TECHNICAL MEMORANDUM

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TO Sam Mangione
Instant Waste Management

CC

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YORK PROPOSED LANDFILL SITE – WATER LEVEL GAUGING AND SAMPLING EVENT

1.0 INTRODUCTION

Golder Associates Pty Ltd (Golder) was engaged by Instant Waste Management (Instant Waste) to undertake a groundwater gauging and monitoring event for the proposed York Landfill (the site), initially referred to as the Allawuna Farm Landfill by the previous proponent. The former proponent had received works approval from the Department of Environment Regulation (DER), but subsequently decided not to proceed with the development. Regular monitoring of the groundwater conditions will provide additional data to support the submission of a new works approval application (WAA), which Instant Waste intends to resubmit to regulators as a new proponent.

2.0 SCOPE

The following scope of work was completed:

- Water level gauging of all accessible wells on site (GMB01, GMB02, GMB03, GMB04, GMB05, GMB07, GMB08, GMB09, GMB10, MB01, MB03, MB04, MB05, MB06, MB07, MB08, MB09, MB10, MB12, MB13 & MB14). See Figure 1 for well locations.
- Water sampling of eight wells (GMB02, GMB03, GMB05, GMB07, MB01, MB05, MB07 & MB14). The eight selected wells aimed to target three upgradient locations, one location within the proposed footprint of the landfill, and four downgradient locations.
- The completion of this technical memorandum document.

3.0 METHODOLOGY

The groundwater sampling and gauging event was carried out by a Golder field engineer between 27 and 28 March 2017.

3.1 Water gauging

Water levels were collected on 27 March 2017. Water levels were collected using a Heron Dipper – T water level probe. The water level probe was decontaminated using deionised water and laboratory grade detergent prior to use at each location.

3.2 Water sampling

Groundwater samples were collected on 27 and 28 March 2017, using low flow methodology consistent with the methodology used when Golder previously sampled at the site.

Prior to sampling, the groundwater level was recorded using a Heron Dipper –T water level probe.

Samples were collected using a peristaltic pump and dedicated HDPE tubing. A short length of flexible silicon tubing was used for the pump and the dedicated tubing was replaced between each sampling location. The sample tubing was placed between 0.5 m and 1 m above the base of the monitoring well. Groundwater was purged at a flow rate approximately of 200 mL/minute where possible, unless drawdown was greater than 10 cm, in which case the flow rate was reduced to a minimum of 100 mL/minute.

During purging, near continuous measurement of temperature, pH, electrical conductivity, dissolved oxygen and redox potential were recorded using a water quality meter and flow through cell.

Once water parameters were considered to be stable (nominal change of less than 10%), the flow cell was removed from the tubing. Samples were collected directly into laboratory supplied containers. When required samples were filtered using disposable 0.45 µm filter for each monitoring well. Samples were stored on ice for storage and transportation to the laboratory.

The following analytes were included in the March 2017 sampling event:

- **General Analytical Parameters**
- **Major Ions:** Sodium, Potassium, Calcium and Magnesium
- **Dissolved metals:** Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Mercury, Nickel, Selenium, Vanadium and Zinc
- **Nutrients:** Nitrate, Nitrite, Nitrogen, Ammonia, Nitrogen, Reactive phosphorous, sulfate, chloride
- **Total recoverable hydrocarbons and BTEXN**
- **Polycyclic aromatic hydrocarbons (PAH)**
- **Organochlorine and organophosphorus pesticides (OCP/OPP)**
- **Polychlorinated biphenyls (PCBs)**
- **Volatile organic compounds (VOCs).**

4.0 RESULTS

4.1 Water gauging

The water levels collected are recorded in Table 1. Monitoring well GMB06 could not be located and is assumed to have been destroyed. The standpipe of monitoring well MB11 has been broken, preventing the measurement of a water level as the water was overflowing from the standpipe. Water was pooled around the base of MB06, leading to the assumption that the seal is no longer intact (this is consistent with previous observations).

A comparison has been presented between the last recorded water levels (February 2015) and the water gauging levels form this sampling event. It appears that the water level has increased at the majority of wells, with the exception of MB06.

Note that the purpose of this memorandum is the presentation of factual results. Interpretation of the data will be carried out as part of the Works Approval Application for the proposed landfill site.

Table 1: Water levels

Location	Date	Water Level (m AHD)	Previous Gauging Date*	Water Level (m AHD)*	Increase (-) / Decrease (+) since Feb-15
GMB01	27/03/2017	Dry	11/2/2015	Dry	No change
GMB02	27/03/2017	328.244	11/2/2015	327.22	-1.024
GMB03	27/03/2017	324.14	11/2/2015	322.75	-1.39
GMB04	27/03/2017	311.93	11/2/2015	310.6	-1.33
GMB05	27/03/2017	303.306	11/2/2015	302.74	-0.566
GMB07	27/03/2017	296.254	-	-	-
GMB08	27/03/2017	297.105	-	-	-
GMB09	27/03/2017	298.556	-	-	-
GMB10	27/03/2017	300.271	-	-	-
MB01	27/03/2017	296.563	10/2/2015	296.44	-0.123

Location	Date	Water Level (m AHD)	Previous Gauging Date*	Water Level (m AHD)*	Increase (-) / Decrease (+) since Feb-15
MB03	27/03/2017	305.48	10/2/2015	303.59	-1.89
MB04	27/03/2017	302.291	10/2/2015	301.76	-0.531
MB05	27/03/2017	300.072	10/2/2015	299.57	-0.502
MB06	27/03/2017	305.831	11/2/2015	307.76	1.929
MB07	27/03/2017	328.688	11/2/2015	326.9	-1.788
MB08	27/03/2017	328.25	11/2/2015	327.24	-1.01
MB09	27/03/2017	302.622	10/2/2015	300.42	-2.202
MB10	27/03/2017	300.322	10/2/2015	299.56	-0.762
MB12	27/03/2017	307.244	10/2/2015	306.28	-0.964
MB13	27/03/2017	310.424	11/2/2015	3096.55	-0.874
MB14	27/03/2017	314.235	11/2/2015	313.34	-0.895

*Data collected by Bowman Associates (Golder 2015)

4.2 Water sampling

4.2.1 Assessment criteria

The sampling results were screened against the following assessment criteria:

- DER long term irrigation guidelines
- ANZECC Livestock low risk trigger values (sheep)

These assessment criteria were selected based on the current land use of the site and surrounding properties.

4.2.2 Groundwater quality

Groundwater quality parameters were measured from each well immediately prior to the collection of a sample for laboratory analysis. Field sampling records are provided in Attachment B.

Table 2: Field parameters for groundwater samples

Well	Electrical Conductivity (µS/cm)	Temperature (°C)	pH	Redox Potential (mV)	Dissolved Oxygen (mg/L)
GMB02	20414	20.6	3.91	13.7	0.45
GMB03	2162	20.5	4.28	149.2	4.18
GMB05	21193	20.1	5.86	74.2	0.31
GMB07	21992	20.5	4.08	118.1	0.42
MB01	29334	21.7	4.12	227.2	0.31
MB05	5609	20.1	5.15	34.3	0.52
MB07	2657	21.6	5.70	-73.7	0.48
MB14	24190	20.7	3.61	142.6	0.41

4.2.3 Results

Groundwater samples were collected as per the methodology described in Section 3.2. A full set of laboratory testing results can be found in Table A in Attachment D. The results within the table have been compared with the assessment criteria as outlined in Section 4.2.1.

Majority of analytes were detected at levels below the laboratory limit of reporting (LOR) and below the adopted assessment criteria:

- ***General Analytical Parameters:*** Results reported below adopted assessment criteria.
- ***Major Ions:*** Results reported below adopted assessment criteria.
- ***Dissolved metals:*** Majority of dissolved metals results were reported below adopted assessment criteria, with the exception of some exceedances of the DER long term irrigation assessment criteria. GMB05 and GMB07 both reported manganese levels above the long term irrigation criteria (1.08 mg/L and 0.564 mg/L respectively). MB01 reported levels of cobalt, manganese and zinc above the long term irrigation assessment criteria. These exceedances are within the historical ranges of results that have previously been reported at the site.

  MB01 triggered an exceedance of the Livestock trigger value. The LOR was greater than the trigger value. The LOR was raised by the laboratory for this sample due to high total dissolved solids (TDS) content in the sample. However, historical monitoring show selenium concentrations at levels below the assessment criteria.
- ***Nutrients:*** Results reported below adopted assessment criteria
- ***Total recoverable hydrocarbons & BTEXN:*** All samples with the exception of two samples reported results below the LOR. Samples from GMB07 and MB14 had low level detections of TRH fraction F3 (0.14 mg/L and 0.19 mg/L respectively). Previous sampling events have not identified detections of TRH in any water samples. Due to the lack of previous detections and low probability of hydrocarbon contamination being present in the groundwater at the site, it is considered that these detections are anomalous. It is possible that they result from the presence of organics in the water as the laboratory method detects all recoverable hydrocarbons, not only those derived from petroleum sources.
- ***Polycyclic aromatic hydrocarbons (PAH):*** All samples reported results below the LOR.
- ***Organochlorine and organophosphorus pesticides (OCP/OPP):*** All samples reported results below the LOR.
- ***Polychlorinated biphenyls (PCBs):*** All samples reported results below the LOR.
- ***Volatile organic compounds (VOCs)***: All samples reported results below the LOR.

5.0 QAQC

The following QA/QC procedures were implemented during the groundwater sampling event:

- Calibration checks of the water quality meter against reference solutions at the beginning and end of daily sampling events. Calibration records are provided in Attachment B.
- One trip blank per esky containing samples for volatile compounds analysis.
- One field duplicate sample.
- One field triplicate sample.

The purpose of the collection of duplicate samples is to assess the reproducibility of the laboratory analytical methods.

Results from the QA/QC procedures for groundwater are presented in Tables B and C in Attachment A. A summary of the QA/QC is presented in Table 3.

Table 3: QA/QC summary

Item	Objective	Summary of Results	Compliance
Calibration check of water quality meter	Ensure water quality meter is calibrated within acceptable limits	Most calibration checks were within acceptable limits	Note 1
Chain of Custody Records	Completed in full	Completed in full	Yes
Recovery and analysis of trip blanks and rinsates	No contamination of blanks	No contamination of blanks	Yes
Recovery and analysis of field replicate samples	Collect replicate samples at a minimum rate of 10% and assess that Relative percentage difference (RPDs) are within ±30% for results >5 × LOR	RPD exceedances noted	Note 2
NATA certification and approved analytical methods	Comply with reference	All complied	Yes
Sample preservation and holding times	Comply with reference	All complied	Yes
Analysis of laboratory duplicates	RPDs are within ±50% for results >5 × LOR	All complied	Yes
Analysis of surrogate and spike recoveries	Percentage recovery within the laboratory's acceptable limits	Recovery within acceptable limits	Yes
Frequency of Laboratory Control Samples	Frequency ≥10%	Laboratory duplicate frequency less than 10% noted	Note 3

Notes: [1] The WQM calibration was generally within acceptable ranges with some exceptions. There was a drift of the EC probe observed on the first day of sampling. On the morning of the second day of sampling the EC reading was acceptable. On the second day of sampling the pH meter was observed to have drifted, though only for the pH 4 solution. We consider the WQM calibration was generally acceptable for the purposes of this sampling event.

[2] There was one RPD exceedances between the primary and duplicate pair for ionic balance. Ionic balance is not a contaminant of concern, as such we do not consider that the RPD exceedance has a material effects on the outcome of this sampling event.

There were three RPD exceedances between the primary and triplicate pair, but only one of these had results greater than five times the LOR; Total Kjeldahl Nitrogen. Although the triplicate sample reported a higher concentration than the primary laboratory, there is no relevant assessment level for this analyte. We do not consider that this will affect the objectives of this sampling event.

[3] For the primary laboratory (ALS) the duplicate frequency was below the target frequency of 10 % for semivolatile TRH fractions, PAH,/Phenols, PCBS and Pesticides due to an internal error (breakdown of procedure). The secondary laboratory (SGS) did not conduct laboratory duplicates on PAH, TRH and MAH. While it is not ideal that the laboratory duplicates were not analysed for these contaminants, it is not expected that the absence of these QA/QC results would affect the findings of this assessment.

6.0 RECOMMENDATIONS

Based on the results of this groundwater gauging and sampling round, it is recommended that sampling of the site be undertaken at quarterly intervals until the submission of the works approval application. In this case the next round of groundwater gauging and sampling would occur in July 2017. In the event that the works approval application is submitted prior to this date, it is advised that a secondary sampling round is completed at an earlier date, in order to assess if the TRH detections were an anomaly or a reoccurring detection.

It is also recommended that a comparison of data collected previously is undertaken to determine if there has been a change in groundwater conditions at the site between this sampling round and those undertaken previously.

7.0 IMPORTANT INFORMATION

Your attention is drawn to the document titled – "Important Information Relating to this Report", which is included in Attachment E of this document. The statements presented in that document are intended to inform a reader of the report about its proper use. There are important limitations as to who can use the report and how it can be used. It is important that a reader of the report understands and has realistic expectations about those matters. The Important Information document does not alter the obligations Golder Associates has under the contract between it and its client.

8.0 REFERENCES

Golder Associates Pty Ltd, 2015. *Allawuna Farm Landfill Hydrogeological Site characterisation Study*. Dated March 2015.

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Attachments: A – Tables
B – Field Sheets
C – Chain of Custody Documentation
D – Laboratory Reports
E – Important Information

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ATTACHMENT A

Tables

Table A: Primary Groundwater Results

					Field ID	Q12487-03	Q12487-02	Q12487-07	Q12487-08	Q12487-09*	Q12487-05	Q12487-01	Q12487-04
					Location Code	GMB02	GMB03	GMB05	GMB07	MB01	MB05	MB07	MB14
					Sampled Date	27/03/2017	27/03/2017	28/03/2017	28/03/2017	28/03/2017	28/03/2017	27/03/2017	27/03/2017
				ANZECC Livestock Low Risk Trigger Values	DER Long-term Irrigation Water								
Chemical Group	**Chemical Name**	**Units**	**LOR**										
Sample Quality Parameters	Sodium (Filtered)	mg/L	1			3840	445	3340	4400	4730	999	515	4420
	Potassium (Filtered)	mg/L	1			68	16	19	21	39	19	12	4
	Calcium (Filtered)	mg/L	1	**1000**		46	<1	410	75	257	17	<1	24
	Magnesium (Filtered)	mg/L	1			484	24	746	826	1260	69	16	798
	Chloride	mg/L	1			7700	712	7990	9470	11,300	1640	752	9020
	Sulfate (as SO_4) (Filtered)	mg/L	1	**1000**		592	83	556	517	825	250	91	647
	Bicarbonate Alkalinity (as $CaCO_3$)	mg/L	1			<1	<1	129	<1	<1	22	54	<1
	Carbonate Alkalinity (as $CaCO_3$)	mg/L	1			<1	<1	<1	<1	<1	<1	<1	<1
	Hydroxide Alkalinity (as $CaCO_3$)	mg/L	1			<1	<1	<1	<1	<1	<1	<1	<1
	Total Alkalinity (as $CaCO_3$)	mg/L	1			<1	<1	129	<1	<1	22	54	<1
	Nitrate (as N)	mg/L	0.01	**400**		<0.01	4.01	<0.01	0.13	<0.01	<0.01	0.12	0.01
	Nitrite (as N)	mg/L	0.01			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Nitrogen (Total Oxidised)	mg/L	0.01			<0.01	4.01	<0.01	0.13	<0.01	<0.01	0.12	0.01
	Ammonia (as N)	mg/L	0.01			0.31	0.02	0.07	0.22	0.22	0.15	0.09	0.33
	Total Kjeldahl Nitrogen (as N)	mg/L	0.1			0.4	0.8	0.1	1.1	0.2	0.2	0.2	0.5
	Nitrogen (Total)	mg/L	0.1		5	0.4	4.8	0.1	1.2	0.2	0.2	0.3	0.5
	Reactive Phosphorus (as P)	mg/L	0.01			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01
	Total Phosphorus (as P)	mg/L	0.01		0.05	<0.01	<0.02	<0.01	0.16	0.01	<0.01	0.02	0.01
	Total Anions	meq/L	0.01			230	21.8	240	278	336	51.9	24.2	268
	Total Cations	meq/L	0.01			211	21.7	228	264	323	50.5	24	259
	Ionic Balance (Lab)	%	0.01			4.23	0.16	2.55	2.63	1.92	1.41	0.34	1.65
Metals	Arsenic (Filtered)	mg/L	0.001	**0.5**	0.1	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	0.003
	Barium (Filtered)	mg/L	0.001			0.036	0.064	0.05	0.063	0.05	0.028	0.076	0.049
	Beryllium (Filtered)	mg/L	0.001		0.1	0.001	<0.001	<0.001	0.001	<0.005	<0.001	<0.001	0.005
	Boron (Filtered)	mg/L	0.05	**5**	0.5	0.37	0.12	0.06	0.07	<0.25	0.15	0.19	<0.05
	Cadmium (Filtered)	mg/L	0.0001	**0.01**	0.01	<0.0001	<0.0001	<0.0001	0.0004	0.0041	<0.0001	<0.0001	<0.0001
	Chromium (Filtered)	mg/L	0.001	**1**	0.1	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	0.001
	Cobalt (Filtered)	mg/L	0.001	**1**	0.05	0.016	<0.001	0.014	0.046	0.073	0.004	<0.001	0.031
	Copper (Filtered)	mg/L	0.001	**0.4**	0.2	0.002	<0.001	0.002	0.005	0.034	<0.001	<0.001	0.004
	Lead (Filtered)	mg/L	0.001	**0.1**	2	0.002	<0.001	<0.001	0.004	0.024	<0.001	<0.001	0.009
	Manganese (Filtered)	mg/L	0.001		0.2	0.114	0.003	1.08	0.564	1.29	0.06	0.004	0.176
	Mercury (Filtered)	mg/L	0.0001	**0.002**	0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Nickel (Filtered)	mg/L	0.001	**1**	0.2	0.009	<0.001	0.01	0.024	0.048	0.004	<0.001	0.017
	Selenium (Filtered)	mg/L	0.01	**0.02**	0.02	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	0.01
	Vanadium (Filtered)	mg/L	0.01		0.1	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	0.02
	Zinc (Filtered)	mg/L	0.005	**20**	2	0.012	<0.005	<0.005	0.025	2.36	<0.005	<0.005	0.055
Total Recoverable Hydrocarbons	TRH C_6-C_9 Fraction	mg/L	0.02			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	TRH C_{10}-C_{14} Fraction	mg/L	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	TRH C_{15}-C_{28} Fraction	mg/L	0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.11
	TRH C_{29}-C_{36} Fraction	mg/L	0.05			<0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	0.12
	TRH+C_{10}-C_{36} (Sum of total) (Lab Reported)	mg/L	0.05			<0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	0.23
	TRH+C_{10}-C_{40} (Sum of total) (Lab Reported)	mg/L	0.1			<0.1	<0.1	<0.1	0.14	<0.1	<0.1	<0.1	0.19
	TRH C_6-C_{10} Fraction F1	mg/L	0.02			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	TRH C_6-C_{10} Fraction Less BTEX F1	mg/L	0.02			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	TRH >C_{10}-C_{16} Fraction F2	mg/L	0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	TRH >C_{10}-C_{16} Fraction Less Naphthalene F2	mg/L	0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	TRH >C_{16}-C_{34} Fraction F3	mg/L	0.1			<0.1	<0.1	<0.1	0.14	<0.1	<0.1	<0.1	0.19
	TRH >C_{34}-C_{40} Fraction F4	mg/L	0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MAH	1,2,4-trimethylbenzene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	1,3,5-Trimethylbenzene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Benzene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Toluene	mg/L	0.002			<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	Isopropylbenzene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	n-Butylbenzene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	n-Propylbenzene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	p-Isopropyltoluene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	sec-Butylbenzene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Styrene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	tert-Butylbenzene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Ethylbenzene	mg/L	0.002			<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	Xylenes (m & p)	mg/L	0.002			<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	Xylene (o)	mg/L	0.002			<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	Xylenes (Sum of total) (Lab Reported)	mg/L	0.002			<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	Total BTEX	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
PAH	Acenaphthene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Acenaphthylene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Anthracene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Benz(a)anthracene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Benzo(a)pyrene	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Benzo(a)pyrene TEQ (lower bound)*	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Benzo(b)&(j)fluoranthene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Benzo(g,h,i)perylene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Benzo(k)fluoranthene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Chrysene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Dibenz(a,h)anthracene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Fluoranthene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Fluorene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Indeno(1,2,3-c,d)pyrene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Naphthalene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Phenanthrene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Pyrene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	PAH (Sum of Common 16 PAHs - Lab Reported)	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Halogenated Benzenes	1,2,3-Trichlorobenzene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	1,2,4-Trichlorobenzene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	1,2-Dichlorobenzene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	1,3-Dichlorobenzene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	1,4-Dichlorobenzene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	2-Chlorotoluene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	4-Chlorotoluene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Bromobenzene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Chlorobenzene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Hexachlorobenzene	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Organochlorine Pesticides	a-BHC	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Aldrin	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Aldrin & Dieldrin (Sum of total) (Lab Reported)	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	b-BHC	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Chlordane (Sum of total)	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	cis-Chlordane	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	trans-Chlordane	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	d-BHC	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	DDD	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	DDE	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	DDT	mg/L	0.002			<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	DDT+DDE+DDD (Sum of total) (Lab Reported)	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Dieldrin	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Endosulfan I	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Endosulfan II	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Endosulfan sulphate	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Endrin	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Endrin aldehyde	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Endrin ketone	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	g-BHC	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Heptachlor	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Heptachlor epoxide	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Methoxychlor	mg/L	0.002			<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Organophosphorous Pesticides	Azinphos-methyl	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Bromophos-ethyl	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Carbophenothion	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Chlorfenvinphos	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Chlorpyriphos	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Chlorpyriphos-methyl	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Diazinon	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Dichlorvos	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Dimethoate	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Ethion	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Fenamiphos	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Fenthion	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Malathion	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Parathion-methyl	mg/L	0.002			<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	Monocrotophos	mg/L	0.002			<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	Parathion	mg/L	0.002			<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	Pirimphos-ethyl	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Prothiofos	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Table A: Primary Groundwater Results

					Field ID	Q12487-03	Q12487-02	Q12487-07	Q12487-08	Q12487-09*	Q12487-05	Q12487-01	Q12487-04
					Location Code	GMB02	GMB03	GMB05	GMB07	MB01	MB05	MB07	MB14
					Sampled Date	27/03/2017	27/03/2017	28/03/2017	28/03/2017	28/03/2017	28/03/2017	27/03/2017	27/03/2017
				ANZECC Livestock Low Risk Trigger Values	DER Long-term Irrigation Water								
Chemical Group	**Chemical Name**	**Units**	**LOR**										
Pesticides-Others	Demeton-s-methyl	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Solvents	Methyl Ethyl Ketone	mg/L	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	2-Hexanone	mg/L	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Methyl iso-butyl ketone	mg/L	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Vinyl acetate	mg/L	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Polychlorinated Biphenyls	PCB (Sum of Total-Lab Reported)	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Volatile Organic Compounds	1,1,1,2-Tetrachloroethane	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	1,1,2,2-Tetrachloroethane	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	1,1,1-Trichloroethane	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	1,1,2-Trichloroethane	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	1,2,3-Trichloropropane	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	1,2-Dibromo-3-chloropropane	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	1,2-Dibromoethane	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	1,1-Dichloroethane	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	1,2-Dichloroethane	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	1,1-Dichloroethene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	cis-1,2-Dichloroethene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	trans-1,2-dichloroethene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	1,2-Dichloropropane	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	1,3-Dichloropropane	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	2,2-Dichloropropane	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	1,1-Dichloropropene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	cis-1,3-Dichloropropene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	trans-1,3-dichloropropene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	cis-1,4-Dichloro-2-butene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	trans-1,4-Dichloro-2-butene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Bromodichloromethane	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Bromoform	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Bromomethane	mg/L	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Carbon disulfide	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Carbon tetrachloride	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Chlorodibromomethane	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Chloroethane	mg/L	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Chloroform	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Chloromethane	mg/L	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Dibromomethane	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Dichlorodifluoromethane	mg/L	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Hexachlorobutadiene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Iodomethane	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Pentachloroethane	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Trichloroethene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Tetrachloroethene	mg/L	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Trichlorofluoromethane	mg/L	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Vinyl chloride	mg/L	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

* Metals LOR for this sample was raised by the Laboratory due to high TDS content

