

CERTIFICATE OF ANALYSIS

Work Order : **EM2215131**
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 : 40926
Sampler : Bryce Drechsler, DARCY MORRIS
Site : HCBC Land run 8/9th August
Quote number : AD/052/20 V2
No. of samples received : 12
No. of samples analysed : 12

Page : 1 of 12
Laboratory : Environmental Division Melbourne
Contact : Kieren Burns
Address : 4 Westall Rd Springvale VIC Australia 3171
Telephone : +61881625130
Date Samples Received : 10-Aug-2022 11:05
Date Analysis Commenced : 10-Aug-2022
Issue Date : 17-Aug-2022 16:55



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 Vijayaratnam	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
Nikki Stepniewski	Senior Inorganic Instrument Chemist	Melbourne Inorganics, Springvale, VIC
Samantha Smith	Assistant Laboratory Manager	WRG Subcontracting, 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.

- EP005:EP002:It is recognised that total organic carbon is less than dissolved organic carbon for samples EM2215131 #3,#8-9,#11-12. However, the difference is within experimental variation of the methods.
- EP002:EP005:It is recognised that total organic carbon is less than dissolved organic carbon for samples EM2215131 #1-2. However, the results confirmed by re-extraction and re-analysis.
- EP008, Chlorophyll-a standard does not contain Pheophytin-a standard.
- EP008, LOR raised for Chlorophyll-b for various samples due to sample matrix.
- EK067G: EM2215131 #5 Poor matrix spike recovery for Total phosphorus due to sample matrix. Confirmed by re-extraction and re-analysis.
- 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: FRESH WATER
 (Matrix: WATER)

Sample ID

				US Tauwitchere	DS Tauwitchere	Long Point	Noonameena	Bonneys
Sampling date / time				08-Aug-2022 13:24	08-Aug-2022 13:21	08-Aug-2022 15:07	08-Aug-2022 15:37	08-Aug-2022 15:57
Compound	CAS Number	LOR	Unit	EM2215131-001	EM2215131-002	EM2215131-003	EM2215131-004	EM2215131-005
				Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	1320	----	----	----	----
EA045: Turbidity								
Turbidity	----	0.1	NTU	66.9	----	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	74	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	74	----	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	633	----	----	----	----
EG052G: Silica by Discrete Analyser								
Reactive Silica	----	0.05	mg/L	3.82	----	----	----	----
EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water								
Ammonia as N	7664-41-7	0.02	mg/L	0.12	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.02	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.02	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.0	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	1.0	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.12	----	----	----	----
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	----	1	mg/L	10	----	----	----	----
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	6	----	----	----	----
EP008: Chlorophyll								
Chlorophyll a	----	1	mg/m³	17	14	6	56	17
Chlorophyll b	----	1	mg/m³	<3	<3	<1	<1	<1



Analytical Results

Sub-Matrix: FRESH WATER
 (Matrix: WATER)

Sample ID

				US Tauwitchere	DS Tauwitchere	Long Point	Noonameena	Bonneys
Sampling date / time				08-Aug-2022 13:24	08-Aug-2022 13:21	08-Aug-2022 15:07	08-Aug-2022 15:37	08-Aug-2022 15:57
Compound	CAS Number	LOR	Unit	EM2215131-001	EM2215131-002	EM2215131-003	EM2215131-004	EM2215131-005
				Result	Result	Result	Result	Result
EP008: Chlorophyll - Continued								
Pheophytin a	----	1	mg/m ³	5	4	3	48	8
Subcontracted Analysis								
Dummy Analyte	----	-	-	NRind	----	----	----	----



Analytical Results

Sub-Matrix: FRESH WATER
 (Matrix: WATER)

