

CERTIFICATE OF ANALYSIS

Work Order : ES2308246 Client : PF FORMATION Contact : Josh Graham Address : 1 Patrica Fay Drive MARROOTA 2756 Telephone : ---- Project : ---- Order number : ---- C-O-C number : ---- Sampler : M.Mass - South East Environmental Site : ---- Quote number : EN/333 No. of samples received : 6 No. of samples analysed : 6	Page : 1 of 6 Laboratory : Environmental Division Sydney Contact : Customer Services ES Address : 277-289 Woodpark Road Smithfield NSW Australia 2164 Telephone : +61-2-8784 8555 Date Samples Received : 14-Mar-2023 13:35 Date Analysis Commenced : 14-Mar-2023 Issue Date : 21-Mar-2023 16:13
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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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, 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.

- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO₂ and Fluoride to the Anions.
- TDS by method EA-015 may bias high for various samples due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID		Pit 5	Pit 4	Lot 198	Hitchcock Rd	Maroota Lodge Dam 1
		Sampling date / time		14-Mar-2023 09:35	14-Mar-2023 10:05	14-Mar-2023 07:50	14-Mar-2023 00:00	14-Mar-2023 10:40
Compound	CAS Number	LOR	Unit	ES2308246-001	ES2308246-002	ES2308246-003	ES2308246-004	ES2308246-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	6.98	7.35	6.56	6.41	6.54
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	98	354	173	108	69
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	65	212	127	64	62
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	10	<5	<5	<5	7
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	13	91	6	5	12
Total Alkalinity as CaCO3	----	1	mg/L	13	91	6	5	12
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	4	31	16	4	6
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	20	38	36	27	9
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	2	28	4	1	4
Magnesium	7439-95-4	1	mg/L	2	11	5	3	1
Sodium	7440-23-5	1	mg/L	13	23	21	13	7
Potassium	7440-09-7	1	mg/L	3	10	2	3	2
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	----	----	----	----	<0.01
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	----	----	----	----	0.3
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	----	----	----	----	0.3
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	----	----	----	----	0.03
EN055: Ionic Balance								
∅ Total Anions	----	0.01	meq/L	0.91	3.54	1.47	0.94	0.62
∅ Total Cations	----	0.01	meq/L	0.91	3.56	1.58	0.94	0.64
∅ Ionic Balance	----	0.01	%	----	0.33	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Pit 5	Pit 4	Lot 198	Hitchcock Rd	Maroota Lodge Dam 1
Sampling date / time				14-Mar-2023 09:35	14-Mar-2023 10:05	14-Mar-2023 07:50	14-Mar-2023 00:00	14-Mar-2023 10:40	
Compound	CAS Number	LOR	Unit	ES2308246-001	ES2308246-002	ES2308246-003	ES2308246-004	ES2308246-005	
				Result	Result	Result	Result	Result	
EP020: Oil and Grease (O&G)									
Oil & Grease	----	5	mg/L	<5	<5	<5	<5	<5	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID		Maroota Lodge Dam 2	----	----	----	----
		Sampling date / time		14-Mar-2023 10:45	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2308246-006	-----	-----	-----	-----
				Result	----	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	6.98	----	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	234	----	----	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	154	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	30	----	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	46	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	46	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	37	----	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	17	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	18	----	----	----	----
Magnesium	7439-95-4	1	mg/L	5	----	----	----	----
Sodium	7440-23-5	1	mg/L	15	----	----	----	----
Potassium	7440-09-7	1	mg/L	11	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.7	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	1.7	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.86	----	----	----	----
EN055: Ionic Balance								
∅ Total Anions	----	0.01	meq/L	2.17	----	----	----	----
∅ Total Cations	----	0.01	meq/L	2.24	----	----	----	----
EP020: Oil and Grease (O&G)								



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID				
				Maroota Lodge Dam 2	----	----	----	----
				Sampling date / time	14-Mar-2023 10:45	----	----	----
Compound	CAS Number	LOR	Unit	ES2308246-006	-----	-----	-----	-----
				Result	----	----	----	----
EP020: Oil and Grease (O&G) - Continued								
Oil & Grease	----	5	mg/L	<5	----	----	----	----