Table B: RPD Table

RPD greater than 30 and results less than 5 × the LOR

RPD greater than 30 and results greater than 5 × the LOR

			Lab Report	EP1702915	EP1702915	RPD	EP1702915	PE115182	RPD
			Field ID	Q12487-05	Q12487-06		Q12487-05	Q12488-01	
			Sampled Date	28/03/2017	28/03/2017		28/03/2017	28/03/2017	
			Sample Type	Field Primary	Field Duplicate		Field Primary	Field Triplicate	
Chemical Group	**Chemical Name**	**Units**	**LOR**						
Sample Quality Parameters	Sodium (Filtered)	mg/L	1 : 0.5 (Interlab)	999	1030	3	999	1000	0
	Potassium (Filtered)	mg/L	1 : 0.1 (Interlab)	19	19	0	19	16	17
	Calcium (Filtered)	mg/L	1 : 0.2 (Interlab)	17	18	6	17	16	6
	Magnesium (Filtered)	mg/L	1 : 0.1 (Interlab)	69	70	1	69	66	4
	Chloride	mg/L	1	1640	1620	1	1640	-	-
	Sulfate (as SO_4) (Filtered)	mg/L	1	250	241	4	250	260	4
	Bicarbonate Alkalinity (as $CaCO_3$)	mg/L	1	22	21	5	22	-	-
	Carbonate Alkalinity (as $CaCO_3$)	mg/L	1	<1	<1	<30	<1	<1	<30
	Hydroxide Alkalinity (as $CaCO_3$)	mg/L	1	<1	<1	<30	<1	-	-
	Total Alkalinity (as $CaCO_3$)	mg/L	1 : 5 (Interlab)	22	21	5	22	22	0
	Nitrate (as N)	mg/L	0.01	<0.01	<0.01	<30	<0.01	-	-
	Nitrite (as N)	mg/L	0.01	<0.01	<0.01	<30	<0.01	-	-
	Nitrogen (Total Oxidised)	mg/L	0.01	<0.01	<0.01	<30	<0.01	-	-
	Ammonia (as N)	mg/L	0.01	0.15	0.15	0	0.15	-	-
	Total Kjeldahl Nitrogen (as N)	mg/L	0.1 : 0.05 (Interlab)	0.2	0.2	0	**0.2**	**0.34**	**52**
	Nitrogen (Total)	mg/L	0.1	0.2	0.2	0	0.2	-	-
	Reactive Phosphorus (as P)	mg/L	0.01	<0.01	<0.01	<30	<0.01	-	-
	Total Phosphorus (as P)	mg/L	0.01 : 0.02 (Interlab)	<0.01	<0.01	<30	<0.01	<0.02	<30
	Total Anions	meq/L	0.01	51.9	51.1	2	51.9	-	-
	Total Cations	meq/L	0.01	50.5	51.9	3	50.5	-	-
	Ionic Balance (Lab)	%	0.01	**1.41**	**0.79**	**56**	1.41	-	-
Metals	Arsenic (Filtered)	mg/L	0.001 : 0.005 (Interlab)	<0.001	<0.001	<30	<0.001	<0.005	<30
	Barium (Filtered)	mg/L	0.001 : 0.005 (Interlab)	0.028	0.028	0	0.028	0.03	7
	Beryllium (Filtered)	mg/L	0.001 : 0.005 (Interlab)	<0.001	<0.001	<30	<0.001	<0.005	<30
	Boron (Filtered)	mg/L	0.05 : 0.025 (Interlab)	0.15	0.15	0	0.15	0.17	13
	Cadmium (Filtered)	mg/L	0.0001 : 0.0005 (Interlab)	<0.0001	<0.0001	<30	<0.0001	<0.0005	<30
	Chromium (Filtered)	mg/L	0.001 : 0.005 (Interlab)	<0.001	<0.001	<30	<0.001	<0.005	<30
	Cobalt (Filtered)	mg/L	0.001 : 0.005 (Interlab)	0.004	0.005	22	**0.004**	**0.006**	**40**
	Copper (Filtered)	mg/L	0.001 : 0.005 (Interlab)	<0.001	<0.001	<30	<0.001	<0.005	<30
	Lead (Filtered)	mg/L	0.001 : 0.005 (Interlab)	<0.001	<0.001	<30	<0.001	<0.005	<30
	Manganese (Filtered)	mg/L	0.001 : 0.005 (Interlab)	0.06	0.062	3	0.06	0.071	17
	Mercury (Filtered)	mg/L	0.0001 : 5e-005 (Interlab)	<0.0001	<0.0001	<30	<0.0001	<0.00005	<30
	Nickel (Filtered)	mg/L	0.001 : 0.005 (Interlab)	0.004	0.004	0	**0.004**	**0.006**	**40**
	Selenium (Filtered)	mg/L	0.01	<0.01	<0.01	<30	<0.01	-	-
	Vanadium (Filtered)	mg/L	0.01	<0.01	<0.01	<30	<0.01	-	-
	Zinc (Filtered)	mg/L	0.005 : 0.025 (Interlab)	<0.005	<0.005	<30	<0.005	<0.025	<30
Total Recoverable Hydrocarbons	TRH C_6-C_9 Fraction	mg/L	0.02 : 0.04 (Interlab)	<0.02	<0.02	<30	<0.02	<0.04	<30
	TRH C_{10}-C_{14} Fraction	mg/L	0.05	<0.05	<0.05	<30	<0.05	<0.05	<30
	TRH C_{15}-C_{28} Fraction	mg/L	0.1 : 0.2 (Interlab)	<0.1	<0.1	<30	<0.1	<0.2	<30
	TRH C_{29}-C_{36} Fraction	mg/L	0.05 : 0.2 (Interlab)	<0.05	<0.05	<30	<0.05	<0.2	<30
	TRH+C_{10}-C_{36} (Sum of total) (Lab Reported)	mg/L	0.05	<0.05	<0.05	<30	<0.05	-	-
	TRH+C_{10}-C_{40} (Sum of total) (Lab Reported)	mg/L	0.1	<0.1	<0.1	<30	<0.1	-	-
	TRH C_6-C_{10} Fraction F1	mg/L	0.02	<0.02	<0.02	<30	<0.02	-	-
	TRH C_6-C_{10} Fraction Less BTEX F1	mg/L	0.02 : 0.05 (Interlab)	<0.02	<0.02	<30	<0.02	<0.05	<30
	TRH >C_{10}-C_{16} Fraction F2	mg/L	0.1 : 0.06 (Interlab)	<0.1	<0.1	<30	<0.1	<0.06	<30
	TRH >C_{10}-C_{16} Fraction Less Naphthalene F2	mg/L	0.1	<0.1	<0.1	<30	<0.1	-	-
	TRH >C_{16}-C_{34} Fraction F3	mg/L	0.1 : 0.5 (Interlab)	<0.1	<0.1	<30	<0.1	<0.5	<30
	TRH >C_{34}-C_{40} Fraction F4	mg/L	0.1 : 0.5 (Interlab)	<0.1	<0.1	<30	<0.1	<0.5	<30
MAH	1,2,4-trimethylbenzene	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	1,3,5-Trimethylbenzene	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	Benzene	mg/L	0.001 : 0.0005 (Interlab)	<0.001	<0.001	<30	<0.001	<0.0005	<30
	Toluene	mg/L	0.002 : 0.0005 (Interlab)	<0.002	<0.002	<30	<0.002	<0.0005	<30
	Isopropylbenzene	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	n-Butylbenzene	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	n-Propylbenzene	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	p-Isopropyltoluene	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	sec-Butylbenzene	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	Styrene	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	tert-Butylbenzene	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	Ethylbenzene	mg/L	0.002 : 0.0005 (Interlab)	<0.002	<0.002	<30	<0.002	<0.0005	<30
	Xylenes (m & p)	mg/L	0.002 : 0.001 (Interlab)	<0.002	<0.002	<30	<0.002	<0.001	<30
	Xylene (o)	mg/L	0.002 : 0.0005 (Interlab)	<0.002	<0.002	<30	<0.002	<0.0005	<30
	Xylenes (Sum of total) (Lab Reported)	mg/L	0.002	<0.002	<0.002	<30	<0.002	-	-
	Total BTEX	mg/L	0.001	<0.001	<0.001	<30	<0.001	-	-
PAH	Acenaphthene	mg/L	0.001 : 0.0001 (Interlab)	<0.001	<0.001	<30	<0.001	<0.0001	<30
	Acenaphthylene	mg/L	0.001 : 0.0001 (Interlab)	<0.001	<0.001	<30	<0.001	<0.0001	<30
	Anthracene	mg/L	0.001 : 0.0001 (Interlab)	<0.001	<0.001	<30	<0.001	<0.0001	<30
	Benz(a)anthracene	mg/L	0.001 : 0.0001 (Interlab)	<0.001	<0.001	<30	<0.001	<0.0001	<30
	Benzo(a)pyrene	mg/L	0.0005 : 0.0001 (Interlab)	<0.0005	<0.0005	<30	<0.0005	<0.0001	<30
	Benzo(a)pyrene TEQ (lower bound)*	mg/L	0.0005	<0.0005	<0.0005	<30	<0.0005	-	-
	Benzo(b)&(j)fluoranthene	mg/L	0.001	<0.001	<0.001	<30	<0.001	-	-
	Benzo(g,h,i)perylene	mg/L	0.001 : 0.0001 (Interlab)	<0.001	<0.001	<30	<0.001	<0.0001	<30
	Benzo(k)fluoranthene	mg/L	0.001 : 0.0001 (Interlab)	<0.001	<0.001	<30	<0.001	<0.0001	<30
	Chrysene	mg/L	0.001 : 0.0001 (Interlab)	<0.001	<0.001	<30	<0.001	<0.0001	<30
	Dibenz(a,h)anthracene	mg/L	0.001 : 0.0001 (Interlab)	<0.001	<0.001	<30	<0.001	<0.0001	<30
	Fluoranthene	mg/L	0.001 : 0.0001 (Interlab)	<0.001	<0.001	<30	<0.001	<0.0001	<30
	Fluorene	mg/L	0.001 : 0.0001 (Interlab)	<0.001	<0.001	<30	<0.001	<0.0001	<30
	Indeno(1,2,3-c,d)pyrene	mg/L	0.001 : 0.0001 (Interlab)	<0.001	<0.001	<30	<0.001	<0.0001	<30
	Naphthalene	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0001	<30
	Naphthalene	mg/L	0.001 : 0.0005 (Interlab)	<0.001	<0.001	<30	<0.001	<0.0001	<30
	Phenanthrene	mg/L	0.001 : 0.0001 (Interlab)	<0.001	<0.001	<30	<0.001	<0.0001	<30
	Pyrene	mg/L	0.001 : 0.0001 (Interlab)	<0.001	<0.001	<30	<0.001	<0.0001	<30
	PAH (Sum of Common 16 PAHs - Lab Reported)	mg/L	0.0005 : 0.001 (Interlab)	<0.0005	<0.0005	<30	<0.0005	<0.001	<30
Halogenated Benzenes	1,2,3-Trichlorobenzene	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	1,2,4-Trichlorobenzene	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	1,2-Dichlorobenzene	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	1,3-Dichlorobenzene	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	1,4-Dichlorobenzene	mg/L	0.005 : 0.0003 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0003	<30
	2-Chlorotoluene	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	4-Chlorotoluene	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	Bromobenzene	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	Chlorobenzene	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	Hexachlorobenzene	mg/L	0.0005 : 0.0001 (Interlab)	<0.0005	<0.0005	<30	<0.0005	<0.0001	<30

Table B: RPD Table

RPD greater than 30 and results less than 5 × the LOR

RPD greater than 30 and results greater than 5 × the LOR

			Lab Report	EP1702915	EP1702915	RPD	EP1702915	PE115182	RPD
			Field ID	Q12487-05	Q12487-06		Q12487-05	Q12488-01	
			Sampled Date	28/03/2017	28/03/2017		28/03/2017	28/03/2017	
			Sample Type	Field Primary	Field Duplicate		Field Primary	Field Triplicate	
Organochlorine Pesticides	a-BHC	mg/L	0.0005 : 0.0001 (Interlab)	<0.0005	<0.0005	<30	<0.0005	<0.0001	<30
	Aldrin	mg/L	0.0005 : 0.0001 (Interlab)	<0.0005	<0.0005	<30	<0.0005	<0.0001	<30
	Aldrin & Dieldrin (Sum of total) (Lab Reported)	mg/L	0.0005	<0.0005	<0.0005	<30	<0.0005	-	-
	b-BHC	mg/L	0.0005 : 0.0001 (Interlab)	<0.0005	<0.0005	<30	<0.0005	<0.0001	<30
	Chlordane (Sum of total)	mg/L	0.0005	<0.0005	<0.0005	<30	<0.0005	-	-
	cis-Chlordane	mg/L	0.0005 : 0.0001 (Interlab)	<0.0005	<0.0005	<30	<0.0005	<0.0001	<30
	trans-Chlordane	mg/L	0.0005	<0.0005	<0.0005	<30	<0.0005	-	-
	d-BHC	mg/L	0.0005 : 0.0001 (Interlab)	<0.0005	<0.0005	<30	<0.0005	<0.0001	<30
	DDD	mg/L	0.0005 : 0.0001 (Interlab)	<0.0005	<0.0005	<30	<0.0005	<0.0001	<30
	DDE	mg/L	0.0005 : 0.0001 (Interlab)	<0.0005	<0.0005	<30	<0.0005	<0.0001	<30
	DDT	mg/L	0.002 : 0.0001 (Interlab)	<0.002	<0.002	<30	<0.002	<0.0001	<30
	DDT+DDE+DDD (Sum of total) (Lab Reported)	mg/L	0.0005	<0.0005	<0.0005	<30	<0.0005	-	-
	Dieldrin	mg/L	0.0005 : 0.0001 (Interlab)	<0.0005	<0.0005	<30	<0.0005	<0.0001	<30
	Endosulfan I	mg/L	0.0005 : 0.0001 (Interlab)	<0.0005	<0.0005	<30	<0.0005	<0.0001	<30
	Endosulfan II	mg/L	0.0005 : 0.0001 (Interlab)	<0.0005	<0.0005	<30	<0.0005	<0.0001	<30
	Endosulfan sulphate	mg/L	0.0005 : 0.0001 (Interlab)	<0.0005	<0.0005	<30	<0.0005	<0.0001	<30
	Endrin	mg/L	0.0005 : 0.0001 (Interlab)	<0.0005	<0.0005	<30	<0.0005	<0.0001	<30
	Endrin aldehyde	mg/L	0.0005	<0.0005	<0.0005	<30	<0.0005	-	-
	Endrin ketone	mg/L	0.0005 : 0.0001 (Interlab)	<0.0005	<0.0005	<30	<0.0005	<0.0001	<30
	g-BHC	mg/L	0.0005 : 0.0001 (Interlab)	<0.0005	<0.0005	<30	<0.0005	<0.0001	<30
	Heptachlor	mg/L	0.0005 : 0.0001 (Interlab)	<0.0005	<0.0005	<30	<0.0005	<0.0001	<30
	Heptachlor epoxide	mg/L	0.0005 : 0.0001 (Interlab)	<0.0005	<0.0005	<30	<0.0005	<0.0001	<30
	Methoxychlor	mg/L	0.002 : 0.0001 (Interlab)	<0.002	<0.002	<30	<0.002	<0.0001	<30
Organophosphorous Pesticides	Azinphos-methyl	mg/L	0.0005 : 0.0002 (Interlab)	<0.0005	<0.0005	<30	<0.0005	<0.0002	<30
	Bromophos-ethyl	mg/L	0.0005 : 0.0002 (Interlab)	<0.0005	<0.0005	<30	<0.0005	<0.0002	<30
	Carbophenothion	mg/L	0.0005	<0.0005	<0.0005	<30	<0.0005	-	-
	Chlorfenvinphos	mg/L	0.0005	<0.0005	<0.0005	<30	<0.0005	-	-
	Chlorpyriphos	mg/L	0.0005 : 0.0002 (Interlab)	<0.0005	<0.0005	<30	<0.0005	<0.0002	<30
	Chlorpyriphos-methyl	mg/L	0.0005	<0.0005	<0.0005	<30	<0.0005	-	-
	Diazinon	mg/L	0.0005	<0.0005	<0.0005	<30	<0.0005	<0.0005	<30
	Dichlorvos	mg/L	0.0005 : 0.001 (Interlab)	<0.0005	<0.0005	<30	<0.0005	<0.001	<30
	Dimethoate	mg/L	0.0005 : 0.001 (Interlab)	<0.0005	<0.0005	<30	<0.0005	<0.001	<30
	Ethion	mg/L	0.0005 : 0.0002 (Interlab)	<0.0005	<0.0005	<30	<0.0005	<0.0002	<30
	Fenamiphos	mg/L	0.0005	<0.0005	<0.0005	<30	<0.0005	-	-
	Fenthion	mg/L	0.0005	<0.0005	<0.0005	<30	<0.0005	-	-
	Malathion	mg/L	0.0005 : 0.0002 (Interlab)	<0.0005	<0.0005	<30	<0.0005	<0.0002	<30
	Parathion-methyl	mg/L	0.002	<0.002	<0.002	<30	<0.002	-	-
	Monocrotophos	mg/L	0.002	<0.002	<0.002	<30	<0.002	-	-
	Parathion	mg/L	0.002 : 0.001 (Interlab)	<0.002	<0.002	<30	<0.002	<0.001	<30
	Pirimphos-ethyl	mg/L	0.0005	<0.0005	<0.0005	<30	<0.0005	-	-
	Prothiofos	mg/L	0.0005	<0.0005	<0.0005	<30	<0.0005	-	-
Pesticides-Others	Demeton-s-methyl	mg/L	0.0005	<0.0005	<0.0005	<30	<0.0005	-	-
Solvents	Methyl Ethyl Ketone	mg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	<30	<0.05	<0.01	<30
	2-Hexanone	mg/L	0.05 : 0.005 (Interlab)	<0.05	<0.05	<30	<0.05	<0.005	<30
	Methyl iso-butyl ketone	mg/L	0.05 : 0.005 (Interlab)	<0.05	<0.05	<30	<0.05	<0.005	<30
	Vinyl acetate	mg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	<30	<0.05	<0.01	<30
Polychlorinated Biphenyls	PCB (Sum of Total-Lab Reported)	mg/L	0.001	<0.001	<0.001	<30	<0.001	<0.001	<30
Volatile Organic Compounds	1,1,1,2-Tetrachloroethane	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	1,1,2,2-Tetrachloroethane	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	1,1,1-Trichloroethane	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	1,1,2-Trichloroethane	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	1,2,3-Trichloropropane	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	1,2-Dibromo-3-chloropropane	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	1,2-Dibromoethane	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	1,1-Dichloroethane	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	1,2-Dichloroethane	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	1,1-Dichloroethene	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	cis-1,2-Dichloroethene	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	trans-1,2-dichloroethene	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	1,2-Dichloropropane	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	1,3-Dichloropropane	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	2,2-Dichloropropane	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	1,1-Dichloropropene	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	cis-1,3-Dichloropropene	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	trans-1,3-dichloropropene	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	cis-1,4-Dichloro-2-butene	mg/L	0.005 : 0.001 (Interlab)	<0.005	<0.005	<30	<0.005	<0.001	<30
	trans-1,4-Dichloro-2-butene	mg/L	0.005 : 0.001 (Interlab)	<0.005	<0.005	<30	<0.005	<0.001	<30
	Bromodichloromethane	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	Bromoform	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	Bromomethane	mg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	<30	<0.05	<0.01	<30
	Carbon disulfide	mg/L	0.005 : 0.002 (Interlab)	<0.005	<0.005	<30	<0.005	<0.002	<30
	Carbon tetrachloride	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	Chlorodibromomethane	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	Chloroethane	mg/L	0.05 : 0.005 (Interlab)	<0.05	<0.05	<30	<0.05	<0.005	<30
	Chloroform	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	Chloromethane	mg/L	0.05 : 0.005 (Interlab)	<0.05	<0.05	<30	<0.05	<0.005	<30
	Dibromomethane	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	Dichlorodifluoromethane	mg/L	0.05 : 0.005 (Interlab)	<0.05	<0.05	<30	<0.05	<0.005	<30
	Hexachlorobutadiene	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	Iodomethane	mg/L	0.005	<0.005	<0.005	<30	<0.005	<0.005	<30
	Pentachloroethane	mg/L	0.005	<0.005	<0.005	<30	<0.005	-	-
	Trichloroethene	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	Tetrachloroethene	mg/L	0.005 : 0.0005 (Interlab)	<0.005	<0.005	<30	<0.005	<0.0005	<30
	Trichlorofluoromethane	mg/L	0.05 : 0.001 (Interlab)	<0.05	<0.05	<30	<0.05	<0.001	<30
	Vinyl chloride	mg/L	0.05 : 0.0003 (Interlab)	<0.05	<0.05	<30	<0.05	<0.0003	<30

Table C: Blanks

			Lab Report	EP1702915	EP1702915	PE115182
			Field ID	TBW271-10	TBW272-11	Q12488-02
			Sampled Date	28/03/2017	28/03/2017	28/03/2017
			Sample Type	Trip_B	Trip_B	Trip_B
Chemical Group	**Chemical Name**	**Units**	**LOR**			
MAH	Benzene	mg/L	0.001 : 0.0005 (Interlab)	<0.001	<0.001	<0.0005
	Toluene	mg/L	0.002 : 0.0005 (Interlab)	<0.002	<0.002	<0.0005
	Ethylbenzene	mg/L	0.002 : 0.0005 (Interlab)	<0.002	<0.002	<0.0005
	Xylenes (m & p)	mg/L	0.002 : 0.001 (Interlab)	<0.002	<0.002	<0.001
	Xylene (o)	mg/L	0.002 : 0.0005 (Interlab)	<0.002	<0.002	<0.0005
	Xylenes (Sum of total) (Lab Reported)	mg/L	0.002	<0.002	<0.002	-
	Total BTEX	mg/L	0.001 : 0.0005 (Interlab)	<0.001	<0.001	-
PAH	Naphthalene	mg/L	0.0001	<0.005	<0.005	<0.0005
Total Recoverable Hydrocarbons	TRH C_6-C_9 Fraction	mg/L	0.02 : 0.04 (Interlab)	<0.02	<0.02	<0.04
	TRH C_6-C_{10} Fraction F1	mg/L	0.02	<0.02	<0.02	-
	TRH C_6-C_{10} Fraction Less BTEX F1	mg/L	0.02 : 0.05 (Interlab)	<0.02	<0.02	<0.05

ATTACHMENT B

Field Sheets

AES
ACTIVE ENVIRONMENTAL SOLUTIONS

Calibration Report

Multi-Parameter Water Quality Instrument

Customer: Golder
Contact: Jess

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 15K100324
Cable length: 1m

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 60 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	176.00 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV -1 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature	Center 370 Thermometer	Room Temp	23.3	-0.2	°C	NA	23.1	°C
pH	pH 7.00	NF1971	7.01	-42.60	mV	6.99	7.01	pH
pH	pH 4.00	NF1636	4.00	133.40	mV	3.98	4.00	pH
Conductivity	2760 µs/cm at 25°C	NF2056	2760	GLP	5.09	2737	2760	µs/cm
ORP (Reference check only)	Zobell A & B	NG1334/1335	233	233	mV	232.4	234.6	mV
Zero Dissolved Oxygen	NaSO3 in distilled water	1504192304	0.0	NA	NA	-0.2	0.0	%
100% Dissolved Oxygen	100% Air Saturation	Air	100.0	5.97	uA	98.9	100	%

Calibrated by: Gaurav Kanwar

Calibration Date: 24-Mar-17

Next Due: 23-Apr-17

Melbourne	**Head Office**	2 Merchant Avenue	THOMASTOWN VIC 3074	T: +(613) 9464 2300	F: +(613) 9464 3421
Sydney	S14 Lvl 2	6-8 Holden Street	ASHFIELD NSW 2131	T: +(612) 9716 5966	F: +(612) 9716 5988
Perth	Unit 6	41 Holder Way	MALAGA WA 6090	T: +(618) 9249 5663	F: +(618) 9249 5362
Brisbane	Unit 17	23 Ashtan Place	BANYO QLD 4014	T: +(617) 3267 1433	F: +(617) 3267 3559

sales@aesolutions.com.au

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AES
ACTIVE ENVIRONMENTAL SOLUTIONS

Equipment Check Report

Water Level/Drawdown Meter

Customer: Golder
Contact: Jess

Manufacturer: QED
Instrument: MP30
Serial #: 1702
Cable length: 45m

Item	Test	Pass	Comments
Battery	Voltage (9v battery)	✓	Voltage above 7.9 V
	Capacity	✓	
Probe	Decontaminated	✓	
	Condition	✓	
	Operation	✓	
Connectors	Condition	✓	
Tape Check	Condition	✓	Good, no tears
	Decontaminated	✓	
Instrument Test	Water level mode	✓	
	Drawdown mode	✓	
Speaker	Operation	✓	

Comments
NA

This is to certify that the above instrument has been checked and is in good working order.

Checked by: Gaurav Kanwar

Check Date 23-Mar-17
Next Due: 22-Apr-17

Melbourne	**Head Office**	2 Merchant Avenue	THOMASTOWN VIC 3074	T: +(613) 9464 2300	F: +(613) 9464 3421
Sydney	S14 Lvl 2	6-8 Holden Street	ASHFIELD NSW 2131	T: +(612) 9716 5966	F: +(612) 9716 5988
Perth	Unit 6	41 Holder Way	MALAGA WA 6090	T: +(618) 9249 5663	F: +(618) 9249 5362
Brisbane	Unit 17	23 Ashtan Place	BANYO QLD 4014	T: +(617) 3267 1433	F: +(617) 3267 3559

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Depth to Groundwater

Golder Associates

Water levels collected by: JH

Project: 1777197

Location	Date	Time	Measured Depth to Groundwater (m)	
GMB1	27/3/17	10:20	Dry	
GMB2	27/3/17	10.48	5.626	
GMB3	27/3/17	11.02	4.71	
GMB4	27/3/17	11.34	7.07	
GMB5	27/3/17	09.36	0.594	→ water pooled around base of well.
GMB6	–	–	–	→ believe destroyed.
GMB7	27/3/17	09:13	1.376	
GMB8	27/3/17	07:45	17.975	
GMB9	27/3/17	09:00	5.744	
GMB10	27/3/17	08:20	2.439	
MB01	27/3/17	08.54	1.705	
MB03	27/3/17	07:55	4.394	
MB04	27/3/17	08:07	0.435	
MB05	27/3/17	09:39	1.360	
MB06	27/3/17	10:02	1.564	→ water pooled around base of well.
MB07	27/3/17	11:15	2.814	
MB08	27/3/17	10:45	5.695	
MB09	27/3/17	08:00	4.817	
MB10	27/3/17	08.14	0.770	
MB11	–	–	–	→ could not ~~sound~~ lip, standpipe broken (see photos)
MB12	27/3/17	09:26	9.667	
MB13	27/3/17	10.13	11.171	
MB14	27/3/17	10.09	0.870	

Golder Associates

GROUNDWATER SAMPLING RECORD FORM

LOW FLOW PURGING and SAMPLING (incl. / yielding wells)

WELL ID:	M131

PROJECT INFORMATION

Project Number:	1777197	Date:	28.3.17
Client:		Sampled By:	JM
Site Location:	York	Time:	10 50

Weather Conditions (Temperature, Precipitation, Wind): warm, clear

Well Maintenance Required? YES / NO (NO circled) Detail

WELL INFORMATION

Diameter of standpipe (mm)	
Standpipe stick up (m)	
Surveyed reference point	
Depth to top of filter pack (from log)	
Depth to bottom of filter pack (from log)	
Depth of well (from log)	

mbRP - metres below top of reference point
Hose volume - 0.12 L/m of 1/2 inch diameter hose
Hose volume - 0.07 L/m of 3/8 inch diameter hose
Hose volume - 0.03 L/m of 1/4 inch diameter hose

GAUGING INFORMATION

Pre-Sampling Information	YES / NO	Purging and Sampling Information	
Interface probe used?		Depth of pump intake (mbRP)	
Initial depth to water (mbRP)	1.656	Length of hose (m)	
Depth to product (mbRP)	–	Volume in hose (L)	
Thickness of product (m)	–	Depth to water after placement of pump (mbRP)	
Bailed product thickness (m)	–	Depth to water at end of purging (mbRP)	
Total depth of well (mbRP)	–	Depth to water after collection of samples (mbRP)	
Thickness of sediment on base of well (m)	–	Purging and Sampling Method	peri

Controller settings

CPM	
Refill	
Discharge	
Throttle	

WQM Model: YSI

WQM Calibration Certificate: 15K100324

GROUNDWATER MONITORING WELL PURGING RECORD

Time	Cumulative Volume Purged (L)	Flow Rate (L/min)	Depth to Water (mbRP)	±0.1 pH	±5% Conductivity (µS)	±10 Redox (mV)	±10% Dissolved Oxygen (ppm)	±0.5°C Temperature (°C)	Appearance (Colour, Turbidity, Odour, etc)
10.55		0.2	1.656	4.12	25513	148.5	0.78	22.1	clear, low turbidity, no odour
11.00	2	↓	1.745	4.09	29271	165.4	0.38	21.9	
11.05	3			4.09	29231	183.9	0.36	21.9	
11.10	4			4.09	29265	204.1	0.35	21.8	
11.15	5			4.09	29290	216.9	0.34	21.6	
11.20	6			4.12	29334	227.2	0.31	21.7	

SAMPLING RECORD

Time Sampled: 11.20
Colour: clear
Odour: no
Turbidity: (Low) Medium High
Hydrocarbon Sheen ? Yes (No)
DI Water Lab Certificate No.
Notes: sampled when ~~[illegible]~~ below not stable.

Sample IDs

Primary Duplicate:	Q1245T-09
Secondary Duplicate:	
Trip Blank:	
Rinsate:	
Field Blank:	

Sample Containers/Preservation (F=Filtered; UF=Unfiltered; P=Preserved; UP=Unpreserved)

2	Vials (P/UP)	1	Metals (F/UF; P/UP)
1	0.1 L Amber		Cyanide
1	0.2 L Plastic		Sulphide
1	Phenols/COD/NH3 (F/UF; P/UP)		Other
	Ferrous/Ferric Iron (F/UF; P/UP)		Other

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Golder Associates

GROUNDWATER SAMPLING REC(FORM

LOW FLOW PURGING and SAMPLING (incl. low yielding wells)

WELL ID:	M135

PROJECT INFORMATION			
Project Number:	1777197	Date:	28-3-17
Client:		Sampled By:	JH
Site Location:	York	Time:	08:10

Weather Conditions (Temperature, Precipitation, Wind): warm, clear

Well Maintenance Required? YES / NO Detail

WELL INFORMATION	
Diameter of standpipe (mm)	
Standpipe stick up (m)	
Surveyed reference point	
Depth to top of filter pack (from log)	
Depth to bottom of filter pack (from log)	
Depth of well (from log)	

mbRP - metres below top of reference point
Hose volume - 0.12 L/m of 1/2 inch diameter hose
Hose volume - 0.07 L/m of 3/8 inch diameter hose
Hose volume - 0.03 L/m of 1/4 inch diameter hose

GAUGING INFORMATION			
Pre-Sampling Information		***Purging and Sampling Information***	
Interface probe used?	YES / NO	Depth of pump intake (mbRP)	
Initial depth to water (mbRP)	1.331	Length of hose (m)	
Depth to product (mbRP)		Volume in hose (L)	
Thickness of product (m)		Depth to water after placement of pump (mbRP)	
Bailed product thickness (m)		Depth to water at end of purging (mbRP)	
Total depth of well (mbRP)		Depth to water after collection of samples (mbRP)	
Thickness of sediment on base of well (m)		Purging and Sampling Method	Peri

Controller settings	
CPM	
Refill	
Discharge	
Throttle	

WQM Model: YSI

WQM Calibration Certificate: 15K1U324

GROUNDWATER MONITORING WELL PURGING RECORD

Time	Cumulative Volume Purged (L)	Flow Rate (L/min)	Depth to Water (mbRP)	±0.1 pH	±5% Conductivity (µS)	±10 Redox (mV)	±10% Dissolved Oxygen (ppm)	±0.5°C Temperature (°C)	Appearance (Colour, Turbidity, Odour, etc)
08:16	1	0.2	1.331	7.86	6018	14.8	0.57	19.8	cloudy, pale orange, med-high turbidity,
08:21	2	↓	1.370	5.39	5797	24.4	0.42	20.1	no odour
08:26	3		1.352	5.18	5662	28.8	0.51	20.0	
08:31	4			5.16	5623	31.6	0.54	20.1	
08:36	5		1.388	5.15	5609	34.3	0.52	20.1	

SAMPLING RECORD

Time Sampled: 08:38
Colour: clear
Odour: none
Turbidity: Low Medium High
Hydrocarbon Sheen ? Yes No
DI Water Lab Certificate No.

