

CERTIFICATE OF ANALYSIS

Work Order : **EM2113768**
Client : **Dept for Environment & Water**
Contact : **Mr FRANK MANGERUCA**
Address : **GPO BOX 2834**
ADELAIDE SA, AUSTRALIA 5001
Telephone : **----**
Project : **HCHB**
Order number : **----**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **AD/052/20 V2**
No. of samples received : **20**
No. of samples analysed : **20**

Page : 1 of 10
Laboratory : Environmental Division Melbourne
Contact : Kieren Burns
Address : 4 Westall Rd Springvale VIC Australia 3171
Telephone : +61881625130
Date Samples Received : 16-Jul-2021 11:25
Date Analysis Commenced : 16-Jul-2021
Issue Date : 23-Jul-2021 17:06



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	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nikki Stepniewski	Senior Inorganic Instrument 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.

- EP005:EP002:It is recognised that total organic carbon is less than dissolved organic carbon for samples EM2113768 #10. 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 EM2113768 #13, #16, #17. However, the difference is within experimental variation of the methods.
- It is recognised that total phosphorus is less than reactive phosphorus for EM2113768 #12. However, the difference is within experimental variation of the methods.
- EK059G: EM2113768 #2 Sample required dilution prior to analysis due to sample matrix. LOR has been raised accordingly.
- Chlorophyll a standard does not contain Pheophytin a.
- EA015H: EM2113768 #1-4, #7-10: 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.
- EA015H: EM2113768 #19: 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.
- NRind - Reported in separate COA
- Total Algae Count (MB010) is conducted by ALS Scoresby NATA accreditation no. 992, site no. 989.

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Stony Well	North Jacks Point	South Policeman Point/ Seagull Island	Snipe Point	Morella Basin @ Outlet Regulator
Sampling date / time				13-Jul-2021 14:10	13-Jul-2021 13:40	13-Jul-2021 13:15	13-Jul-2021 12:55	13-Jul-2021 13:10	
Compound	CAS Number	LOR	Unit	EM2113768-001	EM2113768-002	EM2113768-003	EM2113768-004	EM2113768-005	
				Result	Result	Result	Result	Result	
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L	87500	93000	95600	120000	8160	
EA045: Turbidity									
Turbidity	----	0.1	NTU	8.6	8.2	5.8	6.0	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	74	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	218	220	222	223	365	
Total Alkalinity as CaCO3	----	1	mg/L	218	220	222	223	439	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	50300	46500	48000	48400	3780	
EG052G: Silica by Discrete Analyser									
Reactive Silica	----	0.05	mg/L	0.65	0.79	1.20	1.18	14.5	
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	<0.02	<0.02	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	<0.01	<0.01	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.02	<0.01	<0.01	0.02	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.02	<0.01	<0.01	0.02	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	2.0	2.1	2.2	1.9	1.2	
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L	2.0	2.1	2.2	1.9	1.2	
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L	0.38	0.26	0.89	0.46	0.06	
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	30	32	32	33	6	
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L	36	36	36	36	8	
EP008: Chlorophyll									



Analytical Results

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

Sample ID

				Stony Well	North Jacks Point	South Policeman Point/ Seagull Island	Snipe Point	Morella Basin @ Outlet Regulator
Sampling date / time				13-Jul-2021 14:10	13-Jul-2021 13:40	13-Jul-2021 13:15	13-Jul-2021 12:55	13-Jul-2021 13:10
Compound	CAS Number	LOR	Unit	EM2113768-001	EM2113768-002	EM2113768-003	EM2113768-004	EM2113768-005
				Result	Result	Result	Result	Result
EP008: Chlorophyll - Continued								
Chlorophyll a	----	1	mg/m ³	14	9	11	6	12
Chlorophyll b	----	1	mg/m ³	1	<1	<1	<1	5
Pheophytin a	----	1	mg/m ³	3	2	2	<1	2
Subcontracted Analysis								
Dummy Analyte	----	-	-	NRind	NRind	NRind	NRind	NRind



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Sample ID

				Morella Creek @ Gauge	Salt Creek Outlet	1.8km West of Salt Creek	3.2km South of Salt Creek (Land)	Tilley Swamp Drain U/S Morella
Sampling date / time				13-Jul-2021 12:55	13-Jul-2021 12:25	13-Jul-2021 12:40	13-Jul-2021 12:30	13-Jul-2021 13:45
Compound	CAS Number	LOR	Unit	EM2113768-006	EM2113768-007	EM2113768-008	EM2113768-009	EM2113768-010
				Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	7130	95500	102000	101000	7160
EA045: Turbidity								
Turbidity	----	0.1	NTU	3.2	6.9	5.9	5.5	2.1
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	110	<1	<1	<1	30
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	332	223	221	221	467
Total Alkalinity as CaCO3	----	1	mg/L	442	223	221	221	497
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	3830	47600	46200	48700	3230
EG052G: Silica by Discrete Analyser								
Reactive Silica	----	0.05	mg/L	12.2	1.16	1.14	1.19	13.1
EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water								
Ammonia as N	7664-41-7	0.02	mg/L	0.03	<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	0.02
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	0.45
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	0.47
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.2	2.8	2.4	2.4	0.6
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	1.2	2.8	2.4	2.4	1.1
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.03	0.20	0.24	0.06	0.01
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	10	32	31	34	9
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	10	37	36	36	8



