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Groundwater Investigation Report

Lot 20 Adelaide Street Hazelmere

PREPARED FOR:

Wasterock Pty Ltd

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1 INTRODUCTION

This report has been prepared to detail the sampling methodology and results from the groundwater investigation completed at the Hazelland Landfill in Hazelmere, herein referred to as the Site. MDW Environmental Services (MDWES) were commissioned by Wasterock Pty Ltd to complete a groundwater investigation and compile a Groundwater Investigation Report in support of Section 3.7 of the *Site Remediation Works Agreement and Site Management Plan*.

2 SCOPE OF WORK

The Scope of Work for this project is as follows:

- Install six (6) groundwater monitoring wells;
- Collect and analyse representative samples from the monitoring wells. Samples will be analysed by a NATA certified laboratory for:
 - Total Petroleum Hydrocarbon (TPH);
 - Benzene, Toluene, Ethyl Benzene and Xylene (BTEX);
 - Phenols;
 - Metalloids (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn); and,
 - Organochlorine and Organophosphorous Pesticides,
- Data interpretation and reporting.

2.1 Objectives

The technical objectives of the investigation are to:

- Identify the directional flow of the groundwater below the site; and,
- To identify and determine the extent of the risk that any identified contamination may pose to human health and the environment;
- Establish baseline groundwater data from the Site prior to the proposed remediation works;
- To determine the suitability of water abstraction from the superficial aquifer for the purposes of dust suppression and compaction.

3 SITE IDENTIFICATION

Address:	Lot 20 Adelaide Street, Hazelmere.
Land description:	Industrial
Lots	20
Volume:	2054
Folio:	299
Certificates of Title:	20/D76128 (Appendix A)
Local government authority:	City of Swan
Locality view:	Figure 1

UTM Co-ordinates:

The Site is bounded by the following coordinates.

BOUNDARY CORNERS	MGA94 Zone 50	
	Easting (E)	Northing (N)
North west corner	406595	6467321
North east corner	407034	6467190
North east corner (mid)	406939	6467172
South east corner	407015	6466812
South west corner	406476	6467046
Eastern Corner	407078	6467020

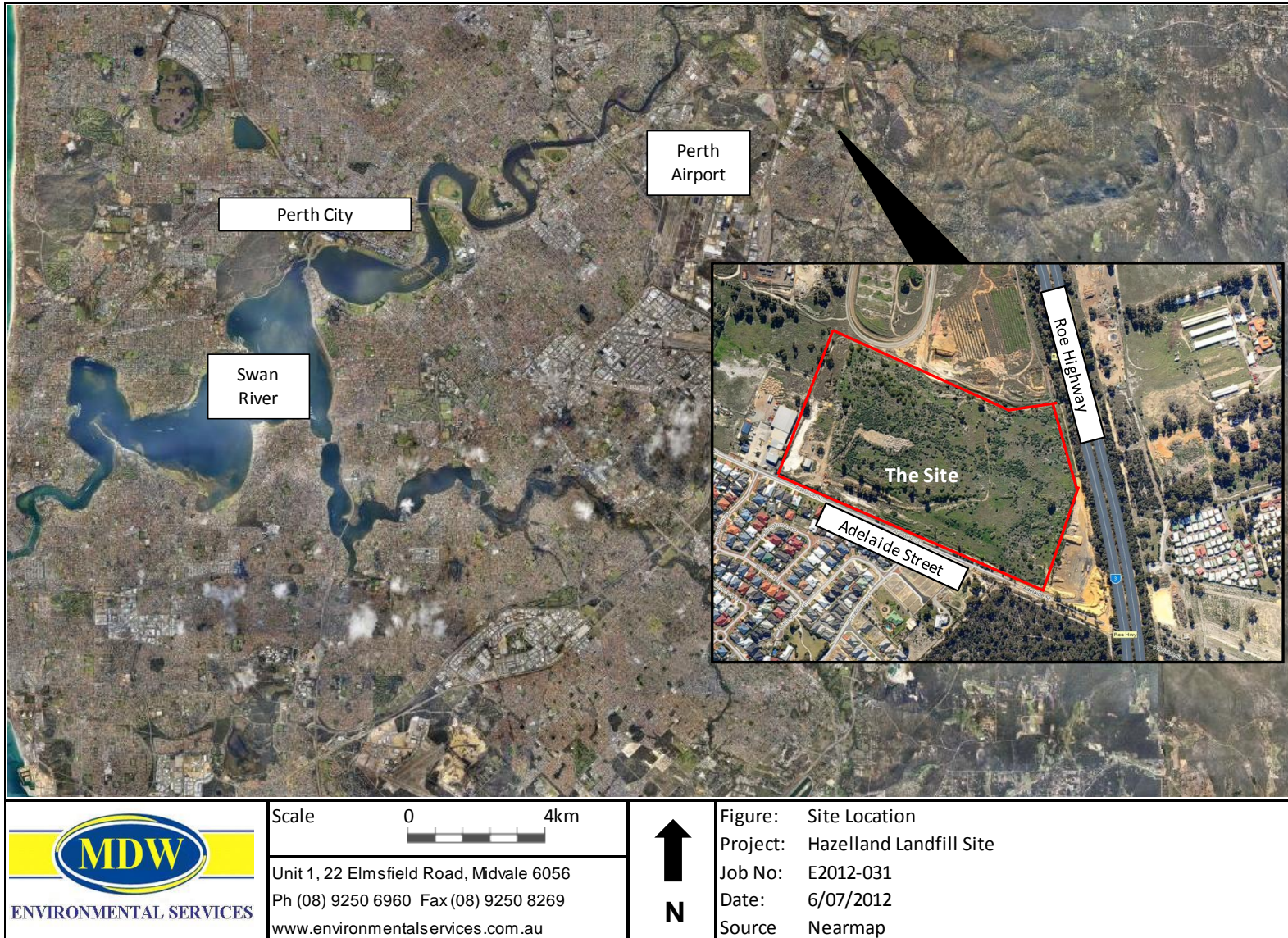


Figure 1 Site location Plan

4 BACKGROUND INFORMATION

The site (Figure 1) is located within the City of Swan, approximately 14 km east north east of Perth CBD. Situated between Talbot Road and Adelaide Street access is gained from the south of the Site off Adelaide Street. Historically the Site was occupied and used as a licenced inert waste landfill in which potentially contaminating wastes were dumped. Following investigation by Parsons Brinckerhoff (2006) the site was classified “Contaminated – Remediation Required” by the Department of Environment and Conservation (DEC). The Parsons Brinckerhoff report contains substantial amounts of background information regarding this property and the Groundwater Investigation Report should be read in conjunction with this previously completed soil investigation.

4.1 Site History

A detailed historical investigation was not completed as part of this Groundwater Investigation Report.

4.2 Land Owner

The Site is currently vested with Hazelland Pty Ltd and has been so since 2006 under the Land Title City of Swan Location Lot 20 Volume 2054 Folio 299. A copy of the Certificate of Title is in Appendix A.

4.3 Land Use

The Site has been used for collection and storage of inert demolition waste as landfill with some potentially contaminating waste.

4.4 Site Boundary

The Site is surrounded by private land to the north and south with industrial properties to the west and Roe Highway runs along the eastern boundary.

4.5 Groundwater Use

The site does not currently make use of groundwater.

4.6 Previous Studies

Soil investigations were completed on the site during 1992 (Dames and Moore) and 2006 (Parsons Brinckerhoff).

4.7 Contaminated Sites Database

The site is currently classed as “*Contaminated – Remediation Required*” as per DEC Contaminated Sites Database.

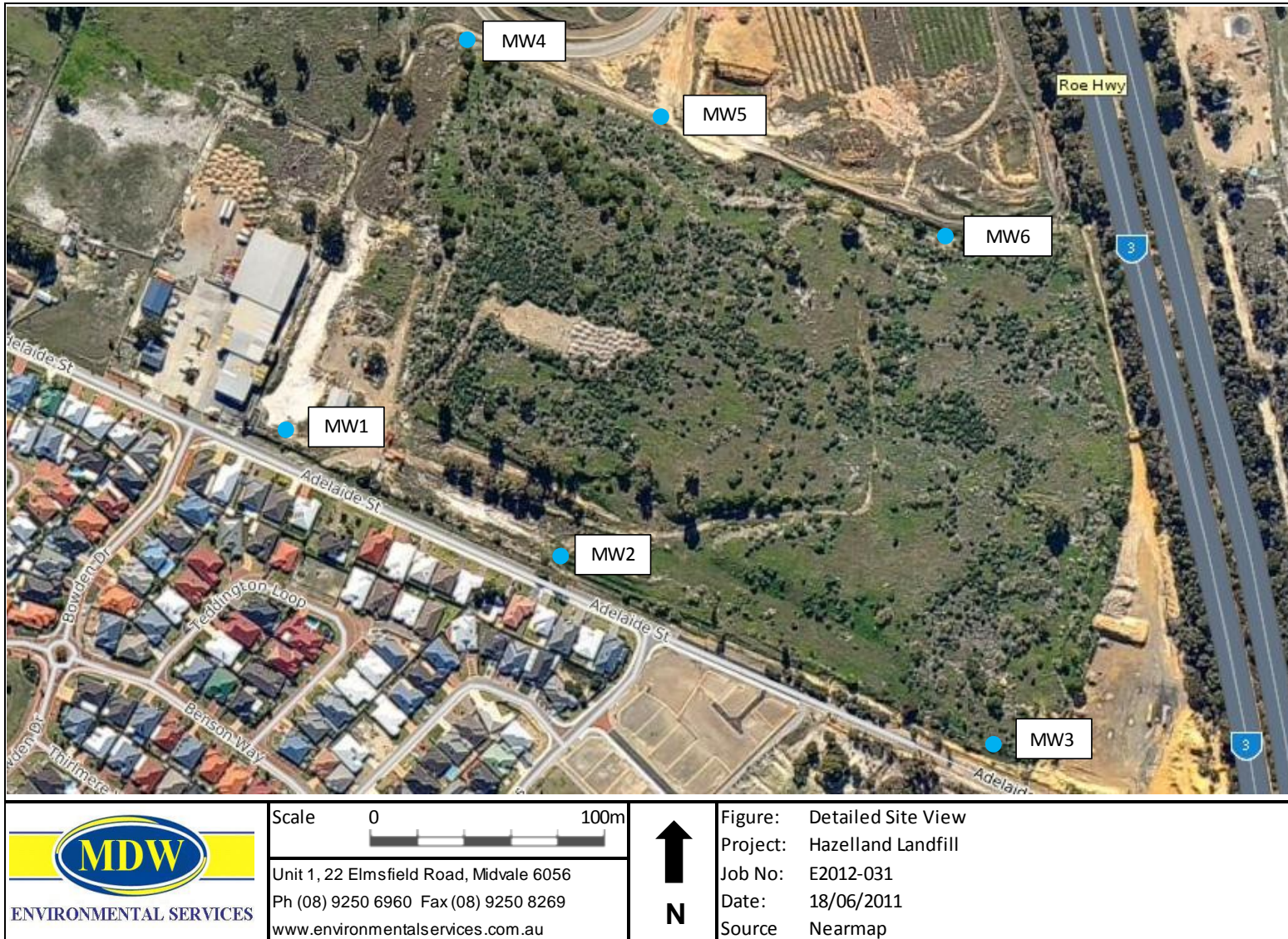


Figure 2 Detailed Site View and Monitoring Well Locations.

5 POTENTIAL CONTAMINANTS OF CONCERN (PCOC)

The land is proposed for development into industrial lots. The following list of PCOC is based on proposed use, historical and current Site activities, regional soil and issues, proximity to Contaminated Sites and off-site sources of impacts:

- Metalloids: Arsenic (As), barium (Ba), beryllium (Be), Cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), manganese (Mn), molybdenum (Mo), nickel (Ni), silver (Ag), selenium (Se), vanadium (V), zinc (Zn), and mercury (Hg);
- Polynuclear Aromatic Hydrocarbons (PAH);
- Monocyclic Aromatic Hydrocarbons (MAH);
- Phenolic compounds;
- Total Petroleum Hydrocarbons (TPH);
- Organochlorine and Organophosphorous Pesticides.

5.1 Preferential Contaminant Pathways

Many of the PCOC identified at the Site have the potential to impact soil and groundwater at the Site and surrounding areas. Listed above are the contaminants most likely to be found within the fill and most likely to present a risk to human health and the environment. The PCOC have been identified due to the wide range of inert demolition waste likely to have been deposited at the Site. The preferential contaminant pathways can be summarized as soil, air and groundwater; notwithstanding that the Scope of Works for this investigation only includes assessment of potential groundwater contamination.

6 SAMPLING ANALYSIS PLAN AND METHODOLOGY

The sampling and analysis of the Groundwater Investigation Report were completed to determine whether imported fill on the site had adversely affected the groundwater. The results within this report will form background groundwater data and be used to highlight any changes in groundwater quality during the proposed site remediation works.

6.1 Groundwater Monitoring Well Installation

Between the 7th and 10th of May 2012, six (6) groundwater monitoring wells were installed around the perimeter of the site (Figure 2) using a trained and competent drilling company. In consultation with the Western Australian Groundwater Atlas estimated depths of the superficial aquifer were determined and drilling and well construction was completed in accordance with this information. Drilling was completed using a mud rotary drill rig to install groundwater wells to depths ranging from 6.0 metres below ground level (mbgl) to 14.5 mbgl with slotted screen installed to a minimum of 1.0 metres above the water table. Post construction the groundwater monitoring wells were left to equilibrate for a minimum stabilization period of seven (7) days as per DEC requirements.

Soil lithology was noted during construction and can be generally described as red clay overlain by layers of coarse then fine sands with brown clay and yellow sands to the surface. Drill Logs and Monitoring Well Construction Logs are included within Appendix B and C respectively.

6.2 Groundwater Sampling

Sampling was completed on the 18th May 2012; the standing water level was recorded using an electronic water level indicator. Sampling was then undertaken using a 12V GeoTech Low Flow Bladder pump, coupled to a YSI Quattro low flow sampler to enable continuous measurement of field parameters. Once stabilisation of the parameters was reached, samples were collected and submitted to a National Association of Testing Authorities (NATA) accredited laboratory for analysis. Field Sheets are attached in Appendix D.

Surveying was completed on the groundwater monitoring wells post installation to establish accurate water levels and enable further characterization of the groundwater below the site. Certificate of Survey is attached in Appendix E.

7 QUALITY ASSURANCE / QUALITY CONTROL

The following Quality Assurance / Quality Control (QA/QC) program was implemented throughout the investigation to ensure the accuracy and precision of the data obtained. QC measures the effectiveness of the procedures of the QA program.

7.1 Quality Assurance

All procedures including staff selection, sampling methodologies, equipment, analysis methods and data transfer were based on:

- *AS/NZS 5667.11:1998: Water Quality, Part 1: Guidance on the design of sampling programs, sampling techniques, and the preservation and handling of samples. (AS/NZS 5667.11:1998), and*
- *AS/NZS 5667.11:1998 Water Quality, Part 11: Guidance on Sampling of Groundwaters (AS/NZS 5667.11:1998).*

Particularly, the following actions applied:

- Samples were collected by a trained, experienced field technician,
- Samples were collected by the same personnel, ensuring that techniques used were consistent across the sampling program.

Following discussions with the primary laboratory and a review of their laboratory certificates of analysis, the following laboratory QC protocols occurred:

- At least 5% of samples are split into internal laboratory duplicate samples. These samples are homogenised prior to splitting into sub samples;
- At least 5% of samples are run with Matrix Spikes of known additions.
- Laboratory Control Samples (LCS) are run at the required rate; minimum 1 LCS per batch of samples. The LCS results are reported in the laboratory certificates named 'Interpretive Quality Control Report' and the 'Quality Control Report'.

7.1.1 Groundwater Sampling Procedure

All groundwater samples were subject to the following procedures:

- Dedicated tubing was used for each well and the pump and low flow cell were decontaminated between wells;
- Samples were collected within an eight hour period into new, laboratory supplied sample bottles. Preservatives (if required) were provided by the laboratory in the appropriate sample bottle;
- Samples were filled to the top to ensure no headspace remained;
- All samples were marked in the field using permanent marker with a label showing sample location, date and job number;
- Samples were immediately placed on ice within an esky for transport to the laboratory accompanied with standard chain of custody documentation.

7.1.2 Decontamination of Sampling Equipment

All sampling and drilling equipment were decontaminated prior to use and between each sample location. Decontamination was completed using the following procedure:

- Equipment washed in water;
- Equipment thoroughly scrubbed in water with Decon 90;
- Equipment rinsed in tap water;

- Equipment rinsed in de-ionised water.

7.2 Laboratory

Two NATA certificated laboratories were selected to analyse the samples. ALS Laboratory Group was selected as the primary laboratory. ARLWA; the secondary laboratory, was used for the analysis of replicate samples and for inter-laboratory quality control (QC).

7.3 Quality Control

To ensure the quality of the sampling method and laboratory analysis Quality Control (QC) samples were collected consisting of one (1) Rinsate Blank, one (1) Field Blank, one set of (1) duplicate and triplicate samples of groundwater.

- A rinsate sample was collected for each day of field sampling (RINSATE);
- A field blank was collected for each day of field sampling (FIELD);
- WRMW4-001 was used as the DUP and TRIP.

Laboratory certificates of analysis including sample receipt notification, chain of custody, and laboratory quality control are available in Appendix F.

The reproducibility of the sampling and analytical methodology is measured as precision. Laboratory and field precision is measured using the Relative Percent Difference (RPD) between the sample and its duplicates. For those RPD values which exceed a generally acceptable 30% - 50% (Australian Standard AS 4482.1), data precision is considered poor, however, consideration needs to be given to sample homogeneity and the concentrations detected. Therefore, the acceptable ranges adopted for the RPDs are based on the laboratories RPD acceptance criteria and are dependent on the magnitude of results in comparison to the limits of reporting (LOR) as follows:

Result < 10 times LOR = No limit

Result 10 – 20 times LOR = 0% - 50%

Result > 20 times LOR = 0% - 20%

Groundwater QC results (Table 1) indicated exceedance of RPD limits for Total Iron and Total Phosphorus these can be likely attributed to moderate levels of Suspended Solids and Turbidity. ALS Laboratory Group QC documentation indicates the lab's internal QC were observed.

Laboratory analysis of QA samples indicates exceedances of adopted criteria of Copper within both samples and levels of Zinc within the Rinsate. Detailed results are found in Table 2.

7.4 Waste Disposal

Sampling was completed in consultation with MDWES Standard Operating Procedure and all waste was disposed of appropriately as to not impose a risk or cause contamination.

Table 1 Groundwater Quality Control Results.