Sample IDs

Primary Duplicate: Q12487-05
Secondary Duplicate: Q12487-06 & Q12488-01
Trip Blank:
Rinsate:
Field Blank:

Sample Containers/Preservation (F=Filtered; UF=Unfiltered; P=Preserved; UP=Unpreserved)

6	Vials (P/UP)	3	Metals (F/UF; P/UP)
3	1L Amber		Cyanide
3	1L Plastic		Sulphide
2	Phenols/COD/NH3 (F/UF; P/UP)	1x 500mL	Other plastic
	Ferrous/Ferric Iron (F/UF; P/UP)		Other

Notes:

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Golder Associates

GROUNDWATER SAMPLING RECORD FORM

LOW FLOW PURGING and SAMPLING (incl. low yielding wells)

WELL ID:	MB07

PROJECT INFORMATION

Project Number:	177197	Date:	27/3/17
Client:		Sampled By:	JH
Site Location:	York	Time:	12:45

Weather Conditions (Temperature, Precipitation, Wind): warm, clear

Well Maintenance Required? YES / (NO) Detail

WELL INFORMATION

Diameter of standpipe (mm)	
Standpipe stick up (m)	
Surveyed reference point	
Depth to top of filter pack (from log)	
Depth to bottom of filter pack (from log)	
Depth of well (from log)	

mbRP - metres below top of reference point
Hose volume - 0.12 L/m of 1/2 inch diameter hose
Hose volume - 0.07 L/m of 3/8 inch diameter hose
Hose volume - 0.03 L/m of 1/4 inch diameter hose

GAUGING INFORMATION

Pre-Sampling Information		Purging and Sampling Information	
Interface probe used?	YES / (NO)	Depth of pump intake (mbRP)	-
Initial depth to water (mbRP)	2.804	Length of hose (m)	-
Depth to product (mbRP)	-	Volume in hose (L)	-
Thickness of product (m)	-	Depth to water after placement of pump (mbRP)	-
Bailed product thickness (m)	-	Depth to water at end of purging (mbRP)	-
Total depth of well (mbRP)	-	Depth to water after collection of samples (mbRP)	-
Thickness of sediment on base of well (m)	-	Purging and Sampling Method	peri

Controller settings

CPM	-
Refill	-
Discharge	-
Throttle	-

WQM Model: YSI

WQM Calibration Certificate: 15K100324

GROUNDWATER MONITORING WELL PURGING RECORD

Time	Cumulative Volume Purged (L)	Flow Rate (L/min)	Depth to Water (mbRP)	pH ±0.1	Conductivity (µS) ±5%	Redox (mV) ±10	Dissolved Oxygen (ppm) ±10%	Temperature (°C) ±0.5°C	Appearance (Colour, Turbidity, Odour, etc)
12.49	1	0.2	2.804	7.89	3057	-62.5	0.45	21.6	cloudy, pale orange, black particles, often egg odour high turbidity
12:54	1.8	0.16	2.92	5.97	2785	-69.5	0.33	21.5	
12:59	2.6	↓	2.90	5.79	2703	-73.0	0.44	21.9	
13:04	3.4		2.90	5.75	2686	-74.3	0.47	21.6	
13:09	4.2			5.74	2669	-73.0	0.51	21.8	
13:14	5.0	0.16	2.91	5.70	2657	-73.7	0.48	21.6	

SAMPLING RECORD

Time Sampled: 13:15
Colour: very pale orange
Odour: rotten eggs
Turbidity: (Low) Medium High
Hydrocarbon Sheen ? Yes (No)
DI Water Lab Certificate No.
Notes:

Sample IDs

Primary Duplicate:	Q12487-01
Secondary Duplicate:	
Trip Blank:	
Rinsate:	
Field Blank:	

Sample Containers/Preservation (F=Filtered; UF=Unfiltered; P=Preserved; UP=Unpreserved)

2	Vials (F/UP)	1	Metals (F/UF;P/UP)
1	~~1L~~ 0.1L Amber		Cyanide
1	~~1L~~ 0.2L Plastic		Sulphide
1	Phenols/COD/NH3 (F/UF; P/UP)		~~Other~~
	Ferrous/Ferric Iron (F/UF; P/UP)		Other

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Golder Associates

GROUNDWATER SAMPLING RECORD FORM

LOW FLOW PURGING and SAMPLING (incl. low yielding wells)

WELL ID:	MB14

PROJECT INFORMATION			
Project Number:	177197.	Date:	27.3.17
Client:		Sampled By:	JH
Site Location:	York	Time:	15:50

Weather Conditions (Temperature, Precipitation, Wind): clear, warm

Well Maintenance Required? YES / NO (NO circled) Detail

WELL INFORMATION	
Diameter of standpipe (mm)	
Standpipe stick up (m)	
Surveyed reference point	
Depth to top of filter pack (from log)	
Depth to bottom of filter pack (from log)	
Depth of well (from log)	

mbRP - metres below top of reference point
Hose volume - 0.12 L/m of 1/2 inch diameter hose
Hose volume - 0.07 L/m of 3/8 inch diameter hose
Hose volume - 0.03 L/m of 1/4 inch diameter hose

GAUGING INFORMATION			
Pre-Sampling Information		***Purging and Sampling Information***	
Interface probe used?	YES / NO	Depth of pump intake (mbRP)	
Initial depth to water (mbRP)	0.82	Length of hose (m)	
Depth to product (mbRP)		Volume in hose (L)	
Thickness of product (m)		Depth to water after placement of pump (mbRP)	
Bailed product thickness (m)		Depth to water at end of purging (mbRP)	
Total depth of well (mbRP)		Depth to water after collection of samples (mbRP)	
Thickness of sediment on base of well (m)		Purging and Sampling Method	pcr.

Controller settings	
CPM	
Refill	
Discharge	
Throttle	

WQM Model: YSI

WQM Calibration Certificate: 15K1032 4.

GROUNDWATER MONITORING WELL PURGING RECORD

Time	Cumulative Volume Purged (L)	Flow Rate (L/min)	Depth to Water (mbRP)	±0.1 pH	±5% Conductivity (µS)	±10 Redox (mV)	±10% Dissolved Oxygen (ppm)	±0.5°C Temperature (°C)	Appearance (Colour, Turbidity, Odour, etc)
15:52		0.18	0.82	3.64	24600	151.3	0.83	20.7	clear, low - medium turbidity.
15:57		0.12	1.031	3.62	24166	141.7	0.48	20.7	
16:02			1.065	3.62	24172	139.7	0.45	20.6	
16:07			1.093	3.62	24142	140.9	0.41	20.7	
16:12			1.124	3.61	24190	142.6	0.41	20.7	

SAMPLING RECORD

Time Sampled: 16:12
Colour: Clear
Odour: no
Turbidity: Low (circled) Medium High
Hydrocarbon Sheen ? Yes No (circled)
DI Water Lab Certificate No.

Sample IDs

Primary Duplicate:	Q12457-04
Secondary Duplicate:	
Trip Blank:	
Rinsate:	
Field Blank:	

Sample Containers/Preservation (F=Filtered; UF=Unfiltered; P=Preserved; UP=Unpreserved)

2	Vials (F/UP)	1	Metals (F/UF;P/UP)
1	1L Amber		Cyanide
1	1L Plastic		Sulphide
	Phenols/COD/NH3 (F/UF; P/UP)		Other
	Ferrous/Ferric Iron (F/UF; P/UP)		Other

Notes:

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Golder Associates

GROUNDWATER SAMPLING REC[illegible] FORM

LOW FLOW PURGING and SAMPLING (incl. low yielding wells)

WELL ID:	CMB2

PROJECT INFORMATION			
Project Number:	1777197	Date:	27.3.17
Client:		Sampled By:	JH
Site Location:	York	Time:	2:45

Weather Conditions (Temperature, Precipitation, Wind): warm, clear

Well Maintenance Required? YES / NO (NO circled) Detail

WELL INFORMATION	
Diameter of standpipe (mm)	
Standpipe stick up (m)	
Surveyed reference point	
Depth to top of filter pack (from log)	
Depth to bottom of filter pack (from log)	
Depth of well (from log)	

mbRP - metres below top of reference point
Hose volume - 0.12 L/m of 1/2 inch diameter hose
Hose volume - 0.07 L/m of 3/8 inch diameter hose
Hose volume - 0.03 L/m of 1/4 inch diameter hose

GAUGING INFORMATION			
Pre-Sampling Information		*Purging and Sampling Information*	
Interface probe used?	YES / NO	Depth of pump intake (mbRP)	
Initial depth to water (mbRP)	5.581	Length of hose (m)	
Depth to product (mbRP)		Volume in hose (L)	
Thickness of product (m)		Depth to water after placement of pump (mbRP)	
Bailed product thickness (m)		Depth to water at end of purging (mbRP)	
Total depth of well (mbRP)		Depth to water after collection of samples (mbRP)	
Thickness of sediment on base of well (m)		Purging and Sampling Method	Peri

Controller settings	
CPM	
Refill	
Discharge	
Throttle	

WQM Model: YSI

WQM Calibration Certificate: 15K0324

GROUNDWATER MONITORING WELL PURGING RECORD

Time	Cumulative Volume Purged (L)	Flow Rate (L/min)	Depth to Water (mbRP)	±0.1 pH	±5% Conductivity (µS)	±10 Redox (mV)	±10% Dissolved Oxygen (ppm)	±0.5°C Temperature (°C)	Appearance (Colour, Turbidity, Odour, etc)
14:48	1	0.2	5.558	4.02	20652	44.5	1.00	20.2	white low-medium turbidity, rotten eggs
14:53	1.8	0.16	5.691	4.04	20529	13.2	0.46	20.2	colour
14:58	2.6			3.96	20450	9.6	0.44	20.5	
15:03	3.4		5.693	3.92	20419	10.4	0.46	20.3	
15:08	4.2			3.90	20455	14.4	0.49	20.4	
15:13	5.0		5.693	3.91	20414	13.7	0.45	20.6	

SAMPLING RECORD

Time Sampled: 15:15
Colour: clear
Odour: rotten eggs
Turbidity: Low (circled) Medium High
Hydrocarbon Sheen ? Yes No (circled)
DI Water Lab Certificate No.

Sample IDs

Primary Duplicate:	Q12487-03
Secondary Duplicate:	
Trip Blank:	
Rinsate:	
Field Blank:	

Sample Containers/Preservation (F=Filtered; UF=Unfiltered; P=Preserved; UP=Unpreserved)

2	Vials (F/UF; P/UP)	1	Metals (F/UF; P/UP)
1	0.1 L Amber		Cyanide
1	0.2 L Plastic		Sulphide
1	Phenols/COD/NH3 (F/UF; P/UP)		Other
	Ferrous/Ferric Iron (F/UF; P/UP)		Other

Notes:

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Golder Associates

GROUNDWATER SAMPLING RECORD FORM
LOW FLOW PURGING and SAMPLING (... low yielding wells)

WELL ID:	GMB3

PROJECT INFORMATION

Project Number:	1777197	Date:	27.3.17
Client:		Sampled By:	JM
Site Location:	York	Time:	13:40

Weather Conditions (Temperature, Precipitation, Wind): warm, clear

Well Maintenance Required? YES / NO (NO circled) Detail

WELL INFORMATION

Diameter of standpipe (mm)	
Standpipe stick up (m)	
Surveyed reference point	
Depth to top of filter pack (from log)	
Depth to bottom of filter pack (from log)	
Depth of well (from log)	

mbRP - metres below top of reference point
Hose volume - 0.12 L/m of 1/2 inch diameter hose
Hose volume - 0.07 L/m of 3/8 inch diameter hose
Hose volume - 0.03 L/m of 1/4 inch diameter hose

GAUGING INFORMATION

Pre-Sampling Information	YES / NO	Purging and Sampling Information	
Interface probe used?		Depth of pump intake (mbRP)	
Initial depth to water (mbRP)	4.71	Length of hose (m)	
Depth to product (mbRP)	-	Volume in hose (L)	
Thickness of product (m)	-	Depth to water after placement of pump (mbRP)	
Bailed product thickness (m)	-	Depth to water at end of purging (mbRP)	
Total depth of well (mbRP)	-	Depth to water after collection of samples (mbRP)	
Thickness of sediment on base of well (m)	-	Purging and Sampling Method	pc1

Controller settings

CPM	
Refill	
Discharge	
Throttle	

WQM Model: YSI

WQM Calibration Certificate: 15K1003 24

GROUNDWATER MONITORING WELL PURGING RECORD

Time	Cumulative Volume Purged (L)	Flow Rate (L/min)	Depth to Water (mbRP)	±0.1 pH	±5% Conductivity (µS)	±10 Redox (mV)	±10% Dissolved Oxygen (ppm)	±0.5°C Temperature (°C)	Appearance (Colour, Turbidity, Odour, etc)
13.42	1	0.2	4.71	5.40	1785	69	4.88	21.2	pale orange, cloudy, medium turbidity
13.47	2		4.728	4.47	1744	100.3	4.46	20.6	
13.52	3		4.735	4.49	1751	116.2	4.65	20.5	
13.57	4		4.741	4.34	1806	126	4.40	20.4	
14.02	5			4.32	1913	133	4.29	20.5	
14.07	6		4.741	4.30	2042	141.5	4.10	20.5	
14.12	7			4.28	2162	149.2	4.18	20.5	

SAMPLING RECORD

Time Sampled: 14.14
Colour: pale orange
Odour: no
Turbidity: Low (circled) Medium High
Hydrocarbon Sheen ? Yes No (circled)
DI Water Lab Certificate No.

Sample IDs

Primary Duplicate:	Q12487-02
Secondary Duplicate:	
Trip Blank:	
Rinsate:	
Field Blank:	

Sample Containers/Preservation (F=Filtered; UF=Unfiltered; P=Preserved; UP=Unpreserved)

2	Vials (P/UP) 0.1L	1	Metals (F/UF;P/UP)
3	½L Amber		Cyanide
1	0.2 ½L Plastic		Sulphide
1	Phenols/COD/NH3 (F/UF; P/UP)		Other
	Ferrous/Ferric Iron (F/UF; P/UP)		Other

Notes: took lab QAQC samples here

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Golder Associates

GROUNDWATER SAMPLING RECORD FORM

LOW FLOW PURGING and SAMPLING (incl. low yielding wells)

WELL ID:	GMB5

PROJECT INFORMATION

Project Number:	1777197	Date:	28.3.17
Client:		Sampled By:	JH
Site Location:	York	Time:	0915

Weather Conditions (Temperature, Precipitation, Wind): warm, clear

Well Maintenance Required? YES / NO Detail

WELL INFORMATION

Diameter of standpipe (mm)	
Standpipe stick up (m)	
Surveyed reference point	
Depth to top of filter pack (from log)	
Depth to bottom of filter pack (from log)	
Depth of well (from log)	

mbRP - metres below top of reference point
Hose volume - 0.12 L/m of 1/2 inch diameter hose
Hose volume - 0.07 L/m of 3/8 inch diameter hose
Hose volume - 0.03 L/m of 1/4 inch diameter hose

GAUGING INFORMATION

Pre-Sampling Information		*Purging and Sampling Information*	
Interface probe used?	YES / NO (NO)	Depth of pump intake (mbRP)	
Initial depth to water (mbRP)	0.565	Length of hose (m)	
Depth to product (mbRP)		Volume in hose (L)	
Thickness of product (m)		Depth to water after placement of pump (mbRP)	
Bailed product thickness (m)		Depth to water at end of purging (mbRP)	
Total depth of well (mbRP)		Depth to water after collection of samples (mbRP)	
Thickness of sediment on base of well (m)		Purging and Sampling Method	PZ1

Controller settings

CPM	
Refill	
Discharge	
Throttle	

WQM Model: YSI

WQM Calibration Certificate: 15K100324

GROUNDWATER MONITORING WELL PURGING RECORD

Time	Cumulative Volume Purged (L)	Flow Rate (L/min)	Depth to Water (mbRP)	±0.1 pH	±5% Conductivity (µS)	±10 Redox (mV)	±10% Dissolved Oxygen (ppm)	±0.5°C Temperature (°C)	Appearance (Colour, Turbidity, Odour, etc)
0917	1	0.2	0.565	5.31	20713	87.8	1.24	20.0	clear, low turbidity, no odour
0922	2	↓	0.593	5.77	21264	81.0	0.33	20.0	
0927	3	↓	0.594	5.83	21234	77.3	0.32	20.0	
0932	4	↓	0.594	5.84	21229	75.4	0.31	20.0	
0937	5	↓	0.581	5.86	21193	74.2	0.31	20.1	

SAMPLING RECORD

Time Sampled:	0940
Colour:	clear
Odour:	no
Turbidity:	(Low) Medium High
Hydrocarbon Sheen ?	Yes (No)
DI Water Lab Certificate No.	

Sample IDs

Primary Duplicate:	Q12487-07
Secondary Duplicate:	
Trip Blank:	
Rinsate:	
Field Blank:	

Sample Containers/Preservation (F=Filtered; UF=Unfiltered; P=Preserved; UP=Unpreserved)

2	Vials ((F)/UP)	1	Metals ((F)/UF;P/(UP))
1	~~1L~~ Amber 0.1		Cyanide
1	~~1L~~ Plastic 0.2		Sulphide
1	Phenols/COD/NH3 (F/UF; P/UP)		Other
	Ferrous/Ferric Iron (F/UF; P/UP)		Other

Notes:

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Golder Associates

GROUNDWATER SAMPLING RECORD FORM

LOW FLOW PURGING and SAMPLING (Incl. [illegible] yielding wells)

PROJECT INFORMATION			
Project Number:	177197	Date:	28 3 17
Client:	–	Sampled By:	AM
Site Location:	York	Time:	10:15

WELL ID:	GMB7

Weather Conditions (Temperature, Precipitation, Wind): warm, clear

Well Maintenance Required? YES / (NO) Detail

WELL INFORMATION	
Diameter of standpipe (mm)	
Standpipe stick up (m)	
Surveyed reference point	
Depth to top of filter pack (from log)	
Depth to bottom of filter pack (from log)	
Depth of well (from log)	

mbRP - metres below top of reference point
Hose volume - 0.12 L/m of 1/2 inch diameter hose
Hose volume - 0.07 L/m of 3/8 inch diameter hose
Hose volume - 0.03 L/m of 1/4 inch diameter hose

GAUGING INFORMATION			
Pre-Sampling Information		***Purging and Sampling Information***	
Interface probe used?	YES / NO	Depth of pump intake (mbRP)	
Initial depth to water (mbRP)	1.323	Length of hose (m)	
Depth to product (mbRP)		Volume in hose (L)	
Thickness of product (m)		Depth to water after placement of pump (mbRP)	
Bailed product thickness (m)		Depth to water at end of purging (mbRP)	
Total depth of well (mbRP)		Depth to water after collection of samples (mbRP)	
Thickness of sediment on base of well (m)		Purging and Sampling Method	peri

Controller settings	
CPM	
Refill	
Discharge	
Throttle	

WQM Model: YSI

WQM Calibration Certificate: 15K1CW324

GROUNDWATER MONITORING WELL PURGING RECORD

Time	Cumulative Volume Purged (L)	Flow Rate (L/min)	Depth to Water (mbRP)	±0.1 pH	±5% Conductivity (µS)	±10 Redox (mV)	±10% Dissolved Oxygen (ppm)	±0.5°C Temperature (°C)	Appearance (Colour, Turbidity, Odour, etc)
10.18		0.2	1.0541	4.50	20062	103.9	1.37	20.4	pale orange w brown particles,
10.23		0.1	1.582	4.09	21029	112.9	0.4	20.3	low turbidity, no odor
10.28		0.1	1.636	4.08	21912	118.1	0.42	20.5	

SAMPLING RECORD

Time Sampled: 10.30

Colour: pale orange w orange particles

Odour: no

Turbidity: (Low) Medium High

Hydrocarbon Sheen ? Yes (No)

DI Water Lab Certificate No.

Sample IDs

Primary Duplicate: Q12487-08

Secondary Duplicate:

Trip Blank:

Rinsate:

Field Blank:

Sample Containers/Preservation (F=Filtered; UF=Unfiltered; P=Preserved; UP=Unpreserved)

2	Vials (P/UP)	1	Metals (F/UF;P/UP)
1	1L Amber		Cyanide
1	1L Plastic		Sulphide
1	Phenols/COD/NH3 (F/UF; P/UP)		Other
	Ferrous/Ferric Iron (F/UF; P/UP)		Other

Notes: sampled using low flow method.

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RL0, January 2013

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Water Quality Meter Calibration Sheet

Golder Associates

Job: 1777197

Date and time: 28/3/17

Name: JH

Signature:

Phase/Task Number: –

WQ meter make/model: YSI

WQ meter serial number: 15K100324

Certificate Number*: –

* use unique identifier (e.g YYYYMMDD_"technician's initials")

Parameter	Standard Solution	Pre-calibration reading	Acceptable range	Calibration Required (Y/N)	Post Calibration Reading
Temperature	– °C	15	± 0.5 °C	N	24.0
pH	4	3.99	3.9 - 4.1	N	4.10
	7	6.98	6.9 - 7.1	N	6.94
	10	–	9.9 – 10.1	–	–
Conductivity	0	–	0.0 - 0.1 mS/cm	–	–
	2.76 mS/cm @ 25 °C	2.839	± 5%	N	2.909
	12.88 mS/cm @ 25 °C	12.88890	± 5%	N	12.960
Dissolved Oxygen	0% Saturation Solution	0.09	± 0.1 ppm	N	0.02
	Ambient Air	9.35	± 0.5 ppm of value on Table A overleaf	N	7.62
Redox	240 mV @ 20 °C	242.3	± 10 mV	N	230.1

GAP Form No. 61
RL1
November 2013

Water Quality Meter Calibration Sheet

Golder Associates

Job: Allawuna Farm

Date and time: 27/3/17 12:20pm

Name: JH

Signature:

Phase/Task Number: –

WQ meter make/model: YSI

WQ meter serial number: 15K100324

Certificate Number*: –

* use unique identifier (e.g YYYYMMDD_"technician's initials")

Parameter	Standard Solution	Pre-calibration reading	Acceptable range	Calibration Required (Y/N)	Post Calibration Reading
Temperature	– °C	19.2	± 0.5 °C	N	23.7
pH	4	4.08	3.9 - 4.1	N	4.18
	7	6.93	6.9 - 7.1	N	6.96
	10	–	9.9 – 10.1	–	–
Conductivity	0	–	0.0 - 0.1 mS/cm	–	–
	2.76 mS/cm @ 25 °C	2.832	± 5%	N	2.786
	12.88 mS/cm @ 25 °C	13.304	± 5%	N	13.107
Dissolved Oxygen	0% Saturation Solution	0.05	± 0.1 ppm	N	0.04
	Ambient Air	7.96	± 0.5 ppm of value on Table A overleaf	N	7.71
Redox	240 mV @ 20 °C	233	± 10 mV	N	224.6

GAP Form No. 61
RL1
November 2013

ATTACHMENT C

Chain of Custody Documentation

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

Q 12487

Golder Associates
1 Havelock Street
West Perth, WA 6005 Australia
Telehone +61 8 9213 7600 Fax +61 8 9213 7611

Project Number: 1777197	Laboratory Name: ALS
Short Title: Allawuna Farm	Address: 10 Hod way Malaga
Golder Contact: Jess Hay, Liza Duprez	Golder Email Address: jhay@golder.com.au, Lduprez@golder.com.au
Telephone/Fax: 9209 7655	Contact: Luke Jones

Address where reports should be sent to

☐ PO Box 1914
West Perth, WA 6872
Telephone (61 8) 9213 7600
Fax (61 8) 9213 7611

☑ Other email

Phone _____ Fax _____

Analyses Required

Sample Control Number (SCN	Sample Location	Sa#	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D/M/Y)	Time Sampled (HH/MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	T-2	T-5	T-10	T-13	T-35	T-84	T-18			RUSH	Remarks (over)
Q12487 - 01	MB07			W	27.3.17					6	X	X	X	X	X	X					
- 02	GMB3									8	X	X	X	X	X	X					Additional QAQC provided
- 03	GMB2									6	X	X	X	X	X	X					
- 04	MB14									6	X	X	X	X	X	X					
- 05	MB5				28.3.17					6	X	X	X	X	X	X					
- 06	MB35						FD	FD	Q12487-05	6	X	X	X	X	X	X					
- 07	GMB5									6	X	X	X	X	X	X					
- 08	GMB7									6	X	X	X	X	X	X					
- 09	MB1									6	X	X	X	X	X	X					
TBW271 - 10	TB271							TB		1							X				
TBW272 - 11	TBW272							TB		1							X				
- 12																					

Sampler's Signature:	Relinquished by: Signature	Company: Golder	Date: 28-3-17	Time	Received by: Signature	Company
Sample Storage (°C): ICE	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Comments:	Method of Shipment:	Waybill No:	Received for Lab by:		Date	Time
	Shipped by:	Shipment Condition: Seal intact:	Temp (°C)	Cooler opened by:	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy PINK: Lab Returns with Final Report

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

Q 12488 page 1 of 1

Golder Associates
1 Havelock Street
West Perth, WA 6005 Australia
Telehone +61 8 9213 7600 Fax +61 8 9213 7611

Project Number: 1777197		Laboratory Name: SGS	
Short Title: Yore		Address: 28 Reid Road	
Golder Contact: Shay	Golder Email Address: Shay @golder.com.au	Telephone/Fax:	Contact: Shaun Wain

Address where reports should be sent to

☐ PO Box 1914
West Perth, WA 6872
Telephone (61 8) 9213 7600
Fax (61 8) 9213 7611

☑ Other email

Quote: GOLDE_FZ62092017

Phone _____ Fax _____

Analyses Required

Sample Control Number (SCN	Sample Location	Sa#	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D/M/Y)	Time Sampled (HH/MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Discussed retain	WQ3	ANZ	ANZ	CL18	CL4	OC/OP/PCB			RUSH	Remarks (over)
Q12488 - 01	AMB5			W	28-3-17	-				7	X	X	X	X	X	X	X				refer to Quote for analysis
- 02	TB									1						X					
- 03																					
- 04																					
- 05																					
- 06																					
- 07																					
- 08																					
- 09																					
- 10																					
- 11																					
- 12																					

Sampler's Signature:	Relinquished by: Signature	Company Golder	Date 28.3.17	Time	Received by: Signature	Company
Sample Storage (°C) ICE	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Comments:	Method of Shipment:	Waybill No:	Received for Lab by:		Date	Time
	Shipped by:	Shipment Condition: Seal intact:	Temp (°C)	Cooler opened by:	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy PINK: Lab Returns with Final Report

ATTACHMENT D

Laboratory Reports

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP1702915**	Page	: 1 of 18
Client	: **GOLDER ASSOCIATES**	Laboratory	: Environmental Division Perth
Contact	: JESS HAY	Contact	: Luke Jones
Address	: PO BOX 1914 WEST PERTH WA 6872	Address	: 10 Hod Way Malaga WA Australia 6090
Telephone	: +61 08 9213 7600	Telephone	: 08 9209 7631
Project	: 1777197	Date Samples Received	: 28-Mar-2017 16:45
Order number	: 1777197 [Q12487]	Date Analysis Commenced	: 29-Mar-2017
C-O-C number	: [Q12487]	Issue Date	: 04-Apr-2017 22:22
Sampler	: ----		
Site	: ----		
Quote number	: EN/002/16 v2		
No. of samples received	: 11		
No. of samples analysed	: 11		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Canhuang Ke	Metals Instrument Chemist	Perth Inorganics, Malaga, WA
Efua Wilson	Metals Chemist	Perth Inorganics, Malaga, WA
Huynh Huynh	Organic Chemist	Perth Organics, Malaga, WA
Jeremy Truong	Laboratory Manager	Perth Inorganics, Malaga, WA

