MSD Brinny Groundwater Monitoring 2019 IEL

IEL Monitoring Round 1

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Quality information

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0	26 June 2019	Draft for review	Yes	Edel O'Hannelly	Principal Hydrogeologist
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said period of time. The scope of this Report and the services are accordingly factually limited by these circumstances. AECOM disclaim any undertaking or obligation to advise any person of any change in any matter affecting the Report, which may come or be brought to AECOM's attention after the date of the Report.

The site reconnaissance consisted of a general external inspection of the site aimed at identifying any obvious signs of geotechnical hazards and potential sources of ground contamination affecting the site. An environmental compliance audit and/or detailed structural inspection of existing buildings were outside the project brief. Similarly, the site visit excluded detailed consideration of the ecological or archaeological aspects of the site, and if such are believed to be of potential significance then it is recommended that specialist advice is sought.

Any risks identified in this Report are perceived risks, based on the information reviewed during the desk study and therefore partially based on conjecture from available information. The study is limited by the non-intrusive nature of the work and actual risks can only be assessed following a physical investigation of the site.

The investigation itself was designed generally to meet the objectives of an exploratory / main investigation, as defined by BS10175:2011 Investigation of Potentially Contaminated Sites: Code of Practice (BSI) (check - 10 to 25m centres for main phase of investigation; and 25 to 50m centres for exploratory phase investigations). As an exploratory/ main investigation, the results may not provide sufficient data to make detailed estimates of the quantities involved in any remediation work, if required.

The opinions expressed in this Report concerning any contamination found and the risks arising there from are based on current good practice simple statistical assessment and comparison with available soil guideline values, AECOM generic assessment criteria and other guidance values.

It should be noted that the effects of ground and water borne contamination on the environment are constantly under review, and authoritative guidance values are potentially subject to change. The conclusions presented herein are based on the guidance values available at the time this Report was prepared, however, no liability by AECOM can be accepted for the retrospective effects of any changes or amendments to these values.

Unless otherwise stated in this Report, the assessments made assume that the sites and facilities will continue to be used for their current purpose without significant changes.

Where assessments of works or costs identified in this Report are made, such assessments are based upon the information available at the time and where appropriate are subject to further investigations or information which may become available.

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Table of Contents

1. Introduction

1.1 Project Contractual Basis and Personnel

AECOM Ireland Limited (AECOM) is pleased to present this report on results for groundwater monitoring at the MSD facility in Brinny, Innishannon, Co. Cork (the site) conducted on 16 and 17 April 2019. This report has been prepared in accordance with AECOM proposal PR-399097-ACM-PL-EN-001, and authorised by Ms. Berniece Hanrahan, Senior EHS Specialist, MSD, Brinny under PO 8102722700.

The project has been managed from AECOM's Cork office, with:

- Project Director – Kevin Forde, Associate Director
- Project Manager – Edel O'Hannelly, Principal Hydrogeologist
- Fieldwork – Brendan McCarthy & Rebecca McGovern, Environmental Scientists

Groundwater analysis was conducted by Exova Jones Environmental Laboratory, UK (Exova). Additional analysis for trichloroacetic acid (TCA) is conducted annually and will be completed by i2 Analytical UK Limited (i2) in Round 2 2019. Both Exova and i2 are AECOM-approved laboratories.

1.2 Project Background

1.2.1 Summary of Monitoring

MSD Brinny has a network of groundwater monitoring wells located across the site, selected wells from this network are routinely sampled.

The site originally operated under an Integrated Pollution Prevention and Control (IPPC) licence (licence number P0005-02), issued by the Environmental Protection Agency (EPA). In December 2013 this was amended by the EPA to an Industrial Emissions Licence (IEL).

Under the terms of the site's IEL, the site is required to conduct groundwater monitoring on a biannual basis from seven wells: MW-1S, MW-1D, MW-2S, MW-3S, MW-3D, MW-4S and MW-4D (Condition 6 and Schedule C.6 of the licence).

1.2.2 Site Setting and History

The site is situated in County Cork, Ireland, 3.8 km north-west of Innishannon and 5.3 km north-east of Bandon, see Appendix A Figure 1; and comprises a bulk pharmaceutical manufacturing facility including large scale biologics fermentation, vaccine production, sterile manufacturing and quality control operations. The site is in two plots located to the north-east and south-west of local road L2235, see Appendix A Figure 2.

Prior to its development in the 1970s, land use at the site was agricultural, as is most current land use in the surrounding area, other than a sandstone quarry development (Kilmore Concrete Ltd) and modular building supplier (Spacecab Limited), both approximately 200 m west of the site. There are no other EPA licensed facilities located within a 1 km radius of the facility.

The site is situated at an elevation of between 20 m and 30 m above Ordnance Datum (OD) and land across the site slopes gently to the south-west toward the valley of the River Brinny, with a steep slope along the western site boundary.

The River Brinny flows past the western and southern site boundary, with an old mill race flowing at the base of the steep slope along the western and southern site boundary. The mill race joins the River Brinny south of the site.

The River Sall, which flows from west to east, also joins the River Brinny to the south of the site, just up-stream of Brinny Bridge; and the River Brinny continues to flow south-eastwards, joining the River Bandon 2.5 km down-stream. Surface water quality in the vicinity of the site is classified as *High*.

The site is underlain by made ground overlying glacial till, derived from sandstone and shale bedrock. Available drilling records for the site indicate that the shallow overburden composition varies from soft, silty clay to gravel, with the deeper overburden consisting of sand and gravel. The bedrock beneath is Carboniferous age sandstones, mudstones and dolomites.

Previous investigations at the site have classified the overburden into a shallow perched gravel aquifer and deeper sand and gravel aquifer, which are separated by a lower permeability silty/clay aquitard.

The deeper gravel unit is classed as a *Locally Important Aquifer (Lg)* while the bedrock aquifer is classed as *Locally Important Aquifer (Ll) – Bedrock which is moderately productive only in Local Zones*.

In addition to a number of supply wells in the general area, the site itself abstracts groundwater for all production and supply purposes on site. Groundwater is abstracted predominantly from the deeper sand and gravel aquifer, but some production wells extend down into the bedrock.

The generalised geologic sequence is:

- 0 – 2 m below ground level (bgl): made ground
- 2 – 5 m bgl: clayey, sandy gravel (perched aquifer)
- 5 – ~10 m bgl: sandy, gravelly, clay and silt (aquitard)
- ~10 m - ~22 m bgl: sand and gravel (with discontinuous silt and clay zones) (aquifer)
- Below ~22 m bgl: mudstone, sandstone and dolomite (bedrock aquifer)

Under natural gradient conditions, groundwater would be expected to mirror the topographic gradient and flow across the site to the west/south-west. Shallow groundwater in the perched aquifer generally appears to do this, and groundwater seepages from the base of the slope are seen. These seepages discharge to the mill race. Continuous groundwater abstraction from the deeper sand and gravel and bedrock aquifers does not appear to affect the direction of groundwater flow in the shallow perched aquifer.

Groundwater in the deeper sand and gravel aquifer is confined by the overlying aquitard, with the vertical hydraulic gradient downwards between the two gravel aquifers.

Groundwater abstraction from the deeper sand and gravel is understood to alternate between three production wells on an approximate 8-hour rotation. Groundwater level monitoring conducted in 2017 indicated that pumping is not continuous during an 8-hour period.

At any given time, groundwater flow in the deeper sand and gravel will converge on whichever well is actively pumping. Over the course of a day, the focus of groundwater flow in the deeper gravel changes depending on which production well is operational. Under natural gradient conditions, it is expected that groundwater in the deeper sand and gravel would discharge to the River Brinny.

Several phases of site investigation have been undertaken at the site. These have been conducted for various reasons, including:

1. Groundwater resource assessment through the installation of trial and abstraction wells;
2. Geotechnical investigations related to construction works on site; and
3. Installation of monitoring wells in the assessment of potential sources of contamination.

From available data, it appears that any historical contamination issues on site have been localised and/or of short duration.

An inventory of known wells installed across the site is presented in Appendix C. Monitoring well locations are illustrated in Appendix A Figure 3. An interpretation of available geological data is presented in the cross-section in Appendix A Figure 4.

1.3 Project Objectives

The main objectives of the 2019 groundwater monitoring programme are:

1. To maintain the site's compliance with groundwater monitoring obligations under the terms of IEL P0005-02.
2. To assess hydrogeological conditions beneath the site during each monitoring round, highlighting changes in the groundwater flow regime and chemistry.

1.4 Scope of Works

1.4.1 Rationale and Strategy

In 2019, IEL monitoring has continued on a biannual basis with samples analysed for parameters as required under the site's IEL.

The analytical schedule for 2019 is presented in Appendix B Table 1, with sample inventory for April 2019 (Round 1) in Appendix B Table 2.

1.4.2 Groundwater Sampling and Monitoring

All fieldwork was conducted under a site-specific Health, Safety and Environment Plan and in accordance with AECOM field procedures, which are based on USEPA and BS standards.

First, a dip round of depth to groundwater measurements was completed at all accessible wells on site. Total well depths were also recorded, to allow the degree of siltation within the well screen section of wells to be determined; and, for wells to be sampled, the volume of standing water in the wells to be calculated.

All dip measurements were taken using an interface probe, which is capable of distinguishing between water and non-aqueous phase liquids (NAPLs), which may accumulate at the top (floating) or base (sinking) of a monitoring well. Many organic liquids can be present as NAPLs in the pure phase; for example, fuel hydrocarbons can form a floating NAPL layer in a well, as they are less dense than water; whereas, chlorinated solvents can sink and accumulate at the base of wells, as they are denser than water.

Before sampling, each well was first purged of between three and five well volumes to ensure that a groundwater sample representative of the aquifer was collected for laboratory analysis.

The monitoring wells sampled are all equipped with dedicated sampling equipment. For some wells, this equipment is a bailer, while for others it is inertial-lift tubing and a foot valve. Bailers have been installed in those wells which have a limited water column and which tend to purge dry, due to the lower permeability of the aquifer material in which they are screened.

During Round 1 2019, some wells purged dry of groundwater before the requisite volume had been purged. In these wells, the water level was allowed to recover for a period of up to two hours before a groundwater sample was collected without further purging. If, within that two hour period, the groundwater level had not recovered sufficiently, then the well was deemed to have purged dry and no sample was collected.

Field measurements of water quality parameters were recorded using a calibrated meter and flow-through cell. Field measurements included pH, electrical conductivity, temperature, dissolved oxygen and redox potential.

To reduce the risk of cross-contamination between sampled wells, field staff wore single-use disposable nitrile gloves, which were changed between wells. Groundwater samples were collected into laboratory-supplied sample containers and were filtered and preserved in the field, as appropriate.

1.4.3 Laboratory Analysis

Laboratory analysis was conducted by Exova Jones Environmental Limited in Round 1 2019.

On-site and during transit to the laboratory, samples were stored in chilled cool-boxes. Sample identities and required analyses were logged on the Chain of Custody form which accompanied samples during transit to the laboratory. Laboratory certificates are presented in Appendix D.

The site is required to conduct biannual groundwater monitoring from seven wells (MW-1S to MW-4D) under Condition 6 of its IEL. On a biannual basis, groundwater samples are analysed for a suite of inorganic parameters (major ions and heavy metals), while additional analysis is conducted on an annual basis for priority substances. Analysis for most priority substances was conducted in April 2019 and, following the 2015 relevant hazardous substance review, have included volatile organic compounds (VOCs), total petroleum hydrocarbons (TPH), ethylene glycol, alcohols and acetates.

Analysis for trichloroacetic acid (TCA) is conducted annually and will be included in Round 2 2019, analysis will be performed by i2 Analytical.

It should be noted that there was insufficient water in wells MW-1S and MW-3S in Round 1 2019 and they were not sampled. From available historic results, it appears that well MW-1S is usually not sampled, indicating that it likely contains little or no groundwater; while MW-3S is dry on occasion. Both monitoring wells are shallow.

A full sample inventory is presented in Appendix B Table 2.

2. Results and Discussion of Monitoring Programme

2.1 Site Hydrogeology and Groundwater Flow

The site is underlain by the thick sequence of unconsolidated deposits overlying sandstone/shale bedrock. Monitoring wells are screened within the unconsolidated deposits, while production and trial wells are screened within both the deeper sand and gravel and bedrock. An inventory of wells is presented in Appendix C, together with available geological and well construction details from earlier reports and projects.

Depth to groundwater measurements from the dip round and corresponding groundwater elevations are presented in Appendix B Table 3; all accessible wells on site were dipped, i.e. not just those specified in the IEL. A groundwater contour map for the shallow perched aquifer is presented in Appendix A Figure 5, with that for the deeper aquifer in Appendix A Figure 6.

From the available data, the overall direction of groundwater flow in the shallow aquifer beneath the main site appears to be to the south-west toward the mill race. Groundwater elevations were higher than the previous two rounds in 2018 reflecting the recovery of general groundwater levels since the extremely dry summer months in 2018. Groundwater elevations for Round 1 2019 were in line with long term averages, see Appendix A Figure 7. The highest groundwater elevation was in well GMW12, with groundwater flow diverging from this to the south west across the main site and to the east across the car park. The horizontal hydraulic gradient appears to be 0.016, as estimated between wells GMW12 and MW-4S.

In the deeper aquifer, groundwater flow appears to flow to the south and south west towards well 653 in the centre of the site, however this well was reportedly not actively pumping at the time of the dip round. It is inferred that Well 653 was likely pumping shortly prior to the dip round, drawing groundwater radially towards it in the deeper aquifer. The horizontal hydraulic gradient estimated between wells BH01 and 653 is 0.009.

Available trends in groundwater elevations are presented in Appendix A Figures 7 and 8 for the shallow and deeper wells, respectively. For any given well, the annual range in groundwater elevations is generally less than 2 m. As can be seen in Figure 8, groundwater elevations in April 2019 were in line with long term average ranges for the deeper wells. Since September 2018, groundwater elevations have risen in many of the deeper aquifer monitoring wells.

Groundwater elevations for paired shallow and deep wells MW-1S/D, MW-3S/D, MW-4S/D, GMW4S/D, GMW5S/D and GMW10/7 are illustrated in Appendix A Figure 9. For most of these paired well installations, it can be seen that the vertical hydraulic gradient between the two aquifers is

downwards across the aquitard in Round 1 2019. For wells GMW4S/D and GMW5S/D the vertically downward hydraulic gradients are 0.18 and 0.17, respectively.

The only pairs of shallow and deep wells for which long-term (since 2006) groundwater elevations are available are MW-4S/D and GMW10/7.

Over the long term in MW-4S/D, the groundwater elevation is generally higher in the shallower well than in the deeper (downward hydraulic gradient). In Round 1 2019 an upward gradient of 0.04 was recorded. Slight upward hydraulic gradients have been observed in the past and generally range between 0.01 and 0.1. Downward hydraulic gradients are more common and range between 0.02 and 0.5.

For wells GMW10/7, the vertical hydraulic gradient is consistently downward. The large fluctuations in elevations during 2007 and 2008 are considered likely to be due to errors in data entry or recording on site, rather than actual fluctuations in elevation, given that groundwater elevations since 2008 have been much less variable.

2.2 Groundwater Results

Field observations and measurements are presented in Appendix B Table 3, with analytical results in Appendix B Table 4. Historic IEL monitoring data are presented in Appendix E, including trends for selected parameters over time.

Groundwater results have been compared to relevant published standards, including:

- IGV (Interim Guideline Values), published by the EPA in 2003. The IGVs represent negligible groundwater contamination and were developed using a number of existing water quality guidelines in use in Ireland, including existing national environmental quality standards, proposed common indicators for the groundwater directive, drinking water standards and Geological Survey of Ireland trigger values.
- GTV (Groundwater Threshold Values), were originally published in January 2010 (Statutory Instrument No. 9 of 2010) and amended in 2016 (SI No. 366 of 2016). Exceedance of a threshold value triggers further investigation to confirm whether the criteria for poor groundwater chemical status are being met.
- DWS (Drinking Water Standards), as published in SI No. 122 of 2014. While groundwater from the monitoring wells sampled is not used for potable supply, the groundwater abstraction wells at the site are used for both process and potable use.

2.2.1 Field Parameters

Field parameters are presented in Appendix B Table 3.

No NAPL, odour or sheen was observed in any of the monitoring wells.

Groundwater pH was close to neutral in most wells, ranging between 7.36 (MW-3D) and 7.89 (MW-4D). However, a higher pH was recorded for groundwater from MW-4S of 9.56. This is the highest pH reading recorded in groundwater from MW-4S since monitoring began. All other pH readings were within normal ranges.

Electrical conductivity readings ranged between 195 µS/cm (MW-4D) and 351 µS/cm (MW-4S), all readings were within previously reported ranges.

Groundwater temperature readings were generally above normal (10-12 °C) for Irish groundwater, ranging between 11.5 °C (MW-1D) and 14.6 °C (MW-3D), however the readings were within previously reported ranges for monitoring wells on the site.

There was a wide range in dissolved oxygen readings, ranging from 0.37 mg/L (MW-3D, indicative of oxygen deficient conditions) and 10.01 mg/L (MW-4S, indicative of aerated groundwater). However, well MW-4S was sampled with a bailer and this may explain the high dissolved oxygen reading.

Redox potential readings ranged between 349 mV (MW-1S) and 433 mV (MW-2S). Given the range in dissolved oxygen readings recorded, there would be expected to be a correspondingly marked

difference in redox potential readings. It is difficult to measure dissolved oxygen and redox potential accurately in the field, in particular, for those wells that are sampled with bailers and in which it is not possible to use a flow-through cell, such as MW-4S.

2.2.2 Laboratory Parameters

Results for laboratory parameters in Round 1 2019 are presented in Appendix B Table 4 and Appendix D, with historic results in Appendix E.

Major Ions

Concentrations were generally in line with those of previous monitoring rounds. Concentrations of nitrite, sulphate, sodium, fluoride, calcium, magnesium and total alkalinity did not exceed relevant screening criteria, where defined.

Potassium was detected in groundwater from all five wells sampled. The concentration in groundwater from well MW-2S (9.4 mg/L) exceeded the IGV of 5 mg/L (no DWS or GTV has been defined for potassium). Potassium concentrations in groundwater from all other wells were within their previously reported ranges and there does not appear to be long term increasing trends (see the trend graphs in Appendix E). The highest potassium concentration is detected in groundwater from well MW-2S, generally between 10 mg/L and 20 mg/L. This well is located close to the south-western site boundary.

Ammonia (reported as both equivalent nitrogen and ammonium concentrations) was above all screening thresholds in groundwater from well MW-3D (1.25 mg/L as nitrogen). Ammonia concentrations were low to non-detect in the remaining wells.

Compared to previous monitoring results, the ammoniacal-nitrogen concentration in groundwater from well MW-2S has been at the lower end of its reported concentration range since 2011. From 1995 to 2010, ammoniacal-nitrogen was typically detected between 0.5 mg/L and 3.0 mg/L in groundwater from MW-2S (see Appendix E), but has been below 0.3 mg/L since. Since 2013, the ammoniacal-nitrogen concentration in groundwater from MW-3D has been at the higher end of its range, close to 1.0 mg/L. A separate report has been prepared on the occurrence of ammonia in groundwater from MW-3D, AECOM report reference PR-289970-ACM-RP-EN-005 while letter PR-289970-ACM-LT-EN-003 was prepared in response to EPA request for information RI010452 in relation to ammonia in MW-3D.

Historically, the pattern of nitrate detections are generally the opposite of that seen for ammonia. Nitrate tends to be elevated in groundwater from those wells with little or no ammonia (MW-1D, MW-2S, MW-4S and MW-4D). Nitrate concentrations exceeded the IGV (25.0 mg/L) in groundwater from MW-1D (35.8 mg/L), MW-4S (27.8 mg/L) and MW-4D (30.6 mg/L), but these results did not exceed the GTV (37.5 mg/L) or the DWS (50 mg/L).

Phosphate (reported as equivalent phosphorous concentration) was detected in groundwater from four monitoring wells MW-2S (0.10 mg/L), MW-3D (0.03 mg/L), MW-4S (0.03 mg/L) and MW-4D (0.05 mg/L) with reported concentrations in MW-2S and MW-4D above the IGV (0.03 mg/L) and GTV (0.035 mg/L).

Phosphate concentrations were within previously reported ranges, see Appendix E. However, it is difficult to distinguish trends, as many concentrations between 2000 and 2012 were reported as 0.16 mg/L, which, it is suspected, may have been the laboratory reporting limit during that time.

Chloride concentrations ranged between 18.0 mg/L (MW-4S) and 46.4 mg/L (MW-3D). The IGV for chloride of 30.0 mg/L was exceeded in groundwater from wells MW-2S (34.6 mg/L), MW-3D (46.4 mg/L) and MW-4D (35.0 mg/L) but did not exceed the GTV (187 mg/L) or the DWS (250 mg/L). Chloride concentrations were within previously reported ranges and are relatively stable in groundwater from most of the MW-series monitoring wells. It is only in groundwater from MW-2S that chloride concentrations above 75 mg/L have been detected, with concentrations above 200 mg/L detected on occasion. However, all concentrations have been below 75 mg/L since March 2015.

Sodium concentrations follow a similar pattern. In Round 1 2019, sodium was detected between 10.5 mg/L (MW-4S) and 45.9 mg/L (MW-3D) in groundwater. The IGV for sodium is 150 mg/L. There is no GTV defined for sodium.

It is noted that concentrations of potassium, chloride and sodium in groundwater from MW-3D do not exceed relevant screening criteria.

COD

In Round 1 2019 COD was detected above the laboratory detection limit (7.0 mg/L) in groundwater from wells: MW-2S (8.0 mg/L) and MW-4S (11.0 mg/L). This is consistent with results of previous monitoring rounds.

Organics

No TPH, VOCs, alcohols or acetates were detected during Round 1 2019. TCA will be analysed Round 2 2019.

Metals

Arsenic, cadmium, chromium, copper, iron, lead and mercury were not detected above the laboratory detection limits.

Cobalt (0.003 mg/L at MW-3D), nickel (0.003 mg/L at MW-3D) and zinc (0.006 mg/L at MW-4S) were detected at low concentrations which did not exceed relevant screening criteria, where defined.

Dissolved manganese was detected above the IGV and DWS (both 0.05 mg/L) in groundwater from well MW-3D (4.702 mg/L). Dissolved manganese was also detected in groundwater from well MW-4D at a concentration of 0.008 mg/L. As in previous monitoring rounds, the dissolved oxygen in groundwater from well MW-3D was low, 0.37 mg/L, indicating slightly reducing conditions which are conducive to manganese entering into solution from common earth minerals and alteration of nitrogen species to ammonia.

2.3 CSM and Potential Pollutant Linkages

As noted in Section 1.2.2, the site is underlain by made ground overlying glacial till derived from sandstone and shales with bedrock aquifer present at least 22 m below ground. Shallow groundwater flow westward across the site and groundwater flow in the deeper sand and gravel converges on the active pumping in the central area of the site.

From available data, it appears that contamination issues on site have been localised and/or of short duration.

Potential pollutant linkages are considered viable where there is a source of contamination on site which can migrate via a defined pathway to identified receptors. Receptors can be either environmental or human, and located either within or outside the site boundary.

Sources

From a review of the site history, it appears that losses to ground from distinct events are limited to:

- Diesel in 2002
- Ethylene glycol in 2003
- Diesel in 2006

The ethylene glycol spill occurred in the vicinity of the fermentation building, and many of the GMW-series monitoring wells are located in this area. Ethylene glycol analysis was included for all wells sampled in April 2019. Ethylene glycol was not detected in groundwater in April 2019. Therefore, from available monitoring data, it appears that there is no on-going loss of ethylene glycol occurring and no residual impact from the loss that occurred in 2003. There is no recent source of ethylene glycol loss to ground.

The diesel losses which occurred appear to have been of limited volume and were addressed by shallow soil excavation to remove the source. While diesel (hydrocarbons, TPH) had not been included in the groundwater analytical suite at the site prior to May 2016, related parameters and constituents would have been detected as part of VOC and PAH analyses, which are conducted annually for all sampled wells (i.e. BTEX and certain PAH compounds). VOC and PAH results for

earlier monitoring rounds did not suggest the presence of diesel in groundwater. TPH analysis was included in Round 1 2019, and indicated that hydrocarbons were below detection in groundwater from all of the sampled wells. Therefore, it appears from available data that there is no residual source of diesel in ground impacting on groundwater at the site.

In Round 2 2019, samples will also be analysed for TCA. These organics are analysed on an annual basis.

The presence of elevated ammoniacal-nitrogen above relevant screening thresholds and higher concentrations of manganese and some major ions in groundwater from MW-3D since 2013 compared to other wells on site are considered in AECOM report reference PR-289970-ACM-RP-EN-005 and letter PR-289970-ACM-LT-EN-003 prepared in response to EPA RI010452.

Pathways

Losses to ground would migrate vertically downwards to the shallow perched aquifer. Contaminants in perched groundwater would then migrate with groundwater flow down hydraulic gradient.

It appears that perched groundwater flows to the south and west toward the mill race; indeed, seepages of shallow groundwater from the base of the slope between the site and the mill race have been observed historically. The mill race flows from north-west to south-east and joins the River Brinny further to the south-east of the site just up-stream of Brinny Bridge.

Although the vertical hydraulic gradient between the two aquifer units is downward across the lower permeability aquitard, it is considered unlikely that diesel, ethylene glycol or inorganics (major ions) would have impacted/impact the deeper gravel aquifer, as the aquitard provides protection and separates the two aquifer units. The primary groundwater flow path through the perched aquifer would likely follow the horizontal hydraulic gradient.

It is also noted that the three active production wells on site abstract groundwater from the deeper gravel aquifer. It is expected that, under active pumping conditions, the vertically downward hydraulic gradient across the aquitard would increase close to the active pumping well, which would locally increase leakage of groundwater from the perched aquifer to the deeper gravel aquifer.

Under natural gradient conditions, the direction of groundwater flow in the deeper gravel aquifer is expected to be to the south or south-west, i.e. toward the River Brinny. However, active pumping alters this, with each production well becoming the focus for groundwater flow when actively pumping. The three active production wells are located in the centre of the site:

- to the north of the purification building (654)
- to the north-east of the services building (651)
- immediately east of the operations building (653)

The zone of contribution was reassessed in early 2017 and an area of ~2.2 km^2 was conservatively delineated, extending from the River Brinny in the west to a local highpoint at Old Chapel Cross Roads in the north-east.

Receptors

The site uses groundwater for all water supply requirements on site. The three active production wells on site abstract groundwater, principally from the deeper gravel aquifer, but with a proportion of water also likely to come from deeper bedrock. As noted above, there is a vertically downward hydraulic gradient between the two aquifer units, which is likely to increase in the vicinity of an actively pumping well; however, the aquitard is considered to provide a protective hydraulic barrier between the two aquifer units.

Therefore, the receptors of groundwater from production wells (i.e. site staff using the water for potable supply) are not considered likely to be at risk from potential groundwater contamination in the shallow aquifer zone. It is understood that groundwater from the abstraction wells is sampled on a quarterly basis and analysed for a suite of drinking water parameters; no issue with the potable water quality has been reported since monitoring began.

The five off-site groundwater supply wells identified in the wider area either abstract water from bedrock, or the deeper gravel aquifer, and are beyond the Brinny River, which forms the local hydraulic low point. Therefore, consumption of groundwater from these wells is not considered to be a potential risk to off-site receptors.

The mill race, into which shallow groundwater from the perched aquifer discharges, joins the River Brinny to the south-east of the site, at a location which appears to be directly up-gradient of the surface water quality monitoring point at Brinny Bridge. Surface water quality at the 'Bridge West of Rockfort House' EPA monitoring location is classified as High Status (Q4-Q5). This is a slightly higher quality classification than the Q4 status which is registered for the EPA monitoring point up-stream of the site at the 'Bridge near Ballinacurra House' location. Therefore, water quality in the River Brinny improves slightly as it flows by the site, indicating that site operations are not having an adverse impact on surface water quality.

The elevated ammoniacal-nitrogen in groundwater from MW-3D appears to be a localised impact, as it is not affecting the quality of surface water in the adjacent River Brinny and the concentration of ammoniacal-nitrogen is lower in groundwater from other monitoring wells.

Water levels in well MW-1D have been monitored since November 2007 and have not shown any long-term changes in groundwater elevation as a result of changes to the abstraction regime at the site during that time, suggesting that the zone of contribution to the site's abstraction wells does not extend to the north-eastern edge of the site.

Summary

Current groundwater data indicate exceedances of relevant assessment criteria for a small number of parameters. These exceedances appear localised and there is no evidence of impact to the adjacent surface water courses; in fact, the quality rating of water in the River Brinny actually increases from up-stream to down-stream of the site.

