

CERTIFICATE OF ANALYSIS

Work Order : **EP1611882**
Client : **GASCOYNE WATER COOPERATIVE LTD**
Contact : MISS LISA HODSON
Address : 50 BOUNDARY ROAD PO BOX 5
 CARNARVON WESTERN AUSTRALIA, AUSTRALIA 6701
Telephone : +61 08 9941 4488
Project : Water Samples NBF
Order number : 0018
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : EP/804/15
No. of samples received : 10
No. of samples analysed : 10

Page : 1 of 6
Laboratory : Environmental Division Perth
Contact : Adrienne Sanders
Address : 10 Hod Way Malaga WA Australia 6090
Telephone : 08 9209 7632
Date Samples Received : 08-Dec-2016 12:30
Date Analysis Commenced : 08-Dec-2016
Issue Date : 15-Dec-2016 12:58



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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Bek Simpfordorfer	Inorganic Supervisor	Perth Inorganics, Malaga, WA
Canhuang Ke	Metals Instrument Chemist	Perth Inorganics, Malaga, WA
Efua Wilson	Metals Chemist	Perth Inorganics, Malaga, WA
Tyrone Cole	Inorganics Preparation Supervisor	Perth Inorganics, Malaga, WA



General Comments

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

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

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

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

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

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

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

- EG020: It is recognised that total boron is less than dissolved boron for various samples. However, the difference is within experimental variation of the methods.
- EA015H (Total Dissolved Solids): TDS for various samples biasing high due to possible sample matrix interferences.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	Bore 2/10	Bore 3/10	Bore 18/10	Bore 19/10	Bore 20/10
Client sampling date / time				07-Dec-2016 00:00	07-Dec-2016 00:00	07-Dec-2016 00:00	07-Dec-2016 00:00	07-Dec-2016 00:00	
Compound	CAS Number	LOR	Unit	EP1611882-001	EP1611882-002	EP1611882-003	EP1611882-004	EP1611882-005	
				Result	Result	Result	Result	Result	
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit	7.70	7.56	7.99	7.61	8.06	
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm	1040	956	570	826	860	
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L	768	704	416	692	606	
EA065: Total Hardness as CaCO3									
Total Hardness as CaCO3	----	1	mg/L	170	265	89	257	84	
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	76	112	128	100	116	
Total Alkalinity as CaCO3	----	1	mg/L	76	112	128	100	116	
ED040F: Dissolved Major Anions									
Silicon	7440-21-3	0.05	mg/L	30.5	28.9	25.6	30.0	28.7	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	59	89	41	58	73	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	356	289	129	259	231	
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L	32	60	19	60	17	
Magnesium	7439-95-4	1	mg/L	22	28	10	26	10	
Sodium	7440-23-5	1	mg/L	169	115	93	90	157	
Potassium	7440-09-7	1	mg/L	18	12	14	10	12	
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
Arsenic	7440-38-2	0.001	mg/L	0.002	<0.001	0.005	<0.001	0.006	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Molybdenum	7439-98-7	0.001	mg/L	0.002	<0.001	0.002	<0.001	0.004	
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	
Boron	7440-42-8	0.05	mg/L	0.61	0.32	0.56	0.25	0.75	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	Bore 2/10	Bore 3/10	Bore 18/10	Bore 19/10	Bore 20/10
Client sampling date / time				07-Dec-2016 00:00	07-Dec-2016 00:00	07-Dec-2016 00:00	07-Dec-2016 00:00	07-Dec-2016 00:00	
Compound	CAS Number	LOR	Unit	EP1611882-001	EP1611882-002	EP1611882-003	EP1611882-004	EP1611882-005	
				Result	Result	Result	Result	Result	
EG020F: Dissolved Metals by ICP-MS - Continued									
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L	0.02	<0.01	<0.01	<0.01	<0.01	
Arsenic	7440-38-2	0.001	mg/L	0.002	<0.001	0.004	<0.001	0.007	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Molybdenum	7439-98-7	0.001	mg/L	0.003	0.001	0.004	0.001	0.007	
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	
Boron	7440-42-8	0.05	mg/L	0.56	0.28	0.51	0.23	0.72	
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EG052F: Dissolved Silica by ICPAES									
Silicon as SiO2	14464-46-1	0.1	mg/L	65.4	61.9	54.9	64.3	61.5	
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L	0.6	0.3	0.6	0.2	1.4	
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L	0.90	1.79	1.13	0.85	1.13	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	0.91	1.79	1.13	0.85	1.13	
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L	12.8	12.2	7.05	10.5	10.4	
Total Cations	----	0.01	meq/L	11.2	10.6	6.17	9.30	8.81	
Ionic Balance	----	0.01	%	6.54	7.16	6.62	6.09	8.07	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID				
				Bore 21/10	Bore 2/14	Bore 11/13	Bore 3/14	Bore 1/10
Client sampling date / time				07-Dec-2016 00:00	07-Dec-2016 00:00	07-Dec-2016 00:00	07-Dec-2016 00:00	07-Dec-2016 00:00
Compound	CAS Number	LOR	Unit	EP1611882-006	EP1611882-007	EP1611882-008	EP1611882-009	EP1611882-010
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.91	7.83	8.03	7.61	8.18
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	764	524	661	830	1070
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	549	414	460	678	740
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	143	184	47	249	51
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	78	118	111	109	160
Total Alkalinity as CaCO3	----	1	mg/L	78	118	111	109	160
ED040F: Dissolved Major Anions								
Silicon	7440-21-3	0.05	mg/L	28.0	15.9	22.3	25.1	22.3
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	85	47	89	92	136
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	207	112	148	255	262
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	31	49	9	57	9
Magnesium	7439-95-4	1	mg/L	16	15	6	26	7
Sodium	7440-23-5	1	mg/L	107	50	135	97	225
Potassium	7440-09-7	1	mg/L	11	8	10	10	13
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	7440-38-2	0.001	mg/L	0.003	<0.001	0.004	<0.001	0.003
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	7439-98-7	0.001	mg/L	0.002	<0.001	0.009	0.001	0.011
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Boron	7440-42-8	0.05	mg/L	0.45	0.20	1.03	0.24	1.87