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- It is recognised that TKN is less than ammonia for sample 'Q12487-09'. However, the difference is within experimental variation of the methods.
- EG020: Metals LOR raised due to high TDS content
- EK067G (Total Phosphorus): LOR raised for sample 'Q12487-02' due to sample matrix interference.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	Q12487-01	Q12487-02	Q12487-03	Q12487-04	Q12487-05
			Client sampling date / time	27-Mar-2017 00:00	27-Mar-2017 00:00	27-Mar-2017 00:00	27-Mar-2017 00:00	28-Mar-2017 00:00
Compound	CAS Number	LOR	Unit	EP1702915-001	EP1702915-002	EP1702915-003	EP1702915-004	EP1702915-005
				Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	54	<1	<1	<1	22
Total Alkalinity as CaCO3	----	1	mg/L	54	<1	<1	<1	22
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	91	83	592	647	250
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	752	712	7700	9020	1640
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	<1	<1	46	24	17
Magnesium	7439-95-4	1	mg/L	16	24	484	798	69
Sodium	7440-23-5	1	mg/L	515	445	3840	4420	999
Potassium	7440-09-7	1	mg/L	12	16	68	4	19
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	0.003	<0.001
Boron	7440-42-8	0.05	mg/L	0.19	0.12	0.37	<0.05	0.15
Barium	7440-39-3	0.001	mg/L	0.076	0.064	0.036	0.049	0.028
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.001	0.005	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.016	0.031	0.004
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	0.001	<0.001
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.002	0.004	<0.001
Manganese	7439-96-5	0.001	mg/L	0.004	0.003	0.114	0.176	0.060
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.009	0.017	0.004
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.002	0.009	<0.001
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	0.02	<0.01
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.012	0.055	<0.005
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.09	0.02	0.31	0.33	0.15
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	Q12487-01	Q12487-02	Q12487-03	Q12487-04	Q12487-05
			Client sampling date / time	27-Mar-2017 00:00	27-Mar-2017 00:00	27-Mar-2017 00:00	27-Mar-2017 00:00	28-Mar-2017 00:00
Compound	CAS Number	LOR	Unit	EP1702915-001	EP1702915-002	EP1702915-003	EP1702915-004	EP1702915-005
				Result	Result	Result	Result	Result
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**0.12**	**4.01**	<0.01	**0.01**	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.12**	**4.01**	<0.01	**0.01**	<0.01
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**0.2**	**0.8**	**0.4**	**0.5**	**0.2**
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	**0.3**	**4.8**	**0.4**	**0.5**	**0.2**
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**0.02**	<0.02	<0.01	**0.01**	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	**0.01**	<0.01	<0.01	<0.01	<0.01
EN055: Ionic Balance								
Total Anions	----	0.01	meq/L	**24.2**	**21.8**	**230**	**268**	**51.9**
Total Cations	----	0.01	meq/L	**24.0**	**21.7**	**211**	**259**	**50.5**
Ionic Balance	----	0.01	%	**0.34**	**0.16**	**4.23**	**1.65**	**1.41**
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	1	µg/L	<1	<1	<1	<1	<1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
beta-BHC	319-85-7	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
gamma-BHC	58-89-9	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
delta-BHC	319-86-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Heptachlor	76-44-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Aldrin	309-00-2	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Dieldrin	60-57-1	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
4.4`-DDE	72-55-9	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Endrin	72-20-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
4.4`-DDD	72-54-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	Q12487-01	Q12487-02	Q12487-03	Q12487-04	Q12487-05
			Client sampling date / time	27-Mar-2017 00:00	27-Mar-2017 00:00	27-Mar-2017 00:00	27-Mar-2017 00:00	28-Mar-2017 00:00
Compound	CAS Number	LOR	Unit	EP1702915-001	EP1702915-002	EP1702915-003	EP1702915-004	EP1702915-005
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
4.4`-DDT	50-29-3	2	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
Endrin ketone	53494-70-5	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Methoxychlor	72-43-5	2	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
^ Total Chlordane (sum)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Monocrotophos	6923-22-4	2	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
Dimethoate	60-51-5	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon	333-41-5	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Parathion-methyl	298-00-0	2	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
Malathion	121-75-5	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Fenthion	55-38-9	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Parathion	56-38-2	2	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Fenamiphos	22224-92-6	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Prothiofos	34643-46-4	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	563-12-2	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Carbophenothion	786-19-6	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100-42-5	5	µg/L	<5	<5	<5	<5	<5
Isopropylbenzene	98-82-8	5	µg/L	<5	<5	<5	<5	<5
n-Propylbenzene	103-65-1	5	µg/L	<5	<5	<5	<5	<5
1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	<5	<5	<5
sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	Q12487-01	Q12487-02	Q12487-03	Q12487-04	Q12487-05
			Client sampling date / time	27-Mar-2017 00:00	27-Mar-2017 00:00	27-Mar-2017 00:00	27-Mar-2017 00:00	28-Mar-2017 00:00
Compound	CAS Number	LOR	Unit	EP1702915-001	EP1702915-002	EP1702915-003	EP1702915-004	EP1702915-005
				Result	Result	Result	Result	Result
EP074A: Monocyclic Aromatic Hydrocarbons - Continued								
1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	<5	<5	<5
tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	<5	<5	<5
p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	<5	<5	<5
n-Butylbenzene	104-51-8	5	µg/L	<5	<5	<5	<5	<5
EP074B: Oxygenated Compounds								
Vinyl Acetate	108-05-4	50	µg/L	<50	<50	<50	<50	<50
2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	<50	<50	<50
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	<50	<50	<50
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	<50	<50	<50
EP074C: Sulfonated Compounds								
Carbon disulfide	75-15-0	5	µg/L	<5	<5	<5	<5	<5
EP074D: Fumigants								
2.2-Dichloropropane	594-20-7	5	µg/L	<5	<5	<5	<5	<5
1.2-Dichloropropane	78-87-5	5	µg/L	<5	<5	<5	<5	<5
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	<5	<5	<5
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	<5	<5	<5
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	<5	<5	<5
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	<50	<50	<50
Chloromethane	74-87-3	50	µg/L	<50	<50	<50	<50	<50
Vinyl chloride	75-01-4	50	µg/L	<50	<50	<50	<50	<50
Bromomethane	74-83-9	50	µg/L	<50	<50	<50	<50	<50
Chloroethane	75-00-3	50	µg/L	<50	<50	<50	<50	<50
Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	<50	<50	<50
1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	<5	<5	<5
Iodomethane	74-88-4	5	µg/L	<5	<5	<5	<5	<5
trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	<5	<5	<5
1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	<5	<5	<5
cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	<5	<5	<5
1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	<5	<5	<5
1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	<5	<5	<5
Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	<5	<5	<5
1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	<5	<5	<5
Trichloroethene	79-01-6	5	µg/L	<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	Q12487-01	Q12487-02	Q12487-03	Q12487-04	Q12487-05
			Client sampling date / time	27-Mar-2017 00:00	27-Mar-2017 00:00	27-Mar-2017 00:00	27-Mar-2017 00:00	28-Mar-2017 00:00
Compound	CAS Number	LOR	Unit	EP1702915-001	EP1702915-002	EP1702915-003	EP1702915-004	EP1702915-005
				Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued								
Dibromomethane	74-95-3	5	µg/L	<5	<5	<5	<5	<5
1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	<5	<5	<5
1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	<5	<5	<5
Tetrachloroethene	127-18-4	5	µg/L	<5	<5	<5	<5	<5
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	<5	<5	<5
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	<5	<5	<5
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	<5	<5	<5
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	<5	<5	<5
1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	<5	<5	<5
Pentachloroethane	76-01-7	5	µg/L	<5	<5	<5	<5	<5
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	<5	<5	<5
Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	<5	<5	<5
EP074F: Halogenated Aromatic Compounds								
Chlorobenzene	108-90-7	5	µg/L	<5	<5	<5	<5	<5
Bromobenzene	108-86-1	5	µg/L	<5	<5	<5	<5	<5
2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	<5	<5	<5
4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	<5	<5	<5
1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	<5	<5	<5
1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	<5	<5	<5
1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	<5	<5	<5
1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	<5	<5	<5
1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	<5	<5	<5
EP074G: Trihalomethanes								
Chloroform	67-66-3	5	µg/L	<5	<5	<5	<5	<5
Bromodichloromethane	75-27-4	5	µg/L	<5	<5	<5	<5	<5
Dibromochloromethane	124-48-1	5	µg/L	<5	<5	<5	<5	<5
Bromoform	75-25-2	5	µg/L	<5	<5	<5	<5	<5
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	Q12487-01	Q12487-02	Q12487-03	Q12487-04	Q12487-05
			Client sampling date / time	27-Mar-2017 00:00	27-Mar-2017 00:00	27-Mar-2017 00:00	27-Mar-2017 00:00	28-Mar-2017 00:00
Compound	CAS Number	LOR	Unit	EP1702915-001	EP1702915-002	EP1702915-003	EP1702915-004	EP1702915-005
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Fluoranthene	206-44-0	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	**110**	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	**120**	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	**230**	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	**190**	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	**190**	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	Q12487-01	Q12487-02	Q12487-03	Q12487-04	Q12487-05
			Client sampling date / time	27-Mar-2017 00:00	27-Mar-2017 00:00	27-Mar-2017 00:00	27-Mar-2017 00:00	28-Mar-2017 00:00
Compound	CAS Number	LOR	Unit	EP1702915-001	EP1702915-002	EP1702915-003	EP1702915-004	EP1702915-005
				Result	Result	Result	Result	Result
EP080: BTEXN - Continued								
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	1	%	103	109	116	102	90.1
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.5	%	80.4	70.0	87.6	84.1	72.7
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.5	%	61.8	54.4	71.1	84.0	78.6
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	17060-07-0	5	%	112	117	113	111	118
Toluene-D8	2037-26-5	5	%	96.2	93.7	95.8	97.9	93.8
4-Bromofluorobenzene	460-00-4	5	%	93.4	94.2	93.3	93.3	93.5
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1	%	28.6	21.6	25.6	27.8	21.7
2-Chlorophenol-D4	93951-73-6	1	%	69.8	54.4	61.9	68.9	55.3
2.4.6-Tribromophenol	118-79-6	1	%	102	83.7	107	103	84.6
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1	%	72.8	59.9	66.6	73.9	58.9
Anthracene-d10	1719-06-8	1	%	65.5	54.8	67.1	67.8	54.8
4-Terphenyl-d14	1718-51-0	1	%	69.2	59.6	74.4	70.3	60.5
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	120	124	121	118	125
Toluene-D8	2037-26-5	2	%	96.6	94.6	96.4	98.8	94.8
4-Bromofluorobenzene	460-00-4	2	%	91.8	93.6	90.4	89.9	90.4

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	Q12487-06	Q12487-07	Q12487-08	Q12487-09	TBW271-10
			Client sampling date / time	28-Mar-2017 00:00	28-Mar-2017 00:00	28-Mar-2017 00:00	28-Mar-2017 00:00	28-Mar-2017 00:00
Compound	CAS Number	LOR	Unit	EP1702915-006	EP1702915-007	EP1702915-008	EP1702915-009	EP1702915-010
				Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	21	129	<1	<1	----
Total Alkalinity as CaCO3	----	1	mg/L	21	129	<1	<1	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	241	556	517	825	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	1620	7990	9470	11300	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	18	410	75	257	----
Magnesium	7439-95-4	1	mg/L	70	746	826	1260	----
Sodium	7440-23-5	1	mg/L	1030	3340	4400	4730	----
Potassium	7440-09-7	1	mg/L	19	19	21	39	----
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.005	----
Boron	7440-42-8	0.05	mg/L	0.15	0.06	0.07	<0.25	----
Barium	7440-39-3	0.001	mg/L	0.028	0.050	0.063	0.050	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.001	<0.005	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0004	0.0041	----
Cobalt	7440-48-4	0.001	mg/L	0.005	0.014	0.046	0.073	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.005	----
Copper	7440-50-8	0.001	mg/L	<0.001	0.002	0.005	0.034	----
Manganese	7439-96-5	0.001	mg/L	0.062	1.08	0.564	1.29	----
Nickel	7440-02-0	0.001	mg/L	0.004	0.010	0.024	0.048	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.004	0.024	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.05	----
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.05	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.025	2.36	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.15	0.07	0.22	0.22	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	Q12487-06	Q12487-07	Q12487-08	Q12487-09	TBW271-10
			Client sampling date / time	28-Mar-2017 00:00	28-Mar-2017 00:00	28-Mar-2017 00:00	28-Mar-2017 00:00	28-Mar-2017 00:00
Compound	CAS Number	LOR	Unit	EP1702915-006	EP1702915-007	EP1702915-008	EP1702915-009	EP1702915-010
				Result	Result	Result	Result	Result
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	**0.13**	<0.01	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	**0.13**	<0.01	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**0.2**	**0.1**	**1.1**	**0.2**	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	**0.2**	**0.1**	**1.2**	**0.2**	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	**0.16**	**0.01**	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
EN055: Ionic Balance								
Total Anions	----	0.01	meq/L	**51.1**	**240**	**278**	**336**	----
Total Cations	----	0.01	meq/L	**51.9**	**228**	**264**	**323**	----
Ionic Balance	----	0.01	%	**0.79**	**2.55**	**2.63**	**1.92**	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	1	µg/L	<1	<1	<1	<1	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
beta-BHC	319-85-7	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
gamma-BHC	58-89-9	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
delta-BHC	319-86-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Heptachlor	76-44-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Aldrin	309-00-2	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Dieldrin	60-57-1	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
4.4`-DDE	72-55-9	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Endrin	72-20-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
4.4`-DDD	72-54-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	Q12487-06	Q12487-07	Q12487-08	Q12487-09	TBW271-10
			Client sampling date / time	28-Mar-2017 00:00	28-Mar-2017 00:00	28-Mar-2017 00:00	28-Mar-2017 00:00	28-Mar-2017 00:00
Compound	CAS Number	LOR	Unit	EP1702915-006	EP1702915-007	EP1702915-008	EP1702915-009	EP1702915-010
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
4.4`-DDT	50-29-3	2	µg/L	<2.0	<2.0	<2.0	<2.0	----
Endrin ketone	53494-70-5	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Methoxychlor	72-43-5	2	µg/L	<2.0	<2.0	<2.0	<2.0	----
^ Total Chlordane (sum)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Monocrotophos	6923-22-4	2	µg/L	<2.0	<2.0	<2.0	<2.0	----
Dimethoate	60-51-5	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Diazinon	333-41-5	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Parathion-methyl	298-00-0	2	µg/L	<2.0	<2.0	<2.0	<2.0	----
Malathion	121-75-5	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Fenthion	55-38-9	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Parathion	56-38-2	2	µg/L	<2.0	<2.0	<2.0	<2.0	----
Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Fenamiphos	22224-92-6	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Prothiofos	34643-46-4	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Ethion	563-12-2	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Carbophenothion	786-19-6	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100-42-5	5	µg/L	<5	<5	<5	<5	----
Isopropylbenzene	98-82-8	5	µg/L	<5	<5	<5	<5	----
n-Propylbenzene	103-65-1	5	µg/L	<5	<5	<5	<5	----
1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	<5	<5	----
sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	<5	<5	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	Q12487-06	Q12487-07	Q12487-08	Q12487-09	TBW271-10
			Client sampling date / time	28-Mar-2017 00:00	28-Mar-2017 00:00	28-Mar-2017 00:00	28-Mar-2017 00:00	28-Mar-2017 00:00
Compound	CAS Number	LOR	Unit	EP1702915-006	EP1702915-007	EP1702915-008	EP1702915-009	EP1702915-010
				Result	Result	Result	Result	Result
EP074A: Monocyclic Aromatic Hydrocarbons - Continued								
1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	<5	<5	----
tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	<5	<5	----
p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	<5	<5	----
n-Butylbenzene	104-51-8	5	µg/L	<5	<5	<5	<5	----
EP074B: Oxygenated Compounds								
Vinyl Acetate	108-05-4	50	µg/L	<50	<50	<50	<50	----
2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	<50	<50	----
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	<50	<50	----
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	<50	<50	----
EP074C: Sulfonated Compounds								
Carbon disulfide	75-15-0	5	µg/L	<5	<5	<5	<5	----
EP074D: Fumigants								
2.2-Dichloropropane	594-20-7	5	µg/L	<5	<5	<5	<5	----
1.2-Dichloropropane	78-87-5	5	µg/L	<5	<5	<5	<5	----
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	<5	<5	----
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	<5	<5	----
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	<5	<5	----
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	<50	<50	----
Chloromethane	74-87-3	50	µg/L	<50	<50	<50	<50	----
Vinyl chloride	75-01-4	50	µg/L	<50	<50	<50	<50	----
Bromomethane	74-83-9	50	µg/L	<50	<50	<50	<50	----
Chloroethane	75-00-3	50	µg/L	<50	<50	<50	<50	----
Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	<50	<50	----
1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	<5	<5	----
Iodomethane	74-88-4	5	µg/L	<5	<5	<5	<5	----
trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	<5	<5	----
1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	<5	<5	----
cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	<5	<5	----
1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	<5	<5	----
1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	<5	<5	----
Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	<5	<5	----
1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	<5	<5	----
Trichloroethene	79-01-6	5	µg/L	<5	<5	<5	<5	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	Q12487-06	Q12487-07	Q12487-08	Q12487-09	TBW271-10
			Client sampling date / time	28-Mar-2017 00:00	28-Mar-2017 00:00	28-Mar-2017 00:00	28-Mar-2017 00:00	28-Mar-2017 00:00
Compound	CAS Number	LOR	Unit	EP1702915-006	EP1702915-007	EP1702915-008	EP1702915-009	EP1702915-010
				Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued								
Dibromomethane	74-95-3	5	µg/L	<5	<5	<5	<5	----
1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	<5	<5	----
1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	<5	<5	----
Tetrachloroethene	127-18-4	5	µg/L	<5	<5	<5	<5	----
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	<5	<5	----
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	<5	<5	----
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	<5	<5	----
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	<5	<5	----
1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	<5	<5	----
Pentachloroethane	76-01-7	5	µg/L	<5	<5	<5	<5	----
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	<5	<5	----
Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	<5	<5	----
EP074F: Halogenated Aromatic Compounds								
Chlorobenzene	108-90-7	5	µg/L	<5	<5	<5	<5	----
Bromobenzene	108-86-1	5	µg/L	<5	<5	<5	<5	----
2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	<5	<5	----
4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	<5	<5	----
1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	<5	<5	----
1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	<5	<5	----
1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	<5	<5	----
1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	<5	<5	----
1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	<5	<5	----
EP074G: Trihalomethanes								
Chloroform	67-66-3	5	µg/L	<5	<5	<5	<5	----
Bromodichloromethane	75-27-4	5	µg/L	<5	<5	<5	<5	----
Dibromochloromethane	124-48-1	5	µg/L	<5	<5	<5	<5	----
Bromoform	75-25-2	5	µg/L	<5	<5	<5	<5	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Acenaphthylene	208-96-8	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Acenaphthene	83-32-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Fluorene	86-73-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Phenanthrene	85-01-8	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Anthracene	120-12-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	Q12487-06	Q12487-07	Q12487-08	Q12487-09	TBW271-10
			Client sampling date / time	28-Mar-2017 00:00	28-Mar-2017 00:00	28-Mar-2017 00:00	28-Mar-2017 00:00	28-Mar-2017 00:00
Compound	CAS Number	LOR	Unit	EP1702915-006	EP1702915-007	EP1702915-008	EP1702915-009	EP1702915-010
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Fluoranthene	206-44-0	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Pyrene	129-00-0	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benz(a)anthracene	56-55-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Chrysene	218-01-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	**70**	<50	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	**70**	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	**140**	<100	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	**140**	<100	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	Q12487-06	Q12487-07	Q12487-08	Q12487-09	TBW271-10
			Client sampling date / time	28-Mar-2017 00:00	28-Mar-2017 00:00	28-Mar-2017 00:00	28-Mar-2017 00:00	28-Mar-2017 00:00
Compound	CAS Number	LOR	Unit	EP1702915-006	EP1702915-007	EP1702915-008	EP1702915-009	EP1702915-010
				Result	Result	Result	Result	Result
EP080: BTEXN - Continued								
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	1	%	103	110	92.2	80.1	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.5	%	84.7	90.8	75.2	90.4	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.5	%	87.2	106	86.8	94.0	----
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	17060-07-0	5	%	113	116	112	119	----
Toluene-D8	2037-26-5	5	%	95.3	96.2	97.9	97.4	----
4-Bromofluorobenzene	460-00-4	5	%	92.2	91.4	91.1	95.4	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1	%	26.4	29.6	24.5	31.2	----
2-Chlorophenol-D4	93951-73-6	1	%	67.5	72.9	59.4	73.3	----
2.4.6-Tribromophenol	118-79-6	1	%	109	109	100	107	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1	%	74.6	79.2	65.4	79.9	----
Anthracene-d10	1719-06-8	1	%	67.5	70.7	59.2	72.2	----
4-Terphenyl-d14	1718-51-0	1	%	71.1	75.0	60.6	75.5	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	121	124	120	127	123
Toluene-D8	2037-26-5	2	%	95.6	96.8	99.0	98.1	95.5
4-Bromofluorobenzene	460-00-4	2	%	88.8	87.8	89.6	92.2	92.4

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	TBW272-11	----	----	----	----
			Client sampling date / time	28-Mar-2017 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EP1702915-011	--------	--------	--------	--------
				Result	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
^ Total Xylenes	1330-20-7	2	µg/L	<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**124**	----	----	----	----
Toluene-D8	2037-26-5	2	%	**96.2**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	**90.7**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	27	136
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	50	146
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	27	153
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	62	134
Toluene-D8	2037-26-5	75	124
4-Bromofluorobenzene	460-00-4	64	119
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	67
2-Chlorophenol-D4	93951-73-6	29	120
2.4.6-Tribromophenol	118-79-6	10	131
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	34	131
Anthracene-d10	1719-06-8	43	127
4-Terphenyl-d14	1718-51-0	41	142
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	61	141
Toluene-D8	2037-26-5	73	126
4-Bromofluorobenzene	460-00-4	60	125

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP1702915**	Page	: 1 of 16
Client	: **GOLDER ASSOCIATES**	Laboratory	: Environmental Division Perth
Contact	: JESS HAY	Contact	: Luke Jones
Address	: PO BOX 1914 WEST PERTH WA 6872	Address	: 10 Hod Way Malaga WA Australia 6090
Telephone	: +61 08 9213 7600	Telephone	: 08 9209 7631
Project	: 1777197	Date Samples Received	: 28-Mar-2017
Order number	: 1777197 [Q12487]	Date Analysis Commenced	: 29-Mar-2017
C-O-C number	: [Q12487]	Issue Date	: 04-Apr-2017
Sampler	: ----		
Site	: ----		
Quote number	: EN/002/16 v2		
No. of samples received	: 11		
No. of samples analysed	: 11		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Canhuang Ke	Metals Instrument Chemist	Perth Inorganics, Malaga, WA
Efua Wilson	Metals Chemist	Perth Inorganics, Malaga, WA
Huynh Huynh	Organic Chemist	Perth Organics, Malaga, WA
Jeremy Truong	Laboratory Manager	Perth Inorganics, Malaga, WA

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 814764)									
EP1702911-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	271	272	0.00	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	271	272	0.00	0% - 20%
EP1702908-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	<1	0.00	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 814767)									
EP1702916-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	42	42	0.00	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	42	42	0.00	0% - 20%
EP1702916-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	69	60	14.2	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	69	60	14.2	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 815094)									
EP1702915-002	Q12487-02	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	83	84	0.00	0% - 20%
EP1702941-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	26	26	0.00	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 815095)									
EP1702915-002	Q12487-02	ED045G: Chloride	16887-00-6	1	mg/L	712	716	0.472	0% - 20%
EP1702941-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	277	279	0.504	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 817888)									

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
ED093F: Dissolved Major Cations (QC Lot: 817888) - continued									
EP1702894-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	33	34	0.00	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	10	10	0.00	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	110	111	1.08	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	8	8	0.00	No Limit
EP1702915-004	Q12487-04	ED093F: Calcium	7440-70-2	1	mg/L	24	24	0.00	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	798	800	0.188	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	4420	4410	0.294	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	4	4	0.00	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 817884)									
EP1702858-002	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Barium	7440-39-3	0.001	mg/L	0.016	0.016	0.00	0% - 50%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.007	0.007	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	0.24	0.25	0.00	No Limit
EP1702864-006	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Barium	7440-39-3	0.001	mg/L	0.047	0.046	2.37	0% - 20%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.009	0.010	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 817889)									
EP1702915-005	Q12487-05	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 817889) - continued									
EP1702915-005	Q12487-05	EG020A-F: Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Barium	7440-39-3	0.001	mg/L	0.028	0.029	0.00	0% - 20%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	0.004	0.004	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.060	0.062	3.35	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.004	0.003	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	0.15	0.15	0.00	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 817885)									
EP1702858-005	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EP1702864-008	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 817890)									
EP1702915-008	Q12487-08	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 815103)									
EP1702915-002	Q12487-02	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.02	0.02	0.00	No Limit
EP1702917-006	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	99.3	97.9	1.36	0% - 20%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 815092)									
EP1702915-002	Q12487-02	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EP1702941-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 815104)									
EP1702915-002	Q12487-02	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	4.01	3.94	1.62	0% - 20%
EP1702917-006	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.01	0.01	0.00	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 816195)									
EP1702873-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	4.4	4.4	0.00	0% - 20%
EP1702915-002	Q12487-02	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.8	0.8	0.00	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 816194)									
EP1702873-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	1.00	1.00	0.00	0% - 20%
EP1702915-002	Q12487-02	EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.02	<0.02	0.00	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 815093)									
EP1702915-002	Q12487-02	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EP1702941-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.04	0.04	0.00	No Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 817215)									
EP1702858-001	Anonymous	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.00	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 817215) - continued									
EP1702858-001	Anonymous	EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.00	No Limit
EP1702858-012	Anonymous	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.00	No Limit
EP074B: Oxygenated Compounds (QC Lot: 817215)									
EP1702858-001	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.00	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.00	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.00	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.00	No Limit
EP1702858-012	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.00	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.00	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.00	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.00	No Limit
EP074C: Sulfonated Compounds (QC Lot: 817215)									
EP1702858-001	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.00	No Limit
EP1702858-012	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.00	No Limit
EP074D: Fumigants (QC Lot: 817215)									
EP1702858-001	Anonymous	EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.00	No Limit
EP1702858-012	Anonymous	EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.00	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP074E: Halogenated Aliphatic Compounds (QC Lot: 817215)									
EP1702858-001	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.00	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.00	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.00	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.00	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.00	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.00	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.00	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.00	No Limit
EP1702858-012	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.00	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.00	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP074E: Halogenated Aliphatic Compounds (QC Lot: 817215) - continued									
EP1702858-012	Anonymous	EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.00	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.00	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.00	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.00	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.00	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.00	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.00	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 817215)									
EP1702858-001	Anonymous	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.00	No Limit
EP1702858-012	Anonymous	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.00	No Limit
EP074G: Trihalomethanes (QC Lot: 817215)									
EP1702858-001	Anonymous	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.00	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EP074G: Trihalomethanes (QC Lot: 817215) - continued									
EP1702858-012	Anonymous	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 815226)									
EP1702915-002	Q12487-02	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 817216)									
EP1702858-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP1702858-012	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 815226)									
EP1702915-002	Q12487-02	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 817216)									
EP1702858-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP1702858-012	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 817216)									
EP1702858-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EP1702858-012	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 814764)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	99.7	76	126
				<1	200 mg/L	97.1	90	106
ED037P: Alkalinity by PC Titrator (QCLot: 814767)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	103	76	126
				<1	200 mg/L	95.0	90	106
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 815094)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	102	89	113
				<1	100 mg/L	99.3	79	121
ED045G: Chloride by Discrete Analyser (QCLot: 815095)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	95.3	84	120
				<1	1000 mg/L	101	84	110
ED093F: Dissolved Major Cations (QCLot: 817888)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	98.6	91	109
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.0	90	108
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	95.9	87	111
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.7	90	110
EG020F: Dissolved Metals by ICP-MS (QCLot: 817884)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	95.7	84	108
EG020A-F: Beryllium	7440-41-7	0.001	mg/L	<0.001	0.1 mg/L	87.3	81	111
EG020A-F: Barium	7440-39-3	0.001	mg/L	<0.001	0.1 mg/L	95.8	85	109
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	93.8	86	108
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	93.4	85	109
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	94.1	84	110
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	88.1	84	110
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	95.1	85	107
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	93.5	85	109

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020F: Dissolved Metals by ICP-MS (QCLot: 817884) - continued								
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	93.8	84	112
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	100	88	112
EG020A-F: Vanadium	7440-62-2	0.01	mg/L	<0.01	0.1 mg/L	92.5	85	109
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	98.3	89	115
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.1 mg/L	91.2	79	115
EG020F: Dissolved Metals by ICP-MS (QCLot: 817889)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	96.1	84	108
EG020A-F: Beryllium	7440-41-7	0.001	mg/L	<0.001	0.1 mg/L	87.2	81	111
EG020A-F: Barium	7440-39-3	0.001	mg/L	<0.001	0.1 mg/L	93.4	85	109
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	93.9	86	108
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	92.1	85	109
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	93.8	84	110
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	91.4	84	110
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	94.4	85	107
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	91.5	85	109
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	93.9	84	112
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	101	88	112
EG020A-F: Vanadium	7440-62-2	0.01	mg/L	<0.01	0.1 mg/L	91.1	85	109
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	99.0	89	115
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.1 mg/L	93.6	79	115
EG035F: Dissolved Mercury by FIMS (QCLot: 817885)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	93.2	92	116
EG035F: Dissolved Mercury by FIMS (QCLot: 817890)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	110	92	116
EK055G: Ammonia as N by Discrete Analyser (QCLot: 815103)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	96.0	87	115
EK057G: Nitrite as N by Discrete Analyser (QCLot: 815092)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	99.6	86	112
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 815104)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	107	92	112
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 816195)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	89.0	82	110
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 816194)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	86.8	70	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 815093)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	106	87	115
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 815225)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 815225) - continued								
EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	5 µg/L	64.0	36	90
EP068A: Organochlorine Pesticides (OC) (QCLot: 815228)								
EP068: alpha-BHC	319-84-6	0.5	µg/L	<0.5	5 µg/L	66.8	42	112
EP068: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	5 µg/L	60.9	39	108
EP068: beta-BHC	319-85-7	0.5	µg/L	<0.5	5 µg/L	70.8	46	116
EP068: gamma-BHC	58-89-9	0.5	µg/L	<0.5	5 µg/L	60.3	43	118
EP068: delta-BHC	319-86-8	0.5	µg/L	<0.5	5 µg/L	75.5	46	115
EP068: Heptachlor	76-44-8	0.5	µg/L	<0.5	5 µg/L	80.6	39	111
EP068: Aldrin	309-00-2	0.5	µg/L	<0.5	5 µg/L	70.6	40	114
EP068: Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	5 µg/L	70.8	42	122
EP068: trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	5 µg/L	69.0	44	121
EP068: alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	5 µg/L	68.4	42	129
EP068: cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	5 µg/L	68.7	43	123
EP068: Dieldrin	60-57-1	0.5	µg/L	<0.5	5 µg/L	72.5	42	121
EP068: 4.4`-DDE	72-55-9	0.5	µg/L	<0.5	5 µg/L	73.3	44	123
EP068: Endrin	72-20-8	0.5	µg/L	<0.5	5 µg/L	66.6	27	127
EP068: beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	5 µg/L	96.8	45	128
EP068: 4.4`-DDD	72-54-8	0.5	µg/L	<0.5	5 µg/L	76.0	42	128
EP068: Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	5 µg/L	83.0	32	121
EP068: Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	5 µg/L	86.6	41	120
EP068: 4.4`-DDT	50-29-3	2	µg/L	<2.0	5 µg/L	69.7	32	123
EP068: Endrin ketone	53494-70-5	0.5	µg/L	<0.5	5 µg/L	81.8	36	124
EP068: Methoxychlor	72-43-5	2	µg/L	<2.0	5 µg/L	65.0	25	124
EP068B: Organophosphorus Pesticides (OP) (QCLot: 815228)								
EP068: Dichlorvos	62-73-7	0.5	µg/L	<0.5	5 µg/L	60.9	39	110
EP068: Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5	5 µg/L	57.0	35	115
EP068: Monocrotophos	6923-22-4	2	µg/L	<2.0	5 µg/L	16.8	0	20
EP068: Dimethoate	60-51-5	0.5	µg/L	<0.5	5 µg/L	45.9	28	102
EP068: Diazinon	333-41-5	0.5	µg/L	<0.5	5 µg/L	75.7	46	122
EP068: Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	5 µg/L	61.5	47	118
EP068: Parathion-methyl	298-00-0	----	µg/L	----	5 µg/L	73.4	27	110
EP068: Malathion	121-75-5	0.5	µg/L	<0.5	5 µg/L	68.3	39	119
EP068: Fenthion	55-38-9	0.5	µg/L	<0.5	5 µg/L	64.7	45	119
EP068: Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	5 µg/L	71.5	45	118
EP068: Parathion	56-38-2	2	µg/L	<2.0	5 µg/L	52.6	30	112
EP068: Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	5 µg/L	64.8	43	123
EP068: Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	5 µg/L	78.0	41	119
EP068: Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	5 µg/L	61.9	34	125
EP068: Fenamiphos	22224-92-6	0.5	µg/L	<0.5	5 µg/L	85.6	20	123

