Environmental Services

Specialising in:

Acid Sulphate Soils
Contaminated Site Assessment
Air Quality Investigations
Remediation Advice and Design
Groundwater Management
Facility Maintenance

ABN 36 835 856 256

ADDENDUM 2

Groundwater Monitoring Event #3 Report

Lot 20 Adelaide Street
Hazelmere

PREPARED FOR:

Wasterock Pty Ltd

Mobile Dewatering Environmental Services Pty Ltd as trustee for
Mobile Dewatering Environmental Services Unit Trust
U1/22 Elmsfield Road, Midvale, Western Australia 6056
P: +61 (0) 8 9250 6960 F: +61 (0) 8 92508269
W: www.environmentalservices.com.au

Environmental Services

DOCUMENT DETAILS

Title:	Groundwater Monitoring Event #3 - Hazelland Landfill Site, Lot 20 Adelaide Street, Hazelmere
Author:	R. Burnell
Status:	Addendum 2
Job number:	E2012-031
Email:	rhian@environmentalservices.com.au
Synopsis:	This document has been prepared to report on the detailed groundwater sampling completed on the Hazelland Landfill Site.

DOCUMENT DISTRIBUTION

Version No	Checked by Date	Issued by Date	Distributed to	Copies
Addendum 2	G. Watts (February 2013)	G. Watts (February 2013)	Hazelland Pty Ltd	1 (Email)
Signed	G. J. Watts	G. J. Watts		

Disclaimer

This document has been prepared in accordance with a scope of works, set out in a proposal, or as otherwise agreed, between the client and MDW Environmental Services (MDWES). The scope of work may have been limited by time, budget, access and or other constraints and has been prepared in the absence of any knowledge of the study area other than that stated in this document. This document has been prepared on behalf of and for the exclusive use of the client, and is subject to and issued in accordance with the agreement between MDWES and the client. MDWES accepts no liability or responsibility whatsoever in respect to its use, or reliance upon, by any third party outside of its intended use. This document has commercial confidence status. Copying of this report or any part thereof is not permitted without the authorisation of the client, for the expressed purpose of regulatory assessment. Unless specifically agreed otherwise, MDWES retains intellectual property rights over the contents of this document.

Unless otherwise stated, MDWES regards the extent of investigations and assessments reasonable in the context of the scope of works and the purpose of the investigation. The information contained in this document is provided in good faith in the general belief that no information, opinions, conclusions or recommendations made are misleading, but are reasonable and appropriate at the time of issue of this document. This document must be read in its entirety. Users are cautioned that assumptions made in this document may change over time and it is the responsibility of the user to ensure that assumptions remain valid. Reported results, while accurate at the time of reporting cannot be considered absolute or conclusive without long term follow up studies.

Comments and opinions presented in this document are based on the extent of the scope of works and / or on information supplied by the client, their agents and / or third parties. In preparing this document MDWES has relied upon reports, data, surveys, analyses, designs, plans and / or other information provided by the client and other individuals and organisations outside its control. Except as stated otherwise in the document MDWES has not verified the accuracy or completeness of this information. To the extent that the statements, opinions, facts, information, conclusions and / or recommendations in the document are based in whole or part on this information, those are contingent upon the accuracy and completeness of the information. MDWES will not be liable in relation to incorrect conclusions should any information be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed.

Within the limitations imposed by the scope of work, the assessment of the study area and preparation of this document have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants and occupational hygienists under similar circumstances. No other warranty, expressed or implied, is made. MDWES will not be liable to update or revise the document to take into account any events, circumstances or facts occurring or becoming apparent after the date of this document.

Specific warning is given that many factors, natural or artificial, may render conditions different from those that prevailed at the time of investigation and should they be revealed at any time, they should be brought to our attention so that its significance may be assessed and appropriate advice may be offered.

MDWES, its agents and employees, expressly disclaim any and all liability for representations, expressed or implied, contained in, or omissions from, this report or any of the written or oral communications transmitted to the client or any third party.

Acceptance of this document denotes acceptance of these terms.

Table of Contents

List of Figures

List of Tables

1 INTRODUCTION

This report has been prepared to detail the sampling methodology and results from Groundwater Monitoring Event #3 (GME) 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 groundwater investigations 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:

- Collect and analyse representative samples from six groundwater 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

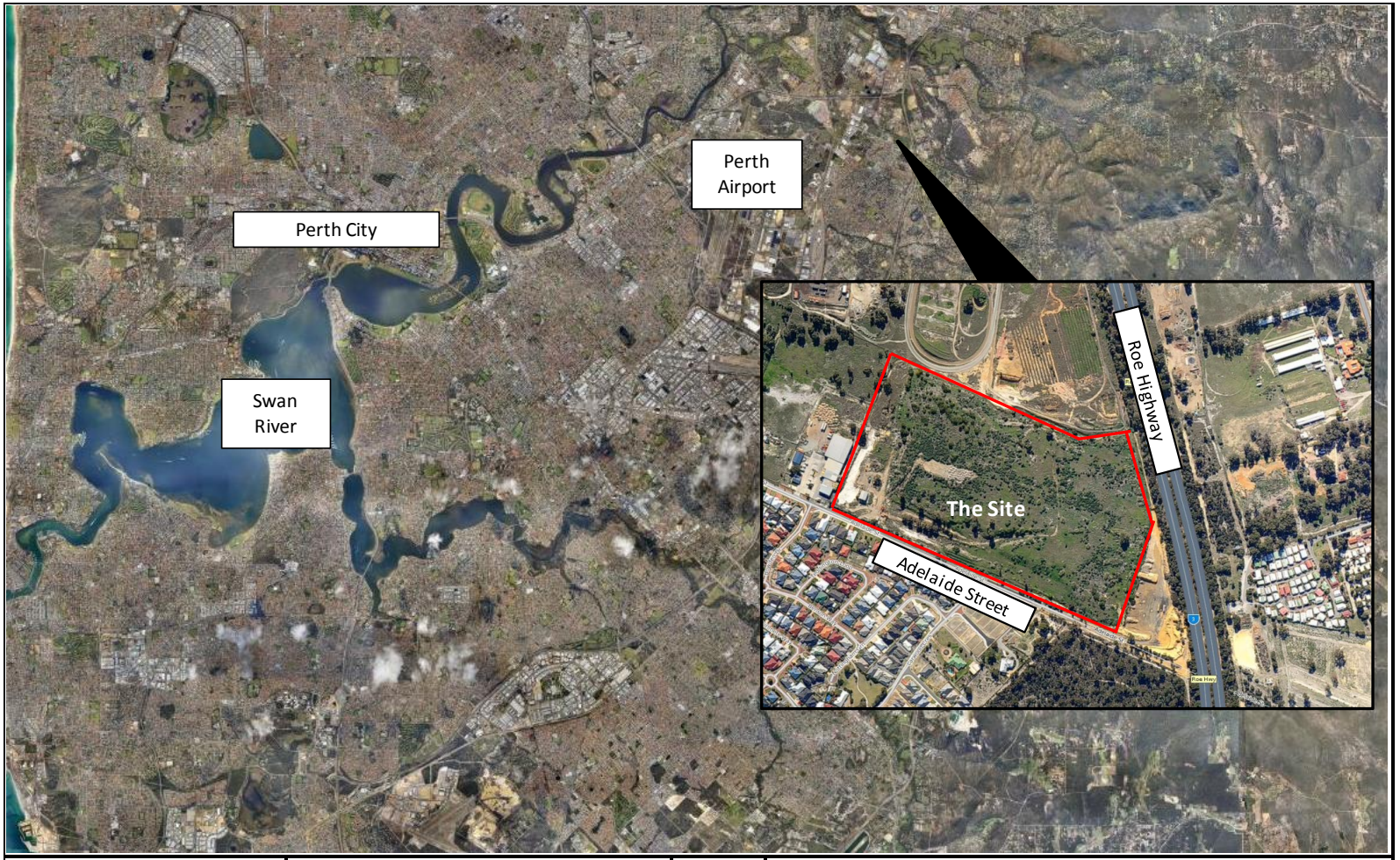
The technical objectives of the investigation are to:

- 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



MDW ENVIRONMENTAL SERVICES

Scale 0 4km

Unit 1, 22 Elmsfield Road, Midvale 6056
Ph (08) 9250 6960 Fax (08) 9250 8269
www.environmentalservices.com.au

N

Figure:	Site Location
Project:	Hazelland Landfill Site
Job No:	E2012-031
Date:	6/07/2012
Source	Nearmap

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 proprieties 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.

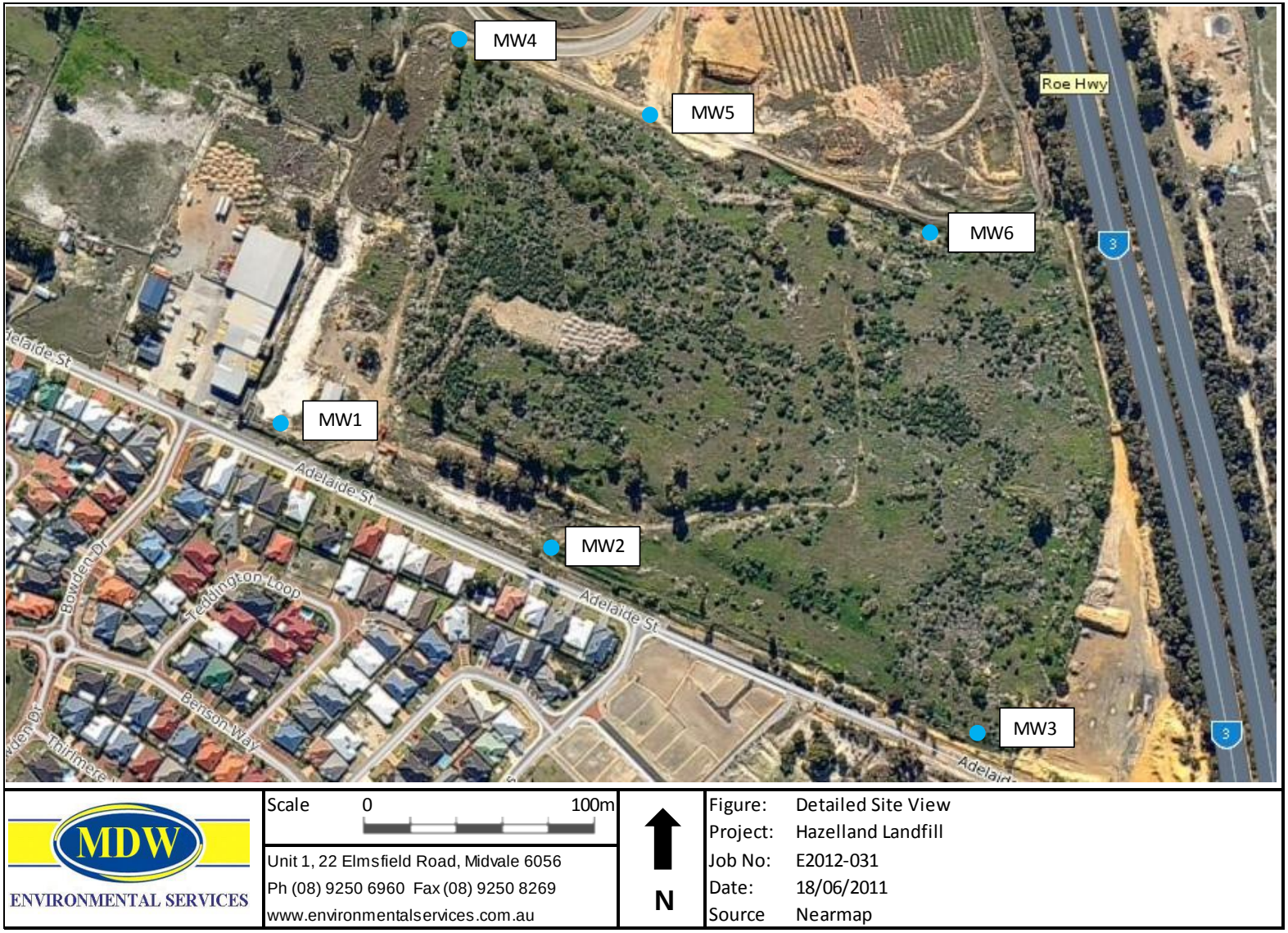


Figure 2 Detailed Site View and Monitoring Well Locations.

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 GME were completed to determine whether imported fill on the site had adversely affected the groundwater. The results within this report will complement previous groundwater data and be used to highlight any changes in groundwater quality during the proposed site remediation works.

6.1 Groundwater Sampling

Sampling was completed on the 15th January 2013; 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-003);
- A field blank was collected for each day of field sampling (BLANK-003);

- WRMW4-003 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 exceedances of RPD limits of the triplicate sample. Exceedances were noted of total dissolved solids, suspended solids, turbidity and total aluminium. As RPD limits between the primary and secondary samples were within allowable limits it is MDWES opinion that the variances noted between the primary and triplicate sample could be due to differing laboratory techniques. ALS Laboratory Group QC documentation indicates the lab's internal QC were observed.

Laboratory analysis of QA samples indicates exceedances of adopted criteria for pH within the Field and Rinsate samples. 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	WRMW4	DUP	DUP RL (%)	*DUP RPD (%)*	TRIP	TRIP RL (%)	*TRIP RPD*
pH Value	pH Unit	5.61	5.16	0-20	*8.02*	4.8	0-20	*14.44*
Electrical Conductivity	µS/cm	118	118	0-20	*0.00*	150	0-50	*21.33*
Total Dissolved Solids	mg/L	74	101	0-50	*26.73*	150	0-20	*50.67*
Suspended Solids	mg/L	313	254	0-20	*18.85*	590	0-20	*46.95*
Turbidity	NTU	81.8	58.7	0-20	*28.24*	500	0-20	*83.64*
Total Alkalinity $CaCO_3$	mg/L	2	<1	N/L	*0.00*	<5	N/L	-
Acidity as $CaCO_3$	mg/L	16	8	N/L	*50.00*	19	N/L	*15.79*
Sulfate as SO_4^{2-}	mg/L	2	2	N/L	*0.00*	-	-	-
Chloride	mg/L	23	23	0-20	*0.00*	24	N/L	-
Dissolved Metals								
Aluminium	mg/L	0.34	0.26	0-50	*23.53*	0.52	N/L	*34.62*
Arsenic	mg/L	<0.001	<0.001	N/L	-	<0.001	N/L	-
Cadmium	mg/L	<0.0001	<0.0001	N/L	-	0.0002	N/L	-
Chromium	mg/L	<0.001	<0.001	N/L	-	<0.001	N/L	-
Manganese	mg/L	0.005	0.003	N/L	*40.00*	<0.01	N/L	-
Nickel	mg/L	0.012	0.012	0-50	*0.00*	0.013	N/L	-
Selenium	mg/L	<0.01	<0.01	N/L	-	<0.001	N/L	-
Zinc	mg/L	0.072	0.072	0-50	*0.00*	0.096	N/L	*25.00*
Iron	mg/L	0.31	0.14	N/L	-	0.39	0-20	-
Ferrous Iron	mg/L	0.09	0.1	N/L	-	-	-	-
Chromium VI	mg/L	<0.01	<0.01	N/L	-	-	-	-
Total Metals								
Aluminium	mg/L	13.9	13.2	0-20	*5.04*	9.3	0-20	*33.09*
Arsenic	mg/L	<0.001	<0.001	N/L	-	<0.001	N/L	-
Cadmium	mg/L	<0.0001	<0.0001	N/L	-	0.0005	N/L	-
Chromium	mg/L	0.008	0.008	N/L	-	0.01	N/L	-
Copper	mg/L	0.025	0.029	0-20	*13.79*	-	-	-
Lead	mg/L	0.012	0.011	0-50	*8.33*	-	-	-
Manganese	mg/L	0.007	0.006	N/L	*14.29*	<0.01	N/L	-
Molybdenum	mg/L	<0.001	<0.001	N/L	-	-	-	-
Nickel	mg/L	0.016	0.016	0-50	*0.00*	0.014	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	0.11	0.109	0-20	*0.91*	0.1	N/L	*9.09*
Iron	mg/L	1.5	1.49	0-20	*0.67*	1.8	0-20	*16.67*
Mercury	mg/L	<0.0001	<0.0001	N/L	-	-	-	-
Nutrients								
Ammonia as N	mg/L	0.03	0.01	N/L	*66.67*	<0.2	N/L	*0.00*
Nitrite as N	mg/L	<0.01	<0.01	N/L	-	<0.01	N/L	-
Nitrate as N	mg/L	4.38	4.33	0-20	*1.14*	4.7	0-20	*6.81*
Kjeldhal Nitrogen	mg/L	0.7	<0.5	50	*0.00*	<0.2	N/L	*0.00*
Total Nitrogen	mg/L	5.1	4.3	0-20	*15.69*	4.7	0-20	*7.84*
Total Phosphorus	mg/L	0.06	0.09	N/L	*33.33*	<0.01	50	*0.00*
Reactive Phosphorus	mg/L	<0.01	<0.01	N/L	-	<0.01	N/L	-
Sulfide	mg/L	<0.1	<0.1	N/L	-	<0.1	N/L	-
COD	mg/L	16	<5	N/L	*0.00*	<10	N/L	*0.00*
BOD	mg/L	4	12	N/L	-	<5	N/L	-
Organochlorine Pesticides (OC)								
alpha-BHC	µg/L	<0.5	<0.5	N/L	-	<0.001	N/L	-
Hexachlorobenzene (HCB)	µg/L	<0.5	<0.5	N/L	-	<0.001	N/L	-
beta-BHC	µg/L	<0.5	<0.5	N/L	-	<0.001	N/L	-
gamma-BHC	µg/L	<0.5	<0.5	N/L	-	-	-	-
delta-BHC	µg/L	<0.5	<0.5	N/L	-	<0.001	N/L	-
Heptachlor	µg/L	<0.5	<0.5	N/L	-	<0.001	N/L	-
Aldrin	µg/L	<0.5	<0.5	N/L	-	<0.001	N/L	-
Heptachlor epoxide	µg/L	<0.5	<0.5	N/L	-	<0.001	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	-	0.041	N/L	-
4.4`-DDE	µg/L	<0.5	<0.5	N/L	-	<0.001	N/L	-
Endrin	µg/L	<0.5	<0.5	N/L	-	<0.01	N/L	-
beta-Endosulfan	µg/L	<0.5	<0.5	N/L	-	-	-	-
4.4`-DDD	µg/L	<0.5	<0.5	N/L	-	<0.001	N/L	-
Endrin aldehyde	µg/L	<0.5	<0.5	N/L	-	-	-	-
Endosulfan sulfate	µg/L	<0.5	<0.5	N/L	-	<0.001	N/L	-
4.4`-DDT	µg/L	<2.0	<2.0	N/L	-	<0.001	N/L	-
Endrin ketone	µg/L	<0.5	<0.5	N/L	-	-	-	-
Methoxychlor	µg/L	<2.0	<2.0	N/L	-	<0.02	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	<2.0	<2.0	N/L	-	-	-	-
Dimethoate	µg/L	<0.5	<0.5	N/L	-	-	-	-
Diazinon	µg/L	<0.5	<0.5	N/L	-	<0.01	N/L	-
Chlorpyrifos-methyl	µg/L	<0.5	<0.5	N/L	-	-	-	-
Parathion-methyl	µg/L	<2.0	<2.0	N/L	-	<0.02	N/L	-
Malathion	µg/L	<0.5	<0.5	N/L	-	<0.01	N/L	-
Fenthion	µg/L	<0.5	<0.5	N/L	-	-	-	-
Chlorpyrifos	µg/L	<0.5	<0.5	N/L	-	<0.005	N/L	-
Parathion	µg/L	<2.0	<2.0	N/L	-	-	-	-
Pirimphos-ethyl	µg/L	<0.5	<0.5	N/L	-	-	N/L	-
Chlorfenvinphos	µg/L	<0.5	<0.5	N/L	-	-	-	-
Bromophos-ethyl	µg/L	<0.5	<0.5	N/L	-	<0.005	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	-	<0.01	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	<1	<1	N/L	-	<0.001	N/L	-
Toluene	µg/L	<2	<2	N/L	-	<0.001	N/L	-
Ethylbenzene	µg/L	<2	<2	N/L	-	<0.001	N/L	-
meta- & para-Xylene	µg/L	<2	<2	N/L	-	-	-	-
Styrene	µg/L	<5	<5	N/L	-	-	-	-
ortho-Xylene	µg/L	<2	<2	N/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-Dichloroethene	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	<5	<5	N/L	-	-	-	-
Bromoform	µg/L	<5	<5	N/L	-	-	-	-
Phenolic Compounds								
Phenol	µg/L	<1.0	<1.0	N/L	-	<0.05	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	-	<0.1	N/L	-
Acenaphthylene	µg/L	<1.0	<1.0	N/L	-	<0.1	N/L	-
Acenaphthene	µg/L	<1.0	<1.0	N/L	-	<0.1	N/L	-
Fluorene	µg/L	<1.0	<1.0	N/L	-	<0.1	N/L	-
Phenanthrene	µg/L	<1.0	<1.0	N/L	-	<0.1	N/L	-
Anthracene	µg/L	<1.0	<1.0	N/L	-	<0.1	N/L	-
Fluoranthene	µg/L	<1.0	<1.0	N/L	-	<0.1	N/L	-
Pyrene	µg/L	<1.0	<1.0	N/L	-	<0.1	N/L	-
Benz(a)anthracene	µg/L	<1.0	<1.0	N/L	-	<0.1	N/L	-
Chrysene	µg/L	<1.0	<1.0	N/L	-	<0.1	N/L	-
Benzo(b)fluoranthene	µg/L	<1.0	<1.0	N/L	-	<0.1	N/L	-
Benzo(k)fluoranthene	µg/L	<1.0	<1.0	N/L	-	<0.1	N/L	-
Benzo(a)pyrene	µg/L	<0.5	<0.5	N/L	-	<0.1	N/L	-
Indeno(1.2.3.cd)pyrene	µg/L	<1.0	<1.0	N/L	-	<0.1	N/L	-
Dibenz(a.h)anthracene	µg/L	<1.0	<1.0	N/L	-	<0.1	N/L	-
Benzo(g.h.i)perylene	µg/L	<1.0	<1.0	N/L	-	<0.1	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]		15/01/2013	15/01/2013
		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]	RINSATE-003	BLANK-003
pH Value	pH Unit	6.5-8.5	8.0-8.4		6.5-8.5			6.0-8.5	5.4	5.54
Electrical Conductivity	µS/cm								7	15
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								4	4
Sulfate as SO_4^{2-}	mg/L								<1	<1
Chloride	mg/L								3	4
Dissolved Metals										
Arsenic	mg/L	0.013		0.01		0.07	2	0.1	<0.01	<0.01
Cadmium	mg/L	0.0002	0.0007	0.00		0.02	0.05	0.01	<0.001	<0.001
Chromium	mg/L						1	0.1	<0.0001	<0.0001
Manganese	mg/L	1.9		0.50	0.1	5	10	0.2	<0.001	<0.001
Nickel	mg/L	0.011	0.02	0.02		0.2	2	0.2	<0.001	<0.001
Selenium	mg/L	0.005		0.01		0.1	0.05	0.02	<0.001	<0.001
Zinc	mg/L	0.008	0.015		3	30	5	2	<0.01	<0.01
Iron	mg/L	0.3	1.0 / 0.3[5]		0.33	3	10	0.2	0.034	<0.005
Ferrous Iron	mg/L								<0.05	<0.05
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	<0.001	<0.001
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	<0.001
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	<0.005
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								<2	<2
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			<2.0	<2.0
Endrin ketone	µg/L								<0.5	<0.5
Methoxychlor	µg/L								<2.0	<2.0
Organophosphorus Pesticides (OP)										
Dichlorvos	µg/L								<0.5	<0.5
Demeton-S-methyl	µg/L								<0.5	<0.5
Monocrotophos	µg/L								<2.0	<2.0
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								<2.0	<2.0
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			<2.0	<2.0
Pirimphos-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			<1	<1
Toluene	µg/L			0.80	0.025	0.025			<2	<2
Ethylbenzene	µg/L			0.30	0.003	0.003			<2	<2
meta- & para-Xylene	µg/L	200							<2	<2
Styrene	µg/L			0.03	0.004	0.004			<5	<5
ortho-Xylene	µg/L	350							<2	<2
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								<5	<5
Fumigants										
2.2-Dichloropropane	µg/L								<5	<5
1.2-Dichloropropane	µg/L								<5	<5
cis-1.3-Dichloropropylene	µg/L								<5	<5
trans-1.3-Dichloropropylene	µg/L								<5	<5
1.2-Dibromoethane (EDB)	µg/L								<5	<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			<5	<5
Iodomethane	µg/L								<5	<5
trans-1.2-Dichloroethene	µg/L								<5	<5
1.1-Dichloroethane	µg/L								<5	<5
cis-1.2-Dichloroethene	µg/L								<5	<5
1.1.1-Trichloroethane	µg/L								<5	<5
1.1-Dichloropropylene	µg/L								<5	<5
Carbon Tetrachloride	µg/L								<5	<5
1.2-Dichloroethane	µg/L			0.003		0.03			<5	<5
Trichloroethene	µg/L								<5	<5
Dibromomethane	µg/L								<5	<5
1.1.2-Trichloroethane	µg/L	6500	1900						<5	<5
1.3-Dichloropropane	µg/L								<5	<5
Tetrachloroethene	µg/L			0.05		0.5			<5	<5
1.1.1.2-Tetrachloroethane	µg/L								<5	<5
trans-1.4-Dichloro-2-butene	µg/L								<5	<5
cis-1.4-Dichloro-2-butene	µg/L								<5	<5
1.1.2.2-Tetrachloroethane	µg/L								<5	<5
1.2.3-Trichloropropane	µg/L								<5	<5
Pentachloroethane	µg/L								<5	<5
1.2-Dibromo-3-chloropropane	µg/L								<5	<5
Hexachlorobutadiene	µg/L								<5	<5
Halogenated Aromatic Compounds										
Chlorobenzene	µg/L			0.30	0.01	0.01			<5	<5
Bromobenzene	µg/L								<5	<5
2-Chlorotoluene	µg/L								<5	<5
4-Chlorotoluene	µg/L								<5	<5
1.3-Dichlorobenzene	µg/L	0.26			0.02	0.02			<5	<5
1.4-Dichlorobenzene	µg/L	0.06		0.04	0.003	0.003			<5	<5
1.2-Dichlorobenzene	µg/L	0.16		1.5	0.001	0.001			<5	<5
1.2.4-Trichlorobenzene	µg/L	0.085	80	0.03	0.005	0.005			<5	<5
1.2.3-Trichlorobenzene	µg/L	0.003		0.03	0.005	0.005			<5	<5
Trihalomethanes										
Chloroform	µg/L								<5	<5
Bromodichloromethane	µg/L								<5	6
Dibromochloromethane	µg/L								<5	9
Bromoform	µg/L								<5	<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

NOTES: 1. SRT Healthy Rivers Action Plan Long Term / Short Term Targets
2. ANZECC 99% protection level for Chlordane
3. ANZECC 99% protection level for Endosulfan
4. Dutch intervention values (2000).
5. pH > 6 / pH < 6
6. ASS disturbance indicators
7. Effluent treatment triggers

8 RESULTS

8.1 Laboratory Results

Field results and laboratory analysis of groundwater samples undertaken onsite are presented in Table 3 through to Table 8. To assess the 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 WRMW6 however concentrations are below assessment criteria. TPH concentrations within the remaining monitoring wells were below LOR.

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
Phenolic compounds were not detected in any of the samples analysed.

Metals
The following dissolved metals exceedances were detected:

- Dissolved aluminium exceeded the following assessment criteria at the associated locations;
    - WRMW1 and WRMW2 exceeded Fresh Waters assessment criteria;
    - WRMW3, WRMW4, WRMW5 and WRMW6 exceeded Fresh Waters and ADWG AV assessment criteria.
- Dissolved zinc exceeded the following assessment criteria at the associated locations;
    - WRMW3 exceeded Fresh Waters assessment criteria;

    - WRMW1, WRMW2, WRMW4, WRMW5 and WRMW6 exceeded Fresh Waters and Marine Waters assessment criteria.
- Dissolved iron exceeded the following assessment criteria at the associated locations;
    - WRMW4 exceeded Long-term Irrigation Water and Fresh Waters assessment criteria;
    - WRMW3 exceeded Long-term Irrigation Water, Fresh Waters and Marine Waters assessment criteria;
    - WRMW6 exceeded Long-term Irrigation Water, Fresh Waters and ADWG AV assessment criteria
- Dissolved nickel exceeded the following assessment criteria at the associated locations;
    - WRMW4 and WRMW6 exceeded Fresh Waters assessment criteria

The following total metals exceedances were detected:

- Total aluminium exceeded the following assessment criteria at the associated locations;
    - WRMW6 exceeded Fresh Waters and ADWG AV assessment criteria;
    - WRMW1 and WRMW2 exceeded Fresh Waters, ADWG AV and DoH assessment criteria;
    - WRMW4 and WRMW5 exceeded Fresh Waters, ADWG AV, DoH and Long-term Irrigation Water assessment criteria;
    - WRMW3 exceeded all assessment criteria.
- Total copper exceeded the Fresh Water assessment criteria for all locations.
- Total lead exceeded the following assessment criteria at the associated locations;
    - WRMW1 exceeded Fresh Waters assessment criteria;
    - WRMW2, WRMW5 and WRMW6 exceeded Fresh Waters and Marine Waters assessment criteria;
    - WRMW3 and WRMW5 exceeded Fresh Waters, Marine Waters and ADWG HV assessment criteria.
- Total nickel exceeded Fresh Waters assessment criteria within WRMW4 and WRMW6.
- Total zinc exceeded the Fresh Waters and Marine Waters assessment criteria at all locations.
- Total iron exceeded the following assessment criteria at the associated locations;
    - WRMW1 exceeded Long-term Irrigation Water assessment criteria;
    - WRMW5 exceeded Long-term Irrigation Waters, Fresh Waters and ADWG AV assessment criteria;
    - WRMW2, WRMW4 and WRMW6 exceeded Long-term Irrigation Water, Fresh Waters and Marine Water assessment criteria;
    - WRMW3 exceeded Long-term Irrigation Water, Fresh Waters, Marine Waters, ADWG AV and DoH assessment criteria.

