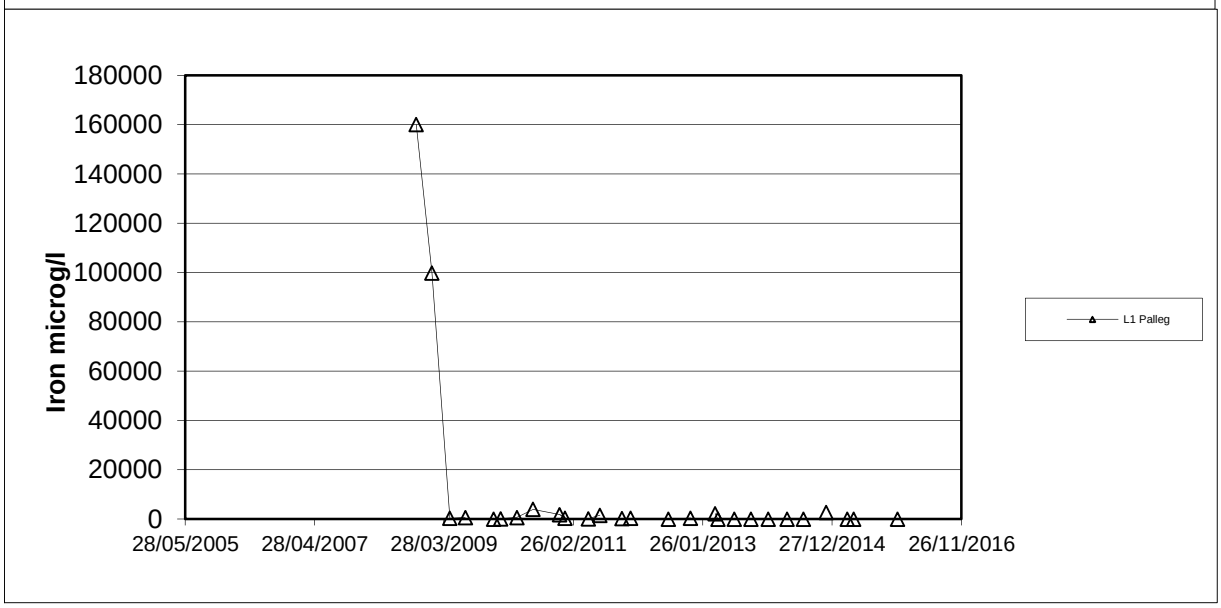

Nickel microg/l
300
250
200
150
100
50
0
28/05/2005
28/04/2007
28/03/2009
26/02/2011
26/01/2013
27/12/2014
26/11/2016
L1 Palleg

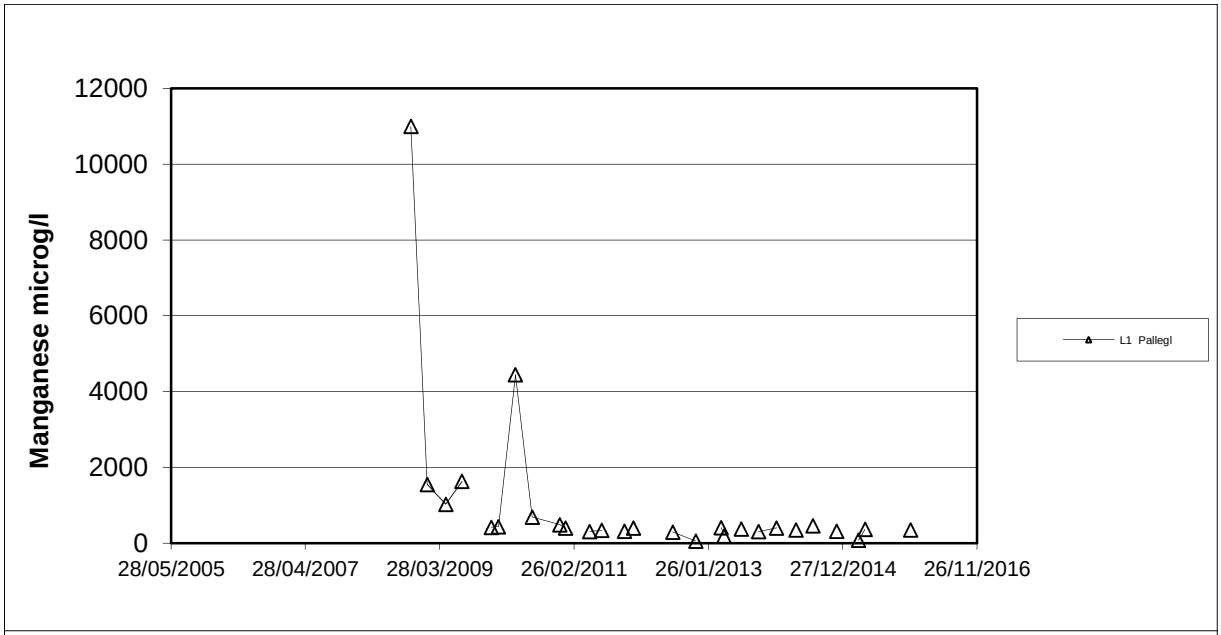

Mercury microg/l
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
28/05/2005
28/04/2007
28/03/2009
26/02/2011
26/01/2013
27/12/2014
26/11/2016
L1 Palleg

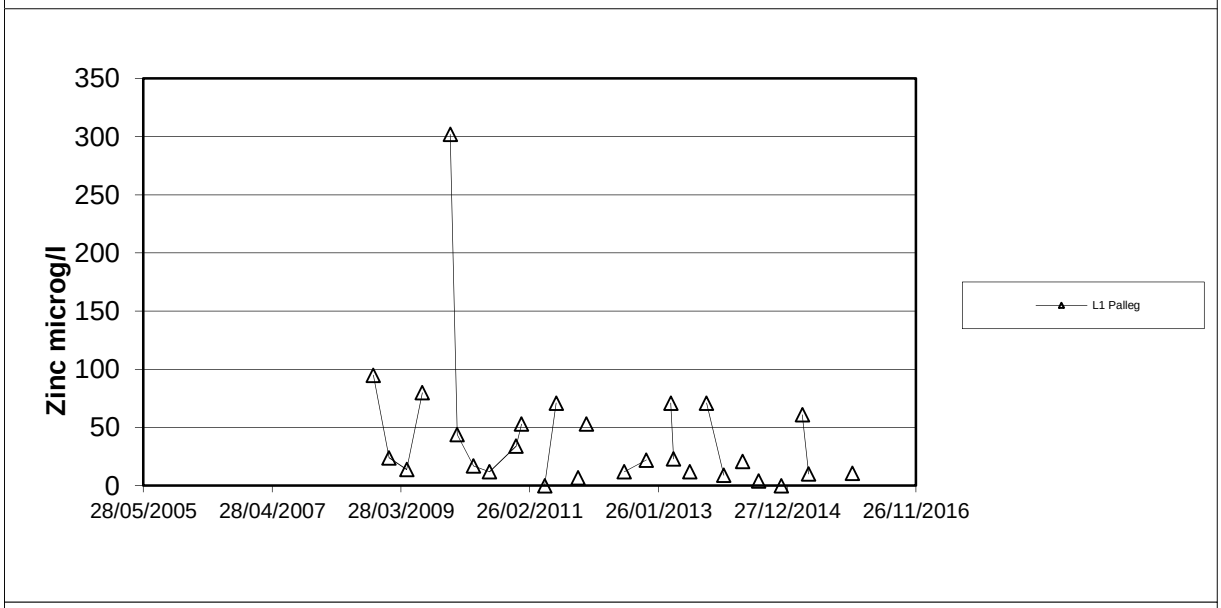

pH
Electrical Conductivity
pH
EC microS/cm
14
12
10
8
6
4
2
0
14000
12000
10000
8000
6000
4000
2000
0
28/05/2005
28/04/2007
28/03/2009
26/02/2011
26/01/2013
27/12/2014
26/11/2016
Alkalinity
Potassium
Sodium
Calcium
Magnesium
Concentration mg/l
7000
6500
6000
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
28/05/2005
28/04/2007
28/03/2009
26/02/2011
26/01/2013
27/12/2014
26/11/2016
Chloride
Sulphate
Concentration mg/l
1500
1000
500
0
28/05/2005
28/04/2007
28/03/2009
26/02/2011
26/01/2013
27/12/2014
26/11/2016

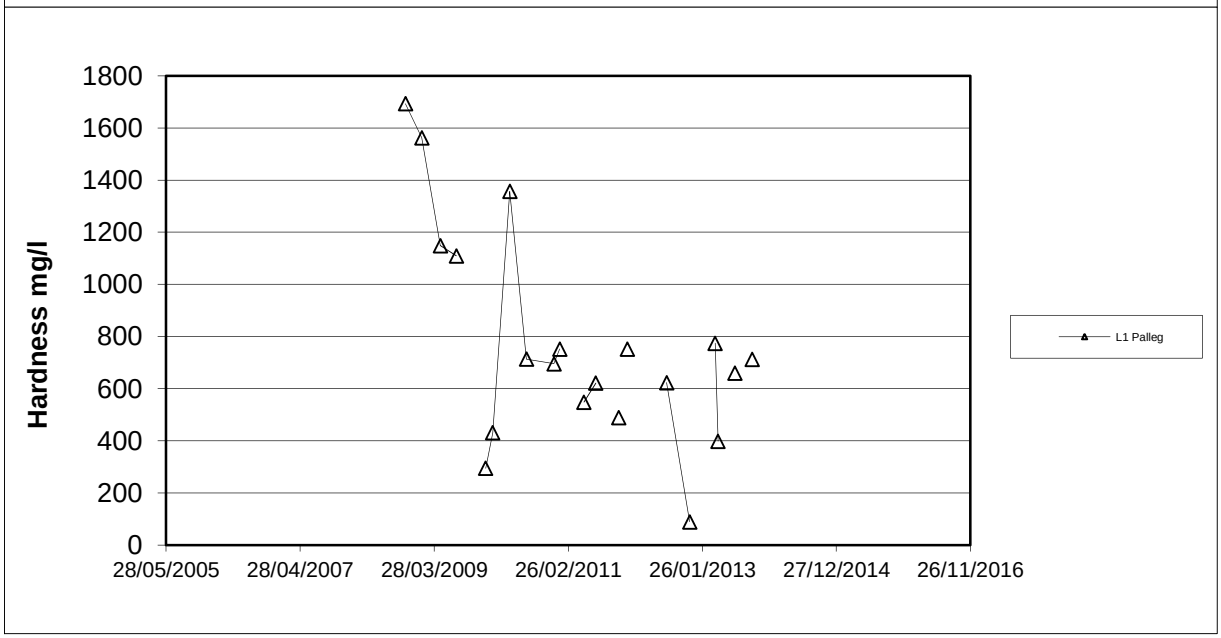

Boron microg/l
16000
14000
12000
10000
8000
6000
4000
2000
0
28/05/2005
28/04/2007
28/03/2009
26/02/2011
26/01/2013
27/12/2014
26/11/2016
L1 Palleg

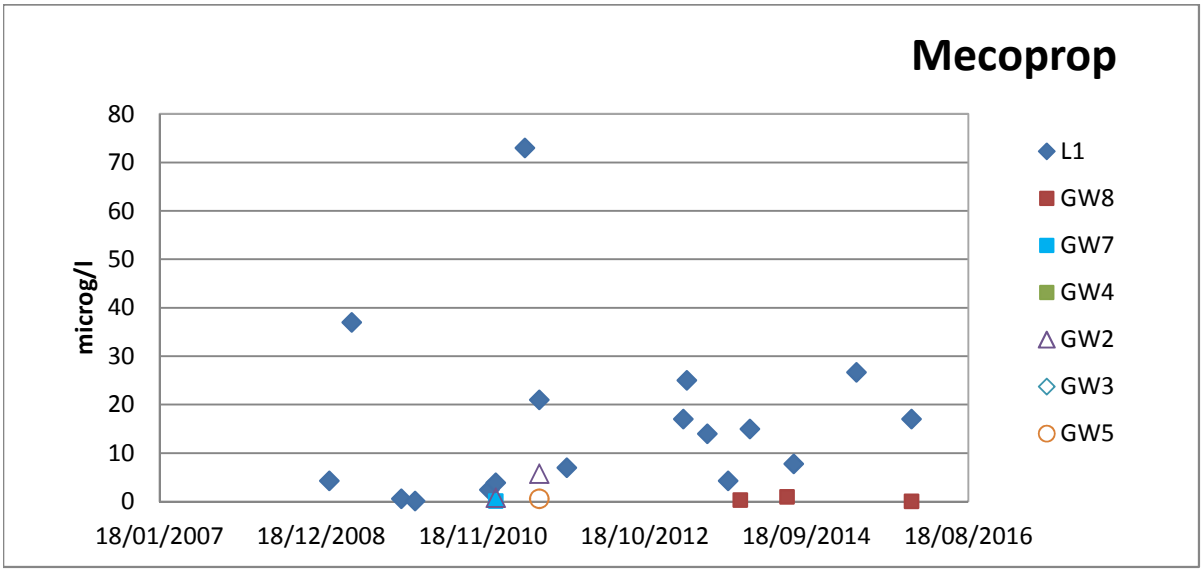

Chromium microg/l
450
400
350
300
250
200
150
100
50
0
28/05/2005
28/04/2007
28/03/2009
26/02/2011
26/01/2013
27/12/2014
26/11/2016
L1 Pallegl

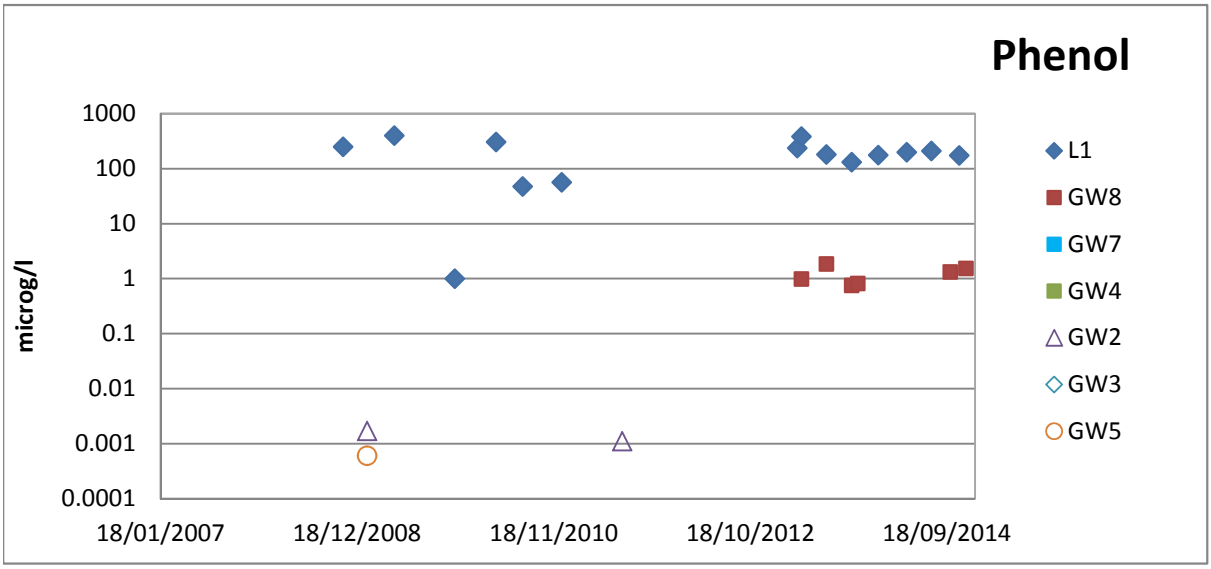

Iron microg/l
180000
160000
140000
120000
100000
80000
60000
40000
20000
0
28/05/2005
28/04/2007
28/03/2009
26/02/2011
26/01/2013
27/12/2014
26/11/2016
L1 Palleg

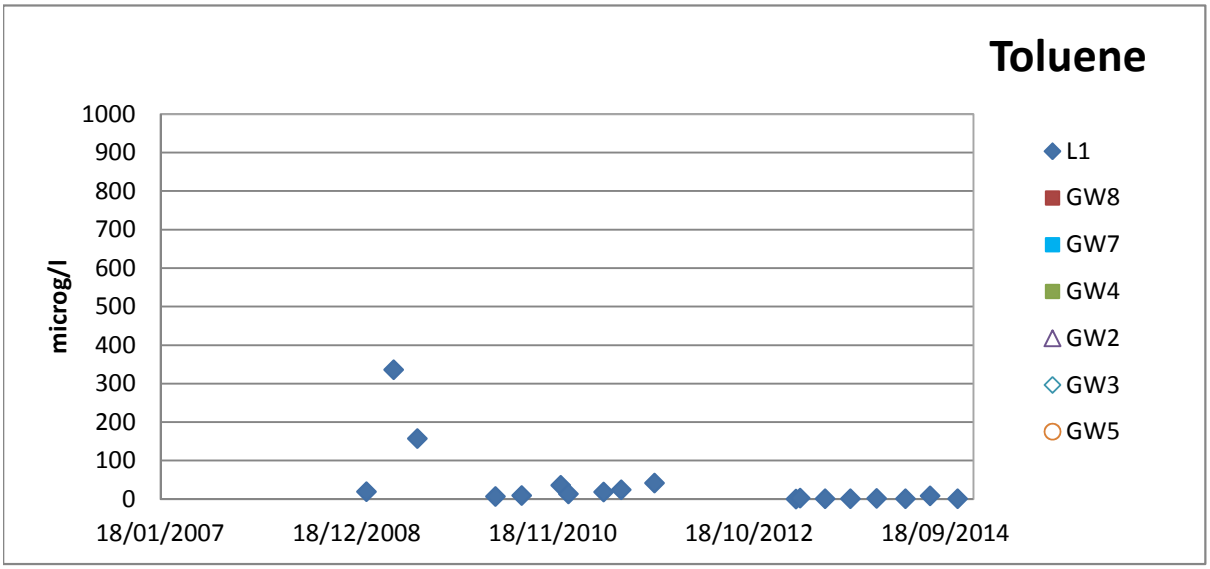

Manganese microg/l
12000
10000
8000
6000
4000
2000
0
28/05/2005
28/04/2007
28/03/2009
26/02/2011
26/01/2013
27/12/2014
26/11/2016
L1 Pallegl


Zinc microg/l
350
300
250
200
150
100
50
0
28/05/2005
28/04/2007
28/03/2009
26/02/2011
26/01/2013
27/12/2014
26/11/2016
L1 Palleg


Hardness mg/l
1800
1600
1400
1200
1000
800
600
400
200
0
28/05/2005
28/04/2007
28/03/2009
26/02/2011
26/01/2013
27/12/2014
26/11/2016
L1 Palleg


Mecoprop
microg/l
80
70
60
50
40
30
20
10
0
18/01/2007
18/12/2008
18/11/2010
18/10/2012
18/09/2014
18/08/2016
L1
GW8
GW7
GW4
GW2
GW3
GW5


Phenol
microg/l
1000
100
10
1
0.1
0.01
0.001
0.0001
18/01/2007
18/12/2008
18/11/2010
18/10/2012
18/09/2014
L1
GW8
GW7
GW4
GW2
GW3
GW5


Toluene
microg/l
1000
900
800
700
600
500
400
300
200
100
0
18/01/2007
18/12/2008
18/11/2010
18/10/2012
18/09/2014
L1
GW8
GW7
GW4
GW2
GW3
GW5

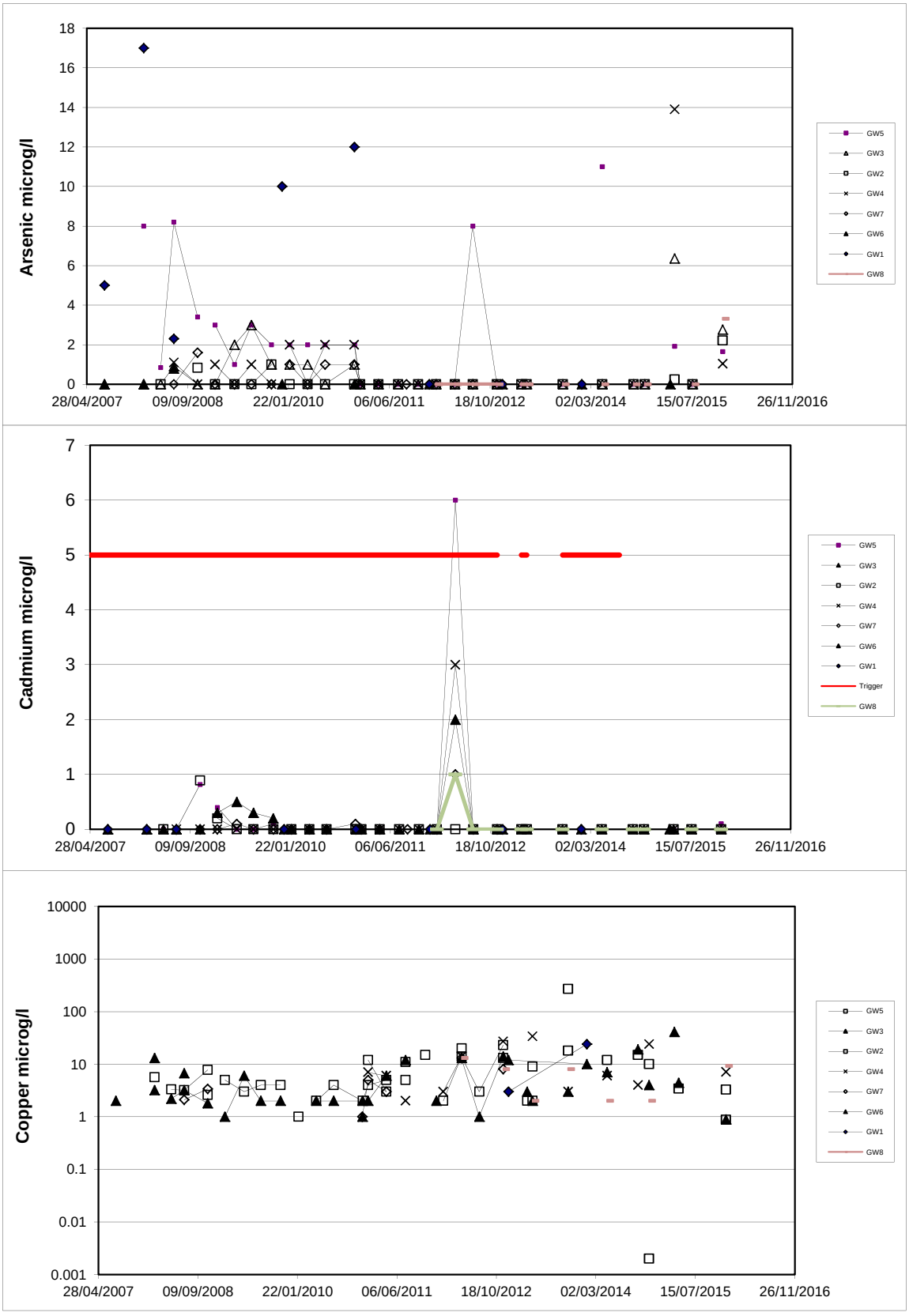
PALLEG LANDFILL
LOWER CWMTWRCH

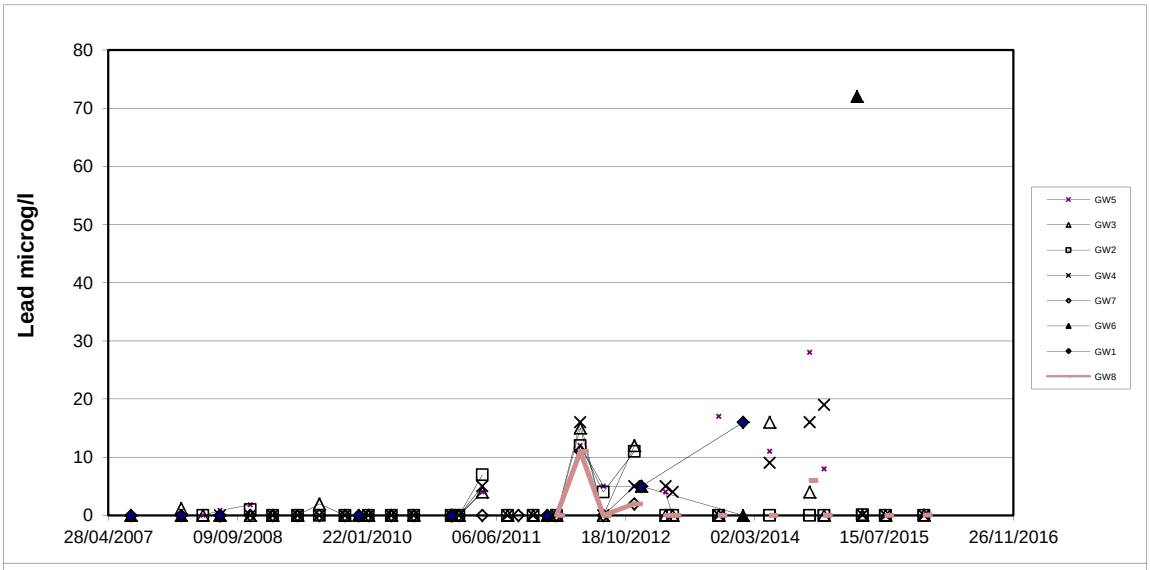
PERMIT BT19081X

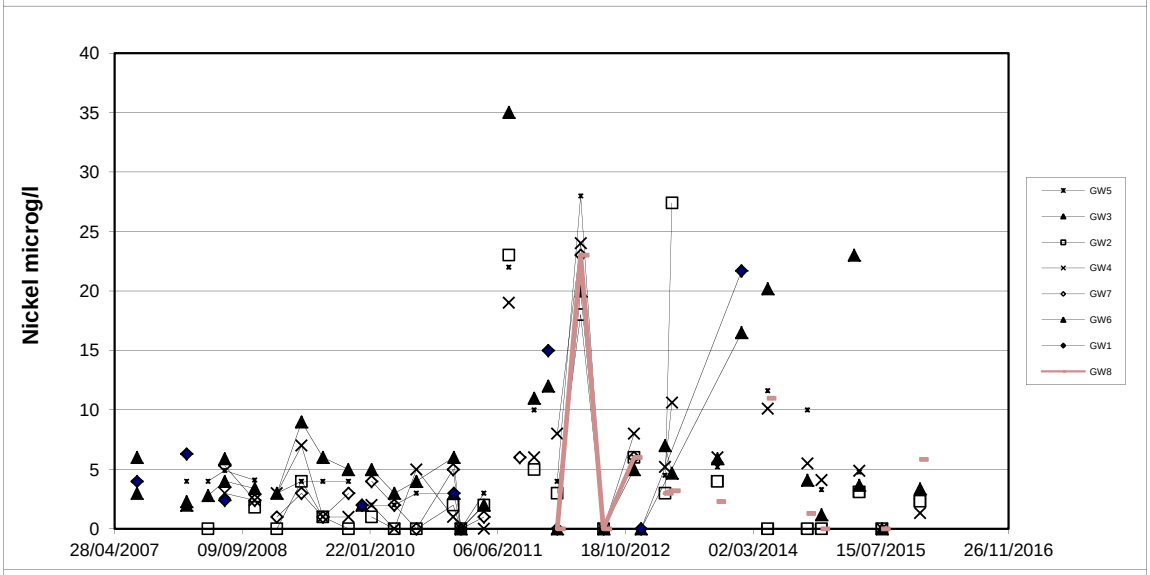
Review of 2015 Landfill Monitoring

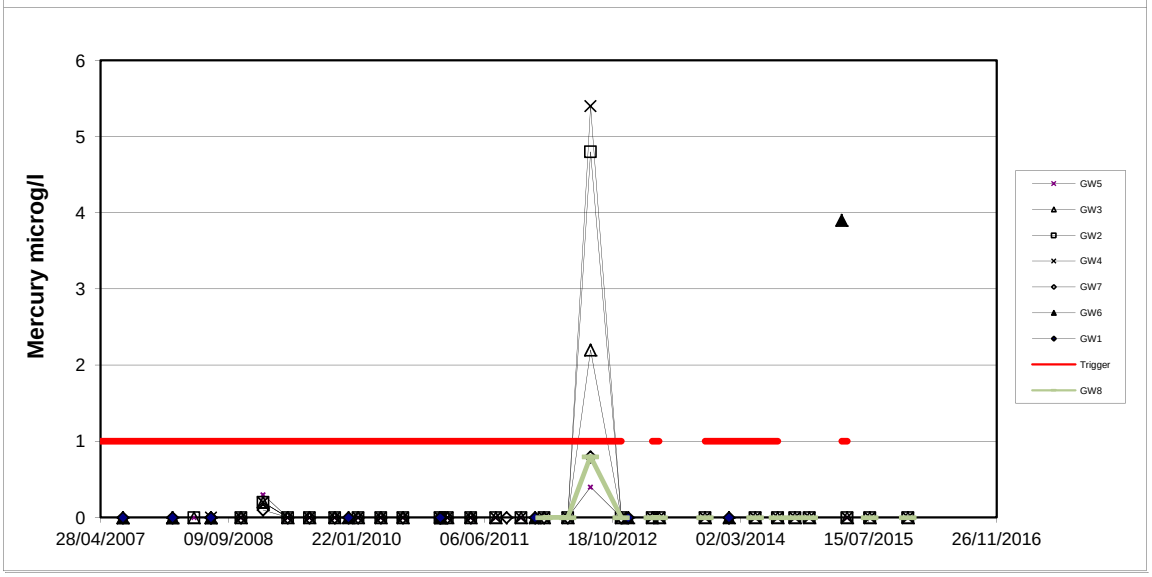
Appendix 4 Summary of Groundwater Monitoring Data

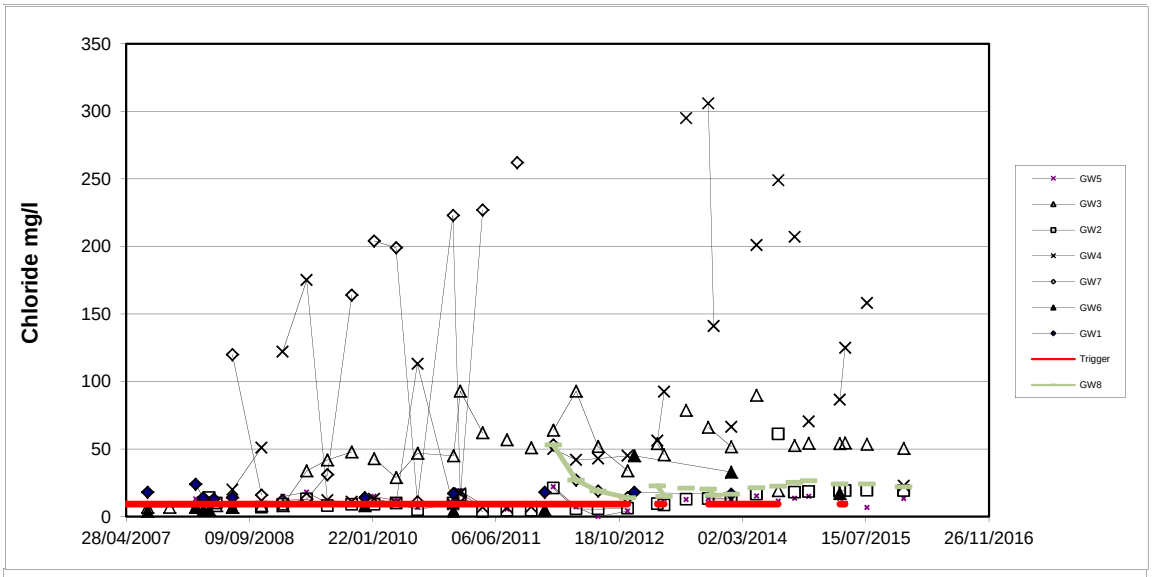
Report Number 1429r1v1d0116

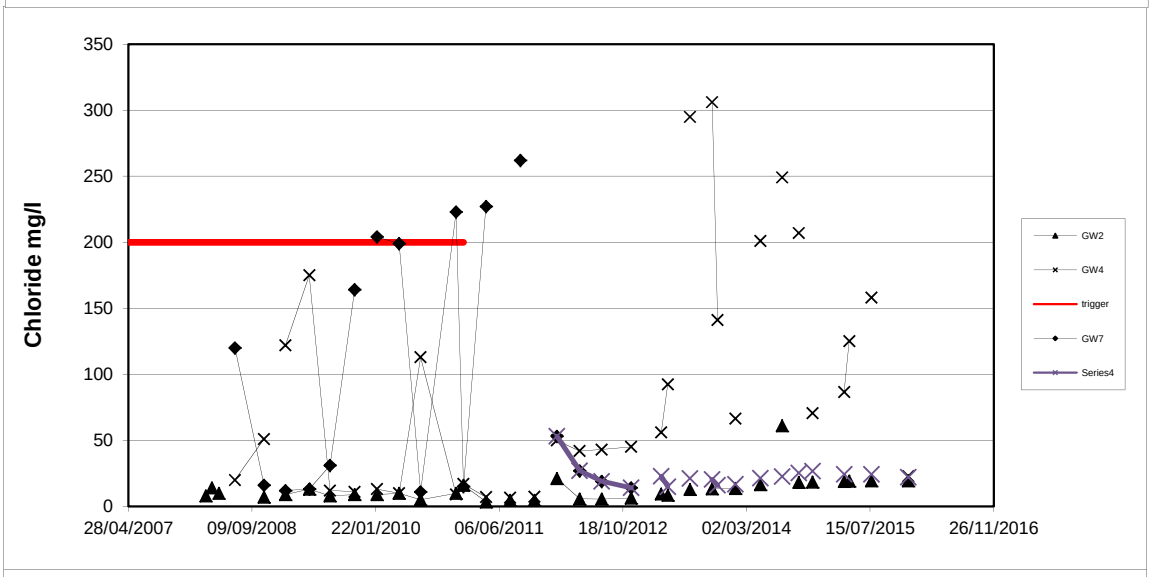

Arsenic microg/l
18
16
14
12
10
8
6
4
2
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8
Cadmium microg/l
7
6
5
4
3
2
1
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
Trigger
GW8
Copper microg/l
10000
1000
100
10
1
0.1
0.01
0.001
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8

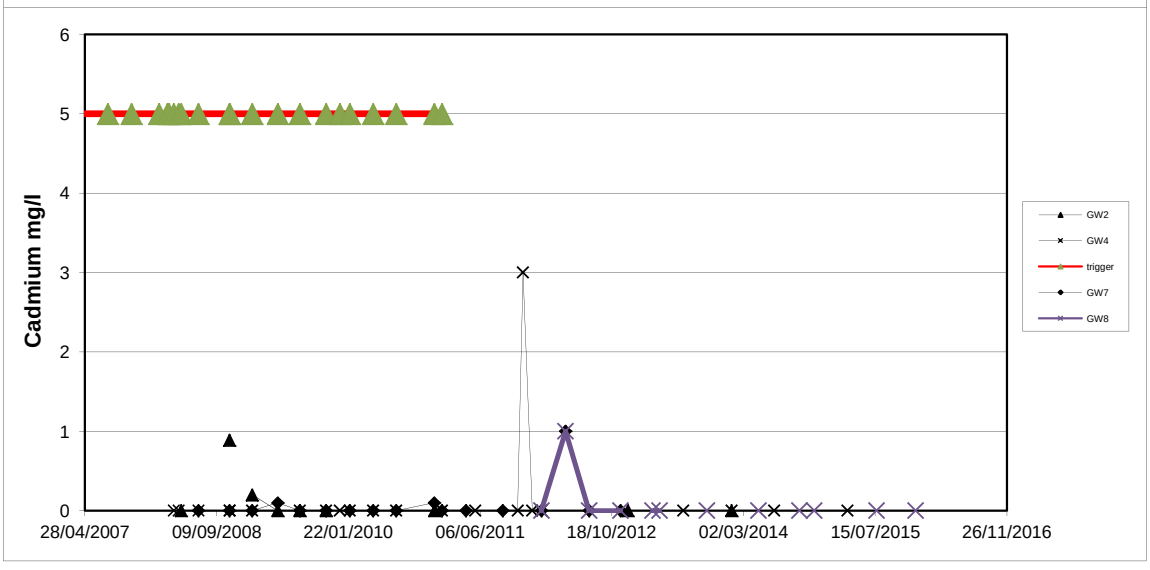

Lead microg/l
80
70
60
50
40
30
20
10
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8

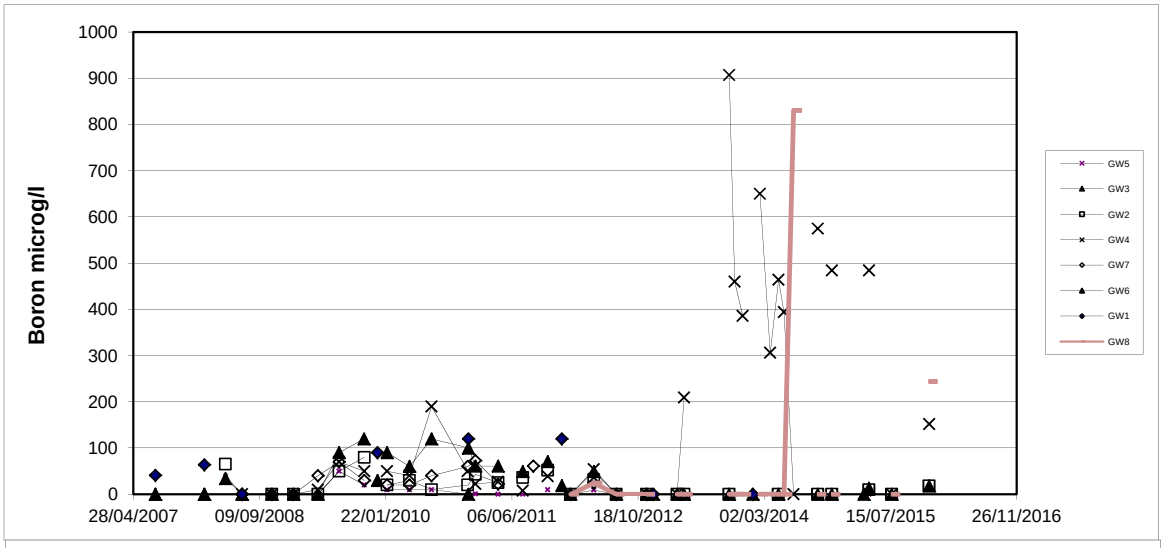

Nickel microg/l
40
35
30
25
20
15
10
5
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8

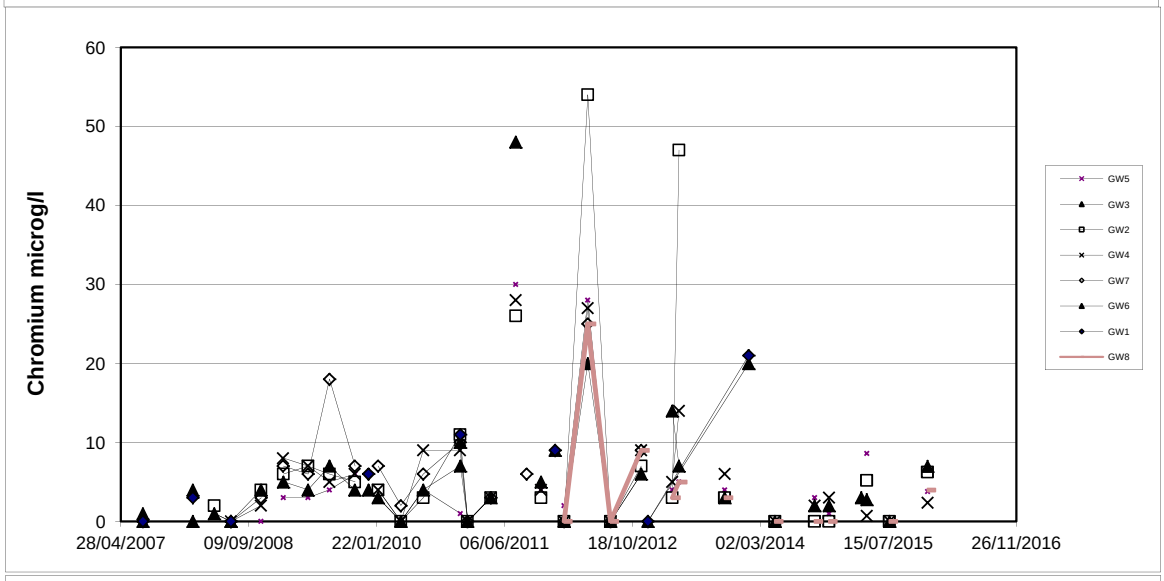

Mercury microg/l
6
5
4
3
2
1
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
Trigger
GW8