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP068B: Organophosphorus Pesticides (OP) (QCLot: 815228) - continued								
EP068: Prothiofos	34643-46-4	0.5	µg/L	<0.5	5 µg/L	61.7	38	121
EP068: Ethion	563-12-2	0.5	µg/L	<0.5	5 µg/L	55.6	40	121
EP068: Carbophenothion	786-19-6	0.5	µg/L	<0.5	5 µg/L	90.3	40	119
EP068: Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	5 µg/L	29.2	0	137
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 817215)								
EP074: Styrene	100-42-5	5	µg/L	<5	10 µg/L	94.2	80	118
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	10 µg/L	95.1	87	113
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	10 µg/L	96.4	78	120
EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	10 µg/L	98.8	84	114
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	10 µg/L	95.7	82	117
EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	10 µg/L	96.5	83	116
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	10 µg/L	97.6	84	115
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	10 µg/L	95.5	80	120
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	10 µg/L	96.4	78	122
EP074B: Oxygenated Compounds (QCLot: 817215)								
EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	100 µg/L	106	79	121
EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	100 µg/L	103	64	142
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	100 µg/L	105	74	126
EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	100 µg/L	98.6	63	142
EP074C: Sulfonated Compounds (QCLot: 817215)								
EP074: Carbon disulfide	75-15-0	5	µg/L	<5	10 µg/L	93.0	78	123
EP074D: Fumigants (QCLot: 817215)								
EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	10 µg/L	88.6	77	123
EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	10 µg/L	94.8	86	113
EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	10 µg/L	93.8	84	115
EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	10 µg/L	90.1	80	119
EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	10 µg/L	92.9	83	116
EP074E: Halogenated Aliphatic Compounds (QCLot: 817215)								
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	100 µg/L	91.4	74	125
EP074: Chloromethane	74-87-3	50	µg/L	<50	100 µg/L	95.6	77	123
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	100 µg/L	81.4	71	128
EP074: Bromomethane	74-83-9	50	µg/L	<50	100 µg/L	83.2	77	125
EP074: Chloroethane	75-00-3	50	µg/L	<50	100 µg/L	98.4	78	121
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	100 µg/L	95.5	80	120
EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	10 µg/L	94.2	80	118
EP074: Iodomethane	74-88-4	5	µg/L	<5	10 µg/L	92.6	63	129
EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	10 µg/L	97.2	84	115
EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	10 µg/L	91.9	84	116

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074E: Halogenated Aliphatic Compounds (QCLot: 817215) - continued								
EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	10 µg/L	96.4	84	115
EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	10 µg/L	97.4	85	116
EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	10 µg/L	94.1	85	113
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	10 µg/L	95.5	82	119
EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	10 µg/L	107	77	121
EP074: Trichloroethene	79-01-6	5	µg/L	<5	10 µg/L	97.3	86	112
EP074: Dibromomethane	74-95-3	5	µg/L	<5	10 µg/L	96.5	78	122
EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	10 µg/L	96.4	83	116
EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	10 µg/L	97.9	84	114
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	10 µg/L	96.2	79	121
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	----	----	----	----
EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	10 µg/L	83.8	76	126
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	10 µg/L	84.3	75	127
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	10 µg/L	96.8	72	125
EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	10 µg/L	96.5	80	121
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	10 µg/L	95.0	68	133
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	10 µg/L	106	72	130
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	10 µg/L	94.1	71	131
EP074F: Halogenated Aromatic Compounds (QCLot: 817215)								
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	10 µg/L	91.2	90	110
EP074: Bromobenzene	108-86-1	5	µg/L	<5	10 µg/L	97.4	88	111
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	10 µg/L	112	76	120
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	10 µg/L	95.3	84	115
EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	10 µg/L	89.7	82	117
EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	10 µg/L	97.3	88	112
EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	10 µg/L	99.1	90	110
EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	10 µg/L	100	76	125
EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	10 µg/L	93.6	85	116
EP074G: Trihalomethanes (QCLot: 817215)								
EP074: Chloroform	67-66-3	5	µg/L	<5	10 µg/L	97.5	83	116
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	10 µg/L	95.2	79	121
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	10 µg/L	99.0	78	123
EP074: Bromoform	75-25-2	5	µg/L	<5	10 µg/L	93.1	76	125
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 815227)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	10 µg/L	84.2	42	99
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	10 µg/L	94.6	36	113
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	10 µg/L	80.7	36	102
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	10 µg/L	87.8	34	113

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 815227) - continued								
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	10 µg/L	76.5	37	115
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	10 µg/L	75.1	46	109
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	10 µg/L	78.6	40	124
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	10 µg/L	80.3	40	123
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	10 µg/L	75.4	40	126
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	10 µg/L	74.3	46	121
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	10 µg/L	78.1	43	123
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	10 µg/L	75.0	47	121
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	10 µg/L	76.5	45	123
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	10 µg/L	79.6	39	120
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	10 µg/L	78.3	39	119
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	10 µg/L	80.4	40	123
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 815226)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	71.1	35	95
EP071: C15 - C28 Fraction	----	100	µg/L	<100	400 µg/L	73.8	34	111
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	76.2	34	105
EP080/071: Total Petroleum Hydrocarbons (QCLot: 817216)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	320 µg/L	95.9	74	113
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 815226)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	400 µg/L	71.5	37	99
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	600 µg/L	75.8	35	108
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	200 µg/L	72.9	11	117
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 817216)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	370 µg/L	95.7	74	115
EP080: BTEXN (QCLot: 817216)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	111	84	114
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	101	81	115
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	107	84	113
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	108	84	114
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	110	87	111
EP080: Naphthalene	91-20-3	5	µg/L	<5	20 µg/L	103	77	118

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 815094)							
EP1702915-001	Q12487-01	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	104	70	130
ED045G: Chloride by Discrete Analyser (QCLot: 815095)							
EP1702915-001	Q12487-01	ED045G: Chloride	16887-00-6	1000 mg/L	100	70	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 817884)							
EP1702858-003	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	97.5	70	130
		EG020A-F: Beryllium	7440-41-7	0.2 mg/L	95.8	70	130
		EG020A-F: Barium	7440-39-3	0.2 mg/L	97.8	70	130
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	99.0	70	130
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	99.9	70	130
		EG020A-F: Cobalt	7440-48-4	0.2 mg/L	97.8	70	130
		EG020A-F: Copper	7440-50-8	0.2 mg/L	91.4	70	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	96.3	70	130
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	94.1	70	130
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	98.6	70	130
		EG020A-F: Vanadium	7440-62-2	0.2 mg/L	89.3	70	130
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	100	70	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 817889)							
EP1702915-006	Q12487-06	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	104	70	130
		EG020A-F: Beryllium	7440-41-7	0.2 mg/L	84.3	70	130
		EG020A-F: Barium	7440-39-3	0.2 mg/L	102	70	130
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	99.2	70	130
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	93.6	70	130
		EG020A-F: Cobalt	7440-48-4	0.2 mg/L	100	70	130
		EG020A-F: Copper	7440-50-8	0.2 mg/L	82.2	70	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	84.3	70	130
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	91.1	70	130
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	99.3	70	130
		EG020A-F: Vanadium	7440-62-2	0.2 mg/L	74.4	70	130
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	104	70	130
EG035F: Dissolved Mercury by FIMS (QCLot: 817885)							
EP1702858-008	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	88.4	70	130
EG035F: Dissolved Mercury by FIMS (QCLot: 817890)							
EP1702915-009	Q12487-09	EG035F: Mercury	7439-97-6	0.01 mg/L	87.5	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 815103)							
EP1702915-001	Q12487-01	EK055G: Ammonia as N	7664-41-7	1 mg/L	112	70	130

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	High
EK057G: Nitrite as N by Discrete Analyser (QCLot: 815092)							
EP1702915-001	Q12487-01	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	106	70	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 815104)							
EP1702915-001	Q12487-01	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	105	70	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 816195)							
EP1702899-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	89.4	70	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 816194)							
EP1702899-001	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	92.7	70	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 815093)							
EP1702915-001	Q12487-01	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	118	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 815228)							
EP1702915-002	Q12487-02	EP068: gamma-BHC	58-89-9	5 µg/L	68.5	50	115
		EP068: Heptachlor	76-44-8	5 µg/L	85.4	48	121
		EP068: Aldrin	309-00-2	5 µg/L	66.9	48	122
		EP068: Dieldrin	60-57-1	5 µg/L	66.5	54	122
		EP068: Endrin	72-20-8	5 µg/L	65.4	53	125
		EP068: 4.4`-DDT	50-29-3	5 µg/L	59.2	49	124
EP068B: Organophosphorus Pesticides (OP) (QCLot: 815228)							
EP1702915-002	Q12487-02	EP068: Diazinon	333-41-5	5 µg/L	79.2	52	120
		EP068: Chlorpyrifos-methyl	5598-13-0	5 µg/L	77.0	54	120
		EP068: Pirimphos-ethyl	23505-41-1	5 µg/L	53.6	49	122
		EP068: Bromophos-ethyl	4824-78-6	5 µg/L	67.0	55	122
		EP068: Prothiofos	34643-46-4	5 µg/L	66.4	53	123
EP074E: Halogenated Aliphatic Compounds (QCLot: 817215)							
EP1702858-002	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	20 µg/L	91.4	74	126
		EP074: Trichloroethene	79-01-6	20 µg/L	89.1	79	120
EP074F: Halogenated Aromatic Compounds (QCLot: 817215)							
EP1702858-002	Anonymous	EP074: Chlorobenzene	108-90-7	20 µg/L	90.9	81	115
EP080/071: Total Petroleum Hydrocarbons (QCLot: 817216)							
EP1702858-002	Anonymous	EP080: C6 - C9 Fraction	----	240 µg/L	81.5	77	137
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 817216)							
EP1702858-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	290 µg/L	83.0	77	137
EP080: BTEXN (QCLot: 817216)							
EP1702858-002	Anonymous	EP080: Benzene	71-43-2	20 µg/L	95.4	77	122
		EP080: Toluene	108-88-3	20 µg/L	86.3	74	126

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP1702915**	Page	: 1 of 13
Client	: **GOLDER ASSOCIATES**	Laboratory	: Environmental Division Perth
Contact	: JESS HAY	Telephone	: 08 9209 7631
Project	: 1777197	Date Samples Received	: 28-Mar-2017
Site	: ----	Issue Date	: 04-Apr-2017
Sampler	: ----	No. of samples received	: 11
Order number	: 1777197 [Q12487]	No. of samples analysed	: 11

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	0	10	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	0	9	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	0	12	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	1	17	5.88	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
PAH/Phenols (GC/MS - SIM)	0	10	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	0	12	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	17	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container / Client Sample ID(s)*	*Sample Date*	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) Q12487-01, Q12487-02, Q12487-03, Q12487-04	**27-Mar-2017**	**----**	----	----	**29-Mar-2017**	10-Apr-2017	✓
Clear Plastic Bottle - Natural (ED037-P) Q12487-05, Q12487-06, Q12487-07, Q12487-08, Q12487-09	**28-Mar-2017**	**----**	----	----	**29-Mar-2017**	11-Apr-2017	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) Q12487-01, Q12487-02, Q12487-03, Q12487-04	**27-Mar-2017**	**----**	----	----	**29-Mar-2017**	24-Apr-2017	✓
Clear Plastic Bottle - Natural (ED041G) Q12487-05, Q12487-06, Q12487-07, Q12487-08, Q12487-09	**28-Mar-2017**	**----**	----	----	**29-Mar-2017**	25-Apr-2017	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
Q12487-01, Q12487-03,	Q12487-02, Q12487-04	**27-Mar-2017**	**----**	----	----	**29-Mar-2017**	24-Apr-2017	✓
Clear Plastic Bottle - Natural (ED045G)								
Q12487-05, Q12487-07, Q12487-09	Q12487-06, Q12487-08,	**28-Mar-2017**	**----**	----	----	**29-Mar-2017**	25-Apr-2017	✓
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F)								
Q12487-01, Q12487-03,	Q12487-02, Q12487-04	**27-Mar-2017**	**----**	----	----	**31-Mar-2017**	24-Apr-2017	✓
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F)								
Q12487-05, Q12487-07, Q12487-09	Q12487-06, Q12487-08,	**28-Mar-2017**	**----**	----	----	**31-Mar-2017**	25-Apr-2017	✓
EG020F: Dissolved Metals by ICP-MS								
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F)								
Q12487-01, Q12487-03,	Q12487-02, Q12487-04	**27-Mar-2017**	**----**	----	----	**31-Mar-2017**	23-Sep-2017	✓
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F)								
Q12487-05, Q12487-07, Q12487-09	Q12487-06, Q12487-08,	**28-Mar-2017**	**----**	----	----	**31-Mar-2017**	24-Sep-2017	✓
EG035F: Dissolved Mercury by FIMS								
Clear Plastic Bottle - Filtered; Lab-acidified (EG035F)								
Q12487-01, Q12487-03,	Q12487-02, Q12487-04	**27-Mar-2017**	**----**	----	----	**31-Mar-2017**	24-Apr-2017	✓
Clear Plastic Bottle - Filtered; Lab-acidified (EG035F)								
Q12487-05, Q12487-07, Q12487-09	Q12487-06, Q12487-08,	**28-Mar-2017**	**----**	----	----	**31-Mar-2017**	25-Apr-2017	✓
EK055G: Ammonia as N by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK055G)								
Q12487-01, Q12487-03,	Q12487-02, Q12487-04	**27-Mar-2017**	**----**	----	----	**29-Mar-2017**	24-Apr-2017	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)								
Q12487-05, Q12487-07, Q12487-09	Q12487-06, Q12487-08,	**28-Mar-2017**	**----**	----	----	**29-Mar-2017**	25-Apr-2017	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) Q12487-01, Q12487-02, Q12487-03, Q12487-04	**27-Mar-2017**	**----**	----	----	**29-Mar-2017**	29-Mar-2017	✓
Clear Plastic Bottle - Natural (EK057G) Q12487-05, Q12487-06, Q12487-07, Q12487-08, Q12487-09	**28-Mar-2017**	**----**	----	----	**29-Mar-2017**	30-Mar-2017	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) Q12487-01, Q12487-02, Q12487-03, Q12487-04	**27-Mar-2017**	**----**	----	----	**29-Mar-2017**	24-Apr-2017	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) Q12487-05, Q12487-06, Q12487-07, Q12487-08, Q12487-09	**28-Mar-2017**	**----**	----	----	**29-Mar-2017**	25-Apr-2017	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) Q12487-01, Q12487-02, Q12487-03, Q12487-04	**27-Mar-2017**	**31-Mar-2017**	24-Apr-2017	✓	**31-Mar-2017**	24-Apr-2017	✓
Clear Plastic Bottle - Sulfuric Acid (EK061G) Q12487-05, Q12487-06, Q12487-07, Q12487-08, Q12487-09	**28-Mar-2017**	**31-Mar-2017**	25-Apr-2017	✓	**31-Mar-2017**	25-Apr-2017	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) Q12487-01, Q12487-02, Q12487-03, Q12487-04	**27-Mar-2017**	**31-Mar-2017**	24-Apr-2017	✓	**31-Mar-2017**	24-Apr-2017	✓
Clear Plastic Bottle - Sulfuric Acid (EK067G) Q12487-05, Q12487-06, Q12487-07, Q12487-08, Q12487-09	**28-Mar-2017**	**31-Mar-2017**	25-Apr-2017	✓	**31-Mar-2017**	25-Apr-2017	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G) Q12487-01, Q12487-02, Q12487-03, Q12487-04	**27-Mar-2017**	**----**	----	----	**29-Mar-2017**	29-Mar-2017	✓
Clear Plastic Bottle - Natural (EK071G) Q12487-05, Q12487-06, Q12487-07, Q12487-08, Q12487-09	**28-Mar-2017**	**----**	----	----	**29-Mar-2017**	30-Mar-2017	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP066: Polychlorinated Biphenyls (PCB)							
Amber Glass Bottle - Unpreserved (EP066) Q12487-01, Q12487-02, Q12487-03, Q12487-04	**27-Mar-2017**	**30-Mar-2017**	03-Apr-2017	✓	**31-Mar-2017**	09-May-2017	✓
Amber Glass Bottle - Unpreserved (EP066) Q12487-05, Q12487-06, Q12487-07, Q12487-08, Q12487-09	**28-Mar-2017**	**30-Mar-2017**	04-Apr-2017	✓	**31-Mar-2017**	09-May-2017	✓
EP068A: Organochlorine Pesticides (OC)							
Amber Glass Bottle - Unpreserved (EP068) Q12487-01, Q12487-02, Q12487-03, Q12487-04	**27-Mar-2017**	**30-Mar-2017**	03-Apr-2017	✓	**31-Mar-2017**	09-May-2017	✓
Amber Glass Bottle - Unpreserved (EP068) Q12487-05, Q12487-06, Q12487-07, Q12487-08, Q12487-09	**28-Mar-2017**	**30-Mar-2017**	04-Apr-2017	✓	**31-Mar-2017**	09-May-2017	✓
EP068B: Organophosphorus Pesticides (OP)							
Amber Glass Bottle - Unpreserved (EP068) Q12487-01, Q12487-02, Q12487-03, Q12487-04	**27-Mar-2017**	**30-Mar-2017**	03-Apr-2017	✓	**31-Mar-2017**	09-May-2017	✓
Amber Glass Bottle - Unpreserved (EP068) Q12487-05, Q12487-06, Q12487-07, Q12487-08, Q12487-09	**28-Mar-2017**	**30-Mar-2017**	04-Apr-2017	✓	**31-Mar-2017**	09-May-2017	✓
EP074A: Monocyclic Aromatic Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP074) Q12487-01, Q12487-02, Q12487-03, Q12487-04	**27-Mar-2017**	**31-Mar-2017**	10-Apr-2017	✓	**31-Mar-2017**	10-Apr-2017	✓
Amber VOC Vial - Sulfuric Acid (EP074) Q12487-05, Q12487-06, Q12487-07, Q12487-08, Q12487-09	**28-Mar-2017**	**31-Mar-2017**	11-Apr-2017	✓	**31-Mar-2017**	11-Apr-2017	✓
EP074B: Oxygenated Compounds							
Amber VOC Vial - Sulfuric Acid (EP074) Q12487-01, Q12487-02, Q12487-03, Q12487-04	**27-Mar-2017**	**31-Mar-2017**	10-Apr-2017	✓	**31-Mar-2017**	10-Apr-2017	✓
Amber VOC Vial - Sulfuric Acid (EP074) Q12487-05, Q12487-06, Q12487-07, Q12487-08, Q12487-09	**28-Mar-2017**	**31-Mar-2017**	11-Apr-2017	✓	**31-Mar-2017**	11-Apr-2017	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP074C: Sulfonated Compounds							
Amber VOC Vial - Sulfuric Acid (EP074) Q12487-01, Q12487-02, Q12487-03, Q12487-04	**27-Mar-2017**	**31-Mar-2017**	10-Apr-2017	✓	**31-Mar-2017**	10-Apr-2017	✓
Amber VOC Vial - Sulfuric Acid (EP074) Q12487-05, Q12487-06, Q12487-07, Q12487-08, Q12487-09	**28-Mar-2017**	**31-Mar-2017**	11-Apr-2017	✓	**31-Mar-2017**	11-Apr-2017	✓
EP074D: Fumigants							
Amber VOC Vial - Sulfuric Acid (EP074) Q12487-01, Q12487-02, Q12487-03, Q12487-04	**27-Mar-2017**	**31-Mar-2017**	10-Apr-2017	✓	**31-Mar-2017**	10-Apr-2017	✓
Amber VOC Vial - Sulfuric Acid (EP074) Q12487-05, Q12487-06, Q12487-07, Q12487-08, Q12487-09	**28-Mar-2017**	**31-Mar-2017**	11-Apr-2017	✓	**31-Mar-2017**	11-Apr-2017	✓
EP074E: Halogenated Aliphatic Compounds							
Amber VOC Vial - Sulfuric Acid (EP074) Q12487-01, Q12487-02, Q12487-03, Q12487-04	**27-Mar-2017**	**31-Mar-2017**	10-Apr-2017	✓	**31-Mar-2017**	10-Apr-2017	✓
Amber VOC Vial - Sulfuric Acid (EP074) Q12487-05, Q12487-06, Q12487-07, Q12487-08, Q12487-09	**28-Mar-2017**	**31-Mar-2017**	11-Apr-2017	✓	**31-Mar-2017**	11-Apr-2017	✓
EP074F: Halogenated Aromatic Compounds							
Amber VOC Vial - Sulfuric Acid (EP074) Q12487-01, Q12487-02, Q12487-03, Q12487-04	**27-Mar-2017**	**31-Mar-2017**	10-Apr-2017	✓	**31-Mar-2017**	10-Apr-2017	✓
Amber VOC Vial - Sulfuric Acid (EP074) Q12487-05, Q12487-06, Q12487-07, Q12487-08, Q12487-09	**28-Mar-2017**	**31-Mar-2017**	11-Apr-2017	✓	**31-Mar-2017**	11-Apr-2017	✓
EP074G: Trihalomethanes							
Amber VOC Vial - Sulfuric Acid (EP074) Q12487-01, Q12487-02, Q12487-03, Q12487-04	**27-Mar-2017**	**31-Mar-2017**	10-Apr-2017	✓	**31-Mar-2017**	10-Apr-2017	✓
Amber VOC Vial - Sulfuric Acid (EP074) Q12487-05, Q12487-06, Q12487-07, Q12487-08, Q12487-09	**28-Mar-2017**	**31-Mar-2017**	11-Apr-2017	✓	**31-Mar-2017**	11-Apr-2017	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM)) Q12487-01, Q12487-02, Q12487-03, Q12487-04	**27-Mar-2017**	**30-Mar-2017**	03-Apr-2017	✓	**31-Mar-2017**	09-May-2017	✓
Amber Glass Bottle - Unpreserved (EP075(SIM)) Q12487-05, Q12487-06, Q12487-07, Q12487-08, Q12487-09	**28-Mar-2017**	**30-Mar-2017**	04-Apr-2017	✓	**31-Mar-2017**	09-May-2017	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) Q12487-01, Q12487-02, Q12487-03, Q12487-04	**27-Mar-2017**	**30-Mar-2017**	03-Apr-2017	✓	**31-Mar-2017**	09-May-2017	✓
Amber Glass Bottle - Unpreserved (EP071) Q12487-05, Q12487-06, Q12487-07, Q12487-08, Q12487-09	**28-Mar-2017**	**30-Mar-2017**	04-Apr-2017	✓	**31-Mar-2017**	09-May-2017	✓
Amber VOC Vial - Sulfuric Acid (EP080) Q12487-01, Q12487-02, Q12487-03, Q12487-04	**27-Mar-2017**	**31-Mar-2017**	10-Apr-2017	✓	**31-Mar-2017**	10-Apr-2017	✓
Amber VOC Vial - Sulfuric Acid (EP080) Q12487-05, Q12487-06, Q12487-07, Q12487-08, Q12487-09, TBW271-10, TBW272-11	**28-Mar-2017**	**31-Mar-2017**	11-Apr-2017	✓	**31-Mar-2017**	11-Apr-2017	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) Q12487-01, Q12487-02, Q12487-03, Q12487-04	**27-Mar-2017**	**30-Mar-2017**	03-Apr-2017	✓	**31-Mar-2017**	09-May-2017	✓
Amber Glass Bottle - Unpreserved (EP071) Q12487-05, Q12487-06, Q12487-07, Q12487-08, Q12487-09	**28-Mar-2017**	**30-Mar-2017**	04-Apr-2017	✓	**31-Mar-2017**	09-May-2017	✓
Amber VOC Vial - Sulfuric Acid (EP080) Q12487-01, Q12487-02, Q12487-03, Q12487-04	**27-Mar-2017**	**31-Mar-2017**	10-Apr-2017	✓	**31-Mar-2017**	10-Apr-2017	✓
Amber VOC Vial - Sulfuric Acid (EP080) Q12487-05, Q12487-06, Q12487-07, Q12487-08, Q12487-09, TBW271-10, TBW272-11	**28-Mar-2017**	**31-Mar-2017**	11-Apr-2017	✓	**31-Mar-2017**	11-Apr-2017	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEXN								
Amber VOC Vial - Sulfuric Acid (EP080)								
Q12487-01,	Q12487-02,	**27-Mar-2017**	**31-Mar-2017**	10-Apr-2017	✓	**31-Mar-2017**	10-Apr-2017	✓
Q12487-03,	Q12487-04							
Amber VOC Vial - Sulfuric Acid (EP080)								
Q12487-05,	Q12487-06,	**28-Mar-2017**	**31-Mar-2017**	11-Apr-2017	✓	**31-Mar-2017**	11-Apr-2017	✓
Q12487-07,	Q12487-08,							
Q12487-09,	TBW271-10,							
TBW272-11								

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	4	32	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	13	15.38	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	3	23	13.04	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	3	26	11.54	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	10	0.00	10.00	×	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	0	9	0.00	10.00	×	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	0	12	0.00	10.00	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	17	5.88	10.00	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	4	32	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	23	8.70	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	26	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Control Samples (LCS) - Continued							
Volatile Organic Compounds	EP074	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	23	**8.70**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	26	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	23	**8.70**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	26	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	10	**0.00**	**5.00**	✗	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	0	12	**0.00**	**5.00**	✗	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	17	**0.00**	**5.00**	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM (2013) Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM (2013) Schedule B(3)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM (2013) Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3-. This method is compliant with NEPM (2013) Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al (1976), Zhang et al (2006). This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM (2013) Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	WATER	In house: Referenced to USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Pesticides by GCMS	EP068	WATER	In house: Referenced to USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
Volatile Organic Compounds	EP074	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

Q 12487

page 1 of 1

Golder Associates
1 Havelock Street
West Perth, WA 6005 Australia
Telehone +61 8 9213 7600 Fax +61 8 9213 7611

Project Number: 1777197	Laboratory Name: ALS
[redacted]	Address: 10 Hod [illegible] Malaga
Golder Contact: [illegible]	Golder Email Address: [illegible]@golder.com.au
Telephone/Fax: [illegible] 7655	Contact: Luke Jones

Address where reports should be sent to

☐ PO Box 1914
West Perth, WA 6872
Telephone (61 8) 9213 7600
Fax (61 8) 9213 7611

☑ Other email

Phone _____ Fax _____

Analyses Required

	Sample Control Number (SCN)	Sample Matrix (over)	Date Sampled (D/M/Y)	Number of Containers	1-2	1-2	1-3	1-3	1-3	1-2	1-3			RUSH	Remarks (over)
1	214857 - 01	W	27.3.17	6	X	X	X	X	X	X					
2	- 02	↓	↓	3	X	X	X	X	X	X					Not enough water provided
3	- 03			6	X	X	X	X	X	X					
4	- 04		↓	6	X	X	X	X	X	X					
5	- 05		28.3.17	6	X	X	X	X	X	X					
6	- 06			6	X	X	X	X	X	X					
7	- 07			6	X	X	X	X	X	X					
8	- 08			6	X	X	X	X	X	X					
9	- 09			6	X	X	X	X	X	X					
10	TB 271 - 10	↓	↓	1							X				
11	218272 - 11	↓	↓	1							X				
	- 12														

Environmental Division
Perth
Work Order Reference
EP1702915

Telephone : - 61-8-9209 7655

Sampler's Signature: [signature]	Relinquished by: Signature [signature]	Company Golder	Date 28.3.17	Time	Received by: Signature	Company
Sample Storage (°C) ICE	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Comments:	Method of Shipment:	Waybill No:	Received for Lab by: [illegible]	Date 28/3/17	Time 1645	
	Shipped by:	Shipment Condition: Seal intact:	Temp (°C) 7.9	Cooler opened by: "	Date "	Time "

WHITE: Golder Copy YELLOW: Lab Copy PINK: Lab Returns with Final Report

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS		LABORATORY DETAILS	
Contact	Jessica Hay	Manager	Ros Ma
Client	Golder Associates Pty Ltd	Laboratory	SGS Perth Environmental
Address	PO Box 1914 (1 Havelock Street, West Perth WA 6005) WEST PERTH WA 6872	Address	28 Reid Rd Perth Airport WA 6105
Telephone	08 9213 7600	Telephone	(08) 9373 3500
Facsimile	08 9213 7611	Facsimile	(08) 9373 3556
Email	jhay@golder.com.au	Email	au.environmental.perth@sgs.com
Project	**1777197_Q12488**	SGS Reference	**PE115182 R0**
Order Number	(Not specified)	Date Received	28 Mar 2017
Samples	2	Date Reported	05 Apr 2017

COMMENTS

Accredited for compliance with ISO/IEC 17025-Testing. NATA accredited laboratory 2562(898/20210).

