Kleinfelder Australia Pty Ltd
95 Mitchell Road
CARDIFF NSW 2285
T| +61 2 4949 5200
www.kleinfelder.com.au
ABN: 23 146 082 500
NEWCASTLE OFFICE

28 March 2020
Document Ref: NCA20R110338

Williamtown Sand Syndicate
PO Box 898
Newcastle, NSW 2300

Attention: Darren Williams
Delivered by email: darren@arbus.com.au

Subject: Quarterly water quality monitoring results at Cabbage Tree Road Sand Quarry – February 2020 monitoring event

Please find enclosed the Quarterly water quality monitoring results at Cabbage Tree Road Sand Quarry for the February 2020 monitoring event.

1. SCOPE OF SERVICE

The scope of work includes the quarterly surface and groundwater monitoring as part of the quarterly monitoring requirements. **Figure 1** (attached) presents the surface water and groundwater sampling locations.

The February monitoring round was a quarterly monitoring event and included gauging of all available monitoring wells (a total of 13 wells) and sampling from 8 monitoring wells (Noting that MW239D, BH3, BH5 and BH12 were not required to be sampled and BH9, BH10 and SW2 were dry).

2. SITE WORK

The quarterly monitoring round was conducted on 27 February 2020. A summary of these results are presented in **Table 3.4**. The results suggest that since quarry operations began in August 2019 there has been no immediate change in analytical results.

Each well location was gauged using a water level meter to determine groundwater depth (relative to the top of the well casing) and the total depth of the well, in order to calculate the volume of water in the well. Following the gauging a HydraSleeve was then placed into the well ensuring the top of the sleeve was located under the water and left in place while all remaining wells were gauged. Following gauging, each of the HydraSleeves were removed and samples taken.

The February 2020 monitoring round included:

- Gauging of all available monitoring wells (a total of 13 wells), note that BH3 is now decommissioned;
- Groundwater sampling from a total of 8 monitoring wells (note MW239D, BH3, BH5 and BH12 did not require sampling, BH9 and BH10 were dry); and
- Surface water sampling (SW2 was dry at the time of sampling).

Water samples were collected in laboratory supplied containers and placed in an ice chilled esky. The samples were then submitted to a NATA accredited laboratory under a chain of custody (COC) for the analytical schedule as per **Table 2-1**.

Table 2-1: Summary of Quarterly Water Quality Analysis

Analysis	Number of Samples				
	Primary	Intra-lab (Duplicate)	Inter-lab (Triplicate)	Transport Blank	Rinsate Blank
Extended Water Suite*	11	0	0	0	0
Hydrocarbons**	11	2	0	1	1
Metals***	11	2	0	1	1
Iron (dissolved)	11	2	0	1	1
Total Dissolved Solids (TDS)	11	0	0	0	0
Total Suspended Solids (TSS)	11	0	0	0	0
PFAS (28 analytes, standard level)	7	2	0	1	1

* Extended Water Suite B: Ca, Mg, Na, K, pH, EC, Cl, SO_4, Alkalinity, Hardness & TDS (Calc'), Nitrite, Nitrate, Ammonia, Reactive Phosphorus, Total Phosphorus, Total Nitrogen, TKN)
** TRH (C6 – C40), BTEXN (Silica Gel)
*** NEPM Metals Suite (dissolved) - Arsenic (As), Boron (B), Barium (Ba), Beryllium (Be), Cadmium (Cd), Chromium (Cr), Cobalt (Co), Copper (Cu), Iron (Fe), Lead (Pb), Manganese (Mn), Mercury (Hg), Nickel (Ni), Selenium (Se), Vanadium (V), Zinc (Zn).

3. SAMPLING RESULTS

Table 3-2 provides a summary of the gauging data and **Table 3-3** provides a summary of the field parameters taken during sampling. The full set of gauging data and field parameters for each monitoring location are provided in the **Tables** section.

Table 3-2: Summary of gauging data

Borehole	Top of Casing (mAHD)	Depth to Water (mBTOC)	Groundwater Elevation (mAHD)	Well Total Depth (mBTOC)	Comment
BH1	8.64	6.701	1.939	8.28	Slight cloudy brown, no odour
BH2	7.79	6.153	1.637	9.03	Cloudy brown, slight sulfur odour
BH3	-	-	-	-	Well Decommissioned
BH4	3.06	2.252	0.808	6.11	Slight cloudy brown, no odour
BH5	7.36	6.315	1.045	8.8	No odour - No sample taken.

Borehole	Top of Casing (mAHD)	Depth to Water (mBTOC)	Groundwater Elevation (mAHD)	Well Total Depth (mBTOC)	Comment
BH6	3.62	2.169	1.451	4.62	Brown, no odour
BH7	2.98	2.169	0.811	4.61	Light brown, slight sulfur odour.
BH8	3.88	2.969	0.911	6.28	Cloudy brown, sulfur odour
BH9	17.75	Dry	-	16.01	Well was dry.
BH10	6.69	Dry	-	3.58	Well was dry.
BH11	6.63	3.962	2.668	5.39	Cloudy brown, sulfur odour
BH12	8.67	7.252	1.418	8.2	No sample taken.
MW239S	3.04	1.823	1.217	4.06	Dark brown, sulfur odour
MW239D	3.04	1.799	1.241	20.32	Slight Sulfur odour, no sample taken
SW01*	N/A	Dry		N/A	Location was dry
SW02*	N/A	Dry		N/A	Location was dry.
SW03*	N/A	Dry		N/A	Location was dry.
SW04*	N/A	Dry		N/A	Location was dry

* Surface water levels measured from measuring tape installed (When dry number is ground elevation AHD).

Table 3-3: Summary of field parameters

Sample ID	Time	Temp (°C)	EC (us/cm)	pH	Redox (mV)
BH01	1145	22.52	123	5.39	27.7
BH02	1130	24.49	94	4.84	186.5
BH04	1100	23.3	85	4.63	221
BH06	1320	24.62	190	4.39	92
BH07	1410	22.39	164	4.45	23.1
BH08	1440	21.99	284	4.08	45.6
BH11	1215	22.37	129	4.61	42
MW239S	1250	24.71	396	4.59	16.1

Table 3.4 presents a summary of the water monitoring results and comparison with identified trigger values. Full results tables are provided in the **Tables** Section. Full Laboratory results, including copies for the COC are provided in **Attachment A**.

