



## CERTIFICATE OF ANALYSIS

Work Order	: ES2441343	Page	: 1 of 9
Client	: Department of Climate Change, Energy, the Environment and Water	Laboratory	: Environmental Division Sydney
Contact Address	: [REDACTED]	Contact Address	: Customer Services ES [REDACTED]
Telephone	: ----	Telephone	: [REDACTED]
Project	: Darling Baaka River Health Program	Date Samples Received	: 17-Dec-2024 16:15
Order number	: ----	Date Analysis Commenced	: 18-Dec-2024
C-O-C number	: ----	Issue Date	: 24-Dec-2024 16:29
Sampler	: ----		
Site	: ----		
Quote number	: ES24DEPENWAT0001		
No. of samples received	: 33		
No. of samples analysed	: 33		



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
[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	S2	S2	S3	S4	S5
Sampling date / time				03-Dec-2024 00:00	12-Dec-2024 00:00	03-Dec-2024 00:00	12-Dec-2024 00:00	12-Dec-2024 00:00	
Compound	CAS Number	LOR	Unit	ES2441343-001	ES2441343-002	ES2441343-003	ES2441343-004	ES2441343-005	
				Result	Result	Result	Result	Result	
<b>ED040F: Dissolved Major Anions</b>									
Sulfate as SO4 2-	14808-79-8	1	mg/L	33	34	33	32	29	
Sulfur as S	63705-05-5	1	mg/L	11	11	11	11	10	
Silicon as SiO2	14464-46-1	0.1	mg/L	1.2	1.5	1.4	0.7	1.2	
Silicon	7440-21-3	0.05	mg/L	0.58	0.71	0.67	0.34	0.58	
<b>EK255A: Ammonia</b>									
Ammonia as N	7664-41-7	0.005	mg/L	0.008	0.011	0.011	0.025	0.005	
<b>EK257A: Nitrite</b>									
Nitrite as N	14797-65-0	0.002	mg/L	<0.002	0.002	0.012	<0.002	<0.002	
<b>EK258A: Nitrate</b>									
Nitrate as N	14797-55-8	0.002	mg/L	0.002	0.002	0.028	0.010	<0.002	
<b>EK259A: Nitrite and Nitrate (NOx)</b>									
Nitrite + Nitrate as N	----	0.002	mg/L	0.002	0.004	0.040	0.010	<0.002	
<b>EK261A: Total Kjeldahl Nitrogen</b>									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	2.47	1.89	1.05	1.55	0.77	
<b>EK262A: Total Nitrogen</b>									
Dissolved Total Nitrogen as N	----	0.01	mg/L	0.64	0.59	0.62	0.56	0.42	
Total Nitrogen as N	----	0.01	mg/L	2.47	1.89	1.09	1.56	0.77	
<b>EK267A: Total Phosphorus (Persulfate Digestion)</b>									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.040	0.029	0.058	0.026	0.022	
Total Phosphorus as P	----	0.005	mg/L	0.243	0.183	0.073	0.200	0.086	
<b>EK271A: Reactive Phosphorus</b>									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.005	0.004	0.014	0.004	0.005	

