ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EW2000567**	Page	: 1 of 4
Client	: **WINGECARRIBEE SHIRE COUNCIL**	Laboratory	: Environmental Division NSW South Coast
Contact	: MR CHRIS MURPHY	Contact	: Tyler Cachia
Address	: PO BOX 141 MOSSVALE NSW AUSTRALIA	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 4/13 Geary Pl, North Nowra 2541 Australia NSW Australia
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: RRC Quarterly	Date Samples Received	: 06-Feb-2020 15:00
Order number	: ----	Date Analysis Commenced	: 06-Feb-2020
C-O-C number	: ----	Issue Date	: 17-Feb-2020 16:23
Sampler	: Robert DaLio		
Site	: ----		
Quote number	: WO/067/12		
No. of samples received	: 7		
No. of samples analysed	: 7		

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.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Glenn Davies	Environmental Services Representative	Laboratory - Wollongong, NSW

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.

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
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- **Analytical work for this work order will be conducted at ALS Sydney.**
- Ionic Balance out of acceptable limits for sample 2 due to analytes not quantified in this report.
- Sampling and sample data supplied by ALS Wollongong.
- Sampling completed as per EN/67.11 Groundwater Sampling.
- Field tests completed on day of sampling/receipt.
- Sampling Completed as per EN/67.4 Lakes and Reservoirs
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.

Analytical Results

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

Compound	CAS Number	LOR	Unit	Client sample ID	Point 1 MW1B (Front Gate)	Point 2 MW06 (Car Park)	Point 3 MW7 (South of Pond)	Point 4 LT1 (Leachate)	Point 5 SW01 (Upstream Stormwater)
				Client sampling date / time	06-Feb-2020 11:20	06-Feb-2020 10:30	06-Feb-2020 10:45	06-Feb-2020 11:10	06-Feb-2020 11:45
					EW2000567-001	EW2000567-002	EW2000567-003	EW2000567-004	EW2000567-005
					Result	Result	Result	Result	Result
EA005FD: Field pH									
pH	----	0.1	pH Unit		**6.6**	**4.7**	**5.6**	**----**	**----**
EA010FD: Field Conductivity									
Electrical Conductivity (Non Compensated)	----	1	µS/cm		**8450**	**334**	**2780**	**----**	**----**
EA015: Total Dissolved Solids									
Total Dissolved Solids @180°C	----	10	mg/L		**7410**	**232**	**1650**	**----**	**----**
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	**----**	**----**
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	**----**	**----**
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**336**	**14**	**22**	**----**	**----**
Total Alkalinity as CaCO3	----	1	mg/L		**336**	**14**	**22**	**----**	**----**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**109**	**10**	<1	**----**	**----**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**2610**	**77**	**829**	**----**	**----**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**460**	<1	**25**	**----**	**----**
Magnesium	7439-95-4	1	mg/L		**326**	**4**	**55**	**----**	**----**
Sodium	7440-23-5	1	mg/L		**1090**	**75**	**509**	**----**	**----**
Potassium	7440-09-7	1	mg/L		**32**	<1	**3**	**----**	**----**
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.07**	**0.07**	<0.01	**----**	**----**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**82.6**	**2.66**	**23.8**	**----**	**----**
ø Total Cations	----	0.01	meq/L		**98.0**	**3.59**	**28.0**	**----**	**----**
ø Ionic Balance	----	0.01	%		**8.53**	**14.9**	**8.04**	**----**	**----**
EN67 PK: Field Tests									
Field Observations	----	0.01	--		**----**	**----**	**----**	**dry**	**dry**
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**82**	**12**	**4**	**----**	**----**
FWI-EN/001: Groundwater Sampling - Depth									
Depth	----	0.01	m		**6.40**	**2.54**	**3.13**	**----**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	Point 6 SW02 (Holding Pond)	Point 7 SW03 (Polishing Pond)	----	----	----
				Client sampling date / time	06-Feb-2020 11:05	06-Feb-2020 10:55	----	----	----
Compound	CAS Number	LOR	Unit		EW2000567-006	EW2000567-007	--------	--------	--------
					Result	Result	----	----	----
EA005FD: Field pH									
pH	----	0.1	pH Unit		**7.2**	**8.7**	**----**	**----**	**----**
EA010FD: Field Conductivity									
Electrical Conductivity (Non Compensated)	----	1	µS/cm		**1940**	**2510**	**----**	**----**	**----**
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		**22**	**74**	**----**	**----**	**----**
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**2.77**	**4.62**	**----**	**----**	**----**
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**52**	**149**	**----**	**----**	**----**
EP030: Biochemical Oxygen Demand (BOD)									
Biochemical Oxygen Demand	----	2	mg/L		**11**	**27**	**----**	**----**	**----**