Analyte grouping/Analyte	Units	18/05/2012 WRMW4	18/05/2012 DUP	DUP RL (%)	DUP RPD (%)	18/05/2012 TRIP	TRIP RL (%)	TRIP RPD
pH Value	pH Unit	6.04	5.88	20	2.65	6.4	20	5.63
Electrical Conductivity	µS/cm	354	334	20	5.65	400	20	11.50
Total Dissolved Solids	mg/L	226	194	20	14.16	280	20	19.29
Suspended Solids	mg/L	144	34	20	76.39	56	50	61.11
Turbidity	NTU	86.9	20.8	20	76.06	72	20	17.15
Total Alkalinity CaCO ₃	mg/L	5	4	N/L	20.00	6	N/L	16.67
Acidity as CaCO ₃	mg/L	8	8	N/L	0.00	<5	N/L	-
Sulfate as SO ₄ ²⁻	mg/L	17	16	50	5.88	-	-	-
Alkalinity : Sulfate	ratio	0.29	0.25	N/L	15.00	-	-	-
Chloride	mg/L	89	84	20	5.62	100	20	11.00
Sulfate : Chloride	ratio	0.19	0.19	N/L	0.28	-	-	-
Dissolved Metals								
Aluminium	mg/L	0.02	0.05	N/L	60.00	<0.1	N/L	-
Arsenic	mg/L	<0.001	<0.001	N/L	-	<0.001	N/L	-
Cadmium	mg/L	<0.0001	<0.0001	N/L	-	<0.002	N/L	-
Chromium	mg/L	<0.001	<0.001	N/L	-	<0.01	N/L	-
Manganese	mg/L	0.013	0.01	50	23.08	0.01	N/L	23.08
Nickel	mg/L	<0.001	<0.001	N/L	-	<0.01	N/L	-
Selenium	mg/L	<0.01	<0.01	N/L	-	<0.001	N/L	-
Zinc	mg/L	0.01	0.01	N/L	0.00	<0.01	N/L	-
Iron	mg/L	0.11	0.09	N/L	18.18	0.03	N/L	72.73
Ferrous Iron	mg/L	<0.05	0.05	N/L	-	<0.1	N/L	-
Chromium VI	mg/L	<0.010	<0.010	N/L	-	-	-	-
Total Metals								
Aluminium	mg/L	4.3	2.34	20	45.58	0.7	N/L	83.72
Arsenic	mg/L	0.001	<0.001	N/L	-	<0.001	N/L	-
Cadmium	mg/L	<0.0001	<0.0001	N/L	-	<0.002	N/L	-
Chromium	mg/L	0.004	0.002	N/L	50.00	<0.01	N/L	-
Copper	mg/L	0.005	0.003	N/L	40.00	-	-	-
Lead	mg/L	0.011	0.006	50	45.45	-	-	-
Manganese	mg/L	0.016	0.012	50	25.00	0.01	N/L	37.50
Molybdenum	mg/L	<0.001	<0.001	N/L	-	-	-	-
Nickel	mg/L	0.001	<0.001	N/L	-	<0.01	N/L	-
Selenium	mg/L	<0.01	<0.01	N/L	-	<0.001	N/L	-
Silver	mg/L	<0.001	<0.001	N/L	-	-	-	-
Zinc	mg/L	0.017	0.013	N/L	23.53	0.01	N/L	41.18
Iron	mg/L	0.88	0.51	50	42.05	0.26	20	70.45
Mercury	mg/L	<0.0001	<0.0001	N/L	-	-	-	-
Nutrients								
Ammonia as N	mg/L	0.11	0.12	50	8.33	0.4	N/L	72.50
Nitrite as N	mg/L	0.01	0.01	N/L	0.00	<0.01	N/L	-
Nitrate as N	mg/L	3.75	3.79	20	1.06	3.9	20	3.85
Kjeldhal Nitrogen	mg/L	0.5	0.7	N/L	28.57	0.4	N/L	20.00
Total Nitrogen	mg/L	4.3	4.5	20	4.44	4.3	20	0.00
Total Phosphorus	mg/L	0.04	0.04	N/L	0.00	0.49	20	91.84
Reactive Phosphorus	mg/L	<0.01	<0.01	N/L	-	0.05	N/L	-
Sulfide	mg/L	<0.1	<0.1	N/L	-	0.4	N/L	-
COD	mg/L	11	13	N/L	15.38	10	N/L	9.09
BOD	mg/L	4	7	N/L	42.86	<5	N/L	-
Organochlorine Pesticides (OC)								
alpha-BHC	µg/L	<0.5	<0.5	N/L	-	-	-	-
Hexachlorobenzene (HCB)	µg/L	<0.5	<0.5	N/L	-	-	-	-
beta-BHC	µg/L	<0.5	<0.5	N/L	-	-	-	-
gamma-BHC	µg/L	<0.5	<0.5	N/L	-	-	-	-
delta-BHC	µg/L	<0.5	<0.5	N/L	-	-	-	-
Heptachlor	µg/L	<0.5	<0.5	N/L	-	-	-	-
Aldrin	µg/L	<0.5	<0.5	N/L	-	-	-	-
Heptachlor epoxide	µg/L	<0.5	<0.5	N/L	-	-	-	-
trans-Chlordane	µg/L	<0.5	<0.5	N/L	-	-	-	-
alpha-Endosulfan	µg/L	<0.5	<0.5	N/L	-	-	-	-
cis-Chlordane	µg/L	<0.5	<0.5	N/L	-	-	-	-
Dieldrin	µg/L	<0.5	<0.5	N/L	-	-	-	-
4,4'-DDE	µg/L	<0.5	<0.5	N/L	-	-	-	-
Endrin	µg/L	<0.5	<0.5	N/L	-	-	-	-
beta-Endosulfan	µg/L	<0.5	<0.5	N/L	-	-	-	-
4,4'-DDD	µg/L	<0.5	<0.5	N/L	-	-	-	-
Endrin aldehyde	µg/L	<0.5	<0.5	N/L	-	-	-	-
Endosulfan sulfate	µg/L	<0.5	<0.5	N/L	-	-	-	-
4,4'-DDT	µg/L	<2	<2	N/L	-	-	-	-
Endrin ketone	µg/L	<0.5	<0.5	N/L	-	-	-	-
Methoxychlor	µg/L	<2	<2	N/L	-	-	-	-
Organophosphorus Pesticides (OP)								
Dichlorvos	µg/L	<0.5	<0.5	N/L	-	-	-	-
Demeton-S-methyl	µg/L	<0.5	<0.5	N/L	-	-	-	-
Monocrotophos	µg/L	<2	<2	N/L	-	-	-	-
Dimethoate	µg/L	<0.5	<0.5	N/L	-	-	-	-
Diazinon	µg/L	<0.5	<0.5	N/L	-	-	-	-
Chlorpyrifos-methyl	µg/L	<0.5	<0.5	N/L	-	-	-	-
Parathion-methyl	µg/L	<2	<2	N/L	-	-	-	-
Malathion	µg/L	<0.5	<0.5	N/L	-	-	-	-
Fenthion	µg/L	<0.5	<0.5	N/L	-	-	-	-
Chlorpyrifos	µg/L	<0.5	<0.5	N/L	-	-	-	-
Parathion	µg/L	<2	<2	N/L	-	-	-	-
Phosphor-ethyl	µg/L	<0.5	<0.5	N/L	-	-	-	-
Chlorfenvinphos	µg/L	<0.5	<0.5	N/L	-	-	-	-
Bromophos-ethyl	µg/L	<0.5	<0.5	N/L	-	-	-	-
Fenamiphos	µg/L	<0.5	<0.5	N/L	-	-	-	-
Prothiofos	µg/L	<0.5	<0.5	N/L	-	-	-	-
Ethion	µg/L	<0.5	<0.5	N/L	-	-	-	-
Carbophenothion	µg/L	<0.5	<0.5	N/L	-	-	-	-
Azinphos Methyl	µg/L	<0.5	<0.5	N/L	-	-	-	-
Monocyclic Aromatic Hydrocarbons								
Benzene	µg/L	-	-	-	-	<0.001	N/L	-
Toluene	µg/L	-	-	-	-	<0.001	N/L	-
Ethylbenzene	µg/L	-	-	-	-	<0.001	N/L	-
meta- & para-Xylene	µg/L	-	-	-	-	-	-	-
Styrene	µg/L	<5	<5	N/L	-	-	-	-
ortho-Xylene	µg/L	-	-	-	-	-	-	-
Isopropylbenzene	µg/L	<5	<5	N/L	-	-	-	-
n-Propylbenzene	µg/L	<5	<5	N/L	-	-	-	-
1,3,5-Trimethylbenzene	µg/L	<5	<5	N/L	-	-	-	-
sec-Butylbenzene	µg/L	<5	<5	N/L	-	-	-	-
1,2,4-Trimethylbenzene	µg/L	<5	<5	N/L	-	-	-	-
tert-Butylbenzene	µg/L	<5	<5	N/L	-	-	-	-
p-Isopropyltoluene	µg/L	<5	<5	N/L	-	-	-	-
n-Butylbenzene	µg/L	<5	<5	N/L	-	-	-	-
Oxygenated Compounds								
Vinyl Acetate	µg/L	<50	<50	N/L	-	-	-	-
2-Butanone (MEK)	µg/L	<50	<50	N/L	-	-	-	-
4-Methyl-2-pentanone (MIBK)	µg/L	<50	<50	N/L	-	-	-	-
2-Hexanone (MBK)	µg/L	<50	<50	N/L	-	-	-	-

Sulfonated Compounds								
Carbon disulfide	µg/L	<5	<5	N/L	-	-	-	-
Fumigants								
2,2-Dichloropropane	µg/L	<5	<5	N/L	-	-	-	-
1,2-Dichloropropane	µg/L	<5	<5	N/L	-	-	-	-
cis-1,3-Dichloropropylene	µg/L	<5	<5	N/L	-	-	-	-
trans-1,3-Dichloropropylene	µg/L	<5	<5	N/L	-	-	-	-
1,2-Dibromoethane (EDB)	µg/L	<5	<5	N/L	-	-	-	-
Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	µg/L	<50	<50	N/L	-	-	-	-
Chloromethane	µg/L	<50	<50	N/L	-	-	-	-
Vinyl chloride	µg/L	<50	<50	N/L	-	-	-	-
Bromomethane	µg/L	<50	<50	N/L	-	-	-	-
Chloroethane	µg/L	<50	<50	N/L	-	-	-	-
Trichlorofluoromethane	µg/L	<50	<50	N/L	-	-	-	-
1,1-Dichloroethene	µg/L	<5	<5	N/L	-	-	-	-
Iodomethane	µg/L	<5	<5	N/L	-	-	-	-
trans-1,2-Dichloroethene	µg/L	<5	<5	N/L	-	-	-	-
1,1-Dichloroethane	µg/L	<5	<5	N/L	-	-	-	-
cis-1,2-Dichloroethane	µg/L	<5	<5	N/L	-	-	-	-
1,1,1-Trichloroethane	µg/L	<5	<5	N/L	-	-	-	-
1,1-Dichloropropylene	µg/L	<5	<5	N/L	-	-	-	-
Carbon Tetrachloride	µg/L	<5	<5	N/L	-	-	-	-
1,2-Dichloroethane	µg/L	<5	<5	N/L	-	-	-	-
Trichloroethene	µg/L	<5	<5	N/L	-	-	-	-
Dibromomethane	µg/L	<5	<5	N/L	-	-	-	-
1,1,2-Trichloroethane	µg/L	<5	<5	N/L	-	-	-	-
1,3-Dichloropropane	µg/L	<5	<5	N/L	-	-	-	-
Tetrachloroethene	µg/L	<5	<5	N/L	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/L	<5	<5	N/L	-	-	-	-
trans-1,4-Dichloro-2-butene	µg/L	<5	<5	N/L	-	-	-	-
cis-1,4-Dichloro-2-butene	µg/L	<5	<5	N/L	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/L	<5	<5	N/L	-	-	-	-
1,2,3-Trichloropropane	µg/L	<5	<5	N/L	-	-	-	-
Pentachloroethane	µg/L	<5	<5	N/L	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/L	<5	<5	N/L	-	-	-	-
Hexachlorobutadiene	µg/L	<5	<5	N/L	-	-	-	-
Halogenated Aromatic Compounds								
Chlorobenzene	µg/L	<5	<5	N/L	-	-	-	-
Bromobenzene	µg/L	<5	<5	N/L	-	-	-	-
2-Chlorotoluene	µg/L	<5	<5	N/L	-	-	-	-
4-Chlorotoluene	µg/L	<5	<5	N/L	-	-	-	-
1,3-Dichlorobenzene	µg/L	<5	<5	N/L	-	-	-	-
1,4-Dichlorobenzene	µg/L	<5	<5	N/L	-	-	-	-
1,2-Dichlorobenzene	µg/L	<5	<5	N/L	-	-	-	-
1,2,4-Trichlorobenzene	µg/L	<5	<5	N/L	-	-	-	-
1,2,3-Trichlorobenzene	µg/L	<5	<5	N/L	-	-	-	-
Trihalomethanes								
Chloroform	µg/L	<5	<5	N/L	-	-	-	-
Bromodichloromethane	µg/L	<5	<5	N/L	-	-	-	-
Dibromochloromethane	µg/L	12	11	N/L	8.33	-	-	-
Bromoform	µg/L	13	15	N/L	13.33	-	-	-
Phenolic Compounds								
Phenol	µg/L	<1.0	<1.0	N/L	-	-	-	-
2-Chlorophenol	µg/L	<1.0	<1.0	N/L	-	-	-	-
2-Methylphenol	µg/L	<1.0	<1.0	N/L	-	-	-	-
3- & 4-Methylphenol	µg/L	<2.0	<2.0	N/L	-	-	-	-
2-Nitrophenol	µg/L	<1.0	<1.0	N/L	-	-	-	-
2,4-Dimethylphenol	µg/L	<1.0	<1.0	N/L	-	-	-	-
2,4-Dichlorophenol	µg/L	<1.0	<1.0	N/L	-	-	-	-
2,6-Dichlorophenol	µg/L	<1.0	<1.0	N/L	-	-	-	-
4-Chloro-3-Methylphenol	µg/L	<1.0	<1.0	N/L	-	-	-	-
2,4,6-Trichlorophenol	µg/L	<1.0	<1.0	N/L	-	-	-	-
2,4,5-Trichlorophenol	µg/L	<1.0	<1.0	N/L	-	-	-	-
Pentachlorophenol	µg/L	<2.0	<2.0	N/L	-	-	-	-
Polynuclear Aromatic Hydrocarbons								
Naphthalene	µg/L	<1.0	<1.0	N/L	-	-	-	-
Acenaphthylene	µg/L	<1.0	<1.0	N/L	-	-	-	-
Acenaphthene	µg/L	<1.0	<1.0	N/L	-	-	-	-
Fluorene	µg/L	<1.0	<1.0	N/L	-	-	-	-
Phenanthrene	µg/L	<1.0	<1.0	N/L	-	-	-	-
Anthracene	µg/L	<1.0	<1.0	N/L	-	-	-	-
Fluoranthene	µg/L	<1.0	<1.0	N/L	-	-	-	-
Pyrene	µg/L	<1.0	<1.0	N/L	-	-	-	-
Benz(a)anthracene	µg/L	<1.0	<1.0	N/L	-	-	-	-
Chrysene	µg/L	<1.0	<1.0	N/L	-	-	-	-
Benzo(b)fluoranthene	µg/L	<1.0	<1.0	N/L	-	-	-	-
Benzo(k)fluoranthene	µg/L	<1.0	<1.0	N/L	-	-	-	-
Benzo(a)pyrene	µg/L	<0.5	<0.5	N/L	-	-	-	-
Indeno(1,2,3,cd)pyrene	µg/L	<1.0	<1.0	N/L	-	-	-	-
Dibenz(a,h)anthracene	µg/L	<1.0	<1.0	N/L	-	-	-	-
Benzo(g,h,i)perylene	µg/L	<1.0	<1.0	N/L	-	-	-	-
Total Petroleum Hydrocarbons								
C6 - C9 Fraction	µg/L	<20	<20	N/L	-	<0.02	N/L	-
C10 - C14 Fraction	µg/L	<50	<50	N/L	-	<0.02	N/L	-
C15 - C28 Fraction	µg/L	<100	<100	N/L	-	<0.04	N/L	-
C29 - C36 Fraction	µg/L	<50	<50	N/L	-	<0.04	N/L	-
C10 - C36 Fraction (sum)	µg/L	<50	<50	N/L	-	<0.04	N/L	-

Table 2 Laboratory Analysis of Field Blank and Rinsate Samples

Analyte grouping/Analyte	Units	ANZECC & ARMCANZ (2000) ¹		ADWG (2004) ²		DOH (2006) ³	ANZECC & ARMCANZ (2000) ¹		18/05/2012	18/05/2012
		Fresh Waters ⁴	Marine Waters ⁴	Drinking Water Health Value (HV)	Drinking Water Aesthetic Value	Domestic non-potable	Short-term Irrigation Water	Long-term Irrigation Water ⁵	FIELD	RINSATE
pH Value	pH Unit	6.5-8.5	8.0-8.4		6.5-8.5			6.0-8.5	5.7	5.7
Electrical Conductivity	µS/cm								1	<1
Total Dissolved Solids	mg/L								<10	<10
Suspended Solids	mg/L								<5	<5
Turbidity	NTU								0.1	<0.1
Total Alkalinity CaCO ₃	mg/L								<1	<1
Acidity as CaCO ₃	mg/L								5	<1
Sulfate as SO ₄ ²⁻	mg/L								<1	<1
Alkalinity : Sulfate	ratio			500	250	5000			<1	<1
Chloride	mg/L								1	<1
Sulfate : Chloride	ratio				250	2500			<1	<1
Total Metals										
Aluminium	mg/L	0.055			0.2	2	20	5	<0.01	<0.01
Arsenic	mg/L	0.013		0.01		0.07	2	0.1	<0.001	<0.001
Cadmium	mg/L	0.0002	0.0007	0.002		0.02	0.05	0.01	<0.0001	<0.0001
Chromium	mg/L						1	0.1	<0.001	<0.001
Copper	mg/L	0.0014	0.0013	2	1	20	5	0.2	0.004	0.004
Lead	mg/L	0.0034	0.0044	0.01		0.1	5	2	<0.001	<0.001
Manganese	mg/L	1.9		0.5	0.1	5	10	0.2	<0.001	<0.001
Molybdenum	mg/L			0.05		0.5	0.05	0.01	<0.001	<0.001
Nickel	mg/L	0.011	0.02	0.02		0.2	2	0.2	<0.001	0.002
Selenium	mg/L	0.005		0.01		0.1	0.05	0.02	<0.01	<0.01
Silver	mg/L	0.00005	0.0014	0.1		1			<0.001	<0.001
Zinc	mg/L	0.008	0.015		3	30	5	2	<0.005	0.045
Iron	mg/L	0.3	1.0 / 0.35		0.33	3	10	0.2	<0.05	<0.05
Mercury	mg/L	0.00006	0.0001	0.001		0.01	0.002	0.002	<0.0001	<0.0001
Nutrients										
Ammonia as N	mg/L	0.9	0.91						0.01	<0.01
Nitrite as N	mg/L			3.0		30			<0.01	<0.01
Nitrate as N	mg/L			50		500			<0.01	<0.01
Kjeldhal Nitrogen	mg/L								<0.1	<0.1
Total Nitrogen	mg/L	1.0 / 2.0 ¹							<0.1	<0.1
Total Phosphorus	mg/L	0.1 / 0.2 ¹							0.01	<0.01
Reactive Phosphorus	mg/L								<0.01	<0.01
Sulfide	mg/L	0.001							<0.1	<0.1
COD	mg/L								<5	<5
BOD	mg/L								4	3
Organochlorine Pesticides (OC)										
alpha-BHC	µg/L								<0.5	<0.5
Hexachlorobenzene (HCB)	µg/L								<0.5	<0.5
beta-BHC	µg/L								<0.5	<0.5
gamma-BHC	µg/L								<0.5	<0.5
delta-BHC	µg/L								<0.5	<0.5
Heptachlor	µg/L	0.01							<0.5	<0.5
Aldrin	µg/L								<0.5	<0.5
Heptachlor epoxide	µg/L			0.05	0.3	3			<0.5	<0.5
trans-Chlordane	µg/L	0.03 ²		0.01	1	10			<0.5	<0.5
alpha-Endosulfan	µg/L	0.03 ³	0.005 ³	0.05	30	30			<0.5	<0.5
cis-Chlordane	µg/L	0.03 ²		0.01	1	10			<0.5	<0.5
Dieldrin	µg/L								<0.5	<0.5
4,4'-DDE	µg/L								<0.5	<0.5
Endrin	µg/L	0.01	0.004						<0.5	<0.5
beta-Endosulfan	µg/L	0.03 ³	0.005 ³						<0.5	<0.5
4,4'-DDD	µg/L								<0.5	<0.5
Endrin aldehyde	µg/L								<0.5	<0.5
Endosulfan sulfate	µg/L								<0.5	<0.5
4,4'-DDT	µg/L	0.006		0.06	30	0.1			<2	<2
Endrin ketone	µg/L								<0.5	<0.5
Methoxychlor	µg/L								<2	<2
Organophosphorus Pesticides (OP)										
Dichlorvos	µg/L								<0.5	<0.5
Demeton-S-methyl	µg/L								<0.5	<0.5
Monocrotophos	µg/L								<2	<2
Dimethoate	µg/L	0.15			50	50			<0.5	<0.5
Diazinon	µg/L	0.01		1	3	1			<0.5	<0.5
Chlorpyrifos-methyl	µg/L	0.01	0.009		10	100			<0.5	<0.5
Parathion-methyl	µg/L								<2	<2
Malathion	µg/L	0.05							<0.5	<0.5
Fenthion	µg/L								<0.5	<0.5
Chlorpyrifos	µg/L	0.01	0.009						<0.5	<0.5
Parathion	µg/L	0.004			10	10			<2	<2
Phosphor-ethyl	µg/L								<0.5	<0.5
Chlorfenvinphos	µg/L								<0.5	<0.5
Bromophos-ethyl	µg/L								<0.5	<0.5
Fenamiphos	µg/L								<0.5	<0.5
Prothiofos	µg/L								<0.5	<0.5
Ethion	µg/L								<0.5	<0.5
Carbophenothion	µg/L								<0.5	<0.5
Azinphos Methyl	µg/L	0.02							<0.5	<0.5
Monocyclic Aromatic Hydrocarbons										
Benzene	µg/L	0.95	0.5	0.001		0.01			-	-
Toluene	µg/L			0.80	0.025	0.025			-	-
Ethylbenzene	µg/L			0.30	0.003	0.003			-	-
meta- & para-Xylene	µg/L	200							-	-
Styrene	µg/L			0.03	0.004	0.004			<5	<5
ortho-Xylene	µg/L	350							-	-
Isopropylbenzene	µg/L								<5	<5
n-Propylbenzene	µg/L								<5	<5
1,3,5-Trimethylbenzene	µg/L								<5	<5
sec-Butylbenzene	µg/L								<5	<5
1,2,4-Trimethylbenzene	µg/L								<5	<5
tert-Butylbenzene	µg/L								<5	<5
p-Isopropyltoluene	µg/L								<5	<5
n-Butylbenzene	µg/L								<5	<5
Oxygenated Compounds										
Vinyl Acetate	µg/L								<50	<50
2-Butanone (MEK)	µg/L								<50	<50
4-Methyl-2-pentanone (MIBK)	µg/L								<50	<50
2-Hexanone (MBK)	µg/L								<50	<50