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

Total Nitrogen exceeded Fresh Waters assessment criteria for all monitoring well locations tested.

Total Phosphorus exceeded Fresh Waters assessment criteria at WRMW3.

8.2 Historical Data

Laboratory analyses of samples completed for GME#3 are tabulated against historical monitoring events to identify changes in groundwater quality. The following points are comparisons of current results from GME#3 against historical data.

- Laboratory results of MW1 samples indicate a decrease in pH, Total Aluminium, Total Lead and Total Nitrogen and Total Phosphorus. Increases in levels were observed for Total Copper, Total Zinc and Total Iron. All other analytes remained similar throughout both monitoring events.
- MW2 laboratory results indicate that pH, Suspended Solids (SS), Total Acidity, Total Zinc and Total Iron have decreased between monitoring events. Electrical Conductivity (EC), Total Dissolved Solids (TDS) Total Aluminium, Total Copper and Total Lead have increased whilst all other analytes have remained similar.
- Results for MW3 show that pH, SS, Turbidity, Total Alkalinity, Total Acidity, Total Aluminium, Total Copper, Total Lead, Total Manganese, Total Zinc, Total Iron and Total Nitrogen have decreased. TDS, Sulfate, Chloride and Total Phosphorus have increased. All other analytes remained similar throughout all monitoring events.
- Laboratory results of MW4 indicate a decrease in EC, TDS, Total Acidity, Chloride, Total Nitrogen and Total Phosphorus; however an increase of SS, Turbidity, Total Aluminium, Total Copper, Total Lead, Total Nickel, Total Zinc, and Total iron were noted. All other analytes remained similar over the monitoring events.
- Comparisons of MW5 results indicate a decrease in SS, Turbidity, Total Acidity, Total Copper, Total Nitrogen and Total Phosphorus, whilst increases were evident in EC, TDS, Total Alkalinity, Sulfate, Chloride, Total Aluminium, Total Lead, Total Nickel, Total Zinc and Total Iron. All other analytes remained relatively similar throughout the monitoring events.
- MW6 laboratory results show a decrease in Total Alkalinity, Total Acidity, Sulfate, Total Iron and Total Nitrogen. Increases were observed for SS, Turbidity, Total Aluminium, Total Copper, Total Nickel, Total Zinc, TPH in the C29 – C36 Fraction and the sum of TPH. All other analytes remained similar throughout the monitoring event.

Table 3 MW1 Groundwater Laboratory Analysis Results

Analyte grouping/Analyte	Units	ANZECC & ARMCANZ		ADWG		DoH	ANZECC & ARMCANZ				
		Fresh Waters	Marine Waters	Drinking Water Health Value (HV)	Drinking Water Aesthetic Value (AV)	Domestic non-potable groundwater use	Short-term Irrigation Water	Long-term Irrigation Water	18/05/2012 WRMW1	30/08/2012 WRMW1	15/01/2013 WRMW1
pH Value	pH Unit	6.5-8.5	8.0-8.4		6.5-8.5			6.0-8.5	6.58	6.77	6.17
Electrical Conductivity	µS/cm								635	716	788
Total Dissolved Solids	mg/L								434	474	562
Suspended Solids	mg/L								582	950	138
Turbidity	NTU								166	202	62.8
Total Alkalinity $CaCO_3$	mg/L								43	36	35
Acidity as $CaCO_3$	mg/L								15	35	40
Sulfate as SO_4^{2-}	mg/L			500	250	5000			105	123	108
Chloride	mg/L				250	2500			134	138	157
Dissolved Metals											
Aluminium	mg/L	0.055			0.2	2	20	5	0.04	0.09	0.11
Arsenic	mg/L	0.013		0.01		0.07	2	0.1	<0.001	<0.001	<0.001
Cadmium	mg/L	0.0002	0.0007	0.00		0.02	0.05	0.01	<0.0001	<0.0001	<0.0001
Chromium	mg/L						1	0.1	<0.001	<0.001	<0.001
Manganese	mg/L	1.9		0.50	0.1	5	10	0.2	0.005	0.004	0.002
Nickel	mg/L	0.011	0.02	0.02		0.2	2	0.2	<0.001	0.002	0.007
Selenium	mg/L	0.005		0.01		0.1	0.05	0.02	<0.01	<0.01	<0.01
Zinc	mg/L	0.008	0.015		3	30	5	2	0.005	0.013	0.045
Iron	mg/L	0.3	1.0 / 0.3[5]		0.33	3	10	0.2	<0.05	0.52	0.07
Ferrous Iron	mg/L								<0.05	0.34	0.11
Chromium VI	mg/L	0.001	0.0044	0.05		0.5			<0.010	<0.010	<0.01
Total Metals											
Aluminium	mg/L	0.055			0.2	2	20	5	11.1	7.69	4.69
Arsenic	mg/L	0.013		0.01		0.07	2	0.1	<0.001	<0.001	<0.001
Cadmium	mg/L	0.0002	0.0007	0.002		0.02	0.05	0.01	<0.0001	<0.0001	<0.0001
Chromium	mg/L						1	0.1	0.007	0.005	0.003
Copper	mg/L	0.0014	0.0013	2	1	20	5	0.2	0.004	0.002	0.005
Lead	mg/L	0.0034	0.0044	0.01		0.1	5	2	0.013	0.015	0.004
Manganese	mg/L	1.9		0.5	0.1	5	10	0.2	0.006	0.004	0.003
Molybdenum	mg/L			0.05		0.5	0.05	0.01	<0.001	<0.001	<0.001
Nickel	mg/L	0.011	0.02	0.02		0.2	2	0.2	0.002	0.003	0.007
Selenium	mg/L	0.005		0.01		0.1	0.05	0.02	<0.01	<0.01	<0.01
Silver	mg/L	0.00005	0.0014	0.1		1			<0.001	<0.001	<0.001
Zinc	mg/L	0.008	0.015		3	30	5	2	0.008	0.007	0.044
Iron	mg/L	0.3	1.0 / 0.35		0.33	3	10	0.2	0.29	0.21	0.23
Mercury	mg/L	0.00006	0.0001	0.001		0.01	0.002	0.002	0.0001	0.0001	<0.0001
Nutrients											
Ammonia as N	mg/L	0.9	0.91						0.06	0.03	0.02
Nitrite as N	mg/L			3.0		30			0.03	0.02	0.01
Nitrate as N	mg/L			50		500			5.15	4.91	1.86
Kjeldhal Nitrogen	mg/L								0.5	1.4	0.5
Total Nitrogen	mg/L	1.0 / 2.0[1]							5.7	6.3	2.4
Total Phosphorus	mg/L	0.1 / 0.2[1]							0.01	0.19	<0.01
Reactive Phosphorus	mg/L								<0.01	<0.01	<0.01
Sulfide	mg/L	0.001							0.1	<0.1	<0.1
COD	mg/L								18	14	13
BOD	mg/L								<2	<2	<2
Organochlorine Pesticides (OC)											
alpha-BHC	µg/L								<0.5	<0.5	<0.5
Hexachlorobenzene (HCB)	µg/L								<0.5	<0.5	<0.5
beta-BHC	µg/L								<0.5	<0.5	<0.5
gamma-BHC	µg/L								<0.5	<0.5	<0.5
delta-BHC	µg/L								<0.5	<0.5	<0.5
Heptachlor	µg/L	0.01							<0.5	<0.5	<0.5
Aldrin	µg/L								<0.5	<0.5	<0.5
Heptachlor epoxide	µg/L			0.05	0.3	3			<0.5	<0.5	<0.5
trans-Chlordane	µg/L	0.03[2]		0.01	1	10			<0.5	<0.5	<0.5
alpha-Endosulfan	µg/L	0.03[3]	0.005[3]	0.05	30	30			<0.5	<0.5	<0.5
cis-Chlordane	µg/L	0.03[2]		0.01	1	10			<0.5	<0.5	<0.5
Dieldrin	µg/L								<0.5	<0.5	<0.5
4.4`-DDE	µg/L								<0.5	<0.5	<0.5
Endrin	µg/L	0.01	0.004						<0.5	<0.5	<0.5
beta-Endosulfan	µg/L	0.03[3]	0.005[3]						<0.5	<0.5	<0.5
4.4`-DDD	µg/L								<0.5	<0.5	<0.5
Endrin aldehyde	µg/L								<0.5	<0.5	<0.5
Endosulfan sulfate	µg/L								<0.5	<0.5	<0.5
4.4`-DDT	µg/L	0.006		0.06	30	0.1			<2	<2	<2.0
Endrin ketone	µg/L								<0.5	<0.5	<0.5
Methoxychlor	µg/L								<2	<2	<2.0
Aldrin plus dieldrin	µg/L			0.010	0.3	3			<1	<0.5	<1.0
Organophosphorus Pesticides (OP)											
Dichlorvos	µg/L								<0.5	<0.5	<0.5
Demeton-S-methyl	µg/L								<0.5	<0.5	<0.5
Monocrotophos	µg/L								<2	<2	<2.0
Dimethoate	µg/L	0.15			50	50			<0.5	<0.5	<0.5
Diazinon	µg/L	0.01		1	3	1			<0.5	<0.5	<0.5
Chlorpyrifos-methyl	µg/L	0.01	0.009		10	100			<0.5	<0.5	<0.5
Parathion-methyl	µg/L								<2	<2	<2.0
Malathion	µg/L	0.05							<0.5	<0.5	<0.5
Fenthion	µg/L								<0.5	<0.5	<0.5
Chlorpyrifos	µg/L	0.01	0.009						<0.5	<0.5	<0.5
Parathion	µg/L	0.004			10	10			<2	<2	<2.0
Pirimphos-ethyl	µg/L								<0.5	<0.5	<0.5
Chlorfenvinphos	µg/L								<0.5	<0.5	<0.5
Bromophos-ethyl	µg/L								<0.5	<0.5	<0.5
Fenamiphos	µg/L								<0.5	<0.5	<0.5
Prothiofos	µg/L								<0.5	<0.5	<0.5
Ethion	µg/L								<0.5	<0.5	<0.5
Carbophenothion	µg/L								<0.5	<0.5	<0.5
Azinphos Methyl	µg/L	0.02							<0.5	<0.5	<0.5

Monocyclic Aromatic Hydrocarbons											
Benzene	µg/L	0.95	0.5	0.001		0.01			-	-	<1
Toluene	µg/L			0.80	0.025	0.025			-	-	<2
Ethylbenzene	µg/L			0.30	0.003	0.003			-	-	<2
meta- & para-Xylene	µg/L	200							-	-	<2
Styrene	µg/L			0.03	0.004	0.004			<5	<5	<5
ortho-Xylene	µg/L	350							-	-	<2
Isopropylbenzene	µg/L								<5	<5	<5
n-Propylbenzene	µg/L								<5	<5	<5
1.3.5-Trimethylbenzene	µg/L								<5	<5	<5
sec-Butylbenzene	µg/L								<5	<5	<5
1.2.4-Trimethylbenzene	µg/L								<5	<5	<5
tert-Butylbenzene	µg/L								<5	<5	<5
p-Isopropyltoluene	µg/L								<5	<5	<5
n-Butylbenzene	µg/L								<5	<5	<5
Oxygenated Compounds											
Vinyl Acetate	µg/L								<50	<50	<50
2-Butanone (MEK)	µg/L								<50	<50	<50
4-Methyl-2-pentanone (MIBK)	µg/L								<50	<50	<50
2-Hexanone (MBK)	µg/L								<50	<50	<50
Sulfonated Compounds											
Carbon disulfide	µg/L								<5	<5	<5
Fumigants											
2.2-Dichloropropane	µg/L								<5	<5	<5
1.2-Dichloropropane	µg/L								<5	<5	<5
cis-1.3-Dichloropropylene	µg/L								<5	<5	<5
trans-1.3-Dichloropropylene	µg/L								<5	<5	<5
1.2-Dibromoethane (EDB)	µg/L								<5	<5	<5
Halogenated Aliphatic Compounds											
Dichlorodifluoromethane	µg/L								<50	<50	<50
Chloromethane	µg/L								<50	<50	<50
Vinyl chloride	µg/L			0.0003		0.003			<50	<50	<50
Bromomethane	µg/L								<50	<50	<50
Chloroethane	µg/L								<50	<50	<50
Trichlorofluoromethane	µg/L								<50	<50	<50
1.1-Dichloroethene	µg/L			0.03		0.3			<5	<5	<5
Iodomethane	µg/L								<5	<5	<5
trans-1.2-Dichloroethene	µg/L								<5	<5	<5
1.1-Dichloroethane	µg/L								<5	<5	<5
cis-1.2-Dichloroethene	µg/L								<5	<5	<5
1.1.1-Trichloroethane	µg/L								<5	<5	<5
1.1-Dichloropropylene	µg/L								<5	<5	<5
Carbon Tetrachloride	µg/L								<5	<5	<5
1.2-Dichloroethane	µg/L			0.003		0.03			<5	<5	<5
Trichloroethene	µg/L								<5	<5	<5
Dibromomethane	µg/L								<5	<5	<5
1.1.2-Trichloroethane	µg/L	6500	1900						<5	<5	<5
1.3-Dichloropropane	µg/L								<5	<5	<5
Tetrachloroethene	µg/L			0.05		0.5			<5	<5	<5
1.1.1.2-Tetrachloroethane	µg/L								<5	<5	<5
trans-1.4-Dichloro-2-butene	µg/L								<5	<5	<5
cis-1.4-Dichloro-2-butene	µg/L								<5	<5	<5
1.1.2.2-Tetrachloroethane	µg/L								<5	<5	<5
1.2.3-Trichloropropane	µg/L								<5	<5	<5
Pentachloroethane	µg/L								<5	<5	<5
1.2-Dibromo-3-chloropropane	µg/L								<5	<5	<5
Hexachlorobutadiene	µg/L								<5	<5	<5
Halogenated Aromatic Compounds											
Chlorobenzene	µg/L			0.30	0.01	0.01			<5	<5	<5
Bromobenzene	µg/L								<5	<5	<5
2-Chlorotoluene	µg/L								<5	<5	<5
4-Chlorotoluene	µg/L								<5	<5	<5
1.3-Dichlorobenzene	µg/L	0.26			0.02	0.02			<5	<5	<5
1.4-Dichlorobenzene	µg/L	0.06		0.04	0.003	0.003			<5	<5	<5
1.2-Dichlorobenzene	µg/L	0.16		1.5	0.001	0.001			<5	<5	<5
1.2.4-Trichlorobenzene	µg/L	0.085	80	0.03	0.005	0.005			<5	<5	<5
1.2.3-Trichlorobenzene	µg/L	0.003		0.03	0.005	0.005			<5	<5	<5
Trihalomethanes											
Chloroform	µg/L								<5	<5	<5
Bromodichloromethane	µg/L								<5	<5	<5
Dibromochloromethane	µg/L								<5	<5	<5
Bromoform	µg/L								<5	<5	<5
Phenolic Compounds											
Phenol	µg/L	320	400						<1.0	<1.0	<1.0
2-Chlorophenol	µg/L	340		300	0.1	3000			<1.0	<1.0	<1.0
2-Methylphenol	µg/L								<1.0	<1.0	<1.0
3- & 4-Methylphenol	µg/L								<2.0	<2.0	<2.0
2-Nitrophenol	µg/L								<1.0	<1.0	<1.0
2.4-Dimethylphenol	µg/L								<1.0	<1.0	<1.0
2.4-Dichlorophenol	µg/L	120		200	0.3	2000			<1.0	<1.0	<1.0
2.6-Dichlorophenol	µg/L								<1.0	<1.0	<1.0
4-Chloro-3-Methylphenol	µg/L								<1.0	<1.0	<1.0
2.4.6-Trichlorophenol	µg/L	3		20	2	200			<1.0	<1.0	<1.0
2.4.5-Trichlorophenol	µg/L								<1.0	<1.0	<1.0
Pentachlorophenol	µg/L	3.6	11						<2.0	<2.0	<2.0

Polynuclear Aromatic Hydrocarbons											
Naphthalene	µg/L	16	50						<1.0	<1.0	<1.0
Acenaphthylene	µg/L								<1.0	<1.0	<1.0
Acenaphthene	µg/L								<1.0	<1.0	<1.0
Fluorene	µg/L								<1.0	<1.0	<1.0
Phenanthrene	µg/L								<1.0	<1.0	<1.0
Anthracene	µg/L								<1.0	<1.0	<1.0
Fluoranthene	µg/L								<1.0	<1.0	<1.0
Pyrene	µg/L								<1.0	<1.0	<1.0
Benz(a)anthracene	µg/L								<1.0	<1.0	<1.0
Chrysene	µg/L								<1.0	<1.0	<1.0
Benzo(b)fluoranthene	µg/L								<1.0	<1.0	<1.0
Benzo(k)fluoranthene	µg/L								<1.0	<1.0	<1.0
Benzo(a)pyrene	µg/L			0.01		0.1			<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	µg/L								<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	µg/L								<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	µg/L								<1.0	<1.0	<1.0
Total Petroleum Hydrocarbons											
C6 - C9 Fraction	µg/L								<20	<20	<20
C10 - C14 Fraction	µg/L								<50	<50	<50
C15 - C28 Fraction	µg/L								<100	<100	<100
C29 - C36 Fraction	µg/L								<50	<50	<50
C10 - C36 Fraction (sum)	µg/L	600 [4]							<50	<50	<50

NOTES: 1. SRT Healthy Rivers Action Plan Long Term / Short Term Targets
2. ANZECC 99% protection level for Chlordane
3. ANZECC 99% protection level for Endosulfan
4. Dutch intervention values (2000).
5. pH > 6 / pH < 6
6. ASS disturbance indicators
7. Effluent treatment triggers

Table 4 MW2 Groundwater Laboratory Analysis Results

Analyte grouping/Analyte	Units	ANZECC & ARMCANZ		ADWG		DoH	ANZECC & ARMCANZ				
		Fresh Waters	Marine Waters	Drinking Water Health Value (HV)	Drinking Water Aesthetic Value (AV)	Domestic non-potable groundwater use	Short-term Irrigation Water	Long-term Irrigation Water	18/05/2012 WRMW2	30/08/2012 WRMW2	15/01/2013 WRMW2
pH Value	pH Unit	6.5-8.5	8.0-8.4		6.5-8.5			6.0-8.5	6.14	5.72	5.21
Electrical Conductivity	µS/cm								307	292	347
Total Dissolved Solids	mg/L								244	169	290
Suspended Solids	mg/L								292	106	75
Turbidity	NTU								236	32	54.7
Total Alkalinity $CaCO_3$	mg/L								17	3	2
Acidity as $CaCO_3$	mg/L								26	42	39
Sulfate as SO_4^{2-}	mg/L			500	250	5000			13	11	9
Chloride	mg/L				250	2500			80	82	88
Dissolved Metals											
Aluminium	mg/L	0.055			0.2	2	20	5	0.02	0.03	0.1
Arsenic	mg/L	0.013		0.01		0.07	2	0.1	0.001	<0.001	<0.001
Cadmium	mg/L	0.0002	0.0007	0.00		0.02	0.05	0.01	<0.0001	<0.0001	<0.0001
Chromium	mg/L						1	0.1	<0.001	<0.001	<0.001
Manganese	mg/L	1.9		0.50	0.1	5	10	0.2	0.022	0.003	0.001
Nickel	mg/L	0.011	0.02	0.02		0.2	2	0.2	0.002	0.006	0.008
Selenium	mg/L	0.005		0.01		0.1	0.05	0.02	<0.01	<0.01	<0.01
Zinc	mg/L	0.008	0.015		3	30	5	2	0.048	0.025	0.066
Iron	mg/L	0.3	1.0 / 0.3[5]		0.33	3	10	0.2	0.68	0.75	0.12
Ferrous Iron	mg/L								0.43	0.76	0.12
Chromium VI	mg/L	0.001	0.0044	0.05		0.5			<0.010	<0.010	<0.01
Total Metals											
Aluminium	mg/L	0.055			0.2	2	20	5	16.2	3.15	3.3
Arsenic	mg/L	0.013		0.01		0.07	2	0.1	<0.001	<0.001	<0.001
Cadmium	mg/L	0.0002	0.0007	0.002		0.02	0.05	0.01	<0.0001	<0.0001	<0.0001
Chromium	mg/L						1	0.1	0.016	0.003	0.003
Copper	mg/L	0.0014	0.0013	2	1	20	5	0.2	0.07	0.005	0.011
Lead	mg/L	0.0034	0.0044	0.01		0.1	5	2	0.017	0.003	0.005
Manganese	mg/L	1.9		0.5	0.1	5	10	0.2	0.026	0.004	0.002
Molybdenum	mg/L			0.05		0.5	0.05	0.01	<0.001	<0.001	<0.001
Nickel	mg/L	0.011	0.02	0.02		0.2	2	0.2	0.005	0.006	0.009
Selenium	mg/L	0.005		0.01		0.1	0.05	0.02	<0.01	<0.01	<0.01
Silver	mg/L	0.00005	0.0014	0.1		1			<0.001	<0.001	<0.001
Zinc	mg/L	0.008	0.015		3	30	5	2	0.08	0.079	0.07
Iron	mg/L	0.3	1.0 / 0.35		0.33	3	10	0.2	4.82	2.12	1.37
Mercury	mg/L	0.00006	0.0001	0.001		0.01	0.002	0.002	0.0001	<0.0001	<0.0001
Nutrients											
Ammonia as N	mg/L	0.9	0.91						0.36	0.03	0.01
Nitrite as N	mg/L			3.0		30			0.02	0.01	<0.01
Nitrate as N	mg/L			50		500			0.62	1.09	1.24
Kjeldhal Nitrogen	mg/L								0.5	0.3	0.2
Total Nitrogen	mg/L	1.0 / 2.0[1]							1.1	1.4	1.4
Total Phosphorus	mg/L	0.1 / 0.2[1]							0.15	0.03	0.04
Reactive Phosphorus	mg/L								<0.01	<0.01	<0.01
Sulfide	mg/L	0.001							<0.1	<0.1	<0.1
COD	mg/L								16	<5	<5
BOD	mg/L								3	<2	<2
Organochlorine Pesticides (OC)											
alpha-BHC	µg/L								<0.5	<0.5	<0.5
Hexachlorobenzene (HCB)	µg/L								<0.5	<0.5	<0.5
beta-BHC	µg/L								<0.5	<0.5	<0.5
gamma-BHC	µg/L								<0.5	<0.5	<0.5
delta-BHC	µg/L								<0.5	<0.5	<0.5
Heptachlor	µg/L	0.01							<0.5	<0.5	<0.5
Aldrin	µg/L								<0.5	<0.5	<0.5
Heptachlor epoxide	µg/L			0.05	0.3	3			<0.5	<0.5	<0.5
trans-Chlordane	µg/L	0.03 [2]		0.01	1	10			<0.5	<0.5	<0.5
alpha-Endosulfan	µg/L	0.03 [3]	0.005 [3]	0.05	30	30			<0.5	<0.5	<0.5
cis-Chlordane	µg/L	0.03 [2]		0.01	1	10			<0.5	<0.5	<0.5
Dieldrin	µg/L								<0.5	<0.5	<0.5
4.4`-DDE	µg/L								<0.5	<0.5	<0.5
Endrin	µg/L	0.01	0.004						<0.5	<0.5	<0.5
beta-Endosulfan	µg/L	0.03 [3]	0.005 [3]						<0.5	<0.5	<0.5
4.4`-DDD	µg/L								<0.5	<0.5	<0.5
Endrin aldehyde	µg/L								<0.5	<0.5	<0.5
Endosulfan sulfate	µg/L								<0.5	<0.5	<0.5
4.4`-DDT	µg/L	0.006		0.06	30	0.1			<2	<2	<2.0
Endrin ketone	µg/L								<0.5	<0.5	<0.5
Methoxychlor	µg/L								<2	<2	<2.0
Aldrin plus dieldrin	µg/L			0.010	0.3	3			<1	<0.5	<1.0
Organophosphorus Pesticides (OP)											
Dichlorvos	µg/L								<0.5	<0.5	<0.5
Demeton-S-methyl	µg/L								<0.5	<0.5	<0.5
Monocrotophos	µg/L								<2	<2	<2.0
Dimethoate	µg/L	0.15			50	50			<0.5	<0.5	<0.5
Diazinon	µg/L	0.01		1	3	1			<0.5	<0.5	<0.5
Chlorpyrifos-methyl	µg/L	0.01	0.009		10	100			<0.5	<0.5	<0.5
Parathion-methyl	µg/L								<2	<2	<2.0
Malathion	µg/L	0.05							<0.5	<0.5	<0.5
Fenthion	µg/L								<0.5	<0.5	<0.5
Chlorpyrifos	µg/L	0.01	0.009						<0.5	<0.5	<0.5
Parathion	µg/L	0.004			10	10			<2	<2	<2.0
Pirimphos-ethyl	µg/L								<0.5	<0.5	<0.5
Chlorfenvinphos	µg/L								<0.5	<0.5	<0.5
Bromophos-ethyl	µg/L								<0.5	<0.5	<0.5
Fenamiphos	µg/L								<0.5	<0.5	<0.5
Prothiofos	µg/L								<0.5	<0.5	<0.5
Ethion	µg/L								<0.5	<0.5	<0.5
Carbophenothion	µg/L								<0.5	<0.5	<0.5
Azinphos Methyl	µg/L	0.02							<0.5	<0.5	<0.5

Monocyclic Aromatic Hydrocarbons											
Benzene	µg/L	0.95	0.5	0.001		0.01			-	-	<1
Toluene	µg/L			0.80	0.025	0.025			-	-	<2
Ethylbenzene	µg/L			0.30	0.003	0.003			-	-	<2
meta- & para-Xylene	µg/L	200							-	-	<2
Styrene	µg/L			0.03	0.004	0.004			<5	<5	<5
ortho-Xylene	µg/L	350							-	-	<2
Isopropylbenzene	µg/L								<5	<5	<5
n-Propylbenzene	µg/L								<5	<5	<5
1.3.5-Trimethylbenzene	µg/L								<5	<5	<5
sec-Butylbenzene	µg/L								<5	<5	<5
1.2.4-Trimethylbenzene	µg/L								<5	<5	<5
tert-Butylbenzene	µg/L								<5	<5	<5
p-Isopropyltoluene	µg/L								<5	<5	<5
n-Butylbenzene	µg/L								<5	<5	<5
Oxygenated Compounds											
Vinyl Acetate	µg/L								<50	<50	<50
2-Butanone (MEK)	µg/L								<50	<50	<50
4-Methyl-2-pentanone (MIBK)	µg/L								<50	<50	<50
2-Hexanone (MBK)	µg/L								<50	<50	<50
Sulfonated Compounds											
Carbon disulfide	µg/L								<5	<5	<5
Fumigants											
2.2-Dichloropropane	µg/L								<5	<5	<5
1.2-Dichloropropane	µg/L								<5	<5	<5
cis-1.3-Dichloropropylene	µg/L								<5	<5	<5
trans-1.3-Dichloropropylene	µg/L								<5	<5	<5
1.2-Dibromoethane (EDB)	µg/L								<5	<5	<5
Halogenated Aliphatic Compounds											
Dichlorodifluoromethane	µg/L								<50	<50	<50
Chloromethane	µg/L								<50	<50	<50
Vinyl chloride	µg/L			0.0003		0.003			<50	<50	<50
Bromomethane	µg/L								<50	<50	<50
Chloroethane	µg/L								<50	<50	<50
Trichlorofluoromethane	µg/L								<50	<50	<50
1.1-Dichloroethene	µg/L			0.03		0.3			<5	<5	<5
Iodomethane	µg/L								<5	<5	<5
trans-1.2-Dichloroethene	µg/L								<5	<5	<5
1.1-Dichloroethane	µg/L								<5	<5	<5
cis-1.2-Dichloroethene	µg/L								<5	<5	<5
1.1.1-Trichloroethane	µg/L								<5	<5	<5
1.1-Dichloropropylene	µg/L								<5	<5	<5
Carbon Tetrachloride	µg/L								<5	<5	<5
1.2-Dichloroethane	µg/L			0.003		0.03			<5	<5	<5
Trichloroethene	µg/L								<5	<5	<5
Dibromomethane	µg/L								<5	<5	<5
1.1.2-Trichloroethane	µg/L	6500	1900						<5	<5	<5
1.3-Dichloropropane	µg/L								<5	<5	<5
Tetrachloroethene	µg/L			0.05		0.5			<5	<5	<5
1.1.1.2-Tetrachloroethane	µg/L								<5	<5	<5
trans-1.4-Dichloro-2-butene	µg/L								<5	<5	<5
cis-1.4-Dichloro-2-butene	µg/L								<5	<5	<5
1.1.2.2-Tetrachloroethane	µg/L								<5	<5	<5
1.2.3-Trichloropropane	µg/L								<5	<5	<5
Pentachloroethane	µg/L								<5	<5	<5
1.2-Dibromo-3-chloropropane	µg/L								<5	<5	<5
Hexachlorobutadiene	µg/L								<5	<5	<5
Halogenated Aromatic Compounds											
Chlorobenzene	µg/L			0.30	0.01	0.01			<5	<5	<5
Bromobenzene	µg/L								<5	<5	<5
2-Chlorotoluene	µg/L								<5	<5	<5
4-Chlorotoluene	µg/L								<5	<5	<5
1.3-Dichlorobenzene	µg/L	0.26			0.02	0.02			<5	<5	<5
1.4-Dichlorobenzene	µg/L	0.06		0.04	0.003	0.003			<5	<5	<5
1.2-Dichlorobenzene	µg/L	0.16		1.5	0.001	0.001			<5	<5	<5
1.2.4-Trichlorobenzene	µg/L	0.085	80	0.03	0.005	0.005			<5	<5	<5
1.2.3-Trichlorobenzene	µg/L	0.003		0.03	0.005	0.005			<5	<5	<5
Trihalomethanes											
Chloroform	µg/L								<5	<5	<5
Bromodichloromethane	µg/L								<5	<5	<5
Dibromochloromethane	µg/L								<5	<5	<5
Bromoform	µg/L								<5	<5	<5
Phenolic Compounds											
Phenol	µg/L	320	400						<1.0	<1.0	<1.0
2-Chlorophenol	µg/L	340		300	0.1	3000			<1.0	<1.0	<1.0
2-Methylphenol	µg/L								<1.0	<1.0	<1.0
3- & 4-Methylphenol	µg/L								**2.6**	<2.0	<2.0
2-Nitrophenol	µg/L								<1.0	<1.0	<1.0
2.4-Dimethylphenol	µg/L								<1.0	<1.0	<1.0
2.4-Dichlorophenol	µg/L	120		200	0.3	2000			<1.0	<1.0	<1.0
2.6-Dichlorophenol	µg/L								<1.0	<1.0	<1.0
4-Chloro-3-Methylphenol	µg/L								<1.0	<1.0	<1.0
2.4.6-Trichlorophenol	µg/L	3		20	2	200			<1.0	<1.0	<1.0
2.4.5-Trichlorophenol	µg/L								<1.0	<1.0	<1.0
Pentachlorophenol	µg/L	3.6	11						<2.0	<2.0	<2.0

