



## CERTIFICATE OF ANALYSIS

Work Order	: ES2413648	Page	: 1 of 7
Client	: Department of Climate Change, Energy, the Environment and Water	Laboratory	: Environmental Division Sydney
Contact	: [REDACTED]	Contact	: Customer Services ES
Address	: [REDACTED]	Address	: [REDACTED]
Telephone	: [REDACTED]	Telephone	: [REDACTED]
Project	: Darling Baaka River Health Program	Date Samples Received	: 26-Apr-2024 16:50
Order number	: ---	Date Analysis Commenced	: 29-Apr-2024
C-O-C number	: ---	Issue Date	: 03-May-2024 17:12
Sampler	: ---		
Site	: ---		
Quote number	: ES24DEPENWAT0001		
No. of samples received	: 24		
No. of samples analysed	: 24		



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
[REDACTED]	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW

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### 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  
∅ = ALS is not NATA accredited for these tests.  
~ = Indicates an estimated value.

- EK271A-CM: Samples for Ultra-Trace Reactive Phosphorus by FIA should be frozen upon sampling. If not, low-level results (below 0.01 mg/L) may bias low.
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**Analytical Results**

Sub-Matrix: WATER  
 (Matrix: WATER)

Sample ID

				MFK-Z-E1_20240415	MFK-Z-E2_20240415	MFK-Z-E2-Upper-Meni n-Buoy_20240415 Received as Upper Menid / Buoy / S.B Trip 25	MFK-Z-E3_20240415	MFK-Z-E4_20240415
Sampling date / time				15-Apr-2024 00:00	15-Apr-2024 00:00	15-Apr-2024 00:00	15-Apr-2024 00:00	15-Apr-2024 00:00
Compound	CAS Number	LOR	Unit	ES2413648-001	ES2413648-002	ES2413648-003	ES2413648-004	ES2413648-005
				Result	Result	Result	Result	Result
<b>ED040F: Dissolved Major Anions</b>								
Sulfate as SO4 2-	14808-79-8	1	mg/L	32	31	30	28	27
Sulfur as S	63705-05-5	1	mg/L	11	10	10	9	9
Silicon as SiO2	14464-46-1	0.1	mg/L	9.6	9.3	9.2	9.3	9.5
Silicon	7440-21-3	0.05	mg/L	4.48	4.36	4.27	4.35	4.44
<b>EK255A: Ammonia</b>								
Ammonia as N	7664-41-7	0.005	mg/L	0.008	0.005	0.006	<0.005	<0.005
<b>EK259A: Nitrite and Nitrate (NOx)</b>								
Nitrite + Nitrate as N	----	0.002	mg/L	0.004	0.003	<0.002	<0.002	<0.002
<b>EK262A: Total Nitrogen</b>								
Dissolved Total Nitrogen as N	----	0.01	mg/L	0.70	0.71	0.71	0.65	0.69
Total Nitrogen as N	----	0.01	mg/L	1.48	1.56	1.58	1.41	1.42
<b>EK267A: Total Phosphorus (Persulfate Digestion)</b>								
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.060	0.067	0.063	0.065	0.055
Total Phosphorus as P	----	0.005	mg/L	0.190	0.189	0.180	0.201	0.189
<b>EK271A: Reactive Phosphorus</b>								
Reactive Phosphate	14625-44-2	0.001	mg/L	0.168	0.175	0.119	0.151	0.136

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**Analytical Results**

Sub-Matrix: WATER  
 (Matrix: WATER)