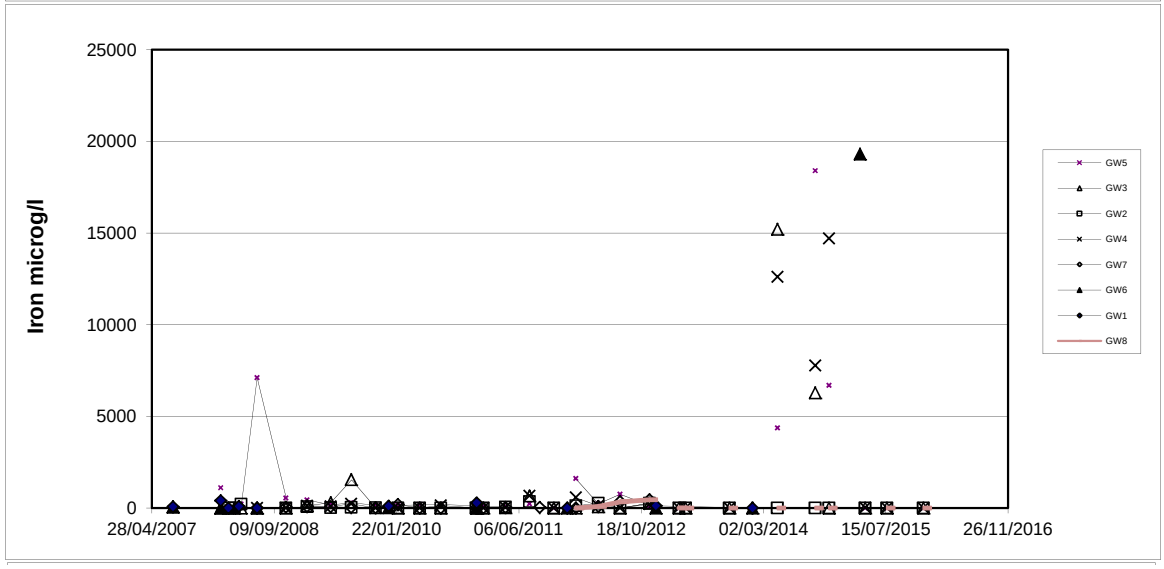

Chloride mg/l
350
300
250
200
150
100
50
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
Trigger
GW8

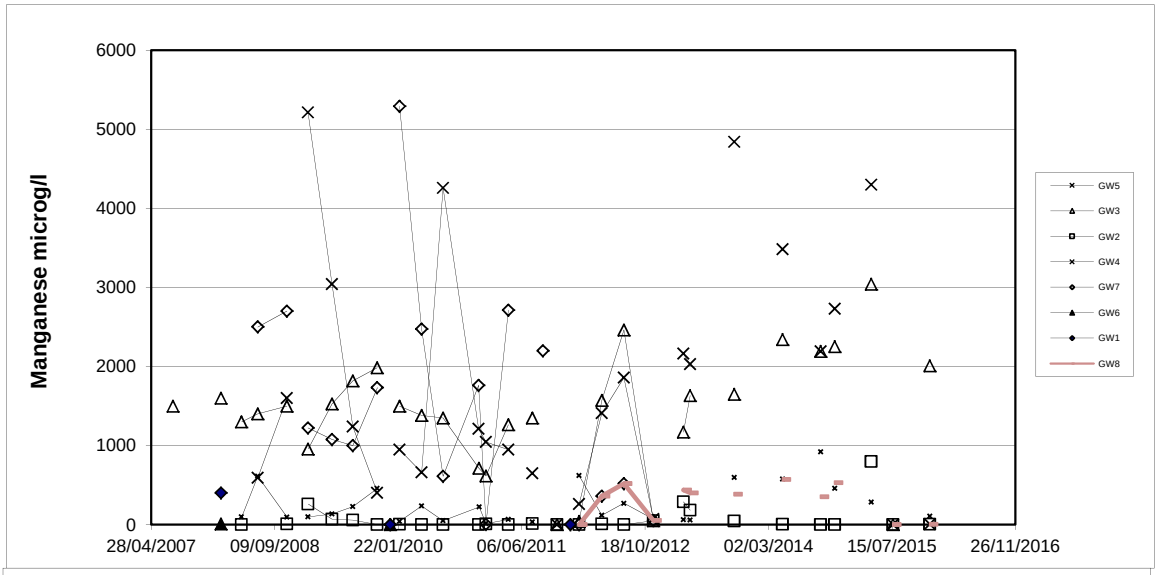

Chloride mg/l
350
300
250
200
150
100
50
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW2
GW4
trigger
GW7
Series4

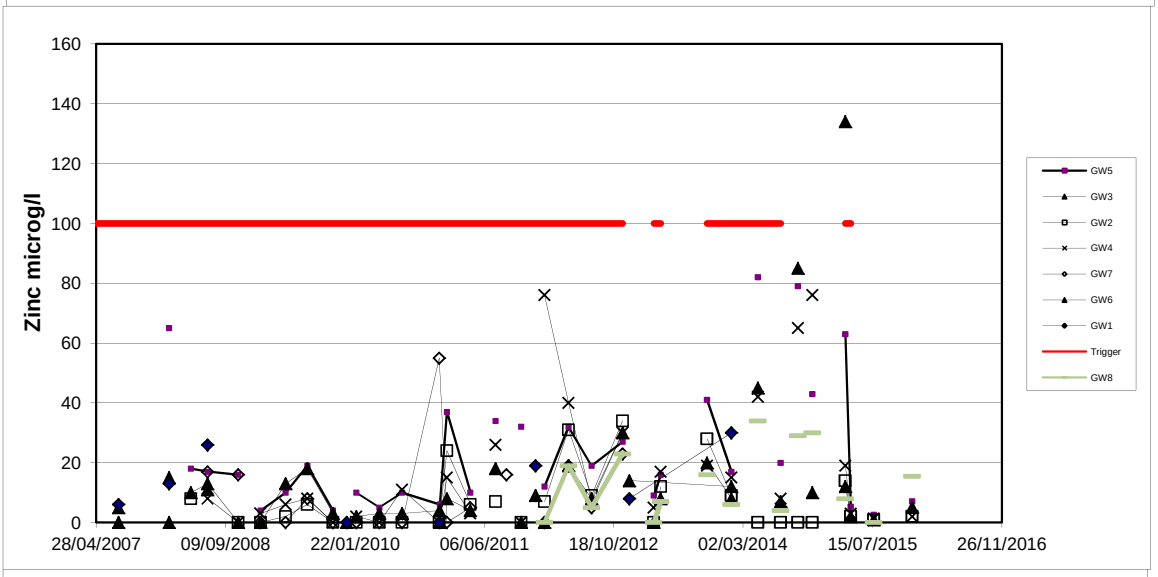

Cadmium mg/l
6
5
4
3
2
1
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW2
GW4
trigger
GW7
GW8

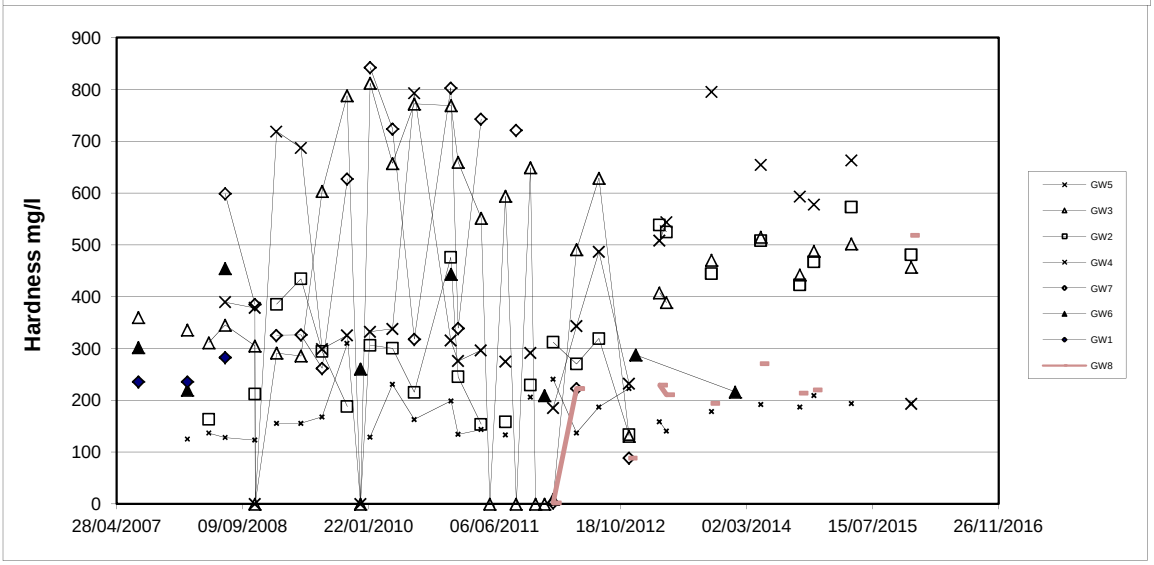

Boron microg/l
1000
900
800
700
600
500
400
300
200
100
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8

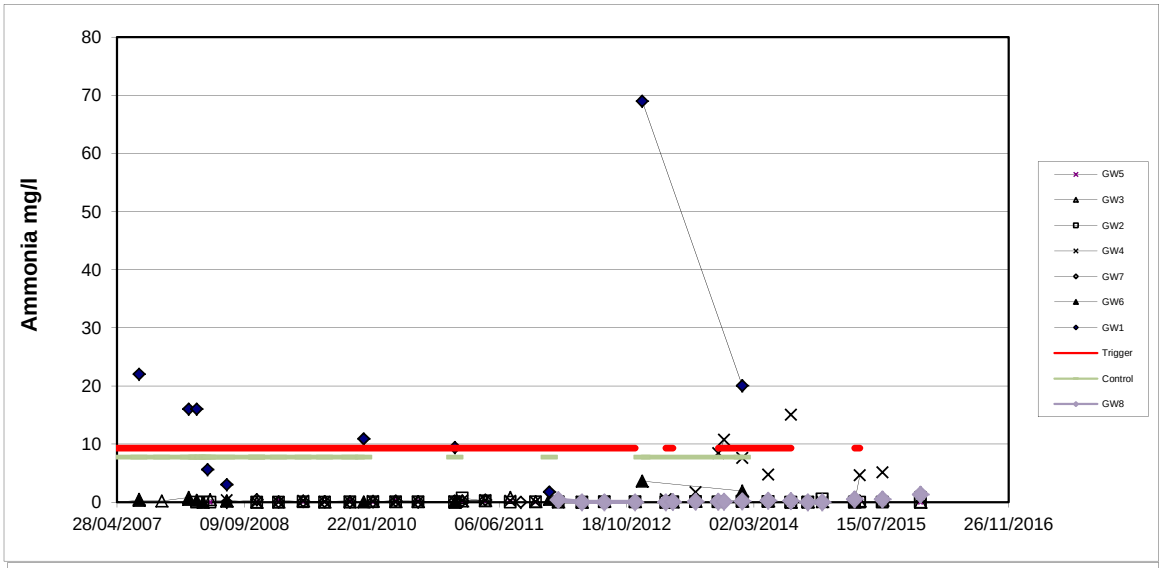

Chromium microg/l
60
50
40
30
20
10
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8

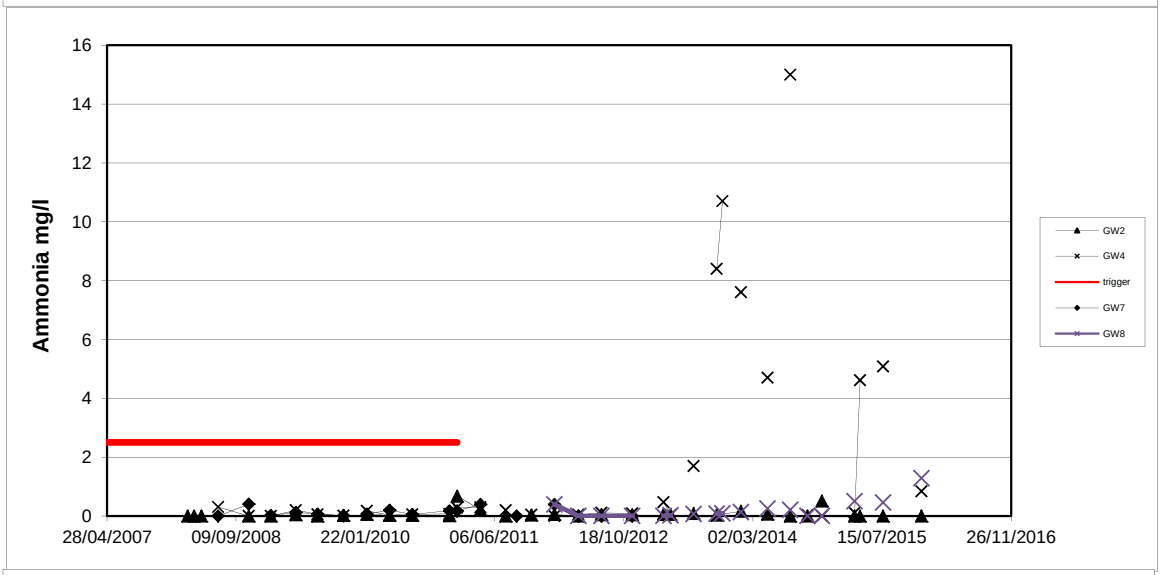

Iron microg/l
25000
20000
15000
10000
5000
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8

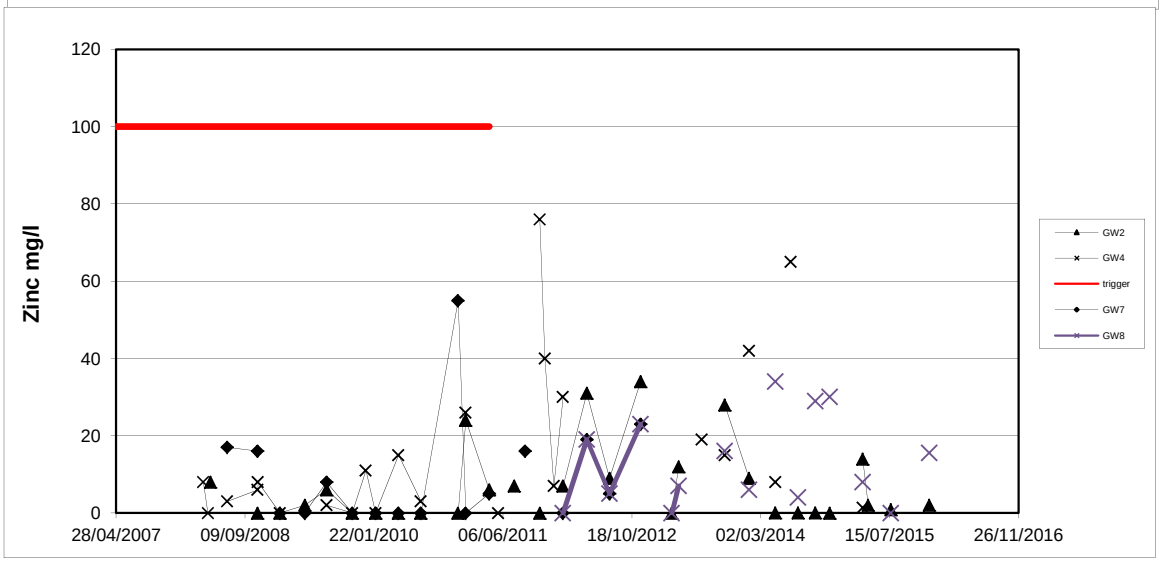

Manganese microg/l
6000
5000
4000
3000
2000
1000
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8

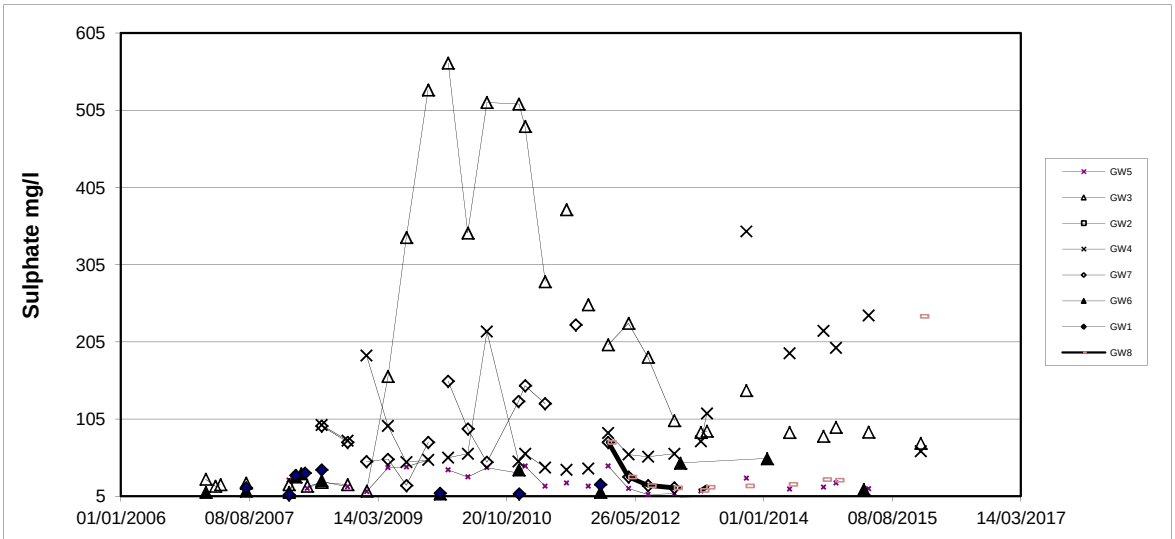

Zinc microg/l
160
140
120
100
80
60
40
20
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
Trigger
GW8

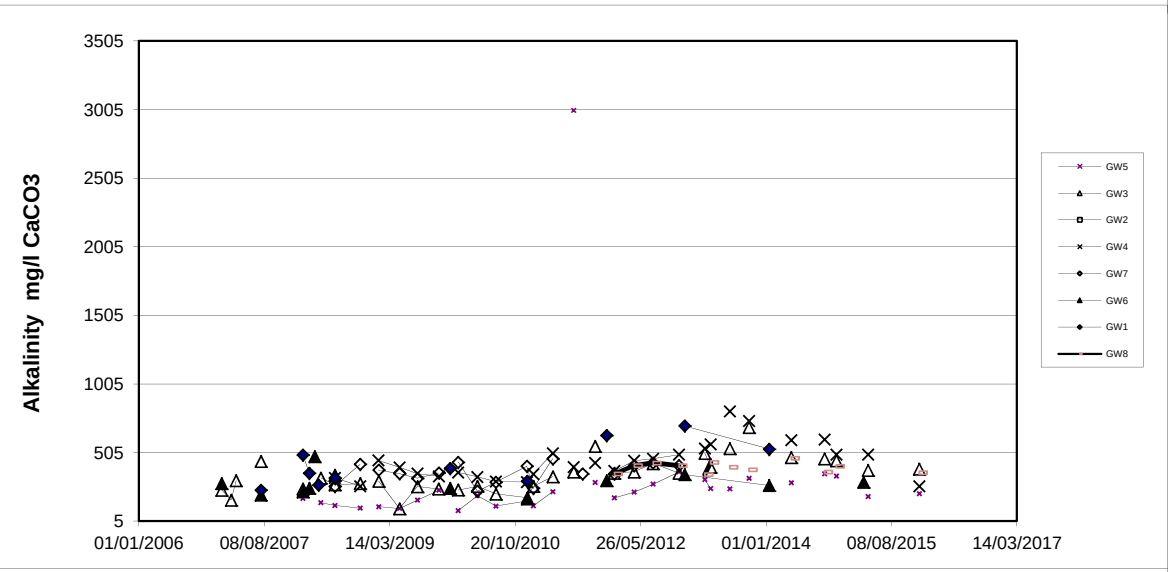

Hardness mg/l
900
800
700
600
500
400
300
200
100
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8

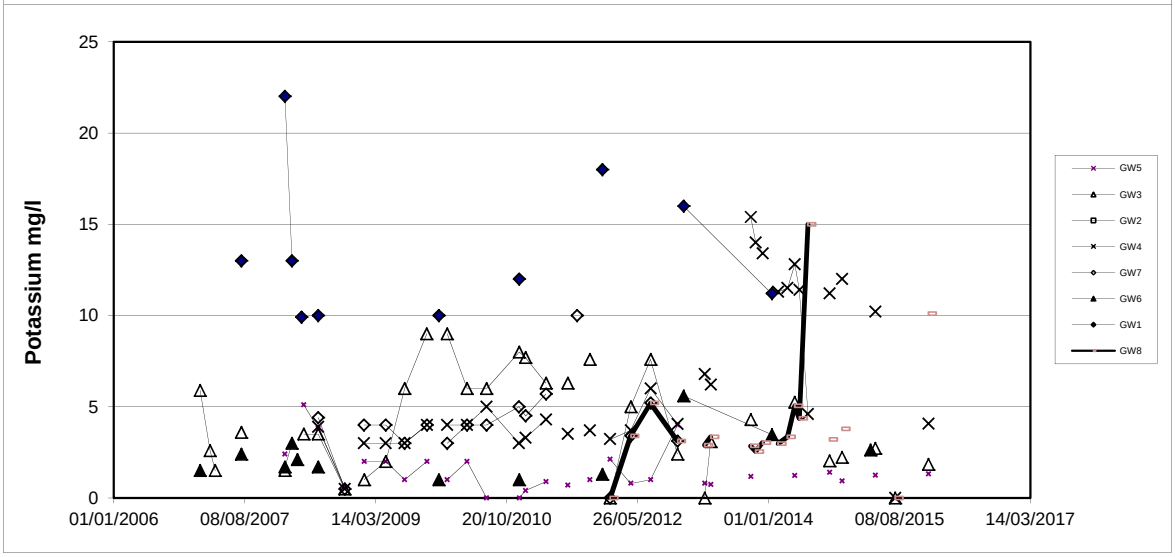

Ammonia mg/l
80
70
60
50
40
30
20
10
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
Trigger
Control
GW8

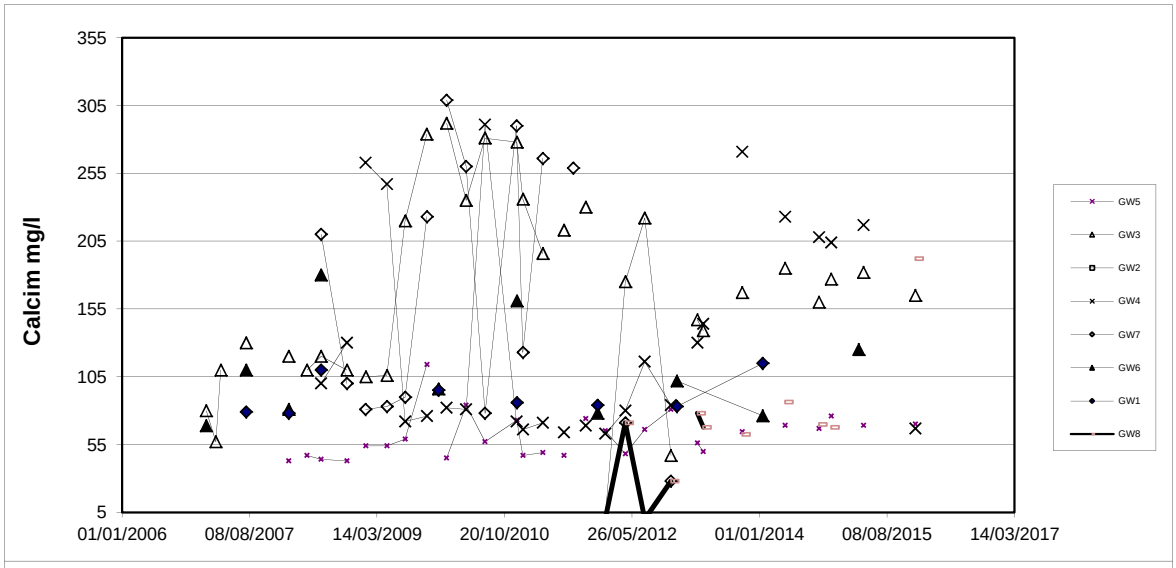

Ammonia mg/l
16
14
12
10
8
6
4
2
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW2
GW4
trigger
GW7
GW8

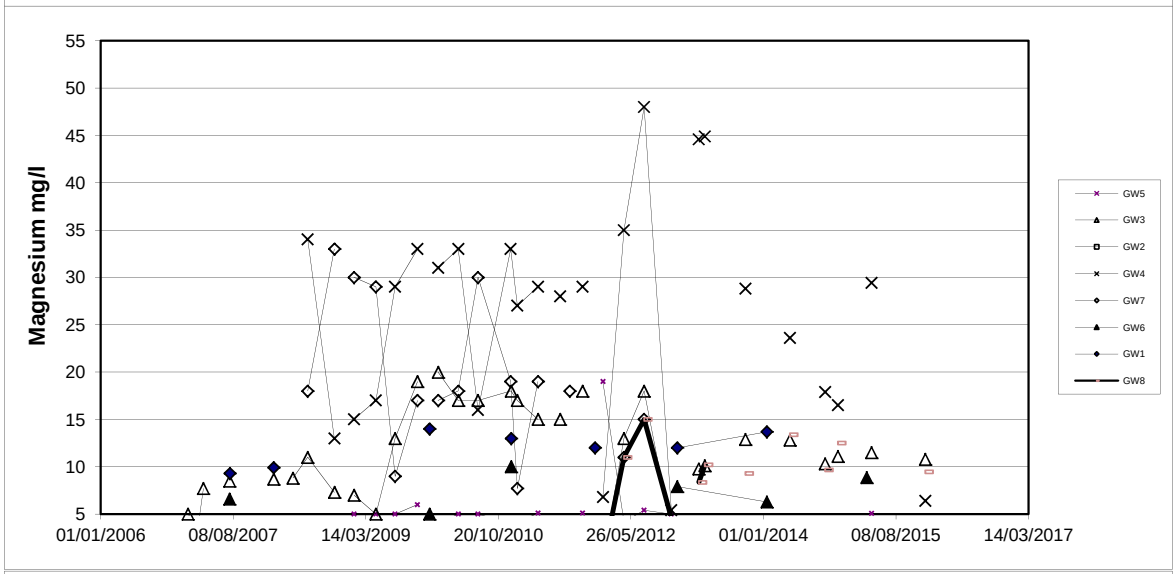

Zinc mg/l
120
100
80
60
40
20
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW2
GW4
trigger
GW7
GW8

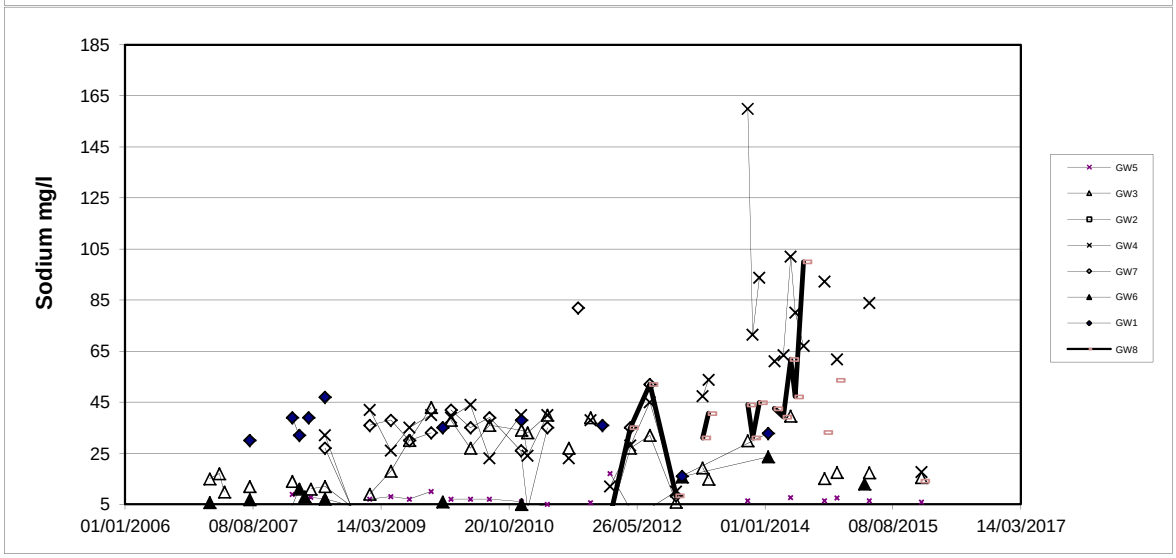

Sulphate mg/l
605
505
405
305
205
105
5
01/01/2006
08/08/2007
14/03/2009
20/10/2010
26/05/2012
01/01/2014
08/08/2015
14/03/2017
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8

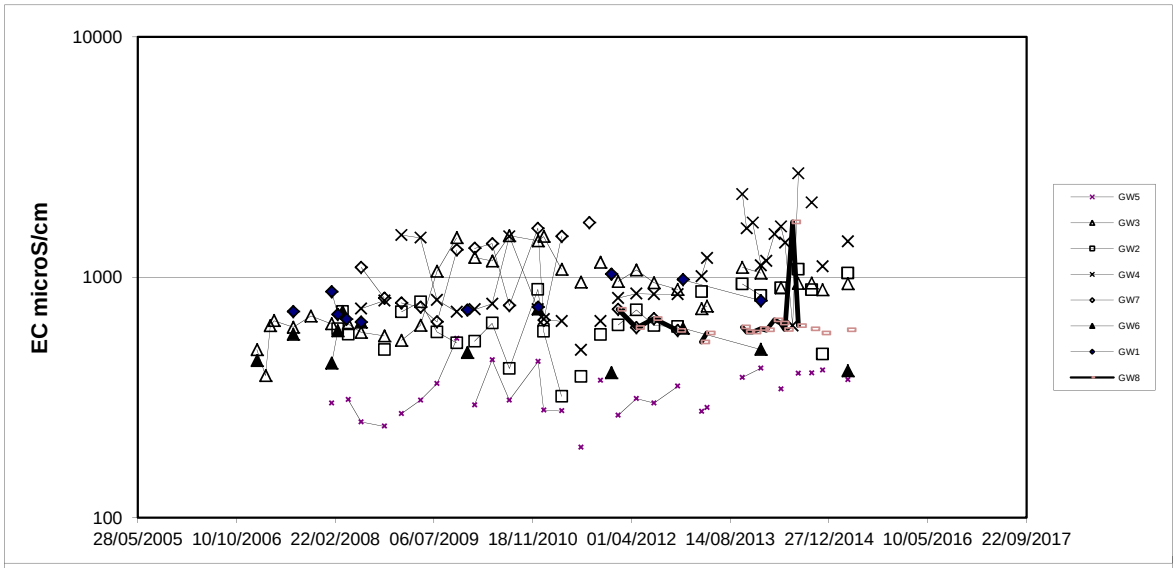

Alkalinity mg/l CaCO3
3505
3005
2505
2005
1505
1005
505
5
01/01/2006
08/08/2007
14/03/2009
20/10/2010
26/05/2012
01/01/2014
08/08/2015
14/03/2017
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8

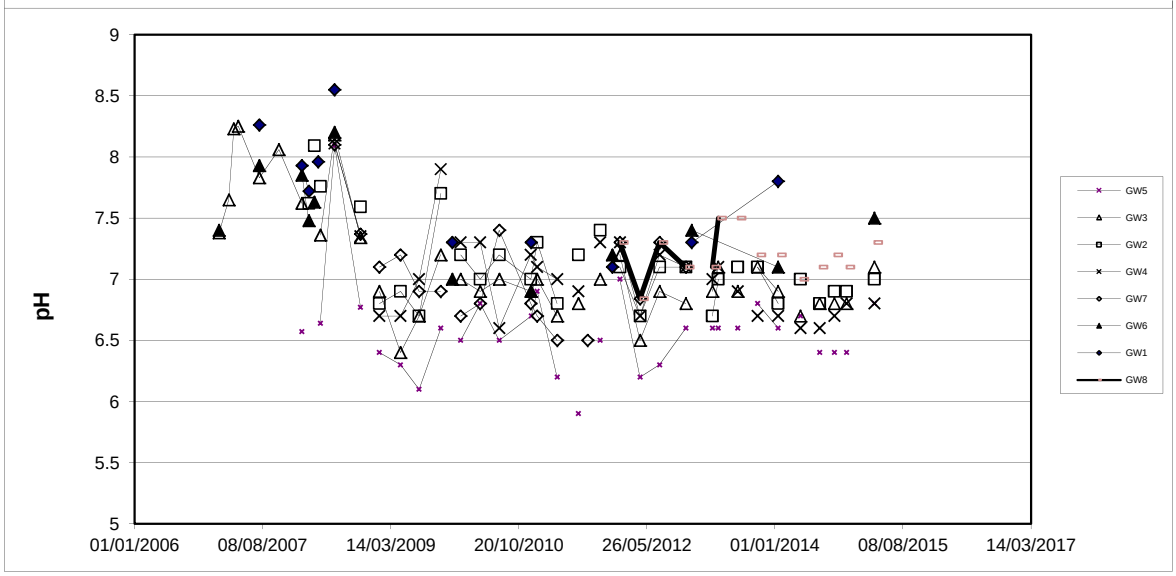

Potassium mg/l
25
20
15
10
5
0
01/01/2006
08/08/2007
14/03/2009
20/10/2010
26/05/2012
01/01/2014
08/08/2015
14/03/2017
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8

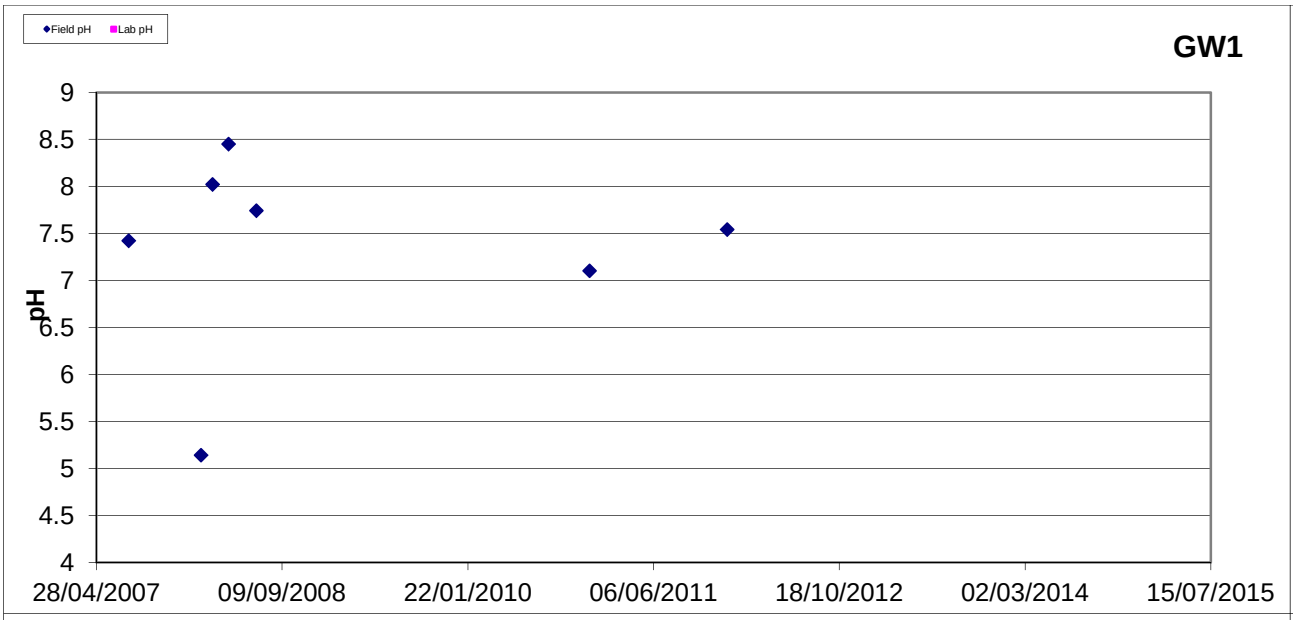

Calcim mg/l
355
305
255
205
155
105
55
5
01/01/2006
08/08/2007
14/03/2009
20/10/2010
26/05/2012
01/01/2014
08/08/2015
14/03/2017
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8

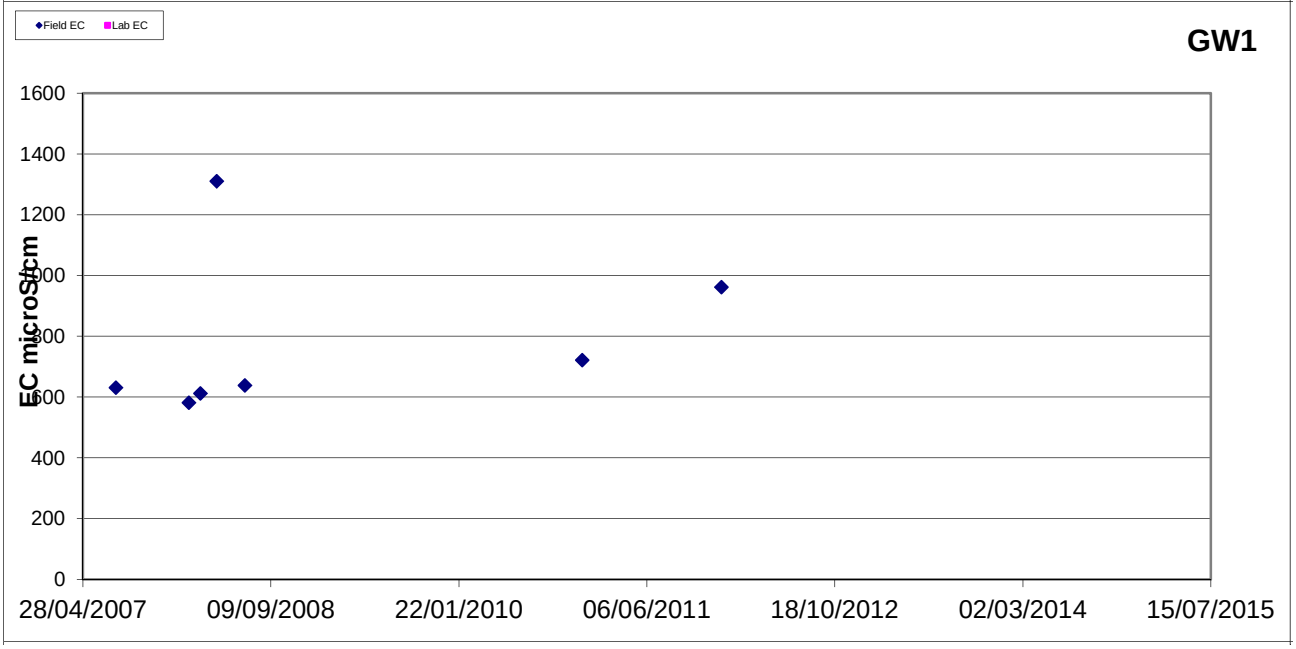

Magnesium mg/l
55
50
45
40
35
30
25
20
15
10
5
01/01/2006
08/08/2007
14/03/2009
20/10/2010
26/05/2012
01/01/2014
08/08/2015
14/03/2017
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8

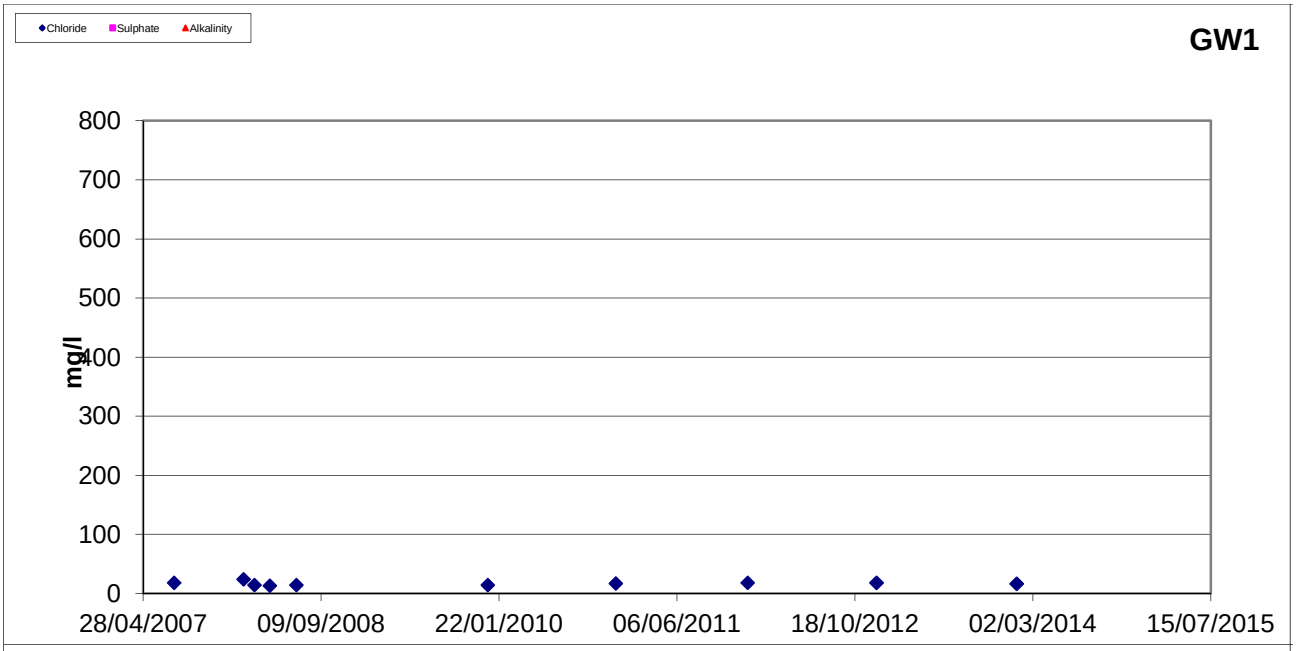

Sodium mg/l
185
165
145
125
105
85
65
45
25
5
01/01/2006
08/08/2007
14/03/2009
20/10/2010
26/05/2012
01/01/2014
08/08/2015
14/03/2017
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8