3. Summary, Conclusions & Recommendations

3.1 Summary and Conclusions

The Round 1 2019 groundwater monitoring was conducted at the MSD Brinny facility from wells specified under the terms of the site's IEL. The analytical suite in Round 1 2019 included major ions, metals, TPH, VOCs, alcohols and acetates and glycols. Across all monitoring wells sampled in Round 1 2019, results were within ranges reported previously, where historic data are available for comparison, and do not indicate a deterioration in groundwater quality.

Higher ammoniacal-nitrogen concentrations have been detected in groundwater from well MW-3D since July 2013. A separate report and letter were prepared on the occurrence of ammonia in groundwater from MW-3D, AECOM report reference PR-289970-ACM-RP-EN-005 and letter PR-289970-ACM-LT-EN-003 in response to EPA RI010452.

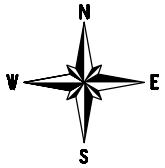
There are two unconsolidated aquifers beneath the site, a shallow perched gravel aquifer and a deeper sand and gravel aquifer. The deeper bedrock is also classified as an aquifer. The two gravel aquifer units are separated from each other by a lower permeability aquitard. The direction of groundwater flow in the perched aquifer is to the south and west toward the mill race. The site abstracts groundwater from the deeper gravel aquifer from three production wells, some of which also extend into the underlying bedrock aquifer. Under natural gradient conditions, the direction of groundwater flow in the deeper gravel aquifer would be to the south; however, prolonged groundwater abstraction has altered this, with groundwater flow focussing on active production wells when pumping. Long term monitoring indicates that these changes to the groundwater flow pattern in the deeper gravel aquifer due to pumping do not extend as far as the north-eastern site boundary (MW-1D).

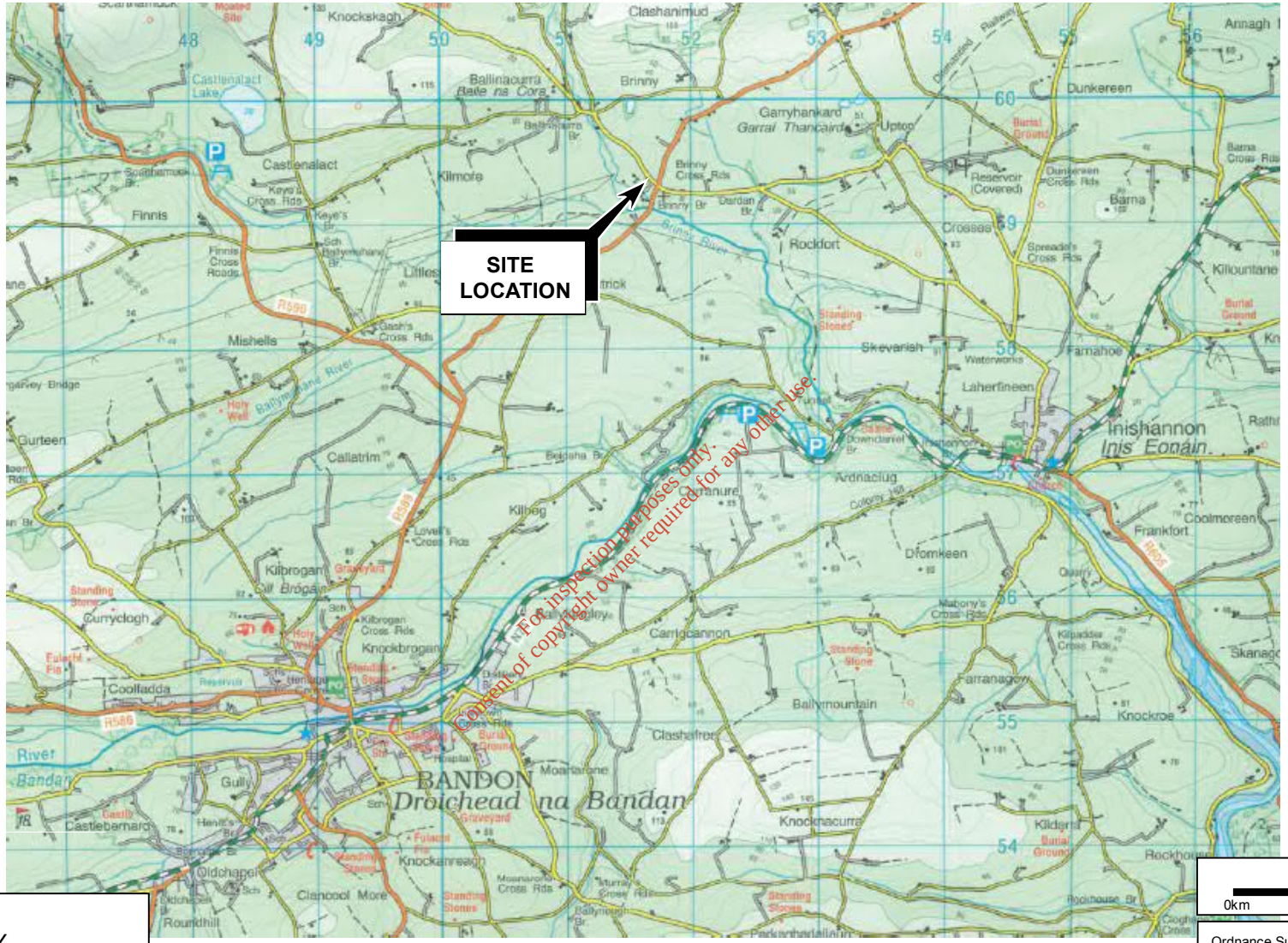
3.2 Recommended Way Forward

Continued monitoring in line with IEL requirements is recommended, analysis for the required substance TCA will be conducted in Round 2 2019.

Appendix A – Figures

North





APPROXIMATE SCALE

0km 1km 2km

CLIENT

MSD BRINNY

PROJECT

GROUNDWATER MONITORING 2019

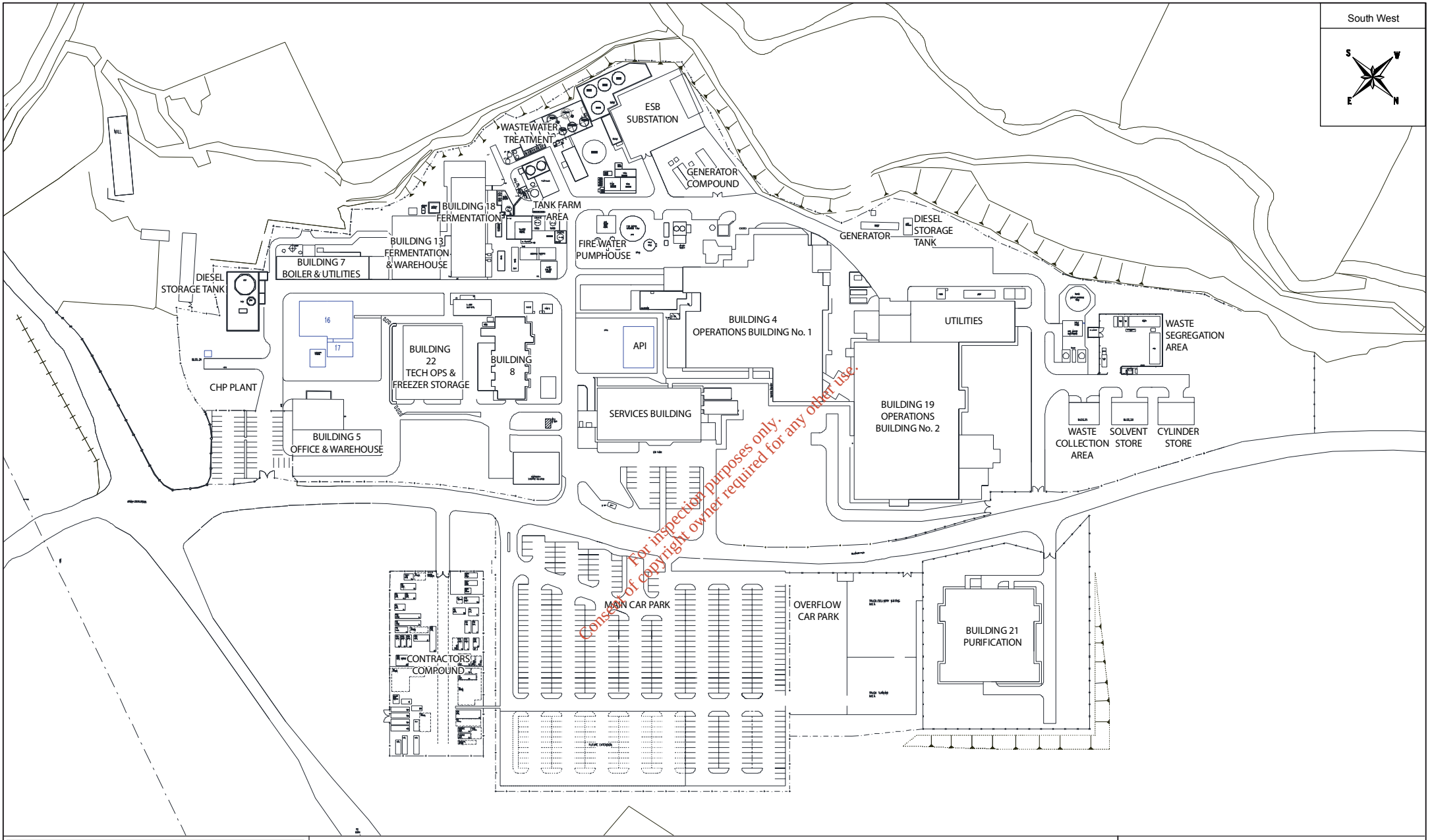
DRAWING TITLE

FIGURE 1_ SITE LOCATION PLAN

DRAWN	CHECKED	APPROVED	DATE
RMG	EO'H	KF	MAY 2019
SCALE	DRG NO		
AS SHOWN	PR-399097-ACM-RP-EN-001		

AECOM

1st Floor, Montrose House, Carrigaline Road, Douglas, Cork
Tel: +353 (0)21 436 5006
www.aecom.com



CLIENT
MSD BRINNY

PROJECT
GROUNDWATER MONITORING 2019

DRAWING TITLE
FIGURE 2_SITE LAYOUT PLAN

NOTES

APPROXIMATE SCALE
0m 50m

DRAWN	CHECKED	APPROVED	DATE
RMG	EO'H	KF/COR	MAY 2019

SCALE	DRG NO.
N.T.S	PR-399097-ACM-RP-EN-001

AECOM
1ST FLOOR, MONTROSE HOUSE, CARRIGALINE ROAD, DOUGLAS, CORK, IRELAND.
T : +353 (21)4365 006
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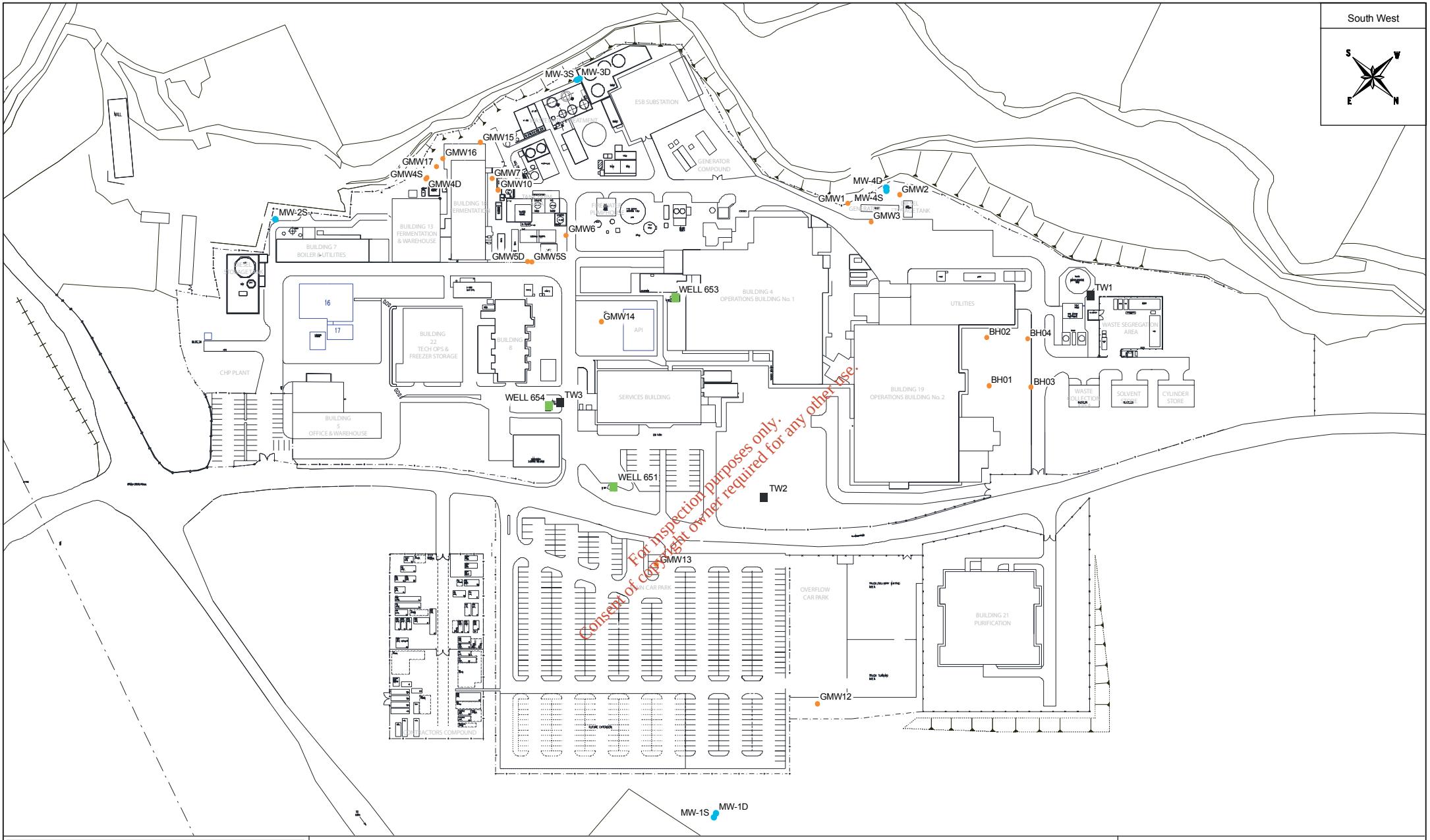

CLIENT
MSD BRINNY

PROJECT
GROUNDWATER MONITORING 2019

DRAWING TITLE
FIGURE 3_WELL LOCATIONS

NOTES
- Production Well
- Trial Well Location
- IEL Monitoring Well
- Additional Groundwater Monitoring Well

APPROXIMATE SCALE
0m 50m

DRAWN	CHECKED	APPROVED	DATE
RMG	EO'H	KF/COR	MAY 2019
SCALE	DRG NO.		
N.T.S	PR-399097-ACM-RP-EN-001		

AECOM
1ST FLOOR, MONTROSE HOUSE, CARRIGALINE ROAD, DOUGLAS, CORK, IRELAND.
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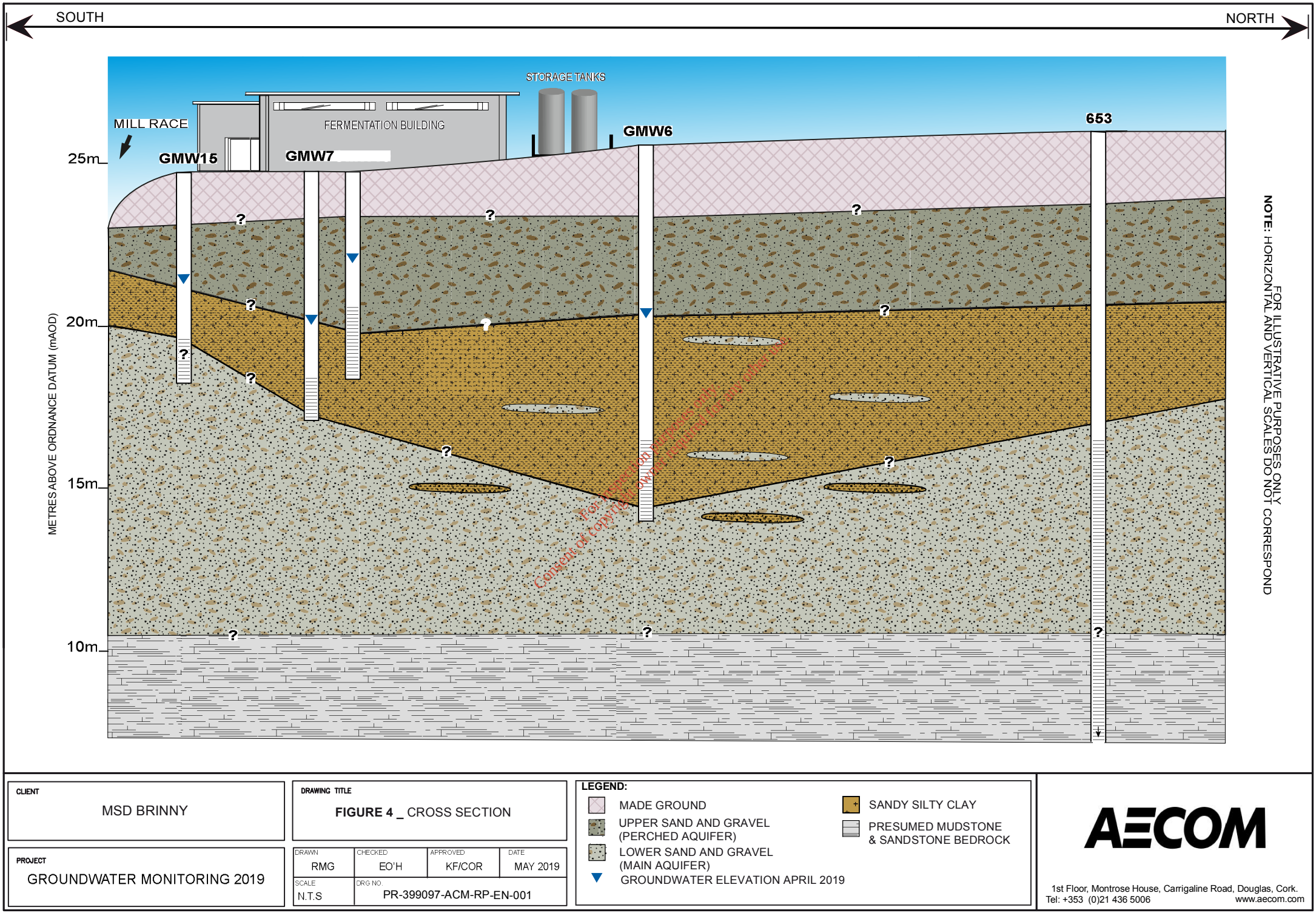

CLIENT
MSD BRINNY

DRAWING TITLE
FIGURE 4 _ CROSS SECTION

PROJECT
GROUNDWATER MONITORING 2019

DRAWN	CHECKED	APPROVED	DATE
RMG	EO'H	KF/COR	MAY 2019

SCALE	DRG NO.
N.T.S	PR-399097-ACM-RP-EN-001

AECOM
1st Floor, Montrose House, Carrigaline Road, Douglas, Cork.
Tel: +353 (0)21 436 5006
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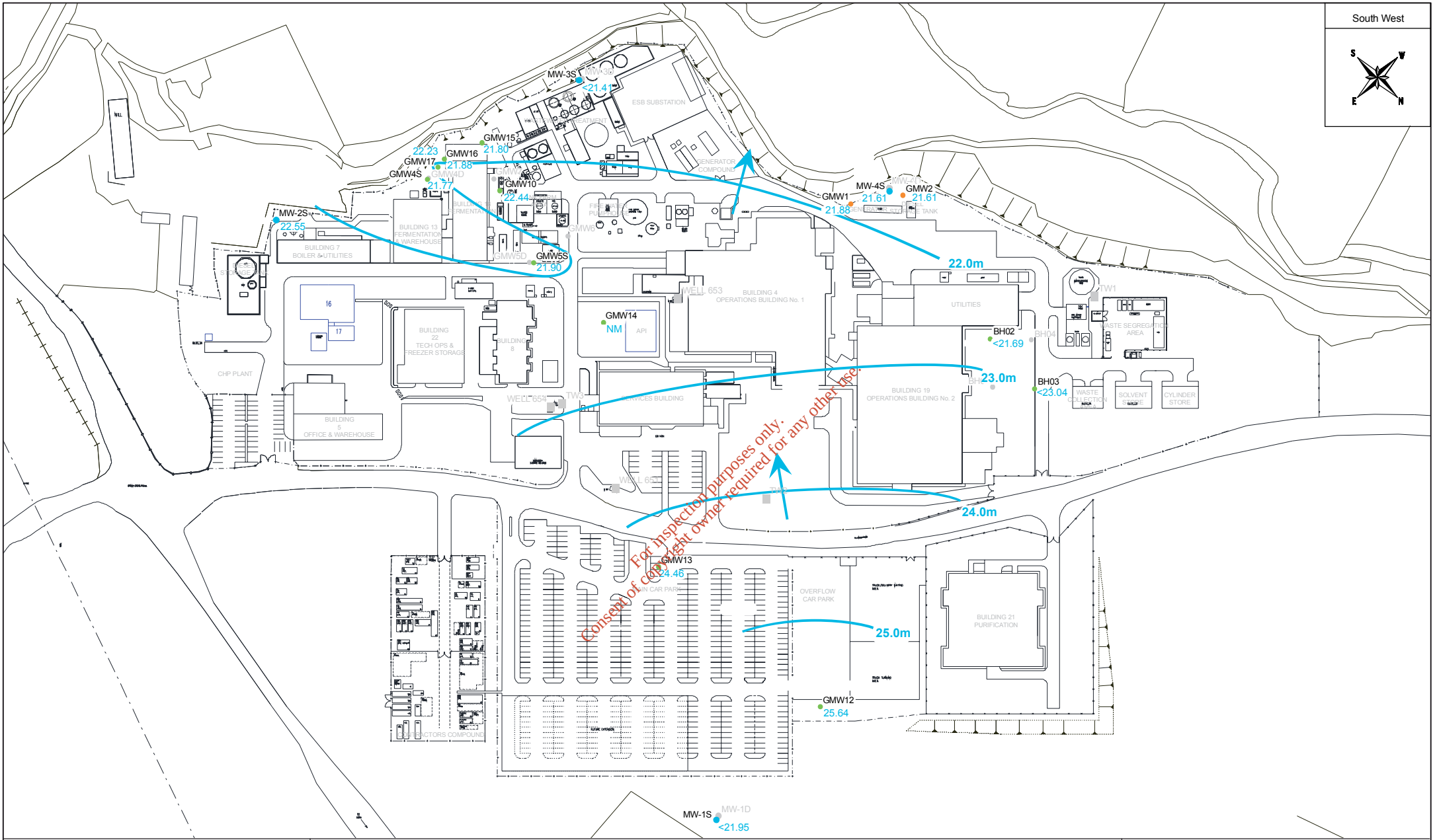

CLIENT	MSD BRINNY
PROJECT	GROUNDWATER MONITORING 2019
DRAWING TITLE	FIGURE 5_SHALLOW AQUIFER CONTOUR PLAN - APRIL 2019

NOTES

- Production Well
- TrialWell Location
- IEL Monitoring Well
- Additional Groundwater Monitoring Well
- Groundwater Monitoring Well in Deep Aquifer

24.11 Groundwater Elevation (m)

Inferred Groundwater Flow Direction

Groundwater Contour

Inferred Groundwater Contour

APPROXIMATE SCALE 0m 50m

DRAWN	CHECKED	APPROVED	DATE
RMG	EO'H	KF/COR	MAY 2019
SCALE	DRG NO.		
N.T.S	PR-399097-ACM-RP-EN-001		

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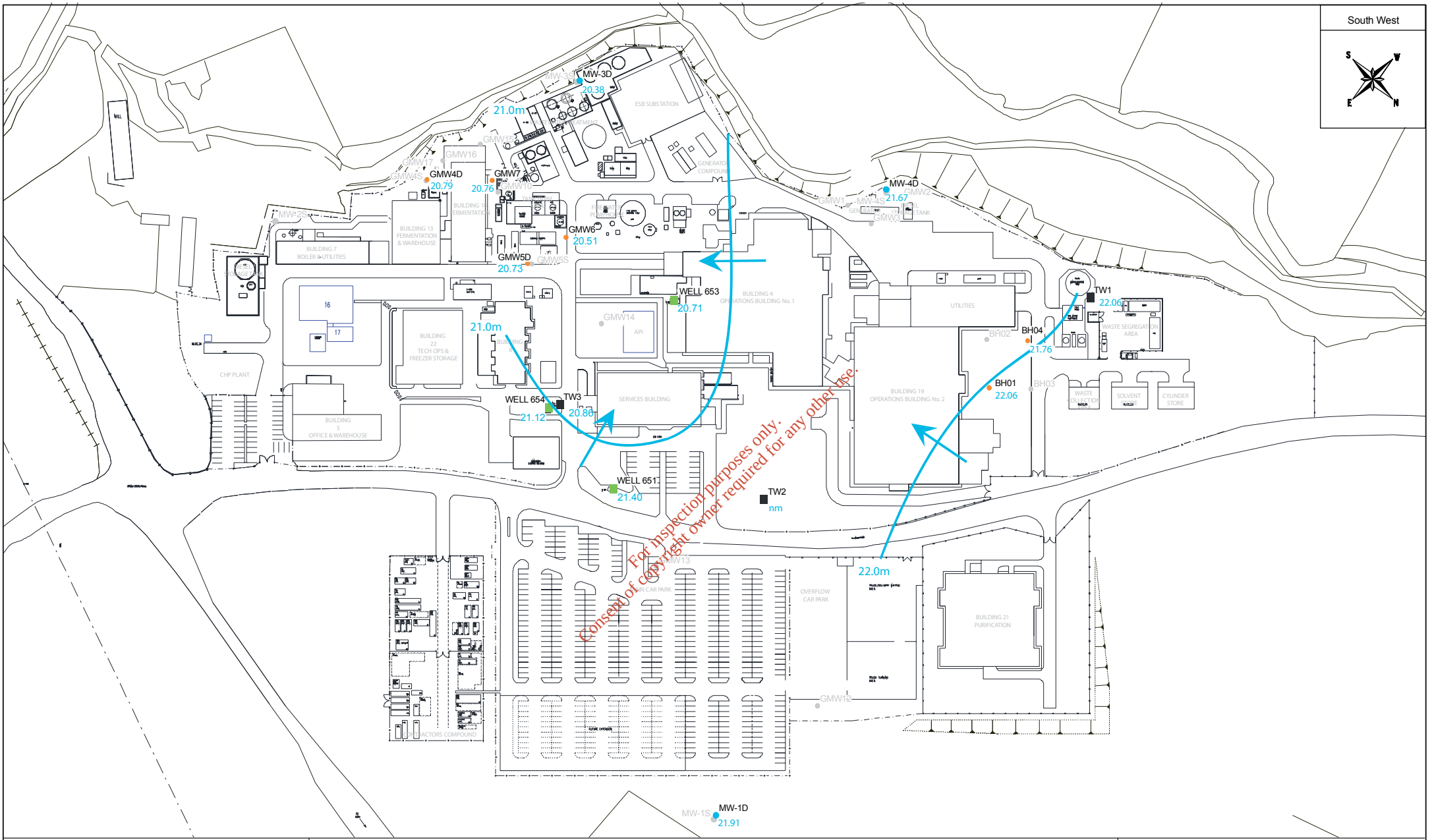

CLIENT
MSD BRINNY

PROJECT
GROUNDWATER MONITORING 2019

DRAWING TITLE
FIGURE 6_DEEP AQUIFER CONTOUR PLAN - APRIL 2019

NOTES

- Production Well
- TrialWell Location
- IEL Monitoring Well
- Additional Monitoring Well
- Groundwater Monitoring Well in Shallow Aquifer

- 21.91 Groundwater Elevation (m)
- nm Not Monitored
- Inferred Groundwater Flow Direction
- Groundwater Contour
- Inferred Groundwater Contour