Sample ID

				MFK-Z-E4-Duplicate_2 0240415 Received as E4 Dup Trip25	MFK-Z-E5_20240415	MFK-Z-E6_5_20240415	MFK-Z-E7_20240415	MFK-Z-E8_20240415
Sampling date / time				15-Apr-2024 00:00	15-Apr-2024 00:00	15-Apr-2024 00:00	15-Apr-2024 00:00	15-Apr-2024 00:00
Compound	CAS Number	LOR	Unit	ES2413648-006	ES2413648-007	ES2413648-008	ES2413648-009	ES2413648-010
				Result	Result	Result	Result	Result
<b>ED040F: Dissolved Major Anions</b>								
Sulfate as SO4 2-	14808-79-8	1	mg/L	27	24	16	16	25
Sulfur as S	63705-05-5	1	mg/L	9	8	5	5	8
Silicon as SiO2	14464-46-1	0.1	mg/L	9.4	9.7	9.6	9.2	9.7
Silicon	7440-21-3	0.05	mg/L	4.37	4.53	4.47	4.30	4.52
<b>EK255A: Ammonia</b>								
Ammonia as N	7664-41-7	0.005	mg/L	<0.005	0.005	0.007	0.006	0.010
<b>EK259A: Nitrite and Nitrate (NOx)</b>								
Nitrite + Nitrate as N	---	0.002	mg/L	<0.002	<0.002	0.003	0.002	<0.002
<b>EK262A: Total Nitrogen</b>								
Dissolved Total Nitrogen as N	---	0.01	mg/L	0.67	0.85	0.80	0.82	0.82
Total Nitrogen as N	---	0.01	mg/L	1.48	1.92	1.32	1.29	1.86
<b>EK267A: Total Phosphorus (Persulfate Digestion)</b>								
Dissolved Total Phosphorus as P	---	0.005	mg/L	0.062	0.069	0.044	0.026	0.065
Total Phosphorus as P	---	0.005	mg/L	0.171	0.233	0.226	0.161	0.184
<b>EK271A: Reactive Phosphorus</b>								
Reactive Phosphate	14625-44-2	0.001	mg/L	0.119	0.114	0.069	0.051	0.166

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**Analytical Results**

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MFK-Z-E9_20240415	MFK-Z-E10_20240415	MFK-Z-E11_20240415	MFK-Z-E12_20240415	MFK-Z-E13_20240415
Sampling date / time				15-Apr-2024 00:00	15-Apr-2024 00:00	15-Apr-2024 00:00	15-Apr-2024 00:00	15-Apr-2024 00:00	
Compound	CAS Number	LOR	Unit	ES2413648-011	ES2413648-012	ES2413648-013	ES2413648-014	ES2413648-015	
				Result	Result	Result	Result	Result	
<b>ED040F: Dissolved Major Anions</b>									
Sulfate as SO4 2-	14808-79-8	1	mg/L	24	24	24	24	24	
Sulfur as S	63705-05-5	1	mg/L	8	8	8	8	8	
Silicon as SiO2	14464-46-1	0.1	mg/L	9.7	10.1	9.9	9.7	8.8	
Silicon	7440-21-3	0.05	mg/L	4.54	4.72	4.62	4.52	4.09	
<b>EK255A: Ammonia</b>									
Ammonia as N	7664-41-7	0.005	mg/L	0.010	0.005	0.012	0.006	<0.005	
<b>EK259A: Nitrite and Nitrate (NOx)</b>									
Nitrite + Nitrate as N	----	0.002	mg/L	<0.002	<0.002	<0.002	<0.002	0.004	
<b>EK262A: Total Nitrogen</b>									
Dissolved Total Nitrogen as N	----	0.01	mg/L	0.78	0.78	0.82	0.72	0.70	
Total Nitrogen as N	----	0.01	mg/L	1.75	1.59	1.39	1.44	1.59	
<b>EK267A: Total Phosphorus (Persulfate Digestion)</b>									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.060	0.058	0.059	0.108	0.066	
Total Phosphorus as P	----	0.005	mg/L	0.175	0.191	0.248	0.149	0.209	
<b>EK271A: Reactive Phosphorus</b>									
Reactive Phosphate	14625-44-2	0.001	mg/L	0.162	0.169	0.115	0.114	0.113	

