



CERTIFICATE OF ANALYSIS

Work Order	: ES2410843	Page	: 1 of 10
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 Baake River Health Program	Date Samples Received	: 03-Apr-2024 13:56
Order number	: [REDACTED]	Date Analysis Commenced	: 06-Apr-2024
C-O-C number	: [REDACTED]	Issue Date	: 15-Apr-2024 17:46
Sampler	: [REDACTED]		
Site	: [REDACTED]		
Quote number	: ES24DEPENWAT0001		
No. of samples received	: 40		
No. of samples analysed	: 40		



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 Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW Sydney Inorganics, Smithfield, NSW

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Page : 2 of 10
Work Order : ES2410843
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Project : Darling Baake 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.

- EK061G: Poor spike recovery for TKN due to matrix interferences(confirmed by re-analysis).
- EK055, invalidated NH3 results for sample 1 , 3, 4 due to insufficient volume.



Analytical Results

Sub-Matrix: SLUDGE (Matrix: SOIL)				Sample ID	MFK-sed-1 20240325	MFK-sed-2 20240325	MFK-sed-3 20240325	MFK-sed-4 20240325	MFK-sed-5 20240325
Sampling date / time					25-Mar-2024 00:00	25-Mar-2024 00:00	25-Mar-2024 00:00	25-Mar-2024 00:00	25-Mar-2024 00:00
Compound	CAS Number	LOR	Unit	ES2410843-001	ES2410843-002	ES2410843-003	ES2410843-004	ES2410843-005	
Result				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%	68.9	68.2	66.0	64.8	72.8	
ED040S: Soluble Major Anions									
Silicon	7440-21-3	1	mg/kg	36	30	27	32	35	
EK055: Ammonia as N									
Ammonia as N	7664-41-7	20	mg/kg	----	220	----	----	300	
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg	0.1	0.1	0.1	0.2	0.2	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N (Sol.)	14797-55-8	0.1	mg/kg	0.4	0.4	0.4	1.0	0.3	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	0.5	0.5	0.5	1.2	0.5	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	20	mg/kg	1870	1770	1530	1040	1810	
EK062: Total Nitrogen as N (TKN + NOx)									
^ Total Nitrogen as N	----	20	mg/kg	1870	1770	1530	1040	1810	
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	2	mg/kg	679	679	543	447	794	
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.1	mg/kg	1.0	0.6	0.4	0.8	0.5	



Analytical Results

Sub-Matrix: SLUDGE (Matrix: SOIL)				Sample ID	MFK-sed-6 20240325	MFK-sed-7 20240325	MFK-sed-8 20240325	MFK-sed-9 20240325	MFK-sed-10 20240325
				Sampling date / time	25-Mar-2024 00:00	25-Mar-2024 00:00	25-Mar-2024 00:00	25-Mar-2024 00:00	25-Mar-2024 00:00
Compound	CAS Number	LOR	Unit		ES2410843-006	ES2410843-007	ES2410843-008	ES2410843-009	ES2410843-010
				Result	Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		66.6	73.1	62.0	70.4	73.3
ED040S: Soluble Major Anions									
Silicon	7440-21-3	1	mg/kg		27	30	28	27	31
EK055: Ammonia as N									
Ammonia as N	7664-41-7	20	mg/kg		340	220	340	200	280
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg		0.2	<0.1	<0.1	<0.1	0.1
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N (Sol.)	14797-55-8	0.1	mg/kg		0.3	0.4	0.8	1.2	0.8
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg		0.5	0.4	0.8	1.2	0.9
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	20	mg/kg		1630	1660	2010	1430	1960
EK062: Total Nitrogen as N (TKN + NOx)									
^A Total Nitrogen as N	----	20	mg/kg		1630	1660	2010	1430	1960
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	2	mg/kg		544	591	653	551	669
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.1	mg/kg		0.8	0.3	0.6	0.4	0.5