APPROXIMATE SCALE
0m 50m

DRAWN	CHECKED	APPROVED	DATE
RMG	EO'H	KF/COR	MAY 2019

SCALE	DRG NO.
N.T.S	PR-399097-ACM-RP-EN-001

AECOM
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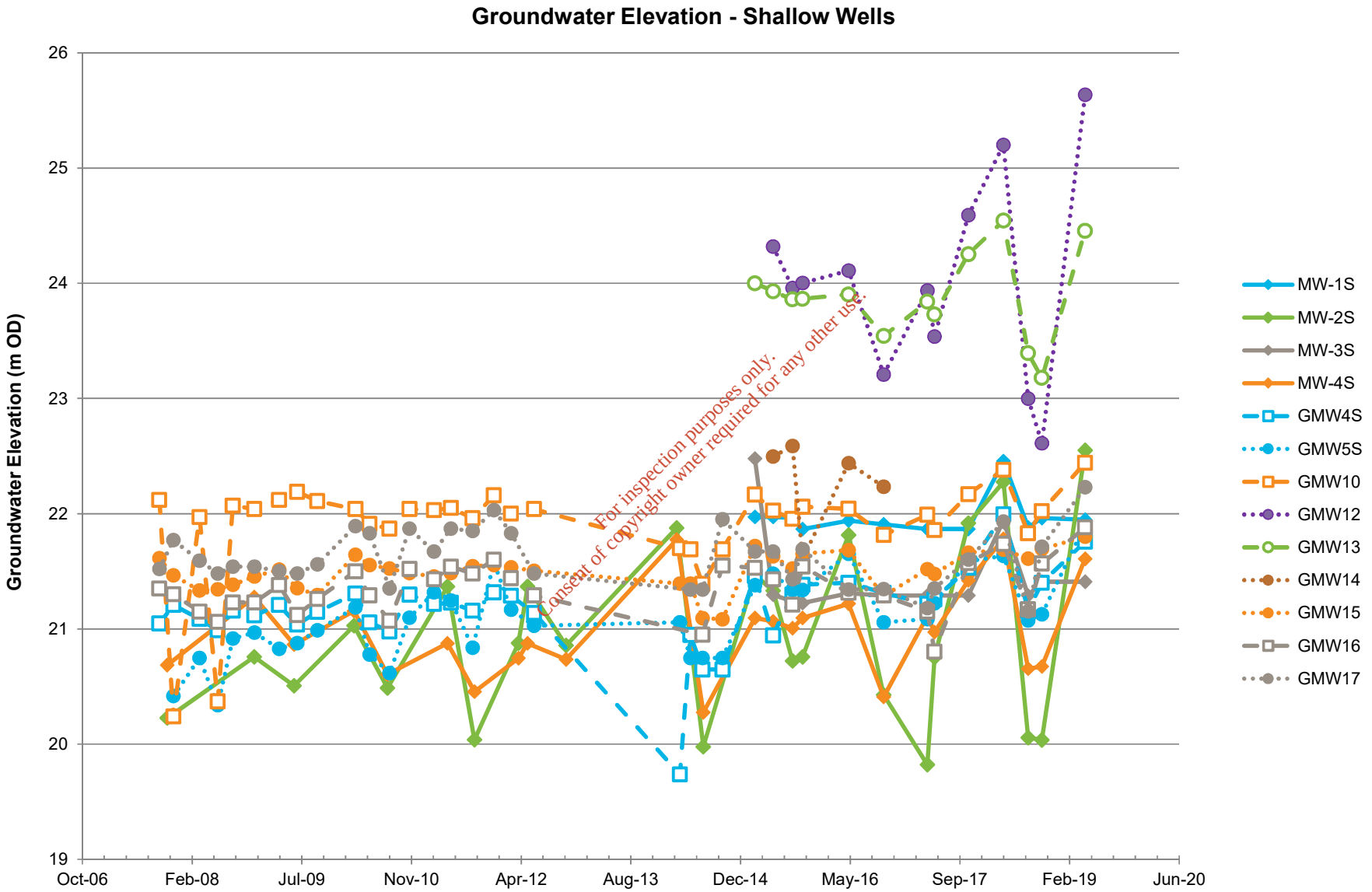
Figure 7



AECOM Ireland Limited

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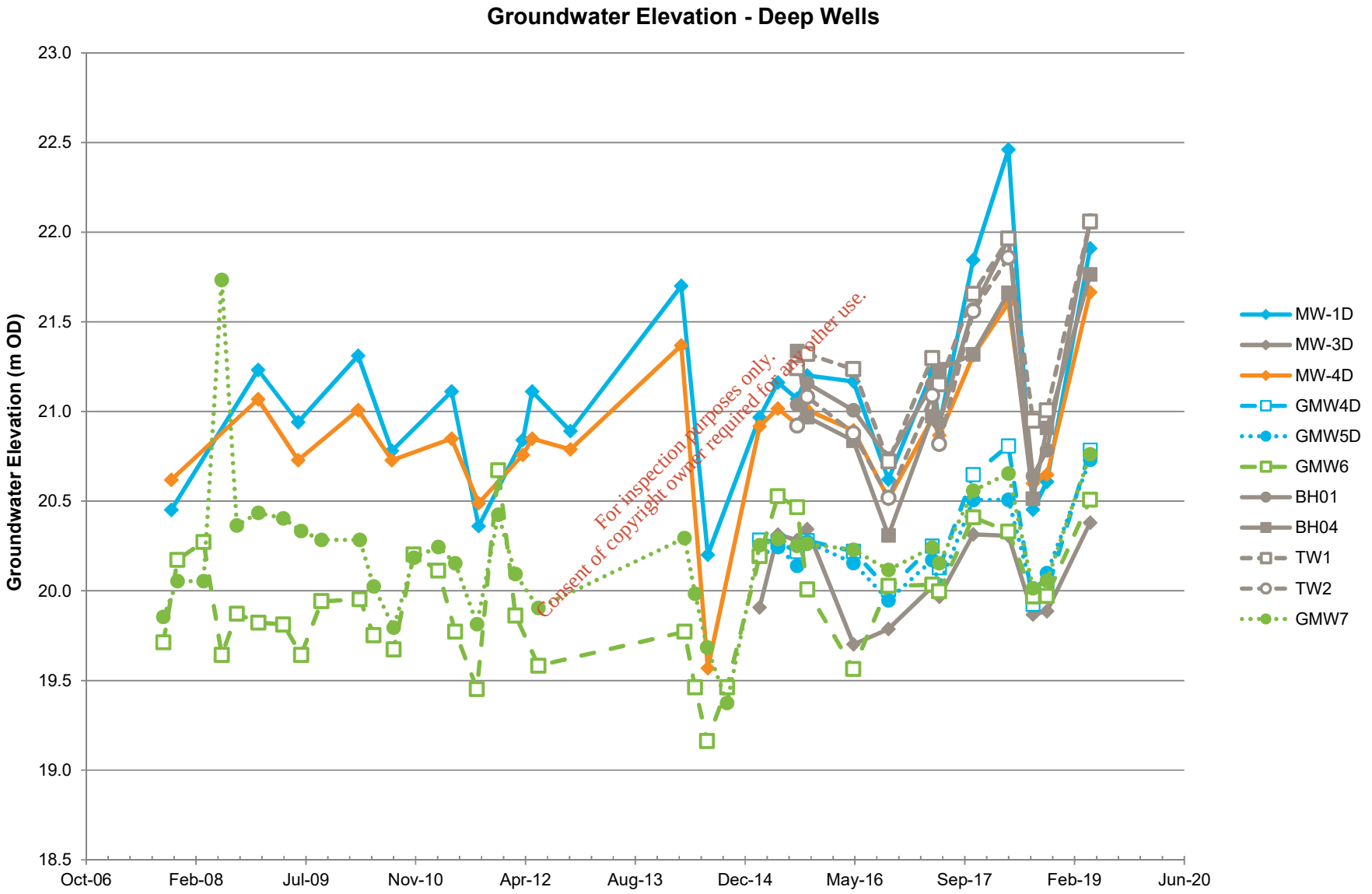
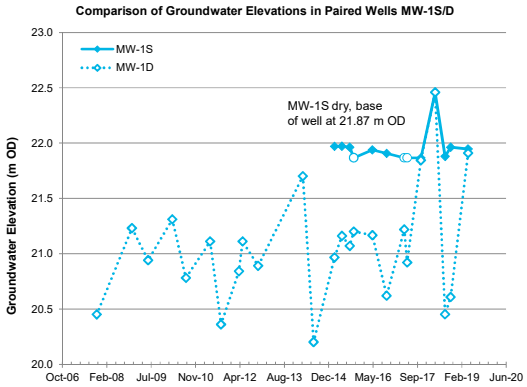
Figure 8

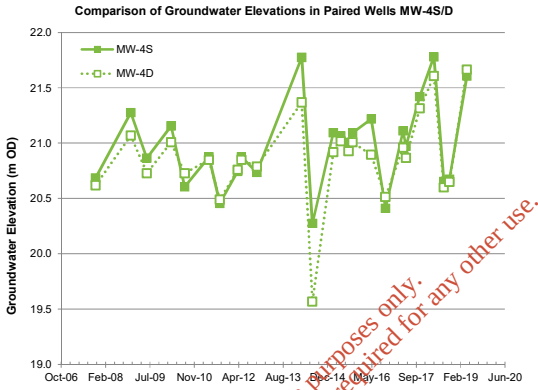


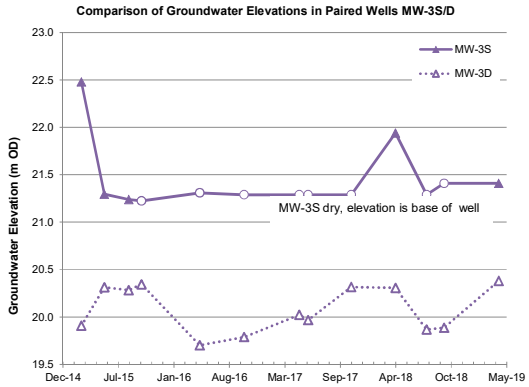
AECOM Ireland Limited

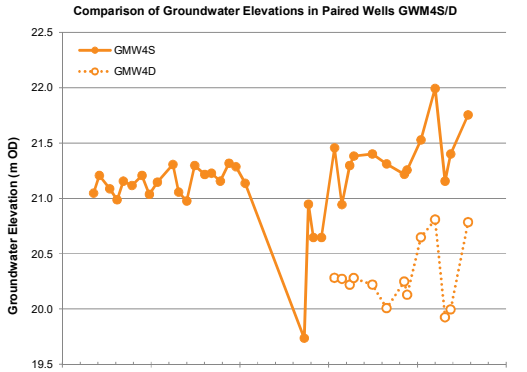
Z:\UKI\IEORK1\Jobs\PR-399097_MSD_Brinny_GWM_2019\400_Technical\430_TechnicalArea_X\Round 1 2019\Tables\PR-399097-ACM-RP-EN-001 App B.xlsx

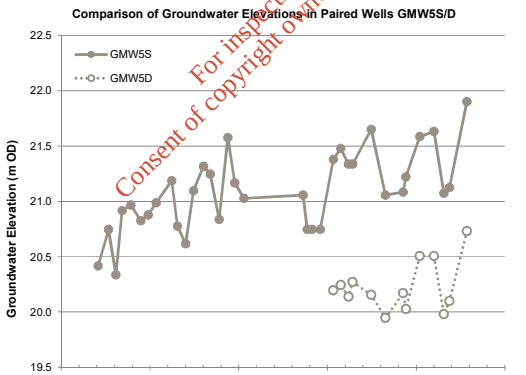
Figure 9

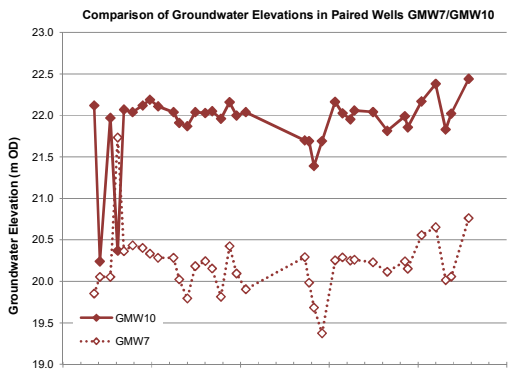












Appendix B – Tables

Table 1 - Analytical Schedule
MSD Brinny Groundwater Monitoring April 2019

Monitoring Well		IEL Parameter						Additional Parameter			
		Total Ammonia	Nitrate / Nitrite	Major Ions	Metals	VOCs	Alcohols & Acetates	TCA	TPH	Glycols	COD
IEL Wells	MW-1S	B	B	B	B	A	A	A	A	A	B
	MW-1D	B	B	B	B	A	A	A	A	A	B
	MW-2S	B	B	B	B	A	A	A	A	A	B
	MW-3S	B	B	B	B	A	A	A	A	A	B
	MW-3D	B	B	B	B	A	A	A	A	A	B
	MW-4S	B	B	B	B	A	A	A	A	A	B
	MW-4D	B	B	B	B	A	A	A	A	A	B

Notes:

Major Ions: chloride, phosphate, sulphate, fluoride, calcium, potassium, magnesium, manganese, nitrite, sodium and total alkalinity
Metals: arsenic, cadmium, chromium, cobalt, copper, lead, iron, nickel, manganese, mercury and zinc
VOCs: volatile organic compounds
TCA: trichloroacetic acid
TPH: total petroleum hydrocarbons (with aliphatic/aromatic speciation)
Alcohols & Acetates: including: methanol and ethanol
Glycols: including ethylene glycol
COD: chemical oxygen demand
B: sampled and analysed biannually
A: sampled and analysed annually

Table 2 - Sample Inventory
MSD Brinny Groundwater Monitoring, April 2019

Monitoring Well		IEL Parameter						Additional Parameter			
		Total Ammonia	Nitrate / Nitrite	Major Ions	Metals	VOCs	Alcohols & Acetates	TCA	TPH	Glycols	COD
IEL Wells	MW-1S	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
	MW-1D	X	X	X	X	X	X	na	X	X	X
	MW-2S	X	X	X	X	X	X	na	X	X	X
	MW-3S	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
	MW-3D	X	X	X	X	X	X	na	X	X	X
	MW-4S	X	X	X	X	X	X	na	X	X	X
	MW-4D	X	X	X	X	X	X	na	X	X	X

Notes:

Major Ions: chloride, phosphate, sulphate, fluoride, calcium, potassium, magnesium, manganese, nitrite, sodium and total alkalinity
Metals: arsenic, cadmium, chromium, cobalt, copper, lead, iron, nickel, manganese, mercury and zinc
VOCs: volatile organic compounds
TCA: trichloroacetic acid
TPH: total petroleum hydrocarbons (with aliphatic/aromatic speciation)
Alcohols & Acetates: including: acetone, methanol, ethanol and isopropanol
Glycols: including ethylene glycol
COD: chemical oxygen demand
ns: not sampled
X: scheduled for analysis
na: not scheduled for analysis

Table 3 - Field Observations
MSD Brinny Groundwater Monitoring, April 2019

Well		Year Installed	Total Depth			Screen Length	Siltation within Screen	Casing Elevation	Depth to Groundwater	Groundwater Elevation	pH	EC	Temperature	Dissolved Oxygen	Field ORP	Eh	LNAPL/ DNAPL Detected	Comments
			Drilled	Installed	Measured Oct-2018													
			m bgl	m bgl	m bct	m	%	m OD	m bct	m OD		µS/cm	°C	mg/L	mV	mV		
Production	PW2	1975	25.6	~	nf	~	~	~	~	~	~	~	~	~	~	~	~	~
	PW4	1975	20.2	~	nf	~	~	~	~	~	~	~	~	~	~	~	~	~
	3	1974	70.1	~	nf	~	~	~	~	~	~	~	~	~	~	~	~	~
	PW3	1975	26.5	~	nf	~	~	~	~	~	~	~	~	~	~	~	~	~
	651	Pre 1992	23.0	23.0	nm	10.0	~	25.735	4.332	21.403	~	~	~	~	~	~	No	Not Pumping
	653	Pre 1992	62.5	60.0	nm	50.0	~	26.704	5.993	20.711	~	~	~	~	~	~	No	Not Pumping
	654	1992	23.6	18.0	nm	6.0	~	25.059	3.935	21.124	~	~	~	~	~	~	No	Not Pumping
Trial or Unused Production	5	Pre 1982	~	~	nf	~	~	25.517	nf	~	~	~	~	~	~	~	~	Decommissioned in 2017
	PW6	1982	23.5	~	nf	~	~	~	~	~	~	~	~	~	~	~	~	~
	7	1974	64.0	~	nf	~	~	~	~	~	~	~	~	~	~	~	~	~
	8	1974	17.7	~	nf	~	~	~	~	~	~	~	~	~	~	~	~	~
	TW1	1992	22.0	~	20.30	~	~	27.301	5.242	22.059	~	~	~	~	~	~	No	~
	TW2	1992	85.0	~	23.92	~	~	27.101	5.630	~	~	~	~	~	~	~	No	Has been landscaped over and inaccessible, (Geomembrane and a number of cinder blocks)
	TW3	1992	17.8	~	16.13	~	~	25.033	4.176	20.857	~	~	~	~	~	~	No	~
IEL Monitoring	MW-1S	1991	~	6.0	6.19	~	~	28.137	6.190	21.947	nm	nm	nm	nm	nm	nm	No	Well went dry almost immediately
	MW-1D	1991	~	9.0	9.22	~	~	28.101	6.191	21.910	7.66	201	11.5	8.23	142	349	No	Slightly brown, NEC
	MW-2S	1991	~	5.9	6.17	~	~	24.877	2.328	22.549	7.70	312	13.9	4.72	228	433	No	Slightly cloudy brown, NEC
	MW-3S	2012	11.0	9.0	5.50	5.0	70%	26.909	5.171	<21.409	nm	nm	nm	nm	nm	nm	No	~
	MW-3D	2012	13.8	13.8	13.68	1.3	9%	26.877	6.497	20.380	7.36	310	14.6	0.37	160	364	No	Slightly cloudy brown, NEC
	MW-4S	1992	7.5	7.5	7.75	3.0	0%	26.975	5.368	21.607	9.56	351	13.0	10.01	209	414	No	Cloudy brown, NEC
	MW-4D	1992	12.0	12.0	11.05	3.0	32%	27.168	5.503	21.665	7.89	195	14.2	3.91	157	360	No	Cloudy brown, NEC
Site Investigation and Additional Monitoring	GMW1	2001	7.0	7.0	6.76	2.0	12%	27.210	5.335	21.875	~	~	~	~	~	~	No	~
	GMW2	2001	7.0	7.0	7.20	2.0	0%	27.048	5.441	21.607	~	~	~	~	~	~	No	~
	GMW3	2001	7.2	7.0	6.96	2.0	0%	~	6.301	~	~	~	~	~	~	~	No	~
	GMW4S	2003	8.5	8.5	7.85	3.0	22%	24.607	2.831	21.776	~	~	~	~	~	~	No	~
	GMW4D	2003	18.0	17.5	17.10	3.0	13%	25.059	4.274	20.785	~	~	~	~	~	~	No	~
	GMW5S	2003	8.0	8.0	6.65	3.0	45%	25.317	3.414	21.903	~	~	~	~	~	~	No	~
	GMW5D	2003	18.0	18.0	16.63	3.0	46%	25.292	4.561	20.731	~	~	~	~	~	~	No	~
	GMW6	2003	15.0	12.0	11.54	3.0	15%	25.562	5.054	20.508	~	~	~	~	~	~	No	~
	GMW7	2003	8.0	8.0	7.59	2.0	21%	24.554	3.793	20.761	~	~	~	~	~	~	No	~
	GMW10	2003	8.0	6.0	5.20	2.0	40%	24.740	2.299	22.441	~	~	~	~	~	~	No	~
	GMW12	Pre 2006	~	~	8.03	~	~	28.443	2.808	25.635	~	~	~	~	~	~	No	~
	GMW13	Pre 2006	~	~	6.73	~	~	27.410	2.955	24.455	~	~	~	~	~	~	No	~
	GMW14	Pre 2006	~	~	nf	~	~	26.358	nf	~	~	~	~	~	~	~	No	~
	GMW15	Pre 2006	~	~	6.25	~	~	24.744	2.943	21.801	~	~	~	~	~	~	No	~
	GMW16	Pre 2006	~	~	6.79	~	~	24.600	2.719	21.881	~	~	~	~	~	~	No	~
	GMW17	Pre 2006	~	~	5.02	~	~	24.691	2.462	22.229	~	~	~	~	~	~	No	~
	BH01	2009	16.1	13.0	11.93	3.0	36%	27.737	5.673	22.064	~	~	~	~	~	~	No	~
	BH02	2009	11.1	8.0	5.75	4.0	56%	27.443	5.821	<21.693	~	~	~	~	~	~	No	~
	BH03	2009	8.0	6.0	4.27	3.0	~	28.040	dry	<23.040	~	~	~	~	~	~	No	~
	BH04	2009	15.3	15.0	14.24	6.5	12%	27.474	5.710	21.764	~	~	~	~	~	~	No	~

Notes:

m OD - Metres to Ordnance Datum, as surveyed 20 August 2015
m bgl - Metres below ground level
m bct - Metres below casing top
nf - Not Found
Dip measurements were taken on 16 April 2019

µS/cm - Microsiemens per centimetre
°C - degrees Celsius
mg/L - milligrams per litre
mV - millivolts
ORP - oxidation-reduction potential

LNAPL - light non-aqueous phase liquid
DNAPL - dense non-aqueous phase liquid
NEC - no evidence of contamination
~ - No data
nm - not measured

WQM - Water quality meter

Table 4 - Monitoring Results
MSD Brinny IEL Groundwater Monitoring, April 2019

Screening Threshold	Major Ions													
	Ammonia-N	Ammonium	Nitrate-N	Nitrate as NO_3	Nitrite as NO_2	Phosphate-P	Chloride	Sulphate	Fluoride	Sodium	Potassium	Calcium	Magnesium	Total Alkalinity as $CaCO_3$
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
IGV	**0.12**	**0.15**	**5.6**	**25**	**0.1**	**0.03**	**30**	**200**	**1**	**150**	**5**	**200**	**50**	NAC
DWS	0.23	0.3	11.3	50	0.5	-	250	250	1.5	200	-	-	-	-
GTV	**0.175**	**0.225**	**8.5**	**37.5**	**0.375**	**0.035**	**187.5**	**187.5**	-	-	-	-	-	-
IEL Well ID														
MW-1D	<0.03	<0.039	**8.09**	**35.80**	<0.02	<0.02	29.40	10.0	<0.3	15.1	2.0	33.7	5.3	78
MW-2S	<0.03	<0.039	4.11	18.20	<0.02	**0.10**	**34.60**	21.1	<0.3	33.6	**9.4**	54.7	2.3	162
MW-3S														
MW-3D	**1.25**	**1.61**	0.52	2.30	<0.02	**0.03**	**46.40**	32.8	<0.3	45.9	4.0	31.9	7.3	130
MW-4S	<0.03	<0.039	**6.28**	**27.80**	<0.02	**0.03**	18.00	26.4	<0.3	10.5	1.9	49.3	5.6	118
MW-4D	0.10	0.13	**6.91**	**30.60**	<0.02	**0.05**	**35.00**	19.3	<0.3	34.1	0.8	15.0	2.7	56

Notes:

XXXXX Indicates result above interim guideline value (IGV)

XXXXX Indicates result above groundwater threshold value (GTV)

XXXXX Indicates result above IGV and GTV

Blank cell indicates no data

- indicates no screening threshold

< indicates result below reporting limit

NAC indicates no abnormal change

Table 4 - Monitoring Results
MSD Brinny IEL Groundwater Monitoring, April 2019

Screening Threshold	Organics and Field Measurements													
	VOCs	Alcohols & Acetates	Trichloroacetic Acid	Ethylene Glycol	Total Petroleum Hydrocarbons	COD	Electrical Conductivity		pH		Temperature	Depth to Groundwater	Groundwater Elevation	Total Depth
							µS/cm	µS/cm						
	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	Lab	Field	Lab	Field	°C	m bct	m OD	m bct
IGV	various	various	-	-	10	-	**1000**		**6.5**	**9.5**	**25**	-	-	-
DWS	various	various	-	-	-	-	2500		6.5	9.5	-	-	-	-
GTV	various	various	-	-	**10**	-	800	**1875**	-	-	-	-	-	-
IEL Well ID														
MW-1D	ND	ND		<10	<10	<7		201		7.7	11.5	6.19	21.91	9.22
MW-2S	ND	ND		<10	<10	8		312		7.7	13.9	2.33	22.55	6.17
MW-3S												5.17	<21.409	5.50
MW-3D	ND	ND		<10	<10	<7		310		7.4	14.6	6.50	20.38	13.68
MW-4S	ND	ND		<10	<10	11		351		**9.6**	13.0	5.37	21.61	7.75
MW-4D	ND	ND		<10	<10	<7		195		7.9	14.2	5.50	21.67	11.05

Notes:

XXXXX Indicates result above interim guideline value (IGV)

XXXXX Indicates result above groundwater threshold value (GTV)

XXXXX Indicates result above IGV and GTV

Blank cell indicates no data

- indicates no screening threshold

< indicates result below reporting limit

NAC indicates no abnormal change

Table 4 - Monitoring Results
MSD Brinny IEL Groundwater Monitoring, April 2019

Screening Threshold	Metals										
	Arsenic	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Zinc
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
IGV	**0.01**	**0.005**	**0.03**	-	**0.03**	**0.2**	**0.01**	**0.05**	**0.001**	**0.02**	**0.1**
DWS	0.01	0.005	0.05	-	2	0.2	0.01	0.05	0.001	0.02	-
GTV	**0.0075**	-	**0.0375**	-	**1.5**	-	**0.0075**	-	**0.00075**	**-**	**0.075**
IEL Well ID											
MW-1D	<0.0025	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	<0.002	<0.001	<0.002	<0.003
MW-2S	<0.0025	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	<0.002	<0.001	<0.002	<0.003
MW-3S											
MW-3D	<0.0025	<0.0005	<0.0015	0.003	<0.007	<0.02	<0.005	**4.702**	<0.001	0.003	<0.003
MW-4S	<0.0025	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	<0.002	<0.001	<0.002	0.006
MW-4D	<0.0025	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	0.008	<0.001	<0.002	<0.003

Notes:

XXXXX	Indicates result above interim guideline value (IGV)	Blank cell indicates no data
XXXXX	Indicates result above groundwater threshold value (GTV)	- indicates no screening threshold
XXXXX	Indicates result above IGV and GTV	< indicates result below reporting limit