Polynuclear Aromatic Hydrocarbons											
Naphthalene	µg/L	16	50						<1.0	<1.0	<1.0
Acenaphthylene	µg/L								<1.0	<1.0	<1.0
Acenaphthene	µg/L								<1.0	<1.0	<1.0
Fluorene	µg/L								<1.0	<1.0	<1.0
Phenanthrene	µg/L								<1.0	<1.0	<1.0
Anthracene	µg/L								<1.0	<1.0	<1.0
Fluoranthene	µg/L								<1.0	<1.0	<1.0
Pyrene	µg/L								<1.0	<1.0	<1.0
Benz(a)anthracene	µg/L								<1.0	<1.0	<1.0
Chrysene	µg/L								<1.0	<1.0	<1.0
Benzo(b)fluoranthene	µg/L								<1.0	<1.0	<1.0
Benzo(k)fluoranthene	µg/L								<1.0	<1.0	<1.0
Benzo(a)pyrene	µg/L			0.01		0.1			<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	µg/L								<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	µg/L								<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	µg/L								<1.0	<1.0	<1.0
Total Petroleum Hydrocarbons											
C6 - C9 Fraction	µg/L								<20	<20	<20
C10 - C14 Fraction	µg/L								<50	<50	<50
C15 - C28 Fraction	µg/L								<100	<100	<100
C29 - C36 Fraction	µg/L								<50	<50	<50
C10 - C36 Fraction (sum)	µg/L	600 [4]							<50	<50	<50

NOTES: 1. SRT Healthy Rivers Action Plan Long Term / Short Term Targets
2. ANZECC 99% protection level for Chlordane
3. ANZECC 99% protection level for Endosulfan
4. Dutch intervention values (2000).
5. pH > 6 / pH < 6
6. ASS disturbance indicators
7. Effluent treatment triggers

Table 5 MW3 Groundwater Laboratory Analysis Results

Analyte grouping/Analyte	Units	ANZECC & ARMCANZ		ADWG		DoH	ANZECC & ARMCANZ				
		Fresh Waters	Marine Waters	Drinking Water Health Value (HV)	Drinking Water Aesthetic Value (AV)	Domestic non-potable groundwater use	Short-term Irrigation Water	Long-term Irrigation Water	18/05/2012 WRMW3	30/08/2012 WRMW3	15/01/2013 WRMW3
pH Value	pH Unit	6.5-8.5	8.0-8.4		6.5-8.5			6.0-8.5	7.41	7.83	7.13
Electrical Conductivity	µS/cm								1070	901	906
Total Dissolved Solids	mg/L								704	567	598
Suspended Solids	mg/L								425	1610	287
Turbidity	NTU								383	1120	900
Total Alkalinity $CaCO_3$	mg/L								292	157	130
Acidity as $CaCO_3$	mg/L								16	18	8
Sulfate as SO_4^{2-}	mg/L			500	250	5000			40	18	41
Chloride	mg/L				250	2500			216	219	184
Dissolved Metals											
Aluminium	mg/L	0.055			0.2	2	20	5	<0.01	0.02	0.61
Arsenic	mg/L	0.013		0.01		0.07	2	0.1	0.004	0.002	0.002
Cadmium	mg/L	0.0002	0.0007	0.00		0.02	0.05	0.01	<0.0001	<0.0001	<0.0001
Chromium	mg/L						1	0.1	<0.001	<0.001	<0.001
Manganese	mg/L	1.9		0.50	0.1	5	10	0.2	0.182	0.108	0.082
Nickel	mg/L	0.011	0.02	0.02		0.2	2	0.2	0.001	0.003	0.003
Selenium	mg/L	0.005		0.01		0.1	0.05	0.02	<0.01	<0.01	<0.01
Zinc	mg/L	0.008	0.015		3	30	5	2	0.005	0.006	0.011
Iron	mg/L	0.3	1.0 / 0.3[5]		0.33	3	10	0.2	2.16	<0.05	1.17
Ferrous Iron	mg/L								2.28	<0.05	0.61
Chromium VI	mg/L	0.001	0.0044	0.05		0.5			<0.010	<0.010	<0.01
Total Metals											
Aluminium	mg/L	0.055			0.2	2	20	5	34.4	24.9	21.5
Arsenic	mg/L	0.013		0.01		0.07	2	0.1	0.01	0.007	0.006
Cadmium	mg/L	0.0002	0.0007	0.002		0.02	0.05	0.01	0.0001	0.0002	<0.0001
Chromium	mg/L						1	0.1	0.047	0.044	0.03
Copper	mg/L	0.0014	0.0013	2	1	20	5	0.2	0.032	0.036	0.022
Lead	mg/L	0.0034	0.0044	0.01		0.1	5	2	0.087	0.079	0.052
Manganese	mg/L	1.9		0.5	0.1	5	10	0.2	0.191	0.129	0.094
Molybdenum	mg/L			0.05		0.5	0.05	0.01	<0.001	0.001	<0.001
Nickel	mg/L	0.011	0.02	0.02		0.2	2	0.2	0.014	0.019	0.011
Selenium	mg/L	0.005		0.01		0.1	0.05	0.02	<0.01	<0.01	<0.01
Silver	mg/L	0.00005	0.0014	0.1		1			<0.001	<0.001	<0.001
Zinc	mg/L	0.008	0.015		3	30	5	2	0.068	0.079	0.061
Iron	mg/L	0.3	1.0 / 0.35		0.33	3	10	0.2	11.9	12.4	9.35
Mercury	mg/L	0.00006	0.0001	0.001		0.01	0.002	0.002	<0.0001	<0.0001	<0.0001
Nutrients											
Ammonia as N	mg/L	0.9	0.91						0.03	0.45	0.1
Nitrite as N	mg/L			3.0		30			<0.01	0.02	<0.01
Nitrate as N	mg/L			50		500			0.17	0.31	0.24
Kjeldhal Nitrogen	mg/L								0.3	1.4	0.9
Total Nitrogen	mg/L	1.0 / 2.0[1]							0.5	1.7	1.1
Total Phosphorus	mg/L	0.1 / 0.2[1]							0.24	0.51	0.63
Reactive Phosphorus	mg/L								<0.01	<0.01	<0.01
Sulfide	mg/L	0.001							<0.1	<0.1	<0.1
COD	mg/L								155	21	11
BOD	mg/L								69	5	2
Organochlorine Pesticides (OC)											
alpha-BHC	µg/L								<0.5	<0.5	<0.5
Hexachlorobenzene (HCB)	µg/L								<0.5	<0.5	<0.5
beta-BHC	µg/L								<0.5	<0.5	<0.5
gamma-BHC	µg/L								<0.5	<0.5	<0.5
delta-BHC	µg/L								<0.5	<0.5	<0.5
Heptachlor	µg/L	0.01							<0.5	<0.5	<0.5
Aldrin	µg/L								<0.5	<0.5	<0.5
Heptachlor epoxide	µg/L			0.05	0.3	3			<0.5	<0.5	<0.5
trans-Chlordane	µg/L	0.03[2]		0.01	1	10			<0.5	<0.5	<0.5
alpha-Endosulfan	µg/L	0.03[3]	0.005[3]	0.05	30	30			<0.5	<0.5	<0.5
cis-Chlordane	µg/L	0.03[2]		0.01	1	10			<0.5	<0.5	<0.5
Dieldrin	µg/L								<0.5	<0.5	<0.5
4.4`-DDE	µg/L								<0.5	<0.5	<0.5
Endrin	µg/L	0.01	0.004						<0.5	<0.5	<0.5
beta-Endosulfan	µg/L	0.03[3]	0.005[3]						<0.5	<0.5	<0.5
4.4`-DDD	µg/L								<0.5	<0.5	<0.5
Endrin aldehyde	µg/L								<0.5	<0.5	<0.5
Endosulfan sulfate	µg/L								<0.5	<0.5	<0.5
4.4`-DDT	µg/L	0.006		0.06	30	0.1			<2	<2	<2.0
Endrin ketone	µg/L								<0.5	<0.5	<0.5
Methoxychlor	µg/L								<2	<2	<2.0
Aldrin plus dieldrin	µg/L			0.010	0.3	3			<1	<0.5	<1.0
Organophosphorus Pesticides (OP)											
Dichlorvos	µg/L								<0.5	<0.5	<0.5
Demeton-S-methyl	µg/L								<0.5	<0.5	<0.5
Monocrotophos	µg/L								<2	<2	<2.0
Dimethoate	µg/L	0.15			50	50			<0.5	<0.5	<0.5
Diazinon	µg/L	0.01		1	3	1			<0.5	<0.5	<0.5
Chlorpyrifos-methyl	µg/L	0.01	0.009		10	100			<0.5	<0.5	<0.5
Parathion-methyl	µg/L								<2	<2	<2.0
Malathion	µg/L	0.05							<0.5	<0.5	<0.5
Fenthion	µg/L								<0.5	<0.5	<0.5
Chlorpyrifos	µg/L	0.01	0.009						<0.5	<0.5	<0.5
Parathion	µg/L	0.004			10	10			<2	<2	<2.0
Pirimphos-ethyl	µg/L								<0.5	<0.5	<0.5
Chlorfenvinphos	µg/L								<0.5	<0.5	<0.5
Bromophos-ethyl	µg/L								<0.5	<0.5	<0.5
Fenamiphos	µg/L								<0.5	<0.5	<0.5
Prothiofos	µg/L								<0.5	<0.5	<0.5
Ethion	µg/L								<0.5	<0.5	<0.5
Carbophenothion	µg/L								<0.5	<0.5	<0.5
Azinphos Methyl	µg/L	0.02							<0.5	<0.5	<0.5

Monocyclic Aromatic Hydrocarbons											
Benzene	µg/L	0.95	0.5	0.001		0.01			-	-	<1
Toluene	µg/L			0.80	0.025	0.025			-	-	<2
Ethylbenzene	µg/L			0.30	0.003	0.003			-	-	<2
meta- & para-Xylene	µg/L	200							-	-	<2
Styrene	µg/L			0.03	0.004	0.004			<5	<5	<5
ortho-Xylene	µg/L	350							-	-	<2
Isopropylbenzene	µg/L								<5	<5	<5
n-Propylbenzene	µg/L								<5	<5	<5
1.3.5-Trimethylbenzene	µg/L								<5	<5	<5
sec-Butylbenzene	µg/L								<5	<5	<5
1.2.4-Trimethylbenzene	µg/L								<5	<5	<5
tert-Butylbenzene	µg/L								<5	<5	<5
p-Isopropyltoluene	µg/L								<5	<5	<5
n-Butylbenzene	µg/L								<5	<5	<5
Oxygenated Compounds											
Vinyl Acetate	µg/L								<50	<50	<50
2-Butanone (MEK)	µg/L								<50	<50	<50
4-Methyl-2-pentanone (MIBK)	µg/L								<50	<50	<50
2-Hexanone (MBK)	µg/L								<50	<50	<50
Sulfonated Compounds											
Carbon disulfide	µg/L								<5	<5	<5
Fumigants											
2.2-Dichloropropane	µg/L								<5	<5	<5
1.2-Dichloropropane	µg/L								<5	<5	<5
cis-1.3-Dichloropropylene	µg/L								<5	<5	<5
trans-1.3-Dichloropropylene	µg/L								<5	<5	<5
1.2-Dibromoethane (EDB)	µg/L								<5	<5	<5
Halogenated Aliphatic Compounds											
Dichlorodifluoromethane	µg/L								<50	<50	<50
Chloromethane	µg/L								<50	<50	<50
Vinyl chloride	µg/L			0.0003		0.003			<50	<50	<50
Bromomethane	µg/L								<50	<50	<50
Chloroethane	µg/L								<50	<50	<50
Trichlorofluoromethane	µg/L								<50	<50	<50
1.1-Dichloroethene	µg/L			0.03		0.3			<5	<5	<5
Iodomethane	µg/L								<5	<5	<5
trans-1.2-Dichloroethene	µg/L								<5	<5	<5
1.1-Dichloroethane	µg/L								<5	<5	<5
cis-1.2-Dichloroethene	µg/L								<5	<5	<5
1.1.1-Trichloroethane	µg/L								<5	<5	<5
1.1-Dichloropropylene	µg/L								<5	<5	<5
Carbon Tetrachloride	µg/L								<5	<5	<5
1.2-Dichloroethane	µg/L			0.003		0.03			<5	<5	<5
Trichloroethene	µg/L								<5	<5	<5
Dibromomethane	µg/L								<5	<5	<5
1.1.2-Trichloroethane	µg/L	6500	1900						<5	<5	<5
1.3-Dichloropropane	µg/L								<5	<5	<5
Tetrachloroethene	µg/L			0.05		0.5			<5	<5	<5
1.1.1.2-Tetrachloroethane	µg/L								<5	<5	<5
trans-1.4-Dichloro-2-butene	µg/L								<5	<5	<5
cis-1.4-Dichloro-2-butene	µg/L								<5	<5	<5
1.1.2.2-Tetrachloroethane	µg/L								<5	<5	<5
1.2.3-Trichloropropane	µg/L								<5	<5	<5
Pentachloroethane	µg/L								<5	<5	<5
1.2-Dibromo-3-chloropropane	µg/L								<5	<5	<5
Hexachlorobutadiene	µg/L								<5	<5	<5
Halogenated Aromatic Compounds											
Chlorobenzene	µg/L			0.30	0.01	0.01			<5	<5	<5
Bromobenzene	µg/L								<5	<5	<5
2-Chlorotoluene	µg/L								<5	<5	<5
4-Chlorotoluene	µg/L								<5	<5	<5
1.3-Dichlorobenzene	µg/L	0.26			0.02	0.02			<5	<5	<5
1.4-Dichlorobenzene	µg/L	0.06		0.04	0.003	0.003			<5	<5	<5
1.2-Dichlorobenzene	µg/L	0.16		1.5	0.001	0.001			<5	<5	<5
1.2.4-Trichlorobenzene	µg/L	0.085	80	0.03	0.005	0.005			<5	<5	<5
1.2.3-Trichlorobenzene	µg/L	0.003		0.03	0.005	0.005			<5	<5	<5
Trihalomethanes											
Chloroform	µg/L								<5	<5	<5
Bromodichloromethane	µg/L								<5	<5	<5
Dibromochloromethane	µg/L								<5	<5	<5
Bromoform	µg/L								<5	<5	<5
Phenolic Compounds											
Phenol	µg/L	320	400						<1.0	<1.0	<1.0
2-Chlorophenol	µg/L	340		300	0.1	3000			<1.0	<1.0	<1.0
2-Methylphenol	µg/L								<1.0	<1.0	<1.0
3- & 4-Methylphenol	µg/L								<2.0	**3.3**	**<2.0**
2-Nitrophenol	µg/L								<1.0	<1.0	<1.0
2.4-Dimethylphenol	µg/L								<1.0	<1.0	<1.0
2.4-Dichlorophenol	µg/L	120		200	0.3	2000			<1.0	<1.0	<1.0
2.6-Dichlorophenol	µg/L								<1.0	<1.0	<1.0
4-Chloro-3-Methylphenol	µg/L								<1.0	<1.0	<1.0
2.4.6-Trichlorophenol	µg/L	3		20	2	200			<1.0	<1.0	<1.0
2.4.5-Trichlorophenol	µg/L								<1.0	<1.0	<1.0
Pentachlorophenol	µg/L	3.6	11						<2.0	<2.0	<2.0

Polynuclear Aromatic Hydrocarbons											
Naphthalene	µg/L	16	50						<1.0	<1.0	<1.0
Acenaphthylene	µg/L								<1.0	<1.0	<1.0
Acenaphthene	µg/L								<1.0	<1.0	<1.0
Fluorene	µg/L								<1.0	<1.0	<1.0
Phenanthrene	µg/L								<1.0	<1.0	<1.0
Anthracene	µg/L								<1.0	<1.0	<1.0
Fluoranthene	µg/L								<1.0	<1.0	<1.0
Pyrene	µg/L								<1.0	<1.0	<1.0
Benz(a)anthracene	µg/L								<1.0	<1.0	<1.0
Chrysene	µg/L								<1.0	<1.0	<1.0
Benzo(b)fluoranthene	µg/L								<1.0	<1.0	<1.0
Benzo(k)fluoranthene	µg/L								<1.0	<1.0	<1.0
Benzo(a)pyrene	µg/L			0.01		0.1			<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	µg/L								<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	µg/L								<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	µg/L								<1.0	<1.0	<1.0
Total Petroleum Hydrocarbons											
C6 - C9 Fraction	µg/L								<20	<20	<20
C10 - C14 Fraction	µg/L								<50	<50	<50
C15 - C28 Fraction	µg/L								<100	<100	<100
C29 - C36 Fraction	µg/L								**270**	<50	<50
C10 - C36 Fraction (sum)	µg/L	600 [4]							**270**	<50	<50

NOTES: 1. SRT Healthy Rivers Action Plan Long Term / Short Term Targets
2. ANZECC 99% protection level for Chlordane
3. ANZECC 99% protection level for Endosulfan
4. Dutch intervention values (2000).
5. pH > 6 / pH < 6
6. ASS disturbance indicators
7. Effluent treatment triggers

Table 6 MW4 Groundwater Laboratory Analysis Results

Analyte grouping/Analyte	Units	ANZECC & ARMCANZ		ADWG		DoH	ANZECC & ARMCANZ				
		Fresh Waters	Marine Waters	Drinking Water Health Value (HV)	Drinking Water Aesthetic Value (AV)	Domestic non-potable groundwater use	Short-term Irrigation Water	Long-term Irrigation Water	18/05/2012 WRMW4	30/08/2012 WRMW4	15/01/2013 WRMW4
pH Value	pH Unit	6.5-8.5	8.0-8.4		6.5-8.5			6.0-8.5	6.04	5.96	5.61
Electrical Conductivity	µS/cm								354	144	118
Total Dissolved Solids	mg/L								226	83	74
Suspended Solids	mg/L								144	9	313
Turbidity	NTU								86.9	10.8	81.8
Total Alkalinity $CaCO_3$	mg/L								5	1	2
Acidity as $CaCO_3$	mg/L								8	21	16
Sulfate as SO_4^{2-}	mg/L			500	250	5000			17	2	2
Chloride	mg/L				250	2500			89	30	23
Dissolved Metals											
Aluminium	mg/L	0.055			0.2	2	20	5	0.02	0.06	0.34
Arsenic	mg/L	0.013		0.01		0.07	2	0.1	<0.001	<0.001	<0.001
Cadmium	mg/L	0.0002	0.0007	0.00		0.02	0.05	0.01	<0.0001	0.0001	<0.0001
Chromium	mg/L						1	0.1	<0.001	<0.001	<0.001
Manganese	mg/L	1.9		0.50	0.1	5	10	0.2	0.013	0.005	0.005
Nickel	mg/L	0.011	0.02	0.02		0.2	2	0.2	<0.001	0.003	0.012
Selenium	mg/L	0.005		0.01		0.1	0.05	0.02	<0.01	<0.01	<0.01
Zinc	mg/L	0.008	0.015		3	30	5	2	0.01	0.01	0.072
Iron	mg/L	0.3	1.0 / 0.3[5]		0.33	3	10	0.2	0.11	<0.05	0.31
Ferrous Iron	mg/L								<0.05	<0.05	0.09
Chromium VI	mg/L	0.001	0.0044	0.05		0.5			<0.010	<0.01	<0.01
Total Metals											
Aluminium	mg/L	0.055			0.2	2	20	5	4.3	1.61	13.9
Arsenic	mg/L	0.013		0.01		0.07	2	0.1	0.001	<0.001	<0.001
Cadmium	mg/L	0.0002	0.0007	0.002		0.02	0.05	0.01	<0.0001	<0.0001	<0.0001
Chromium	mg/L						1	0.1	0.004	0.001	0.008
Copper	mg/L	0.0014	0.0013	2	1	20	5	0.2	0.005	0.003	0.025
Lead	mg/L	0.0034	0.0044	0.01		0.1	5	2	0.011	0.005	0.012
Manganese	mg/L	1.9		0.5	0.1	5	10	0.2	0.016	0.006	0.007
Molybdenum	mg/L			0.05		0.5	0.05	0.01	<0.001	<0.001	<0.001
Nickel	mg/L	0.011	0.02	0.02		0.2	2	0.2	0.001	0.003	0.016
Selenium	mg/L	0.005		0.01		0.1	0.05	0.02	<0.01	<0.01	<0.01
Silver	mg/L	0.00005	0.0014	0.1		1			<0.001	<0.001	<0.001
Zinc	mg/L	0.008	0.015		3	30	5	2	0.017	0.011	0.11
Iron	mg/L	0.3	1.0 / 0.35		0.33	3	10	0.2	0.88	0.4	1.5
Mercury	mg/L	0.00006	0.0001	0.001		0.01	0.002	0.002	<0.0001	<0.0001	<0.0001
Nutrients											
Ammonia as N	mg/L	0.9	0.91						0.11	0.05	0.03
Nitrite as N	mg/L			3.0		30			0.01	<0.01	<0.01
Nitrate as N	mg/L			50		500			3.75	4.92	4.38
Kjeldhal Nitrogen	mg/L								0.5	1.1	0.7
Total Nitrogen	mg/L	1.0 / 2.0[1]							4.3	6	5.1
Total Phosphorus	mg/L	0.1 / 0.2[1]							0.04	0.12	0.06
Reactive Phosphorus	mg/L								<0.01	<0.01	<0.01
Sulfide	mg/L	0.001							<0.1	<0.1	<0.1
COD	mg/L								11	7	16
BOD	mg/L								4	<2	4
Organochlorine Pesticides (OC)											
alpha-BHC	µg/L								<0.5	<0.5	<0.5
Hexachlorobenzene (HCB)	µg/L								<0.5	<0.5	<0.5
beta-BHC	µg/L								<0.5	<0.5	<0.5
gamma-BHC	µg/L								<0.5	<0.5	<0.5
delta-BHC	µg/L								<0.5	<0.5	<0.5
Heptachlor	µg/L	0.01							<0.5	<0.5	<0.5
Aldrin	µg/L								<0.5	<0.5	<0.5
Heptachlor epoxide	µg/L			0.05	0.3	3			<0.5	<0.5	<0.5
trans-Chlordane	µg/L	0.03[2]		0.01	1	10			<0.5	<0.5	<0.5
alpha-Endosulfan	µg/L	0.03[3]	0.005[3]	0.05	30	30			<0.5	<0.5	<0.5
cis-Chlordane	µg/L	0.03[2]		0.01	1	10			<0.5	<0.5	<0.5
Dieldrin	µg/L								<0.5	<0.5	<0.5
4.4`-DDE	µg/L								<0.5	<0.5	<0.5
Endrin	µg/L	0.01	0.004						<0.5	<0.5	<0.5
beta-Endosulfan	µg/L	0.03[3]	0.005[3]						<0.5	<0.5	<0.5
4.4`-DDD	µg/L								<0.5	<0.5	<0.5
Endrin aldehyde	µg/L								<0.5	<0.5	<0.5
Endosulfan sulfate	µg/L								<0.5	<0.5	<0.5
4.4`-DDT	µg/L	0.006		0.06	30	0.1			<2	<2	<2.0
Endrin ketone	µg/L								<0.5	<0.5	<0.5
Methoxychlor	µg/L								<2	<2	<2.0
Aldrin plus dieldrin	µg/L			0.010	0.3	3			<1	<0.5	<1.0
Organophosphorus Pesticides (OP)											
Dichlorvos	µg/L								<0.5	<0.5	<0.5
Demeton-S-methyl	µg/L								<0.5	<0.5	<0.5
Monocrotophos	µg/L								<2	<2	<2.0
Dimethoate	µg/L	0.15			50	50			<0.5	<0.5	<0.5
Diazinon	µg/L	0.01		1	3	1			<0.5	<0.5	<0.5
Chlorpyrifos-methyl	µg/L	0.01	0.009		10	100			<0.5	<0.5	<0.5
Parathion-methyl	µg/L								<2	<2	<2.0
Malathion	µg/L	0.05							<0.5	<0.5	<0.5
Fenthion	µg/L								<0.5	<0.5	<0.5
Chlorpyrifos	µg/L	0.01	0.009						<0.5	<0.5	<0.5
Parathion	µg/L	0.004			10	10			<2	<2	<2.0
Pirimphos-ethyl	µg/L								<0.5	<0.5	<0.5
Chlorfenvinphos	µg/L								<0.5	<0.5	<0.5
Bromophos-ethyl	µg/L								<0.5	<0.5	<0.5
Fenamiphos	µg/L								<0.5	<0.5	<0.5
Prothiofos	µg/L								<0.5	<0.5	<0.5
Ethion	µg/L								<0.5	<0.5	<0.5
Carbophenothion	µg/L								<0.5	<0.5	<0.5
Azinphos Methyl	µg/L	0.02							<0.5	<0.5	<0.5