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### Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	S6	S7	S8	S9	S10
Sampling date / time				12-Dec-2024 00:00	12-Dec-2024 00:00	10-Dec-2024 00:00	09-Dec-2024 00:00	11-Dec-2024 00:00	
Compound	CAS Number	LOR	Unit	ES2441343-006	ES2441343-007	ES2441343-008	ES2441343-009	ES2441343-010	
				Result	Result	Result	Result	Result	
<b>ED040F: Dissolved Major Anions</b>									
Sulfate as SO4 2-	14808-79-8	1	mg/L	26	29	24	26	26	
Sulfur as S	63705-05-5	1	mg/L	9	10	8	8	9	
Silicon as SiO2	14464-46-1	0.1	mg/L	1.5	2.0	3.3	5.8	10.8	
Silicon	7440-21-3	0.05	mg/L	0.71	0.95	1.55	2.72	5.06	
<b>EK255A: Ammonia</b>									
Ammonia as N	7664-41-7	0.005	mg/L	0.009	0.006	0.006	<0.005	0.049	
<b>EK257A: Nitrite</b>									
Nitrite as N	14797-65-0	0.002	mg/L	<0.002	<0.002	0.002	<0.002	0.013	
<b>EK258A: Nitrate</b>									
Nitrate as N	14797-55-8	0.002	mg/L	0.005	0.004	0.002	<0.002	0.109	
<b>EK259A: Nitrite and Nitrate (NOx)</b>									
Nitrite + Nitrate as N	----	0.002	mg/L	0.005	0.004	0.004	<0.002	0.122	
<b>EK261A: Total Kjeldahl Nitrogen</b>									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	0.80	0.71	0.82	0.94	1.09	
<b>EK262A: Total Nitrogen</b>									
Dissolved Total Nitrogen as N	----	0.01	mg/L	0.48	0.43	0.58	0.64	0.89	
Total Nitrogen as N	----	0.01	mg/L	0.81	0.71	0.82	0.94	1.21	
<b>EK267A: Total Phosphorus (Persulfate Digestion)</b>									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.015	0.043	0.054	0.044	0.143	
Total Phosphorus as P	----	0.005	mg/L	0.094	0.073	0.093	0.096	0.226	
<b>EK271A: Reactive Phosphorus</b>									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.006	0.014	0.028	0.022	0.101	

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 Project : Darling Baaka River Health Program



### Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	S11	S12	S13	S14	S15
Sampling date / time				11-Dec-2024 00:00	02-Dec-2024 00:00	11-Dec-2024 00:00	11-Dec-2024 00:00	11-Dec-2024 00:00	
Compound	CAS Number	LOR	Unit	ES2441343-011	ES2441343-012	ES2441343-013	ES2441343-014	ES2441343-015	
				Result	Result	Result	Result	Result	
<b>ED040F: Dissolved Major Anions</b>									
Sulfate as SO4 2-	14808-79-8	1	mg/L	24	23	26	24	24	
Sulfur as S	63705-05-5	1	mg/L	8	8	9	8	8	
Silicon as SiO2	14464-46-1	0.1	mg/L	10.9	10.4	9.6	10.6	11.0	
Silicon	7440-21-3	0.05	mg/L	5.08	4.87	4.48	4.96	5.15	
<b>EK255A: Ammonia</b>									
Ammonia as N	7664-41-7	0.005	mg/L	<0.005	0.017	0.010	0.006	0.011	
<b>EK257A: Nitrite</b>									
Nitrite as N	14797-65-0	0.002	mg/L	0.008	<0.002	0.009	0.012	0.012	
<b>EK258A: Nitrate</b>									
Nitrate as N	14797-55-8	0.002	mg/L	0.011	0.015	0.035	0.007	0.081	
<b>EK259A: Nitrite and Nitrate (NOx)</b>									
Nitrite + Nitrate as N	----	0.002	mg/L	0.019	0.015	0.044	0.019	0.093	
<b>EK261A: Total Kjeldahl Nitrogen</b>									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	1.26	1.28	1.43	1.52	1.32	
<b>EK262A: Total Nitrogen</b>									
Dissolved Total Nitrogen as N	----	0.01	mg/L	0.70	0.68	0.73	0.77	0.77	
Total Nitrogen as N	----	0.01	mg/L	1.28	1.30	1.47	1.54	1.41	
<b>EK267A: Total Phosphorus (Persulfate Digestion)</b>									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.131	0.127	0.121	0.081	0.123	
Total Phosphorus as P	----	0.005	mg/L	0.212	0.272	0.301	0.301	0.280	
<b>EK271A: Reactive Phosphorus</b>									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.080	0.071	0.051	0.052	0.067	