Appendix C – Well Inventory and Available Geological and Well Construction Logs

Well		Year Installed	Year Decommissioned	Location Co-ordinate, as surveyed 21 August 2015		Elevation					Diameter		Total Depth			Screen Interval				Geological Unit	Yield	Hydraulic Conductivity	Well Condition	Sources of Information
						Ground		Casing			Borehole	Well	Drilled	Installed	Measured Apr-2019	Top		Base						
				Easting	Northing	m SD	m OD	m SD	m SD [6]	m OD	mm	mm	m bgl	m bgl	m bct	m bgl	m bct	m bgl	m bct		m^3/hr	m/d		
Production	PW2	1975	~	151630	59320	~	~	~	~	~	~	~	25.6	~	nf	~	~	~	~	Gravel, bedrock at 24 m bgl	61.4	~	Not found.	1, 12
	PW4	1975	~	151690	59290	~	~	~	~	~	~	~	20.2	~	nf	~	~	~	~	Gravel, bedrock at 18 m bgl	13.6	~	Not found.	1, 12
	3	1974	~	151660	59340	~	~	~	~	~	~	~	70.1	~	nf	~	~	~	~	Bedrock at 9.1 m bgl	22.7	~	Not found.	1, 12
	PW3	1975	~	151590	59290	~	~	~	~	~	~	~	26.5	~	nf	~	~	~	~	Bedrock at 24.5 m bgl	27.3	~	Not found.	1, 12
	651	Pre 1992	na	551549.71	559544.43	28.450	27.204	27.500	39.060	27.204	350	250	23.0	23.0	nm	13.0	~	23.0	~	Gravel and bedrock	39.5	80	Well located in pump house, sealed, upright headworks.	3, 4, 5, 6
	653	Pre 1992	na	551461.08	559509.14	29.050	26.574	29.300	40.030	26.574	350	250	62.5	60.0	nm	10.0	~	60.0	~	Gravel and bedrock	39.5	17	Well located in pump house, sealed, upright headworks.	3, 4, 5, 6
	654	1992	na	551538.85	559498.76	27.700	24.450	27.700	38.370	24.450	350	250	23.6	18.0	nm	12.0	~	18.0	~	Gravel, bedrock at 19 m bgl	39.5	60	Well located in pump house, sealed, upright headworks.	3, 4, 5, 6, 12
Trial or Unused Production	5	Pre 1982	na	~	~	28.25	~	28.25	38.58	25.517	~	~	~	~	nf	~	~	~	~	Gravel and bedrock	~	~	Well decommissioned in 2017	1, 4, 6
	PW6	1982	~	151520	59450	~	~	~	~	~	~	~	23.5	~	nf	~	~	~	~	Gravel	67.0	50	Not found.	1, 12
	7	1974	~	151620	59290	~	~	~	~	~	~	~	64.0	~	nf	~	~	~	~	Gravel and bedrock, bedrock at 9.1 mbgl	2.3	50	Not found.	1, 12
	8	1974	~	151630	59450	~	~	~	~	~	~	~	17.7	~	nf	~	~	~	~	Gravel, bedrock at 14 m bgl	1.2	~	Not found.	1, 12
	TW1	1992	na	551334.59	559663.06	~	27.414	~	~	27.301	~	150	22.0	~	20.300	~	~	~	~	Bedrock at 20 m bgl	2.0	~	Upright cover. Lacth is loose and will need to be repaired.	5, 12
	TW2	1992	na	551509.04	559602.39	~	~	~	~	27.101	~	~	85.0	~	23.92	~	~	~	~	Bedrock at 23.5 m bgl	30.3	~	Needs to be re-surveyed in, well not at same height as previous monitoring rounds.	5, 12
	TW3	1992	na	551534.59	559499.43	~	~	~	~	~	~	~	17.8	~	16.130	~	~	~	~	Bedrock at 17 m bgl	38.5	~	Locked, upright cover, good condition.	5, 12
IEL Monitoring	MW-1S	1991	na	551643.10	559681.20	27.908	28.058	28.228	41.440	28.137	~	50	~	6.0	6.190	~	~	~	~	~	~	~	Locked, labelled as 1D on upright cover.	2, 6, 8
	MW-1D	1991	na	551642.38	559681.00	27.903	28.058	28.273	41.410	28.101	~	50	~	9.0	9.220	~	~	~	~	~	~	~	Locked, labelled as 1S on upright cover, good condition.	2, 6, 8
	MW-2S	1991	na	551553.65	559337.24	24.771	24.891	24.885	37.900	24.877	~	50	~	5.9	6.170	~	~	~	~	~	~	~	Labelled upright cover, no lock hole.	2, 6, 8
	MW-3S	1991	2012	151441	59342	26.049	~	26.331	39.300	~	~	50	~	5.9	~	~	~	~	~	~	~	~	Labelled, upright cover, good condition. PVC bailer installed.	2, 6, 7, 8
		2012	na	551409.95	559406.97	~	26.871	~	~	26.909	150	50	11.0	9.0	5.500	4.0	~	9.0	~	Sandy silt and clay	~	~		7
	MW-3D	1991	2012	151441	59342	26.067	~	26.232	39.160	~	~	50	~	9.1	~	~	~	~	~	~	~	~	Upright cover, good condition.	2, 6, 7, 8
		2012	na	551408.74	559407.47	~	26.865	~	~	26.877	150	50	13.8	13.8	13.680	12.5	~	13.8	~	Gravel	~	~		7
	MW-4S	1992	na	551356.88	559555.00	27.027	27.177	27.217	40.000	26.975	200	50	7.5	7.5	7.730	4.5	4.69	7.5	7.69	Silty sand	~	~	Locked, labelled upright cover, good condition.	2, 6
	MW-4D	1992	na	551356.48	559554.66	27.020	27.177	27.210	40.200	27.168	200	50	12.0	12.0	11.050	9.0	9.19	12.0	12.19	Gravel	~	~	Locked, labelled upright cover, good condition.	2, 6
Site Investigation and Additional Monitoring	GMW1	2001	na	551373.80	559544.91	28.940	27.073	29.190	~	27.210	200	50	7.0	7.0	6.760	5.0	~	7.0	~	Silty sand	~	~	Upright cover, good condition. No lock.	3
	GMW2	2001	na	551354.97	559561.61	28.880	27.216	28.900	~	27.048	200	50	7.0	7.0	7.200	5.0	~	7.0	~	Silty sand	~	~	Upright cover, good condition. No lock.	3
	GMW3	2001	na	~	~	28.850	~	28.760	~	~	200	50	7.2	7.0	6.960	5.0	~	7.0	~	Silty sand	~	~	Flush cover, no label, chamber filled with mud, no lock.	3
	GMW4S	2003	na	551492.88	559380.67	27.740	24.886	27.440	37.630	24.607	150	50	8.5	8.5	7.850	5.5	5.20	8.5	8.20	Sand, silt and clay	~	~	Locked, labelled upright cover, good condition.	4, 6
	GMW4D	2003	na	551492.16	559380.87	27.740	24.879	27.350	37.670	25.059	150	50	18.0	17.5	17.100	14.5	14.11	17.5	17.11	Sandy gravel	~	~	Locked, labelled upright cover, good condition.	4, 6
	GMW5S	2003	na	551491.73	559445.30	27.980	25.235	28.150	38.700	25.317	150	50	8.0	8.0	6.650	5.0	5.17	8.0	8.17	Sand, silt and clay	~	~	Locked, labelled upright cover, good condition.	4, 6
	GMW5D	2003	na	551492.63	559443.97	27.980	25.164	28.120	38.670	25.292	150	50	18.0	18.0	16.630	15.0	15.14	18.0	18.14	Sandy gravel	~	~	Labelled upright cover, good condition.	4, 6
	GMW6	2003	na	551471.51	559450.04	28.360	25.620	28.400	38.870	25.562	150	50	15.0	12.0	11.540	9.0	9.04	12.0	12.04	Sand, silt and clay and sandy gravel	~	~	Locked, labelled upright cover, good condition.	4, 6
	GMW7	2003	na	551472.41	559405.20	27.700	24.654	27.700	37.580	24.554	100	50	8.0	8.0	7.590	6.0	~	8.0	~	Boulder clay	~	~	Locked, labelled upright cover, good condition.	6, 8, 9
	GMW8	2003	2004	~	~	27.700	~	27.715	~	~	100	50	8.0	8.0	~	6.0	~	8.0	~	Boulder clay	~	~	Well decommissioned.	8, 9
	GMW9	2003	2004	~	~	27.700	~	27.710	~	~	100	50	8.0	8.0	~	6.0	~	8.0	~	Boulder clay	~	~	Well decommissioned.	8, 9
	GMW10	2003	na	551475.09	559411.06	27.700	24.734	27.720	37.590	24.740	150	50	8.0	6.0	5.200	4.0	~	6.0	~	Silty sand	~	~	Labelled upright cover, good condition. PVC bailer installed.	6, 8, 9
	GMW11	2003	2004	~	~	27.700	~	27.710	~	~	150	50	8.0	8.0	~	6.0	~	8.0	~	Sand	~	~	Well decommissioned.	8, 9
	GMW12	Pre July 2004	na	551569.91	559685.71	~	28.368	~	41.740	28.443	~	~	~	~	8.030	~	~	~	~	~	~	~	Labelled upright cover, good condition. No lock.	6
	GMW13	Pre July 2004	na	551567.06	559583.00	~	27.325	~	40.720	27.410	~	~	~	~	6.730	~	~	~	~	~	~	~	Labelled upright cover, good condition.	6
	GMW14	Pre July 2004	na	551493.04	559489.20	~	26.402	~	39.660	26.358	~	~	~	~	nf	~	~	~	~	~	~	~	Capped under a new building.	6
	GMW15	Q4 2004	na	551462.61	559389.92	~	24.817	~	37.690	24.744	~	50	~	~	6.250	~	~	~	~	~	~	~	Labelled upright cover, good condition.	6
	GMW16	Q4 2004	na	551480.25	559380.88	~	24.726	~	37.630	24.600	~	50	~	~	6.790	~	~	~	~	~	~	~	Locked, labelled upright cover, good condition.	6
	GMW17	Q4 2004	na	551485.17	559380.96	~	24.745	~	37.720	24.691	~	50	~	~	5.020	~	~	~	~	~	~	~	Locked, labelled upright cover, good condition.	6
	BH01	2009	na	551399.09	559652.91	~	27.483	~	~	27.737	200	50	16.1	13.0	11.930	10.0	~	13.0	~	Sand and gravel	~	11 - 25	Locked. labelled upright cover.	10
	BH02	2009	na	551381.75	559637.40	~	27.443	~	~	27.723	200	50	11.1	8.0	5.750	4.0	~	8.0	~	Sand, clay and gravel	~	0.08 - 0.18	Locked. labelled upright cover.	10
	BH03	2009	na	551387.25	559668.85	~	27.443	~	~	28.040	200	50	8.0	6.0	4.270	3.0	~	6.0	~	Clay	~	7	Labelled upright cover but this is loose and not affixed to the ground.	10
	BH04	2009	na	551370.118	559653.074	~	27.474	~	~	27.942	200	50	15.3	15.0	14.240	8.5	~	15.0	~	Gravel	~	3	Labelled upright cover.	10

Sources of Information:

1 - KT Cullen, 1982: Report on the Possible Effect on Local Groundwater Levels due to Increased Abstractions at Chemibitoic (Irl.) Ltd., Brinny, Co. Cork
2 - KT Cullen, 1992: Groundwater Monitoring Well Installation and Sampling, Schering-Plough, Brinny, Innishannon, Co. Cork FINAL
3 - KT Cullen, 2002: Environmental Investigation, Schering-Plough (Brinny) Company, Innishannon, Co. Cork FINAL, # 3037
4 - WYG, 2003: Environmental Assessment Phase II, Schering-Plough (Brinny) Company, Innishannon, Co. Cork DRAFT, # C002681/2
5 - WYG, 2004: Schering-Plough (Brinny) Company Source Protection Study, # C001697
6 - WYG, 2006: Groundwater Level Investigation at Schering-Plough Pharmaceutical Plant, Brinny, Co. Cork, # CE05101
7 - WYG, 2012: The Relocation of Groundwater Monitoring Boreholes MW3S & MW3D due to Site Expansion Works, # CE08805
8 - WYG, CE08805 project file
9 - WYG, CE02681 project file
10 - WYG, 2009: Geotechnical Interpretive Report, # CE06761
11 - WYG, 2010 IPPC Licence Application
12 - Geological Survey of Ireland website, www.gsi.ie

Notes:

m OD - Metres to Ordnance Datum, as surveyed 21 August 2015
m SD - Metres to site datum, as originally reported
m SD [6] - Top of well casing elevations as re-surveyed in 2006
m bgl - Metres below ground level
m bct - Metres below casing top
m^3/hr - Cubic metres per hour
m/d - Metres per day
na - Not applicable
nf - Not found
nm - Not measured due to access
~ - No data
Bold - Indicates data for decommissioned well

Appendix D – Laboratory Documentation

Exova Jones Environmental

Registered Office: Exova Environmental UK Limited, 10 Lower Grosvenor Place, London, SW1W 0EN. Reg No. 11371415

Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781

AECOM
1st Floor, Montrose House
Carrigaline Road
Douglas
Cork
Ireland

Attention :	Edel O'Hannelly
Date :	3rd May, 2019
Your reference :	PR-399097
Our reference :	Test Report 19/6659 Batch 1
Location :	PR-399097
Date samples received :	24th April, 2019
Status :	Final report
Issue :	1

Five samples were received for analysis on 24th April, 2019 of which five were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Simon Gomery BSc
Project Manager

Client Name: AECOM
Reference: PR-399097
Location: PR-399097
Contact: Edel O'Hannelly
JE Job No.: 19/6659

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-7	8-14	15-21	77-83	84-90						LOD/LOR	Units	Method No.
Sample ID	MW1D	MW2S	MW3D	MW4S	MW4D								
Depth													
COC No / misc													
Containers	V H HN P G	V H HN P G	V H HN P G	V H HN P G	V H HN P G								
Sample Date	17/04/2019	16/04/2019	16/04/2019	16/04/2019	16/04/2019								
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water								
Batch Number	1	1	1	1	1								
Date of Receipt	24/04/2019	24/04/2019	24/04/2019	24/04/2019	24/04/2019								
Dissolved Arsenic #	<2.5	<2.5	<2.5	<2.5	<2.5						<2.5	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5	<0.5	<0.5	<0.5						<0.5	ug/l	TM30/PM14
Dissolved Calcium #	33.7	54.7	31.9	49.3	15.0						<0.2	mg/l	TM30/PM14
Total Dissolved Chromium #	<1.5	<1.5	<1.5	<1.5	<1.5						<1.5	ug/l	TM30/PM14
Dissolved Cobalt #	<2	<2	3	<2	<2						<2	ug/l	TM30/PM14
Dissolved Copper #	<7	<7	<7	<7	<7						<7	ug/l	TM30/PM14
Total Dissolved Iron #	<20	<20	<20	<20	<20						<20	ug/l	TM30/PM14
Dissolved Lead #	<5	<5	<5	<5	<5						<5	ug/l	TM30/PM14
Dissolved Magnesium #	5.3	2.3	7.3	5.6	2.7						<0.1	mg/l	TM30/PM14
Dissolved Manganese #	<2	<2	4702	<2	8						<2	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1	<1	<1	<1						<1	ug/l	TM30/PM14
Dissolved Nickel #	<2	<2	3	<2	<2						<2	ug/l	TM30/PM14
Dissolved Potassium #	2.0	9.4	4.0	1.9	0.8						<0.1	mg/l	TM30/PM14
Dissolved Sodium #	15.1	33.6	45.9	10.5	34.1						<0.1	mg/l	TM30/PM14
Dissolved Zinc #	<3	<3	<3	6	<3						<3	ug/l	TM30/PM14
Methyl Tertiary Butyl Ether #	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	<0.5	<0.5	<0.5						<0.5	ug/l	TM15/PM10
Toluene #	<5	<5	<5	<5	<5						<5	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	<1	<1	<1						<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2	<2	<2	<2						<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	<1	<1	<1						<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	103	103	119	108	109						<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	99	86	100	98	106						<0	%	TM15/PM10
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10	<10	<10	<10						<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10	<10	<10	<10						<10	ug/l	TM36/PM12
>C8-C10 #	<10	<10	<10	<10	<10						<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5	<5	<5	<5						<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10	<10	<10	<10						<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10	<10	<10	<10						<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10	<10	<10	<10						<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	<10	<10	<10	<10	<10						<10	ug/l	TM5/TM36/PM12/PM16/PM30

Client Name: AECOM
Reference: PR-399097
Location: PR-399097
Contact: Edel O'Hannelly
JE Job No.: 19/6659

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

J E Sample No.	1-7	8-14	15-21	77-83	84-90						LOD/LOR	Units	Method No.
Sample ID	MW1D	MW2S	MW3D	MW4S	MW4D								
Depth													
COC No / misc													
Containers	V H HN P G	V H HN P G	V H HN P G	V H HN P G	V H HN P G								
Sample Date	17/04/2019	16/04/2019	16/04/2019	16/04/2019	16/04/2019								
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water								
Batch Number	1	1	1	1	1								
Date of Receipt	24/04/2019	24/04/2019	24/04/2019	24/04/2019	24/04/2019								
TPH CWG													
Aromatics													
>C5-EC7 #	<10	<10	<10	<10	<10						<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10	<10	<10	<10						<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10	<10	<10	<10						<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5	<5	<5	<5						<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10	<10	<10	<10	<10						<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10	<10	<10	<10						<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10	<10	<10	<10						<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	<10	<10	<10	<10	<10						<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35) #	<10	<10	<10	<10	<10						<10	ug/l	TM5/TM36/PM12/PM16/PM30
Fluoride	<0.3	<0.3	<0.3	<0.3	<0.3						<0.3	mg/l	TM173/PM0
Alcohols/Acetates													
Methyl Alcohol (Methanol)	<500	<500	<500	<500	<500						<500	ug/l	TM83/PM10
Ethyl Alcohol (Ethanol)	<500	<500	<500	<500	<500						<500	ug/l	TM83/PM10
i-Propyl Alcohol (Isopropanol)	<100	<100	<100	<100	<100						<100	ug/l	TM83/PM10
n-Propyl Alcohol	<100	<100	<100	<100	<100						<100	ug/l	TM83/PM10
n-Butyl Alcohol	<100	<100	<100	<100	<100						<100	ug/l	TM83/PM10
n-Pentyl Alcohol	<100	<100	<100	<100	<100						<100	ug/l	TM83/PM10
n-Hexyl Alcohol	<100	<100	<100	<100	<100						<100	ug/l	TM83/PM10
n-Heptyl Alcohol	<100	<100	<100	<100	<100						<100	ug/l	TM83/PM10
Methyl Acetate	<100	<100	<100	<100	<100						<100	ug/l	TM83/PM10
Ethyl Acetate	<100	<100	<100	<100	<100						<100	ug/l	TM83/PM10
i-Propyl Acetate	<100	<100	<100	<100	<100						<100	ug/l	TM83/PM10
n-Propyl Acetate	<100	<100	<100	<100	<100						<100	ug/l	TM83/PM10
n-Butyl Acetate	<100	<100	<100	<100	<100						<100	ug/l	TM83/PM10
Methyl Ethyl Ketone (MEK)	<2	<2	<2	<2	<2						<2	ug/l	TM83/PM10
Tetrahydrofuran	<1	<1	<1	<1	<1						<1	ug/l	TM83/PM10
Sulphate as SO4 #	10.0	21.1	32.8	26.4	19.3						<0.5	mg/l	TM38/PM0
Chloride #	29.4	34.6	46.4	18.0	35.0						<0.3	mg/l	TM38/PM0
Nitrate as NO3 #	35.8	18.2	2.3	27.8	30.6						<0.2	mg/l	TM38/PM0
Nitrite as NO2 #	<0.02	<0.02	<0.02	<0.02	0.10						<0.02	mg/l	TM38/PM0
Ortho Phosphate as PO4 #	<0.06	0.32	0.09	0.09	0.14						<0.06	mg/l	TM38/PM0
Monoethylene glycol	<10	<10	<10	<10	<10						<10	ug/l	TM179/PM0
Propylene glycol	<10	<10	<10	<10	<10						<10	ug/l	TM179/PM0
Diethylene glycol	<10	<10	<10	<10	<10						<10	ug/l	TM179/PM0
Triethylene glycol	<10	<10	<10	<10	<10						<10	ug/l	TM179/PM0
Thiodiglycol	<10	<10	<10	<10	<10						<10	ug/l	TM179/PM0
Total Ammonia as N #	<0.03	<0.03	1.25	<0.03	0.10						<0.03	mg/l	TM38/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR-399097
Location: PR-399097
Contact: Edel O'Hannelly
JE Job No.: 19/6659

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

J E Sample No.	1-7	8-14	15-21	77-83	84-90						LOD/LOR	Units	Method No.
Sample ID	MW1D	MW2S	MW3D	MW4S	MW4D								
Depth													
COC No / misc													
Containers	V H HN P G	V H HN P G	V H HN P G	V H HN P G	V H HN P G								
Sample Date	17/04/2019	16/04/2019	16/04/2019	16/04/2019	16/04/2019								
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water								
Batch Number	1	1	1	1	1								
Date of Receipt	24/04/2019	24/04/2019	24/04/2019	24/04/2019	24/04/2019								
Total Alkalinity as CaCO3 #	78	162	130	118	56						<1	mg/l	TM75/PM0
COD (Settled) #	<7	8	<7	11	<7						<7	mg/l	TM57/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR-399097
Location: PR-399097
Contact: Edel O'Hannelly
JE Job No.: 19/6659

VOC Report : **Liquid**

J E Sample No.	1-7	8-14	15-21	77-83	84-90						LOD/LOR	Units	Method No.
Sample ID	MW1D	MW2S	MW3D	MW4S	MW4D								
Depth													
COC No / misc													
Containers	V H HN P G	V H HN P G	V H HN P G	V H HN P G	V H HN P G								
Sample Date	17/04/2019	16/04/2019	16/04/2019	16/04/2019	16/04/2019								
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water								
Batch Number	1	1	1	1	1								
Date of Receipt	24/04/2019	24/04/2019	24/04/2019	24/04/2019	24/04/2019								
VOC MS													
Dichlorodifluoromethane	<2	<2	<2	<2	<2						<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1	<1	<1	<1						<1	ug/l	TM15/PM10
Chloroethane #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<5	<5	<5	<5	<5						<5	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1	<1	<1	<1						<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2	<2	<2	<2						<2	ug/l	TM15/PM10
Chloroform #	<2	<2	<2	<2	<2						<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2	<2	<2	<2						<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2	<2	<2	<2						<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2	<2	<2	<2						<2	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	<0.5	<0.5	<0.5						<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2	<2	<2	<2						<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2	<2	<2	<2						<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2	<2	<2	<2						<2	ug/l	TM15/PM10
Toluene #	<5	<5	<5	<5	<5						<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2	<2	<2	<2						<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2	<2	<2	<2						<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2	<2	<2	<2						<2	ug/l	TM15/PM10
Dibromochloromethane #	<2	<2	<2	<2	<2						<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2	<2	<2	<2						<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2	<2	<2	<2						<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2	<2	<2	<2						<2	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	<1	<1	<1						<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2	<2	<2	<2						<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	<1	<1	<1						<1	ug/l	TM15/PM10
Styrene	<2	<2	<2	<2	<2						<2	ug/l	TM15/PM10
Bromoform #	<2	<2	<2	<2	<2						<2	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4	<4	<4	<4						<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2	<2	<2	<2						<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2	<2	<2	<2						<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
Naphthalene	<2	<2	<2	<2	<2						<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	103	103	119	108	109						<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	99	86	100	98	106						<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR-399097
Location: PR-399097
Contact: Edel O'Hannelly

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 19/6659						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 19/6659

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to an Exova Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 19/6659

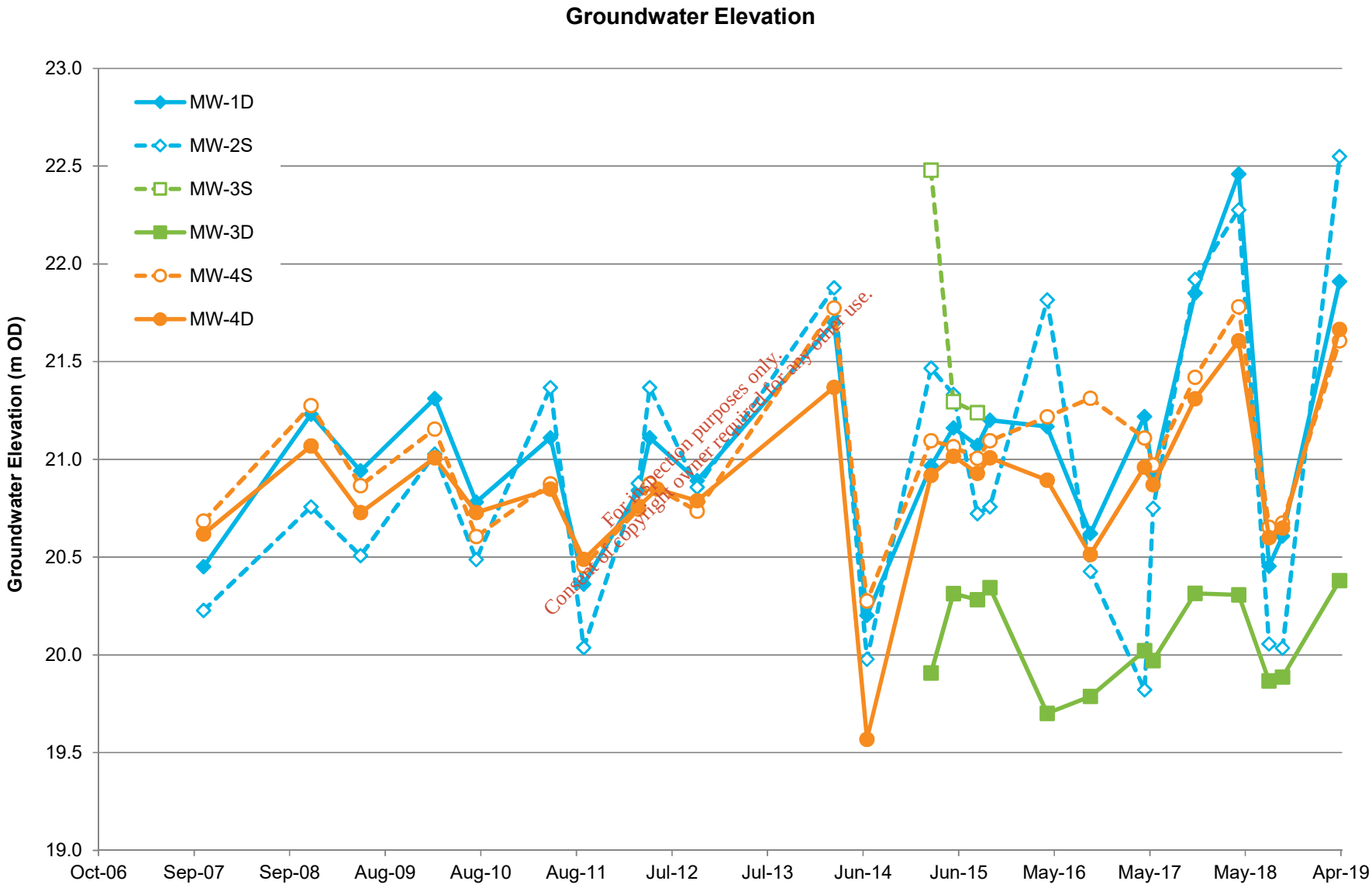
Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.	Yes			
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.	Yes			
TM57	Modified US EPA Method 410.4. Comparable with ISO 15705:2002. Chemical Oxygen Demand is determined by hot digestion with Potassium Dichromate and measured spectrophotometerically.	PM0	No preparation is required.	Yes			
TM75	Modified US EPA method 310.1. Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.	Yes			
TM83	Modified USEPA method 8260. Determination of Alcohols, Acetates, Acetone, Fuel Oxygenates, THF and Cyclohexane by Headspace GC-MS	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				

JE Job No: 19/6659

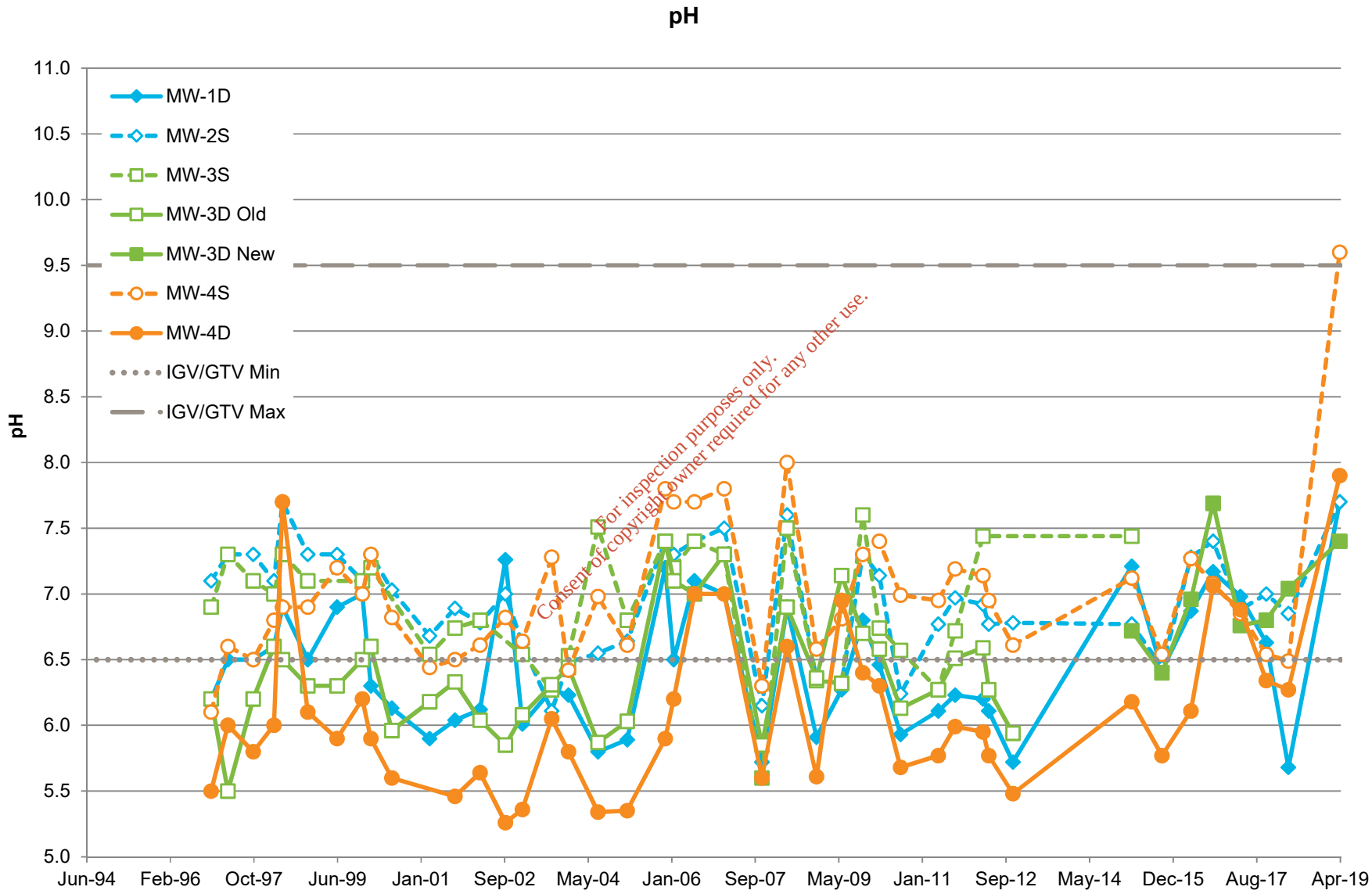
Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 340.2	PM0	No preparation is required.				
TM179	Determination of Glycols using LCMS	PM0	No preparation is required.				