Sulfonated Compounds										
Carbon disulfide	µg/L								ϕ	<5
Fumigants										
2,2-Dichloropropane	µg/L								ϕ	<5
1,2-Dichloropropane	µg/L								ϕ	<5
cis-1,3-Dichloropropylene	µg/L								ϕ	<5
trans-1,3-Dichloropropylene	µg/L								ϕ	<5
1,2-Dibromoethane (EDB)	µg/L								ϕ	<5
Halogenated Aliphatic Compounds										
Dichlorodifluoromethane	µg/L								<50	<50
Chloromethane	µg/L								<50	<50
Vinyl chloride	µg/L			0.0003		0.003			<50	<50
Bromomethane	µg/L								<50	<50
Chloroethane	µg/L								<50	<50
Trichlorofluoromethane	µg/L								<50	<50
1,1-Dichloroethene	µg/L			0.03		0.3			ϕ	<5
Iodomethane	µg/L								ϕ	<5
trans-1,2-Dichloroethene	µg/L								ϕ	<5
1,1-Dichloroethane	µg/L								ϕ	<5
cis-1,2-Dichloroethene	µg/L								ϕ	<5
1,1,1-Trichloroethane	µg/L								ϕ	<5
1,1-Dichloropropylene	µg/L								ϕ	<5
Carbon Tetrachloride	µg/L								ϕ	<5
1,2-Dichloroethane	µg/L			0.003		0.03			ϕ	<5
Trichloroethene	µg/L								ϕ	<5
Dibromomethane	µg/L								ϕ	<5
1,1,2-Trichloroethane	µg/L	6500	1900						ϕ	<5
1,3-Dichloropropane	µg/L								ϕ	<5
Tetrachloroethene	µg/L			0.05		0.5			ϕ	<5
1,1,1,2-Tetrachloroethane	µg/L								ϕ	<5
trans-1,4-Dichloro-2-butene	µg/L								ϕ	<5
cis-1,4-Dichloro-2-butene	µg/L								ϕ	<5
1,1,2,2-Tetrachloroethane	µg/L								ϕ	<5
1,2,3-Trichloropropane	µg/L								ϕ	<5
Pentachloroethane	µg/L								ϕ	<5
1,2-Dibromo-3-chloropropane	µg/L								ϕ	<5
Hexachlorobutadiene	µg/L								ϕ	<5
Halogenated Aromatic Compounds										
Chlorobenzene	µg/L			0.30	0.01	0.01			ϕ	<5
Bromobenzene	µg/L								ϕ	<5
2-Chlorotoluene	µg/L								ϕ	<5
4-Chlorotoluene	µg/L								ϕ	<5
1,3-Dichlorobenzene	µg/L	0.26			0.02	0.02			ϕ	<5
1,4-Dichlorobenzene	µg/L	0.06		0.04	0.003	0.003			ϕ	<5
1,2-Dichlorobenzene	µg/L	0.16		1.5	0.001	0.001			ϕ	<5
1,2,4-Trichlorobenzene	µg/L	0.085	80	0.03	0.005	0.005			ϕ	<5
1,2,3-Trichlorobenzene	µg/L	0.003		0.03	0.005	0.005			ϕ	<5
Trihalomethanes										
Chloroform	µg/L								ϕ	<5
Bromodichloromethane	µg/L								ϕ	<5
Dibromochloromethane	µg/L								ϕ	<5
Bromoform	µg/L								ϕ	<5
Phenolic Compounds										
Phenol	µg/L	320	400						<1.0	<1.0
2-Chlorophenol	µg/L	340		300	0.1	3000			<1.0	<1.0
2-Methylphenol	µg/L								<1.0	<1.0
3- & 4-Methylphenol	µg/L								<2.0	<2.0
2-Nitrophenol	µg/L								<1.0	<1.0
2,4-Dimethylphenol	µg/L								<1.0	<1.0
2,4-Dichlorophenol	µg/L	120		200	0.3	2000			<1.0	<1.0
2,6-Dichlorophenol	µg/L								<1.0	<1.0
4-Chloro-3-Methylphenol	µg/L								<1.0	<1.0
2,4,6-Trichlorophenol	µg/L	3		20	2	200			<1.0	<1.0
2,4,5-Trichlorophenol	µg/L								<1.0	<1.0
Pentachlorophenol	µg/L	3.6	11						<2.0	<2.0
Polynuclear Aromatic Hydrocarbons										
Naphthalene	µg/L	16	50						<1.0	<1.0
Acenaphthylene	µg/L								<1.0	<1.0
Acenaphthene	µg/L								<1.0	<1.0
Fluorene	µg/L								<1.0	<1.0
Phenanthrene	µg/L								<1.0	<1.0
Anthracene	µg/L								<1.0	<1.0
Fluoranthene	µg/L								<1.0	<1.0
Pyrene	µg/L								<1.0	<1.0
Benz(a)anthracene	µg/L								<1.0	<1.0
Chrysene	µg/L								<1.0	<1.0
Benzo(b)fluoranthene	µg/L								<1.0	<1.0
Benzo(k)fluoranthene	µg/L								<1.0	<1.0
Benzo(a)pyrene	µg/L			0.01		0.1			<0.5	<0.5
Indeno(1,2,3,cd)pyrene	µg/L								<1.0	<1.0
Dibenz(a,h)anthracene	µg/L								<1.0	<1.0
Benzo(g,h,i)perylene	µg/L								<1.0	<1.0
Total Petroleum Hydrocarbons										
C6 - C9 Fraction	µg/L								<20	<20
C10 - C14 Fraction	µg/L								<50	<50
C15 - C28 Fraction	µg/L								<100	<100
C29 - C36 Fraction	µg/L								<50	<50
C10 - C36 Fraction (sum)	µg/L	600 ⁴							<50	<50

8 RESULTS

Field results and laboratory analysis of groundwater samples undertaken onsite are presented in Table 3. To assess the background groundwater quality at the Site, water quality results were compared against the criteria outlined within the DEC's *Contaminated Site Management Series - Assessment Levels for Soil, Sediment and Water* (DEC, 2010). Laboratory results were compared against the following criteria;

- Freshwater Ecosystem Trigger Values, Marine Ecosystem Trigger Values, Short-term Irrigation Water and the Long-term Irrigation Water from the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* prepared by the Australian and New Zealand Environment and Conservation Council (ANZECC, 2000);
- Drinking Water Health Value and Drinking Water Aesthetic Value from the *Australian Drinking Water Guidelines* (NHMRC & ARMCANZ, 2004); and,
- Domestic Non-potable Groundwater Use from the Department of Health's (DoH) *Contaminated Sites Reporting Guideline for Chemicals in Groundwater* (DoH, 2006).

The following notes are the summaries of laboratory results and the comparison to assessment criteria.

Total Petroleum Hydrocarbons (TPH)

Laboratory results indicate the presence of TPH with in WRMW3 and WRMW6 however are below assessment criteria.

Monocyclic Aromatic Hydrocarbons (MAH)

MAHs were not detected in any of the samples analysed.

Polycyclic Aromatic Hydrocarbons

PAHs were not detected in any of the samples analysed.

Phenols

Laboratory results indicate the presence of 3-&4-Methylphenol within WRMW2 all other samples were below laboratory detection limits.

Metals

The following metals exceedances were detected:

- Aluminium exceeded the following assessment criteria at the associated locations;
 - WRMW3 exceeded all assessment criteria;
 - WRMW1, WRMW2 and WRMW5 exceeded all assessment criteria excluding the Short-term Irrigation levels;
 - WRMW4 exceeded the Domestic Non-potable groundwater use and Drinking Water Aesthetic Values; and
 - WWRMW6 exceeded Drinking Water Aesthetic Values,
- Copper exceeded the Fresh and Marine waters criteria for all locations,

- Lead exceeded Drinking Water Aesthetic Values, Fresh and Marine waters criteria at WRMW3,
- Manganese exceeded Fresh waters and Drinking Water Aesthetic values criteria at WRMW3,
- Zinc exceeded the following assessment criteria at the following location;
 - Fresh and Marine waters criteria was exceeded at WRMW2, WRMW3 and WRMW4,
 - Fresh waters criteria was exceeded at WRMW5 and WRMW6,
- Iron exceeded assessment criteria at the following locations for the associated locations;
 - WRMW3 and WRMW6 exceeded all assessment criteria,
 - Drinking Water Aesthetic Values, Long-term Irrigation, Fresh and Marine waters criteria was exceeded at WRMW4 and WRMW5,
 - WRMW2 exceeds all assessment criteria with the exception of Short-term Irrigation criteria,
 - WRMW1 exceeds Short-term irrigation criteria,
- Mercury exceeds Fresh waters criteria at WRMW1 and WRMW2

OC Pesticides

OC pesticides were below laboratory assessment criteria for all laboratory samples.

OP Pesticides

OP pesticides were not detected in any of the samples analysed. It is noted that the primary laboratory detection limits were not low enough to detect methyl parathion at DNPGW trigger values.

Major Anions and Cations

No exceedances were identified.

Nutrients

Ammonia (NH₃-N) exceeded Fresh and Marine water criteria for WRMW6.

Total Nitrogen exceeded Fresh water s assessment criteria for WRMW1, WRMW2, WRMW4 and WRMW6.

Total Phosphorus exceeded Fresh waters criteria at WRMW2 and WRMW3.

WRMW1 exceeded Fresh waters criteria for Sulphide.

Sulfonated Compounds														
Carbon disulfide	µg/L							<5	<5	<5	<5	<5	<5	
Fumigants														
2,2-Dichloropropane	µg/L							<5	<5	<5	<5	<5	<5	
1,2-Dichloropropane	µg/L							<5	<5	<5	<5	<5	<5	
cis-1,3-Dichloropropylene	µg/L							<5	<5	<5	<5	<5	<5	
trans-1,3-Dichloropropylene	µg/L							<5	<5	<5	<5	<5	<5	
1,2-Dibromoethane (EDB)	µg/L							<5	<5	<5	<5	<5	<5	
Halogenated Aliphatic Compounds														
Dichlorodifluoromethane	µg/L							<50	<50	<50	<50	<50	<50	
Chloromethane	µg/L							<50	<50	<50	<50	<50	<50	
Vinyl chloride	µg/L			0.0003			0.003	<50	<50	<50	<50	<50	<50	
Bromomethane	µg/L							<50	<50	<50	<50	<50	<50	
Chloroethane	µg/L							<50	<50	<50	<50	<50	<50	
Trichlorofluoromethane	µg/L							<50	<50	<50	<50	<50	<50	
1,1-Dichloroethene	µg/L			0.03			0.3	<5	<5	<5	<5	<5	<5	
Iodomethane	µg/L							<5	<5	<5	<5	<5	<5	
trans-1,2-Dichloroethene	µg/L							<5	<5	<5	<5	<5	<5	
1,1-Dichloroethane	µg/L							<5	<5	<5	<5	<5	<5	
cis-1,2-Dichloroethene	µg/L							<5	<5	<5	<5	<5	<5	
1,1,1-Trichloroethane	µg/L							<5	<5	<5	<5	<5	<5	
1,1-Dichloropropylene	µg/L							<5	<5	<5	<5	<5	<5	
Carbon Tetrachloride	µg/L							<5	<5	<5	<5	<5	<5	
1,2-Dichloroethane	µg/L			0.003			0.03	<5	<5	<5	<5	<5	<5	
Trichloroethene	µg/L							<5	<5	<5	<5	<5	<5	
Dibromomethane	µg/L							<5	<5	<5	<5	<5	<5	
1,1,2-Trichloroethane	µg/L	6500	1900					<5	<5	<5	<5	<5	<5	
1,3-Dichloropropane	µg/L							<5	<5	<5	<5	<5	<5	
Tetrachloroethene	µg/L			0.05			0.5	<5	<5	<5	<5	<5	<5	
1,1,1,2-Tetrachloroethane	µg/L							<5	<5	<5	<5	<5	<5	
trans-1,4-Dichloro-2-butene	µg/L							<5	<5	<5	<5	<5	<5	
cis-1,4-Dichloro-2-butene	µg/L							<5	<5	<5	<5	<5	<5	
1,1,2,2-Tetrachloroethane	µg/L							<5	<5	<5	<5	<5	<5	
1,2,3-Trichloropropane	µg/L							<5	<5	<5	<5	<5	<5	
Pentachloroethane	µg/L							<5	<5	<5	<5	<5	<5	
1,2-Dibromo-3-chloropropane	µg/L							<5	<5	<5	<5	<5	<5	
Hexachlorobutadiene	µg/L							<5	<5	<5	<5	<5	<5	
Halogenated Aromatic Compounds														
Chlorobenzene	µg/L			0.30	0.01	0.01		<5	<5	<5	<5	<5	<5	
Bromobenzene	µg/L							<5	<5	<5	<5	<5	<5	
2-Chlorotoluene	µg/L							<5	<5	<5	<5	<5	<5	
4-Chlorotoluene	µg/L							<5	<5	<5	<5	<5	<5	
1,3-Dichlorobenzene	µg/L	0.26			0.02	0.02		<5	<5	<5	<5	<5	<5	
1,4-Dichlorobenzene	µg/L	0.06		0.04	0.003	0.003		<5	<5	<5	<5	<5	<5	
1,2-Dichlorobenzene	µg/L	0.16		1.5	0.001	0.001		<5	<5	<5	<5	<5	<5	
1,2,4-Trichlorobenzene	µg/L	0.085	80	0.03	0.005	0.005		<5	<5	<5	<5	<5	<5	
1,2,3-Trichlorobenzene	µg/L	0.003		0.03	0.005	0.005		<5	<5	<5	<5	<5	<5	
Trihalomethanes														
Chloroform	µg/L							<5	<5	<5	<5	<5	<5	
Bromodichloromethane	µg/L							<5	<5	<5	<5	5	<5	
Dibromochloromethane	µg/L							<5	<5	<5	12	20	<5	
Bromoform	µg/L							<5	<5	<5	13	22	<5	
Phenolic Compounds														
Phenol	µg/L	320	400					<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
2-Chlorophenol	µg/L	340		300	0.1	3000		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
2-Methylphenol	µg/L							<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
3- & 4-Methylphenol	µg/L							<2.0	2.6	<2.0	<2.0	<2.0	<2.0	
2-Nitrophenol	µg/L							<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
2,4-Dimethylphenol	µg/L							<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
2,4-Dichlorophenol	µg/L	120		200	0.3	2000		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
2,6-Dichlorophenol	µg/L							<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
4-Chloro-3-Methylphenol	µg/L							<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
2,4,6-Trichlorophenol	µg/L	3		20	2	200		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
2,4,5-Trichlorophenol	µg/L							<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Pentachlorophenol	µg/L	3.6	11					<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Polynuclear Aromatic Hydrocarbons														
Naphthalene	µg/L	16	50					<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Acenaphthylene	µg/L							<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Acenaphthene	µg/L							<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Fluorene	µg/L							<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Phenanthrene	µg/L							<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Anthracene	µg/L							<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Fluoranthene	µg/L							<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Pyrene	µg/L							<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Benz(a)anthracene	µg/L							<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Chrysene	µg/L							<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(b)fluoranthene	µg/L							<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(k)fluoranthene	µg/L							<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(a)pyrene	µg/L			0.01		0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Indeno(1,2,3-cd)pyrene	µg/L							<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Dibenz(a,h)anthracene	µg/L							<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(g,h,i)perylene	µg/L							<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Total Petroleum Hydrocarbons														
C6 - C9 Fraction	µg/L							<20	<20	<20	<20	<20	<20	
C10 - C14 Fraction	µg/L							<50	<50	<50	<50	<50	<50	
C15 - C28 Fraction	µg/L							<100	<100	<100	<100	<100	260	
C29 - C36 Fraction	µg/L							<50	<50	270	<50	<50	60	
C10 - C36 Fraction (sum)	µg/L	600 ⁴						<50	<50	270	<50	<50	320	

8.1 Groundwater Levels

The depth to groundwater was measured on 18th May 2012. An interface meter was used to verify the presence / absence of free phase hydrocarbon products over the groundwater: no free phase products were detected. Groundwater is intercepted between 19 RL mAHD (Relative level metres Australian Height Datum) and 24 RL mAHD detailed groundwater depths are displayed in Table 4.

Plotting the water table values enable determination of groundwater direction. Figure 3 identifies a groundwater flux towards the northwest, with a hydraulic gradient covering the Site of between 0.009 and 0.015.

Table 4 Groundwater Measurements

Groundwater Well ID	Date	Depth to Water mbgl	Top of Casing RL	Groundwater RL
MW1	18/05/2012	3.700	27.281	23.581
MW2	18/05/2012	7.666	30.607	22.941
MW3	18/05/2012	11.846	34.622	22.776
MW4	18/05/2012	8.509	27.751	19.242
MW5	18/05/2012	8.836	29.034	20.198
MW6	18/05/2012	8.759	31.611	22.852

Figure 3 Groundwater Contours



MW4 (RL 19.242m)

MW5 (RL 20.198m)


MW6 (RL 22.852m)

MW1 (RL 23.581m)

MW2 (RL 22.941m)

MW3 (RL 22.776m)

Reserve 49079

LEGEND:
 MW1 - BORE LOCATIONS



DEPTH OF GROUNDWATER AND DIRECTION FLOW

LOT 20 ADELAIDE STREET
 HAZELMERE



0 20 40 60 80m
 SCALE 1:4000
 ORIGINAL PLAN SIZE: A4

DATE: 16.07.2012

22 ELMSFIELD ROAD, MIDVALE WA 6056
 PH: (08) 9250 6960 FAX: (08) 9250 8269
 www.environmentalservices.com.au

9 DISCUSSION

Standing water level measurements recorded by MDWES during May 2012 sampling indicate that groundwater is encountered at between 3.7 – 11.8 mbgl (RL 19.2 m – 23.58 m AHD) beneath the Site. Based upon current redevelopment plans, groundwater will not be intercepted during the proposed remediation work.

Field results indicate that the groundwater beneath the site is fresh and mildly acidic with pH ranging from 5.83 to 7.41. This is an acceptable range of pH for groundwater within this locality.

Contamination of the groundwater from material previously deposited on the Site appears to be minimal. With the exception of metalloids, low levels of TPH in WRMW3 and WRMW6, and the presence of 3-&4-Methylphenol within WRMW2 all other PCOC were below laboratory detection limits.

Metalloid results could be considered higher than expected for background waters within this locality, however, moderate levels of suspended solids within all samples could have contributed to artificially increasing the results. It is further suspected that if dissolved metal concentrations were requested, these would be significantly lower than the total metal results and more indicative of the quality of water that would be abstracted for use for dust suppression and compaction

Although nutrient levels were slightly elevated above ANZECC criteria, surface waters are not located in the immediate vicinity of the site and downstream receptors are likely to be more significantly impacted upon by land uses to the north of the site including rendering facilities.

MDWES are of the opinion that the contamination of the groundwater from material previously deposited on the Site is minimal and the site does not appear to be a source site for contamination external to the site boundaries. Groundwater flux appears to be in a northwest direction and if the properties to the north of the site are to be included in the redevelopment proposal for this site, it is recommended that additional groundwater investigations are completed on these properties.

It is also recommended that field monitoring of groundwater wells be completed on a monthly basis and laboratory analysis be completed on a quarterly basis until the remediation commence to gather additional groundwater data prior to the inert wastes being disturbed during remediation earthmoving activities.

10 REFERENCES

ANZECC (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Australian and New Zealand Environment and Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ).

DEC (2010) *Contaminated Site Management Series - Assessment Levels for Soil, Sediment and Water*. Contaminated Sites Branch, Department of Environment and Conservation.

DEC 2009. Department of Environment and Conservation, Contaminated Sites Management Series - Site classification scheme.

DEC 2006a. Department of Environment and Conservation: Contaminated Sites Management Series – The Use of Risk Assessment in Contaminated Site Assessment Management.

DEC 2006b. Department of Environment and Conservation: Contaminated Sites Management Series – Community Consultation Guideline

DEC 2010. Department of Environment and Conservation: Assessment Levels for Soil, Sediment, and Water, Feb 2010

DEP 2004. Department of Environmental Protection, Contaminated Sites Management Series - Potentially contaminating activities, Industries and land uses

DoH 2006. Department of Health Domestic non-potable groundwater use.

DEP 2001. Department of Environmental Protection, Contaminated Sites Management Series - Reporting of site assessments.

Standards Australia/Standards New Zealand. 1998. AS/NZS 5667.1:1998. Water Quality – Sampling. Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of sample. Standards Australia and Standards New Zealand, Homebush NSW and Wellington NZ.

11 APPENDICES

Appendix A Certificate of Title

WESTERN



AUSTRALIA

REGISTER NUMBER 20/D76128	
DUPLICATE EDITION 3	DATE DUPLICATE ISSUED 13/6/2008

RECORD OF CERTIFICATE OF TITLE
UNDER THE TRANSFER OF LAND ACT 1893

VOLUME **2054** FOLIO **299**

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES



LAND DESCRIPTION:

LOT 20 ON DIAGRAM 76128

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

HAZELLAND PTY LTD OF SUITE 5, 17 FOLEY STREET, BALCATTA
(TP K606822) REGISTERED 26 MAY 2008

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

1. *K606823 NOTIFICATION CONTAINS FACTORS AFFECTING THE WITHIN LAND. LODGED 26.5.2008.
2. *L520703 MEMORIAL. CONTAMINATED SITES ACT 2003 (CONTAMINATED SITE - REMEDIATION REQUIRED) REGISTERED 30.12.2010.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

-----END OF CERTIFICATE OF TITLE-----

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: 2054-299 (20/D76128).
PREVIOUS TITLE: 1697-970, 1103-577.
PROPERTY STREET ADDRESS: LOT 20 ADELAIDE ST, HAZELMERE.
LOCAL GOVERNMENT AREA: CITY OF SWAN.

ORIGINAL—NOT TO BE REMOVED FROM OFFICE OF TITLES

Application G704

WESTERN



AUSTRALIA

REGISTER BOOK

VOL.

FOL.

Volume Folio
1103 577
1697 970

CT 2054 299



CERTIFICATE OF TITLE

UNDER THE "TRANSFER OF LAND ACT, 1893" AS AMENDED

I certify that the person described in the First Schedule hereto is the registered proprietor of the undermentioned estate in the undermentioned land subject to the easements and encumbrances shown in the Second Schedule hereto.

Dated 9th October, 1995

CG Sack

REGISTRAR OF TITLES



ESTATE AND LAND REFERRED TO

Estate in fee simple in portion of Helena Location 20a and being Lot 20 the subject of Diagram 76128, delineated on the map in the Third Schedule hereto.