Table 3.4 Water screening levels

Analytical Groupings	Analyte	Limit of reporting (mg/L)	Number of Samples	Minimum (mg/L)	Maximum (mg/L)	Above adopted criteria	Relative to previous monitoring
Physical and Chemical Stressors	Sodium	1	11	11	64	No	Similar
	Sulphate	1	11	<1	34	No	Similar
	Chloride	1	11	16	126	No	Similar
	Fluoride	0.1	11	<0.1	0.4	No	Similar
	Reactive [3] Phosphorous	0.01	11	<0.01-	<0.01-	No	Similar
	Total Phosphorous [3]	0.01	11	<0.01-	2.76-	7 above ANZECC 2000 Trigger range[1] (BH2, BH4, BH6, BH8, BH11, MW239S & SW1)	Similar
	Nitrite [3]	0.01	11	<0.01	<0.01-	No	Similar
	Nitrate [3]	0.01	11	<0.01	2.18	1 above ANZECC 2000 Trigger range[1] (BH2)	Similar
	Ammonia [3]	0.01	11	<0.01	0.27	No-	Similar
	Total Nitrogen [3]	0.1	11	0.2	4.5	8 above ANZECC 2000- Trigger range[1] (BH1, BH2,BH4, BH6, BH7, BH8, BH11, MW239S & SW1)	Similar
	Total Hardness	1	11	8	126	No	Similar
	Total Dissolved Solids	1	11	64	358	No	Similar
	pH	0.01	11	3.82	6.83	10 outside ANZECC 2000 Trigger range[1] and drinking water guidelines (BH1, BH2,BH4, BH6, BH7, BH8, BH11, MW239S, SW3 & SW4)	Similar

Analytical Groupings	Analyte	Limit of reporting (mg/L)	Number of Samples	Minimum (mg/L)	Maximum (mg/L)	Above adopted criteria	Relative to previous monitoring
Dissolved Metals	As	0.001	11	<0.001	<0.002	No	Similar
	B	0.05	11	<0.05	0.06	No	Similar
	Ba	0.001	11	0.004	0.054	No	Similar
	Be	0.001	11	<0.001	<0.001	No	Similar
	Cd	0.005-0.1	11	<0.0001	<0.0001	No	Similar
	Cr	0.005-0.1	11	<0.001	0.006	6 above ANZECC 2000 Trigger Values[2] (BH1, BH7, BH8, BH11, MW239S & SW1)	Similar
	Co	0.001	11	<0.001	0.006	No	Similar
	Cu	0.001	11	<0.001	0.026	6 above ANZECC 2000 Trigger Values[2] (BH1, BH2, BH4, SW1, SW3 & SW4)	General decrease in concentrations following a spike in September 2019.
	Fe	0.05	11	0.07	4.1	9 above NHMRC ADWG 6 aesthetics (BH1, BH6, BH7, BH8, BH11, MW239S, SW1, SW3 & SW4)	Similar
	Mn	0.001	11	0.002	0.211	No	Similar
	Ni	0.001	11	<0.001	0.01	No	Similar
	Pb	0.005-0.1	11	<0.001	<0.001	No	Similar
	Se	0.005-0.1	11	<0.01	<0.01	No	Similar
	V	0.005-0.1	11	<0.01	<0.01	No	Similar
	Zn	0.005-0.1	11	0.009	0.075	All above ANZECC 2000 Trigger Values[2]	Similar
	Hg	0.0001	11	<0.0001	<0.0001	No	Similar
TRH – Silica Clean up	C_6-C_{10}	0.02	11	<0.02	<0.02	No	Similar
	>C_{10}-C_{16}	0.1	11	<0.1	<0.1	No	Similar

Analytical Groupings	Analyte	Limit of reporting (mg/L)	Number of Samples	Minimum (mg/L)	Maximum (mg/L)	Above adopted criteria	Relative to previous monitoring
	$>C_{16}$-C_{34}	0.1	11	<0.1	<0.1	No	Similar
	$>C_{34}$-C_{40}	0.1	11	<0.1	<0.1	No	Similar
	Total $>C_{10}$-C_{40}	0.1	11	<0.1	0.16	No	Slightly elevated concentrations at BH4 compared to previous months. Concentrations have previously been identified at BH4 following rainfall.
	C_6-C_{10} minus BTEX (F1)	0.02	11	<0.02	<0.02	No	Similar
	$>C_{10}$-C_{16} minus Naphthalene (F2)	0.1	11	<0.1	<0.1	No	Similar
BTEX	Benzene	0.001-0.005	11	<0.001	<0.001	No	Similar
	Toluene	0.001-0.005	11	<0.002	<0.002	No	Similar
	Ethylbenzene	0.001-0.005	11	<0.002	<0.002	No	Similar
	Total Xylene	0.001-0.005	11	<0.002	<0.002	No	Similar
	Naphthalene	0.001	11	<0.005	<0.005	No	Similar
PFAS	PFOS	0.00001-0.0001	7	<0.00001	<0.00002	No	Minor concentrations of PFOS identified at SW1 and SW2. Follow up sampling 1 week later identified similar concentrations to be present
	PFOA	0.00001-0.0001	7	<0.00001	<0.00001	No	Similar

Analytical Groupings	Analyte	Limit of reporting (mg/L)	Number of Samples	Minimum (mg/L)	Maximum (mg/L)	Above adopted criteria	Relative to previous monitoring
	PFOS/PFHxS	0.00001-0.0001	7	<0.00001	<0.00002	No	Minor concentrations of PFOS identified at SW1 and SW2. Follow up sampling 1 week later identified similar concentrations to be present
	PFDS	0.00001-0.0001	7	<0.00001	<0.00001	No	Similar

* The LOR is above the Heads of EPA Australia and New Zealand – National Environmental Management Plan (HEPA NEMP) 2018 99% Level of protection in freshwater. No concentrations were found to be above the LOR.

[1]Australian and New Zealand Environmental Conservation Council (ANZECC) 2000 Trigger Values – Default trigger values for physical and chemical stressors, for slightly disturbed ecosystems in lowland rivers, Southeast Australia (value is for base flow and not storm event)

[2]ANZECC 2000 Trigger Values – 95% Level of protection in freshwater

National Health and Medical Research Council Australian Drinking Water Guidelines (NHMRC ADWG) 6 2011 Version 3.5 Updated August 2018

[3]Analysis only undertaken during Quarterly Sampling Event.

4. THANKYOU

We trust the information presented is acceptable. If you have any questions, please do not hesitate in contacting the undersigned.

Sincerely,

Kleinfelder Australia Pty Ltd

Daniel Kousbroek B.Env.Sc (Hons)