Appendix E – IEL Monitoring Data

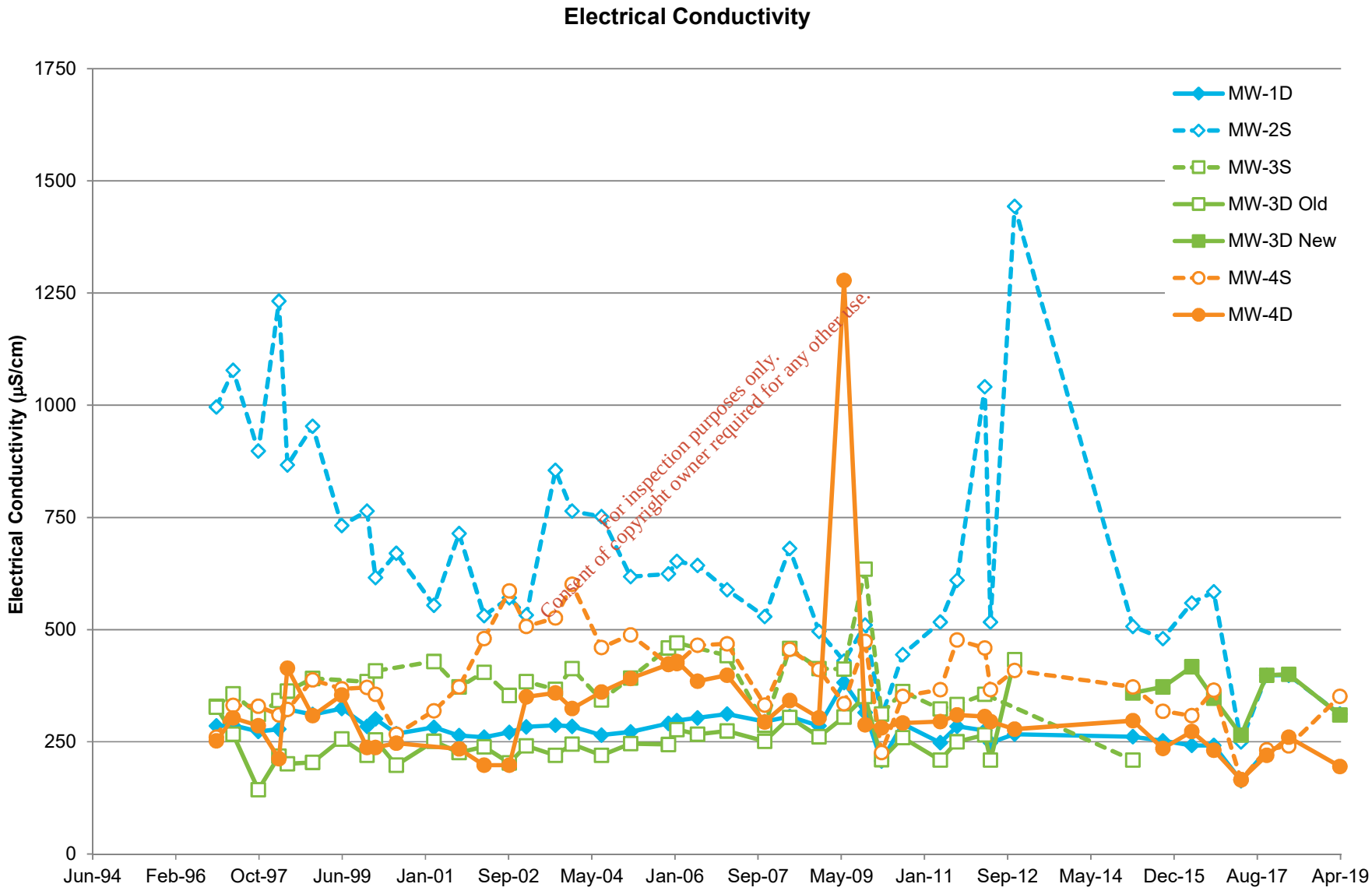
Appendix E - IEL Monitoring Trends
MSD Brinny



Appendix E - IEL Monitoring Trends
MSD Brinny

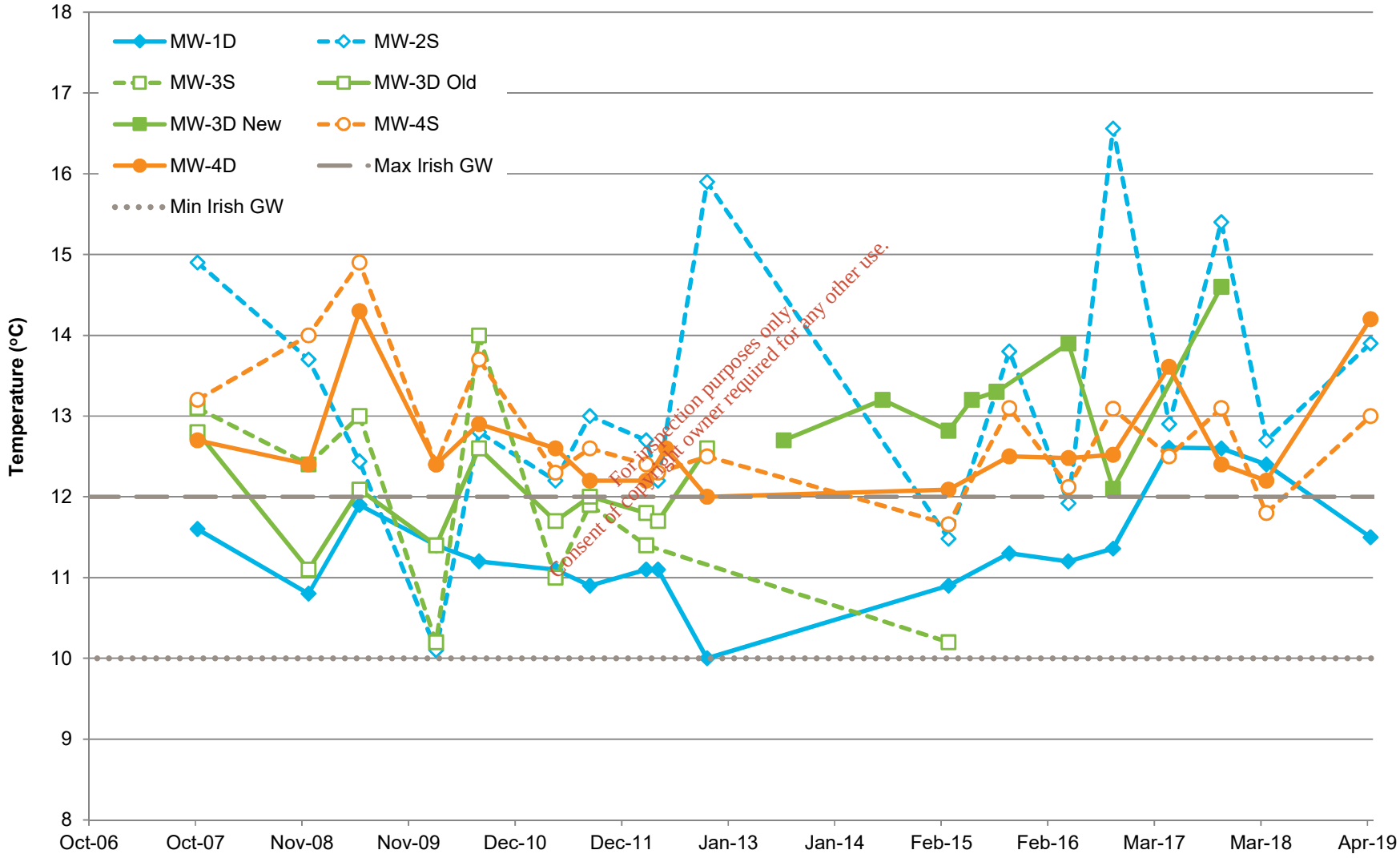


Appendix E - IEL Monitoring Trends
MSD Brinny

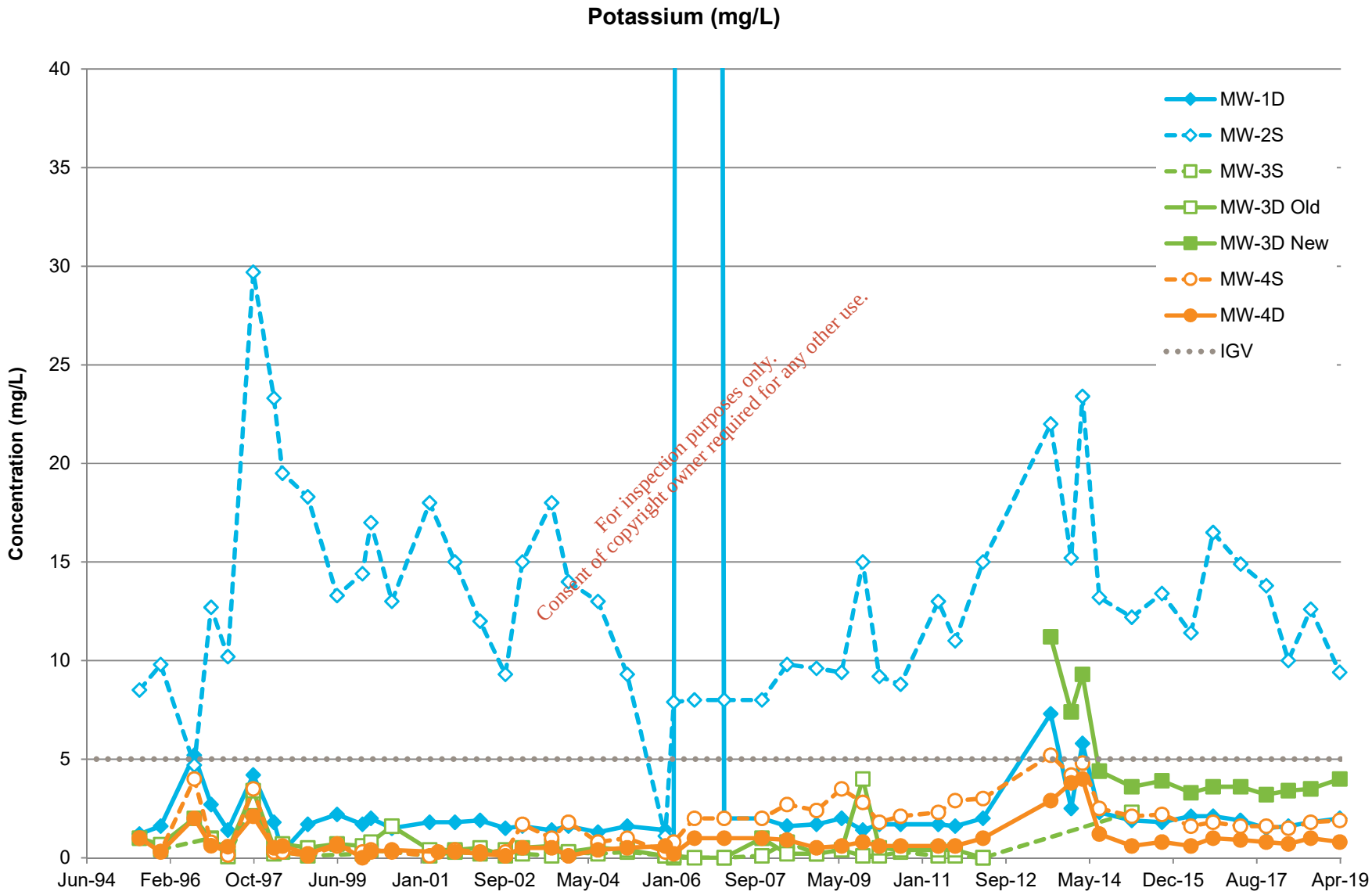


Appendix E - IEL Monitoring Trends
MSD Brinny

Groundwater Temperature



Appendix E - IEL Monitoring Trends
MSD Brinny



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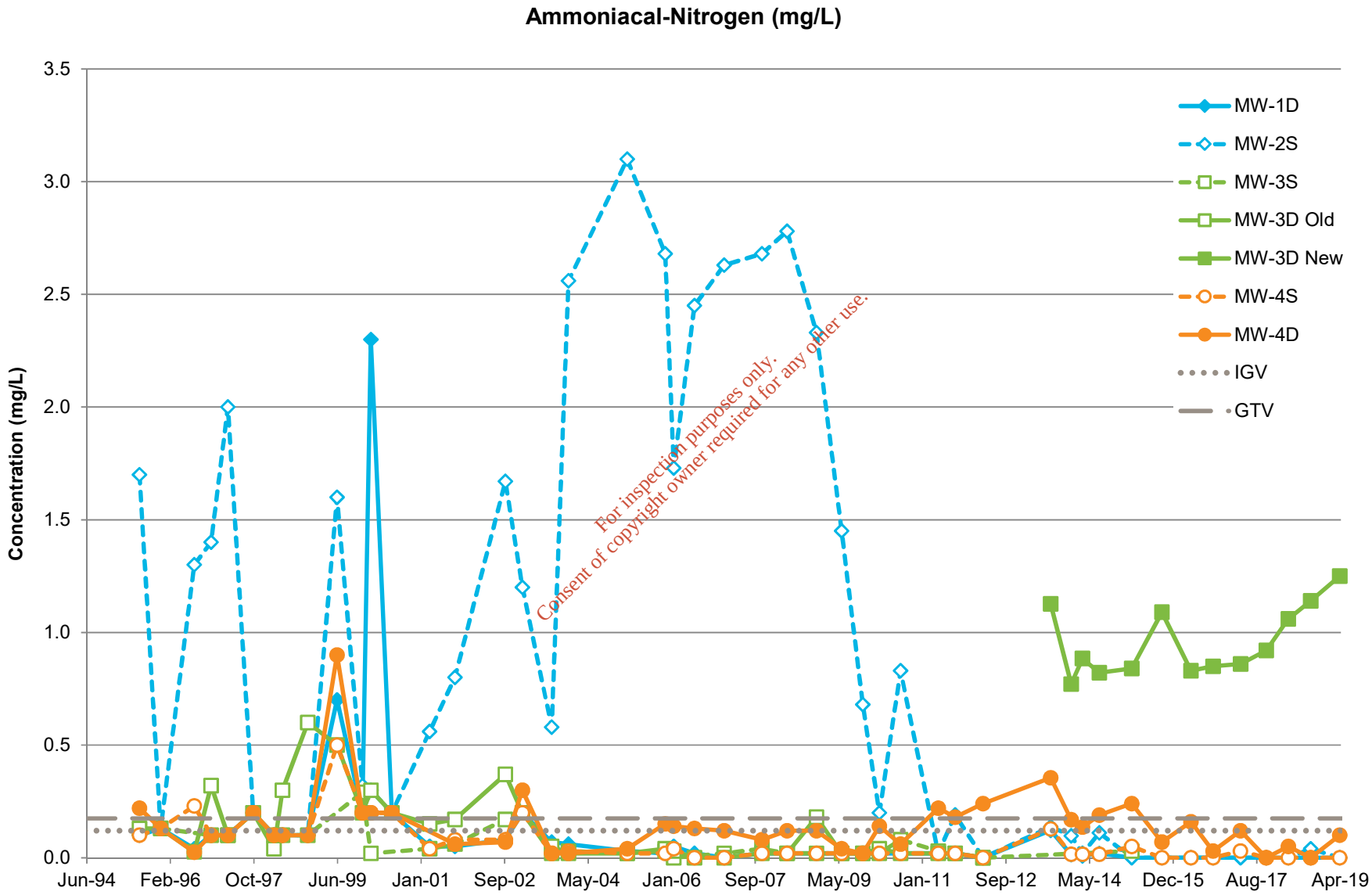
Appendix E - IEL Monitoring Trends
MSD Brinny



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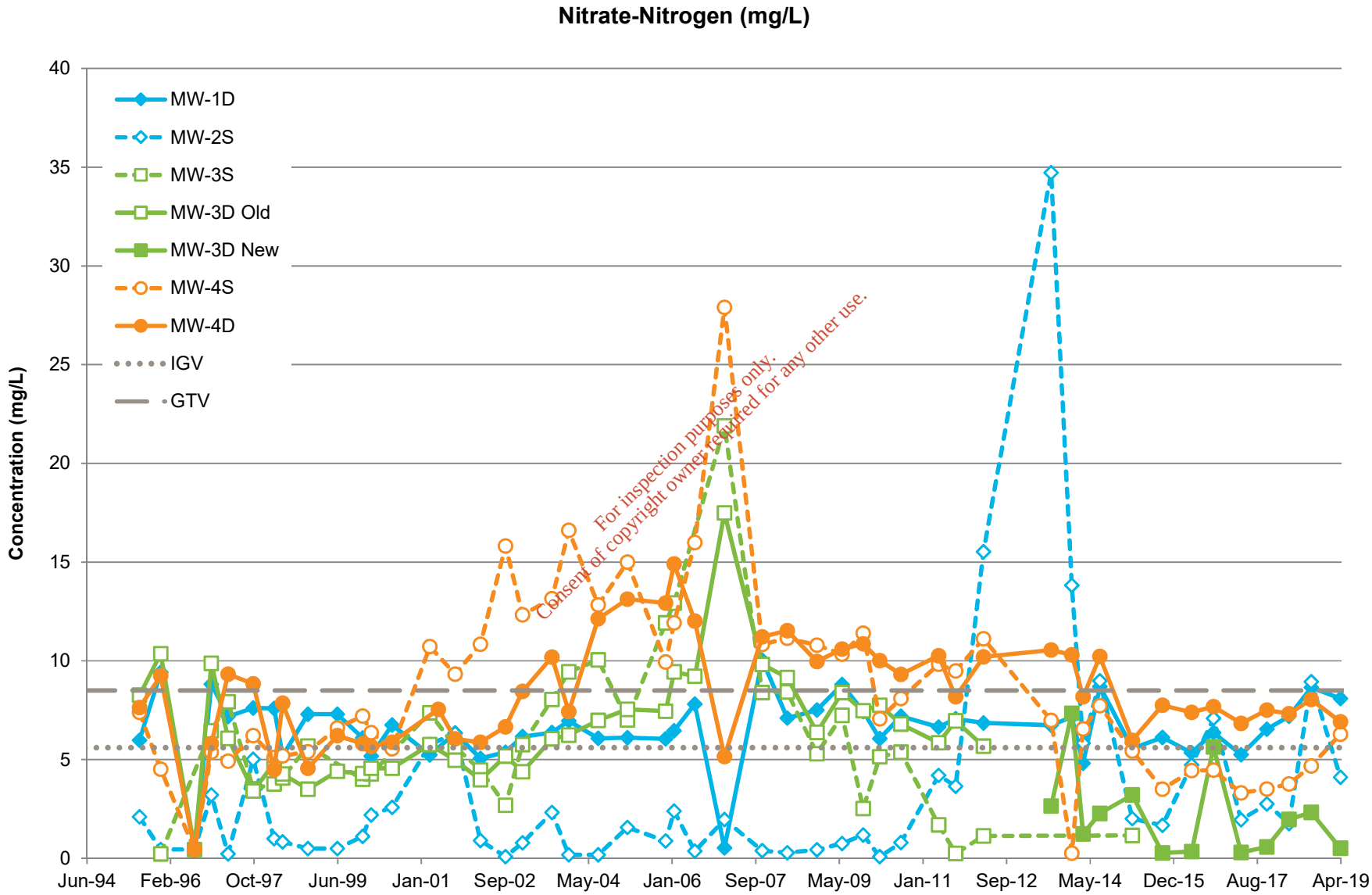
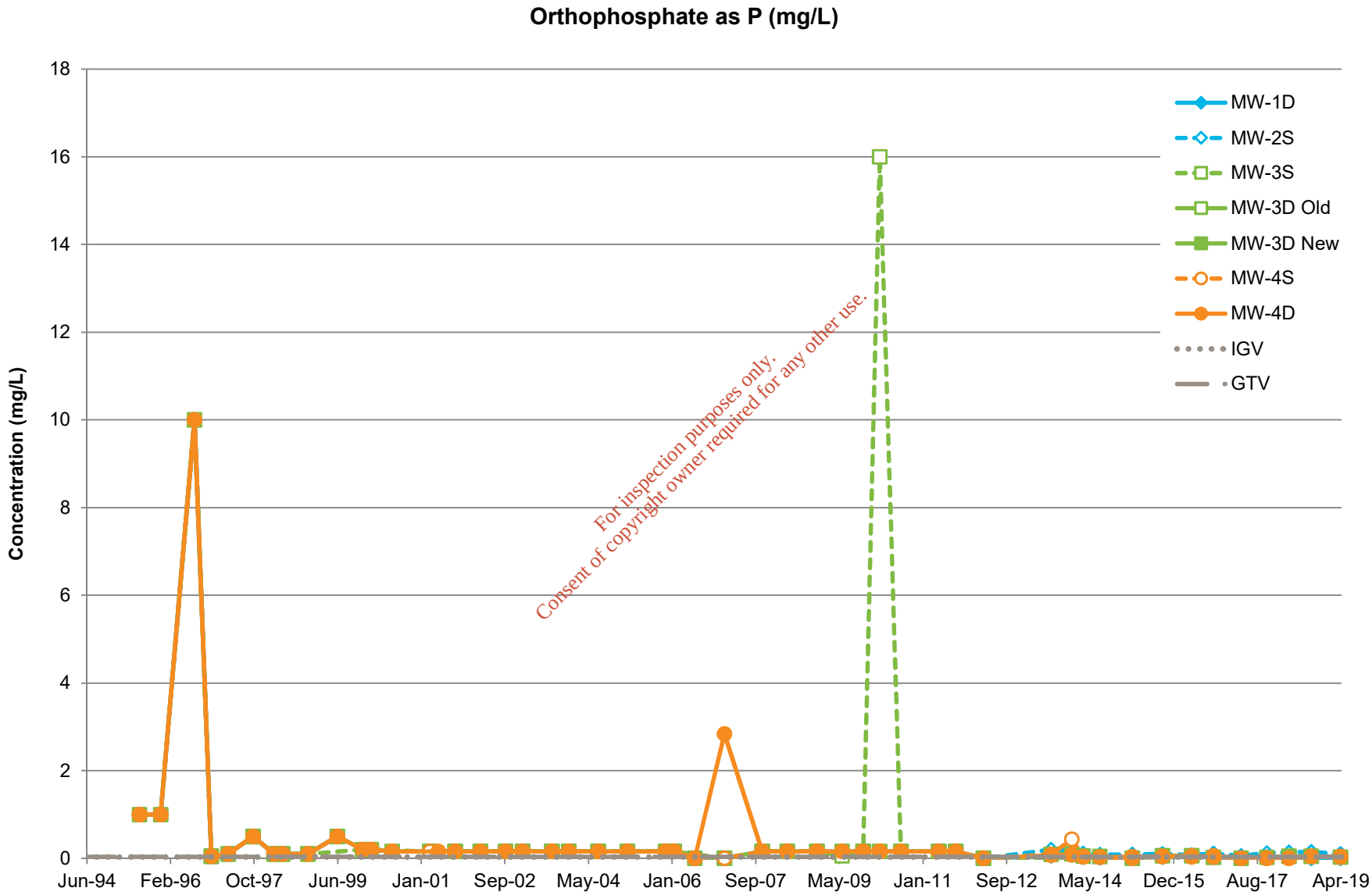
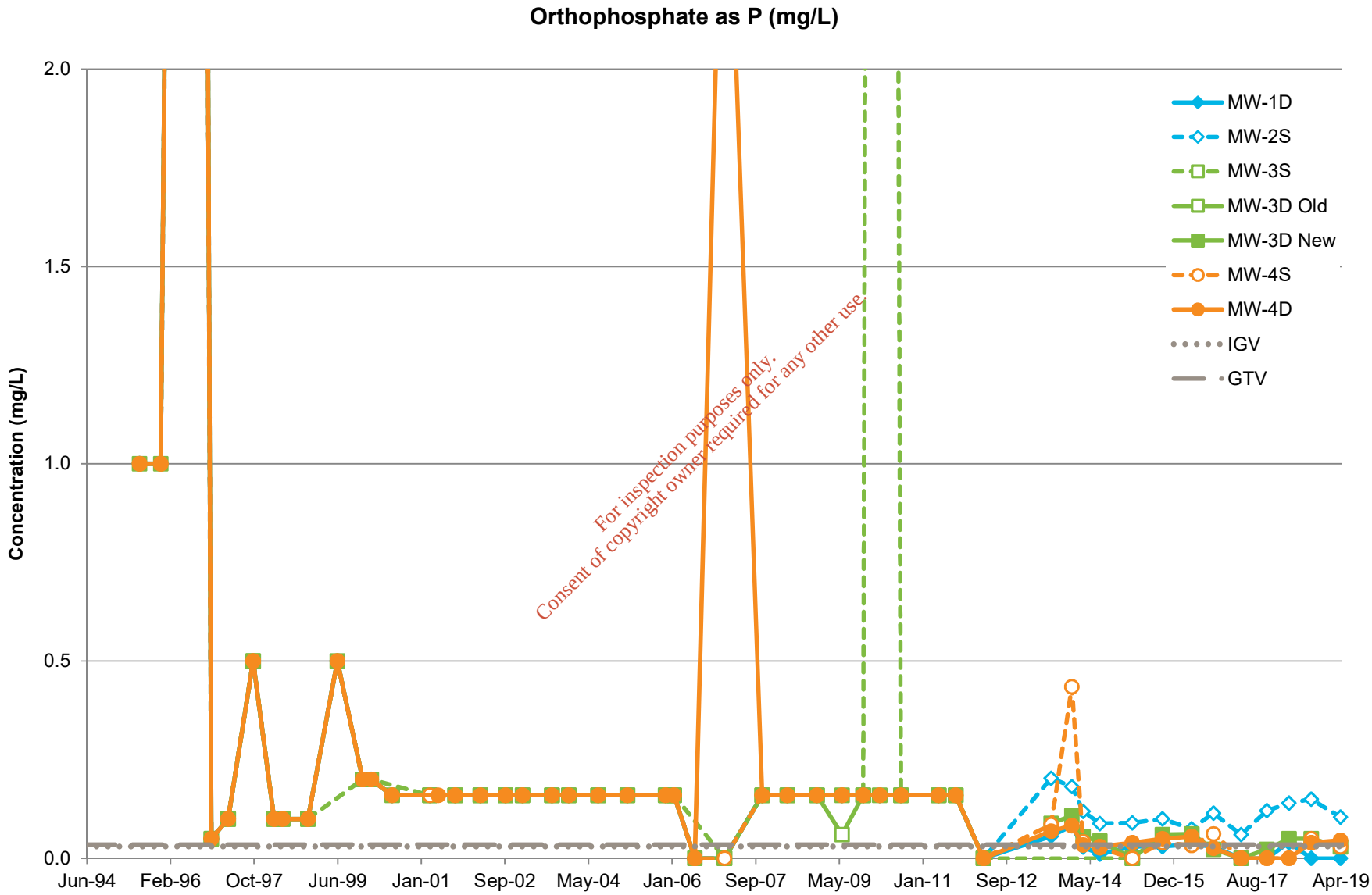
Appendix E - IEL Monitoring Trends
MSD Brinny



