Environmental Resources Management Australia

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17 May, 2013

Rajan Sinha
Yara Pilbara Nitrates Pty Ltd
5th Floor, 182 St Georges Terrace, Perth
Western Australia 6000
AUSTRALIA

Our Reference: *0086269*

Attention: **Rajan Sinha**

Dear Rajan,

RE: GROUNDWATER MONITORING MARCH AND APRIL 2013

1. INTRODUCTION

Environmental Resources Management Australia Pty Ltd (ERM) was engaged by Yara Pilbara Nitrates Pty Ltd (YPNPL) to conduct a Groundwater Monitoring Event (GME) at the proposed site for the YPNPL Technical Ammonium Nitrates Plant Facility (TANPF) in March 2013. Following detections of analytes above trigger levels, an additional GME was undertaken in April 2013. The site location and layout are illustrated in *Figures 1 and 2*, provided in *Annex A*.

2. PROJECT APPRECIATION

Lot 3017 within the Burrup Industrial Estate (BIE) occupies an area of approximately 49 ha with Village Road to the north and Hearson Cove Road to the south. The existing ammonia fertiliser plant is situated adjacent to the western boundary of Lot 3017, with vacant land present between the site and Hearson Cove to the east.

The site (including temporary laydown areas) occupies approximately 35 ha of land in the north-western section of Lot 3017. Bulk earthworks disturbance associated with construction of permanent works for the TANPF will be constrained to approximately 20.5 ha of land located within the western quadrant of the site (see *Figure 1).*

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The TANPF will comprise three major processing units, including: a nitric acid plant, ammonium nitrate solutions plant and the technical ammonium nitrate (TAN) plant. The proposed site preparation works for the TANPF are anticipated to include the following activities:

- Removal of vegetation within the designated area;
- Preparing the TANPF footprint and lay-down/stockpile areas, which will include cut and fill activities;
- Installation of site drainage;
- Establishment of perimeter fencing;
- Road and access tracks for construction; and
- Potential dewatering and trenching (pending more detailed design requirements).

3. OBJECTIVES

Prior to the commencement of construction at the site, the groundwater below the site was characterised and baseline conditions were established. The baseline conditions were used to establish trigger levels (set at 10% above the maximum baseline concentration) for ongoing GME's during the construction of the site. The primary objective of the March and April GME was to determine if the construction activities at the site has impacted the groundwater below the site. The April GME was undertaken to further assess groundwater conditions following low level exceedences of trigger levels recorded during the March GME.

4. SCOPE OF WORKS

In order to achieve the project objectives, the following scope of work was completed by ERM for each of the March and April GME's:

1) Preparation of site works risk/hazard analysis documents (Work Activity Risk Assessment (WARN)) and the preparation of a health and safety plan to oversee safe work practices at the site.

2) A single GME in March 2013 with an additional follow-on GME in April 2013, comprising the sampling of five established on-site wells (*Figure 2*). Each GME included:

    a. Gauging of groundwater depths;

    b. Measurement of groundwater field parameters during well purging to determine a stabilisation of field parameters prior to groundwater sampling; and

    c. Collection and analysis of groundwater samples to assess groundwater conditions.

3) Laboratory analysis of groundwater samples, including a Modified Acid Sulphate Soils Suite and an Extended Groundwater Quality suite. Five primary samples (one from each well), one duplicate sample and relevant quality assurance samples were taken. Analysis was undertaken by a NATA accredited laboratory to ensure quality assurance.

4) Screening of laboratory results against trigger levels.

5) The preparation of this short factual report to detail the scope of works undertaken and the results of the investigation.

5. METHODOLGY

5.1 HEALTH AND SAFETY

All works were completed in accordance with ERM health and safety (H&S) procedures. This included the preparation of site works risk/hazard analysis documents and the preparation of an H&S plan to ensure safe work practices at the site.

5.2 GAUGING OF GROUNDWATER DEPTHS

Groundwater monitoring wells were gauged during both the March 2013 and April 2013 GME's with an interface probe in accordance with ERM's standard operation procedures with the exception of MW1 during the April 2013 GME. The ground around the well has been lowered and the monitoring well casing sticking up above the ground has bent such that the interface probe would not fit down the well. Groundwater levels where recorded, are presented in *Annex B*.

5.3 GROUNDWATER SAMPLING

March 2013 GME

The five existing groundwater monitoring wells (MW1-MW5) were purged and sampled in accordance with ERM's standard groundwater sampling protocols using disposable plastic bailers. A minimum of three well volumes were purged from each groundwater monitoring well prior to sampling. Field parameters were measured after each well volume and the sample collected following the stabilisation of field parameters over three consecutive readings. Construction work around the well heads has caused damage to the well casing on monitoring wells MW4 which prevented purging and sampling from the monitoring well.

April 2013 GME

The three groundwater monitoring wells (MW2, MW3 and MW5) were purged and sampled in accordance with ERM's standard groundwater sampling protocols using disposable plastic bailers. A minimum of three well volumes were purged from each groundwater monitoring well prior to sampling. Field parameters were measured after each well volume and the sample collected following the stabilisation of field parameters over three consecutive readings. Construction work around the well heads has caused damage to the well casing on monitoring wells MW1 and MW4 which prevented the use of bailers for purging and sampling. For these two wells a low flow peristaltic pump was used. Field parameters were measured at two minute intervals with the peristaltic pump operating at a flow of 0.5L per minuet in accordance with ERM's standard

low flow groundwater sampling protocols. The groundwater sample was collected following the stabilisation of field parameters over three consecutive readings. It is considered unlikely that the change of sampling technique will compromise the quality of the field data and groundwater samples for laboratory analysis.

Field parameters for both the March and April GME were measured using a calibrated water quality meter and included temperature, pH, oxygen reduction potential, electrical conductivity and dissolved oxygen. The stabilised water quality parameters are detailed in *Annex B.* All groundwater samples were collected, stored and transported to the laboratory under strict chain of custody procedures.

5.4 QUALITY ASSURANCE AND QUALITY CONTROL

For each of the GME's QA/QC samples were collected and analysed in accordance with *Australian Standard AS/NZS 5667.11:1998: Water Quality – Sampling – Guidance on Sampling of Groundwater.* This included the collection of field duplicates at a frequency of no less than 1 in 10 samples as well as a rinsate sample from the interface meter to demonstrate the sufficiency of the decontamination procedure.

March 2013 GME

A single duplicate sample was collected from MW3 and submitted for laboratory analysis. Of the Relative Percentage Difference (RPD) values able to be calculated, all but three were within the acceptable limit. The analytes outside of the acceptable RPDs were aluminium, iron and phosphorous. Given the high level of reproducibility for other analytes, this is not considered to represent an unacceptable level of uncertainty with respect to data quality.

A rinsate sample was collected from the equipment and submitted for laboratory analysis following the GME. The results showed all analytes below the laboratory limit of detection with the exception of zinc where a low concentration, slightly above the laboratory limit of detection was recorded. The presence of zinc in rinsate samples from previous GME's would suggest that the rinsate provided by the Laboratory contains trace concentrations of zinc.

The trip blank sample stored in the esky during transit did not record any analytes above the limit of detection therefore suggesting that there has been no cross contamination from samples during transit and storage.

April 2013 GME

A single duplicate sample was collected from MW5 and submitted for laboratory analysis. Of the Relative Percentage Difference (RPD) values able to be calculated all were within the acceptable limit.

A rinsate sample was collected from the equipment and submitted for laboratory analysis following the GME. The results showed all analytes below the laboratory limit of detection with the exception of zinc where a low concentration, slightly above the laboratory limit of detection was recorded. The presence of zinc in rinsate samples from the March 2013 GME and previous GME's would suggest that the rinsate provided by the Laboratory contains trace concentrations of zinc.

The trip blank sample stored in the esky during transit did not record any analytes above the limit of detection therefore suggesting that there has been no cross contamination from samples during transit and storage.

5.5 LABORATORY ANALYSIS

Groundwater samples from both the March 2013 and April 2013 GME's were submitted to SGS Australia Pty Ltd (SGS), a NATA accredited laboratory. Samples were analysed for a suite of compounds including:

- Cations and anions including calcium, magnesium, sodium, potassium, phosphate, ammonia, carbonate, bicarbonate, chloride, sulphate, nitrate, nitrite and silica;
- Total dissolved solids (TDS), and total alkalinity; and
- Dissolved metals including; aluminium, arsenic, cadmium, chromium, iron, lead, manganese, mercury, selenium and zinc.

6. RESULTS AND DISCUSSION

March 2013 GME

Groundwater temperature was ranged between 30.7 and 34.3˚C; which higher than previous monitoring in October 2012 but can most likely be attributed to seasonal changes in weather conditions. The pH results ranged between 6.84 and 7.32 indicating neutral conditions, which is consistent with historical results. Oxygen reduction potentials were consistent for the duration of the sampling period (approx. 33.2 – 135.9 mV). Electrical conductivity remained consistent across the monitoring wells with the exception of MW5 where an elevated electrical conductivity reading compared to previous GME's was displayed. Dissolved oxygen content was recorded as 0.99 – 1.82 mg/L during the GME which is consistent with previous GMEs.

The field and laboratory results of the GME are presented in *Annex B* and laboratory analytical reports and chain of custody documentation are presented in *Annex C*. A review of the displayed a number of low exceedences of the trigger levels (set at 10% above the maximum baseline concentration). The Following exceedences of trigger levels were observed.

- Monitoring well MW1 recorded a Total suspended soils (TSS) concentration of 2,900 mg/L;
- Monitoring well MW3 recorded a phosphorous concentration of 1.6 mg/L; and
- Monitoring well MW5 recorded an ammonia concentration of 1.2 mg/L and an ammonia (as N) concentration of 1,000 ug/L.

April 2013 GME

Groundwater temperature was ranged between 31.9 and 34.4˚C; which slightly higher than the March 2013 GME. The pH results ranged between 6.71 and 7.19 indicating neutral conditions, which is consistent with March 2013 GME and historical results. Oxygen reduction readings remain comparable to previous GME's with reading between 2.69 and 210.7 mV. Electrical conductivity appears to have increased in monitoring wells MW3, MW4 and MW5 of the in comparison to previous GME's undertaken. MW5 remains hypersaline however salinity of other wells closest to the drainage system are also increasing likely as a result of precipitation of salts after high rainfall/flood events and leaching of these into the groundwater. Dissolved oxygen content was recorded as 0.13 – 3.44 mg/L during the GME which is consistent with previous GMEs.

The field and laboratory results of the GME are presented in *Annex B* and laboratory analytical reports and chain of custody documentation are presented in *Annex C*. A review of the displayed a number of low exceedences of the trigger levels (set at 10% above the maximum baseline concentration). The following exceedences of trigger levels were observed:

- Monitoring well MW1 recorded a nitrate concentration of 9.7 mg/l;
- Monitoring well MW3 recorded an ammonia concentration of 0.94 mg/L, an aluminium concentration of 0.072 mg/L, an iron (filtered) concentration of 0.52 mg/L and a manganese (filtered) concentration of 1.7 mg/L;
- Monitoring well MW4 recorded an aluminium concentration of 0.031 mg/L; and
- Monitoring well MW5 recorded a reactive phosphorous (as P) concentration of 0.014 and an aluminium concentration of 0.3 mg/L.

7. CONCLUSION

The results of the March 2013 and April 2013 Groundwater Monitoring Events (GMEs) display a number of exceedences in the set trigger levels. However none of the analytes which exceeded a trigger level during the March 2013 GME exceeded the trigger level during the April 2013 GME at the same well location. Sampling methodology has remained generally consistent and while two wells were sampled with low flow pumps as opposed to bailers, this would be unlikely to affect the groundwater chemistry.

It is noted that the salinity of the groundwater varies from brackish to hypersaline the closer the wells are to the natural surface water drainage systems. Groundwater in the vicinity of MW5 has likely been derived from multiple directions, while those monitoring wells located further away from the main drainage intercept groundwater from more discrete flow directions.

Until the wells are surveyed in, it is not possible to assess actual groundwater flow direction. However what is likely is that depending on the groundwater flow paths intercepted by the monitoring wells, groundwater chemistry is likely to differ between wells. In addition, rainfall events and cyclonic activity causing localised flooding will result in seasonal changes to groundwater recharge and resultant groundwater chemistry.

The variability in the groundwater chemistry observed both between monitoring wells and between monitoring events with no clear trends suggests the results depict natural variability in groundwater chemistry as opposed to increasing concentrations of analytes associated with site activities. None of the analytes observed exceeding the trigger levels are attributed to current on site activities.

Site levelling activities may have exposed areas of ground and soils not previously exposed to rainfall and leaching, and it is possible that leaching of these soils has released localised increased metals into the groundwater.

The variability in chemistry between monitoring wells and between monitoring events should continue to be assessed biannually in order to build a more comprehensive data set of range in concentration over time and determine whether there are clear trends emerging and if so likely causes. Based on this data, the current trigger level concentrations may need to be revaluated to account for natural variability.

Should you require any clarification please contact the undersigned.

Yours Sincerely,
for Environmental Resources Management Australia Pty Ltd

Sean Scaife
Project Manager

Paul Myers-Allen
Partner

Annex A

SITE LOCATION & WELL LOCATIONS

Legend

- Area of Disturbance 'The Site'
- Lot 3017
- Site D Boundary

N

0 490 980 1,470m

Client:	Yarra Pilbara Nitrates Pty Ltd	
Drawing No:	0086269p_GME_Mar_Apr_2013_G001_R0.mxd	
Date:	09/05/2013	Drawing Size: A4
Drawn By:	DN	Reviewed By: JG

Figure 1 - Site Location

GME Report March & April 2013

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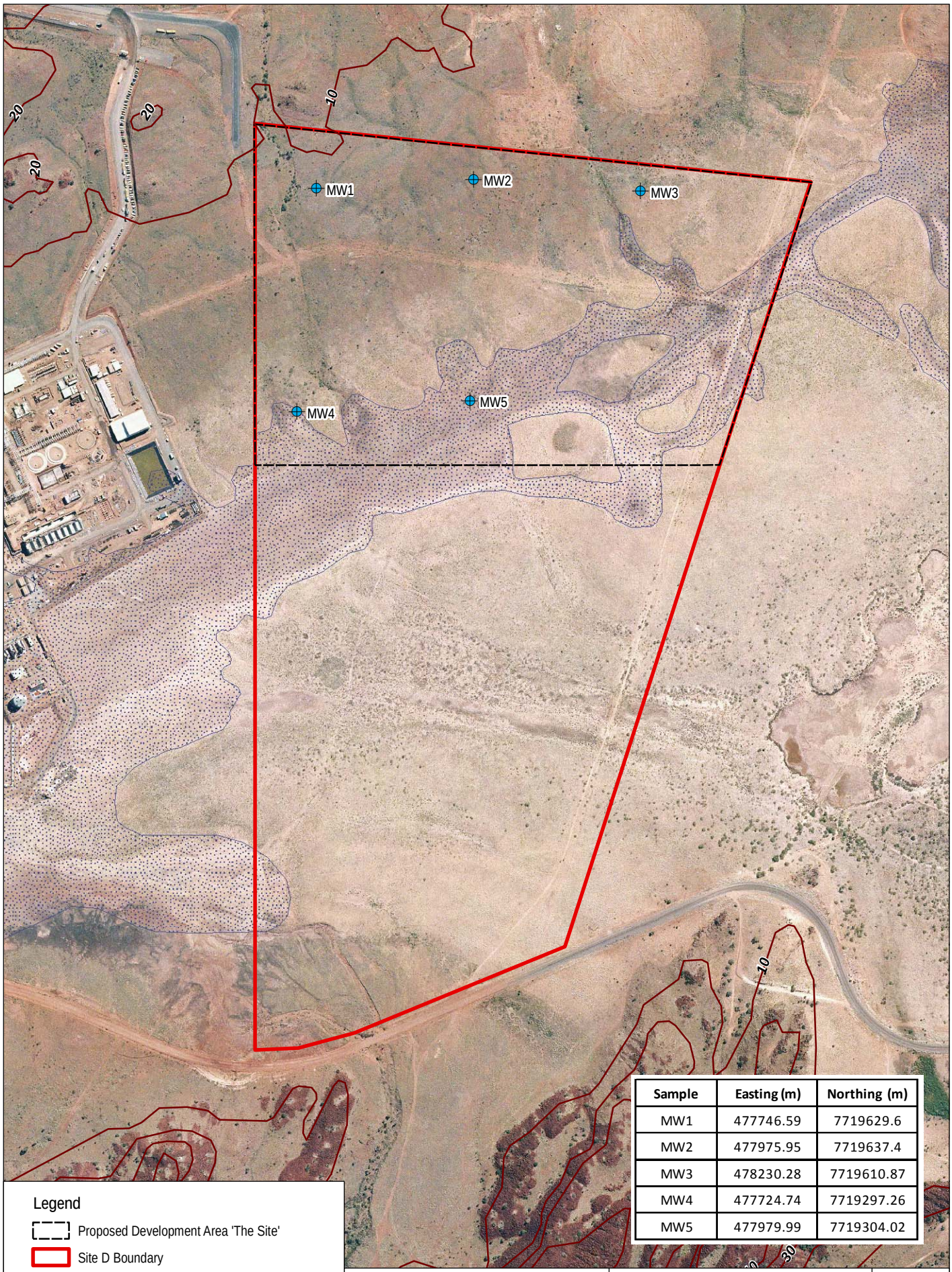

Sample	Easting (m)	Northing (m)
MW1	477746.59	7719629.6
MW2	477975.95	7719637.4
MW3	478230.28	7719610.87
MW4	477724.74	7719297.26
MW5	477979.99	7719304.02

Legend

- Proposed Development Area 'The Site'
- Site D Boundary
- Monitoring Well
- Contour Elevation (10m interval)
- Saline Coastal Flat

0 100 200 300m

N

Client:	Yarra Pilbara Nitrates Pty Ltd	
Drawing No:	0086269p_GME_Mar_Apr_2013_G002_R0.mxd	
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Figure 2 - Well Locations

GME Report March & April 2013

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ERM

Annex B

RESULTS TABLES

March 2013 GME

Bore ID	Easting	Northing	Date	Bore Depth (m ToC)	Depth to Water (m ToC)
MW1	477750.267	7719618.897	6-Mar-13	8.74	4.90
MW2	477982.134	7719632.321	6-Mar-13	8.20	4.43
MW3	478228.561	7719614.98	6-Mar-13	7.18	2.80
MW4	477721.886	7719289.889	6-Mar-13	7.21	3.95
MW5	477976.901	7719306.205	6-Mar-13	5.07	0.91

April 2013 GME

Bore ID	Easting	Northing	Date	Bore Depth (m ToC)	Depth to Water (m ToC)
MW1	477750.267	7719618.897	17-Apr-13	Probe would not fit down well	
MW2	477982.134	7719632.321	17-Apr-13	8.21	4.60
MW3	478228.561	7719614.98	17-Apr-13	8.19	3.01
MW4	477721.886	7719289.889	17-Apr-13	7.35	4.07
MW5	477976.901	7719306.205	17-Apr-13	5.97	2.02

March 2013 GME

Well ID	Date	Time	Volume purged (L)	pH	Temperature (ºC)	Electrical Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Field Redox Potential (mV)	Estimated TDS (mg/L)	Comments
MW1	6/03/2013	16:45	21.5	7.26	30.7	1820	1.82	70.5	1183	Slightly cloudy, no odour
MW2	6/03/2013	14:30	21.0	7.28	32.0	1650	1.65	37.9	1073	Turbid, slightly brown, no odour
MW3	6/03/2013	14:32	24.0	7.32	31.1	1490	1.49	33.2	969	Turbid, pale brown, no odour
MW4	6/03/2013									Unable to monitor due to damage to well casing
MW5	6/03/2013	16:11	24.0	6.84	34.3	141200	0.99	135.9	91780	Turbid, cream to pale brown, no odour

April 2013 GME

Well ID	Date	Time	Volume purged (L)	pH	Temperature (ºC)	Electrical Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Field Redox Potential (mV)	Estimated TDS (mg/L)	Comments
MW1	17/04/2013	12:14	4.0	6.71	32.4	1563	0.58	2.69	1016	
MW2	17/04/2013	11:48	33.0	6.9	32.2	4690	3.44	101	3049	
MW3	17/04/2013	11:18	33.0	7.19	31.90	17950	1.78	27.5	11668	
MW4	17/04/2013	12:50	2.5	7.17	33.9	67400	0.13	15.72	43810	Turbid, red brown
MW5	17/04/2013	13:21	33.0	6.77	34.4	147300	2.24	210.7	95745	