Environmental Consultant
Contaminated Land Management
Dkousbroek@kleinfelder.com

Mobile: 0458 197 676

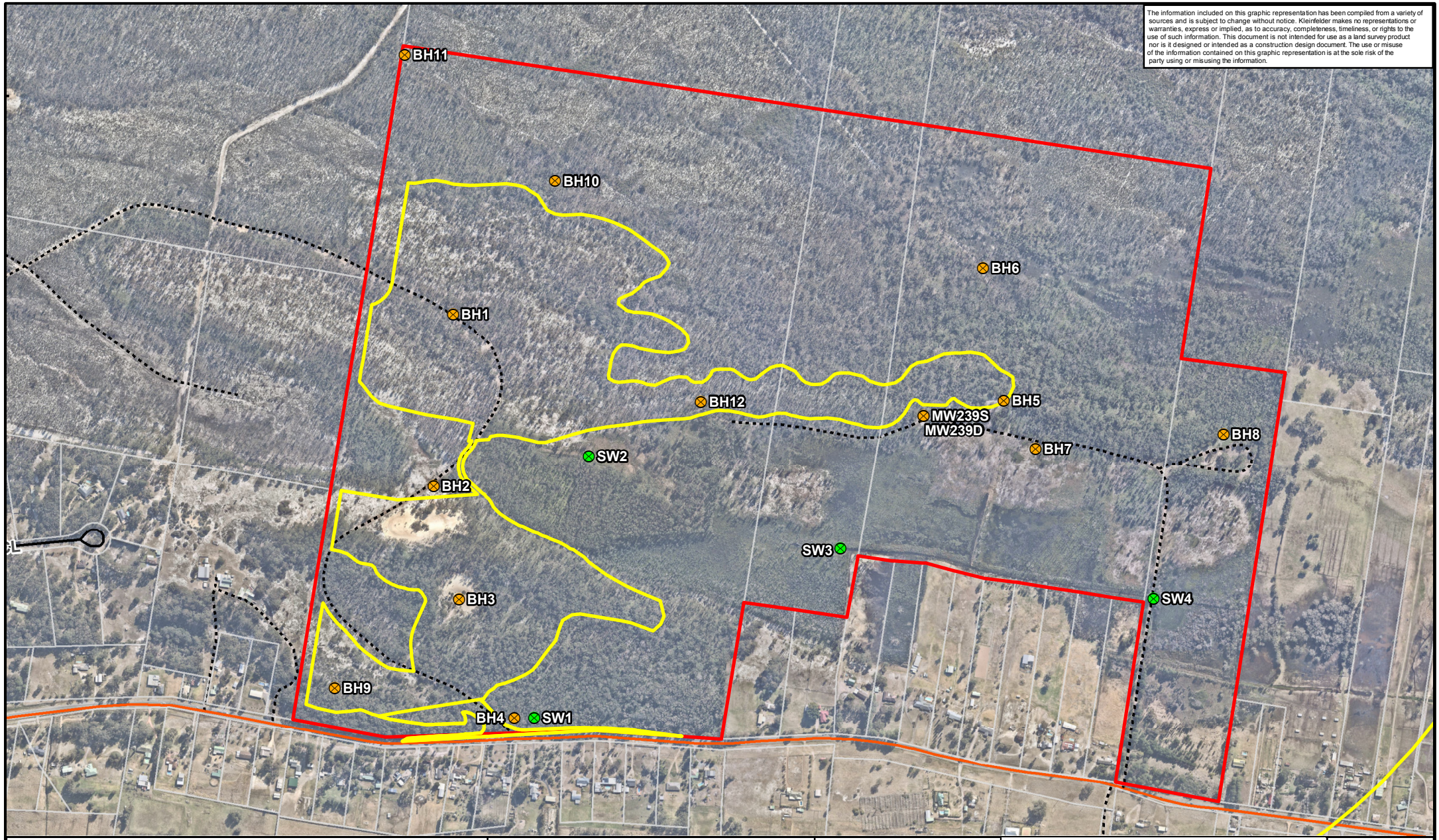
Attached:

Figure 1

Data Tables

Attachment A – Laboratory reports

FIGURE 1



- Groundwater Sample Site
- Surface Water Sample Site
- Subject Land Boundary
- Quarry Project Area
- Arterial Road
- Local Road
- Track

Metres
0 50 100 200 300 400 500
N

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT REFERENCE: 20170448
DATE DRAWN: 13/02/2019 09:48 Version 1
DRAWN BY: gjoyce

DATA SOURCE:
NSW DFSI - 2017
Nearmap - 2018

Water monitoring locations February 2019 Monitoring

Williamtown Sand Syndicate
Proposed Sand Quarry
Cabbage Tree Road, Williamtown

FIGURE:
1

L:\GIS FOLDER\00 CLIENT FILES\126863_TrusteeForWSS_UnitTrust\20170448_Williamtown\Mapping\20170448_WMP_Fig2_WaterMonitoringPlan.mxd

DATA TABLES

Table 1
Groundwater Analytical Data - BTEXN
Williamtown Sand Syndicate

Analyte		BTEXN								Total Petroleum Hydrocarbons	Total Petroleum Hydrocarbons - Silcia Clean up				Total Recoverable Hydrocarbons		Total Recoverable Hydrocarbons - Silcia Clean up				
		Benzene**	Toluene	Ethylbenzene	meta- & para-Xylene	ortho-Xylene**	Total Xylenes	Naphthalene **	Sum of BTEX	C_6 - C_9	C_{10}-C_{14} - Silica Cleanup	C_{15}-C_{28} - Silica Cleanup	C_{29}-C_{36} - Silica Cleanup	C_{10}-C_{36} Sum - Silica Cleanup	C_6 - C_{10}	C_6 - C_{10} minus BTEX (F1)	>C_{10}-C_{16} - Silica Cleanup	F2 - Silica Cleanup	>C_{16}-C_{34} - Silica Cleanup	>C_{34}-C_{40} - Silica Cleanup	>C_{10}-C_{40} - Silica Cleanup
LOR		1	2	2	2	2	2	5	1	20	50	100	50	50	20	20	100	100	100	100	100
Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
ANZECC 2000 Trigger Values		950	-	-	-	350		16													
NHMRC ADWG 6		1	800	300	-	350	600														
Sample Name	Sample Date																				
BH1	15-Mar-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	**1,710**	< 50	< 100	< 50	< 50	**1,690**	**1,690**	< 100	< 100	< 100	< 100	< 100
	23-Apr-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	**40**	< 50	< 100	< 50	< 50	**30**	**30**	< 100	< 100	< 100	< 100	< 100
	16-May-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	14-Jun-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Jul-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	15-Aug-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Sep-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	15-Oct-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	18-Nov-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	17-Dec-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Jan-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	27-Feb-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
BH11	21-Feb-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	15-Mar-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	23-Apr-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-May-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	14-Jun-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Jul-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	15-Aug-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Sep-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	15-Oct-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	18-Nov-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	17-Dec-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Jan-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	27-Feb-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
BH2	22-Feb-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	15-Mar-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	23-Apr-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-May-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	14-Jun-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Jul-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	15-Aug-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Sep-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	15-Oct-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	18-Nov-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	17-Dec-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Jan-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	27-Feb-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
BH3	21-Feb-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
BH4	21-Feb-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	15-Mar-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	23-Apr-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-May-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	**250**	< 50	**250**	< 20	< 20	< 100	< 100	**280**	< 100	**280**
	14-Jun-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Jul-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	15-Aug-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Sep-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	**130**	< 50	**130**	< 20	< 20	< 100	< 100	**140**	< 100	**140**
	15-Oct-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	18-Nov-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	17-Dec-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Jan-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	27-Feb-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	<50	**160**	<50	**160**	< 20	<100	<100	< 100	**160**	< 100	**160**
BH5	22-Feb-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
BH6	22-Feb-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	14-Mar-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	23-Apr-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-May-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	14-Jun-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Jul-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	15-Aug-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Sep-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	15-Oct-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	18-Nov-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	17-Dec-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Jan-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	27-Feb-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
BH7	22-Feb-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	14-Mar-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	23-Apr-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-May-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	14-Jun-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Jul-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	15-Aug-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Sep-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	15-Oct-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	18-Nov-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100