Analytical Results

Sub-Matrix: SLUDGE (Matrix: SOIL)				Sample ID	MFK-sed-11 20240325	MFK-sed-12 20240325	MFK-sed-13 20240325	MFK-sed-14 20240325	MFK-sed-15 20240325
				Sampling date / time	25-Mar-2024 00:00	25-Mar-2024 00:00	25-Mar-2024 00:00	25-Mar-2024 00:00	25-Mar-2024 00:00
Compound	CAS Number	LOR	Unit		ES2410843-011	ES2410843-012	ES2410843-013	ES2410843-014	ES2410843-015
				Result	Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		64.4	64.7	67.5	71.7	70.4
ED040S: Soluble Major Anions									
Silicon	7440-21-3	1	mg/kg		20	32	33	29	29
EK055: Ammonia as N									
Ammonia as N	7664-41-7	20	mg/kg		170	400	140	260	230
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N (Sol.)	14797-85-0	0.1	mg/kg		<0.1	0.2	0.1	0.2	0.2
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N (Sol.)	14797-55-8	0.1	mg/kg		0.6	0.6	0.5	0.5	1.2
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg		0.6	0.8	0.6	0.7	1.4
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	20	mg/kg		1120	1560	1900	2150	1940
EK062: Total Nitrogen as N (TKN + NOx)									
^ Total Nitrogen as N	----	20	mg/kg		1120	1560	1900	2150	1940
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	2	mg/kg		514	661	578	681	617
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.1	mg/kg		0.6	1.2	0.8	0.6	0.6



Analytical Results

Sub-Matrix: SLUDGE (Matrix: SOIL)				Sample ID	MFK-sed-16 20240325	MFK-sed-17A 20240325	MFK-sed-17B 20240325	MFK-sed-17C 20240325	MFK-sed-18A 20240325
				Sampling date / time	25-Mar-2024 00:00	25-Mar-2024 00:00	25-Mar-2024 00:00	25-Mar-2024 00:00	25-Mar-2024 00:00
Compound	CAS Number	LOR	Unit		ES2410843-016	ES2410843-017	ES2410843-018	ES2410843-019	ES2410843-020
				Result	Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		63.3	59.9	72.3	30.6	30.1
ED040S: Soluble Major Anions									
Silicon	7440-21-3	1	mg/kg		25	20	26	8	<1
EK055: Ammonia as N									
Ammonia as N	7664-41-7	20	mg/kg		290	120	270	<20	<20
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N (Sol.)	14797-85-0	0.1	mg/kg		<0.1	0.1	0.1	<0.1	0.4
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N (Sol.)	14797-55-8	0.1	mg/kg		0.6	0.3	0.5	0.2	1.3
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg		0.6	0.4	0.6	0.2	1.7
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	20	mg/kg		1460	1530	1700	230	200
EK062: Total Nitrogen as N (TKN + NOx)									
^ Total Nitrogen as N	----	20	mg/kg		1460	1530	1700	230	200
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	2	mg/kg		598	438	699	179	132
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.1	mg/kg		0.8	0.5	0.7	0.5	0.3



Analytical Results

Sub-Matrix: SLUDGE (Matrix: SOIL)				Sample ID	MFK-sed-18B 20240325	MFK-sed-19 20240325	MFK-sed-20 20240325	MFK-sed-21 20240325	MFK-sed-22 20240325
				Sampling date / time	25-Mar-2024 00:00	25-Mar-2024 00:00	25-Mar-2024 00:00	25-Mar-2024 00:00	25-Mar-2024 00:00
Compound	CAS Number	LOR	Unit	ES2410843-021	ES2410843-022	ES2410843-023	ES2410843-024	ES2410843-025	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%	17.6	70.2	70.9	68.5	71.9	
ED040S: Soluble Major Anions									
Silicon	7440-21-3	1	mg/kg	<1	<1	<1	<1	<1	
EK055: Ammonia as N									
Ammonia as N	7664-41-7	20	mg/kg	<20	330	260	320	310	
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N (Sol.)	14797-85-0	0.1	mg/kg	<0.1	<0.1	0.2	0.1	0.1	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N (Sol.)	14797-55-8	0.1	mg/kg	0.5	0.8	0.7	0.4	1.0	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	0.5	0.8	0.9	0.5	1.1	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	20	mg/kg	150	1850	1570	1420	2000	
EK062: Total Nitrogen as N (TKN + NOx)									
^ Total Nitrogen as N	----	20	mg/kg	150	1850	1570	1420	2000	
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	2	mg/kg	148	626	692	628	718	
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.1	mg/kg	0.5	0.7	0.5	0.7	0.8	