Inorganics

Field_ID	LocCode	Sampled_Date-Time	Alkalinity (Bicarbonate)	Alkalinity (total) as CaCO3	Ammonia	Ammonia as N	Chloride	Fluoride	Hydrogen sulfide	Ionic Balance	Kjeldahl Nitrogen Total	Nitrate (as N)	Nitrate (as NO3-)	Nitrite (as N)	Nitrite (as NO2-)	Nitrogen (Total Oxidised)	Nitrogen (Total)	Reactive Phosphorus as P	Silica	Silica (Filtered)	Sodium (Filtered)	Sulphate	Sulphide	TDS	Hardness as CaCO3 (Filtered)	TSS
			mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL			5	5	0.005	5	1	0.1	0.5	-100	0.05	0.005	0.05	0.005	0.05	0.005	50	0.002	100	50	0.5	1	0.5	10	5	5
ADW 2004								1.5					50		3							500				
ANZECC 2000 95%					0.9				0.001				0.7													
ANZECC 2000 Marine 95%					0.91																					
MW1	MW1	30/04/2011	420	350	-	38	780	-	<0.5	-3	-	1.7	-	<0.005	-	1.7	2500	<0.002	-	30,000	350	170	-	2000	760	-
MW1	MW1	20/09/2011	390	320	-	18	710	0.4	-	-6	0.28	-	-	-	-	3.1	3400	0.008	-	28,000	300	150	<0.5	-	-	180
MW1	MW1	27/02/2012	370	300	<0.005	<5	670	0.5	-	-	0.17	2	8.7	<0.005	<0.05	2	2100	<0.002	-	29,000	340	140	<0.5	-	-	220
MW1	MW1	11/10/2012	370	300	0.064	53	600	0.4	-	1	0.49	1.1	4.7	<0.005	<0.05	1.1	1500	0.003	32,000	-	290	100	<0.5	-	-	520
MW1	MW1	6/03/2013	370	300	0.018	15	570	0.5	<0.5		0.14	1.9	<0.05	0.025	0.08	1.9	2000	0.003		32,000	280	100	<0.5	-	-	2900
MW1	MW1	17/04/2013	350	290	<0.005	<5	560	0.4			0.15	2.2	9.7	0.022	0.07	2.2	2400	0.004	-	33,000	270	120	<0.5	-	-	16
MW2	MW2	30/04/2011	340	280	-	200	930	-	<0.5	1	-	3.3	-	<0.005	-	3.3	3900	0.004	-	26,000	570	170	-	2000	520	-
MW2	MW2	20/09/2011	350	290	-	<5	1200	0.6	-	-3	0.2	-	-	-	-	1.2	1400	0.004	-	24,000	610	210	<0.5	-	-	190
MW2	MW2	27/02/2012	370	300	0.036	30	1400	0.7	-	-	0.26	0.62	2.7	<0.005	<0.05	0.62	880	<0.002	-	24,000	1000	220	<0.5	-	-	84
MW2	MW2	11/10/2012	450	370	<0.005	<5	1300	0.5	-	-5	0.51	0.63	2.8	<0.005	<0.05	0.63	1100	<0.002	25,000	-	600	180	<0.5	-	-	440
MW2	MW2	6/03/2013	440	360	<0.005	<5	1000	0.6	<0.5		0.1	0.6	2.7	<0.005	<0.05	0.6	700	<0.002	-	27,000	580	170	<0.5	-	-	320
MW2	MW2	17/04/2013	410	340	<0.005	<5	1100	0.6			0.21	0.51	2.3	<0.005	<0.05	0.51	720	0.003	-	28,000	610	200	<0.5	-	-	290
MW3	MW3	30/04/2011	490	400	-	54	5400	-	<0.5	1	-	1.9	-	<0.005	-	1.9	2600	0.003	-	34,000	3400	800	-	9800	1500	-
MW3	MW3	20/09/2011	530	450	-	57	3700	1.4	-	2	0.18	-	-	-	-	0.033	220	0.006	-	32,000	2500	810	<0.5	-	-	280
MW3	MW3	27/02/2012	560	460	<0.005	<5	4000	1.5	-	-	0.29	0.32	1.4	<0.005	<0.05	0.32	610	<0.002	-	33,000	3200	940	<0.5	-	-	230
MW3	MW3	11/10/2012	660	540	0.015	12	4200	<0.1	-	3	0.22	0.12	0.51	<0.005	<0.05	0.12	330	0.003	33,000	-	2800	710	<0.5	-	-	270
MW3	MW3	6/03/2013	580	470	<0.005	<5	5900	1.4	<0.5		0.16	0.26	1.1	<0.005	<0.05	0.26	420	0.003	-	36,000	3500	670	<0.5	-	-	180
MW3	MW3	17/04/2013	680	560	0.94	770	28000	1			1.5	0.031	0.14	<0.005	<0.05	0.031	1500	0.006	-	30,000	8000	1400	<0.5	-	-	470
MW4	MW4	30/04/2011	630	510	-	740	3900	-	<0.5	0	-	0.82	-	<0.005	-	0.82	2100	0.008	-	19,000	2700	350	-	6700	520	-
MW4	MW4	21/09/2011	420	370	-	18	2500	0.7	-	1	0.31	-	-	-	-	0.24	540	0.009	-	16,000	1800	280	<0.5	-	-	670
MW4	MW4	28/02/2012	480	390	<0.005	<5	3200	0.6	-	-	0.59	0.17	0.74	<0.005	<0.05	0.17	760	0.007	-	19,000	2700	410	<0.5	-	-	1900
MW4	MW4	11/10/2012	510	420	<0.005	<5	3700	0.4	-	1	0.72	0.44	1.9	<0.005	<0.05	0.44	1200	0.007	19,000	-	2400	380	<0.5	-	-	2900
MW4	MW4	6/03/2013	NOT SAMPLED (UNABLE TO ACCESS WELL)																							
MW4	MW4	17/04/2013	470	390	<0.005	<5	4700	0.4			0.49	0.24	1	<0.005	<0.05	0.24	730	0.01	-	23000	2600	440	<0.5	-	-	210
MW5	MW5	30/04/2011	450	370	-	56	87,000	-	<0.5	-1	-	1.1	-	<0.005	-	1.1	5100	0.007	-	10,000	48,000	5200	-	130,000	19,000	-
MW5	MW5	21/09/2011	250	210	-	47	87,000	0.3	-	0	2.7	-	-	-	-	0.02	2700	0.01	-	9900	48,000	4100	<0.5	-	-	1100
MW5	MW5	28/02/2012	180	150	<0.005	<5	80,000	0.4	-	-	2.2	1.2	5.5	<0.005	<0.05	1.2	3400	0.006	-	9800	57,000	4400	<0.5	-	-	1400
MW5	MW5	11/10/2012	200	160	0.75	620	77,000	0.3	-	-4	0.72	1.1	4.7	<0.005	<0.05	1.1	1800	0.005	8000	-	39,000	3500	<0.5	-	-	2600
MW5	MW5	6/03/2013	210	170	1.2	1000	64,000	0.4	<0.5		2.1	1.3	6	<0.005	<0.05	1.3	3400	0.007	-	13,000	36,000	3800	<0.5	-	-	660
MW5	MW5	17/04/2013	210	170	<0.005	<5	58,000	0.4			1	1.6	6.9	<0.005	<0.05	1.6	2600	0.014	-	13,000	33,000	3300	<0.5	-	-	1600
DUP01	MW1	30/04/2011	380	310	-	47	800	-	<0.5	-1	-	1.4	-	<0.005	-	1.4	2000	<0.002	-	31,000	390	170	-	2000	730	-
DUP01	MW4	11/10/2012	510	420	<0.005	<5	3900	0.4	-	-2	0.67	0.44	1.9	<0.005	<0.05	0.44	1100	0.007	20,000	-	2300	390	<0.5	-	-	4000
DUP01	MW5	21/09/2011	270	220	-	42	87,000	0.3	-	-1	2.7	-	-	-	-	0.02	2700	0.009	-	9700	48,000	5000	<0.5	-	-	1000
DUP01	MW5	28/02/2012	200	170	<0.005	<5	81,000	0.4	-	-	3.3	1.2	5.5	<0.005	<0.05	1.2	4500	0.008	-	9800	52,000	4600	<0.5	-	-	2200
DUP01	MW03	6/03/2013	580	470	<0.005	<5	5800	1.4	<0.5		0.2	0.26	1.2	<0.005	<0.05	0.26	460	<0.002	-	36,000	3600	710	<0.5	-	-	180
DUP01	MW5	17/04/2013	210	170	<0.005	<5	56000	0.4			0.98	1.6	6.9	<0.005	<0.05	1.6	2500	0.012	-	13,000	33000	3400	<0.5	-	-	1400
RIN 1		30/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RIN01		21/09/2011	<5	<5	-	-	<1	-	-	-100	-	-	-	-	-	-	-	-	-	-	<0.5	<1	-	-	-	-
RIN01		28/02/2012	<5	<5	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	2	<1	-	-	-	-
RIN01		11/10/2012	<5	<5	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<1	-	-	-	-
RIN01		6/03/2013	<5	<5			<1														<0.5	<1				
RIN01		17/04/2013	<5	<5	-	-	<1	-			-	-	-	-	-	-	-	-	-	-	<0.5	<1	-			-
Trip Blank		30/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TRIP01		21/09/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TRIP01		28/02/2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TRIP02		21/09/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TRIPBLANK 1		11/10/2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TRIPBLANK 2		11/10/2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TRIPBLANK		6/03/2013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trip Blank		17/04/2013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Field_ID	LocCode	Sampled_Date-Time	Lead (Filtered)	Aluminium	Aluminium (Filtered)	Arsenic (Filtered)	Cadmium (Filtered)	Calcium (Filtered)	Chromium (hexavalent)	Chromium (III+VI) (Filtered)	Chromium (Trivalent)	Copper (Filtered)	Iron	Iron (Filtered)	Magnesium (Filtered)	Manganese (Filtered)	Mercury	Nickel (Filtered)	Phosphorus	Potassium (Filtered)	Selenium (Filtered)	Silicon (Filtered)	Zinc (Filtered)	Alkalinity (Carbonate)	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)
			Lead	**Metals**																				**Organic**	**TPH**				
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			0.001	0.005	0.001	0.001	0.0001	0.2	0.002	0.001	0.005	0.001	0.005	0.005	0.1	0.001	0.00005	0.001	0.01	0.1	0.002	20	0.001	1	40	50	200	200	
ADW 2004			0.01			0.007	0.002		0.05			2				0.5	0.001	0.02			0.01								
ANZECC 2000 95%			0.0034				0.0002		0.001			0.0014				1.9	0.0006	0.011			0.011		0.008						
ANZECC 2000 Marine 95%			0.0044				0.0055		0.0044		0.0274	0.0013					0.0004	0.07					0.015						
MW1	MW1	30/04/2011	<0.001	-	0.01	<0.001	<0.0001	200	<0.002	<0.001	<0.005	-	-	0.008	63	0.17	<0.00005	-	0.06	10	<0.002	14,000	0.016	<1	<40	<50	<200	<200	<450
MW1	MW1	20/09/2011	-	1.8	0.002	<0.001	<0.0001	170	-	<0.001	-	-	1.8	<0.005	54	0.046	-	<0.001	0.05	7.9	<0.002	13,000	0.027	<1	-	-	-	-	-
MW1	MW1	27/02/2012	-	3.6	0.002	<0.001	<0.0001	180	-	<0.001	-	-	4.2	<0.005	53	0.088	-	<0.001	0.08	7.7	<0.002	-	0.038	<1	-	-	-	-	-
MW1	MW1	11/10/2012	-	21	0.005	<0.001	<0.0001	170	-	<0.001	-	-	30	0.009	51	0.038	-	<0.001	10	8.6	<0.002	-	0.008	<1	-	-	-	-	-
MW1	MW1	6/03/2013	-	10	<0.005	<0.001	<0.0001	160	-	<0.001	-	-	14	<0.005	49	0.17	-	<0.001	<0.01	8.2	<0.002	15,000	0.01	<1	-	-	-	-	-
MW1	MW1	17/04/2013	<0.001	0.33	<0.005	<0.001	0.0004	160	-	<0.001	-	0.001	0.39	<0.005	49	0.087	-	<0.001	0.02	8.2	<0.002	16,000	0.01	<1	-	-	-	-	-
MW2	MW2	30/04/2011	<0.001	-	0.005	<0.001	<0.0001	99	<0.002	<0.001	<0.005	-	-	<0.005	66	<0.005 - 0.005	<0.00005	-	0.09	19	0.003	12,000	0.013	<1	<40	<50	<200	<200	<450
MW2	MW2	20/09/2011	-	4.2	0.002	<0.001	<0.0001	150	-	<0.001	-	-	6	<0.005	98	0.001	-	<0.001	0.06	20	<0.002	11,000	0.021	<1	-	-	-	-	-
MW2	MW2	27/02/2012	-	3.6	0.005	<0.001	<0.0001	240	-	<0.001	-	-	4.6	0.24	140	0.22	-	<0.001	0.03	24	<0.002	-	0.047	<1	-	-	-	-	-
MW2	MW2	11/10/2012	-	9.2	0.002	<0.001	<0.0001	160	-	<0.001	-	-	12	<0.005	94	0.01	-	<0.001	0.17	21	<0.002	-	0.021	<1	-	-	-	-	-
MW2	MW2	6/03/2013	-	10	0.006	<0.001	<0.0001	150	-	<0.001	-	-	15	<0.005	87	0.012	-	<0.001	<0.01	21	<0.002	13,000	0.017	<1	-	-	-	-	-
MW2	MW2	17/04/2013	<0.001	3.5	<0.005	<0.001	0.0003	160	-	<0.001	-	<0.001	5.2	<0.005	100	0.012	-	<0.001	0.1	23	<0.002	13,000	0.012	<1	-	-	-	-	-
MW3	MW3	30/04/2011	<0.005	-	0.013	<0.005	<0.0005	120	<0.002	<0.005	<0.005	-	-	<0.025	300	0.02 - 0.022	<0.00005	-	0.16	130	<0.01	16,000	0.02	<1	<40	<50	<200	<200	<450
MW3	MW3	20/09/2011	-	5.8	0.019	<0.005	<0.0005	85	-	<0.005	-	-	7.4	<0.025	210	0.014	-	<0.005	0.05	90	<0.01	15,000	0.047	8	-	-	-	-	-
MW3	MW3	27/02/2012	-	6.5	0.005	<0.005	<0.0005	95	-	<0.005	-	-	6.8	<0.025	210	0.026	-	<0.005	0.05	120	<0.01	-	0.032	<1	-	-	-	-	-
MW3	MW3	11/10/2012	-	5	<0.01	<0.01	<0.001	100	-	<0.01	-	-	5.8	<0.05	260	0.027	-	<0.01	0.06	120	<0.02	-	0.031	<1	-	-	-	-	-
MW3	MW3	6/03/2013	-	5.8	<0.025	<0.005	<0.0005	130	-	<0.005	-	-	6.3	<0.025	340	0.018	-	<0.005	1.6	130	<0.01	17,000	<0.025	<1	-	-	-	-	-
MW3	MW3	17/04/2013	<0.01	14	0.072	<0.01	<0.001	350	-	<0.01	-	<0.01	21	0.52	910	1.7	-	<0.01	0.16	340	<0.02	14,000	0.05	<1	-	-	-	-	-
MW4	MW4	30/04/2011	<0.005	-	<0.005	<0.005	<0.0005	39	<0.002	<0.005	<0.005	-	-	<0.025	100	0.013 - 0.014	<0.00005	-	0.79	110	<0.01	8700	0.01	<1	<40	<50	<200	<200	<450
MW4	MW4	21/09/2011	-	21	<0.005	<0.005	<0.0005	28	-	<0.005	-	-	31	<0.025	68	0.011	-	<0.005	0.14	69	<0.01	7500	0.029	12	-	-	-	-	-
MW4	MW4	28/02/2012	-	82	<0.005	<0.005	<0.0005	49	-	<0.005	-	-	130	<0.025	96	0.033	-	<0.005	0.48	110	<0.01	-	0.047	<1	-	-	-	-	-
MW4	MW4	11/10/2012	-	65	<0.01	<0.01	<0.001	69	-	<0.01	-	-	130	<0.05	150	0.041	-	<0.01	0.54	110	<0.02	-	0.012	<1	-	-	-	-	-
MW4	MW4	6/03/2013																											
MW4	MW4	17/04/2013	<0.005	4.4	0.031	<0.005	<0.0005	94	-	<0.005	-	<0.005	7.4	<.025	190	0.12	-	<0.005	0.05	120	<0.01	11000	0.025	<1	-	-	-	-	-
MW5	MW5	30/04/2011	<0.05	-	<0.05	<0.05	<0.005	1000	0.01	<0.05	<0.005	-	-	<0.25	4100	0.2 - 0.22	0.00011	-	0.11	1900	<0.1	4900	<0.05	<1	<40	81	<200	<200	281
MW5	MW5	21/09/2011	-	11	<0.1	<0.1	<0.01	1100	-	<0.1	-	-	12	<0.5	4300	<0.1	-	<0.1	0.04	1700	<0.2	4600	<0.1	<1	-	-	-	-	-
MW5	MW5	28/02/2012	-	18	<0.1	<0.1	<0.01	1100	-	<0.1	-	-	25	<0.5	4700	<0.1	-	<0.1	0.21	2100	<0.2	-	<0.1	<1	-	-	-	-	-
MW5	MW5	11/10/2012	-	31	<0.05	<0.05	<0.005	970	-	<0.05	-	-	37	<0.25	3700	<0.05	-	<0.05	<0.01	1700	<0.1	-	<0.05	<1	-	-	-	-	-
MW5	MW5	6/03/2013	-	16	<0.25	<0.05	<0.005	770	-	<0.05	-	-	18	<0.25	3000	<0.05	-	<0.05	0.04	1500	<0.1	5900	<0.25	<1	-	-	-	-	-
MW5	MW5	17/04/2013	<0.05	33	0.3	<0.05	<0.05	740	-	<0.05	-	<0.05	44	<0.25	2900	<0.05	-	<0.05	0.16	1400	<0.1	6000	<0.25	<1	-	-	-	-	-
DUP01	MW1	30/04/2011	<0.001	-	0.009	<0.001	<0.0001	190	<0.002	<0.001	<0.005	-	-	0.008	62	0.18 - 0.19	<0.00005	-	0.05	10	<0.002	14,000	0.02	<1	<40	<50	<200	<200	<450
DUP01	MW4	11/10/2012	-	74	<0.01	<0.01	<0.001	68	-	<0.01	-	-	150	<0.05	150	0.04	-	<0.01	0.55	100	<0.02	-	0.018	<1	-	-	-	-	-
DUP01	MW5	21/09/2011	-	11	<0.1	<0.1	<0.01	1100	-	<0.1	-	-	13	<0.5	4300	<0.1	-	<0.1	0.04	1700	<0.2	4500	<0.1	<1	-	-	-	-	-
DUP01	MW5	28/02/2012	-	18	<0.1	<0.1	<0.01	1000	-	<0.1	-	-	23	<0.5	4300	<0.1	-	<0.1	0.25	2000	<0.2	-	<0.1	<1	-	-	-	-	-
DUP01	MW03	6/03/2013	-																						-	-	-	-	-
DUP01	MW5	17/04/2013	<0.05	30	0.33	<0.05	<0.05	740	-	<0.05	-	<0.05	41	<0.25	2900	<0.05	-	<0.05	0.16	1400	<0.1	6000	<0.25	<1	-	-	-	-	-
RIN 1		30/04/2011	<0.001	-	0.002	<0.001	<0.0001	-	-	<0.001	-	-	-	<0.005	-	<0.001	<0.00005	-	-	-	<0.002	-	0.009	-	<40	-	-	-	-
RIN01		21/09/2011	<0.001	-	-	<0.001	<0.0001	<0.2	-	<0.001	-	<0.001	-	-	<0.1	-	-	<0.001	-	<0.1	-	-	0.005	<1	-	-	-	-	-
RIN01		28/02/2012	<0.001	-	-	<0.001	<0.0001	<0.2	-	<0.001	-	<0.001	-	-	0.1	-	<0.0001	<0.001	-	<0.1	-	-	0.007	<1	-	-	-	-	-
RIN01		11/10/2012	<0.001	-	-	<0.001	<0.0001	<0.2	-	<0.001	-	<0.001	-	-	<0.1	-	<0.00005	<0.001	-	<0.1	-	-	0.015	<1	-	-	-	-	-
RIN01		6/03/2013	<0.001			<0.001	<0.0001	<0.2		<0.001		<0.001			<0.1		<0.00005	<0.001		<0.1			0.013		-	-	-	-	-
RIN01		17/04/2013	<0.001	-	-	<0.001	<0.0001	<0.2	-	<0.001	-	<0.001	-	-	<0.1	-	<0.0001	<0.001	-	<0.1	-	-	0.008	<1	-	-	-	-	-
Trip Blank		30/04/2011	<0.001	-	<0.001	<0.001	<0.0001	-	-	<0.001	-	-	-	<0.005	-	<0.001	<0.00005	-	-	-	<0.002	-	0.012	-	<40	-	-	-	-
TRIP01		21/09/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<40	-	-	-	-
TRIP01		28/02/2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	-	-	-	-
TRIP02		21/09/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<40	-	-	-	-
TRIPBLANK 1		11/10/2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<200	<200	-
TRIPBLANK 2		11/10/2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<200	<200	-
TRIPBLANK		6/03/2013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<40				
Trip Blank		17/04/2013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<40				

Statistical Summary

		Alkalinity (Bicarbonate)	Alkalinity (total) as CaCO3	Ammonia	Ammonia as N	Chloride	Fluoride	Hydrogen sulfide	Ionic Balance	Kjeldahl Nitrogen Total	Nitrate (as N)	Nitrate (as NO3-)	Nitrite (as N)	Nitrite (as NO2-)	Nitrogen (Total Oxidised)	Nitrogen (Total)	Reactive Phosphorus as P	Silica	Silica (Filtered)	Sodium (Filtered)	Sulphate	Sulphide	TDS	Hardness as CaCO3 (Filtered)	TSS
Number of Results		15	15	5	15	15	10	5	10	10	10	5	10	5	15	15	15		15	15	15	10	5	5	10
Number of Detects		15	15	1	10	15	10	0	10	10	10	5	0	0	15	15	11		15	15	15	0	5	5	10
Minimum Concentration		180	150	<0.005	<5	670	0.3	<0.5	-6	0.17	0.17	0.74	<0.005	<0.05	0.02	220	<0.002		9800	300	140	<0.5	2000	520	84
Minimum Detect		180	150	0.036	18	670	0.3	ND	ND	0.17	0.17	0.74	ND	ND	0.02	220	0.003		9800	300	140	ND	2000	520	84
Maximum Concentration		630	510	0.036	740	87000	1.5	<0.5	2	2.7	3.3	8.7	<0.005	<0.05	3.3	5100	0.01		34000	57000	5200	<0.5	130000	19000	1900
Maximum Detect		630	510	0.036	740	87000	1.5	ND	2	2.7	3.3	8.7	ND	ND	3.3	5100	0.01		34000	57000	5200	ND	130000	19000	1900
Maximum Detect + 10%		693	561	0.0396	814	95700	1.65	NA	2.2	2.97	3.63	9.57	NA	NA	3.63	5610	0.011		37400	62700	5720	NA	143000	20900	2090
Average Concentration		415	343	0.0092	85	18826	0.71	0.25	-0.8	0.72	1.3	3.8	0.0025	0.025	1.2	2147	0.0051		22913	11498	1223	0.25	30100	4460	625
Median Concentration		420	350	0.0025	30	3200	0.6	0.25	0	0.285	1.15	2.7	0.0025	0.025	1.1	2100	0.006		24000	2500	350	0.25	6700	760	255
Standard Deviation		116	95	0.015	188	34141	0.41	0	2.5	0.93	0.94	3.3	0	0	1	1422	0.0032		8530	20567	1763	0	55944	8138	630
Number of Guideline Exceedances		0	0	0	0	0	1	5	0	0	0	5	0	0	0	0	0		0	0	6	0	0	0	0
Number of Guideline Exceedances(Detects Only)		0	0	0	0	0	1	0	0	0	0	5	0	0	0	0	0		0	0	6	0	0	0	0

		Lead (Filtered)	Aluminium	Aluminium (Filtered)	Arsenic (Filtered)	Cadmium (Filtered)	Calcium (Filtered)	Chromium (hexavalent)	Chromium (III+VI) (Filtered)	Chromium (Trivalent)	Copper (Filtered)	Iron	Iron (Filtered)	Magnesium (Filtered)	Manganese (Filtered)	Mercury	Nickel (Filtered)	Phosphorus	Potassium (Filtered)	Selenium (Filtered)	Silicon (Filtered)	Zinc (Filtered)	Alkalinity (Carbonate)	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)
Number of Results		5	10	15	15	15	15	5	15	5		10	15	15	15	5	10	15	15	15	10	15	15	5	5	5	5	5
Number of Detects		0	10	9	0	0	15	1	0	0		10	2	15	13	1	0	15	15	1	10	12	2	0	1	0	0	1
Minimum Concentration		<0.001	1.8	0.002	<0.001	<0.0001	28	<0.002	<0.001	<0.005		1.8	<0.005	53	0.001	<0.00005	<0.001	0.03	7.7	<0.002	4600	0.01	<1	<40	<50	<200	<200	281
Minimum Detect		ND	1.8	0.002	ND	ND	28	0.01	ND	ND		1.8	0.008	53	0.001	0.00011	ND	0.03	7.7	0.003	4600	0.01	8	ND	81	ND	ND	281
Maximum Concentration		<0.05	82	<0.1	<0.1	<0.01	1100	0.01	<0.1	<0.005		130	<0.5	4700	0.22	0.00011	<0.1	0.79	2100	<0.2	16000	<0.1	12	<40	81	<200	<200	<450
Maximum Detect		ND	82	0.019	ND	ND	1100	0.01	ND	ND		130	0.24	4700	0.22	0.00011	ND	0.79	2100	0.003	16000	0.047	12	ND	81	ND	ND	281
Maximum Detect + 10%		NA	90.2	0.0209	NA	NA	1210	0.011	NA	NA		143	0.264	5170	0.242	0.000121	NA	0.869	2310	0.0033	17600	0.0517	13.2	NA	89.1	NA	NA	309.1
Average Concentration		0.0062	16	0.013	0.0095	0.00095	310	0.0028	0.0095	0.0025		23	0.064	971	0.064	0.000042	0.011	0.16	428	0.019	10670	0.031	1.8	20	36	100	100	236
Median Concentration		0.0025	6.15	0.005	0.0025	0.00025	150	0.001	0.0025	0.0025		7.1	0.0125	100	0.033	0.000025	0.0025	0.08	90	0.005	11500	0.029	0.5	20	25	100	100	225
Standard Deviation		0.011	24	0.017	0.018	0.0018	397	0.004	0.018	0		39	0.099	1763	0.075	0.000038	0.02	0.21	767	0.035	4077	0.014	3.4	0	25	0	0	25
Number of Guideline Exceedances		3	0	0	3	9	0	5	0	0		0	0	0	0	0	2	0	0	3	0	15	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)		0	0	0	0	0	0	1	0	0		0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0

March 2013 GME
Field Duplicates (WATER)
Filter: SDG in('PE075425-1')

SDG	PE075425-1	PE075425-1	
Field_ID	MW3	DUP01	**RPD**
Sampled_Date-Time	6/03/2013	6/03/2013	

Chem_Group	**ChemName**	**Units**	**EQL**			
	Acidity	mg/L	5	54.0	45.0	18
Inorganics	Alkalinity (Bicarbonate)	mg/l	5	580.0	580.0	0
	Alkalinity (total) as CaCO3	mg/l	5	470.0	470.0	0
	Ammonia	mg/l	0.005	<0.005	<0.005	0
	Ammonia as N	µg/l	5	<5.0	<5.0	0
	Chloride	mg/l	1	5900.0	5800.0	2
	Fluoride	mg/l	0.1	1.4	1.4	0
	Hydrogen sulfide	mg/l	0.5	<0.5	<0.5	0
	Kjeldahl Nitrogen Total	mg/l	0.05	0.16	0.2	22
	Nitrate (as N)	mg/l	0.005	0.26	0.26	0
	Nitrate (as NO3-)	mg/l	0.05	1.1	1.2	9
	Nitrite (as N)	mg/l	0.005	<0.005	<0.005	0
	Nitrite (as NO2-)	mg/l	0.05	<0.05	<0.05	0
	Nitrogen (Total Oxidised)	mg/l	0.005	0.26	0.26	0
	Nitrogen (Total)	µg/l	50	420.0	460.0	9
	Reactive Phosphorus as P	mg/l	0.002	0.003	<0.002	40
	Silica (Filtered)	µg/l	50	36000.0	36000.0	0
	Sodium (Filtered)	mg/l	0.5	3500.0	3600.0	3
	Sulphate	mg/l	1	670.0	710.0	6
	Sulphide	mg/l	0.5	<0.5	<0.5	0
	TSS	mg/l	5	180.0	180.0	0
Metals	Aluminium (Filtered)	mg/l	0.025	<0.025	<0.025	0
	Aluminium	mg/l	0.05	**5.8**	**3.7**	**44**
	Arsenic (Filtered)	mg/l	0.005	<0.005	<0.005	0
	Cadmium (Filtered)	mg/l	0.0005	<0.0005	<0.0005	0
	Calcium (Filtered)	mg/l	0.2	130.0	130.0	0
	Chromium (III+VI) (Filtered)	mg/l	0.005	<0.005	<0.005	0
	Iron (Filtered)	mg/l	0.025	<0.025	<0.025	0
	Iron	mg/l	0.05	**6.3**	**3.8**	**50**
	Magnesium (Filtered)	mg/l	0.1	340.0	340.0	0
	Manganese (Filtered)	mg/l	0.005	0.018	0.017	6
	Nickel (Filtered)	mg/l	0.005	<0.005	<0.005	0
	Phosphorus	mg/l	0.01	**1.6**	**<0.01**	**198**
	Potassium (Filtered)	mg/l	0.1	130.0	130.0	0
	Selenium (Filtered)	mg/l	0.01	<0.01	<0.01	0
	Silicon (Filtered)	µg/l	20	17000.0	17000.0	0
	Zinc (Filtered)	mg/l	0.025	<0.025	<0.025	0
Organic	Alkalinity (Carbonate)	mg/l	1	<1.0	<1.0	0

*RPDs have only been considered where a concentration is greater than 0 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (0-10 x EQL); 30 (10-30 x EQL); 30 (> 30 x EQL))

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

April 2013 GME
Field Duplicates (WATER)
Filter: SDG in('PE076727-1')

SDG	PE076727-1	PE076727-1	
Field_ID	MW05	DUP01	**RPD**
Sampled_Date-Time	17/04/2013	17/04/2013	

Chem_Group	**ChemName**	**Units**	**EQL**			
	Acidity	mg/L	5	58.0	57.0	2
Inorganics	Alkalinity (Bicarbonate)	mg/l	5	210.0	210.0	0
	Alkalinity (total) as CaCO3	mg/l	5	170.0	170.0	0
	Ammonia	mg/l	0.005	<0.005	<0.005	0
	Ammonia as N	µg/l	5	<5.0	<5.0	0
	Chloride	mg/l	1	58000.0	56000.0	4
	Fluoride	mg/l	0.1	0.4	0.4	0
	Kjeldahl Nitrogen Total	mg/l	0.05	1.0	0.98	2
	Nitrate (as N)	mg/l	0.005	1.6	1.6	0
	Nitrate (as NO3-)	mg/l	0.05	6.9	6.9	0
	Nitrite (as N)	mg/l	0.005	<0.005	<0.005	0
	Nitrite (as NO2-)	mg/l	0.05	<0.05	<0.05	0
	Nitrogen (Total Oxidised)	mg/l	0.005	1.6	1.6	0
	Nitrogen (Total)	µg/l	50	2600.0	2500.0	4
	Reactive Phosphorus as P	mg/l	0.002	0.014	0.012	15
	Silica (Filtered)	µg/l	500	13000.0	13000.0	0
	Sodium (Filtered)	mg/l	5	33000.0	33000.0	0
	Sulphate	mg/l	1	3300.0	3400.0	3
	Sulphide	mg/l	0.5	<0.5	<0.5	0
	TSS	mg/l	5	1600.0	1400.0	13
Lead	Lead (Filtered)	mg/l	0.05	<0.05	<0.05	0
Metals	Aluminium (Filtered)	mg/l	0.25	0.3	0.33	10
	Aluminium	mg/l	0.1	33.0	30.0	10
	Arsenic (Filtered)	mg/l	0.05	<0.05	<0.05	0
	Cadmium (Filtered)	mg/l	0.005	<0.005	<0.005	0
	Calcium (Filtered)	mg/l	2	740.0	740.0	0
	Chromium (III+VI) (Filtered)	mg/l	0.05	<0.05	<0.05	0
	Copper (Filtered)	mg/l	0.05	<0.05	<0.05	0
	Iron (Filtered)	mg/l	0.25	<0.25	<0.25	0
	Iron	mg/l	0.1	44.0	41.0	7
	Magnesium (Filtered)	mg/l	1	2900.0	2900.0	0
	Manganese (Filtered)	mg/l	0.05	<0.05	<0.05	0
	Nickel (Filtered)	mg/l	0.05	<0.05	<0.05	0
	Phosphorus	mg/l	0.01	0.16	0.16	0
	Potassium (Filtered)	mg/l	1	1400.0	1400.0	0
	Selenium (Filtered)	mg/l	0.1	<0.1	<0.1	0
	Silicon (Filtered)	µg/l	200	6000.0	6000.0	0
	Zinc (Filtered)	mg/l	0.25	<0.25	<0.25	0
Organic	Alkalinity (Carbonate)	mg/l	1	<1.0	<1.0	0

*RPDs have only been considered where a concentration is greater than 0 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (0-10 x EQL); 30 (10-30 x EQL); 30 (> 30 x EQL))

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Annex C

LABORATORY ANALYTICAL REPORTS

ERM

☐ Sydney
☐ Melbourne
☐ Brisbane
☑ Perth
☐ Hunter Valley
☐ North Coast
☐ Other

Grnd Floor, 33 Saunders Street, Pyrmont, NSW, 2009. (ph) 02 8584 8888 (fax) 02 8584 8800
Level 3, Yarra Tower, WTC, 18-38 Siddeley Street, Docklands, VIC, 3005. (ph) 03 9696 8011 (fax) 03 9696 8022
Level 1, 60 Leichhardt Street, Spring Hill, QLD, 4004. (ph) 07 3839 8393 (fax) 07 3839 8381
Level 6, Grain Pool Bld, 172 St Georges Tce, WA, 6850. (ph) 08 9321 5200 (fax) 08 9321 5262
53 Bonville Avenue, Thornton, NSW, 2322. (ph) 02 4964 2150 (fax) 02 4964 2152
Suite 3/146 Gordon Street, Port Macquarie, NSW, 2444. (ph) 02 6584 7155 (fax) 02 6584 7160

Project No: 0086269
Project Name: Burrup Nitrates
Project Location: Burrup
Project Manager: Joe Edgell
Sampler: C. Gorman / C. Mair

COC Number
A 07500

Laboratory
SGS

General Analysis Requirements	Yes (tick)
1. Turn Around Time (please tick: ☐1 Day ☐2 Days ☐3 Days ☑Normal TAT)	
2. Do you wish any sediment layers in water to be exluded from extractions?	
3. Additional QA/QC reported where sample batches are < 10 samples?	
4. % of extraneous material removed from samples to be reported as per NEPM 5.1.1?	

