CERTIFICATE OF ANALYSIS

Work Order	: **ES2316870**	Page	: 1 of 10
Client	: **DEPARTMENT OF PLANNING AND ENVIRONMENT (NSW-DPE)**	Laboratory	: Environmental Division Sydney
Contact	: OEH	Contact	: Customer Services ES
Address	: [redacted] Lidcombe 2141	Address	: [redacted]
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 20230171	Date Samples Received	: 19-May-2023 16:04
Order number	: 4500806025	Date Analysis Commenced	: 19-May-2023
C-O-C number	: ----	Issue Date	: 25-May-2023 14:29
Sampler	: ----		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 28		
No. of samples analysed	: 28		

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
- Surrogate Control Limits

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
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

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.

- EP202: Poor matrix spike recoveries for Clopyralid due to matrix effects.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	233711	233712	233713	233714	233715
			Sampling date / time	13-May-2023 00:00	13-May-2023 00:00	13-May-2023 00:00	13-May-2023 00:00	13-May-2023 00:00
Compound	CAS Number	LOR	Unit	ES2316870-001	ES2316870-002	ES2316870-003	ES2316870-004	ES2316870-005
				Result	Result	Result	Result	Result
EP202A: Phenoxyacetic Acid Herbicides by LCMS								
4-Chlorophenoxy acetic acid	122-88-3	10	µg/L	<10	<10	<10	<10	<10
2.4-DB	94-82-6	10	µg/L	<10	<10	<10	<10	<10
Dicamba	1918-00-9	10	µg/L	<10	<10	<10	<10	<10
Mecoprop	93-65-2	10	µg/L	<10	<10	<10	<10	<10
MCPA	94-74-6	10	µg/L	<10	<10	<10	<10	<10
2.4-DP	120-36-5	10	µg/L	<10	<10	<10	<10	<10
2.4-D	94-75-7	10	µg/L	<10	<10	<10	<10	<10
Triclopyr	55335-06-3	10	µg/L	<10	<10	<10	<10	<10
Silvex (2.4.5-TP/Fenoprop)	93-72-1	10	µg/L	<10	<10	<10	<10	<10
2.4.5-T	93-76-5	10	µg/L	<10	<10	<10	<10	<10
MCPB	94-81-5	10	µg/L	<10	<10	<10	<10	<10
Picloram	1918-02-1	10	µg/L	<10	<10	<10	<10	<10
Clopyralid	1702-17-6	10	µg/L	<10	<10	<10	<10	<10
Fluroxypyr	69377-81-7	10	µg/L	<10	<10	<10	<10	<10
2.6-D	575-90-6	10	µg/L	<10	<10	<10	<10	<10
2.4.6-T	575-89-3	10	µg/L	<10	<10	<10	<10	<10
EP204: Glyphosate and AMPA								
Glyphosate	1071-83-6	10	µg/L	<10	<10	<10	<10	<10
AMPA	1066-51-9	10	µg/L	<10	<10	<10	<10	<10
EP202S: Phenoxyacetic Acid Herbicide Surrogate								
2.4-Dichlorophenyl Acetic Acid	19719-28-9	10	%	**104**	**112**	**107**	**109**	**105**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	233716	233717	233723	233724	233725
			Sampling date / time	13-May-2023 00:00	13-May-2023 00:00	13-May-2023 00:00	13-May-2023 00:00	13-May-2023 00:00
Compound	CAS Number	LOR	Unit	ES2316870-006	ES2316870-007	ES2316870-008	ES2316870-009	ES2316870-010
				Result	Result	Result	Result	Result
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	----	----	**0.03**	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	----	----	**0.04**	**0.04**	**0.04**
EK061F: Filtered Total Kjeldahl Nitrogen as N (TKN)								
Dissolved TKN as N	----	0.1	mg/L	----	----	----	**0.8**	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	----	----	----	----	**1.1**
EK062F: Filtered Total Nitrogen as N								
^ Filtered Total Nitrogen as N	----	0.1	mg/L	----	----	----	**0.8**	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	----	----	----	----	**1.1**
EK067FG: Filtered Total Phosphorus as P by Discrete Analyser								
Filtered Total Phosphorus as P	----	0.01	mg/L	----	----	----	**0.16**	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	----	----	----	----	**0.25**
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	----	----	**0.13**	----	----
EP202A: Phenoxyacetic Acid Herbicides by LCMS								
4-Chlorophenoxy acetic acid	122-88-3	10	µg/L	<10	<10	----	----	----
2.4-DB	94-82-6	10	µg/L	<10	<10	----	----	----
Dicamba	1918-00-9	10	µg/L	<10	<10	----	----	----
Mecoprop	93-65-2	10	µg/L	<10	<10	----	----	----
MCPA	94-74-6	10	µg/L	<10	<10	----	----	----
2.4-DP	120-36-5	10	µg/L	<10	<10	----	----	----
2.4-D	94-75-7	10	µg/L	<10	<10	----	----	----
Triclopyr	55335-06-3	10	µg/L	<10	<10	----	----	----
Silvex (2.4.5-TP/Fenoprop)	93-72-1	10	µg/L	<10	<10	----	----	----
2.4.5-T	93-76-5	10	µg/L	<10	<10	----	----	----
MCPB	94-81-5	10	µg/L	<10	<10	----	----	----
Picloram	1918-02-1	10	µg/L	<10	<10	----	----	----
Clopyralid	1702-17-6	10	µg/L	<10	<10	----	----	----
Fluroxypyr	69377-81-7	10	µg/L	<10	<10	----	----	----
2.6-D	575-90-6	10	µg/L	<10	<10	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	233716	233717	233723	233724	233725
				Sampling date / time	13-May-2023 00:00	13-May-2023 00:00	13-May-2023 00:00	13-May-2023 00:00	13-May-2023 00:00
Compound	CAS Number	LOR	Unit		ES2316870-006	ES2316870-007	ES2316870-008	ES2316870-009	ES2316870-010
					Result	Result	Result	Result	Result
EP202A: Phenoxyacetic Acid Herbicides by LCMS - Continued									
2.4.6-T	575-89-3	10	µg/L		<10	<10	----	----	----
EP204: Glyphosate and AMPA									
Glyphosate	1071-83-6	10	µg/L		<10	<10	----	----	----
AMPA	1066-51-9	10	µg/L		<10	<10	----	----	----
EP202S: Phenoxyacetic Acid Herbicide Surrogate									
2.4-Dichlorophenyl Acetic Acid	19719-28-9	10	%		**116**	**106**	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	233731	233732	233733	233739	233740
				Sampling date / time	13-May-2023 00:00	13-May-2023 00:00	13-May-2023 00:00	13-May-2023 00:00	13-May-2023 00:00
Compound	CAS Number	LOR	Unit		ES2316870-011	ES2316870-012	ES2316870-013	ES2316870-014	ES2316870-015
					Result	Result	Result	Result	Result
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		0.04	----	----	0.03	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		0.05	0.04	0.05	0.05	0.05
EK061F: Filtered Total Kjeldahl Nitrogen as N (TKN)									
Dissolved TKN as N	----	0.1	mg/L		----	0.6	----	----	0.8
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		----	----	1.0	----	----
EK062F: Filtered Total Nitrogen as N									
^ Filtered Total Nitrogen as N	----	0.1	mg/L		----	0.6	----	----	0.8
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		----	----	1.0	----	----
EK067FG: Filtered Total Phosphorus as P by Discrete Analyser									
Filtered Total Phosphorus as P	----	0.01	mg/L		----	0.14	----	----	0.12
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		----	----	0.25	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		0.12	----	----	0.10	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	233741	233747	233748	233749	233755
				Sampling date / time	13-May-2023 00:00	13-May-2023 00:00	13-May-2023 00:00	13-May-2023 00:00	13-May-2023 00:00
Compound	CAS Number	LOR	Unit		ES2316870-016	ES2316870-017	ES2316870-018	ES2316870-019	ES2316870-020
					Result	Result	Result	Result	Result
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		----	<0.01	----	----	0.10
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		0.06	<0.01	<0.01	0.01	0.01
EK061F: Filtered Total Kjeldahl Nitrogen as N (TKN)									
Dissolved TKN as N	----	0.1	mg/L		----	----	0.5	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		1.4	----	----	1.1	----
EK062F: Filtered Total Nitrogen as N									
^ Filtered Total Nitrogen as N	----	0.1	mg/L		----	----	0.5	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		1.5	----	----	1.1	----
EK067FG: Filtered Total Phosphorus as P by Discrete Analyser									
Filtered Total Phosphorus as P	----	0.01	mg/L		----	----	0.26	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		0.27	----	----	0.29	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		----	0.23	----	----	0.15