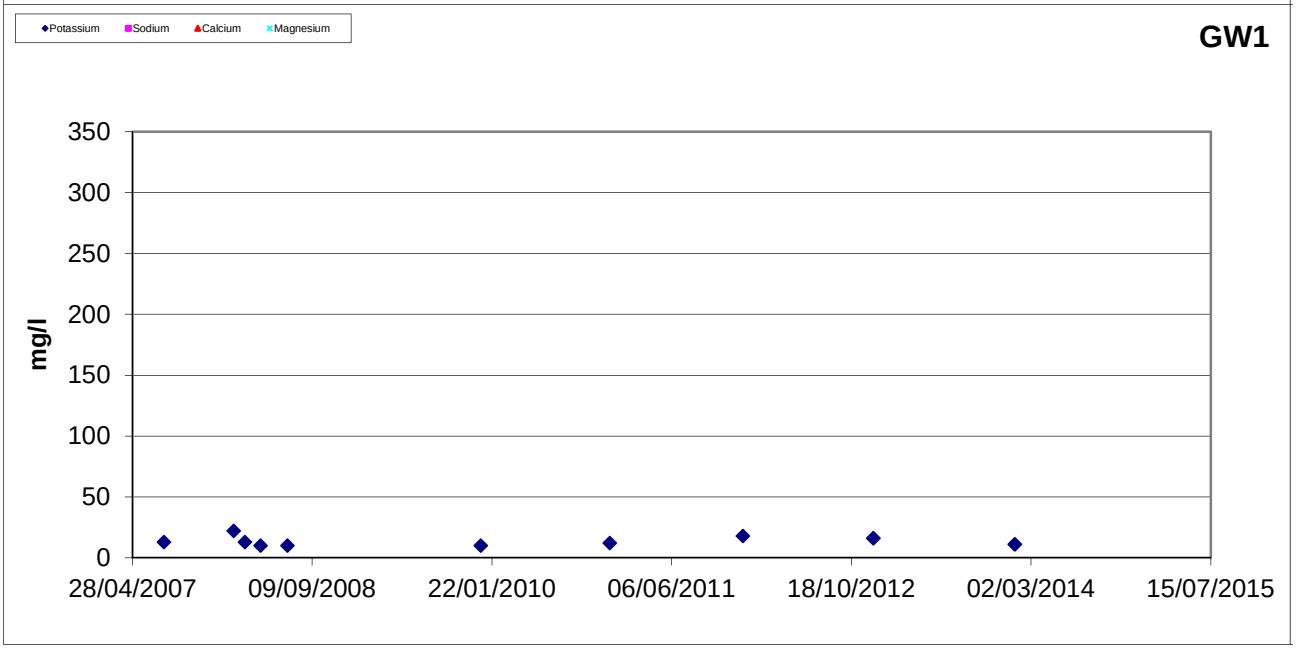

EC microS/cm
10000
1000
100
28/05/2005
10/10/2006
22/02/2008
06/07/2009
18/11/2010
01/04/2012
14/08/2013
27/12/2014
10/05/2016
22/09/2017
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8

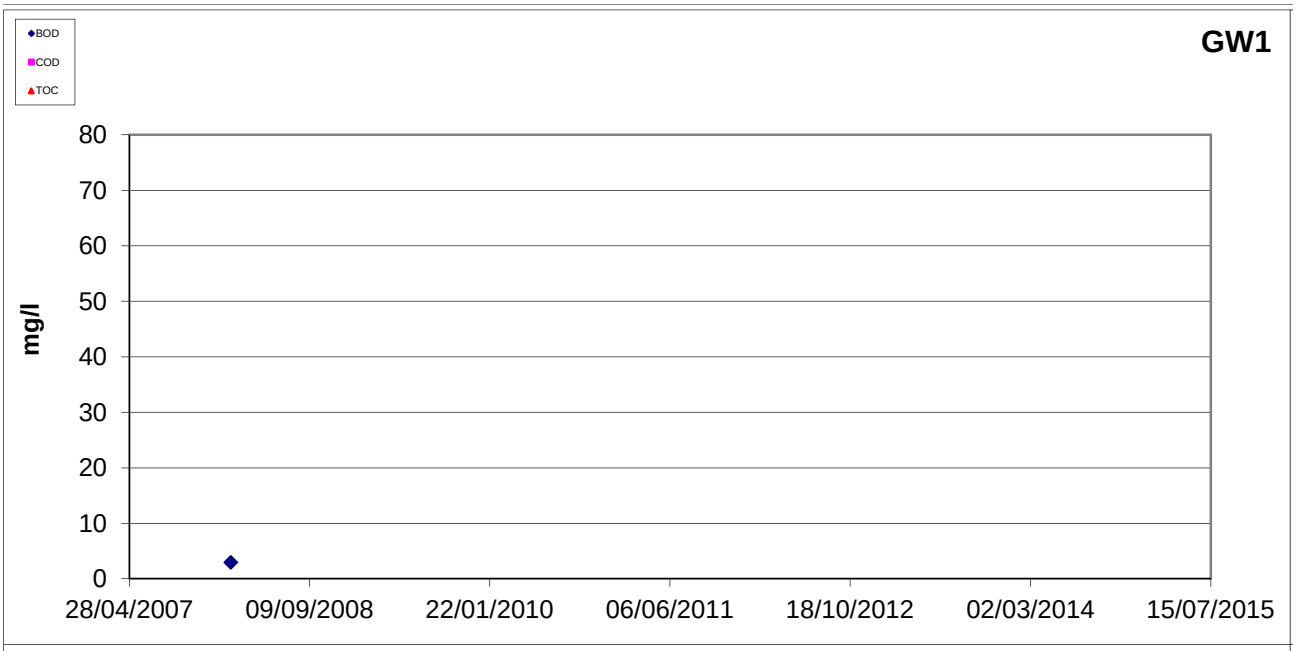

pH
9
8.5
8
7.5
7
6.5
6
5.5
5
01/01/2006
08/08/2007
14/03/2009
20/10/2010
26/05/2012
01/01/2014
08/08/2015
14/03/2017
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8

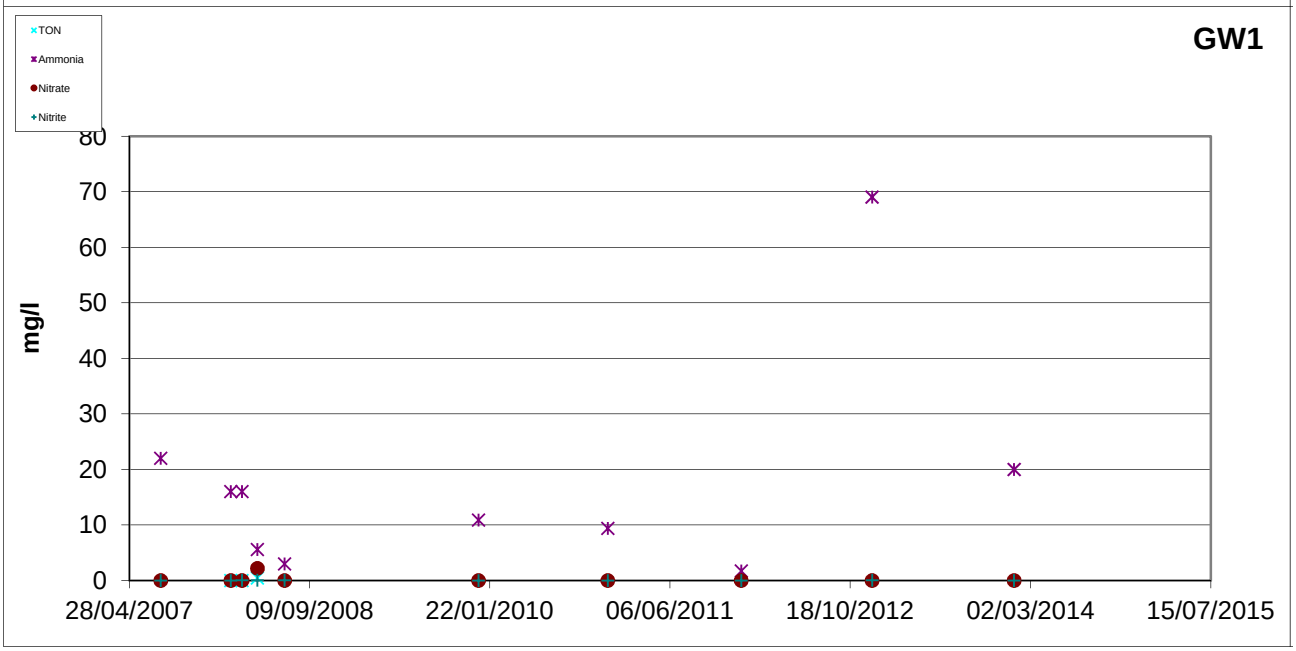

Field pH
Lab pH
GW1
pH
9
8.5
8
7.5
7
6.5
6
5.5
5
4.5
4
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015

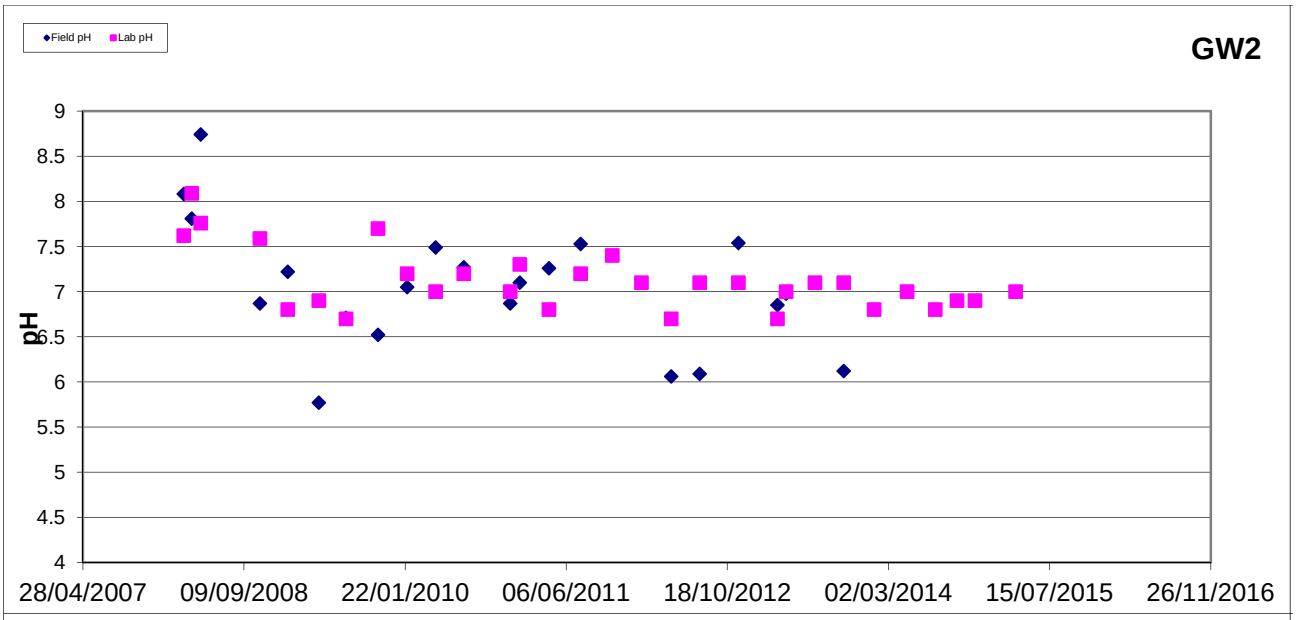

Field EC
Lab EC
GW1
EC microS/cm
1600
1400
1200
1000
800
600
400
200
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015

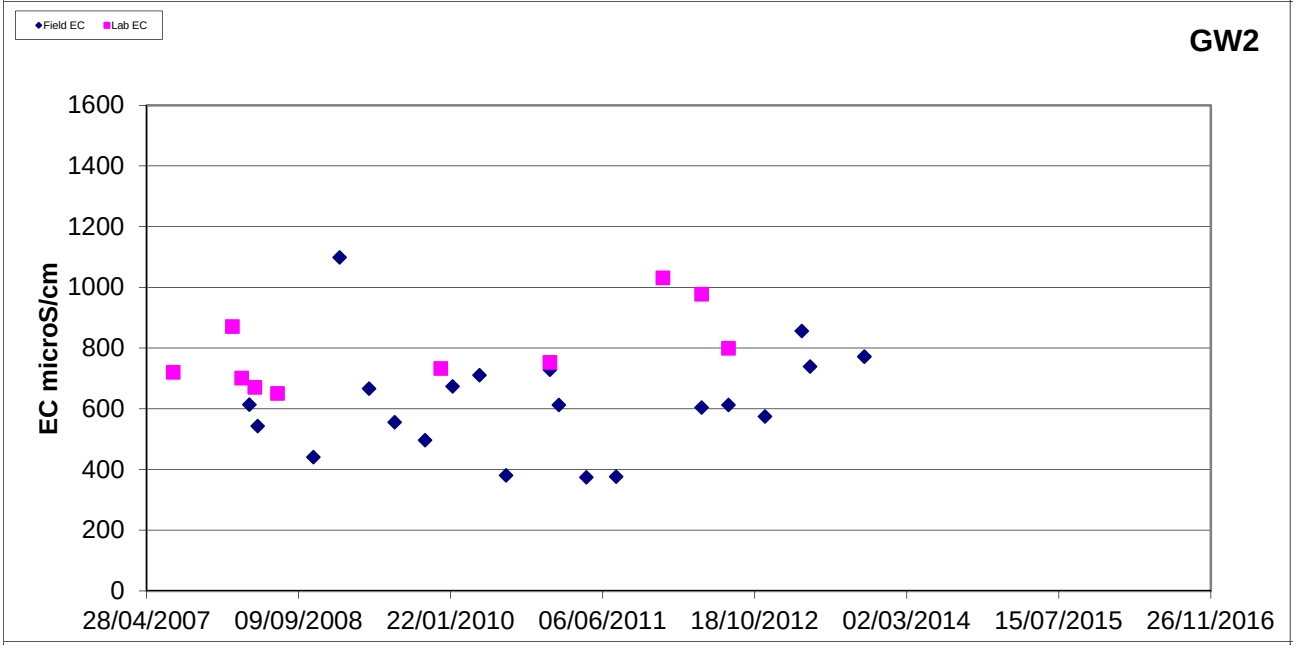

Chloride
Sulphate
Alkalinity
GW1
mg/l
800
700
600
500
400
300
200
100
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015

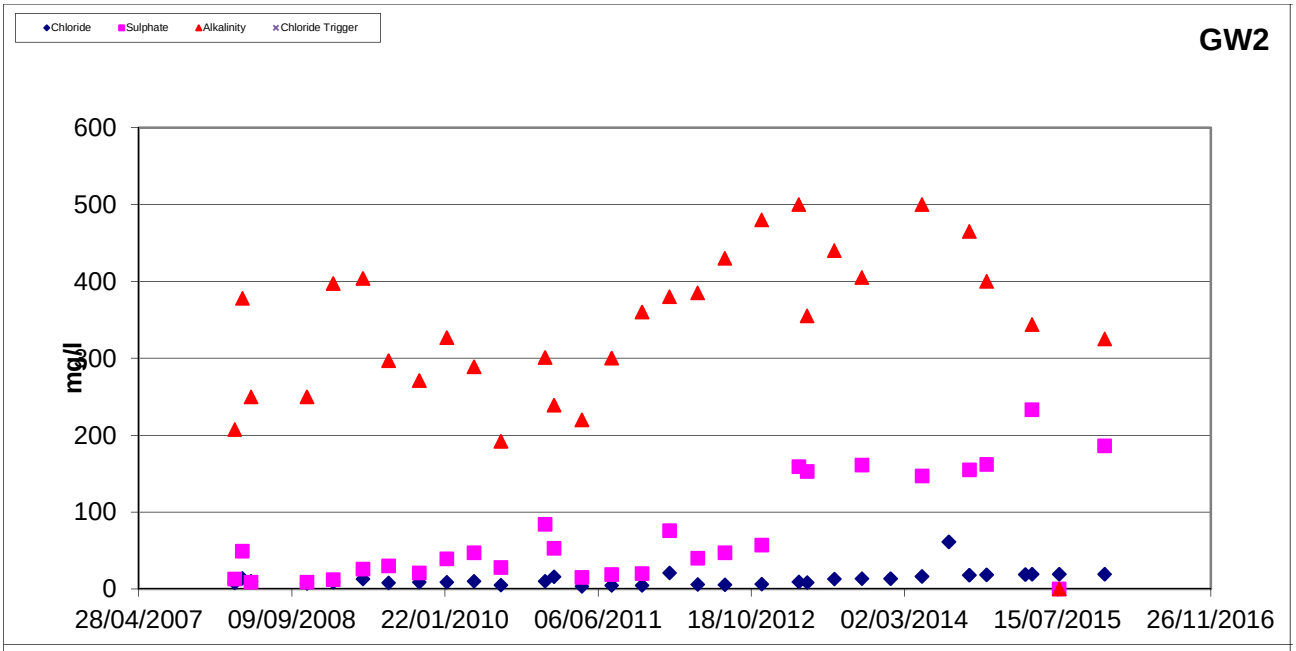

Potassium
Sodium
Calcium
Magnesium
GW1
mg/l
350
300
250
200
150
100
50
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015

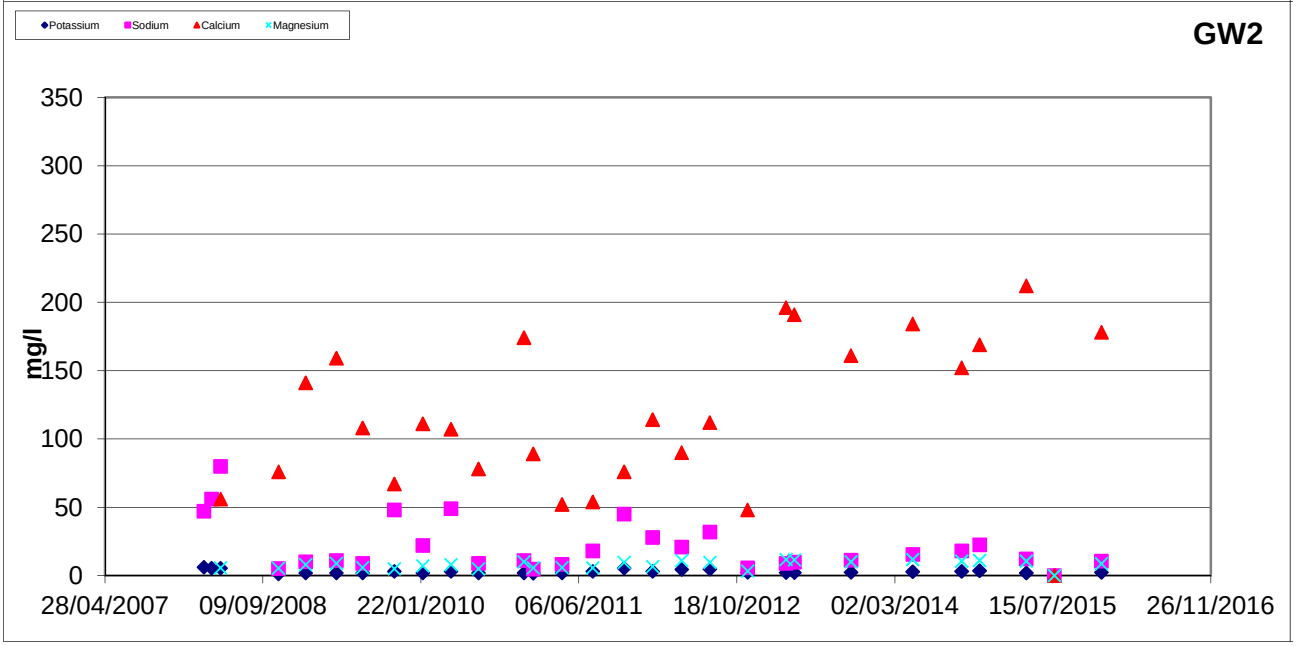

GW1
BOD
COD
TOC
mg/l
80
70
60
50
40
30
20
10
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015

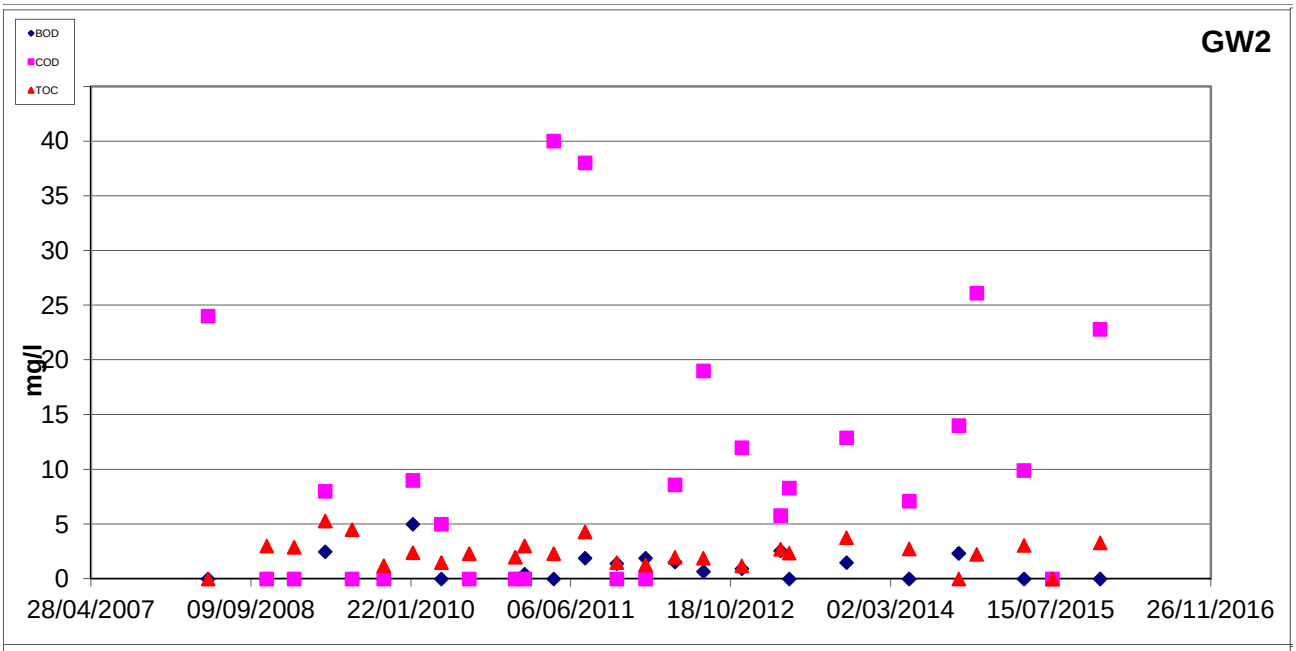

GW1
TON
Ammonia
Nitrate
Nitrite
mg/l
80
70
60
50
40
30
20
10
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015

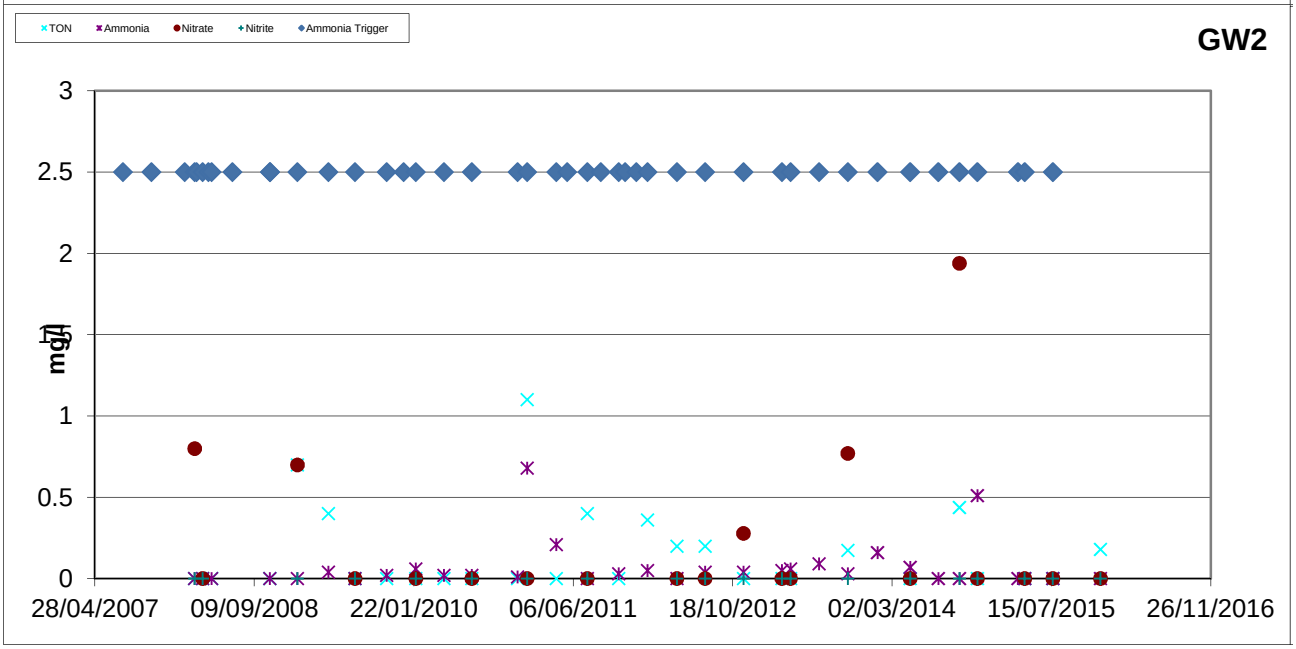

Field pH
Lab pH
GW2
pH
9
8.5
8
7.5
7
6.5
6
5.5
5
4.5
4
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

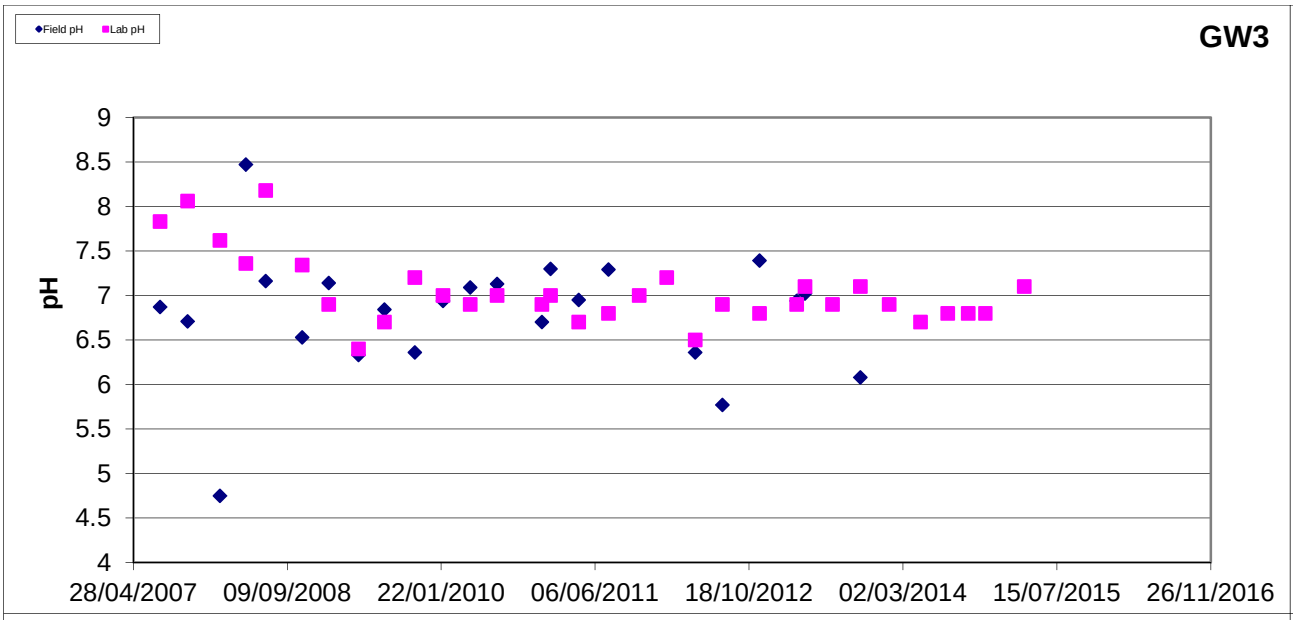

Field EC
Lab EC
GW2
EC microS/cm
1600
1400
1200
1000
800
600
400
200
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

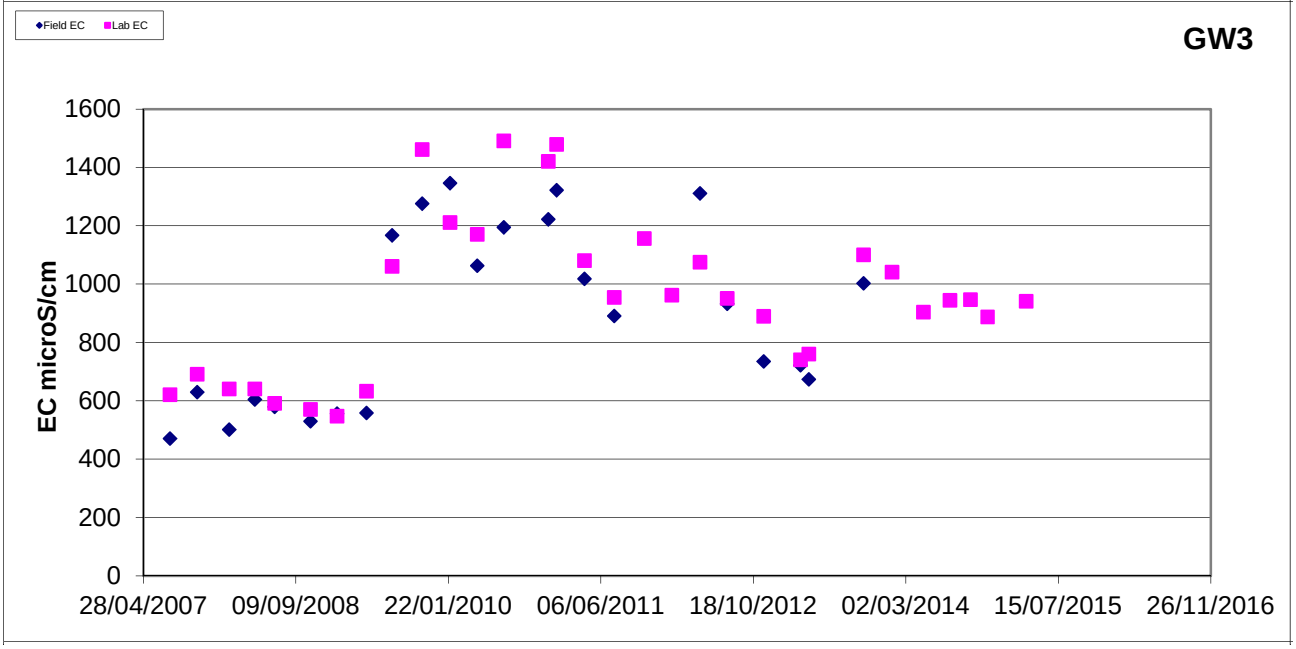

Chloride
Sulphate
Alkalinity
Chloride Trigger
GW2
mg/l
600
500
400
300
200
100
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

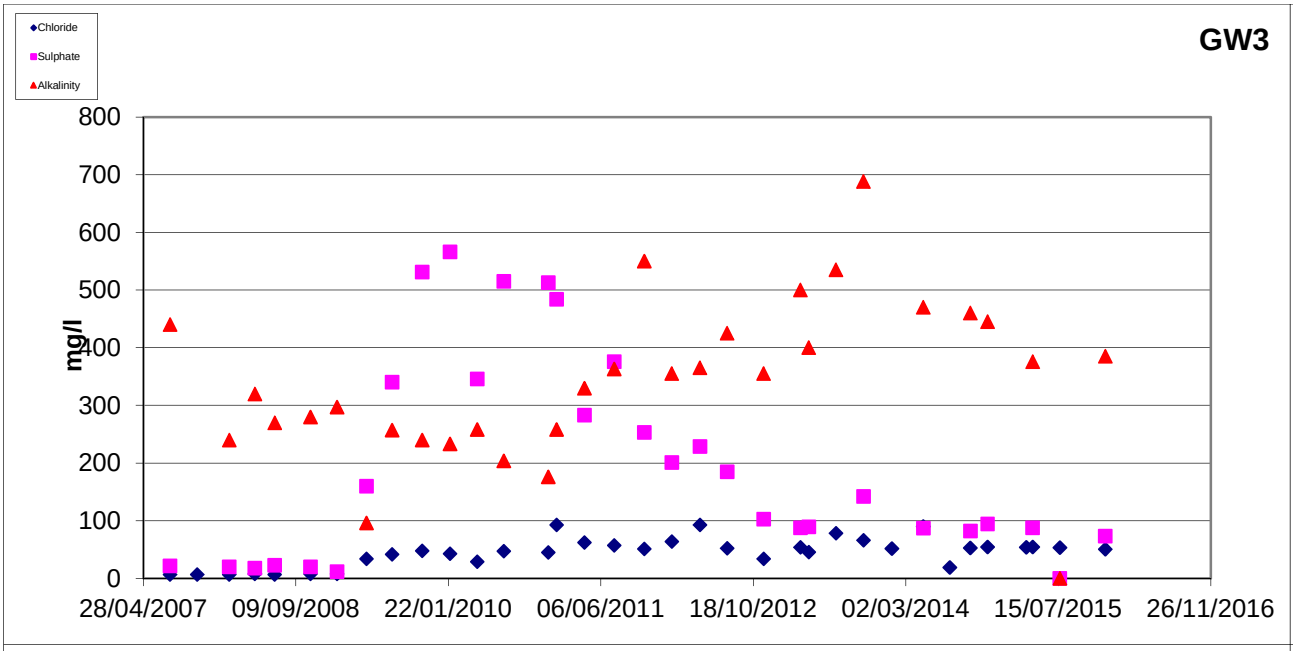

Potassium
Sodium
Calcium
Magnesium
GW2
mg/l
350
300
250
200
150
100
50
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

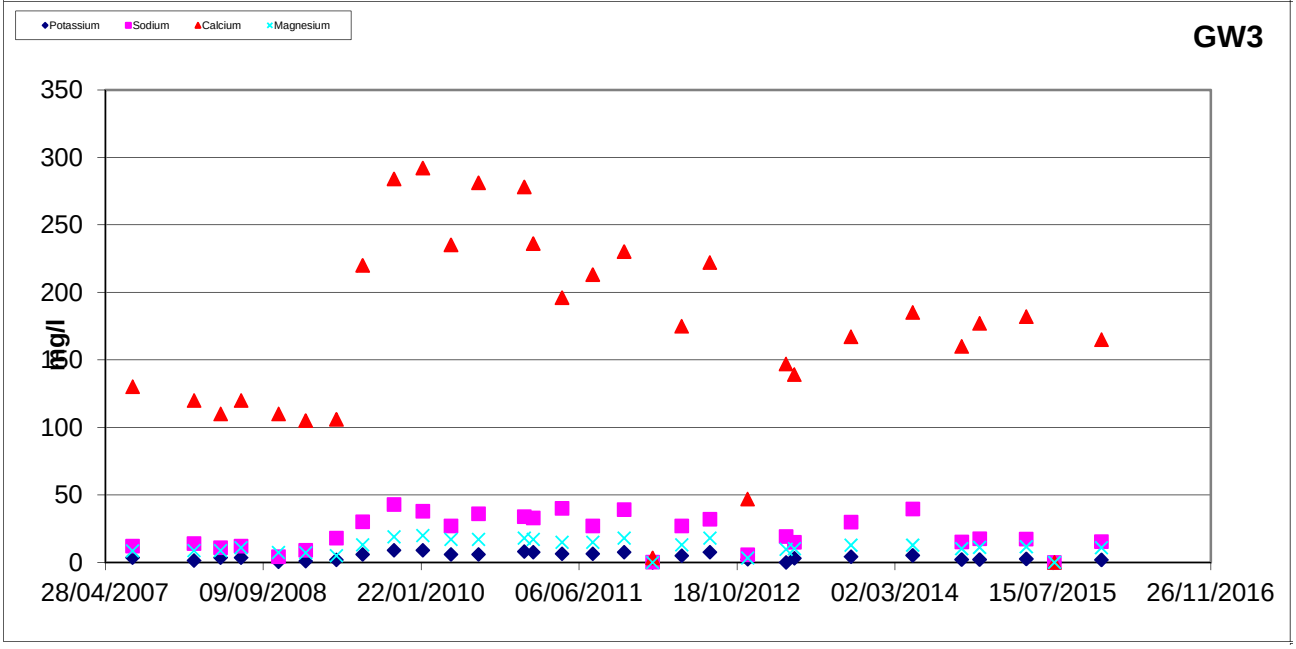

GW2
BOD
COD
TOC
mg/l
0
5
10
15
20
25
30
35
40
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

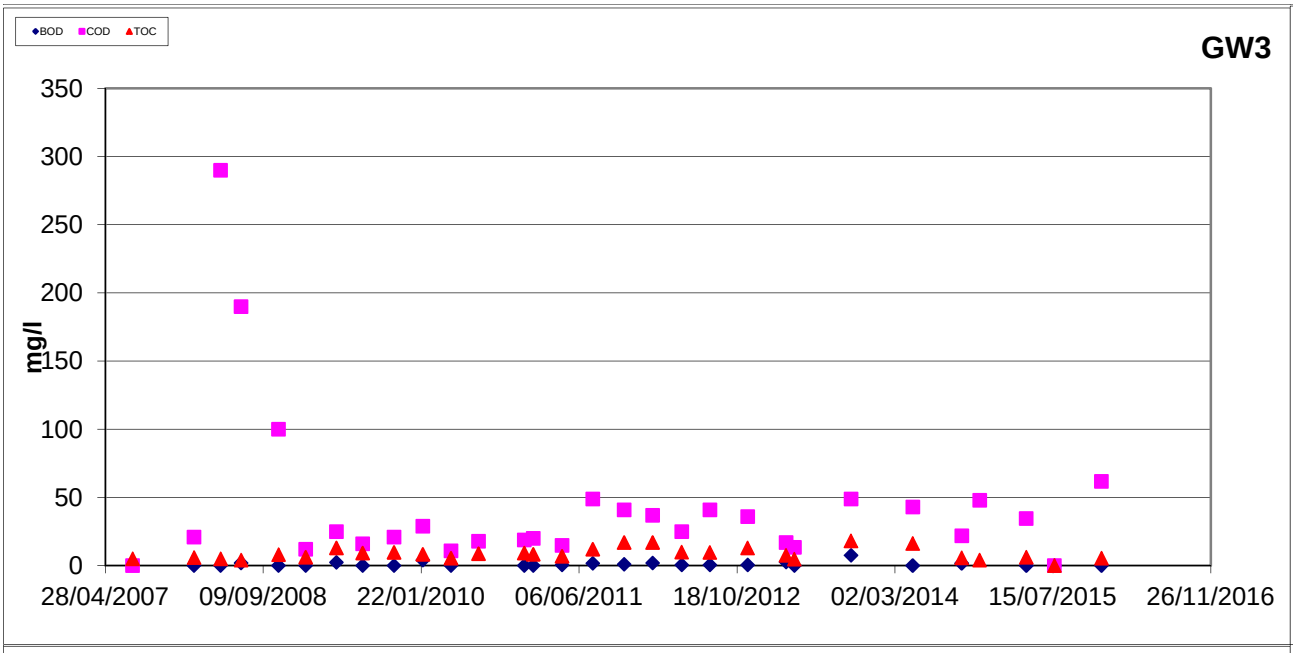

GW2
TON
Ammonia
Nitrate
Nitrite
Ammonia Trigger
mg/l
0
0.5
1
1.5
2
2.5
3
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