Laboratory Number	Sample ID	Sample Depth	Sample Date	Sample Time	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Preservation: Filter	Preservation: Other	Containers (number/type)	BTEX	TPH (C6-C9 P & T) + TPH (C10-C36)	Speciated TPH	VOC Scan (USEPA 8260 List)	SVOC Scan (USEPA 8270 List)	OC OP Pesticides	PAH	Phenols	PCB	Metals* (dissolved / total)	WATER SUITE	RINSATE	TRIP BLANK
1	MW1		6-3-13			X		X				5p											X		
2	MW2																						X		
3	MW3																						X		
4	MW4																						X		
54	MW5																						X		
55	DUP01																						X		
56	RIN01											2p												X	
57	Trip blank1											1v													X

Other Comments on sample
(eg: high voc, highly contaminated, special detection limits etc etc)
PE075425

Attn: Heide Meilke

Comments: Ref quote = ENV1124146. Pls send results & invoice to: carrie.gorman@erm.com joe.edgell@erm.com

*Metals (circle)
As Cd Cr Cu Hg Ni Pb Zn

Relinquished by: C. Gorman Signed: Carrie Gorman Date/Time: Received by: Alex Dickinson Date/Time: 7/3/13 12:50p

Relinquished by: Signed: Date/Time: Received by: Date/Time:

SGS

AUSTRALIA-ENVIRONMENTAL-PERTH AIRPORT- PROFORMA -QU101

REGISTRATION DETAILS

APPROVED BY: R. MA

Bottle Map Sample Numbers:	1L Plastic Green	500mL Plastic Yellow Green	500mL Plastic Purple	500mL Amber Green	250mL Plastic Green	125mL Plastic Red	1L Amber Green	500mL Amber Orange	100mL Amber Green	40mL Glass Vial White	40mL Glass Vial HAA	500mL Plastic Blue	250mL Plastic Orange	125mL Plastic Brown	250mL Glass Jar	125mL Glass Jar	1L Plastic Yellow	Other Lab	Ziplock Bag/ Other
~~1-3, 5-6~~	1	1			1	2													
4 6		X			1	1													
8 7										1									
1-5	1	1			1	2													

Job Number: PE075425

# of Eskies: 1 Esky

(IB) / ~~ICE / None~~

Temp: 14.6 °C

Tray Numbers: W-319- 320
V-9

Registration comments:
* MW4 bottles received empty.

Action Taken:

Registered By: 7/3/13

SAMPLE RECEIPT ADVICE

PE075425

CLIENT DETAILS

Contact	Joe Edgell
Client	ERM Australia Pty Ltd
Address	PO Box 7338 Cloisters Square Level 6, Grain Pool Bld, 172 St Georges Tce PERTH WA 6850
Telephone	08 9321 5200
Facsimile	08 9321 5262
Email	(Not specified)
Project	**0086269 Burrup Nitrates**
Order Number	**A07500**
Samples	7

LABORATORY DETAILS

Manager	Ros Ma
Laboratory	SGS Newburn Environmental
Address	10 Reid Rd Newburn WA 6105
Telephone	(08) 9373 3500
Facsimile	(08) 9373 3556
Email	au.environmental.perth@sgs.com
Samples Received	Thu 7/3/2013
Report Due	Thu 14/3/2013
SGS Reference	**PE075425**

SUBMISSION DETAILS

This is to confirm that 7 samples were received on Thursday 7/3/2013. Results are expected to be ready by Thursday 14/3/2013. Please quote SGS reference PE075425 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Sample counts by matrix	7 Water	Type of documentation received	COC
Date documentation received	7/3/2013	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	15°C
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes	Number of eskies/boxes received	1

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

COMMENTS

Sample bottles labelled MW4 received empty.

SAMPLE RECEIPT ADVICE

PE075425

CLIENT DETAILS

Client	ERM Australia Pty Ltd	Project	0086269 Burrup Nitrates

SUMMARY OF ANALYSIS

No.	Sample ID	Acidity and Free CO2	Alkalinity	Chloride by Discrete Analyser in Water	Colour by Discrete Analyser	Fluoride by Ion Selective Electrode in Water	Nitrate Nitrogen and Nitrite Nitrogen (NOx) by FIA	Sulphate in water	Sulphide by Titration in Water	Total and Volatile Suspended Solids (TSS /
001	MW1	1	3	1	1	1	5	1	2	1
002	MW2	1	3	1	1	1	5	1	2	1
003	MW3	1	3	1	1	1	5	1	2	1
004	MW5	1	3	1	1	1	5	1	2	1
005	DUP01	1	3	1	1	1	5	1	2	1
006	RIN01	-	3	1	-	-	-	1	-	-

CONTINUED OVERLEAF

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

SAMPLE RECEIPT ADVICE

PE075425

CLIENT DETAILS

Client	ERM Australia Pty Ltd	Project	0086269 Burrup Nitrates

SUMMARY OF ANALYSIS

No.	Sample ID	Filterable Reactive Phosphorus (FRP)	Low Level Ammonia Nitrogen by FIA	Mercury (dissolved) in Water	Metals in Water (Dissolved) by ICPOES	TKN Kjeldahl Digestion by Discrete Analyser	Total Phosphorus by Kjeldahl Digestion DA in	Trace Metals (Dissolved) in Water by ICPMS	Trace Metals (Total) in Water by ICPMS	VOCs in Water	Volatile Petroleum Hydrocarbons in Water
001	MW1	1	2	-	6	2	1	9	2	-	-
002	MW2	1	2	-	6	2	1	9	2	-	-
003	MW3	1	2	-	6	2	1	9	2	-	-
004	MW5	1	2	-	6	2	1	9	2	-	-
005	DUP01	1	2	-	6	2	1	9	2	-	-
006	RIN01	-	-	1	4	-	-	7	-	-	-
007	Trip Blank	-	-	-	-	-	-	-	-	11	5

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

ANALYTICAL REPORT

WORLD RECOGNISED ACCREDITATION

CLIENT DETAILS

Contact	Joe Edgell
Client	ERM Australia Pty Ltd
Address	PO Box 7338 Cloisters Square Level 6, Grain Pool Bld, 172 St Georges Tce PERTH WA 6850
Telephone	08 9321 5200
Facsimile	08 9321 5262
Email	(Not specified)
Project	**0086269 Burrup Nitrates**
Order Number	**A07500**
Samples	7

LABORATORY DETAILS

Manager	Ros Ma
Laboratory	SGS Newburn Environmental
Address	10 Reid Rd Newburn WA 6105
Telephone	(08) 9373 3500
Facsimile	(08) 9373 3556
Email	au.environmental.perth@sgs.com
SGS Reference	**PE075425 R0**
Report Number	0000057055
Date Reported	15 Mar 2013
Date Received	07 Mar 2013

COMMENTS

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

Samples were diluted due to high conductivity for metals. Hence the LORs were raised.

Total Al and Fe spike recoveries for "MW1" were outside acceptance criteria due to high background.

SIGNATORIES

Dale Lang
Organics Team Leader

Hue Thanh Ly
Metals Supervisor

Leanne Orsmond
Inorganics Coordinator

Lien Tang
Project Manager

Michael McKay
Inorganic Team Leader - Waters

Ohmar David
Metals Chemist

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name PE075425.001 Water 06 Mar 2013 MW1	PE075425.002 Water 06 Mar 2013 MW2	PE075425.003 Water 06 Mar 2013 MW3	PE075425.004 Water 06 Mar 2013 MW5
Total and Volatile Suspended Solids (TSS / VSS) Method: AN114						
Total Suspended Solids Dried at 105°C	mg/L	5	**2900**	**320**	**180**	**660**
Acidity and Free CO2 Method: AN140						
Acidity to pH 8.3	mg CaCO3/L	5	**210**	**63**	**54**	**130**
Alkalinity Method: AN135						
Total Alkalinity as CaCO3	mg/L	5	**300**	**360**	**470**	**170**
Carbonate Alkalinity as CO3	mg/L	1	<1	<1	<1	<1
Bicarbonate Alkalinity as HCO3	mg/L	5	**370**	**440**	**580**	**210**
Colour by Discrete Analyser Method: AN285						
Colour (True)	Hazen	1	<1	<1	<1	<1
Fluoride by Ion Selective Electrode in Water Method: AN141						
Fluoride by ISE	mg/L	0.1	**0.5**	**0.6**	**1.4**	**0.4**
Chloride by Discrete Analyser in Water Method: AN274						
Chloride	mg/L	1	**570**	**1000**	**5900**	**64000**
Sulphate in water Method: AN275						
Sulphate	mg/L	1	**100**	**170**	**670**	**3800**
Sulphide by Titration in Water Method: AN149						
Sulphide	mg/L	0.5	<0.5	<0.5	<0.5	<0.5
Hydrogen Sulphide at 20 C	mg/L	0.5	<0.5	<0.5	<0.5	<0.5
Nitrate Nitrogen and Nitrite Nitrogen (NOx) by FIA Method: AN258						
Nitrate, NO_3 as NO_3	mg/L	0.05	<0.05	**2.7**	**1.1**	**6.0**
Nitrate/Nitrite Nitrogen, NOx as N	mg/L	0.005	**1.9**	**0.60**	**0.26**	**1.3**
Nitrite Nitrogen, NO_2 as N	mg/L	0.005	**0.025**	<0.005	<0.005	<0.005
Nitrate Nitrogen, NO_3 as N	mg/L	0.005	**1.9**	**0.60**	**0.26**	**1.3**
Nitrite, NO_2 as NO_2	mg/L	0.05	**0.08**	<0.05	<0.05	<0.05

Parameter	Units	LOR	Sample Number: PE075425.001 Sample Matrix: Water Sample Date: 06 Mar 2013 Sample Name: MW1	PE075425.002 Water 06 Mar 2013 MW2	PE075425.003 Water 06 Mar 2013 MW3	PE075425.004 Water 06 Mar 2013 MW5
Low Level Ammonia Nitrogen by FIA Method: AN261						
Ammonia Nitrogen, NH_3 as N	mg/L	0.005	**0.015**	<0.005	<0.005	**1.0**
Ammonia, NH_3	mg/L	0.005	**0.018**	<0.005	<0.005	**1.2**
TKN Kjeldahl Digestion by Discrete Analyser Method: AN281						
Total Kjeldahl Nitrogen	mg/L	0.05	**0.14**	**0.10**	**0.16**	**2.1**
Total Nitrogen (calc)	mg/L	0.05	**2.0**	**0.70**	**0.42**	**3.4**
Total Phosphorus by Kjeldahl Digestion DA in Water Method: AN279/AN293						
Total Phosphorus (Kjeldahl Digestion)	mg/L	0.01	<0.01	<0.01	**1.6**	**0.04**
Filterable Reactive Phosphorus (FRP) Method: AN278						
Filterable Reactive Phosphorus	mg/L	0.002	**0.003**	<0.002	**0.003**	**0.007**
Metals in Water (Dissolved) by ICPOES Method: AN320/AN321						
Calcium, Ca	mg/L	0.2	**160**	**150**	**130**	**770**
Magnesium, Mg	mg/L	0.1	**49**	**87**	**340**	**3000**
Potassium, K	mg/L	0.1	**8.2**	**21**	**130**	**1500**
Silica, Soluble	mg/L	0.05	**32**	**27**	**36**	**13**
Silicon, Si	mg/L	0.02	**15**	**13**	**17**	**5.9**
Sodium, Na	mg/L	0.5	**280**	**580**	**3500**	**36000**
Trace Metals (Dissolved) in Water by ICPMS Method: AN318						
Aluminium, Al	µg/L	5	<5	**6**	<25↑	<250↑
Arsenic, As	µg/L	1	<1	<1	<5↑	<50↑
Cadmium, Cd	µg/L	0.1	<0.1	<0.1	<0.5↑	<5.0↑
Chromium, Cr	µg/L	1	<1	<1	<5↑	<50↑
Copper, Cu	µg/L	1	-	-	-	-
Iron, Fe	µg/L	5	<5	<5	<25↑	<250↑
Lead, Pb	µg/L	1	-	-	-	-
Manganese, Mn	µg/L	1	**170**	**12**	**18**	<50↑
Nickel, Ni	µg/L	1	<1	<1	<5↑	<50↑
Selenium, Se	µg/L	2	<2	<2	<10↑	<100↑
Zinc, Zn	µg/L	5	**10**	**17**	<25↑	<250↑
Trace Metals (Total) in Water by ICPMS Method: AN318						
Total Aluminium	µg/L	5	**10000**	**10000**	**5800**	**16000**
Total Iron	µg/L	5	**14000**	**15000**	**6300**	**18000**
Mercury (dissolved) in Water Method: AN311/AN312						
Mercury	mg/L	0.00005	-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	PE075425.001 Water 06 Mar 2013 MW1	PE075425.002 Water 06 Mar 2013 MW2	PE075425.003 Water 06 Mar 2013 MW3	PE075425.004 Water 06 Mar 2013 MW5
Volatile Petroleum Hydrocarbons in Water Method: AN433/AN434/AN410							
TRH C6-C9	µg/L	40		-	-	-	-
Surrogates							
Dibromofluoromethane (Surrogate)	%	-		-	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-		-	-	-	-
d8-toluene (Surrogate)	%	-		-	-	-	-
Bromofluorobenzene (Surrogate)	%	-		-	-	-	-
VOCs in Water Method: AN433/AN434							
Monocyclic Aromatic Hydrocarbons							
Benzene	µg/L	0.5		-	-	-	-
Toluene	µg/L	0.5		-	-	-	-
Ethylbenzene	µg/L	0.5		-	-	-	-
m/p-xylene	µg/L	1		-	-	-	-
o-xylene	µg/L	0.5		-	-	-	-
Oxygenated Compounds							
MtBE (Methyl-tert-butyl ether)	µg/L	0.5		-	-	-	-
Polycyclic VOCs							
Naphthalene	µg/L	0.5		-	-	-	-
Surrogates							
Dibromofluoromethane (Surrogate)	%	-		-	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-		-	-	-	-
d8-toluene (Surrogate)	%	-		-	-	-	-
Bromofluorobenzene (Surrogate)	%	-		-	-	-	-

Parameter	Units	LOR	Sample Number: PE075425.005 Sample Matrix: Water Sample Date: 06 Mar 2013 Sample Name: DUP01	Sample Number: PE075425.006 Sample Matrix: Water Sample Date: 06 Mar 2013 Sample Name: RIN01	Sample Number: PE075425.007 Sample Matrix: Water Sample Date: 06 Mar 2013 Sample Name: Trip Blank
Total and Volatile Suspended Solids (TSS / VSS) Method: AN114					
Total Suspended Solids Dried at 105°C	mg/L	5	**180**	-	-
Acidity and Free CO2 Method: AN140					
Acidity to pH 8.3	mg CaCO3/L	5	**45**	-	-
Alkalinity Method: AN135					
Total Alkalinity as CaCO3	mg/L	5	**470**	<5	-
Carbonate Alkalinity as CO3	mg/L	1	<1	<1	-
Bicarbonate Alkalinity as HCO3	mg/L	5	**580**	<5	-
Colour by Discrete Analyser Method: AN285					
Colour (True)	Hazen	1	<1	-	-
Fluoride by Ion Selective Electrode in Water Method: AN141					
Fluoride by ISE	mg/L	0.1	**1.4**	-	-
Chloride by Discrete Analyser in Water Method: AN274					
Chloride	mg/L	1	**5800**	<1	-
Sulphate in water Method: AN275					
Sulphate	mg/L	1	**710**	<1	-
Sulphide by Titration in Water Method: AN149					
Sulphide	mg/L	0.5	<0.5	-	-
Hydrogen Sulphide at 20 C	mg/L	0.5	<0.5	-	-
Nitrate Nitrogen and Nitrite Nitrogen (NOx) by FIA Method: AN258					
Nitrate, NO_3 as NO_3	mg/L	0.05	**1.2**	-	-
Nitrate/Nitrite Nitrogen, NOx as N	mg/L	0.005	**0.26**	-	-
Nitrite Nitrogen, NO_2 as N	mg/L	0.005	<0.005	-	-
Nitrate Nitrogen, NO_3 as N	mg/L	0.005	**0.26**	-	-
Nitrite, NO_2 as NO_2	mg/L	0.05	<0.05	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name PE075425.005 Water 06 Mar 2013 DUP01	PE075425.006 Water 06 Mar 2013 RIN01	PE075425.007 Water 06 Mar 2013 Trip Blank
Low Level Ammonia Nitrogen by FIA Method: AN261					
Ammonia Nitrogen, NH_3 as N	mg/L	0.005	<0.005	-	-
Ammonia, NH_3	mg/L	0.005	<0.005	-	-
TKN Kjeldahl Digestion by Discrete Analyser Method: AN281					
Total Kjeldahl Nitrogen	mg/L	0.05	**0.20**	-	-
Total Nitrogen (calc)	mg/L	0.05	**0.46**	-	-
Total Phosphorus by Kjeldahl Digestion DA in Water Method: AN279/AN293					
Total Phosphorus (Kjeldahl Digestion)	mg/L	0.01	<0.01	-	-
Filterable Reactive Phosphorus (FRP) Method: AN278					
Filterable Reactive Phosphorus	mg/L	0.002	<0.002	-	-
Metals in Water (Dissolved) by ICPOES Method: AN320/AN321					
Calcium, Ca	mg/L	0.2	**130**	<0.2	-
Magnesium, Mg	mg/L	0.1	**340**	<0.1	-
Potassium, K	mg/L	0.1	**130**	<0.1	-
Silica, Soluble	mg/L	0.05	**36**	-	-
Silicon, Si	mg/L	0.02	**17**	-	-
Sodium, Na	mg/L	0.5	**3600**	<0.5	-
Trace Metals (Dissolved) in Water by ICPMS Method: AN318					
Aluminium, Al	µg/L	5	<25↑	-	-
Arsenic, As	µg/L	1	<5↑	<1	-
Cadmium, Cd	µg/L	0.1	<0.5↑	<0.1	-
Chromium, Cr	µg/L	1	<5↑	<1	-
Copper, Cu	µg/L	1	-	<1	-
Iron, Fe	µg/L	5	<25↑	-	-
Lead, Pb	µg/L	1	-	<1	-
Manganese, Mn	µg/L	1	**17**	-	-
Nickel, Ni	µg/L	1	<5↑	<1	-
Selenium, Se	µg/L	2	<10↑	-	-
Zinc, Zn	µg/L	5	<25↑	**13**	-
Trace Metals (Total) in Water by ICPMS Method: AN318					
Total Aluminium	µg/L	5	**3700**	-	-
Total Iron	µg/L	5	**3800**	-	-

Parameter	Units	LOR	Sample Number: PE075425.005 Sample Matrix: Water Sample Date: 06 Mar 2013 Sample Name: DUP01	PE075425.006 Water 06 Mar 2013 RIN01	PE075425.007 Water 06 Mar 2013 Trip Blank
Mercury (dissolved) in Water Method: AN311/AN312					
Mercury	mg/L	0.00005	-	<0.00005	-
Volatile Petroleum Hydrocarbons in Water Method: AN433/AN434/AN410					
TRH C6-C9	µg/L	40	-	-	<40
Surrogates					
Dibromofluoromethane (Surrogate)	%	-	-	-	**102**
d4-1,2-dichloroethane (Surrogate)	%	-	-	-	**102**
d8-toluene (Surrogate)	%	-	-	-	**100**
Bromofluorobenzene (Surrogate)	%	-	-	-	**97**
VOCs in Water Method: AN433/AN434					
Monocyclic Aromatic Hydrocarbons					
Benzene	µg/L	0.5	-	-	<0.5
Toluene	µg/L	0.5	-	-	<0.5
Ethylbenzene	µg/L	0.5	-	-	<0.5
m/p-xylene	µg/L	1	-	-	<1
o-xylene	µg/L	0.5	-	-	<0.5
Oxygenated Compounds					
MtBE (Methyl-tert-butyl ether)	µg/L	0.5	-	-	<0.5
Polycyclic VOCs					
Naphthalene	µg/L	0.5	-	-	<0.5
Surrogates					
Dibromofluoromethane (Surrogate)	%	-	-	-	**102**
d4-1,2-dichloroethane (Surrogate)	%	-	-	-	**102**
d8-toluene (Surrogate)	%	-	-	-	**100**
Bromofluorobenzene (Surrogate)	%	-	-	-	**97**

QC SUMMARY

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

Acidity and Free CO2 Method: ME-(AU)-[ENV]AN140

Parameter	QC Reference	Units	LOR	MB	DUP %RPD
Acidity to pH 8.3	LB060108	mg CaCO3/L	5	<5	0 - 6%

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Total Alkalinity as CaCO3	LB060106	mg/L	5	<5	0%	101%
	LB060191	mg/L	5	<5	0 - 8%	98%
Carbonate Alkalinity as CO3	LB060106	mg/L	1	<1		
	LB060191	mg/L	1	<1		
Bicarbonate Alkalinity as HCO3	LB060106	mg/L	5	<5		
	LB060191	mg/L	5	<5		

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Chloride	LB060097	mg/L	1	<1	0 - 1%	102%	100 - 106%

Colour by Discrete Analyser Method: ME-(AU)-[ENV]AN285

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Colour (True)	LB060138	Hazen	1	<1	0%	96 - 97%

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Filterable Reactive Phosphorus	LB060032	mg/L	0.002	<0.002	0 - 1%	99 - 103%	106 - 119%

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

Fluoride by Ion Selective Electrode in Water **Method: ME-(AU)-[ENV]AN141**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Fluoride by ISE	LB060212	mg/L	0.1	<0.1	0%	104%	78 - 102%

Low Level Ammonia Nitrogen by FIA **Method: ME-(AU)-[ENV]AN261**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Ammonia Nitrogen, NH_3 as N	LB060285	mg/L	0.005	<0.005	0 - 9%	100 - 109%
Ammonia, NH_3	LB060285	mg/L	0.005	<0.005	0 - 1%	100 - 109%

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Mercury	LB060277	mg/L	0.00005	<0.00005	0%	98%	120%

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Calcium, Ca	LB060176	mg/L	0.2	<0.2	0 - 1%	96%	77%
Magnesium, Mg	LB060176	mg/L	0.1	<0.1	0 - 1%	99%	90%
Potassium, K	LB060176	mg/L	0.1	<0.1	1 - 7%	109%	96%
Silica, Soluble	LB060176	mg/L	0.05	<0.05			
Silicon, Si	LB060176	mg/L	0.02	<0.02		104%	87%
Sodium, Na	LB060176	mg/L	0.5	<0.5	1 - 2%	108%	71%