Monocyclic Aromatic Hydrocarbons											
Benzene	µg/L	0.95	0.5	0.001		0.01			-	-	<1
Toluene	µg/L			0.80	0.025	0.025			-	-	<2
Ethylbenzene	µg/L			0.30	0.003	0.003			-	-	<2
meta- & para-Xylene	µg/L	200							-	-	<2
Styrene	µg/L			0.03	0.004	0.004			<5	<5	<5
ortho-Xylene	µg/L	350							-	-	<2
Isopropylbenzene	µg/L								<5	<5	<5
n-Propylbenzene	µg/L								<5	<5	<5
1.3.5-Trimethylbenzene	µg/L								<5	<5	<5
sec-Butylbenzene	µg/L								<5	<5	<5
1.2.4-Trimethylbenzene	µg/L								<5	<5	<5
tert-Butylbenzene	µg/L								<5	<5	<5
p-Isopropyltoluene	µg/L								<5	<5	<5
n-Butylbenzene	µg/L								<5	<5	<5
Oxygenated Compounds											
Vinyl Acetate	µg/L								<50	<50	<50
2-Butanone (MEK)	µg/L								<50	<50	<50
4-Methyl-2-pentanone (MIBK)	µg/L								<50	<50	<50
2-Hexanone (MBK)	µg/L								<50	<50	<50
Sulfonated Compounds											
Carbon disulfide	µg/L								<5	<5	<5
Fumigants											
2.2-Dichloropropane	µg/L								<5	<5	<5
1.2-Dichloropropane	µg/L								<5	<5	<5
cis-1.3-Dichloropropylene	µg/L								<5	<5	<5
trans-1.3-Dichloropropylene	µg/L								<5	<5	<5
1.2-Dibromoethane (EDB)	µg/L								<5	<5	<5
Halogenated Aliphatic Compounds											
Dichlorodifluoromethane	µg/L								<50	<50	<50
Chloromethane	µg/L								<50	<50	<50
Vinyl chloride	µg/L			0.0003		0.003			<50	<50	<50
Bromomethane	µg/L								<50	<50	<50
Chloroethane	µg/L								<50	<50	<50
Trichlorofluoromethane	µg/L								<50	<50	<50
1.1-Dichloroethene	µg/L			0.03		0.3			<5	<5	<5
Iodomethane	µg/L								<5	<5	<5
trans-1.2-Dichloroethene	µg/L								<5	<5	<5
1.1-Dichloroethane	µg/L								<5	<5	<5
cis-1.2-Dichloroethene	µg/L								<5	<5	<5
1.1.1-Trichloroethane	µg/L								<5	<5	<5
1.1-Dichloropropylene	µg/L								<5	<5	<5
Carbon Tetrachloride	µg/L								<5	<5	<5
1.2-Dichloroethane	µg/L			0.003		0.03			<5	<5	<5
Trichloroethene	µg/L								<5	<5	<5
Dibromomethane	µg/L								<5	<5	<5
1.1.2-Trichloroethane	µg/L	6500	1900						<5	<5	<5
1.3-Dichloropropane	µg/L								<5	<5	<5
Tetrachloroethene	µg/L			0.05		0.5			<5	<5	<5
1.1.1.2-Tetrachloroethane	µg/L								<5	<5	<5
trans-1.4-Dichloro-2-butene	µg/L								<5	<5	<5
cis-1.4-Dichloro-2-butene	µg/L								<5	<5	<5
1.1.2.2-Tetrachloroethane	µg/L								<5	<5	<5
1.2.3-Trichloropropane	µg/L								<5	<5	<5
Pentachloroethane	µg/L								<5	<5	<5
1.2-Dibromo-3-chloropropane	µg/L								<5	<5	<5
Hexachlorobutadiene	µg/L								<5	<5	<5
Halogenated Aromatic Compounds											
Chlorobenzene	µg/L			0.30	0.01	0.01			<5	<5	<5
Bromobenzene	µg/L								<5	<5	<5
2-Chlorotoluene	µg/L								<5	<5	<5
4-Chlorotoluene	µg/L								<5	<5	<5
1.3-Dichlorobenzene	µg/L	0.26			0.02	0.02			<5	<5	<5
1.4-Dichlorobenzene	µg/L	0.06		0.04	0.003	0.003			<5	<5	<5
1.2-Dichlorobenzene	µg/L	0.16		1.5	0.001	0.001			<5	<5	<5
1.2.4-Trichlorobenzene	µg/L	0.085	80	0.03	0.005	0.005			<5	<5	<5
1.2.3-Trichlorobenzene	µg/L	0.003		0.03	0.005	0.005			<5	<5	<5
Trihalomethanes											
Chloroform	µg/L								<5	<5	<5
Bromodichloromethane	µg/L								<5	<5	<5
Dibromochloromethane	µg/L								**12**	<5	<5
Bromoform	µg/L								**13**	<5	<5
Phenolic Compounds											
Phenol	µg/L	320	400						<1.0	<1.0	<1.0
2-Chlorophenol	µg/L	340		300	0.1	3000			<1.0	<1.0	<1.0
2-Methylphenol	µg/L								<1.0	<1.0	<1.0
3- & 4-Methylphenol	µg/L								<2.0	<2.0	<2.0
2-Nitrophenol	µg/L								<1.0	<1.0	<1.0
2.4-Dimethylphenol	µg/L								<1.0	<1.0	<1.0
2.4-Dichlorophenol	µg/L	120		200	0.3	2000			<1.0	<1.0	<1.0
2.6-Dichlorophenol	µg/L								<1.0	<1.0	<1.0
4-Chloro-3-Methylphenol	µg/L								<1.0	<1.0	<1.0
2.4.6-Trichlorophenol	µg/L	3		20	2	200			<1.0	<1.0	<1.0
2.4.5-Trichlorophenol	µg/L								<1.0	<1.0	<1.0
Pentachlorophenol	µg/L	3.6	11						<2.0	<2.0	<2.0

Polynuclear Aromatic Hydrocarbons											
Naphthalene	µg/L	16	50						<1.0	<1.0	<1.0
Acenaphthylene	µg/L								<1.0	<1.0	<1.0
Acenaphthene	µg/L								<1.0	<1.0	<1.0
Fluorene	µg/L								<1.0	<1.0	<1.0
Phenanthrene	µg/L								<1.0	<1.0	<1.0
Anthracene	µg/L								<1.0	<1.0	<1.0
Fluoranthene	µg/L								<1.0	<1.0	<1.0
Pyrene	µg/L								<1.0	<1.0	<1.0
Benz(a)anthracene	µg/L								<1.0	<1.0	<1.0
Chrysene	µg/L								<1.0	<1.0	<1.0
Benzo(b)fluoranthene	µg/L								<1.0	<1.0	<1.0
Benzo(k)fluoranthene	µg/L								<1.0	<1.0	<1.0
Benzo(a)pyrene	µg/L			0.01		0.1			<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	µg/L								<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	µg/L								<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	µg/L								<1.0	<1.0	<1.0
Total Petroleum Hydrocarbons											
C6 - C9 Fraction	µg/L								<20	<20	<20
C10 - C14 Fraction	µg/L								<50	<50	<50
C15 - C28 Fraction	µg/L								<100	<100	<100
C29 - C36 Fraction	µg/L								<50	<50	<50
C10 - C36 Fraction (sum)	µg/L	600 [4]							<50	<50	<50

NOTES: 1. SRT Healthy Rivers Action Plan Long Term / Short Term Targets
2. ANZECC 99% protection level for Chlordane
3. ANZECC 99% protection level for Endosulfan
4. Dutch intervention values (2000).
5. pH > 6 / pH < 6
6. ASS disturbance indicators
7. Effluent treatment triggers

Table 7 MW5 Groundwater Laboratory Analysis Results

Analyte grouping/Analyte	Units	ANZECC & ARMCANZ		ADWG		DoH	ANZECC & ARMCANZ		18/05/2012	30/08/2012	15/01/2013
		Fresh Waters	Marine Waters	Drinking Water Health Value (HV)	Drinking Water Aesthetic Value (AV)	Domestic non-potable groundwater use	Short-term Irrigation Water	Long-term Irrigation Water	WRMW5	WRMW5	WRMW5
pH Value	pH Unit	6.5-8.5	8.0-8.4		6.5-8.5			6.0-8.5	5.86	5.72	6.07
Electrical Conductivity	µS/cm								449	97	124
Total Dissolved Solids	mg/L								341	56	133
Suspended Solids	mg/L								59	660	42
Turbidity	NTU								137	854	57.6
Total Alkalinity $CaCO_3$	mg/L								5	<1	3
Acidity as $CaCO_3$	mg/L								13	11	6
Sulfate as SO_4^{2-}	mg/L			500	250	5000			19	7	11
Chloride	mg/L				250	2500			132	17	25
Dissolved Metals											
Aluminium	mg/L	0.055			0.2	2	20	5	0.19	1.48	0.41
Arsenic	mg/L	0.013		0.01		0.07	2	0.1	<0.001	0.001	<0.001
Cadmium	mg/L	0.0002	0.0007	0.00		0.02	0.05	0.01	<0.0001	<0.0001	<0.0001
Chromium	mg/L						1	0.1	<0.001	<0.001	<0.001
Manganese	mg/L	1.9		0.50	0.1	5	10	0.2	0.01	0.005	0.001
Nickel	mg/L	0.011	0.02	0.02		0.2	2	0.2	0.001	0.004	0.004
Selenium	mg/L	0.005		0.01		0.1	0.05	0.02	<0.01	<0.01	<0.01
Zinc	mg/L	0.008	0.015		3	30	5	2	0.008	0.021	0.028
Iron	mg/L	0.3	1.0 / 0.3[5]		0.33	3	10	0.2	0.08	0.54	<0.05
Ferrous Iron	mg/L								<0.05	0.12	<0.05
Chromium VI	mg/L	0.001	0.0044	0.05		0.5			<0.010	<0.010	<0.01
Total Metals											
Aluminium	mg/L	0.055			0.2	2	20	5	10	2.57	5.03
Arsenic	mg/L	0.013		0.01		0.07	2	0.1	0.001	<0.001	<0.001
Cadmium	mg/L	0.0002	0.0007	0.002		0.02	0.05	0.01	<0.0001	<0.0001	<0.0001
Chromium	mg/L						1	0.1	0.005	0.001	0.003
Copper	mg/L	0.0014	0.0013	2	1	20	5	0.2	0.005	0.015	0.006
Lead	mg/L	0.0034	0.0044	0.01		0.1	5	2	0.015	0.002	0.005
Manganese	mg/L	1.9		0.5	0.1	5	10	0.2	0.01	0.002	0.002
Molybdenum	mg/L			0.05		0.5	0.05	0.01	<0.001	<0.001	<0.001
Nickel	mg/L	0.011	0.02	0.02		0.2	2	0.2	0.003	0.002	0.004
Selenium	mg/L	0.005		0.01		0.1	0.05	0.02	<0.01	<0.01	<0.01
Silver	mg/L	0.00005	0.0014	0.1		1			<0.001	<0.001	<0.001
Zinc	mg/L	0.008	0.015		3	30	5	2	0.011	0.007	0.025
Iron	mg/L	0.3	1.0 / 0.35		0.33	3	10	0.2	0.49	0.13	0.37
Mercury	mg/L	0.00006	0.0001	0.001		0.01	0.002	0.002	<0.0001	<0.0001	<0.0001
Nutrients											
Ammonia as N	mg/L	0.9	0.91						0.01	0.06	<0.01
Nitrite as N	mg/L			3.0		30			0.04	<0.01	<0.01
Nitrate as N	mg/L			50		500			0.45	2.03	1.63
Kjeldhal Nitrogen	mg/L								0.1	1.5	0.2
Total Nitrogen	mg/L	1.0 / 2.0[1]							0.6	3.5	1.8
Total Phosphorus	mg/L	0.1 / 0.2[1]							0.02	0.23	0.02
Reactive Phosphorus	mg/L								<0.01	<0.01	<0.01
Sulfide	mg/L	0.001							<0.1	<0.1	<0.1
COD	mg/L								9	<5	<5
BOD	mg/L								3	3	<2
Organochlorine Pesticides (OC)											
alpha-BHC	µg/L								<0.5	<0.5	<0.5
Hexachlorobenzene (HCB)	µg/L								<0.5	<0.5	<0.5
beta-BHC	µg/L								<0.5	<0.5	<0.5
gamma-BHC	µg/L								<0.5	<0.5	<0.5
delta-BHC	µg/L								<0.5	<0.5	<0.5
Heptachlor	µg/L	0.01							<0.5	<0.5	<0.5
Aldrin	µg/L								<0.5	<0.5	<0.5
Heptachlor epoxide	µg/L			0.05	0.3	3			<0.5	<0.5	<0.5
trans-Chlordane	µg/L	0.03 [2]		0.01	1	10			<0.5	<0.5	<0.5
alpha-Endosulfan	µg/L	0.03 [3]	0.005 [3]	0.05	30	30			<0.5	<0.5	<0.5
cis-Chlordane	µg/L	0.03 [2]		0.01	1	10			<0.5	<0.5	<0.5
Dieldrin	µg/L								<0.5	<0.5	<0.5
4.4`-DDE	µg/L								<0.5	<0.5	<0.5
Endrin	µg/L	0.01	0.004						<0.5	<0.5	<0.5
beta-Endosulfan	µg/L	0.03 [3]	0.005 [3]						<0.5	<0.5	<0.5
4.4`-DDD	µg/L								<0.5	<0.5	<0.5
Endrin aldehyde	µg/L								<0.5	<0.5	<0.5
Endosulfan sulfate	µg/L								<0.5	<0.5	<0.5
4.4`-DDT	µg/L	0.006		0.06	30	0.1			<2	<2	<2.0
Endrin ketone	µg/L								<0.5	<0.5	<0.5
Methoxychlor	µg/L								<2	<2	<2.0
Aldrin plus dieldrin	µg/L			0.010	0.3	3			<1	<0.5	<1.0
Organophosphorus Pesticides (OP)											
Dichlorvos	µg/L								<0.5	<0.5	<0.5
Demeton-S-methyl	µg/L								<0.5	<0.5	<0.5
Monocrotophos	µg/L								<2	<2	<2.0
Dimethoate	µg/L	0.15			50	50			<0.5	<0.5	<0.5
Diazinon	µg/L	0.01		1	3	1			<0.5	<0.5	<0.5
Chlorpyrifos-methyl	µg/L	0.01	0.009		10	100			<0.5	<0.5	<0.5
Parathion-methyl	µg/L								<2	<2	<2.0
Malathion	µg/L	0.05							<0.5	<0.5	<0.5
Fenthion	µg/L								<0.5	<0.5	<0.5
Chlorpyrifos	µg/L	0.01	0.009						<0.5	<0.5	<0.5
Parathion	µg/L	0.004			10	10			<2	<2	<2.0
Pirimphos-ethyl	µg/L								<0.5	<0.5	<0.5
Chlorfenvinphos	µg/L								<0.5	<0.5	<0.5
Bromophos-ethyl	µg/L								<0.5	<0.5	<0.5
Fenamiphos	µg/L								<0.5	<0.5	<0.5
Prothiofos	µg/L								<0.5	<0.5	<0.5
Ethion	µg/L								<0.5	<0.5	<0.5
Carbophenothion	µg/L								<0.5	<0.5	<0.5
Azinphos Methyl	µg/L	0.02							<0.5	<0.5	<0.5

Monocyclic Aromatic Hydrocarbons											
Benzene	µg/L	0.95	0.5	0.001		0.01			-	-	<1
Toluene	µg/L			0.80	0.025	0.025			-	-	<2
Ethylbenzene	µg/L			0.30	0.003	0.003			-	-	<2
meta- & para-Xylene	µg/L	200							-	-	<2
Styrene	µg/L			0.03	0.004	0.004			<5	<5	<5
ortho-Xylene	µg/L	350							-	-	<2
Isopropylbenzene	µg/L								<5	<5	<5
n-Propylbenzene	µg/L								<5	<5	<5
1.3.5-Trimethylbenzene	µg/L								<5	<5	<5
sec-Butylbenzene	µg/L								<5	<5	<5
1.2.4-Trimethylbenzene	µg/L								<5	<5	<5
tert-Butylbenzene	µg/L								<5	<5	<5
p-Isopropyltoluene	µg/L								<5	<5	<5
n-Butylbenzene	µg/L								<5	<5	<5
Oxygenated Compounds											
Vinyl Acetate	µg/L								<50	<50	<50
2-Butanone (MEK)	µg/L								<50	<50	<50
4-Methyl-2-pentanone (MIBK)	µg/L								<50	<50	<50
2-Hexanone (MBK)	µg/L								<50	<50	<50
Sulfonated Compounds											
Carbon disulfide	µg/L								<5	<5	<5
Fumigants											
2.2-Dichloropropane	µg/L								<5	<5	<5
1.2-Dichloropropane	µg/L								<5	<5	<5
cis-1.3-Dichloropropylene	µg/L								<5	<5	<5
trans-1.3-Dichloropropylene	µg/L								<5	<5	<5
1.2-Dibromoethane (EDB)	µg/L								<5	<5	<5
Halogenated Aliphatic Compounds											
Dichlorodifluoromethane	µg/L								<50	<50	<50
Chloromethane	µg/L								<50	<50	<50
Vinyl chloride	µg/L			0.0003		0.003			<50	<50	<50
Bromomethane	µg/L								<50	<50	<50
Chloroethane	µg/L								<50	<50	<50
Trichlorofluoromethane	µg/L								<50	<50	<50
1.1-Dichloroethene	µg/L			0.03		0.3			<5	<5	<5
Iodomethane	µg/L								<5	<5	<5
trans-1.2-Dichloroethene	µg/L								<5	<5	<5
1.1-Dichloroethane	µg/L								<5	<5	<5
cis-1.2-Dichloroethene	µg/L								<5	<5	<5
1.1.1-Trichloroethane	µg/L								<5	<5	<5
1.1-Dichloropropylene	µg/L								<5	<5	<5
Carbon Tetrachloride	µg/L								<5	<5	<5
1.2-Dichloroethane	µg/L			0.003		0.03			<5	<5	<5
Trichloroethene	µg/L								<5	<5	<5
Dibromomethane	µg/L								<5	<5	<5
1.1.2-Trichloroethane	µg/L	6500	1900						<5	<5	<5
1.3-Dichloropropane	µg/L								<5	<5	<5
Tetrachloroethene	µg/L			0.05		0.5			<5	<5	<5
1.1.1.2-Tetrachloroethane	µg/L								<5	<5	<5
trans-1.4-Dichloro-2-butene	µg/L								<5	<5	<5
cis-1.4-Dichloro-2-butene	µg/L								<5	<5	<5
1.1.2.2-Tetrachloroethane	µg/L								<5	<5	<5
1.2.3-Trichloropropane	µg/L								<5	<5	<5
Pentachloroethane	µg/L								<5	<5	<5
1.2-Dibromo-3-chloropropane	µg/L								<5	<5	<5
Hexachlorobutadiene	µg/L								<5	<5	<5
Halogenated Aromatic Compounds											
Chlorobenzene	µg/L			0.30	0.01	0.01			<5	<5	<5
Bromobenzene	µg/L								<5	<5	<5
2-Chlorotoluene	µg/L								<5	<5	<5
4-Chlorotoluene	µg/L								<5	<5	<5
1.3-Dichlorobenzene	µg/L	0.26			0.02	0.02			<5	<5	<5
1.4-Dichlorobenzene	µg/L	0.06		0.04	0.003	0.003			<5	<5	<5
1.2-Dichlorobenzene	µg/L	0.16		1.5	0.001	0.001			<5	<5	<5
1.2.4-Trichlorobenzene	µg/L	0.085	80	0.03	0.005	0.005			<5	<5	<5
1.2.3-Trichlorobenzene	µg/L	0.003		0.03	0.005	0.005			<5	<5	<5
Trihalomethanes											
Chloroform	µg/L								<5	<5	<5
Bromodichloromethane	µg/L								5	<5	<5
Dibromochloromethane	µg/L								**20**	<5	<5
Bromoform	µg/L								**22**	<5	<5
Phenolic Compounds											
Phenol	µg/L	320	400						<1.0	<1.0	<1.0
2-Chlorophenol	µg/L	340		300	0.1	3000			<1.0	<1.0	<1.0
2-Methylphenol	µg/L								<1.0	<1.0	<1.0
3- & 4-Methylphenol	µg/L								<2.0	<2.0	<2.0
2-Nitrophenol	µg/L								<1.0	<1.0	<1.0
2.4-Dimethylphenol	µg/L								<1.0	<1.0	<1.0
2.4-Dichlorophenol	µg/L	120		200	0.3	2000			<1.0	<1.0	<1.0
2.6-Dichlorophenol	µg/L								<1.0	<1.0	<1.0
4-Chloro-3-Methylphenol	µg/L								<1.0	<1.0	<1.0
2.4.6-Trichlorophenol	µg/L	3		20	2	200			<1.0	<1.0	<1.0
2.4.5-Trichlorophenol	µg/L								<1.0	<1.0	<1.0
Pentachlorophenol	µg/L	3.6	11						<2.0	<2.0	<2.0

Polynuclear Aromatic Hydrocarbons											
Naphthalene	µg/L	16	50						<1.0	<1.0	<1.0
Acenaphthylene	µg/L								<1.0	<1.0	<1.0
Acenaphthene	µg/L								<1.0	<1.0	<1.0
Fluorene	µg/L								<1.0	<1.0	<1.0
Phenanthrene	µg/L								<1.0	<1.0	<1.0
Anthracene	µg/L								<1.0	<1.0	<1.0
Fluoranthene	µg/L								<1.0	<1.0	<1.0
Pyrene	µg/L								<1.0	<1.0	<1.0
Benz(a)anthracene	µg/L								<1.0	<1.0	<1.0
Chrysene	µg/L								<1.0	<1.0	<1.0
Benzo(b)fluoranthene	µg/L								<1.0	<1.0	<1.0
Benzo(k)fluoranthene	µg/L								<1.0	<1.0	<1.0
Benzo(a)pyrene	µg/L			0.01		0.1			<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	µg/L								<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	µg/L								<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	µg/L								<1.0	<1.0	<1.0
Total Petroleum Hydrocarbons											
C6 - C9 Fraction	µg/L								<20	<20	<20
C10 - C14 Fraction	µg/L								<50	<50	<50
C15 - C28 Fraction	µg/L								<100	<100	<100
C29 - C36 Fraction	µg/L								<50	<50	<50
C10 - C36 Fraction (sum)	µg/L	600 [4]							<50	<50	<50

NOTES: 1. SRT Healthy Rivers Action Plan Long Term / Short Term Targets
2. ANZECC 99% protection level for Chlordane
3. ANZECC 99% protection level for Endosulfan
4. Dutch intervention values (2000).
5. pH > 6 / pH < 6
6. ASS disturbance indicators
7. Effluent treatment triggers

Table 8 MW6 Groundwater Laboratory Analysis Results

Analyte grouping/Analyte	Units	ANZECC & ARMCANZ		ADWG		DoH	ANZECC & ARMCANZ				
		Fresh Waters	Marine Waters	Drinking Water Health Value (HV)	Drinking Water Aesthetic Value (AV)	Domestic non-potable groundwater use	Short-term Irrigation Water	Long-term Irrigation Water	18/05/2012 WRMW6	30/08/2012 WRMW6	15/01/2013 WRMW6
pH Value	pH Unit	6.5-8.5	8.0-8.4		6.5-8.5			6.0-8.5	5.83	5.87	5.15
Electrical Conductivity	µS/cm								808	914	912
Total Dissolved Solids	mg/L								492	578	588
Suspended Solids	mg/L								50	6	32
Turbidity	NTU								76.6	4	19.9
Total Alkalinity $CaCO_3$	mg/L								38	10	3
Acidity as $CaCO_3$	mg/L								22	39	28
Sulfate as SO_4^{2-}	mg/L			500	250	5000			173	203	169
Chloride	mg/L				250	2500			124	153	168
Dissolved Metals											
Aluminium	mg/L	0.055			0.2	2	20	5	0.01	0.15	0.3
Arsenic	mg/L	0.013		0.01		0.07	2	0.1	<0.001	<0.001	0.001
Cadmium	mg/L	0.0002	0.0007	0.00		0.02	0.05	0.01	<0.0001	<0.0001	<0.0001
Chromium	mg/L						1	0.1	<0.001	<0.001	<0.001
Manganese	mg/L	1.9		0.50	0.1	5	10	0.2	0.035	0.032	0.032
Nickel	mg/L	0.011	0.02	0.02		0.2	2	0.2	0.001	0.004	0.014
Selenium	mg/L	0.005		0.01		0.1	0.05	0.02	<0.01	<0.01	<0.01
Zinc	mg/L	0.008	0.015		3	30	5	2	0.01	0.016	0.132
Iron	mg/L	0.3	1.0 / 0.3[5]		0.33	3	10	0.2	1.42	0.11	0.91
Ferrous Iron	mg/L								0.35	<0.05	0.73
Chromium VI	mg/L	0.001	0.0044	0.05		0.5			<0.010	<0.010	<0.01
Total Metals											
Aluminium	mg/L	0.055			0.2	2	20	5	0.74	0.41	1.15
Arsenic	mg/L	0.013		0.01		0.07	2	0.1	<0.001	<0.001	<0.001
Cadmium	mg/L	0.0002	0.0007	0.002		0.02	0.05	0.01	<0.0001	<0.0001	<0.0001
Chromium	mg/L						1	0.1	<0.001	<0.001	0.005
Copper	mg/L	0.0014	0.0013	2	1	20	5	0.2	0.002	0.003	0.013
Lead	mg/L	0.0034	0.0044	0.01		0.1	5	2	0.007	0.009	0.008
Manganese	mg/L	1.9		0.5	0.1	5	10	0.2	0.034	0.034	0.035
Molybdenum	mg/L			0.05		0.5	0.05	0.01	<0.001	<0.001	<0.001
Nickel	mg/L	0.011	0.02	0.02		0.2	2	0.2	0.002	0.003	0.013
Selenium	mg/L	0.005		0.01		0.1	0.05	0.02	<0.01	<0.01	<0.01
Silver	mg/L	0.00005	0.0014	0.1		1			<0.001	<0.001	<0.001
Zinc	mg/L	0.008	0.015		3	30	5	2	0.012	0.011	0.107
Iron	mg/L	0.3	1.0 / 0.35		0.33	3	10	0.2	10.4	3.21	1.74
Mercury	mg/L	0.00006	0.0001	0.001		0.01	0.002	0.002	<0.0001	<0.0001	<0.0001
Nutrients											
Ammonia as N	mg/L	0.9	0.91						1.64	0.73	0.33
Nitrite as N	mg/L			3.0		30			0.05	0.02	<0.01
Nitrate as N	mg/L			50		500			0.17	1.43	1.16
Kjeldhal Nitrogen	mg/L								1.6	1.1	0.8
Total Nitrogen	mg/L	1.0 / 2.0[1]							1.8	2.6	2
Total Phosphorus	mg/L	0.1 / 0.2[1]							0.03	0.02	0.03
Reactive Phosphorus	mg/L								<0.01	<0.01	<0.01
Sulfide	mg/L	0.001							<0.1	<0.1	<0.1
COD	mg/L								25	30	23
BOD	mg/L								26	2	<2
Organochlorine Pesticides (OC)											
alpha-BHC	µg/L								<0.5	<0.5	<0.5
Hexachlorobenzene (HCB)	µg/L								<0.5	<0.5	<0.5
beta-BHC	µg/L								<0.5	<0.5	<0.5
gamma-BHC	µg/L								<0.5	<0.5	<0.5
delta-BHC	µg/L								<0.5	<0.5	<0.5
Heptachlor	µg/L	0.01							<0.5	<0.5	<0.5
Aldrin	µg/L								<0.5	<0.5	<0.5
Heptachlor epoxide	µg/L			0.05	0.3	3			<0.5	<0.5	<0.5
trans-Chlordane	µg/L	0.03[2]		0.01	1	10			<0.5	<0.5	<0.5
alpha-Endosulfan	µg/L	0.03[3]	0.005[3]	0.05	30	30			<0.5	<0.5	<0.5
cis-Chlordane	µg/L	0.03[2]		0.01	1	10			<0.5	<0.5	<0.5
Dieldrin	µg/L								<0.5	<0.5	<0.5
4.4`-DDE	µg/L								<0.5	<0.5	<0.5
Endrin	µg/L	0.01	0.004						<0.5	<0.5	<0.5
beta-Endosulfan	µg/L	0.03[3]	0.005[3]						<0.5	<0.5	<0.5
4.4`-DDD	µg/L								<0.5	<0.5	<0.5
Endrin aldehyde	µg/L								<0.5	<0.5	<0.5
Endosulfan sulfate	µg/L								<0.5	<0.5	<0.5
4.4`-DDT	µg/L	0.006		0.06	30	0.1			<2	<2	<2.0
Endrin ketone	µg/L								<0.5	<0.5	<0.5
Methoxychlor	µg/L								<2	<2	<2.0
Aldrin plus dieldrin	µg/L			0.010	0.3	3			<1	<0.5	<1.0
Organophosphorus Pesticides (OP)											
Dichlorvos	µg/L								<0.5	<0.5	<0.5
Demeton-S-methyl	µg/L								<0.5	<0.5	<0.5
Monocrotophos	µg/L								<2	<2	<2.0
Dimethoate	µg/L	0.15			50	50			<0.5	<0.5	<0.5
Diazinon	µg/L	0.01		1	3	1			<0.5	<0.5	<0.5
Chlorpyrifos-methyl	µg/L	0.01	0.009		10	100			<0.5	<0.5	<0.5
Parathion-methyl	µg/L								<2	<2	<2.0
Malathion	µg/L	0.05							<0.5	<0.5	<0.5
Fenthion	µg/L								<0.5	<0.5	<0.5
Chlorpyrifos	µg/L	0.01	0.009						<0.5	<0.5	<0.5
Parathion	µg/L	0.004			10	10			<2	<2	<2.0
Pirimphos-ethyl	µg/L								<0.5	<0.5	<0.5
Chlorfenvinphos	µg/L								<0.5	<0.5	<0.5
Bromophos-ethyl	µg/L								<0.5	<0.5	<0.5
Fenamiphos	µg/L								<0.5	<0.5	<0.5
Prothiofos	µg/L								<0.5	<0.5	<0.5
Ethion	µg/L								<0.5	<0.5	<0.5
Carbophenothion	µg/L								<0.5	<0.5	<0.5
Azinphos Methyl	µg/L	0.02							<0.5	<0.5	<0.5

