

CERTIFICATE OF ANALYSIS

Work Order	: EP1516864	Page	: 1 of 6
Client	: GASCOYNE WATER COOPERATIVE LTD	Laboratory	: Environmental Division Perth
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Project	: Water Samples NBF	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: 0018	Date Samples Received	: 09-Dec-2015 11:00
C-O-C number	: ----	Date Analysis Commenced	: 09-Dec-2015
Sampler	: SAXON BOSTON	Issue Date	: 17-Dec-2015 13:24
Site	: ----		
Quote number	: ----	No. of samples received	: 9
		No. of samples analysed	: 9

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Indra Astuty	Instrument Chemist	Perth Inorganics, Malaga, WA
Jeremy Truong	Laboratory 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 sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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

- Metals by ICPMS conducted by ALS Melbourne, NATA accreditation no. 825, site no 13778
- It is recognised that total Boron is less than dissolved Boron for sample #9. However, the difference is within experimental variation of the methods.
- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.



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				08-Dec-2015 08:05	08-Dec-2015 08:20	08-Dec-2015 07:40	08-Dec-2015 08:15	08-Dec-2015 07:45	
Compound	CAS Number	LOR	Unit	EP1516864-001	EP1516864-002	EP1516864-003	EP1516864-004	EP1516864-005	
				Result	Result	Result	Result	Result	
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit	7.96	8.04	8.22	7.92	8.14	
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm	1140	806	592	1040	1100	
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L	818	518	404	770	676	
EA016: Calculated TDS (from Electrical Conductivity)									
Total Dissolved Solids (Calc.)	----	10	mg/L	741	524	385	676	715	
EA065: Total Hardness as CaCO3									
Total Hardness as CaCO3	----	1	mg/L	242	183	82	283	177	
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	67	118	106	114	105	
Total Alkalinity as CaCO3	----	1	mg/L	67	118	106	114	105	
ED040F: Dissolved Major Anions									
Silicon	7440-21-3	0.05	mg/L	32.7	30.0	26.4	30.3	27.3	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	44	58	38	72	90	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	302	158	96	229	237	
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L	44	42	18	67	38	
Magnesium	7439-95-4	1	mg/L	32	19	9	28	20	
Sodium	7440-23-5	1	mg/L	122	97	90	97	147	
Potassium	7440-09-7	1	mg/L	21	8	13	11	16	
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	0.001	<0.001	0.006	<0.001	0.004	
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	0.002	<0.001	0.001	0.003	
Molybdenum	7439-98-7	0.001	mg/L	<0.001	0.002	0.003	<0.001	0.003	



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					08-Dec-2015 08:05	08-Dec-2015 08:20	08-Dec-2015 07:40	08-Dec-2015 08:15	08-Dec-2015 07:45
Compound	CAS Number	LOR	Unit	EP1516864-001	EP1516864-002	EP1516864-003	EP1516864-004	EP1516864-005	
				Result	Result	Result	Result	Result	
EG020F: Dissolved Metals by ICP-MS - Continued									
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	0.35	0.34	0.47	0.25	0.48	
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	0.001	<0.001	0.006	<0.001	0.005	
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	0.003	<0.001	0.001	0.003	
Molybdenum	7439-98-7	0.001	mg/L	0.001	0.002	0.004	0.001	0.005	
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	0.37	0.34	0.48	0.24	0.52	
Iron	7439-89-6	0.05	mg/L	<0.05	0.16	<0.05	<0.05	0.08	
EG052F: Dissolved Silica by ICPAES									
Silicon as SiO2	14464-46-1	0.1	mg/L	70.1	64.3	56.6	64.9	58.5	
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L	0.4	0.4	0.6	0.3	0.9	
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	0.72	1.22	1.07	0.55	1.09	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	0.72	1.22	1.07	0.55	1.09	
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L	10.8	8.02	5.62	10.2	10.6	
Total Cations	----	0.01	meq/L	10.7	8.08	5.89	10.1	10.3	
Ionic Balance	----	0.01	%	0.46	0.38	2.32	0.42	1.49	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	Bore 21/10	Bore 2/14	Bore 11/13	Bore 3/14	----
Client sampling date / time				08-Dec-2015 08:00	08-Dec-2015 07:30	08-Dec-2015 08:50	08-Dec-2015 08:20	----	
Compound	CAS Number	LOR	Unit	EP1516864-006	EP1516864-007	EP1516864-008	EP1516864-009	-----	
				Result	Result	Result	Result	Result	
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit	8.19	8.08	8.20	7.81	----	
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm	772	493	753	1110	----	
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L	518	316	476	828	----	
EA016: Calculated TDS (from Electrical Conductivity)									
Total Dissolved Solids (Calc.)	----	10	mg/L	502	320	489	722	----	
EA065: Total Hardness as CaCO3									
Total Hardness as CaCO3	----	1	mg/L	52	154	50	308	----	
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	----	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	----	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	118	102	116	88	----	
Total Alkalinity as CaCO3	----	1	mg/L	118	102	116	88	----	
ED040F: Dissolved Major Anions									
Silicon	7440-21-3	0.05	mg/L	21.6	15.6	22.0	24.5	----	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	77	31	79	100	----	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	117	59	115	256	----	
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L	11	42	10	74	----	
Magnesium	7439-95-4	1	mg/L	6	12	6	30	----	
Sodium	7440-23-5	1	mg/L	133	44	135	107	----	
Potassium	7440-09-7	1	mg/L	9	8	10	10	----	
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----	
Arsenic	7440-38-2	0.001	mg/L	0.004	0.001	0.005	<0.001	----	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----	
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----	
Manganese	7439-96-5	0.001	mg/L	0.001	<0.001	<0.001	<0.001	----	
Molybdenum	7439-98-7	0.001	mg/L	0.016	<0.001	0.016	0.002	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	Bore 21/10	Bore 2/14	Bore 11/13	Bore 3/14	----
Client sampling date / time					08-Dec-2015 08:00	08-Dec-2015 07:30	08-Dec-2015 08:50	08-Dec-2015 08:20	----
Compound	CAS Number	LOR	Unit	EP1516864-006	EP1516864-007	EP1516864-008	EP1516864-009	-----	-----
				Result	Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	----	----
Boron	7440-42-8	0.05	mg/L	1.02	0.18	1.08	0.24	----	----
Iron	7439-89-6	0.05	mg/L	<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	----	----
Arsenic	7440-38-2	0.001	mg/L	0.005	0.001	0.005	<0.001	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----	----
Copper	7440-50-8	0.001	mg/L	0.001	<0.001	<0.001	<0.001	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----	----
Manganese	7439-96-5	0.001	mg/L	0.002	<0.001	<0.001	<0.001	----	----
Molybdenum	7439-98-7	0.001	mg/L	0.020	0.001	0.021	0.002	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	----	----
Boron	7440-42-8	0.05	mg/L	1.06	0.18	1.13	0.23	----	----
Iron	7439-89-6	0.05	mg/L	0.42	<0.05	<0.05	<0.05	----	----
EG052F: Dissolved Silica by ICPAES									
Silicon as SiO2	14464-46-1	0.1	mg/L	46.3	33.4	47.1	52.5	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L	2.3	0.2	2.4	0.3	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L	0.81	3.33	0.82	1.05	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	0.81	3.33	0.82	1.05	----	----
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L	7.26	4.35	7.21	11.1	----	----
Total Cations	----	0.01	meq/L	7.06	5.20	7.12	11.1	----	----
Ionic Balance	----	0.01	%	1.45	8.95	0.63	0.06	----	----