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Nitrate, NO_3 as NO_3	LB060285	mg/L	0.05	<0.05		
Nitrate/Nitrite Nitrogen, NOx as N	LB060285	mg/L	0.005	<0.005	0 - 14%	102 - 107%
Nitrite Nitrogen, NO_2 as N	LB060285	mg/L	0.005	<0.005	0%	103 - 105%
Nitrate Nitrogen, NO_3 as N	LB060285	mg/L	0.005	<0.005		
Nitrite, NO_2 as NO_2	LB060285	mg/L	0.05	<0.05		

QC SUMMARY

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

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Sulphate	LB060097	mg/L	1	<1	0 - 3%	102 - 103%	94 - 97%

Sulphide by Titration in Water **Method: ME-(AU)-[ENV]AN149**

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Sulphide	LB060025	mg/L	0.5	<0.5	96 - 103%

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Total Kjeldahl Nitrogen	LB060220	mg/L	0.05	<0.05	1 - 12%	105%

Total and Volatile Suspended Solids (TSS / VSS) **Method: ME-(AU)-[ENV]AN114**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Total Suspended Solids Dried at 105°C	LB060142	mg/L	5	<5	6 - 19%	95%

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Total Phosphorus (Kjeldahl Digestion)	LB060220	mg/L	0.01	<0.01	0 - 4%	101%

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Aluminium, Al	LB060179	µg/L	5	<5		108%	
Arsenic, As	LB060179	µg/L	1	<1	0%	94%	94%
Cadmium, Cd	LB060179	µg/L	0.1	<0.1	0%	100%	92%
Chromium, Cr	LB060179	µg/L	1	<1	0%	98%	101%
Copper, Cu	LB060179	µg/L	1	<1	0 - 1%	101%	75%
Iron, Fe	LB060179	µg/L	5	<5	9%	94%	90%
Lead, Pb	LB060179	µg/L	1	<1	0 - 1%	108%	101%
Manganese, Mn	LB060179	µg/L	1	<1	11%	97%	99%
Nickel, Ni	LB060179	µg/L	1	<1	0%	103%	99%
Selenium, Se	LB060179	µg/L	2	<2		83%	
Zinc, Zn	LB060179	µg/L	5	<5	4 - 13%	113%	101%

QC SUMMARY

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

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

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery	MS %Recovery
Total Aluminium	LB060182	µg/L	5	<5	103%	NA
Total Iron	LB060182	µg/L	5	<5	95%	NA

VOCs in Water Method: ME-(AU)-[ENV]AN433/AN434

Monocyclic Aromatic Hydrocarbons

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Benzene	LB060117	µg/L	0.5	<0.5	95%
Toluene	LB060117	µg/L	0.5	<0.5	95%
Ethylbenzene	LB060117	µg/L	0.5	<0.5	94%
m/p-xylene	LB060117	µg/L	1	<1	
o-xylene	LB060117	µg/L	0.5	<0.5	

Oxygenated Compounds

Parameter	QC Reference	Units	LOR	MB
MtBE (Methyl-tert-butyl ether)	LB060117	µg/L	0.5	<0.5

Polycyclic VOCs

Parameter	QC Reference	Units	LOR	MB
Naphthalene	LB060117	µg/L	0.5	<0.5

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Dibromofluoromethane (Surrogate)	LB060117	%	-	100%	105%
d4-1,2-dichloroethane (Surrogate)	LB060117	%	-	97%	105%
d8-toluene (Surrogate)	LB060117	%	-	96%	102%
Bromofluorobenzene (Surrogate)	LB060117	%	-	93%	96%

QC SUMMARY

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

Volatile Petroleum Hydrocarbons in Water **Method: ME-(AU)-[ENV]AN433/AN434/AN410**

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
TRH C6-C9	LB060117	µg/L	40	<40	90%

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Dibromofluoromethane (Surrogate)	LB060117	%	-	100%	105%
d4-1,2-dichloroethane (Surrogate)	LB060117	%	-	97%	105%
d8-toluene (Surrogate)	LB060117	%	-	96%	102%
Bromofluorobenzene (Surrogate)	LB060117	%	-	93%	96%

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN114	Total Suspended and Volatile Suspended Solids: The sample is homogenised by shaking and a known volume is filtered through a pre-weighed GF/C filter paper and washed well with deionised water. The filter paper is dried and reweighed. The TSS is the residue retained by the filter per unit volume of sample. Reference APHA 2540 D. Internal Reference AN114
AN135	Alkalinity (and forms of) by Titration: The sample is titrated with standard acid to pH 8.3 (P titre) and pH 4.5 (T titre) and permanent and/or total alkalinity calculated. The results are expressed as equivalents of calcium carbonate or recalculated as bicarbonate, carbonate and hydroxide. Reference APHA 2320. Internal Reference AN135
AN135	Free and Total Carbon Dioxide may be calculated using alkalinity forms only when the samples TDS is <500mg/L. If TDS is >500mg/L free or total carbon dioxide cannot be reported. APHA4500CO2 D.
AN140	Acidity by Tritration: The water sample is titrated with sodium hydroxide to designated pH end point. In a sample containing only carbon dioxide, bicarbonates and carbonates, titration to pH 8.3 at 25°C corresponds to stoichiometric neutralisation of carbonic acid to bicarbonate. Method reference APHA 2310 B.
AN141	Determination of Fluoride by ISE: A fluoride ion selective electrode and reference electrode combination, in the presence of a pH/complexation buffer, is used to determine the fluoride concentration. The electrode millivolt response is measured logarithmically against fluoride concentration. Reference APHA F- C.
AN149	Sulphide by Iodometric Titration: Sulphide is precipitated as zinc sulphide to overcome interferences with sulphite and thiosulphate. After filtration, sulphide is determined titrimetrically. Reference APHA 4500-S2-
AN258	Nitrate and Nitrite by FIA: In an acidic medium, nitrate is reduced quantitatively to nitrite by cadmium metal. This nitrite plus any original nitrite is determined as an intense red-pink azo dye at 540 nm following diazotisation with sulphanilamide and subsequent coupling with N-(1-naphthyl) ethylenediamine dihydrochloride. Without the cadmium reduction only the original nitrite is determined. Reference APHA 4500-NO3- F.
AN261	Ammonia by Continuous Flow Analyser: Ammonium in a basic medium forms ammonia gas, which is separated from the sample matrix by diffusion through a polypropylene membrane. The ammonia is reacted with phenol and hypochlorite to form indophenol blue at an intensity proportional to the ammonia concentration. The blue colour is intensified with sodium nitroprusside and the absorbance measured at 630 nm. The sensitivity of the automated method is 10-20 times that of the macro method. Reference APHA 4500-NH3 H.
AN274	Chloride by Aquakem DA: Chloride reacts with mercuric thiocyanate forming a mercuric chloride complex. In the presence of ferric iron, highly coloured ferric thiocyanate is formed which is proportional to the chloride concentration. Reference APHA 4500Cl-
AN275	Sulphate by Aquakem DA: Sulphate is precipitated in an acidic medium with barium chloride. The resulting turbidity is measured photometrically at 405nm and compared with standard calibration solutions to determine the sulphate concentration in the sample. Reference APHA 4500-SO42-. Internal reference AN275.
AN278	Reactive Phosphorus by DA: Orthophosphate reacts with ammonium molybdate (Mo VI) and potassium antimonyl tartrate (Sb III) in acid medium to form an antimony-phosphomolybdate complex. This complex is subsequently reduced with ascorbic acid to form a blue colour and the absorbance is read at 880 nm. The sensitivity of the automated method is 10-20 times that of the macro method. Reference APHA 4500-P F
AN279/AN293	The sample is digested with Sulphuric acid, K2SO4 and CuSO4. All forms of phosphorus are converted into orthophosphate. The digest is cooled and placed on the discrete analyser for colorimetric analysis.

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN281	An unfiltered water or soil sample is first digested in a block digestor with sulphuric acid, K2SO4 and CuSO4. The ammonia produced following digestion is then measured colourimetrically using the Aquakem 250 Discrete Analyser. A portion of the digested sample is buffered to an alkaline pH, and interfering cations are complexed. The ammonia then reacts with salicylate and hypochlorite to give a blue colour whose absorbance is measured at 660nm and compared with calibration standards. This is proportional to the concentration of Total Kjeldahl Nitrogen in the original sample.
AN285	The term 'colour' is used here to mean true colour, that is, the colour of water from which turbidity has been removed. The term 'apparent colour' includes not only colour due to substances in solution, but also that due to suspended matter. Apparent colour is determined on the original sample without filtration.
AN311/AN312	Mercury by Cold Vapour AAS in Waters: Mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500.
AN318	Determination of elements at trace level in waters by ICP-MS technique, in accordance with USEPA 6020A.
AN320/AN321	Metals by ICP-OES: Samples are preserved with 10% nitric acid for a wide range of metals and some non-metals. This solution is measured by Inductively Coupled Plasma. Solutions are aspirated into an argon plasma at 8000-10000K and emit characteristic energy or light as a result of electron transitions through unique energy levels. The emitted light is focused onto a diffraction grating where it is separated into components.
AN320/AN321	Photomultipliers or CCDs are used to measure the light intensity at specific wavelengths. This intensity is directly proportional to concentration. Corrections are required to compensate for spectral overlap between elements. Reference APHA 3120 B.
AN433/AN434	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
AN433/AN434/AN410	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

FOOTNOTES

IS	Insufficient sample for analysis.	LOR	Limit of Reporting
LNR	Sample listed, but not received.	↑↓	Raised or Lowered Limit of Reporting
*	This analysis is not covered by the scope of accreditation.	QFH	QC result is above the upper tolerance
		QFL	QC result is below the lower tolerance
**	Indicative data, theoretical holding time exceeded.	-	The sample was not analysed for this analyte
^	Performed by outside laboratory.	NVL	Not Validated

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

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

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here:
http://www.sgs.com.au.pv.sgsv3/~/media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

STATEMENT OF QA/QC PERFORMANCE

PE075425 R0

CLIENT DETAILS

Contact	Joe Edgell
Client	ERM Australia Pty Ltd
Address	PO Box 7338 Cloisters Square Level 6, Grain Pool Bld, 172 St Georges Tce PERTH WA 6850
Telephone	08 9321 5200
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Email	(Not specified)
Project	**0086269 Burrup Nitrates**
Order Number	**A07500**
Samples	7

LABORATORY DETAILS

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SGS Reference	PE075425 R0
Report Number	0000057056
Date Reported	15 Mar 2013

COMMENTS

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

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

All Data Quality Objectives were met with the exception of the following:

Extraction Date	Colour by Discrete Analyser	5 items
Analysis Date	Colour by Discrete Analyser	5 items

SAMPLE SUMMARY

Sample counts by matrix	7 Water	Type of documentation received	COC
Date documentation received	7/3/2013	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	15°C
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes	Number of eskies/boxes received	1

HOLDING TIME SUMMARY

PE075425 R0

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

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

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

Acidity and Free CO2

Method: ME-(AU)-[ENV]AN140

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	PE075425.001	LB060108	06 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013
MW2	PE075425.002	LB060108	06 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013
MW3	PE075425.003	LB060108	06 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013
MW5	PE075425.004	LB060108	06 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013
DUP01	PE075425.005	LB060108	06 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013

Alkalinity

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	PE075425.001	LB060106	06 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013
MW2	PE075425.002	LB060106	06 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013
MW3	PE075425.003	LB060106	06 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013
MW5	PE075425.004	LB060106	06 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013
DUP01	PE075425.005	LB060106	06 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013
RIN01	PE075425.006	LB060191	06 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013	07 Mar 2013

Chloride by Discrete Analyser in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	PE075425.001	LB060097	06 Mar 2013	07 Mar 2013	03 Apr 2013	08 Mar 2013	03 Apr 2013	11 Mar 2013
MW2	PE075425.002	LB060097	06 Mar 2013	07 Mar 2013	03 Apr 2013	08 Mar 2013	03 Apr 2013	11 Mar 2013
MW3	PE075425.003	LB060097	06 Mar 2013	07 Mar 2013	03 Apr 2013	08 Mar 2013	03 Apr 2013	11 Mar 2013
MW5	PE075425.004	LB060097	06 Mar 2013	07 Mar 2013	03 Apr 2013	08 Mar 2013	03 Apr 2013	11 Mar 2013
DUP01	PE075425.005	LB060097	06 Mar 2013	07 Mar 2013	03 Apr 2013	08 Mar 2013	03 Apr 2013	11 Mar 2013
RIN01	PE075425.006	LB060097	06 Mar 2013	07 Mar 2013	03 Apr 2013	08 Mar 2013	03 Apr 2013	11 Mar 2013

Colour by Discrete Analyser

Method: ME-(AU)-[ENV]AN285

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	PE075425.001	LB060138	06 Mar 2013	07 Mar 2013	08 Mar 2013	11 Mar 2013†	08 Mar 2013	11 Mar 2013†
MW2	PE075425.002	LB060138	06 Mar 2013	07 Mar 2013	08 Mar 2013	11 Mar 2013†	08 Mar 2013	11 Mar 2013†
MW3	PE075425.003	LB060138	06 Mar 2013	07 Mar 2013	08 Mar 2013	11 Mar 2013†	08 Mar 2013	11 Mar 2013†
MW5	PE075425.004	LB060138	06 Mar 2013	07 Mar 2013	08 Mar 2013	11 Mar 2013†	08 Mar 2013	11 Mar 2013†
DUP01	PE075425.005	LB060138	06 Mar 2013	07 Mar 2013	08 Mar 2013	11 Mar 2013†	08 Mar 2013	11 Mar 2013†

Filterable Reactive Phosphorus (FRP)

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	PE075425.001	LB060032	06 Mar 2013	07 Mar 2013	03 Apr 2013	08 Mar 2013	03 Apr 2013	08 Mar 2013
MW2	PE075425.002	LB060032	06 Mar 2013	07 Mar 2013	03 Apr 2013	08 Mar 2013	03 Apr 2013	08 Mar 2013
MW3	PE075425.003	LB060032	06 Mar 2013	07 Mar 2013	03 Apr 2013	08 Mar 2013	03 Apr 2013	08 Mar 2013
MW5	PE075425.004	LB060032	06 Mar 2013	07 Mar 2013	03 Apr 2013	08 Mar 2013	03 Apr 2013	08 Mar 2013
DUP01	PE075425.005	LB060032	06 Mar 2013	07 Mar 2013	03 Apr 2013	08 Mar 2013	03 Apr 2013	08 Mar 2013

Fluoride by Ion Selective Electrode in Water

Method: ME-(AU)-[ENV]AN141

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	PE075425.001	LB060212	06 Mar 2013	07 Mar 2013	03 Apr 2013	12 Mar 2013	03 Apr 2013	13 Mar 2013
MW2	PE075425.002	LB060212	06 Mar 2013	07 Mar 2013	03 Apr 2013	12 Mar 2013	03 Apr 2013	13 Mar 2013
MW3	PE075425.003	LB060212	06 Mar 2013	07 Mar 2013	03 Apr 2013	12 Mar 2013	03 Apr 2013	13 Mar 2013
MW5	PE075425.004	LB060212	06 Mar 2013	07 Mar 2013	03 Apr 2013	12 Mar 2013	03 Apr 2013	13 Mar 2013
DUP01	PE075425.005	LB060212	06 Mar 2013	07 Mar 2013	03 Apr 2013	12 Mar 2013	03 Apr 2013	13 Mar 2013

Low Level Ammonia Nitrogen by FIA

Method: ME-(AU)-[ENV]AN261

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	PE075425.001	LB060285	06 Mar 2013	07 Mar 2013	03 Apr 2013	13 Mar 2013	03 Apr 2013	14 Mar 2013
MW2	PE075425.002	LB060285	06 Mar 2013	07 Mar 2013	03 Apr 2013	13 Mar 2013	03 Apr 2013	14 Mar 2013
MW3	PE075425.003	LB060285	06 Mar 2013	07 Mar 2013	03 Apr 2013	13 Mar 2013	03 Apr 2013	14 Mar 2013
MW5	PE075425.004	LB060285	06 Mar 2013	07 Mar 2013	03 Apr 2013	13 Mar 2013	03 Apr 2013	14 Mar 2013
DUP01	PE075425.005	LB060285	06 Mar 2013	07 Mar 2013	03 Apr 2013	13 Mar 2013	03 Apr 2013	14 Mar 2013

Mercury (dissolved) in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
RIN01	PE075425.006	LB060277	06 Mar 2013	07 Mar 2013	03 Apr 2013	13 Mar 2013	03 Apr 2013	14 Mar 2013

Metals in Water (Dissolved) by ICPOES

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

Sample Name	Sample No.	QC Ref

HOLDING TIME SUMMARY

PE075425 R0

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

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

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

Metals in Water (Dissolved) by ICPOES (continued)

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	PE075425.001	LB060176	06 Mar 2013	07 Mar 2013	02 Sep 2013	11 Mar 2013	02 Sep 2013	14 Mar 2013
MW2	PE075425.002	LB060176	06 Mar 2013	07 Mar 2013	02 Sep 2013	11 Mar 2013	02 Sep 2013	14 Mar 2013
MW3	PE075425.003	LB060176	06 Mar 2013	07 Mar 2013	02 Sep 2013	11 Mar 2013	02 Sep 2013	14 Mar 2013
MW5	PE075425.004	LB060176	06 Mar 2013	07 Mar 2013	02 Sep 2013	11 Mar 2013	02 Sep 2013	14 Mar 2013
DUP01	PE075425.005	LB060176	06 Mar 2013	07 Mar 2013	02 Sep 2013	11 Mar 2013	02 Sep 2013	14 Mar 2013
RIN01	PE075425.006	LB060176	06 Mar 2013	07 Mar 2013	02 Sep 2013	11 Mar 2013	02 Sep 2013	14 Mar 2013

Nitrate Nitrogen and Nitrite Nitrogen (NOx) by FIA

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	PE075425.001	LB060285	06 Mar 2013	07 Mar 2013	03 Apr 2013	13 Mar 2013	03 Apr 2013	14 Mar 2013
MW2	PE075425.002	LB060285	06 Mar 2013	07 Mar 2013	03 Apr 2013	13 Mar 2013	03 Apr 2013	14 Mar 2013
MW3	PE075425.003	LB060285	06 Mar 2013	07 Mar 2013	03 Apr 2013	13 Mar 2013	03 Apr 2013	14 Mar 2013
MW5	PE075425.004	LB060285	06 Mar 2013	07 Mar 2013	03 Apr 2013	13 Mar 2013	03 Apr 2013	14 Mar 2013
DUP01	PE075425.005	LB060285	06 Mar 2013	07 Mar 2013	03 Apr 2013	13 Mar 2013	03 Apr 2013	14 Mar 2013

Sulphate in water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	PE075425.001	LB060097	06 Mar 2013	07 Mar 2013	03 Apr 2013	08 Mar 2013	03 Apr 2013	11 Mar 2013
MW2	PE075425.002	LB060097	06 Mar 2013	07 Mar 2013	03 Apr 2013	08 Mar 2013	03 Apr 2013	11 Mar 2013
MW3	PE075425.003	LB060097	06 Mar 2013	07 Mar 2013	03 Apr 2013	08 Mar 2013	03 Apr 2013	11 Mar 2013
MW5	PE075425.004	LB060097	06 Mar 2013	07 Mar 2013	03 Apr 2013	08 Mar 2013	03 Apr 2013	11 Mar 2013
DUP01	PE075425.005	LB060097	06 Mar 2013	07 Mar 2013	03 Apr 2013	08 Mar 2013	03 Apr 2013	11 Mar 2013
RIN01	PE075425.006	LB060097	06 Mar 2013	07 Mar 2013	03 Apr 2013	08 Mar 2013	03 Apr 2013	11 Mar 2013

Sulphide by Titration in Water

Method: ME-(AU)-[ENV]AN149

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	PE075425.001	LB060025	06 Mar 2013	07 Mar 2013	13 Mar 2013	08 Mar 2013	13 Mar 2013	13 Mar 2013
MW2	PE075425.002	LB060025	06 Mar 2013	07 Mar 2013	13 Mar 2013	08 Mar 2013	13 Mar 2013	13 Mar 2013
MW3	PE075425.003	LB060025	06 Mar 2013	07 Mar 2013	13 Mar 2013	08 Mar 2013	13 Mar 2013	13 Mar 2013
MW5	PE075425.004	LB060025	06 Mar 2013	07 Mar 2013	13 Mar 2013	08 Mar 2013	13 Mar 2013	13 Mar 2013
DUP01	PE075425.005	LB060025	06 Mar 2013	07 Mar 2013	13 Mar 2013	08 Mar 2013	13 Mar 2013	13 Mar 2013

TKN Kjeldahl Digestion by Discrete Analyser

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	PE075425.001	LB060220	06 Mar 2013	07 Mar 2013	03 Apr 2013	12 Mar 2013	03 Apr 2013	13 Mar 2013
MW2	PE075425.002	LB060220	06 Mar 2013	07 Mar 2013	03 Apr 2013	12 Mar 2013	03 Apr 2013	13 Mar 2013
MW3	PE075425.003	LB060220	06 Mar 2013	07 Mar 2013	03 Apr 2013	12 Mar 2013	03 Apr 2013	13 Mar 2013
MW5	PE075425.004	LB060220	06 Mar 2013	07 Mar 2013	03 Apr 2013	12 Mar 2013	03 Apr 2013	13 Mar 2013
DUP01	PE075425.005	LB060220	06 Mar 2013	07 Mar 2013	03 Apr 2013	12 Mar 2013	03 Apr 2013	13 Mar 2013

Total and Volatile Suspended Solids (TSS / VSS)

Method: ME-(AU)-[ENV]AN114

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	PE075425.001	LB060142	06 Mar 2013	07 Mar 2013	13 Mar 2013	11 Mar 2013	18 Mar 2013	11 Mar 2013
MW2	PE075425.002	LB060142	06 Mar 2013	07 Mar 2013	13 Mar 2013	11 Mar 2013	18 Mar 2013	11 Mar 2013
MW3	PE075425.003	LB060142	06 Mar 2013	07 Mar 2013	13 Mar 2013	11 Mar 2013	18 Mar 2013	11 Mar 2013
MW5	PE075425.004	LB060142	06 Mar 2013	07 Mar 2013	13 Mar 2013	11 Mar 2013	18 Mar 2013	11 Mar 2013
DUP01	PE075425.005	LB060142	06 Mar 2013	07 Mar 2013	13 Mar 2013	11 Mar 2013	18 Mar 2013	11 Mar 2013

Total Phosphorus by Kjeldahl Digestion DA in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	PE075425.001	LB060220	06 Mar 2013	07 Mar 2013	03 Apr 2013	12 Mar 2013	03 Apr 2013	13 Mar 2013
MW2	PE075425.002	LB060220	06 Mar 2013	07 Mar 2013	03 Apr 2013	12 Mar 2013	03 Apr 2013	13 Mar 2013
MW3	PE075425.003	LB060220	06 Mar 2013	07 Mar 2013	03 Apr 2013	12 Mar 2013	03 Apr 2013	13 Mar 2013
MW5	PE075425.004	LB060220	06 Mar 2013	07 Mar 2013	03 Apr 2013	12 Mar 2013	03 Apr 2013	13 Mar 2013
DUP01	PE075425.005	LB060220	06 Mar 2013	07 Mar 2013	03 Apr 2013	12 Mar 2013	03 Apr 2013	13 Mar 2013

Trace Metals (Dissolved) in Water by ICPMS

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	PE075425.001	LB060179	06 Mar 2013	07 Mar 2013	02 Sep 2013	11 Mar 2013	02 Sep 2013	13 Mar 2013
MW2	PE075425.002	LB060179	06 Mar 2013	07 Mar 2013	02 Sep 2013	11 Mar 2013	02 Sep 2013	13 Mar 2013
MW3	PE075425.003	LB060179	06 Mar 2013	07 Mar 2013	02 Sep 2013	11 Mar 2013	02 Sep 2013	13 Mar 2013
MW5	PE075425.004	LB060179	06 Mar 2013	07 Mar 2013	02 Sep 2013	11 Mar 2013	02 Sep 2013	13 Mar 2013
DUP01	PE075425.005	LB060179	06 Mar 2013	07 Mar 2013	02 Sep 2013	11 Mar 2013	02 Sep 2013	13 Mar 2013

HOLDING TIME SUMMARY

PE075425 R0

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

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

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

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

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
RIN01	PE075425.006	LB060179	06 Mar 2013	07 Mar 2013	02 Sep 2013	11 Mar 2013	02 Sep 2013	13 Mar 2013

Trace Metals (Total) in Water by ICPMS

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	PE075425.001	LB060182	06 Mar 2013	07 Mar 2013	02 Sep 2013	11 Mar 2013	02 Sep 2013	14 Mar 2013
MW2	PE075425.002	LB060182	06 Mar 2013	07 Mar 2013	02 Sep 2013	11 Mar 2013	02 Sep 2013	14 Mar 2013
MW3	PE075425.003	LB060182	06 Mar 2013	07 Mar 2013	02 Sep 2013	11 Mar 2013	02 Sep 2013	14 Mar 2013
MW5	PE075425.004	LB060182	06 Mar 2013	07 Mar 2013	02 Sep 2013	11 Mar 2013	02 Sep 2013	14 Mar 2013
DUP01	PE075425.005	LB060182	06 Mar 2013	07 Mar 2013	02 Sep 2013	11 Mar 2013	02 Sep 2013	14 Mar 2013

VOCs in Water

Method: ME-(AU)-[ENV]AN433/AN434

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Trip Blank	PE075425.007	LB060117	06 Mar 2013	07 Mar 2013	13 Mar 2013	10 Mar 2013	19 Apr 2013	14 Mar 2013

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Trip Blank	PE075425.007	LB060117	06 Mar 2013	07 Mar 2013	13 Mar 2013	10 Mar 2013	19 Apr 2013	14 Mar 2013