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**Analytical Results**

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MFK-Z-E14_20240415	MFK-Z-E15_20240415	MFK-Z-B2_20240415	MFK-Z-B4_20240415	MFK-Z-BLTK1_20240415
Sampling date / time				15-Apr-2024 00:00	15-Apr-2024 00:00	15-Apr-2024 00:00	15-Apr-2024 00:00	15-Apr-2024 00:00	
Compound	CAS Number	LOR	Unit	ES2413648-016	ES2413648-017	ES2413648-018	ES2413648-019	ES2413648-020	
				Result	Result	Result	Result	Result	
<b>ED040F: Dissolved Major Anions</b>									
Sulfate as SO4 2-	14808-79-8	1	mg/L	26	26	30	15	<1	
Sulfur as S	63705-05-5	1	mg/L	9	9	10	5	<1	
Silicon as SiO2	14464-46-1	0.1	mg/L	7.6	7.3	9.4	9.7	<0.1	
Silicon	7440-21-3	0.05	mg/L	3.55	3.42	4.41	4.52	<0.05	
<b>EK255A: Ammonia</b>									
Ammonia as N	7664-41-7	0.005	mg/L	0.009	0.012	0.013	0.009	<0.005	
<b>EK259A: Nitrite and Nitrate (NOx)</b>									
Nitrite + Nitrate as N	----	0.002	mg/L	<0.002	0.003	0.002	0.004	<0.002	
<b>EK262A: Total Nitrogen</b>									
Dissolved Total Nitrogen as N	----	0.01	mg/L	0.72	0.75	0.77	0.75	<0.01	
Total Nitrogen as N	----	0.01	mg/L	1.73	1.71	1.45	1.16	<0.01	
<b>EK267A: Total Phosphorus (Persulfate Digestion)</b>									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.029	0.029	0.075	0.053	<0.005	
Total Phosphorus as P	----	0.005	mg/L	0.119	0.140	0.221	0.189	<0.005	
<b>EK271A: Reactive Phosphorus</b>									
Reactive Phosphate	14625-44-2	0.001	mg/L	0.076	0.074	0.151	0.073	<0.001	

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**Analytical Results**

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MFK-Z-BLNK2_202404 15	MFK-Z-BLNK3_202404 15	MFK-Z-Willcannia_202 40415 Received as Buoy Wetherell/Wetherell	MFK-Z-Willcannia-Buo y_20240415	---
Sampling date / time				15-Apr-2024 00:00	15-Apr-2024 00:00	15-Apr-2024 00:00	15-Apr-2024 00:00	---	
Compound	CAS Number	LOR	Unit	ES2413648-021	ES2413648-022	ES2413648-023	ES2413648-024	-----	
				Result	Result	Result	Result	---	
<b>ED040F: Dissolved Major Anions</b>									
Sulfate as SO4 2-	14808-79-8	1	mg/L	<1	<1	28	10	---	
Sulfur as S	63705-05-5	1	mg/L	<1	<1	9	3	---	
Silicon as SiO2	14464-46-1	0.1	mg/L	<0.1	<0.1	14.4	21.0	---	
Silicon	7440-21-3	0.05	mg/L	<0.05	<0.05	6.72	9.80	---	
<b>EK255A: Ammonia</b>									
Ammonia as N	7664-41-7	0.005	mg/L	<0.005	<0.005	<0.005	0.010	---	
<b>EK259A: Nitrite and Nitrate (NOx)</b>									
Nitrite + Nitrate as N	---	0.002	mg/L	<0.002	<0.002	0.305	0.802	---	
<b>EK262A: Total Nitrogen</b>									
Dissolved Total Nitrogen as N	---	0.01	mg/L	<0.01	<0.01	0.91	1.32	---	
Total Nitrogen as N	---	0.01	mg/L	<0.01	<0.01	1.41	1.86	---	
<b>EK267A: Total Phosphorus (Persulfate Digestion)</b>									
Dissolved Total Phosphorus as P	---	0.005	mg/L	<0.005	<0.005	0.184	0.272	---	
Total Phosphorus as P	---	0.005	mg/L	<0.005	<0.005	0.222	0.763	---	
<b>EK271A: Reactive Phosphorus</b>									
Reactive Phosphate	14625-44-2	0.001	mg/L	<0.001	<0.001	0.359	0.713	---	