CERTIFICATE OF ANALYSIS

Work Order	: **EW1510328**	Page	: 1 of 4
Client	: **WOLLONGONG CITY COUNCIL**	Laboratory	: Environmental Division NSW South Coast
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Project	: Helensburgh Groundwater Quarterly	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 3032573	Date Samples Received	: 19-May-2015 16:18
C-O-C number	: ----	Date Analysis Commenced	: 19-May-2015
Sampler	: Craig Wilson	Issue Date	: 27-May-2015 15:51
Site	: ----		
		No. of samples received	: 9
Quote number	: ----	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.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Glenn Davies	Environmental Services Representative	Laboratory - Wollongong
Shobhna Chandra	Metals Coordinator	Sydney Inorganics

General Comments

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

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

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

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

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
ø = ALS is not NATA accredited for these tests.

- Sampling and sample data supplied by ALS Wollongong.
- Sampling completed as per FWI-EN001 Groundwater Sampling.
- Field tests completed on day of sampling/receipt.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	BH1	BH2	BH4	BH5	BH6
			Client sampling date / time	19-May-2015 13:30	19-May-2015 12:35	19-May-2015 11:50	19-May-2015 13:50	19-May-2015 11:35
Compound	CAS Number	LOR	Unit	EW1510328-001	EW1510328-002	EW1510328-003	EW1510328-004	EW1510328-005
				Result	Result	Result	Result	Result
EA005FD: Field pH								
pH	----	0.1	pH Unit	5.2	6.0	4.5	4.8	6.9
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	----	1	mg/L	----	----	----	----	----
^ Total Dissolved Solids @180°C	----	1	mg/L	379	408	256	103	218
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	10	152	<1	<1	172
Total Alkalinity as CaCO3	----	1	mg/L	10	152	<1	<1	172
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	122	64	83	22	3
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	160	133	109	34	21
ED093T: Total Major Cations								
Calcium	7440-70-2	1	mg/L	35	10	<1	4	41
Magnesium	7439-95-4	1	mg/L	26	5	5	4	19
Sodium	7440-23-5	1	mg/L	61	144	92	22	17
Potassium	7440-09-7	1	mg/L	2	25	1	<1	2
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.02	11.0	<0.01	<0.01	<0.01
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	4	22	2	<1	11
FWI-EN/001: Groundwater Sampling - Depth								
Depth	----	0.01	m	2.67	1.48	1.77	3.73	2.30

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	LGMB1	LGMB2	LGMB3	LGMB4	----
			Client sampling date / time	19-May-2015 13:40	19-May-2015 13:15	19-May-2015 03:12	19-May-2015 13:05	----
Compound	CAS Number	LOR	Unit	EW1510328-006	EW1510328-007	EW1510328-008	EW1510328-009	--------
				Result	Result	Result	Result	Result
EA005FD: Field pH								
pH	----	0.1	pH Unit	6.2	5.8	5.6	5.0	----
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	----	1	mg/L	----	----	----	94	----
^ Total Dissolved Solids @180°C	----	1	mg/L	286	178	83	----	----
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	156	30	28	5	----
Total Alkalinity as CaCO3	----	1	mg/L	156	30	28	5	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	71	31	20	39	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	19	48	12	13	----
ED093T: Total Major Cations								
Calcium	7440-70-2	1	mg/L	54	19	9	7	----
Magnesium	7439-95-4	1	mg/L	19	5	4	3	----
Sodium	7440-23-5	1	mg/L	23	32	11	10	----
Potassium	7440-09-7	1	mg/L	2	3	4	29	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.01	0.04	0.06	<0.01	----
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	2	3	3	3	----
FWI-EN/001: Groundwater Sampling - Depth								
Depth	----	0.01	m	2.10	2.16	1.94	1.70	----