Table 1
Groundwater Analytical Data - BTEXN
Williamtown Sand Syndicate

Analyte		BTEXN								Total Petroleum Hydrocarbons	Total Petroleum Hydrocarbons - Silcia Clean up				Total Recoverable Hydrocarbons		Total Recoverable Hydrocarbons - Silcia Clean up				
		Benzene**	Toluene	Ethylbenzene	meta- & para-Xylene	ortho-Xylene**	Total Xylenes	Naphthalene **	Sum of BTEX	C_6 - C_9	C_{10}-C_{14} - Silica Cleanup	C_{15}-C_{28} - Silica Cleanup	C_{29}-C_{36} - Silica Cleanup	C_{10}-C_{36} Sum - Silica Cleanup	C_6 - C_{10}	C_6 - C_{10} minus BTEX (F1)	>C_{10}-C_{16} - Silica Cleanup	F2 - Silica Cleanup	>C_{16}-C_{34} - Silica Cleanup	>C_{34}-C_{40} - Silica Cleanup	>C_{10}-C_{40} - Silica Cleanup
LOR		1	2	2	2	2	2	5	1	20	50	100	50	50	20	20	100	100	100	100	100
Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
ANZECC 2000 Trigger Values		950	-	-	-	350		16													
NHMRC ADWG 6		1	800	300	-	350	600														
Sample Name	Sample Date																				
	17-Dec-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Jan-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	27-Feb-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
BH8	21-Feb-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	14-Mar-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	23-Apr-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-May-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	14-Jun-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Jul-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	15-Aug-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Sep-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	15-Oct-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	18-Nov-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	17-Dec-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Jan-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	27-Feb-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
MW239S	22-Feb-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	14-Mar-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	23-Apr-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-May-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	14-Jun-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Jul-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	15-Aug-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Sep-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	15-Oct-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	18-Nov-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	17-Dec-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Jan-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Jan-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
SW1	23-Apr-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-May-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	14-Jun-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Jul-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	15-Aug-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Sep-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	15-Oct-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	18-Nov-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	27-Feb-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
SW3	22-Feb-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	14-Mar-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	23-Apr-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-May-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	14-Jun-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Jul-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	15-Aug-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Sep-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	15-Oct-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	18-Nov-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	17-Dec-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	27-Feb-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
SW4	23-Apr-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-May-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	14-Jun-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Jul-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	15-Aug-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	16-Sep-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	15-Oct-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	18-Nov-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	27-Feb-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100

Notes:
- - Not analysed
< - Less than laboratory limit of reporting
µg/L - Micrograms per litre
BTEXN - Benzene, toluene, ethylbenzene, xylenes, naphthalen