Metals: LORs raised due to high conductivity.

SIGNATORIES

Donald Smith
Chemist

Gary Walton
Organics Supervisor

Hue Thanh Ly
Metals Team Leader

Louise Hope
Laboratory Technician

Mary Ann Ola-A
Inorganics Team Leader

Michael McKay
Inorganics and ARD Supervisor

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	PE115182.001 Water 28 Mar 2017 Q12488-01	PE115182.002 Water 28 Mar 2017 Q12488-02
pH in water Method: AN101 Tested: 29/3/2017					
pH**	pH Units	-		6.3	-
Conductivity and TDS by Calculation - Water Method: AN106 Tested: 29/3/2017					
Conductivity @ 25 C	µS/cm	2		5200	-
Alkalinity Method: AN135 Tested: 29/3/2017					
Total Alkalinity as CaCO3	mg/L	5		22	-
Carbonate Alkalinity as CO3	mg/L	1		<1	-
Bicarbonate Alkalinity as HCO3	mg/L	5		27	-
Chloride by Discrete Analyser in Water Method: AN274 Tested: 30/3/2017					
Chloride, Cl	mg/L	1		1500	-
Sulphate in water Method: AN275 Tested: 31/3/2017					
Sulphate, SO4	mg/L	1		260	-
Nitrate Nitrogen and Nitrite Nitrogen (NOx) by FIA Method: AN258 Tested: 30/3/2017					
Nitrite Nitrogen, NO_2 as N	mg/L	0.05		<0.05	-
Nitrate Nitrogen, NO_3 as N	mg/L	0.05		<0.05	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	PE115182.001 Water 28 Mar 2017 Q12488-01	PE115182.002 Water 28 Mar 2017 Q12488-02
TKN Kjeldahl Digestion by Discrete Analyser Method: AN281 Tested: 30/3/2017					
Total Kjeldahl Nitrogen	mg/L	0.05		**0.34**	-
Total Phosphorus by Kjeldahl Digestion DA in Water Method: AN279/AN293(Sydney only) Tested: 30/3/2017					
Total Phosphorus (Kjeldahl Digestion)	mg/L	0.02		<0.02	-
Filterable Reactive Phosphorus (FRP) Method: AN278 Tested: 30/3/2017					
Filterable Reactive Phosphorus	mg/L	0.002		<0.002	-
Filterable Reactive Phosphorus as PO4	mg/L	0.02		<0.02	-
Metals in Water (Dissolved) by ICPOES Method: AN320/AN321 Tested: 4/4/2017					
Calcium, Ca	mg/L	0.2		**16**	-
Magnesium, Mg	mg/L	0.1		**66**	-
Potassium, K	mg/L	0.1		**16**	-
Sodium, Na	mg/L	0.5		**1000**	-
Trace Metals (Dissolved) in Water by ICPMS Method: AN318 Tested: 3/4/2017					
Aluminium, Al	µg/L	5		**120**	-
Arsenic, As	µg/L	1		<5↑	-
Barium, Ba	µg/L	1		**30**	-
Beryllium, Be	µg/L	1		<5↑	-
Boron, B	µg/L	5		**170**	-
Cadmium, Cd	µg/L	0.1		<0.5↑	-
Chromium, Cr	µg/L	1		<5↑	-
Cobalt, Co	µg/L	1		**6**	-
Copper, Cu	µg/L	1		<5↑	-
Lead, Pb	µg/L	1		<5↑	-
Manganese, Mn	µg/L	1		**71**	-
Molybdenum, Mo	µg/L	1		<5↑	-
Nickel, Ni	µg/L	1		**6**	-
Zinc, Zn	µg/L	5		<25↑	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	PE115182.001 Water 28 Mar 2017 Q12488-01	PE115182.002 Water 28 Mar 2017 Q12488-02
Mercury (dissolved) in Water Method: AN311(Perth)/AN312 Tested: 31/3/2017					
Mercury	mg/L	0.00005		<0.00005	-
VOCs in Water Method: AN433 Tested: 31/3/2017					
Fumigants					
2,2-dichloropropane	µg/L	0.5		<0.5	-
1,2-dichloropropane	µg/L	0.5		<0.5	-
cis-1,3-dichloropropene	µg/L	0.5		<0.5	-
trans-1,3-dichloropropene	µg/L	0.5		<0.5	-
1,2-dibromoethane (EDB)	µg/L	0.5		<0.5	-
Halogenated Aliphatics					
Dichlorodifluoromethane (CFC-12)	µg/L	5		<5	-
Chloromethane	µg/L	5		<5	-
Vinyl chloride (Chloroethene)	µg/L	0.3		<0.3	-
Bromomethane	µg/L	10		<10	-
Chloroethane	µg/L	5		<5	-
Trichlorofluoromethane	µg/L	1		<1	-
Iodomethane	µg/L	5		<5	-
1,1-dichloroethene	µg/L	0.5		<0.5	-
Dichloromethane (Methylene chloride)	µg/L	5		<5	-
Allyl chloride	µg/L	2		<2	-
trans-1,2-dichloroethene	µg/L	0.5		<0.5	-
1,1-dichloroethane	µg/L	0.5		<0.5	-
cis-1,2-dichloroethene	µg/L	0.5		<0.5	-
Bromochloromethane	µg/L	0.5		<0.5	-
1,2-dichloroethane	µg/L	0.5		<0.5	-
1,1,1-trichloroethane	µg/L	0.5		<0.5	-
1,1-dichloropropene	µg/L	0.5		<0.5	-
Carbon tetrachloride	µg/L	0.5		<0.5	-
Dibromomethane	µg/L	0.5		<0.5	-
Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5		<0.5	-
1,1,2-trichloroethane	µg/L	0.5		<0.5	-
1,3-dichloropropane	µg/L	0.5		<0.5	-
Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5		<0.5	-
1,1,1,2-tetrachloroethane	µg/L	0.5		<0.5	-
cis-1,4-dichloro-2-butene	µg/L	1		<1	-
1,1,2,2-tetrachloroethane	µg/L	0.5		<0.5	-
1,2,3-trichloropropane	µg/L	0.5		<0.5	-
trans-1,4-dichloro-2-butene	µg/L	1		<1	-
1,2-dibromo-3-chloropropane	µg/L	0.5		<0.5	-
Hexachlorobutadiene	µg/L	0.5		<0.5	-
Halogenated Aromatics					
Chlorobenzene	µg/L	0.5		<0.5	-
Bromobenzene	µg/L	0.5		<0.5	-
2-chlorotoluene	µg/L	0.5		<0.5	-
4-chlorotoluene	µg/L	0.5		<0.5	-
1,3-dichlorobenzene	µg/L	0.5		<0.5	-
1,4-dichlorobenzene	µg/L	0.3		<0.3	-
1,2-dichlorobenzene	µg/L	0.5		<0.5	-
1,2,4-trichlorobenzene	µg/L	0.5		<0.5	-
1,2,3-trichlorobenzene	µg/L	0.5		<0.5	-
Monocyclic Aromatic Hydrocarbons					
Benzene	µg/L	0.5		<0.5	<0.5
Toluene	µg/L	0.5		<0.5	<0.5
Ethylbenzene	µg/L	0.5		<0.5	<0.5
m/p-xylene	µg/L	1		<1	<1

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	PE115182.001 Water 28 Mar 2017 Q12488-01	PE115182.002 Water 28 Mar 2017 Q12488-02
VOCs in Water Method: AN433 Tested: 31/3/2017 (continued)					
o-xylene	µg/L	0.5		<0.5	<0.5
Styrene (Vinyl benzene)	µg/L	0.5		<0.5	-
Isopropylbenzene (Cumene)	µg/L	0.5		<0.5	-
n-propylbenzene	µg/L	0.5		<0.5	-
1,3,5-trimethylbenzene	µg/L	0.5		<0.5	-
tert-butylbenzene	µg/L	0.5		<0.5	-
1,2,4-trimethylbenzene	µg/L	0.5		<0.5	-
sec-butylbenzene	µg/L	0.5		<0.5	-
p-isopropyltoluene	µg/L	0.5		<0.5	-
n-butylbenzene	µg/L	0.5		<0.5	-
Nitrogenous Compounds					
Acrylonitrile	µg/L	0.5		<0.5	-
Oxygenated Compounds					
Acetone (2-propanone)	µg/L	10		<10	-
MtBE (Methyl-tert-butyl ether)	µg/L	0.5		<0.5	-
Vinyl acetate	µg/L	10		<10	-
MEK (2-butanone)	µg/L	10		<10	-
MIBK (4-methyl-2-pentanone)	µg/L	5		<5	-
2-hexanone (MBK)	µg/L	5		<5	-
Polycyclic VOCs					
Naphthalene	µg/L	0.5		<0.5	<0.5
Sulphonated Compounds					
Carbon disulfide	µg/L	2		<2	-
Surrogates					
Dibromofluoromethane (Surrogate)	%	-		108	106
d4-1,2-dichloroethane (Surrogate)	%	-		111	106
d8-toluene (Surrogate)	%	-		94	96
Bromofluorobenzene (Surrogate)	%	-		89	88

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	PE115182.001 Water 28 Mar 2017 Q12488-01	PE115182.002 Water 28 Mar 2017 Q12488-02
VOCs in Water Method: AN433 Tested: 31/3/2017 (continued)					
Trihalomethanes					
Chloroform (THM)	µg/L	0.5		<0.5	-
Bromodichloromethane (THM)	µg/L	0.5		<0.5	-
Dibromochloromethane (THM)	µg/L	0.5		<0.5	-
Bromoform (THM)	µg/L	0.5		<0.5	-
Volatile Petroleum Hydrocarbons in Water Method: AN433 Tested: 31/3/2017					
TRH C6-C9	µg/L	40		<40	<40
Surrogates					
Dibromofluoromethane (Surrogate)	%	-		**108**	**106**
d4-1,2-dichloroethane (Surrogate)	%	-		**111**	**106**
d8-toluene (Surrogate)	%	-		**94**	**96**
Bromofluorobenzene (Surrogate)	%	-		**89**	**88**
VPH F Bands					
Benzene (F0)	µg/L	0.5		<0.5	<0.5
TRH C6-C10 minus BTEX (F1)	µg/L	50		<50	<50
TRH (Total Recoverable Hydrocarbons) in Water Method: AN403 Tested: 31/3/2017					
TRH C10-C14	µg/L	50		<50	-
TRH C15-C28	µg/L	200		<200	-
TRH C29-C36	µg/L	200		<200	-
TRH F Bands					
TRH >C10-C16 (F2)	µg/L	60		<60	-
TRH >C16-C34 (F3)	µg/L	500		<500	-
TRH >C34-C40 (F4)	µg/L	500		<500	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	PE115182.001 Water 28 Mar 2017 Q12488-01	PE115182.002 Water 28 Mar 2017 Q12488-02
SVOC in Water Method: AN420 Tested: 31/3/2017					
PAHs					
Naphthalene	µg/L	0.1		<0.1	-
2-methylnaphthalene	µg/L	0.1		<0.1	-
1-methylnaphthalene	µg/L	0.1		<0.1	-
Acenaphthylene	µg/L	0.1		<0.1	-
Acenaphthene	µg/L	0.1		<0.1	-
Fluorene	µg/L	0.1		<0.1	-
Phenanthrene	µg/L	0.1		<0.1	-
Anthracene	µg/L	0.1		<0.1	-
Fluoranthene	µg/L	0.1		<0.1	-
Pyrene	µg/L	0.1		<0.1	-
Benzo(a)anthracene	µg/L	0.1		<0.1	-
Chrysene	µg/L	0.1		<0.1	-
Benzo(b&j)fluoranthene	µg/L	0.1		<0.1	-
Benzo(k)fluoranthene	µg/L	0.1		<0.1	-
Benzo(a)pyrene	µg/L	0.1		<0.1	-
Indeno(1,2,3-cd)pyrene	µg/L	0.1		<0.1	-
Dibenzo(ah)anthracene	µg/L	0.1		<0.1	-
Benzo(ghi)perylene	µg/L	0.1		<0.1	-
Total PAH	µg/L	1		<1	-
OCs					
Alpha-BHC	µg/L	0.1		<0.1	-
Hexachlorobenzene (HCB)	µg/L	0.1		<0.1	-
Beta-BHC	µg/L	0.1		<0.1	-
Gamma-BHC (Lindane)	µg/L	0.1		<0.1	-
Delta-BHC	µg/L	0.1		<0.1	-
Heptachlor	µg/L	0.1		<0.1	-
Aldrin	µg/L	0.1		<0.1	-
Heptachlor epoxide	µg/L	0.1		<0.1	-
Isodrin	µg/L	0.1		<0.1	-
Gamma-chlordane	µg/L	0.1		<0.1	-
Alpha-chlordane	µg/L	0.1		<0.1	-
Alpha-endosulfan	µg/L	0.1		<0.1	-
p,p-DDE	µg/L	0.1		<0.1	-
Dieldrin	µg/L	0.1		<0.1	-
Endrin	µg/L	0.1		<0.1	-
Beta-endosulfan	µg/L	0.1		<0.1	-
p,p-DDD	µg/L	0.1		<0.1	-
Endosulfan sulphate	µg/L	0.1		<0.1	-
p,p-DDT	µg/L	0.1		<0.1	-
Endrin ketone	µg/L	0.1		<0.1	-
Methoxychlor	µg/L	0.1		<0.1	-
Mirex	µg/L	0.1		<0.1	-
OPs					
Dichlorvos	µg/L	1		<1	-
Dimethoate	µg/L	1		<1	-
Diazinon (Dimpylate)	µg/L	0.5		<0.5	-
Fenitrothion	µg/L	0.2		<0.2	-
Malathion (Maldison)	µg/L	0.2		<0.2	-
Chlorpyrifos (Chlorpyrifos Ethyl)	µg/L	0.2		<0.2	-
Parathion ethyl (Parathion)	µg/L	1		<1.0	-
Bromophos ethyl	µg/L	0.2		<0.2	-
Methidathion	µg/L	1		<1	-
Ethion	µg/L	0.2		<0.2	-
Azinphos-methyl (Guthion)	µg/L	0.2		<0.2	-

Arochlors/PCB's

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	PE115182.001 Water 28 Mar 2017 Q12488-01	PE115182.002 Water 28 Mar 2017 Q12488-02
SVOC in Water Method: AN420 Tested: 29/3/2017 (continued)					
Arochlor 1016	µg/L	1		<1	-
Arochlor 1221	µg/L	1		<1	-
Arochlor 1232	µg/L	1		<1	-
Arochlor 1242	µg/L	1		<1	-
Arochlor 1248	µg/L	1		<1	-
Arochlor 1254	µg/L	1		<1	-
Arochlor 1260	µg/L	1		<1	-
Arochlor 1262	µg/L	1		<1	-
Arochlor 1268	µg/L	1		<1	-
Total Arochlors	µg/L	1		<1	-
Surrogates					
2-fluorobiphenyl (Surrogate)	%	-		**74**	-
d5-phenol (Surrogate)	%	-		-	-
2,4,6-tribromophenol (Surrogate)	%	-		-	-
d14-p-terphenyl (Surrogate)	%	-		**64**	-
d5-nitrobenzene (Surrogate)	%	-		**60**	-

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage.* Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Alkalinity Method: ME-(AU)-[ENV]AN135

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Total Alkalinity as CaCO3	LB129770	mg/L	5	<5	0 - 1%	96%
Carbonate Alkalinity as CO3	LB129770	mg/L	1	<1		
Bicarbonate Alkalinity as HCO3	LB129770	mg/L	5	<5		

Chloride by Discrete Analyser in Water Method: ME-(AU)-[ENV]AN274

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Chloride, Cl	LB129803	mg/L	1	<1	0%	102%	91 - 94%

Conductivity and TDS by Calculation - Water Method: ME-(AU)-[ENV]AN106

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Conductivity @ 25 C	LB129846	µS/cm	2	<2	2%	98%

Filterable Reactive Phosphorus (FRP) Method: ME-(AU)-[ENV]AN278

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Filterable Reactive Phosphorus	LB129800	mg/L	0.002	<0.002	0%	100%	95%
Filterable Reactive Phosphorus as PO4	LB129800	mg/L	0.02	<0.02		NA	NA

Mercury (dissolved) in Water Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Mercury	LB129816	mg/L	0.00005	<5e-005	200%	101%	110%

Metals in Water (Dissolved) by ICPOES Method: ME-(AU)-[ENV]AN320/AN321

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Calcium, Ca	LB129814	mg/L	0.2	<0.2	2 - 4%	94%	95%
Magnesium, Mg	LB129814	mg/L	0.1	<0.1	5%	99%	98%
Potassium, K	LB129814	mg/L	0.1	<0.1	3%	106%	103%
Sodium, Na	LB129814	mg/L	0.5	<0.5	3%	96%	109%

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Nitrate Nitrogen and Nitrite Nitrogen (NOx) by FIA Method: ME-(AU)-[ENV]AN258

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Nitrite Nitrogen, NO_2 as N	LB129744	mg/L	0.05	<0.05	0%	94 - 96%
Nitrate Nitrogen, NO_3 as N	LB129744	mg/L	0.05	<0.05	0 - 1%	NA

pH in water Method: ME-(AU)-[ENV]AN101

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
pH**	LB129846	pH Units	-	6.8	1%	100%

Sulphate in water Method: ME-(AU)-[ENV]AN275

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Sulphate, SO4	LB129803	mg/L	1	<1	0%	101 - 102%	89 - 98%

SVOC in Water Method: ME-(AU)-[ENV]AN420

PAHs

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Naphthalene	LB129768	µg/L	0.1	<0.1	96%
2-methylnaphthalene	LB129768	µg/L	0.1	<0.1	
1-methylnaphthalene	LB129768	µg/L	0.1	<0.1	
Acenaphthylene	LB129768	µg/L	0.1	<0.1	
Acenaphthene	LB129768	µg/L	0.1	<0.1	
Fluorene	LB129768	µg/L	0.1	<0.1	97%
Phenanthrene	LB129768	µg/L	0.1	<0.1	95%
Anthracene	LB129768	µg/L	0.1	<0.1	
Fluoranthene	LB129768	µg/L	0.1	<0.1	
Pyrene	LB129768	µg/L	0.1	<0.1	100%
Benzo(a)anthracene	LB129768	µg/L	0.1	<0.1	105%
Chrysene	LB129768	µg/L	0.1	<0.1	
Benzo(b&j)fluoranthene	LB129768	µg/L	0.1	<0.1	
Benzo(k)fluoranthene	LB129768	µg/L	0.1	<0.1	
Benzo(a)pyrene	LB129768	µg/L	0.1	<0.1	92%
Indeno(1,2,3-cd)pyrene	LB129768	µg/L	0.1	<0.1	
Dibenzo(ah)anthracene	LB129768	µg/L	0.1	<0.1	
Benzo(ghi)perylene	LB129768	µg/L	0.1	<0.1	
Total PAH	LB129768	µg/L	1	<1	

OCs

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Alpha-BHC	LB129768	µg/L	0.1	<0.1	
Hexachlorobenzene (HCB)	LB129768	µg/L	0.1	<0.1	101%
Beta-BHC	LB129768	µg/L	0.1	<0.1	
Gamma-BHC (Lindane)	LB129768	µg/L	0.1	<0.1	108%
Delta-BHC	LB129768	µg/L	0.1	<0.1	
Heptachlor	LB129768	µg/L	0.1	<0.1	90%
Aldrin	LB129768	µg/L	0.1	<0.1	91%
Heptachlor epoxide	LB129768	µg/L	0.1	<0.1	
Isodrin	LB129768	µg/L	0.1	<0.1	98%
Gamma-chlordane	LB129768	µg/L	0.1	<0.1	94%
Alpha-chlordane	LB129768	µg/L	0.1	<0.1	
Alpha-endosulfan	LB129768	µg/L	0.1	<0.1	
p,p-DDE	LB129768	µg/L	0.1	<0.1	104%
Dieldrin	LB129768	µg/L	0.1	<0.1	108%
Endrin	LB129768	µg/L	0.1	<0.1	98%
Beta-endosulfan	LB129768	µg/L	0.1	<0.1	
p,p-DDD	LB129768	µg/L	0.1	<0.1	

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage.* Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

SVOC in Water Method: ME-(AU)-[ENV]AN420 (continued)

				MB	LCS %Recovery
Endosulfan sulphate	LB129768	µg/L	0.1	<0.1	
p,p-DDT	LB129768	µg/L	0.1	<0.1	
Endrin ketone	LB129768	µg/L	0.1	<0.1	
Methoxychlor	LB129768	µg/L	0.1	<0.1	
Mirex	LB129768	µg/L	0.1	<0.1	91%

OPs

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Dichlorvos	LB129768	µg/L	1	<1	
Dimethoate	LB129768	µg/L	1	<1	
Diazinon (Dimpylate)	LB129768	µg/L	0.5	<0.5	114%
Fenitrothion	LB129768	µg/L	0.2	<0.2	
Malathion (Maldison)	LB129768	µg/L	0.2	<0.2	
Chlorpyrifos (Chlorpyrifos Ethyl)	LB129768	µg/L	0.2	<0.2	95%
Parathion ethyl (Parathion)	LB129768	µg/L	1	<1.0	98%
Bromophos ethyl	LB129768	µg/L	0.2	<0.2	
Methidathion	LB129768	µg/L	1	<1	64%
Ethion	LB129768	µg/L	0.2	<0.2	
Azinphos-methyl (Guthion)	LB129768	µg/L	0.2	<0.2	

Arochlors/PCB's

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Arochlor 1016	LB129768	µg/L	1	<1	
Arochlor 1221	LB129768	µg/L	1	<1	
Arochlor 1232	LB129768	µg/L	1	<1	
Arochlor 1242	LB129768	µg/L	1	<1	
Arochlor 1248	LB129768	µg/L	1	<1	
Arochlor 1254	LB129768	µg/L	1	<1	
Arochlor 1260	LB129768	µg/L	1	<1	96%
Arochlor 1262	LB129768	µg/L	1	<1	
Arochlor 1268	LB129768	µg/L	1	<1	
Total Arochlors	LB129768	µg/L	1	<1	

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
2-fluorobiphenyl (Surrogate)	LB129768	%	-	80%	90%
d14-p-terphenyl (Surrogate)	LB129768	%	-	74%	80%
d5-nitrobenzene (Surrogate)	LB129768	%	-	70%	100%

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

TKN Kjeldahl Digestion by Discrete Analyser Method: ME-(AU)-[ENV]AN281

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Total Kjeldahl Nitrogen	LB129746	mg/L	0.05	<0.05	1 - 7%	97 - 99%

Total Phosphorus by Kjeldahl Digestion DA in Water Method: ME-(AU)-[ENV]AN279/AN293(Sydney only)

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Total Phosphorus (Kjeldahl Digestion)	LB129746	mg/L	0.02	<0.02	0 - 13%	110 - 113%

Trace Metals (Dissolved) in Water by ICPMS Method: ME-(AU)-[ENV]AN318

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Aluminium, Al	LB129759	µg/L	5	<5	2%	99%	104%
Arsenic, As	LB129759	µg/L	1	<1	0%	115%	111%
Barium, Ba	LB129759	µg/L	1	<1	2%	106%	
Beryllium, Be	LB129759	µg/L	1	<1	0%	110%	
Boron, B	LB129759	µg/L	5	<5	1%	104%	
Cadmium, Cd	LB129759	µg/L	0.1	<0.1	0%	114%	104%
Chromium, Cr	LB129759	µg/L	1	<1	0%	109%	
Cobalt, Co	LB129759	µg/L	1	<1	3%	106%	
Copper, Cu	LB129759	µg/L	1	<1	0%	117%	110%
Lead, Pb	LB129759	µg/L	1	<1	0%	108%	110%
Manganese, Mn	LB129759	µg/L	1	<1	1%	108%	112%
Molybdenum, Mo	LB129759	µg/L	1	<1	0%	102%	
Nickel, Ni	LB129759	µg/L	1	<1	0%	108%	
Zinc, Zn	LB129759	µg/L	5	<5	0%	114%	111%

TRH (Total Recoverable Hydrocarbons) in Water Method: ME-(AU)-[ENV]AN403

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
TRH C10-C14	LB129768	µg/L	50	<50	96%
TRH C15-C28	LB129768	µg/L	200	<200	101%
TRH C29-C36	LB129768	µg/L	200	<200	106%

TRH F Bands

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
TRH >C10-C16 (F2)	LB129768	µg/L	60	<60	96%
TRH >C16-C34 (F3)	LB129768	µg/L	500	<500	101%
TRH >C34-C40 (F4)	LB129768	µg/L	500	<500	106%

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

VOCs in Water Method: ME-(AU)-[ENV]AN433

Fumigants

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
2,2-dichloropropane	LB129893	µg/L	0.5	<0.5	
1,2-dichloropropane	LB129893	µg/L	0.5	<0.5	116%
cis-1,3-dichloropropene	LB129893	µg/L	0.5	<0.5	90%
trans-1,3-dichloropropene	LB129893	µg/L	0.5	<0.5	86%
1,2-dibromoethane (EDB)	LB129893	µg/L	0.5	<0.5	

Halogenated Aliphatics

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Dichlorodifluoromethane (CFC-12)	LB129893	µg/L	5	<5	NA
Chloromethane	LB129893	µg/L	5	<5	
Vinyl chloride (Chloroethene)	LB129893	µg/L	0.3	<0.3	NA
Bromomethane	LB129893	µg/L	10	<10	
Chloroethane	LB129893	µg/L	5	<5	
Trichlorofluoromethane	LB129893	µg/L	1	<1	
Iodomethane	LB129893	µg/L	5	<5	
1,1-dichloroethene	LB129893	µg/L	0.5	<0.5	130%
Dichloromethane (Methylene chloride)	LB129893	µg/L	5	<5	
Allyl chloride	LB129893	µg/L	2	<2	
trans-1,2-dichloroethene	LB129893	µg/L	0.5	<0.5	118%
1,1-dichloroethane	LB129893	µg/L	0.5	<0.5	126%
cis-1,2-dichloroethene	LB129893	µg/L	0.5	<0.5	
Bromochloromethane	LB129893	µg/L	0.5	<0.5	
1,2-dichloroethane	LB129893	µg/L	0.5	<0.5	121%
1,1,1-trichloroethane	LB129893	µg/L	0.5	<0.5	125%
1,1-dichloropropene	LB129893	µg/L	0.5	<0.5	
Carbon tetrachloride	LB129893	µg/L	0.5	<0.5	113%
Dibromomethane	LB129893	µg/L	0.5	<0.5	
Trichloroethene (Trichloroethylene,TCE)	LB129893	µg/L	0.5	<0.5	119%
1,1,2-trichloroethane	LB129893	µg/L	0.5	<0.5	108%
1,3-dichloropropane	LB129893	µg/L	0.5	<0.5	
Tetrachloroethene (Perchloroethylene,PCE)	LB129893	µg/L	0.5	<0.5	92%
1,1,1,2-tetrachloroethane	LB129893	µg/L	0.5	<0.5	
cis-1,4-dichloro-2-butene	LB129893	µg/L	1	<1	
1,1,2,2-tetrachloroethane	LB129893	µg/L	0.5	<0.5	110%
1,2,3-trichloropropane	LB129893	µg/L	0.5	<0.5	
trans-1,4-dichloro-2-butene	LB129893	µg/L	1	<1	
1,2-dibromo-3-chloropropane	LB129893	µg/L	0.5	<0.5	
Hexachlorobutadiene	LB129893	µg/L	0.5	<0.5	

