

## CERTIFICATE OF ANALYSIS

**Work Order** : **EM2216764**  
**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** : 41794  
**Sampler** : Bryce Drechsler, DARCY MORRIS  
**Site** : HCBC Land 30/31st August  
**Quote number** : AD/052/20 V2  
**No. of samples received** : 12  
**No. of samples analysed** : 12

**Page** : 1 of 10  
**Laboratory** : Environmental Division Melbourne  
**Contact** : Kieren Burns  
**Address** : 4 Westall Rd Springvale VIC Australia 3171  
**Telephone** : +61881625130  
**Date Samples Received** : 01-Sep-2022 12:05  
**Date Analysis Commenced** : 02-Sep-2022  
**Issue Date** : 09-Sep-2022 17:58



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



## 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.

- It is recognised that total organic carbon is less than dissolved organic carbon for samples #1, #2 & #4. However, the difference is within experimental variation of the methods.
- EP008: Chlorophyll-a standard does not contain pheophytin-a standard
- EP008, LOR raised for Chlorophyll-b for various samples due to samples matrix.
- EA015H: EM2216764 #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.
- 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 Tauwitschere	DS Tauwitschere	Long Point	Noonameena	Bonneys
Sampling date / time				30-Aug-2022 12:07	30-Aug-2022 12:09	30-Aug-2022 13:15	30-Aug-2022 13:50	30-Aug-2022 14:09
Compound	CAS Number	LOR	Unit	EM2216764-001	EM2216764-002	EM2216764-003	EM2216764-004	EM2216764-005
				Result	Result	Result	Result	Result
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C</b>								
Total Dissolved Solids @180°C	----	10	mg/L	616	----	----	----	----
<b>EA045: Turbidity</b>								
Turbidity	----	0.1	NTU	246	----	----	----	----
<b>ED037P: Alkalinity by PC Titrator</b>								
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	66	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	66	----	----	----	----
<b>ED045G: Chloride by Discrete Analyser</b>								
Chloride	16887-00-6	1	mg/L	236	----	----	----	----
<b>EG052G: Silica by Discrete Analyser</b>								
Reactive Silica	----	0.05	mg/L	2.94	----	----	----	----
<b>EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water</b>								
Ammonia as N	7664-41-7	0.02	mg/L	<0.02	----	----	----	----
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N	14797-65-0	0.01	mg/L	0.01	----	----	----	----
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
Nitrate as N	14797-55-8	0.01	mg/L	0.03	----	----	----	----
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	0.04	----	----	----	----
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.7	----	----	----	----
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>								
^ Total Nitrogen as N	----	0.1	mg/L	0.7	----	----	----	----
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	0.14	----	----	----	----
<b>EP002: Dissolved Organic Carbon (DOC)</b>								
Dissolved Organic Carbon	----	1	mg/L	11	----	----	----	----
<b>EP005: Total Organic Carbon (TOC)</b>								
Total Organic Carbon	----	1	mg/L	10	----	----	----	----
<b>EP008: Chlorophyll</b>								
Chlorophyll a	----	1	mg/m³	23	18	16	4	16
Chlorophyll b	----	1	mg/m³	<7	<6	<2	<1	<2



## Analytical Results

Sub-Matrix: FRESH WATER  
 (Matrix: WATER)

Sample ID

				US Tauwitchere	DS Tauwitchere	Long Point	Noonameena	Bonneys
Sampling date / time				30-Aug-2022 12:07	30-Aug-2022 12:09	30-Aug-2022 13:15	30-Aug-2022 13:50	30-Aug-2022 14:09
Compound	CAS Number	LOR	Unit	EM2216764-001	EM2216764-002	EM2216764-003	EM2216764-004	EM2216764-005
				Result	Result	Result	Result	Result
EP008: Chlorophyll - Continued								
Pheophytin a	----	1	mg/m <sup>3</sup>	23	15	4	4	22