** 95% Level of protection in freshwater

Table 2
Groundwater Analytical Data - Metals
Williamtown Sand Syndicate

Analyte		Metals															
		Arsenic**	Barium	Beryllium	Boron**	Cadmium**	Chromium**[1]	Cobalt	Copper**	Iron	Lead**	Manganese**	Mercury**[2]	Nickel**	Selenium**	Vanadium	Zinc**
LOR		**0.001**	**0.001**	**0.001**	**0.05**	**0.0001**	**0.001**	**0.001**	**0.001**	**0.05**	**0.001**	**0.001**	**0.0001**	**0.001**	**0.01**	**0.01**	**0.005**
Units		**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**
ANZECC 2000 Trigger Values		0.013		-	0.37	0.0002	0.001	-	0.0014	-	0.0034	1.9	0.0006	0.011	0.011	-	0.008
NHMRC ADWG 6		0.01		0.06	4	0.002	0.05	-	2	0.3[3]	0.01	0.5	0.001	0.02	0.01	-	3[3]
Sample Name	Sample Date																
BH1	15-Mar-19	< 0.001	**0.003**	< 0.001	< 0.05	< 0.0001	**0.004**	< 0.001	< 0.001	**13**	< 0.001	**0.014**	< 0.0001	< 0.001	< 0.01	< 0.01	**1.27**
	23-Apr-19	< 0.001	**0.003**	< 0.001	< 0.05	< 0.0001	**0.004**	< 0.001	**0.002**	**10**	**0.001**	**0.015**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.363**
	16-May-19	< 0.001	**0.002**	< 0.001	< 0.05	< 0.0001	**0.003**	< 0.001	< 0.001	**8.33**	< 0.001	**0.009**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.132**
	14-Jun-19	< 0.001	**0.001**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	**0.001**	**6.31**	< 0.001	**0.009**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.074**
	16-Jul-19	< 0.001	**0.002**	< 0.001	< 0.05	< 0.0001	**0.003**	< 0.001	**0.002**	**7.35**	< 0.001	**0.01**	< 0.0001	**0.001**	< 0.01	< 0.01	**0.116**
	15-Aug-19	< 0.001	**0.002**	< 0.001	< 0.05	< 0.0001	**0.003**	< 0.001	**0.002**	**7.96**	< 0.001	**0.008**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.023**
	16-Sep-19	< 0.001	**0.002**	< 0.001	< 0.05	< 0.0001	**0.004**	< 0.001	**0.001**	**8.84**	< 0.001	**0.009**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.034**
	15-Oct-19	< 0.001	**0.005**	< 0.001	< 0.05	< 0.0001	**0.003**	< 0.001	**0.006**	**4.32**	< 0.001	**0.007**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.037**
	18-Nov-19	< 0.001	**0.001**	< 0.001	< 0.05	< 0.0001	**0.004**	< 0.001	< 0.001	**11**	< 0.001	**0.008**	< 0.0001	**0.001**	< 0.01	< 0.01	**0.012**
	17-Dec-19	<0.001	**0.002**	<0.001	<0.05	<0.0001	**0.003**	<0.001	0.001	**8.48**	<0.001	**0.009**	<0.0001	<0.001	<0.01	<0.01	**0.028**
	16-Jan-20	<0.001	**0.003**	<0.001	<0.05	<0.0001	**0.002**	<0.001	**0.002**	**4.43**	<0.001	**0.011**	<0.0001	**0.002**	<0.01	<0.01	**0.044**
	27-Feb-20	<0.001	**0.005**	<0.001	<0.05	<0.0001	**0.002**	<0.001	**0.022**	**4.10**	<0.001	**0.008**	<0.0001	**0.004**	<0.01	<0.01	**0.075**
BH11	21-Feb-19	< 0.001	**0.008**	< 0.001	< 0.05	< 0.0001	**0.002**	**0.001**	< 0.001	**0.26**	< 0.001	**0.003**	< 0.0001	**0.005**	< 0.01	< 0.01	**0.031**
	15-Mar-19	< 0.001	**0.005**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	< 0.001	**1.49**	< 0.001	**0.007**	< 0.0001	**0.037**	< 0.01	< 0.01	**0.016**
	23-Apr-19	< 0.001	**0.006**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	< 0.001	**0.98**	< 0.001	**0.007**	< 0.0001	**0.07**	< 0.01	< 0.01	**0.04**
	16-May-19	< 0.001	**0.005**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	< 0.001	**0.97**	< 0.001	**0.006**	< 0.0001	**0.004**	< 0.01	< 0.01	**0.024**
	14-Jun-19	< 0.001	**0.004**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	< 0.001	**0.98**	< 0.001	**0.005**	< 0.0001	**0.001**	< 0.01	< 0.01	**0.005**
	16-Jul-19	< 0.001	**0.01**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	< 0.001	**0.47**	< 0.001	**0.003**	< 0.0001	**0.004**	< 0.01	< 0.01	**0.007**
	15-Aug-19	< 0.001	**0.004**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	**0.001**	**0.87**	< 0.001	**0.007**	< 0.0001	**0.001**	< 0.01	< 0.01	**0.005**
	16-Sep-19	< 0.001	**0.005**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	< 0.001	**0.79**	< 0.001	**0.008**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.012**
	15-Oct-19	< 0.001	**0.004**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	**0.004**	**0.74**	< 0.001	**0.006**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.016**
	18-Nov-19	< 0.001	**0.004**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	< 0.001	**0.95**	< 0.001	**0.008**	< 0.0001	**0.002**	< 0.01	< 0.01	< 0.005
	17-Dec-19	<0.001	**0.004**	<0.001	**0.06**	<0.0001	**0.002**	<0.001	**0.002**	**1**	<0.001	**0.008**	<0.0001	**0.001**	<0.01	<0.01	**0.006**
	16-Jan-20	<0.001	**0.005**	<0.001	<0.05	<0.0001	**0.002**	<0.001	<0.001	**1.08**	<0.001	**0.007**	<0.0001	**0.003**	<0.01	<0.01	**0.005**
	27-Feb-20	<0.001	**0.004**	<0.001	<0.05	<0.0001	**0.002**	<0.001	<0.001	**0.60**	<0.001	**0.003**	<0.0001	**0.002**	<0.01	<0.01	**0.027**
BH2	22-Feb-19	< 0.001	**0.005**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.002**	**0.14**	< 0.001	**0.021**	< 0.0001	**0.015**	< 0.01	< 0.01	**0.006**
	15-Mar-19	< 0.001	**0.004**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.003**	< 0.05	< 0.001	**0.02**	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
	23-Apr-19	< 0.001	**0.005**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.004**	**0.19**	< 0.001	**0.018**	< 0.0001	**0.001**	< 0.01	< 0.01	**0.008**
	16-May-19	< 0.001	**0.004**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.001**	**0.06**	< 0.001	**0.014**	< 0.0001	**0.001**	< 0.01	< 0.01	< 0.005
	14-Jun-19	< 0.001	**0.004**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.004**	**0.08**	< 0.001	**0.009**	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
	16-Jul-19	< 0.001	**0.004**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.008**	**0.05**	< 0.001	**0.013**	< 0.0001	**0.001**	< 0.01	< 0.01	**0.006**
	15-Aug-19	< 0.001	**0.004**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.012**	**0.08**	< 0.001	**0.011**	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
	16-Sep-19	< 0.001	**0.004**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.008**	**0.26**	< 0.001	**0.014**	< 0.0001	**0.001**	< 0.01	< 0.01	**0.007**
	15-Oct-19	< 0.001	**0.004**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.006**	**0.46**	< 0.001	**0.011**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.007**
	18-Nov-19	< 0.001	**0.007**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.013**	**0.08**	< 0.001	**0.011**	< 0.0001	**0.007**	< 0.01	< 0.01	**0.028**
	17-Dec-19	<0.001	**0.004**	<0.001	<0.05	<0.0001	**0.002**	<0.001	**0.006**	**0.1**	<0.001	**0.012**	<0.0001	**0.001**	<0.01	<0.01	**0.006**
	16-Jan-20	<0.001	**0.004**	<0.001	<0.05	<0.0001	<0.001	<0.001	**0.005**	**0.73**	<0.001	**0.014**	<0.0001	<0.001	<0.01	<0.01	**0.01**
	27-Feb-20	<0.001	**0.005**	<0.001	<0.05	<0.0001	<0.001	<0.001	**0.008**	**0.07**	<0.001	**0.012**	<0.0001	**0.003**	<0.01	<0.01	**0.021**
BH3	21-Feb-19	< 0.001	**0.003**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	< 0.001	**0.06**	< 0.001	**0.005**	< 0.0001	**0.053**	< 0.01	< 0.01	< 0.005
BH4	21-Feb-19	< 0.001	**0.014**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.002**	**0.16**	< 0.001	**0.039**	< 0.0001	**0.018**	< 0.01	< 0.01	**0.014**
	15-Mar-19	< 0.001	**0.014**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.001**	< 0.05	< 0.001	**0.014**	< 0.0001	**0.022**	< 0.01	< 0.01	**0.043**
	23-Apr-19	< 0.001	**0.013**	< 0.001	**0.05**	< 0.0001	< 0.001	< 0.001	**0.002**	**0.99**	< 0.001	**0.045**	< 0.0001	**0.007**	< 0.01	< 0.01	**0.008**