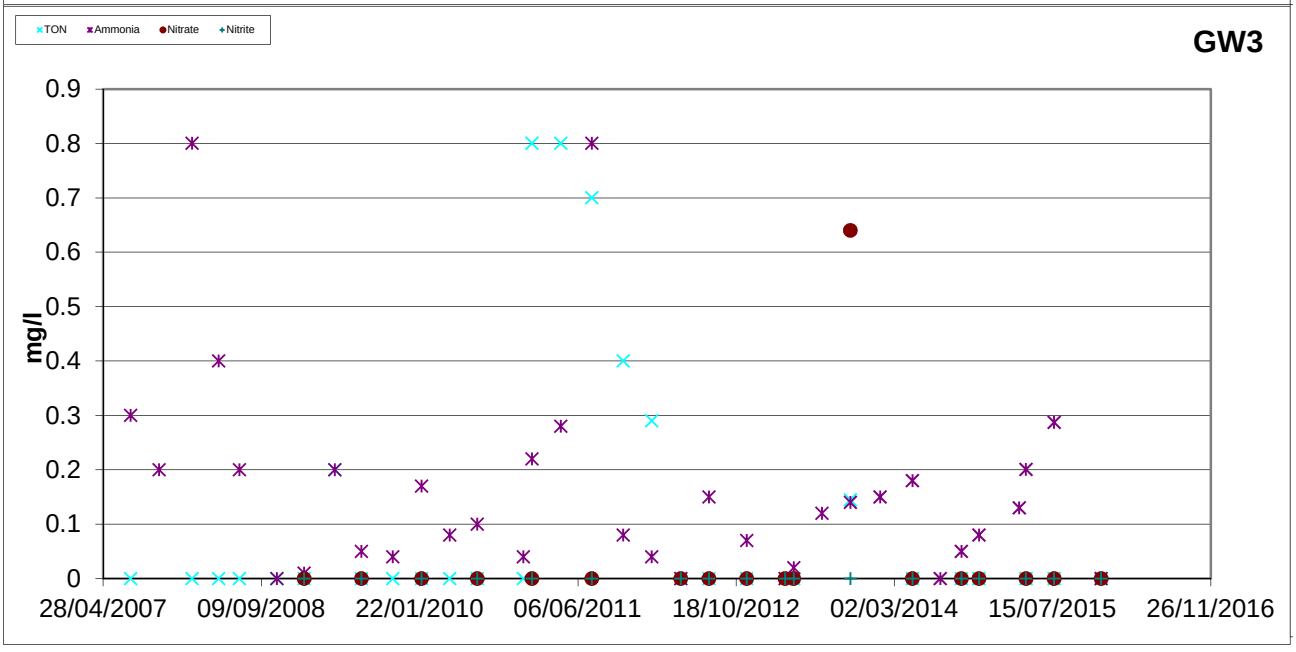

Field pH
Lab pH
GW3
pH
9
8.5
8
7.5
7
6.5
6
5.5
5
4.5
4
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

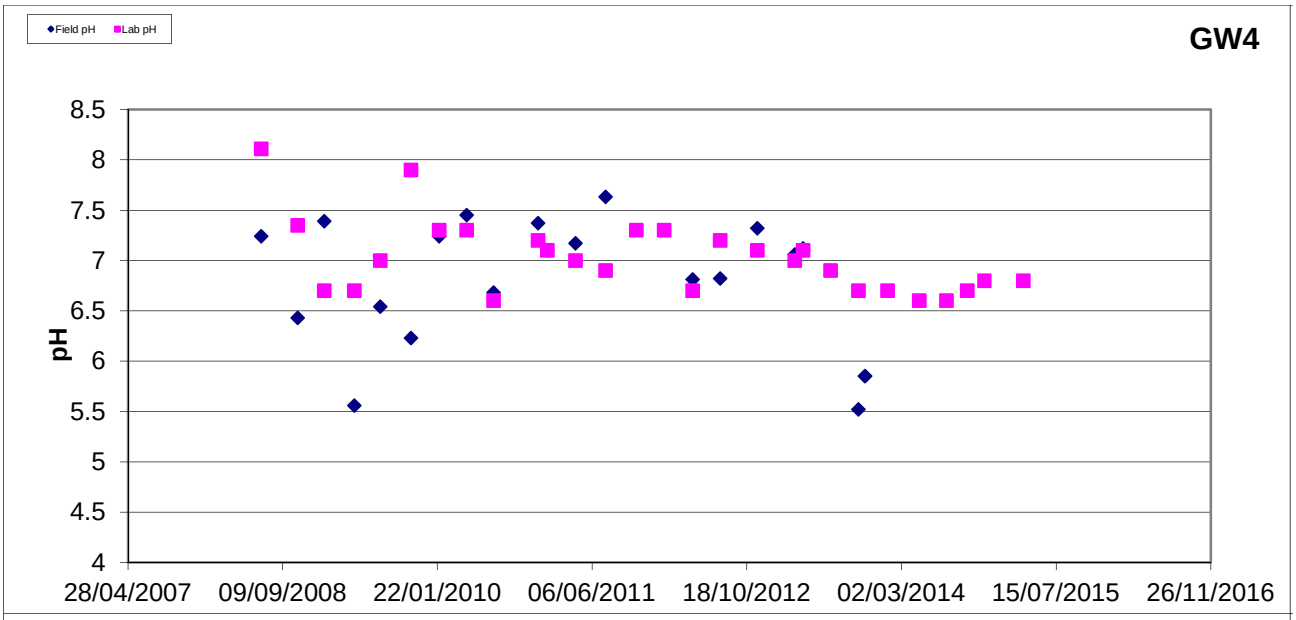

Field EC
Lab EC
GW3
EC microS/cm
1600
1400
1200
1000
800
600
400
200
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

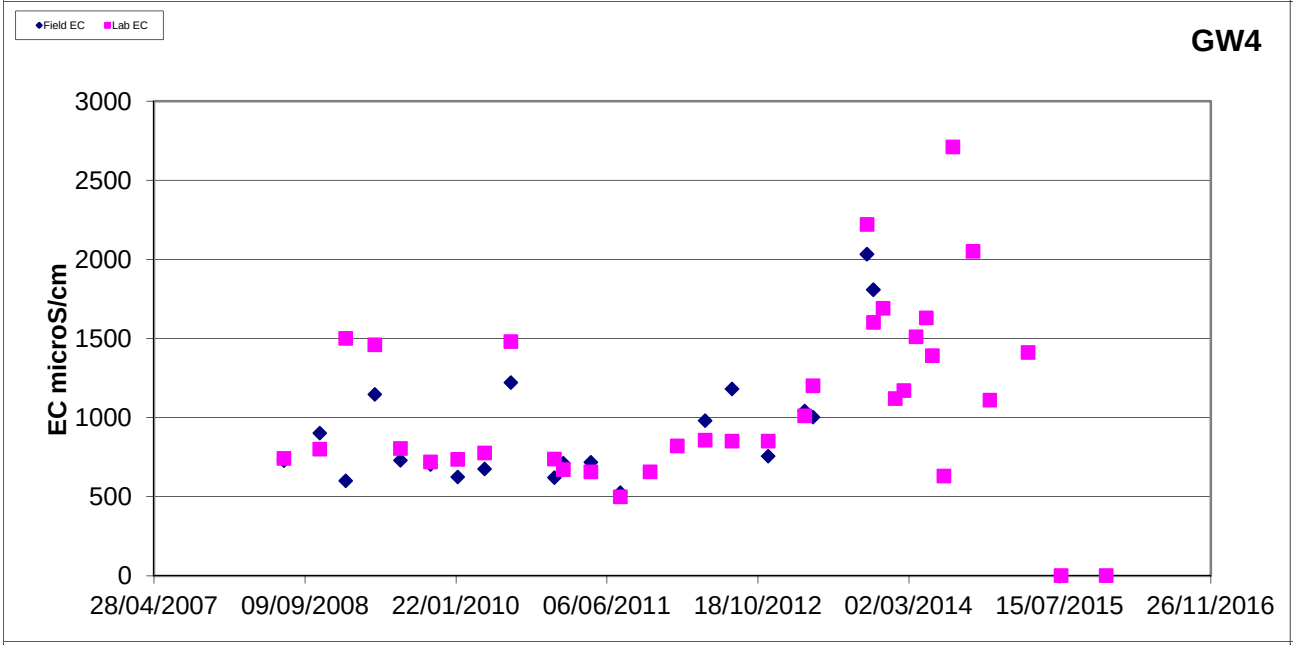

Chloride
Sulphate
Alkalinity
GW3
mg/l
800
700
600
500
400
300
200
100
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

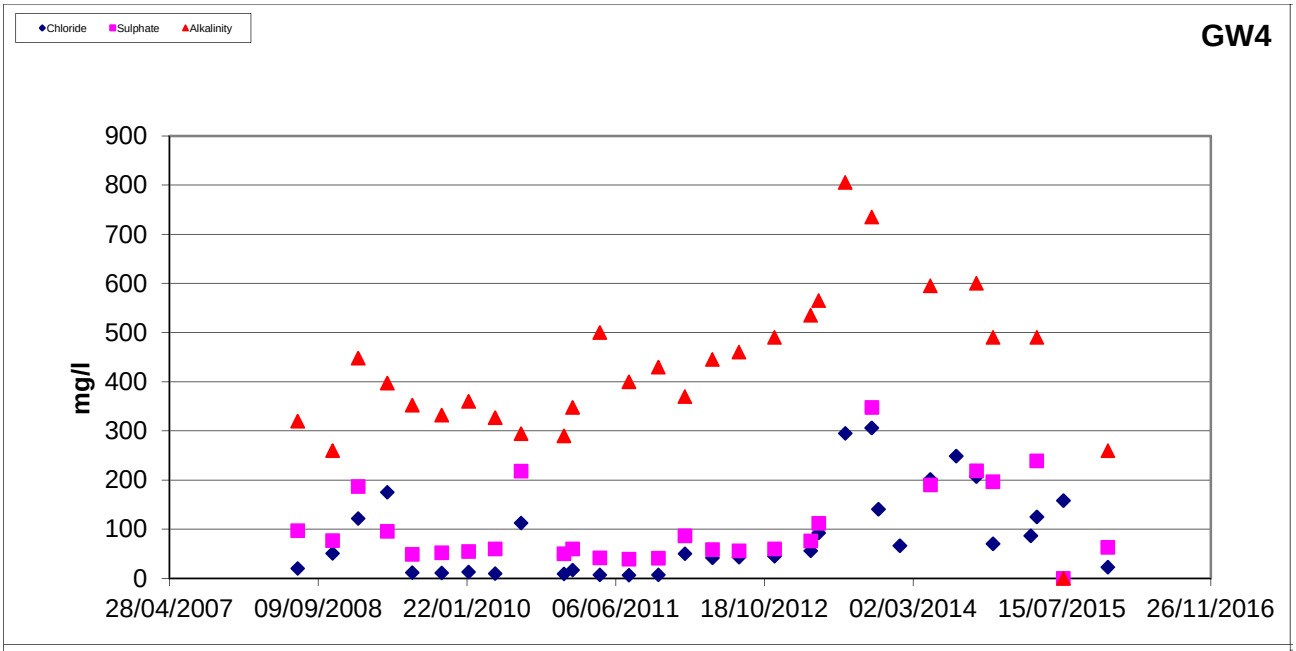

Potassium
Sodium
Calcium
Magnesium
GW3
mg/l
350
300
250
200
150
100
50
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

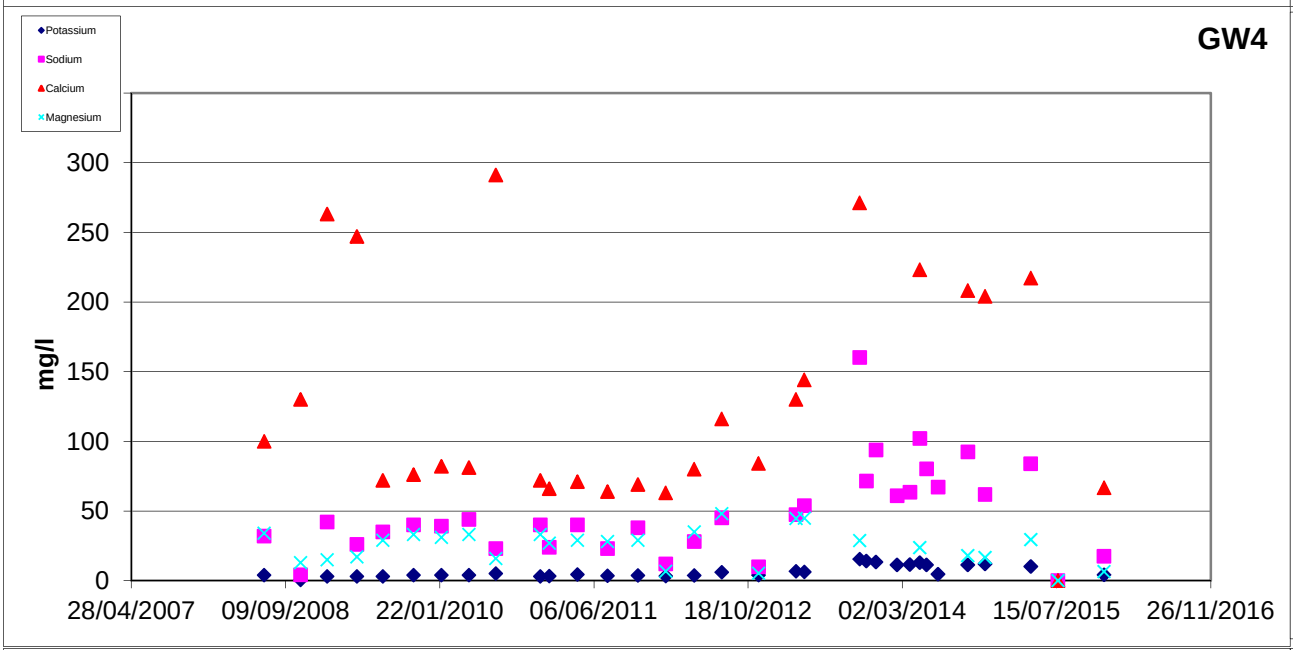

BOD
COD
TOC
GW3
350
300
250
200
150
100
50
0
mg/l
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

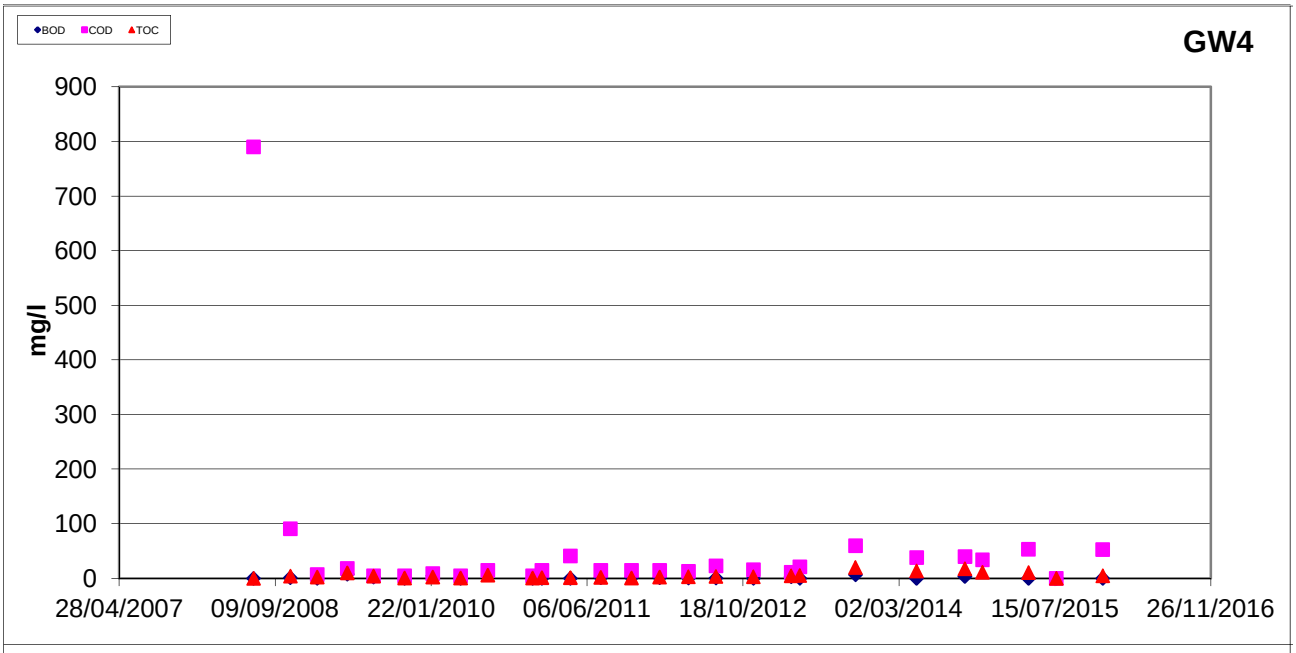

TON
Ammonia
Nitrate
Nitrite
GW3
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
mg/l
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

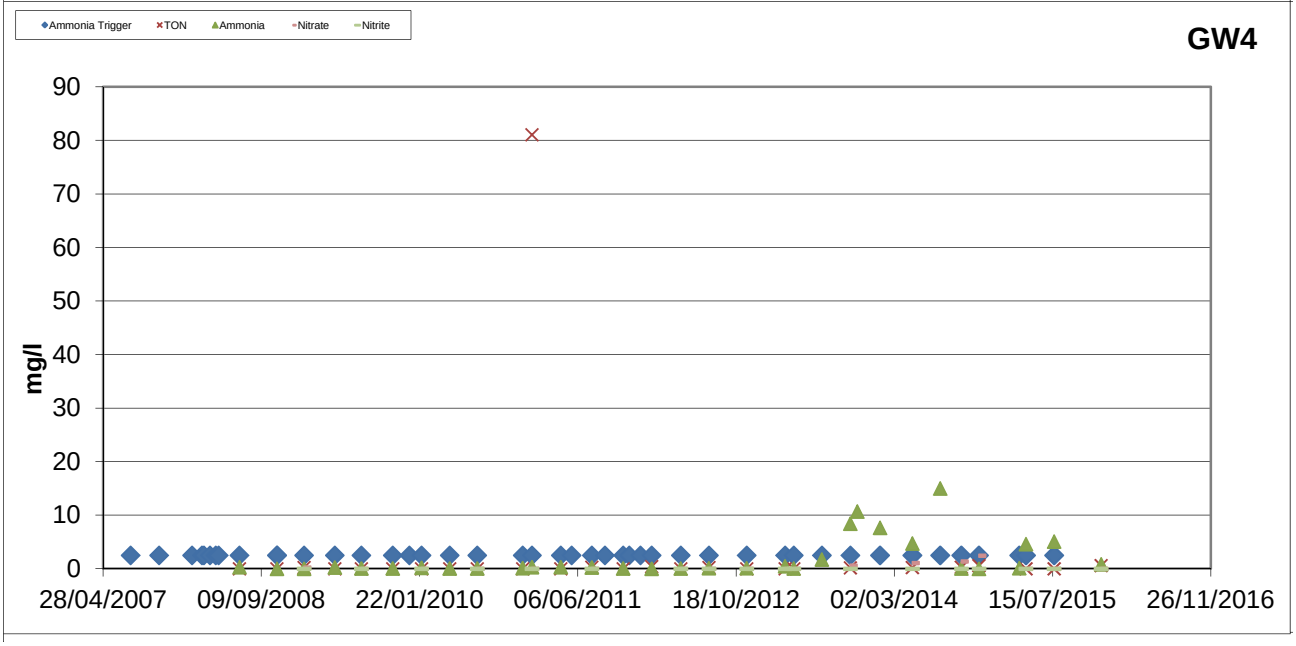

Field pH
Lab pH
GW4
pH
8.5
8
7.5
7
6.5
6
5.5
5
4.5
4
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

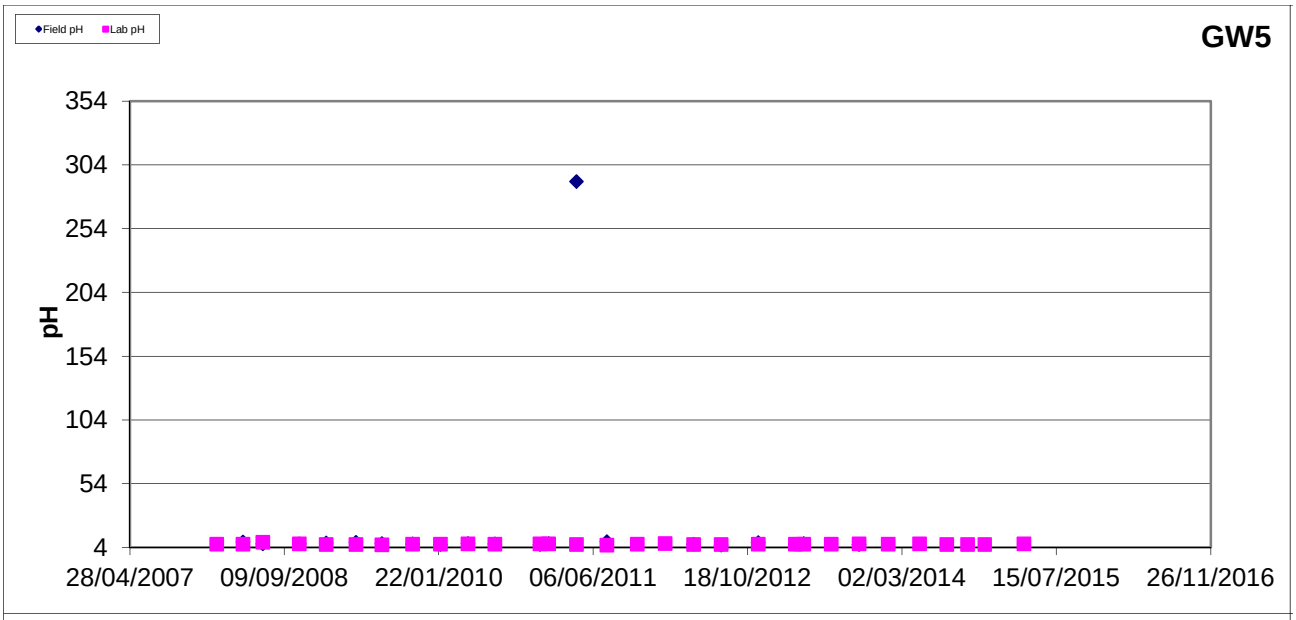

Field EC
Lab EC
GW4
EC microS/cm
3000
2500
2000
1500
1000
500
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

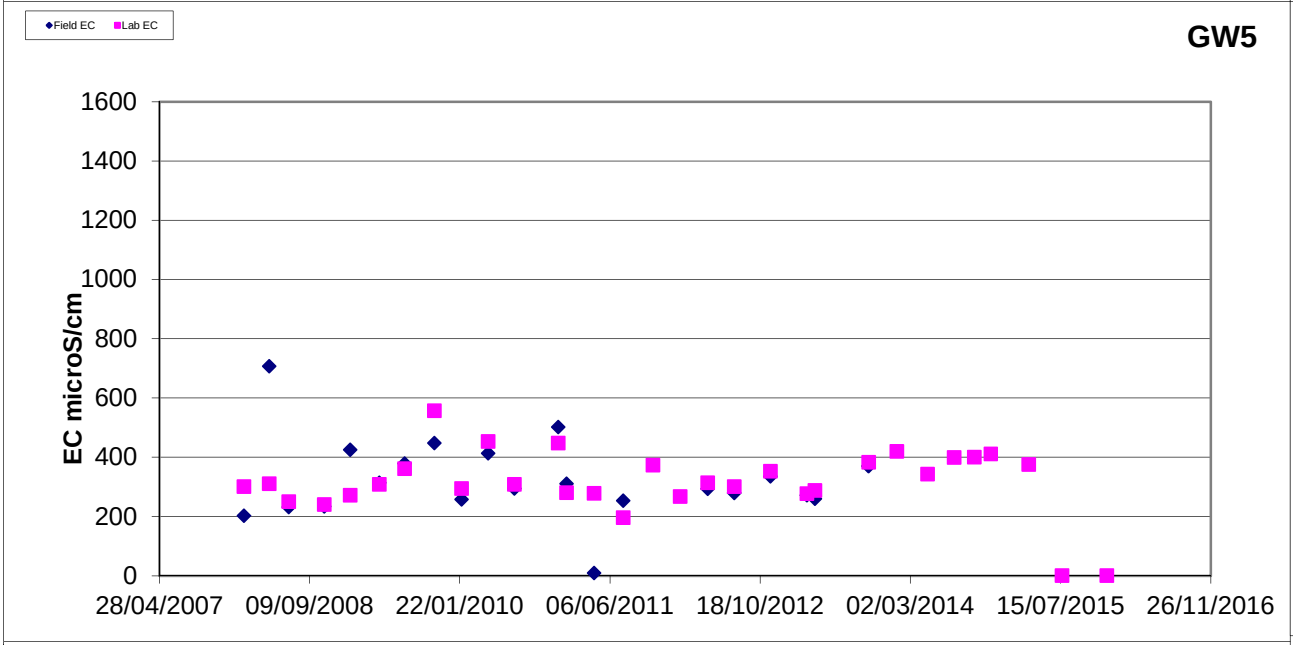

Chloride
Sulphate
Alkalinity
GW4
mg/l
900
800
700
600
500
400
300
200
100
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

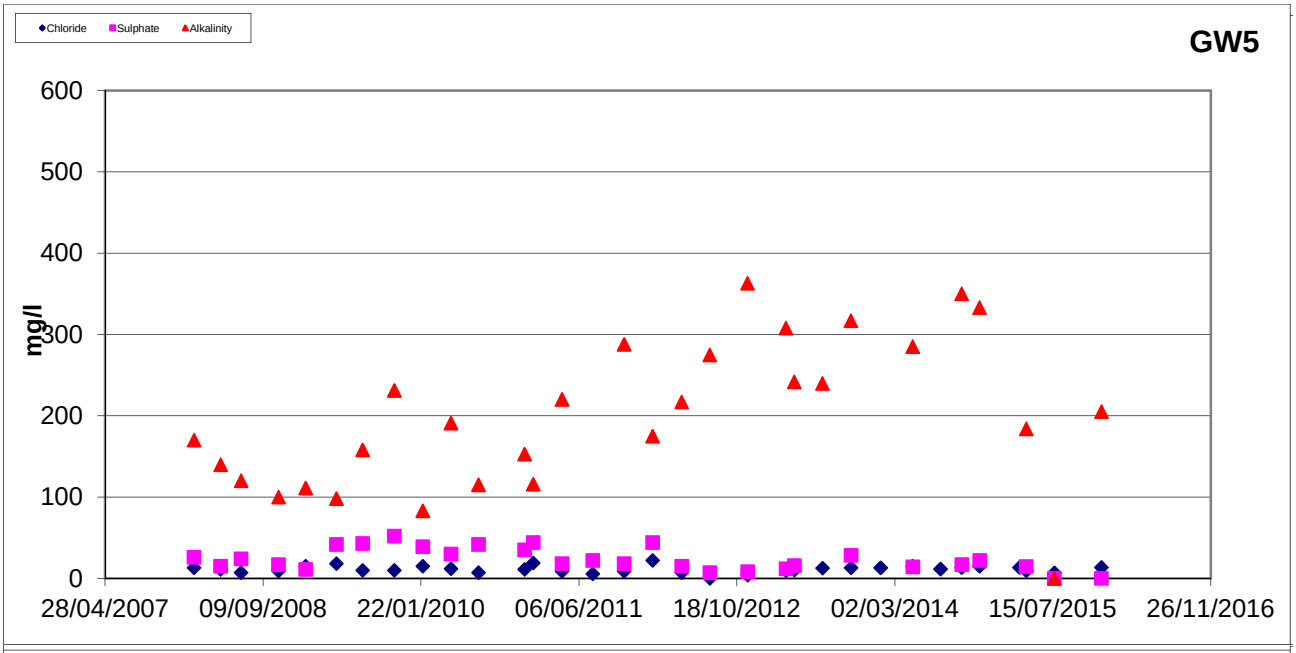

Potassium
Sodium
Calcium
Magnesium
GW4
mg/l
300
250
200
150
100
50
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

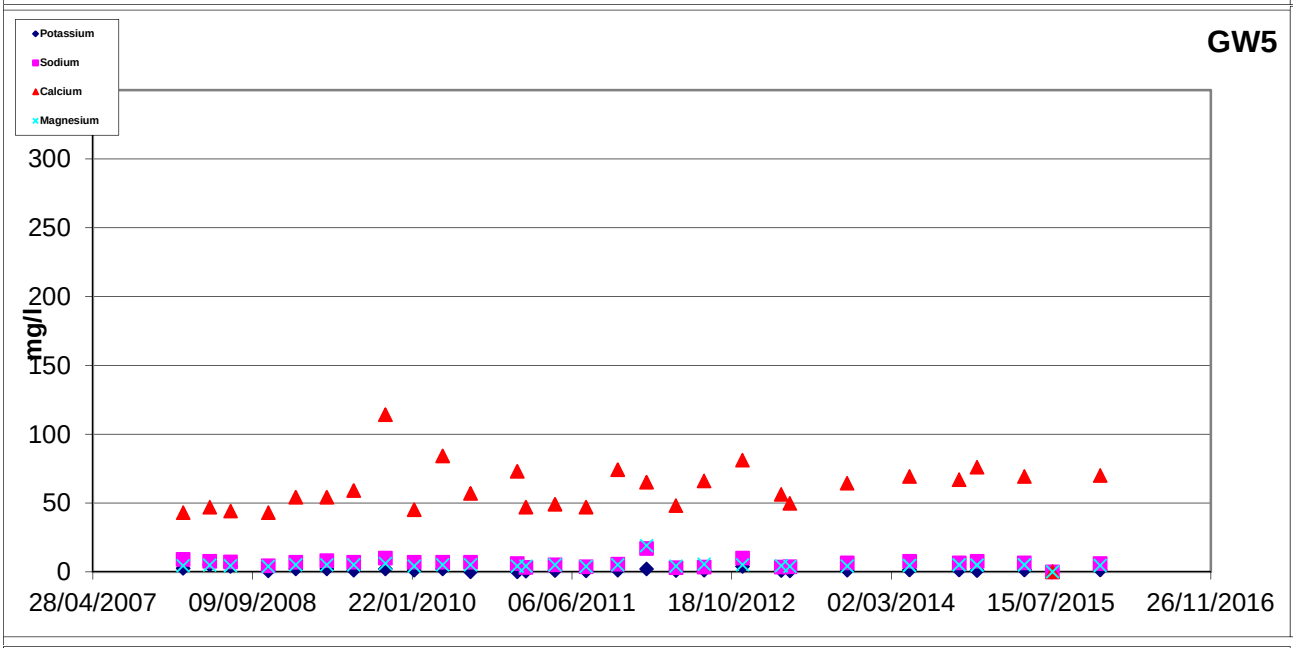

BOD
COD
TOC
GW4
900
800
700
600
500
400
300
200
100
0
mg/l
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

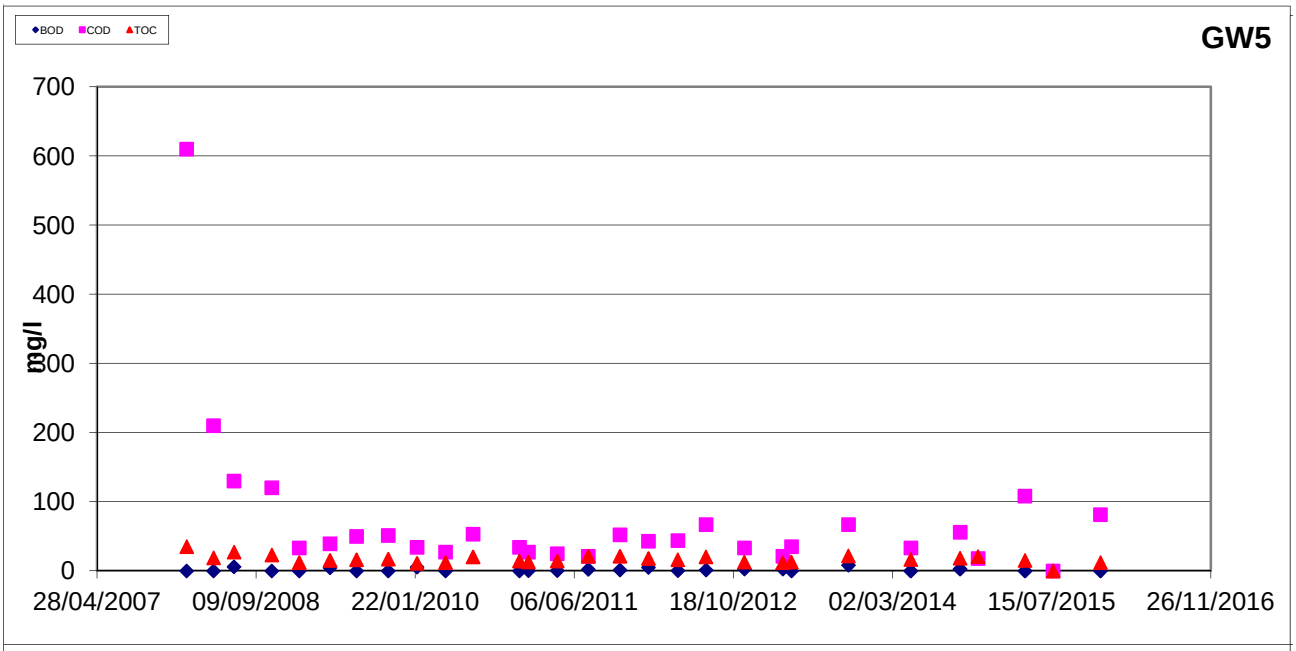

Ammonia Trigger
TON
Ammonia
Nitrate
Nitrite
GW4
90
80
70
60
50
40
30
20
10
0
mg/l
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

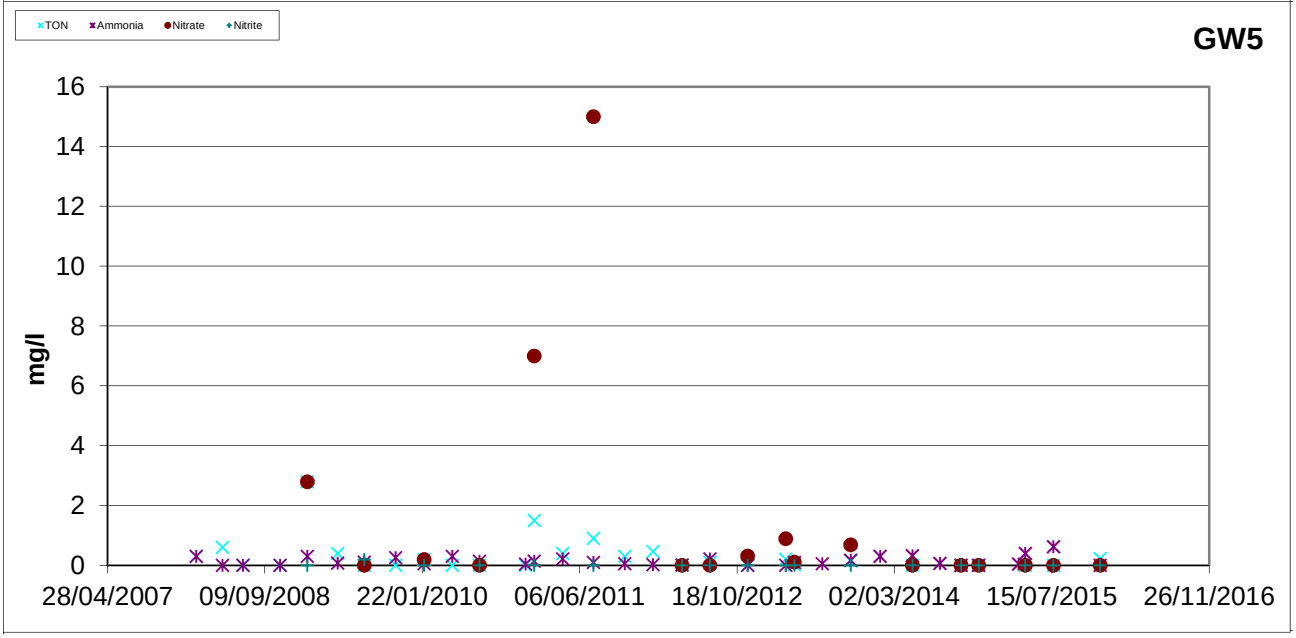

Field pH
Lab pH
GW5
pH
354
304
254
204
154
104
54
4
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

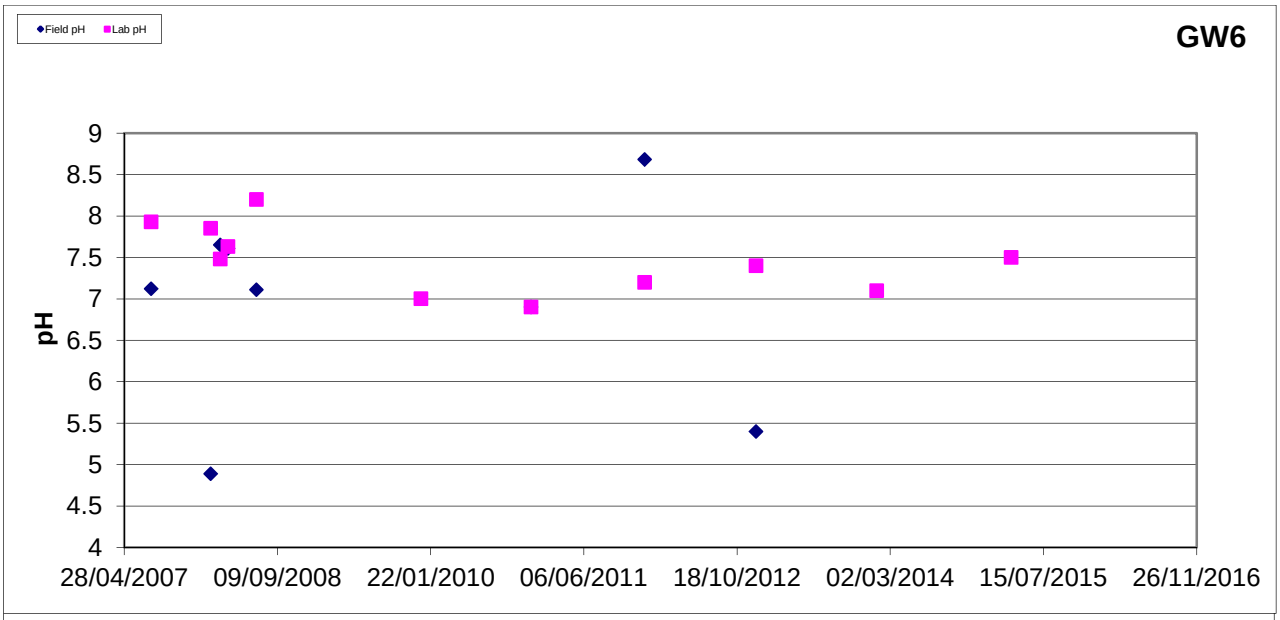

Field EC
Lab EC
GW5
EC microS/cm
1600
1400
1200
1000
800
600
400
200
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

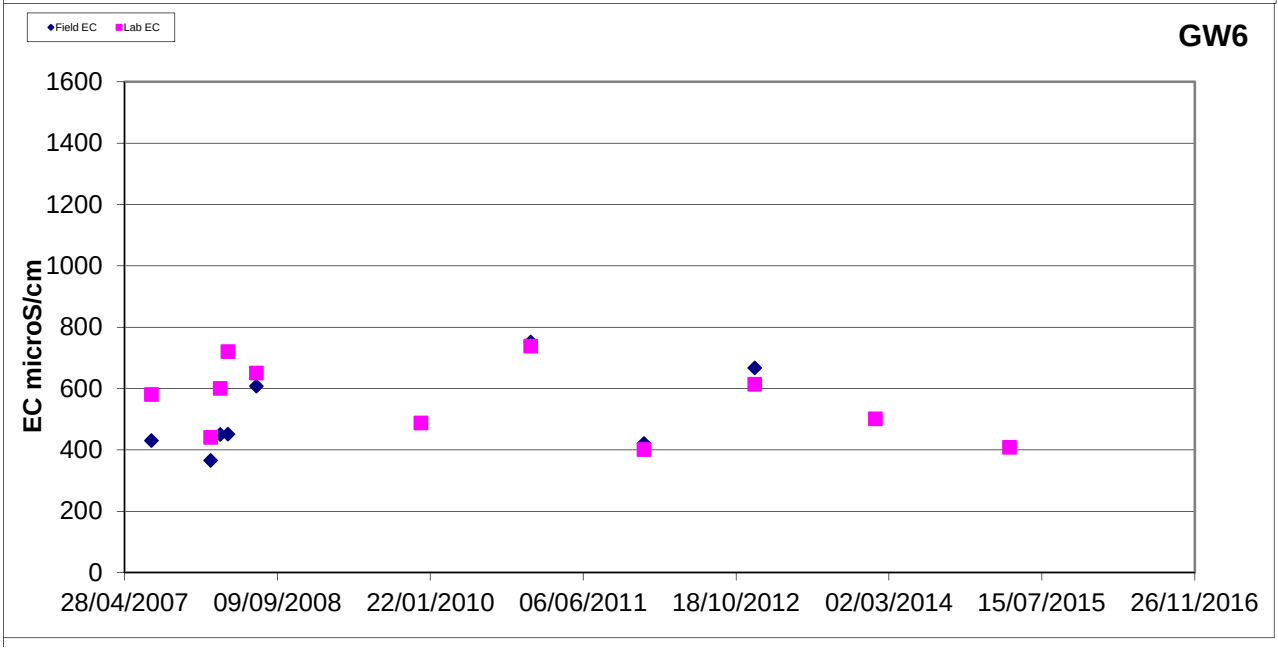

Chloride
Sulphate
Alkalinity
GW5
600
500
400
300
200
100
0
mg/l
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