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

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

VOCs in Water — Method: ME-(AU)-[ENV]AN433/AN434

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	Trip Blank	PE075425.007	%	60 - 130%	97
d4-1,2-dichloroethane (Surrogate)	Trip Blank	PE075425.007	%	40 - 130%	102
d8-toluene (Surrogate)	Trip Blank	PE075425.007	%	60 - 130%	100
Dibromofluoromethane (Surrogate)	Trip Blank	PE075425.007	%	60 - 130%	102

Volatile Petroleum Hydrocarbons in Water — Method: ME-(AU)-[ENV]AN433/AN434/AN410

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	Trip Blank	PE075425.007	%	60 - 130%	97
d4-1,2-dichloroethane (Surrogate)	Trip Blank	PE075425.007	%	60 - 130%	102
d8-toluene (Surrogate)	Trip Blank	PE075425.007	%	60 - 130%	100
Dibromofluoromethane (Surrogate)	Trip Blank	PE075425.007	%	60 - 130%	102

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

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

Acidity and Free CO2

Method: ME-(AU)-[ENV]AN140

Sample Number	Parameter	Units	LOR	Result
LB060108.001	Acidity to pH 8.3	mg CaCO3/L	5	<5

Alkalinity

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

Sample Number	Parameter	Units	LOR	Result
LB060106.001	Total Alkalinity as CaCO3	mg/L	5	<5
LB060191.001	Total Alkalinity as CaCO3	mg/L	5	<5

Chloride by Discrete Analyser in Water

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

Sample Number	Parameter	Units	LOR	Result
LB060097.001	Chloride	mg/L	1	<1
LB060097.026	Chloride	mg/L	1	<1

Colour by Discrete Analyser

Method: ME-(AU)-[ENV]AN285

Sample Number	Parameter	Units	LOR	Result
LB060138.001	Colour (True)	Hazen	1	<1
LB060138.025	Colour (True)	Hazen	1	<1

Filterable Reactive Phosphorus (FRP)

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

Sample Number	Parameter	Units	LOR	Result
LB060032.001	Filterable Reactive Phosphorus	mg/L	0.002	<0.002
LB060032.025	Filterable Reactive Phosphorus	mg/L	0.002	<0.002

Fluoride by Ion Selective Electrode in Water

Method: ME-(AU)-[ENV]AN141

Sample Number	Parameter	Units	LOR	Result
LB060212.001	Fluoride by ISE	mg/L	0.1	<0.1
LB060212.026	Fluoride by ISE	mg/L	0.1	<0.1

Low Level Ammonia Nitrogen by FIA

Method: ME-(AU)-[ENV]AN261

Sample Number	Parameter	Units	LOR	Result
LB060285.001	Ammonia Nitrogen, NH_3 as N	mg/L	0.005	<0.005
	Ammonia, NH_3	mg/L	0.005	<0.005
LB060285.024	Ammonia Nitrogen, NH_3 as N	mg/L	0.005	<0.005
	Ammonia, NH_3	mg/L	0.005	<0.005
LB060285.047	Ammonia Nitrogen, NH_3 as N	mg/L	0.005	<0.005
	Ammonia, NH_3	mg/L	0.005	<0.005

Mercury (dissolved) in Water

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

Sample Number	Parameter	Units	LOR	Result
LB060277.001	Mercury	mg/L	0.00005	<0.00005

Metals in Water (Dissolved) by ICPOES

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

Sample Number	Parameter	Units	LOR	Result
LB060176.001	Calcium, Ca	mg/L	0.2	<0.2
	Magnesium, Mg	mg/L	0.1	<0.1
	Potassium, K	mg/L	0.1	<0.1
	Silicon, Si	mg/L	0.02	<0.02
	Sodium, Na	mg/L	0.5	<0.5

Nitrate Nitrogen and Nitrite Nitrogen (NOx) by FIA

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

Sample Number	Parameter	Units	LOR	Result
LB060285.001	Nitrate/Nitrite Nitrogen, NOx as N	mg/L	0.005	<0.005
	Nitrite Nitrogen, NO_2 as N	mg/L	0.005	<0.005
LB060285.024	Nitrate/Nitrite Nitrogen, NOx as N	mg/L	0.005	<0.005
	Nitrite Nitrogen, NO_2 as N	mg/L	0.005	<0.005
LB060285.047	Nitrate/Nitrite Nitrogen, NOx as N	mg/L	0.005	<0.005
	Nitrite Nitrogen, NO_2 as N	mg/L	0.005	<0.005

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

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

Sulphate in water

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

Sample Number	Parameter	Units	LOR	Result
LB060097.001	Sulphate	mg/L	1	<1
LB060097.026	Sulphate	mg/L	1	<1

Sulphide by Titration in Water

Method: ME-(AU)-[ENV]AN149

Sample Number	Parameter	Units	LOR	Result
LB060025.001	Sulphide	mg/L	0.5	<0.5
LB060025.025	Sulphide	mg/L	0.5	<0.5

TKN Kjeldahl Digestion by Discrete Analyser

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

Sample Number	Parameter	Units	LOR	Result
LB060220.002	Total Kjeldahl Nitrogen	mg/L	0.05	<0.05

Total and Volatile Suspended Solids (TSS / VSS)

Method: ME-(AU)-[ENV]AN114

Sample Number	Parameter	Units	LOR	Result
LB060142.001	Total Suspended Solids Dried at 105°C	mg/L	5	<5

Total Phosphorus by Kjeldahl Digestion DA in Water

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

Sample Number	Parameter	Units	LOR	Result
LB060220.001	Total Phosphorus (Kjeldahl Digestion)	mg/L	0.01	<0.01

Trace Metals (Dissolved) in Water by ICPMS

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

Sample Number	Parameter	Units	LOR	Result
LB060179.001	Aluminium, Al	µg/L	5	<5
	Arsenic, As	µg/L	1	<1
	Cadmium, Cd	µg/L	0.1	<0.1
	Chromium, Cr	µg/L	1	<1
	Copper, Cu	µg/L	1	<1
	Iron, Fe	µg/L	5	<5
	Lead, Pb	µg/L	1	<1
	Manganese, Mn	µg/L	1	<1
	Nickel, Ni	µg/L	1	<1
	Selenium, Se	µg/L	2	<2
	Zinc, Zn	µg/L	5	<5

Trace Metals (Total) in Water by ICPMS

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

Sample Number	Parameter	Units	LOR	Result
LB060182.001	Total Aluminium	µg/L	5	<5

VOCs in Water

Method: ME-(AU)-[ENV]AN433/AN434

Sample Number		Parameter	Units	LOR	Result
LB060117.001	Monocyclic Aromatic Hydrocarbons	Benzene	µg/L	0.5	<0.5
		Toluene	µg/L	0.5	<0.5
		Ethylbenzene	µg/L	0.5	<0.5
		m/p-xylene	µg/L	1	<1
		o-xylene	µg/L	0.5	<0.5
	Oxygenated Compounds	MtBE (Methyl-tert-butyl ether)	µg/L	0.5	<0.5
	Polycyclic VOCs	Naphthalene	µg/L	0.5	<0.5
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	100
		d4-1,2-dichloroethane (Surrogate)	%	-	97
		d8-toluene (Surrogate)	%	-	96
		Bromofluorobenzene (Surrogate)	%	-	93

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Sample Number	Parameter	Units	LOR

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

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

Volatile Petroleum Hydrocarbons in Water (continued) — **Method: ME-(AU)-[ENV]AN433/AN434/AN410**

Sample Number		Parameter	Units	LOR	Result
LB060117.001		TRH C6-C9	µg/L	40	<40
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	100
		d4-1,2-dichloroethane (Surrogate)	%	-	97
		d8-toluene (Surrogate)	%	-	96
		Bromofluorobenzene (Surrogate)	%	-	93

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

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

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

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

Acidity and Free CO2

Method: ME-(AU)-[ENV]AN140

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE075381.010	LB060108.012	Acidity to pH 8.3	mg CaCO3/L	5	50	54	25	6
PE075381.013	LB060108.016	Acidity to pH 8.3	mg CaCO3/L	5	19	19	41	0
PE075425.005	LB060108.023	Acidity to pH 8.3	mg CaCO3/L	5	45	46	26	2

Alkalinity

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE075398.002	LB060191.007	Total Alkalinity as CaCO3	mg/L	5	16	14	48	8
PE075425.001	LB060106.012	Total Alkalinity as CaCO3	mg/L	5	300	300	17	0
PE075447A.009	LB060191.017	Total Alkalinity as CaCO3	mg/L	5	379.78	380.54	16	0

Chloride by Discrete Analyser in Water

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE075373.003	LB060097.015	Chloride	mg/L	1	61	61	17	1
PE075381.009	LB060097.029	Chloride	mg/L	1	<1	<1	125	0
PE075425.006	LB060097.040	Chloride	mg/L	1	<1	<1	200	0

Colour by Discrete Analyser

Method: ME-(AU)-[ENV]AN285

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE075398.001	LB060138.013	Colour (True)	Hazen	1	<1	<1	200	0
PE075425.002	LB060138.024	Colour (True)	Hazen	1	<1	<1	200	0
PE075447A.009	LB060138.035	Colour (True)	Hazen	1	0	0	200	0

Filterable Reactive Phosphorus (FRP)

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE075425.002	LB060032.014	Filterable Reactive Phosphorus	mg/L	0.002	<0.002	<0.002	200	0
PE075429.010	LB060032.028	Filterable Reactive Phosphorus	mg/L	0.002	0.017	0.017	45	1
PE075429.012	LB060032.031	Filterable Reactive Phosphorus	mg/L	0.002	0.039	0.039	28	1

Fluoride by Ion Selective Electrode in Water

Method: ME-(AU)-[ENV]AN141

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE075327.004	LB060212.014	Fluoride by ISE	mg/L	0.1	<0.1	<0.1	200	0
PE075399.004	LB060212.028	Fluoride by ISE	mg/L	0.1	<0.1	<0.1	200	0
PE075425.005	LB060212.045	Fluoride by ISE	mg/L	0.1	1.4	1.4	22	0
PE075450.001	LB060212.040	Fluoride by ISE	mg/L	0.1	0.65	0.65	30	0

Low Level Ammonia Nitrogen by FIA

Method: ME-(AU)-[ENV]AN261

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE075429.001	LB060285.037	Ammonia Nitrogen, NH_3 as N	mg/L	0.005	1.1	1.1	15	4
PE075429.012	LB060285.049	Ammonia Nitrogen, NH_3 as N	mg/L	0.005	0.13	0.12	19	9
PE075470.010	LB060285.013	Ammonia Nitrogen, NH_3 as N	mg/L	0.005	0	0	200	0
		Ammonia, NH_3	mg/L	0.005	0	0	200	0
PE075473.005	LB060285.026	Ammonia Nitrogen, NH_3 as N	mg/L	0.005	0.39	0.39	16	1
		Ammonia, NH_3	mg/L	0.005	0.47	0.47	16	1

Mercury (dissolved) in Water

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE075399.001	LB060277.014	Mercury	µg/L	0.00005	<0.00005	<0.00005	200	0
PE075472.001	LB060277.024	Mercury	µg/L	0.00005	0	0	200	0

Metals in Water (Dissolved) by ICPOES

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE075429.004	LB060176.014	Calcium, Ca	mg/L	0.2	4.9	5.0	19	0
		Magnesium, Mg	mg/L	0.1	3.6	3.5	18	0
		Potassium, K	mg/L	0.1	2.4	2.6	19	7
		Sodium, Na	mg/L	0.5	27	28	17	1
PE075429.012	LB060176.021	Calcium, Ca	mg/L	0.2	110	110	15	1
		Magnesium, Mg	mg/L	0.1	37	37	15	1
		Potassium, K	mg/L	0.1	3.0	3.1	18	1
		Sodium, Na	mg/L	0.5	170	170	15	2

Nitrate Nitrogen and Nitrite Nitrogen (NOx) by FIA

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

Original	Duplicate	Parameter	Units	LOR

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

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

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

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

Nitrate Nitrogen and Nitrite Nitrogen (NOx) by FIA (continued)

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE075429.001	LB060285.037	Nitrate/Nitrite Nitrogen, NOx as N	mg/L	0.005	<0.005	<0.005	200	0
PE075429.012	LB060285.049	Nitrate/Nitrite Nitrogen, NOx as N	mg/L	0.005	0.015	0.013	51	14
PE075470.010	LB060285.013	Nitrate/Nitrite Nitrogen, NOx as N	mg/L	0.005	0	0	200	0
		Nitrite Nitrogen, NO_2 as N	mg/L	0.005	0	0	200	0
PE075473.005	LB060285.026	Nitrate/Nitrite Nitrogen, NOx as N	mg/L	0.005	<0	0	200	0
		Nitrite Nitrogen, NO_2 as N	mg/L	0.005	<0	0	200	0

Sulphate in water

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE075373.003	LB060097.015	Sulphate	mg/L	1	73	71	16	3
PE075381.009	LB060097.030	Sulphate	mg/L	1	5	5	34	1
PE075425.006	LB060097.041	Sulphate	mg/L	1	<1	<1	200	0

TKN Kjeldahl Digestion by Discrete Analyser

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE075425.001	LB060220.011	Total Kjeldahl Nitrogen	mg/L	0.05	0.14	0.13	52	12
PE075474.004	LB060220.023	Total Kjeldahl Nitrogen	mg/L	0.05	2.3675	2.3975	17	1

Total and Volatile Suspended Solids (TSS / VSS)

Method: ME-(AU)-[ENV]AN114

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE075391.001	LB060142.020	Total Suspended Solids Dried at 105°C	mg/L	5	70.918367346	58.499999999	23	19
PE075450.001	LB060142.013	Total Suspended Solids Dried at 105°C	mg/L	5	7.14285714286	7.5757575757	83	6

Total Phosphorus by Kjeldahl Digestion DA in Water

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE075425.001	LB060220.011	Total Phosphorus (Kjeldahl Digestion)	mg/L	0.01	<0.01	<0.01	200	0
PE075474.004	LB060220.022	Total Phosphorus (Kjeldahl Digestion)	mg/L	0.01	42.4375	40.6125	15	4

Trace Metals (Dissolved) in Water by ICPMS

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE075405.008	LB060179.014	Arsenic, As	µg/L	1	<1	<1	200	0
		Cadmium, Cd	µg/L	0.1	<0.1	<0.1	200	0
		Chromium, Cr	µg/L	1	<1	<1	200	0
		Copper, Cu	µg/L	1	1100	1100	15	1
		Iron, Fe	µg/L	5	11	10	63	9
		Lead, Pb	µg/L	1	<1	1	118	1
		Manganese, Mn	µg/L	1	1	1	101	11
		Nickel, Ni	µg/L	1	<1	<1	200	0
		Zinc, Zn	µg/L	5	93	89	20	4
PE075425.006	LB060179.023	Arsenic, As	µg/L	1	<1	<1	200	0
		Cadmium, Cd	µg/L	0.1	<0.1	<0.1	200	0
		Chromium, Cr	µg/L	1	<1	<1	200	0
		Copper, Cu	µg/L	1	<1	<1	200	0
		Lead, Pb	µg/L	1	<1	<1	200	0
		Nickel, Ni	µg/L	1	<1	<1	200	0
		Zinc, Zn	µg/L	5	13	12	56	13

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

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

Alkalinity

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB060106.002	Total Alkalinity as CaCO3	mg/L	5	230	225	85 - 115	101
LB060191.002	Total Alkalinity as CaCO3	mg/L	5	220	225	85 - 115	98

Chloride by Discrete Analyser in Water

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB060097.002	Chloride	mg/L	1	20	20	85 - 115	102
LB060097.027	Chloride	mg/L	1	20	20	85 - 115	102

Colour by Discrete Analyser

Method: ME-(AU)-[ENV]AN285

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB060138.002	Colour (True)	Hazen	1	5	5	90 - 110	97
LB060138.026	Colour (True)	Hazen	1	5	5	90 - 110	96

Filterable Reactive Phosphorus (FRP)

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB060032.002	Filterable Reactive Phosphorus	mg/L	0.002	0.051	0.05	80 - 120	103
LB060032.026	Filterable Reactive Phosphorus	mg/L	0.002	0.049	0.05	80 - 120	99

Fluoride by Ion Selective Electrode in Water

Method: ME-(AU)-[ENV]AN141

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB060212.002	Fluoride by ISE	mg/L	0.1	2.1	2	80 - 120	104

Low Level Ammonia Nitrogen by FIA

Method: ME-(AU)-[ENV]AN261

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB060285.002	Ammonia Nitrogen, NH_3 as N	mg/L	0.005	0.87	0.8	85 - 115	109
	Ammonia, NH_3	mg/L	0.005	1.1	0.971	85 - 115	109
LB060285.025	Ammonia Nitrogen, NH_3 as N	mg/L	0.005	0.80	0.8	85 - 115	100
	Ammonia, NH_3	mg/L	0.005	0.97	0.971	85 - 115	100
LB060285.048	Ammonia Nitrogen, NH_3 as N	mg/L	0.005	0.80	0.8	85 - 115	100
	Ammonia, NH_3	mg/L	0.005	0.97	0.971	85 - 115	100

Mercury (dissolved) in Water

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB060277.002	Mercury	mg/L	0.00005	0.0025	2.5	80 - 120	98

Metals in Water (Dissolved) by ICPOES

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB060176.002	Calcium, Ca	mg/L	0.2	190	200	80 - 120	96
	Magnesium, Mg	mg/L	0.1	200	200	80 - 120	99
	Potassium, K	mg/L	0.1	22	20	80 - 120	109
	Silicon, Si	mg/L	0.02	2.1	2	80 - 120	104
	Sodium, Na	mg/L	0.5	220	200	80 - 120	108

Nitrate Nitrogen and Nitrite Nitrogen (NOx) by FIA

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB060285.002	Nitrate/Nitrite Nitrogen, NOx as N	mg/L	0.005	0.82	0.8	85 - 115	102
	Nitrite Nitrogen, NO_2 as N	mg/L	0.005	0.83	0.8	85 - 115	103
LB060285.025	Nitrate/Nitrite Nitrogen, NOx as N	mg/L	0.005	0.84	0.8	85 - 115	105
	Nitrite Nitrogen, NO_2 as N	mg/L	0.005	0.84	0.8	85 - 115	105
LB060285.048	Nitrate/Nitrite Nitrogen, NOx as N	mg/L	0.005	0.85	0.8	85 - 115	107
	Nitrite Nitrogen, NO_2 as N	mg/L	0.005	0.83	0.8	85 - 115	104

Sulphate in water

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB060097.002	Sulphate	mg/L	1	10	10	80 - 120	103
LB060097.028	Sulphate	mg/L	1	10	10	80 - 120	102

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

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

Sulphide by Titration in Water

Method: ME-(AU)-[ENV]AN149

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB060025.002	Sulphide	mg/L	0.5	1.0	1	80 - 120	96
LB060025.026	Sulphide	mg/L	0.5	1.0	1	80 - 120	103

TKN Kjeldahl Digestion by Discrete Analyser

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB060220.001	Total Kjeldahl Nitrogen	mg/L	0.05	1.1	1	80 - 120	105

Total and Volatile Suspended Solids (TSS / VSS)

Method: ME-(AU)-[ENV]AN114

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB060142.002	Total Suspended Solids Dried at 105°C	mg/L	5	470	500	85 - 115	95

Total Phosphorus by Kjeldahl Digestion DA in Water

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB060220.001	Total Phosphorus (Kjeldahl Digestion)	mg/L	0.01	0.51	0.5	80 - 120	101

Trace Metals (Dissolved) in Water by ICPMS

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB060179.002	Aluminium, Al	µg/L	5	11	10	80 - 120	108
	Arsenic, As	µg/L	1	9	10	80 - 120	94
	Cadmium, Cd	µg/L	0.1	10	10	80 - 120	100
	Chromium, Cr	µg/L	1	10	10	80 - 120	98
	Copper, Cu	µg/L	1	10	10	80 - 120	101
	Iron, Fe	µg/L	5	9	10	80 - 120	94
	Lead, Pb	µg/L	1	11	10	80 - 120	108
	Manganese, Mn	µg/L	1	10	10	80 - 120	97
	Nickel, Ni	µg/L	1	10	10	80 - 120	103
	Selenium, Se	µg/L	2	8	10	80 - 120	83
	Zinc, Zn	µg/L	5	11	10	80 - 120	113

Trace Metals (Total) in Water by ICPMS

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB060182.002	Total Aluminium	µg/L	5	5	5	80 - 120	103
	Total Iron	µg/L	5	<5	5	80 - 120	95

VOCs in Water

Method: ME-(AU)-[ENV]AN433/AN434

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB060117.002	Monocyclic	Benzene	µg/L	0.5	4.8	5	50 - 150	95
	Aromatic	Toluene	µg/L	0.5	4.8	5	50 - 150	95
		Ethylbenzene	µg/L	0.5	4.7	5	50 - 150	94
	Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	5.2	5	60 - 130	105
		d4-1,2-dichloroethane (Surrogate)	µg/L	-	5.2	5	60 - 130	105
		d8-toluene (Surrogate)	µg/L	-	5.1	5	60 - 130	102
		Bromofluorobenzene (Surrogate)	µg/L	-	4.8	5	60 - 130	96

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB060117.002		TRH C6-C9	µg/L	40	<40	30	70 - 130	90
	Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	5.2	5	60 - 130	105
		d4-1,2-dichloroethane (Surrogate)	µg/L	-	5.2	5	60 - 130	105
		d8-toluene (Surrogate)	µg/L	-	5.1	5	60 - 130	102
		Bromofluorobenzene (Surrogate)	µg/L	-	4.8	5	60 - 130	96

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

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

Chloride by Discrete Analyser in Water

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
PE075373.001	LB060097.012	Chloride	mg/L	1	160	61	100	100
PE075381.012	LB060097.032	Chloride	mg/L	1	110	<1	100	106

Filterable Reactive Phosphorus (FRP)

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
PE071460H16.	LB060032.004	Filterable Reactive Phosphorus	mg/L	0.002	0.057	<0.005	0.05	106
PE075429.012	LB060032.030	Filterable Reactive Phosphorus	mg/L	0.002	0.099	0.039	0.05	119

Fluoride by Ion Selective Electrode in Water

Method: ME-(AU)-[ENV]AN141

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
PE075301.001	LB060212.004	Fluoride by ISE	mg/L	0.1	1.2	0.8	0.5	78
PE075398.001	LB060212.029	Fluoride by ISE	mg/L	0.1	0.6	<0.1	0.5	102

Mercury (dissolved) in Water

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
PE075344.003	LB060277.004	Mercury	mg/L	0.00005	0.0024	0	0.0025	120

Metals in Water (Dissolved) by ICPOES

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
PE075425.001	LB060176.004	Calcium, Ca	mg/L	0.2	310	160	200	77
		Magnesium, Mg	mg/L	0.1	230	49	200	90
		Potassium, K	mg/L	0.1	27	8.2	20	96
		Silicon, Si	mg/L	0.02	17	15	2	87
		Sodium, Na	mg/L	0.5	420	280	200	71

Sulphate in water

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
PE075373.001	LB060097.012	Sulphate	mg/L	1	170	76	100	94
PE075381.012	LB060097.032	Sulphate	mg/L	1	97	<1	100	97

Trace Metals (Dissolved) in Water by ICPMS

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
PE075376.001	LB060179.004	Arsenic, As	µg/L	1	10	0.407105	10	94
		Cadmium, Cd	µg/L	0.1	9.2	0.015736	10	92
		Chromium, Cr	µg/L	1	11	1.305448	10	101
		Copper, Cu	µg/L	1	64	56.713463	10	75
		Iron, Fe	µg/L	5	13	3.6	10	90
		Lead, Pb	µg/L	1	10	0.2646	10	101
		Manganese, Mn	µg/L	1	10	0.26393	10	99
		Nickel, Ni	µg/L	1	10	0.204747	10	99
		Zinc, Zn	µg/L	5	74	64.243586	10	101

Trace Metals (Total) in Water by ICPMS

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
PE075425.001	LB060182.004	Total Aluminium	µg/L	5	9600	10000	5	-
		Total Iron	µg/L	5	12000	14000	5	-

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

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

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

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

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

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here:
http://www.au.sgs.com/sgs-mp-au-env-qu-022-qa-qc-plan-en-11.pdf

*	Non-accredited analysis.
-	Sample not analysed for this analyte.
^	Analysis performed by external laboratory.

IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

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

ERM

☐ Sydney
☐ Melbourne
☐ Brisbane
☐ Perth
☐ Hunter Valley
☐ North Coast
☐ Other

Grnd Floor, 33 Saunders Street, Pyrmont, NSW, 2009. (ph) 02 8584 8888 (fax) 02 8584 8800
Level 3, Yarra Tower, WTC, 18-38 Siddeley Street, Docklands, VIC, 3005. (ph) 03 9696 8011 (fax) 03 9696 8022
Level 1, 60 Leichhardt Street, Spring Hill, QLD, 4004. (ph) 07 3839 8393 (fax) 07 3839 8381
Level 6, Grain Pool Bld, 172 St Georges Tce, WA, 6850. (ph) 08 9321 5200 (fax) 08 9321 5262
53 Bonville Avenue, Thornton, NSW, 2322. (ph) 02 4964 2150 (fax) 02 4964 2152
Suite 3/146 Gordon Street, Port Macquarie, NSW, 2444. (ph) 02 6584 7155 (fax) 02 6584 7160

Project No: 0086269
Project Name: ~~YNPL~~ YARA TANPF
Project Location: Burrup
Project Manager: Sean Scaife
Sampler: James Garshon

COC Number: A 06995
Laboratory: SGS

General Analysis Requirements — Yes (tick)

1. Turn Around Time (please tick: ☐ 1 Day ☐ 2 Days ☐ 3 Days ☑ Normal TAT)
2. Do you wish any sediment layers in water to be exluded from extractions?
3. Additional QA/QC reported where sample batches are < 10 samples?
4. % of extraneous material removed from samples to be reported as per NEPM 5.1.1?