	16-May-19	< 0.001	**0.013**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**0.27**	< 0.001	**0.022**	< 0.0001	**0.022**	< 0.01	< 0.01	**0.011**
	14-Jun-19	< 0.001	**0.012**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.038**	< 0.05	< 0.001	**0.014**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.005**
	16-Jul-19	< 0.001	**0.013**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.046**	< 0.05	< 0.001	**0.019**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.007**
	15-Aug-19	< 0.001	**0.013**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.026**	< 0.05	< 0.001	**0.018**	< 0.0001	**0.001**	< 0.01	< 0.01	**0.007**
	16-Sep-19	< 0.001	**0.012**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.051**	**0.19**	< 0.001	**0.026**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.005**
	15-Oct-19	< 0.001	**0.01**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.011**	**0.31**	< 0.001	**0.136**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.014**
	18-Nov-19	< 0.001	**0.011**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.005**	< 0.05	< 0.001	**0.013**	< 0.0001	**0.001**	< 0.01	< 0.01	< 0.005
	17-Dec-19	<0.001	**0.012**	<0.001	**0.06**	<0.0001	**0.001**	<0.001	**0.008**	<0.05	<0.001	**0.014**	<0.0001	<0.001	<0.01	<0.01	**0.005**
	16-Jan-20	<0.001	**0.014**	<0.001	<0.05	<0.0001	<0.001	<0.001	**0.006**	<0.05	<0.001	**0.014**	<0.0001	<0.001	<0.01	<0.01	**0.009**
	27-Feb-20	<0.001	**0.009**	<0.001	<0.05	<0.0001	**0.001**	<0.001	**0.006**	**0.09**	<0.001	**0.013**	<0.0001	**0.001**	<0.01	<0.01	**0.009**
BH5	22-Feb-19	< 0.001	**0.01**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	< 0.001	**1.4**	< 0.001	**0.005**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.008**
BH6	22-Feb-19	< 0.001	**0.03**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**1.03**	< 0.001	**0.014**	< 0.0001	**0.001**	< 0.01	< 0.01	**0.019**
	14-Mar-19	< 0.001	**0.027**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**1.9**	< 0.001	**0.01**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.012**
	23-Apr-19	< 0.001	**0.03**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.001**	**0.96**	< 0.001	**0.01**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.022**
	16-May-19	< 0.001	**0.029**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**2.57**	< 0.001	**0.009**	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
	14-Jun-19	< 0.001	**0.027**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.001**	**2.86**	< 0.001	**0.008**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.008**
	16-Jul-19	< 0.001	**0.026**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.002**	**2.41**	< 0.001	**0.008**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.005**
	15-Aug-19	< 0.001	**0.026**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.001**	**2.19**	< 0.001	**0.008**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.007**
	16-Sep-19	< 0.001	**0.034**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.008**	**2.08**	< 0.001	**0.012**	< 0.0001	**0.007**	< 0.01	< 0.01	**0.035**
	15-Oct-19	< 0.001	**0.026**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**1.95**	< 0.001	**0.009**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.006**
	18-Nov-19	< 0.001	**0.03**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**1.58**	< 0.001	**0.009**	< 0.0001	**0.008**	< 0.01	< 0.01	**0.073**
	17-Dec-19	<0.001	**0.026**	<0.001	**0.05**	<0.0001	**0.001**	<0.001	**0.003**	**1.78**	<0.001	**0.007**	<0.0001	**0.001**	<0.01	<0.01	**0.006**
	16-Jan-20	<0.001	**0.032**	<0.001	<0.05	<0.0001	<0.001	<0.001	<0.001	**2.15**	<0.001	**0.01**	<0.0001	<0.001	<0.01	<0.01	<0.005
	27-Feb-20	<0.001	**0.030**	<0.001	<0.05	<0.0001	<0.001	<0.001	<0.001	**1.69**	<0.001	**0.010**	<0.0001	**0.004**	<0.01	<0.01	**0.019**
BH7	22-Feb-19	< 0.001	**0.004**	< 0.001	< 0.05	< 0.0001	**0.002**	**0.003**	< 0.001	**1.8**	< 0.001	**0.026**	< 0.0001	**0.004**	< 0.01	< 0.01	**0.019**
	14-Mar-19	< 0.001	**0.01**	< 0.001	< 0.05	< 0.0001	**0.001**	**0.003**	< 0.001	**1.8**	< 0.001	**0.02**	< 0.0001	**0.004**	< 0.01	< 0.01	**0.009**
	23-Apr-19	< 0.001	**0.012**	< 0.001	< 0.05	< 0.0001	**0.002**	**0.003**	< 0.001	**2.0**	< 0.001	**0.026**	< 0.0001	**0.004**	< 0.01	< 0.01	**0.01**
	16-May-19	< 0.001	**0.008**	< 0.001	< 0.05	< 0.0001	**0.002**	**0.003**	< 0.001	**2.32**	< 0.001	**0.035**	< 0.0001	**0.005**	< 0.01	< 0.01	**0.013**
	14-Jun-19	< 0.001	**0.005**	< 0.001	< 0.05	< 0.0001	**0.002**	**0.002**	< 0.001	**2.06**	< 0.001	**0.03**	< 0.0001	**0.004**	< 0.01	< 0.01	**0.006**
	16-Jul-19	< 0.001	**0.005**	< 0.001	< 0.05	< 0.0001	**0.002**	**0.002**	< 0.001	**1.66**	< 0.001	**0.025**	< 0.0001	**0.003**	< 0.01	< 0.01	< 0.005
	15-Aug-19	< 0.001	**0.005**	< 0.001	< 0.05	< 0.0001	**0.002**	**0.002**	< 0.001	**1.54**	< 0.001	**0.023**	< 0.0001	**0.003**	< 0.01	< 0.01	< 0.005
	16-Sep-19	< 0.001	**0.016**	< 0.001	**0.06**	< 0.0001	**0.002**	**0.002**	**0.007**	**1.42**	**0.001**	**0.024**	< 0.0001	**0.02**	< 0.01	< 0.01	**0.085**
	15-Oct-19	< 0.001	**0.009**	< 0.001	< 0.05	< 0.0001	**0.002**	**0.002**	**0.003**	**1.32**	< 0.001	**0.018**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.011**
	18-Nov-19	< 0.001	**0.016**	< 0.001	< 0.05	< 0.0001	**0.002**	**0.002**	< 0.001	**1.1**	< 0.001	**0.015**	< 0.0001	**0.013**	< 0.01	< 0.01	**0.053**
	17-Dec-19	<0.001	**0.009**	<0.001	**0.06**	<0.0001	**0.002**	**0.001**	<0.001	**0.98**	<0.001	**0.011**	<0.0001	**0.003**	<0.01	<0.01	**0.007**
	16-Jan-20	<0.001	**0.01**	<0.001	<0.05	<0.0001	**0.002**	<0.001	<0.001	**0.93**	<0.001	**0.006**	<0.0001	**0.003**	<0.01	<0.01	**0.007**
	27-Feb-20	<0.001	**0.01**	<0.001	<0.05	<0.0001	**0.003**	<0.001	<0.001	**1.18**	<0.001	**0.008**	<0.0001	**0.004**	<0.01	<0.01	**0.027**
BH8	21-Feb-19	**0.001** *	**0.011**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	< 0.001	**4.1**	< 0.001	**0.012**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.006**
	14-Mar-19	< 0.001	**0.006**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	< 0.001	**3.25**	< 0.001	**0.008**	< 0.0001	**0.002**	< 0.01	< 0.01	< 0.005
	23-Apr-19	**0.001**	**0.008**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	< 0.001	**3.2**	< 0.001	**0.009**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.008**
	16-May-19	**0.003**	**0.01**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	< 0.001	**3.0**	< 0.001	**0.01**	< 0.0001	**0.003**	< 0.01	< 0.01	< 0.005
	14-Jun-19	< 0.001	**0.01**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	< 0.001	**2.5**	< 0.001	**0.005**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.006**
	16-Jul-19	**0.001**	**0.012**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	< 0.001	**2.6**	< 0.001	**0.004**	< 0.0001	**0.002**	< 0.01	< 0.01	< 0.005
	15-Aug-19	**0.001**	**0.008**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	< 0.001	**1.72**	< 0.001	**0.004**	< 0.0001	**0.001**	< 0.01	< 0.01	< 0.005
	16-Sep-19	**0.001**	**0.01**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	< 0.001	**2.06**	< 0.001	**0.005**	< 0.0001	**0.002**	< 0.01	< 0.01	< 0.005
	15-Oct-19	< 0.001	**0.007**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	**0.002**	**2.08**	< 0.001	**0.009**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.011**
	18-Nov-19	< 0.001	**0.012**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	**0.002**	**2.49**	< 0.001	**0.01**	< 0.0001	**0.013**	< 0.01	< 0.01	**0.053**