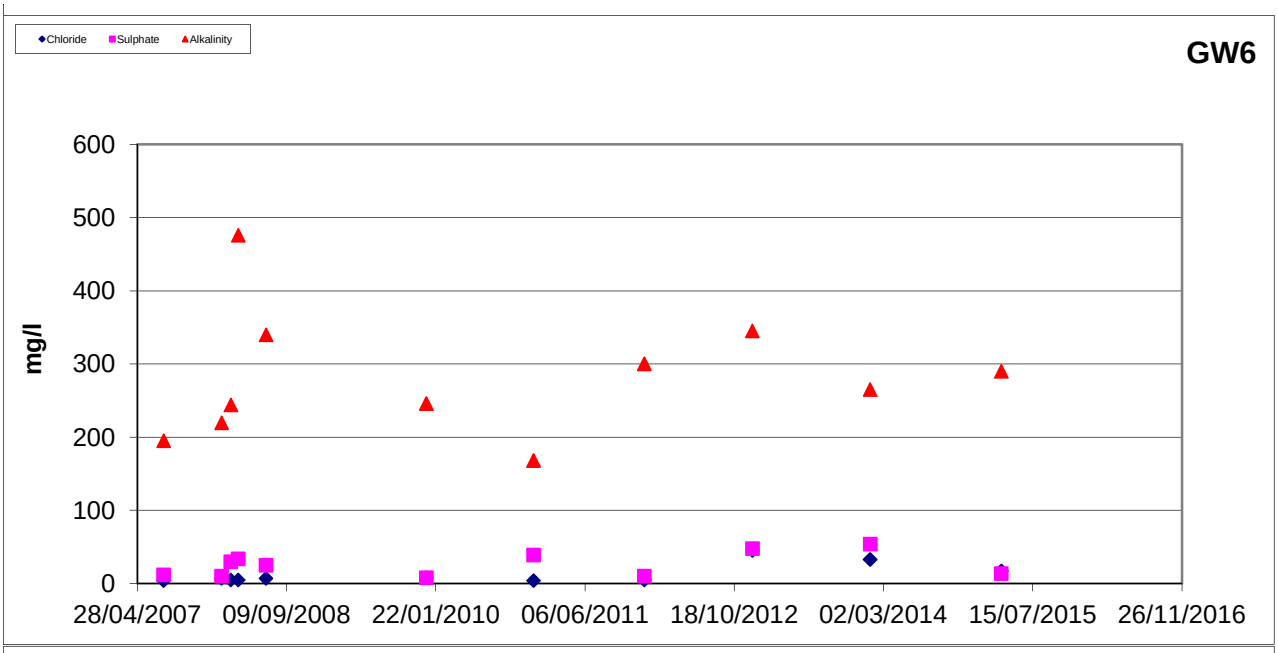

Potassium
Sodium
Calcium
Magnesium
GW5
300
250
200
150
100
50
0
mg/l
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

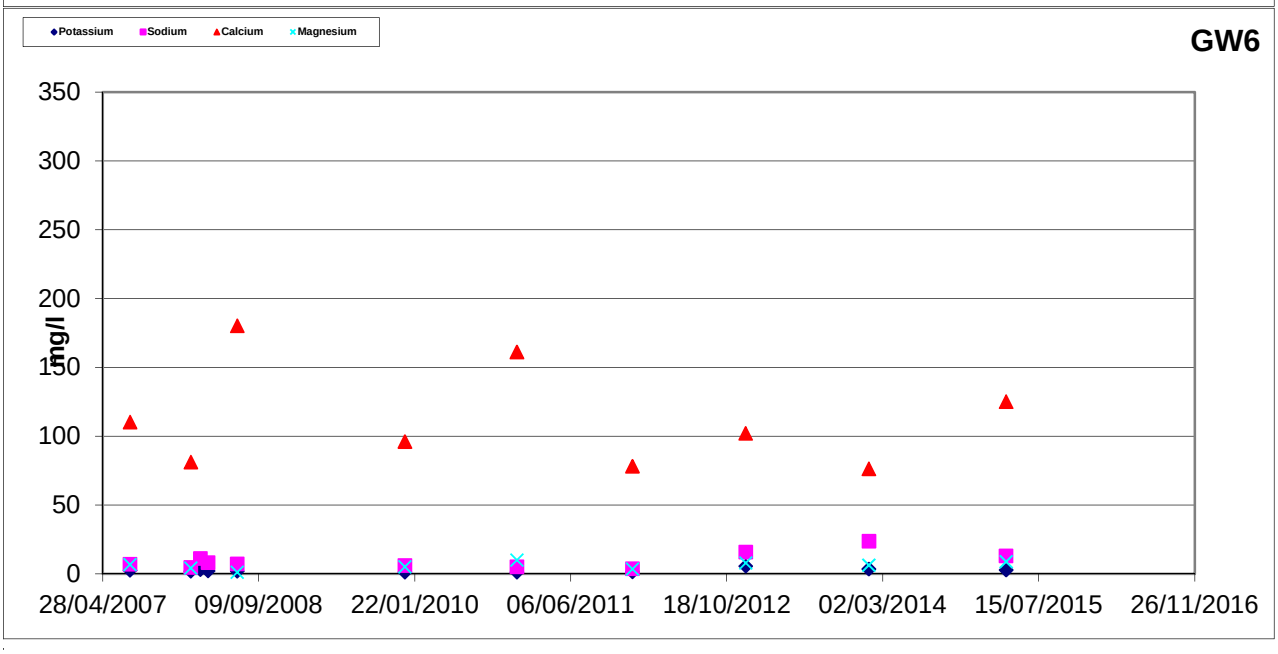

BOD
COD
TOC
GW5
700
600
500
400
300
200
100
0
mg/l
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

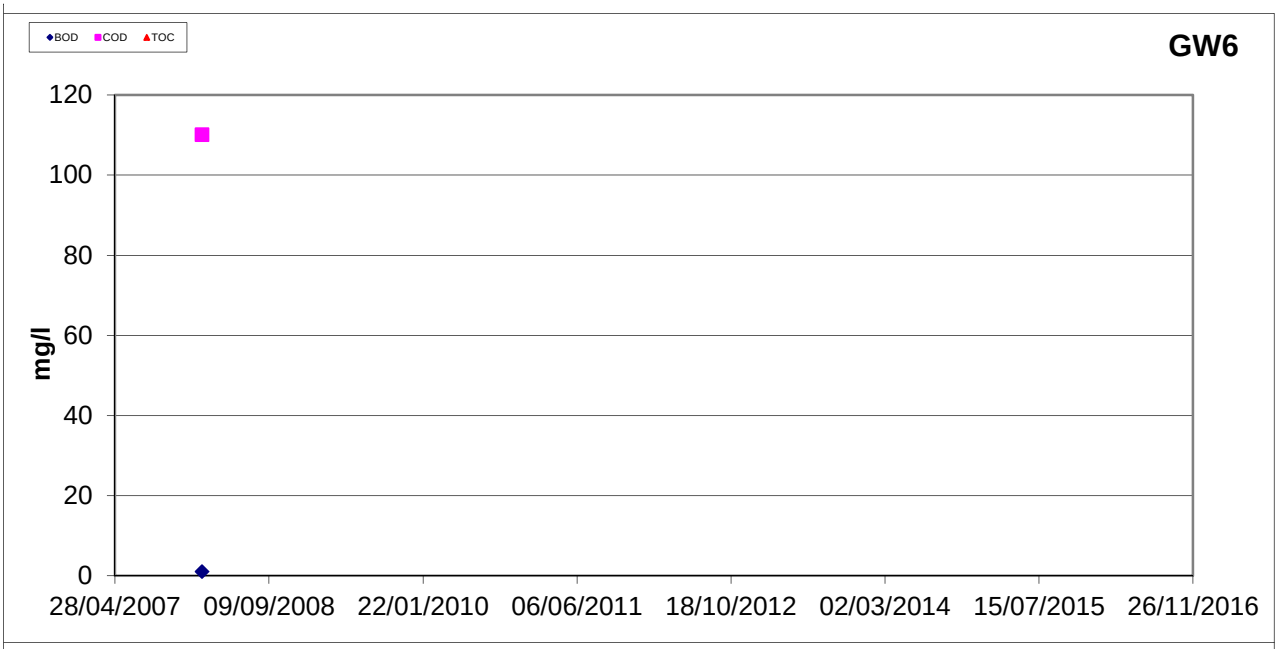

TON
Ammonia
Nitrate
Nitrite
GW5
16
14
12
10
8
6
4
2
0
mg/l
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

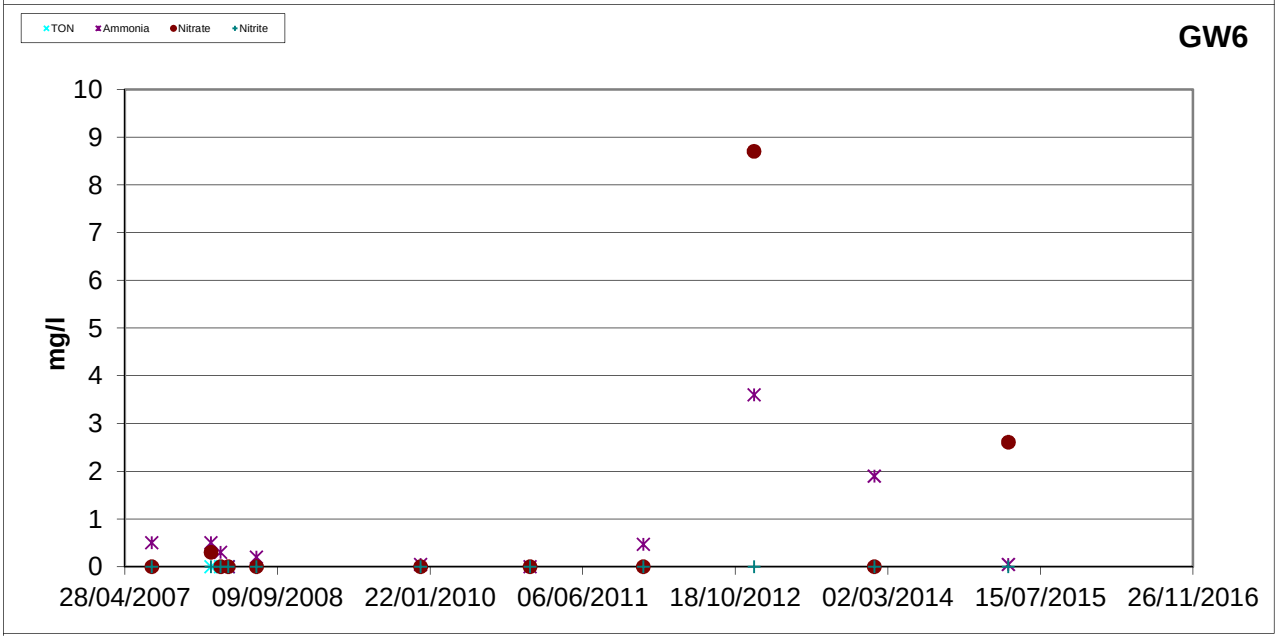

Field pH
Lab pH
GW6
pH
9
8.5
8
7.5
7
6.5
6
5.5
5
4.5
4
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

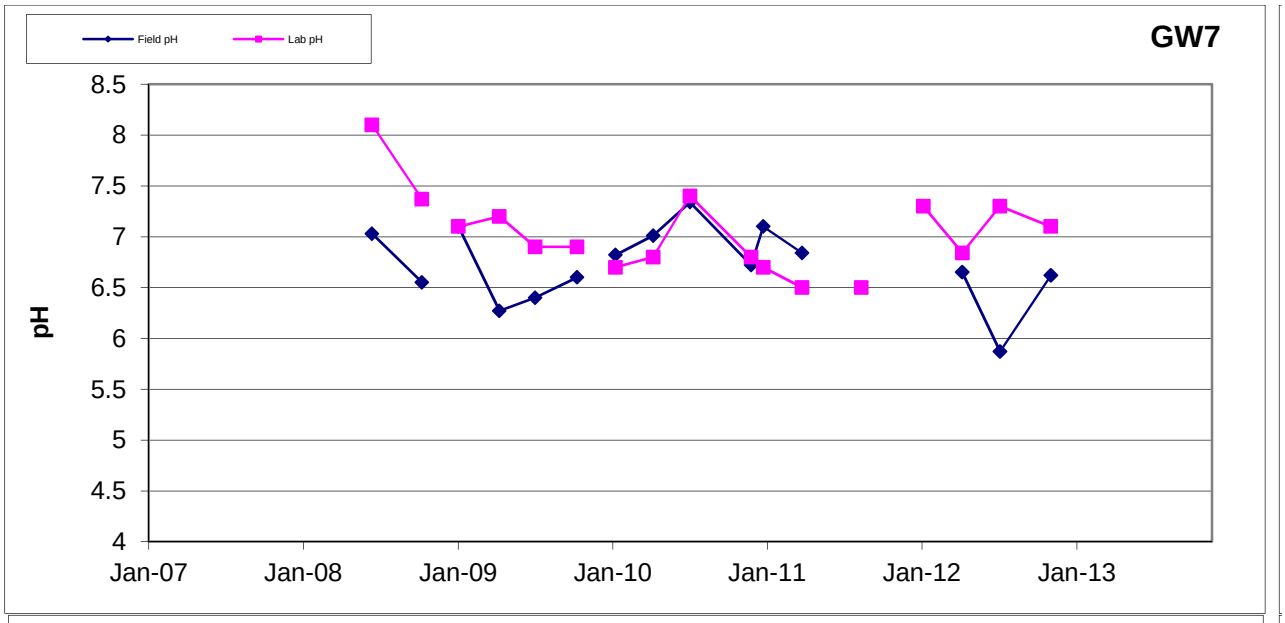

Field EC
Lab EC
GW6
EC microS/cm
1600
1400
1200
1000
800
600
400
200
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

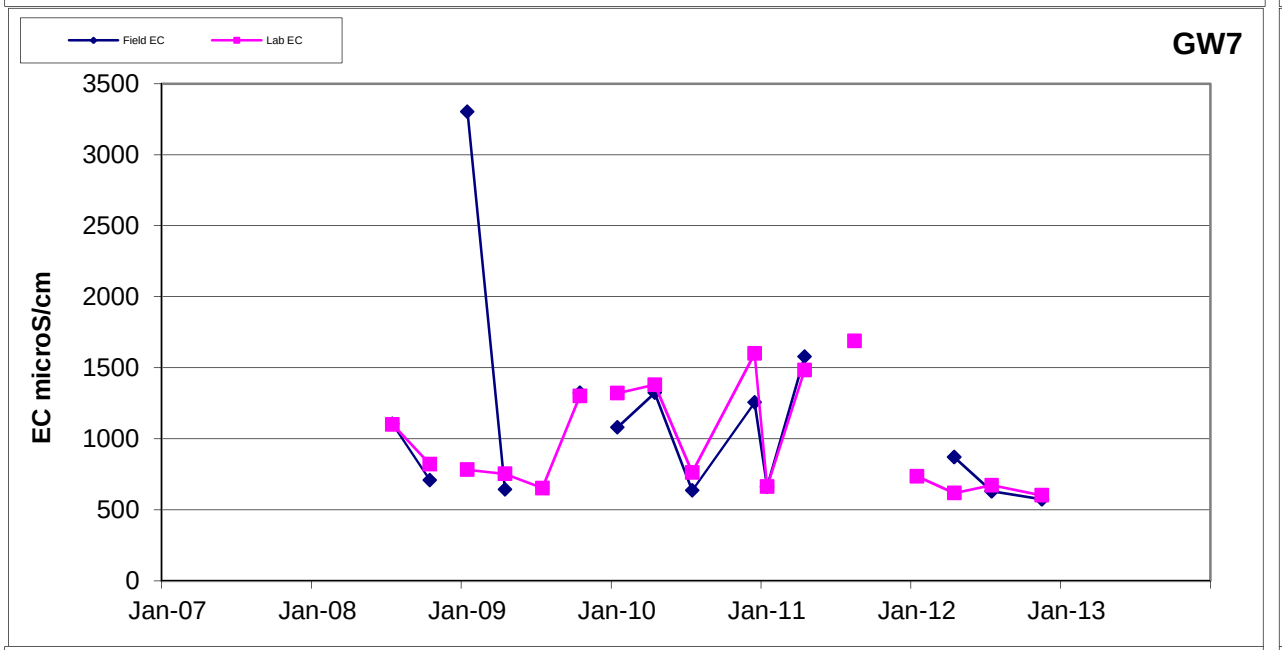

Chloride
Sulphate
Alkalinity
GW6
mg/l
600
500
400
300
200
100
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

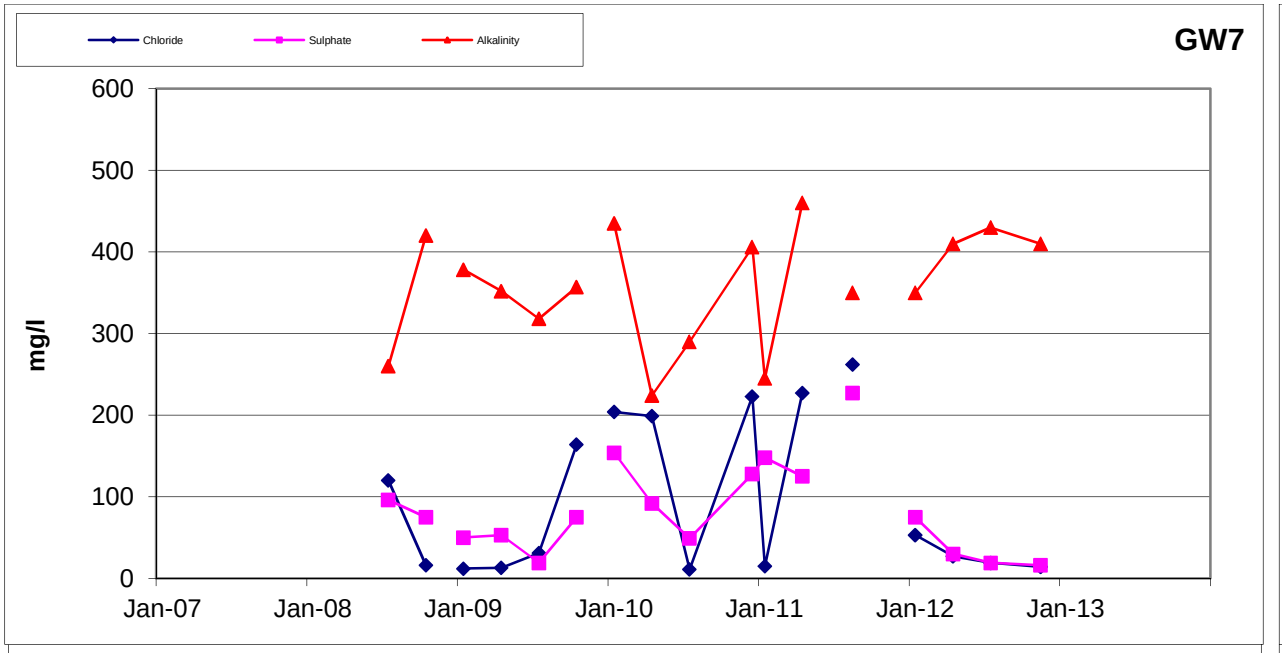

Potassium
Sodium
Calcium
Magnesium
GW6
mg/l
350
300
250
200
150
100
50
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

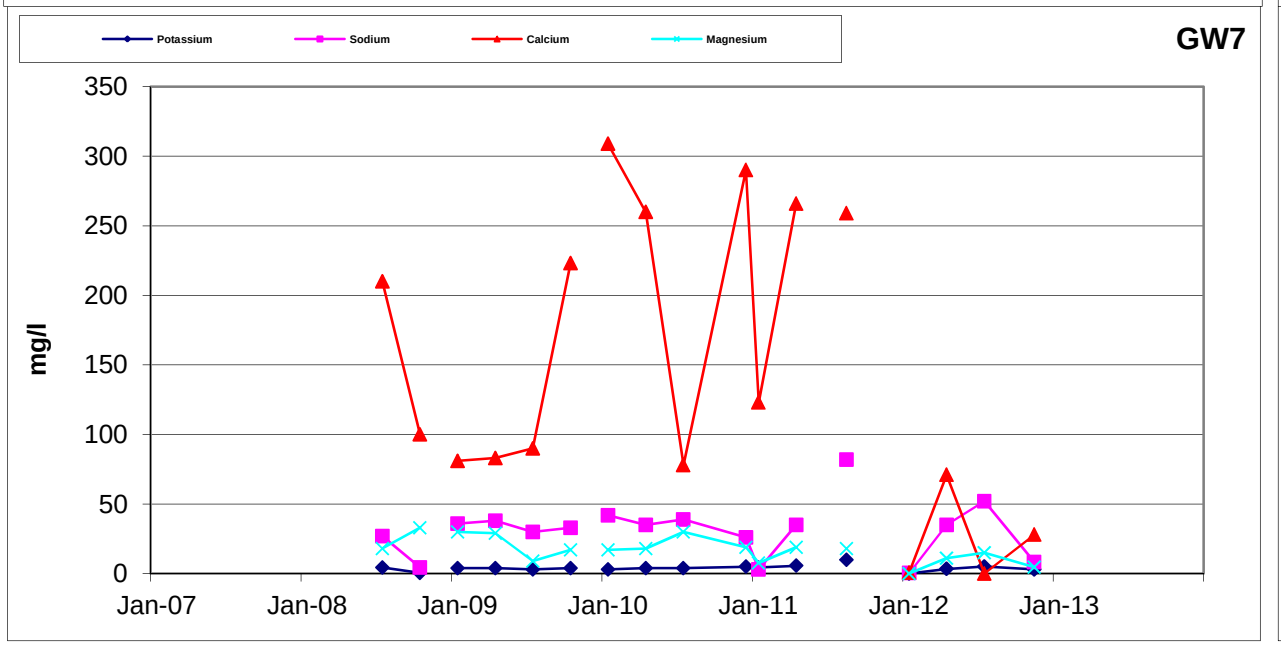

BOD
COD
TOC
GW6
120
100
80
60
40
20
0
mg/l
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

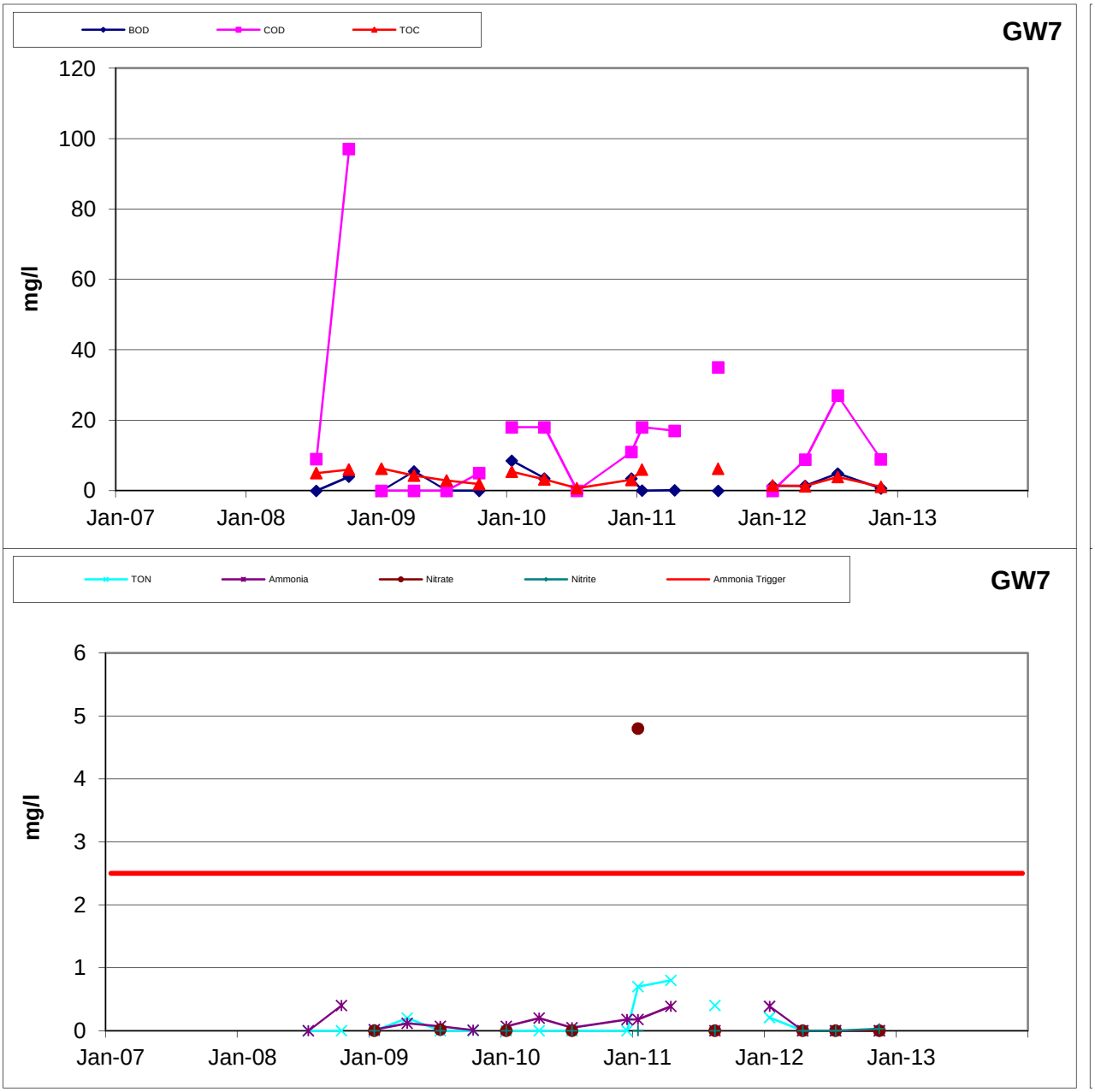

TON
Ammonia
Nitrate
Nitrite
GW6
10
9
8
7
6
5
4
3
2
1
0
mg/l
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

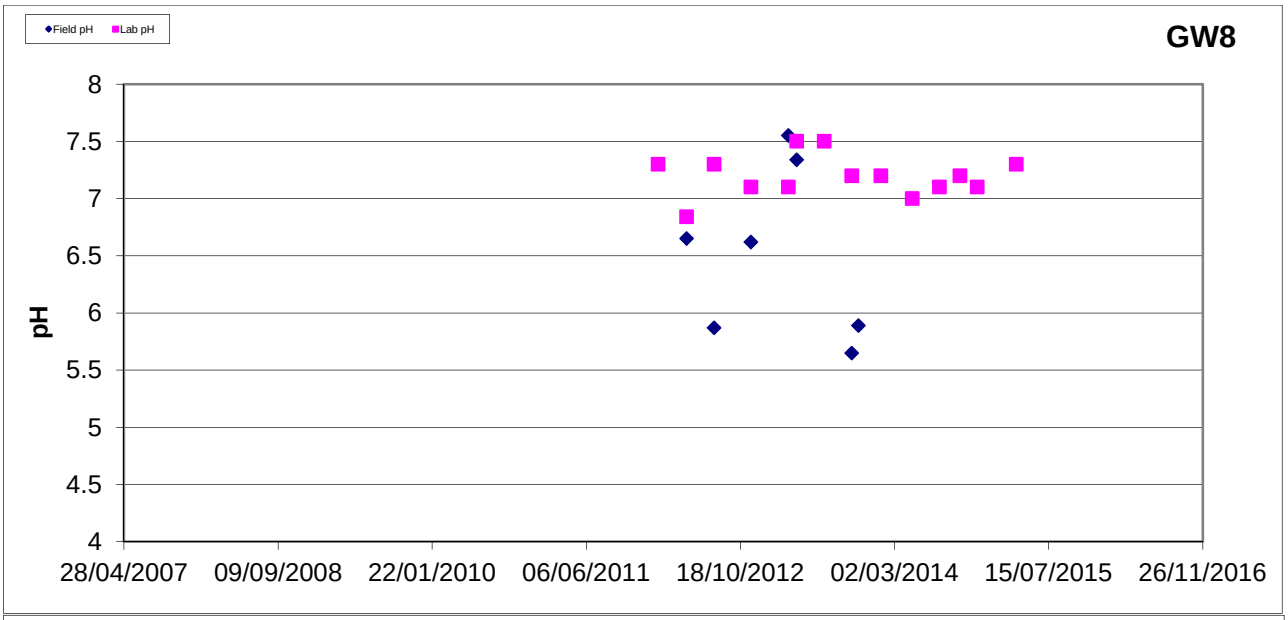

Field pH
Lab pH
GW7
pH
8.5
8
7.5
7
6.5
6
5.5
5
4.5
4
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13

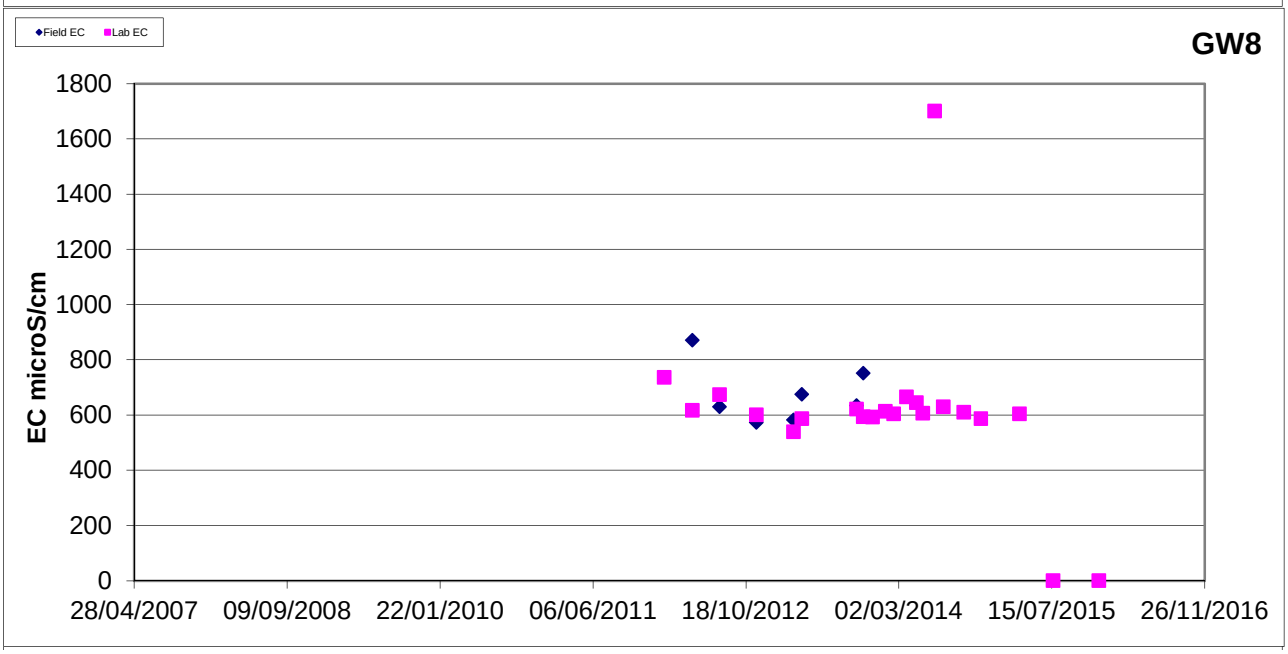

Field EC
Lab EC
GW7
EC microS/cm
3500
3000
2500
2000
1500
1000
500
0
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13

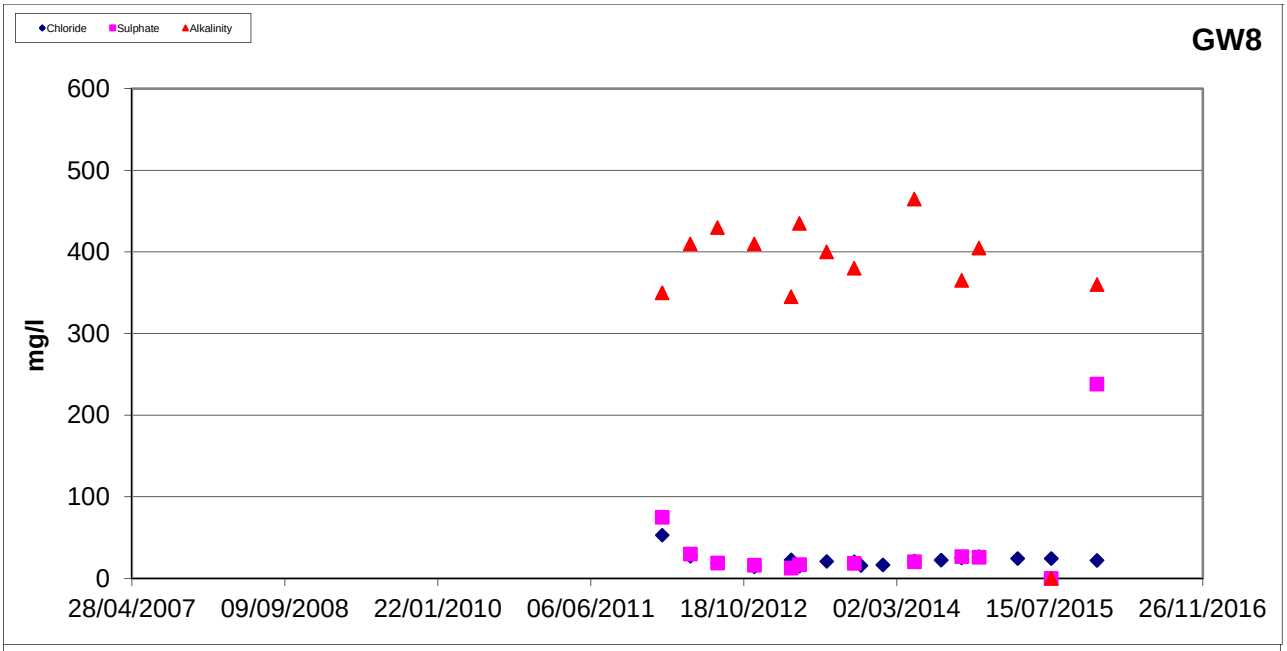

Chloride
Sulphate
Alkalinity
GW7
mg/l
600
500
400
300
200
100
0
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13

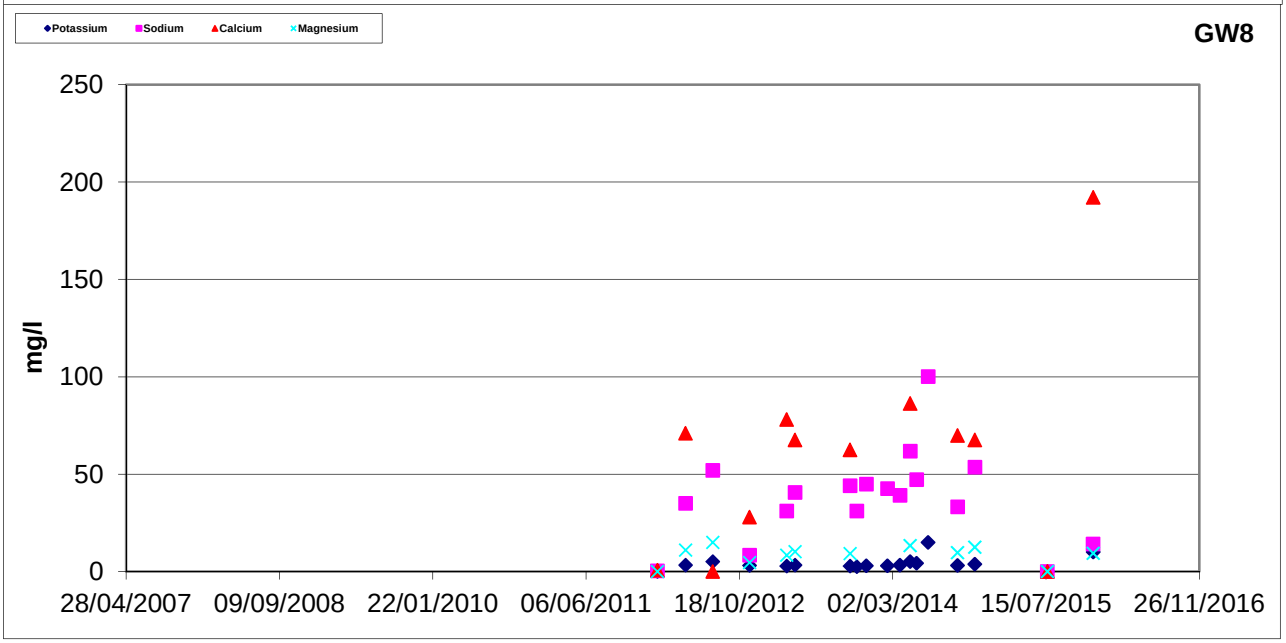

Potassium
Sodium
Calcium
Magnesium
GW7
mg/l
350
300
250
200
150
100
50
0
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13

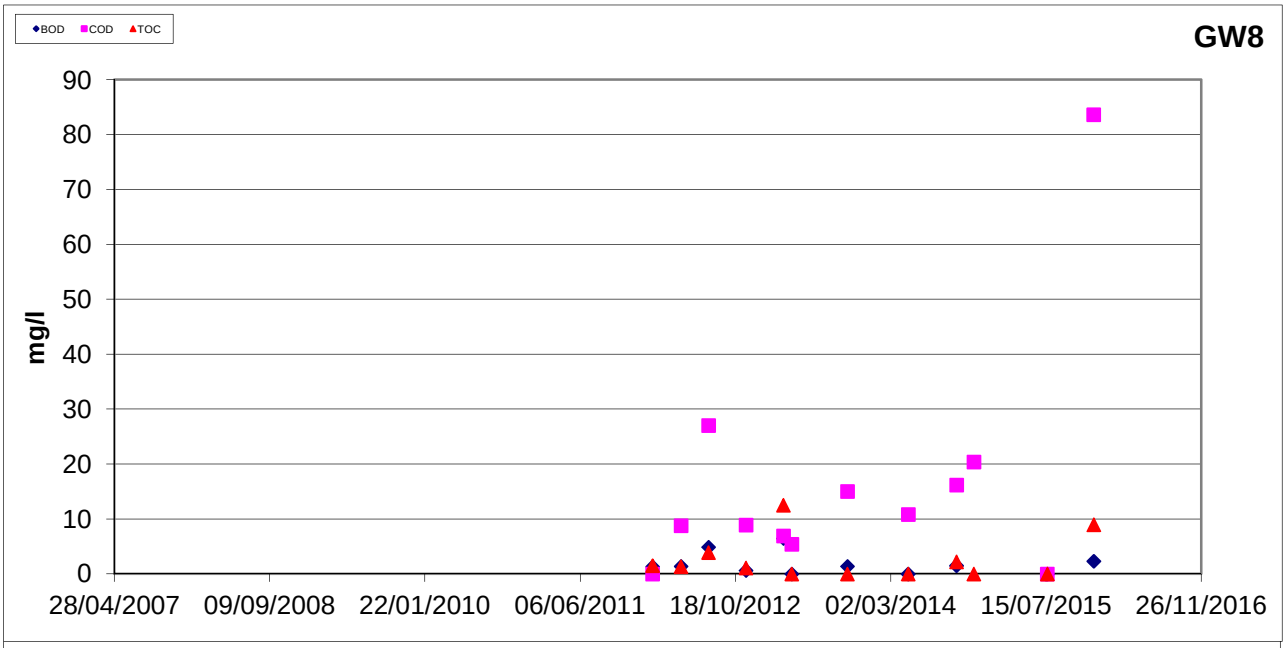

BOD
COD
TOC
GW7
120
100
80
60
40
20
0
mg/l
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
TON
Ammonia
Nitrate
Nitrite
Ammonia Trigger
GW7
6
5
4
3
2
1
0
mg/l
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13

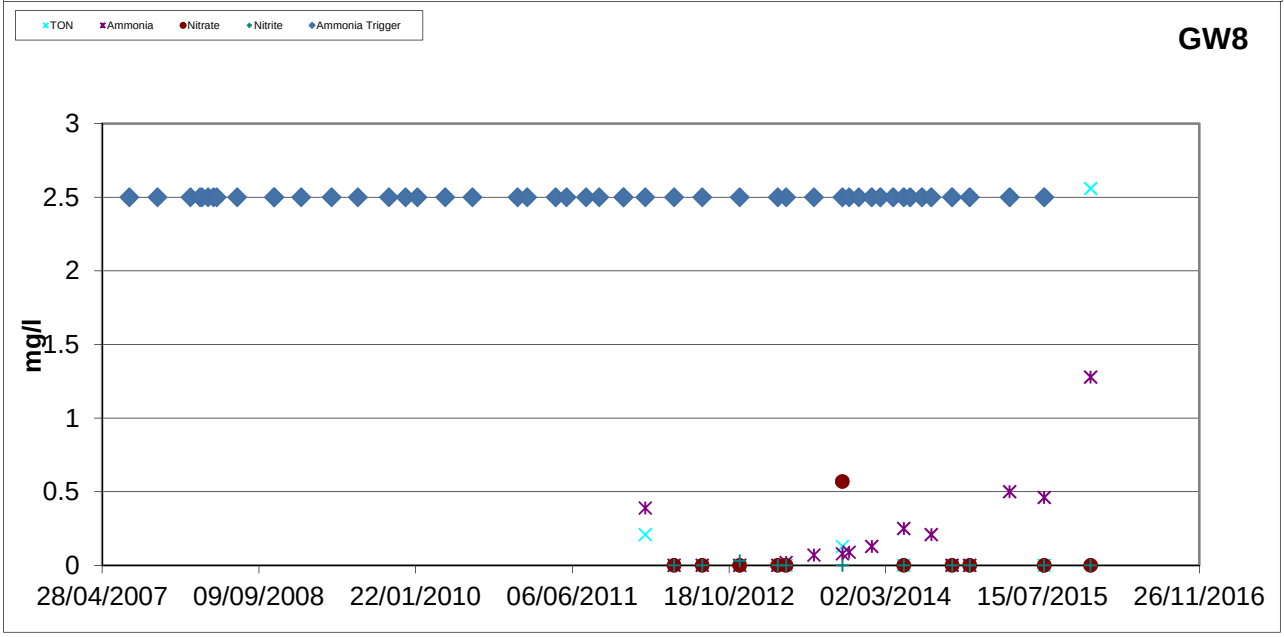

Field pH
Lab pH
GW8
pH
8
7.5
7
6.5
6
5.5
5
4.5
4
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

