



## CERTIFICATE OF ANALYSIS

Work Order	: ES2427881	Page	: 1 of 9
Client	: Department of Climate Change, Energy, the Environment and Water	Laboratory	: Environmental Division Sydney
Contact Address		Contact Address	
Telephone	: ----	Telephone	: ----
Project	: Darling Baaka River Health Program	Date Samples Received	: ----
Order number	: ----	Date Analysis Commenced	: ----
C-O-C number	: ----	Issue Date	: ----
Sampler	: ----		
Site	: ----		
Quote number	: ES24DEPENWAT0001		
No. of samples received	: 31		
No. of samples analysed	: 31		



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
	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW

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Project : Darling Baaka River Health Program



### 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.

- 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.
- EK267: It has been noted that Dissolved TP is greater than TP for sample no.5, however this difference is within the limits of experimental variation.
- EK071G, EK067G: It has been noted that RP is greater than Dissolved TP for sample no.19, however this difference is within the limits of experimental variation.
- EK262: It has been noted that Dissolved TN is greater than TN for sample no.15, however this difference is within the limits of experimental variation.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	S4	S5	S6	S7	S8
Sampling date / time					09-Aug-2024 00:00	09-Aug-2024 00:00	09-Aug-2024 00:00	14-Aug-2024 00:00	14-Aug-2024 00:00
Compound	CAS Number	LOR	Unit	ES2427881-001	ES2427881-002	ES2427881-003	ES2427881-004	ES2427881-005	
				Result	Result	Result	Result	Result	
ED040F: Dissolved Major Anions									
Sulfate as SO4 2-	14808-79-8	1	mg/L	14	12	11	12	11	
Sulfur as S	63705-05-5	1	mg/L	5	4	4	4	4	
Silicon as SiO2	14464-46-1	0.1	mg/L	12.8	12.9	11.5	13.0	11.4	
Silicon	7440-21-3	0.05	mg/L	5.96	6.01	5.35	6.08	5.33	
EK255A: Ammonia									
Ammonia as N	7664-41-7	0.005	mg/L	0.006	0.007	0.009	0.009	0.010	
EK257A: Nitrite									
Nitrite as N	14797-65-0	0.002	mg/L	<0.002	0.003	<0.002	<0.002	<0.002	
EK258A: Nitrate									
Nitrate as N	14797-55-8	0.002	mg/L	0.649	0.733	0.757	0.513	0.623	
EK259A: Nitrite and Nitrate (NOx)									
Nitrite + Nitrate as N	----	0.002	mg/L	0.649	0.736	0.757	0.513	0.623	
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	0.67	0.48	0.71	0.77	0.84	
EK262A: Total Nitrogen									
Dissolved Total Nitrogen as N	----	0.01	mg/L	1.11	1.18	1.26	1.03	1.10	
Total Nitrogen as N	----	0.01	mg/L	1.32	1.22	1.47	1.28	1.46	
EK267A: Total Phosphorus (Persulfate Digestion)									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.163	0.164	0.154	0.177	0.163	
Total Phosphorus as P	----	0.005	mg/L	0.411	0.348	0.471	0.433	0.156	
EK271A: Reactive Phosphorus									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.160	0.162	0.153	0.177	0.155	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	S9	S10	S11	S12	S13