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	233756	233757	233763	233764	233765
				Sampling date / time	13-May-2023 00:00	13-May-2023 00:00	13-May-2023 00:00	13-May-2023 00:00	13-May-2023 00:00
Compound	CAS Number	LOR	Unit		ES2316870-021	ES2316870-022	ES2316870-023	ES2316870-024	ES2316870-025
					Result	Result	Result	Result	Result
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		----	----	----	0.03	----
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	0.01
EK061F: Filtered Total Kjeldahl Nitrogen as N (TKN)									
Dissolved TKN as N	----	0.1	mg/L		0.8	----	----	0.6	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		----	1.0	----	----	0.6
EK062F: Filtered Total Nitrogen as N									
^ Filtered Total Nitrogen as N	----	0.1	mg/L		0.8	----	----	0.6	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		----	1.0	----	----	0.6
EK067FG: Filtered Total Phosphorus as P by Discrete Analyser									
Filtered Total Phosphorus as P	----	0.01	mg/L		0.20	----	----	0.25	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		----	0.26	----	----	0.30
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		----	----	0.24	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	233771	233772	233773	----	----
			Sampling date / time	13-May-2023 00:00	13-May-2023 00:00	13-May-2023 00:00	----	----
Compound	CAS Number	LOR	Unit	ES2316870-026	ES2316870-027	ES2316870-028	--------	--------
				Result	Result	Result	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.04**	**----**	**----**	**----**	**----**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	**0.01**	**0.01**	**----**	**----**
EK061F: Filtered Total Kjeldahl Nitrogen as N (TKN)								
Dissolved TKN as N	----	0.1	mg/L	**----**	**0.7**	**----**	**----**	**----**
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**----**	**----**	**1.0**	**----**	**----**
EK062F: Filtered Total Nitrogen as N								
^ **Filtered Total Nitrogen as N**	----	0.1	mg/L	**----**	**0.7**	**----**	**----**	**----**
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ **Total Nitrogen as N**	----	0.1	mg/L	**----**	**----**	**1.0**	**----**	**----**
EK067FG: Filtered Total Phosphorus as P by Discrete Analyser								
Filtered Total Phosphorus as P	----	0.01	mg/L	**----**	**0.21**	**----**	**----**	**----**
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**----**	**----**	**0.31**	**----**	**----**
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	**0.18**	**----**	**----**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP202S: Phenoxyacetic Acid Herbicide Surrogate			
2.4-Dichlorophenyl Acetic Acid	19719-28-9	64	140