ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM2216763**	Page	: 1 of 6
Client	: **Dept for Environment & Water**	Laboratory	: Environmental Division Melbourne
Contact	: DARCY MORRIS	Contact	: Kieren Burns
Address	: GPO BOX 2834 ADELAIDE SA, AUSTRALIA 5001	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61881625130
Project	: HCHB Monitoring Program	Date Samples Received	: 01-Sep-2022 12:05
Order number	: -	Date Analysis Commenced	: 02-Sep-2022
C-O-C number	: 41793	Issue Date	: 09-Sep-2022 17:45
Sampler	: Bryce Drechsler, DARCY MORRIS		
Site	: HCHB Boat 30/31st August		
Quote number	: AD/052/20 V2		
No. of samples received	: 10		
No. of samples analysed	: 10		

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, unless the sampling was conducted by ALS. 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	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Nikki Stepniewski	Senior Inorganic Instrument Chemist	Melbourne Inorganics, Springvale, VIC

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the 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 Contract 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.

- EP008: Chlorophyll-a standard does not contain pheophytin-a standard
- EP008, LOR raised for Chlorohphyll-b for various samples due to samples matrix.
- EA015H: EM2216763 #3-10: TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- It has been noted that DOC is greater than TOC for samples #1-2, however this difference is within the limits of experimental variation.
- EK067G: EM2216763, samples required a dilution prior to analysis due to sample matrix. LOR has been raised accordingly.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.
- Total Algae Count (MB010) is conducted by ALS Scoresby NATA accreditation no. 992, site no. 989.

Analytical Results

Sub-Matrix: MARINE WATER (Matrix: WATER)			Sample ID	Murray Mouth	Mark Point	Parnka Point	Villa De Yumpa	Stoney Well
			Sampling date / time	30-Aug-2022 11:17	30-Aug-2022 12:37	31-Aug-2022 10:56	31-Aug-2022 10:06	31-Aug-2022 09:43
Compound	CAS Number	LOR	Unit	EM2216763-001	EM2216763-002	EM2216763-003	EM2216763-004	EM2216763-005
				Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	9130	7760	54900	71600	69400
EA045: Turbidity								
Turbidity	----	0.1	NTU	65.4	45.9	8.7	11.8	11.7
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	77	88	171	186	189
Total Alkalinity as CaCO3	----	1	mg/L	77	88	171	186	189
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	4680	4180	21100	26200	27200
EG052G: Silica by Discrete Analyser								
Reactive Silica	----	0.05	mg/L	2.72	4.12	0.46	0.81	0.94
EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water								
Ammonia as N	7664-41-7	0.02	mg/L	<0.02	0.06	<0.02	<0.02	<0.02
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	0.05	0.06	<0.01	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.06	0.07	<0.01	<0.01	<0.01
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.0	2.4	3.0	3.4	4.4
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	1.1	2.5	3.0	3.4	4.4
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.04	0.08	<0.10	<0.10	0.12
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	----	1	mg/L	9	12	22	24	26
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	8	10	24	28	30
EP008: Chlorophyll								
Chlorophyll a	----	1	mg/m³	5	9	5	8	7
Chlorophyll b	----	1	mg/m³	<3	<3	<1	<1	<1

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	Murray Mouth	Mark Point	Parnka Point	Villa De Yumpa	Stoney Well
				Sampling date / time	30-Aug-2022 11:17	30-Aug-2022 12:37	31-Aug-2022 10:56	31-Aug-2022 10:06	31-Aug-2022 09:43
					EM2216763-001	EM2216763-002	EM2216763-003	EM2216763-004	EM2216763-005
					Result	Result	Result	Result	Result
EP008: Chlorophyll - Continued									
Pheophytin a	----	1	mg/m³		**8**	**8**	**2**	**2**	**3**

Analytical Results

Sub-Matrix: MARINE WATER (Matrix: WATER)			Sample ID	North Jacks Point	South Policeman Point	Snipe Point	Salt Creek Outlet	1.8km west of Salt Creek
			Sampling date / time	31-Aug-2022 09:13	31-Aug-2022 08:53	31-Aug-2022 08:37	31-Aug-2022 07:59	31-Aug-2022 08:15
Compound	CAS Number	LOR	Unit	EM2216763-006	EM2216763-007	EM2216763-008	EM2216763-009	EM2216763-010
				Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	81000	74400	82600	74800	76800
EA045: Turbidity								
Turbidity	----	0.1	NTU	13.7	8.6	10.5	9.2	12.7
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	189	190	190	199	189
Total Alkalinity as CaCO3	----	1	mg/L	189	190	190	199	189
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	28600	31100	31100	30900	31600
EG052G: Silica by Discrete Analyser								
Reactive Silica	----	0.05	mg/L	0.98	1.26	1.38	1.72	1.34
EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water								
Ammonia as N	7664-41-7	0.02	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02
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	<0.01	<0.01	<0.01	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	4.3	3.8	3.2	3.9	3.2
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	4.3	3.8	3.2	3.9	3.2
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.32	0.19	<0.10	<0.10	0.15
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	----	1	mg/L	28	27	27	28	28
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	32	34	34	31	35
EP008: Chlorophyll								
Chlorophyll a	----	1	mg/m³	9	13	14	11	14
Chlorophyll b	----	1	mg/m³	2	2	2	2	2

Analytical Results

Sub-Matrix: **MARINE WATER** (Matrix: **WATER**)				Sample ID	North Jacks Point	South Policeman Point	Snipe Point	Salt Creek Outlet	1.8km west of Salt Creek
				Sampling date / time	31-Aug-2022 09:13	31-Aug-2022 08:53	31-Aug-2022 08:37	31-Aug-2022 07:59	31-Aug-2022 08:15
Compound	*CAS Number*	*LOR*	*Unit*		**EM2216763-006**	**EM2216763-007**	**EM2216763-008**	**EM2216763-009**	**EM2216763-010**
					Result	Result	Result	Result	Result
EP008: Chlorophyll - Continued									
Pheophytin a	----	1	mg/m³		**4**	**3**	**4**	**2**	**4**

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP008: Chlorophyll