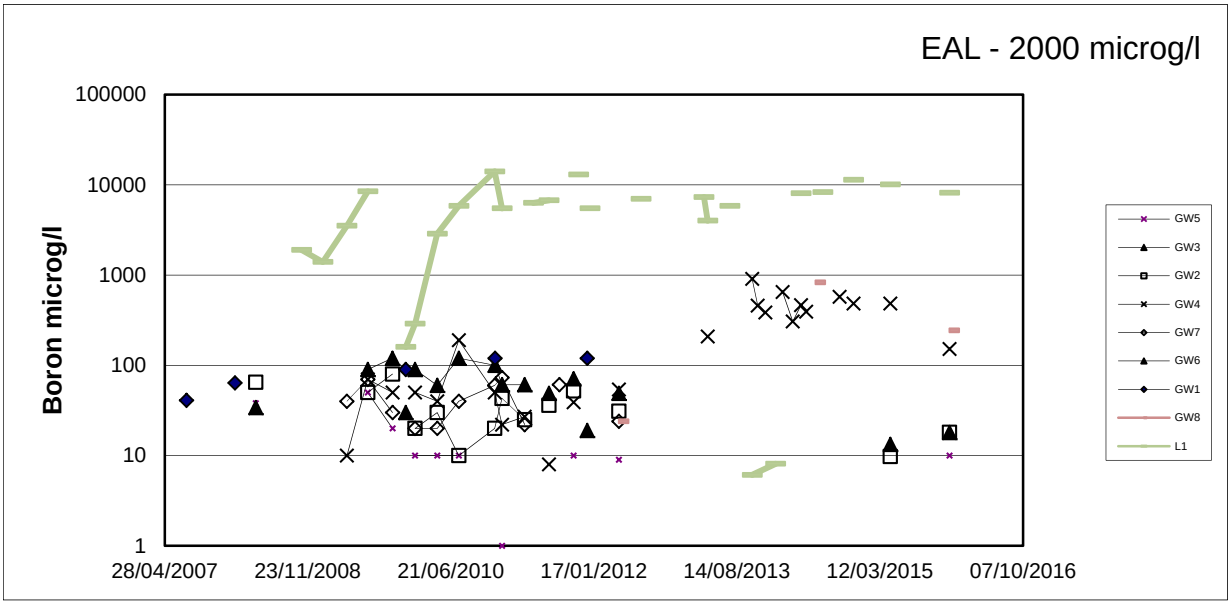

Field EC
Lab EC
GW8
EC microS/cm
1800
1600
1400
1200
1000
800
600
400
200
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

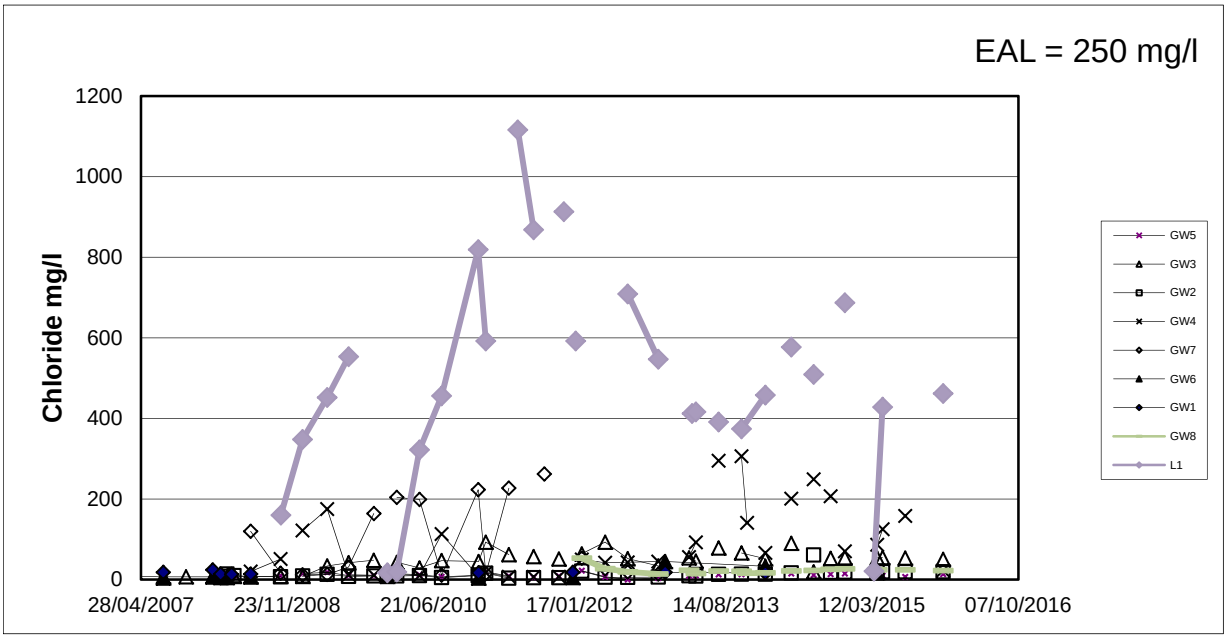

Chloride
Sulphate
Alkalinity
GW8
600
500
400
300
200
100
0
mg/l
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

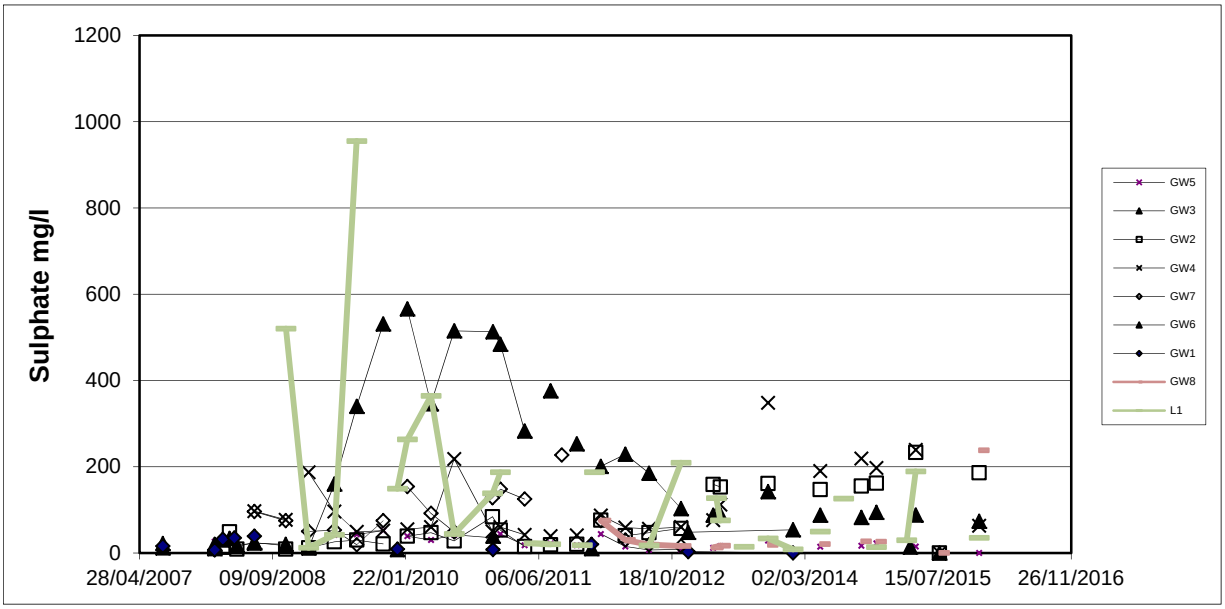

Potassium
Sodium
Calcium
Magnesium
GW8
250
200
150
100
50
0
mg/l
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

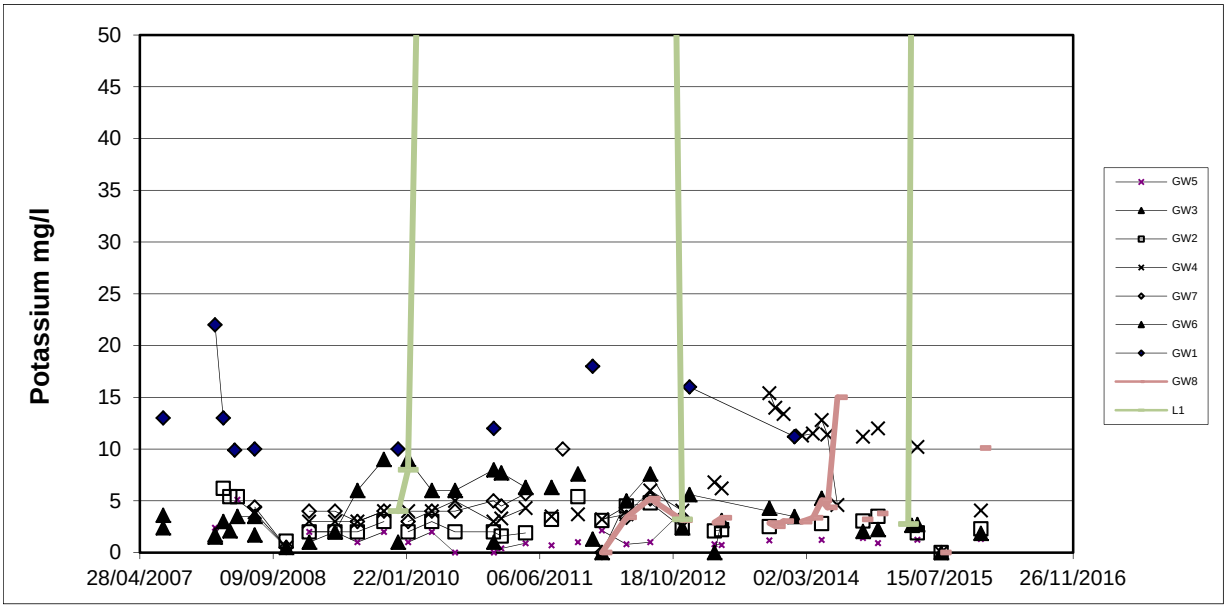

BOD
COD
TOC
GW8
90
80
70
60
50
40
30
20
10
0
mg/l
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

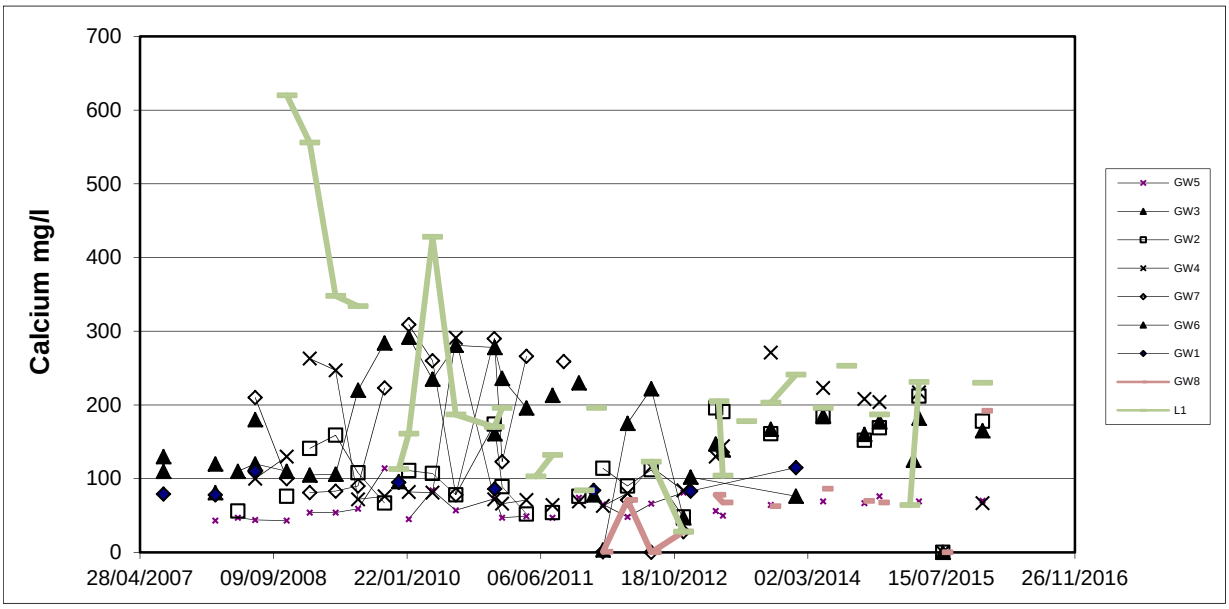

TON
Ammonia
Nitrate
Nitrite
Ammonia Trigger
GW8
3
2.5
2
1.5
1
0.5
0
mg/l
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016

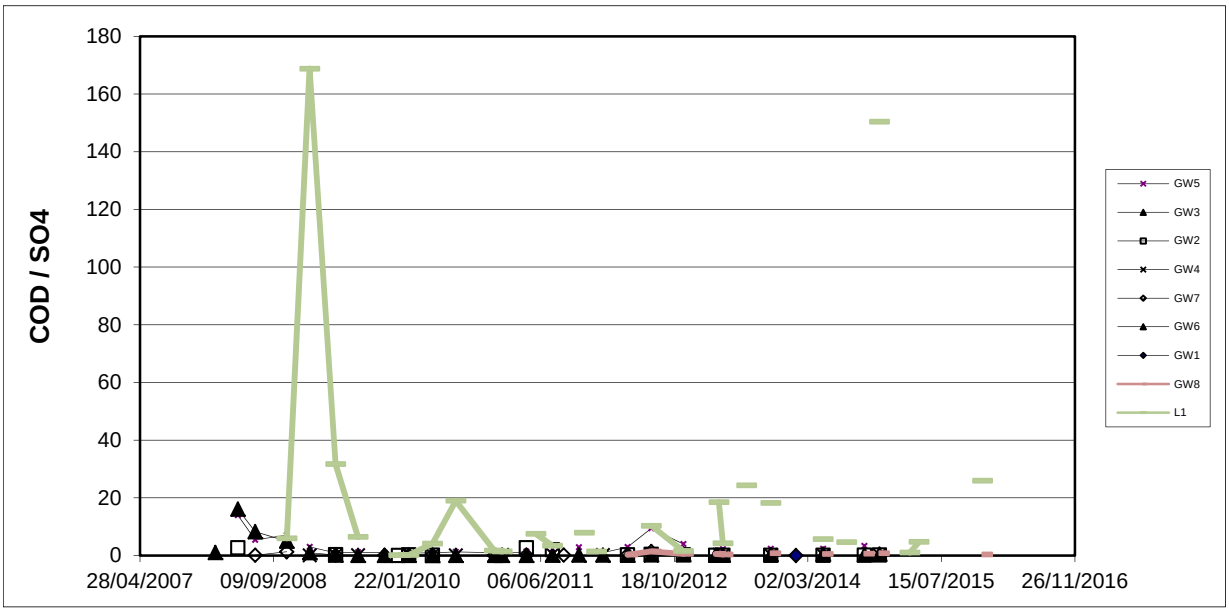

EAL - 2000 microg/l
Boron microg/l
100000
10000
1000
100
10
1
28/04/2007
23/11/2008
21/06/2010
17/01/2012
14/08/2013
12/03/2015
07/10/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8
L1

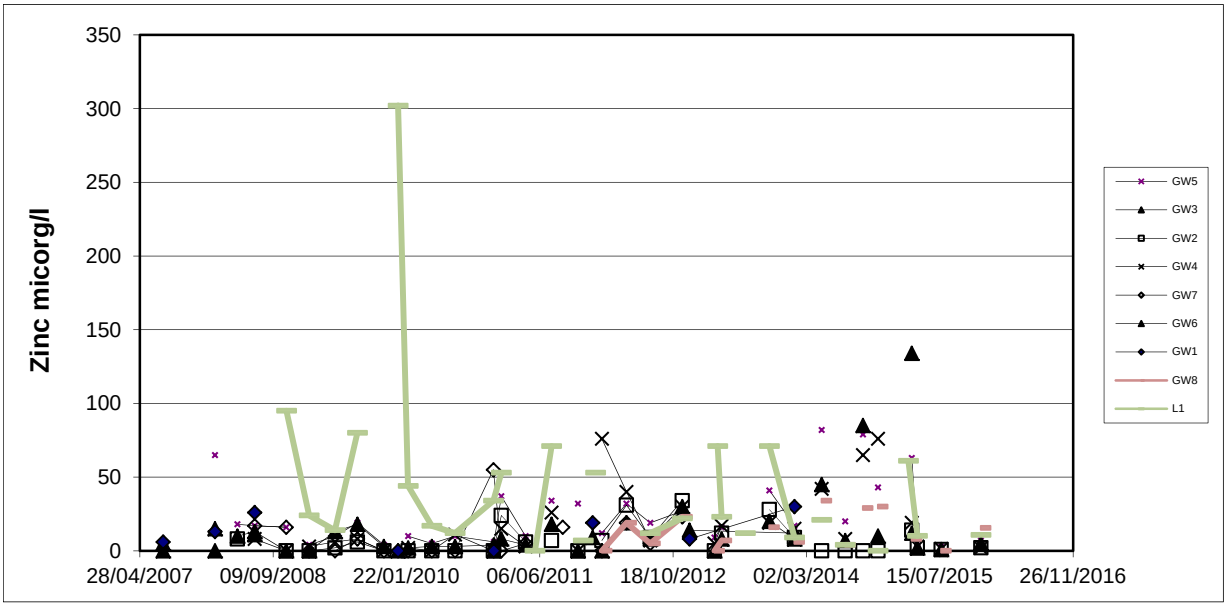

EAL = 250 mg/l
Chloride mg/l
1200
1000
800
600
400
200
0
28/04/2007
23/11/2008
21/06/2010
17/01/2012
14/08/2013
12/03/2015
07/10/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8
L1

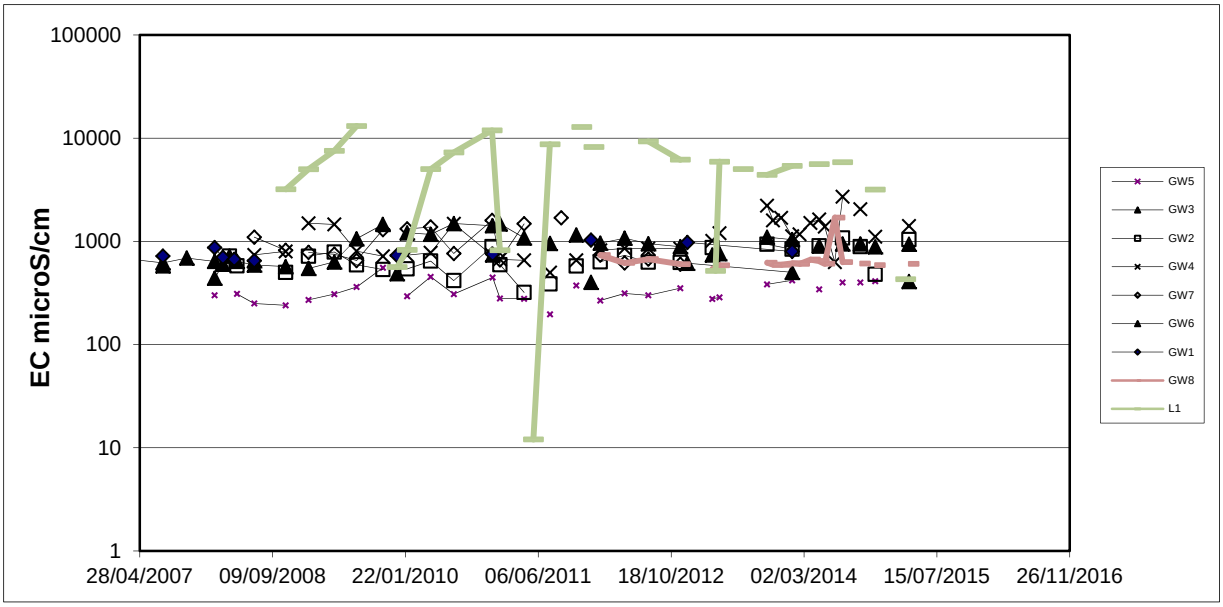

Sulphate mg/l
1200
1000
800
600
400
200
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8
L1

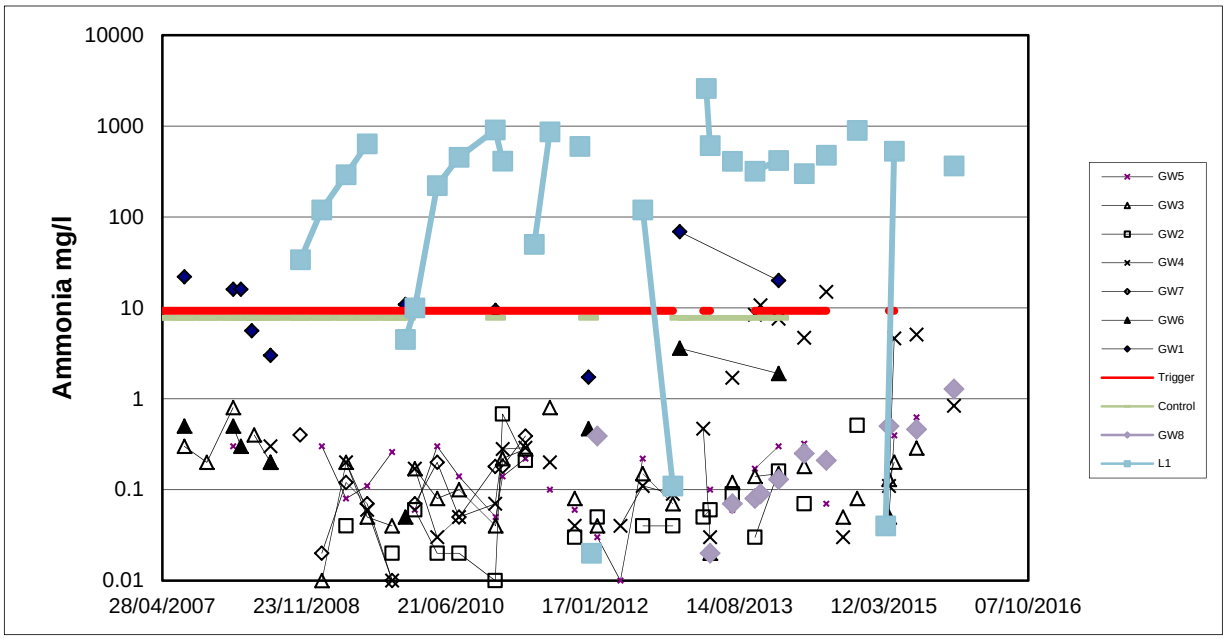

Potassium mg/l
50
45
40
35
30
25
20
15
10
5
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8
L1

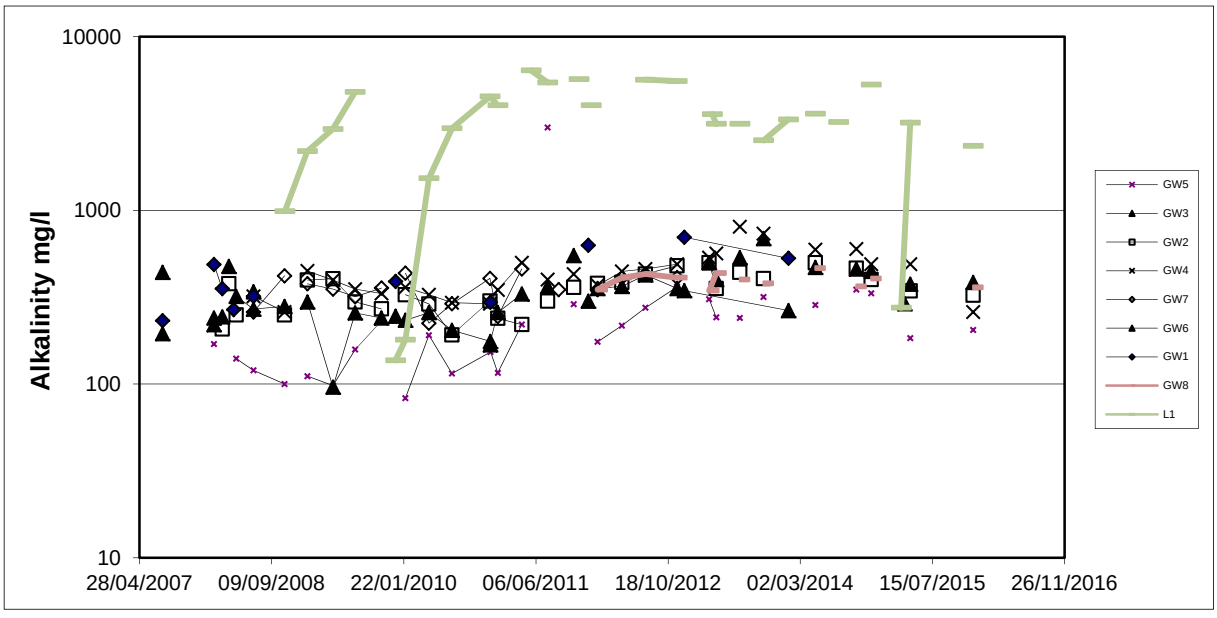

Calcium mg/l
700
600
500
400
300
200
100
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8
L1

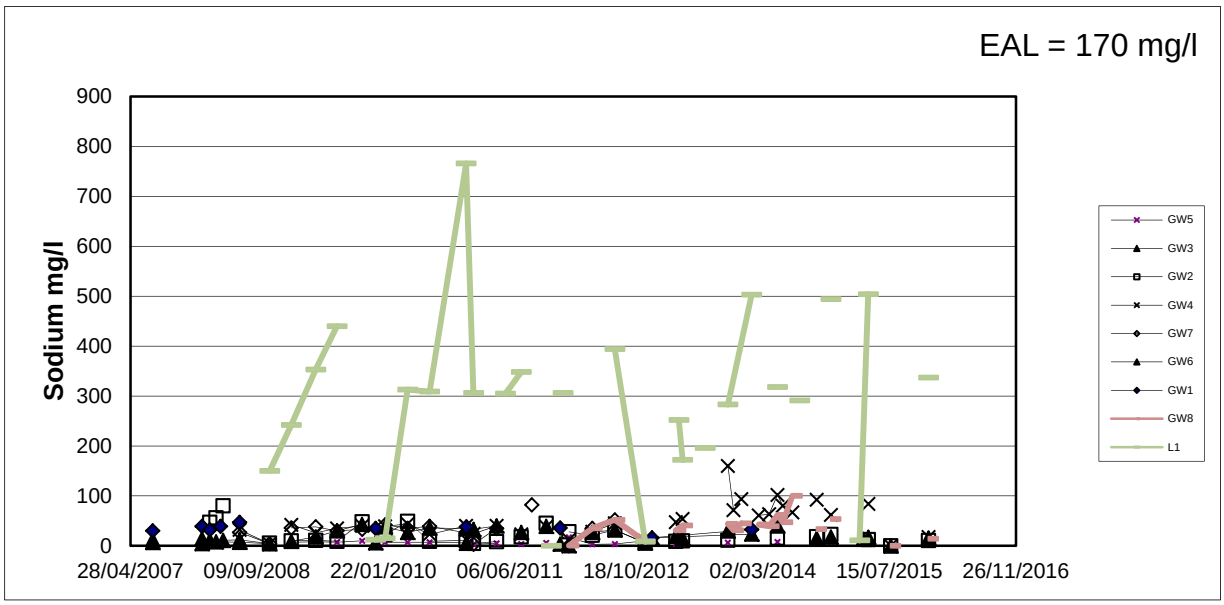

COD / SO4
180
160
140
120
100
80
60
40
20
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8
L1

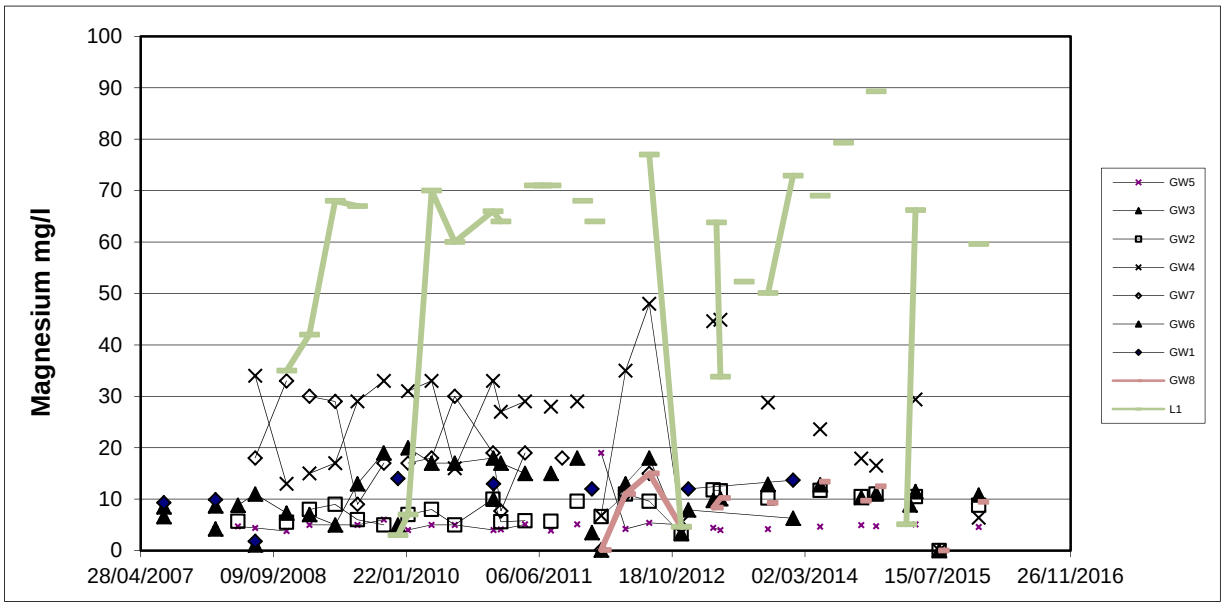

Zinc micorg/l
350
300
250
200
150
100
50
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8
L1

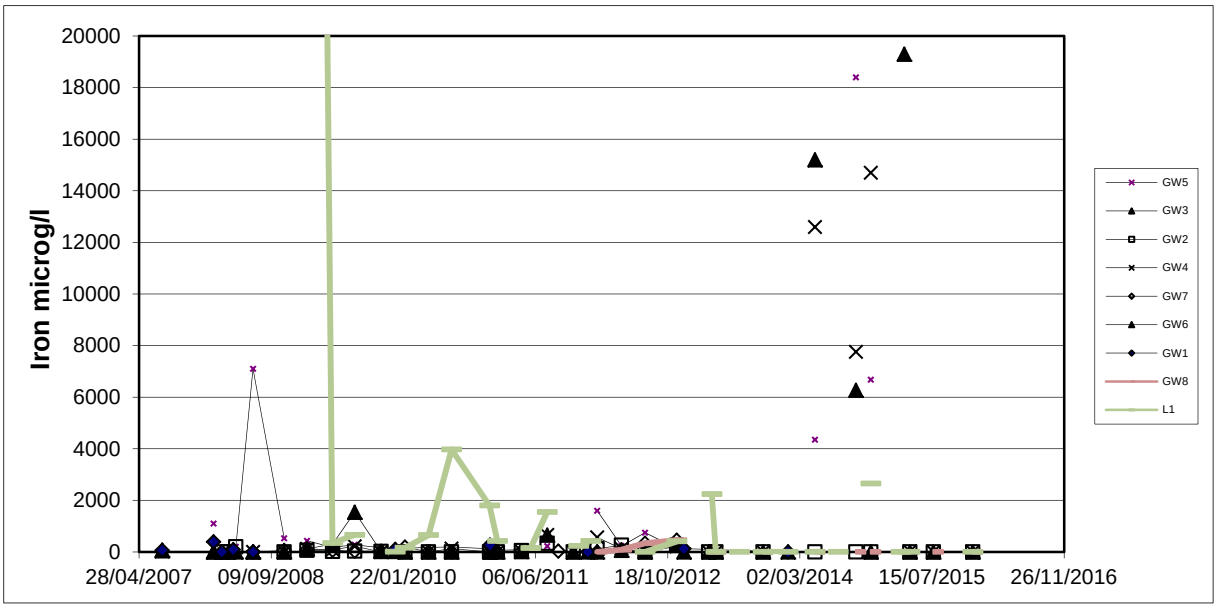

EC microS/cm
100000
10000
1000
100
10
1
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8
L1


Ammonia mg/l
10000
1000
100
10
1
0.1
0.01
28/04/2007
23/11/2008
21/06/2010
17/01/2012
14/08/2013
12/03/2015
07/10/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
Trigger
Control
GW8
L1


Alkalinity mg/l
10000
1000
100
10
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8
L1


EAL = 170 mg/l
Sodium mg/l
900
800
700
600
500
400
300
200
100
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8
L1


Magnesium mg/l
100
90
80
70
60
50
40
30
20
10
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8
L1


Iron microg/l
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
28/04/2007
09/09/2008
22/01/2010
06/06/2011
18/10/2012
02/03/2014
15/07/2015
26/11/2016
GW5
GW3
GW2
GW4
GW7
GW6
GW1
GW8
L1

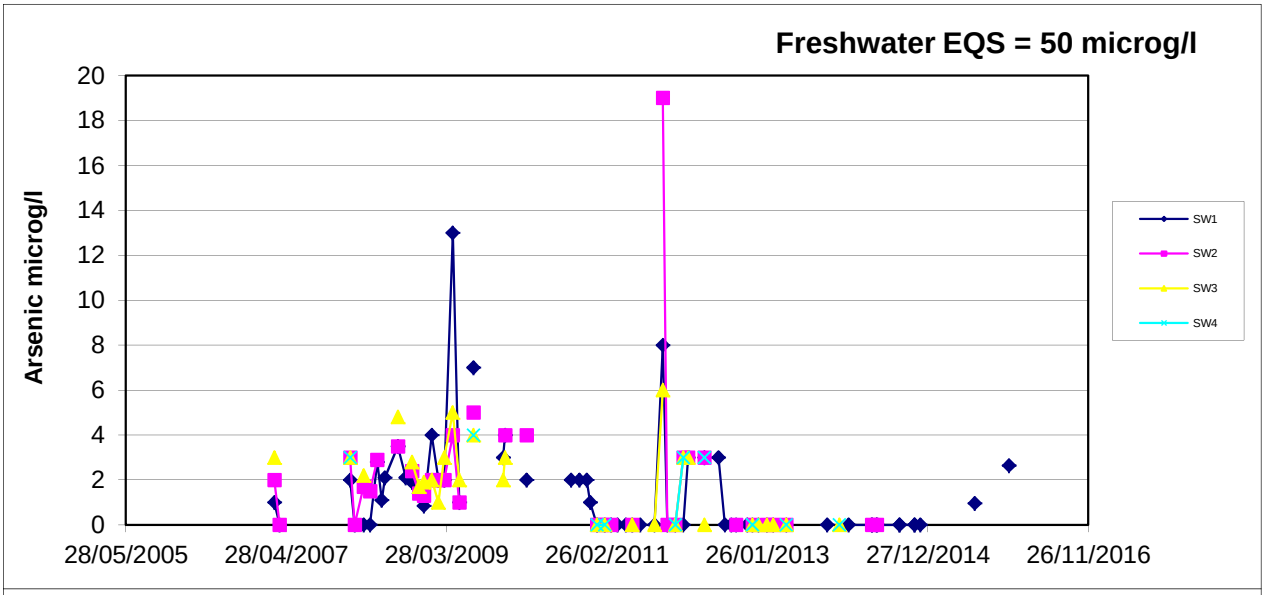
PALLEG LANDFILL
LOWER CWMTWRCH

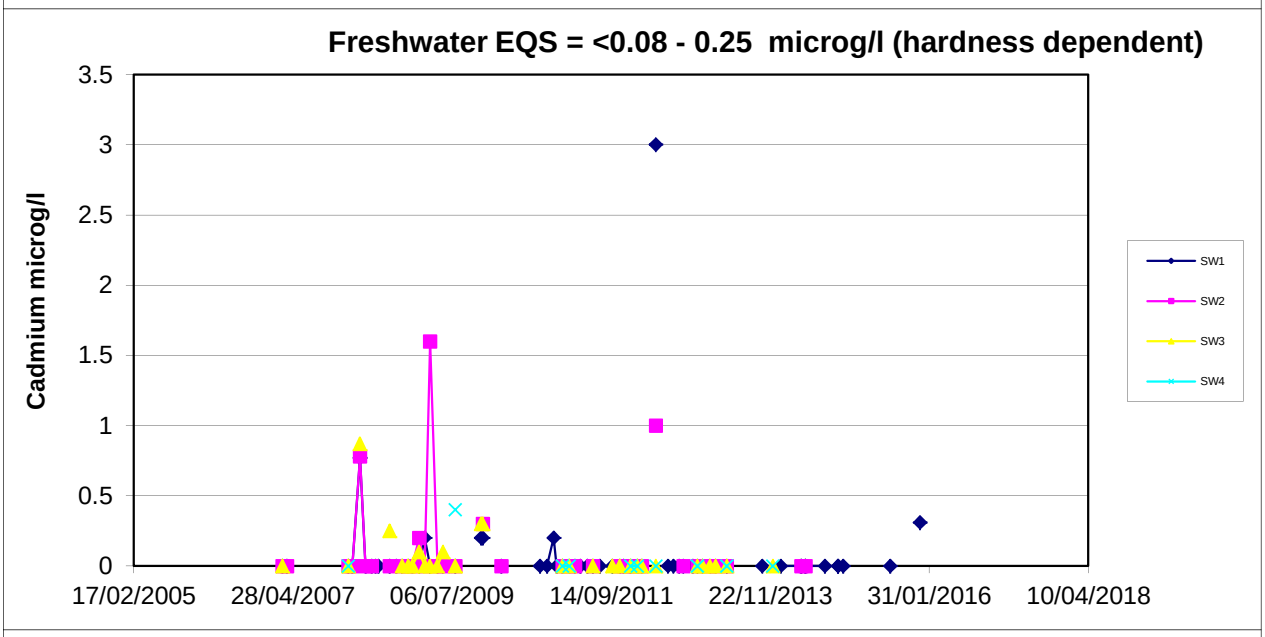
PERMIT BT19081X

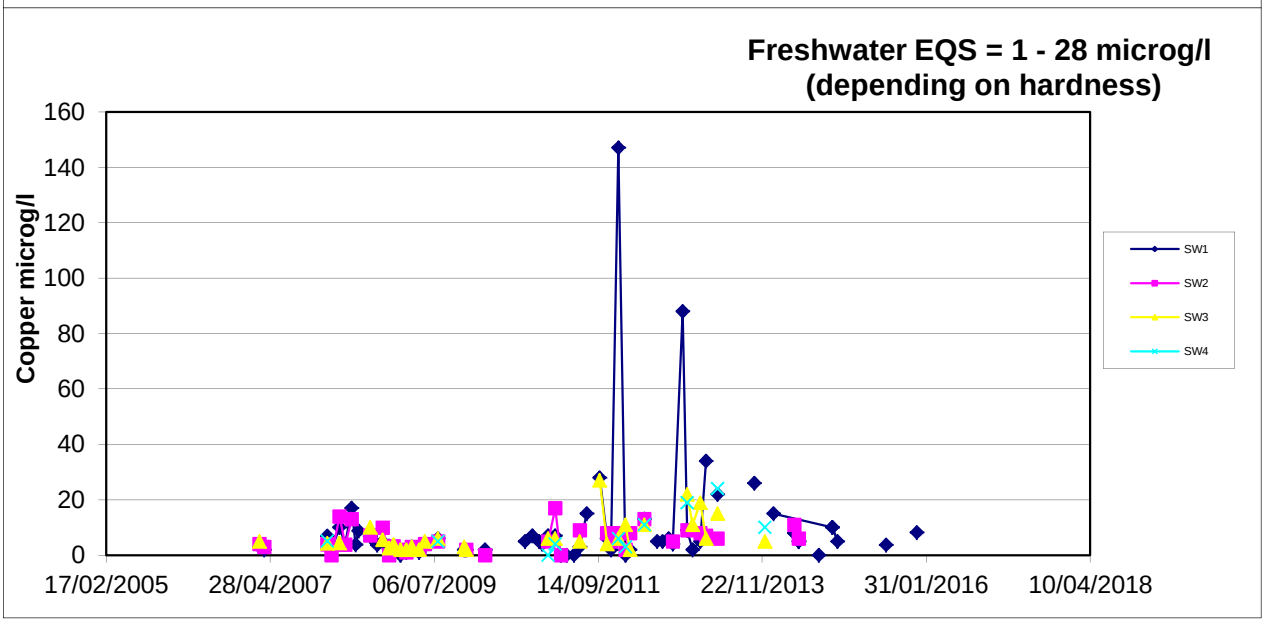
Review of 2015 Landfill Monitoring

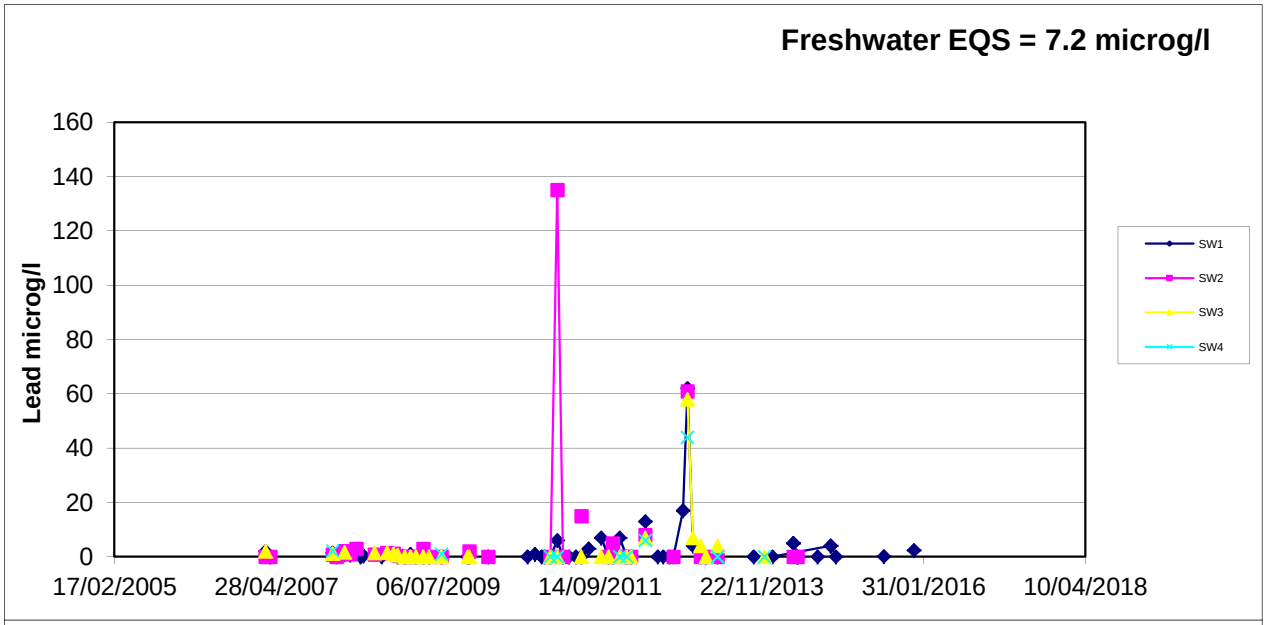
Appendix 5
Summary of Surface Water Monitoring Data