Monocyclic Aromatic Hydrocarbons											
Benzene	µg/L	0.95	0.5	0.001		0.01			-	-	<1
Toluene	µg/L			0.80	0.025	0.025			-	-	<2
Ethylbenzene	µg/L			0.30	0.003	0.003			-	-	<2
meta- & para-Xylene	µg/L	200							-	-	<2
Styrene	µg/L			0.03	0.004	0.004			<5	<5	<5
ortho-Xylene	µg/L	350							-	-	<2
Isopropylbenzene	µg/L								<5	<5	<5
n-Propylbenzene	µg/L								<5	<5	<5
1.3.5-Trimethylbenzene	µg/L								<5	<5	<5
sec-Butylbenzene	µg/L								<5	<5	<5
1.2.4-Trimethylbenzene	µg/L								<5	<5	<5
tert-Butylbenzene	µg/L								<5	<5	<5
p-Isopropyltoluene	µg/L								<5	<5	<5
n-Butylbenzene	µg/L								<5	<5	<5
Oxygenated Compounds											
Vinyl Acetate	µg/L								<50	<50	<50
2-Butanone (MEK)	µg/L								<50	<50	<50
4-Methyl-2-pentanone (MIBK)	µg/L								<50	<50	<50
2-Hexanone (MBK)	µg/L								<50	<50	<50
Sulfonated Compounds											
Carbon disulfide	µg/L								<5	<5	<5
Fumigants											
2.2-Dichloropropane	µg/L								<5	<5	<5
1.2-Dichloropropane	µg/L								<5	<5	<5
cis-1.3-Dichloropropylene	µg/L								<5	<5	<5
trans-1.3-Dichloropropylene	µg/L								<5	<5	<5
1.2-Dibromoethane (EDB)	µg/L								<5	<5	<5
Halogenated Aliphatic Compounds											
Dichlorodifluoromethane	µg/L								<50	<50	<50
Chloromethane	µg/L								<50	<50	<50
Vinyl chloride	µg/L			0.0003		0.003			<50	<50	<50
Bromomethane	µg/L								<50	<50	<50
Chloroethane	µg/L								<50	<50	<50
Trichlorofluoromethane	µg/L								<50	<50	<50
1.1-Dichloroethene	µg/L			0.03		0.3			<5	<5	<5
Iodomethane	µg/L								<5	<5	<5
trans-1.2-Dichloroethene	µg/L								<5	<5	<5
1.1-Dichloroethane	µg/L								<5	<5	<5
cis-1.2-Dichloroethene	µg/L								<5	<5	<5
1.1.1-Trichloroethane	µg/L								<5	<5	<5
1.1-Dichloropropylene	µg/L								<5	<5	<5
Carbon Tetrachloride	µg/L								<5	<5	<5
1.2-Dichloroethane	µg/L			0.003		0.03			<5	<5	<5
Trichloroethene	µg/L								<5	<5	<5
Dibromomethane	µg/L								<5	<5	<5
1.1.2-Trichloroethane	µg/L	6500	1900						<5	<5	<5
1.3-Dichloropropane	µg/L								<5	<5	<5
Tetrachloroethene	µg/L			0.05		0.5			<5	<5	<5
1.1.1.2-Tetrachloroethane	µg/L								<5	<5	<5
trans-1.4-Dichloro-2-butene	µg/L								<5	<5	<5
cis-1.4-Dichloro-2-butene	µg/L								<5	<5	<5
1.1.2.2-Tetrachloroethane	µg/L								<5	<5	<5
1.2.3-Trichloropropane	µg/L								<5	<5	<5
Pentachloroethane	µg/L								<5	<5	<5
1.2-Dibromo-3-chloropropane	µg/L								<5	<5	<5
Hexachlorobutadiene	µg/L								<5	<5	<5
Halogenated Aromatic Compounds											
Chlorobenzene	µg/L			0.30	0.01	0.01			<5	<5	<5
Bromobenzene	µg/L								<5	<5	<5
2-Chlorotoluene	µg/L								<5	<5	<5
4-Chlorotoluene	µg/L								<5	<5	<5
1.3-Dichlorobenzene	µg/L	0.26			0.02	0.02			<5	<5	<5
1.4-Dichlorobenzene	µg/L	0.06		0.04	0.003	0.003			<5	<5	<5
1.2-Dichlorobenzene	µg/L	0.16		1.5	0.001	0.001			<5	<5	<5
1.2.4-Trichlorobenzene	µg/L	0.085	80	0.03	0.005	0.005			<5	<5	<5
1.2.3-Trichlorobenzene	µg/L	0.003		0.03	0.005	0.005			<5	<5	<5
Trihalomethanes											
Chloroform	µg/L								<5	<5	<5
Bromodichloromethane	µg/L								<5	<5	<5
Dibromochloromethane	µg/L								<5	<5	<5
Bromoform	µg/L								<5	<5	<5
Phenolic Compounds											
Phenol	µg/L	320	400						<1.0	<1.0	<1.0
2-Chlorophenol	µg/L	340		300	0.1	3000			<1.0	<1.0	<1.0
2-Methylphenol	µg/L								<1.0	<1.0	<1.0
3- & 4-Methylphenol	µg/L								<2.0	<2.0	<2.0
2-Nitrophenol	µg/L								<1.0	<1.0	<1.0
2.4-Dimethylphenol	µg/L								<1.0	<1.0	<1.0
2.4-Dichlorophenol	µg/L	120		200	0.3	2000			<1.0	<1.0	<1.0
2.6-Dichlorophenol	µg/L								<1.0	<1.0	<1.0
4-Chloro-3-Methylphenol	µg/L								<1.0	<1.0	<1.0
2.4.6-Trichlorophenol	µg/L	3		20	2	200			<1.0	<1.0	<1.0
2.4.5-Trichlorophenol	µg/L								<1.0	<1.0	<1.0
Pentachlorophenol	µg/L	3.6	11						<2.0	<2.0	<2.0

Polynuclear Aromatic Hydrocarbons											
Naphthalene	µg/L	16	50						<1.0	<1.0	<1.0
Acenaphthylene	µg/L								<1.0	<1.0	<1.0
Acenaphthene	µg/L								<1.0	<1.0	<1.0
Fluorene	µg/L								<1.0	<1.0	<1.0
Phenanthrene	µg/L								<1.0	<1.0	<1.0
Anthracene	µg/L								<1.0	<1.0	<1.0
Fluoranthene	µg/L								<1.0	<1.0	<1.0
Pyrene	µg/L								<1.0	<1.0	<1.0
Benz(a)anthracene	µg/L								<1.0	<1.0	<1.0
Chrysene	µg/L								<1.0	<1.0	<1.0
Benzo(b)fluoranthene	µg/L								<1.0	<1.0	<1.0
Benzo(k)fluoranthene	µg/L								<1.0	<1.0	<1.0
Benzo(a)pyrene	µg/L			0.01		0.1			<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	µg/L								<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	µg/L								<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	µg/L								<1.0	<1.0	<1.0
Total Petroleum Hydrocarbons											
C6 - C9 Fraction	µg/L								<20	<20	<20
C10 - C14 Fraction	µg/L								<50	<50	<50
C15 - C28 Fraction	µg/L								**260**	**380**	**380**
C29 - C36 Fraction	µg/L								**60**	<50	60
C10 - C36 Fraction (sum)	µg/L	600 [4]							**320**	**380**	**440**

NOTES: 1. SRT Healthy Rivers Action Plan Long Term / Short Term Targets
2. ANZECC 99% protection level for Chlordane
3. ANZECC 99% protection level for Endosulfan
4. Dutch intervention values (2000).
5. pH > 6 / pH < 6
6. ASS disturbance indicators
7. Effluent treatment triggers

8.3 Groundwater Levels

The depth to groundwater was measured on 15th January 2013 and tabulated with historical data (Table 4). 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 19.5 RL mAHD (Relative level metres Australian Height Datum) and 23.6 RL mAHD.

Plotting the water table values enable determination of groundwater direction. Figure 3 identifies a groundwater flux towards the northwest.

Table 9 Groundwater Measurements

Groundwater Well I.D.	Date	Top of Casing	Water Level		
		RL mAHD	mBGL	RL mAHD	Change mm
WRMW1	18/05/2012	27.281	3.700	23.581	N/A
	30/08/2012		3.455	23.826	-245
	11/10/2012		3.130	24.151	-325
	15/01/2013		3.646	23.635	516
WRMW2	18/05/2012	30.607	7.666	22.941	N/A
	30/08/2012		7.26	23.347	-406
	11/10/2012		7.316	23.291	56
	15/01/2013		7.682	22.925	366
WRMW3	18/05/2012	34.622	11.846	22.776	N/A
	30/08/2012		11.725	22.897	-121
	11/10/2012		11.794	22.828	69
	15/01/2013		11.858	22.764	64
WRMW4	18/05/2012	27.751	8.509	19.242	N/A
	30/08/2012		7.79	19.961	-719
	11/10/2012		7.753	19.998	-37
	15/01/2013		8.289	19.462	536
WRMW5	18/05/2012	29.034	8.836	20.198	N/A
	30/08/2012		8.28	20.754	-556
	11/10/2012		8.170	20.864	-110
	15/01/2013		8.641	20.393	471
WRMW6	18/05/2012	31.611	8.759	22.852	N/A
	30/08/2012		9.215	22.396	456
	11/10/2012		8.998	22.613	-217
	15/01/2013		9.312	22.299	314

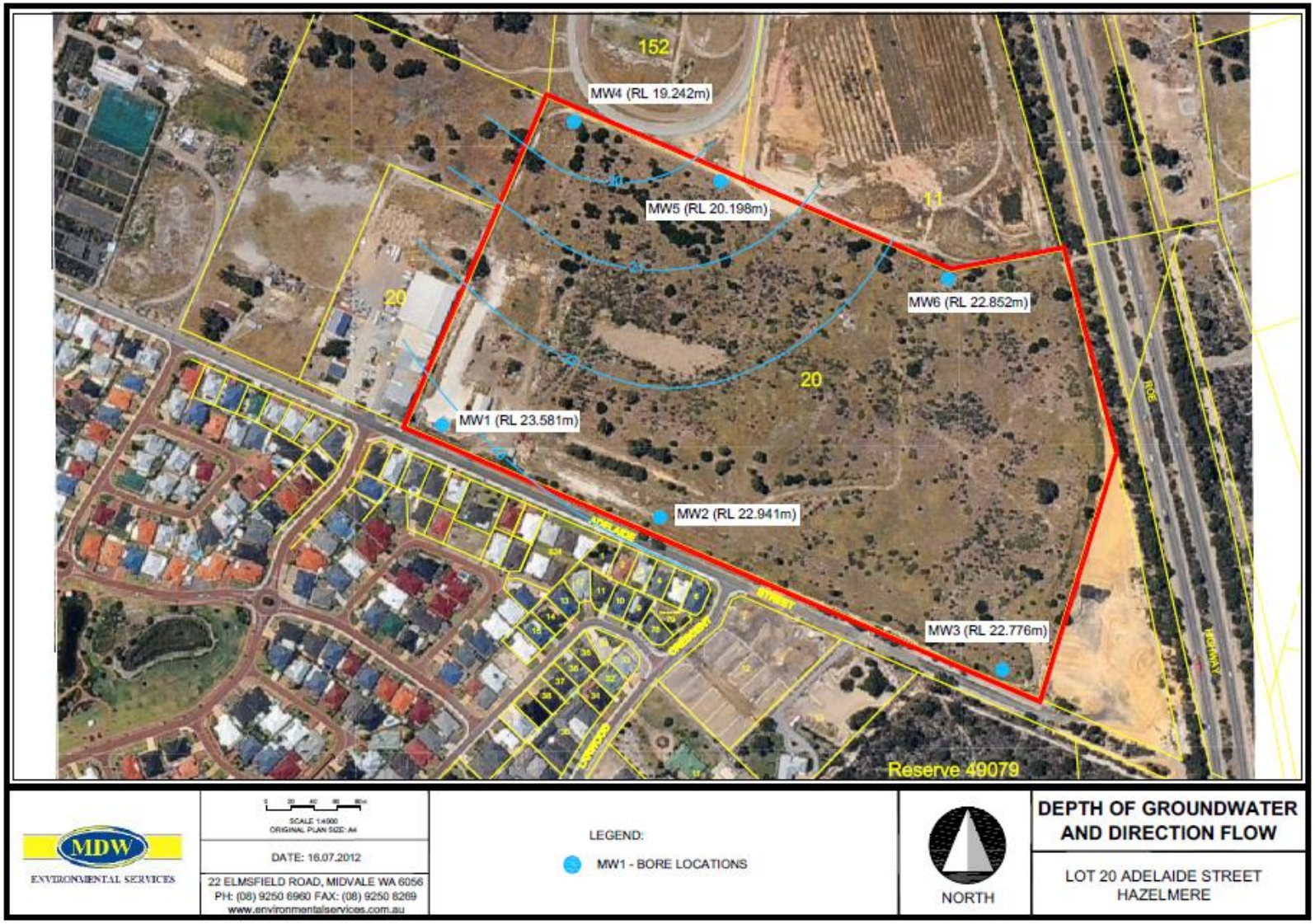


Figure 3 Groundwater Contours

9 DISCUSSION

Standing water level measurements recorded by MDWES during the GME sampling indicate that groundwater is encountered between RL 19.5 mAHD and 23.6 mAHD 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 5.5 to 7.13. 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, nutrients and low levels of TPH in WRMW6, all other PCOC were below laboratory detection limits.

Metalloid results could be considered higher than expected for background waters within this locality, however, elevated levels of suspended solids within majority of the 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. Comparison of historical data indicates that concentrations of TPH, a contaminant of high concern is increasing, whilst the other contaminant of concern, 3-&4-Methylphenol, is decreasing in concentration. Further data is needed to accurately determine fluctuations in groundwater quality.

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 groundwater investigations be continued on the property to ensure sufficient data is collected.

It has been recommended that groundwater gauging 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.

MDW
ENVIRONMENTAL SERVICES

Monitoring Well Field Record

Job #: E2012-031 Client: Waste Rock Location: Adelaide Street

Well ID: MW1 Date: 15.1.2013 Sampler: DA + RB

Monitoring Well Information

Depth to Water: 3646 (mm TOC) Depth to Bottom: 6.754 (m)

Standpipe: _____ (m) Monument Cover ☐

Lock: ☐ None ☐ Padlock (YL) ☐ Enviro Cap ☐ Gatic

Equipment IDs

Water Quality Meter: 451 TTA Kit: 3

Pump: Low Flow TALK Kit: 3

Dipper: Con Sites

Sampling

Sample ID: WRMW1-003 COC No: E2012-031-004

Time	pH	EC	DO	Temp	Redox	TTA	TALK
9.15	6.03	789	3.3	27.7	23.6		
9.20	6.10	762	3.2	23.3	26.0		
9.25	5.99	773	1.7	22.7	48.0		
9.30	5.98	767	1.5	22.5	35.1	0.65	0.10

Bottles — ASSESSMENT SUITE 2

1 x 1000mL plastic GREEN ☐	2 x 40mL vials MAROON ☐	1 x 500mL plastic GREEN** ☐
1 x 125mL plastic YELLOW ☐	1 x 500mL glass ORANGE ☐	**BRING BACK &FILTER INTO:
1 x 125mL plastic PURPLE ☐	2 x 500mL glass ORANGE per sample set (Lab Dups) ☐	1 x 60mL plastic MAROON ☐
1 x 60mL plastic BLUE ☐		1 x 60mL plastic RED/GREEN ☐
1 x 60mL plastic RED/GREEN ☐	1 x 500mL plastic GREEN ☐	

Comments

MDW ENVIRONMENTAL SERVICES

Monitoring Well Field Record

Job #: E2012-031 Client: Waste Rock Location: Adelaide Street

Well ID: MW2 Date: 15.1.2013 Sampler: DA + RB

Monitoring Well Information

Depth to Water: 7682 (mm TOC) Depth to Bottom: 11.180 (m)

Standpipe: _____(m) Monument Cover ☐

Lock: ☐ None ☒ Padlock (YL) ☐ Enviro Cap ☐ Gatic

Equipment IDs

Water Quality Meter: 451 TTA Kit: 3

Pump: Low Flow TALK Kit: 3

Dipper: Con Sites

Sampling

Sample ID: WRMW2-003 COC No: E2012-031-004

Time	pH	EC	DO	Temp	Redox	TTA	TALK
8.29	5.37	350.9	-	22.3	176.5		
8.34	4.63	328.1	-	21.5	207.0		
8.39	4.50	337.3	-	21.5	214.0	0.68	0.5
8.44	4.51	341.4	-	21.8	215.4		

Bottles

ASSESSMENT SUITE 2

1 x 1000mL plastic GREEN ☐	2 x 40mL vials MAROON ☐	1 x 500mL plastic GREEN** ☐
1 x 125mL plastic YELLOW ☐	1 x 500mL glass ORANGE ☐	**BRING BACK &FILTER INTO:
1 x 125mL plastic PURPLE ☐	2 x 500mL glass ORANGE per sample set (Lab Dups) ☐	1 x 60mL plastic MAROON ☐
1 x 60mL plastic BLUE ☐		1 x 60mL plastic RED/GREEN ☐
1 x 60mL plastic RED/GREEN ☐	1 x 500mL plastic GREEN ☐	

Comments

MDW ENVIRONMENTAL SERVICES

Monitoring Well Field Record

Job #: E2012-031 Client: Waste Rock Location: Adelaide Street

Well ID: MW3 Date: 15.1.13 Sampler: DA/RB

Monitoring Well Information

Depth to Water: 11.858 (mm TOC) Depth to Bottom: 15.150 (m)

Standpipe: _____(m) Monument Cover ☑

Lock: ☐ None ☑ Padlock (YL) ☐ Enviro Cap ☐ Gatic

Equipment IDs

Water Quality Meter: YSI TTA Kit: _____

Pump: LOW FLOW TALK Kit: _____

Dipper: CON SITES

Sampling

Sample ID: WRMW3-003 COC No: E2012-031-004

Time	pH	EC	DO	Temp	Redox	TTA	TALK
741	7.57	1077	0.0	24.4	-56.9		
746	6.91	919	0.0	23.3	-97.1		
751	6.84	884	0.0	23.1	-81.5		
756	6.84	883	0.0	23.2	-71.4	0.3	0.21

Bottles — ASSESSMENT SUITE 2

1 x 1000mL plastic GREEN ☐	2 x 40mL vials MAROON ☐	1 x 500mL plastic GREEN** ☐
1 x 125mL plastic YELLOW ☐	1 x 500mL glass ORANGE ☐	**BRING BACK &FILTER INTO:
1 x 125mL plastic PURPLE ☐	2 x 500mL glass ORANGE per sample set (Lab Dups) ☐	1 x 60mL plastic MAROON ☐
1 x 60mL plastic BLUE ☐		1 x 60mL plastic RED/GREEN ☐
1 x 60mL plastic RED/GREEN ☐	1 x 500mL plastic GREEN ☐	

Comments

MDW
ENVIRONMENTAL SERVICES

Monitoring Well Field Record

Job #: E2012-031 Client: Waste Rock Location: Adelaide Street

Well ID: MW4 Date: 15.1.2013 Sampler: DA + RB

Monitoring Well Information

Depth to Water: 8289 (mm TOC) Depth to Bottom: 11470 (m)

Standpipe: _____ (m) Monument Cover ☐

Lock: ☐ None ☒ Padlock (YL) ☐ Enviro Cap ☐ Gatic

Equipment IDs

Water Quality Meter: 451 TTA Kit: 3

Pump: Low Flow TALK Kit: 3

Dipper: Con Sites

Sampling

Sample ID: WRMW4-003 COC No: E2012-031-004

Time	pH	EC	DO	Temp	Redox	TTA	TALK
10.44	5.20	145.7	–	28.7	167.5		
10.49	4.85	133.0	0.2	23.4	193.4		
10.55	4.35	133.1	1.0	23.7	223.7		
10.59	4.40	2.045	1.1	23.8	226.4	0.25	0.05

Bottles — ASSESSMENT SUITE 2

1 x 1000mL plastic GREEN ☐	2 x 40mL vials MAROON ☐	1 x 500mL plastic GREEN** ☐
1 x 125mL plastic YELLOW ☐	1 x 500mL glass ORANGE ☐	**BRING BACK &FILTER INTO:
1 x 125mL plastic PURPLE ☐	2 x 500mL glass ORANGE per sample set (Lab Dups) ☐	1 x 60mL plastic MAROON ☐
1 x 60mL plastic BLUE ☐		1 x 60mL plastic RED/GREEN ☐
1 x 60mL plastic RED/GREEN ☐	1 x 500mL plastic GREEN ☐	

Comments

DUP + TRIP

MDW
ENVIRONMENTAL SERVICES

Monitoring Well Field Record

Job #: E2012-031 Client: Waste Rock Location: Adelaide Street

Well ID: MW5 Date: 15.1.2013 Sampler: DA + RB

Monitoring Well Information

Depth to Water: 8641 (mm TOC) Depth to Bottom: 12.375 (m)

Standpipe: _____(m) Monument Cover ☐

Lock: ☐ None ☒ Padlock (YL) ☐ Enviro Cap ☐ Gatic

Equipment IDs

Water Quality Meter: 451 TTA Kit: 3

Pump: Low Flow TALK Kit: 3

Dipper: Low Sites

Sampling

Sample ID: WRMW5-003 COC No: E2012-031-004

Time	pH	EC	DO	Temp	Redox	TTA	TALK
9.57	6.36	126.9	-	25.2	96.6		
10.02	5.43	132.4	-	22.9	146.7		
10.07	4.96	115.4	-	22.6	175.8		
10.12	4.98	117.7	-	22.6	179.8	0.11	0.06

Bottles — ASSESSMENT SUITE 2

1 x 1000mL plastic GREEN ☐	2 x 40mL vials MAROON ☐	1 x 500mL plastic GREEN** ☐
1 x 125mL plastic YELLOW ☐	1 x 500mL glass ORANGE ☐	**BRING BACK &FILTER INTO:
1 x 125mL plastic PURPLE ☐	2 x 500mL glass ORANGE per sample set (Lab Dups) ☐	1 x 60mL plastic MAROON ☐
1 x 60mL plastic BLUE ☐		1 x 60mL plastic RED/GREEN ☐
1 x 60mL plastic RED/GREEN ☐	1 x 500mL plastic GREEN ☐	

Comments

MDW
ENVIRONMENTAL SERVICES

Monitoring Well Field Record

Job #: E2012-031 Client: Waste Rock Location: Adelaide Street

Well ID: MW6 Date: 15.1.2013 Sampler: DA + RB

Monitoring Well Information

Depth to Water: 9312 (mm TOC) Depth to Bottom: 9774 (m)

Standpipe: _____(m) Monument Cover ☐

Lock: ☐ None ☒ Padlock (YL) ☐ Enviro Cap ☐ Gatic

Equipment IDs

Water Quality Meter: 451 TTA Kit: 3

Pump: Low Flow TALK Kit: 3

Dipper: Con Sites

Sampling

Sample ID: WRMW5-003 COC No: E2012-031-004

Time	pH	EC	DO	Temp	Redox	TTA	TALK
12.36	5.29	1060	1.9	30.1	160.4		
12.41	5.20	957	0.9	25.3	161.7		
12.46	5.26	957	0.8	25.0	154.2	1.59	0.05
12.51							

Bottles — ASSESSMENT SUITE 2

1 x 1000mL plastic GREEN ☐	2 x 40mL vials MAROON ☐	1 x 500mL plastic GREEN** ☐
1 x 125mL plastic YELLOW ☐	1 x 500mL glass ORANGE ☐	**BRING BACK &FILTER INTO:
1 x 125mL plastic PURPLE ☐	2 x 500mL glass ORANGE per sample set (Lab Dups) ☐	1 x 60mL plastic MAROON ☐
1 x 60mL plastic BLUE ☐		1 x 60mL plastic RED/GREEN ☐
1 x 60mL plastic RED/GREEN ☐	1 x 500mL plastic GREEN ☐	

Comments

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **EP1300272**	Page	: 1 of 19
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	: E2012-31	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: E2012-31-005	Date Samples Received	: 15-JAN-2013
Sampler	: DA/RB	Issue Date	: 24-JAN-2013
Site	: WASTEROCK		
		No. of samples received	: 9
Quote number	: EP/785/12	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

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

- **EG020: Positive results for sample EP1300272 #8 have been confirmed by reanalysis.**
- **EG020:It has been confirmed by re-digestion and re-analysis that total Zinc concentration is less than dissolved for sample EP1200272 #6.**
- **EP075(SIM) - PAH/Phenols: High d10-Anthracene surrogate recovery for the sample "WRMW1-003". However no positive results recorded and the rest of the surrogates are in acceptable range.**
- **TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.**

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.

Signatories	Position	Accreditation Category
Agnes Szilagyi	Senior Organic Chemist	Perth Organics
		Perth Organics
Benjamin Nicholson	Metals Chemist	Perth Inorganics
Chas Tucker	Inorganic Chemist	Perth Inorganics
		Perth Inorganics
		Perth Inorganics
Hoa Nguyen	Senior Inorganic Chemist	Sydney Inorganics
Rassem Ayoubi	Senior Organic Chemist	Perth Organics

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID	WRMW1-003	WRMW2-003	WRMW3-003	WRMW4-003	WRMW5-003
				Client sampling date / time	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]
					EP1300272-001	EP1300272-002	EP1300272-003	EP1300272-004	EP1300272-005
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**6.17**	**5.21**	**7.13**	**5.61**	**6.07**
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**788**	**347**	**906**	**118**	**124**
EA015: Total Dissolved Solids									
Total Dissolved Solids @180°C	GIS-210-010	10	mg/L		**562**	**290**	**598**	**74**	**133**
EA025: Suspended Solids									
Suspended Solids (SS)	----	5	mg/L		**138**	**75**	**287**	**313**	**42**
EA045: Turbidity									
Turbidity	----	0.1	NTU		**62.8**	**54.7**	**900**	**81.8**	**57.6**
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		**35**	**2**	**130**	**2**	**3**
Total Alkalinity as CaCO3	ALK_TOTAL	1	mg/L		**35**	**2**	**130**	**2**	**3**
ED038A: Acidity									
Acidity as CaCO3	----	1	mg/L		**40**	**39**	**8**	**16**	**6**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**108**	**9**	**41**	**2**	**11**
ED045G: Chloride Discrete analyser									
Chloride	16887-00-6	1	mg/L		**157**	**88**	**184**	**23**	**25**
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		**0.11**	**0.10**	**0.61**	**0.34**	**0.41**
Arsenic	7440-38-2	0.001	mg/L		<0.001	<0.001	**0.002**	<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		**0.002**	**0.001**	**0.082**	**0.005**	**0.001**
Nickel	7440-02-0	0.001	mg/L		**0.007**	**0.008**	**0.003**	**0.012**	**0.004**
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		**0.045**	**0.066**	**0.011**	**0.072**	**0.028**
Iron	7439-89-6	0.05	mg/L		**0.07**	**0.12**	**1.17**	**0.31**	<0.05
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		**4.69**	**3.30**	**21.5**	**13.9**	**5.03**
Arsenic	7440-38-2	0.001	mg/L		<0.001	<0.001	**0.006**	<0.001	<0.001

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID	WRMW1-003	WRMW2-003	WRMW3-003	WRMW4-003	WRMW5-003
				Client sampling date / time	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]
					EP1300272-001	EP1300272-002	EP1300272-003	EP1300272-004	EP1300272-005
EG020T: Total Metals by ICP-MS - Continued									
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		**0.003**	**0.003**	**0.030**	**0.008**	**0.003**
Copper	7440-50-8	0.001	mg/L		**0.005**	**0.011**	**0.022**	**0.025**	**0.006**
Lead	7439-92-1	0.001	mg/L		**0.004**	**0.005**	**0.052**	**0.012**	**0.005**
Manganese	7439-96-5	0.001	mg/L		**0.003**	**0.002**	**0.094**	**0.007**	**0.002**
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		**0.007**	**0.009**	**0.011**	**0.016**	**0.004**
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		**0.044**	**0.070**	**0.061**	**0.110**	**0.025**
Iron	7439-89-6	0.05	mg/L		**0.23**	**1.37**	**9.35**	**1.50**	**0.37**
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	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EG051G: Ferrous Iron by Discrete Analyser									
Ferrous Iron	----	0.05	mg/L		**0.11**	**0.12**	**0.61**	**0.09**	<0.05
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.02**	**0.01**	**0.10**	**0.03**	<0.01
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		**0.01**	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**1.86**	**1.24**	**0.24**	**4.38**	**1.63**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**1.87**	**1.24**	**0.24**	**4.38**	**1.63**
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**0.5**	**0.2**	**0.9**	**0.7**	**0.2**
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**2.4**	**1.4**	**1.1**	**5.1**	**1.8**
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		<0.01	**0.04**	**0.63**	**0.06**	**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

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID	WRMW1-003	WRMW2-003	WRMW3-003	WRMW4-003	WRMW5-003
				Client sampling date / time	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]
					EP1300272-001	EP1300272-002	EP1300272-003	EP1300272-004	EP1300272-005
EK085M: Sulfide as S2-									
Sulfide as S2-	18496-25-8	0.1	mg/L		<0.1	<0.1	<0.1	<0.1	<0.1
EP026ST: Chemical Oxygen Demand (Sealed Tube)									
Chemical Oxygen Demand	----	5	mg/L		**13**	<5	**11**	**16**	<5
EP030: Biochemical Oxygen Demand (BOD)									
Biochemical Oxygen Demand	----	2	mg/L		<2	<2	**2**	**4**	<2
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	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
Endrin ketone	53494-70-5	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Methoxychlor	72-43-5	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
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	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
Dimethoate	60-51-5	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon	333-41-5	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID: WRMW1-003	WRMW2-003	WRMW3-003	WRMW4-003	WRMW5-003
				Client sampling date / time: [15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]
				EP1300272-001	EP1300272-002	EP1300272-003	EP1300272-004	EP1300272-005
EP068B: Organophosphorus Pesticides (OP) - Continued								
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Parathion-methyl	298-00-0	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
Malathion	121-75-5	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Fenthion	55-38-9	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Parathion	56-38-2	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Fenamiphos	22224-92-6	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Prothiofos	34643-46-4	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	563-12-2	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Carbophenothion	786-19-6	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
EP074A: Monocyclic Aromatic Hydrocarbons								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
Styrene	100-42-5	5	µg/L	<5	<5	<5	<5	<5
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
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