Laboratory Number	Sample ID	Sample Depth	Sample Date	Sample Time	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Preservation: Filter	Preservation: Other	Containers (number/type)	BTEX	TPH (C6-C9 P & T) + TPH (C10-C36)	Speciated TPH	VOC Scan (USEPA 8260 List)	SVOC Scan (USEPA 8270 List)	OC OP Pesticides	PAH	Phenols	PCB	Metals* (dissolved / total)	ENV12416	Major Anions/cations	Other Comments on sample
1	MW01					X		X				5× plastic											X		PE076727
2	MW02					X		X															X		
3	MW03					X		X															X		
4	MW04					X		X															X		
5	MW05					X		X															X		
6	DUP01					X		X															X		
7	RIN01					X		X				3× plastic										X		X	dissolved and total
8	Trip Blank					X						2	X													

Comments: Invoice and results to sean.scaife@erm.com, james.garshon@erm.com

*Metals (circle): As Cd Cr Cu Hg Ni Pb Zn

Relinquished by: David Richards — Signed: — Date/Time: 17-4-13 2:15pm — Received by: Alex Dickinson — Date/Time: 18/4/13 10am

Relinquished by: — Signed: — Date/Time: — Received by: — Date/Time:

SGS

AUSTRALIA-ENVIRONMENTAL-PERTH AIRPORT- PROFORMA -QU101

REGISTRATION DETAILS

APPROVED BY: R. MA

Bottle Map Sample Numbers:	1L Plastic Green	500mL Plastic Green	500mL Plastic Purple	500mL Amber Green	250mL Plastic Green	125mL Plastic Red	1L Amber Green	500mL Amber Orange	100mL Amber Green	40mL Glass Vial White	40mL Glass Vial HAA	500mL Plastic Blue	250mL Plastic Orange	125mL Plastic Brown	250mL Glass Jar	125mL Glass Jar	1L Plastic Yellow	Other Lab	Ziplock Bag/ Other
1-6	1				1	2											1		
7					1	2													
8										2									

Job Number: PE076727

# of Eskies: 2 Eskies

~~IB~~ / ICE / ~~None~~

Temp: 18.4 °C

Tray Numbers: W-164-165

Registration comments:

Received extra sample labelled as Trip Blank.
Bottles are 2x40ml VOC vials.

Action Taken:

- Book in for BTEX & C_6-C_9 as per HM.

Registered By: DB 18/4/13

SAMPLE RECEIPT ADVICE

PE076727

CLIENT DETAILS

Contact	Sean Scaife
Client	ERM Australia Pty Ltd
Address	PO Box 7338 Cloisters Square Level 6, Grain Pool Bld, 172 St Georges Tce PERTH WA 6850
Telephone	08 9321 5200
Facsimile	08 9321 5262
Email	sean.scaife@erm.com
Project	**0086269 YARA TANPF Burrup**
Order Number	**A06995**
Samples	8

LABORATORY DETAILS

Manager	Ros Ma
Laboratory	SGS Newburn Environmental
Address	10 Reid Rd Newburn WA 6105
Telephone	(08) 9373 3500
Facsimile	(08) 9373 3556
Email	au.environmental.perth@sgs.com
Samples Received	Thu 18/4/2013
Report Due	Fri 26/4/2013
SGS Reference	**PE076727**

SUBMISSION DETAILS

This is to confirm that 8 samples were received on Thursday 18/4/2013. Results are expected to be ready by Friday 26/4/2013. Please quote SGS reference PE076727 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Sample counts by matrix	8 Water	Type of documentation received	COC
Date documentation received	18/4/2013	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	18°C
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice	Samples clearly labelled	Yes
Complete documentation received	Yes	Number of eskies/boxes received	2

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

COMMENTS

SAMPLE RECEIPT ADVICE

PE076727

CLIENT DETAILS

Client	ERM Australia Pty Ltd	Project	0086269 YARA TANPF Burrup

SUMMARY OF ANALYSIS

No.	Sample ID	Acidity and Free CO2	Alkalinity	Chloride by Discrete Analyser in Water	Colour by Discrete Analyser	Fluoride by Ion Selective Electrode in Water	Nitrate Nitrogen and Nitrite Nitrogen (NOx) by FIA	Sulphate in water	Sulphide by Titration in Water	Total and Volatile Suspended Solids (TSS /
001	MW01	1	3	1	1	1	5	1	1	1
002	MW02	1	3	1	1	1	5	1	1	1
003	MW03	1	3	1	1	1	5	1	1	1
004	MW04	1	3	1	1	1	5	1	1	1
005	MW05	1	3	1	1	1	5	1	1	1
006	DUP01	1	3	1	1	1	5	1	1	1
007	RIN01	-	3	1	-	-	-	1	-	-

CONTINUED OVERLEAF

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

SAMPLE RECEIPT ADVICE

PE076727

CLIENT DETAILS

Client	ERM Australia Pty Ltd	Project	0086269 YARA TANPF Burrup

SUMMARY OF ANALYSIS

No.	Sample ID	Filterable Reactive Phosphorus (FRP)	Low Level Ammonia Nitrogen by FIA	Mercury (dissolved) in Water	Mercury (total) in Water	Metals in Water (Dissolved) by ICPOES	TKN Kjeldahl Digestion by Discrete Analyser	Total Phosphorus by Kjeldahl Digestion DA in	Trace Metals (Dissolved) in Water by ICPMS	Trace Metals (Total) in Water by ICPMS	Volatile Petroleum Hydrocarbons in Water
001	MW01	1	2	-	-	6	2	1	11	2	-
002	MW02	1	2	-	-	6	2	1	11	2	-
003	MW03	1	2	-	-	6	2	1	11	2	-
004	MW04	1	2	-	-	6	2	1	11	2	-
005	MW05	1	2	-	-	6	2	1	11	2	-
006	DUP01	1	2	-	-	6	2	1	11	2	-
007	RIN01	-	-	1	1	4	-	-	7	7	-
008	Trip Blank	-	-	-	-	-	-	-	-	-	5

CONTINUED OVERLEAF

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

SAMPLE RECEIPT ADVICE

PE076727

CLIENT DETAILS

Client	ERM Australia Pty Ltd	Project	0086269 YARA TANPF Burrup

SUMMARY OF ANALYSIS

No.	Sample ID	VOCs in Water
008	Trip Blank	11

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

ANALYTICAL REPORT

WORLD RECOGNISED ACCREDITATION

CLIENT DETAILS

Contact	Sean Scaife
Client	ERM Australia Pty Ltd
Address	PO Box 7338 Cloisters Square Level 6, Grain Pool Bld, 172 St Georges Tce PERTH WA 6850
Telephone	08 9321 5200
Facsimile	08 9321 5262
Email	sean.scaife@erm.com
Project	**0086269 YARA TANPF Burrup**
Order Number	**A06995**
Samples	8

LABORATORY DETAILS

Manager	Ros Ma
Laboratory	SGS Newburn Environmental
Address	10 Reid Rd Newburn WA 6105
Telephone	(08) 9373 3500
Facsimile	(08) 9373 3556
Email	au.environmental.perth@sgs.com
SGS Reference	**PE076727 R0**
Report Number	0000060075
Date Reported	30 Apr 2013
Date Received	18 Apr 2013

COMMENTS

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

Samples were diluted due to high conductivity for metals. Hence the LORs were raised.

SIGNATORIES

Leanne Orsmond
Inorganics Coordinator

Lien Tang
Project Manager

Michael McKay
Inorganic Team Leader - Waters

Ohmar David
Metals Chemist

Orla Brady
Organic Supervisor (VOC/TRH)

Ros Ma
Laboratory Manager

Parameter	Units	LOR	Sample Number: PE076727.001 Sample Matrix: Water Sample Date: 17 Apr 2013 Sample Name: MW01	PE076727.002 Water 17 Apr 2013 MW02	PE076727.003 Water 17 Apr 2013 MW03	PE076727.004 Water 17 Apr 2013 MW04
Total and Volatile Suspended Solids (TSS / VSS) Method: AN114						
Total Suspended Solids Dried at 105°C	mg/L	5	**16**	**290**	**470**	**210**
Acidity and Free CO2 Method: AN140						
Acidity to pH 8.3	mg CaCO3/L	5	**46**	**44**	**91**	**21**
Alkalinity Method: AN135						
Total Alkalinity as CaCO3	mg/L	5	**290**	**340**	**560**	**390**
Carbonate Alkalinity as CO3	mg/L	1	<1	<1	<1	<1
Bicarbonate Alkalinity as HCO3	mg/L	5	**350**	**410**	**680**	**470**
Colour by Discrete Analyser Method: AN285						
Colour (True)	Hazen	1	<1	<1	**17**	<1
Fluoride by Ion Selective Electrode in Water Method: AN141						
Fluoride by ISE	mg/L	0.1	**0.4**	**0.6**	**1.0**	**0.4**
Chloride by Discrete Analyser in Water Method: AN274						
Chloride	mg/L	1	**560**	**1100**	**28000**	**4700**
Sulphate in water Method: AN275						
Sulphate	mg/L	1	**120**	**200**	**1400**	**440**
Sulphide by Titration in Water Method: AN149						
Sulphide	mg/L	0.5	<0.5	<0.5	<0.5	<0.5
Nitrate Nitrogen and Nitrite Nitrogen (NOx) by FIA Method: AN258						
Nitrate, NO_3 as NO_3	mg/L	0.05	**9.7**	**2.3**	**0.14**	**1.0**
Nitrate/Nitrite Nitrogen, NOx as N	mg/L	0.005	**2.2**	**0.51**	**0.031**	**0.24**
Nitrite Nitrogen, NO_2 as N	mg/L	0.005	**0.022**	<0.005	<0.005	<0.005
Nitrate Nitrogen, NO_3 as N	mg/L	0.005	**2.2**	**0.51**	**0.031**	**0.24**
Nitrite, NO_2 as NO_2	mg/L	0.05	**0.07**	<0.05	<0.05	<0.05

Parameter	Units	LOR	Sample Number: PE076727.001 Sample Matrix: Water Sample Date: 17 Apr 2013 Sample Name: MW01	PE076727.002 Water 17 Apr 2013 MW02	PE076727.003 Water 17 Apr 2013 MW03	PE076727.004 Water 17 Apr 2013 MW04
Low Level Ammonia Nitrogen by FIA Method: AN261						
Ammonia Nitrogen, NH_3 as N	mg/L	0.005	<0.005	<0.005	**0.77**	<0.005
Ammonia, NH_3	mg/L	0.005	<0.005	<0.005	**0.94**	<0.005
TKN Kjeldahl Digestion by Discrete Analyser Method: AN281						
Total Kjeldahl Nitrogen	mg/L	0.05	**0.15**	**0.21**	**1.5**	**0.49**
Total Nitrogen (calc)	mg/L	0.05	**2.4**	**0.72**	**1.5**	**0.73**
Total Phosphorus by Kjeldahl Digestion DA in Water Method: AN279/AN293						
Total Phosphorus (Kjeldahl Digestion)	mg/L	0.01	**0.02**	**0.10**	**0.16**	**0.05**
Filterable Reactive Phosphorus (FRP) Method: AN278						
Filterable Reactive Phosphorus	mg/L	0.002	**0.004**	**0.003**	**0.006**	**0.010**
Metals in Water (Dissolved) by ICPOES Method: AN320/AN321						
Calcium, Ca	mg/L	0.2	**160**	**160**	**350**	**94**
Magnesium, Mg	mg/L	0.1	**49**	**100**	**910**	**190**
Potassium, K	mg/L	0.1	**8.2**	**23**	**340**	**120**
Silica, Soluble	mg/L	0.05	**33**	**28**	**30**	**23**
Silicon, Si	mg/L	0.02	**16**	**13**	**14**	**11**
Sodium, Na	mg/L	0.5	**270**	**610**	**8000**	**2600**
Trace Metals (Dissolved) in Water by ICPMS Method: AN318						
Aluminium, Al	µg/L	5	<5	<5	**72**	**31**
Arsenic, As	µg/L	1	<1	<1	<10↑	<5↑
Cadmium, Cd	µg/L	0.1	**0.4**	**0.3**	<1.0↑	<0.5↑
Chromium, Cr	µg/L	1	<1	<1	<10↑	<5↑
Copper, Cu	µg/L	1	**1**	<1	<10↑	<5↑
Iron, Fe	µg/L	5	<5	<5	**520**	<25↑
Lead, Pb	µg/L	1	<1	<1	<10↑	<5↑
Manganese, Mn	µg/L	1	**87**	**12**	**1700**	**120**
Nickel, Ni	µg/L	1	<1	<1	<10↑	<5↑
Selenium, Se	µg/L	2	<2	<2	<20↑	<10↑
Zinc, Zn	µg/L	5	**10**	**12**	<50↑	<25↑
Mercury (dissolved) in Water Method: AN311/AN312						
Mercury	mg/L	0.00005	-	-	-	-

Parameter	Units	LOR	Sample Number: PE076727.001 Sample Matrix: Water Sample Date: 17 Apr 2013 Sample Name: MW01	PE076727.002 Water 17 Apr 2013 MW02	PE076727.003 Water 17 Apr 2013 MW03	PE076727.004 Water 17 Apr 2013 MW04
Trace Metals (Total) in Water by ICPMS Method: AN318						
Total Aluminium	µg/L	5	**330**	**3500**	**14000**	**4400**
Total Arsenic	µg/L	1	-	-	-	-
Total Cadmium	µg/L	0.1	-	-	-	-
Total Chromium	µg/L	1	-	-	-	-
Total Copper	µg/L	1	-	-	-	-
Total Iron	µg/L	5	**390**	**5200**	**21000**	**7400**
Total Lead	µg/L	1	-	-	-	-
Total Nickel	µg/L	1	-	-	-	-
Total Zinc	µg/L	5	-	-	-	-
Mercury (total) in Water Method: AN311/AN312						
Total Mercury	mg/L	0.0001	-	-	-	-
Volatile Petroleum Hydrocarbons in Water Method: AN433/AN434/AN410						
TRH C6-C9	µg/L	40	-	-	-	-
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	-	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-	-	-	-	-
d8-toluene (Surrogate)	%	-	-	-	-	-
Bromofluorobenzene (Surrogate)	%	-	-	-	-	-
VOCs in Water Method: AN433/AN434						
Monocyclic Aromatic Hydrocarbons						
Benzene	µg/L	0.5	-	-	-	-
Toluene	µg/L	0.5	-	-	-	-
Ethylbenzene	µg/L	0.5	-	-	-	-
m/p-xylene	µg/L	1	-	-	-	-
o-xylene	µg/L	0.5	-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	PE076727.001 Water 17 Apr 2013 MW01	PE076727.002 Water 17 Apr 2013 MW02	PE076727.003 Water 17 Apr 2013 MW03	PE076727.004 Water 17 Apr 2013 MW04
VOCs in Water Method: AN433/AN434 (continued)							
Oxygenated Compounds							
MtBE (Methyl-tert-butyl ether)	µg/L	0.5		-	-	-	-
Polycyclic VOCs							
Naphthalene	µg/L	0.5		-	-	-	-
Surrogates							
Dibromofluoromethane (Surrogate)	%	-		-	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-		-	-	-	-
d8-toluene (Surrogate)	%	-		-	-	-	-
Bromofluorobenzene (Surrogate)	%	-		-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name PE076727.005 Water 17 Apr 2013 MW05	PE076727.006 Water 17 Apr 2013 DUP01	PE076727.007 Water 17 Apr 2013 RIN01	PE076727.008 Water 17 Apr 2013 Trip Blank
Total and Volatile Suspended Solids (TSS / VSS) Method: AN114						
Total Suspended Solids Dried at 105°C	mg/L	5	**1600**	**1400**	-	-
Acidity and Free CO2 Method: AN140						
Acidity to pH 8.3	mg CaCO3/L	5	**58**	**57**	-	-
Alkalinity Method: AN135						
Total Alkalinity as CaCO3	mg/L	5	**170**	**170**	<5	-
Carbonate Alkalinity as CO3	mg/L	1	<1	<1	<1	-
Bicarbonate Alkalinity as HCO3	mg/L	5	**210**	**210**	<5	-
Colour by Discrete Analyser Method: AN285						
Colour (True)	Hazen	1	<1	<1	-	-
Fluoride by Ion Selective Electrode in Water Method: AN141						
Fluoride by ISE	mg/L	0.1	**0.4**	**0.4**	-	-
Chloride by Discrete Analyser in Water Method: AN274						
Chloride	mg/L	1	**58000**	**56000**	<1	-
Sulphate in water Method: AN275						
Sulphate	mg/L	1	**3300**	**3400**	<1	-
Sulphide by Titration in Water Method: AN149						
Sulphide	mg/L	0.5	<0.5	<0.5	-	-
Nitrate Nitrogen and Nitrite Nitrogen (NOx) by FIA Method: AN258						
Nitrate, NO_3 as NO_3	mg/L	0.05	**6.9**	**6.9**	-	-
Nitrate/Nitrite Nitrogen, NOx as N	mg/L	0.005	**1.6**	**1.6**	-	-
Nitrite Nitrogen, NO_2 as N	mg/L	0.005	<0.005	<0.005	-	-
Nitrate Nitrogen, NO_3 as N	mg/L	0.005	**1.6**	**1.6**	-	-
Nitrite, NO_2 as NO_2	mg/L	0.05	<0.05	<0.05	-	-

Parameter	Units	LOR	Sample Number: PE076727.005 Sample Matrix: Water Sample Date: 17 Apr 2013 Sample Name: MW05	Sample Number: PE076727.006 Sample Matrix: Water Sample Date: 17 Apr 2013 Sample Name: DUP01	Sample Number: PE076727.007 Sample Matrix: Water Sample Date: 17 Apr 2013 Sample Name: RIN01	Sample Number: PE076727.008 Sample Matrix: Water Sample Date: 17 Apr 2013 Sample Name: Trip Blank
Low Level Ammonia Nitrogen by FIA Method: AN261						
Ammonia Nitrogen, NH_3 as N	mg/L	0.005	<0.005	<0.005	-	-
Ammonia, NH_3	mg/L	0.005	<0.005	<0.005	-	-
TKN Kjeldahl Digestion by Discrete Analyser Method: AN281						
Total Kjeldahl Nitrogen	mg/L	0.05	**1.0**	**0.98**	-	-
Total Nitrogen (calc)	mg/L	0.05	**2.6**	**2.5**	-	-
Total Phosphorus by Kjeldahl Digestion DA in Water Method: AN279/AN293						
Total Phosphorus (Kjeldahl Digestion)	mg/L	0.01	**0.16**	**0.16**	-	-
Filterable Reactive Phosphorus (FRP) Method: AN278						
Filterable Reactive Phosphorus	mg/L	0.002	**0.014**	**0.012**	-	-
Metals in Water (Dissolved) by ICPOES Method: AN320/AN321						
Calcium, Ca	mg/L	0.2	**740**	**740**	<0.2	-
Magnesium, Mg	mg/L	0.1	**2900**	**2900**	<0.1	-
Potassium, K	mg/L	0.1	**1400**	**1400**	<0.1	-
Silica, Soluble	mg/L	0.05	**13**	**13**	-	-
Silicon, Si	mg/L	0.02	**6.0**	**6.0**	-	-
Sodium, Na	mg/L	0.5	**33000**	**33000**	<0.5	-
Trace Metals (Dissolved) in Water by ICPMS Method: AN318						
Aluminium, Al	µg/L	5	**300**	**330**	-	-
Arsenic, As	µg/L	1	<50↑	<50↑	<1	-
Cadmium, Cd	µg/L	0.1	<5.0↑	<5.0↑	<0.1	-
Chromium, Cr	µg/L	1	<50↑	<50↑	<1	-
Copper, Cu	µg/L	1	<50↑	<50↑	<1	-
Iron, Fe	µg/L	5	<250↑	<250↑	-	-
Lead, Pb	µg/L	1	<50↑	<50↑	<1	-
Manganese, Mn	µg/L	1	<50↑	<50↑	-	-
Nickel, Ni	µg/L	1	<50↑	<50↑	<1	-
Selenium, Se	µg/L	2	<100↑	<100↑	-	-
Zinc, Zn	µg/L	5	<250↑	<250↑	**8**	-
Mercury (dissolved) in Water Method: AN311/AN312						
Mercury	mg/L	0.00005	-	-	<0.00005	-

Parameter	Units	LOR	Sample Number: PE076727.005 Sample Matrix: Water Sample Date: 17 Apr 2013 Sample Name: MW05	PE076727.006 Water 17 Apr 2013 DUP01	PE076727.007 Water 17 Apr 2013 RIN01	PE076727.008 Water 17 Apr 2013 Trip Blank
Trace Metals (Total) in Water by ICPMS Method: AN318						
Total Aluminium	µg/L	5	**33000**	**30000**	-	-
Total Arsenic	µg/L	1	-	-	<1	-
Total Cadmium	µg/L	0.1	-	-	<0.1	-
Total Chromium	µg/L	1	-	-	<1	-
Total Copper	µg/L	1	-	-	<1	-
Total Iron	µg/L	5	**44000**	**41000**	-	-
Total Lead	µg/L	1	-	-	<1	-
Total Nickel	µg/L	1	-	-	<1	-
Total Zinc	µg/L	5	-	-	**10**	-
Mercury (total) in Water Method: AN311/AN312						
Total Mercury	mg/L	0.0001	-	-	<0.0001	-
Volatile Petroleum Hydrocarbons in Water Method: AN433/AN434/AN410						
TRH C6-C9	µg/L	40	-	-	-	<40
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	-	-	-	**99**
d4-1,2-dichloroethane (Surrogate)	%	-	-	-	-	**97**
d8-toluene (Surrogate)	%	-	-	-	-	**120**
Bromofluorobenzene (Surrogate)	%	-	-	-	-	**123**
VOCs in Water Method: AN433/AN434						
Monocyclic Aromatic Hydrocarbons						
Benzene	µg/L	0.5	-	-	-	<0.5
Toluene	µg/L	0.5	-	-	-	<0.5
Ethylbenzene	µg/L	0.5	-	-	-	<0.5
m/p-xylene	µg/L	1	-	-	-	<1
o-xylene	µg/L	0.5	-	-	-	<0.5

Parameter	Units	LOR	Sample Number: PE076727.005 Sample Matrix: Water Sample Date: 17 Apr 2013 Sample Name: MW05	PE076727.006 Water 17 Apr 2013 DUP01	PE076727.007 Water 17 Apr 2013 RIN01	PE076727.008 Water 17 Apr 2013 Trip Blank
VOCs in Water Method: AN433/AN434 (continued)						
Oxygenated Compounds						
MtBE (Methyl-tert-butyl ether)	µg/L	0.5	-	-	-	<0.5
Polycyclic VOCs						
Naphthalene	µg/L	0.5	-	-	-	<0.5
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	-	-	-	**99**
d4-1,2-dichloroethane (Surrogate)	%	-	-	-	-	**97**
d8-toluene (Surrogate)	%	-	-	-	-	**120**
Bromofluorobenzene (Surrogate)	%	-	-	-	-	**123**

QC SUMMARY

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

Acidity and Free CO2 Method: ME-(AU)-[ENV]AN140

Parameter	QC Reference	Units	LOR	MB	DUP %RPD
Acidity to pH 8.3	LB062657	mg CaCO3/L	5	<5	1%

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Total Alkalinity as CaCO3	LB062656	mg/L	5	<5	0%	91%
Carbonate Alkalinity as CO3	LB062656	mg/L	1	<1		
Bicarbonate Alkalinity as HCO3	LB062656	mg/L	5	<5		

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Chloride	LB062899	mg/L	1	<1	1 - 5%	101%	93 - 96%

Colour by Discrete Analyser Method: ME-(AU)-[ENV]AN285

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Colour (True)	LB062679	Hazen	1	<1	0%	98 - 101%

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Filterable Reactive Phosphorus	LB062623	mg/L	0.002	<0.002	0 - 4%	108%	115%

Fluoride by Ion Selective Electrode in Water Method: ME-(AU)-[ENV]AN141

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Fluoride by ISE	LB062935	mg/L	0.1	<0.1	0 - 3%	104%	106%
	LB063107	mg/L	0.1	<0.1	0 - 6%	100%	104 - 110%

QC SUMMARY

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

Low Level Ammonia Nitrogen by FIA **Method: ME-(AU)-[ENV]AN261**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Ammonia Nitrogen, NH_3 as N	LB063004	mg/L	0.005	<0.005	0%	93 - 96%
Ammonia, NH_3	LB063004	mg/L	0.005	<0.005	0%	93 - 96%

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Mercury	LB062798	mg/L	0.00005	<0.00005	0%	106%	94%

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Total Mercury	LB062795	mg/L	0.0001	<0.0001	0%	106%	101%

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Calcium, Ca	LB062598	mg/L	0.2	<0.2	0 - 5%	96%	
Magnesium, Mg	LB062598	mg/L	0.1	<0.1	0 - 4%	98%	
Potassium, K	LB062598	mg/L	0.1	<0.1	0 - 4%	109%	
Silica, Soluble	LB062598	mg/L	0.05	<0.05			
Silicon, Si	LB062598	mg/L	0.02	<0.02	4%	105%	
Sodium, Na	LB062598	mg/L	0.5	<0.5	0 - 5%	101%	105%

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Nitrate, NO_3 as NO_3	LB063004	mg/L	0.05	<0.05		
Nitrate/Nitrite Nitrogen, NOx as N	LB063004	mg/L	0.005	<0.005	0 - 38%	99 - 113%
Nitrite Nitrogen, NO_2 as N	LB063004	mg/L	0.005	<0.005	0%	97 - 99%
Nitrate Nitrogen, NO_3 as N	LB063004	mg/L	0.005	<0.005		
Nitrite, NO_2 as NO_2	LB063004	mg/L	0.05	<0.05		

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

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Sulphate	LB062899	mg/L	1	<1	0 - 4%	98 - 101%	99 - 110%

Sulphide by Titration in Water **Method: ME-(AU)-[ENV]AN149**

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Sulphide	LB062681	mg/L	0.5	<0.5	92%

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Total Kjeldahl Nitrogen	LB062640	mg/L	0.05	<0.05	3 - 10%	101%

Total and Volatile Suspended Solids (TSS / VSS) **Method: ME-(AU)-[ENV]AN114**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Total Suspended Solids Dried at 105°C	LB062689	mg/L	5	<5	4%	100%

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Total Phosphorus (Kjeldahl Digestion)	LB062640	mg/L	0.01	<0.01	1 - 11%	96%