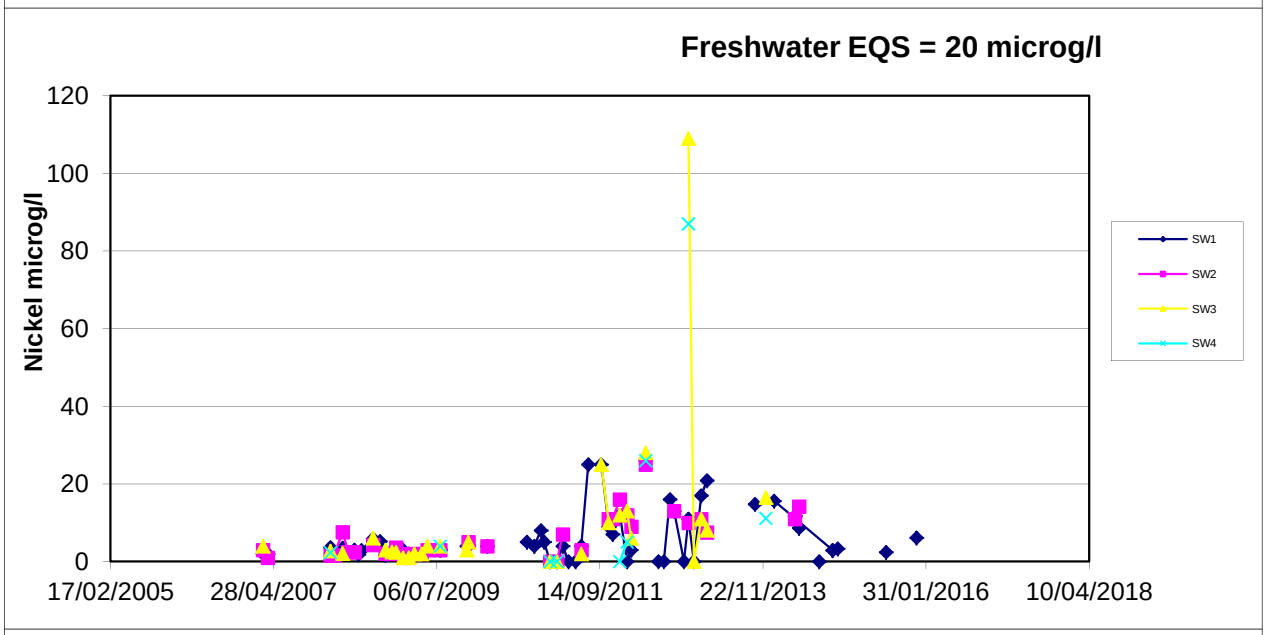
Report Number 1429r1v1d0116

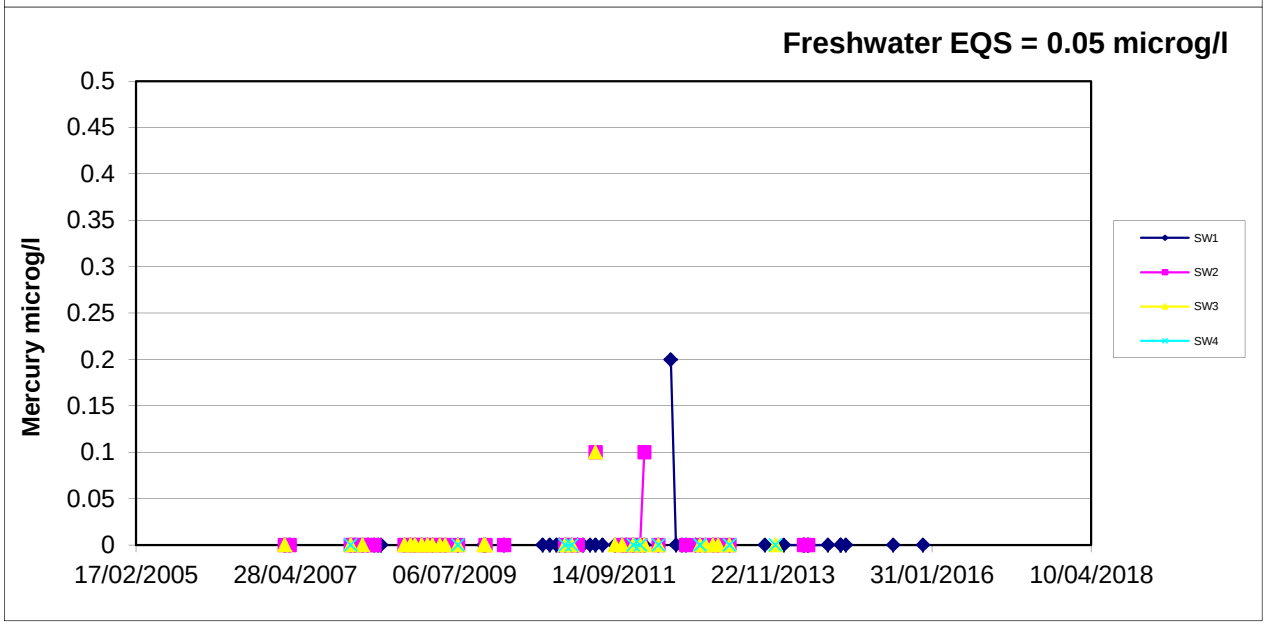

Freshwater EQS = 50 microg/l
Arsenic microg/l
20
18
16
14
12
10
8
6
4
2
0
28/05/2005
28/04/2007
28/03/2009
26/02/2011
26/01/2013
27/12/2014
26/11/2016
SW1
SW2
SW3
SW4

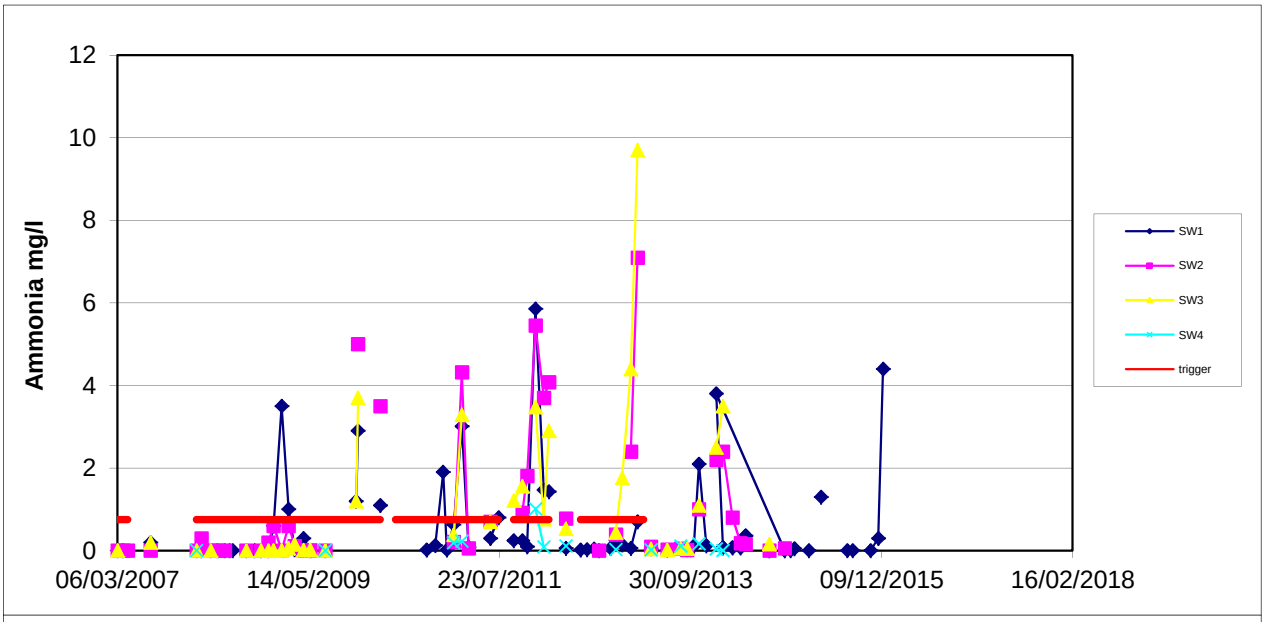

Freshwater EQS = <0.08 - 0.25 microg/l (hardness dependent)
Cadmium microg/l
3.5
3
2.5
2
1.5
1
0.5
0
17/02/2005
28/04/2007
06/07/2009
14/09/2011
22/11/2013
31/01/2016
10/04/2018
SW1
SW2
SW3
SW4

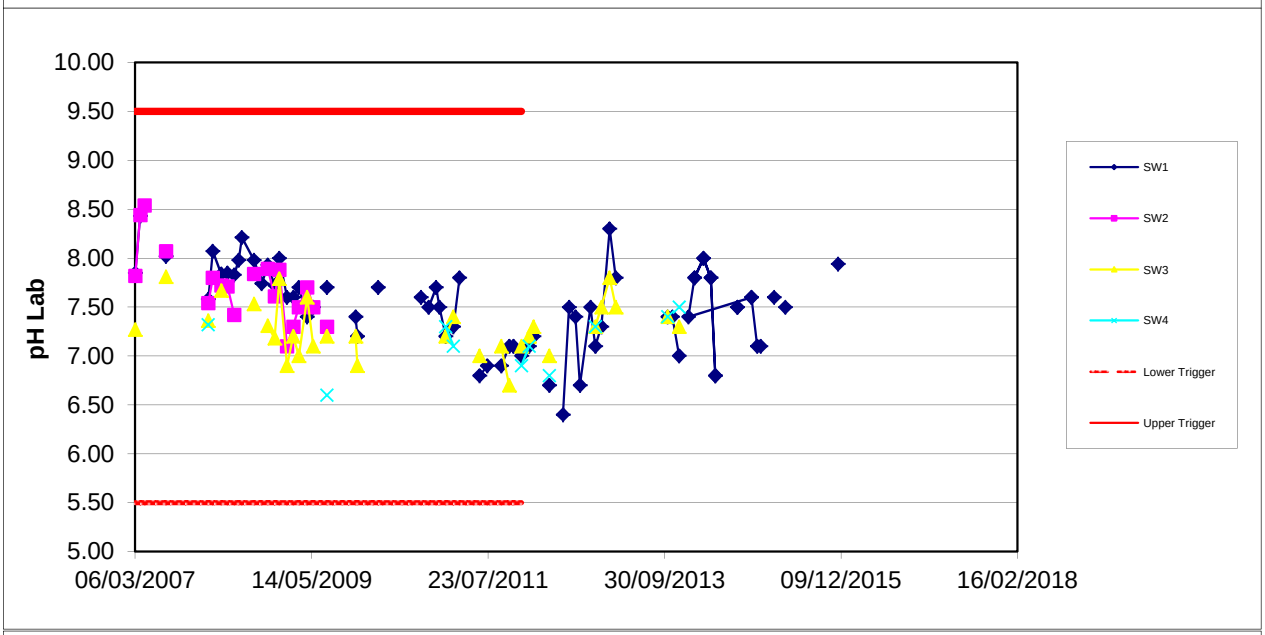

Freshwater EQS = 1 - 28 microg/l
(depending on hardness)
Copper microg/l
160
140
120
100
80
60
40
20
0
17/02/2005
28/04/2007
06/07/2009
14/09/2011
22/11/2013
31/01/2016
10/04/2018
SW1
SW2
SW3
SW4

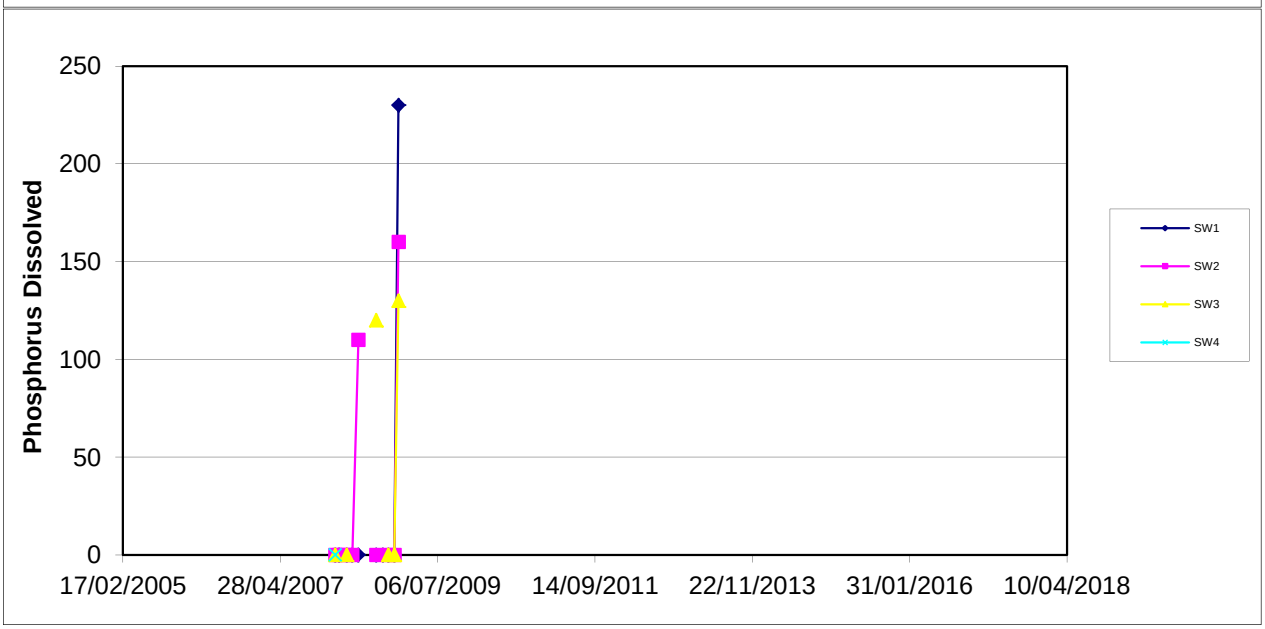

Freshwater EQS = 7.2 microg/l
Lead microg/l
160
140
120
100
80
60
40
20
0
17/02/2005
28/04/2007
06/07/2009
14/09/2011
22/11/2013
31/01/2016
10/04/2018
SW1
SW2
SW3
SW4

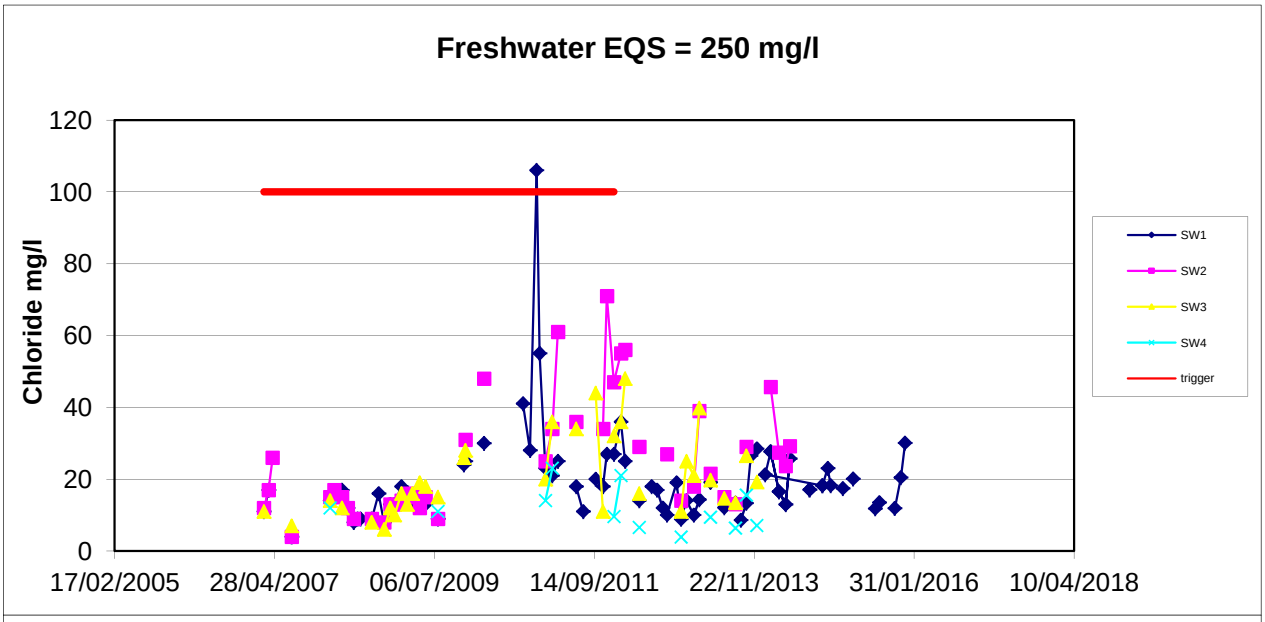

Freshwater EQS = 20 microg/l
Nickel microg/l
120
100
80
60
40
20
0
17/02/2005
28/04/2007
06/07/2009
14/09/2011
22/11/2013
31/01/2016
10/04/2018
SW1
SW2
SW3
SW4

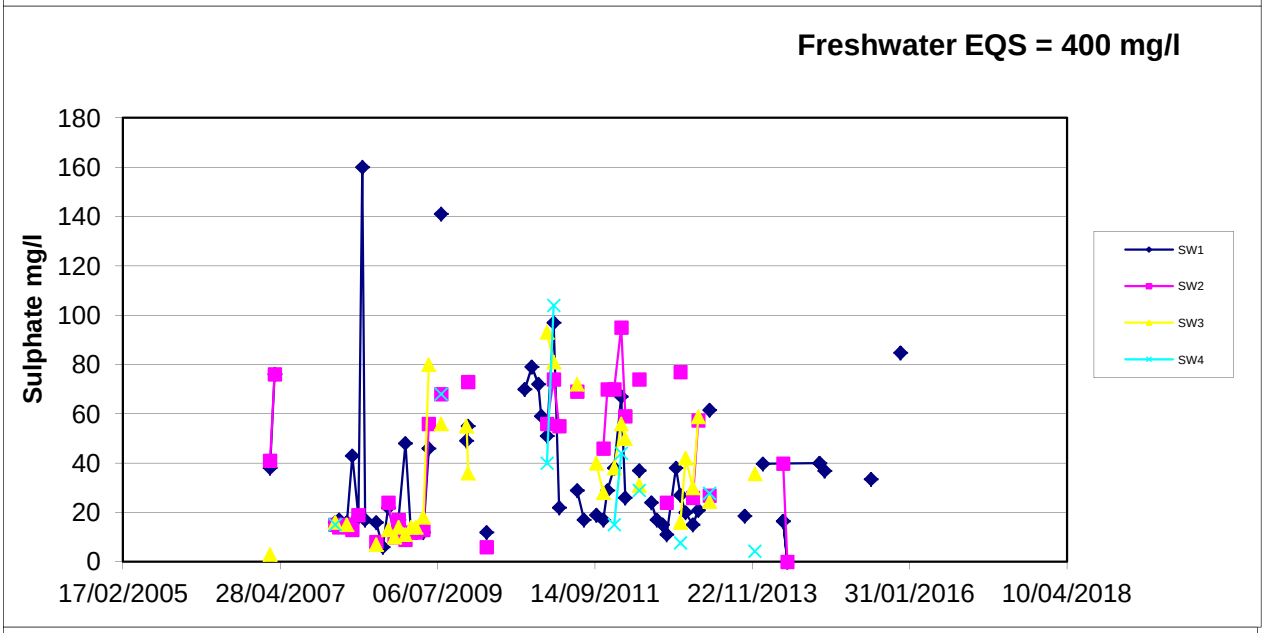

Freshwater EQS = 0.05 microg/l
Mercury microg/l
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
17/02/2005
28/04/2007
06/07/2009
14/09/2011
22/11/2013
31/01/2016
10/04/2018
SW1
SW2
SW3
SW4

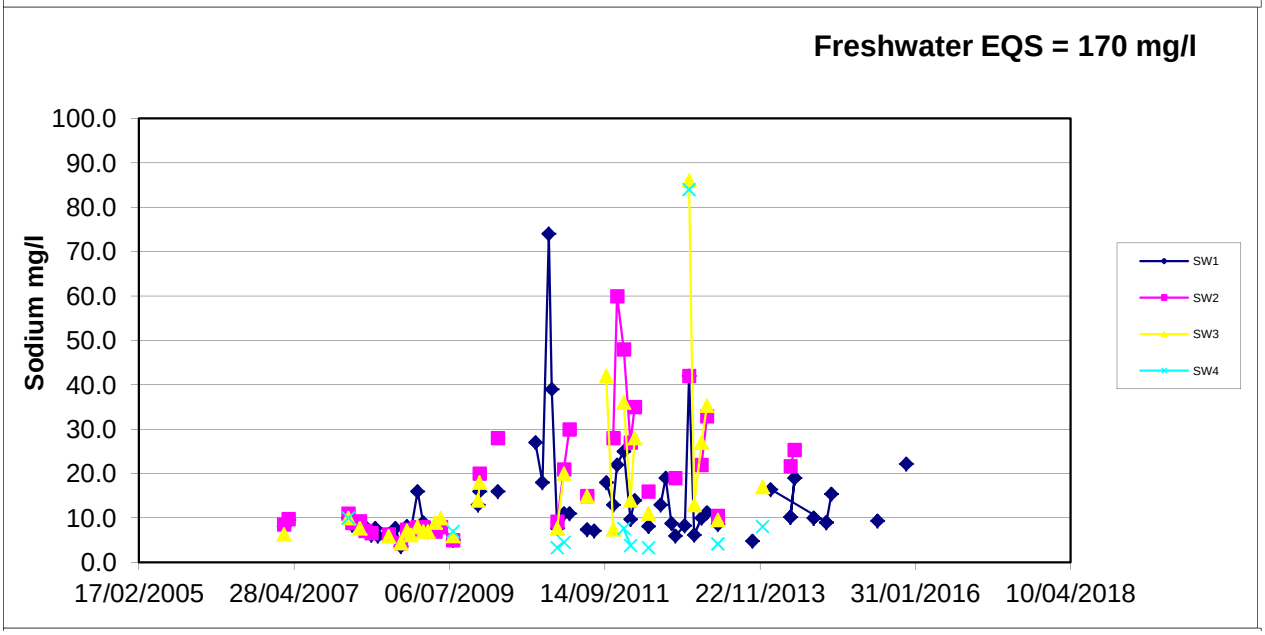

Ammonia mg/l
12
10
8
6
4
2
0
06/03/2007
14/05/2009
23/07/2011
30/09/2013
09/12/2015
16/02/2018
SW1
SW2
SW3
SW4
trigger

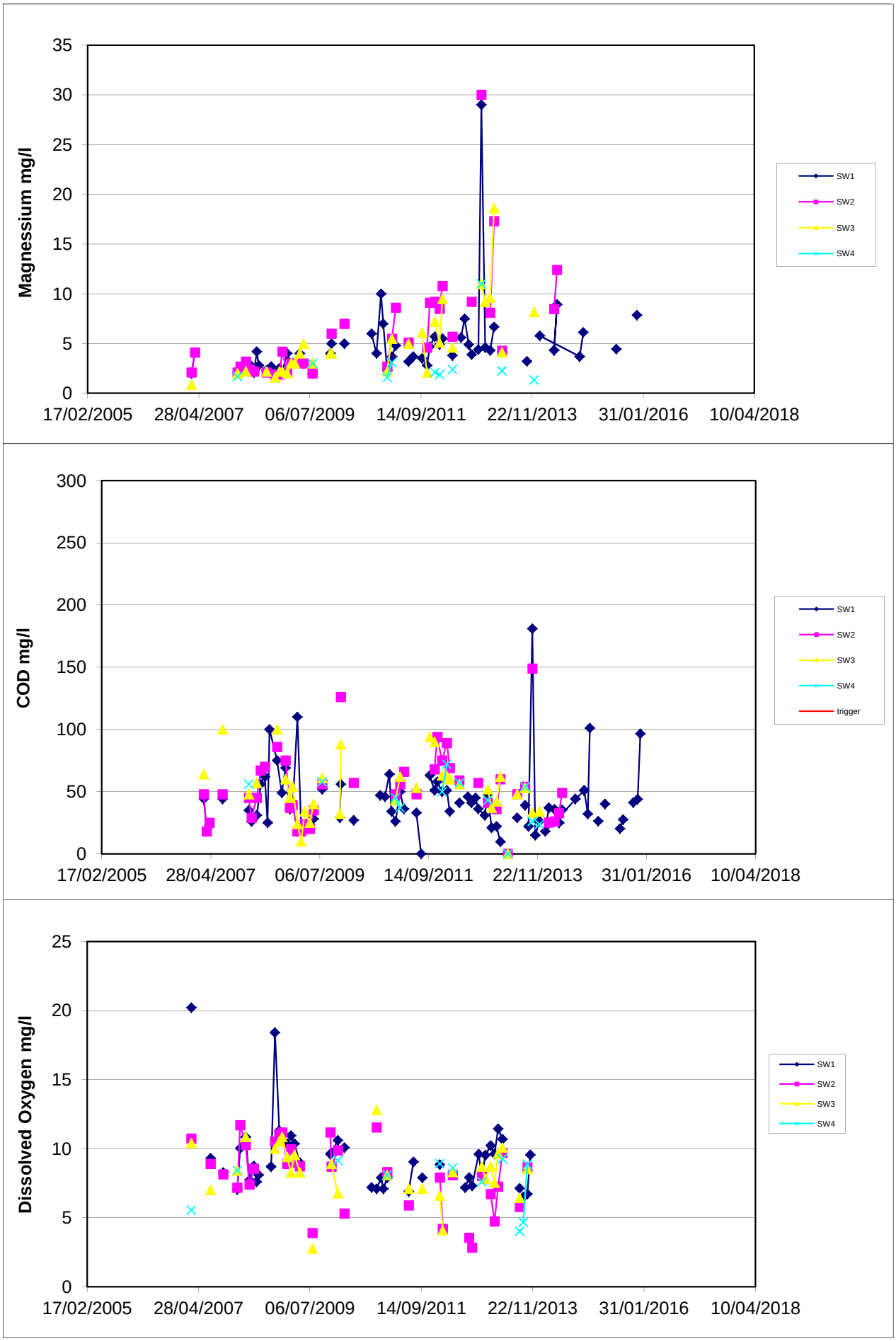

pH Lab
10.00
9.50
9.00
8.50
8.00
7.50
7.00
6.50
6.00
5.50
5.00
06/03/2007
14/05/2009
23/07/2011
30/09/2013
09/12/2015
16/02/2018
SW1
SW2
SW3
SW4
Lower Trigger
Upper Trigger

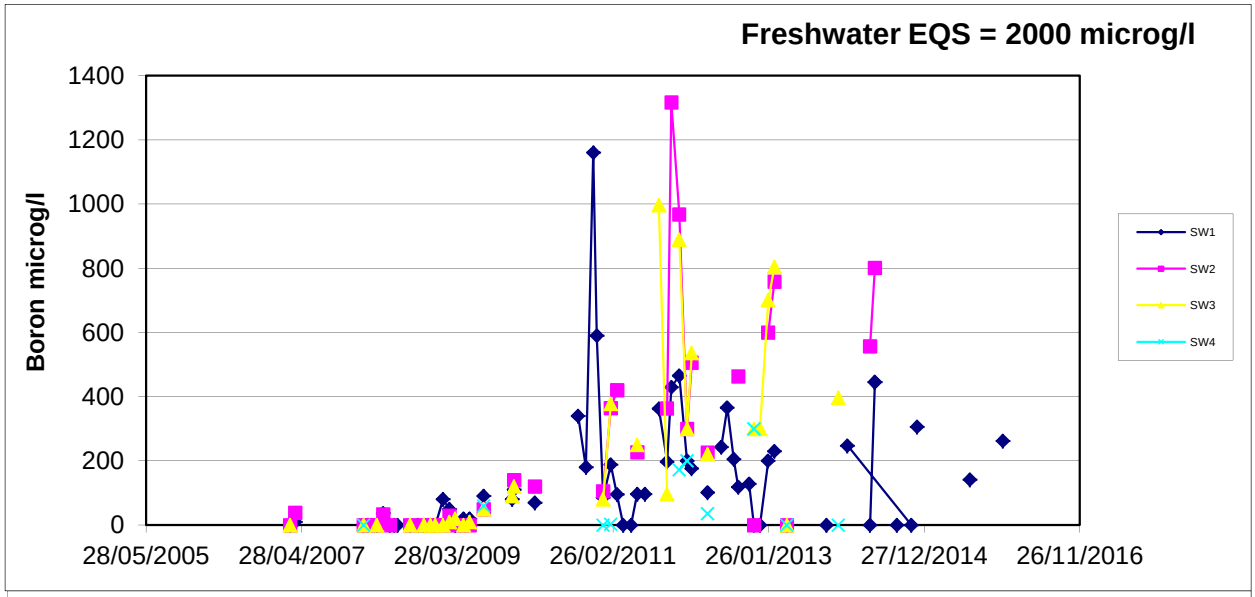

Phosphorus Dissolved
250
200
150
100
50
0
17/02/2005
28/04/2007
06/07/2009
14/09/2011
22/11/2013
31/01/2016
10/04/2018
SW1
SW2
SW3
SW4

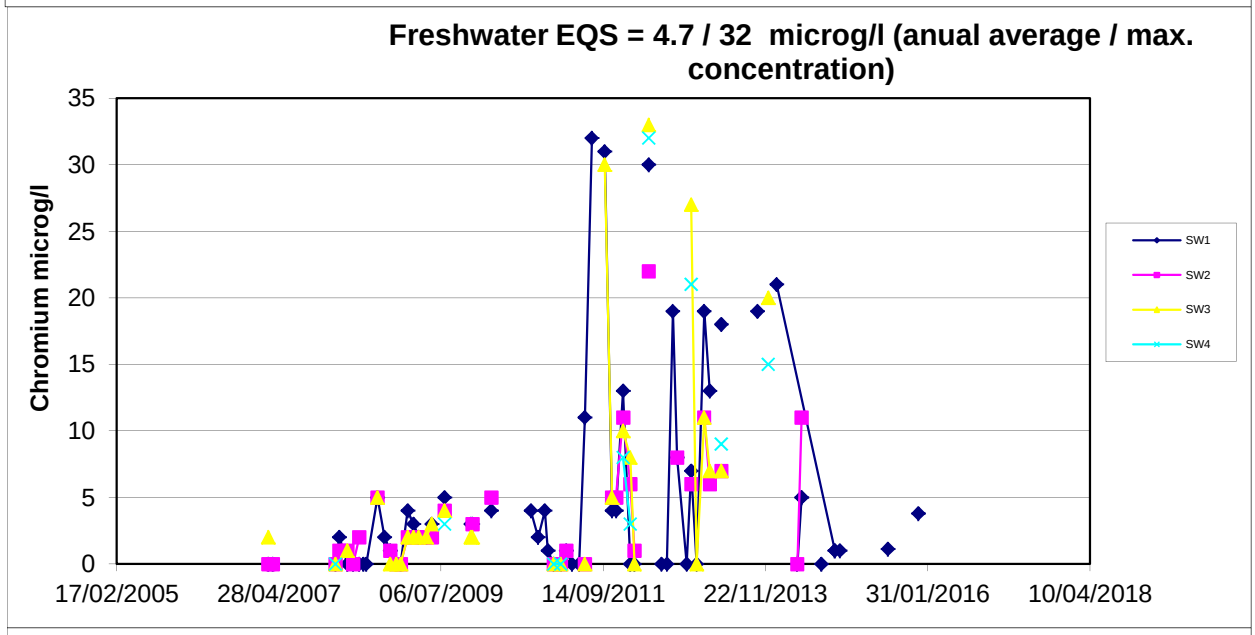

Freshwater EQS = 250 mg/l
Chloride mg/l
120
100
80
60
40
20
0
17/02/2005
28/04/2007
06/07/2009
14/09/2011
22/11/2013
31/01/2016
10/04/2018
SW1
SW2
SW3
SW4
trigger

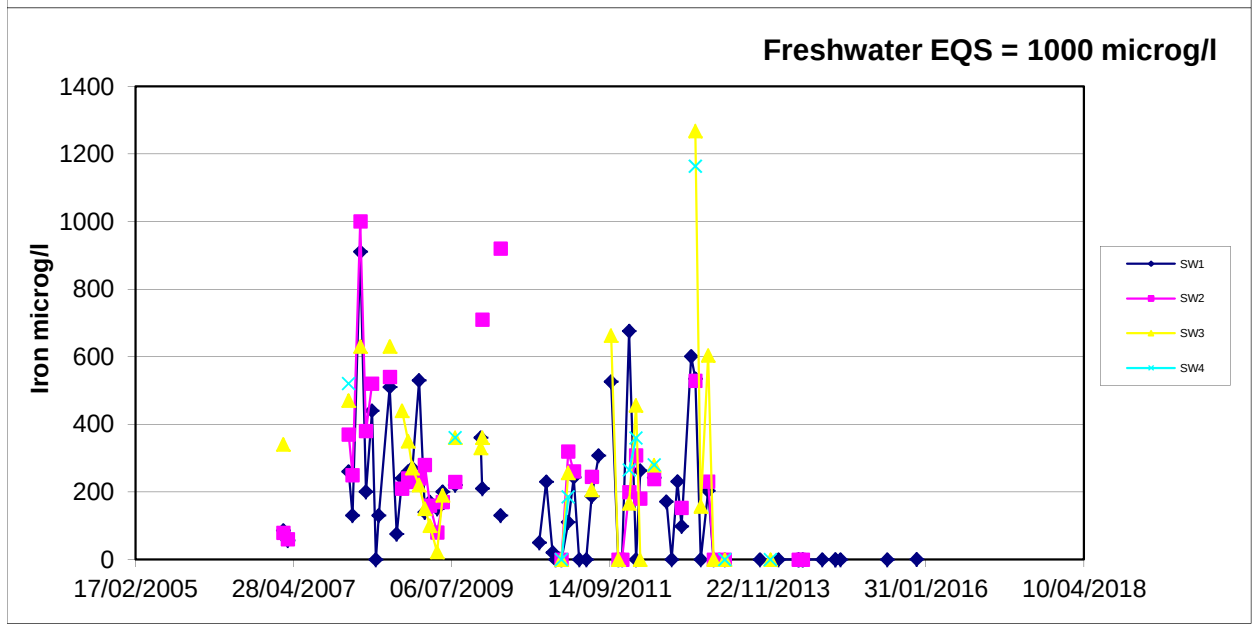

Freshwater EQS = 400 mg/l
Sulphate mg/l
180
160
140
120
100
80
60
40
20
0
17/02/2005
28/04/2007
06/07/2009
14/09/2011
22/11/2013
31/01/2016
10/04/2018
SW1
SW2
SW3
SW4

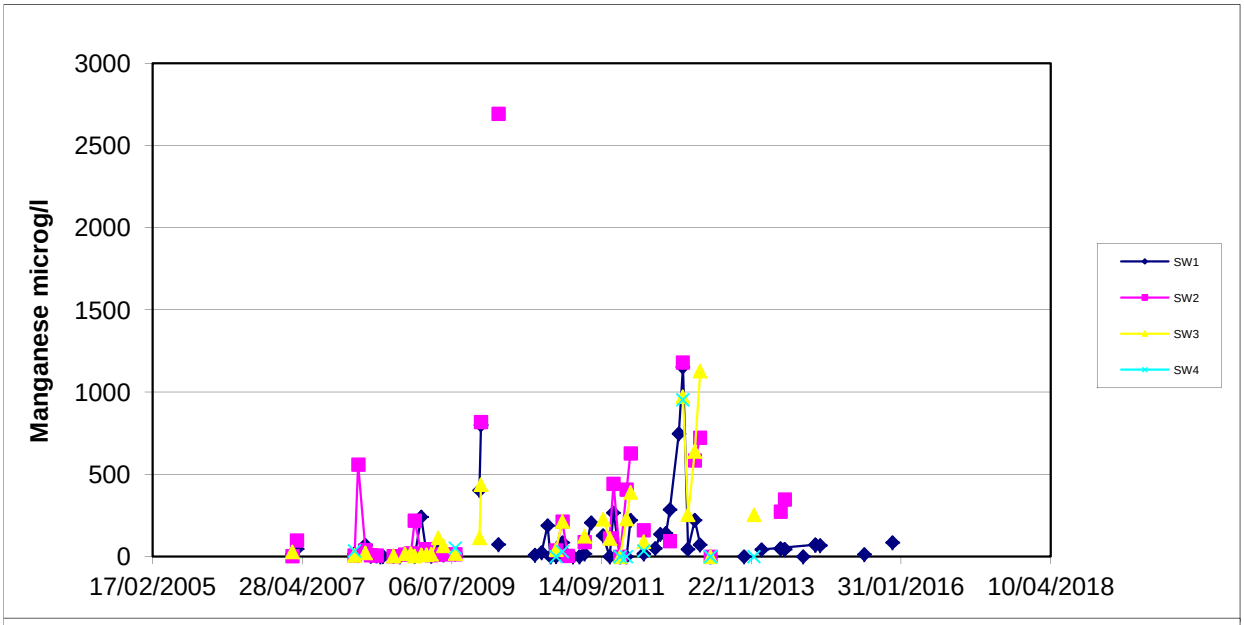

Freshwater EQS = 170 mg/l
Sodium mg/l
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
17/02/2005
28/04/2007
06/07/2009
14/09/2011
22/11/2013
31/01/2016
10/04/2018
SW1
SW2
SW3
SW4

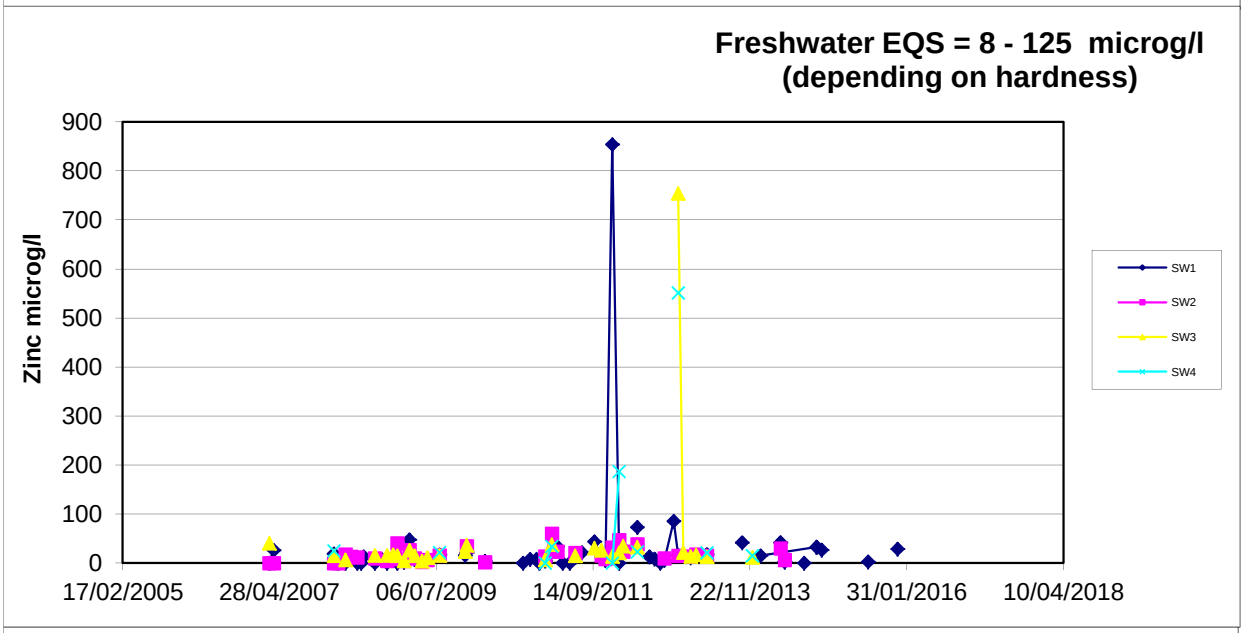

Magnesium mg/l
35
30
25
20
15
10
5
0
17/02/2005
28/04/2007
06/07/2009
14/09/2011
22/11/2013
31/01/2016
10/04/2018
SW1
SW2
SW3
SW4
COD mg/l
300
250
200
150
100
50
0
17/02/2005
28/04/2007
06/07/2009
14/09/2011
22/11/2013
31/01/2016
10/04/2018
SW1
SW2
SW3
SW4
trigger
Dissolved Oxygen mg/l
25
20
15
10
5
0
17/02/2005
28/04/2007
06/07/2009
14/09/2011
22/11/2013
31/01/2016
10/04/2018
SW1
SW2
SW3
SW4