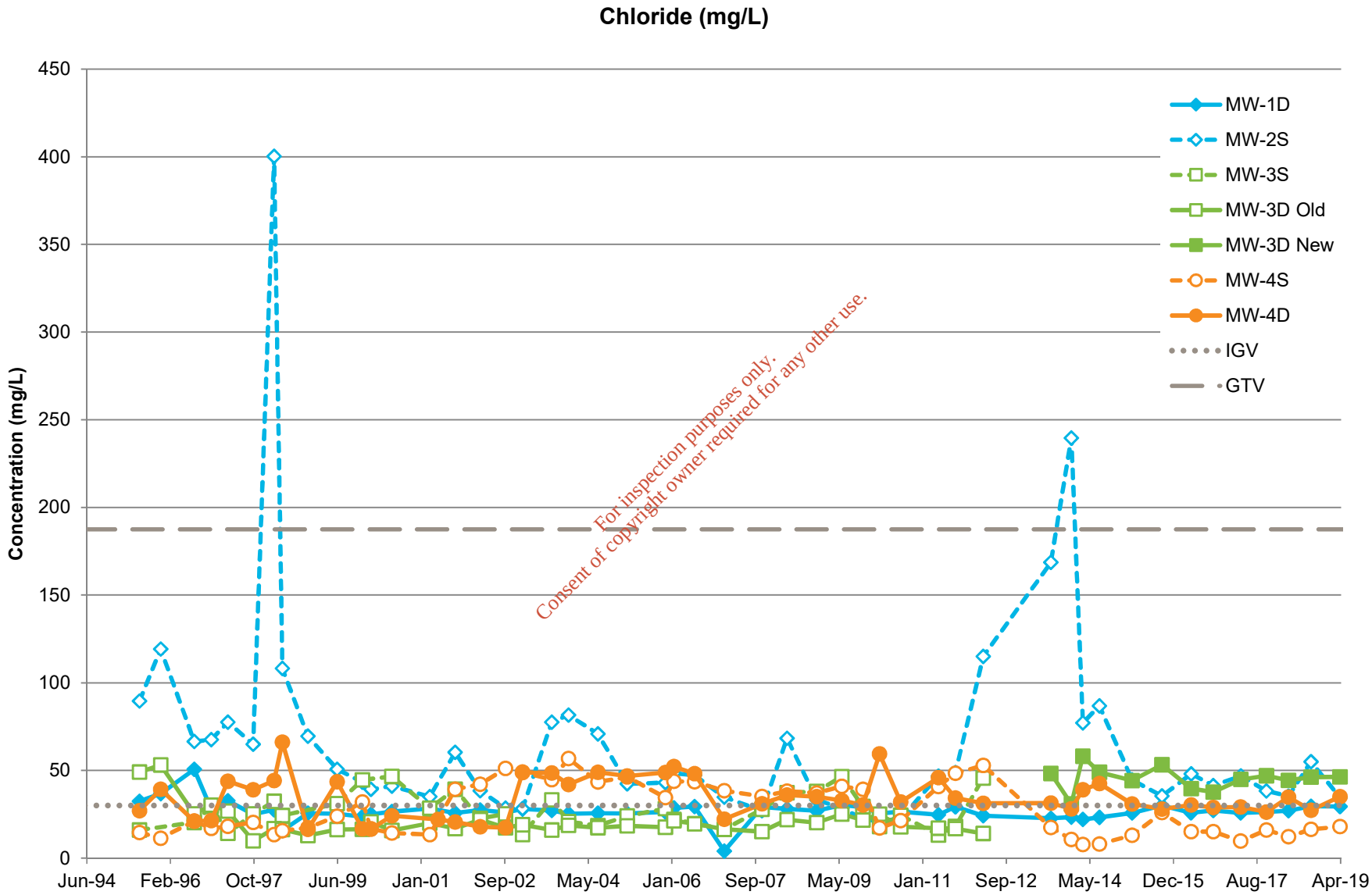
Appendix E - IEL Monitoring Trends
MSD Brinny



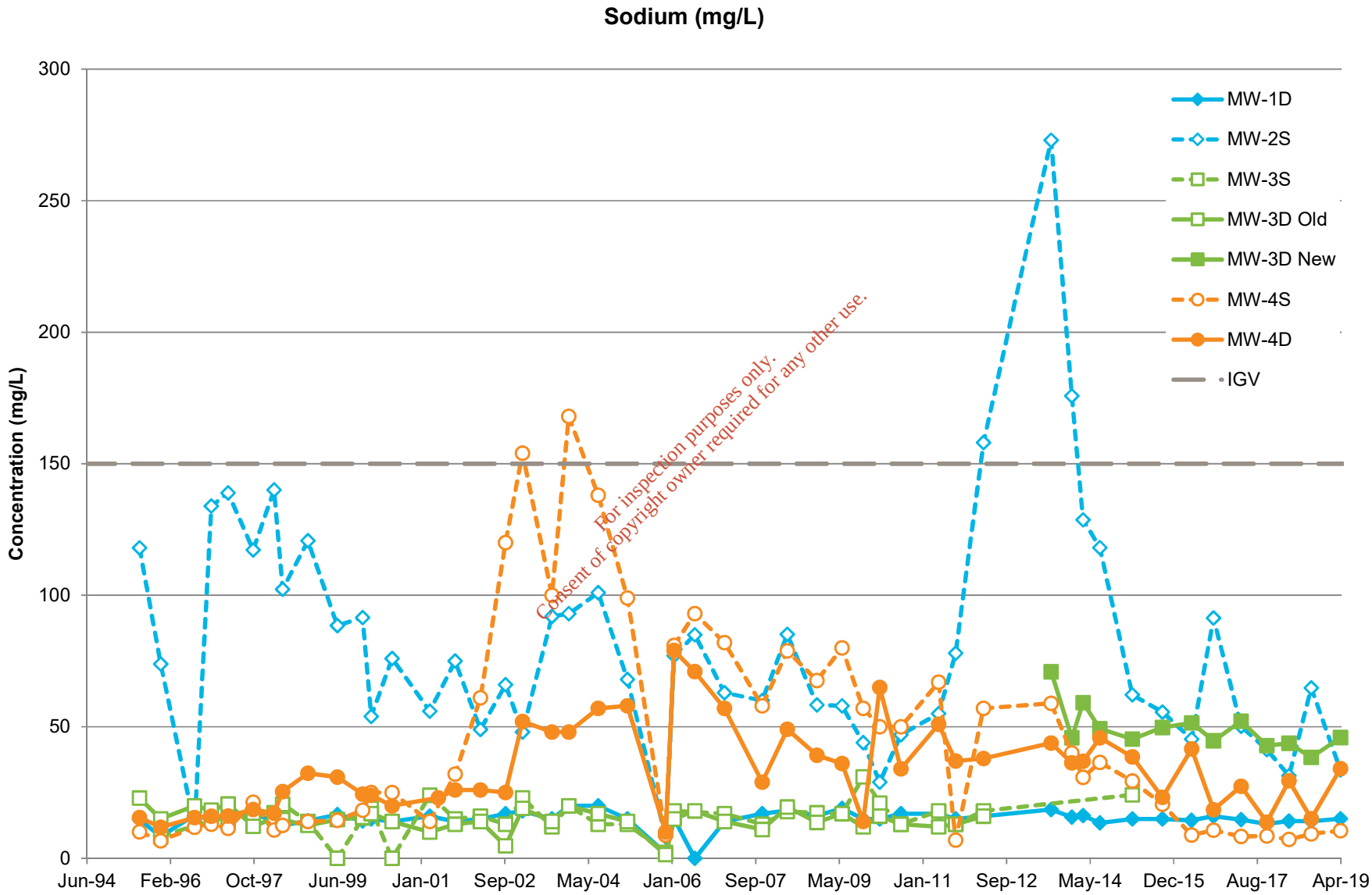
Appendix E - IEL Monitoring Trends
MSD Brinny



Appendix E - IEL Monitoring Trends
MSD Brinny



Appendix E - IEL Monitoring Trends
MSD Brinny



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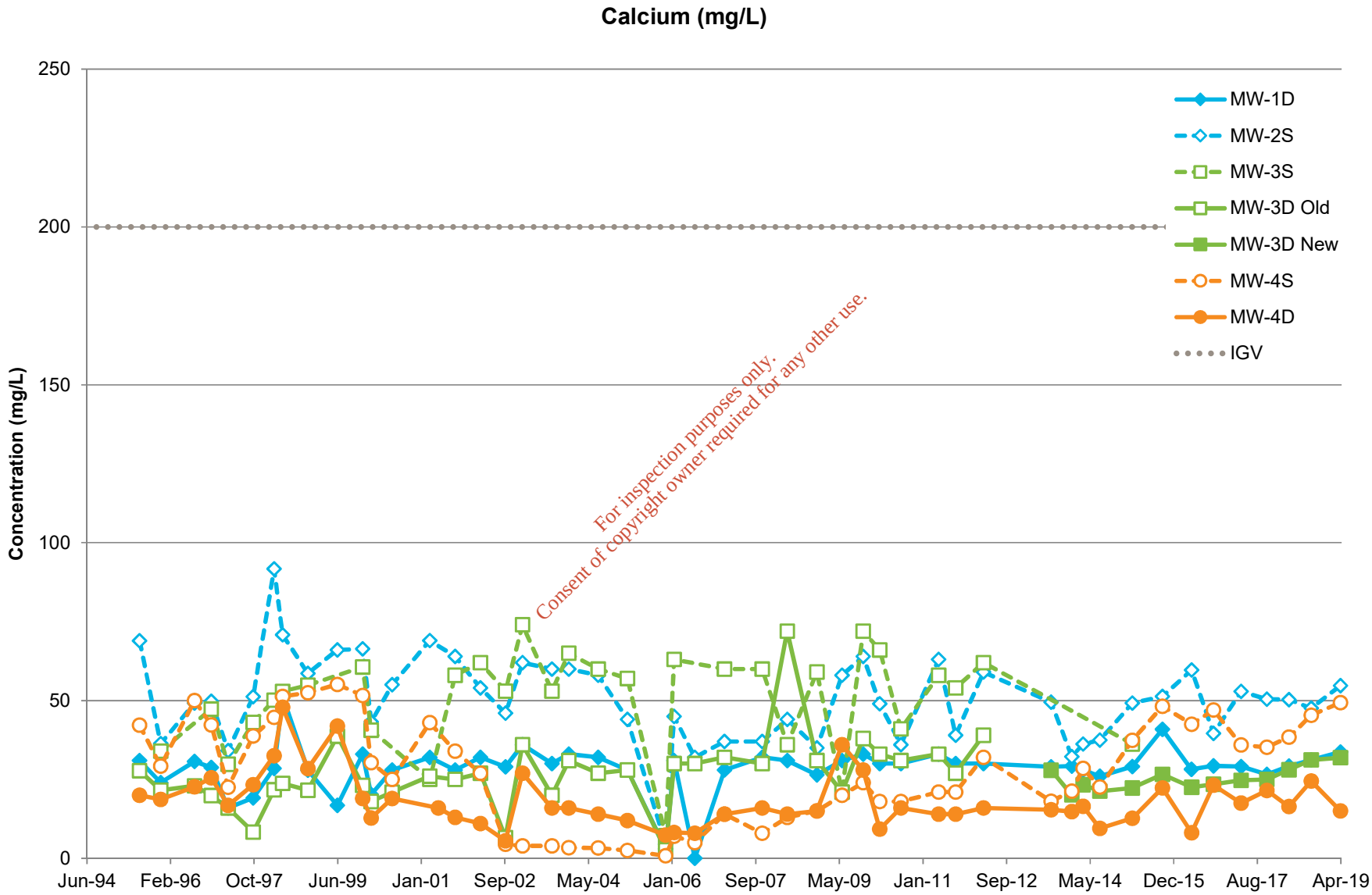
MSD Brinny



MW-1D	Major Ions														Organics and Field Measurements												Metals										
	Ammonia-N	Ammonium	Nitrate-N	Nitrate as NO_3	Nitrite as NO_2	Phosphate-P	Chloride	Sulphate	Fluoride	Sodium	Potassium	Calcium	Magnesium	Total Alkalinity as $CaCO_3$	VOCs	Alcohols & Acetates	Trichloroacetic Acid	Ethylene Glycol	Total Petroleum Hydrocarbons	COD	Electrical Conductivity µS/cm		pH		Temperature	Depth to Groundwater	Groundwater Elevation	Total Depth	Arsenic	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Zinc
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	Lab	Field	Lab	Field	°C	m bct	m OD	m bct	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
IGV	**0.12**	**0.15**	**5.6**	**25**	**0.1**	**0.03**	**30**	**200**	**1**	**150**	**5**	**200**	**50**	NAC	various	various	-	-	10	-	**1000**		**6.5**	**9.5**	**25**	-	-	-	**0.01**	**0.005**	**0.03**	-	**0.03**	**0.2**	**0.01**	**0.05**	**0.001**	**0.02**	**0.1**
DWS	0.23	0.3	11.3	50	0.5	-	250	250	1.5	200	-	-	-	-	various	various	-	-	-	-	2500		6.5	9.5	-	-	-	-	0.01	0.005	0.05	-	2	0.2	0.01	0.05	0.001	0.02	-
GTV	**0.175**	**0.225**	**8.5**	**37.5**	**0.375**	**0.035**	**187.5**	**187.5**	-	-	-	-	-	-	various	various	-	-	**10**	-	800	**1875**	-	-	-	-	-	-	**0.0075**	-	**0.0375**	-	**1.5**	-	**0.0075**	-	**0.00075**	-	**0.075**
Date																																							
Jul-95	0.100	0.129	**6.0**	**26.5**		1.000	**33**	21		15	1.2	31	5.6																				0.020	**10.800**		**1.410**			0.030
Dec-95	**0.130**	**0.167**	9.4	41.7		1.000	**37**	14		8	1.6	24	4.2																				0.010	0.020		**0.090**			0.020
Aug-96	0.040	0.051	0.5	2.0		10.000	**51**	19		17	**5.2**	31	6.1																				0.010	**4.200**		0.040			0.010
Dec-96	0.100	0.129	8.8	39.0		0.050	28	18		15	2.7	29	4.5								285		**6.2**										0.030	0.040		0.040			**0.180**
Apr-97	0.100	0.129	**7.2**	**31.8**		0.100	**33**	20		16	1.4	16	4.2								287		6.5										**0.030**	0.040		**0.060**			0.060
Oct-97	0.200	0.257	**7.6**	**33.7**		0.500	25	13		17	4.2	19	4.0								273		6.5										**0.030**	**0.810**		0.040			0.020
Mar-98	0.100	0.129	**7.6**	**33.6**		0.100	28	13		14	1.8	29	4.9								278		6.6										**0.030**	0.040		0.040			0.050
May-98	0.100	0.129	5.2	23.0		0.100	16	44		13	0.3	51	3.3								322		6.9										**0.030**	0.040		0.040			**0.160**
Nov-98	0.100	0.129	**7.3**	**32.3**		0.100	26	12		14	1.7	28	4.8								311		6.5										**0.030**	0.040		0.040			**0.100**
Jun-99	0.700	0.900	**7.3**	**32.3**		0.500	25	12		17	2.2	17	5.1								324		6.9										**0.030**	0.040		0.040			**0.200**
Dec-99	0.200	0.257	**6.1**	**27.0**		0.200	24	11		14	1.7	33	4.7								284		7.0										0.002	0.002		0.007			0.086
Feb-00	2.300	2.957	5.2	22.9		0.200	25	11		15	2.0	20	5.3								301		**6.3**										0.018	0.002		0.003			**0.234**
Jul-00	0.200	0.257	**6.8**	**29.9**		0.160	27	45		14	1.5	28	3.8								268		**6.1**										0.002	0.100		0.003			0.053
Apr-01	0.050	0.064	5.2	23.2		0.160	28	12		16	1.8	32	4.2								282		**5.9**										0.002	0.100		0.040			0.057
Oct-01	0.050	0.064	**6.3**	**28.1**		0.160	26	11		14	1.8	28	4.5								264		**6.0**										0.002	0.100		0.002			0.007
Apr-02			5.1	22.4		0.160	27	16		15	1.9	32	5.0								260		**6.1**										0.002	0.100		0.002			0.007
Oct-02	0.080	0.103	5.4	23.8		0.160	26	26		17	1.5	29	3.6								271		7.3										0.003	0.100		0.006			0.073
Feb-03	0.200	0.257	**6.2**	**27.3**		0.160	28	22		18	1.6	36	4.4								283		**6.0**										0.002	0.100		0.003			0.053
Sep-03	0.070	0.090	**6.4**	**28.2**		0.160	27	20		15	1.4	30	3.7								287		**6.3**										0.002	0.100		0.003			0.079
Jan-04	0.060	0.077	**7.0**	**30.8**		0.160	25	38		20	1.6	33	5.6								284		**6.2**										0.002	0.100		0.003			**0.110**
Aug-04			**6.1**	**26.9**		0.160	26	12		20	1.3	32	4.2								265		**5.8**										0.002	0.100		0.002			**0.255**
Mar-05	0.030	0.039	**6.1**	**27.1**		0.160	26	13		15	1.6	28	4.3								272		**5.9**										0.002	0.100		<0.100			0.049
Dec-05	0.020	0.026	**6.1**	**26.8**		0.160	26	12		2	1.4	3	4.0								291		7.2										0.002	0.100		0.022			0.002
Jul-06	0.020	0.026	**7.8**	**34.6**		<0.16	29	13		<0.1	**721.0**	<0.1	0.1								303		7.1										<0.002	0.100		**0.148**			0.002
Feb-07	<0.02	<0.026	0.5	2.3		<0.16	4	8		14	2.0	28	4.0								312		7.0										<0.002	<0.100		0.003			**0.160**
Nov-07	0.020	0.026	10.0	44.4		0.160	29	13		17	2.0	32	4.0								297	295	6.7	**5.7**	11.6	7.65	20.45	9.20					0.002	0.100		0.003			0.091
May-08	0.020	0.026	**7.1**	**31.4**		0.160	28	19		18	1.6	31	5.0								306		6.9										0.001	0.038		0.001			0.003
Dec-08	0.020	0.026	**7.5**	**33.2**		0.160	27	12		16	1.7	27	4.4								280	285	6.8	**5.9**	10.8	6.87	21.23	9.46					0.001	0.002		0.001			0.019
Jun-09	0.020	0.026	8.8	39.0		0.160	**30**	12		19	2.0	31	5.6								299	382	6.5	**6.3**	11.9	7.16	20.94	9.42					0.002	0.100		0.002			0.002
Nov-09	0.020	0.026	**7.4**	**32.9**		0.160	29	12		15	1.4	33	4.3								315		6.8										0.002	0.100		0.002			0.002
Mar-10	0.020	0.026	**6.1**	**26.9**		0.160	26	12		15	1.7	30	4.4								287	207	6.6	**6.5**	11.4	6.79	21.31	9.24					0.002	0.100		0.002			0.002
Aug-10	0.020	0.026	**7.2**	**31.9**		0.160	27	10		17	1.7	30	4.8								330	290	6.5	**5.9**	11.2	7.32	20.78	9.24					0.002	0.100		0.003			0.002
May-11	0.020	0.026	**6.7**	**29.4**		0.160	25	11		17	1.7	33	5.2								296	248	6.6	**6.1**	11.1	6.99	21.11	9.24					0.002	0.100		0.007			0.003
Sep-11	0.020	0.026	**7.1**	**31.3**		0.160	29	12		15	1.6	30	4.6								288	284	6.6	**6.2**	10.9	7.74	20.36	9.24					0.002	0.100		0.002			0.010
Mar-12	<0.020	0.026	**6.9**	**30.4**		<0.16	24	11	<0.1	16	2.0	30	5.0	ND							288	275	6.6	**6.2**	11.1	7.26	20.84	9.24	<0.002	<0.002	<0.002	<0.002	<0.002	<0.1	<0.002	<0.002		<0.002	0.003
May-12																						248		**6.1**	11.1	6.99	21.11	9.24											
Oct-12																						267		**5.7**	10.0	7.21	20.89	9.22											
Jul-13	**0.122**	**0.157**	**6.7**	**29.8**		0.056	23	8		19	**7.3**	29	7.3																				**0.052**	0.148		0.032			0.060
Dec-13	0.014	0.018	**7.2**	**31.7**		0.083	23	7		16	2.5	29	5.0																				<0.003	<0.02		0.002			0.010
Mar-14	0.008	0.010	4.8	21.3		0.029	22	11	<0.1	16	**5.8**	28	4.6	0.9												6.40	21.70	10.40	0.0003	<0.0001	<0.001	<0.001	0.005	<0.020	<0.0003	<0.001	<0.00002	<0.0005	0.005
Jul-14	0.019	0.024	**8.7**	**38.5**		0.011	23	9	<0.1	14	2.3	26	4.1	18.3												7.90	20.20	9.80	0.0002	<0.0001	<0.001	<0.001	<0.003	<0.02	<0.0003	<0.001	0.00004	<0.0005	0.004
Mar-15	<0.03	<0.039	**5.6**	24.6	<0.02	**0.030**	26	9	<0.3	15	1.9	29	4.9	76	ND	ND		<1		<7		261		7.2	10.9	7.13	20.97	9.26	<0.0025	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	0.005	<0.001	<0.002	<0.003
May-15																										6.94	21.16												
Aug-15																										7.03	21.07	9.25											
Oct-15	<0.03	<0.039	**6.1**	**27.1**	<0.02	**0.030**	30	22	<0.3	15	1.8	41	4.9	82				<1		<7		252		6.4	11.3	6.90	21.20	9.26	<0.0025	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	0.004	<0.001	<0.002	0.003
May-16	<0.02	<0.032	5.4	23.7	<0.02	0.036	26	8	<0.3	15	2.1	28	4.4	58	ND	ND	<10	<1	<10	<7		242		6.9	11.2	6.93	21.17	9.27	<0.0025	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	<0.002	<0.001	<0.002	<0.003
Oct-16	<0.03	<0.039	**6.4**	**28.2**	<0.02	0.029	27	9	<0.3	16	2.1	29	4.9	68						<7		242		7.2	11.4	7.48	20.62	9.20	<0.0025	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	<0.002	<0.001	<0.002	<0.003
Apr-17	<0.03	<0.039	5.3	23.2	<0.02	<0.03	26	11	<0.3	15	1.9	29	4.9	84	ND	ND	<10	<1	ND	<7		163		7.0	12.6	6.88	21.22	9.22	<0.0025	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	<0.002	<0.001	<0.002	<0.003
May-17																										7.18	20.92												
Oct-17	<0.03	<0.039	**6.5**	**29.0**	<0.02	<0.02	26	12	<0.3	13	1.5	27	4.5	78						<7		231		6.6	12.6	6.26	21.85	9.22	<0.0025	<0.0005	<0.0015	<0.002	0.008	<0.02	<0.005	<0.002	<0.001	<0.002	<0.003
Apr-18	<0.03	<0.039	**7.2**	**31.9**	<0.02	0.040	27	10	<0.3	14	1.6	29	5.1	70	ND	ND		<10	<10	<7		433		5.7	12.4	5.64	22.46	9.22	<0.0025	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	<0.002	<0.001	<0.002	<0.003
Jul-18																										7.65	20.45												
Sep-18	<0.03	<0.039	8.7	38.3	<0.02	<0.03	30	12	<0.3	14	1.8	31	4.6	58			<10			<7						7.49	20.61	9.22	<0.0025	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	<0.002	<0.001	<0.002	<0.003
Apr-19	<0.03	<0.039	**8.1**	**35.8**	<0.02	<0.02	29	10	<0.3	15	2	34	5.3	78	ND	ND		<10	<10	<7		201		7.7	11.5	6.19	21.91	9.21	<2.5	<0.5	<1.5	<2	<7	<20	<5	<2	<1	<2	<3

Notes:

XXXXX Indicates result above interim guideline value (IGV)

XXXXX Indicates result above groundwater threshold value (GTV)

XXXXX Indicates result above IGV and GTV

Blank cell indicates no data

- indicates no screening threshold

< indicates result below reporting limit

ND indicates nothing detected in suite

NAC indicates no abnormal change

MW-1D Old Data	Phosphorous	PAHs	BOD	Total Organic Carbon	Aluminium	Antimony	Barium	Beryllium	Boron	Selenium	Silver	Tin
	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
IGV	-	various	-	NAC	**0.2**	-	**0.1**	-	**1**	-	-	-
DWS	-	0.1	-	-	0.2	0.005		-	1	0.01	-	-
GTV	-	**0.075**	-	-	**0.15**	-	-	-	-	-	-	-
Date												
Mar-12			<2	<5	<0.002	<0.002	0.005	<0.002		<0.002	<0.002	<0.002
Mar-14		0.11			0.009	<0.0001	0.009	<0.001		0.0006	<0.001	0.001
Jul-14		0.41			<0.005	<0.0001	0.009	<0.001		0.0007	<0.001	<0.001
Mar-15	0.031	<0.195	<2	<2	<0.02	<0.002	0.007	<0.0005	0.016	<0.003	<0.005	<0.005
Oct-15	0.020		<4	<2	<0.02	<0.002	0.006	<0.0005	0.015	<0.003	<0.005	<0.005

Notes:

XXXXX Indicates result above interim guideline value (IGV)

XXXXX Indicates result above groundwater threshold value (GTV)