	17-Dec-19	<0.001	**0.007**	<0.001	**0.05**	<0.0001	**0.002**	<0.001	**0.003**	**3.02**	<0.001	**0.011**	<0.0001	**0.002**	<0.01	<0.01	**0.007**
	16-Jan-20	<0.001	**0.007**	<0.001	<0.05	<0.0001	**0.002**	<0.001	<0.001	**2.94**	<0.001	**0.011**	<0.0001	**0.002**	<0.01	<0.01	**0.011**
	27-Feb-20	<0.001	**0.007**	<0.001	<0.05	<0.0001	**0.002**	<0.001	<0.001	**2.56**	<0.001	**0.01**	<0.0001	**0.005**	<0.01	<0.01	**0.032**
MW239S	22-Feb-19	< 0.001	**0.007**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	< 0.001	**1.11**	< 0.001	**0.003**	< 0.0001	**0.001**	< 0.01	< 0.01	**0.006**
	14-Mar-19	< 0.001	**0.008**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	< 0.001	**1.25**	< 0.001	**0.005**	< 0.0001	**0.005**	< 0.01	< 0.01	**0.008**
	23-Apr-19	< 0.001	**0.008**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	< 0.001	**1.01**	< 0.001	**0.004**	< 0.0001	**0.004**	< 0.01	< 0.01	**0.007**
	16-May-19	< 0.001	**0.005**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	< 0.001	**0.87**	< 0.001	**0.003**	< 0.0001	**0.002**	< 0.01	< 0.01	< 0.005
	14-Jun-19	< 0.001	**0.005**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	**0.002**	**0.8**	< 0.001	**0.003**	< 0.0001	**0.001**	< 0.01	< 0.01	< 0.005
	16-Jul-19	< 0.001	**0.006**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	< 0.001	**0.87**	< 0.001	**0.003**	< 0.0001	**0.002**	< 0.01	< 0.01	< 0.005
	15-Aug-19	< 0.001	**0.006**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	< 0.001	**1.0**	< 0.001	**0.004**	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
	16-Sep-19	< 0.001	**0.01**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	**0.002**	**0.94**	< 0.001	**0.006**	< 0.0001	**0.006**	< 0.01	< 0.01	**0.032**
	15-Oct-19	< 0.001	**0.005**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	**0.003**	**0.68**	< 0.001	**0.004**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.011**
	18-Nov-19	< 0.001	**0.01**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	< 0.001	**1.1**	< 0.001	**0.004**	< 0.0001	**0.008**	< 0.01	< 0.01	**0.03**
	17-Dec-19	<0.001	**0.008**	<0.001	<0.05	<0.0001	**0.003**	<0.001	**0.001**	**1.33**	<0.001	**0.003**	<0.0001	**0.002**	<0.01	<0.01	<0.005
	16-Jan-20	<0.001	**0.008**	<0.001	<0.05	<0.0001	**0.002**	<0.001	<0.001	**1.31**	<0.001	**0.004**	<0.0001	**0.002**	<0.01	<0.01	**0.007**
	27-Feb-20	<0.001	**0.008**	<0.001	<0.05	<0.0001	**0.002**	<0.001	<0.001	**1.03**	<0.001	**0.002**	<0.0001	**0.002**	<0.01	<0.01	**0.019**
SW1	23-Apr-19	< 0.001	**0.043**	< 0.001	**0.14**	< 0.0001	< 0.001	**0.017**	**0.002**	**4.16**	< 0.001	**0.841**	< 0.0001	**0.02**	< 0.01	< 0.01	**0.356**
	16-May-19	< 0.001	**0.029**	< 0.001	**0.1**	< 0.0001	< 0.001	**0.01**	**0.003**	**7.25**	< 0.001	**0.666**	< 0.0001	**0.012**	< 0.01	< 0.01	**0.077**
	14-Jun-19	< 0.001	**0.029**	< 0.001	**0.09**	**0.0002**	< 0.001	**0.009**	**0.006**	**2.75**	< 0.001	**0.595**	< 0.0001	**0.011**	< 0.01	< 0.01	**0.535**
	16-Jul-19	< 0.001	**0.032**	< 0.001	**0.08**	**0.0001**	< 0.001	**0.007**	**0.003**	**1.86**	< 0.001	**0.59**	< 0.0001	**0.008**	< 0.01	< 0.01	**0.239**
	15-Aug-19	< 0.001	**0.027**	< 0.001	**0.09**	< 0.0001	< 0.001	**0.005**	**0.003**	**2.15**	< 0.001	**0.482**	< 0.0001	**0.005**	< 0.01	< 0.01	**0.075**
	16-Sep-19	< 0.001	**0.056**	< 0.001	**0.09**	**0.0002**	**0.001**	**0.008**	**0.012**	**2.45**	**0.001**	**0.587**	< 0.0001	**0.014**	< 0.01	< 0.01	**0.282**
	15-Oct-19	< 0.001	**0.036**	< 0.001	**0.07**	< 0.0001	< 0.001	**0.005**	**0.003**	**1.61**	< 0.001	**0.383**	< 0.0001	**0.005**	< 0.01	< 0.01	**0.055**
	18-Nov-19	< 0.001	**0.042**	< 0.001	**0.11**	< 0.0001	**0.001**	**0.003**	< 0.001	**1.14**	< 0.001	**0.366**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.026**
	27-Feb-20	**0.002**	**0.029**	<0.001	**0.06**	<0.0001	**0.006**	**0.002**	**0.026**	**1.67**	**0.002**	**0.211**	<0.0001	**0.009**	<0.01	<0.01	**0.061**
SW3	22-Feb-19	**0.003**	**0.075**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**4.84**	< 0.001	**0.033**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.016**
	14-Mar-19	**0.006**	**0.08**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.003**	< 0.001	**9.26**	< 0.001	**0.048**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.009**
	23-Apr-19	< 0.001	**0.043**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.003**	**0.001**	**2.01**	< 0.001	**0.046**	< 0.0001	**0.004**	< 0.01	< 0.01	**0.016**
	16-May-19	< 0.001	**0.034**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.002**	< 0.001	**1.78**	< 0.001	**0.038**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.012**
	14-Jun-19	< 0.001	**0.035**	< 0.001	< 0.05	< 0.0001	**0.001** *	**0.003**	< 0.001	**1.68**	< 0.001	**0.038**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.016**
	16-Jul-19	< 0.001	**0.055**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.007**	**0.002**	**1.25**	< 0.001	**0.043**	< 0.0001	**0.006**	< 0.01	< 0.01	**0.029**
	15-Aug-19	< 0.001	**0.035**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.003**	**0.002**	**1.16**	< 0.001	**0.036**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.013**
	16-Sep-19	< 0.001	**0.045**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.004**	**0.02**	**0.69**	**0.001**	**0.036**	< 0.0001	**0.017**	< 0.01	< 0.01	**0.094**
	15-Oct-19	< 0.001	**0.034**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.005**	**0.002**	**1.7**	< 0.001	**0.027**	< 0.0001	**0.005**	< 0.01	< 0.01	**0.022**
	18-Nov-19	< 0.001	**0.031**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	< 0.001	**2.6**	< 0.001	**0.026**	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
	17-Dec-19	<0.001	**0.041**	<0.001	<0.05	<0.0001	**0.002**	<0.001	**0.003**	**1.42**	<0.001	**0.026**	<0.0001	**0.001**	<0.01	<0.01	<0.005
	27-Feb-20	**0.002**	**0.051**	<0.001	<0.05	<0.0001	<0.001	**0.006**	**0.008**	**6.00**	<0.001	**0.054**	<0.0001	**0.010**	<0.01	<0.01	**0.049**
SW4	23-Apr-19	< 0.001	**0.059**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.003**	**0.003**	**2.09**	< 0.001	**0.037**	< 0.0001	**0.005**	< 0.01	< 0.01	**0.03**
	16-May-19	< 0.001	**0.047**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.002**	< 0.001	**1.12**	< 0.001	**0.03**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.019**
	14-Jun-19	< 0.001	**0.041**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.002**	**0.003**	**0.79**	< 0.001	**0.034**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.014**
	16-Jul-19	< 0.001	**0.044**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.002**	**0.002**	**0.96**	< 0.001	**0.043**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.014**
	15-Aug-19	< 0.001	**0.04**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.001**	**0.001**	**0.57**	< 0.001	**0.032**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.009**
	16-Sep-19	< 0.001	**0.046**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.002**	**0.02**	**0.7**	**0.001**	**0.039**	< 0.0001	**0.017**	< 0.01	< 0.01	**0.085**
	15-Oct-19	< 0.001	**0.037**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.002**	**0.004**	**0.66**	< 0.001	**0.031**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.018**
	18-Nov-19	< 0.001	**0.035**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**6.32**	< 0.001	**0.032**	< 0.0001	**0.002**	< 0.01	< 0.01	< 0.005
	27-Feb-20	<0.001	**0.054**	<0.001	<0.05	<0.0001	<0.001	**0.002**	**0.018**	**2.52**	<0.001	**0.050**	<0.0001	**0.009**	<0.01	<0.01	**0.060**

