

CERTIFICATE OF ANALYSIS

Work Order : **EM2012826**
Client : **Dept for Environment & Water**
Contact : **Mr FRANK MANGERUCA**
Address : **GPO BOX 2834**
ADELAIDE SA, AUSTRALIA 5001
Telephone : **----**
Project : **HCHB Sampling**
Order number : **----**
C-O-C number : **----**
Sampler : **JOSHUA CASTLE**
Site : **----**
Quote number : **AD/052/20 V2**
No. of samples received : **19**
No. of samples analysed : **19**

Page : 1 of 10
Laboratory : Environmental Division Melbourne
Contact : Kieren Burns
Address : 4 Westall Rd Springvale VIC Australia 3171
Telephone : +61881625130
Date Samples Received : 23-Jul-2020 14:20
Date Analysis Commenced : 24-Jul-2020
Issue Date : 03-Aug-2020 11:39



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Arenie Vijayaratnam	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Samantha Smith	Laboratory Coordinator	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 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.

- EP008, Chlorophyll-a standard does not contained Pheophytin-a standard.
- EA015H: EM2012826 #4, #8-9, #11: 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 can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.
- NR - Reported in separate COA
- Algal Count (BM010) has been performed by ALS Water Resources Group, NATA Accreditation no. 992, Site no. 989.

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	Stony Well	North Jacks Point	Seagull Island	Snipe Point	Morella Creek @ gauge
Client sampling date / time					22-Jul-2020 09:40	22-Jul-2020 08:55	22-Jul-2020 08:40	22-Jul-2020 08:25	22-Jul-2020 08:30
Compound	CAS Number	LOR	Unit	EM2012826-001	EM2012826-002	EM2012826-003	EM2012826-004	EM2012826-005	
				Result	Result	Result	Result	Result	
BM010: Algal Count									
Algal Count	----	-	-	NR	NR	NR	NR	NR	
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L	64500	74100	84800	91300	10700	
EA045: Turbidity									
Turbidity	----	0.1	NTU	8.9	10.0	8.4	8.6	2.2	
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	45	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	198	214	220	224	360	
Total Alkalinity as CaCO3	----	1	mg/L	198	214	220	224	406	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	37800	44000	49100	49900	5730	
EG052G: Silica by Discrete Analyser									
Reactive Silica	----	0.05	mg/L	<0.05	<0.05	0.57	0.95	13.8	
EK055G-SW: Ammonia as N by Discrete Analyser in Sea Water									
Ammonia as N	7664-41-7	0.02	mg/L	<0.02	<0.02	<0.02	<0.02	0.06	
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	0.02	<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	0.02	<0.01	<0.01	<0.01	0.02	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	3.1	3.5	3.9	4.1	1.6	
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L	3.1	3.5	3.9	4.1	1.6	
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L	0.90	1.50	2.59	3.64	0.04	
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.01	<0.01	<0.01	<0.01	
EP002: Dissolved Organic Carbon (DOC)									
Dissolved Organic Carbon	----	1	mg/L	21	26	27	27	11	
EP005: Total Organic Carbon (TOC)									



Analytical Results

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

Client sample ID

				Stony Well	North Jacks Point	Seagull Island	Snipe Point	Morella Creek @ gauge
Client sampling date / time				22-Jul-2020 09:40	22-Jul-2020 08:55	22-Jul-2020 08:40	22-Jul-2020 08:25	22-Jul-2020 08:30
Compound	CAS Number	LOR	Unit	EM2012826-001	EM2012826-002	EM2012826-003	EM2012826-004	EM2012826-005
				Result	Result	Result	Result	Result
EP005: Total Organic Carbon (TOC) - Continued								
Total Organic Carbon	----	1	mg/L	25	33	32	33	13
EP008: Chlorophyll								
Chlorophyll a	----	1	mg/m ³	4	6	8	10	10
Chlorophyll b	----	1	mg/m ³	<1	<1	<1	<1	<1
Pheophytin a	----	1	mg/m ³	<1	2	3	3	3



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Client sample ID

				Salt Creek Outlet	1.8km west of Salt Creek	3.2km south of Salt Creek (land)	Tilley Swamp Drain U/S Morella	Murray Mouth
Client sampling date / time				22-Jul-2020 07:50	22-Jul-2020 08:10	22-Jul-2020 08:00	22-Jul-2020 09:00	22-Jul-2020 15:20
Compound	CAS Number	LOR	Unit	EM2012826-006	EM2012826-007	EM2012826-008	EM2012826-009	EM2012826-010
				Result	Result	Result	Result	Result
BM010: Algal Count								
Algal Count	----	-	-	NR	NR	NR	NR	NR
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	81200	80100	90800	11200	29600
EA045: Turbidity								
Turbidity	----	0.1	NTU	7.4	9.9	8.1	1.4	5.3
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	225	225	226	420	130
Total Alkalinity as CaCO3	----	1	mg/L	225	225	226	420	130
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	48500	49000	48200	4200	15900
EG052G: Silica by Discrete Analyser								
Reactive Silica	----	0.05	mg/L	0.93	1.00	0.62	12.5	<0.05
EK055G-SW: Ammonia as N by Discrete Analyser in Sea Water								
Ammonia as N	7664-41-7	0.02	mg/L	<0.02	<0.02	<0.02	0.04	0.07
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	0.02	<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	0.46	<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	0.48	<0.01
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	4.2	4.4	4.1	0.6	0.8
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	4.2	4.4	4.1	1.1	0.8
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	2.21	1.84	2.14	<0.01	0.05
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	----	1	mg/L	28	26	28	<1	<1