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID	WRMW1-003	WRMW2-003	WRMW3-003	WRMW4-003	WRMW5-003
				Client sampling date / time	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]
					EP1300272-001	EP1300272-002	EP1300272-003	EP1300272-004	EP1300272-005
EP074B: Oxygenated Compounds - Continued									
2-Hexanone (MBK)	591-78-6	50	µg/L		<50	<50	<50	<50	<50
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	5	µg/L		<5	<5	<5	<5	<5
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	5	µg/L		<5	<5	<5	<5	<5
1.2-Dichloropropane	78-87-5	5	µg/L		<5	<5	<5	<5	<5
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L		<5	<5	<5	<5	<5
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L		<5	<5	<5	<5	<5
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L		<5	<5	<5	<5	<5
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L		<50	<50	<50	<50	<50
Chloromethane	74-87-3	50	µg/L		<50	<50	<50	<50	<50
Vinyl chloride	75-01-4	50	µg/L		<50	<50	<50	<50	<50
Bromomethane	74-83-9	50	µg/L		<50	<50	<50	<50	<50
Chloroethane	75-00-3	50	µg/L		<50	<50	<50	<50	<50
Trichlorofluoromethane	75-69-4	50	µg/L		<50	<50	<50	<50	<50
1.1-Dichloroethene	75-35-4	5	µg/L		<5	<5	<5	<5	<5
Iodomethane	74-88-4	5	µg/L		<5	<5	<5	<5	<5
trans-1.2-Dichloroethene	156-60-5	5	µg/L		<5	<5	<5	<5	<5
1.1-Dichloroethane	75-34-3	5	µg/L		<5	<5	<5	<5	<5
cis-1.2-Dichloroethene	156-59-2	5	µg/L		<5	<5	<5	<5	<5
1.1.1-Trichloroethane	71-55-6	5	µg/L		<5	<5	<5	<5	<5
1.1-Dichloropropylene	563-58-6	5	µg/L		<5	<5	<5	<5	<5
Carbon Tetrachloride	56-23-5	5	µg/L		<5	<5	<5	<5	<5
1.2-Dichloroethane	107-06-2	5	µg/L		<5	<5	<5	<5	<5
Trichloroethene	79-01-6	5	µg/L		<5	<5	<5	<5	<5
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

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID	WRMW1-003	WRMW2-003	WRMW3-003	WRMW4-003	WRMW5-003
				Client sampling date / time	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]
					EP1300272-001	EP1300272-002	EP1300272-003	EP1300272-004	EP1300272-005
EP074E: Halogenated Aliphatic Compounds - Continued									
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L		<5	<5	<5	<5	<5
1.2.3-Trichloropropane	96-18-4	5	µg/L		<5	<5	<5	<5	<5
Pentachloroethane	76-01-7	5	µg/L		<5	<5	<5	<5	<5
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L		<5	<5	<5	<5	<5
Hexachlorobutadiene	87-68-3	5	µg/L		<5	<5	<5	<5	<5
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L		<5	<5	<5	<5	<5
Bromobenzene	108-86-1	5	µg/L		<5	<5	<5	<5	<5
2-Chlorotoluene	95-49-8	5	µg/L		<5	<5	<5	<5	<5
4-Chlorotoluene	106-43-4	5	µg/L		<5	<5	<5	<5	<5
1.3-Dichlorobenzene	541-73-1	5	µg/L		<5	<5	<5	<5	<5
1.4-Dichlorobenzene	106-46-7	5	µg/L		<5	<5	<5	<5	<5
1.2-Dichlorobenzene	95-50-1	5	µg/L		<5	<5	<5	<5	<5
1.2.4-Trichlorobenzene	120-82-1	5	µg/L		<5	<5	<5	<5	<5
1.2.3-Trichlorobenzene	87-61-6	5	µg/L		<5	<5	<5	<5	<5
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		<5	<5	<5	<5	<5
Bromodichloromethane	75-27-4	5	µg/L		<5	<5	<5	<5	<5
Dibromochloromethane	124-48-1	5	µg/L		<5	<5	<5	<5	<5
Bromoform	75-25-2	5	µg/L		<5	<5	<5	<5	<5
EP074H: Naphthalene									
Naphthalene	91-20-3	7	µg/L		<7	<7	<7	<7	<7
EP075(SIM)A: Phenolic Compounds									
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	<2.0	<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

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID	WRMW1-003	WRMW2-003	WRMW3-003	WRMW4-003	WRMW5-003
				Client sampling date / time	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]
					EP1300272-001	EP1300272-002	EP1300272-003	EP1300272-004	EP1300272-005
EP075(SIM)A: Phenolic Compounds - Continued									
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	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	<50	<50
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.1	%		**102**	**143**	**140**	**146**	**137**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.1	%		**106**	**69.6**	**104**	**99.4**	**64.8**
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**95.3**	**97.5**	**110**	**104**	**126**
Toluene-D8	2037-26-5	0.1	%		**96.5**	**91.6**	**89.8**	**92.7**	**92.0**
4-Bromofluorobenzene	460-00-4	0.1	%		**93.0**	**107**	**97.5**	**97.2**	**97.3**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID	WRMW1-003	WRMW2-003	WRMW3-003	WRMW4-003	WRMW5-003
				Client sampling date / time	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]
					EP1300272-001	EP1300272-002	EP1300272-003	EP1300272-004	EP1300272-005
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		**38.4**	**39.9**	**32.6**	**28.6**	**36.4**
2-Chlorophenol-D4	93951-73-6	0.1	%		**86.4**	**87.7**	**72.7**	**65.2**	**78.7**
2.4.6-Tribromophenol	118-79-6	0.1	%		**117**	**122**	**103**	**87.7**	**107**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**82.7**	**86.4**	**75.6**	**73.1**	**77.0**
Anthracene-d10	1719-06-8	0.1	%		**126**	**120**	**110**	**101**	**119**
4-Terphenyl-d14	1718-51-0	0.1	%		**128**	**120**	**107**	**100**	**119**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**98.8**	**99.2**	**113**	**107**	**128**
Toluene-D8	2037-26-5	0.1	%		**103**	**101**	**96.9**	**99.4**	**98.7**
4-Bromofluorobenzene	460-00-4	0.1	%		**93.0**	**110**	**103**	**103**	**102**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WRMW6-003	DUP-003	RINSATE -003	BLANK -003	----
				Client sampling date / time	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	----
Compound	CAS Number	LOR	Unit		EP1300272-006	EP1300272-007	EP1300272-008	EP1300272-009	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**5.15**	**5.16**	**5.40**	**5.54**	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**912**	**118**	**7**	**15**	----
EA015: Total Dissolved Solids									
Total Dissolved Solids @180°C	GIS-210-010	10	mg/L		**588**	**101**	<10	<10	----
EA025: Suspended Solids									
Suspended Solids (SS)	----	5	mg/L		**32**	**254**	<5	**5**	----
EA045: Turbidity									
Turbidity	----	0.1	NTU		**19.9**	**58.7**	<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		**3**	<1	<1	<1	----
Total Alkalinity as CaCO3	ALK_TOTAL	1	mg/L		**3**	<1	<1	<1	----
ED038A: Acidity									
Acidity as CaCO3	----	1	mg/L		**28**	**8**	**4**	**4**	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**169**	**2**	<1	<1	----
ED045G: Chloride Discrete analyser									
Chloride	16887-00-6	1	mg/L		**168**	**23**	**3**	**4**	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		**0.30**	**0.26**	<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		**0.032**	**0.003**	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L		**0.014**	**0.012**	<0.001	<0.001	----
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	----
Zinc	7440-66-6	0.005	mg/L		**0.132**	**0.072**	**0.034**	<0.005	----
Iron	7439-89-6	0.05	mg/L		**0.91**	**0.14**	<0.05	<0.05	----
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		**1.15**	**13.2**	<0.01	<0.01	----
Arsenic	7440-38-2	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID: WRMW6-003	DUP-003	RINSATE -003	BLANK -003	----
				Client sampling date / time: [15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	----
				EP1300272-006	EP1300272-007	EP1300272-008	EP1300272-009	----
EG020T: Total Metals by ICP-MS - Continued								
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	**0.005**	**0.008**	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	**0.013**	**0.029**	<0.001	<0.001	----
Lead	7439-92-1	0.001	mg/L	**0.008**	**0.011**	<0.001	<0.001	----
Manganese	7439-96-5	0.001	mg/L	**0.035**	**0.006**	<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	**0.013**	**0.016**	<0.001	<0.001	----
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	**0.107**	**0.109**	<0.005	<0.005	----
Iron	7439-89-6	0.05	mg/L	**1.74**	**1.49**	<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	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
EG051G: Ferrous Iron by Discrete Analyser								
Ferrous Iron	----	0.05	mg/L	**0.73**	**0.10**	<0.05	<0.05	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.33**	**0.01**	**0.01**	<0.01	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**1.16**	**4.33**	<0.01	<0.01	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**1.16**	**4.33**	<0.01	<0.01	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**0.8**	<0.5	<0.1	<0.1	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ **Total Nitrogen as N**	----	0.1	mg/L	**2.0**	**4.3**	<0.1	<0.1	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**0.03**	**0.09**	<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	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID	WRMW6-003	DUP-003	RINSATE -003	BLANK -003	----
				Client sampling date / time	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	----
					EP1300272-006	EP1300272-007	EP1300272-008	EP1300272-009	----
EK085M: Sulfide as S2-									
Sulfide as S2-	18496-25-8	0.1	mg/L		<0.1	<0.1	<0.1	<0.1	----
EP026ST: Chemical Oxygen Demand (Sealed Tube)									
Chemical Oxygen Demand	----	5	mg/L		**23**	<5	<5	<5	----
EP030: Biochemical Oxygen Demand (BOD)									
Biochemical Oxygen Demand	----	2	mg/L		<2	**12**	<2	<2	----
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	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	----
Endrin ketone	53494-70-5	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Methoxychlor	72-43-5	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	----
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	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	----
Dimethoate	60-51-5	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Diazinon	333-41-5	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID	WRMW6-003	DUP-003	RINSATE -003	BLANK -003	----
				Client sampling date / time	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	----
					EP1300272-006	EP1300272-007	EP1300272-008	EP1300272-009	----
EP068B: Organophosphorus Pesticides (OP) - Continued									
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Parathion-methyl	298-00-0	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	----
Malathion	121-75-5	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Fenthion	55-38-9	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Chlorpyrifos	2921-88-2	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Parathion	56-38-2	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	----
Pirimphos-ethyl	23505-41-1	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Chlorfenvinphos	470-90-6	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Bromophos-ethyl	4824-78-6	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Fenamiphos	22224-92-6	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Prothiofos	34643-46-4	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Ethion	563-12-2	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Carbophenothion	786-19-6	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Azinphos Methyl	86-50-0	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	----
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	----
Styrene	100-42-5	5	µg/L		<5	<5	<5	<5	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	----
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	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WRMW6-003	DUP-003	RINSATE -003	BLANK -003	----
				Client sampling date / time	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	----
Compound	CAS Number	LOR	Unit		EP1300272-006	EP1300272-007	EP1300272-008	EP1300272-009	----
EP074B: Oxygenated Compounds - Continued									
2-Hexanone (MBK)	591-78-6	50	µg/L		<50	<50	<50	<50	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	5	µg/L		<5	<5	<5	<5	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	5	µg/L		<5	<5	<5	<5	----
1.2-Dichloropropane	78-87-5	5	µg/L		<5	<5	<5	<5	----
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L		<5	<5	<5	<5	----
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L		<5	<5	<5	<5	----
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L		<5	<5	<5	<5	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L		<50	<50	<50	<50	----
Chloromethane	74-87-3	50	µg/L		<50	<50	<50	<50	----
Vinyl chloride	75-01-4	50	µg/L		<50	<50	<50	<50	----
Bromomethane	74-83-9	50	µg/L		<50	<50	<50	<50	----
Chloroethane	75-00-3	50	µg/L		<50	<50	<50	<50	----
Trichlorofluoromethane	75-69-4	50	µg/L		<50	<50	<50	<50	----
1.1-Dichloroethene	75-35-4	5	µg/L		<5	<5	<5	<5	----
Iodomethane	74-88-4	5	µg/L		<5	<5	<5	<5	----
trans-1.2-Dichloroethene	156-60-5	5	µg/L		<5	<5	<5	<5	----
1.1-Dichloroethane	75-34-3	5	µg/L		<5	<5	<5	<5	----
cis-1.2-Dichloroethene	156-59-2	5	µg/L		<5	<5	<5	<5	----
1.1.1-Trichloroethane	71-55-6	5	µg/L		<5	<5	<5	<5	----
1.1-Dichloropropylene	563-58-6	5	µg/L		<5	<5	<5	<5	----
Carbon Tetrachloride	56-23-5	5	µg/L		<5	<5	<5	<5	----
1.2-Dichloroethane	107-06-2	5	µg/L		<5	<5	<5	<5	----
Trichloroethene	79-01-6	5	µg/L		<5	<5	<5	<5	----
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	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID	WRMW6-003	DUP-003	RINSATE -003	BLANK -003	----
				Client sampling date / time	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	----
					EP1300272-006	EP1300272-007	EP1300272-008	EP1300272-009	----
EP074E: Halogenated Aliphatic Compounds - Continued									
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	**6**	----
Dibromochloromethane	124-48-1	5	µg/L		<5	<5	<5	**9**	----
Bromoform	75-25-2	5	µg/L		<5	<5	<5	<5	----
EP074H: Naphthalene									
Naphthalene	91-20-3	7	µg/L		<7	<7	<7	<7	----
EP075(SIM)A: Phenolic Compounds									
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	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID	WRMW6-003	DUP-003	RINSATE -003	BLANK -003	----
				Client sampling date / time	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	----
					EP1300272-006	EP1300272-007	EP1300272-008	EP1300272-009	----
EP075(SIM)A: Phenolic Compounds - Continued									
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		**380**	<100	<100	<100	----
C29 - C36 Fraction	----	50	µg/L		**60**	<50	<50	<50	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L		**440**	<50	<50	<50	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.1	%		**124**	**108**	**110**	**140**	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.1	%		**129**	**109**	**108**	**68.2**	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**105**	**104**	**105**	**108**	----
Toluene-D8	2037-26-5	0.1	%		**90.1**	**91.9**	**90.8**	**92.9**	----
4-Bromofluorobenzene	460-00-4	0.1	%		**97.4**	**96.4**	**94.7**	**96.6**	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID	WRMW6-003	DUP-003	RINSATE -003	BLANK -003	----
				Client sampling date / time	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	[15-JAN-2013]	----
					EP1300272-006	EP1300272-007	EP1300272-008	EP1300272-009	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		**32.5**	**23.0**	**42.6**	**35.2**	----
2-Chlorophenol-D4	93951-73-6	0.1	%		**72.8**	**48.0**	**94.4**	**76.8**	----
2.4.6-Tribromophenol	118-79-6	0.1	%		**106**	**61.6**	**129**	**101**	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**74.1**	**47.9**	**92.1**	**80.2**	----
Anthracene-d10	1719-06-8	0.1	%		**109**	**70.7**	**125**	**114**	----
4-Terphenyl-d14	1718-51-0	0.1	%		**107**	**69.6**	**124**	**113**	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**110**	**107**	**111**	**107**	----
Toluene-D8	2037-26-5	0.1	%		**96.5**	**97.8**	**96.8**	**97.1**	----
4-Bromofluorobenzene	460-00-4	0.1	%		**102**	**98.2**	**101**	**99.1**	----

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) 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	: **EP1300272**	Page	: 1 of 20
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	: E2012-31	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: WASTEROCK		
C-O-C number	: E2012-31-005	Date Samples Received	: 15-JAN-2013
Sampler	: DA/RB	Issue Date	: 24-JAN-2013
Order number	: ----		
		No. of samples received	: 9
Quote number	: EP/785/12	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 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

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

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.

Signatories	*Position*	*Accreditation Category*
Agnes Szilagyi	Senior Organic Chemist	Perth Organics
		Perth Organics
Benjamin Nicholson	Metals Chemist	Perth Inorganics
Chas Tucker	Inorganic Chemist	Perth Inorganics
		Perth Inorganics
		Perth Inorganics
Hoa Nguyen	Senior Inorganic Chemist	Sydney Inorganics
Rassem Ayoubi	Senior Organic Chemist	Perth Organics

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: 2689067)									
EP1300266-006	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	6.92	6.90	0.3	0% - 20%
EP1300272-003	WRMW3-003	EA005-P: pH Value	----	0.01	pH Unit	7.13	7.17	0.6	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 2689070)									
EP1300272-009	BLANK -003	EA005-P: pH Value	----	0.01	pH Unit	5.54	5.67	2.3	0% - 20%
EP1300292-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.63	7.74	1.4	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 2689066)									
EP1300266-006	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1030	1040	0.7	0% - 20%
EP1300272-003	WRMW3-003	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	906	911	0.6	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 2689069)									
EP1300272-009	BLANK -003	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	15	10	39.4	0% - 50%
EP1300292-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1310	1300	0.9	0% - 20%
EA015: Total Dissolved Solids (QC Lot: 2690364)									
EP1300269-001	Anonymous	EA015H: Total Dissolved Solids @180°C	GIS-210-010	10	mg/L	579	626	7.8	0% - 20%
EP1300272-005	WRMW5-003	EA015H: Total Dissolved Solids @180°C	GIS-210-010	10	mg/L	133	135	1.5	0% - 50%
EA025: Suspended Solids (QC Lot: 2690365)									
EP1300269-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
EP1300272-005	WRMW5-003	EA025H: Suspended Solids (SS)	----	5	mg/L	42	36	15.4	No Limit
EA045: Turbidity (QC Lot: 2686461)									
EP1300231-001	Anonymous	EA045: Turbidity	----	0.1	NTU	83.2	86.5	3.9	0% - 20%
EP1300272-004	WRMW4-003	EA045: Turbidity	----	0.1	NTU	81.8	80.4	1.7	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 2689068)									
EP1300266-006	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	242	242	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	ALK_TOTAL	1	mg/L	242	242	0.0	0% - 20%
EP1300272-003	WRMW3-003	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	130	132	1.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	ALK_TOTAL	1	mg/L	130	132	1.6	0% - 20%
ED038A: Acidity (QC Lot: 2693485)									
EP1300247-001	Anonymous	ED038: Acidity as CaCO3	----	1	mg/L	8	8	0.0	No Limit
EP1300272-007	DUP-003	ED038: Acidity as CaCO3	----	1	mg/L	8	9	0.0	No Limit
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 2686052)									
EP1300269-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	29	29	0.0	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 (%)*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 2686052) - continued									
EP1300272-007	DUP-003	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2	2	0.0	No Limit
ED045G: Chloride Discrete analyser (QC Lot: 2686051)									
EP1300269-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	264	272	2.7	0% - 20%
EP1300272-007	DUP-003	ED045G: Chloride	16887-00-6	1	mg/L	23	23	0.0	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2693609)									
EP1300260-005	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0001	<0.0001	0.0	0% - 20%
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.003	0.003	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	0.097	0.100	3.0	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.332	0.332	0.0	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	1.22	1.22	0.1	0% - 20%
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.52	0.54	3.6	0% - 20%
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.43	0.45	4.0	No Limit
EP1300272-006	WRMW6-003	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	0.032	0.033	0.0	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.014	0.015	0.0	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.132	0.135	2.8	0% - 20%
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.30	0.31	4.9	0% - 20%
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.91	0.96	5.4	0% - 50%
EG020T: Total Metals by ICP-MS (QC Lot: 2689428)									
EP1300254-001	Anonymous	EG020B-T: Silver	7440-22-4	0.001	mg/L	0.001	<0.001	0.0	0% - 20%
EG020T: Total Metals by ICP-MS (QC Lot: 2689430)									
EP1300262-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0002	0.0003	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.028	0.029	0.0	0% - 20%
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.013	0.013	0.0	0% - 20%
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.164	0.163	0.0	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.007	0.006	0.0	0% - 20%
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.242	0.241	0.0	0% - 20%
		EG020A-T: Molybdenum	7439-98-7	0.001	mg/L	0.012	0.012	0.0	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	1.47	1.44	2.2	0% - 20%
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.594	0.574	3.3	0% - 20%
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.24	0.24	0.0	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	3.36	3.29	2.1	0% - 20%
EP1300272-008	RINSATE -003	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

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 (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 2689430) - continued									
EP1300272-008	RINSATE -003	EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	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	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.07	146	No Limit
		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	<0.05	<0.05	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2693256)									
EP1300251-009	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP1300261-010	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2693257)									
EP1300272-009	BLANK -003	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG050F: Dissolved Hexavalent Chromium (QC Lot: 2691938)									
EP1300206-031	Anonymous	EG050G-F: Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP1300272-005	WRMW5-003	EG050G-F: Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EG051G: Ferrous Iron by Discrete Analyser (QC Lot: 2685937)									
EP1300238-001	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EP1300272-001	WRMW1-003	EG051G: Ferrous Iron	----	0.05	mg/L	0.11	0.10	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 2685987)									
EP1300269-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.32	0.34	4.8	0% - 20%
EP1300272-007	DUP-003	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.01	0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 2686049)									
EP1300269-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP1300272-007	DUP-003	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 2685986)									
EP1300267-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.33	0.34	3.7	0% - 20%
EP1300268-005	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	3.11	3.10	0.4	0% - 20%
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 2685988)									
EP1300272-004	WRMW4-003	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	4.38	4.46	2.0	0% - 20%
EP1300275-003	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	325	320	1.6	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 2689329)									
EP1300257-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.6	0.6	0.0	No Limit
EP1300260-005	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	8.6	8.6	0.0	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 2689331)									
EP1300272-004	WRMW4-003	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.7	0.8	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 (%)*
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 2689330)									
EP1300257-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.50	0.58	15.0	0% - 20%
EP1300260-005	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	1.18	1.22	2.9	0% - 20%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 2689332)									
EP1300272-004	WRMW4-003	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.06	0.06	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 2686050)									
EP1300269-001	Anonymous	EK071G: Reactive Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP1300272-007	DUP-003	EK071G: Reactive Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK085M: Sulfide as S2- (QC Lot: 2693143)									
EP1300272-001	WRMW1-003	EK085: Sulfide as S2-	18496-25-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EP1300290-001	Anonymous	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: 2693333)									
EP1300255-001	Anonymous	EP026ST: Chemical Oxygen Demand	----	5	mg/L	27	27	0.0	No Limit
EP1300270-002	Anonymous	EP026ST: Chemical Oxygen Demand	----	5	mg/L	78	76	2.6	0% - 50%
EP026ST: Chemical Oxygen Demand (Sealed Tube) (QC Lot: 2693334)									
EP1300272-009	BLANK -003	EP026ST: Chemical Oxygen Demand	----	5	mg/L	<5	<5	0.0	No Limit
ES1300931-003	Anonymous	EP026ST: Chemical Oxygen Demand	----	5	mg/L	23	20	14.0	No Limit
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 2688536)									
EP1300255-001	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	25	23	6.7	0% - 50%
EP1300272-003	WRMW3-003	EP030: Biochemical Oxygen Demand	----	2	mg/L	2	4	62.1	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 2691795)									
EP1300272-006	WRMW6-003	EP068: alpha-BHC	319-84-6	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: Aldrin	309-00-2	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: Endrin	72-20-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.5	µg/L	<0.5	<0.5	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 (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 2691795) - continued									
EP1300272-006	WRMW6-003	EP068: 4.4`-DDT	50-29-3	2.0	µg/L	<2.0	<2.0	0.0	No Limit
		EP068: Methoxychlor	72-43-5	2.0	µg/L	<2.0	<2.0	0.0	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 2691795)									
EP1300272-006	WRMW6-003	EP068: Dichlorvos	62-73-7	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: Dimethoate	60-51-5	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: Diazinon	333-41-5	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: Malathion	121-75-5	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: Fenthion	55-38-9	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: Fenamiphos	22224-92-6	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: Prothiofos	34643-46-4	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: Ethion	563-12-2	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: Carbophenothion	786-19-6	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP068: Monocrotophos	6923-22-4	2.0	µg/L	<2.0	<2.0	0.0	No Limit
		EP068: Parathion-methyl	298-00-0	2.0	µg/L	<2.0	<2.0	0.0	No Limit
		EP068: Parathion	56-38-2	2.0	µg/L	<2.0	<2.0	0.0	No Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 2688930)									
EP1300237-001	Anonymous	EP074: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP074: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP074: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		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: 2688930)									
EP1300237-001	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	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 (%)*
EP074B: Oxygenated Compounds (QC Lot: 2688930) - continued									
EP1300237-001	Anonymous	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: 2688930)									
EP1300237-001	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
EP074D: Fumigants (QC Lot: 2688930)									
EP1300237-001	Anonymous	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: 2688930)									
EP1300237-001	Anonymous	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
		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

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 (%)*
EP074F: Halogenated Aromatic Compounds (QC Lot: 2688930)									
EP1300237-001	Anonymous	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: 2688930)									
EP1300237-001	Anonymous	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
EP074H: Naphthalene (QC Lot: 2688930)									
EP1300237-001	Anonymous	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2688931)									
EP1300237-001	Anonymous	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	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 2689067)								
EA005-P: pH Value	----	0.01	pH Unit	----	7.00 pH Unit	100	70	130
EA005P: pH by PC Titrator (QCLot: 2689070)								
EA005-P: pH Value	----	0.01	pH Unit	----	7.00 pH Unit	100	70	130
EA010P: Conductivity by PC Titrator (QCLot: 2689066)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	24800 µS/cm	99.4	95	110
EA010P: Conductivity by PC Titrator (QCLot: 2689069)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	24800 µS/cm	99.1	95	110
EA015: Total Dissolved Solids (QCLot: 2690364)								
EA015H: Total Dissolved Solids @180°C	GIS-210-010	10	mg/L	<10	293 mg/L	117	70	130
EA025: Suspended Solids (QCLot: 2690365)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	97.3	70	130
EA045: Turbidity (QCLot: 2686461)								
EA045: Turbidity	----	0.1	NTU	<0.1	40 NTU	95.3	91	107
ED037P: Alkalinity by PC Titrator (QCLot: 2689068)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	ALK_TOTAL	1	mg/L	<1	200 mg/L	95.2	87	121
ED038A: Acidity (QCLot: 2693485)								
ED038: Acidity as CaCO3	----	1	mg/L	----	20 mg/L	107	85	119
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2686052)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	93.6	88	121
ED045G: Chloride Discrete analyser (QCLot: 2686051)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	92.6	84	120
EG020F: Dissolved Metals by ICP-MS (QCLot: 2693609)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.50 mg/L	102	77	113
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.100 mg/L	94.9	89	109
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1000 mg/L	99.1	89	109
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.100 mg/L	89.1	88	106
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.100 mg/L	91.8	87	107
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.100 mg/L	94.3	87	109
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.10 mg/L	105	93	117

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020F: Dissolved Metals by ICP-MS (QCLot: 2693609) - continued								
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.100 mg/L	101	89	115
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.50 mg/L	87.2	83	109
EG020T: Total Metals by ICP-MS (QCLot: 2689428)								
EG020B-T: Silver	7440-22-4	0.001	mg/L	<0.001	0.01 mg/L	91.3	70	130
EG020T: Total Metals by ICP-MS (QCLot: 2689430)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	103	78	116
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	95.3	77	109
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	98.1	78	108
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.5	80	112
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	92.9	79	111
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	97.7	81	109
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	96.7	80	112
EG020A-T: Molybdenum	7439-98-7	0.001	mg/L	<0.001	0.1 mg/L	103	86	118
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	94.0	80	112
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	99.0	75	107
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	96.4	74	108
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	97.0	75	115
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2693256)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.0100 mg/L	96.5	82.3	118
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2693257)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.0100 mg/L	98.6	82.3	118
EG050F: Dissolved Hexavalent Chromium (QCLot: 2691938)								
EG050G-F: Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	0.5 mg/L	102	91	115
EG051G: Ferrous Iron by Discrete Analyser (QCLot: 2685937)								
EG051G: Ferrous Iron	----	0.05	mg/L	<0.05	2.00 mg/L	98.5	89	113
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2685987)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	100	87	115
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2686049)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	94.2	86	112
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2685986)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	98.5	92	112
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2685988)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	97.6	92	112
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2689329)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	94.6	74	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2689331)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	94.7	74	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2689330)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	97.5	70	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2689332)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	101	70	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2686050)								
EK071G: Reactive Phosphorus as P	----	0.01	mg/L	<0.01	0.5 mg/L	93.4	87	115
EK085M: Sulfide as S2- (QCLot: 2693143)								
EK085: Sulfide as S2-	18496-25-8	0.10	mg/L	<0.1	0.50 mg/L	94.2	82	116
EP026ST: Chemical Oxygen Demand (Sealed Tube) (QCLot: 2693333)								
EP026ST: Chemical Oxygen Demand	----	5	mg/L	<5	500 mg/L	92.9	88	114
EP026ST: Chemical Oxygen Demand (Sealed Tube) (QCLot: 2693334)								
EP026ST: Chemical Oxygen Demand	----	5	mg/L	<5	500 mg/L	92.9	88	114
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 2688536)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	198 mg/L	89.2	84	114
EP068A: Organochlorine Pesticides (OC) (QCLot: 2691795)								
EP068: alpha-BHC	319-84-6	0.5	µg/L	<0.5	5 µg/L	94.2	26.9	125
EP068: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	5 µg/L	93.1	17.1	121
EP068: beta-BHC	319-85-7	0.5	µg/L	<0.5	5 µg/L	90.0	36	128
EP068: gamma-BHC	58-89-9	0.5	µg/L	<0.5	5 µg/L	101	36	124
EP068: delta-BHC	319-86-8	0.5	µg/L	<0.5	5 µg/L	92.4	42	128
EP068: Heptachlor	76-44-8	0.5	µg/L	<0.5	5 µg/L	91.1	26.5	133
EP068: Aldrin	309-00-2	0.5	µg/L	<0.5	5 µg/L	92.6	34	130
EP068: Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	5 µg/L	92.4	36	130
EP068: trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	5 µg/L	90.8	34	134
EP068: alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	5 µg/L	104	42	124
EP068: cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	5 µg/L	91.4	39	127
EP068: Dieldrin	60-57-1	0.5	µg/L	<0.5	5 µg/L	91.0	38	134
EP068: 4.4`-DDE	72-55-9	0.5	µg/L	<0.5	5 µg/L	91.2	41	133
EP068: Endrin	72-20-8	0.5	µg/L	<0.5	5 µg/L	89.3	29.6	148
EP068: beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	5 µg/L	90.1	40	136
EP068: 4.4`-DDD	72-54-8	0.5	µg/L	<0.5	5 µg/L	90.3	38	140
EP068: Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	5 µg/L	95.2	30.8	145
EP068: Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	5 µg/L	94.3	36	132
EP068: 4.4`-DDT	50-29-3	2.0	µg/L	<2.0	5 µg/L	93.0	16	142
EP068: Endrin ketone	53494-70-5	0.5	µg/L	<0.5	5 µg/L	94.3	32	132
EP068: Methoxychlor	72-43-5	2.0	µg/L	<2.0	5 µg/L	92.8	8	154
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2691795)								
EP068: Dichlorvos	62-73-7	0.5	µg/L	<0.5	5 µg/L	82.7	28.5	133
EP068: Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5	5 µg/L	104	29	143

