

## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1926040</b> <b>Client</b> : <b>PF FORMATION</b> <b>Contact</b> : Josh <b>Address</b> : 1 Patrica Fay Drive Maroota 2756  Telephone : ---- Project : ---- Order number : ---- C-O-C number : ---- <b>Sampler</b> : M.Mass / L. Steadson S.E. Enviro Site : ---- Quote number : ---- No. of samples received : 10 No. of samples analysed : 10	<b>Page</b> : 1 of 4  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Customer Services ES <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  Telephone : +61-2-8784 8555 Date Samples Received : 15-Aug-2019 15:30 Date Analysis Commenced : 15-Aug-2019 Issue Date : 21-Aug-2019 14:39
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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. 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	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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 Contact 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.

- EN055: Ionic Balance out of acceptable limits for sample 3 due to analytes not quantified in this report.
- 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)				Client sample ID	PFLHITCHMW1	PF214MW1	PF167MW4D	PF166MW2S	4378ONRPF1
Client sampling date / time				15-Aug-2019 00:00	15-Aug-2019 00:00	15-Aug-2019 00:00	15-Aug-2019 00:00	15-Aug-2019 00:00	
Compound	CAS Number	LOR	Unit	ES1926040-001	ES1926040-002	ES1926040-003	ES1926040-004	ES1926040-005	
				Result	Result	Result	Result	Result	
<b>EA005P: pH by PC Titrator</b>									
pH Value	----	0.01	pH Unit	7.11	4.84	5.65	6.15	5.76	
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm	284	202	149	168	156	
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C</b>									
Total Dissolved Solids @180°C	----	10	mg/L	172	108	92	----	79	
<b>ED037P: Alkalinity by PC Titrator</b>									
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	9	<1	7	4	12	
Total Alkalinity as CaCO3	----	1	mg/L	9	<1	7	4	12	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	6	<1	3	3	2	
<b>ED045G: Chloride by Discrete Analyser</b>									
Chloride	16887-00-6	1	mg/L	67	37	9	36	32	
<b>ED093F: Dissolved Major Cations</b>									
Calcium	7440-70-2	1	mg/L	<1	<1	2	3	<1	
Magnesium	7439-95-4	1	mg/L	4	6	2	3	2	
Sodium	7440-23-5	1	mg/L	38	17	21	18	16	
Potassium	7440-09-7	1	mg/L	<1	<1	<1	2	2	
<b>EN055: Ionic Balance</b>									
∅ Total Anions	----	0.01	meq/L	2.19	1.04	0.46	1.16	1.18	
∅ Total Cations	----	0.01	meq/L	1.98	1.23	1.18	1.23	0.91	
<b>EP020: Oil and Grease (O&amp;G)</b>									
Oil & Grease	----	5	mg/L	<5	<5	<5	<5	<5	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	4378ONRPF2	LOT198BH01	PF156MW2D	LOT198BH02	PF166MW3D
Client sampling date / time				15-Aug-2019 00:00	15-Aug-2019 00:00	15-Aug-2019 00:00	15-Aug-2019 00:00	15-Aug-2019 00:00	15-Aug-2019 00:00
Compound	CAS Number	LOR	Unit	ES1926040-006	ES1926040-007	ES1926040-008	ES1926040-009	ES1926040-010	
				Result	Result	Result	Result	Result	
<b>EA005P: pH by PC Titrator</b>									
pH Value	----	0.01	pH Unit	5.84	5.43	5.76	5.54	4.98	
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm	72	169	156	152	250	
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C</b>									
Total Dissolved Solids @180°C	----	10	mg/L	38	91	----	82	130	
<b>ED037P: Alkalinity by PC Titrator</b>									
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	11	5	12	5	<1	
Total Alkalinity as CaCO3	----	1	mg/L	11	5	12	5	<1	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3	8	3	3	2	
<b>ED045G: Chloride by Discrete Analyser</b>									
Chloride	16887-00-6	1	mg/L	9	36	29	35	57	
<b>ED093F: Dissolved Major Cations</b>									
Calcium	7440-70-2	1	mg/L	1	1	4	<1	1	
Magnesium	7439-95-4	1	mg/L	<1	3	2	3	4	
Sodium	7440-23-5	1	mg/L	8	20	18	19	31	
Potassium	7440-09-7	1	mg/L	<1	1	2	<1	<1	
<b>EN055: Ionic Balance</b>									
∅ Total Anions	----	0.01	meq/L	0.54	1.28	1.12	1.15	1.65	
∅ Total Cations	----	0.01	meq/L	0.40	1.19	1.20	1.07	1.73	
<b>EP020: Oil and Grease (O&amp;G)</b>									
Oil & Grease	----	5	mg/L	<5	<5	43	<5	<5	