Analytical Results

Sub-Matrix: SLUDGE (Matrix: SOIL)				Sample ID	MFK-sed-23 20240325	MFK-sed-24 20240325	MFK-sed-25 20240325	MFK-sed-26 20240325	MFK-sed-27 20240325
				Sampling date / time	25-Mar-2024 00:00	25-Mar-2024 00:00	25-Mar-2024 00:00	25-Mar-2024 00:00	25-Mar-2024 00:00
Compound	CAS Number	LOR	Unit		ES2410843-026	ES2410843-027	ES2410843-028	ES2410843-029	ES2410843-030
				Result	Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		37.1	29.0	44.9	68.0	70.6
ED040S: Soluble Major Anions									
Silicon	7440-21-3	1	mg/kg		6	<1	<1	15	<1
EK055: Ammonia as N									
Ammonia as N	7664-41-7	20	mg/kg		80	<20	40	360	200
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N (Sol.)	14797-85-0	0.1	mg/kg		<0.1	0.2	<0.1	0.1	0.1
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N (Sol.)	14797-55-8	0.1	mg/kg		0.5	0.5	0.5	0.5	0.7
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg		0.5	0.7	0.5	0.6	0.8
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	20	mg/kg		980	610	900	1710	2000
EK062: Total Nitrogen as N (TKN + NOx)									
^ Total Nitrogen as N	----	20	mg/kg		980	610	900	1710	2000
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	2	mg/kg		568	242	307	680	665
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.1	mg/kg		0.4	0.3	0.3	1.2	0.5



Analytical Results

Sub-Matrix: SLUDGE (Matrix: SOIL)				Sample ID	MFK-sed-28 20240325	MFK-sed-29 20240325	MFK-sed-30 20240325	MFK-sed-31 20240325	MFK-sed-32 20240325
				Sampling date / time	25-Mar-2024 00:00	25-Mar-2024 00:00	25-Mar-2024 00:00	25-Mar-2024 00:00	25-Mar-2024 00:00
Compound	CAS Number	LOR	Unit	ES2410843-031	ES2410843-032	ES2410843-033	ES2410843-034	ES2410843-035	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%	53.6	32.1	78.0	77.6	67.3	
ED040S: Soluble Major Anions									
Silicon	7440-21-3	1	mg/kg	3	<1	<1	<1	4	
EK055: Ammonia as N									
Ammonia as N	7664-41-7	20	mg/kg	90	20	600	590	980	
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N (Sol.)	14797-85-0	0.1	mg/kg	0.1	0.1	0.2	<0.1	<0.1	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N (Sol.)	14797-55-8	0.1	mg/kg	0.5	2.0	1.0	0.8	0.6	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	0.6	2.1	1.2	0.8	0.6	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	20	mg/kg	920	630	2520	2830	1900	
EK062: Total Nitrogen as N (TKN + NOx)									
^ Total Nitrogen as N	----	20	mg/kg	920	630	2520	2830	1900	
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	2	mg/kg	391	212	884	902	873	
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.1	mg/kg	0.5	0.5	0.7	0.6	1.0	



Analytical Results

Sub-Matrix: SLUDGE (Matrix: SOIL)				Sample ID	MFK-sed-33 20240325	MFK-sed-34 20240325	MFK-sed-35 20240325	30 TRIP 24 GRAIN SIZE	TRIP 24 METALS SITE 1
				Sampling date / time	25-Mar-2024 00:00	25-Mar-2024 00:00	25-Mar-2024 00:00	25-Mar-2024 00:00	25-Mar-2024 00:00
Compound	CAS Number	LOR	Unit		ES2410843-036	ES2410843-037	ES2410843-038	ES2410843-039	ES2410843-040
				Result	Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		75.2	73.3	55.7	76.6	26.7
ED040S: Soluble Major Anions									
Silicon	7440-21-3	1	mg/kg		4	9	<1	3	<1
EK055: Ammonia as N									
Ammonia as N	7664-41-7	20	mg/kg		540	410	50	680	<20
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	0.3
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N (Sol.)	14797-55-8	0.1	mg/kg		0.8	0.4	0.4	0.7	0.8
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg		0.8	0.4	0.4	0.7	1.1
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	20	mg/kg		2030	2000	1530	2620	180
EK062: Total Nitrogen as N (TKN + NOx)									
^A Total Nitrogen as N	----	20	mg/kg		2030	2000	1530	2620	180
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	2	mg/kg		774	759	472	1620	158
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.1	mg/kg		0.6	0.6	0.4	0.7	0.5