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2691795) - continued								
EP068: Monocrotophos	6923-22-4	2.0	µg/L	<2.0	5 µg/L	7.0	4.2	45
EP068: Dimethoate	60-51-5	0.5	µg/L	<0.5	5 µg/L	78.9	28.4	116
EP068: Diazinon	333-41-5	0.5	µg/L	<0.5	5 µg/L	94.2	39	125
EP068: Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	5 µg/L	93.1	40	128
EP068: Parathion-methyl	298-00-0	2.0	µg/L	<2.0	5 µg/L	91.1	33	131
EP068: Malathion	121-75-5	0.5	µg/L	<0.5	5 µg/L	91.7	33	137
EP068: Fenthion	55-38-9	0.5	µg/L	<0.5	5 µg/L	91.9	41	127
EP068: Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	5 µg/L	93.1	43	127
EP068: Parathion	56-38-2	2.0	µg/L	<2.0	5 µg/L	89.8	33	131
EP068: Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	5 µg/L	92.7	35	125
EP068: Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	5 µg/L	91.0	39	135
EP068: Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	5 µg/L	91.4	38	128
EP068: Fenamiphos	22224-92-6	0.5	µg/L	<0.5	5 µg/L	68.2	30.4	140
EP068: Prothiofos	34643-46-4	0.5	µg/L	<0.5	5 µg/L	90.0	40	128
EP068: Ethion	563-12-2	0.5	µg/L	<0.5	5 µg/L	87.1	38	132
EP068: Carbophenothion	786-19-6	0.5	µg/L	<0.5	5 µg/L	93.0	34	134
EP068: Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	5 µg/L	83.0	6.4	158
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 2688930)								
EP074: Benzene	71-43-2	1	µg/L	<1	10 µg/L	80.6	76	120
EP074: Toluene	108-88-3	2	µg/L	<2	10 µg/L	80.5	75	121
EP074: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	77.3	74	120
EP074: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	20 µg/L	77.8	75	119
EP074: Styrene	100-42-5	5	µg/L	<5	10 µg/L	80.8	74	124
EP074: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	80.3	75	119
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	10 µg/L	76.0	75	121
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	10 µg/L	79.2	72	122
EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	10 µg/L	79.9	73	121
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	10 µg/L	76.6	72	122
EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	10 µg/L	79.8	74	122
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	10 µg/L	78.7	73	121
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	10 µg/L	76.6	73	123
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	10 µg/L	79.8	70	126
EP074B: Oxygenated Compounds (QCLot: 2688930)								
EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	100 µg/L	86.8	61	135
EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	100 µg/L	82.1	66	130
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	100 µg/L	87.3	72	126
EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	100 µg/L	79.3	70	126
EP074C: Sulfonated Compounds (QCLot: 2688930)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074C: Sulfonated Compounds (QCLot: 2688930) - continued								
EP074: Carbon disulfide	75-15-0	5	µg/L	<5	10 µg/L	86.6	71	127
EP074D: Fumigants (QCLot: 2688930)								
EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	10 µg/L	83.1	71	129
EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	10 µg/L	84.3	74	124
EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	10 µg/L	89.4	73	127
EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	10 µg/L	91.4	70	130
EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	10 µg/L	83.0	74	124
EP074E: Halogenated Aliphatic Compounds (QCLot: 2688930)								
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	100 µg/L	85.9	70	130
EP074: Chloromethane	74-87-3	50	µg/L	<50	100 µg/L	87.2	73	125
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	100 µg/L	94.4	72	128
EP074: Bromomethane	74-83-9	50	µg/L	<50	100 µg/L	82.4	73	127
EP074: Chloroethane	75-00-3	50	µg/L	<50	100 µg/L	80.5	74	124
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	100 µg/L	85.5	72	130
EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	10 µg/L	85.2	73	129
EP074: Iodomethane	74-88-4	5	µg/L	<5	10 µg/L	68.6	42	142
EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	10 µg/L	83.2	72	126
EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	10 µg/L	83.9	73	125
EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	10 µg/L	86.0	76	122
EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	10 µg/L	86.6	76	124
EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	10 µg/L	81.2	74	124
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	10 µg/L	85.6	73	129
EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	10 µg/L	90.3	76	126
EP074: Trichloroethene	79-01-6	5	µg/L	<5	10 µg/L	83.0	75	125
EP074: Dibromomethane	74-95-3	5	µg/L	<5	10 µg/L	92.4	75	127
EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	10 µg/L	80.2	74	122
EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	10 µg/L	78.5	72	128
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	10 µg/L	74.8	74	124
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	73.2	54	142
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	10 µg/L	84.8	61	135
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	10 µg/L	82.7	66	132
EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	10 µg/L	81.6	66	130
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	10 µg/L	89.8	66	134
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	10 µg/L	84.8	56	140
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	10 µg/L	78.4	66	134
EP074F: Halogenated Aromatic Compounds (QCLot: 2688930)								
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	10 µg/L	81.1	78	120
EP074: Bromobenzene	108-86-1	5	µg/L	<5	10 µg/L	79.0	76	122

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074F: Halogenated Aromatic Compounds (QCLot: 2688930) - continued								
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	10 µg/L	80.7	75	121
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	10 µg/L	82.0	74	122
EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	10 µg/L	80.4	75	121
EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	10 µg/L	81.2	75	121
EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	10 µg/L	83.0	76	122
EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	10 µg/L	78.6	68	132
EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	10 µg/L	81.5	72	128
EP074G: Trihalomethanes (QCLot: 2688930)								
EP074: Chloroform	67-66-3	5	µg/L	<5	10 µg/L	88.6	75	125
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	10 µg/L	91.5	73	129
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	10 µg/L	93.1	68	132
EP074: Bromoform	75-25-2	5	µg/L	<5	10 µg/L	92.5	67	133
EP074H: Naphthalene (QCLot: 2688930)								
EP074: Naphthalene	91-20-3	7	µg/L	<7	10 µg/L	70.7	60	120
EP075(SIM)A: Phenolic Compounds (QCLot: 2691797)								
EP075(SIM): Phenol	108-95-2	1	µg/L	<1.0	25 µg/L	37.4	17.9	56
EP075(SIM): 2-Chlorophenol	95-57-8	1	µg/L	<1.0	25 µg/L	80.2	42	104
EP075(SIM): 2-Methylphenol	95-48-7	1	µg/L	<1.0	25 µg/L	72.8	36	104
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	2	µg/L	<2.0	50 µg/L	67.6	37	95
EP075(SIM): 2-Nitrophenol	88-75-5	1	µg/L	<1.0	25 µg/L	93.9	37	115
EP075(SIM): 2.4-Dimethylphenol	105-67-9	1	µg/L	<1.0	25 µg/L	85.1	37	117
EP075(SIM): 2.4-Dichlorophenol	120-83-2	1	µg/L	<1.0	25 µg/L	93.4	38	116
EP075(SIM): 2.6-Dichlorophenol	87-65-0	1	µg/L	<1.0	25 µg/L	86.8	36	110
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	1	µg/L	<1.0	25 µg/L	91.6	37	117
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	1	µg/L	<1.0	25 µg/L	90.4	29	117
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	1	µg/L	<1.0	25 µg/L	94.4	36	120
EP075(SIM): Pentachlorophenol	87-86-5	2	µg/L	<2.0	25 µg/L	94.1	5.4	155
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2691797)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	25 µg/L	92.0	43	97
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	25 µg/L	97.0	41	113
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	25 µg/L	91.9	43	121
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	25 µg/L	94.7	46	122
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	25 µg/L	108	50	122
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	25 µg/L	109	47	123
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	25 µg/L	111	55	125
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	25 µg/L	110	55	131
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	25 µg/L	110	48	142
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	25 µg/L	110	33	143

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2691797) - continued								
EP075(SIM): Benzo(b)fluoranthene	205-99-2	1	µg/L	<1.0	25 µg/L	127	35	145
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	25 µg/L	121	43	139
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	25 µg/L	132	33	151
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	25 µg/L	126	30.7	137
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	25 µg/L	126	27.4	133
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	25 µg/L	125	25.4	135
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2688931)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	320 µg/L	90.5	74.2	142
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2691796)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	4000 µg/L	71.2	30.7	123
EP071: C15 - C28 Fraction	----	100	µg/L	<100	4000 µg/L	73.2	34	142
EP071: C29 - C36 Fraction	----	50	µg/L	<50	4000 µg/L	62.8	32	124

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**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2686052)							
EP1300269-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	112	70	130
ED045G: Chloride Discrete analyser (QCLot: 2686051)							
EP1300269-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	99.1	70	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 2693609)							
EP1300260-006	Anonymous	EG020A-F: Arsenic	7440-38-2	0.200 mg/L	110	70	130
		EG020A-F: Cadmium	7440-43-9	0.0500 mg/L	108	70	130
		EG020A-F: Chromium	7440-47-3	0.200 mg/L	97.2	70	130
		EG020A-F: Manganese	7439-96-5	0.200 mg/L	97.5	70	130
		EG020A-F: Nickel	7440-02-0	0.200 mg/L	# Not Determined	70	130
		EG020A-F: Zinc	7440-66-6	0.200 mg/L	# Not Determined	70	130
EG020T: Total Metals by ICP-MS (QCLot: 2689430)							
EP1300270-004	Anonymous	EG020A-T: Arsenic	7440-38-2	1.00 mg/L	116	70	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	109	70	130
		EG020A-T: Chromium	7440-47-3	1.00 mg/L	104	70	130
		EG020A-T: Copper	7440-50-8	1.00 mg/L	105	70	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 2689430) - continued							
EP1300270-004	Anonymous	EG020A-T: Lead	7439-92-1	1.00 mg/L	103	70	130
		EG020A-T: Manganese	7439-96-5	1.00 mg/L	105	70	130
		EG020A-T: Nickel	7440-02-0	1.00 mg/L	105	70	130
		EG020A-T: Zinc	7440-66-6	1.00 mg/L	112	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2693256)							
EP1300261-001	Anonymous	EG035T: Mercury	7439-97-6	0.0100 mg/L	98.6	70	130
EG050F: Dissolved Hexavalent Chromium (QCLot: 2691938)							
EP1300206-031	Anonymous	EG050G-F: Hexavalent Chromium	18540-29-9	0.5 mg/L	106	70	130
EG051G: Ferrous Iron by Discrete Analyser (QCLot: 2685937)							
EP1300238-001	Anonymous	EG051G: Ferrous Iron	----	2.5 mg/L	106	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2685987)							
EP1300269-001	Anonymous	EK055G: Ammonia as N	7664-41-7	1.00 mg/L	106	70	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2686049)							
EP1300269-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.6 mg/L	86.7	70	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2685986)							
EP1300267-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	104	70	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2685988)							
EP1300272-004	WRMW4-003	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	# Not Determined	70	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2689329)							
EP1300257-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	4.293 mg/L	71.6	70	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2689331)							
EP1300272-004	WRMW4-003	EK061G: Total Kjeldahl Nitrogen as N	----	25 mg/L	89.9	70	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2689330)							
EP1300257-001	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	87.2	70	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2689332)							
EP1300272-004	WRMW4-003	EK067G: Total Phosphorus as P	----	5 mg/L	93.4	70	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2686050)							
EP1300269-001	Anonymous	EK071G: Reactive Phosphorus as P	----	0.5 mg/L	96.7	70	130
EP026ST: Chemical Oxygen Demand (Sealed Tube) (QCLot: 2693333)							
EP1300255-001	Anonymous	EP026ST: Chemical Oxygen Demand	----	143 mg/L	120	70	130
EP026ST: Chemical Oxygen Demand (Sealed Tube) (QCLot: 2693334)							
EP1300272-009	BLANK -003	EP026ST: Chemical Oxygen Demand	----	143 mg/L	123	70	130
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 2688930)							

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 2688930) - continued							
EP1300272-001	WRMW1-003	EP074: Benzene	71-43-2	20 µg/L	84.5	82.7	115
		EP074: Toluene	108-88-3	20 µg/L	96.2	77.1	118
EP074E: Halogenated Aliphatic Compounds (QCLot: 2688930)							
EP1300272-001	WRMW1-003	EP074: 1.1-Dichloroethene	75-35-4	20 µg/L	96.3	73.7	126
		EP074: Trichloroethene	79-01-6	20 µg/L	87.6	79.1	120
EP074F: Halogenated Aromatic Compounds (QCLot: 2688930)							
EP1300272-001	WRMW1-003	EP074: Chlorobenzene	108-90-7	20 µg/L	99.7	81.4	115
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2688931)							
EP1300272-001	WRMW1-003	EP080: C6 - C9 Fraction	----	280 µg/L	81.9	77.0	137

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are 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**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%): MS	Spike Recovery (%): MSD	Recovery Limits (%): Low	Recovery Limits (%): High	RPDs (%): Value	RPDs (%): Control Limit
EG051G: Ferrous Iron by Discrete Analyser (QCLot: 2685937)										
EP1300238-001	Anonymous	EG051G: Ferrous Iron	----	2.5 mg/L	106	----	70	130	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2685986)										
EP1300267-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	104	----	70	130	----	----
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2685987)										
EP1300269-001	Anonymous	EK055G: Ammonia as N	7664-41-7	1.00 mg/L	106	----	70	130	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2685988)										
EP1300272-004	WRMW4-003	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	# Not Determined	----	70	130	----	----
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2686049)										
EP1300269-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.6 mg/L	86.7	----	70	130	----	----
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2686050)										
EP1300269-001	Anonymous	EK071G: Reactive Phosphorus as P	----	0.5 mg/L	96.7	----	70	130	----	----
ED045G: Chloride Discrete analyser (QCLot: 2686051)										
EP1300269-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	99.1	----	70	130	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2686052)										
EP1300269-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	112	----	70	130	----	----
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 2688930)										
EP1300272-001	WRMW1-003	EP074: Benzene	71-43-2	20 µg/L	84.5	----	82.7	115	----	----

Sub-Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 2688930) - continued										
EP1300272-001	WRMW1-003	EP074: Toluene	108-88-3	20 µg/L	96.2	----	77.1	118	----	----
EP074E: Halogenated Aliphatic Compounds (QCLot: 2688930)										
EP1300272-001	WRMW1-003	EP074: 1.1-Dichloroethene	75-35-4	20 µg/L	96.3	----	73.7	126	----	----
		EP074: Trichloroethene	79-01-6	20 µg/L	87.6	----	79.1	120	----	----
EP074F: Halogenated Aromatic Compounds (QCLot: 2688930)										
EP1300272-001	WRMW1-003	EP074: Chlorobenzene	108-90-7	20 µg/L	99.7	----	81.4	115	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2688931)										
EP1300272-001	WRMW1-003	EP080: C6 - C9 Fraction	----	280 µg/L	81.9	----	77.0	137	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2689329)										
EP1300257-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	4.293 mg/L	71.6	----	70	130	----	----
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2689330)										
EP1300257-001	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	87.2	----	70	130	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2689331)										
EP1300272-004	WRMW4-003	EK061G: Total Kjeldahl Nitrogen as N	----	25 mg/L	89.9	----	70	130	----	----
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2689332)										
EP1300272-004	WRMW4-003	EK067G: Total Phosphorus as P	----	5 mg/L	93.4	----	70	130	----	----
EG020T: Total Metals by ICP-MS (QCLot: 2689430)										
EP1300270-004	Anonymous	EG020A-T: Arsenic	7440-38-2	1.00 mg/L	116	----	70	130	----	----
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	109	----	70	130	----	----
		EG020A-T: Chromium	7440-47-3	1.00 mg/L	104	----	70	130	----	----
		EG020A-T: Copper	7440-50-8	1.00 mg/L	105	----	70	130	----	----
		EG020A-T: Lead	7439-92-1	1.00 mg/L	103	----	70	130	----	----
		EG020A-T: Manganese	7439-96-5	1.00 mg/L	105	----	70	130	----	----
		EG020A-T: Nickel	7440-02-0	1.00 mg/L	105	----	70	130	----	----
		EG020A-T: Zinc	7440-66-6	1.00 mg/L	112	----	70	130	----	----
EG050F: Dissolved Hexavalent Chromium (QCLot: 2691938)										
EP1300206-031	Anonymous	EG050G-F: Hexavalent Chromium	18540-29-9	0.5 mg/L	106	----	70	130	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2693256)										
EP1300261-001	Anonymous	EG035T: Mercury	7439-97-6	0.0100 mg/L	98.6	----	70	130	----	----
EP026ST: Chemical Oxygen Demand (Sealed Tube) (QCLot: 2693333)										
EP1300255-001	Anonymous	EP026ST: Chemical Oxygen Demand	----	143 mg/L	120	----	70	130	----	----
EP026ST: Chemical Oxygen Demand (Sealed Tube) (QCLot: 2693334)										
EP1300272-009	BLANK -003	EP026ST: Chemical Oxygen Demand	----	143 mg/L	123	----	70	130	----	----
EG020F: Dissolved Metals by ICP-MS (QCLot: 2693609)										
EP1300260-006	Anonymous	EG020A-F: Arsenic	7440-38-2	0.200 mg/L	110	----	70	130	----	----
		EG020A-F: Cadmium	7440-43-9	0.0500 mg/L	108	----	70	130	----	----

Sub-Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EG020F: Dissolved Metals by ICP-MS (QCLot: 2693609) - continued										
EP1300260-006	Anonymous	EG020A-F: Chromium	7440-47-3	0.200 mg/L	97.2	----	70	130	----	----
		EG020A-F: Manganese	7439-96-5	0.200 mg/L	97.5	----	70	130	----	----
		EG020A-F: Nickel	7440-02-0	0.200 mg/L	# Not Determined	----	70	130	----	----
		EG020A-F: Zinc	7440-66-6	0.200 mg/L	# Not Determined	----	70	130	----	----

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EP1300272**	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	: E2012-31	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: WASTEROCK		
C-O-C number	: E2012-31-005	Date Samples Received	: 15-JAN-2013
Sampler	: DA/RB	Issue Date	: 24-JAN-2013
Order number	: ----		
		No. of samples received	: 9
Quote number	: EP/785/12	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 Interpretive Quality Control Report contains the following information:

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

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 (EA005-P)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	---	15-JAN-2013	----	**17-JAN-2013**	15-JAN-2013	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	---	12-FEB-2013	----	**17-JAN-2013**	12-FEB-2013	✓
EA015: Total Dissolved Solids							
Clear Plastic Bottle - Natural (EA015H)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	---	22-JAN-2013	----	**18-JAN-2013**	22-JAN-2013	✓
EA025: Suspended Solids							
Clear Plastic Bottle - Natural (EA025H)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	---	22-JAN-2013	----	**18-JAN-2013**	22-JAN-2013	✓

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
EA045: Turbidity							
Clear Plastic Bottle - Natural (EA045)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**----**	----	----	**16-JAN-2013**	17-JAN-2013	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**---**	29-JAN-2013	----	**17-JAN-2013**	29-JAN-2013	✓
ED038A: Acidity							
Clear Plastic Bottle - Natural (ED038)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**----**	----	----	**21-JAN-2013**	29-JAN-2013	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**---**	12-FEB-2013	----	**15-JAN-2013**	12-FEB-2013	✓
ED045G: Chloride Discrete analyser							
Clear Plastic Bottle - Natural (ED045G)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**---**	12-FEB-2013	----	**15-JAN-2013**	12-FEB-2013	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**---**	14-JUL-2013	----	**21-JAN-2013**	14-JUL-2013	✓

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
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**21-JAN-2013**	14-JUL-2013	✓	**21-JAN-2013**	14-JUL-2013	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020B-T)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**21-JAN-2013**	14-JUL-2013	✓	**21-JAN-2013**	14-JUL-2013	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG035T)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**----**	----	----	**22-JAN-2013**	12-FEB-2013	✓
EG050F: Dissolved Hexavalent Chromium							
Clear Plastic Bottle - NaOH (EG050G-F)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**----**	----	----	**21-JAN-2013**	12-FEB-2013	✓
EG051G: Ferrous Iron by Discrete Analyser							
Clear Plastic Bottle - HCl (EG051G)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**----**	----	----	**15-JAN-2013**	16-JAN-2013	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulphuric Acid (EK055G)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**---**	12-FEB-2013	----	**15-JAN-2013**	12-FEB-2013	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	---	17-JAN-2013	----	**15-JAN-2013**	17-JAN-2013	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulphuric Acid (EK059G)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	---	12-FEB-2013	----	**15-JAN-2013**	12-FEB-2013	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulphuric Acid (EK061G)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**21-JAN-2013**	12-FEB-2013	✓	**21-JAN-2013**	12-FEB-2013	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulphuric Acid (EK067G)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**21-JAN-2013**	12-FEB-2013	✓	**21-JAN-2013**	12-FEB-2013	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	---	17-JAN-2013	----	**15-JAN-2013**	17-JAN-2013	✓
EK085M: Sulfide as S2-							
Clear Plastic Bottle - Zinc Acetate/NaOH (EK085)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**----**	----	----	**21-JAN-2013**	22-JAN-2013	✓

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 (EP026ST)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**----**	----	----	**21-JAN-2013**	12-FEB-2013	✓
EP030: Biochemical Oxygen Demand (BOD)							
Clear Plastic Bottle - Natural (EP030)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**----**	----	----	**17-JAN-2013**	17-JAN-2013	✓
EP068A: Organochlorine Pesticides (OC)							
Amber Glass Bottle - Unpreserved (EP068)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**18-JAN-2013**	22-JAN-2013	✓	**21-JAN-2013**	27-FEB-2013	✓
EP068B: Organophosphorus Pesticides (OP)							
Amber Glass Bottle - Unpreserved (EP068)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**18-JAN-2013**	22-JAN-2013	✓	**21-JAN-2013**	27-FEB-2013	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**18-JAN-2013**	22-JAN-2013	✓	**21-JAN-2013**	27-FEB-2013	✓
EP074D: Fumigants							
Amber VOC Vial - Sulfuric Acid (EP074)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**17-JAN-2013**	29-JAN-2013	✓	**17-JAN-2013**	29-JAN-2013	✓

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
EP074E: Halogenated Aliphatic Compounds							
Amber VOC Vial - Sulfuric Acid (EP074)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**17-JAN-2013**	29-JAN-2013	✓	**17-JAN-2013**	29-JAN-2013	✓
EP074F: Halogenated Aromatic Compounds							
Amber VOC Vial - Sulfuric Acid (EP074)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**17-JAN-2013**	29-JAN-2013	✓	**17-JAN-2013**	29-JAN-2013	✓
EP074A: Monocyclic Aromatic Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP074)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**17-JAN-2013**	29-JAN-2013	✓	**17-JAN-2013**	29-JAN-2013	✓
EP074H: Naphthalene							
Amber VOC Vial - Sulfuric Acid (EP074)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**17-JAN-2013**	29-JAN-2013	✓	**17-JAN-2013**	29-JAN-2013	✓
EP074B: Oxygenated Compounds							
Amber VOC Vial - Sulfuric Acid (EP074)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**17-JAN-2013**	29-JAN-2013	✓	**17-JAN-2013**	29-JAN-2013	✓
EP074C: Sulfonated Compounds							
Amber VOC Vial - Sulfuric Acid (EP074)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**17-JAN-2013**	29-JAN-2013	✓	**17-JAN-2013**	29-JAN-2013	✓

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
EP074G: Trihalomethanes							
Amber VOC Vial - Sulfuric Acid (EP074)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**17-JAN-2013**	29-JAN-2013	✓	**17-JAN-2013**	29-JAN-2013	✓
EP075(SIM)A: Phenolic Compounds							
Amber Glass Bottle - Unpreserved (EP075(SIM))							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**18-JAN-2013**	22-JAN-2013	✓	**21-JAN-2013**	27-FEB-2013	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM))							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**18-JAN-2013**	22-JAN-2013	✓	**21-JAN-2013**	27-FEB-2013	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP080)							
WRMW1-003, WRMW2-003, WRMW3-003, WRMW4-003, WRMW5-003, WRMW6-003, DUP-003, RINSATE -003, BLANK -003	**15-JAN-2013**	**17-JAN-2013**	29-JAN-2013	✓	**17-JAN-2013**	29-JAN-2013	✓

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		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Acidity as Calcium Carbonate	ED038	2	16	**12.5**	**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	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Biochemical Oxygen Demand (BOD)	EP030	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chemical Oxygen Demand (Sealed Tube)	EP026ST	4	40	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Conductivity by PC Titrator	EA010-P	4	38	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	19	**10.5**	**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
Hexavalent Chromium by Discrete Analyser - Dissolved	EG050G-F	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	4	32	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	2	18	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	9	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
pH by PC Titrator	EA005-P	4	37	**10.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfide as S2-	EK085	2	19	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Suspended Solids (High Level)	EA025H	2	18	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	3	29	**10.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	3	21	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	2	15	**13.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite B	EG020B-T	1	10	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Phosphorus as P By Discrete Analyser	EK067G	3	29	**10.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	10	**10.0**	**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	10	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Acidity as Calcium Carbonate	ED038	1	16	**6.3**	**5.0**	✓	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	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Biochemical Oxygen Demand (BOD)	EP030	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chemical Oxygen Demand (Sealed Tube)	EP026ST	4	40	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Conductivity by PC Titrator	EA010-P	6	38	**15.8**	**15.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	19	**5.3**	**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		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Control Samples (LCS) - Continued							
Ferrous Iron by Discrete Analyser	EG051G	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Hexavalent Chromium by Discrete Analyser - Dissolved	EG050G-F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	32	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	11	**9.1**	**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	37	**10.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfide as S2-	EK085	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Suspended Solids (High Level)	EA025H	2	18	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	4	29	**13.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	21	**9.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite B	EG020B-T	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Phosphorus as P By Discrete Analyser	EK067G	4	29	**13.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	11	**9.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	10	**10.0**	**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	10	**10.0**	**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	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Biochemical Oxygen Demand (BOD)	EP030	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chemical Oxygen Demand (Sealed Tube)	EP026ST	2	40	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Conductivity by PC Titrator	EA010-P	2	38	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	19	**5.3**	**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
Hexavalent Chromium by Discrete Analyser - Dissolved	EG050G-F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	32	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	11	**9.1**	**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	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfide as S2-	EK085	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Suspended Solids (High Level)	EA025H	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	17	**5.9**	**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		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	29	**6.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	21	**9.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite B	EG020B-T	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Phosphorus as P By Discrete Analyser	EK067G	2	29	**6.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	11	**9.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	10	**10.0**	**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	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	17	**5.9**	**5.0**	✓	ALS QCS3 requirement
Chemical Oxygen Demand (Sealed Tube)	EP026ST	2	40	**5.0**	**5.0**	✓	ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	1	17	**5.9**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	19	**5.3**	**5.0**	✓	ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	19	**5.3**	**5.0**	✓	ALS QCS3 requirement
Hexavalent Chromium by Discrete Analyser - Dissolved	EG050G-F	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	32	**6.3**	**5.0**	✓	ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	18	**5.6**	**5.0**	✓	ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	17	**5.9**	**5.0**	✓	ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.9**	**5.0**	✓	ALS QCS3 requirement
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	29	**6.9**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	15	**6.7**	**5.0**	✓	ALS QCS3 requirement
Total Phosphorus as P By Discrete Analyser	EK067G	2	29	**6.9**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	10	**10.0**	**5.0**	✓	ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	10	**10.0**	**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 Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (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 librated thiocynate forms highly-coloured ferric thiocynate 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.

Analytical Methods	Method	Matrix	Method Descriptions
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.
Total Mercury by FIMS	EG035T	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl2)(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 SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (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 Descrete Analyser as received by pH adjustment and colour development using dephenylcarbazide. 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)
Ammonia as N by Discrete analyser	EK055G	WATER	APHA 21st ed., 4500-NH3 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-NO2- 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-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	APHA 21st ed., 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM (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-NO3-. 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 othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Analytical Methods	Method	Matrix	Method Descriptions
Sulfide as S2-	EK085	WATER	APHA 21st ed., 4500-S2- 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)
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
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.