Analytical Results

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

Sample ID

				Morella Creek @ Gauge	Salt Creek Outlet	1.8km West of Salt Creek	3.2km South of Salt Creek (Land)	Tilley Swamp Drain U/S Morella
Sampling date / time				13-Jul-2021 12:55	13-Jul-2021 12:25	13-Jul-2021 12:40	13-Jul-2021 12:30	13-Jul-2021 13:45
Compound	CAS Number	LOR	Unit	EM2113768-006	EM2113768-007	EM2113768-008	EM2113768-009	EM2113768-010
				Result	Result	Result	Result	Result
EP008: Chlorophyll								
Chlorophyll a	----	1	mg/m ³	6	10	8	8	2
Chlorophyll b	----	1	mg/m ³	<1	<1	<1	<1	<1
Pheophytin a	----	1	mg/m ³	<1	2	<1	6	<1
Subcontracted Analysis								
Dummy Analyte	----	-	-	NRind	NRind	NRind	NRind	NRind

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Tauwitschere U/S	Noonameena	Bonneys	McGrath Flat	Tauwitschere DS
Sampling date / time				14-Jul-2021 08:50	13-Jul-2021 14:25	13-Jul-2021 16:05	13-Jul-2021 15:00	14-Jul-2021 08:50	
Compound	CAS Number	LOR	Unit	EM2113768-011	EM2113768-012	EM2113768-013	EM2113768-014	EM2113768-015	
				Result	Result	Result	Result	Result	
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L	683	33900	37300	59500	7550	
EA045: Turbidity									
Turbidity	----	0.1	NTU	50.7	12.3	4.2	5.3	39.9	
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	26	3	<1	<1	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	100	148	177	207	111	
Total Alkalinity as CaCO3	----	1	mg/L	100	174	180	207	111	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	342	19000	25400	32300	4480	
EG052G: Silica by Discrete Analyser									
Reactive Silica	----	0.05	mg/L	<0.05	0.09	0.12	0.45	0.28	
EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water									
Ammonia as N	7664-41-7	0.02	mg/L	0.10	0.04	<0.02	<0.02	0.05	
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	0.21	0.10	0.02	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.21	0.10	0.02	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.4	<0.1	<0.1	0.6	1.3	
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L	1.4	<0.1	0.2	0.7	1.3	
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L	0.09	0.07	<0.01	<0.01	0.08	
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.12	<0.01	<0.01	<0.01	
EP002: Dissolved Organic Carbon (DOC)									
Dissolved Organic Carbon	----	1	mg/L	7	12	14	21	6	
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L	9	12	12	24	8	
EP008: Chlorophyll									



Analytical Results

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

Sample ID

				Tauwitchere U/S	Noonameena	Bonneys	McGrath Flat	Tauwitchere DS
Sampling date / time				14-Jul-2021 08:50	13-Jul-2021 14:25	13-Jul-2021 16:05	13-Jul-2021 15:00	14-Jul-2021 08:50
Compound	CAS Number	LOR	Unit	EM2113768-011	EM2113768-012	EM2113768-013	EM2113768-014	EM2113768-015
				Result	Result	Result	Result	Result
EP008: Chlorophyll - Continued								
Chlorophyll a	----	1	mg/m ³	10	3	4	3	8
Chlorophyll b	----	1	mg/m ³	1	<1	<1	<1	<1
Pheophytin a	----	1	mg/m ³	<1	2	1	<1	2
Subcontracted Analysis								
Dummy Analyte	----	-	-	NRind	NRind	NRind	NRind	NRind

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Long Point	Murray Mouth	Parnka Point	Villa de Yumpa	Mark Point
Sampling date / time				14-Jul-2021 07:20	14-Jul-2021 10:00	13-Jul-2021 15:25	13-Jul-2021 14:40	14-Jul-2021 08:10	
Compound	CAS Number	LOR	Unit	EM2113768-016	EM2113768-017	EM2113768-018	EM2113768-019	EM2113768-020	
				Result	Result	Result	Result	Result	
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L	21900	27200	61000	165000	18700	
EA045: Turbidity									
Turbidity	----	0.1	NTU	6.4	4.5	5.7	6.2	6.2	
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	131	134	200	216	128	
Total Alkalinity as CaCO3	----	1	mg/L	131	134	200	216	128	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	12600	14000	40900	45900	10500	
EG052G: Silica by Discrete Analyser									
Reactive Silica	----	0.05	mg/L	0.52	0.24	0.21	0.28	0.87	
EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water									
Ammonia as N	7664-41-7	0.02	mg/L	0.03	0.06	<0.02	<0.02	0.04	
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	<0.1	<0.1	0.7	1.7	<0.1	
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L	<0.1	<0.1	0.7	1.7	<0.1	
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	0.22	<0.01	0.18	
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	0.02	
EP002: Dissolved Organic Carbon (DOC)									
Dissolved Organic Carbon	----	1	mg/L	6	2	22	27	5	
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L	5	3	25	33	7	
EP008: Chlorophyll									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Long Point	Murray Mouth	Parnka Point	Villa de Yumpa	Mark Point
Sampling date / time					14-Jul-2021 07:20	14-Jul-2021 10:00	13-Jul-2021 15:25	13-Jul-2021 14:40	14-Jul-2021 08:10
Compound	CAS Number	LOR	Unit		EM2113768-016	EM2113768-017	EM2113768-018	EM2113768-019	EM2113768-020
					Result	Result	Result	Result	Result
EP008: Chlorophyll - Continued									
Chlorophyll a	----	1	mg/m ³		10	3	5	8	4
Chlorophyll b	----	1	mg/m ³		<1	<1	<1	<1	<1
Pheophytin a	----	1	mg/m ³		4	<1	<1	1	<1
Subcontracted Analysis									
Dummy Analyte	----	-	-		NRind	NRind	NRind	NRind	NRind

Inter-Laboratory Testing

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

(WATER) EP008: Chlorophyll