Sampling date / time					14-Aug-2024 00:00	08-Aug-2024 00:00	21-Aug-2024 00:00	08-Aug-2024 00:00	20-Aug-2024 00:00
Compound	CAS Number	LOR	Unit	ES2427881-006	ES2427881-007	ES2427881-008	ES2427881-009	ES2427881-010	
				Result	Result	Result	Result	Result	
ED040F: Dissolved Major Anions									
Sulfate as SO4 2-	14808-79-8	1	mg/L	10	16	12	13	22	
Sulfur as S	63705-05-5	1	mg/L	3	5	4	4	7	
Silicon as SiO2	14464-46-1	0.1	mg/L	11.2	12.1	13.9	13.5	12.8	
Silicon	7440-21-3	0.05	mg/L	5.21	5.65	6.47	6.31	5.99	
EK255A: Ammonia									
Ammonia as N	7664-41-7	0.005	mg/L	0.011	0.125	0.046	0.028	0.065	
EK257A: Nitrite									
Nitrite as N	14797-65-0	0.002	mg/L	<0.002	0.002	0.004	<0.002	0.005	
EK258A: Nitrate									
Nitrate as N	14797-55-8	0.002	mg/L	0.574	0.482	0.688	0.716	0.554	
EK259A: Nitrite and Nitrate (NOx)									
Nitrite + Nitrate as N	----	0.002	mg/L	0.574	0.484	0.692	0.716	0.559	
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	0.79	0.85	0.74	0.68	0.76	
EK262A: Total Nitrogen									
Dissolved Total Nitrogen as N	----	0.01	mg/L	1.13	1.18	1.32	1.32	1.28	
Total Nitrogen as N	----	0.01	mg/L	1.36	1.33	1.43	1.40	1.32	
EK267A: Total Phosphorus (Persulfate Digestion)									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.180	0.179	0.202	0.153	0.175	
Total Phosphorus as P	----	0.005	mg/L	0.462	0.381	0.486	0.399	0.330	
EK271A: Reactive Phosphorus									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.176	0.174	0.196	0.150	0.172	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	S14	S15	S16	S17	S18
Sampling date / time				20-Aug-2024 00:00		15-Aug-2024 00:00	15-Aug-2024 00:00	10-Aug-2024 00:00	15-Aug-2024 00:00
Compound	CAS Number	LOR	Unit	ES2427881-011	ES2427881-012	ES2427881-013	ES2427881-014	ES2427881-015	
				Result	Result	Result	Result	Result	
ED040F: Dissolved Major Anions									
Sulfate as SO4 2-	14808-79-8	1	mg/L	16	16	16	17	16	
Sulfur as S	63705-05-5	1	mg/L	5	5	5	6	5	
Silicon as SiO2	14464-46-1	0.1	mg/L	12.1	10.0	9.4	9.4	7.6	
Silicon	7440-21-3	0.05	mg/L	5.67	4.68	4.36	4.38	3.56	
EK255A: Ammonia									
Ammonia as N	7664-41-7	0.005	mg/L	0.037	0.034	<0.005	0.014	<0.005	
EK257A: Nitrite									
Nitrite as N	14797-65-0	0.002	mg/L	0.002	0.007	0.004	0.003	0.002	
EK258A: Nitrate									
Nitrate as N	14797-55-8	0.002	mg/L	0.552	0.433	0.299	0.541	0.325	
EK259A: Nitrite and Nitrate (NOx)									
Nitrite + Nitrate as N	----	0.002	mg/L	0.554	0.440	0.303	0.544	0.327	
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	0.81	1.28	1.19	1.14	0.78	
EK262A: Total Nitrogen									
Dissolved Total Nitrogen as N	----	0.01	mg/L	1.21	1.40	1.19	1.43	1.14	
Total Nitrogen as N	----	0.01	mg/L	1.36	1.72	1.49	1.68	1.11	
EK267A: Total Phosphorus (Persulfate Digestion)									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.163	0.131	0.116	0.125	0.111	
Total Phosphorus as P	----	0.005	mg/L	0.348	0.304	0.276	0.290	0.119	
EK271A: Reactive Phosphorus									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.159	0.102	0.079	0.114	0.094	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	S19	S20	S21	S22	S23