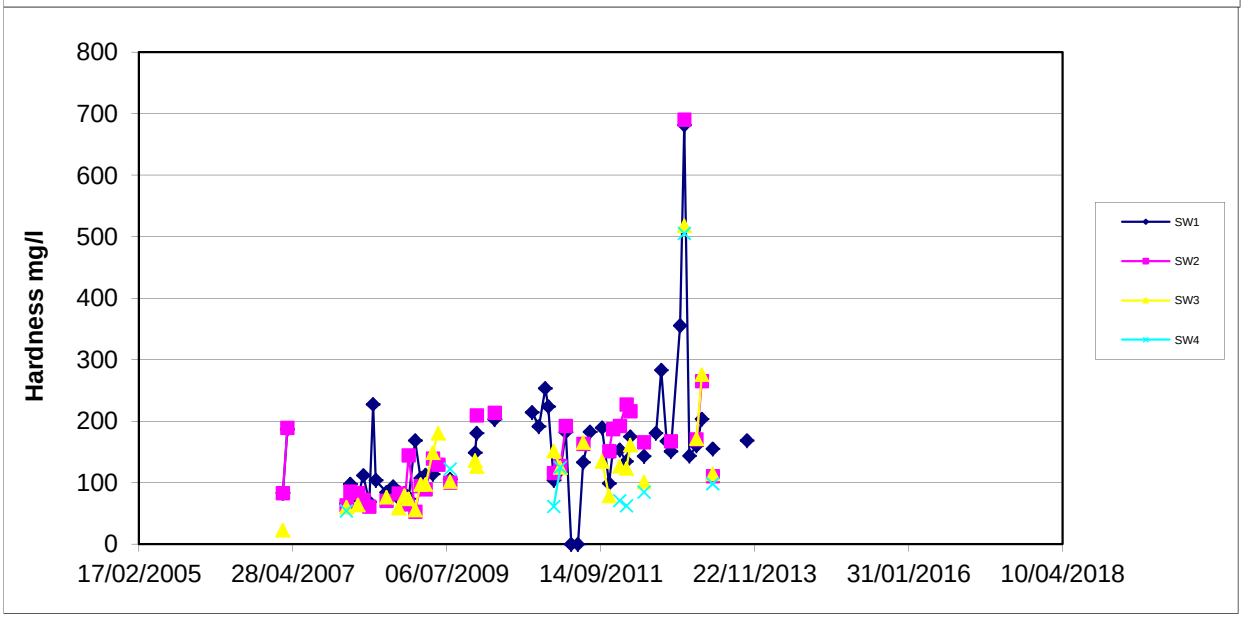

Freshwater EQS = 2000 microg/l
Boron microg/l
1400
1200
1000
800
600
400
200
0
28/05/2005
28/04/2007
28/03/2009
26/02/2011
26/01/2013
27/12/2014
26/11/2016
SW1
SW2
SW3
SW4

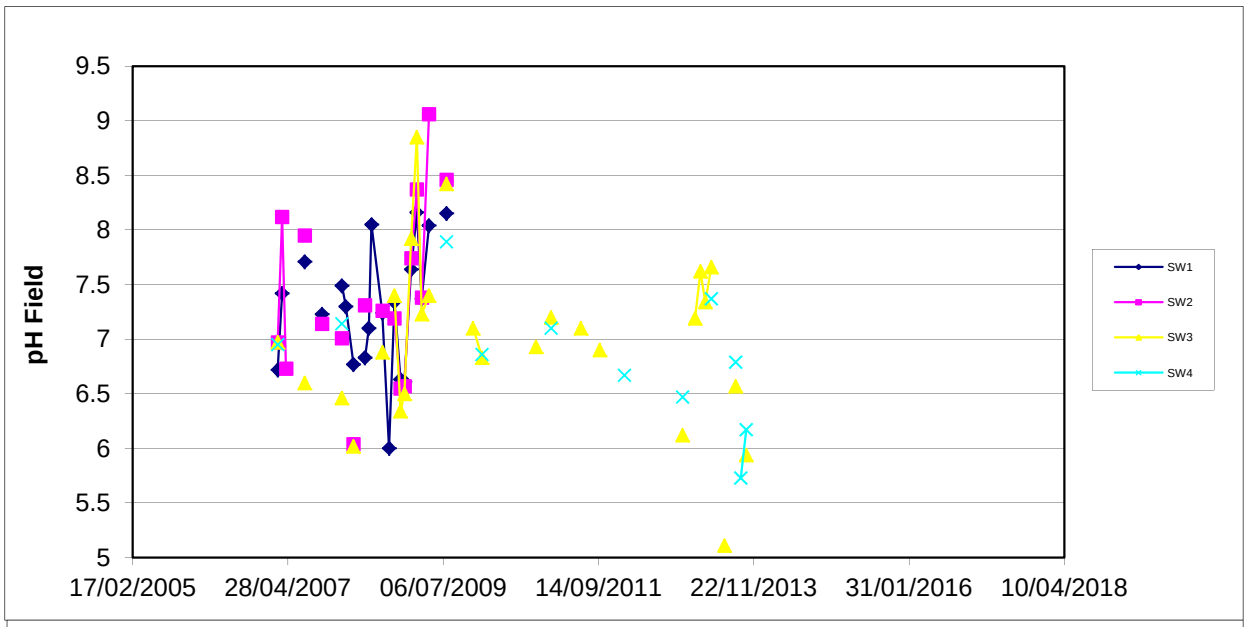

Freshwater EQS = 4.7 / 32 microg/l (anual average / max. concentration)
Chromium microg/l
35
30
25
20
15
10
5
0
17/02/2005
28/04/2007
06/07/2009
14/09/2011
22/11/2013
31/01/2016
10/04/2018
SW1
SW2
SW3
SW4

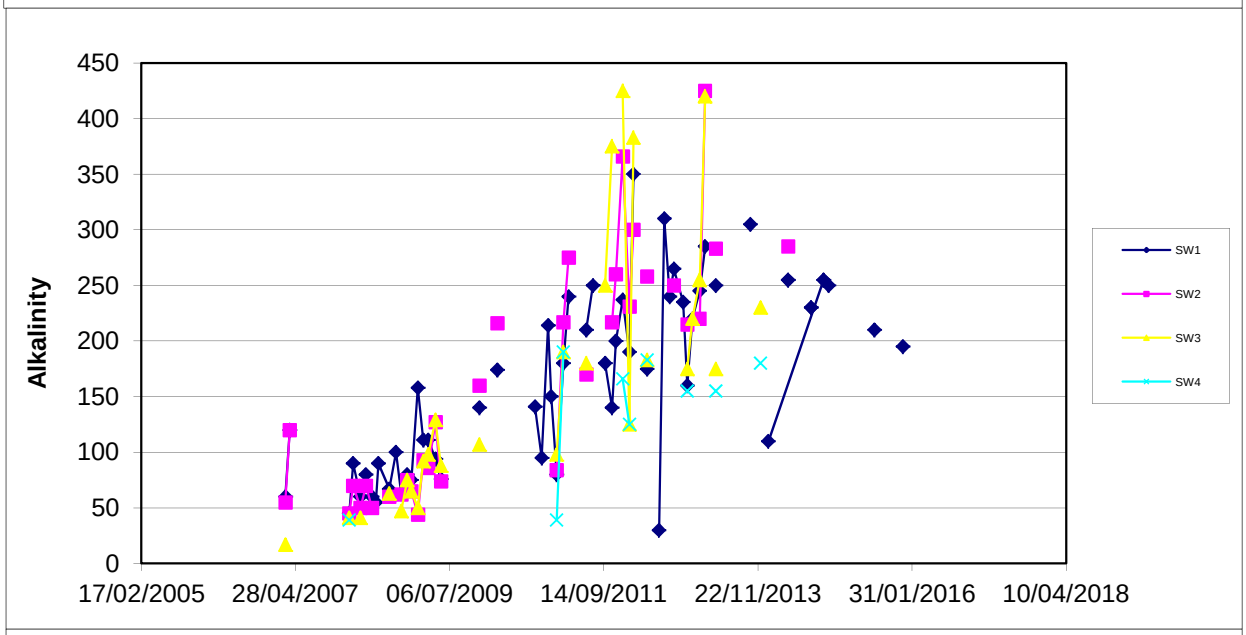

Freshwater EQS = 1000 microg/l
Iron microg/l
1400
1200
1000
800
600
400
200
0
17/02/2005
28/04/2007
06/07/2009
14/09/2011
22/11/2013
31/01/2016
10/04/2018
SW1
SW2
SW3
SW4

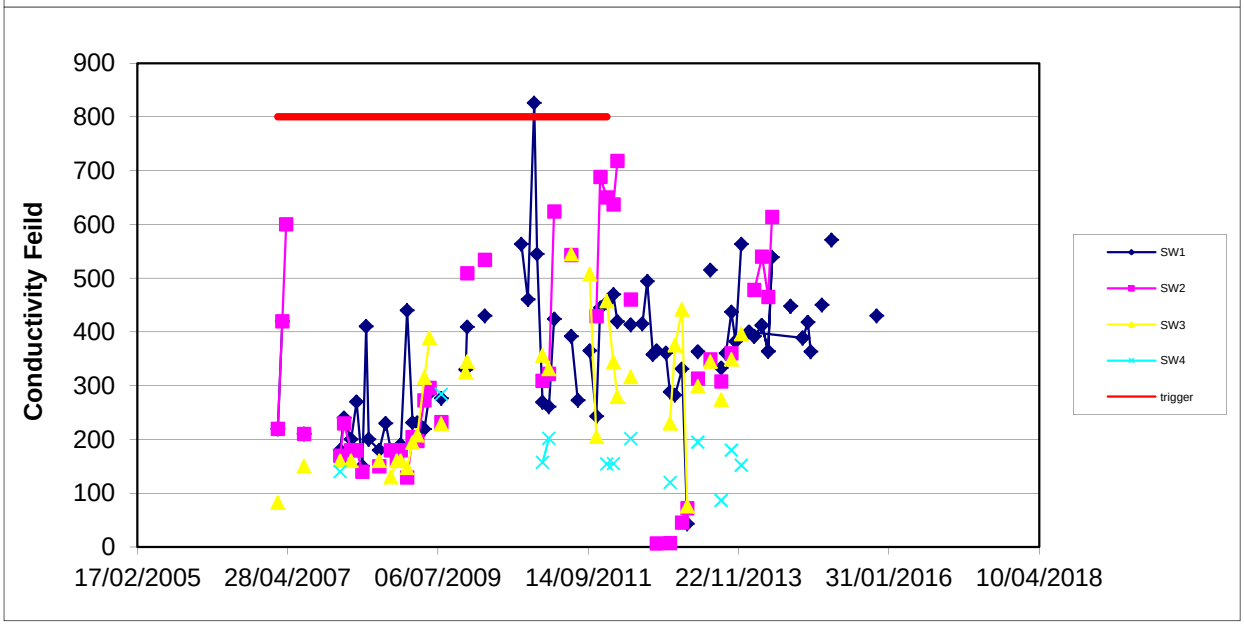

Manganese microg/l
3000
2500
2000
1500
1000
500
0
17/02/2005
28/04/2007
06/07/2009
14/09/2011
22/11/2013
31/01/2016
10/04/2018
SW1
SW2
SW3
SW4

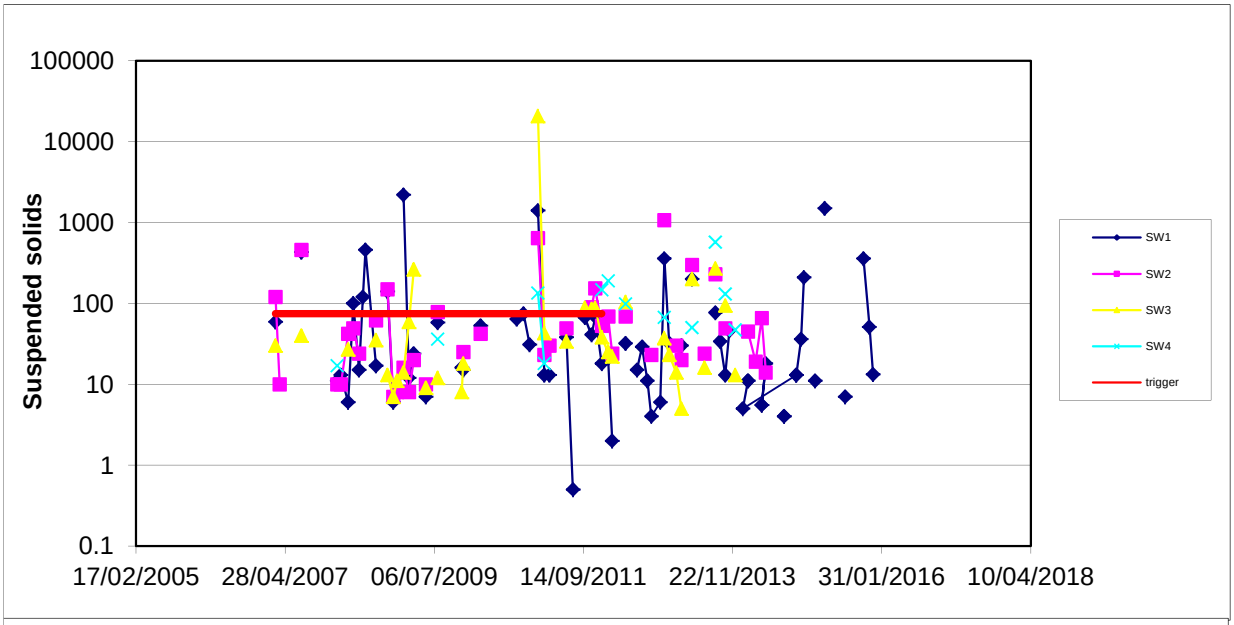

Freshwater EQS = 8 - 125 microg/l
(depending on hardness)
Zinc microg/l
900
800
700
600
500
400
300
200
100
0
17/02/2005
28/04/2007
06/07/2009
14/09/2011
22/11/2013
31/01/2016
10/04/2018
SW1
SW2
SW3
SW4

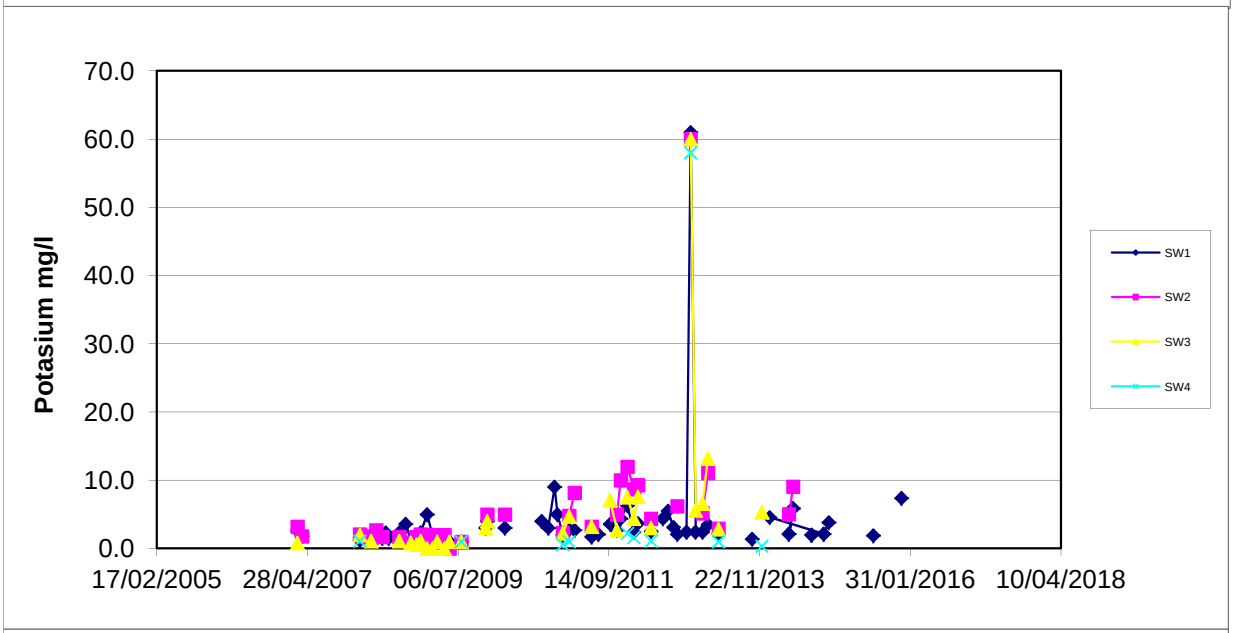

Hardness mg/l
800
700
600
500
400
300
200
100
0
17/02/2005
28/04/2007
06/07/2009
14/09/2011
22/11/2013
31/01/2016
10/04/2018
SW1
SW2
SW3
SW4

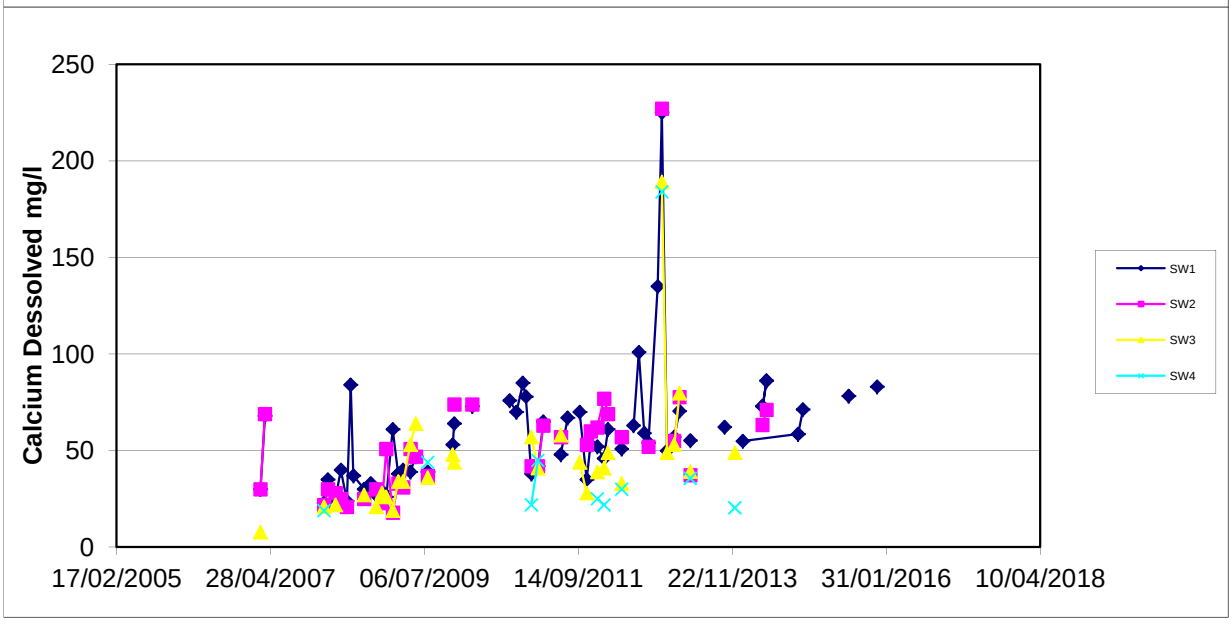

pH Field
9.5
9
8.5
8
7.5
7
6.5
6
5.5
5
17/02/2005
28/04/2007
06/07/2009
14/09/2011
22/11/2013
31/01/2016
10/04/2018
SW1
SW2
SW3
SW4

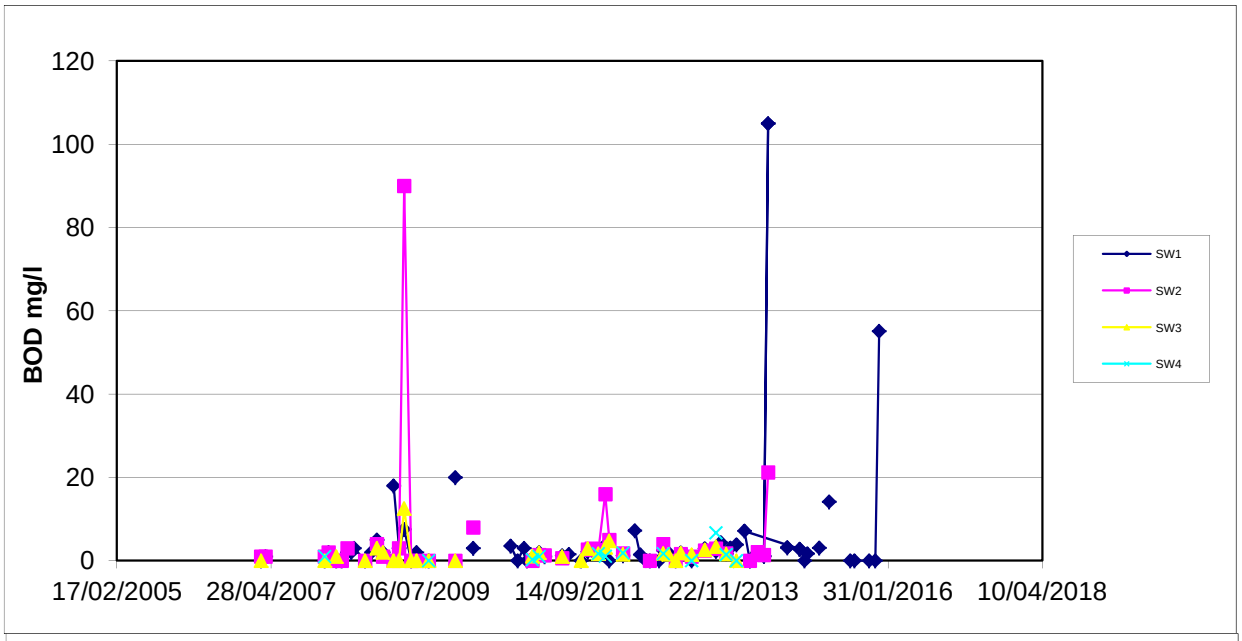

Alkalinity
450
400
350
300
250
200
150
100
50
0
17/02/2005
28/04/2007
06/07/2009
14/09/2011
22/11/2013
31/01/2016
10/04/2018
SW1
SW2
SW3
SW4

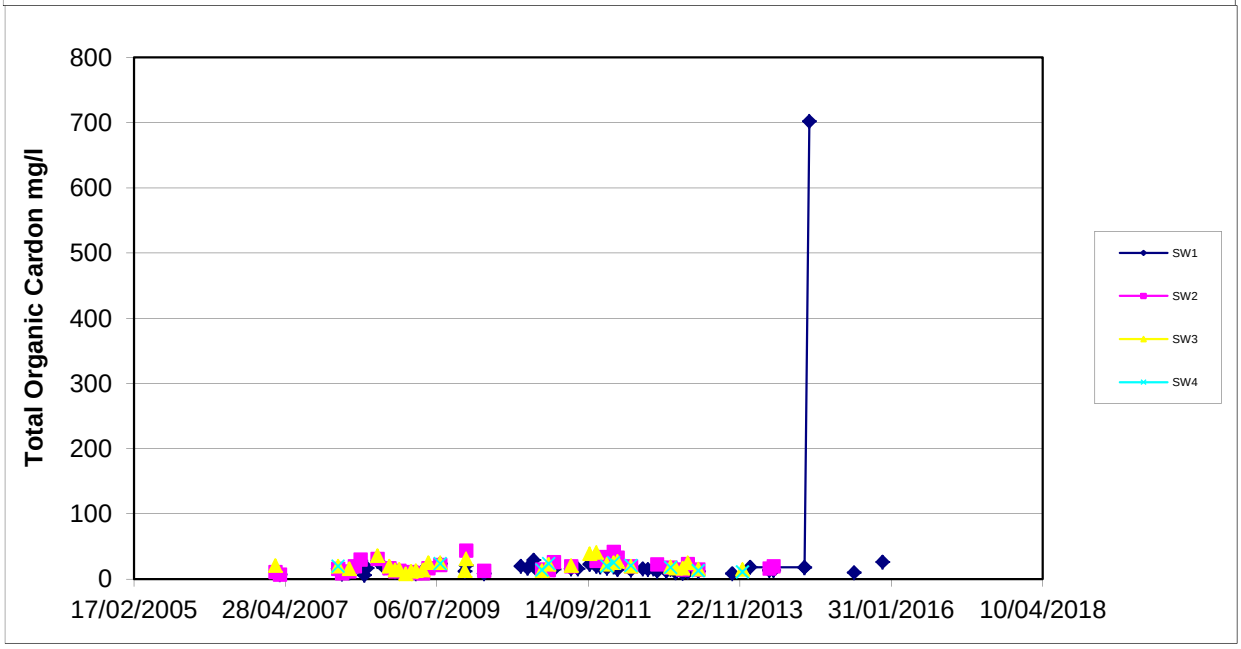

Conductivity Feild
900
800
700
600
500
400
300
200
100
0
17/02/2005
28/04/2007
06/07/2009
14/09/2011
22/11/2013
31/01/2016
10/04/2018
SW1
SW2
SW3
SW4
trigger


Suspended solids
100000
10000
1000
100
10
1
0.1
17/02/2005
28/04/2007
06/07/2009
14/09/2011
22/11/2013
31/01/2016
10/04/2018
SW1
SW2
SW3
SW4
trigger


Potasium mg/l
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
17/02/2005
28/04/2007
06/07/2009
14/09/2011
22/11/2013
31/01/2016
10/04/2018
SW1
SW2
SW3
SW4


Calcium Dessolved mg/l
250
200
150
100
50
0
17/02/2005
28/04/2007
06/07/2009
14/09/2011
22/11/2013
31/01/2016
10/04/2018
SW1
SW2
SW3
SW4


BOD mg/l
120
100
80
60
40
20
0
17/02/2005
28/04/2007
06/07/2009
14/09/2011
22/11/2013
31/01/2016
10/04/2018
SW1
SW2
SW3
SW4


Total Organic Cardon mg/l
800
700
600
500
400
300
200
100
0
17/02/2005
28/04/2007
06/07/2009
14/09/2011
22/11/2013
31/01/2016
10/04/2018
SW1
SW2
SW3
SW4

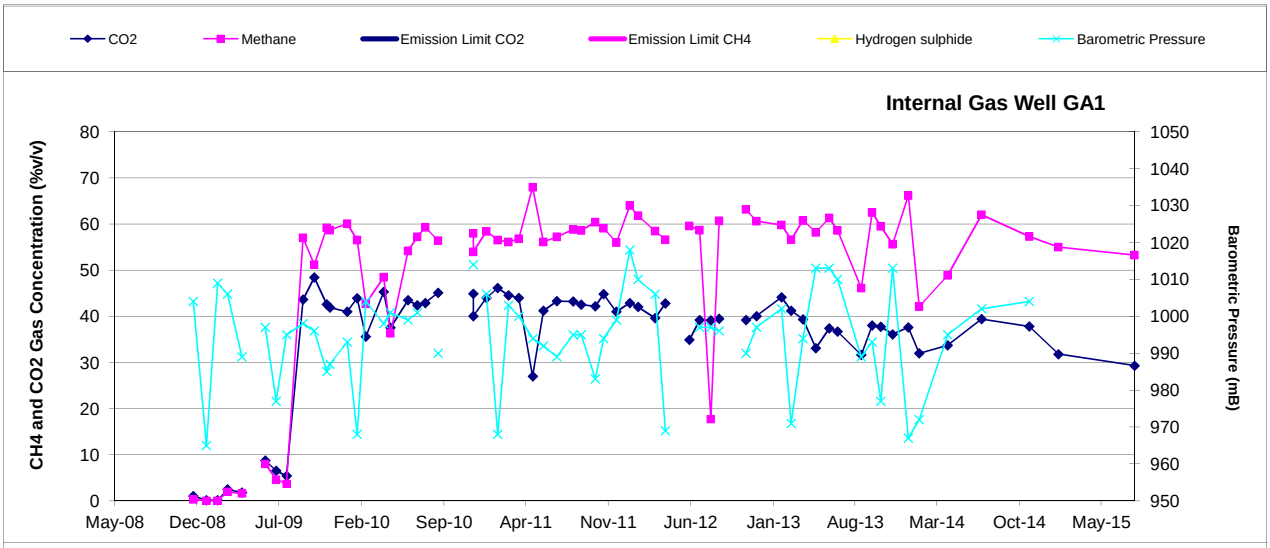
PALLEG LANDFILL
LOWER CWMTWRCH

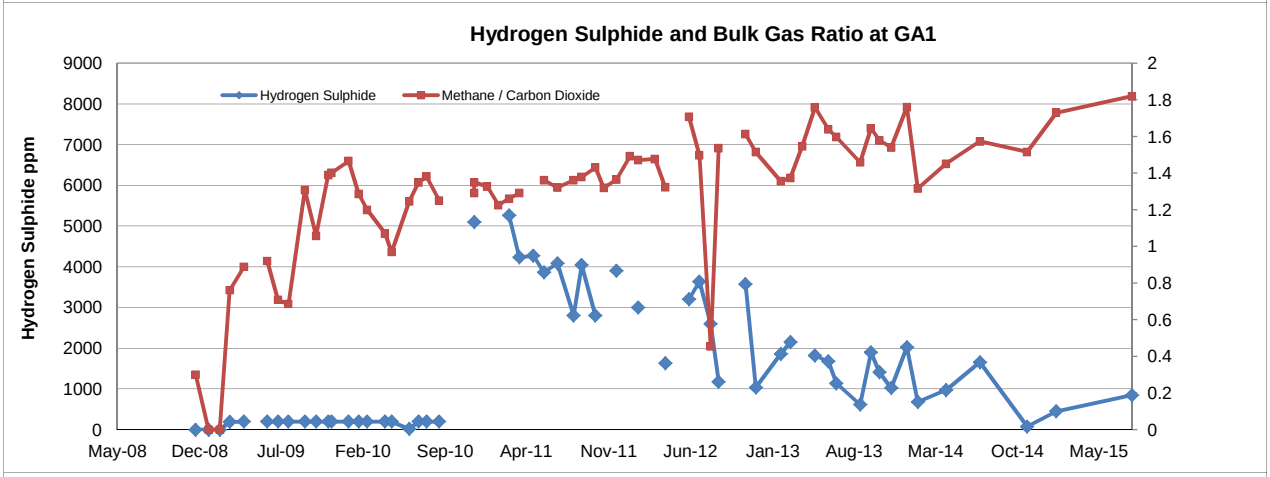
PERMIT BT19081X

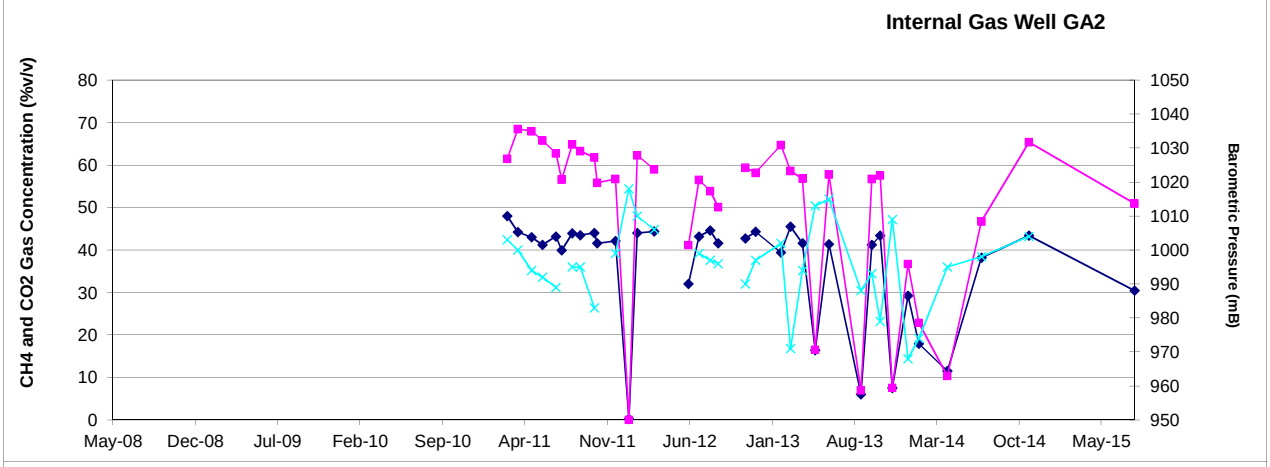
Review of 2015 Landfill Monitoring

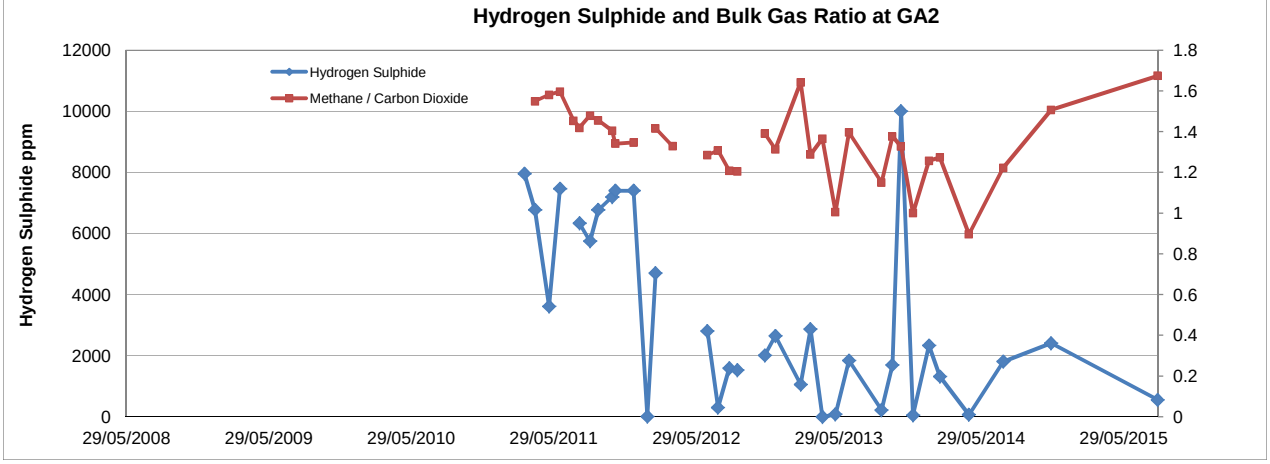
Appendix 6
Summary of Gas Monitoring Data

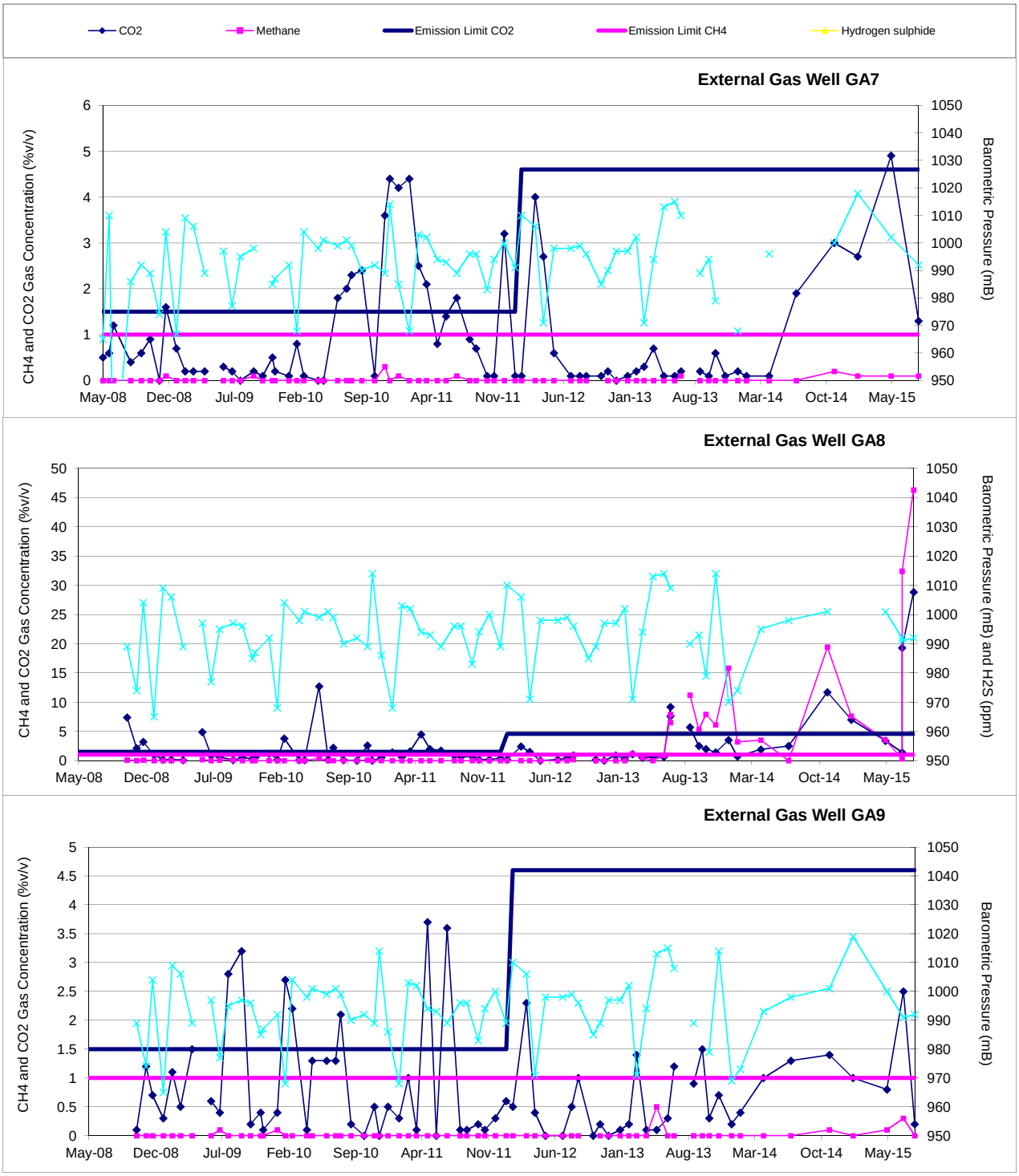
Report Number 1429r1v1d0116


CO2
Methane
Emission Limit CO2
Emission Limit CH4
Hydrogen sulphide
Barometric Pressure
Internal Gas Well GA1
CH4 and CO2 Gas Concentration (%v/v)
Barometric Pressure (mB)
May-08
Dec-08
Jul-09
Feb-10
Sep-10
Apr-11
Nov-11
Jun-12
Jan-13
Aug-13
Mar-14
Oct-14
May-15


Hydrogen Sulphide and Bulk Gas Ratio at GA1
Hydrogen Sulphide
Methane / Carbon Dioxide
Hydrogen Sulphide ppm
May-08
Dec-08
Jul-09
Feb-10
Sep-10
Apr-11
Nov-11
Jun-12
Jan-13
Aug-13
Mar-14
Oct-14
May-15


Internal Gas Well GA2
CH4 and CO2 Gas Concentration (%v/v)
Barometric Pressure (mB)
May-08
Dec-08
Jul-09
Feb-10
Sep-10
Apr-11
Nov-11
Jun-12
Jan-13
Aug-13
Mar-14
Oct-14
May-15


Hydrogen Sulphide and Bulk Gas Ratio at GA2
Hydrogen Sulphide
Methane / Carbon Dioxide
Hydrogen Sulphide ppm
29/05/2008
29/05/2009
29/05/2010
29/05/2011
29/05/2012
29/05/2013
29/05/2014
29/05/2015


CO2
Methane
Emission Limit CO2
Emission Limit CH4
Hydrogen sulphide
External Gas Well GA7
CH4 and CO2 Gas Concentration (%v/v)
Barometric Pressure (mB)
May-08
Dec-08
Jul-09
Feb-10
Sep-10
Apr-11
Nov-11
Jun-12
Jan-13
Aug-13
Mar-14
Oct-14
May-15
External Gas Well GA8
CH4 and CO2 Gas Concentration (%v/v)
Barometric Pressure (mB) and H2S (ppm)
External Gas Well GA9
CH4 and CO2 Gas Concentration (%v/v)
Barometric Pressure (mB)