

CERTIFICATE OF ANALYSIS

Work Order : **EM2218952**
Client : **Dept for Environment & Water**
Contact : DARCY MORRIS
Address : GPO BOX 2834
 ADELAIDE SA, AUSTRALIA 5001
Telephone : ----
Project : HCHB Monitoring Program
Order number : -
C-O-C number : 38354
Sampler : Bryce Drechsler, DARCY MORRIS
Site : HCHB Boat 28/29th September
Quote number : AD/052/20 V2
No. of samples received : 10
No. of samples analysed : 10

Page : 1 of 6
Laboratory : Environmental Division Melbourne
Contact : Kieren Burns
Address : 4 Westall Rd Springvale VIC Australia 3171
Telephone : +61881625130
Date Samples Received : 30-Sep-2022 14:20
Date Analysis Commenced : 30-Sep-2022
Issue Date : 10-Oct-2022 17:16



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
Arenie Vijayaratham	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Narelle Drummond	Laboratory Manager	Townsville Inorganics, Townsville, QLD



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.

- EK061G: EM2218952 #2 Sample required dilution for TKN due to sample matrix. LOR has been raised accordingly.
- EP008: Chlorophyll-a standard does not contain pheophytin-a standard
- EA015H: EM2218952 #1: 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.
- EA015H: EM2218952 #9-10: 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.
- EK067G: EM2218952 #2-6 Sample required dilution for Total phosphorus 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				28-Sep-2022 11:22	28-Sep-2022 13:01	29-Sep-2022 10:36	29-Sep-2022 10:09	29-Sep-2022 09:43
Compound	CAS Number	LOR	Unit	EM2218952-001	EM2218952-002	EM2218952-003	EM2218952-004	EM2218952-005
				Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	1210	15000	54500	54700	57600
EA045: Turbidity								
Turbidity	----	0.1	NTU	119	6.2	21.2	18.8	15.6
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	70	99	212	210	208
Total Alkalinity as CaCO3	----	1	mg/L	70	99	212	210	208
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	224	8430	31000	30700	32300
EG052G: Silica by Discrete Analyser								
Reactive Silica	----	0.05	mg/L	0.96	2.42	0.55	0.64	0.77
EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water								
Ammonia as N	7664-41-7	0.02	mg/L	0.04	<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	0.05	<0.01	0.02	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.05	<0.01	0.02	<0.01	<0.01
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	9.9	<1.0	1.9	2.2	2.6
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	10.0	<1.0	1.9	2.2	2.6
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	1.21	<0.10	<0.10	<0.10	<0.10
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	----	1	mg/L	7	8	22	23	23
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	7	9	30	28	29
EP008: Chlorophyll								
Chlorophyll a	----	1	mg/m³	20	4	13	12	9
Chlorophyll b	----	1	mg/m³	2	<1	2	3	3



Analytical Results

Sub-Matrix: MARINE WATER
 (Matrix: WATER)

Sample ID

				Murray Mouth	Mark Point	Parnka Point	Villa De Yumpa	Stoney Well
Sampling date / time				28-Sep-2022 11:22	28-Sep-2022 13:01	29-Sep-2022 10:36	29-Sep-2022 10:09	29-Sep-2022 09:43
Compound	CAS Number	LOR	Unit	EM2218952-001	EM2218952-002	EM2218952-003	EM2218952-004	EM2218952-005
				Result	Result	Result	Result	Result
EP008: Chlorophyll - Continued								
Pheophytin a	----	1	mg/m ³	16	1	5	9	6



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				29-Sep-2022 09:22	29-Sep-2022 09:04	29-Sep-2022 08:47	29-Sep-2022 08:18	29-Sep-2022 08:31
Compound	CAS Number	LOR	Unit	EM2218952-006	EM2218952-007	EM2218952-008	EM2218952-009	EM2218952-010
				Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	63500	65800	65200	63700	65100
EA045: Turbidity								
Turbidity	----	0.1	NTU	15.8	15.4	15.8	12.1	12.3
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	201	206	204	205	200
Total Alkalinity as CaCO3	----	1	mg/L	201	206	204	205	200
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	36100	37000	37500	37000	37700
EG052G: Silica by Discrete Analyser								
Reactive Silica	----	0.05	mg/L	0.46	0.50	0.56	0.65	0.63
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	3.7	2.9	3.6	3.0	3.8
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	3.7	2.9	3.6	3.0	3.8
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	<0.10	0.11	0.15	0.11	0.20
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	----	1	mg/L	27	28	30	30	28
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	34	37	36	35	37
EP008: Chlorophyll								
Chlorophyll a	----	1	mg/m³	10	12	9	10	11
Chlorophyll b	----	1	mg/m³	2	3	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				29-Sep-2022 09:22	29-Sep-2022 09:04	29-Sep-2022 08:47	29-Sep-2022 08:18	29-Sep-2022 08:31
Compound	CAS Number	LOR	Unit	EM2218952-006	EM2218952-007	EM2218952-008	EM2218952-009	EM2218952-010
				Result	Result	Result	Result	Result
EP008: Chlorophyll - Continued								
Pheophytin a	----	1	mg/m ³	5	4	3	4	4

Inter-Laboratory Testing

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

(WATER) EP008: Chlorophyll

Analysis conducted by ALS Townsville, NATA accreditation no. 825, site no. 23472 (Chemistry) 23313 (Biology).

(WATER) ED037P: Alkalinity by PC Titrator