Sample ID

				McGrath Flat North	Tilley Swamp Drain D/S Nth Outlet	Morella Basin @ outlet regulator	Morella Creek @ gauge	3.2km south of Salt Creek (land)
Sampling date / time				08-Aug-2022 16:29	09-Aug-2022 10:48	09-Aug-2022 09:25	09-Aug-2022 09:04	09-Aug-2022 08:36
Compound	CAS Number	LOR	Unit	EM2215131-006	EM2215131-007	EM2215131-008	EM2215131-009	EM2215131-010
				Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	----	----	6940	6970	----
EA045: Turbidity								
Turbidity	----	0.1	NTU	----	----	6.4	4.8	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	----	----	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	----	----	68	67	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	----	----	321	324	----
Total Alkalinity as CaCO3	----	1	mg/L	----	----	389	391	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	----	----	3940	4050	----
EG052G: Silica by Discrete Analyser								
Reactive Silica	----	0.05	mg/L	----	----	15.4	15.4	----
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	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	----	----	<0.01	<0.01	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	----	----	0.08	0.02	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	----	----	0.08	0.02	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	----	----	5.0	1.1	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	----	----	5.1	1.1	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	----	----	0.04	0.04	----
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	----	1	mg/L	----	----	8	8	----
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	----	----	6	7	----
EP008: Chlorophyll								
Chlorophyll a	----	1	mg/m³	14	<1	7	6	24
Chlorophyll b	----	1	mg/m³	<1	<1	<1	<1	2



Analytical Results

Sub-Matrix: FRESH WATER
 (Matrix: WATER)

Sample ID

				McGrath Flat North	Tilley Swamp Drain D/S Nth Outlet	Morella Basin @ outlet regulator	Morella Creek @ gauge	3.2km south of Salt Creek (land)
Sampling date / time				08-Aug-2022 16:29	09-Aug-2022 10:48	09-Aug-2022 09:25	09-Aug-2022 09:04	09-Aug-2022 08:36
Compound	CAS Number	LOR	Unit	EM2215131-006	EM2215131-007	EM2215131-008	EM2215131-009	EM2215131-010
				Result	Result	Result	Result	Result
EP008: Chlorophyll - Continued								
Pheophytin a	----	1	mg/m ³	5	<1	<1	1	3
Subcontracted Analysis								
Dummy Analyte	----	-	-	----	----	NRind	NRind	----



Analytical Results

Sub-Matrix: FRESH WATER
 (Matrix: WATER)

Sample ID

				Tilley Swamp Drain U/S Morella	Tilley Swamp Drain Watercourse Outlet	----	----	----
Sampling date / time				09-Aug-2022 09:56	09-Aug-2022 10:35	----	----	----
Compound	CAS Number	LOR	Unit	EM2215131-011	EM2215131-012	-----	-----	-----
				Result	Result	----	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	7920	6500	----	----	----
EA045: Turbidity								
Turbidity	----	0.1	NTU	2.5	3.3	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	387	386	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	387	386	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	4060	3580	----	----	----
EG052G: Silica by Discrete Analyser								
Reactive Silica	----	0.05	mg/L	12.5	12.5	----	----	----
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	----	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	0.02	0.02	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.27	0.40	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.29	0.42	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.6	0.6	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	0.9	1.0	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.02	0.02	----	----	----
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	----	1	mg/L	3	4	----	----	----
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	1	2	----	----	----
EP008: Chlorophyll								
Chlorophyll a	----	1	mg/m³	<1	<1	----	----	----
Chlorophyll b	----	1	mg/m³	<1	<1	----	----	----



Analytical Results

Sub-Matrix: FRESH WATER
 (Matrix: WATER)

Sample ID

				Tilley Swamp Drain U/S Morella	Tilley Swamp Drain Watercourse Outlet	----	----	----
Sampling date / time				09-Aug-2022 09:56	09-Aug-2022 10:35	----	----	----
Compound	CAS Number	LOR	Unit	EM2215131-011	EM2215131-012	-----	-----	-----
Result				Result	Result	----	----	----
EP008: Chlorophyll - Continued								
Pheophytin a	----	1	mg/m ³	<1	<1	----	----	----
Subcontracted Analysis								
Dummy Analyte	----	-	-	NRind	NRind	----	----	----