XXXXX Indicates result above IGV and GTV

Blank cell indicates no data

- indicates no screening threshold

< indicates result below reporting limit

ND indicates nothing detected in suite

NAC indicates no abnormal change

MW-2S	Major Ions														Organics and Field Measurements												Metals										
	Ammonia-N	Ammonium	Nitrate-N	Nitrate as NO_3	Nitrite as NO_2	Phosphate-P	Chloride	Sulphate	Fluoride	Sodium	Potassium	Calcium	Magnesium	Total Alkalinity as $CaCO_3$	VOCs	Alcohols & Acetates	Trichloroacetic Acid	Ethylene Glycol	Total Petroleum Hydrocarbons	COD	Electrical Conductivity µS/cm		pH		Temperature	Depth to Groundwater	Groundwater Elevation	Total Depth	Arsenic	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Zinc
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	Lab	Field	Lab	Field	°C	m bct	m OD	m bct	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
IGV	0.12	0.15	5.6	25	0.1	0.03	30	200	1	150	5	200	50	NAC	various	various	-	-	10	-	1000		6.5	9.5	25	-	-	-	0.01	0.005	0.03	-	0.03	0.2	0.01	0.05	0.001	0.02	0.1
DWS	0.23	0.3	11.3	50	0.5	-	250	250	1.5	200	-	-	-	-	various	various	-	-	-	-	2500		6.5	9.5	-	-	-	-	0.01	0.005	0.05	-	2	0.2	0.01	0.05	0.001	0.02	-
GTV	0.175	0.225	8.5	37.5	0.375	0.035	187.5	187.5	-	-	-	-	-	-	various	various	-	-	10	-	800	1875	-	-	-	-	-	-	0.0075	-	0.0375	-	1.5	-	0.0075	-	0.00075	-	0.075
Date																																							
Jul-95	1.700	2.185	2.1	9.3		1.000	90	115		118	8.5	69	4.0																				0.020			4.000			1.600
Dec-95	0.130	0.167	0.4	2.0		1.000	119	203		74	9.8	36	2.6																				0.010	0.730		0.090			0.020
Aug-96	1.300	1.671	0.5	2.0		10.000	67	707		12	4.7	49	6.4																				0.010	6.400		0.080			0.020
Dec-96	1.400	1.800	3.2	14.2		0.050	68	302		134	12.7	50	3.8								996		7.1										0.030	0.040		5.100			0.140
Apr-97	2.000	2.571	0.2	1.0		0.100	78	140		139	10.2	34	4.3								1078		7.3										0.030	0.040		5.400			0.030
Oct-97	0.200	0.257	5.0	22.2		0.500	65	144		117	29.7	51	3.5								898		7.3										0.030	12.400		8.540			0.090
Mar-98	0.100	0.129	1.0	4.4		0.100	400	265		140	23.3	92	5.5								1232		7.1										0.030	0.040		0.040			0.030
May-98	0.100	0.129	0.8	3.7		0.100	108	126		102	19.5	71	3.0								867		7.7										0.030	0.040		1.060			0.160
Nov-98	0.100	0.129	0.5	2.2		0.100	70	149		121	18.3	59	3.8								953		7.3										0.030	0.040		2.000			0.060
Jun-99	1.600	2.057	0.5	2.2		0.500	51	122		89	13.3	66	3.0								732		7.3										0.030	0.040		0.040			0.280
Dec-99	0.320	0.411	1.1	4.9		0.200	43	96		92	14.4	66	4.0								764		7.1										0.002	0.023		0.021			0.050
Feb-00	0.300	0.386	2.2	9.7		0.200	39	72		54	17.0	43	3.6								616		7.3										0.007	0.002		0.573			0.079
Jul-00	0.200	0.257	2.6	11.4		0.160	41	139		76	13.0	55	2.3								670		7.0										0.002	0.100		0.871			0.062
Apr-01	0.560	0.720	5.8	25.5		0.160	35	102		56	18.0	69	3.0								554		6.7										0.002	0.100		0.040			0.082
Oct-01	0.800	1.028	6.3	28.1		0.160	60	64		75	15.0	64	4.0								714		6.9										0.002	0.100		0.002			0.002
Apr-02			0.9	4.0		0.160	39	61		49	12.0	54	3.4								531		6.8										0.002	0.100		0.002			0.002
Oct-02	1.670	2.147	0.1	0.4		0.160	29	102		66	9.3	46	2.6								571		7.0										0.002	0.100		1.223			0.089
Feb-03	1.200	1.543	0.8	3.5		0.160	28	79		48	15.0	62	2.6								532		6.6										0.013	0.100		2.896			0.047
Sep-03	0.580	0.746	2.3	10.3		0.160	78	156		92	18.0	60	2.8								855		6.1										0.013	0.100		1.848			0.841
Jan-04	2.560	3.291	0.2	0.8		0.160	82	119		93	14.0	60	4.7								764		6.5										0.002	0.200		6.008			0.106
Aug-04			0.2	0.8		0.160	71	107		101	13.0	58	3.4								752		6.6										0.002	0.200		3.466			0.208
Mar-05	3.100	3.985	1.6	7.0		0.160	42	92		68	9.3	44	2.6								693		6.6										0.002	0.100		1.000			0.063
Dec-05	2.680	3.445	0.9	3.9		0.160	43	76		8	1.1	5	0.4								624		7.4										0.002	0.100		0.438			0.002
Feb-06	1.730	2.224	2.4	10.6		0.160	49	76		77	7.9	45	1.5								652		7.3										0.007	0.600		0.101			0.136
Jul-06	2.450	3.150	0.4	1.6		<0.16	47	87		85	8.0	32	2.0								643		7.4										<2	0.100		2.131			0.071
Feb-07	2.630	3.381	2.0	8.7		<0.16	35	83		63	8.0	37	3.0								589		7.5										<0.002	<0.100		3.874			0.066
Nov-07	2.680	3.445	0.4	1.7		0.160	27	87		60	8.0	37	2.0								546	529	7.3	6.2	14.9	4.65	20.23	6.32					0.002	0.100		3.303			0.061
May-08	2.780	3.574	0.3	1.2		0.160	68	69		85	9.8	44	3.0								681		7.6										0.001	0.020		0.002			0.001
Dec-08	2.330	2.995	0.4	1.9		0.160	33	61		58	9.6	35	2.4								491	496	7.4	6.3	13.7	4.12	20.76	6.30					0.002	0.005		0.534			0.016
Jun-09	1.450	1.864	0.8	3.3		0.160	29	57		58	9.4	58	2.3								475	430	7.4	6.3	12.4	4.37	20.51	6.31					0.002	0.100		0.023			0.002
Nov-09	0.680	0.874	1.2	5.2		0.160	22	43		44	15.0	64	2.7								510		7.3										0.002	0.100		0.349			0.002
Mar-10	0.200	0.257	0.1	0.4		0.160	21	34		29	9.2	49	2.3								408	306	7.6	7.1	10.1	3.85	21.03	6.27					0.002	0.100		0.083			0.002
Aug-10	0.830	1.067	0.8	3.5		0.160	23	55		47	8.8	36	2.3								489	444	7.2	6.2	12.8	4.39	20.49	6.27					0.002	0.100		0.608			0.002
May-11	0.020	0.026	4.2	18.6		0.160	47	50		55	13.0	63	3.0								621	517	7.2	6.8	12.2	3.51	21.37	6.27					0.002	0.100		0.111			0.021
Sep-11	0.190	0.244	3.7	16.2		0.160	49	67		78	11.0	39	2.0								618	610	7.4	7.0	13.0	4.84	20.04	6.27					0.002	0.100		0.135			0.009
Mar-12	<0.020	<0.026	15.5	68.7		<0.16	115	128	<0.1	158	15.0	59	3.0		ND						1067	1041	7.3	6.9	12.7	4.00	20.88	6.27	0.004	<0.002	<0.002	<0.002	0.003	<0.1	<0.002	0.114		<0.002	0.016
May-12																						517		6.8	12.2	3.51	21.37	6.27											
Oct-12																						1443		6.8	15.9	4.02	20.86	6.42											
Jul-13	0.137	0.176	34.7	153.7		0.203	169	94		273	22.0	50	4.5																				0.082	0.258		0.508			0.089
Dec-13	0.097	0.125	13.8	61.2		0.182	240	89		176	15.2	32	1.3																				0.008	0.025		0.008			0.003
Mar-14	0.020	0.026	5.8	25.8		0.119	77	55	<0.1	129	23.4	36	1.9		ND											3.00	21.88	6.40	0.0023	<0.0001	<0.001	<0.001	0.007	<0.02	<0.0003	<0.001	<0.00002	0.0009	0.010
Jul-14	0.111	0.143	9.0	39.8		0.088	87	86	<0.1	118	13.2	38	1.9		0.5											4.90	19.98	6.40	0.0018	0.038	0.001	0.0010	0.004	0.027	0.0003	<0.001	0.00012	0.0012	0.002
Mar-15	<0.03	<0.039	2.0	8.9	<0.02	0.090	45	36	<0.3	62	12.2	49	2.6	180	ND	ND		<1		8		507		6.8	11.5	3.41	21.47	6.28	0.0029	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	<0.002	<0.001	<0.002	<0.003
May-15																										3.55	21.33												
Aug-15																										4.16	20.72	6.25											
Oct-15	<0.03	<0.039	1.7	7.4	<0.02		36	38	<0.3	56	13.4	51	2.4	174				<1		9		480		6.4	13.8	4.12	20.76	6.25	0.0051	<0.0005	<0.0015	<0.002	<0.007	0.022	<0.005	<0.002	<0.001	<0.002	<0.003
May-16	<0.02	<0.032	4.7	20.9	<0.02	0.075	48	40	<0.3	45	11.4	60	2.8	150	ND	ND	<10	<1	<10	14		559		7.3	11.9	3.06	21.82	6.24	<0.0025	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	0.002	<0.001	<0.002	<0.003
Oct-16	<0.03	<0.039	7.1	31.4	<0.02	0.114	41	76	<0.3	91	16.5	40	1.8	180						11		584		7.4	16.6	4.45	20.43	6.40	0.0030	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	0.004	<0.001	<0.002	<0.003
Apr-17	<0.03	<0.039	2.0	8.6	<0.02	0.060	47	61	<0.3	50	14.9	53	2.4	156	ND	ND	<10	<1	ND	<7		250		6.9	12.9	5.06	19.82	6.25	0.0039	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	0.002	<0.001	<0.002	<0.003
May-17																										4.13	20.75												
Oct-17	<0.03	<0.039	2.8	12.2	<0.02	0.121	38	32	<0.3	41	13.8	50	2.5	178						<7		449		7.0	15.4	2.96	21.92	6.25	<0.0025	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	<0.002	<0.001	<0.002	<0.003
Apr-18	<0.03	<0.039	1.8	7.8	<0.02	0.140	35	25	<0.3	31	10.0	50	2.4	144	ND	ND	<10	<10	<10	12		398		6.9	12.7	2.60	22.28	6.23	0.0041	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	<0.002	<0.001	<0.002	<0.003
Jul-18																										4.82	20.06												
Sep-18	0.040	0.051	8.9	39.6	<0.02	0.150	55	33	<0.3	65	12.6	48	1.9	158						12						4.84	20.04	6.17	0.0026	<0.0005	0.0016	<0.002	<0.007	0.027	<0.005	0.062	<0.001	<0.002	0.009
Apr-19	<0.03	<0.039	4.1	18.2	<0.02	0.104	35	21	<0.3	34	9.4	55	2.3	162	ND	ND		<10	<10	8		312		7.7	13.9	2.33	22.55	6.24	<2.5	<0.5	<1.5	<2	<7	<20	<5	<2	<1	<2	<3

Notes:

XXXXX Indicates result above interim guideline value (IGV)

XXXXX Indicates result above groundwater threshold value (GTV)

XXXXX Indicates result above IGV and GTV

Blank cell indicates no data

- indicates no screening threshold

< indicates result below reporting limit

ND indicates nothing detected in suite

NAC indicates no abnormal change

MW-2S Old Data	Phosphorous	PAHs	BOD	Total Organic Carbon	Aluminium	Antimony	Barium	Beryllium	Boron	Selenium	Silver	Tin
	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
IGV	-	various	-	NAC	**0.2**	-	**0.1**	-	**1**	-	-	-
DWS	-	0.1	-	-	0.2	0.005	-	-	1	0.01	-	-
GTV	-	**0.075**	-	-	**0.15**	-		-	-	-	-	-
Date												
Mar-12				<5	0.007	<0.002	0.038	<0.002		0.002	<0.002	<0.002
Mar-14		<0.05			0.014	0.0008	0.020	<0.001		0.0037	<0.001	0.001
Jul-14		0.26			<0.005	0.0006	0.025	<0.001		0.0020	<0.001	<0.001
Mar-15	0.136	<0.195	<2	<2	<0.02	<0.002	0.024	<0.0005	0.035	<0.003	<0.005	<0.005
Oct-15	0.148		2	2.00	<0.02	<0.002	0.017	<0.0005	0.040	<0.003	<0.005	<0.005

Notes:

XXXXX Indicates result above interim guideline value (IGV)

XXXXX Indicates result above groundwater threshold value (GTV)

XXXXX Indicates result above IGV and GTV

Blank cell indicates no data

- indicates no screening threshold

< indicates result below reporting limit

ND indicates nothing detected in suite

NAC indicates no abnormal change

MW-3S	Major Ions														Organics and Field Measurements												Metals										
	Ammonia-N	Ammonium	Nitrate-N	Nitrate as NO_3	Nitrite as NO_2	Phosphate-P	Chloride	Sulphate	Fluoride	Sodium	Potassium	Calcium	Magnesium	Total Alkalinity as $CaCO_3$	VOCs	Alcohols & Acetates	Trichloroacetic Acid	Ethylene Glycol	Total Petroleum Hydrocarbons	COD	Electrical Conductivity		pH		Temperature	Depth to Groundwater	Groundwater Elevation	Total Depth	Arsenic	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Zinc
																					µS/cm																		
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	Lab	Field	Lab	Field	°C	m bct	m OD	m bct	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
IGV	0.12	0.15	5.6	25	0.1	0.03	30	200	1	150	5	200	50	NAC	various	various	-	-	10	-	1000		6.5	9.5	25	-	-	-	0.01	0.005	0.03	-	0.03	0.2	0.01	0.05	0.001	0.02	0.1
DWS	0.23	0.3	11.3	50	0.5	-	250	250	1.5	200	-	-	-	-	various	various	-	-	-	-	2500		6.5	9.5	-	-	-	-	0.01	0.005	0.05	-	2	0.2	0.01	0.05	0.001	0.02	-
GTV	0.175	0.225	8.5	37.5	0.375	0.035	187.5	187.5	-	-	-	-	-	-	various	various	-	-	10	-	800	1875	-	-	-	-	-	-	0.0075	-	0.0375	-	1.5	-	0.0075	-	0.00075	-	0.075
Date																																							
Jul-95																																							
Dec-95	0.130	0.167	0.2	1.0			16	28		8	0.4	34	1.0																				0.010	0.100		0.090			0.020
Aug-96																																							
Dec-96	0.100	0.129	6.5	28.6		0.050	20	34		15	1.0	47	1.4								329		6.9										0.030	0.050		0.020			0.240
Apr-97	0.100	0.129	7.9	35.1		0.100	30	24		15	0.1	30	1.7								357		7.3										0.030	0.040		0.040			0.050
Oct-97	0.200	0.257	3.5	15.6		0.500	14	17		17	2.8	43	5.2								311		7.1										0.030	16.900		0.500			0.220
Mar-98	0.100	0.129	3.8	16.7		0.100	25	17		17	0.2	50	1.7								342		7.0										0.030	0.040		0.050			0.070
May-98	0.100	0.129	4.1	18.0		0.100	32	19		21	0.3	53	1.7								363		7.3										0.030	0.040		0.040			0.210
Nov-98	0.100	0.129	5.7	25.2		0.100	24	14		14	0.1	55	2.1								391		7.1										0.030	0.040		0.050			0.080
Jun-99										Dry																														
Dec-99	0.290	0.373	4.0	17.7		0.200	31	15		15	0.2	61	2.3								384		7.1										0.002	0.024		0.003			0.058
Feb-00	0.020	0.026	4.3	18.9		0.200	45	20		19	0.4	41	2.7								408		7.2										0.005	0.002		0.008			0.089
Jul-00										Dry																														
Apr-01	0.040	0.051	7.4	32.6		0.160	47	18		24	0.1	25	2.3								429		6.5										0.002	0.100		0.040			0.092
Oct-01	0.060	0.077	5.6	25.0		0.160	29	15		15	0.3	58	2.9								372		6.7										0.003	0.100		0.003			0.006
Apr-02			4.5	19.8		0.160	39	16		16	0.2	62	2.6								405		6.8										0.002	0.100		0.002			0.002
Oct-02	0.170	0.219	2.7	11.9		0.160	23	19		13	0.4	53	2.5								353												0.007	0.100		0.003			0.160
Feb-03	0.200	0.257	5.8	25.5		0.160	25	21		23	0.2	74	2.3								384		6.5										0.002	0.100		0.004			0.048
Sep-03	0.020	0.026	8.0	35.6		0.160	13	89		12	0.1	53	2.4								362		6.3										0.015	0.100		0.018			0.637
Jan-04	0.030	0.039	9.4	41.8		0.160	33	55		20	0.3	65	3.3								413		6.5										0.003	0.200		0.007			0.079
Aug-04			10.1	44.5		0.160	21	13		13	0.2	60	3.0								343		7.5										0.005	0.200		0.019			0.112
Mar-05	0.020	0.026	7.0	31.0		0.160	19	28		13	0.3	57	2.6								392		6.8										0.002	0.200		0.100			0.036
Dec-05	0.030	0.039	11.9	52.8		0.160	24	25		2	0.1	7	0.4								459		7.4										0.002	0.100		0.008			0.002
Feb-06	<0.02	<0.026	12.9	57.2		0.160	28	25		18	<0.1	63	2.0								470		7.2										0.005	0.700		0.011			0.093
Feb-07	0.020	0.026	21.9	96.9		<0.16	22	20		17	<0.1	60	3.0								442		7.4										<0.002	<0.100		0.029			0.079
Nov-07	0.040	0.051	8.4	37.1		0.160	16	17		13	0.1	60	3.0								382	287	7.3	5.6	13.1	5.38		6.30					0.003	0.100		0.030			0.132
May-08	0.020	0.026	8.4	37.3		0.160	28	18		18	0.8	36	3.0								458		7.6										0.005	0.070		0.008			0.008
Dec-08	0.020	0.026	5.3	23.4		0.160	37	16		17	0.2	59	2.8								394	413	7.5	6.5	12.4	4.77		6.28					0.003	0.005		0.006			0.016
Jun-09	0.020	0.026	7.2	32.0		0.160	38	15		17	0.4	21	2.9								443	412	7.2	7.0	13.0	5.44		6.30					0.002	0.100		0.002			0.002
Nov-09	0.020	0.026	2.5	11.2		0.160	47	21		31	0.1	72	2.0								635		7.1										0.002	0.100		0.002			0.002
Mar-10	0.020	0.026	5.1	22.8		16.000	29	16		21	0.1	66	2.5								432	312	7.6	6.7	10.2	4.88		6.21					0.002	0.100		0.005			0.002
Aug-10	0.080	0.103	5.4	23.8		0.160	18	11		13	0.3	41	2.6								329	362	6.8	6.6	14.0	5.49		6.21					0.002	0.100		0.065			0.002
May-11	0.030	0.039	1.7	7.5		0.160	24	12		18	0.1	58	2.3								404	323	7.3	6.3	11.0	4.58		6.21					0.002	0.100		0.028			0.004
Sep-11	0.020	0.026	0.3	1.1		0.160	13	8		13	0.1	54	2.3								331	333	7.1	6.7	11.9	5.23		6.21					0.002	0.100		0.024			0.009
Mar-12	<0.020	<0.026	1.1	5.0		<0.16	18	10	<0.1	18	<0.1	62	3.0			ND					377	356	7.2	6.4	11.4	5.12		6.21	<0.002	<0.002	<0.002	<0.002	0.002	<0.1	<0.002	0.451		<0.002	0.016
Mar-15	0.030	0.039	1.2	5.1	<0.02	<0.02	46	12	<0.3	24	2.3	36	2.2	90	ND	ND		<1		<7		209		7.4	10.2	4.43	22.48	5.92	<0.0025	<0.0005	<0.0015	<0.002	<0.007	0.026	<0.005	0.004	<0.001	<0.002	0.004
May-15																										5.61	21.30												
Aug-15																										5.67	21.24	5.69											
Oct-15																										dry	<21.22	5.69											
May-16																										dry	<21.31	5.60											
Oct-16																										dry	<21.29	5.62											
Apr-17																										dry	<21.29	5.62											
May-17																										dry	<21.29	5.62											
Oct-17																										5.06	21.85	5.54											
Apr-18																										4.97	21.94	5.54											
Jul-18																										dry	<21.29												
Sep-18																										dry	<21.41	5.50											
Apr-19																										5.17	<21.409	5.55											

Notes:

XXXXX	Indicates result above interim guideline value (IGV)	Blank cell indicates no data	
XXXXX	Indicates result above groundwater threshold value (GTV)	- indicates no screening threshold	
XXXXX	Indicates result above IGV and GTV	< indicates result below reporting limit	
		ND indicates nothing detected in suite	NAC indicates no abnormal change

MW-3S Old Data	Phosphorous	PAHs	BOD	Total Organic Carbon	Aluminium	Antimony	Barium	Beryllium	Boron	Selenium	Silver	Tin
	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
IGV	-	various	-	NAC	**0.2**	-	**0.1**	-	**1**	-	-	-
DWS	-	0.1	-	-	0.2	0.005	-	-	1	0.01	-	-
GTV	-	**0.075**	-	-	**0.15**		-	-	-	-	-	-
Date												
Mar-12				<5	0.042	<0.002	0.005	<0.002		<0.002	<0.002	<0.002
Mar-15	0.015	<0.195	5	3.00	<0.02	<0.002	0.025	<0.0005	<0.012	<0.003	<0.005	<0.005

Notes:

XXXXX Indicates result above interim guideline value (IGV)

XXXXX Indicates result above groundwater threshold value (GTV)

XXXXX Indicates result above IGV and GTV

Blank cell indicates no data

- indicates no screening threshold

< indicates result below reporting limit

ND indicates nothing detected in suite

NAC indicates no abnormal change

MW-3D	Major Ions														Organics and Field Measurements												Metals										
	Ammonia-N	Ammonium	Nitrate-N	Nitrate as NO_3	Nitrite as NO_2	Phosphate-P	Chloride	Sulphate	Fluoride	Sodium	Potassium	Calcium	Magnesium	Total Alkalinity as $CaCO_3$	VOCs	Alcohols & Acetates	Trichloroacetic Acid	Ethylene Glycol	Total Petroleum Hydrocarbons	COD	Electrical Conductivity µS/cm		pH		Temperature	Depth to Groundwater	Groundwater Elevation	Total Depth	Arsenic	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Zinc
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	Lab	Field	Lab	Field	°C	m bct	m OD	m bct	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
IGV	0.12	0.15	5.6	25	0.1	0.03	30	200	1	150	5	200	50	NAC	various	various	-	-	10	-	1000		6.5	9.5	25	-	-	-	0.01	0.005	0.03	-	0.03	0.2	0.01	0.05	0.001	0.02	0.1
DWS	0.23	0.3	11.3	50	0.5	-	250	250	1.5	200	-	-	-	-	various	various	-	-	-	-	2500		6.5	9.5	-	-	-	-	0.01	0.005	0.05	-	2	0.2	0.01	0.05	0.001	0.02	-
GTV	0.175	0.225	8.5	37.5	0.375	0.035	187.5	187.5	-	-	-	-	-	-	various	various	-	-	10	-	800	1875	-	-	-	-	-	-	0.0075	-	0.0375	-	1.5	-	0.0075	-	0.00075	-	0.075
Date																																							
Jul-95	0.130	0.167	8.3	36.6		1.000	49	46		23	1.0	28	1.6																				0.010	1.600		0.770			0.040
Dec-95	0.130	0.167	10.4	45.9		1.000	53	46		15	0.7	22	2.1																				0.010	0.030		0.130			0.020
Aug-96	0.027	0.035	0.5	2.0		10.000	25	27		20	2.0	23	2.4																				0.010	0.930		0.010			0.010
Dec-96	0.320	0.411	9.9	43.7		0.050	30	38		18	1.0	20	1.7								327		6.2										0.030	0.270		1.130			0.140
Apr-97	0.100	0.129	6.1	26.9		0.100	27	46		21	0.4	16	1.9								267		5.5										0.030	0.040		0.040			0.060
Oct-97	0.200	0.257	3.4	15.1		0.500	10	14		12	3.4	8	1.1								143		6.2										0.030	1.160		0.110			0.060
Mar-98	0.040	0.051	4.8	21.3		0.100	17	20		15	0.5	22	1.9								218		6.6										0.030	7.600		0.040			0.030
May-98	0.300	0.386	4.3	18.9		0.100	16	20		15	0.7	24	1.7								201		6.5										0.030	0.040		0.070			0.180
Nov-98	0.600	0.771	3.5	15.5		0.100	13	17		13	0.5	22	1.6								204		6.3										0.030	0.040		0.040			0.080
Jun-99	0.500	0.643	4.4	19.5		0.500	16	37		15	0.7	39	2.1								256		6.3										0.030	0.040		0.040			0.340
Dec-99	0.200	0.257	4.3	19.0		0.200	16	19		16	0.6	23	1.9								220		6.5										0.002	0.002		0.072			0.095
Feb-00	0.300	0.386	4.6	20.2		0.200	21	33		17	0.8	18	2.4								254		6.6										0.016	0.002		0.080			0.090
Jul-00	0.200	0.257	4.6	20.2		0.160	16	48		14	1.6	21	0.5								198		6.0										0.002	0.100		0.600			0.036
Apr-01	0.150	0.193	5.8	25.5		0.160	20	120		10	0.4	26	1.5								251		6.2										0.002	0.100		0.050			0.063
Oct-01	0.170	0.219	5.0	22.0		0.160	17	11		13	0.4	25	2.1								226		6.3										0.002	0.100		0.002			0.002
Apr-02			4.0	17.6		0.160	22	17		14	0.5	27	2.1								239		6.0										0.002	0.100		0.016			0.002
Oct-02	0.370	0.476	5.2	22.9		0.160	17	102		5	0.1	7	0.6								203		5.9										0.002	0.100		0.032			0.015
Feb-03	0.200	0.257	4.4	19.4		0.160	19	37		19	0.5	36	2.1								241		6.1										0.002	0.100		0.064			0.056
Sep-03	0.050	0.064	6.1	26.8		0.160	16	30		14	0.6	20	1.9								220		6.3										0.002	0.100		0.044			0.090
Jan-04	0.020	0.026	6.2	27.6		0.160	19	49		20	0.3	31	2.4								245		6.4										0.002	0.100		3.458			0.092
Aug-04			7.0	30.9		0.160	17	16		17	0.5	27	2.2								220		5.9										0.002	0.100		0.003			0.158
Mar-05	0.020	0.026	7.5	33.4		0.160	18	17		14	0.4	28	2.2								240		6.0										0.002	0.100		0.100			0.021
Dec-05	0.040	0.051	7.5	33.0		0.160	18	14		1	0.1	3	0.3								244		7.4										0.002	0.100		0.002			0.002
Feb-06	0.030	0.039	9.4	41.8		0.160	21	17		15	0.1	30	1.5								277		7.1										0.002	0.300		0.018			0.057
Jul-06	<0.02	<0.026	9.2	40.8		<0.16	20	15		18	<0.1	30	2.0								267		7.0										<2	0.100		0.012			<2
Feb-07	<0.02	<0.026	17.5	77.5		<0.16	16	15		14	<0.1	32	2.0								274		7.3										<0.002	<0.100		0.012			0.031
Nov-07	0.020	0.026	9.8	43.5		0.160	15	14		11	1.0	30	2.0								263	251	6.6	5.9	12.8	6.00		9.40					0.002	0.100		0.013			0.038
May-08	0.020	0.026	9.2	40.5		0.160	22	15		20	0.2	72	4.0								304		6.9										0.002	0.020		0.001			0.004
Dec-08	0.180	0.231	6.4	28.2		0.160	20	12		14	0.2	31	2.4								264	261	7.0	6.4	11.1	5.52		9.44					0.001	0.002		0.001			0.011
Jun-09	0.020	0.026	8.4	37.1		0.060	25	13		17	0.4	21	2.9								290	305	6.6	7.1	12.1	5.97		9.46					0.002	0.100		0.002			0.002
Nov-09	0.020	0.026	7.5	33.1		0.160	22	13		12	4.0	38	2.2								351		6.7										0.002	0.100		0.002			0.002
Mar-10	0.040	0.051	7.8	34.3		0.160	25	14		16	0.5	33	2.6								286	210	6.7	6.6	11.4	5.75		9.34					0.002	0.100		0.074			0.004
Aug-10	0.020	0.026	6.8	30.1		0.160	18	11		13	0.4	31	2.7								288	259	6.8	6.1	12.6	6.43		9.34					0.002	0.400		0.077			0.002
May-11	0.020	0.026	5.9	25.9		0.160	17	11		12	0.4	33	2.7								256	209	6.7	6.3	11.7	5.48		9.34					0.002	0.100		0.128			0.008
Sep-11	0.020	0.026	7.0	30.8		0.160	17	11		13	0.4	27	2.5								254	250	6.7	6.5	12.0	5.92		9.34					0.002	0.100		0.064			0.011
Mar-12	<0.020	<0.026	5.7	25.1		<0.16	14	10	<0.1	16	<0.1	39	3.0		ND						262	266	7.3	6.6	11.8	5.84		9.34	<0.002	<0.002	<0.002	<0.002	<0.002	<0.1	<0.002	0.267		<0.002	0.016
May-12																						209		6.3	11.7	5.48		9.34											
Oct-12																						433		5.9	12.6	6.84		13.92											
Jul-13	1.126	1.448	2.7	11.7		0.089	48	35		71	11.2	28	8.2																				0.096	0.780		5.835			0.212
Dec-13	0.771	0.991	7.4	32.5		0.108	31	23		46	7.4	20	4.1																				<0.003	<0.02		2.949			0.003
Mar-14	0.884	1.136	1.2	5.5		0.055	58	35	0.3	59	9.3	23	5.3		ND											6.40		13.70	0.0005	0.0001	<0.001	0.0041	0.006	<0.02	<0.0003	3.781	<0.00002	0.0036	0.010
Jul-14	0.821	1.055	2.3	10.1		0.044	49	37	0.2	49	4.4	21	4.6		ND	ND										7.30		14.00	0.0006	<0.0001	<0.001	0.0038	<0.003	<0.02	<0.0003	3.382	0.00004	0.0033	0.005
Mar-15	0.840	1.080	3.2	14.2	<0.02	<0.02	44	21	<0.3	45	3.6	22	5.1	96	ND	ND		<1		<7		359		6.7	12.7	6.97	19.91	13.48	<0.0025	<0.0005	<0.0015	0.0030	<0.007	<0.02	<0.005	3.256	<0.001	<0.002	0.008
May-15																										6.56	20.31												
Aug-15																										6.60	20.28	13.62											
Oct-15	1.090	1.401	0.3	1.2	<0.02	0.060	53	34	<0.3	50	3.9	27	5.6	108				<1		11		372		6.4	13.2	6.53	20.34	13.62	<0.0025	<0.0005	<0.0015	0.0030	<0.007	0.101	<0.005	3.898	<0.001	<0.002	0.007
May-16	0.830	1.069	0.3	1.5	<0.02	0.062	40	33	<0.3	52	3.3	23	5.0	110	ND	ND	<10	<1	<10	11		417		7.0	12.8	7.18	19.70	13.69	<0.0025	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	3.302	<0.001	<0.002	<0.003
Oct-16	0.850	1.093	5.6	25.0	<0.02	0.023	38	25	<0.3	45	3.6	24	5.5	98						<7		347		7.7	13.2	7.09	19.79	13.78	<0.0025	<0.0005	<0.0015	0.0030	<0.007	0.02	<0.005	3.195	<0.001	0.002	<0.003
Apr-17	0.860	1.106	0.3	1.3	<0.02	<0.03	45	31	<0.3	52	3.6	25	5.7	130	ND	ND	<10	<1	ND	<7		265		6.8	13.3	6.86	20.02	13.92	<0.0025	<0.0005	<0.0015	0.0030	<0.007	<0.02	<0.005	3.750	<0.001	0.003	<0.003
May-17																										6.91	19.97												
Oct-17	0.920	1.183	0.6	2.6	<0.02	0.023	47	30	<0.3	43	3.2	25	5.9	112						13		398		6.8	13.9	6.56	20.32	14.03	<0.0025	<0.0005	<0.0015	0.0020	<0.007	<0.02	<0.005	4.110	<0.001	<0.002	<0.003
Apr-18	1.060	1.363	2.0	8.7	<0.02	0.050	44	29	<0.3	44	3.4	28	6.8	112	ND	ND	<10	<10	<10	17		400		7.0	12.1	6.57	20.31	13.76	<0.0025	<0.0005	0.0016	0.0040	<0.007	<0.02	<0.005	4.449	<0.001	0.003	0.004
Jul-18																										7.01	19.87												
Sep-18	1.140	1.466	2.3	10.3	<0.02	0.050	46	29	<0.3	38	3.5	31	6.6	108						20				6.99	19.89	13.68	<0.0025	<0.0005	<0.0015	0.0030	<0.007	<0.02	<0.005	4.765	<0.001	0.002	0.004
Apr-19	1.250	1.607	0.5	2.3	<0.02	0.029	46	33	<0.3	46	4.0	32	7.3	130	ND	ND		<10	<10	<7		310		7.4	14.6	6.50	20.38	13.71	<2.5	<0.5	<1.5	3.0000	<7	<20	<5	4.702	<1	3.000	<3