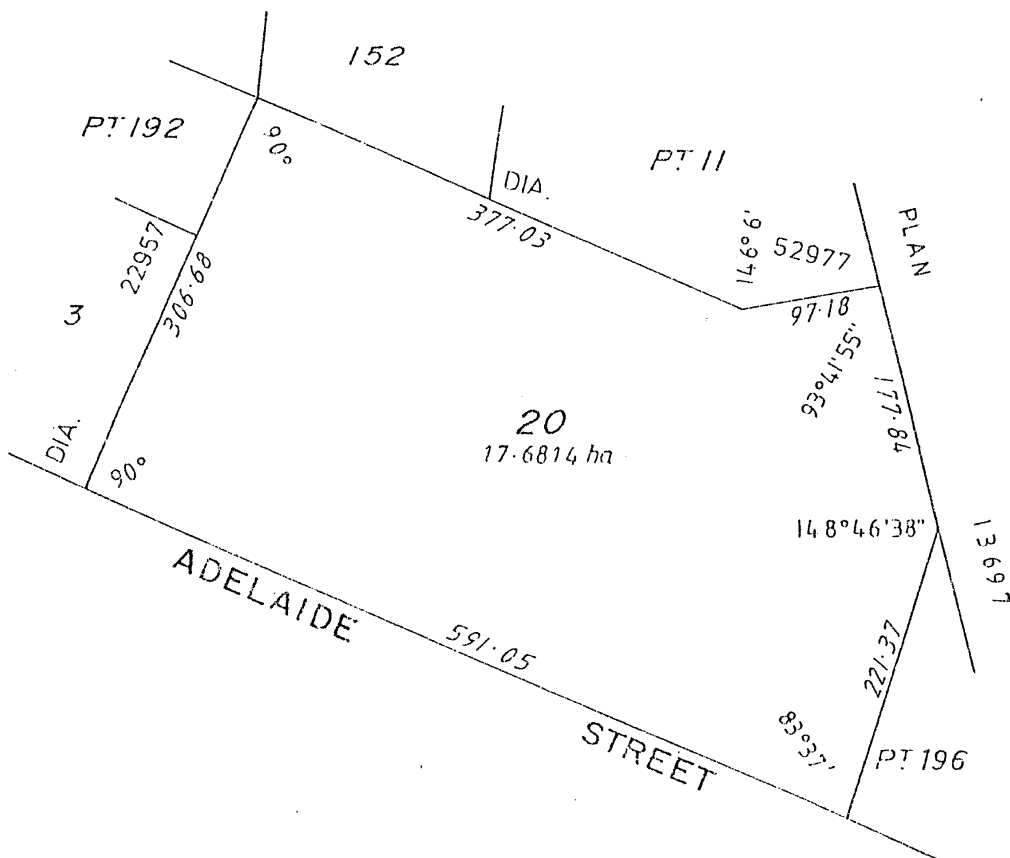
FIRST SCHEDULE (continued overleaf)

~~Enviroclean Waste Services Pty Ltd of Post Office Box 347 Victoria Park.~~

SECOND SCHEDULE (continued overleaf)

- ~~1. MORTGAGE E223538 to Commonwealth Bank of Australia, Registered 31.10.89 at 10.02 hrs
Discharged G108671 23.2.96~~
- ~~2. CAVEAT E674833 Lodged 9.8.91 at 11.27 hrs
Withdrawn G108674 23.2.96~~
- ~~3. MEMORIAL E730989 of Section 46 Land Tax Assessment Act 1976, Registered 25.10.91
at 9.15 hrs.
Withdrawn G108673 23.2.96~~
- ~~4. CAVEAT F544516 Lodged 10.5.94 at 12.10 hrs.
Withdrawn G108672 23.2.96~~

THIRD SCHEDULE



SCALE 1:5000



NOTE: ENTRIES MAY BE AFFECTED BY SUBSEQUENT ENDORSEMENTS.













Superseded - Copy for Sketch Only

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

Superseded Copy for Sketch Only

FIRST SCHEDULE CONTINUED
 NO. E: ENTRIES MAY BE AFFECTED BY SUBSEQUENT ENDORSEMENTS
 REGISTERED PROPRIETOR

Westgroup Pty Ltd of 665 Welshpool Road, Wattle Grove. REGISTERED PROPRIETOR	INSTRUMENT NATURE Transfer	INSTRUMENT NUMBER G108675	REGISTERED 23.2.96	TIME 10.18	SEAL 	CERT. OFFICER 
---	-------------------------------	------------------------------	-----------------------	---------------	---	--

INSTRUMENT		PARTICULARS	REGISTERED	TIME	SEAL	CERT. OFFICER	CANCELLATION	NUMBER	REGISTERED OR LODGED	SEAL	CERT. OFFICER
NATURE	NUMBER										
Mortgage	G108676	to Cash Resources Australia Pty Ltd	23.2.96	10.18			Discharged	G708165	9.2.98		
Mortgage	G108677	to Cash Resources Australia Pty Ltd	23.2.96	10.18			Discharged	G708165	9.2.98		
Caveat	G108552	Lodged 23.2.96 at 10.18 hrs.					Withdrawn	G708164	9.2.98		
Mortgage	G708166	to National Australia Bank Ltd.	9.2.98	9.16			Withdrawn	H178898	27.7.99		
Caveat	G708167	Lodged 9.2.98 at 9.16 hrs.									
Memorial	G806391	Land tax Assessment Act 1976. Lodged 29.5.98 at 15.00 hrs.									
Memorial	H663104	Land Tax Assessment Act 1976. Lodged 7.2.01 at 10.35 hrs.									

SECOND SCHEDULE (continued) NOTE: ENTRIES MAY BE AFFECTED BY SUBSEQUENT ENDORSEMENTS

Appendix B Drill Logs

0892564460

BANNISTER DRILLING & IRRIGATION

ABN 59 776 488 257

LITHOLOGY & CONSTRUCTION REPORT

DRILLER: Philip DRILLER LICENCE NUMBER: 183
 JOB LOCATION: Adelaide St. Hazelnere
 DATE COMMENCED: 7-5-12 DATE COMPLETED: 10-5-12
 DRILLING METHOD: Mud AIR DEVELOPMENT: Yes (1hr) GRAVEL PACK: Yes

STRATA DESCRIPTION

FROM.....TO.....|.....

Bore no. 1
 0mts - 2mts Yellow Sand
 2mts - 4mts Yellow Sand / Brown Clay
 4mts - 6mts Red Clay

Bore no. 2
 0mts - 3mts Yellow Sand
 3mts - 7mts Red Clay
 7mts - 9.5mts Coarse Sand

Bore no. 3
 0mts - 2.5mts Yellow Sand
 2.5mts - 7mts Brown Clay
 7mts - 11mts Red Clay
 11mts - 14.5mts Coarse Sand

18 DORNOCH WAY CANNINGVALE 6155 PH/FAX 92564460 MOB 0410 422 006

0892564460

BANNISTER DRILLING & IRRIGATION

ABN 59 776 488 257

LITHOLOGY & CONSTRUCTION REPORT

DRILLER: Philip..... DRILLER LICENCE NUMBER: 183.....
 JOB LOCATION: Adelaide St Hazelmere.....
 DATE COMMENCED: 7-5-12..... DATE COMPLETED: 10-5-12.....
 DRILLING METHOD: Mud..... AIR DEVELOPMENT: Yes (1hr) GRAVEL PACK: Yes.....

STRATA DESCRIPTION

FROM...../TO...../

Bore no. 4

0mts - 4mts	Brown Clay
4mts - 5.5mts	fine Sand
5.5mts - 7mts	Coarse Sand
7mts - 10mts	Red Clay

Bore no 5

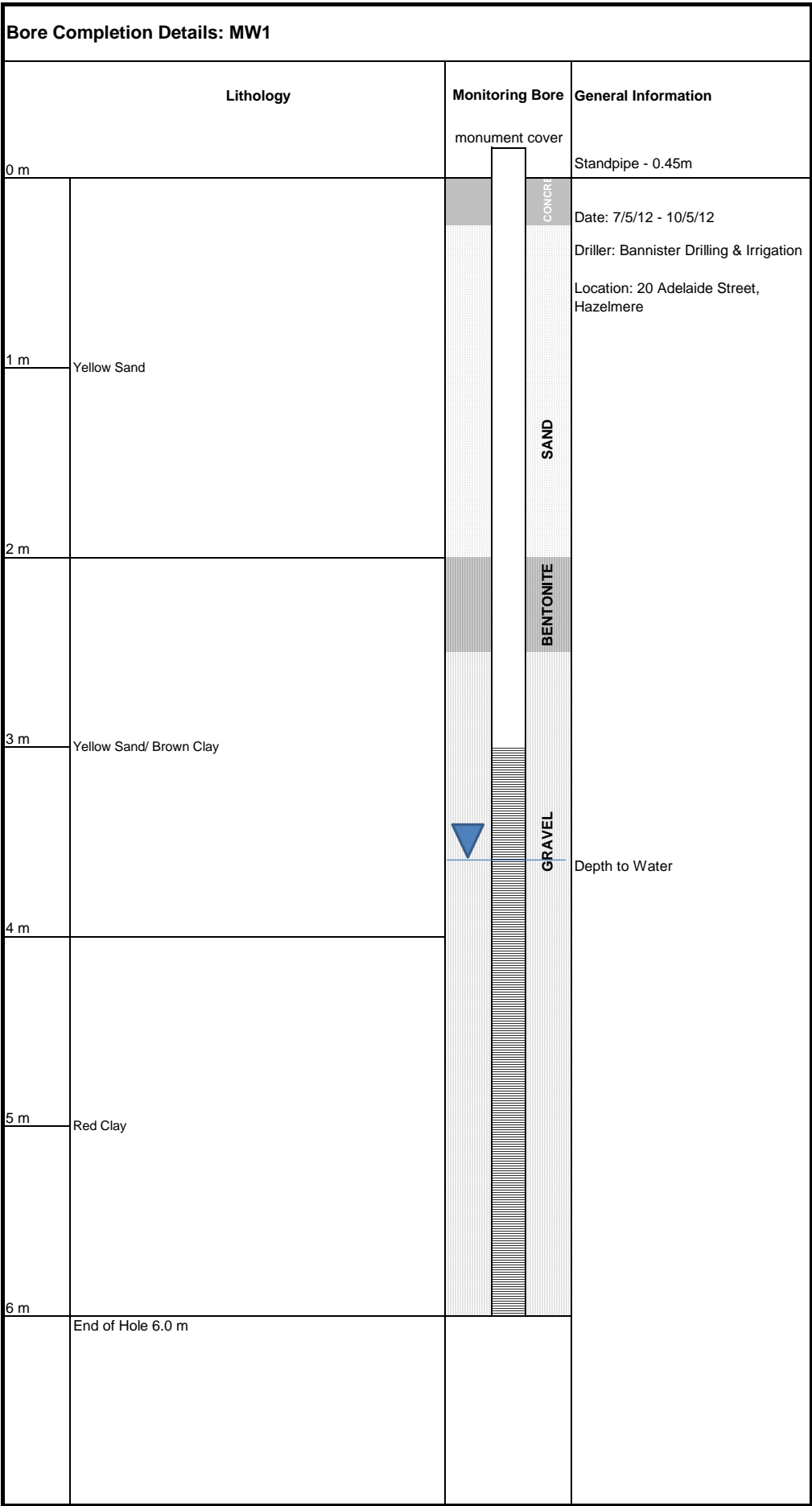
0mts - 3mts	Brown Clay
3mts - 4mts	fine Sand
4mts - 6mts	Coarse Sand
6mts - 11mts	Red Clay

Bore no. 6

0mts - 2.5mts	Brown Clay
2.5mts - 3.5mts	fine Sand
3.5mts - 5mts	Coarse Sand
5mts - 9mts	Red Clay

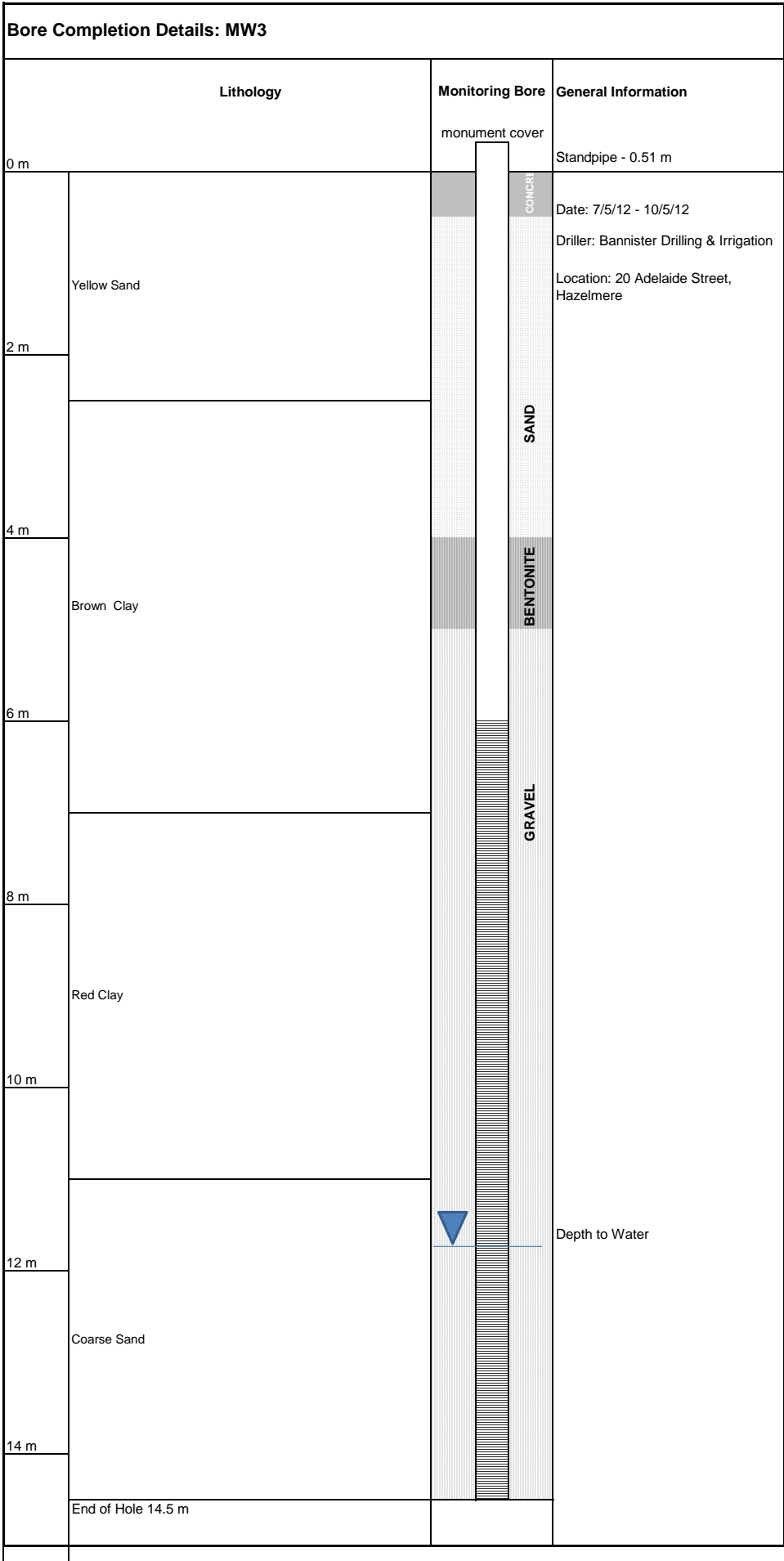
18 DORNOCH WAY CANNINGVALE 6155 PH/FAX 92564460 MOB 0410 422 006

Appendix C Monitoring Well Construction Logs

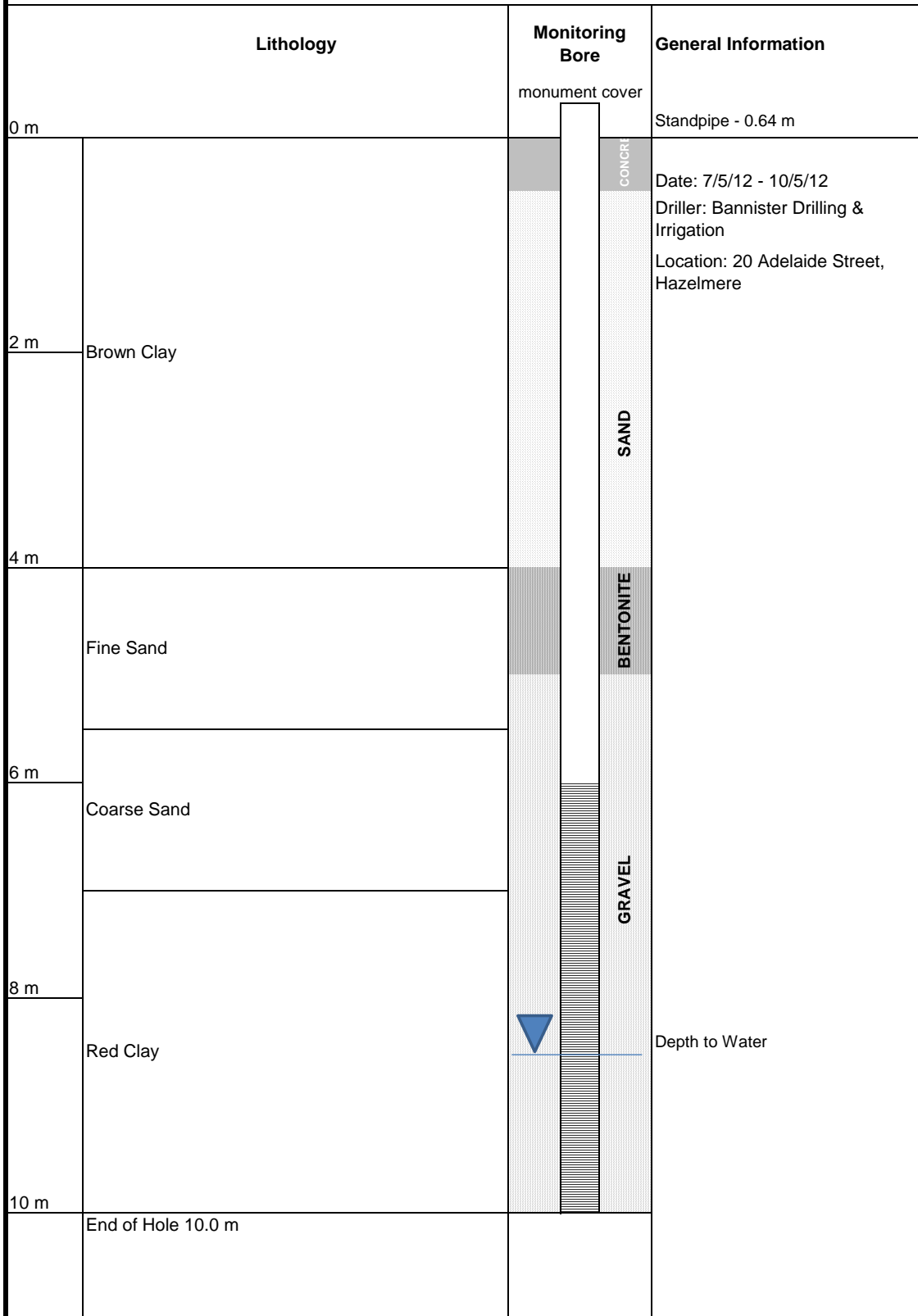


Bore Completion Details: MW2

Lithology		Monitoring Bore	General Information
0 m		monument cover	Standpipe - 0.68 m
2 m	Yellow Sand	CONCRETE	Date: 7/5/12 - 10/5/12 Driller: Bannister Drilling & Irrigation Location: 20 Adelaide Street, Hazelmere
4 m	Red Clay	BENTONITE	
6 m		GRAVEL	
8 m	Coarse Sand		Depth to Water
10 m	End of Hole 9.5 m		

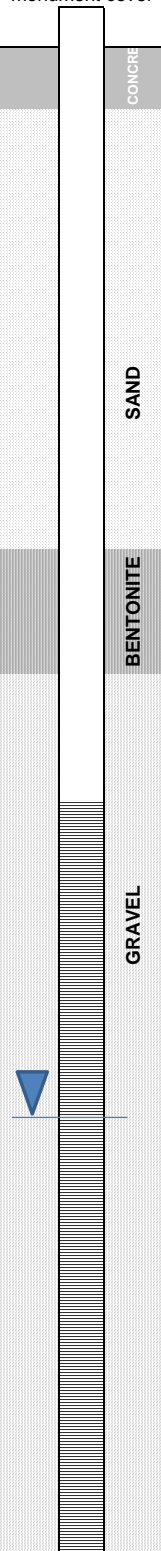


Bore Completion Details: MW4

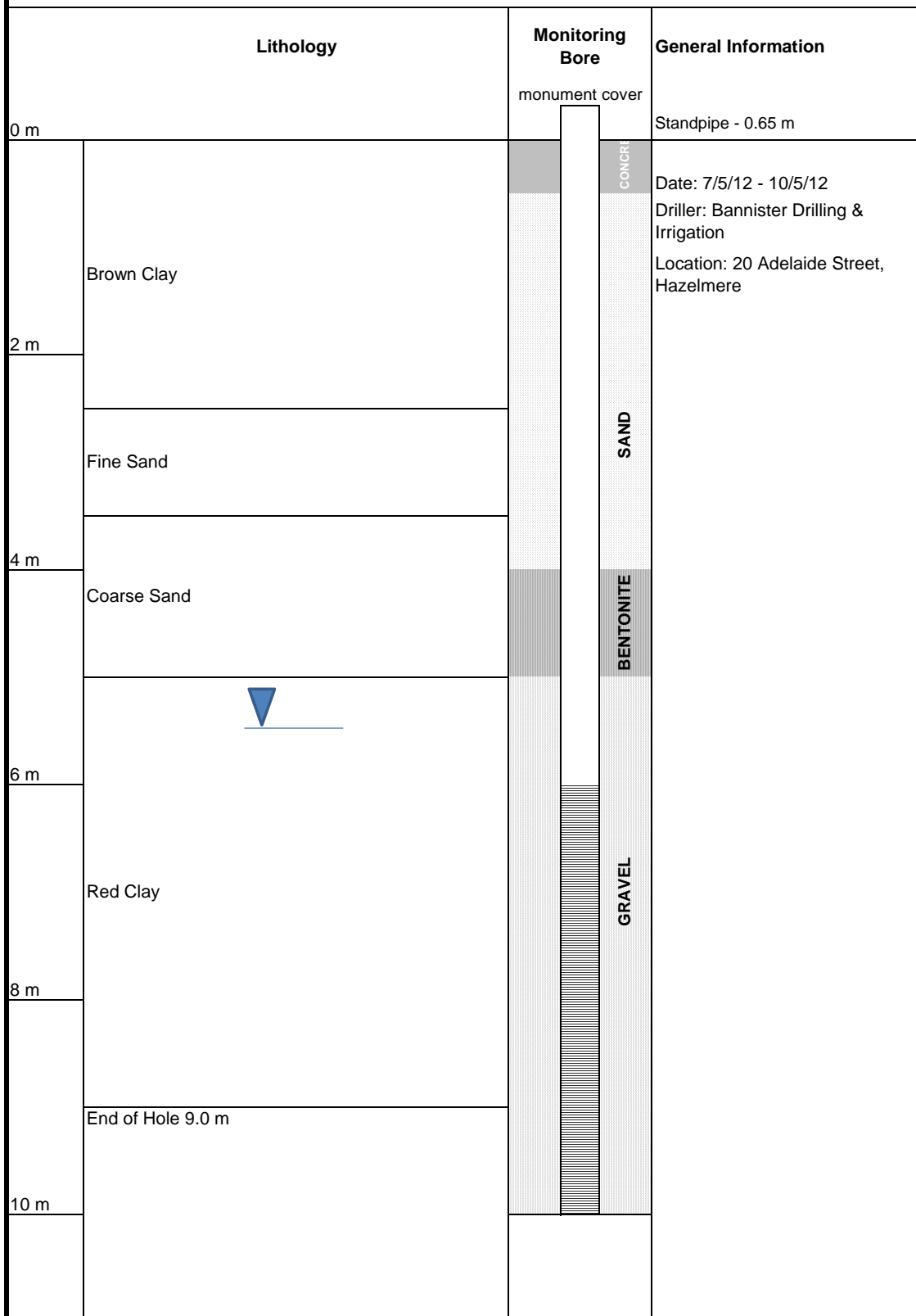


Bore Completion Details: MW5

Lithology		Monitoring Bore	General Information
0 m		monument cover	Standpipe -
2 m	Brown Clay	CONCRETE	Date: 7/5/12 - 10/5/12 Driller: Bannister Drilling & Irrigation Location: 20 Adelaide Street, Hazelmere
4 m	Fine Sand	SAND	
6 m	Coarse Sand	BENTONITE	
8 m	Red Clay	GRAVEL	
10 m			
12 m	End of Hole 11.0 m		