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### Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	S16	S18	S19	S20	S21
Sampling date / time				11-Dec-2024 00:00	11-Dec-2024 00:00	11-Dec-2024 00:00	10-Dec-2024 00:00	10-Dec-2024 00:00	
Compound	CAS Number	LOR	Unit	ES2441343-016	ES2441343-017	ES2441343-018	ES2441343-019	ES2441343-020	
				Result	Result	Result	Result	Result	
<b>ED040F: Dissolved Major Anions</b>									
Sulfate as SO4 2-	14808-79-8	1	mg/L	24	25	26	25	26	
Sulfur as S	63705-05-5	1	mg/L	8	8	9	8	8	
Silicon as SiO2	14464-46-1	0.1	mg/L	10.8	10.1	8.4	8.8	8.5	
Silicon	7440-21-3	0.05	mg/L	5.04	4.70	3.92	4.08	3.98	
<b>EK255A: Ammonia</b>									
Ammonia as N	7664-41-7	0.005	mg/L	0.006	<0.005	0.006	<0.005	0.006	
<b>EK257A: Nitrite</b>									
Nitrite as N	14797-65-0	0.002	mg/L	0.007	0.006	<0.002	<0.002	0.002	
<b>EK258A: Nitrate</b>									
Nitrate as N	14797-55-8	0.002	mg/L	0.012	0.011	<0.002	<0.002	0.002	
<b>EK259A: Nitrite and Nitrate (NOx)</b>									
Nitrite + Nitrate as N	----	0.002	mg/L	0.019	0.017	<0.002	<0.002	0.004	
<b>EK261A: Total Kjeldahl Nitrogen</b>									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	1.98	2.41	1.58	1.48	1.47	
<b>EK262A: Total Nitrogen</b>									
Dissolved Total Nitrogen as N	----	0.01	mg/L	0.89	0.92	0.86	0.88	0.88	
Total Nitrogen as N	----	0.01	mg/L	2.00	2.43	1.58	1.48	1.47	
<b>EK267A: Total Phosphorus (Persulfate Digestion)</b>									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.022	0.068	0.078	0.087	0.082	
Total Phosphorus as P	----	0.005	mg/L	0.298	0.354	0.276	0.187	0.243	
<b>EK271A: Reactive Phosphorus</b>									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.011	0.024	0.034	0.035	0.035	

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**Analytical Results**

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	S22	S23	S24	S25	S26
Sampling date / time				10-Dec-2024 00:00	11-Dec-2024 00:00	11-Dec-2024 00:00	10-Dec-2024 00:00	10-Dec-2024 00:00	
Compound	CAS Number	LOR	Unit	ES2441343-021	ES2441343-022	ES2441343-023	ES2441343-024	ES2441343-025	
				Result	Result	Result	Result	Result	
<b>ED040F: Dissolved Major Anions</b>									
Sulfate as SO4 2-	14808-79-8	1	mg/L	26	28	18	25	16	
Sulfur as S	63705-05-5	1	mg/L	9	9	6	8	6	
Silicon as SiO2	14464-46-1	0.1	mg/L	8.3	9.2	0.6	9.6	9.4	
Silicon	7440-21-3	0.05	mg/L	3.88	4.28	0.26	4.50	4.38	
<b>EK255A: Ammonia</b>									
Ammonia as N	7664-41-7	0.005	mg/L	<0.005	<0.005	0.009	0.016	0.012	
<b>EK257A: Nitrite</b>									
Nitrite as N	14797-65-0	0.002	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	
<b>EK258A: Nitrate</b>									
Nitrate as N	14797-55-8	0.002	mg/L	<0.002	<0.002	0.003	0.005	0.006	
<b>EK259A: Nitrite and Nitrate (NOx)</b>									
Nitrite + Nitrate as N	----	0.002	mg/L	<0.002	<0.002	0.003	0.005	0.006	
<b>EK261A: Total Kjeldahl Nitrogen</b>									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	1.48	1.24	2.18	4.34	2.99	
<b>EK262A: Total Nitrogen</b>									
Dissolved Total Nitrogen as N	----	0.01	mg/L	0.80	0.70	1.22	1.92	1.45	
Total Nitrogen as N	----	0.01	mg/L	1.48	1.24	2.18	4.34	3.00	
<b>EK267A: Total Phosphorus (Persulfate Digestion)</b>									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.067	0.097	0.039	0.118	0.073	
Total Phosphorus as P	----	0.005	mg/L	0.238	0.199	0.229	0.368	0.329	
<b>EK271A: Reactive Phosphorus</b>									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.028	0.043	0.003	0.032	0.020	