## 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				30-Aug-2022 14:38	31-Aug-2022 10:00	31-Aug-2022 08:54	31-Aug-2022 08:37	31-Aug-2022 08:13
Compound	CAS Number	LOR	Unit	EM2216764-006	EM2216764-007	EM2216764-008	EM2216764-009	EM2216764-010
				Result	Result	Result	Result	Result
<b>EP008: Chlorophyll</b>								
Chlorophyll a	----	1	mg/m <sup>3</sup>	8	1	6	5	18
Chlorophyll b	----	1	mg/m <sup>3</sup>	<2	<1	<1	<1	1
Pheophytin a	----	1	mg/m <sup>3</sup>	6	<1	<1	<1	4



## Analytical Results

Sub-Matrix: FRESH WATER  
 (Matrix: WATER)

Sample ID

				Tilley Swamp Drain U/S Morella	Tilley Swamp Drain Watercourse Outlet	----	----	----
Sampling date / time				31-Aug-2022 09:24	31-Aug-2022 09:44	----	----	----
Compound	CAS Number	LOR	Unit	EM2216764-011	EM2216764-012	-----	-----	-----
				Result	Result	----	----	----
EP008: Chlorophyll								
Chlorophyll a	----	1	mg/m <sup>3</sup>	2	1	----	----	----
Chlorophyll b	----	1	mg/m <sup>3</sup>	<1	<1	----	----	----
Pheophytin a	----	1	mg/m <sup>3</sup>	<1	<1	----	----	----



## Analytical Results

Sub-Matrix: MARINE WATER  
 (Matrix: WATER)

Sample ID

				DS Tauwitschere	Long Point	Noonameena	Bonneys	McGrath Flat North
Sampling date / time				30-Aug-2022 12:09	30-Aug-2022 13:15	30-Aug-2022 13:50	30-Aug-2022 14:09	30-Aug-2022 14:38
Compound	CAS Number	LOR	Unit	EM2216764-002	EM2216764-003	EM2216764-004	EM2216764-005	EM2216764-006
				Result	Result	Result	Result	Result
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C</b>								
Total Dissolved Solids @180°C	----	10	mg/L	951	12500	23600	27800	45400
<b>EA045: Turbidity</b>								
Turbidity	----	0.1	NTU	255	28.1	23.7	38.8	35.8
<b>ED037P: Alkalinity by PC Titrator</b>								
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	68	102	124	135	170
Total Alkalinity as CaCO3	----	1	mg/L	68	102	124	135	170
<b>ED045G: Chloride by Discrete Analyser</b>								
Chloride	16887-00-6	1	mg/L	432	6460	11300	13400	20300
<b>EG052G: Silica by Discrete Analyser</b>								
Reactive Silica	----	0.05	mg/L	2.92	3.25	1.99	0.70	0.24
<b>EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water</b>								
Ammonia as N	7664-41-7	0.02	mg/L	<0.02	<0.02	<0.02	0.05	<0.02
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N	14797-65-0	0.01	mg/L	0.01	<0.01	<0.01	0.02	<0.01
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
Nitrate as N	14797-55-8	0.01	mg/L	0.05	<0.01	<0.01	0.04	<0.01
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	0.06	<0.01	<0.01	0.06	<0.01
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.5	1.8	1.5	2.2	3.3
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>								
^ Total Nitrogen as N	----	0.1	mg/L	0.6	1.8	1.5	2.3	3.3
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	0.11	0.29	0.12	0.26	0.25
<b>EP002: Dissolved Organic Carbon (DOC)</b>								
Dissolved Organic Carbon	----	1	mg/L	11	11	15	16	22
<b>EP005: Total Organic Carbon (TOC)</b>								
Total Organic Carbon	----	1	mg/L	9	11	14	17	24



## Analytical Results

Sub-Matrix: MARINE WATER  
 (Matrix: WATER)