Notes:

XXXXX Indicates result above interim guideline value (IGV)

XXXXX Indicates result above groundwater threshold value (GTV)

XXXXX Indicates result above IGV and GTV

Blank cell indicates no data

- indicates no screening threshold

< indicates result below reporting limit

ND indicates nothing detected in suite

NAC indicates no abnormal change

MW-3D Old Data	Phosphorous	PAHs	BOD	Total Organic Carbon	Aluminium	Antimony	Barium	Beryllium	Boron	Selenium	Silver	Tin
	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
IGV	-	various	-	NAC	**0.2**	-	**0.1**	-	**1**	-	-	-
DWS	-	0.1	-	-	0.2	0.005		-	1	0.01	-	-
GTV	-	**0.075**	-	-	**0.15**	-	-	-	-	-	-	-
Date												
Mar-12				<5	0.053	<0.002	0.008	<0.002		<0.002	<0.002	<0.002
Mar-14		<0.05			<0.005	<0.0001	0.007	<0.001		<0.0002	<0.001	0.002
Jul-14		0.13			<0.005	<0.0001	0.008	<0.001		0.0005	<0.001	<0.001
Mar-15	0.066	<0.195	4	<2	<0.02	<0.002	0.006	<0.0005	0.023	<0.003	<0.005	<0.005
Oct-15	0.052		4	<2	<0.02	<0.002	0.008	<0.0005	0.023	<0.003	<0.005	<0.005

Notes:

XXXXX Indicates result above interim guideline value (IGV)

XXXXX Indicates result above groundwater threshold value (GTV)

XXXXX Indicates result above IGV and GTV

Blank cell indicates no data

- indicates no screening threshold

< indicates result below reporting limit

ND indicates nothing detected in suite

NAC indicates no abnormal change

MW-4S	Major Ions														Organics and Field Measurements												Metals										
	Ammonia-N	Ammonium	Nitrate-N	Nitrate as NO_3	Nitrite as NO_2	Phosphate-P	Chloride	Sulphate	Fluoride	Sodium	Potassium	Calcium	Magnesium	Total Alkalinity as $CaCO_3$	VOCs	Alcohols & Acetates	Trichloroacetic Acid	Ethylene Glycol	Total Petroleum Hydrocarbons	COD	Electrical Conductivity µS/cm		pH		Temperature	Depth to Groundwater	Groundwater Elevation	Total Depth	Arsenic	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Zinc
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	Lab	Field	Lab	Field	°C	m bct	m OD	m bct	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
IGV	0.12	0.15	5.6	25	0.1	0.03	30	200	1	150	5	200	50	NAC	various	various	-	-	10	-	1000		6.5	9.5	25	-	-	-	0.01	0.005	0.03	-	0.03	0.2	0.01	0.05	0.001	0.02	0.1
DWS	0.23	0.3	11.3	50	0.5	-	250	250	1.5	200	-	-	-	-	various	various	-	-	-	-	2500		6.5	9.5	-	-	-	-	0.01	0.005	0.05	-	2	0.2	0.01	0.05	0.001	0.02	-
GTV	0.175	0.225	8.5	37.5	0.375	0.035	187.5	187.5	-	-	-	-	-	-	various	various	-	-	10	-	800	1875	-	-	-	-	-	-	0.0075	-	0.0375	-	1.5	-	0.0075	-	0.00075	-	0.075
Date																																							
Jul-95	0.100	0.129	7.4	32.7		1.000	15	72		10	1.0	42	4.9																				0.050	13.600		2.100			0.010
Dec-95	0.130	0.167	4.5	20.0		1.000	11	77		7	0.3	29	2.8																				0.010	0.020		0.090			0.020
Aug-96	0.230	0.296	0.5	2.0		10.000	21	62		12	4.0	50	5.9																				0.010	4.100		0.040			0.010
Dec-96	0.100	0.129	5.4	23.8		0.050	17	72		13	0.8	42	3.1								260		6.1										0.030	0.040		0.020			0.280
Apr-97	0.100	0.129	4.9	21.8		0.100	18	70		11	0.1	23	3.9								331		6.6										0.030	0.040		0.040			0.050
Oct-97	0.200	0.257	6.2	27.5		0.500	20	39		21	3.5	39	3.7								329		6.5										0.030	2.140		0.050			0.450
Mar-98	0.100	0.129	5.1	22.6		0.100	13	50		11	0.3	45	3.5								310		6.8										0.030	0.040		0.040			0.020
May-98	0.100	0.129	5.2	23.0		0.100	16	44		13	0.3	51	3.3								322		6.9										0.030	0.040		0.040			0.160
Nov-98	0.100	0.129	5.4	23.9		0.100	17	28		14	0.1	53	3.6								388		6.9										0.030	0.040		0.050			0.070
Jun-99	0.500	0.643	6.6	29.2		0.500	24	36		15	0.6	55	5.0								368		7.2										0.030	0.040		0.040			0.250
Dec-99	0.200	0.257	7.2	31.9		0.200	32	32		18	0.3	52	5.0								371		7.0										0.002	0.010		0.005			0.062
Feb-00	0.200	0.257	6.4	28.2		0.200	17	45		25	0.4	30	3.9								356		7.3										0.004	0.002		0.008			0.150
Jul-00	0.200	0.257	5.6	24.6		0.160	14	46		25	0.3	25	2.9								267		6.8										0.002	0.100		0.006			0.068
Apr-01	0.040	0.051	10.7	47.5		0.160	13	135		14	0.1	43	2.4								319		6.4										0.002	0.100		0.040			0.068
Oct-01	0.080	0.103	9.3	41.3		0.160	39	22		32	0.4	34	4.5								372		6.5										0.002	0.100		0.002			0.002
Apr-02			10.8	48.0		0.160	42	45		61	0.3	27	2.1								480		6.6										0.002	0.100		0.002			0.002
Oct-02	0.080	0.103	15.8	70.0		0.160	51	45		120	0.3	5	0.5								586		6.8										0.002	0.100		0.002			0.030
Feb-03	0.200	0.257	12.3	54.6		0.160	49	42		154	1.7	4	0.3								507		6.6										0.002	0.100		0.002			0.053
Sep-03	0.020	0.026	13.1	58.2		0.160	45	44		100	1.0	4	0.4								526		7.3										0.007	0.100		0.002			0.948
Jan-04	0.030	0.039	16.6	73.5		0.160	57	83		168	1.8	3	0.3								601		6.4										0.002	0.100		3.000			0.084
Aug-04			12.8	56.8		0.160	44	30		138	0.8	3	0.3								460		7.0										0.003	0.100		0.002			0.066
Mar-05	0.020	0.026	15.0	66.4		0.160	46	32		99	1.0	3	0.2								488		6.6										0.002	0.100		<0.100			0.039
Dec-05	0.020	0.026	9.9	44.0		0.160	35	25		9	0.3	1	0.1								423		7.8										0.002	0.100		0.002			0.002
Feb-06	0.040	0.051	11.9	52.8		0.160	44	25		81	0.8	7	0.4								424		7.7										0.002	0.100		0.011			0.079
Jul-06	<0.02	<0.026	16.0	70.8		<0.16	44	26		93	2.0	5	1.0								465		7.7										<2	<0.100		0.004			0.017
Feb-07	<0.02	<0.026	27.9	123.5		<0.16	39	26		82	2.0	14	<2								468		7.8										0.002	<0.100		<0.002			0.048
Nov-07	0.020	0.026	10.8	47.9		0.160	35	24		58	2.0	8	1.0								379	332	7.4	6.3	13.2	6.29	20.69	7.65					0.003	0.100		0.002			0.066
May-08	0.020	0.026	11.1	49.3		0.160	38	26		79	2.7	13	2.0								456		8.0										0.009	0.200		0.004			0.022
Dec-08	0.020	0.026	10.8	47.8		0.160	37	27		68	2.4	15	2.1								385	411	7.5	6.6	14.0	5.70	21.28	7.78					0.001	0.003		0.001			0.013
Jun-09	0.020	0.026	10.3	45.8		0.160	41	29		80	3.5	20	2.4								433	335	7.3	6.8	14.9	6.11	20.87	7.70					0.002	0.100		0.002			0.002
Nov-09	0.020	0.026	11.4	50.5		0.160	39	32		57	2.8	24	2.3								474		7.3										0.002	0.100		0.002			0.002
Mar-10	0.020	0.026	7.1	31.3		0.160	17	32		50	1.8	18	1.8								337	226	7.8	7.4	12.4	5.82	21.16	7.82					0.002	0.100		0.003			0.002
Aug-10	0.020	0.026	8.1	35.8		0.160	21	29		50	2.1	18	2.1								408	351	7.4	7.0	13.7	6.37	20.61	7.82					0.002	0.100		0.003			0.002
May-11	0.020	0.026	9.8	43.5		0.160	41	21		67	2.3	21	2.6								444	366	7.7	7.0	12.3	6.10	20.88	7.82					0.002	0.100		0.016			0.003
Sep-11	0.020	0.026	9.5	42.0		0.160	48	21		7	2.9	21	2.5								475	477	7.5	7.2	12.6	6.52	20.46	7.82					0.002	0.100		0.008			0.011
Mar-12	<0.020	<0.026	11.1	49.2		<0.16	53	27	<0.1	57	3.0	32	4.0		ND						479	459	7.4	7.1	12.4	6.23	20.75	7.82	<0.002	<0.002	<0.002	<0.002	<0.002	<0.1	<0.002	0.005		<0.002	0.018
May-12																						366		7.0	12.3	6.10	20.88	7.82											
Oct-12																						409		6.6	12.5	6.24	20.74	7.97											
Jul-13	0.128	0.165	7.0	30.9		0.086	18	22		59	5.2	18	4.5																				0.063	0.227		0.050			0.082
Dec-13	0.016	0.021	0.3	1.2		0.435	11	21		40	4.2	21	2.4																				<0.003	0.023		<0.001			4.200
Mar-14	0.016	0.021	6.6	29.0		0.042	8	21	<0.1	31	4.8	29	3.0		ND											5.20	21.78	7.90	0.0004	0.0001	<0.001	<0.001	0.004	<0.02	<0.0003	<0.001	<0.00002	<0.0005	0.018
Jul-14	0.016	0.021	7.7	34.2		0.027	8	22	<0.1	37	2.5	23	2.9		ND											6.70	20.28	8.50	0.0003	<0.0001	<0.001	<0.002	<0.003	<0.02	<0.0003	0.001	0.00003	<0.0005	0.003
Mar-15	0.050	0.064	5.4	24.0	<0.02	<0.02	13	19	<0.3	29	2.1	37	5.3	126	ND	ND			<1		<7		372		7.1	11.7	5.88	21.10	7.78	<0.0025	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	<0.002	<0.001	<0.002	0.007
May-15																										5.91	21.07												
Aug-15																										5.97	21.01	7.79											
Oct-15	<0.03	<0.039	3.5	15.5	<0.02	0.040	26	23	<0.3	21	2.2	48	6.5	128					<1		<7		318		6.5	13.1	5.88	21.10	7.78	<0.0025	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	<0.002	<0.001	<0.002	0.007
May-16	<0.025	<0.032	4.5	19.7	<0.02	0.033	15	27	<0.3	9	1.6	43	6.3	88	ND	ND	<10	<1	<10	<7		308		7.3	12.1	5.76	21.22	7.79	<0.0025	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	<0.002	<0.001	<0.002	<0.003
Oct-16	<0.03	<0.039	4.5	19.8	<0.02	0.062	15	37	<0.3	11	1.8	47	6.6	108						<7		365		7.1	13.1	3.30	21.31	7.87	<0.0025	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	<0.002	<0.001	<0.002	0.011
Apr-17	0.03	0.039	3.3	14.7	<0.02	<0.03	10	23	<0.3	8	1.6	36	5.0	124	ND	ND	<10	<1	ND	<7		165		6.9	12.5	5.87	21.11	7.85	<0.0025	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	<0.002	<0.001	<0.002	0.006
May-17																										6.01	20.97												
Oct-17	<0.03	<0.039	3.5	15.5	<0.02	<0.02	16	17	<0.3	9	1.6	35	5.0	100						<7		232		6.5	13.1	5.55	21.42	7.78	<0.0025	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	<0.002	<0.001	<0.002	0.004
Apr-18	<0.03	<0.039	3.8	16.7	<0.02	<0.03	12	21	<0.3	7	1.5	38	5.2	100	ND	ND	<10	<10	<10	<7		241		6.5	11.8	5.20	21.78	7.78	<0.0025	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	<0.002	<0.001	<0.002	0.005
Jul-18																										6.32	20.65												
Sep-18	<0.03	<0.039	4.7	20.7	<0.02	0.05	16	19	<0.3	9	1.8	45	5.8	106						<7						6.30	20.67	7.75	<0.0025	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	0.003	<0.001	<0.002	0.027
Apr-19	<0.03	<0.039	6.3	27.8	<0.02	0.03	18	26	<0.3	11	1.9	49	5.6	118	ND	ND		<10	<10	11		351		9.6	13.0	5.37	21.61	7.79	<2.5	<0.5	<1.5	<2	<7	<20	<5	<2	<1	<2	0.006

Notes:

XXXXX Indicates result above interim guideline value (IGV)

XXXXX Indicates result above groundwater threshold value (GTV)

XXXXX Indicates result above IGV and GTV

Blank cell indicates no data

- indicates no screening threshold

< indicates result below reporting limit

ND indicates nothing detected in suite

NAC indicates no abnormal change

MW-4S Old Data	Phosphorous	PAHs	BOD	Total Organic Carbon	Aluminium	Antimony	Barium	Beryllium	Boron	Selenium	Silver	Tin
	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		mg/L	mg/L	mg/L
IGV	-	various	-	NAC	**0.2**	-	**0.1**	-	**1**	-	-	-
DWS	-	0.1	-	-	0.2	0.005		-	1	0.01	-	-
GTV	-	**0.075**	-	-	**0.15**	-	-	-	-	-	-	-
Date												
Mar-12				<5	0.044	<0.002	0.012	<0.002		<0.002	<0.002	<0.002
Mar-14		<0.05			0.006	<0.0001	0.003	<0.001		0.0028	<0.001	0.001
Jul-14		<0.05			0.006	<0.0001	0.004	<0.001		0.0023	<0.001	<0.001
Mar-15	0.04	<0.195	<2	<2	<0.02	<0.002	0.004	<0.0005	0.022	<0.003	<0.005	<0.005
Oct-15	0.04		<4	<2	<0.02	<0.002	0.003	<0.0005	0.020	<0.003	<0.005	<0.005

Notes:

XXXXX Indicates result above interim guideline value (IGV)

XXXXX Indicates result above groundwater threshold value (GTV)

XXXXX Indicates result above IGV and GTV

Blank cell indicates no data

- indicates no screening threshold

< indicates result below reporting limit

ND indicates nothing detected in suite

NAC indicates no abnormal change

MW-4D	Major Ions														Organics and Field Measurements												Metals									
	Ammonia-N	Ammonium	Nitrate-N	Nitrate as NO_3	Nitrite as NO_2	Phosphate-P	Chloride	Sulphate	Fluoride	Sodium	Potassium	Calcium	Magnesium	Total Alkalinity as $CaCO_3$	VOCs	Alcohols & Acetates	Trichloroacetic Acid	Ethylene Glycol	Total Petroleum Hydrocarbons	COD	Electrical Conductivity µS/cm		pH		Temperature	Depth to Groundwater	Groundwater Elevation	Total Depth	Arsenic	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Zinc
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	Lab	Field	Lab	Field	°C	m bct	m OD	m bct	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
IGV	0.12	0.15	5.6	25	0.1	0.03	30	200	1	150	5	200	50	NAC	various	various	-	-	10	-	1000		6.5	9.5	25	-	-	-	0.01	0.005	0.03	-	0.03	0.2	0.01	0.05	0.001	0.02	0.1
DWS	0.23	0.3	11.3	50	0.5	-	250	250	1.5	200	-	-	-	-	various	various	-	-	-	-	2500		6.5	9.5	-	-	-	-	0.01	0.005	0.05	-	2	0.2	0.01	0.05	0.001	0.02	-
GTV	0.175	0.225	8.5	37.5	0.375	0.035	187.5	187.5	-	-	-	-	-	-	various	various	-	-	10	-	800	1875	-	-	-	-	-	-	0.0075	-	0.0375	-	1.5	-	0.0075	-	0.00075	-	0.075
Date																																							
Jul-95	0.220	0.283	7.6	33.8		1.000	27	33		16	1.0	20	1.6																				0.010	2.950		1.600			0.030
Dec-95	0.130	0.167	9.2	40.9		1.000	39	36		12	0.3	19	2.2																				0.010	0.020		0.150			0.020
Aug-96	0.025	0.032	0.5	2.0		10.000	21	31		16	2.0	23	1.8																				0.010	0.010		0.040			0.010
Dec-96	0.100	0.129	5.8	25.7		0.050	21	22		16	0.6	26	1.6								252		5.5										0.030	0.040		0.050			0.160
Apr-97	0.100	0.129	9.3	41.3		0.100	44	30		16	0.6	17	1.8								303		6.0										0.030	0.040		0.100			0.140
Oct-97	0.200	0.257	8.8	39.1		0.500	39	27		19	2.1	23	2.0								286		5.8										0.030	2.200		0.110			0.120
Mar-98	0.100	0.129	4.5	19.9		0.100	44	32		17	0.5	33	2.3								212		6.0										0.030	0.040		0.040			0.020
May-98	0.100	0.129	7.9	34.8		0.100	66	41		25	0.6	48	2.6								414		7.7										0.030	0.040		0.070			0.190
Nov-98	0.100	0.129	4.6	20.2		0.100	16	49		32	0.2	28	1.3								308		6.1										0.030	0.040		0.040			0.080
Jun-99	0.900	1.157	6.2	27.5		0.500	44	48		31	0.7	42	1.9								354		5.9										0.030	0.040		0.060			0.170
Dec-99	0.200	0.257	5.8	25.7		0.200	17	27		24	0.0	19	0.8								237		6.2										0.002	0.012		0.015			0.064
Feb-00	0.200	0.257	5.7	25.1		0.200	17	41		24	0.3	13	1.0								237		5.9										0.007	0.002		0.009			0.096
Jul-00	0.200	0.257	5.9	26.0		0.160	24	53		20	0.4	19	1.3								247		5.6										0.002	0.100		0.031			0.039
Jun-01			7.5	33.4		0.160	22	30		23	0.3	16	0.7																				0.003	0.100		0.025			0.013
Oct-01	0.060	0.077	6.1	26.8		0.160	21	27		26	0.3	13	0.7								234		5.5										0.002	0.100		0.006			0.002
Apr-02			5.9	26.0		0.160	18	24		26	0.2	11	0.4								198		5.6										0.002	0.100		0.002			0.071
Oct-02	0.070	0.090	6.7	29.5		0.160	17	26		25	0.1	6	0.3								198		5.3										0.006	0.100		0.012			0.032
Feb-03	0.300	0.386	8.4	37.4		0.160	49	47		52	0.5	27	1.4								350		5.4										0.002	0.100		0.076			0.045
Sep-03	0.020	0.026	10.2	45.1		0.160	49	44		48	0.5	16	0.9								359		6.1										0.004	0.100		0.068			0.123
Jan-04	0.020	0.026	7.4	32.9		0.160	42	68		48	0.1	16	0.8								324		5.8										0.002	0.100		0.060			0.107
Aug-04			12.1	53.7		0.160	49	40		57	0.4	14	1.0								361		5.3										0.002	0.100		0.050			0.150
Mar-05	0.040	0.051	13.1	58.1		0.160	47	43		58	0.5	12	0.8								39		5.4										0.002	0.100		0.100			0.055
Dec-05	0.150	0.193	12.9	57.2		0.160	49	39		10	0.6	7	0.6								422		5.9										0.002	0.100		0.048			0.002
Feb-06	0.140	0.180	14.9	66.0		0.160	52	44		79	0.2	8	0.3								429		6.2										0.002	0.100		0.217			0.099
Jul-06	0.130	0.167	12.0	53.2		<0.16	48	36		71	1.0	8	1.0								385		7.0										<0.002	0.100		0.199			<0.002
Feb-07	0.120	0.154	5.2	22.8		2.840	22	23		57	1.0	14	<2								398		7.0										<0.002	<0.01		0.063			0.083
Nov-07	0.080	0.103	11.2	49.6		0.160	31	27		29	1.0	16	3.0								292	294	6.2	5.6	12.7	6.55	20.62	11.20					0.002	0.100		0.030			0.057
May-08	0.120	0.154	11.5	51.0		0.160	36	28		49	0.9	14	2.0								342		6.6										0.001	0.030		0.044			0.004
Dec-08	0.120	0.154	10.0	44.1		0.160	35	24		39	0.5	15	2.6								280	303	6.4	5.6	12.4	6.10	21.07	11.25					0.001	0.010		0.032			0.017
Jun-09	0.040	0.051	10.6	46.9		0.160	33	24		36	0.6	36	3.4								299	1278	6.4	7.0	14.3	6.44	20.73	11.28					0.002	0.100		0.015			0.002
Nov-09	0.020	0.026	10.9	48.1		0.160	30	18		14	0.8	28	4.2								288		6.4										0.002	0.100		0.008			0.004
Mar-10	0.140	0.180	10.0	44.4		0.160	59	31		65	0.6	9	1.2								402	281	6.8	6.3	12.4	6.16	21.01	11.04					0.003	0.100		0.032			0.012
Aug-10	0.060	0.077	9.3	41.3		0.160	32	19		34	0.6	16	3.1								314	292	6.3	5.7	12.9	6.44	20.73	11.04					0.002	0.100		0.014			0.002
May-11	0.220	0.283	10.3	45.4		0.160	46	27		51	0.6	14	1.8								354	295	6.2	5.8	12.6	6.32	20.85	11.04					0.002	0.100		0.037			0.014
Sep-11	0.180	0.231	8.2	36.3		0.160	34	23		37	0.6	14	2.4								301	310	6.4	6.0	12.2	6.68	20.49	11.04					0.002	0.100		0.002			0.043
Mar-12	0.240	0.309	10.2	45.2		<0.16	31	22	<0.1	38	1.0	16	3.0		ND						309	306	6.3	6.0	12.2	6.41	20.76	11.04	<0.002	<0.002	<0.002	0.003	<0.002	<0.1	<0.002	0.025		<0.002	0.043
May-12																						295		5.8	12.6	6.32	20.85	11.04											
Oct-12																						278		5.5	12.0	6.38	20.79	11.05											
Jul-13	0.355	0.456	10.6	46.7		0.069	31	17		44	2.9	15	5.3																				0.071	0.209		0.064			0.082
Dec-13	0.169	0.217	10.3	45.6		0.083	28	18		36	3.8	15	2.7																				<0.003	<0.020		0.025			0.007
Mar-14	0.136	0.175	8.2	36.3		0.034	39	20	<0.1	37	4.0	17	0.003		2											5.80	21.37	11.30	0.0002	0.0003	<0.001	0.002	0.004	<0.020	0.0003	0.021	0.00002	0.0005	0.010
Jul-14	0.189	0.243	10.2	45.2		0.030	43	21	<0.1	46	1.2	10	1.6		ND											7.60	19.57	11.60	<0.0003	<0.0001	<0.001	0.002	<0.003	<0.020	<0.0003	0.019	0.00006	<0.0005	0.013
Mar-15	0.240	0.309	6.0	26.4	<0.02	0.040	31	19	<0.3	39	0.6	13	2.4	48	ND	ND		<1		<7		297		6.2	12.1	6.25	20.92	11.00	<0.0025	<0.0005	<0.0015	0.002	<0.007	<0.020	<0.005	0.019	<0.001	<0.002	0.010
May-15																										6.15	21.02												
Aug-15																										6.24	20.93	11.00											
Oct-15			7.7	34.3	<0.02		28	18	<0.3	23	0.8	22	4.4	56				<1		<7		235		5.8	12.5	6.16	21.01	11.00	0.0026	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	0.007	<0.001	<0.002	0.009
May-16	0.160	0.21	7.4	32.7	0.04	0.055	30	20	<0.3	42	0.6	8	1.2	42	ND	ND	<10	<1	<10	9		273		6.1	12.5	6.27	20.89	11.00	<0.0025	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	0.018	<0.001	<0.002	<0.003
Oct-16	0.030	0.039	7.7	34.0	<0.02	0.026	29	17	<0.3	19	1.0	23	5.3	48						<7		231		7.1	12.5	6.66	20.51	11.26	<0.0025	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	0.003	<0.001	<0.002	<0.003
Apr-17	0.120	0.154	6.8	30.2	0.03	<0.03	29	19	<0.3	27	0.9	18	3.7	64	ND	ND	<10	<1	ND	<7		166		6.9	13.6	6.21	20.96	11.04	0.0028	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	0.009	<0.001	<0.002	<0.003
May-17																										6.30	20.87												
Oct-17	<0.03	<0.039	7.5	33.3	<0.02	<0.02	26	17	<0.3	14	0.8	22	4.8	36						13		220		6.3	12.4	5.86	21.31	11.07	<0.0025	<0.0005	<0.0015	<0.002	<0.007	<0.020	<0.005	<0.002	<0.001	<0.002	<0.003
Apr-18	0.050	0.064	7.3	32.4	<0.02	<0.03	35	17	<0.3	30	0.7	16	3.4	48	ND	ND	<10	<10	<10	12		260		6.3	12.2	5.56	21.61	11.07	<0.0025	<0.0005	<0.0015	<0.002	<0.007	<0.020	<0.005	0.009	<0.001	<0.002	0.004
Jul-18																										6.57	20.60												
Sep-18	<0.03	<0.039	8.0	35.6	<0.02	0.040	27	16	<0.3	15	1.0	25	4.7	38						8						6.52	20.65	11.05	<0.0025	<0.0005	<0.0015	<0.002	<0.007	<0.02	<0.005	0.002	<0.001	<0.002	0.006
Apr-19	0.100	0.129	6.9	30.6	<0.02	0.046	35	19	<0.3	34	0.8	15	2.7	56	ND	ND		<10	<10	<7		195		7.9	14.2	5.50	21.67	11.02	<2.5	<0.5	<1.5	<2	<7	<20	<5	0.008	<1	<2	<3

Notes:

XXXXX	Indicates result above interim guideline value (IGV)
XXXXX	Indicates result above groundwater threshold value (GTV)
XXXXX	Indicates result above IGV and GTV

Blank cell indicates no data
- indicates no screening threshold
< indicates result below reporting limit
ND indicates nothing detected in suite
NAC indicates no abnormal change

MW-4D Old Data	Phosphorous	PAHs	BOD	Total Organic Carbon	Aluminium	Antimony	Barium	Beryllium	Boron	Selenium	Silver	Tin
	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
IGV	-	various	-	NAC	**0.2**	-	**0.1**	-	**1**	-	-	-
DWS	-	0.1	-	-	0.2	0.005		-	1	0.01	-	-
GTV	-	**0.075**	-	-	**0.15**	-	-	-	-	-	-	-
Date												
Mar-12			<2	<5	0.029	<0.002	0.029	<0.002		<0.002	<0.002	<0.002
Mar-14		<0.05			0.006	<0.0001	0.025	<0.001		0.0003	<0.001	0.001
Jul-14		<0.05			0.006	<0.0001	0.332	<0.001		0.0008	<0.001	<0.001
Mar-15	0.055	<0.195	<2	2	<0.02	<0.002	0.021	<0.0005	0.013	<0.003	<0.005	<0.005
Oct-15	0.044		3	<2	<0.02	<0.002	0.018	<0.0005	<0.012	<0.003	<0.005	<0.005

Notes:

XXXXX Indicates result above interim guideline value (IGV)

XXXXX Indicates result above groundwater threshold value (GTV)

XXXXX Indicates result above IGV and GTV

Blank cell indicates no data

- indicates no screening threshold

< indicates result below reporting limit

ND indicates nothing detected in suite

NAC indicates no abnormal change

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