Analytical Results

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

Client sample ID

				Salt Creek Outlet	1.8km west of Salt Creek	3.2km south of Salt Creek (land)	Tilley Swamp Drain U/S Morella	Murray Mouth
Client sampling date / time				22-Jul-2020 07:50	22-Jul-2020 08:10	22-Jul-2020 08:00	22-Jul-2020 09:00	22-Jul-2020 15:20
Compound	CAS Number	LOR	Unit	EM2012826-006	EM2012826-007	EM2012826-008	EM2012826-009	EM2012826-010
				Result	Result	Result	Result	Result
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	32	34	32	2	<1
EP008: Chlorophyll								
Chlorophyll a	----	1	mg/m ³	7	11	2	25	2
Chlorophyll b	----	1	mg/m ³	<1	<1	<1	<1	<1
Pheophytin a	----	1	mg/m ³	<1	5	3	<1	<1

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	US Tauwitchere	DS Tauwitchere	Mark Point	Long Point	Noonameena
Client sampling date / time				22-Jul-2020 14:15	22-Jul-2020 14:15	22-Jul-2020 13:50	22-Jul-2020 13:05	22-Jul-2020 11:45	
Compound	CAS Number	LOR	Unit	EM2012826-011	EM2012826-012	EM2012826-013	EM2012826-014	EM2012826-015	
				Result	Result	Result	Result	Result	
BM010: Algal Count									
Algal Count	----	-	-	NR	NR	NR	NR	NR	
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L	1100	4480	18400	25500	38000	
EA045: Turbidity									
Turbidity	----	0.1	NTU	64.2	40.1	12.5	7.0	2.8	
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	105	111	130	137	162	
Total Alkalinity as CaCO3	----	1	mg/L	105	111	130	137	162	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	280	2520	10000	12700	22900	
EG052G: Silica by Discrete Analyser									
Reactive Silica	----	0.05	mg/L	0.31	0.38	0.49	0.58	<0.05	
EK055G-SW: Ammonia as N by Discrete Analyser in Sea Water									
Ammonia as N	7664-41-7	0.02	mg/L	<0.02	0.02	0.04	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	0.02	0.03	0.04	<0.01	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	0.01	0.02	0.03	0.04	<0.01	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.7	2.0	1.4	1.2	1.8	
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L	1.7	2.0	1.4	1.2	1.8	
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L	0.37	0.18	0.05	0.06	0.10	
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
EP002: Dissolved Organic Carbon (DOC)									
Dissolved Organic Carbon	----	1	mg/L	5	4	4	5	5	
EP005: Total Organic Carbon (TOC)									



Analytical Results

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

Client sample ID

				US Tauwitchere	DS Tauwitchere	Mark Point	Long Point	Noonameena
Client sampling date / time				22-Jul-2020 14:15	22-Jul-2020 14:15	22-Jul-2020 13:50	22-Jul-2020 13:05	22-Jul-2020 11:45
Compound	CAS Number	LOR	Unit	EM2012826-011	EM2012826-012	EM2012826-013	EM2012826-014	EM2012826-015
				Result	Result	Result	Result	Result
EP005: Total Organic Carbon (TOC) - Continued								
Total Organic Carbon	----	1	mg/L	4	4	4	4	5
EP008: Chlorophyll								
Chlorophyll a	----	1	mg/m ³	22	15	3	9	5
Chlorophyll b	----	1	mg/m ³	<1	<1	<1	1	<1
Pheophytin a	----	1	mg/m ³	6	5	1	3	<1

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	Bonneys	McGrath Flat North	Parnka Point	Villa de Yumpa	----
Client sampling date / time				22-Jul-2020 11:25	22-Jul-2020 10:35	22-Jul-2020 10:20	22-Jul-2020 09:55	----	
Compound	CAS Number	LOR	Unit	EM2012826-016	EM2012826-017	EM2012826-018	EM2012826-019	-----	
				Result	Result	Result	Result	----	
BM010: Algal Count									
Algal Count	----	-	-	NR	NR	NR	NR	----	
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L	53900	55900	57600	64000	----	
EA045: Turbidity									
Turbidity	----	0.1	NTU	5.6	7.2	7.4	7.7	----	
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	----	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	----	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	179	200	191	195	----	
Total Alkalinity as CaCO3	----	1	mg/L	179	200	191	195	----	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	29500	31100	31400	33300	----	
EG052G: Silica by Discrete Analyser									
Reactive Silica	----	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	----	
EK055G-SW: Ammonia as N by Discrete Analyser in Sea Water									
Ammonia as N	7664-41-7	0.02	mg/L	<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	----	
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	----	
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	----	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	2.8	3.1	2.5	2.6	----	
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L	2.8	3.1	2.5	2.6	----	
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L	0.30	0.33	0.38	0.48	----	
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----	
EP002: Dissolved Organic Carbon (DOC)									
Dissolved Organic Carbon	----	1	mg/L	14	14	12	14	----	
EP005: Total Organic Carbon (TOC)									



Analytical Results

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

Client sample ID

				Bonneys	McGrath Flat North	Parnka Point	Villa de Yumpa	----
Client sampling date / time				22-Jul-2020 11:25	22-Jul-2020 10:35	22-Jul-2020 10:20	22-Jul-2020 09:55	----
Compound	CAS Number	LOR	Unit	EM2012826-016	EM2012826-017	EM2012826-018	EM2012826-019	-----
				Result	Result	Result	Result	----
EP005: Total Organic Carbon (TOC) - Continued								
Total Organic Carbon	----	1	mg/L	12	15	14	16	----
EP008: Chlorophyll								
Chlorophyll a	----	1	mg/m ³	5	4	2	2	----
Chlorophyll b	----	1	mg/m ³	<1	<1	<1	<1	----
Pheophytin a	----	1	mg/m ³	3	2	1	1	----