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Aluminium, Al	LB062606	µg/L	5	<5		104%	77%
Arsenic, As	LB062606	µg/L	1	<1	0%	98%	103%
Cadmium, Cd	LB062606	µg/L	0.1	<0.1	0%	95%	87%
Chromium, Cr	LB062606	µg/L	1	<1	0%	100%	99%
Copper, Cu	LB062606	µg/L	1	<1	0%	97%	83%
Iron, Fe	LB062606	µg/L	5	<5		105%	98%
Lead, Pb	LB062606	µg/L	1	<1	0%	105%	87%
Manganese, Mn	LB062606	µg/L	1	<1		99%	107%
Nickel, Ni	LB062606	µg/L	1	<1	0%	99%	85%
Selenium, Se	LB062606	µg/L	2	<2		112%	107%
Zinc, Zn	LB062606	µg/L	5	<5	2%	96%	85%

QC SUMMARY

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

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Total Aluminium	LB062610	µg/L	5	<5	14%	120%	94%
Total Arsenic	LB062610	µg/L	1	<1	0%	96%	
Total Cadmium	LB062610	µg/L	0.1	<0.1	0%	111%	
Total Chromium	LB062610	µg/L	1	<1	0%	116%	
Total Copper	LB062610	µg/L	1	<1	0%	119%	
Total Iron	LB062610	µg/L	5	<5	7%	108%	
Total Lead	LB062610	µg/L	1	<1	0%	113%	
Total Nickel	LB062610	µg/L	1	<1	0%	93%	
Total Zinc	LB062610	µg/L	5	<5	13%	96%	

VOCs in Water Method: ME-(AU)-[ENV]AN433/AN434

Monocyclic Aromatic Hydrocarbons

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Benzene	LB062719	µg/L	0.5	<0.5	111%
Toluene	LB062719	µg/L	0.5	<0.5	107%
Ethylbenzene	LB062719	µg/L	0.5	<0.5	101%
m/p-xylene	LB062719	µg/L	1	<1	
o-xylene	LB062719	µg/L	0.5	<0.5	

Oxygenated Compounds

Parameter	QC Reference	Units	LOR	MB
MtBE (Methyl-tert-butyl ether)	LB062719	µg/L	0.5	<0.5

Polycyclic VOCs

Parameter	QC Reference	Units	LOR	MB
Naphthalene	LB062719	µg/L	0.5	<0.5

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Dibromofluoromethane (Surrogate)	LB062719	%	-	100%	119%
d4-1,2-dichloroethane (Surrogate)	LB062719	%	-	101%	119%
d8-toluene (Surrogate)	LB062719	%	-	108%	129%
Bromofluorobenzene (Surrogate)	LB062719	%	-	104%	124%

QC SUMMARY

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

Volatile Petroleum Hydrocarbons in Water **Method: ME-(AU)-[ENV]AN433/AN434/AN410**

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
TRH C6-C9	LB062719	µg/L	40	<40	99%

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Dibromofluoromethane (Surrogate)	LB062719	%	-	100%	119%
d4-1,2-dichloroethane (Surrogate)	LB062719	%	-	101%	119%
d8-toluene (Surrogate)	LB062719	%	-	108%	129%
Bromofluorobenzene (Surrogate)	LB062719	%	-	104%	124%

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN114	Total Suspended and Volatile Suspended Solids: The sample is homogenised by shaking and a known volume is filtered through a pre-weighed GF/C filter paper and washed well with deionised water. The filter paper is dried and reweighed. The TSS is the residue retained by the filter per unit volume of sample. Reference APHA 2540 D. Internal Reference AN114
AN135	Alkalinity (and forms of) by Titration: The sample is titrated with standard acid to pH 8.3 (P titre) and pH 4.5 (T titre) and permanent and/or total alkalinity calculated. The results are expressed as equivalents of calcium carbonate or recalculated as bicarbonate, carbonate and hydroxide. Reference APHA 2320. Internal Reference AN135
AN135	Free and Total Carbon Dioxide may be calculated using alkalinity forms only when the samples TDS is <500mg/L. If TDS is >500mg/L free or total carbon dioxide cannot be reported. APHA4500CO2 D.
AN140	Acidity by Tritration: The water sample is titrated with sodium hydroxide to designated pH end point. In a sample containing only carbon dioxide, bicarbonates and carbonates, titration to pH 8.3 at 25°C corresponds to stoichiometric neutralisation of carbonic acid to bicarbonate. Method reference APHA 2310 B.
AN141	Determination of Fluoride by ISE: A fluoride ion selective electrode and reference electrode combination, in the presence of a pH/complexation buffer, is used to determine the fluoride concentration. The electrode millivolt response is measured logarithmically against fluoride concentration. Reference APHA F- C.
AN149	Sulphide by Iodometric Titration: Sulphide is precipitated as zinc sulphide to overcome interferences with sulphite and thiosulphate. After filtration, sulphide is determined titrimetrically. Reference APHA 4500-S2-
AN258	Nitrate and Nitrite by FIA: In an acidic medium, nitrate is reduced quantitatively to nitrite by cadmium metal. This nitrite plus any original nitrite is determined as an intense red-pink azo dye at 540 nm following diazotisation with sulphanilamide and subsequent coupling with N-(1-naphthyl) ethylenediamine dihydrochloride. Without the cadmium reduction only the original nitrite is determined. Reference APHA 4500-NO3- F.
AN261	Ammonia by Continuous Flow Analyser: Ammonium in a basic medium forms ammonia gas, which is separated from the sample matrix by diffusion through a polypropylene membrane. The ammonia is reacted with phenol and hypochlorite to form indophenol blue at an intensity proportional to the ammonia concentration. The blue colour is intensified with sodium nitroprusside and the absorbance measured at 630 nm. The sensitivity of the automated method is 10-20 times that of the macro method. Reference APHA 4500-NH3 H.
AN274	Chloride by Aquakem DA: Chloride reacts with mercuric thiocyanate forming a mercuric chloride complex. In the presence of ferric iron, highly coloured ferric thiocyanate is formed which is proportional to the chloride concentration. Reference APHA 4500Cl-
AN275	Sulphate by Aquakem DA: Sulphate is precipitated in an acidic medium with barium chloride. The resulting turbidity is measured photometrically at 405nm and compared with standard calibration solutions to determine the sulphate concentration in the sample. Reference APHA 4500-SO42-. Internal reference AN275.
AN278	Reactive Phosphorus by DA: Orthophosphate reacts with ammonium molybdate (Mo VI) and potassium antimonyl tartrate (Sb III) in acid medium to form an antimony-phosphomolybdate complex. This complex is subsequently reduced with ascorbic acid to form a blue colour and the absorbance is read at 880 nm. The sensitivity of the automated method is 10-20 times that of the macro method. Reference APHA 4500-P F
AN279/AN293	The sample is digested with Sulphuric acid, K2SO4 and CuSO4. All forms of phosphorus are converted into orthophosphate. The digest is cooled and placed on the discrete analyser for colorimetric analysis.

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN281	An unfiltered water or soil sample is first digested in a block digestor with sulphuric acid, K2SO4 and CuSO4. The ammonia produced following digestion is then measured colourimetrically using the Aquakem 250 Discrete Analyser. A portion of the digested sample is buffered to an alkaline pH, and interfering cations are complexed. The ammonia then reacts with salicylate and hypochlorite to give a blue colour whose absorbance is measured at 660nm and compared with calibration standards. This is proportional to the concentration of Total Kjeldahl Nitrogen in the original sample.
AN285	The term 'colour' is used here to mean true colour, that is, the colour of water from which turbidity has been removed. The term 'apparent colour' includes not only colour due to substances in solution, but also that due to suspended matter. Apparent colour is determined on the original sample without filtration.
AN311/AN312	Mercury by Cold Vapour AAS in Waters: Mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500.
AN318	Determination of elements at trace level in waters by ICP-MS technique, in accordance with USEPA 6020A.
AN320/AN321	Metals by ICP-OES: Samples are preserved with 10% nitric acid for a wide range of metals and some non-metals. This solution is measured by Inductively Coupled Plasma. Solutions are aspirated into an argon plasma at 8000-10000K and emit characteristic energy or light as a result of electron transitions through unique energy levels. The emitted light is focused onto a diffraction grating where it is separated into components.
AN320/AN321	Photomultipliers or CCDs are used to measure the light intensity at specific wavelengths. This intensity is directly proportional to concentration. Corrections are required to compensate for spectral overlap between elements. Reference APHA 3120 B.
AN433/AN434	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
AN433/AN434/AN410	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

FOOTNOTES

IS	Insufficient sample for analysis.	LOR	Limit of Reporting
LNR	Sample listed, but not received.	↑↓	Raised or Lowered Limit of Reporting
*	This analysis is not covered by the scope of accreditation.	QFH	QC result is above the upper tolerance
		QFL	QC result is below the lower tolerance
**	Indicative data, theoretical holding time exceeded.	-	The sample was not analysed for this analyte
^	Performed by outside laboratory.	NVL	Not Validated

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

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

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here:
http://www.sgs.com.au.pv.sgsv3/~/media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

STATEMENT OF QA/QC PERFORMANCE

PE076727 R0

CLIENT DETAILS

Contact	Sean Scaife
Client	ERM Australia Pty Ltd
Address	PO Box 7338 Cloisters Square Level 6, Grain Pool Bld, 172 St Georges Tce PERTH WA 6850
Telephone	08 9321 5200
Facsimile	08 9321 5262
Email	sean.scaife@erm.com
Project	**0086269 YARA TANPF Burrup**
Order Number	**A06995**
Samples	8

LABORATORY DETAILS

Manager	Ros Ma
Laboratory	SGS Newburn Environmental
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Email	au.environmental.perth@sgs.com
SGS Reference	PE076727 R0
Report Number	0000060076
Date Reported	30 Apr 2013

COMMENTS

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

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

All Data Quality Objectives were met with the exception of the following:

Extraction Date	Colour by Discrete Analyser	6 items
Analysis Date	Colour by Discrete Analyser	6 items

SAMPLE SUMMARY

Sample counts by matrix	8 Water	Type of documentation received	COC
Date documentation received	18/4/2013	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	18°C
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice	Samples clearly labelled	Yes
Complete documentation received	Yes	Number of eskies/boxes received	2

HOLDING TIME SUMMARY

PE076727 R0

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

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

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

Acidity and Free CO2

Method: ME-(AU)-[ENV]AN140

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW01	PE076727.001	LB062657	17 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013
MW02	PE076727.002	LB062657	17 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013
MW03	PE076727.003	LB062657	17 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013
MW04	PE076727.004	LB062657	17 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013
MW05	PE076727.005	LB062657	17 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013
DUP01	PE076727.006	LB062657	17 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013

Alkalinity

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW01	PE076727.001	LB062656	17 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013
MW02	PE076727.002	LB062656	17 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013
MW03	PE076727.003	LB062656	17 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013
MW04	PE076727.004	LB062656	17 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013
MW05	PE076727.005	LB062656	17 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013
DUP01	PE076727.006	LB062656	17 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013
RIN01	PE076727.007	LB062656	17 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013	18 Apr 2013

Chloride by Discrete Analyser in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW01	PE076727.001	LB062899	17 Apr 2013	18 Apr 2013	15 May 2013	24 Apr 2013	15 May 2013	26 Apr 2013
MW02	PE076727.002	LB062899	17 Apr 2013	18 Apr 2013	15 May 2013	24 Apr 2013	15 May 2013	26 Apr 2013
MW03	PE076727.003	LB062899	17 Apr 2013	18 Apr 2013	15 May 2013	24 Apr 2013	15 May 2013	26 Apr 2013
MW04	PE076727.004	LB062899	17 Apr 2013	18 Apr 2013	15 May 2013	24 Apr 2013	15 May 2013	26 Apr 2013
MW05	PE076727.005	LB062899	17 Apr 2013	18 Apr 2013	15 May 2013	24 Apr 2013	15 May 2013	26 Apr 2013
DUP01	PE076727.006	LB062899	17 Apr 2013	18 Apr 2013	15 May 2013	24 Apr 2013	15 May 2013	26 Apr 2013
RIN01	PE076727.007	LB062899	17 Apr 2013	18 Apr 2013	15 May 2013	24 Apr 2013	15 May 2013	26 Apr 2013

Colour by Discrete Analyser

Method: ME-(AU)-[ENV]AN285

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW01	PE076727.001	LB062679	17 Apr 2013	18 Apr 2013	19 Apr 2013	22 Apr 2013†	19 Apr 2013	22 Apr 2013†
MW02	PE076727.002	LB062679	17 Apr 2013	18 Apr 2013	19 Apr 2013	22 Apr 2013†	19 Apr 2013	22 Apr 2013†
MW03	PE076727.003	LB062679	17 Apr 2013	18 Apr 2013	19 Apr 2013	22 Apr 2013†	19 Apr 2013	22 Apr 2013†
MW04	PE076727.004	LB062679	17 Apr 2013	18 Apr 2013	19 Apr 2013	22 Apr 2013†	19 Apr 2013	22 Apr 2013†
MW05	PE076727.005	LB062679	17 Apr 2013	18 Apr 2013	19 Apr 2013	22 Apr 2013†	19 Apr 2013	22 Apr 2013†
DUP01	PE076727.006	LB062679	17 Apr 2013	18 Apr 2013	19 Apr 2013	22 Apr 2013†	19 Apr 2013	22 Apr 2013†

Filterable Reactive Phosphorus (FRP)

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW01	PE076727.001	LB062623	17 Apr 2013	18 Apr 2013	15 May 2013	19 Apr 2013	15 May 2013	19 Apr 2013
MW02	PE076727.002	LB062623	17 Apr 2013	18 Apr 2013	15 May 2013	19 Apr 2013	15 May 2013	19 Apr 2013
MW03	PE076727.003	LB062623	17 Apr 2013	18 Apr 2013	15 May 2013	19 Apr 2013	15 May 2013	19 Apr 2013
MW04	PE076727.004	LB062623	17 Apr 2013	18 Apr 2013	15 May 2013	19 Apr 2013	15 May 2013	19 Apr 2013
MW05	PE076727.005	LB062623	17 Apr 2013	18 Apr 2013	15 May 2013	19 Apr 2013	15 May 2013	19 Apr 2013
DUP01	PE076727.006	LB062623	17 Apr 2013	18 Apr 2013	15 May 2013	19 Apr 2013	15 May 2013	19 Apr 2013

Fluoride by Ion Selective Electrode in Water

Method: ME-(AU)-[ENV]AN141

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW01	PE076727.001	LB062935	17 Apr 2013	18 Apr 2013	15 May 2013	24 Apr 2013	15 May 2013	24 Apr 2013
MW02	PE076727.002	LB062935	17 Apr 2013	18 Apr 2013	15 May 2013	24 Apr 2013	15 May 2013	24 Apr 2013
MW03	PE076727.003	LB062935	17 Apr 2013	18 Apr 2013	15 May 2013	24 Apr 2013	15 May 2013	24 Apr 2013
MW04	PE076727.004	LB062935	17 Apr 2013	18 Apr 2013	15 May 2013	24 Apr 2013	15 May 2013	24 Apr 2013
MW05	PE076727.005	LB062935	17 Apr 2013	18 Apr 2013	15 May 2013	24 Apr 2013	15 May 2013	24 Apr 2013
DUP01	PE076727.006	LB063107	17 Apr 2013	18 Apr 2013	15 May 2013	29 Apr 2013	15 May 2013	29 Apr 2013

Low Level Ammonia Nitrogen by FIA

Method: ME-(AU)-[ENV]AN261

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW01	PE076727.001	LB063004	17 Apr 2013	18 Apr 2013	15 May 2013	26 Apr 2013	15 May 2013	29 Apr 2013
MW02	PE076727.002	LB063004	17 Apr 2013	18 Apr 2013	15 May 2013	26 Apr 2013	15 May 2013	29 Apr 2013
MW03	PE076727.003	LB063004	17 Apr 2013	18 Apr 2013	15 May 2013	26 Apr 2013	15 May 2013	29 Apr 2013
MW04	PE076727.004	LB063004	17 Apr 2013	18 Apr 2013	15 May 2013	26 Apr 2013	15 May 2013	29 Apr 2013
MW05	PE076727.005	LB063004	17 Apr 2013	18 Apr 2013	15 May 2013	26 Apr 2013	15 May 2013	29 Apr 2013
DUP01	PE076727.006	LB063004	17 Apr 2013	18 Apr 2013	15 May 2013	26 Apr 2013	15 May 2013	29 Apr 2013

HOLDING TIME SUMMARY

PE076727 R0

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

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

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

Mercury (dissolved) in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
RIN01	PE076727.007	LB062798	17 Apr 2013	18 Apr 2013	15 May 2013	23 Apr 2013	15 May 2013	23 Apr 2013

Mercury (total) in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
RIN01	PE076727.007	LB062795	17 Apr 2013	18 Apr 2013	15 May 2013	23 Apr 2013	15 May 2013	23 Apr 2013

Metals in Water (Dissolved) by ICPOES

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW01	PE076727.001	LB062598	17 Apr 2013	18 Apr 2013	14 Oct 2013	19 Apr 2013	14 Oct 2013	24 Apr 2013
MW02	PE076727.002	LB062598	17 Apr 2013	18 Apr 2013	14 Oct 2013	19 Apr 2013	14 Oct 2013	24 Apr 2013
MW03	PE076727.003	LB062598	17 Apr 2013	18 Apr 2013	14 Oct 2013	19 Apr 2013	14 Oct 2013	24 Apr 2013
MW04	PE076727.004	LB062598	17 Apr 2013	18 Apr 2013	14 Oct 2013	19 Apr 2013	14 Oct 2013	24 Apr 2013
MW05	PE076727.005	LB062598	17 Apr 2013	18 Apr 2013	14 Oct 2013	19 Apr 2013	14 Oct 2013	24 Apr 2013
DUP01	PE076727.006	LB062598	17 Apr 2013	18 Apr 2013	14 Oct 2013	19 Apr 2013	14 Oct 2013	24 Apr 2013
RIN01	PE076727.007	LB062598	17 Apr 2013	18 Apr 2013	14 Oct 2013	19 Apr 2013	14 Oct 2013	24 Apr 2013

Nitrate Nitrogen and Nitrite Nitrogen (NOx) by FIA

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW01	PE076727.001	LB063004	17 Apr 2013	18 Apr 2013	15 May 2013	26 Apr 2013	15 May 2013	29 Apr 2013
MW02	PE076727.002	LB063004	17 Apr 2013	18 Apr 2013	15 May 2013	26 Apr 2013	15 May 2013	29 Apr 2013
MW03	PE076727.003	LB063004	17 Apr 2013	18 Apr 2013	15 May 2013	26 Apr 2013	15 May 2013	29 Apr 2013
MW04	PE076727.004	LB063004	17 Apr 2013	18 Apr 2013	15 May 2013	26 Apr 2013	15 May 2013	29 Apr 2013
MW05	PE076727.005	LB063004	17 Apr 2013	18 Apr 2013	15 May 2013	26 Apr 2013	15 May 2013	29 Apr 2013
DUP01	PE076727.006	LB063004	17 Apr 2013	18 Apr 2013	15 May 2013	26 Apr 2013	15 May 2013	29 Apr 2013

Sulphate in water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW01	PE076727.001	LB062899	17 Apr 2013	18 Apr 2013	15 May 2013	24 Apr 2013	15 May 2013	26 Apr 2013
MW02	PE076727.002	LB062899	17 Apr 2013	18 Apr 2013	15 May 2013	24 Apr 2013	15 May 2013	26 Apr 2013
MW03	PE076727.003	LB062899	17 Apr 2013	18 Apr 2013	15 May 2013	24 Apr 2013	15 May 2013	26 Apr 2013
MW04	PE076727.004	LB062899	17 Apr 2013	18 Apr 2013	15 May 2013	24 Apr 2013	15 May 2013	26 Apr 2013
MW05	PE076727.005	LB062899	17 Apr 2013	18 Apr 2013	15 May 2013	24 Apr 2013	15 May 2013	26 Apr 2013
DUP01	PE076727.006	LB062899	17 Apr 2013	18 Apr 2013	15 May 2013	24 Apr 2013	15 May 2013	26 Apr 2013
RIN01	PE076727.007	LB062899	17 Apr 2013	18 Apr 2013	15 May 2013	24 Apr 2013	15 May 2013	26 Apr 2013

Sulphide by Titration in Water

Method: ME-(AU)-[ENV]AN149

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW01	PE076727.001	LB062681	17 Apr 2013	18 Apr 2013	24 Apr 2013	22 Apr 2013	24 Apr 2013	24 Apr 2013
MW02	PE076727.002	LB062681	17 Apr 2013	18 Apr 2013	24 Apr 2013	22 Apr 2013	24 Apr 2013	24 Apr 2013
MW03	PE076727.003	LB062681	17 Apr 2013	18 Apr 2013	24 Apr 2013	22 Apr 2013	24 Apr 2013	24 Apr 2013
MW04	PE076727.004	LB062681	17 Apr 2013	18 Apr 2013	24 Apr 2013	22 Apr 2013	24 Apr 2013	24 Apr 2013
MW05	PE076727.005	LB062681	17 Apr 2013	18 Apr 2013	24 Apr 2013	22 Apr 2013	24 Apr 2013	24 Apr 2013
DUP01	PE076727.006	LB062681	17 Apr 2013	18 Apr 2013	24 Apr 2013	22 Apr 2013	24 Apr 2013	24 Apr 2013

TKN Kjeldahl Digestion by Discrete Analyser

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW01	PE076727.001	LB062640	17 Apr 2013	18 Apr 2013	15 May 2013	19 Apr 2013	15 May 2013	24 Apr 2013
MW02	PE076727.002	LB062640	17 Apr 2013	18 Apr 2013	15 May 2013	19 Apr 2013	15 May 2013	24 Apr 2013
MW03	PE076727.003	LB062640	17 Apr 2013	18 Apr 2013	15 May 2013	19 Apr 2013	15 May 2013	24 Apr 2013
MW04	PE076727.004	LB062640	17 Apr 2013	18 Apr 2013	15 May 2013	19 Apr 2013	15 May 2013	24 Apr 2013
MW05	PE076727.005	LB062640	17 Apr 2013	18 Apr 2013	15 May 2013	19 Apr 2013	15 May 2013	24 Apr 2013
DUP01	PE076727.006	LB062640	17 Apr 2013	18 Apr 2013	15 May 2013	19 Apr 2013	15 May 2013	24 Apr 2013

Total and Volatile Suspended Solids (TSS / VSS)

Method: ME-(AU)-[ENV]AN114

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW01	PE076727.001	LB062689	17 Apr 2013	18 Apr 2013	24 Apr 2013	22 Apr 2013	29 Apr 2013	24 Apr 2013
MW02	PE076727.002	LB062689	17 Apr 2013	18 Apr 2013	24 Apr 2013	22 Apr 2013	29 Apr 2013	24 Apr 2013
MW03	PE076727.003	LB062689	17 Apr 2013	18 Apr 2013	24 Apr 2013	22 Apr 2013	29 Apr 2013	24 Apr 2013
MW04	PE076727.004	LB062689	17 Apr 2013	18 Apr 2013	24 Apr 2013	22 Apr 2013	29 Apr 2013	24 Apr 2013
MW05	PE076727.005	LB062689	17 Apr 2013	18 Apr 2013	24 Apr 2013	22 Apr 2013	29 Apr 2013	24 Apr 2013
DUP01	PE076727.006	LB062689	17 Apr 2013	18 Apr 2013	24 Apr 2013	22 Apr 2013	29 Apr 2013	24 Apr 2013

HOLDING TIME SUMMARY

PE076727 R0

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

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

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

Total Phosphorus by Kjeldahl Digestion DA in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW01	PE076727.001	LB062640	17 Apr 2013	18 Apr 2013	15 May 2013	19 Apr 2013	15 May 2013	24 Apr 2013
MW02	PE076727.002	LB062640	17 Apr 2013	18 Apr 2013	15 May 2013	19 Apr 2013	15 May 2013	24 Apr 2013
MW03	PE076727.003	LB062640	17 Apr 2013	18 Apr 2013	15 May 2013	19 Apr 2013	15 May 2013	24 Apr 2013
MW04	PE076727.004	LB062640	17 Apr 2013	18 Apr 2013	15 May 2013	19 Apr 2013	15 May 2013	24 Apr 2013
MW05	PE076727.005	LB062640	17 Apr 2013	18 Apr 2013	15 May 2013	19 Apr 2013	15 May 2013	24 Apr 2013
DUP01	PE076727.006	LB062640	17 Apr 2013	18 Apr 2013	15 May 2013	19 Apr 2013	15 May 2013	24 Apr 2013

Trace Metals (Dissolved) in Water by ICPMS

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW01	PE076727.001	LB062606	17 Apr 2013	18 Apr 2013	14 Oct 2013	19 Apr 2013	14 Oct 2013	22 Apr 2013
MW02	PE076727.002	LB062606	17 Apr 2013	18 Apr 2013	14 Oct 2013	19 Apr 2013	14 Oct 2013	22 Apr 2013
MW03	PE076727.003	LB062606	17 Apr 2013	18 Apr 2013	14 Oct 2013	19 Apr 2013	14 Oct 2013	23 Apr 2013
MW04	PE076727.004	LB062606	17 Apr 2013	18 Apr 2013	14 Oct 2013	19 Apr 2013	14 Oct 2013	23 Apr 2013
MW05	PE076727.005	LB062606	17 Apr 2013	18 Apr 2013	14 Oct 2013	19 Apr 2013	14 Oct 2013	23 Apr 2013
DUP01	PE076727.006	LB062606	17 Apr 2013	18 Apr 2013	14 Oct 2013	19 Apr 2013	14 Oct 2013	23 Apr 2013
RIN01	PE076727.007	LB062606	17 Apr 2013	18 Apr 2013	14 Oct 2013	19 Apr 2013	14 Oct 2013	22 Apr 2013