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	Bore 21/10	Bore 2/14	Bore 11/13	Bore 3/14	Bore 1/10
Client sampling date / time				07-Dec-2016 00:00	07-Dec-2016 00:00	07-Dec-2016 00:00	07-Dec-2016 00:00	07-Dec-2016 00:00	
Compound	CAS Number	LOR	Unit	EP1611882-006	EP1611882-007	EP1611882-008	EP1611882-009	EP1611882-010	
				Result	Result	Result	Result	Result	
EG020F: Dissolved Metals by ICP-MS - Continued									
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L	<0.01	0.01	<0.01	<0.01	<0.01	
Arsenic	7440-38-2	0.001	mg/L	0.004	<0.001	0.004	<0.001	0.003	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Molybdenum	7439-98-7	0.001	mg/L	0.004	<0.001	0.015	0.002	0.019	
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	
Boron	7440-42-8	0.05	mg/L	0.43	0.19	1.00	0.22	1.69	
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EG052F: Dissolved Silica by ICPAES									
Silicon as SiO2	14464-46-1	0.1	mg/L	60.0	34.1	47.8	53.8	47.8	
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L	0.8	0.2	2.0	0.3	1.8	
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.01	<0.01	<0.01	<0.01	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L	1.25	3.87	0.80	1.70	0.67	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	1.25	3.88	0.80	1.70	0.67	
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L	9.17	6.50	8.24	11.3	13.4	
Total Cations	----	0.01	meq/L	7.80	6.06	7.07	9.46	11.1	
Ionic Balance	----	0.01	%	8.06	3.48	7.67	8.81	9.26	