Sample ID

				Morella Basin @ outlet regulator	Morella Creek @ gauge	3.2km south of Salt Creek (land)	Tilley Swamp Drain U/S Morella	Tilley Swamp Drain Watercourse Outlet
Sampling date / time				31-Aug-2022 08:54	31-Aug-2022 08:37	31-Aug-2022 08:13	31-Aug-2022 09:24	31-Aug-2022 09:44
Compound	CAS Number	LOR	Unit	EM2216764-008	EM2216764-009	EM2216764-010	EM2216764-011	EM2216764-012
				Result	Result	Result	Result	Result
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C</b>								
Total Dissolved Solids @180°C	----	10	mg/L	6880	6950	80700	8930	7800
<b>EA045: Turbidity</b>								
Turbidity	----	0.1	NTU	4.2	10.0	16.6	2.1	3.1
<b>ED037P: Alkalinity by PC Titrator</b>								
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	48	50	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	326	326	193	403	408
Total Alkalinity as CaCO3	----	1	mg/L	375	376	193	403	408
<b>ED045G: Chloride by Discrete Analyser</b>								
Chloride	16887-00-6	1	mg/L	3490	3540	31600	4110	3990
<b>EG052G: Silica by Discrete Analyser</b>								
Reactive Silica	----	0.05	mg/L	16.2	16.3	1.49	11.6	12.4
<b>EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water</b>								
Ammonia as N	7664-41-7	0.02	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	0.02	0.02
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	0.68	0.70
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	0.70	0.72
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.7	0.7	4.0	0.5	0.2
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>								
^ Total Nitrogen as N	----	0.1	mg/L	0.7	0.7	4.0	1.2	0.9
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	<0.02	<0.02	<0.10	<0.02	<0.01
<b>EP002: Dissolved Organic Carbon (DOC)</b>								
Dissolved Organic Carbon	----	1	mg/L	10	14	28	7	7
<b>EP005: Total Organic Carbon (TOC)</b>								
Total Organic Carbon	----	1	mg/L	17	16	37	14	13





## Analytical Results

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

Sample ID

				<b>Tilley Swamp Drain D/S Nth Outlet</b>	----	----	----	----
Sampling date / time				31-Aug-2022 10:00	----	----	----	----
Compound	CAS Number	LOR	Unit	<b>EM2216764-007</b>	-----	-----	-----	-----
Result				----	----	----	----	----
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C</b>								
Total Dissolved Solids @180°C	----	10	mg/L	<b>6430</b>	----	----	----	----
<b>EA045: Turbidity</b>								
Turbidity	----	0.1	NTU	<b>2.8</b>	----	----	----	----
<b>ED037P: Alkalinity by PC Titrator</b>								
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	<b>403</b>	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	<b>403</b>	----	----	----	----
<b>ED045G: Chloride by Discrete Analyser</b>								
Chloride	16887-00-6	1	mg/L	<b>2510</b>	----	----	----	----
<b>EG052G: Silica by Discrete Analyser</b>								
Reactive Silica	----	0.05	mg/L	<b>14.0</b>	----	----	----	----
<b>EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water</b>								
Ammonia as N	7664-41-7	0.02	mg/L	<0.02	----	----	----	----
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N	14797-65-0	0.01	mg/L	<b>0.03</b>	----	----	----	----
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
Nitrate as N	14797-55-8	0.01	mg/L	<b>0.79</b>	----	----	----	----
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	<b>0.82</b>	----	----	----	----
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<b>0.5</b>	----	----	----	----
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>								
^ Total Nitrogen as N	----	0.1	mg/L	<b>1.3</b>	----	----	----	----
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	<0.01	----	----	----	----
<b>EP002: Dissolved Organic Carbon (DOC)</b>								
Dissolved Organic Carbon	----	1	mg/L	<b>8</b>	----	----	----	----
<b>EP005: Total Organic Carbon (TOC)</b>								
Total Organic Carbon	----	1	mg/L	<b>12</b>	----	----	----	----

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Work Order : EM2216764  
Client : Dept for Environment & Water  
Project : HCHB Monitoring Program

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### ***Inter-Laboratory Testing***

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

(WATER) EP008: Chlorophyll

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