Sampling date / time					15-Aug-2024 00:00	13-Aug-2024 00:00	12-Aug-2024 00:00	12-Aug-2024 00:00	12-Aug-2024 00:00
Compound	CAS Number	LOR	Unit	ES2427881-016	ES2427881-017	ES2427881-018	ES2427881-019	ES2427881-020	
				Result	Result	Result	Result	Result	
ED040F: Dissolved Major Anions									
Sulfate as SO4 2-	14808-79-8	1	mg/L	16	14	15	13	15	
Sulfur as S	63705-05-5	1	mg/L	5	5	5	4	5	
Silicon as SiO2	14464-46-1	0.1	mg/L	9.2	13.3	12.7	12.7	15.5	
Silicon	7440-21-3	0.05	mg/L	4.30	6.20	5.91	5.93	7.24	
EK255A: Ammonia									
Ammonia as N	7664-41-7	0.005	mg/L	0.112	0.014	0.014	0.017	0.014	
EK257A: Nitrite									
Nitrite as N	14797-65-0	0.002	mg/L	0.009	<0.002	<0.002	<0.002	0.003	
EK258A: Nitrate									
Nitrate as N	14797-55-8	0.002	mg/L	0.648	0.778	0.779	0.866	0.969	
EK259A: Nitrite and Nitrate (NOx)									
Nitrite + Nitrate as N	----	0.002	mg/L	0.657	0.778	0.779	0.866	0.972	
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	1.28	1.01	0.96	0.97	0.98	
EK262A: Total Nitrogen									
Dissolved Total Nitrogen as N	----	0.01	mg/L	1.74	1.36	1.39	1.48	1.60	
Total Nitrogen as N	----	0.01	mg/L	1.94	1.79	1.74	1.84	1.95	
EK267A: Total Phosphorus (Persulfate Digestion)									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.156	0.177	0.186	0.179	0.161	
Total Phosphorus as P	----	0.005	mg/L	0.304	0.431	0.483	0.506	0.448	
EK271A: Reactive Phosphorus									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.137	0.172	0.170	0.182	0.161	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	S24	S25	S26	S27	S28
Sampling date / time					11-Aug-2024 00:00	11-Aug-2024 00:00	11-Aug-2024 00:00	13-Aug-2024 00:00	13-Aug-2024 00:00
Compound	CAS Number	LOR	Unit	ES2427881-021	ES2427881-022	ES2427881-023	ES2427881-024	ES2427881-025	
				Result	Result	Result	Result	Result	
ED040F: Dissolved Major Anions									
Sulfate as SO4 2-	14808-79-8	1	mg/L	16	16	17	17	18	
Sulfur as S	63705-05-5	1	mg/L	5	5	6	6	6	
Silicon as SiO2	14464-46-1	0.1	mg/L	0.5	1.2	0.7	2.2	4.1	
Silicon	7440-21-3	0.05	mg/L	0.24	0.55	0.33	1.03	1.90	
EK255A: Ammonia									
Ammonia as N	7664-41-7	0.005	mg/L	0.015	0.138	0.058	0.016	<0.005	
EK257A: Nitrite									
Nitrite as N	14797-65-0	0.002	mg/L	<0.002	0.012	0.005	0.002	<0.002	
EK258A: Nitrate									
Nitrate as N	14797-55-8	0.002	mg/L	0.005	0.049	0.012	0.008	0.007	
EK259A: Nitrite and Nitrate (NOx)									
Nitrite + Nitrate as N	----	0.002	mg/L	0.005	0.061	0.017	0.010	0.007	
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	1.66	1.20	1.41	1.41	2.12	
EK262A: Total Nitrogen									
Dissolved Total Nitrogen as N	----	0.01	mg/L	1.03	1.19	0.96	1.05	1.11	
Total Nitrogen as N	----	0.01	mg/L	1.67	1.26	1.43	1.42	2.13	
EK267A: Total Phosphorus (Persulfate Digestion)									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.026	0.033	0.023	0.061	0.038	
Total Phosphorus as P	----	0.005	mg/L	0.153	0.089	0.154	0.219	0.340	