Analytical Results

Sub-Matrix: MARINE WATER
 (Matrix: WATER)

Sample ID

				DS Tauwitschere	Long Point	Bonneys	McGrath Flat North	3.2km south of Salt Creek (land)
Sampling date / time				08-Aug-2022 13:21	08-Aug-2022 15:07	08-Aug-2022 15:57	08-Aug-2022 16:29	09-Aug-2022 08:36
Compound	CAS Number	LOR	Unit	EM2215131-002	EM2215131-003	EM2215131-005	EM2215131-006	EM2215131-010
				Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	1600	6530	20300	45300	61600
EA045: Turbidity								
Turbidity	----	0.1	NTU	56.4	13.9	6.5	16.0	13.2
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	75	96	123	169	191
Total Alkalinity as CaCO3	----	1	mg/L	75	96	123	169	191
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	853	3870	11000	24000	39400
EG052G: Silica by Discrete Analyser								
Reactive Silica	----	0.05	mg/L	3.94	5.40	0.90	0.65	2.23
EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water								
Ammonia as N	7664-41-7	0.02	mg/L	0.09	0.21	0.10	<0.02	<0.02
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	0.01	0.02	<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	0.12	0.03	0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.06	0.14	0.03	0.01	<0.01
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.6	3.7	2.0	2.5	4.1
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	1.7	3.8	2.0	2.5	4.1
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.15	0.71	0.06	0.22	0.98
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	----	1	mg/L	9	10	13	24	30
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	6	8	13	24	38
Subcontracted Analysis								
Dummy Analyte	----	-	-	NRind	NRind	NRind	NRind	NRind



Analytical Results

Sub-Matrix: SEAWATER
 (Matrix: WATER)

Sample ID

				Noonameena	----	----	----	----
Sampling date / time				08-Aug-2022 15:37	----	----	----	----
Compound	CAS Number	LOR	Unit	EM2215131-004	-----	-----	-----	-----
Result				----	----	----	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	16700	----	----	----	----
EA045: Turbidity								
Turbidity	----	0.1	NTU	14.3	----	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	118	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	118	----	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	9120	----	----	----	----
EG052G: Silica by Discrete Analyser								
Reactive Silica	----	0.05	mg/L	3.48	----	----	----	----
EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water								
Ammonia as N	7664-41-7	0.02	mg/L	0.07	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.02	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.02	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	3.3	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	3.3	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.28	----	----	----	----
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	----	1	mg/L	16	----	----	----	----
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	16	----	----	----	----
Subcontracted Analysis								
Dummy Analyte	----	-	-	NRind	----	----	----	----



Analytical Results

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

Sample ID

				Tilley Swamp Drain D/S Nth Outlet	----	----	----	----
Sampling date / time				09-Aug-2022 10:48	----	----	----	----
Compound	CAS Number	LOR	Unit	EM2215131-007	-----	-----	-----	-----
Result				----	----	----	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	5200	----	----	----	----
EA045: Turbidity								
Turbidity	----	0.1	NTU	4.2	----	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	12	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	377	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	389	----	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	2720	----	----	----	----
EG052G: Silica by Discrete Analyser								
Reactive Silica	----	0.05	mg/L	13.0	----	----	----	----
EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water								
Ammonia as N	7664-41-7	0.02	mg/L	0.02	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	0.02	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.44	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.46	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.7	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	1.2	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.02	----	----	----	----
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	----	1	mg/L	<1	----	----	----	----
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	<1	----	----	----	----
Subcontracted Analysis								
Dummy Analyte	----	-	-	NRind	----	----	----	----

Page : 12 of 12
Work Order : EM2215131
Client : Dept for Environment & Water
Project : HCHB Monitoring Program



Inter-Laboratory Testing

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

(WATER) EP008: Chlorophyll