Bore Completion Details: MW6



Appendix D Field Sheets



ENVIRONMENTAL SERVICES

Monitoring Well Field Record

Job #: ⁰³¹ E2012-~~005~~ Client: WASTE-ROCK Location: ADCLAUDE ST

Well ID: MW1 Date: 18/5/12 Sampler: DA/PT

Monitoring Well Information

Depth to Water: 3700 (mm TOC) Depth to Bottom: 6.65 (m)
Standpipe: 0.45 (m) Monument Cover
Lock: None Padlock (YL) Enviro Cap Gatic

Equipment IDs

Water Quality Meter: ECO 451 TTA Kit: Lab Kit
Pump: LOW FLOW TALK Kit: Lab Kit
Dipper: DIPPER-T

Sampling

Sample ID: WR MW1-001 COC No: E20

Time	pH	EC	DO	Temp	Redox	TTA	TALK
1130	5.64	805 805	3.78	23.6	110.2		
1135	5.53	775	0.72	23.6	128.6		
1140	5.37	749	0.46	23.5	157.6		
1145	5.36	748	0.49	23.5	159.5	0.6	0.06
1150							
1155							

Bottles

ASSESSMENT SUITE 2

1 x 1000mL plastic GREEN <input checked="" type="checkbox"/>	2 x 40mL vials MAROON <input checked="" type="checkbox"/>	1 x 500mL plastic GREEN** <input checked="" type="checkbox"/>
1 x 125mL plastic YELLOW <input checked="" type="checkbox"/>	1 x 500mL glass ORANGE <input checked="" type="checkbox"/>	**BRING BACK & FILTER INTO:
1 x 125mL plastic PURPLE <input checked="" type="checkbox"/>	2 x 500mL glass ORANGE <input checked="" type="checkbox"/>	1 x 60mL plastic MAROON <input checked="" type="checkbox"/>
1 x 60mL plastic BLUE <input checked="" type="checkbox"/>	per sample set (Lab Dups) <input checked="" type="checkbox"/>	1 x 60mL plastic RED/GREEN <input checked="" type="checkbox"/>
1 x 60mL plastic RED/GREEN <input checked="" type="checkbox"/>	1 x 500mL plastic GREEN <input checked="" type="checkbox"/>	

Comments

SAMPLE TAKEN FOR MICRO + CYANIDE



ENVIRONMENTAL SERVICES

Monitoring Well Field Record

Job #: _____ Client: WASTE ROCK Location: ADELAIDE ST

Well ID: MW2 Date: 18/5/12 Sampler: DA/PT

Monitoring Well Information

Depth to Water: 7666 (mm TOC) Depth to Bottom: 10443 (m)

Standpipe: 0.68 (m) Monument Cover

Lock: None Padlock (YL) Enviro Cap Gatic

Equipment IDs

Water Quality Meter: ECO451 TTA Kit: _____

Pump: LOW FLOW # TALK Kit: _____

Dipper: DIPPER-T

Sampling

Sample ID: WP MW2-001 COC No: _____

	Time	pH	EC	DO	Temp	Redox	TTA	TALK
0	1033	5.41	349.2	0.74	22.0	90.0		
5	1038	5.10	344.3	0.49	22.1	85.2		
10	1043	5.07	342.6	0.53	22.2	97.5		
15	1048	5.04	342.9	0.54	22.2	125.0		
20	1053	5.03	346.6	0.53	22.0	129.5		
25	1058	5.02	347.4	0.56	22.0	136.0	0.6	0.14

Bottles

ASSESSMENT SUITE 2

1 x 1000mL plastic GREEN <input checked="" type="checkbox"/>	2 x 40mL vials MAROON <input checked="" type="checkbox"/>	1 x 500mL plastic GREEN** <input checked="" type="checkbox"/>
1 x 125mL plastic YELLOW <input checked="" type="checkbox"/>	1 x 500mL glass ORANGE <input checked="" type="checkbox"/>	**BRING BACK & FILTER INTO:
1 x 125mL plastic PURPLE <input checked="" type="checkbox"/>	2 x 500mL glass ORANGE <input checked="" type="checkbox"/>	1 x 60mL plastic MAROON <input checked="" type="checkbox"/>
1 x 60mL plastic BLUE <input checked="" type="checkbox"/>	per sample set (Lab Dups) <input checked="" type="checkbox"/>	1 x 60mL plastic RED/GREEN <input checked="" type="checkbox"/>
1 x 60mL plastic RED/GREEN <input checked="" type="checkbox"/>	1 x 500mL plastic GREEN <input checked="" type="checkbox"/>	

Comments

SAMPLE TAKEN FOR CYANIDE + MICRO.

STANDPIPE SUNK.



ENVIRONMENTAL SERVICES

Monitoring Well Field Record

Job #: _____ Client: WASTE ROCK Location: ADELPHI ST HIGH WYCOMBE

Well ID: MW3 Date: 18/5/12 Sampler: DA/FT

Monitoring Well Information

Depth to Water: 11846 (mm TOC) Depth to Bottom: 14.58 (m)

Standpipe: .51 (m) Monument Cover

Lock: None Padlock (YL) Enviro Cap Gatic

Equipment IDs

Water Quality Meter: EA ~~4000~~ ECO451 TTA Kit: _____

Pump: LOW FLOW TALK Kit: _____

Dipper: DIPPER - T

Sampling

Sample ID: WR MW3 - 001 COC No: _____

Time	pH	EC	DO	Temp	Redox	TTA	TALK
908	6.58	1347	0.56	22.0	118.0 -120.0		
913	6.48	1373	0.73	22.0	-118.0		
918	6.46	1360	0.75	22.0	-110.8		
923	6.48	1308	0.87	21.9	-102.4		
928	6.44	1271	1.21	21.2	-93.8		
931 933	6.46	1274	2.15	21.6	-80.2	0.62	0.03

Bottles

ASSESSMENT SUITE 2

1 x 1000mL plastic GREEN <input checked="" type="checkbox"/>	2 x 40mL vials MAROON <input checked="" type="checkbox"/>	1 x 500mL plastic GREEN** <input checked="" type="checkbox"/>
1 x 125mL plastic YELLOW <input checked="" type="checkbox"/>	1 x 500mL glass ORANGE <input checked="" type="checkbox"/>	**BRING BACK & FILTER INTO:
1 x 125mL plastic PURPLE <input checked="" type="checkbox"/>	2 x 500mL glass ORANGE per sample set (Lab Dups) <input checked="" type="checkbox"/>	1 x 60mL plastic MAROON <input checked="" type="checkbox"/>
1 x 60mL plastic BLUE <input checked="" type="checkbox"/>		1 x 60mL plastic RED/GREEN <input checked="" type="checkbox"/>
1 x 60mL plastic RED/GREEN <input checked="" type="checkbox"/>	1 x 500mL plastic GREEN <input checked="" type="checkbox"/>	

Comments

*SAMPLES TAKEN FOR CYANIDE & MICRO.



ENVIRONMENTAL SERVICES

Monitoring Well Field Record

Job #: _____ Client: WASTE ROCK Location: ADELAIDE ST

Well ID: MW 4 Date: 18/5/12 Sampler: DA/FT

Monitoring Well Information

Depth to Water: 8509 (mm TOC) Depth to Bottom: 11.127 (m)
 Standpipe: 0.1A (m) Monument Cover
 Lock: None Padlock (YL) Enviro Cap Gatic

Equipment IDs

Water Quality Meter: 610431 TTA Kit: _____
 Pump: LOW FLOW TALK Kit: _____
 Dipper: DIPPER-T

Sampling

Sample ID: WR MW4-001 COC No: _____

Time	pH	EC	DO	Temp	Redox	TTA	TALK
6 12:20	4.95	405.4	3.22	22.7	200.1		
5 12:25	4.83	400.6	3.01	22.2	222.4		
10 12:30	4.80	398.5	3.10	22.2	229.4		
15 12:35	4.78	388.9	3.21	22.2	232.9	0.28	0.08

Bottles

ASSESSMENT SUITE 2

1 x 1000mL plastic GREEN <input checked="" type="checkbox"/>	2 x 40mL vials MAROON <input checked="" type="checkbox"/>	1 x 500mL plastic GREEN** <input checked="" type="checkbox"/>
1 x 125mL plastic YELLOW <input checked="" type="checkbox"/>	1 x 500mL glass ORANGE <input checked="" type="checkbox"/>	**BRING BACK & FILTER INTO:
1 x 125mL plastic PURPLE <input checked="" type="checkbox"/>	2 x 500mL glass ORANGE per sample set (Lab Dups) <input checked="" type="checkbox"/>	1 x 60mL plastic MAROON <input checked="" type="checkbox"/>
1 x 60mL plastic BLUE <input checked="" type="checkbox"/>		1 x 60mL plastic RED/GREEN <input checked="" type="checkbox"/>
1 x 60mL plastic RED/GREEN <input checked="" type="checkbox"/>	1 x 500mL plastic GREEN <input checked="" type="checkbox"/>	

Comments

* SAMPLES TAKEN FOR CYANIDE + MICRO
 * DUP + TRIP COMPLETED.



ENVIRONMENTAL SERVICES

Monitoring Well Field Record

Job #: _____ Client: WASTE ROCK Location: ADCLAINE ST

Well ID: MW5 Date: 18/5/12 Sampler: DA/FT

Monitoring Well Information

Depth to Water: 8836 (mm TOC) Depth to Bottom: 12:162 (m)

Standpipe: _____ (m) Monument Cover

Lock: None Padlock (YL) Enviro Cap Gatic

Equipment IDs

Water Quality Meter: ECO 451 TTA Kit: _____

Pump: LOW FLOW TALK Kit: _____

Dipper: DIPPER-T

Sampling

Sample ID: WR MW5-001 COC No: _____

Time	pH	EC	DO	Temp	Redox	TTA	TALK
08 1310	4.85 4.77	513 528	1.33	23.3 23.1	227.3 207.3		
05 1315	4.75	507	0.37	23.1	238.6		
10 1320	4.75	504	0.28	22.8	241.7		
15 1325	4.74	496.2	0.29	22.8	244.0	0.42	0.07

Bottles

ASSESSMENT SUITE 2

1 x 1000mL plastic GREEN <input checked="" type="checkbox"/>	2 x 40mL vials MAROON <input checked="" type="checkbox"/>	1 x 500mL plastic GREEN** <input checked="" type="checkbox"/>
1 x 125mL plastic YELLOW <input checked="" type="checkbox"/>	1 x 500mL glass ORANGE <input checked="" type="checkbox"/>	**BRING BACK & FILTER INTO:
1 x 125mL plastic PURPLE <input checked="" type="checkbox"/>	2 x 500mL glass ORANGE per sample set (Lab Dups) <input checked="" type="checkbox"/>	1 x 60mL plastic MAROON <input checked="" type="checkbox"/>
1 x 60mL plastic BLUE <input checked="" type="checkbox"/>		1 x 60mL plastic RED/GREEN <input checked="" type="checkbox"/>
1 x 60mL plastic RED/GREEN <input checked="" type="checkbox"/>	1 x 500mL plastic GREEN <input checked="" type="checkbox"/>	

Comments

* SAMPLE TAKEN FOR CYANIDE + MICRO.



ENVIRONMENTAL SERVICES

Monitoring Well Field Record

Job #: _____ Client: WASTE ROCK Location: ADELAIDE ST

Well ID: MW6 Date: 18/5/12 Sampler: DA/FT

Monitoring Well Information

Depth to Water: 8759 (mm TOC) Depth to Bottom: 9.895 (m)

Standpipe: 0.647 (m) Monument Cover

Lock: None Padlock (YL) Enviro Cap Gatic

Equipment IDs

Water Quality Meter: ECO TSI TTA Kit: _____

Pump: LOW FLOW TALK Kit: _____

Dipper: DIPPER T

Sampling

Sample ID: WR MW6-001 COC No: _____

Time	pH	EC	DO	Temp	Redox	TTA	TALK
0 1350	4.84	906	1.41	24.3	186		
5 1355	4.83	894	1.05	23.7	187		
10 13 1400	4.83	898	0.93	24.0	189.6		
15 1405	4.84	899	0.74	24.0	191.9	1.76	0.11

Bottles

ASSESSMENT SUITE 2

1 x 1000mL plastic GREEN <input checked="" type="checkbox"/>	2 x 40mL vials MAROON <input checked="" type="checkbox"/>	1 x 500mL plastic GREEN** <input checked="" type="checkbox"/>
1 x 125mL plastic YELLOW <input checked="" type="checkbox"/>	1 x 500mL glass ORANGE <input checked="" type="checkbox"/>	**BRING BACK & FILTER INTO:
1 x 125mL plastic PURPLE <input checked="" type="checkbox"/>	2 x 500mL glass ORANGE per sample set (Lab Dups) <input checked="" type="checkbox"/>	1 x 60mL plastic MAROON <input checked="" type="checkbox"/>
1 x 60mL plastic BLUE <input checked="" type="checkbox"/>		1 x 60mL plastic RED/GREEN <input checked="" type="checkbox"/>
1 x 60mL plastic RED/GREEN <input checked="" type="checkbox"/>	1 x 500mL plastic GREEN <input checked="" type="checkbox"/>	

Comments

* SAMPLES TAKEN FOR CYANIDE + MICRO.

Appendix E Survey Results



REPORT

Midland Survey Services
 3 Victoria Street MIDLAND WA 6056
 Tel: (08) 9374 7777 | Fax: (08) 9374 7799
 E-Mail: survey@midlandsurveys.com.au

DATE	29 th June 2012	FAX No.			
TO	Environmental Services	ATTENTION	Greg Watts		
FROM	Chew Chee Xun	JOB - DOCUMENT No.	11460-W1	REV	0
TOTAL PAGES INCLUDING THIS ONE		1	REPLY REQUIRED		No

HEADING Lot 20 Adelaide Street, Hazelmere

CLIENT ORDER No.

1. Co-ordinates are in metres related to MGA on SSM MV75
2. Levels are in metres related to AHD based on SSM MV75 (RL: 23.0803m)
3. Levels are to **top of PVC pipe within outer casing**
4. Surveyor: **Chew Chee Xun**
5. Date of Survey: **29th June 2012**
6. Field Book Number: **1215**

Name	Easting	Northing	Casing RL(m)
MB1	406504.04	6467036.79	27.281
MB2	406693.90	6466947.24	30.607
MB3	406997.15	6466823.35	34.622
MB4	406617.75	6467311.73	27.751
MB5	406731.40	6467262.78	29.034
MB6	406998.45	6467183.20	31.611

Approved _____
 Training Manager

Important: The attached information is strictly confidential and intended only for the use of the individual or entity named above. If you receive this fax and are not the intended recipient, please contact the sender by telephone (reverse charges if necessary) and return the original message to the above address via Australia Post. Unauthorised accessing, use, or disclosure of the attached information is prohibited.

Appendix F Laboratory Documentation

Site: Hazelland - U20 Adelaide St, Hazelmere

Job #: E2012-031

Sampler: DA + FT

CoC #: E2012-031-001

Quote #:

Laboratory: ALS

Date and time delivered: 18/5/12 1155

Received by: Mr Daburh



ENVIRONMENTAL SERVICES

Mobile Dewatering Environmental

22 Elmsfield Road

Midvale WA 6056

P: 08 9250 6960

F: 08 9250 8269

E: info@environmentalservices.com.au

Comments:

Analysis Detection Limits

Sample ID	Lab ID	Type	Sampling		Assessment Site 2	Cyanide (free state)	Analysis Detection Limits			
			Date	Time						
WRMW1	1	water	18/5	1500						
WRMW2	2	water	18/5							
WRMW3	3	water	18/5							
WRMW4	4	water	18/5							
WRMW5	5	water	18/5							
WRMW6	6	water	18/5							
DUP	7	water	18/5							
FIELD	8	water	18/5							
RINSATE	9	water	18/5							

Environmental Division
Perth

Work Order

EP1203954



Telephone : + 61-8-9209 7655



Environmental Division

SAMPLE RECEIPT NOTIFICATION (SRN)
Comprehensive Report

Work Order : EP1203954

Client	: MOBILE DEWATERING	Laboratory	: Environmental Division Perth
Contact	: INFO	Contact	: Lauren Ockwell
Address	: PO BOX 239 MIDLAND WA, AUSTRALIA 6939	Address	: 10 Hod Way Malaga WA Australia 6090
E-mail	: info@environmentalservices.com.au	E-mail	: lauren.ockwell@alsenviro.com
Telephone	: +61 08 9250 4995	Telephone	: 08 9209 7606
Facsimile	: ----	Facsimile	: 08 9209 7600
Project	: E2012-031	Page	: 1 of 3
Order number	: ----	Quote number	: EP2012MOBDEW0131 (EP/324/12)
C-O-C number	: E2012-031-001	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: Hazelland-LT20 Adelaide St, Ha		
Sampler	: DA+FT		

Dates

Date Samples Received	: 18-MAY-2012	Issue Date	: 21-MAY-2012 08:09
Client Requested Due Date	: 29-MAY-2012	Scheduled Reporting Date	: 29-MAY-2012

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 3.9 - Ice present
No. of coolers/boxes	: 4 medium hard eskies	No. of samples received	: 9
Security Seal	: Intact.	No. of samples analysed	: 9

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- Samples received in appropriately pretreated and preserved containers.
- Please see scanned COC for sample discrepancies: extra samples , samples not received etc.
- Sulphide analysis will be conducted by ALS Environmental, Melbourne, NATA accreditation No. 825, Site No. 13778.
- **Samples received in appropriately pretreated and preserved containers.**
- **pH analysis should be conducted within 6 hours of sampling.**
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (SamplesPerth@alsenviro.com)
- Sample Disposal - Aqueous (14 days), Solid (90 days) from date of completion of Work Order.



Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- No sample container / preservation non-compliance exist.