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 SW 846 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
Matrix Spike (MS) Recoveries							
EG020F: Dissolved Metals by ICP-MS	EP1300260-006	Anonymous	**Nickel**	7440-02-0	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG020F: Dissolved Metals by ICP-MS	EP1300260-006	Anonymous	**Zinc**	7440-66-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Ar	EP1300272-004	WRMW4-003	**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.**
- **For all matrices, no Laboratory Control 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							
EP075(SIM)T: PAH Surrogates	EP1300272-001	WRMW1-003	**Anthracene-d10**	1719-06-8	126 %	42.7-126.5 %	**Recovery greater than upper 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							
WRMW1-003,	WRMW2-003,	----	----	----	17-JAN-2013	15-JAN-2013	**2**
WRMW3-003,	WRMW4-003,						
WRMW5-003,	WRMW6-003,						
DUP-003,	RINSATE -003,						
BLANK -003							

Outliers : Frequency of Quality Control Samples

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

- **No Quality Control Sample Frequency Outliers exist.**

Environmental Division

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **EP1300272**		
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	: E2012-31	Page	: 1 of 3
Order number	: ----		
C-O-C number	: E2012-31-005	Quote number	: EP2012MOBDEW0134 (EP/785/12)
Site	: WASTEROCK		
Sampler	: DA/RB	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 15-JAN-2013	Issue Date	: 15-JAN-2013 18:43
Client Requested Due Date	: 22-JAN-2013	Scheduled Reporting Date	: **22-JAN-2013**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 8.0 - Ice present
No. of coolers/boxes	: 4 Medum 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 discrepencies: extra samples , samples not received etc.
- **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 neccessary 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*	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
EP1300272-001	[15-JAN-2013]	WRMW1-003	✓	✓	✓	✓	✓	✓	✓	✓
EP1300272-002	[15-JAN-2013]	WRMW2-003	✓	✓	✓	✓	✓	✓	✓	✓
EP1300272-003	[15-JAN-2013]	WRMW3-003	✓	✓	✓	✓	✓	✓	✓	✓
EP1300272-004	[15-JAN-2013]	WRMW4-003	✓	✓	✓	✓	✓	✓	✓	✓
EP1300272-005	[15-JAN-2013]	WRMW5-003	✓	✓	✓	✓	✓	✓	✓	✓
EP1300272-006	[15-JAN-2013]	WRMW6-003	✓	✓	✓	✓	✓	✓	✓	✓
EP1300272-007	[15-JAN-2013]	DUP-003	✓	✓	✓	✓	✓	✓	✓	✓
EP1300272-008	[15-JAN-2013]	RINSATE -003	✓	✓	✓	✓	✓	✓	✓	✓
EP1300272-009	[15-JAN-2013]	BLANK -003	✓	✓	✓	✓	✓	✓	✓	✓

Matrix: **WATER**

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 - EK085M Sulfide as S 2-	WATER - EP026ST COD- Sealed Tube	WATER - EP030 BOD	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)	WATER - NT-08A Total Nitrogen + NO2 + NO3 + NH3 + Total P + Reactive P
EP1300272-001	[15-JAN-2013]	WRMW1-003	✓	✓	✓	✓	✓	✓	✓	✓
EP1300272-002	[15-JAN-2013]	WRMW2-003	✓	✓	✓	✓	✓	✓	✓	✓
EP1300272-003	[15-JAN-2013]	WRMW3-003	✓	✓	✓	✓	✓	✓	✓	✓
EP1300272-004	[15-JAN-2013]	WRMW4-003	✓	✓	✓	✓	✓	✓	✓	✓
EP1300272-005	[15-JAN-2013]	WRMW5-003	✓	✓	✓	✓	✓	✓	✓	✓
EP1300272-006	[15-JAN-2013]	WRMW6-003	✓	✓	✓	✓	✓	✓	✓	✓
EP1300272-007	[15-JAN-2013]	DUP-003	✓	✓	✓	✓	✓	✓	✓	✓
EP1300272-008	[15-JAN-2013]	RINSATE -003	✓	✓	✓	✓	✓	✓	✓	✓
EP1300272-009	[15-JAN-2013]	BLANK -003	✓	✓	✓	✓	✓	✓	✓	✓

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - W-09 TPH/VOC	WATER - W-12 OC/OP Pesticides	WATER - W-14A PAH/Phenols (SIM)
EP1300272-001	[15-JAN-2013]	WRMW1-003	✓	✓	✓
EP1300272-002	[15-JAN-2013]	WRMW2-003	✓	✓	✓
EP1300272-003	[15-JAN-2013]	WRMW3-003	✓	✓	✓
EP1300272-004	[15-JAN-2013]	WRMW4-003	✓	✓	✓
EP1300272-005	[15-JAN-2013]	WRMW5-003	✓	✓	✓
EP1300272-006	[15-JAN-2013]	WRMW6-003	✓	✓	✓
EP1300272-007	[15-JAN-2013]	DUP-003	✓	✓	✓
EP1300272-008	[15-JAN-2013]	RINSATE -003	✓	✓	✓
EP1300272-009	[15-JAN-2013]	BLANK -003	✓	✓	✓

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)	Email	info@environmentalservices.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	info@environmentalservices.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	info@environmentalservices.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	info@environmentalservices.com.au
- Chain of Custody (CoC) (COC)	Email	info@environmentalservices.com.au
- EDI Format - ENMRG (ENMRG)	Email	info@environmentalservices.com.au
- EDI Format - ESDAT (ESDAT)	Email	info@environmentalservices.com.au
- EDI Format - XTab (XTAB)	Email	info@environmentalservices.com.au

1081

Site: ~~E2012~~ WASTEROCK	
Job #: E2012-031	
Sampler: DALE A/RHIAN B	
CoC #: E2012-031-005	
Quote #: EP1304/12	
Laboratory: ALS ENVIRO	
Date and time delivered: 15/1 15:35	
Received by: AM	

MDW
ENVIRONMENTAL SERVICES
Mobile Dewatering Environmental Services
Unit 1, 22 Elmsfield Road
Midvale WA 6056
P: 08 9250 6960
F: 08 9250 8269
E: info@environmentalservices.com.au

Comments:

PLEASE FILTER FERROUS IRON & TOTAL METALS.

Analysis Detection Limits

Sample ID	Lab ID	Type	Sampling Date	Sampling Time	ASS (2) SUITE
WRMW1-003		WATER	15.1.13	0900-1330	/
WRMW2-003					/
WRMW3-003					/
WRMW4-003					/
WRMW5-003					/
WRMW6-003					/
DUP-003					/
RINSATE-003					/
BLANK-003					/

Environmental Division
Perth
Work Order
EP1300272

Telephone : +61-8-9209 7655

Condition of Sample: (Cool) / Ambient / Warm Relinquished by: C.J. Watts

Environmental and Analytical Laboratory

LABORATORY REPORT

Job Number: 13-0327
Revision: 00
Date: 25 January 2013

ADDRESS: **Mobile Dewatering Environmental Services**
Unit 1, 22 Elmsfield Road
MIDVALE WA 6056

ATTENTION: Dale A

DATE RECEIVED: 15/01/2013

YOUR REFERENCE: E2012-031-004

PURCHASE ORDER: 1080

APPROVALS:

Paul Nottle
Chemist - Organics

Douglas Todd
Section Manager - Inorganics

REPORT COMMENTS:

Samples are analysed on an as received basis unless otherwise noted.

NATA
WORLD RECOGNISED
ACCREDITATION
This document is issued in accordance with NATA's accreditation requirements
Accreditation No. 2377

Analytical Reference Laboratory (WA) Pty. Ltd.
46-48 Banksia Road, Welshpool, Western Australia 6106 Telephone: 08 6253 4444 Facsimile: 08 6253 4440
www.arlwa.com.au ABN: 91 050 159 898

METHOD REFERENCES:

ARL No. 007	Benzene, Toluene, Ethylbenzene and Xylenes in Water
ARL No. 005	Polycyclic Aromatic Hydrocarbons in Water
ARL No. 009	Total Petroleum Hydrocarbons (TPH) in Water
ARL No. 002	OCOP and PCB in Water
ARL No. 044	Total Phenols in Water
ARL No. 402/403	Metals in Water by ICPOES/MS
ARL No. 040	Arsenic by Hydride Atomic Absorption
ARL No. 330	Persulphate Method for Simultaneous Determination of TN & TP
ARL No. 308	Total Phosphorus in Water by Discrete Analyser
ARL No. 305	Chloride in Water by Discrete Analyser
ARL No. 309	Filterable Reactive Phosphorus in Water by Discrete Analyser
ARL No. 303	Ammonia in Water by Discrete Analyser
ARL No. 313	NOx in Water by Discrete Analyser
ARL No. 311	Nitrite in Water by Discrete Analyser
ARL No. 021	Acidity in Water
ARL No. 037	Alkalinity in Water
ARL No. 014	pH in Water
ARL No. 019	Conductivity and Salinity in Water
ARL No. 017	Total Dissolved Solids (At 105^{o}C)
ARL No. 016	Total Suspended Solids
ARL No. 045	Turbidity
ARL No. 011	Biochemical Oxygen Demand
ARL No. 020	Chemical Oxygen Demand
ARL No. 121	Ferrous Iron in Water
ARL No. 023	Sulphide in Water

Analytical Reference Laboratory (WA) Pty. Ltd.
46-48 Banksia Road, Welshpool, Western Australia 6106 Telephone: 08 6253 4444 Facsimile: 08 6253 4440
www.arlwa.com.au ABN: 91 050 159 898

BTEX in Water **Sample No:** **Sample Description:**	**LOR**	**UNITS**	**13-0327-1** **Trip-003** **15/01/2013**
Benzene	0.001	mg/L	<0.001
Toluene	0.001	mg/L	<0.001
Ethyl Benzene	0.001	mg/L	<0.001
Xylenes (Total)	0.003	mg/L	<0.003
a,a,a-Trifluorotoluene(SS)		%	100

PAH in Water **Sample No:** **Sample Description:**	**LOR**	**UNITS**	**13-0327-1** **Trip-003** **15/01/2013**
Naphthalene	0.1	µg/L	<0.1
2-Methylnaphthalene	0.1	µg/L	<0.1
Acenaphthylene	0.1	µg/L	<0.1
Acenaphthene	0.1	µg/L	<0.1
Fluorene	0.1	µg/L	<0.1
Phenanthrene	0.1	µg/L	<0.1
Anthracene	0.1	µg/L	<0.1
Fluoranthene	0.1	µg/L	<0.1
Pyrene	0.1	µg/L	<0.1
Benz(a)anthracene	0.1	µg/L	<0.1
Chrysene	0.1	µg/L	<0.1
Benzo(b)fluoranthene	0.1	µg/L	<0.1
Benzo(k)fluoranthene	0.1	µg/L	<0.1
Benzo(a)pyrene	0.1	µg/L	<0.1
Indeno(1,2,3-c,d)pyrene	0.1	µg/L	<0.1
Dibenz(a,h)anthracene	0.1	µg/L	<0.1
Benzo(ghi)perylene	0.1	µg/L	<0.1
2-Fluoro-1,1'-Biphenyl (SS)		%	66
p-Terphenyl-d14 (SS)		%	71

Analytical Reference Laboratory (WA) Pty. Ltd.
46-48 Banksia Road, Welshpool, Western Australia 6106 Telephone: 08 6253 4444 Facsimile: 08 6253 4440
www.arlwa.com.au ABN: 91 050 159 898

TPH in Water Sample No: Sample Description:	LOR	UNITS	13-0327-1 Trip-003 15/01/2013
C_{6-9}	0.02	mg/L	<0.02
C_{10-14}	0.02	mg/L	<0.02
C_{15-28}	0.04	mg/L	<0.04
C_{29-36}	0.04	mg/L	<0.04
$C_{>36}$	0.04	mg/L	<0.04

OCOP in Water Sample No: Sample Description:	LOR	UNITS	13-0327-1 Trip-003 15/01/2013
Aldrin	0.001	µg/L	<0.001
alpha-BHC (HCH)	0.001	µg/L	<0.001
beta-BHC (HCH)	0.001	µg/L	<0.001
delta-BHC (HCH)	0.001	µg/L	<0.001
Bifenthrin	0.05	µg/L	<0.05
Bromophos Ethyl	0.005	µg/L	<0.005
Chlordane	0.002	µg/L	<0.002
Chlorothalonil	0.01	µg/L	<0.01
Chlorpyrifos	0.005	µg/L	<0.005
Diazinon	0.01	µg/L	<0.01
Dieldrin	0.001	µg/L	0.041
Endosulphan I	0.001	µg/L	<0.001
Endosulphan II	0.001	µg/L	<0.001
Endosulphan Sulphate	0.001	µg/L	<0.001
Endrin	0.01	µg/L	<0.01
Ethion	0.01	µg/L	<0.01
Fenitrothion	0.01	µg/L	<0.01
Fipronil	0.02	µg/L	<0.02
Hexachlorobenzene (HCB)	0.001	µg/L	<0.001
Heptachlor Epoxide	0.001	µg/L	<0.001
Heptachlor	0.001	µg/L	<0.001
Lindane	0.001	µg/L	<0.001
Malathion	0.01	µg/L	<0.01
Methoxychlor	0.02	µg/L	<0.02
o,p-DDT	0.001	µg/L	<0.001
Oxychlordane	0.001	µg/L	<0.001
p,p-DDD	0.001	µg/L	<0.001
p,p-DDE	0.001	µg/L	<0.001
p,p-DDT	0.001	µg/L	<0.001
Parathion Ethyl	0.02	µg/L	<0.02
Parathion Methyl	0.02	µg/L	<0.02
Trifluralin	0.01	µg/L	<0.01
Vinclozolin	0.02	µg/L	<0.02
Dibutyl chlorendate (SS)		%	65
Tetrachloro-m-Xylene (SS)		%	68

Analytical Reference Laboratory (WA) Pty. Ltd.
46-48 Banksia Road, Welshpool, Western Australia 6106 Telephone: 08 6253 4444 Facsimile: 08 6253 4440
www.arlwa.com.au ABN: 91 050 159 898

Environmental and Analytical Laboratory

Misc. Organics in Water **Sample No:** **Sample Description:**	**LOR**	**UNITS**	**13-0327-1** **Trip-003** **15/01/2013**
Total Phenols	0.05	mg/L	<0.05

Metals in Water **Sample No:** **Sample Description:**	**LOR**	**UNITS**	**13-0327-1** **Trip-003** **15/01/2013**
Aluminium - Dissolved	0.01	mg/L	0.52
Aluminium - Total	0.01	mg/L	9.3
Arsenic - Dissolved	0.001	mg/L	<0.001
Arsenic - Total	0.001	mg/L	<0.001
Cadmium - Dissolved	0.0001	mg/L	0.0002
Cadmium - Total	0.0001	mg/L	0.0005
Chromium - Dissolved	0.001	mg/L	<0.001
Chromium - Total	0.001	mg/L	0.010
Iron - Dissolved	0.01	mg/L	0.39
Iron - Total	0.01	mg/L	1.8
Manganese - Dissolved	0.01	mg/L	<0.01
Manganese - Total	0.01	mg/L	<0.01
Nickel - Dissolved	0.001	mg/L	0.013
Nickel - Total	0.001	mg/L	0.014
Selenium - Dissolved	0.001	mg/L	<0.001
Selenium - Total	0.001	mg/L	<0.001
Zinc - Dissolved	0.005	mg/L	0.096
Zinc - Total	0.005	mg/L	0.10

Total Nitrogen in Water **Sample No:** **Sample Description:**	**LOR**	**UNITS**	**13-0327-1** **Trip-003** **15/01/2013**
Total Nitrogen	0.2	mg/L	4.7
TKN	0.2	mg/L	<0.2

Total Phosporus in Water **Sample No:** **Sample Description:**	**LOR**	**UNITS**	**13-0327-1** **Trip-003** **15/01/2013**
Total Phosphorus	0.01	mg/L	<0.01

Ions by Discrete Analyser **Sample No:** **Sample Description:**	**LOR**	**UNITS**	**13-0327-1** **Trip-003** **15/01/2013**
Chloride	5	mg/L	24
Filterable Reactive Phosphorus	0.01	mg/L	<0.01

Analytical Reference Laboratory (WA) Pty. Ltd.
46-48 Banksia Road, Welshpool, Western Australia 6106 Telephone: 08 6253 4444 Facsimile: 08 6253 4440
www.arlwa.com.au ABN: 91 050 159 898

Ions by Discrete Analyser Sample No: Sample Description:	LOR	UNITS	13-0327-1 Trip-003 15/01/2013
Ammonia-N	0.2	mg/L	<0.2
NOx-N	0.01	mg/L	4.7
Nitrate-N	0.01	mg/L	4.7
Nitrite-N	0.01	mg/L	<0.01

Physical Parameters Sample No: Sample Description:	LOR	UNITS	13-0327-1 Trip-003 15/01/2013
Acidity	5	mgCaCO3/L	19
Alkalinity	5	mgCaCO3/L	<5
pH	0.1	pH units	4.8
Conductivity	0.01	mS/cm	0.15
Total Dissolved Solids	5	mg/L	150
Total Suspended Solids	5	mg/L	590
Turbidity	0.1	NTU	500

Biochemical Oxygen Demand Sample No: Sample Description:	LOR	UNITS	13-0327-1 Trip-003 15/01/2013
Biochemical Oxygen Demand	5	mg/L	<5

Misc. Inorganics in Water Sample No: Sample Description:	LOR	UNITS	13-0327-1 Trip-003 15/01/2013
Chemical Oxygen Demand	10	mg/L	<10
Ferrous Iron	0.1	mg/L	<0.1
Sulphide	0.1	mg/L	<0.1

Result Definitions

LOR Limit of Reporting
[NT] Not Tested
[ND] Not Detected at indicated Limit of Reporting
[NR] Analysis Not Requested
(SS) Surrogate Standard Compound - Used for QC purposes. Acceptance Criteria is 60-120%.

Analytical Reference Laboratory (WA) Pty. Ltd.
46-48 Banksia Road, Welshpool, Western Australia 6106 Telephone: 08 6253 4444 Facsimile: 08 6253 4440
www.arlwa.com.au ABN: 91 050 159 898

Quality Control Report

Job Number: 13-0327
Date: 25/01/2013

Environmental and Analytical Laboratory

This Quality Control Report is issued in accordance with Section 18 of the ARL Quality Management Manual. All QC parameters are contained within the relevant ARL Method as indicated by the method reference, either on this report or the Laboratory Report.

Acceptance of Holding Times, Duplicate RPD, Spike, LCS and CRM Recoveries are determined at the time of analysis by the Signatory indicated on the Laboratory Report.

DEFINITIONS

Duplicate Analysis
A sample, chosen randomly by the analyst at the time of sample preparation, analysed in duplicate.

RPD
Relative Percent Difference is the absolute difference between the sample and a duplicate analysis compared to the average of the two analytical results. Acceptance Limits can be exceeded by matrix interference or when the result is less than 5 times the LOR.

Matrix Spike
An additional portion of sample to which known amounts of the target analytes are added before sample preparation. Acceptance Limits can be exceeded by matrix interference or when the target analytes are present in the sample.

Certified Reference Material (CRM)
A commercially available certified solution/mixture of the target analyte of known concentration.

Laboratory Control Sample (LCS)
An in-house certified solution/mixture of the target analyte of known concentration.

Analytical Reference Laboratory (WA) PTY. Ltd
46-48 Banksia Road, Welshpool, Western Australia 6106 Telephone: 08 6253 4444 Facsmile 08 6253 4440
www.arlwa.com.au ABN: 91 050 159 898

Quality Control Report

Job Number: 13-0327

Date: 25/01/2013

Environmental and Analytical Laboratory

BTEX in Water

ARL007

Holding Time Criteria	Date	
Extracted	22/01/2013	
Analysed	23/01/2013	
Duplicate Analysis (13-0327-1)	**RPD (%)**	**Limits (%)**
Benzene	0	25
Toluene	0	25
Ethyl Benzene	0	25
Xylenes (Total)	0	25
Duplicate Analysis (13-0336-1)	**RPD (%)**	**Limits (%)**
Benzene	0	25
Toluene	0	25
Ethyl Benzene	0	25
Xylenes (Total)	0	25
Matrix Spike (13-0477-1)	**Recovery (%)**	**Limits (%)**
Benzene	104	60 - 120
Toluene	103	60 - 120
Ethyl Benzene	114	60 - 120
Xylenes (Total)	113	60 - 120

PAH in Water

ARL005

Holding Time Criteria	Date	
Extracted	18/01/2013	
Analysed	21/01/2013	
Matrix Spike (13-0402-4)	**Recovery (%)**	**Limits (%)**
Naphthalene	85	60 - 120
Acenaphthene	119	60 - 120
Phenanthrene	118	60 - 120
Pyrene	120	60 - 120
Chrysene	120	60 - 120
Benzo(a)pyrene	94	60 - 120

TPH in Water

ARL009

Holding Time Criteria	Date	
Extracted	17/01/2013	
Analysed	18/01/2013	
Matrix Spike (13-0327-1)	**Recovery (%)**	**Limits (%)**
C_{15-28}	106	60 - 120

Total Petroleum Hydrocarbons - Matrix Spike

A known quantity of commercially available Diesel Fuel is spiked into the sample(s) indicated. Due to the nature of petroleum hydrocarbons, the matrix spike recovery is reported in the TPH C15-28 Range.

Analytical Reference Laboratory (WA) PTY. Ltd
46-48 Banksia Road, Welshpool, Western Australia 6106 Telephone: 08 6253 4444 Facsimile 08 6253 4440
www.arlwa.com.au ABN: 91 050 159 898

Quality Control Report

Job Number: 13-0327

Date: 25/01/2013

Environmental and Analytical Laboratory

OCOP in Water

ARL002

Holding Time Criteria	Date	
Extracted	17/01/2013	
Analysed	18/01/2013	
Matrix Spike (13-0327-1)	**Recovery (%)**	**Limits (%)**
Aldrin	120	60 - 120
Dieldrin	70	60 - 120
Endrin	69	60 - 120
Heptachlor	120	60 - 120
Lindane	114	60 - 120
p,p-DDT	66	60 - 120

Misc. Organics in Water

ARL044

Holding Time Criteria	Date	
Extracted	22/01/2013	
Analysed	22/01/2013	
Duplicate Analysis (13-0477-1)	**RPD (%)**	**Limits (%)**
Total Phenols	0	25
Matrix Spike (13-0477-1)	**Recovery (%)**	**Limits (%)**
Total Phenols	95	60 - 120
Certified Reference Material	**Recovery (%)**	**Limits (%)**
Total Phenols	105	73 - 127

Analytical Reference Laboratory (WA) PTY. Ltd
46-48 Banksia Road, Welshpool, Western Australia 6106 Telephone: 08 6253 4444 Facsmile 08 6253 4440
www.arlwa.com.au ABN: 91 050 159 898

Quality Control Report

Job Number: 13-0327

Date: 25/01/2013

Environmental and Analytical Laboratory

Metals in Water

Holding Time Criteria	Date	
Analysed	18/01/2013	
Duplicate Analysis (13-0327-1)	**RPD (%)**	**Limits (%)**
Aluminium - Dissolved	2	25
Arsenic - Dissolved	0	25
Cadmium - Dissolved	0	25
Chromium - Dissolved	0	25
Iron - Dissolved	0	25
Manganese - Dissolved	0	25
Nickel - Dissolved	0	25
Zinc - Dissolved	0	25
Matrix Spike (13-0327-1)	**Recovery (%)**	**Limits (%)**
Aluminium - Dissolved	95	60 - 120
Arsenic - Dissolved	90	60 - 120
Arsenic - Total	90	60 - 120
Cadmium - Dissolved	100	60 - 120
Cadmium - Total	100	60 - 120
Chromium - Dissolved	96	60 - 120
Chromium - Total	96	60 - 120
Iron - Dissolved	84	60 - 120
Iron - Total	84	60 - 120
Manganese - Dissolved	81	60 - 120
Manganese - Total	81	60 - 120
Nickel - Dissolved	93	60 - 120
Nickel - Total	93	60 - 120
Selenium - Dissolved	85	60 - 120
Selenium - Total	85	60 - 120
Certified Reference Material	**Recovery (%)**	**Limits (%)**
Aluminium - Dissolved	103	80 - 120
Aluminium - Total	95	80 - 120
Arsenic - Dissolved	92	80 - 120
Arsenic - Total	92	80 - 120
Cadmium - Dissolved	103	80 - 120
Cadmium - Total	103	80 - 120
Chromium - Dissolved	86	80 - 120
Chromium - Total	86	80 - 120
Iron - Dissolved	95	80 - 120
Iron - Total	95	80 - 120
Manganese - Dissolved	105	80 - 120
Manganese - Total	105	80 - 120
Nickel - Dissolved	92	80 - 120

Analytical Reference Laboratory (WA) PTY. Ltd
46-48 Banksia Road, Welshpool, Western Australia 6106 Telephone: 08 6253 4444 Facsimile 08 6253 4440
www.arlwa.com.au ABN: 91 050 159 898

Certified Reference Material	Recovery (%)	Limits (%)
Nickel - Total	92	80 - 120
Selenium - Dissolved	94	80 - 120
Selenium - Total	94	80 - 120
Zinc - Dissolved	100	80 - 120
Zinc - Total	100	80 - 120

Total Nitrogen in Water

Holding Time Criteria	Date	
Extracted	21/01/13	
Analysed	21/01/13	
Matrix Spike (13-0327-1)	**Recovery (%)**	**Limits (%)**
Total Nitrogen	92	60 - 120
TKN	92	60 - 120
Certified Reference Material	**Recovery (%)**	**Limits (%)**
TKN	94	80 - 120

Total Phosporus in Water

Holding Time Criteria	Date	
Extracted	23/01/13	
Analysed	23/01/13	
Matrix Spike (13-0327-1)	**Recovery (%)**	**Limits (%)**
Total Phosphorus	101	60 - 120
Certified Reference Material	**Recovery (%)**	**Limits (%)**
Total Phosphorus	95	80 - 120

Ions by Discrete Analyser

Holding Time Criteria	Date	
Analysed	17/01/2013	
Matrix Spike (13-0318-1)	**Recovery (%)**	**Limits (%)**
Chloride	120	60 - 120
Nitrate-N	81	60 - 120
Certified Reference Material	**Recovery (%)**	**Limits (%)**
Nitrite-N	104	80 - 120
Filterable Reactive Phosphorus	97	80 - 120
Ammonia-N	118	80 - 120
NOx-N	93	80 - 120
Nitrate-N	93	80 - 120
Chloride	111	80 - 120

Analytical Reference Laboratory (WA) PTY. Ltd

46-48 Banksia Road, Welshpool, Western Australia 6106 Telephone: 08 6253 4444 Facsmile 08 6253 4440

www.arlwa.com.au ABN: 91 050 159 898

Quality Control Report

Job Number: 13-0327

Date: 25/01/2013

Environmental and Analytical Laboratory

Physical Parameters

Holding Time Criteria	Date	
Analysed	16/01/2013	
Duplicate Analysis (13-0315-1)	**RPD (%)**	**Limits (%)**
Total Dissolved Solids	0	25
Certified Reference Material	**Recovery (%)**	**Limits (%)**
Acidity	96	80 - 120
Total Dissolved Solids	117	80 - 120
Total Suspended Solids	97	80 - 120
Alkalinity	86	80 - 120
Conductivity	96	80 - 120
pH	99	80 - 120
Turbidity	80	80 - 120

Biochemical Oxygen Demand

Holding Time Criteria	Date	
Analysed	21/01/2013	
Certified Reference Material	**Recovery (%)**	**Limits (%)**
Biochemical Oxygen Demand	85	80 - 120

Miscellaneous Inorganic in Water

Holding Time Criteria	Date	
Analysed	17/01/2013	
Laboratory Control Sample	**Recovery (%)**	**Limits (%)**
Ferrous Iron	99	80 - 120
Certified Reference Material	**Recovery (%)**	**Limits (%)**
Chemical Oxygen Demand	97	80 - 120

Analytical Reference Laboratory (WA) PTY. Ltd
46-48 Banksia Road, Welshpool, Western Australia 6106 Telephone: 08 6253 4444 Facsmile 08 6253 4440
www.arlwa.com.au ABN: 91 050 159 898

13-0327 1080

Site: WASTE ROCK	
Job #: E2012-031-004	
Sampler: DALE A / RHIAN B	
CoC #: E2012-031-006	
Quote #:	
Laboratory: ARL WA	
Date and time delivered: 15/1/13 16:00	
Received by: Chris Harvey	

ENVIRONMENTAL SERVICES
Mobile Dewatering Environmental Services
Unit 1, 22 Elmsfield Road
Midvale WA 6056
P: 08 9250 6960
F: 08 9250 8269
E: info@environmentalservices.com.au

Comments:

PLEASE CONTACT DALE WITH ANY ISSUES (0412453646)

Analysis Detection Limits

Sample ID	Lab ID	Type	Sampling Date	Sampling Time	pH, EC, TDS, TSS TAA	TALK	SPECIATED CHROMIUM	BTEX, PHENOLS TPH	PAH, OC/OP	BOD, COD	FERROUS IRON	TURBIDITY	NH_3, TP, SRP TKN, TN, NO_3, NO_2	Fe, Mn, Ni, Se, Zn TOTAL: Al, As, Cd, Cr	Fe, Mn, Ni, Se, Zn DISS Al, As, Cd, Cr
1 TRIP-003		WATER	15-1-13	1330	1	1	1	1	1	1	1	1	1	1	1

DATE: 15/1/13
CHECKED BY: Chris
No OF SAMPLES: 1
No OF GLASS: 9
No OF PLASTIC: 4

Condition of Sample: Cool / Ambient / Warm Relinquished by: DA