Halogenated Aromatics

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Chlorobenzene	LB129893	µg/L	0.5	<0.5	129%
Bromobenzene	LB129893	µg/L	0.5	<0.5	
2-chlorotoluene	LB129893	µg/L	0.5	<0.5	
4-chlorotoluene	LB129893	µg/L	0.5	<0.5	
1,3-dichlorobenzene	LB129893	µg/L	0.5	<0.5	106%
1,4-dichlorobenzene	LB129893	µg/L	0.3	<0.3	116%
1,2-dichlorobenzene	LB129893	µg/L	0.5	<0.5	113%
1,2,4-trichlorobenzene	LB129893	µg/L	0.5	<0.5	
1,2,3-trichlorobenzene	LB129893	µg/L	0.5	<0.5	

Monocyclic Aromatic Hydrocarbons

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

VOCs in Water Method: ME-(AU)-[ENV]AN433 (continued)

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Benzene	LB129893	µg/L	0.5	<0.5	119%
Toluene	LB129893	µg/L	0.5	<0.5	116%
Ethylbenzene	LB129893	µg/L	0.5	<0.5	117%
m/p-xylene	LB129893	µg/L	1	<1	101%
o-xylene	LB129893	µg/L	0.5	<0.5	100%
Styrene (Vinyl benzene)	LB129893	µg/L	0.5	<0.5	
Isopropylbenzene (Cumene)	LB129893	µg/L	0.5	<0.5	
n-propylbenzene	LB129893	µg/L	0.5	<0.5	
1,3,5-trimethylbenzene	LB129893	µg/L	0.5	<0.5	
tert-butylbenzene	LB129893	µg/L	0.5	<0.5	
1,2,4-trimethylbenzene	LB129893	µg/L	0.5	<0.5	
sec-butylbenzene	LB129893	µg/L	0.5	<0.5	
p-isopropyltoluene	LB129893	µg/L	0.5	<0.5	
n-butylbenzene	LB129893	µg/L	0.5	<0.5	

Nitrogenous Compounds

Parameter	QC Reference	Units	LOR	MB
Acrylonitrile	LB129893	µg/L	0.5	<0.5

Oxygenated Compounds

Parameter	QC Reference	Units	LOR	MB
Acetone (2-propanone)	LB129893	µg/L	10	<10
MtBE (Methyl-tert-butyl ether)	LB129893	µg/L	0.5	<0.5
Vinyl acetate	LB129893	µg/L	10	<10
MEK (2-butanone)	LB129893	µg/L	10	<10
MIBK (4-methyl-2-pentanone)	LB129893	µg/L	5	<5
2-hexanone (MBK)	LB129893	µg/L	5	<5

Polycyclic VOCs

Parameter	QC Reference	Units	LOR	MB
Naphthalene	LB129893	µg/L	0.5	<0.5

Sulphonated Compounds

Parameter	QC Reference	Units	LOR	MB
Carbon disulfide	LB129893	µg/L	2	<2

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Dibromofluoromethane (Surrogate)	LB129893	%	-	103%	92%
d4-1,2-dichloroethane (Surrogate)	LB129893	%	-	105%	98%
d8-toluene (Surrogate)	LB129893	%	-	92%	83%
Bromofluorobenzene (Surrogate)	LB129893	%	-	86%	80%

Trihalomethanes

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Chloroform (THM)	LB129893	µg/L	0.5	<0.5	120%
Bromodichloromethane (THM)	LB129893	µg/L	0.5	<0.5	95%
Dibromochloromethane (THM)	LB129893	µg/L	0.5	<0.5	89%
Bromoform (THM)	LB129893	µg/L	0.5	<0.5	95%

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Volatile Petroleum Hydrocarbons in Water **Method: ME-(AU)-[ENV]AN433**

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
TRH C6-C9	LB129893	µg/L	40	<40	83%

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Dibromofluoromethane (Surrogate)	LB129893	%	-	103%	92%
d4-1,2-dichloroethane (Surrogate)	LB129893	%	-	105%	98%
d8-toluene (Surrogate)	LB129893	%	-	92%	83%
Bromofluorobenzene (Surrogate)	LB129893	%	-	86%	80%

VPH F Bands

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Benzene (F0)	LB129893	µg/L	0.5	<0.5	119%
TRH C6-C10 minus BTEX (F1)	LB129893	µg/L	50	<50	

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
	Nitrate and Nitrite by FIA: In an acidic medium, nitrate is reduced quantitatively to nitrite by cadmium metal. This nitrite plus any original nitrite is determined as an intense red-pink azo dye at 540 nm following diazotisation with sulphanilamide and subsequent coupling with N-(1-naphthyl) ethylenediamine dihydrochloride. Without the cadmium reduction only the original nitrite is determined. Reference APHA 4500-NO3- F.
AN083	Separatory funnels are used for aqueous samples and extracted by transferring an appropriate volume (mass) of liquid into a separatory funnel and adding 3 serial aliquots of dichloromethane. Samples receive a single extraction at pH 7 to recover base / neutral analytes and two extractions at pH < 2 to recover acidic analytes. QC samples are prepared by spiking organic free water with target analytes and extracting as per samples.
AN101	pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode (glass plus reference electrode) and is calibrated against 3 buffers purchased commercially. For soils, an extract with water is made at a ratio of 1:5 and the pH determined and reported on the extract. Reference APHA 4500-H+.
AN106	Conductivity and TDS by Calculation: Conductivity is measured by meter with temperature compensation and is calibrated against a standard solution of potassium chloride. Conductivity is generally reported as µmhos/cm or µS/cm @ 25°C. For soils, an extract with water is made at a ratio of 1:5 and the EC determined and reported on the extract, or calculated back to the as-received sample. Total Dissolved Salts can be estimated from conductivity using a conversion factor, which for natural waters, is in the range 0.55 to 0.75. SGS use 0.6. Reference APHA 2510 B.
AN135	Alkalinity (and forms of) by Titration: The sample is titrated with standard acid to pH 8.3 (P titre) and pH 4.5 (T titre) and permanent and/or total alkalinity calculated. The results are expressed as equivalents of calcium carbonate or recalculated as bicarbonate, carbonate and hydroxide. Reference APHA 2320. Internal Reference AN135
AN274	Chloride by Aquakem DA: Chloride reacts with mercuric thiocyanate forming a mercuric chloride complex. In the presence of ferric iron, highly coloured ferric thiocyanate is formed which is proportional to the chloride concentration. Reference APHA 4500Cl-
AN275	sulfate by Aquakem DA: sulfate is precipitated in an acidic medium with barium chloride. The resulting turbidity is measured photometrically at 405nm and compared with standard calibration solutions to determine the sulfate concentration in the sample. Reference APHA 4500-SO42-. Internal reference AN275.
AN278	Filterable Reactive Phosphorus by DA (determined on filtered sample): Orthophosphate reacts with ammonium molybdate (Mo VI) and potassium antimonyl tartrate (Sb III) in acid medium to form an antimony-phosphomolybdate complex. This complex is subsequently reduced with ascorbic acid to form a blue colour and the absorbance is read at 880 nm. The sensitivity of the automated method is 10-20 times that of the macro method. Reference APHA 4500-P F
AN279/AN293(Sydney)	The sample is digested with Sulphuric acid, K2SO4 and CuSO4. All forms of phosphorus are converted into orthophosphate. The digest is cooled and placed on the discrete analyser for colorimetric analysis.
AN281	An unfiltered water or soil sample is first digested in a block digestor with sulfuric acid, K2SO4 and CuSO4. The ammonia produced following digestion is then measured colourimetrically using the Aquakem 250 Discrete Analyser. A portion of the digested sample is buffered to an alkaline pH, and interfering cations are complexed. The ammonia then reacts with salicylate and hypochlorite to give a blue colour whose absorbance is measured at 660nm and compared with calibration standards. This is proportional to the concentration of Total Kjeldahl Nitrogen in the original sample.
AN311(Perth)/AN312	Mercury by Cold Vapour AAS in Waters: Mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500.
AN318	Determination of elements at trace level in waters by ICP-MS technique, in accordance with USEPA 6020A.

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN320/AN321	Metals by ICP-OES: Samples are preserved with 10% nitric acid for a wide range of metals and some non-metals. This solution is measured by Inductively Coupled Plasma. Solutions are aspirated into an argon plasma at 8000-10000K and emit characteristic energy or light as a result of electron transitions through unique energy levels. The emitted light is focused onto a diffraction grating where it is separated into components .
AN320/AN321	Photomultipliers or CCDs are used to measure the light intensity at specific wavelengths. This intensity is directly proportional to concentration. Corrections are required to compensate for spectral overlap between elements. Reference APHA 3120 B.
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the Draft NEPM 2011, >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is not corrected for Naphthalene.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Silica)) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents .
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
Calculation	Free and Total Carbon Dioxide may be calculated using alkalinity forms only when the samples TDS is <500mg/L. If TDS is >500mg/L free or total carbon dioxide cannot be reported. APHA4500CO2 D.

FOOTNOTES

IS	Insufficient sample for analysis.	LOR	Limit of Reporting
LNR	Sample listed, but not received.	↑↓	Raised or Lowered Limit of Reporting
*	NATA accreditation does not cover the performance of this service.	QFH	QC result is above the upper tolerance
		QFL	QC result is below the lower tolerance
**	Indicative data, theoretical holding time exceeded.	-	The sample was not analysed for this analyte
		NVL	Not Validated

Samples analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calcuated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here : http://www.sgs.com.au/~/media/Local/Australia/Documents/ Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

STATEMENT OF QA/QC PERFORMANCE

PE115182 R0

CLIENT DETAILS

Contact	Jessica Hay
Client	Golder Associates Pty Ltd
Address	PO Box 1914 (1 Havelock Street, West Perth WA 6005) WEST PERTH WA 6872
Telephone	08 9213 7600
Facsimile	08 9213 7611
Email	jhay@golder.com.au
Project	**1777197_Q12488**
Order Number	(Not specified)
Samples	2

LABORATORY DETAILS

Manager	Ros Ma
Laboratory	SGS Perth Environmental
Address	28 Reid Rd Perth Airport WA 6105
Telephone	(08) 9373 3500
Facsimile	(08) 9373 3556
Email	au.environmental.perth@sgs.com
SGS Reference	**PE115182 R0**
Date Received	28 Mar 2017
Date Reported	05 Apr 2017

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document and was supplied by the Client.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met (within the SGS Perth Environmental laboratory).

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice
Samples received in correct containers	Yes	Sample counts by matrix	2 Water
Date documentation received	28/3/2017	Type of documentation received	COC
Number of eskies/boxes received	1	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	8.5°C
Sufficient sample for analysis	Yes	Turnaround time requested	Standard

HOLDING TIME SUMMARY

PE115182 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Alkalinity

Method: ME-(AU)-[ENV]AN135

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Q12488-01	PE115182.001	LB129770	28 Mar 2017	28 Mar 2017	29 Mar 2017	28 Mar 2017	29 Mar 2017	28 Mar 2017

Chloride by Discrete Analyser in Water

Method: ME-(AU)-[ENV]AN274

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Q12488-01	PE115182.001	LB129803	28 Mar 2017	28 Mar 2017	25 Apr 2017	30 Mar 2017	25 Apr 2017	30 Mar 2017

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Q12488-01	PE115182.001	LB129846	28 Mar 2017	28 Mar 2017	25 Apr 2017	28 Mar 2017	25 Apr 2017	28 Mar 2017

Filterable Reactive Phosphorus (FRP)

Method: ME-(AU)-[ENV]AN278

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Q12488-01	PE115182.001	LB129800	28 Mar 2017	28 Mar 2017	25 Apr 2017	30 Mar 2017	25 Apr 2017	30 Mar 2017

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Q12488-01	PE115182.001	LB129816	28 Mar 2017	28 Mar 2017	25 Apr 2017	30 Mar 2017	25 Apr 2017	31 Mar 2017

Metals in Water (Dissolved) by ICPOES

Method: ME-(AU)-[ENV]AN320/AN321

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Q12488-01	PE115182.001	LB129814	28 Mar 2017	28 Mar 2017	24 Sep 2017	30 Mar 2017	24 Sep 2017	04 Apr 2017

Nitrate Nitrogen and Nitrite Nitrogen (NOx) by FIA

Method: ME-(AU)-[ENV]AN258

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Q12488-01	PE115182.001	LB129744	28 Mar 2017	28 Mar 2017	01 Apr 2017	29 Mar 2017	01 Apr 2017	29 Mar 2017

pH in water

Method: ME-(AU)-[ENV]AN101

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Q12488-01	PE115182.001	LB129846	28 Mar 2017	28 Mar 2017	29 Mar 2017	28 Mar 2017	29 Mar 2017	28 Mar 2017

Sulphate in water

Method: ME-(AU)-[ENV]AN275

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Q12488-01	PE115182.001	LB129803	28 Mar 2017	28 Mar 2017	25 Apr 2017	30 Mar 2017	25 Apr 2017	30 Mar 2017

SVOC in Water

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Q12488-01	PE115182.001	LB129768	28 Mar 2017	28 Mar 2017	04 Apr 2017	29 Mar 2017	08 May 2017	05 Apr 2017

TKN Kjeldahl Digestion by Discrete Analyser

Method: ME-(AU)-[ENV]AN281

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Q12488-01	PE115182.001	LB129746	28 Mar 2017	28 Mar 2017	25 Apr 2017	29 Mar 2017	25 Apr 2017	31 Mar 2017

Total Phosphorus by Kjeldahl Digestion DA in Water

Method: ME-(AU)-[ENV]AN279/AN293(Sydney only)

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Q12488-01	PE115182.001	LB129746	28 Mar 2017	28 Mar 2017	25 Apr 2017	29 Mar 2017	25 Apr 2017	31 Mar 2017

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Q12488-01	PE115182.001	LB129759	28 Mar 2017	28 Mar 2017	24 Sep 2017	29 Mar 2017	24 Sep 2017	03 Apr 2017

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref

HOLDING TIME SUMMARY

PE115182 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

TRH (Total Recoverable Hydrocarbons) in Water (continued)

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Q12488-01	PE115182.001	LB129768	28 Mar 2017	28 Mar 2017	04 Apr 2017	29 Mar 2017	08 May 2017	31 Mar 2017

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Q12488-01	PE115182.001	LB129893	28 Mar 2017	28 Mar 2017	04 Apr 2017	31 Mar 2017	10 May 2017	03 Apr 2017
Q12488-02	PE115182.002	LB129893	28 Mar 2017	28 Mar 2017	04 Apr 2017	31 Mar 2017	10 May 2017	03 Apr 2017

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Q12488-01	PE115182.001	LB129893	28 Mar 2017	28 Mar 2017	04 Apr 2017	31 Mar 2017	10 May 2017	03 Apr 2017
Q12488-02	PE115182.002	LB129893	28 Mar 2017	28 Mar 2017	04 Apr 2017	31 Mar 2017	10 May 2017	03 Apr 2017

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

SVOC in Water

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	Q12488-01	PE115182.001	%	40 - 130%	74
d14-p-terphenyl (Surrogate)	Q12488-01	PE115182.001	%	40 - 130%	64
d5-nitrobenzene (Surrogate)	Q12488-01	PE115182.001	%	40 - 130%	60

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	Q12488-01	PE115182.001	%	40 - 130%	89
	Q12488-02	PE115182.002	%	40 - 130%	88
d4-1,2-dichloroethane (Surrogate)	Q12488-01	PE115182.001	%	40 - 130%	111
	Q12488-02	PE115182.002	%	40 - 130%	106
d8-toluene (Surrogate)	Q12488-01	PE115182.001	%	40 - 130%	94
	Q12488-02	PE115182.002	%	40 - 130%	96
Dibromofluoromethane (Surrogate)	Q12488-01	PE115182.001	%	40 - 130%	108
	Q12488-02	PE115182.002	%	40 - 130%	106

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	Q12488-01	PE115182.001	%	40 - 130%	89
	Q12488-02	PE115182.002	%	40 - 130%	88
d4-1,2-dichloroethane (Surrogate)	Q12488-01	PE115182.001	%	60 - 130%	111
	Q12488-02	PE115182.002	%	60 - 130%	106
d8-toluene (Surrogate)	Q12488-01	PE115182.001	%	40 - 130%	94
	Q12488-02	PE115182.002	%	40 - 130%	96
Dibromofluoromethane (Surrogate)	Q12488-01	PE115182.001	%	40 - 130%	108
	Q12488-02	PE115182.002	%	40 - 130%	106

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Alkalinity

Method: ME-(AU)-[ENV]AN135

Sample Number	Parameter	Units	LOR	Result
LB129770.001	Total Alkalinity as CaCO3	mg/L	5	<5

Chloride by Discrete Analyser in Water

Method: ME-(AU)-[ENV]AN274

Sample Number	Parameter	Units	LOR	Result
LB129803.001	Chloride, Cl	mg/L	1	<1
LB129803.026	Chloride, Cl	mg/L	1	<1

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result
LB129846.001	Conductivity @ 25 C	µS/cm	2	<2

Filterable Reactive Phosphorus (FRP)

Method: ME-(AU)-[ENV]AN278

Sample Number	Parameter	Units	LOR	Result
LB129800.001	Filterable Reactive Phosphorus	mg/L	0.002	<0.002

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Number	Parameter	Units	LOR	Result
LB129816.001	Mercury	mg/L	0.00005	<5e-005

Metals in Water (Dissolved) by ICPOES

Method: ME-(AU)-[ENV]AN320/AN321

Sample Number	Parameter	Units	LOR	Result
LB129814.001	Calcium, Ca	mg/L	0.2	<0.2
	Magnesium, Mg	mg/L	0.1	<0.1
	Potassium, K	mg/L	0.1	<0.1
	Sodium, Na	mg/L	0.5	<0.5

Nitrate Nitrogen and Nitrite Nitrogen (NOx) by FIA

Method: ME-(AU)-[ENV]AN258

Sample Number	Parameter	Units	LOR	Result
LB129744.001	Nitrite Nitrogen, NO_2 as N	mg/L	0.05	<0.05
	Nitrate Nitrogen, NO_3 as N	mg/L	0.05	<0.05
LB129744.026	Nitrite Nitrogen, NO_2 as N	mg/L	0.05	<0.05
	Nitrate Nitrogen, NO_3 as N	mg/L	0.05	<0.05

pH in water

Method: ME-(AU)-[ENV]AN101

Sample Number	Parameter	Units	LOR	Result
LB129846.001	pH**	pH Units	-	6.8

Sulphate in water

Method: ME-(AU)-[ENV]AN275

Sample Number	Parameter	Units	LOR	Result
LB129803.001	Sulphate, SO4	mg/L	1	<1
LB129803.026	Sulphate, SO4	mg/L	1	<1

SVOC in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB129768.001	01-PAHs	Naphthalene	µg/L	0.1	<0.1
		2-methylnaphthalene	µg/L	0.1	<0.1
		1-methylnaphthalene	µg/L	0.1	<0.1
		Acenaphthylene	µg/L	0.1	<0.1
		Acenaphthene	µg/L	0.1	<0.1
		Fluorene	µg/L	0.1	<0.1
		Phenanthrene	µg/L	0.1	<0.1
		Anthracene	µg/L	0.1	<0.1
		Fluoranthene	µg/L	0.1	<0.1

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

SVOC in Water (continued)

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB129768.001	01-PAHs	Pyrene	µg/L	0.1	<0.1
		Benzo(a)anthracene	µg/L	0.1	<0.1
		Chrysene	µg/L	0.1	<0.1
		Benzo(a)pyrene	µg/L	0.1	<0.1
		Dibenzo(ah)anthracene	µg/L	0.1	<0.1
	02-OCs	Alpha-BHC	µg/L	0.1	<0.1
		Hexachlorobenzene (HCB)	µg/L	0.1	<0.1
		Beta-BHC	µg/L	0.1	<0.1
		Gamma-BHC (Lindane)	µg/L	0.1	<0.1
		Delta-BHC	µg/L	0.1	<0.1
		Heptachlor	µg/L	0.1	<0.1
		Aldrin	µg/L	0.1	<0.1
		Heptachlor epoxide	µg/L	0.1	<0.1
		Isodrin	µg/L	0.1	<0.1
		Gamma-chlordane	µg/L	0.1	<0.1
		Alpha-chlordane	µg/L	0.1	<0.1
		Alpha-endosulfan	µg/L	0.1	<0.1
		p,p-DDE	µg/L	0.1	<0.1
		Dieldrin	µg/L	0.1	<0.1
		Endrin	µg/L	0.1	<0.1
		Beta-endosulfan	µg/L	0.1	<0.1
		p,p-DDD	µg/L	0.1	<0.1
		Endosulfan sulphate	µg/L	0.1	<0.1
		p,p-DDT	µg/L	0.1	<0.1
		Endrin ketone	µg/L	0.1	<0.1
		Methoxychlor	µg/L	0.1	<0.1
		Mirex	µg/L	0.1	<0.1
	03-OPs	Dichlorvos	µg/L	1	<1
		Dimethoate	µg/L	1	<1
		Diazinon (Dimpylate)	µg/L	0.5	<0.5
		Fenitrothion	µg/L	0.2	<0.2
		Malathion (Maldison)	µg/L	0.2	<0.2
		Chlorpyrifos (Chlorpyrifos Ethyl)	µg/L	0.2	<0.2
		Parathion ethyl (Parathion)	µg/L	1	<1.0
		Bromophos ethyl	µg/L	0.2	<0.2
		Methidathion	µg/L	1	<1
		Ethion	µg/L	0.2	<0.2
		Azinphos-methyl (Guthion)	µg/L	0.2	<0.2
	Surrogates	2-fluorobiphenyl (Surrogate)	%	-	80
		d14-p-terphenyl (Surrogate)	%	-	74
		d5-nitrobenzene (Surrogate)	%	-	70

TKN Kjeldahl Digestion by Discrete Analyser

Method: ME-(AU)-[ENV]AN281

Sample Number	Parameter	Units	LOR	Result
LB129746.001	Total Kjeldahl Nitrogen	mg/L	0.05	<0.05
LB129746.019	Total Kjeldahl Nitrogen	mg/L	0.05	<0.05

Total Phosphorus by Kjeldahl Digestion DA in Water

Method: ME-(AU)-[ENV]AN279/AN293(Sydney only)

Sample Number	Parameter	Units	LOR	Result
LB129746.001	Total Phosphorus (Kjeldahl Digestion)	mg/L	0.02	<0.02
LB129746.020	Total Phosphorus (Kjeldahl Digestion)	mg/L	0.02	<0.02

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result
LB129759.001	Aluminium, Al	µg/L	5	<5
	Arsenic, As	µg/L	1	<1
	Barium, Ba	µg/L	1	<1
	Beryllium, Be	µg/L	1	<1
	Boron, B	µg/L	5	<5
	Cadmium, Cd	µg/L	0.1	<0.1

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Trace Metals (Dissolved) in Water by ICPMS (continued)

Method: ME-(AU)-[ENV]AN318

Sample Number		Parameter	Units	LOR	Result
LB129759.001		Chromium, Cr	µg/L	1	<1
		Cobalt, Co	µg/L	1	<1
		Copper, Cu	µg/L	1	<1
		Lead, Pb	µg/L	1	<1
		Manganese, Mn	µg/L	1	<1
		Molybdenum, Mo	µg/L	1	<1
		Nickel, Ni	µg/L	1	<1
		Zinc, Zn	µg/L	5	<5

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result
LB129768.001		TRH C10-C14	µg/L	50	<50
		TRH C15-C28	µg/L	200	<200
		TRH C29-C36	µg/L	200	<200
	TRH F Bands	TRH >C10-C16 (F2)	µg/L	60	<60
		TRH >C16-C34 (F3)	µg/L	500	<500
		TRH >C34-C40 (F4)	µg/L	500	<500

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB129893.001	Fumigants	2,2-dichloropropane	µg/L	0.5	<0.5
		1,2-dichloropropane	µg/L	0.5	<0.5
		cis-1,3-dichloropropene	µg/L	0.5	<0.5
		trans-1,3-dichloropropene	µg/L	0.5	<0.5
		1,2-dibromoethane (EDB)	µg/L	0.5	<0.5
	Halogenated Aliphatics	Dichlorodifluoromethane (CFC-12)	µg/L	5	<5
		Chloromethane	µg/L	5	<5
		Vinyl chloride (Chloroethene)	µg/L	0.3	<0.3
		Bromomethane	µg/L	10	<10
		Chloroethane	µg/L	5	<5
		Trichlorofluoromethane	µg/L	1	<1
		Iodomethane	µg/L	5	<5
		1,1-dichloroethene	µg/L	0.5	<0.5
		Allyl chloride	µg/L	2	<2
		trans-1,2-dichloroethene	µg/L	0.5	<0.5
		1,1-dichloroethane	µg/L	0.5	<0.5
		cis-1,2-dichloroethene	µg/L	0.5	<0.5
		Bromochloromethane	µg/L	0.5	<0.5
		1,2-dichloroethane	µg/L	0.5	<0.5
		1,1-dichloropropene	µg/L	0.5	<0.5
		Carbon tetrachloride	µg/L	0.5	<0.5
		Dibromomethane	µg/L	0.5	<0.5
		Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	<0.5
		1,1,2-trichloroethane	µg/L	0.5	<0.5
		1,3-dichloropropane	µg/L	0.5	<0.5
		Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	<0.5
		1,1,1,2-tetrachloroethane	µg/L	0.5	<0.5
		cis-1,4-dichloro-2-butene	µg/L	1	<1
		1,1,2,2-tetrachloroethane	µg/L	0.5	<0.5
		1,2,3-trichloropropane	µg/L	0.5	<0.5
		trans-1,4-dichloro-2-butene	µg/L	1	<1
		1,2-dibromo-3-chloropropane	µg/L	0.5	<0.5
		Hexachlorobutadiene	µg/L	0.5	<0.5
	Halogenated Aromatics	Chlorobenzene	µg/L	0.5	<0.5
		Bromobenzene	µg/L	0.5	<0.5
		2-chlorotoluene	µg/L	0.5	<0.5
		4-chlorotoluene	µg/L	0.5	<0.5
		1,3-dichlorobenzene	µg/L	0.5	<0.5
		1,4-dichlorobenzene	µg/L	0.3	<0.3
		1,2-dichlorobenzene	µg/L	0.5	<0.5
		1,2,4-trichlorobenzene	µg/L	0.5	<0.5
		1,2,3-trichlorobenzene	µg/L	0.5	<0.5

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

VOCs in Water (continued)

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB129893.001	Monocyclic Aromatic Hydrocarbons	Benzene	µg/L	0.5	<0.5
		Toluene	µg/L	0.5	<0.5
		Ethylbenzene	µg/L	0.5	<0.5
		m/p-xylene	µg/L	1	<1
		o-xylene	µg/L	0.5	<0.5
		Styrene (Vinyl benzene)	µg/L	0.5	<0.5
		Isopropylbenzene (Cumene)	µg/L	0.5	<0.5
		n-propylbenzene	µg/L	0.5	<0.5
		1,3,5-trimethylbenzene	µg/L	0.5	<0.5
		tert-butylbenzene	µg/L	0.5	<0.5
		1,2,4-trimethylbenzene	µg/L	0.5	<0.5
		sec-butylbenzene	µg/L	0.5	<0.5
		p-isopropyltoluene	µg/L	0.5	<0.5
		n-butylbenzene	µg/L	0.5	<0.5
	Nitrogenous Compounds	Acrylonitrile	µg/L	0.5	<0.5
	Oxygenated Compounds	Acetone (2-propanone)	µg/L	10	<10
		MtBE (Methyl-tert-butyl ether)	µg/L	0.5	<0.5
		Vinyl acetate	µg/L	10	<10
		MEK (2-butanone)	µg/L	10	<10
		MIBK (4-methyl-2-pentanone)	µg/L	5	<5
		2-hexanone (MBK)	µg/L	5	<5
	Polycyclic VOCs	Naphthalene	µg/L	0.5	<0.5
	Sulphonated	Carbon disulfide	µg/L	2	<2
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	103
		d4-1,2-dichloroethane (Surrogate)	%	-	105
		d8-toluene (Surrogate)	%	-	92
		Bromofluorobenzene (Surrogate)	%	-	86
	Trihalomethanes	Chloroform (THM)	µg/L	0.5	<0.5
		Bromodichloromethane (THM)	µg/L	0.5	<0.5
		Dibromochloromethane (THM)	µg/L	0.5	<0.5
		Bromoform (THM)	µg/L	0.5	<0.5

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB129893.001		TRH C6-C9	µg/L	40	<40
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	103
		d4-1,2-dichloroethane (Surrogate)	%	-	105
		d8-toluene (Surrogate)	%	-	92
		Bromofluorobenzene (Surrogate)	%	-	86
	VPH F Bands	Benzene (F0)	µg/L	0.5	<0.5
		TRH C6-C10 minus BTEX (F1)	µg/L	50	<50

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Alkalinity

Method: ME-(AU)-[ENV]AN135

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE115153.005	LB129770.012	Total Alkalinity as CaCO3	mg/L	5	72	71	22	0
PE115182.001	LB129770.024	Total Alkalinity as CaCO3	mg/L	5	22	22	37	1

Chloride by Discrete Analyser in Water

Method: ME-(AU)-[ENV]AN274

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE115193.005	LB129803.015	Chloride, Cl	mg/L	1	130	130	16	0
PE115194.001	LB129803.029	Chloride, Cl	mg/L	1	130	130	16	0
PE115196.002	LB129803.033	Chloride, Cl	mg/L	1	94	94	16	0