EK271A: Reactive Phosphorus									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.006	0.009	0.010	0.025	0.016	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	S29	S30	S31	B1	B2
Sampling date / time					14-Aug-2024 00:00	10-Aug-2024 00:00	10-Aug-2024 00:00	08-Aug-2024 00:00	08-Aug-2024 00:00
Compound	CAS Number	LOR	Unit	ES2427881-026	ES2427881-027	ES2427881-028	ES2427881-029	ES2427881-030	
				Result	Result	Result	Result	Result	
ED040F: Dissolved Major Anions									
Sulfate as SO4 2-	14808-79-8	1	mg/L	21	26	15	10	14	
Sulfur as S	63705-05-5	1	mg/L	7	8	5	4	5	
Silicon as SiO2	14464-46-1	0.1	mg/L	4.4	2.0	0.4	16.6	14.8	
Silicon	7440-21-3	0.05	mg/L	2.04	0.91	0.16	7.76	6.91	
EK255A: Ammonia									
Ammonia as N	7664-41-7	0.005	mg/L	0.007	0.011	0.012	0.099	0.069	
EK257A: Nitrite									
Nitrite as N	14797-65-0	0.002	mg/L	<0.002	0.004	<0.002	0.004	0.006	
EK258A: Nitrate									
Nitrate as N	14797-55-8	0.002	mg/L	0.004	0.004	0.007	0.535	0.372	
EK259A: Nitrite and Nitrate (NOx)									
Nitrite + Nitrate as N	----	0.002	mg/L	0.004	0.008	0.007	0.539	0.378	
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	2.21	1.77	1.01	0.77	0.84	
EK262A: Total Nitrogen									
Dissolved Total Nitrogen as N	----	0.01	mg/L	1.19	1.28	0.98	1.15	1.08	
Total Nitrogen as N	----	0.01	mg/L	2.21	1.78	1.02	1.31	1.22	
EK267A: Total Phosphorus (Persulfate Digestion)									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.032	0.025	0.025	0.181	0.159	
Total Phosphorus as P	----	0.005	mg/L	0.362	0.240	0.063	0.387	0.342	
EK271A: Reactive Phosphorus									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.010	0.003	0.005	0.175	0.145	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	B3	---	---	---	---
				Sampling date / time	20-Aug-2024 00:00	---	---	---	---
Compound	CAS Number	LOR	Unit	ES2427881-031	-----	-----	-----	-----	-----
				Result	---	---	---	---	---
ED040F: Dissolved Major Anions									
Sulfate as SO4 2-	14808-79-8	1	mg/L	20	---	---	---	---	---
Sulfur as S	63705-05-5	1	mg/L	7	---	---	---	---	---
Silicon as SiO2	14464-46-1	0.1	mg/L	8.3	---	---	---	---	---
Silicon	7440-21-3	0.05	mg/L	3.87	---	---	---	---	---
EK255A: Ammonia									
Ammonia as N	7664-41-7	0.005	mg/L	0.198	---	---	---	---	---
EK257A: Nitrite									
Nitrite as N	14797-65-0	0.002	mg/L	0.023	---	---	---	---	---
EK258A: Nitrate									
Nitrate as N	14797-55-8	0.002	mg/L	0.205	---	---	---	---	---
EK259A: Nitrite and Nitrate (NOx)									
Nitrite + Nitrate as N	----	0.002	mg/L	0.228	---	---	---	---	---
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	1.50	---	---	---	---	---
EK262A: Total Nitrogen									
Dissolved Total Nitrogen as N	----	0.01	mg/L	1.50	---	---	---	---	---
Total Nitrogen as N	----	0.01	mg/L	1.73	---	---	---	---	---
EK267A: Total Phosphorus (Persulfate Digestion)									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.112	---	---	---	---	---
Total Phosphorus as P	----	0.005	mg/L	0.270	---	---	---	---	---
EK271A: Reactive Phosphorus									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.072	---	---	---	---	---