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**Analytical Results**

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	S27	S28	S29	S30	S32
Sampling date / time				10-Dec-2024 00:00	10-Dec-2024 00:00	12-Dec-2024 00:00	12-Dec-2024 00:00	11-Dec-2024 00:00	
Compound	CAS Number	LOR	Unit	ES2441343-026	ES2441343-027	ES2441343-028	ES2441343-029	ES2441343-030	
				Result	Result	Result	Result	Result	
<b>ED040F: Dissolved Major Anions</b>									
Sulfate as SO4 2-	14808-79-8	1	mg/L	14	14	16	17	26	
Sulfur as S	63705-05-5	1	mg/L	5	5	5	6	9	
Silicon as SiO2	14464-46-1	0.1	mg/L	10.2	8.1	11.4	12.6	9.7	
Silicon	7440-21-3	0.05	mg/L	4.75	3.80	5.32	5.90	4.53	
<b>EK255A: Ammonia</b>									
Ammonia as N	7664-41-7	0.005	mg/L	0.008	0.008	0.005	<0.005	<0.005	
<b>EK257A: Nitrite</b>									
Nitrite as N	14797-65-0	0.002	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	
<b>EK258A: Nitrate</b>									
Nitrate as N	14797-55-8	0.002	mg/L	0.003	<0.002	0.005	0.005	0.003	
<b>EK259A: Nitrite and Nitrate (NOx)</b>									
Nitrite + Nitrate as N	----	0.002	mg/L	0.003	<0.002	0.005	0.005	0.003	
<b>EK261A: Total Kjeldahl Nitrogen</b>									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	2.26	1.90	1.50	1.54	1.39	
<b>EK262A: Total Nitrogen</b>									
Dissolved Total Nitrogen as N	----	0.01	mg/L	1.23	1.11	1.09	0.99	0.79	
Total Nitrogen as N	----	0.01	mg/L	2.26	1.90	1.50	1.54	1.39	
<b>EK267A: Total Phosphorus (Persulfate Digestion)</b>									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.176	0.121	0.151	0.122	0.072	
Total Phosphorus as P	----	0.005	mg/L	0.228	0.285	0.267	0.341	0.210	
<b>EK271A: Reactive Phosphorus</b>									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.052	0.051	0.062	0.040	0.040	

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### Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	B1	B2	B3	----	----
Sampling date / time				11-Dec-2024 00:00	09-Dec-2024 00:00	09-Dec-2024 00:00	----	----	
Compound	CAS Number	LOR	Unit	ES2441343-031	ES2441343-032	ES2441343-033	-----	-----	
				Result	Result	Result	---	---	
<b>ED040F: Dissolved Major Anions</b>									
Sulfate as SO4 2-	14808-79-8	1	mg/L	24	23	22	----	----	
Sulfur as S	63705-05-5	1	mg/L	8	8	7	----	----	
Silicon as SiO2	14464-46-1	0.1	mg/L	10.4	10.0	10.4	----	----	
Silicon	7440-21-3	0.05	mg/L	4.85	4.66	4.86	----	----	
<b>EK255A: Ammonia</b>									
Ammonia as N	7664-41-7	0.005	mg/L	<0.005	0.087	<0.005	----	----	
<b>EK257A: Nitrite</b>									
Nitrite as N	14797-65-0	0.002	mg/L	<0.002	0.010	0.010	----	----	
<b>EK258A: Nitrate</b>									
Nitrate as N	14797-55-8	0.002	mg/L	0.003	0.117	0.007	----	----	
<b>EK259A: Nitrite and Nitrate (NOx)</b>									
Nitrite + Nitrate as N	----	0.002	mg/L	0.003	0.127	0.017	----	----	
<b>EK261A: Total Kjeldahl Nitrogen</b>									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	1.40	1.10	2.79	----	----	
<b>EK262A: Total Nitrogen</b>									
Dissolved Total Nitrogen as N	----	0.01	mg/L	0.70	0.90	0.97	----	----	
Total Nitrogen as N	----	0.01	mg/L	1.40	1.23	2.81	----	----	
<b>EK267A: Total Phosphorus (Persulfate Digestion)</b>									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.112	0.148	0.027	----	----	
Total Phosphorus as P	----	0.005	mg/L	0.304	0.218	0.312	----	----	
<b>EK271A: Reactive Phosphorus</b>									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.076	0.115	0.013	----	----	