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE115182.001	LB129846.009	Conductivity @ 25 C	µS/cm	2	5200	5300	15	2

Filterable Reactive Phosphorus (FRP)

Method: ME-(AU)-[ENV]AN278

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE115203.007	LB129800.014	Filterable Reactive Phosphorus	mg/L	0.002	0.0744	0.0745	22	0
PE115203.010	LB129800.018	Filterable Reactive Phosphorus	mg/L	0.002	0.0017	0.0013	200	0

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE115196.001	LB129816.015	Mercury	µg/L	0.00005	<0.00005	0.00005	200	200

Metals in Water (Dissolved) by ICPOES

Method: ME-(AU)-[ENV]AN320/AN321

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE115185.003	LB129814.015	Calcium, Ca	mg/L	0.2	5.45814	5.35004	19	2
PE115196.002	LB129814.021	Calcium, Ca	mg/L	0.2	21	20	16	4
		Magnesium, Mg	mg/L	0.1	13	14	16	5
		Potassium, K	mg/L	0.1	5.2	5.4	17	3
		Sodium, Na	mg/L	0.5	64	67	16	3

Nitrate Nitrogen and Nitrite Nitrogen (NOx) by FIA

Method: ME-(AU)-[ENV]AN258

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE115132.022	LB129744.013	Nitrite Nitrogen, NO_2 as N	mg/L	0.05	0.011	-0.0004698	200	0
		Nitrate Nitrogen, NO_3 as N	mg/L	0.05	0.027	0.037	171	0
PE115151.004	LB129744.028	Nitrite Nitrogen, NO_2 as N	mg/L	0.05	0.012	0.013	200	0
		Nitrate Nitrogen, NO_3 as N	mg/L	0.05	0.356	0.359	29	1
PE115182.001	LB129744.038	Nitrite Nitrogen, NO_2 as N	mg/L	0.05	<0.05	<0.05	200	0
		Nitrate Nitrogen, NO_3 as N	mg/L	0.05	<0.05	<0.05	200	0

pH in water

Method: ME-(AU)-[ENV]AN101

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE115182.001	LB129846.008	pH**	pH Units	-	6.3	6.2	17	1

Sulphate in water

Method: ME-(AU)-[ENV]AN275

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE115193.005	LB129803.015	Sulphate, SO4	mg/L	1	60	60	17	0
PE115194.001	LB129803.030	Sulphate, SO4	mg/L	1	47	47	17	0
PE115196.002	LB129803.033	Sulphate, SO4	mg/L	1	11	11	24	0

TKN Kjeldahl Digestion by Discrete Analyser

Method: ME-(AU)-[ENV]AN281

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE114869B.008	LB129746.005	Total Kjeldahl Nitrogen	mg/L	0.05	0.073	0.061	90	18
PE115099.001	LB129746.010	Total Kjeldahl Nitrogen	mg/L	0.05	0.513	0.50625	25	1
PE115120.001	LB129746.014	Total Kjeldahl Nitrogen	mg/L	0.05	0.416	0.444	27	7

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Total Phosphorus by Kjeldahl Digestion DA in Water

Method: ME-(AU)-[ENV]AN279/AN293(Sydney only)

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE114869B.008	LB129746.005	Total Phosphorus (Kjeldahl Digestion)	mg/L	0.02	0	0.011	200	0
PE115099.001	LB129746.010	Total Phosphorus (Kjeldahl Digestion)	mg/L	0.02	0.07	0.08	41	13
PE115120.001	LB129746.014	Total Phosphorus (Kjeldahl Digestion)	mg/L	0.02	0.08	0.07	42	10

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE115182.001	LB129759.009	Aluminium, Al	µg/L	5	120	120	19	2
		Arsenic, As	µg/L	1	<5	<5	200	0
		Barium, Ba	µg/L	1	30	30	18	2
		Beryllium, Be	µg/L	1	<5	<5	99	0
		Boron, B	µg/L	5	170	170	18	1
		Cadmium, Cd	µg/L	0.1	<0.5	<0.5	200	0
		Chromium, Cr	µg/L	1	<5	<5	200	0
		Cobalt, Co	µg/L	1	6	6	32	3
		Copper, Cu	µg/L	1	<5	<5	86	0
		Lead, Pb	µg/L	1	<5	<5	120	0
		Manganese, Mn	µg/L	1	71	71	16	1
		Molybdenum, Mo	µg/L	1	<5	<5	200	0
		Nickel, Ni	µg/L	1	6	6	31	0
		Zinc, Zn	µg/L	5	<25	<25	120	0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Alkalinity

Method: ME-(AU)-[ENV]AN135

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB129770.002	Total Alkalinity as CaCO3	mg/L	5	220	229	85 - 115	96

Chloride by Discrete Analyser in Water

Method: ME-(AU)-[ENV]AN274

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB129803.002	Chloride, Cl	mg/L	1	20	20	85 - 115	102
LB129803.027	Chloride, Cl	mg/L	1	20	20	85 - 115	102

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB129846.002	Conductivity @ 25 C	µS/cm	2	310	303	90 - 110	103
LB129846.003	Conductivity @ 25 C	µS/cm	2	1000	1015	90 - 110	98

Filterable Reactive Phosphorus (FRP)

Method: ME-(AU)-[ENV]AN278

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB129800.002	Filterable Reactive Phosphorus	mg/L	0.002	0.050	0.05	80 - 120	100

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB129816.002	Mercury	mg/L	0.00005	0.0025	0.0025	80 - 120	101

Metals in Water (Dissolved) by ICPOES

Method: ME-(AU)-[ENV]AN320/AN321

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB129814.002	Calcium, Ca	mg/L	0.2	190	200	80 - 120	94
	Magnesium, Mg	mg/L	0.1	200	200	80 - 120	99
	Potassium, K	mg/L	0.1	21	20	80 - 120	106
	Sodium, Na	mg/L	0.5	190	200	80 - 120	96

Nitrate Nitrogen and Nitrite Nitrogen (NOx) by FIA

Method: ME-(AU)-[ENV]AN258

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB129744.002	Nitrite Nitrogen, NO_2 as N	mg/L	0.05	3.8	4	85 - 115	96
LB129744.027	Nitrite Nitrogen, NO_2 as N	mg/L	0.05	3.8	4	85 - 115	94

pH in water

Method: ME-(AU)-[ENV]AN101

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB129846.002	pH**	pH Units	-	7.4	7.4	98 - 102	100

Sulphate in water

Method: ME-(AU)-[ENV]AN275

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB129803.002	Sulphate, SO4	mg/L	1	10	10	80 - 120	101
LB129803.028	Sulphate, SO4	mg/L	1	10	10	80 - 120	102

SVOC in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB129768.002	01-PAHs	Naphthalene	µg/L	0.1	1.2	1.25	50 - 150	96
		Fluorene	µg/L	0.1	1.2	1.25	50 - 150	97
		Phenanthrene	µg/L	0.1	1.2	1.25	50 - 150	95
		Pyrene	µg/L	0.1	1.3	1.25	50 - 150	100
		Benzo(a)anthracene	µg/L	0.1	1.3	1.25	50 - 150	105
		Benzo(a)pyrene	µg/L	0.1	1.2	1.25	50 - 150	92
	02-OCs	Hexachlorobenzene (HCB)	µg/L	0.1	1.3	1.25	50 - 150	101
		Gamma-BHC (Lindane)	µg/L	0.1	1.4	1.25	50 - 150	108
		Heptachlor	µg/L	0.1	1.1	1.25	50 - 150	90
		Aldrin	µg/L	0.1	1.1	1.25	50 - 150	91

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

SVOC in Water (continued)

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB129768.002	02-OCs	Isodrin	µg/L	0.1	1.2	1.25	50 - 150	98
		Gamma-chlordane	µg/L	0.1	1.2	1.25	50 - 150	94
		p,p-DDE	µg/L	0.1	1.3	1.25	50 - 150	104
		Dieldrin	µg/L	0.1	1.4	1.25	50 - 150	108
		Endrin	µg/L	0.1	1.2	1.25	50 - 150	98
		Mirex	µg/L	0.1	1.1	1.25	50 - 150	91
	03-OPs	Diazinon (Dimpylate)	µg/L	0.5	1.4	1.25	50 - 150	114
		Chlorpyrifos (Chlorpyrifos Ethyl)	µg/L	0.2	1.2	1.25	50 - 150	95
		Parathion ethyl (Parathion)	µg/L	1	1.2	1.25	50 - 150	98
		Methidathion	µg/L	1	<1	1.25	50 - 150	64
	04-Arochlors/P	Arochlor 1260	µg/L	1	1	1.25	50 - 150	96
	Surrogates	2-fluorobiphenyl (Surrogate)	µg/L	-	0.5	0.5	40 - 130	90
		d14-p-terphenyl (Surrogate)	µg/L	-	0.4	0.5	40 - 130	80
		d5-nitrobenzene (Surrogate)	µg/L	-	0.5	0.5	40 - 130	100

TKN Kjeldahl Digestion by Discrete Analyser

Method: ME-(AU)-[ENV]AN281

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB129746.002	Total Kjeldahl Nitrogen	mg/L	0.05	0.99	1	80 - 120	99
LB129746.020	Total Kjeldahl Nitrogen	mg/L	0.05	0.97	1	80 - 120	97

Total Phosphorus by Kjeldahl Digestion DA in Water

Method: ME-(AU)-[ENV]AN279/AN293(Sydney only)

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB129746.002	Total Phosphorus (Kjeldahl Digestion)	mg/L	0.02	0.55	0.5	80 - 120	110
LB129746.021	Total Phosphorus (Kjeldahl Digestion)	mg/L	0.02	0.57	0.5	80 - 120	113

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB129759.002	Aluminium, Al	µg/L	5	10	10	80 - 120	99
	Arsenic, As	µg/L	1	12	10	80 - 120	115
	Barium, Ba	µg/L	1	11	10	80 - 120	106
	Beryllium, Be	µg/L	1	11	10	80 - 120	110
	Boron, B	µg/L	5	10	10	80 - 120	104
	Cadmium, Cd	µg/L	0.1	11	10	80 - 120	114
	Chromium, Cr	µg/L	1	11	10	80 - 120	109
	Cobalt, Co	µg/L	1	11	10	80 - 120	106
	Copper, Cu	µg/L	1	12	10	80 - 120	117
	Lead, Pb	µg/L	1	11	10	80 - 120	108
	Manganese, Mn	µg/L	1	11	10	80 - 120	108
	Molybdenum, Mo	µg/L	1	10	10	80 - 120	102
	Nickel, Ni	µg/L	1	11	10	80 - 120	108
	Zinc, Zn	µg/L	5	11	10	80 - 120	114

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB129768.002		TRH C10-C14	µg/L	50	480	500	60 - 130	96
		TRH C15-C28	µg/L	200	510	500	60 - 130	101
		TRH C29-C36	µg/L	200	530	500	60 - 130	106
	TRH F Bands	TRH >C10-C16 (F2)	µg/L	60	480	500	60 - 130	96
		TRH >C16-C34 (F3)	µg/L	500	510	500	60 - 130	101
		TRH >C34-C40 (F4)	µg/L	500	530	500	60 - 130	106

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB129893.002	Fumigants	1,2-dichloropropane	µg/L	0.5	5.8	5	50 - 150	116
		cis-1,3-dichloropropene	µg/L	0.5	4.5	5	50 - 150	90
		trans-1,3-dichloropropene	µg/L	0.5	4.3	5	50 - 150	86
	Halogenated Aliphatics	1,1-dichloroethene	µg/L	0.5	6.5	5	50 - 150	130
		trans-1,2-dichloroethene	µg/L	0.5	5.9	5	50 - 150	118
		1,1-dichloroethane	µg/L	0.5	6.3	5	50 - 150	126
		1,2-dichloroethane	µg/L	0.5	6.1	5	50 - 150	121
		1,1,1-trichloroethane	µg/L	0.5	6.2	5	50 - 150	125

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

VOCs in Water (continued)

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB129893.002	Halogenated Aliphatics	Carbon tetrachloride	µg/L	0.5	5.7	5	50 - 150	113
		Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	5.9	5	50 - 150	119
		1,1,2-trichloroethane	µg/L	0.5	5.4	5	50 - 150	108
		Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	4.6	5	50 - 150	92
		1,1,2,2-tetrachloroethane	µg/L	0.5	5.5	5	50 - 150	110
	Halogenated Aromatics	Chlorobenzene	µg/L	0.5	6.4	5	50 - 150	129
		1,3-dichlorobenzene	µg/L	0.5	5.3	5	50 - 150	106
		1,4-dichlorobenzene	µg/L	0.3	5.8	5	50 - 150	116
		1,2-dichlorobenzene	µg/L	0.5	5.7	5	50 - 150	113
	Monocyclic Aromatic	Benzene	µg/L	0.5	6.0	5	50 - 150	119
		Toluene	µg/L	0.5	5.8	5	50 - 150	116
		Ethylbenzene	µg/L	0.5	5.9	5	50 - 150	117
		m/p-xylene	µg/L	1	5	5	50 - 150	101
		o-xylene	µg/L	0.5	5.0	5	50 - 150	100
	Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	4.6	5	60 - 130	92
		d4-1,2-dichloroethane (Surrogate)	µg/L	-	4.9	5	60 - 130	98
		d8-toluene (Surrogate)	µg/L	-	4.2	5	60 - 130	83
		Bromofluorobenzene (Surrogate)	µg/L	-	4.0	5	60 - 130	80
	Trihalomethanes	Chloroform (THM)	µg/L	0.5	6.0	5	50 - 150	120
		Bromodichloromethane (THM)	µg/L	0.5	4.8	5	50 - 150	95
		Dibromochloromethane (THM)	µg/L	0.5	4.5	5	70 - 130	89
		Bromoform (THM)	µg/L	0.5	4.7	5	50 - 150	95

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB129893.002		TRH C6-C9	µg/L	40	<40	30	70 - 130	83
	Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	4.6	5	60 - 130	92
		d4-1,2-dichloroethane (Surrogate)	µg/L	-	4.9	5	60 - 130	98
		d8-toluene (Surrogate)	µg/L	-	4.2	5	60 - 130	83
		Bromofluorobenzene (Surrogate)	µg/L	-	4.0	5	60 - 130	80
	VPH F Bands	Benzene (F0)	µg/L	0.5	6.0	5	70 - 130	119

MATRIX SPIKES

PE115182 R0

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Chloride by Discrete Analyser in Water

Method: ME-(AU)-[ENV]AN274

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
PE115193.002	LB129803.011	Chloride, Cl	mg/L	1	140	43	100	94
PE115196.001	LB129803.031	Chloride, Cl	mg/L	1	180	90	100	91

Filterable Reactive Phosphorus (FRP)

Method: ME-(AU)-[ENV]AN278

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
PE115182.001	LB129800.004	Filterable Reactive Phosphorus	mg/L	0.002	0.048	<0.002	0.05	95
		Filterable Reactive Phosphorus as PO4	mg/L	0.02	0.15	<0.02	-	-

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
PE114964A.00	LB129816.004	Mercury	mg/L	0.00005	0.0022	<0.00005	0.0025	110

Metals in Water (Dissolved) by ICPOES

Method: ME-(AU)-[ENV]AN320/AN321

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
PE115169.001	LB129814.009	Calcium, Ca	mg/L	0.2	210	18.0056	200	95
		Magnesium, Mg	mg/L	0.1	210	10.1809	200	98
		Potassium, K	mg/L	0.1	22	1.85845	20	103
		Sodium, Na	mg/L	0.5	230	15.0846	200	109

Sulphate in water

Method: ME-(AU)-[ENV]AN275

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
PE115193.002	LB129803.011	Sulphate, SO4	mg/L	1	120	19	100	98
PE115196.001	LB129803.031	Sulphate, SO4	mg/L	1	99	11	100	89

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
PE115169.001	LB129759.004	Aluminium, Al	µg/L	5	13	2.536284	10	104
		Arsenic, As	µg/L	1	11	0.198341	10	111
		Cadmium, Cd	µg/L	0.1	10	0.006884	10	104
		Copper, Cu	µg/L	1	29	18.468447	10	110
		Lead, Pb	µg/L	1	11	0.049983	10	110
		Manganese, Mn	µg/L	1	11	0.237913	10	112
		Zinc, Zn	µg/L	5	34	22.425653	10	111

MATRIX SPIKE DUPLICATES

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: http://www.sgs.com.au/~/media/Local/Australia/Documents/ Technical Documents/MP-AU-ENV-QU-022 QA QC Plan.pdf

*	NATA accreditation does not cover the performance of this service.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Low surrogate recovery due to the sample emulsifying during extraction.
†	Refer to Analytical Report comments for further information.

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

Q 12488 page___of___

Golder Associates
1 Havelock Street
West Perth, WA 6005 Australia
Telehone +61 8 9213 7600 Fax +61 8 9213 7611

Project Number: 1777197		Laboratory Name: SGS PE115182	
[redacted]		Address: 28 Reid Road	
Golder Contact: Shay	Golder Email Address: Shay @golder.com.au	Telephone/Fax:	Contact: Simon Wain

Address where reports should be sent to

☐ PO Box 1914
West Perth, WA 6872
Telephone (61 8) 9213 7600
Fax (61 8) 9213 7611

☐ Other email
Quote: GOLDE_F26209207

Phone _____ Fax _____

Analyses Required

Sample Control Number (SCN	[redacted]	Sample Matrix (over)	Date Sampled (D/M/Y)	[redacted]	Number of Containers	Reduced metals	LUQ	AN25	AN25	CL16	CL4	OC/OP/PCB			RUSH	Remarks (over)
Q12488 - 01	[redacted]	W	28.3.17	[redacted]	7	X	X	X	X	X	X	X				refer to quote for analysis
- 02	[redacted]	↓	↓	[redacted]	1						X					
- 03	[redacted]			[redacted]												
- 04	[redacted]			[redacted]												
- 05	[redacted]			[redacted]												
- 06	[redacted]			[redacted]												
- 07	[redacted]			[redacted]												
- 08	[redacted]			[redacted]												
- 09	[redacted]			[redacted]												
- 10	[redacted]			[redacted]												
- 11	[redacted]			[redacted]												
- 12	[redacted]			[redacted]												

SGS Perth Environmental
PE115182 COC
Received: 28 – Mar – 2017

Sampler's Signature:	Relinquished by: Signature	Company Golder	Date 28.3.17	Time	Received by: Signature	Company
Sample Storage (°C) ICE	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Comments:	Method of Shipment:	Waybill No:	Received for Lab by: SP	Date 28/3/17	Time 1555	
	Shipped by:	Shipment Condition: Seal intact:	Temp (°C)	Cooler opened by:	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy PINK: Lab Returns with Final Report

SGS

AUSTRALIA-ENVIRONMENTAL-PERTH AIRPORT- PROFORMA -QU101

REGISTRATION DETAILS

APPROVED BY: R. MA

Bottle Map Sample Numbers:	1L Plastic Green	500mL Plastic Green	250mL Plastic Purple	500mL Amber Green	250mL Plastic Green	125mL Plastic Green	125mL UF/F Plastic Red	1L Amber Green	500mL Amber Orange	100mL Amber Green	40mL Glass Vial VOC	40mL Glass Vial HAA	500mL Plastic Blue	250mL Plastic Orange	125mL Plastic Brown	1L Plastic Yellow	250mL Glass Jar	125ml Glass Jar	Bottles Supplied By	Ziplock Bag/ Other
1		1			1		1			1	2									
2											1									

Job Number: PE115182

# of Eskies: 1

Esky Numbers:

IB / ICE / None

Temp: 8.5 °C

Tray Numbers: W 1/46 M " V 40

Registration comments:

Action Taken:

Registered By: SP 28/3/17

SGS AUSTRALIA
PROPOSAL FOR SERVICES

Quote Number:	GOLDE_FZ62DG_2017
Date:	23.3.2017
Organisation:	Golder Associates
Contact Name:	Jessica Hay
Client Reference (Project/Site):	n/a
Phone:	9213 7600
Email:	Jhay@golder.com.au
Valid Until:	31st December 2017
Sample Type:	Water
Approximate Number of Samples:	1
Expected Commencement:	TBC
Duration:	5 days
Primary Laboratory:	SGS Perth Airport
Subcontracting Laboratory:	n/a

Dear Jessica,

Thank you for allowing SGS to quote on your project, please see the following pages for details regarding proposed pricing and additional services for the selected analyses.

SGS is able to offer value added services for your project such as

- Priority booking of couriers
- Competitive pricing
- Reduced minimum invoice fee to $100
- Standard 5 day TAT on routine or fast TAT where available

Please ensure this quotation is accurate based on your project requirements. To commence your project with SGS please confirm your acceptance by email and advise me if you require the relevant sampling containers.

If you have any questions please do not hesitate to contact me on the below details.

Yours Sincerely,

Shaun Watt
Environmental Services
Senior Account & Business Development Manager

SGS Australia Pty Ltd
28 Reid Rd
Perth Airport
Western Australia, 6105

Phone: 08 9373 3508
Mobile: 0476 834 850
E-mail: shaun.watt@sgs.com

View Your Results Online: labview.sgs.com

WHEN YOU NEED TO BE SURE

SGS

1 PRICING

SUITE/ANALYTE	PARAMETER	REFERENCE	LOR WATER (mg/L)	UNIT PRICE	UNITS	COST
15 Dissolved Metals	Al, As, Ba, Be, B, Cd, Co, Cr, Cu, Pb, Mn, Mo, Hg, Ni, Zn	USEPA 200.8/3050/6010 B	0.1-5 ug/L	$43.40	1	$43.40
WQ3 Basic Water Suite	pH	APHA 4500 H	0.1 pH units	$49.00	1	$49.00
	Conductivity (EC)	APHA 2510B	2 µS/cm			
	Ca, K, Mg, Na	USEPA 6020	1			
	Alkalinity	APHA 2320B	5 mg CaCO3/L			
	Sulfate (SO4)	APHA 4500 $SO4^{2-}$	1			
	Chloride (Cl)	APHA 4500 CIN	1			
AN6 Total Nitrogen	Total Kjeldahl Nitrogen (TKN)	APHA 4500 Norg	0.05	$56.00	1	$56.00
	Nitrate	APHA 4500 NO3N	0.05			
	Nitrite	APHA 4500 NO2N	0.05			
AN9 Forms of Phosphorus	Orthophosphate	APHA 4500 P	0.005	$35.00	1	$35.00
	Total Phosphorus	APHA 4500 P	0.01			
CL18 TRH/BTEX/PAH/VOC	TRH C6-C40	USEPA 8270	50-200ug/L	$238.00	1	$238.00
	BTEXN F1	USEPA 8260	1.0-2.0 ug/L			
	PAH	USEPA 8270	0.1-0.2 ug/L			
	VOC	USEPA8260	0.5-20ug/L			
	OC Pesticides	USEPA 8270	0.1	$63.00	1	$63.00
	OP Pesticides	USEPA 8270	0.2-1	$63.00	1	$63.00
	PCB	USEPA 8270	1	$63.00	1	$63.00
CL4 Volatiles - Trip Blank	TRH C6-C10	USEPA 8260	40ug/L	$42.00	1	$42.00
	BTEXN F1	USEPA 8260	1.0-2.0 ug/L			
	ADMIN FEE			$30.00	1	$30.00
	DISPOSAL FEES					$0.00
	FREIGHT					$0.00
	SUBTOTAL					$682.40
	GST					$68.24
	TOTAL					**$750.64**

SAMPLE RECEIPT ADVICE

PE115182

CLIENT DETAILS

Contact	Jessica Hay
Client	Golder Associates Pty Ltd
Address	PO Box 1914 (1 Havelock Street, West Perth WA 6005) WEST PERTH WA 6872
Telephone	08 9213 7600
Facsimile	08 9213 7611
Email	jhay@golder.com.au
Project	**1777197_Q12488**
Order Number	(Not specified)
Samples	2

LABORATORY DETAILS

Manager	Ros Ma
Laboratory	SGS Perth Environmental
Address	28 Reid Rd Perth Airport WA 6105
Telephone	(08) 9373 3500
Facsimile	(08) 9373 3556
Email	au.environmental.perth@sgs.com
Samples Received	Tue 28/3/2017
Report Due	Wed 5/4/2017
SGS Reference	**PE115182**

SUBMISSION DETAILS

This is to confirm that 2 samples were received on Tuesday 28/3/2017. Results are expected to be ready by Wednesday 5/4/2017. Please quote SGS reference PE115182 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice
Samples received in correct containers	Yes	Sample counts by matrix	2 Water
Date documentation received	28/3/2017	Type of documentation received	COC
Number of eskies/boxes received	1	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	8.5°C
Sufficient sample for analysis	Yes	Turnaround time requested	Standard

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

SVOC in Water denotes PCB, PAH, OC and OP Pesticides.

SAMPLE RECEIPT ADVICE

PE115182

CLIENT DETAILS

Client Golder Associates Pty Ltd

Project 1777197_Q12488

SUMMARY OF ANALYSIS

No.	Sample ID	Alkalinity	Chloride by Discrete Analyser in Water	Conductivity and TDS by Calculation - Water	Nitrate Nitrogen and Nitrite Nitrogen (NOx) by FIA	pH in water	Sulphate in water	TKN Kjeldahl Digestion by Discrete Analyser	Total Phosphorus by Kjeldahl Digestion DA in
001	Q12488-01	3	1	1	2	1	1	1	1

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

SAMPLE RECEIPT ADVICE

PE115182

CLIENT DETAILS

Client Golder Associates Pty Ltd

Project 1777197_Q12488

SUMMARY OF ANALYSIS

No.	Sample ID	Filterable Reactive Phosphorus (FRP)	Mercury (dissolved) in Water	Metals in Water (Dissolved) by ICPOES	SVOC in Water	Trace Metals (Dissolved) in Water by ICPMS	TRH (Total Recoverable Hydrocarbons) in Water	VOCs in Water	Volatile Petroleum Hydrocarbons in Water
001	Q12488-01	2	1	4	67	14	6	75	7
002	Q12488-02	-	-	-	-	-	-	10	7

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

ATTACHMENT E

Important Information

IMPORTANT INFORMATION RELATING TO THIS REPORT

The document ("Report") to which this page is attached and which this page forms a part of, has been issued by Golder Associates Pty Ltd ("Golder") subject to the important limitations and other qualifications set out below.

This Report constitutes or is part of services ("Services") provided by Golder to its client ("Client") under and subject to a contract between Golder and its Client ("Contract"). The contents of this page are not intended to and do not alter Golder's obligations (including any limits on those obligations) to its Client under the Contract.

This Report is provided for use solely by Golder's Client and persons acting on the Client's behalf, such as its professional advisers. Golder is responsible only to its Client for this Report. Golder has no responsibility to any other person who relies or makes decisions based upon this Report or who makes any other use of this Report. Golder accepts no responsibility for any loss or damage suffered by any person other than its Client as a result of any reliance upon any part of this Report, decisions made based upon this Report or any other use of it.

This Report has been prepared in the context of the circumstances and purposes referred to in, or derived from, the Contract and Golder accepts no responsibility for use of the Report, in whole or in part, in any other context or circumstance or for any other purpose.

The scope of Golder's Services and the period of time they relate to are determined by the Contract and are subject to restrictions and limitations set out in the Contract. If a service or other work is not expressly referred to in this Report, do not assume that it has been provided or performed. If a matter is not addressed in this Report, do not assume that any determination has been made by Golder in regards to it.

At any location relevant to the Services conditions may exist which were not detected by Golder, in particular due to the specific scope of the investigation Golder has been engaged to undertake. Conditions can only be verified at the exact location of any tests undertaken. Variations in conditions may occur between tested locations and there may be conditions which have not been revealed by the investigation and which have not therefore been taken into account in this Report.

Golder accepts no responsibility for and makes no representation as to the accuracy or completeness of the information provided to it by or on behalf of the Client or sourced from any third party. Golder has assumed that such information is correct unless otherwise stated and no responsibility is accepted by Golder for incomplete or inaccurate data supplied by its Client or any other person for whom Golder is not responsible. Golder has not taken account of matters that may have existed when the Report was prepared but which were only later disclosed to Golder.

Having regard to the matters referred to in the previous paragraphs on this page in particular, carrying out the Services has allowed Golder to form no more than an opinion as to the actual conditions at any relevant location. That opinion is necessarily constrained by the extent of the information collected by Golder or otherwise made available to Golder. Further, the passage of time may affect the accuracy, applicability or usefulness of the opinions, assessments or other information in this Report. This Report is based upon the information and other circumstances that existed and were known to Golder when the Services were performed and this Report was prepared. Golder has not considered the effect of any possible future developments including physical changes to any relevant location or changes to any laws or regulations relevant to such location.

Where permitted by the Contract, Golder may have retained subconsultants affiliated with Golder to provide some or all of the Services. However, it is Golder which remains solely responsible for the Services and there is no legal recourse against any of Golder's affiliated companies or the employees, officers or directors of any of them.

By date, or revision, the Report supersedes any prior report or other document issued by Golder dealing with any matter that is addressed in the Report.

Any uncertainty as to the extent to which this Report can be used or relied upon in any respect should be referred to Golder for clarification.