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **WATER**

Laboratory sample ID Client sampling date / time Client sample ID

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EA005P pH (PC)	WATER - EA010P Conductivity (PC)	WATER - EA015H Total Dissolved Solids - High Level	WATER - EA025H Suspended Solids (High Level)	WATER - EA045 Turbidity	WATER - ED038 Acidity as CaCO3	WATER - EG020F Dissolved Metals by ICPMS	WATER - EG020T Total Recoverable Metals by ICPMS
EP1203954-001	18-MAY-2012 15:00	WRMW1	✓	✓	✓	✓	✓	✓	✓	✓
EP1203954-002	18-MAY-2012 15:00	WRMW2	✓	✓	✓	✓	✓	✓	✓	✓
EP1203954-003	18-MAY-2012 15:00	WRMW3	✓	✓	✓	✓	✓	✓	✓	✓
EP1203954-004	18-MAY-2012 15:00	WRMW4	✓	✓	✓	✓	✓	✓	✓	✓
EP1203954-005	18-MAY-2012 15:00	WRMW5	✓	✓	✓	✓	✓	✓	✓	✓
EP1203954-006	18-MAY-2012 15:00	WRMW6	✓	✓	✓	✓	✓	✓	✓	✓
EP1203954-007	18-MAY-2012 15:00	DUP	✓	✓	✓	✓	✓	✓	✓	✓
EP1203954-008	18-MAY-2012 15:00	FIELD	✓	✓	✓	✓	✓	✓	✓	✓
EP1203954-009	18-MAY-2012 15:00	RINSATE	✓	✓	✓	✓	✓	✓	✓	✓

Matrix: **WATER**

Laboratory sample ID Client sampling date / time Client sample ID

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EG035T Total Mercury by FIMS	WATER - EG050G-F Hexavalent Chromium by Discrete Analyser - Filtered	WATER - EG051G Ferrous Iron by Discrete Analyser	WATER - EK025G Free CN By Discrete Analyser	WATER - EK026G Total Cyanide by Discrete Analyser	WATER - EK085M Sulfide as S 2-	WATER - EP026ST COD- Sealed Tube	WATER - EP030 BOD
EP1203954-001	18-MAY-2012 15:00	WRMW1	✓	✓	✓	✓	✓	✓	✓	✓
EP1203954-002	18-MAY-2012 15:00	WRMW2	✓	✓	✓	✓	✓	✓	✓	✓
EP1203954-003	18-MAY-2012 15:00	WRMW3	✓	✓	✓	✓	✓	✓	✓	✓
EP1203954-004	18-MAY-2012 15:00	WRMW4	✓	✓	✓	✓	✓	✓	✓	✓
EP1203954-005	18-MAY-2012 15:00	WRMW5	✓	✓	✓	✓	✓	✓	✓	✓
EP1203954-006	18-MAY-2012 15:00	WRMW6	✓	✓	✓	✓	✓	✓	✓	✓
EP1203954-007	18-MAY-2012 15:00	DUP	✓	✓	✓	✓	✓	✓	✓	✓
EP1203954-008	18-MAY-2012 15:00	FIELD	✓	✓	✓	✓	✓	✓	✓	✓
EP1203954-009	18-MAY-2012 15:00	RINSATE	✓	✓	✓	✓	✓	✓	✓	✓



Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)	WATER - NT-08A Total Nitrogen + NO2 + NO3 + NH3 + Total P + Reactive P	WATER - W-09 TPH/VOC	WATER - W-12 OC/OP Pesticides	WATER - W-14A PAH/Phenols (SIM)
EP1203954-001	18-MAY-2012 15:00	WRMW1	✓	✓	✓	✓	✓
EP1203954-002	18-MAY-2012 15:00	WRMW2	✓	✓	✓	✓	✓
EP1203954-003	18-MAY-2012 15:00	WRMW3	✓	✓	✓	✓	✓
EP1203954-004	18-MAY-2012 15:00	WRMW4	✓	✓	✓	✓	✓
EP1203954-005	18-MAY-2012 15:00	WRMW5	✓	✓	✓	✓	✓
EP1203954-006	18-MAY-2012 15:00	WRMW6	✓	✓	✓	✓	✓
EP1203954-007	18-MAY-2012 15:00	DUP	✓	✓	✓	✓	✓
EP1203954-008	18-MAY-2012 15:00	FIELD	✓	✓	✓	✓	✓
EP1203954-009	18-MAY-2012 15:00	RINSATE	✓	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ACCOUNTS PAYABLE (WA)

- A4 - AU Tax Invoice (INV)

Email deb@mobiledewatering.com.au

INFO

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- Chain of Custody (CoC) (COC)
- EDI Format - ENMRG (ENMRG)
- EDI Format - ESDAT (ESDAT)
- EDI Format - XTab (XTAB)

Email info@environmentalservices.com.au
Email info@environmentalservices.com.au
Email info@environmentalservices.com.au
Email info@environmentalservices.com.au
Email info@environmentalservices.com.au
Email info@environmentalservices.com.au
Email info@environmentalservices.com.au



Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EP1203954	Page	: 1 of 18
Client	: MOBILE DEWATERING	Laboratory	: Environmental Division Perth
Contact	: INFO	Contact	: Lauren Ockwell
Address	: PO BOX 239	Address	: 10 Hod Way Malaga WA Australia 6090
	MIDLAND WA, AUSTRALIA 6939		
E-mail	: info@environmentalservices.com.au	E-mail	: lauren.ockwell@alsenviro.com
Telephone	: +61 08 9250 4995	Telephone	: 08 9209 7606
Facsimile	: ----	Facsimile	: 08 9209 7600
Project	: E2012-031	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: E2012-031-001	Date Samples Received	: 18-MAY-2012
Sampler	: D.A+F.T	Issue Date	: 30-MAY-2012
Site	: Hazelland-LT20 Adelaide St, Ha		
Quote number	: EP/324/12	No. of samples received	: 9
		No. of samples analysed	: 9

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Agnes Szilagyi	Senior Organic Chemist	Perth Organics
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Canhuang Ke	Metals Instrument Chemist	Perth Inorganics
Chas Tucker	Inorganic Chemist	Perth Inorganics
Cicelia Bartels	Metals Instrument Chemist	Perth Inorganics
Herman Lin	Laboratory Coordinator	Melbourne Inorganics
Sarah Millington	Senior Inorganic Chemist	Sydney Inorganics

Environmental Division Perth
Part of the **ALS Laboratory Group**

10 Hod Way Malaga WA Australia 6090

Tel. **+61-8-9209 7655** Fax. +61-8-9209 7600 www.alsglobal.com

A Campbell Brothers Limited Company





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 sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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

- **EK025G: Poor matrix spike recoveries due to matrix effects.**
- **EP068: DEF surrogate recoveries for various samples fall outside ALS dynamic control limits. However, they are within the acceptance criteria based on standard USEPA 8270 limits. No further action is required.**
- **EP075(sim): Various LCS analytes fall outside ALS dynamic control limits. However, they are within the acceptance criteria based on standard USEPA 8270 limits. No further action is required.**
- **It has been noted that Ammonia is greater than Total Kjeldahl Nitrogen for sample 'WRMW6', however this difference is within the limits of experimental variation.**
- **Sulphide analysis conducted by ALS Melbourne, NATA accreditation no. 825, site no 13778**



Analytical Results

Sub-Matrix: WATER

				Client sample ID				
				WRMW1	WRMW2	WRMW3	WRMW4	WRMW5
				18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00
				Client sampling date / time	Client sampling date / time	Client sampling date / time	Client sampling date / time	Client sampling date / time
Compound	CAS Number	LOR	Unit	EP1203954-001	EP1203954-002	EP1203954-003	EP1203954-004	EP1203954-005
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	6.58	6.14	7.41	6.04	5.86
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	635	307	1070	354	449
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	GIS-210-010	10	mg/L	434	244	704	226	341
EA025: Suspended Solids								
Suspended Solids (SS)	----	5	mg/L	582	292	425	144	59
EA045: Turbidity								
Turbidity	----	0.1	NTU	166	236	383	86.9	137
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	43	17	292	5	5
Total Alkalinity as CaCO3	----	1	mg/L	43	17	292	5	5
ED038A: Acidity								
Acidity as CaCO3	----	1	mg/L	15	26	16	8	13
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	105	13	40	17	19
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	134	80	216	89	132
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.04	0.02	<0.01	0.02	0.19
Arsenic	7440-38-2	0.001	mg/L	<0.001	0.001	0.004	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	0.005	0.022	0.182	0.013	0.010
Nickel	7440-02-0	0.001	mg/L	<0.001	0.002	0.001	<0.001	0.001
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L	0.005	0.048	0.005	0.010	0.008
Iron	7439-89-6	0.05	mg/L	<0.05	0.68	2.16	0.11	0.08
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	11.1	16.2	34.4	4.30	10.0
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.010	0.001	0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	0.007	0.016	0.047	0.004	0.005
Copper	7440-50-8	0.001	mg/L	0.004	0.070	0.032	0.005	0.005



Analytical Results

Sub-Matrix: WATER

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	WRMW1	WRMW2	WRMW3	WRMW4	WRMW5
				18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00
				EP1203954-001	EP1203954-002	EP1203954-003	EP1203954-004	EP1203954-005
EG020T: Total Metals by ICP-MS - Continued								
Lead	7439-92-1	0.001	mg/L	0.013	0.017	0.087	0.011	0.015
Manganese	7439-96-5	0.001	mg/L	0.006	0.026	0.191	0.016	0.010
Molybdenum	7439-98-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L	0.002	0.005	0.014	0.001	0.003
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	7440-66-6	0.005	mg/L	0.008	0.080	0.068	0.017	0.011
Iron	7439-89-6	0.05	mg/L	0.29	4.82	11.9	0.88	0.49
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	0.0001	0.0001	<0.0001	<0.0001	<0.0001
EG050F: Dissolved Hexavalent Chromium								
Hexavalent Chromium	18540-29-9	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
EG051G: Ferrous Iron by Discrete Analyser								
Ferrous Iron	----	0.05	mg/L	<0.05	0.43	2.28	<0.05	<0.05
EK025G: Free cyanide by Discrete Analyser								
Free Cyanide	----	0.004	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
EK026G: Total Cyanide By Discrete Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.06	0.36	0.03	0.11	0.01
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	----	0.01	mg/L	0.03	0.02	<0.01	0.01	0.04
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	5.15	0.62	0.17	3.75	0.45
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	5.18	0.64	0.17	3.76	0.49
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.5	0.5	0.3	0.5	0.1
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
Total Nitrogen as N	----	0.1	mg/L	5.7	1.1	0.5	4.3	0.6
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.01	0.15	0.24	0.04	0.02
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK085M: Sulfide as S2-								
Sulfide as S2-	18496-25-8	0.1	mg/L	0.1	<0.1	<0.1	<0.1	<0.1



Analytical Results

Sub-Matrix: WATER

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	WRMW1	WRMW2	WRMW3	WRMW4	WRMW5
				18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00
				EP1203954-001	EP1203954-002	EP1203954-003	EP1203954-004	EP1203954-005
EP026ST: Chemical Oxygen Demand (Sealed Tube)								
Chemical Oxygen Demand	----	5	mg/L	18	16	155	11	9
EP030: Biochemical Oxygen Demand (BOD)								
Biochemical Oxygen Demand	----	2	mg/L	<2	3	69	4	3
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
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	<2	<2	<2	<2
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	<2	<2	<2	<2
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	<2	<2	<2	<2
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	<2	<2	<2	<2
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	<2	<2	<2	<2
Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5



Analytical Results

Sub-Matrix: WATER

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	WRMW1	WRMW2	WRMW3	WRMW4	WRMW5
				18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00
				EP1203954-001	EP1203954-002	EP1203954-003	EP1203954-004	EP1203954-005
EP068B: Organophosphorus Pesticides (OP) - Continued								
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
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



Analytical Results

Sub-Matrix: WATER

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	WRMW1	WRMW2	WRMW3	WRMW4	WRMW5
				18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00
				EP1203954-001	EP1203954-002	EP1203954-003	EP1203954-004	EP1203954-005
EP074E: Halogenated Aliphatic Compounds - Continued								
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
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	12	20
Bromoform	75-25-2	5	µg/L	<5	<5	<5	13	22

EP075(SIM)A: Phenolic Compounds



Analytical Results

Sub-Matrix: WATER

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	WRMW1	WRMW2	WRMW3	WRMW4	WRMW5
				18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00
				EP1203954-001	EP1203954-002	EP1203954-003	EP1203954-004	EP1203954-005
EP075(SIM)A: Phenolic Compounds - Continued								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	2.6	<2.0	<2.0	<2.0
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-Methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	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	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
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	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	270	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	270	<50	<50
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	68.5	53.4	58.3	65.7	56.5
EP068T: Organophosphorus Pesticide Surrogate								



Analytical Results

Sub-Matrix: WATER

Client sample ID

Client sampling date / time

				WRMW1	WRMW2	WRMW3	WRMW4	WRMW5
				18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00
Compound	CAS Number	LOR	Unit	EP1203954-001	EP1203954-002	EP1203954-003	EP1203954-004	EP1203954-005
EP068T: Organophosphorus Pesticide Surrogate - Continued								
DEF	78-48-8	0.1	%	22.9	17.3	24.6	20.6	17.7
EP074S: VOC Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	98.6	101	101	100	100
Toluene-D8	2037-26-5	0.1	%	98.8	97.5	97.6	98.7	97.6
4-Bromofluorobenzene	460-00-4	0.1	%	94.4	93.1	96.1	91.8	91.3
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	21.6	21.7	20.2	22.7	21.7
2-Chlorophenol-D4	93951-73-6	0.1	%	54.0	49.3	46.9	55.9	49.0
2,4,6-Tribromophenol	118-79-6	0.1	%	84.1	59.1	70.5	74.3	75.2
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	72.9	62.8	50.3	61.1	58.1
Anthracene-d10	1719-06-8	0.1	%	91.8	82.9	74.7	82.3	82.6
4-Terphenyl-d14	1718-51-0	0.1	%	96.9	103	74.9	78.0	77.9
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	96.9	98.5	99.0	97.8	98.3
Toluene-D8	2037-26-5	0.1	%	102	102	101	103	101
4-Bromofluorobenzene	460-00-4	0.1	%	95.8	96.0	98.3	94.8	96.5



Analytical Results

Sub-Matrix: WATER

				Client sample ID				
				WRMW6	DUP	FIELD	RINSATE	----
				18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	----
				Client sampling date / time				
Compound	CAS Number	LOR	Unit	EP1203954-006	EP1203954-007	EP1203954-008	EP1203954-009	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	5.83	5.88	5.70	5.70	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	808	334	1	<1	----
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	GIS-210-010	10	mg/L	492	194	<10	<10	----
EA025: Suspended Solids								
Suspended Solids (SS)	----	5	mg/L	50	34	<5	<5	----
EA045: Turbidity								
Turbidity	----	0.1	NTU	76.6	20.8	0.1	<0.1	----
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	38	4	<1	<1	----
Total Alkalinity as CaCO3	----	1	mg/L	38	4	<1	<1	----
ED038A: Acidity								
Acidity as CaCO3	----	1	mg/L	22	8	5	<1	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	173	16	<1	<1	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	124	84	1	<1	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.01	0.05	<0.01	<0.01	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Manganese	7439-96-5	0.001	mg/L	0.035	0.010	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	0.001	<0.001	<0.001	0.002	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Zinc	7440-66-6	0.005	mg/L	0.010	0.010	<0.005	0.047	----
Iron	7439-89-6	0.05	mg/L	1.42	0.09	<0.05	<0.05	----
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.74	2.34	<0.01	<0.01	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	0.002	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	0.002	0.003	0.004	0.004	----



Analytical Results

Sub-Matrix: WATER

				Client sample ID	WRMW6	DUP	FIELD	RINSATE	----
				Client sampling date / time	18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	----
Compound	CAS Number	LOR	Unit		EP1203954-006	EP1203954-007	EP1203954-008	EP1203954-009	----
EG020T: Total Metals by ICP-MS - Continued									
Lead	7439-92-1	0.001	mg/L		0.007	0.006	<0.001	<0.001	----
Manganese	7439-96-5	0.001	mg/L		0.034	0.012	<0.001	<0.001	----
Molybdenum	7439-98-7	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L		0.002	<0.001	<0.001	0.002	----
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	----
Silver	7440-22-4	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L		0.012	0.013	<0.005	0.045	----
Iron	7439-89-6	0.05	mg/L		10.4	0.51	<0.05	<0.05	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	----
EG050F: Dissolved Hexavalent Chromium									
Hexavalent Chromium	18540-29-9	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	----
EG051G: Ferrous Iron by Discrete Analyser									
Ferrous Iron	----	0.05	mg/L		0.35	0.05	<0.05	<0.05	----
EK025G: Free cyanide by Discrete Analyser									
Free Cyanide	----	0.004	mg/L		<0.004	<0.004	<0.004	<0.004	----
EK026G: Total Cyanide By Discrete Analyser									
Total Cyanide	57-12-5	0.004	mg/L		<0.004	<0.004	<0.004	<0.004	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		1.64	0.12	0.01	<0.01	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	----	0.01	mg/L		0.05	0.01	<0.01	<0.01	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		0.17	3.79	<0.01	<0.01	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		0.22	3.80	<0.01	<0.01	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		1.6	0.7	<0.1	<0.1	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
Total Nitrogen as N	----	0.1	mg/L		1.8	4.5	<0.1	<0.1	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		0.03	0.04	0.01	<0.01	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	----	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	----
EK085M: Sulfide as S2-									
Sulfide as S2-	18496-25-8	0.1	mg/L		<0.1	<0.1	<0.1	<0.1	----



Analytical Results

Sub-Matrix: WATER

Client sample ID

Client sampling date / time

				WRMW6	DUP	FIELD	RINSATE	----
				18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	----
Compound	CAS Number	LOR	Unit	EP1203954-006	EP1203954-007	EP1203954-008	EP1203954-009	----
EP026ST: Chemical Oxygen Demand (Sealed Tube)								
Chemical Oxygen Demand	----	5	mg/L	25	13	<5	<5	----
EP030: Biochemical Oxygen Demand (BOD)								
Biochemical Oxygen Demand	----	2	mg/L	26	7	4	3	----
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	----
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	<2	<2	<2	----
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	<2	<2	<2	----
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	<2	<2	<2	----
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	<2	<2	<2	----
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	<2	<2	<2	----
Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----



Analytical Results

Sub-Matrix: WATER

Client sample ID

Client sampling date / time

				WRMW6	DUP	FIELD	RINSATE	----
				18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	----
Compound	CAS Number	LOR	Unit	EP1203954-006	EP1203954-007	EP1203954-008	EP1203954-009	----
EP068B: Organophosphorus Pesticides (OP) - Continued								
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	----
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	----



Analytical Results

Sub-Matrix: WATER

Client sample ID

Client sampling date / time

				WRMW6	DUP	FIELD	RINSATE	----
				18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	----
Compound	CAS Number	LOR	Unit	EP1203954-006	EP1203954-007	EP1203954-008	EP1203954-009	----
EP074E: Halogenated Aliphatic Compounds - Continued								
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	----
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	11	<5	<5	----
Bromoform	75-25-2	5	µg/L	<5	15	<5	<5	----

EP075(SIM)A: Phenolic Compounds



Analytical Results

Sub-Matrix: WATER

Client sample ID

Client sampling date / time

				WRMW6	DUP	FIELD	RINSATE	----
				18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	----
Compound	CAS Number	LOR	Unit	EP1203954-006	EP1203954-007	EP1203954-008	EP1203954-009	----
EP075(SIM)A: Phenolic Compounds - Continued								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	----
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
4-Chloro-3-Methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(k)fluoranthene	207-08-9	1.0	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	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	----
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	µg/L	260	<100	<100	<100	----
C29 - C36 Fraction	----	50	µg/L	60	<50	<50	<50	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	320	<50	<50	<50	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	69.0	73.7	51.9	69.1	----
EP068T: Organophosphorus Pesticide Surrogate								



Analytical Results

Sub-Matrix: WATER

Client sample ID

Client sampling date / time

				WRMW6	DUP	FIELD	RINSATE	----
				18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	18-MAY-2012 15:00	----
Compound	CAS Number	LOR	Unit	EP1203954-006	EP1203954-007	EP1203954-008	EP1203954-009	----
EP068T: Organophosphorus Pesticide Surrogate - Continued								
DEF	78-48-8	0.1	%	34.6	23.6	14.6	21.1	----
EP074S: VOC Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	101	99.2	102	101	----
Toluene-D8	2037-26-5	0.1	%	96.5	99.2	95.2	98.2	----
4-Bromofluorobenzene	460-00-4	0.1	%	91.2	94.6	91.1	92.4	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	23.5	26.4	19.0	25.6	----
2-Chlorophenol-D4	93951-73-6	0.1	%	56.8	61.5	43.9	58.4	----
2,4,6-Tribromophenol	118-79-6	0.1	%	89.3	89.4	59.5	61.9	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	72.8	73.6	56.1	75.0	----
Anthracene-d10	1719-06-8	0.1	%	89.2	91.2	71.5	83.6	----
4-Terphenyl-d14	1718-51-0	0.1	%	93.3	88.9	69.2	83.3	----
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	99.2	97.1	100	101	----
Toluene-D8	2037-26-5	0.1	%	101	103	100	102	----
4-Bromofluorobenzene	460-00-4	0.1	%	94.7	95.9	93.7	93.0	----



Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	50.0	146.3
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	26.8	153.4
EP074S: VOC Surrogates			
1,2-Dichloroethane-D4	17060-07-0	62.3	133.9
Toluene-D8	2037-26-5	74.5	124.3
4-Bromofluorobenzene	460-00-4	63.9	118.5
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10.0	67.2
2-Chlorophenol-D4	93951-73-6	29.4	119.5
2,4,6-Tribromophenol	118-79-6	10.0	130.8
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	33.8	130.7
Anthracene-d10	1719-06-8	42.7	126.5
4-Terphenyl-d14	1718-51-0	40.5	142.4
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	60.5	141.2
Toluene-D8	2037-26-5	73.4	126
4-Bromofluorobenzene	460-00-4	59.6	125.3



Environmental Division

QUALITY CONTROL REPORT

Work Order	: EP1203954	Page	: 1 of 16
Client	: MOBILE DEWATERING	Laboratory	: Environmental Division Perth
Contact	: INFO	Contact	: Lauren Ockwell
Address	: PO BOX 239 MIDLAND WA, AUSTRALIA 6939	Address	: 10 Hod Way Malaga WA Australia 6090
E-mail	: info@environmentalservices.com.au	E-mail	: lauren.ockwell@alsenviro.com
Telephone	: +61 08 9250 4995	Telephone	: 08 9209 7606
Facsimile	: ----	Facsimile	: 08 9209 7600
Project	: E2012-031	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: Hazelland-LT20 Adelaide St, Ha	Date Samples Received	: 18-MAY-2012
C-O-C number	: E2012-031-001	Issue Date	: 30-MAY-2012
Sampler	: D.A+F.T	No. of samples received	: 9
Order number	: ----	No. of samples analysed	: 9
Quote number	: EP/324/12		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

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



NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Agnes Szilagyi	Senior Organic Chemist	Perth Organics
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Canhuang Ke	Metals Instrument Chemist	Perth Inorganics
Chas Tucker	Inorganic Chemist	Perth Inorganics
Cicelia Bartels	Metals Instrument Chemist	Perth Inorganics
Herman Lin	Laboratory Coordinator	Melbourne Inorganics
Sarah Millington	Senior Inorganic Chemist	Sydney Inorganics



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.