Trace Metals (Total) in Water by ICPMS

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW01	PE076727.001	LB062610	17 Apr 2013	18 Apr 2013	14 Oct 2013	19 Apr 2013	14 Oct 2013	22 Apr 2013
MW02	PE076727.002	LB062610	17 Apr 2013	18 Apr 2013	14 Oct 2013	19 Apr 2013	14 Oct 2013	22 Apr 2013
MW03	PE076727.003	LB062610	17 Apr 2013	18 Apr 2013	14 Oct 2013	19 Apr 2013	14 Oct 2013	23 Apr 2013
MW04	PE076727.004	LB062610	17 Apr 2013	18 Apr 2013	14 Oct 2013	19 Apr 2013	14 Oct 2013	23 Apr 2013
MW05	PE076727.005	LB062610	17 Apr 2013	18 Apr 2013	14 Oct 2013	19 Apr 2013	14 Oct 2013	23 Apr 2013
DUP01	PE076727.006	LB062610	17 Apr 2013	18 Apr 2013	14 Oct 2013	19 Apr 2013	14 Oct 2013	23 Apr 2013
RIN01	PE076727.007	LB062610	17 Apr 2013	18 Apr 2013	14 Oct 2013	19 Apr 2013	14 Oct 2013	22 Apr 2013

VOCs in Water

Method: ME-(AU)-[ENV]AN433/AN434

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Trip Blank	PE076727.008	LB062719	17 Apr 2013	18 Apr 2013	24 Apr 2013	22 Apr 2013	01 Jun 2013	24 Apr 2013

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Trip Blank	PE076727.008	LB062719	17 Apr 2013	18 Apr 2013	24 Apr 2013	22 Apr 2013	01 Jun 2013	24 Apr 2013

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

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

VOCs in Water — Method: ME-(AU)-[ENV]AN433/AN434

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	Trip Blank	PE076727.008	%	40 - 130%	123
d4-1,2-dichloroethane (Surrogate)	Trip Blank	PE076727.008	%	40 - 130%	97
d8-toluene (Surrogate)	Trip Blank	PE076727.008	%	40 - 130%	120
Dibromofluoromethane (Surrogate)	Trip Blank	PE076727.008	%	40 - 130%	99

Volatile Petroleum Hydrocarbons in Water — Method: ME-(AU)-[ENV]AN433/AN434/AN410

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	Trip Blank	PE076727.008	%	60 - 130%	123
d4-1,2-dichloroethane (Surrogate)	Trip Blank	PE076727.008	%	60 - 130%	97
d8-toluene (Surrogate)	Trip Blank	PE076727.008	%	60 - 130%	120
Dibromofluoromethane (Surrogate)	Trip Blank	PE076727.008	%	60 - 130%	99

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

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

Acidity and Free CO2

Method: ME-(AU)-[ENV]AN140

Sample Number	Parameter	Units	LOR	Result
LB062657.001	Acidity to pH 8.3	mg CaCO3/L	5	<5

Alkalinity

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

Sample Number	Parameter	Units	LOR	Result
LB062656.001	Total Alkalinity as CaCO3	mg/L	5	<5

Chloride by Discrete Analyser in Water

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

Sample Number	Parameter	Units	LOR	Result
LB062899.001	Chloride	mg/L	1	<1
LB062899.026	Chloride	mg/L	1	<1

Colour by Discrete Analyser

Method: ME-(AU)-[ENV]AN285

Sample Number	Parameter	Units	LOR	Result
LB062679.001	Colour (True)	Hazen	1	<1
LB062679.025	Colour (True)	Hazen	1	<1

Filterable Reactive Phosphorus (FRP)

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

Sample Number	Parameter	Units	LOR	Result
LB062623.001	Filterable Reactive Phosphorus	mg/L	0.002	<0.002

Fluoride by Ion Selective Electrode in Water

Method: ME-(AU)-[ENV]AN141

Sample Number	Parameter	Units	LOR	Result
LB062935.001	Fluoride by ISE	mg/L	0.1	<0.1
LB062935.026	Fluoride by ISE	mg/L	0.1	<0.1
LB063107.001	Fluoride by ISE	mg/L	0.1	<0.1
LB063107.026	Fluoride by ISE	mg/L	0.1	<0.1

Low Level Ammonia Nitrogen by FIA

Method: ME-(AU)-[ENV]AN261

Sample Number	Parameter	Units	LOR	Result
LB063004.001	Ammonia Nitrogen, NH_3 as N	mg/L	0.005	<0.005
	Ammonia, NH_3	mg/L	0.005	<0.005
LB063004.024	Ammonia Nitrogen, NH_3 as N	mg/L	0.005	<0.005
	Ammonia, NH_3	mg/L	0.005	<0.005

Mercury (dissolved) in Water

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

Sample Number	Parameter	Units	LOR	Result
LB062798.001	Mercury	mg/L	0.00005	<0.00005

Mercury (total) in Water

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

Sample Number	Parameter	Units	LOR	Result
LB062795.001	Total Mercury	mg/L	0.0001	<0.0001

Metals in Water (Dissolved) by ICPOES

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

Sample Number	Parameter	Units	LOR	Result
LB062598.001	Calcium, Ca	mg/L	0.2	<0.2
	Magnesium, Mg	mg/L	0.1	<0.1
	Potassium, K	mg/L	0.1	<0.1
	Silicon, Si	mg/L	0.02	<0.02
	Sodium, Na	mg/L	0.5	<0.5

Nitrate Nitrogen and Nitrite Nitrogen (NOx) by FIA

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

Sample Number	Parameter	Units	LOR

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

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

Nitrate Nitrogen and Nitrite Nitrogen (NOx) by FIA (continued)

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

Sample Number	Parameter	Units	LOR	Result
LB063004.001	Nitrate/Nitrite Nitrogen, NOx as N	mg/L	0.005	<0.005
	Nitrite Nitrogen, NO_2 as N	mg/L	0.005	<0.005
LB063004.024	Nitrate/Nitrite Nitrogen, NOx as N	mg/L	0.005	<0.005
	Nitrite Nitrogen, NO_2 as N	mg/L	0.005	<0.005

Sulphate in water

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

Sample Number	Parameter	Units	LOR	Result
LB062899.001	Sulphate	mg/L	1	<1
LB062899.025	Sulphate	mg/L	1	<1

Sulphide by Titration in Water

Method: ME-(AU)-[ENV]AN149

Sample Number	Parameter	Units	LOR	Result
LB062681.001	Sulphide	mg/L	0.5	<0.5

TKN Kjeldahl Digestion by Discrete Analyser

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

Sample Number	Parameter	Units	LOR	Result
LB062640.001	Total Kjeldahl Nitrogen	mg/L	0.05	<0.05

Total and Volatile Suspended Solids (TSS / VSS)

Method: ME-(AU)-[ENV]AN114

Sample Number	Parameter	Units	LOR	Result
LB062689.001	Total Suspended Solids Dried at 105°C	mg/L	5	<5

Total Phosphorus by Kjeldahl Digestion DA in Water

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

Sample Number	Parameter	Units	LOR	Result
LB062640.001	Total Phosphorus (Kjeldahl Digestion)	mg/L	0.01	<0.01

Trace Metals (Dissolved) in Water by ICPMS

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

Sample Number	Parameter	Units	LOR	Result
LB062606.001	Aluminium, Al	µg/L	5	<5
	Arsenic, As	µg/L	1	<1
	Cadmium, Cd	µg/L	0.1	<0.1
	Chromium, Cr	µg/L	1	<1
	Copper, Cu	µg/L	1	<1
	Iron, Fe	µg/L	5	<5
	Lead, Pb	µg/L	1	<1
	Manganese, Mn	µg/L	1	<1
	Nickel, Ni	µg/L	1	<1
	Selenium, Se	µg/L	2	<2
	Zinc, Zn	µg/L	5	<5

Trace Metals (Total) in Water by ICPMS

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

Sample Number	Parameter	Units	LOR	Result
LB062610.001	Total Aluminium	µg/L	5	<5
	Total Arsenic	µg/L	1	<1
	Total Cadmium	µg/L	0.1	<0.1
	Total Chromium	µg/L	1	<1
	Total Copper	µg/L	1	<1
	Total Lead	µg/L	1	<1
	Total Nickel	µg/L	1	<1
	Total Zinc	µg/L	5	<5

VOCs in Water

Method: ME-(AU)-[ENV]AN433/AN434

Sample Number		Parameter	Units	LOR	Result
LB062719.001	Monocyclic Aromatic Hydrocarbons	Benzene	µg/L	0.5	<0.5
		Toluene	µg/L	0.5	<0.5
		Ethylbenzene	µg/L	0.5	<0.5

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

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

VOCs in Water (continued)

Method: ME-(AU)-[ENV]AN433/AN434

Sample Number		Parameter	Units	LOR	Result
LB062719.001	Monocyclic Aromatic	m/p-xylene	µg/L	1	<1
	Hydrocarbons	o-xylene	µg/L	0.5	<0.5
	Oxygenated Compounds	MtBE (Methyl-tert-butyl ether)	µg/L	0.5	<0.5
	Polycyclic VOCs	Naphthalene	µg/L	0.5	<0.5
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	100
		d4-1,2-dichloroethane (Surrogate)	%	-	101
		d8-toluene (Surrogate)	%	-	108
		Bromofluorobenzene (Surrogate)	%	-	104

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Sample Number		Parameter	Units	LOR	Result
LB062719.001		TRH C6-C9	µg/L	40	<40
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	100
		d4-1,2-dichloroethane (Surrogate)	%	-	101
		d8-toluene (Surrogate)	%	-	108
		Bromofluorobenzene (Surrogate)	%	-	104

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

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

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

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

Acidity and Free CO2

Method: ME-(AU)-[ENV]AN140

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE076727.006	LB062657.012	Acidity to pH 8.3	mg CaCO3/L	5	57	58	24	1

Alkalinity

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE076724.003	LB062656.015	Total Alkalinity as CaCO3	mg/L	5	<5	<5	200	0
PE076724.007	LB062656.020	Total Alkalinity as CaCO3	mg/L	5	<5	<5	200	0
PE076727.003	LB062656.007	Total Alkalinity as CaCO3	mg/L	5	560	560	16	0

Chloride by Discrete Analyser in Water

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE076804.010	LB062899.014	Chloride	mg/L	1	10579.8	10063.897	15	5
PE076820.005	LB062899.029	Chloride	mg/L	1	1541.373	1554.99	15	1
PE076828.003	LB062899.039	Chloride	mg/L	1	14.252	14.154	22	1

Colour by Discrete Analyser

Method: ME-(AU)-[ENV]AN285

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE076680.003	LB062679.024	Colour (True)	Hazen	1	<1	<1	200	0
PE076713.002	LB062679.013	Colour (True)	Hazen	1	<1	<1	200	0
PE076727.001	LB062679.037	Colour (True)	Hazen	1	<1	<1	200	0
PE076727.006	LB062679.043	Colour (True)	Hazen	1	<1	<1	200	0

Filterable Reactive Phosphorus (FRP)

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE076717.001	LB062623.014	Filterable Reactive Phosphorus	mg/L	0.002	0.1052	0.1093	20	4
PE076732.003	LB062623.024	Filterable Reactive Phosphorus	mg/L	0.002	22.5035	22.4227	15	0

Fluoride by Ion Selective Electrode in Water

Method: ME-(AU)-[ENV]AN141

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE066891CL32.	LB063107.014	Fluoride by ISE	mg/L	0.1	0	0	200	0
PE076680.001	LB062935.014	Fluoride by ISE	mg/L	0.1	0.3	0.3	48	3
PE076713.001	LB062935.028	Fluoride by ISE	mg/L	0.1	<0.1	<0.1	200	0
PE076717.002	LB062935.040	Fluoride by ISE	mg/L	0.1	0.6	0.59	32	2
PE076727.005	LB062935.045	Fluoride by ISE	mg/L	0.1	0.4	0.4	42	0
PE076774.007	LB063107.045	Fluoride by ISE	mg/L	0.1	0	0	200	0
PE076865.008	LB063107.040	Fluoride by ISE	mg/L	0.1	0.32	0.3	47	6
PE076868.002	LB063107.028	Fluoride by ISE	mg/L	0.1	0.23	0.22	59	4

Low Level Ammonia Nitrogen by FIA

Method: ME-(AU)-[ENV]AN261

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE076628.002	LB063004.037	Ammonia Nitrogen, NH_3 as N	mg/L	0.005	0	0	200	0
PE076762.008	LB063004.026	Ammonia Nitrogen, NH_3 as N	mg/L	0.005	0	0	200	0
		Ammonia, NH_3	mg/L	0.005	0	0	200	0
PE076775.012	LB063004.013	Ammonia Nitrogen, NH_3 as N	mg/L	0.005	0	0	200	0
		Ammonia, NH_3	mg/L	0.005	<0.005	<0.005	200	0

Mercury (dissolved) in Water

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE076685.001	LB062798.014	Mercury	µg/L	0.00005	<0.00005	<0.00005	200	0
PE076727.007	LB062798.027	Mercury	µg/L	0.00005	<0.00005	<0.00005	200	0

Mercury (total) in Water

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE076727.007	LB062795.010	Total Mercury	µg/L	0.0001	<0.0001	<0.0001	200	0

Metals in Water (Dissolved) by ICPOES

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

Original	Duplicate	Parameter	Units	LOR

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

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

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

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

Metals in Water (Dissolved) by ICPOES (continued)

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE076727.001	LB062598.014	Calcium, Ca	mg/L	0.2	160	150	15	5
		Magnesium, Mg	mg/L	0.1	49	47	15	4
		Potassium, K	mg/L	0.1	8.2	7.9	16	4
		Silicon, Si	mg/L	0.02	16	15	15	4
		Sodium, Na	mg/L	0.5	270	260	15	5
PE076727.007	LB062598.021	Calcium, Ca	mg/L	0.2	<0.2	<0.2	200	0
		Magnesium, Mg	mg/L	0.1	<0.1	<0.1	200	0
		Potassium, K	mg/L	0.1	<0.1	<0.1	200	0
		Sodium, Na	mg/L	0.5	<0.5	<0.5	200	0

Nitrate Nitrogen and Nitrite Nitrogen (NOx) by FIA

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE076762.008	LB063004.026	Nitrate/Nitrite Nitrogen, NOx as N	mg/L	0.005	0.013	0.019	46	38
		Nitrite Nitrogen, NO_2 as N	mg/L	0.005	0	0	200	0
PE076775.012	LB063004.013	Nitrate/Nitrite Nitrogen, NOx as N	mg/L	0.005	0	0	200	0
		Nitrite Nitrogen, NO_2 as N	mg/L	0.005	0	0	200	0

Sulphate in water

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE076804.010	LB062899.014	Sulphate	mg/L	1	13.804	13.743	22	0
PE076820.005	LB062899.029	Sulphate	mg/L	1	181.811	188.72	16	4
PE076828.003	LB062899.040	Sulphate	mg/L	1	2.013	2.685	58	29

TKN Kjeldahl Digestion by Discrete Analyser

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE076655.003	LB062640.024	Total Kjeldahl Nitrogen	mg/L	0.05	22.1125	19.94	15	10
PE076655.010	LB062640.032	Total Kjeldahl Nitrogen	mg/L	0.05	15.9575	16.365	15	3
PE076717.001	LB062640.006	Total Kjeldahl Nitrogen	mg/L	0.05				

Total and Volatile Suspended Solids (TSS / VSS)

Method: ME-(AU)-[ENV]AN114

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE076717.001	LB062689.015	Total Suspended Solids Dried at 105°C	mg/L	5	39.215686274	45.588235294	19	4

Total Phosphorus by Kjeldahl Digestion DA in Water

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE076655.003	LB062640.024	Total Phosphorus (Kjeldahl Digestion)	mg/L	0.01	20.74	18.6525	15	11
PE076655.010	LB062640.032	Total Phosphorus (Kjeldahl Digestion)	mg/L	0.01	19.2375	19.1125	15	1
PE076717.001	LB062640.006	Total Phosphorus (Kjeldahl Digestion)	mg/L	0.01				

Trace Metals (Dissolved) in Water by ICPMS

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE076727.007	LB062606.011	Arsenic, As	µg/L	1	<1	<1	200	0
		Cadmium, Cd	µg/L	0.1	<0.1	<0.1	200	0
		Chromium, Cr	µg/L	1	<1	<1	200	0
		Copper, Cu	µg/L	1	<1	<1	200	0
		Lead, Pb	µg/L	1	<1	<1	200	0
		Nickel, Ni	µg/L	1	<1	<1	200	0
		Zinc, Zn	µg/L	5	8	8	80	2

Trace Metals (Total) in Water by ICPMS

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
PE076727.003	LB062610.014	Total Aluminium	µg/L	5	14000	12000	15	14
		Total Iron	µg/L	5	21000	20000	15	7
PE076727.007	LB062610.019	Total Arsenic	µg/L	1	<1	<1	200	0
		Total Cadmium	µg/L	0.1	<0.1	<0.1	200	0
		Total Chromium	µg/L	1	<1	<1	200	0
		Total Copper	µg/L	1	<1	<1	188	0
		Total Lead	µg/L	1	<1	<1	200	0
		Total Nickel	µg/L	1	<1	<1	145	0
		Total Zinc	µg/L	5	10	9	69	13

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

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

Alkalinity

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB062656.002	Total Alkalinity as CaCO3	mg/L	5	200	225	85 - 115	91

Chloride by Discrete Analyser in Water

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB062899.002	Chloride	mg/L	1	20	20	85 - 115	101
LB062899.027	Chloride	mg/L	1	20	20	85 - 115	101

Colour by Discrete Analyser

Method: ME-(AU)-[ENV]AN285

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB062679.002	Colour (True)	Hazen	1	5	5	90 - 110	98
LB062679.026	Colour (True)	Hazen	1	5	5	90 - 110	101

Filterable Reactive Phosphorus (FRP)

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB062623.002	Filterable Reactive Phosphorus	mg/L	0.002	0.054	0.05	80 - 120	108

Fluoride by Ion Selective Electrode in Water

Method: ME-(AU)-[ENV]AN141

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB062935.002	Fluoride by ISE	mg/L	0.1	2.1	2	80 - 120	104
LB063107.002	Fluoride by ISE	mg/L	0.1	2.0	2	80 - 120	100

Low Level Ammonia Nitrogen by FIA

Method: ME-(AU)-[ENV]AN261

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB063004.002	Ammonia Nitrogen, NH_3 as N	mg/L	0.005	0.75	0.8	85 - 115	93
	Ammonia, NH_3	mg/L	0.005	0.90	0.971	85 - 115	93
LB063004.025	Ammonia Nitrogen, NH_3 as N	mg/L	0.005	0.77	0.8	85 - 115	96
	Ammonia, NH_3	mg/L	0.005	0.93	0.971	85 - 115	96

Mercury (dissolved) in Water

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB062798.002	Mercury	mg/L	0.00005	0.0026	2.5	80 - 120	106

Mercury (total) in Water

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB062795.002	Total Mercury	mg/L	0.0001	0.0027	2.5	80 - 120	106

Metals in Water (Dissolved) by ICPOES

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB062598.002	Calcium, Ca	mg/L	0.2	190	200	80 - 120	96
	Magnesium, Mg	mg/L	0.1	200	200	80 - 120	98
	Potassium, K	mg/L	0.1	22	20	80 - 120	109
	Silicon, Si	mg/L	0.02	2.1	2	80 - 120	105
	Sodium, Na	mg/L	0.5	200	200	80 - 120	101

Nitrate Nitrogen and Nitrite Nitrogen (NOx) by FIA

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB063004.002	Nitrate/Nitrite Nitrogen, NOx as N	mg/L	0.005	0.90	0.8	85 - 115	113
	Nitrite Nitrogen, NO_2 as N	mg/L	0.005	0.78	0.8	85 - 115	97
LB063004.025	Nitrate/Nitrite Nitrogen, NOx as N	mg/L	0.005	0.79	0.8	85 - 115	99
	Nitrite Nitrogen, NO_2 as N	mg/L	0.005	0.79	0.8	85 - 115	99

Sulphate in water

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

Sample Number	Parameter	Units	LOR

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

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

Sulphate in water (continued)

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB062899.002	Sulphate	mg/L	1	10	10	80 - 120	101
LB062899.027	Sulphate	mg/L	1	10	10	80 - 120	98

Sulphide by Titration in Water

Method: ME-(AU)-[ENV]AN149

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB062681.002	Sulphide	mg/L	0.5	0.9	1	80 - 120	92

TKN Kjeldahl Digestion by Discrete Analyser

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB062640.002	Total Kjeldahl Nitrogen	mg/L	0.05	1.0	1	80 - 120	101

Total and Volatile Suspended Solids (TSS / VSS)

Method: ME-(AU)-[ENV]AN114

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB062689.002	Total Suspended Solids Dried at 105°C	mg/L	5	500	500	85 - 115	100

Total Phosphorus by Kjeldahl Digestion DA in Water

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB062640.002	Total Phosphorus (Kjeldahl Digestion)	mg/L	0.01	0.48	0.5	80 - 120	96

Trace Metals (Dissolved) in Water by ICPMS

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB062606.002	Aluminium, Al	µg/L	5	10	10	80 - 120	104
	Arsenic, As	µg/L	1	10	10	80 - 120	98
	Cadmium, Cd	µg/L	0.1	9.5	10	80 - 120	95
	Chromium, Cr	µg/L	1	10	10	80 - 120	100
	Copper, Cu	µg/L	1	10	10	80 - 120	97
	Iron, Fe	µg/L	5	11	10	80 - 120	105
	Lead, Pb	µg/L	1	11	10	80 - 120	105
	Manganese, Mn	µg/L	1	10	10	80 - 120	99
	Nickel, Ni	µg/L	1	10	10	80 - 120	99
	Selenium, Se	µg/L	2	11	10	80 - 120	112
	Zinc, Zn	µg/L	5	10	10	80 - 120	96

Trace Metals (Total) in Water by ICPMS

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB062610.002	Total Aluminium	µg/L	5	6	5	80 - 120	120
	Total Arsenic	µg/L	1	5	5	80 - 120	96
	Total Cadmium	µg/L	0.1	5.6	5	80 - 120	111
	Total Chromium	µg/L	1	6	5	80 - 120	116
	Total Copper	µg/L	1	6	5	80 - 120	119
	Total Iron	µg/L	5	5	5	80 - 120	108
	Total Lead	µg/L	1	6	5	80 - 120	113
	Total Nickel	µg/L	1	5	5	80 - 120	93
	Total Zinc	µg/L	5	<5	5	80 - 120	96

VOCs in Water

Method: ME-(AU)-[ENV]AN433/AN434

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB062719.002	Monocyclic	Benzene	µg/L	0.5	5.5	5	50 - 150	111
	Aromatic	Toluene	µg/L	0.5	5.3	5	50 - 150	107
		Ethylbenzene	µg/L	0.5	5.1	5	50 - 150	101
	Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	5.9	5	60 - 130	119
		d4-1,2-dichloroethane (Surrogate)	µg/L	-	5.9	5	60 - 130	119
		d8-toluene (Surrogate)	µg/L	-	6.4	5	60 - 130	129
		Bromofluorobenzene (Surrogate)	µg/L	-	6.2	5	60 - 130	124

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

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

Volatile Petroleum Hydrocarbons in Water — **Method: ME-(AU)-[ENV]AN433/AN434/AN410**

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB062719.002		TRH C6-C9	µg/L	40	<40	30	70 - 130	99
	Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	5.9	5	60 - 130	119
		d4-1,2-dichloroethane (Surrogate)	µg/L	-	5.9	5	60 - 130	119
		d8-toluene (Surrogate)	µg/L	-	6.4	5	60 - 130	129
		Bromofluorobenzene (Surrogate)	µg/L	-	6.2	5	60 - 130	124

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

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

Chloride by Discrete Analyser in Water

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
PE076820.002	LB062899.022	Chloride	mg/L	1	130	33.507	100	96
PE076828.002	LB062899.037	Chloride	mg/L	1	150	51.711	100	93

Filterable Reactive Phosphorus (FRP)

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
PE076727.001	LB062623.017	Filterable Reactive Phosphorus	mg/L	0.002	0.061	0.004	0.05	115

Fluoride by Ion Selective Electrode in Water

Method: ME-(AU)-[ENV]AN141

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
PE066116CL32	LB063107.004	Fluoride by ISE	mg/L	0.1	0.6	0	0.5	110
PE066228AH24	LB062935.004	Fluoride by ISE	mg/L	0.1	0.5	<0.1	0.5	106
PE076713.002	LB062935.029	Fluoride by ISE	mg/L	0.1	0.5	<0.1	0.5	106
PE076868.003	LB063107.029	Fluoride by ISE	mg/L	0.1	0.8	0.27	0.5	104

Mercury (dissolved) in Water

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
PE076628.001	LB062798.004	Mercury	mg/L	0.00005	0.0019	0	0.0025	94

Mercury (total) in Water

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
PE076679.001	LB062795.004	Total Mercury	mg/L	0.0001	0.0020	<0.0001	0.002	101

Metals in Water (Dissolved) by ICPOES

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
PE076725.001	LB062598.004	Sodium, Na	mg/L	0.5	290	80	200	105

Sulphate in water

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
PE076820.002	LB062899.021	Sulphate	mg/L	1	160	48.59	100	110
PE076828.002	LB062899.038	Sulphate	mg/L	1	130	34.468	100	99

Trace Metals (Dissolved) in Water by ICPMS

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
PE076727.001	LB062606.004	Aluminium, Al	µg/L	5	11	<5	10	77
		Arsenic, As	µg/L	1	11	<1	10	103
		Cadmium, Cd	µg/L	0.1	9.1	0.4	10	87
		Chromium, Cr	µg/L	1	10	<1	10	99
		Copper, Cu	µg/L	1	10	1	10	83
		Iron, Fe	µg/L	5	11	<5	10	98
		Lead, Pb	µg/L	1	9	<1	10	87
		Manganese, Mn	µg/L	1	98	87	10	107
		Nickel, Ni	µg/L	1	9	<1	10	85
		Selenium, Se	µg/L	2	12	<2	10	107
		Zinc, Zn	µg/L	5	19	10	10	85

Trace Metals (Total) in Water by ICPMS

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
PE076720.002	LB062610.004	Total Aluminium	µg/L	5	31	27	5	94

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

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

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

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

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

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here:
http://www.au.sgs.com/sgs-mp-au-env-qu-022-qa-qc-plan-en-11.pdf

*	Non-accredited analysis.
-	Sample not analysed for this analyte.
^	Analysis performed by external laboratory.

IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

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