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 (%)
EA005P: pH by PC Titrator (QC Lot: 2314149)									
EP1203946-003	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.99	8.01	0.2	0% - 20%
EP1203946-012	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	5.46	5.44	0.4	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 2314152)									
EP1203954-003	WRMW3	EA005-P: pH Value	----	0.01	pH Unit	7.41	7.45	0.5	0% - 20%
EP1203955-003	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	6.49	6.55	0.9	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 2314148)									
EP1203946-003	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1130	1140	1.1	0% - 20%
EP1203946-012	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	90100	90400	0.4	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 2314151)									
EP1203954-003	WRMW3	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1070	1120	4.2	0% - 20%
EP1203955-003	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1020	1020	0.3	0% - 20%
EA015: Total Dissolved Solids (QC Lot: 2321314)									
EP1203954-001	WRMW1	EA015H: Total Dissolved Solids @180°C	GIS-210-010	10	mg/L	434	458	5.4	0% - 20%
EP1203954-009	RINSATE	EA015H: Total Dissolved Solids @180°C	GIS-210-010	10	mg/L	<10	<10	0.0	No Limit
EA025: Suspended Solids (QC Lot: 2315144)									
EP1203951-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	75	83	10.1	0% - 50%
EP1203954-008	FIELD	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
EA045: Turbidity (QC Lot: 2315356)									
EP1203951-001	Anonymous	EA045: Turbidity	----	0.1	NTU	66.7	65.4	2.0	0% - 20%
EP1203954-008	FIELD	EA045: Turbidity	----	0.1	NTU	0.1	0.1	0.0	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 2314150)									
EP1203954-003	WRMW3	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	292	293	0.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	292	293	0.3	0% - 20%
EP1203955-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	54	50	8.8	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	54	50	8.8	0% - 20%
ED038A: Acidity (QC Lot: 2327559)									
EP1203954-001	WRMW1	ED038: Acidity as CaCO3	----	1	mg/L	15	15	0.0	0% - 50%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 2314584)									
EP1203951-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	74	74	0.0	0% - 20%
EP1203954-008	FIELD	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	0.0	No Limit



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 (%)
ED045G: Chloride Discrete analyser (QC Lot: 2314583)									
EP1203951-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	658	655	0.4	0% - 20%
EP1203954-008	FIELD	ED045G: Chloride	16887-00-6	1	mg/L	1	1	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2320962)									
EP1203954-001	WRMW1	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.005	0.005	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.005	0.006	0.0	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.04	0.04	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP1203999-002	Anonymous	EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.192	0.193	0.0	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP1203954-001	WRMW1	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.007	0.006	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.013	0.013	0.0	0% - 50%
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.006	0.007	0.0	No Limit
		EG020A-T: Molybdenum	7439-98-7	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.008	0.008	0.0	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	11.1	9.81	12.8	0% - 20%
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.29	0.27	9.4	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 2318676)									
EG020T: Total Metals by ICP-MS (QC Lot: 2318677)									
EP1203954-001	WRMW1	EG020B-T: Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2319271)									
EP1203954-001	WRMW1	EG035T: Mercury	7439-97-6	0.0001	mg/L	0.0001	0.0001	0.0	No Limit
EG050F: Dissolved Hexavalent Chromium (QC Lot: 2326861)									

Page : 5 of 16
 Work Order : EP1203954
 Client : MOBILE DEWATERING
 Project : E2012-031



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 (%)
EG050F: Dissolved Hexavalent Chromium (QC Lot: 2326861) - continued									
EP1203954-001	WRMW1	EG050G-F: Hexavalent Chromium	18540-29-9	0.010	mg/L	0.025	<0.010	85.4	No Limit
EP1204000-001	Anonymous	EG050G-F: Hexavalent Chromium	18540-29-9	0.010	mg/L	<0.010	<0.010	0.0	No Limit
EG051G: Ferrous Iron by Discrete Analyser (QC Lot: 2319446)									
EP1203954-001	WRMW1	EG051G: Ferrous Iron	----	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EP1204008-001	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EK025G: Free cyanide by Discrete Analyser (QC Lot: 2331081)									
EP1203954-001	WRMW1	EK025G: Free Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK026G: Total Cyanide By Discrete Analyser (QC Lot: 2327991)									
EP1203954-001	WRMW1	EK026G: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EP1204025-002	Anonymous	EK026G: Total Cyanide	57-12-5	0.004	mg/L	0.596	0.542	9.5	0% - 20%
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 2314730)									
EP1203954-001	WRMW1	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.06	0.08	17.0	No Limit
EP1203955-002	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.02	0.02	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 2314581)									
EP1203951-001	Anonymous	EK057G: Nitrite as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP1203954-008	FIELD	EK057G: Nitrite as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 2314729)									
EP1203954-001	WRMW1	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	5.18	5.20	0.4	0% - 20%
EP1203955-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	1.28	1.28	0.0	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 2313580)									
EP1203876-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.6	1.3	22.4	0% - 50%
EP1203901-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.1	1.1	0.0	0% - 50%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 2313582)									
EP1203954-003	WRMW3	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.3	0.3	0.0	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 2313581)									
EP1203954-003	WRMW3	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.24	0.23	0.0	0% - 20%
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 2314582)									
EP1203951-001	Anonymous	EK071G: Reactive Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP1203954-008	FIELD	EK071G: Reactive Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK085M: Sulfide as S2- (QC Lot: 2320626)									
EP1203936-001	Anonymous	EK085: Sulfide as S2-	18496-25-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EP1203954-004	WRMW4	EK085: Sulfide as S2-	18496-25-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EP026ST: Chemical Oxygen Demand (Sealed Tube) (QC Lot: 2317977)									
EP1203954-001	WRMW1	EP026ST: Chemical Oxygen Demand	----	5	mg/L	18	18	0.0	No Limit
ES1212225-011	Anonymous	EP026ST: Chemical Oxygen Demand	----	5	mg/L	11	11	0.0	No Limit
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 2319873)									
EP1203954-001	WRMW1	EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	4	62.1	No Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 2313529)									



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 (%)
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 2313529) - continued									
EP1203954-001	WRMW1	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
EP074B: Oxygenated Compounds (QC Lot: 2313529)									
EP1203954-001	WRMW1	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
EP074C: Sulfonated Compounds (QC Lot: 2313529)									
EP1203954-001	WRMW1	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
EP074D: Fumigants (QC Lot: 2313529)									
EP1203954-001	WRMW1	EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 2313529)									
EP1203954-001	WRMW1	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit



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 (%)
EP074E: Halogenated Aliphatic Compounds (QC Lot: 2313529) - continued									
EP1203954-001	WRMW1	EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 2313529)									
EP1203954-001	WRMW1	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
EP074G: Trihalomethanes (QC Lot: 2313529)									
EP1203954-001	WRMW1	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2313530)									
EP1203954-001	WRMW1	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	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 Sample (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 Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Low			High	
EA005P: pH by PC Titrator (QCLot: 2314149)								
EA005-P: pH Value	----	0.01	pH Unit	----	7.00 pH Unit	100	70	130
EA005P: pH by PC Titrator (QCLot: 2314152)								
EA005-P: pH Value	----	0.01	pH Unit	----	7.00 pH Unit	100	70	130
EA010P: Conductivity by PC Titrator (QCLot: 2314148)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	4000 µS/cm	101	93.2	107
EA010P: Conductivity by PC Titrator (QCLot: 2314151)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	4000 µS/cm	98.4	93.2	107
EA015: Total Dissolved Solids (QCLot: 2321314)								
EA015H: Total Dissolved Solids @180°C	GIS-210-010	10	mg/L	<10	2000 mg/L	101	79.8	116
EA025: Suspended Solids (QCLot: 2315144)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	104	82	122
EA045: Turbidity (QCLot: 2315356)								
EA045: Turbidity	----	0.1	NTU	<0.1	40 NTU	99.0	90.1	107
ED037P: Alkalinity by PC Titrator (QCLot: 2314150)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-00 1	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	200 mg/L	106	87	109
ED038A: Acidity (QCLot: 2327559)								
ED038: Acidity as CaCO3	----	1	mg/L	----	20 mg/L	108	85	119
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2314584)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	91.0	85	130
ED045G: Chloride Discrete analyser (QCLot: 2314583)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	93.4	78	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 2320962)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.50 mg/L	99.1	77	113
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.100 mg/L	94.6	79	111
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1000 mg/L	104	81	109
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.100 mg/L	98.6	81	109
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.100 mg/L	101	79	109
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.100 mg/L	93.7	79	109
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.10 mg/L	89.3	80	112



Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 2320962) - continued								
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.100 mg/L	101	79	113
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.50 mg/L	101	76	112
EG020T: Total Metals by ICP-MS (QCLot: 2318676)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	95.3	78	116
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	94.9	77	109
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	93.3	78	108
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	94.7	80	112
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	96.1	79	111
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	93.3	81	109
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	94.3	80	112
EG020A-T: Molybdenum	7439-98-7	0.001	mg/L	<0.001	0.1 mg/L	94.4	86	118
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	97.0	80	112
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	83.5	75	107
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	92.8	74	108
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	94.6	75	115
EG020T: Total Metals by ICP-MS (QCLot: 2318677)								
EG020B-T: Silver	7440-22-4	0.001	mg/L	<0.001	0.01 mg/L	84.0	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2319271)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.0100 mg/L	108	82.3	118
EG050F: Dissolved Hexavalent Chromium (QCLot: 2326861)								
EG050G-F: Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.010	0.5 mg/L	98.6	90	114
EG051G: Ferrous Iron by Discrete Analyser (QCLot: 2319446)								
EG051G: Ferrous Iron	----	0.05	mg/L	<0.05	2.00 mg/L	96.4	87	111
EK025G: Free cyanide by Discrete Analyser (QCLot: 2331081)								
EK025G: Free Cyanide	----	0.004	mg/L	<0.004	0.20 mg/L	114	64.3	126
EK026G: Total Cyanide By Discrete Analyser (QCLot: 2327991)								
EK026G: Total Cyanide	57-12-5	0.004	mg/L	<0.004	0.500 mg/L	99.2	72	122
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2314730)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	93.6	87.5	124
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2314581)								
EK057G: Nitrite as N	----	0.01	mg/L	<0.01	0.5 mg/L	105	86	124
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2314729)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	96.6	75.6	124
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2313580)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	83.4	70	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2313582)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	78.6	70	130



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
						LCS	Low	High
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2313581)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	92.6	70	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2314582)								
EK071G: Reactive Phosphorus as P	----	0.01	mg/L	<0.01	0.5 mg/L	101	82	128
EK085M: Sulfide as S2- (QCLot: 2320626)								
EK085: Sulfide as S2-	18496-25-8	0.10	mg/L	<0.1	0.5 mg/L	92.6	82	116
EP026ST: Chemical Oxygen Demand (Sealed Tube) (QCLot: 2317977)								
EP026ST: Chemical Oxygen Demand	----	5	mg/L	<5	500 mg/L	104	88	114
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 2319873)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	198 mg/L	97.3	84	114
EP068A: Organochlorine Pesticides (OC) (QCLot: 2319911)								
EP068: alpha-BHC	319-84-6	0.5	µg/L	<0.5	5 µg/L	81.4	49.9	119
EP068: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	5 µg/L	74.1	38.7	125
EP068: beta-BHC	319-85-7	0.5	µg/L	<0.5	5 µg/L	79.4	48.1	121
EP068: gamma-BHC	58-89-9	0.5	µg/L	<0.5	5 µg/L	83.7	50.1	119
EP068: delta-BHC	319-86-8	0.5	µg/L	<0.5	5 µg/L	81.3	51.2	127
EP068: Heptachlor	76-44-8	0.5	µg/L	<0.5	5 µg/L	84.5	45.5	130
EP068: Aldrin	309-00-2	0.5	µg/L	<0.5	5 µg/L	90.3	48.2	126
EP068: Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	5 µg/L	86.7	51.9	126
EP068: trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	5 µg/L	86.6	51.9	126
EP068: alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	5 µg/L	89.6	53.9	125
EP068: cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	5 µg/L	87.0	52.3	126
EP068: Dieldrin	60-57-1	0.5	µg/L	<0.5	5 µg/L	90.6	52.6	127
EP068: 4,4'-DDE	72-55-9	0.5	µg/L	<0.5	5 µg/L	89.1	51.9	126
EP068: Endrin	72-20-8	0.5	µg/L	<0.5	5 µg/L	68.7	50.4	132
EP068: beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	5 µg/L	90.6	53.6	126
EP068: 4,4'-DDD	72-54-8	0.5	µg/L	<0.5	5 µg/L	87.2	53.6	124
EP068: Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	5 µg/L	112	48.3	139
EP068: Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	5 µg/L	84.8	50	128
EP068: 4,4'-DDT	50-29-3	2.0	µg/L	<2	5 µg/L	101	41.8	135
EP068: Endrin ketone	53494-70-5	0.5	µg/L	<0.5	5 µg/L	103	52.3	127
EP068: Methoxychlor	72-43-5	2.0	µg/L	<2	5 µg/L	112	40.5	133
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2319911)								
EP068: Dichlorvos	62-73-7	0.5	µg/L	<0.5	5 µg/L	65.7	42	124
EP068: Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5	5 µg/L	59.8	34.6	125
EP068: Monocrotophos	6923-22-4	2.0	µg/L	<2	5 µg/L	19.2	14.2	51.8
EP068: Dimethoate	60-51-5	0.5	µg/L	<0.5	5 µg/L	60.0	32.6	110
EP068: Diazinon	333-41-5	0.5	µg/L	<0.5	5 µg/L	84.6	50.3	127
EP068: Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	5 µg/L	76.0	53	125



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2319911) - continued									
EP068: Parathion-methyl	298-00-0	2.0	µg/L	<2	5 µg/L	76.1	47.4	128	
EP068: Malathion	121-75-5	0.5	µg/L	<0.5	5 µg/L	77.9	46.6	133	
EP068: Fenthion	55-38-9	0.5	µg/L	<0.5	5 µg/L	82.2	51.2	125	
EP068: Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	5 µg/L	82.6	51.9	127	
EP068: Parathion	56-38-2	2.0	µg/L	<2	5 µg/L	77.2	38.8	142	
EP068: Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	5 µg/L	77.5	48	127	
EP068: Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	5 µg/L	74.2	43.7	137	
EP068: Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	5 µg/L	81.7	51.1	130	
EP068: Fenamiphos	22224-92-6	0.5	µg/L	<0.5	5 µg/L	84.8	36.7	137	
EP068: Prothiofos	34643-46-4	0.5	µg/L	<0.5	5 µg/L	81.2	51.3	126	
EP068: Ethion	563-12-2	0.5	µg/L	<0.5	5 µg/L	79.4	51.1	127	
EP068: Carbophenothion	786-19-6	0.5	µg/L	<0.5	5 µg/L	88.5	50.8	127	
EP068: Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	5 µg/L	97.5	18.8	140	
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 2313529)									
EP074: Styrene	100-42-5	5	µg/L	<5	10 µg/L	112	80.8	117	
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	10 µg/L	105	78	118	
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	10 µg/L	104	77.9	120	
EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	10 µg/L	100	77	121	
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	10 µg/L	104	74	120	
EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	10 µg/L	105	77	117	
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	10 µg/L	103	78.6	119	
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	10 µg/L	104	76.6	121	
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	10 µg/L	103	73.8	123	
EP074B: Oxygenated Compounds (QCLot: 2313529)									
EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	100 µg/L	99.7	67	127	
EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	100 µg/L	97.3	62	134	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	100 µg/L	104	74.9	122	
EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	100 µg/L	110	74.6	120	
EP074C: Sulfonated Compounds (QCLot: 2313529)									
EP074: Carbon disulfide	75-15-0	5	µg/L	<5	10 µg/L	107	68.4	134	
EP074D: Fumigants (QCLot: 2313529)									
EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	10 µg/L	109	67	137	
EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	10 µg/L	104	77.4	121	
EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	10 µg/L	101	68	128	
EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	10 µg/L	114	71.7	127	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	10 µg/L	99.8	77.9	118	
EP074E: Halogenated Aliphatic Compounds (QCLot: 2313529)									
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	100 µg/L	103	63	143	



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
EP074E: Halogenated Aliphatic Compounds (QCLot: 2313529) - continued									
EP074: Chloromethane	74-87-3	50	µg/L	<50	100 µg/L	105	72.1	125	
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	100 µg/L	103	71	131	
EP074: Bromomethane	74-83-9	50	µg/L	<50	100 µg/L	87.3	63	137	
EP074: Chloroethane	75-00-3	50	µg/L	<50	100 µg/L	108	65	135	
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	100 µg/L	107	75	135	
EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	10 µg/L	106	67	135	
EP074: Iodomethane	74-88-4	5	µg/L	<5	10 µg/L	82.3	49	111	
EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	10 µg/L	109	72	128	
EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	10 µg/L	106	76.1	126	
EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	10 µg/L	105	80.7	118	
EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	10 µg/L	105	67	131	
EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	10 µg/L	106	72	124	
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	10 µg/L	105	69	137	
EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	10 µg/L	101	75.3	124	
EP074: Trichloroethene	79-01-6	5	µg/L	<5	10 µg/L	103	75	125	
EP074: Dibromomethane	74-95-3	5	µg/L	<5	10 µg/L	107	78.8	118	
EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	10 µg/L	101	79.6	118	
EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	10 µg/L	91.7	76	116	
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	10 µg/L	100	74	122	
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	112	39	149	
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	10 µg/L	107	63.4	135	
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	10 µg/L	94.8	79.6	117	
EP074: 1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	10 µg/L	113	66	114	
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	10 µg/L	107	60	138	
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	10 µg/L	102	69.2	129	
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	10 µg/L	117	73	129	
EP074F: Halogenated Aromatic Compounds (QCLot: 2313529)									
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	10 µg/L	97.7	81.4	115	
EP074: Bromobenzene	108-86-1	5	µg/L	<5	10 µg/L	100	78.6	119	
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	10 µg/L	104	81.2	117	
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	10 µg/L	100	79	117	
EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	10 µg/L	105	78	120	
EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	10 µg/L	102	77.4	122	
EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	10 µg/L	99.0	81.3	116	
EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	10 µg/L	110	69.9	126	
EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	10 µg/L	103	69	125	
EP074G: Trihalomethanes (QCLot: 2313529)									
EP074: Chloroform	67-66-3	5	µg/L	<5	10 µg/L	104	80.2	120	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
EP074G: Trihalomethanes (QCLot: 2313529) - continued									
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	10 µg/L	103	74	130	
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	10 µg/L	102	62	136	
EP074: Bromoform	75-25-2	5	µg/L	<5	10 µg/L	100	65	131	
EP075(SIM)A: Phenolic Compounds (QCLot: 2319913)									
EP075(SIM): Phenol	108-95-2	1	µg/L	<1.0	25 µg/L	18.4	17.6	57	
EP075(SIM): 2-Chlorophenol	95-57-8	1	µg/L	<1.0	25 µg/L	40.7	37.6	118	
EP075(SIM): 2-Methylphenol	95-48-7	1	µg/L	<1.0	25 µg/L	# 35.1	35.2	105	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	2	µg/L	<2.0	50 µg/L	33.9	31.2	97.4	
EP075(SIM): 2-Nitrophenol	88-75-5	1	µg/L	<1.0	25 µg/L	47.7	34.8	137	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	1	µg/L	<1.0	25 µg/L	# 35.1	38.2	126	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	1	µg/L	<1.0	25 µg/L	46.5	41.4	128	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	1	µg/L	<1.0	25 µg/L	50.8	44.1	122	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	1	µg/L	<1.0	25 µg/L	54.7	41.4	117	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	1	µg/L	<1.0	25 µg/L	52.4	41.3	125	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	1	µg/L	<1.0	25 µg/L	63.1	41.3	125	
EP075(SIM): Pentachlorophenol	87-86-5	2	µg/L	<2.0	25 µg/L	53.3	21.3	145	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2319913)									
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	25 µg/L	50.4	29.5	123	
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	25 µg/L	55.2	41.4	127	
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	25 µg/L	53.9	41.6	126	
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	25 µg/L	56.6	48.9	126	
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	25 µg/L	56.2	54.4	124	
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	25 µg/L	57.9	53.1	125	
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	25 µg/L	57.5	53.2	127	
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	25 µg/L	59.8	54.1	126	
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	25 µg/L	57.9	52	127	
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	25 µg/L	84.4	55.4	127	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	1	µg/L	<1.0	25 µg/L	62.2	45.6	130	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	25 µg/L	73.4	48.9	128	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	25 µg/L	65.5	50.9	124	
EP075(SIM): Indeno(1,2,3.cd)pyrene	193-39-5	1	µg/L	<1.0	25 µg/L	60.6	47.4	127	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1	µg/L	<1.0	25 µg/L	72.4	47.2	128	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1	µg/L	<1.0	25 µg/L	76.4	47.7	127	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2313530)									
EP080: C6 - C9 Fraction	----	20	µg/L	<20	320 µg/L	96.7	74.2	142	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2319912)									
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	98.1	44.5	122	
EP071: C15 - C28 Fraction	----	100	µg/L	<100	400 µg/L	92.8	55.1	143	

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 Client : MOBILE DEWATERING
 Project : E2012-031



Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound		CAS Number	LOR		Unit	Result	Spike Concentration	Spike Recovery (%) LCS
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2319912) - continued								
EP071: C29 - C36 Fraction		----	50	µg/L	<50	400 µg/L	77.9	53.6 128



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			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
					MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2314584)							
EP1203951-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	91.1	70	130
ED045G: Chloride Discrete analyser (QCLot: 2314583)							
EP1203951-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	95.4	70	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 2320962)							
EP1203954-002	WRMW2	EG020A-F: Arsenic	7440-38-2	0.200 mg/L	99.3	70	130
		EG020A-F: Cadmium	7440-43-9	0.0500 mg/L	102	70	130
		EG020A-F: Chromium	7440-47-3	0.200 mg/L	94.8	70	130
		EG020A-F: Manganese	7439-96-5	0.200 mg/L	96.2	70	130
		EG020A-F: Nickel	7440-02-0	0.200 mg/L	93.2	70	130
		EG020A-F: Zinc	7440-66-6	0.200 mg/L	98.1	70	130
EG020T: Total Metals by ICP-MS (QCLot: 2318676)							
EP1203954-002	WRMW2	EG020A-T: Arsenic	7440-38-2	1.00 mg/L	86.2	70	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	98.9	70	130
		EG020A-T: Chromium	7440-47-3	1.00 mg/L	100	70	130
		EG020A-T: Copper	7440-50-8	1.00 mg/L	92.6	70	130
		EG020A-T: Lead	7439-92-1	1.00 mg/L	105	70	130
		EG020A-T: Manganese	7439-96-5	1.00 mg/L	101	70	130
		EG020A-T: Nickel	7440-02-0	1.00 mg/L	93.9	70	130
		EG020A-T: Zinc	7440-66-6	1.00 mg/L	93.7	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2319271)							
EP1203954-002	WRMW2	EG035T: Mercury	7439-97-6	0.0100 mg/L	102	70	130
EG050F: Dissolved Hexavalent Chromium (QCLot: 2326861)							
EP1203954-001	WRMW1	EG050G-F: Hexavalent Chromium	18540-29-9	0.5 mg/L	108	70	130
EG051G: Ferrous Iron by Discrete Analyser (QCLot: 2319446)							
EP1203954-001	WRMW1	EG051G: Ferrous Iron	----	2.5 mg/L	102	70	130
EK025G: Free cyanide by Discrete Analyser (QCLot: 2331081)							
EP1203954-002	WRMW2	EK025G: Free Cyanide	----	0.3 mg/L	# 10.0	70	130
EK026G: Total Cyanide By Discrete Analyser (QCLot: 2327991)							
EP1203954-002	WRMW2	EK026G: Total Cyanide	57-12-5	0.500 mg/L	106	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2314730)							
EP1203954-001	WRMW1	EK055G: Ammonia as N	7664-41-7	1.00 mg/L	106	70	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2314581)							
EP1203951-001	Anonymous	EK057G: Nitrite as N	----	0.6 mg/L	89.7	70	130

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 Client : MOBILE DEWATERING
 Project : E2012-031



Sub-Matrix: WATER

				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike	Spike Recovery (%)	Recovery Limits (%)	
				Concentration	MS	Low	High
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2314729)							
EP1203954-001	WRMW1	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	# Not Determined	70	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2313580)							
EP1203876-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5.0 mg/L	71.9	70	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2313582)							
EP1203954-003	WRMW3	EK061G: Total Kjeldahl Nitrogen as N	----	5.0 mg/L	86.8	70	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2313581)							
EP1203954-003	WRMW3	EK067G: Total Phosphorus as P	----	1 mg/L	120	70	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2314582)							
EP1203951-001	Anonymous	EK071G: Reactive Phosphorus as P	----	0.5 mg/L	102	70	130
EP026ST: Chemical Oxygen Demand (Sealed Tube) (QCLot: 2317977)							
EP1203954-001	WRMW1	EP026ST: Chemical Oxygen Demand	----	143 mg/L	94.5	70	130
EP074E: Halogenated Aliphatic Compounds (QCLot: 2313529)							
EP1203954-002	WRMW2	EP074: 1,1-Dichloroethene	75-35-4	20 µg/L	103	73.7	126
		EP074: Trichloroethene	79-01-6	20 µg/L	86.0	79.1	120
EP074F: Halogenated Aromatic Compounds (QCLot: 2313529)							
EP1203954-002	WRMW2	EP074: Chlorobenzene	108-90-7	20 µg/L	91.2	81.4	115
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2313530)							
EP1203954-002	WRMW2	EP080: C6 - C9 Fraction	----	280 µg/L	83.1	77.0	137



Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: EP1203954	Page	: 1 of 16
Client	: MOBILE DEWATERING	Laboratory	: Environmental Division Perth
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Project	: E2012-031	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: Hazelland-LT20 Adelaide St, Ha	Date Samples Received	: 18-MAY-2012
C-O-C number	: E2012-031-001	Issue Date	: 30-MAY-2012
Sampler	: D.A+F.T	No. of samples received	: 9
Order number	: ----	No. of samples analysed	: 9
Quote number	: EP/324/12		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

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Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non-volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

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		
EA005P: pH by PC Titrator									
Clear Plastic Bottle - Natural WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	---	18-MAY-2012	----	21-MAY-2012	18-MAY-2012	*	
EA010P: Conductivity by PC Titrator									
Clear Plastic Bottle - Natural WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	---	15-JUN-2012	----	21-MAY-2012	15-JUN-2012	✓	
EA015: Total Dissolved Solids									
Clear Plastic Bottle - Natural WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	----	----	----	24-MAY-2012	25-MAY-2012	✓	
EA025: Suspended Solids									
Clear Plastic Bottle - Natural WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	----	----	----	21-MAY-2012	25-MAY-2012	✓	
EA045: Turbidity									
Clear Plastic Bottle - Natural WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	----	----	----	22-MAY-2012	20-MAY-2012	*	



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 WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	---	01-JUN-2012	----	21-MAY-2012	01-JUN-2012	✓
ED038A: Acidity								
Clear Plastic Bottle - Natural WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	----	----	----	29-MAY-2012	01-JUN-2012	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	---	15-JUN-2012	----	18-MAY-2012	15-JUN-2012	✓
ED045G: Chloride Discrete analyser								
Clear Plastic Bottle - Natural WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	---	15-JUN-2012	----	18-MAY-2012	15-JUN-2012	✓
EG020F: Dissolved Metals by ICP-MS								
Clear Plastic Bottle - Filtered; Lab-acidified WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	---	14-NOV-2012	----	25-MAY-2012	14-NOV-2012	✓
EG020T: Total Metals by ICP-MS								
Clear Plastic Bottle - Unfiltered; Lab-acidified WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	24-MAY-2012	14-NOV-2012	✓	24-MAY-2012	14-NOV-2012	✓



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	
EG035T: Total Recoverable Mercury by FIMS								
Clear Plastic Bottle - Unfiltered; Lab-acidified WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	----	----	----	24-MAY-2012	15-JUN-2012	✓
EG050F: Dissolved Hexavalent Chromium								
Clear Plastic Bottle - NaOH WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	----	----	----	29-MAY-2012	15-JUN-2012	✓
EG051G: Ferrous Iron by Discrete Analyser								
Clear Plastic Bottle - HCl - Filtered WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	----	----	----	23-MAY-2012	25-MAY-2012	✓
EK025G: Free cyanide by Discrete Analyser								
White Plastic Bottle-NaOH WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	30-MAY-2012	01-JUN-2012	✓	30-MAY-2012	01-JUN-2012	✓
EK026G: Total Cyanide By Discrete Analyser								
White Plastic Bottle-NaOH WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	30-MAY-2012	01-JUN-2012	✓	30-MAY-2012	01-JUN-2012	✓
EK055G: Ammonia as N by Discrete Analyser								
Clear Plastic Bottle - Sulphuric Acid WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	---	15-JUN-2012	----	18-MAY-2012	15-JUN-2012	✓



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 WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	---	20-MAY-2012	----	18-MAY-2012	20-MAY-2012	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Clear Plastic Bottle - Sulphuric Acid WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	---	15-JUN-2012	----	18-MAY-2012	15-JUN-2012	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Clear Plastic Bottle - Sulphuric Acid WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	22-MAY-2012	15-JUN-2012	✓	22-MAY-2012	15-JUN-2012	✓
EK067G: Total Phosphorus as P by Discrete Analyser								
Clear Plastic Bottle - Sulphuric Acid WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	22-MAY-2012	15-JUN-2012	✓	22-MAY-2012	15-JUN-2012	✓
EK071G: Reactive Phosphorus as P by discrete analyser								
Clear Plastic Bottle - Natural WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	---	20-MAY-2012	----	18-MAY-2012	20-MAY-2012	✓
EK085M: Sulfide as S2-								
Clear Plastic Bottle - Zinc Acetate/NaOH WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	----	----	----	24-MAY-2012	25-MAY-2012	✓



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	
EP026ST: Chemical Oxygen Demand (Sealed Tube)								
Clear Plastic Bottle - Sulfuric Acid WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	----	----	----	23-MAY-2012	15-JUN-2012	✓
EP030: Biochemical Oxygen Demand (BOD)								
Clear Plastic Bottle - Natural WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	----	----	----	23-MAY-2012	20-MAY-2012	*✗
EP068A: Organochlorine Pesticides (OC)								
Amber Glass Bottle - Unpreserved WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	24-MAY-2012	25-MAY-2012	✓	25-MAY-2012	03-JUL-2012	✓
EP068B: Organophosphorus Pesticides (OP)								
Amber Glass Bottle - Unpreserved WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	24-MAY-2012	25-MAY-2012	✓	25-MAY-2012	03-JUL-2012	✓
EP074A: Monocyclic Aromatic Hydrocarbons								
Amber VOC Vial - HCl WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	21-MAY-2012	01-JUN-2012	✓	21-MAY-2012	01-JUN-2012	✓
EP074B: Oxygenated Compounds								
Amber VOC Vial - HCl WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	21-MAY-2012	01-JUN-2012	✓	21-MAY-2012	01-JUN-2012	✓



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 - HCl WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	21-MAY-2012	01-JUN-2012	✓	21-MAY-2012	01-JUN-2012	✓
EP074D: Fumigants								
Amber VOC Vial - HCl WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	21-MAY-2012	01-JUN-2012	✓	21-MAY-2012	01-JUN-2012	✓
EP074E: Halogenated Aliphatic Compounds								
Amber VOC Vial - HCl WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	21-MAY-2012	01-JUN-2012	✓	21-MAY-2012	01-JUN-2012	✓
EP074F: Halogenated Aromatic Compounds								
Amber VOC Vial - HCl WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	21-MAY-2012	01-JUN-2012	✓	21-MAY-2012	01-JUN-2012	✓
EP074G: Trihalomethanes								
Amber VOC Vial - HCl WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	21-MAY-2012	01-JUN-2012	✓	21-MAY-2012	01-JUN-2012	✓
EP075(SIM)A: Phenolic Compounds								
Amber Glass Bottle - Unpreserved WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	24-MAY-2012	25-MAY-2012	✓	25-MAY-2012	03-JUL-2012	✓



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 WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	24-MAY-2012	25-MAY-2012	✓	25-MAY-2012	03-JUL-2012	✓
EP080/071: Total Petroleum Hydrocarbons								
Amber Glass Bottle - Unpreserved WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	24-MAY-2012	25-MAY-2012	✓	25-MAY-2012	03-JUL-2012	✓
Amber VOC Vial - HCl WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	18-MAY-2012	21-MAY-2012	01-JUN-2012	✓	21-MAY-2012	01-JUN-2012	✓



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(where) 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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Acidity as Calcium Carbonate	ED038	1	9	11.1	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Alkalinity by PC Titrator	ED037-P	2	20	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Ammonia as N by Discrete analyser	EK055G	2	20	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Biochemical Oxygen Demand (BOD)	EP030	1	9	11.1	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chemical Oxygen Demand (Sealed Tube)	EP026ST	2	20	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Conductivity by PC Titrator	EA010-P	4	40	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	18	11.1	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	2	19	10.5	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	9	11.1	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Hexavalent Chromium by Discrete Analyser - Dissolved	EG050G-F	2	17	11.8	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	2	19	10.5	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
pH by PC Titrator	EA005-P	4	40	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	20	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfide as S2-	EK085	2	20	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Suspended Solids (High Level)	EA025H	2	12	16.7	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	20	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	2	9	22.2	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	3	27	11.1	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	9	11.1	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	9	11.1	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite B	EG020B-T	1	9	11.1	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Phosphorus as P By Discrete Analyser	EK067G	1	14	7.1	10.0	✘	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	9	11.1	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Turbidity	EA045	2	20	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	9	11.1	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Acidity as Calcium Carbonate	ED038	1	9	11.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Alkalinity by PC Titrator	ED037-P	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Ammonia as N by Discrete analyser	EK055G	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Biochemical Oxygen Demand (BOD)	EP030	1	9	11.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chemical Oxygen Demand (Sealed Tube)	EP026ST	2	20	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Conductivity by PC Titrator	EA010-P	2	40	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	5.6	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	19	5.3	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	9	11.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement



Matrix: **WATER** Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Control Samples (LCS) - Continued							
Hexavalent Chromium by Discrete Analyser - Dissolved	EG050G-F	1	17	5.9	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	19	5.3	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	9	11.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	9	11.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
pH by PC Titrator	EA005-P	4	40	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfide as S2-	EK085	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Suspended Solids (High Level)	EA025H	1	12	8.3	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	9	11.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	4	27	14.8	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	9	11.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	9	11.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite B	EG020B-T	1	9	11.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Phosphorus as P By Discrete Analyser	EK067G	2	14	14.3	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	9	11.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	9	11.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Turbidity	EA045	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	9	11.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Ammonia as N by Discrete analyser	EK055G	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Biochemical Oxygen Demand (BOD)	EP030	1	9	11.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chemical Oxygen Demand (Sealed Tube)	EP026ST	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Conductivity by PC Titrator	EA010-P	2	40	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	5.6	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	19	5.3	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	9	11.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Hexavalent Chromium by Discrete Analyser - Dissolved	EG050G-F	1	17	5.9	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	19	5.3	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	9	11.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	9	11.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfide as S2-	EK085	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Suspended Solids (High Level)	EA025H	1	12	8.3	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	9	11.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	27	7.4	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement



Matrix: **WATER** Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Method Blanks (MB) - Continued							
Total Mercury by FIMS	EG035T	1	9	11.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	9	11.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite B	EG020B-T	1	9	11.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Phosphorus as P By Discrete Analyser	EK067G	1	14	7.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	9	11.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	9	11.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Turbidity	EA045	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	9	11.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	5.0	5.0	✓	ALS QCS3 requirement
Chemical Oxygen Demand (Sealed Tube)	EP026ST	1	20	5.0	5.0	✓	ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	1	20	5.0	5.0	✓	ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	5.6	5.0	✓	ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	19	5.3	5.0	✓	ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	9	11.1	5.0	✓	ALS QCS3 requirement
Hexavalent Chromium by Discrete Analyser - Dissolved	EG050G-F	1	17	5.9	5.0	✓	ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.0	5.0	✓	ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	19	5.3	5.0	✓	ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	20	5.0	5.0	✓	ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.0	5.0	✓	ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	20	5.0	5.0	✓	ALS QCS3 requirement
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	27	7.4	5.0	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	9	11.1	5.0	✓	ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	9	11.1	5.0	✓	ALS QCS3 requirement
Total Phosphorus as P By Discrete Analyser	EK067G	1	14	7.1	5.0	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	9	11.1	5.0	✓	ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	9	11.1	5.0	✓	ALS QCS3 requirement



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
pH by PC Titrator	EA005-P	WATER	APHA 21st ed. 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Conductivity by PC Titrator	EA010-P	WATER	APHA 21st ed., 2510 B This procedure determines conductivity by automated ISE. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Dissolved Solids (High Level)	EA015H	WATER	In-House, APHA 21st ed., 2540C A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Suspended Solids (High Level)	EA025H	WATER	In-House, APHA 21st ed., 2540D A gravimetric procedure employed to determine the amount of `non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Turbidity	EA045	WATER	APHA 21st ed., 2130 B. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 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 (1999) Schedule B(3) (Appdx. 2)
Acidity as Calcium Carbonate	ED038	WATER	APHA 21st ed., 2310 B Acidity is determined by titration with a standardised alkali to an end-point pH of 8.3. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO4 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 (1999) Schedule B(3) (Appdx. 2)
Chloride by Discrete Analyser	ED045G	WATER	APHA 21st ed., 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 liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): Samples are 0.45 um 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.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): 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.
Total Metals by ICP-MS - Suite B	EG020B-T	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): 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.



Analytical Methods	Method	Matrix	Method Descriptions
Total Mercury by FIMS	EG035T	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Hexavalent Chromium by Discrete Analyser - Dissolved	EG050G-F	WATER	APHA 21st ed., 3500 Cr-A & B. Samples are 0.45 um filtered prior to analysis. Hexavalent chromium is determined directly on water sample by Discrete Analyser as received by pH adjustment and colour development using dephenylcarbazine. Each run of samples is measured against a five-point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Ferrous Iron by Discrete Analyser	EG051G	WATER	APHA 21st ed., 3500 Fe-B. A colorimetric determination based on the reaction between phenanthroline and ferrous iron at pH 3.2-3.3 to form an orange-red complex that is measured against a five-point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Free CN by Discrete Analyser	EK025G	WATER	APHA 21st ed., 4500-CN-C&N Free Cyanide is determined on samples after distillation using a pyridine- barbituric acid colouring reagent followed with an Discrete Analyser finish. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Cyanide By Discrete Analyser	EK026G	WATER	APHA 21st ed., 4500-CN-C & N Total Cyanide is determined from aqueous solutions after distillation with sulphuric acid. The resultant distillate is then captured in a caustic absorber solution followed by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Ammonia as N by Discrete analyser	EK055G	WATER	APHA 21st ed., 4500-NH ₃ G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Nitrite as N by Discrete Analyser	EK057G	WATER	APHA 21st ed., 4500-NO ₂ - B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Nitrate as N by Discrete Analyser	EK058G	WATER	APHA 21st ed., 4500-NO ₃ - F. Nitrate is reduced to nitrite by way of a cadmium reduction column 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 (1999) Schedule B(3) (Appdx. 2)
Nitrite and Nitrate as N (NO _x) by Discrete Analyser	EK059G	WATER	APHA 21st ed., 4500-NO ₃ - F. Combined oxidised Nitrogen (NO ₂ +NO ₃) is determined by Cadmium Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	APHA 21st ed., 4500-Norg D. 25mL water samples are digested using a traditional Kjeldahl digestion followed by determination by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	APHA 21st ed., 4500-Norg / 4500-NO ₃ -. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	APHA 21st ed., 4500-P B&F This procedure involves sulphuric acid digestion of a 100mL sample 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 (1999) Schedule B(3) (Appdx. 2)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	APHA 21st ed., 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with orthophosphate 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 (1999) Schedule B(3) (Appdx. 2)
Sulfide as S ₂ -	EK085	WATER	APHA 21st ed., 4500-S ₂ - D Sulfide species present in water samples are immediately precipitated when collected in pretreated caustic/zinc acetate preserved sample containers. After the supernatant is discarded, the resultant precipitate is then coloured using methylene blue indicator and measured using UV-VIS detection at 664nm. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)



Analytical Methods	Method	Matrix	Method Descriptions
Chemical Oxygen Demand (Sealed Tube)	EP026ST	WATER	(APHA 21st ed., 5220C, ALS QWI-EN/EP026) Samples are digested with a known excess of an acidic potassium dichromate solution using silver sulfate as a catalyst. The chromium is reduced from the Cr (VI) oxidation state to the Cr (III) state by the oxygen present in the organic material. The unreacted Cr (VI) can then be titrated with ferrous ammonium sulfate to determine the amount of Cr (VI) consumed. The oxidisable organic matter can be calculated in terms of oxygen equivalents.
Biochemical Oxygen Demand (BOD)	EP030	WATER	APHA 21st ed., 5210 B The 5-Day BOD test provides an empirical measure of the oxygen consumption capacity of a given water. A portion of the sample is diluted into oxygenated, nutrient rich water, and a seed added to begin biological decay. The initial dissolved oxygen content is measured, then the bottle is sealed and incubated for five days. The remaining dissolved oxygen is measured, and from the difference, the demand for oxygen, by biological decay, is determined. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Pesticides by GCMS	EP068	WATER	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 (1999) Schedule B(3) (Appdx. 2)
TPH - Semivolatile Fraction	EP071	WATER	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 NEPM (1999) Schedule B(3) (Appdx. 2)
Volatile Organic Compounds	EP074	WATER	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 (1999) Schedule B(3) (Appdx. 2)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	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 (1999) Schedule B(3) (Appdx. 2)
TPH Volatiles/BTEX	EP080	WATER	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 NEPM (1999) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Free Cyanide	EK025-PR	WATER	APHA 21st ed., 4500 CN- C&N. The sample is distilled at natural pH. The CN is trapped in a caustic solution, and quantified by colourimetry on FIA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Cyanide	EK026-PR	WATER	APHA 21st ed., 4500 CN- C&N. The sample is distilled with H2SO4 releasing all bound cyanides as HCN. The CN is trapped in a caustic solution, and quantified by colourimetry on FIA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TKN/TP Digestion	EK061/EK067	WATER	APHA 21st ed., 4500 Norg - D; APHA 21st ed., 4500 P - H. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Digestion for Total Recoverable Metals	EN25	WATER	USEPA SW846-3005 Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 500 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 (1999) Schedule B(3) (Appdx. 2). 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.



Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EP075(SIM)A: Phenolic Compounds	2747061-008	----	2-Methylphenol	95-48-7	35.1 %	35.2-105%	Recovery less than lower control limit
EP075(SIM)A: Phenolic Compounds	2747061-008	----	2,4-Dimethylphenol	105-67-9	35.1 %	38.2-126%	Recovery less than lower control limit
Matrix Spike (MS) Recoveries							
EK025G: Free cyanide by Discrete Analyser	EP1203954-002	WRMW2	Free Cyanide	----	10.0 %	70-130%	Recovery less than lower data quality objective
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Ar	EP1203954-001	WRMW1	Nitrite + Nitrate as N	----	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.

Regular Sample Surrogates

Sub-Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP068T: Organophosphorus Pesticide Surrogate	EP1203954-003	WRMW3	DEF	78-48-8	24.6 %	26.8-153.4 %	Recovery less than lower data quality objective
EP068T: Organophosphorus Pesticide Surrogate	EP1203954-005	WRMW5	DEF	78-48-8	17.7 %	26.8-153.4 %	Recovery less than lower data quality objective
EP068T: Organophosphorus Pesticide Surrogate	EP1203954-001	WRMW1	DEF	78-48-8	22.9 %	26.8-153.4 %	Recovery less than lower data quality objective
EP068T: Organophosphorus Pesticide Surrogate	EP1203954-007	DUP	DEF	78-48-8	23.6 %	26.8-153.4 %	Recovery less than lower data quality objective
EP068T: Organophosphorus Pesticide Surrogate	EP1203954-009	RINSATE	DEF	78-48-8	21.1 %	26.8-153.4 %	Recovery less than lower data quality objective
EP068T: Organophosphorus Pesticide Surrogate	EP1203954-002	WRMW2	DEF	78-48-8	17.3 %	26.8-153.4 %	Recovery less than lower data quality objective
EP068T: Organophosphorus Pesticide Surrogate	EP1203954-004	WRMW4	DEF	78-48-8	20.6 %	26.8-153.4 %	Recovery less than lower data quality objective
EP068T: Organophosphorus Pesticide Surrogate	EP1203954-008	FIELD	DEF	78-48-8	14.6 %	26.8-153.4 %	Recovery less than lower data quality objective

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.



Matrix: **WATER**

Method Container / Client Sample ID(s)	Extraction / Preparation			Analysis			
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue	
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	---	---	---	21-MAY-2012	18-MAY-2012	3
EA045: Turbidity							
Clear Plastic Bottle - Natural WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	---	---	---	22-MAY-2012	20-MAY-2012	2
EP030: Biochemical Oxygen Demand (BOD)							
Clear Plastic Bottle - Natural WRMW1, WRMW3, WRMW5, DUP, RINSATE	WRMW2, WRMW4, WRMW6, FIELD,	---	---	---	23-MAY-2012	20-MAY-2012	3

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

Matrix: **WATER**

Quality Control Sample Type Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Total Phosphorus as P By Discrete Analyser	1	14	7.1	10.0	NEPM 1999 Schedule B(3) and ALS QCS3 requirement