Notes:
- - Not analysed
< - Less than laboratory limit of reporting
mg/L - Milligrams per litre
Bold indicates a detection above the laboratory limit of reporting
"*" denotes duplicate/triplicate sample result adopted for analytical use due to RPD >50%
RPD - Relative Percentage Difference

** 95% Level of protection in freshwater
[1] value for CR VI
[2] as inorganioc
[3] Aesthetic

Table 3
Groundwater Analytical Data - PFAS
Williamtown Sand Syndicate

Analyte		Perfluoroalkyl Sulfonic Acids						Perfluoroalkyl Carboxylic Acids											
		Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonate (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)
LOR		0.02	0.02	0.02	0.02	0.01	0.02	0.1	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.05	0.02
Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
NHMRC ADWG 6												0.56							
HEPA NEMP 2018***						0.00023						19							
HEPA NEMP 2018[4]												5.6							
Sample Name	Sample Date																		
BH11	21-Feb-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
BH2	22-Feb-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
BH3	21-Feb-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
BH4	21-Feb-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	15-Mar-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	23-Apr-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	16-May-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	14-Jun-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	16-Jul-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	15-Aug-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	16-Sep-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	**0.02**	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	25-Sep-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	<0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	15-Oct-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	18-Nov-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	17-Dec-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	16-Jan-20	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	27-Feb-20	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
BH5	22-Feb-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
BH6	22-Feb-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	14-Mar-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	23-Apr-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	16-May-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	14-Jun-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	16-Jul-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	15-Aug-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	16-Sep-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	15-Oct-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	18-Nov-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	17-Dec-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	16-Jan-20	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	27-Feb-20	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
BH7	22-Feb-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	14-Mar-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	23-Apr-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	16-May-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	14-Jun-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	16-Jul-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	15-Aug-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	16-Sep-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	15-Oct-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	18-Nov-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	17-Dec-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	16-Jan-20	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	27-Feb-20	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
BH8	21-Feb-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	14-Mar-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	23-Apr-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	16-May-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	14-Jun-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	16-Jul-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	15-Aug-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	16-Sep-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	15-Oct-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	18-Nov-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	17-Dec-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	16-Jan-20	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	27-Feb-20	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
MW239S	22-Feb-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
SW1	16-May-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	16-Sep-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	18-Nov-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	27-Jan-20	< 0.02	< 0.02	< 0.02	< 0.02	**0.02**	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
SW3	22-Feb-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	16-May-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	16-Sep-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	18-Nov-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	27-Feb-20	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
SW4	16-May-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	16-Sep-19	< 0.02	< 0.02	< 0.02	< 0.02	**0.03 ***	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	25-Sep-19	< 0.02	< 0.02	< 0.02	< 0.02	**0.05**	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	18-Nov-19	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02
	27-Feb-20	< 0.02	< 0.02	< 0.02	< 0.02	**0.01**	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02

Notes:
- - Not analysed
< - Less than laboratory limit of reporting
µg/L - Micrograms per litre

*** 99% Level of protection in freshwater
[4] Recreation water

Table 3
Groundwater Analytical Data - PFAS
Williamtown Sand Syndicate

Analyte		Perfluoroalkyl Sulfonamides						(n:2) Fluorotelomer Sulfonic Acids				Sum of PFAS		
		N-Methyl-perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
LOR		0.05	0.05	0.05	0.05	0.02	0.02	0.05	0.05	0.05	0.05	0.01	0.01	0.01
Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
NHMRC ADWG 6												0.07		
HEPA NEMP 2018***														
HEPA NEMP 2018[4]												0.7		
Sample Name	Sample Date													
BH11	21-Feb-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
BH2	22-Feb-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
BH3	21-Feb-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
BH4	21-Feb-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	15-Mar-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	23-Apr-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	16-May-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	14-Jun-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	16-Jul-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	15-Aug-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	16-Sep-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	**0.02**
	25-Sep-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	**0.02**
	15-Oct-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	18-Nov-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	17-Dec-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	16-Jan-20	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	27-Feb-20	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
BH5	22-Feb-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
BH6	22-Feb-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	14-Mar-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	23-Apr-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	16-May-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	14-Jun-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	16-Jul-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	15-Aug-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	16-Sep-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	15-Oct-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	18-Nov-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	17-Dec-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	**0.19**	< 0.05	< 0.05	< 0.01	< 0.01	**0.19**
	16-Jan-20	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	27-Feb-20	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
BH7	22-Feb-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	14-Mar-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	23-Apr-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	16-May-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	14-Jun-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	16-Jul-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	15-Aug-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	16-Sep-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	15-Oct-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	18-Nov-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	17-Dec-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	16-Jan-20	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	27-Feb-20	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
BH8	21-Feb-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	14-Mar-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	23-Apr-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	16-May-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	14-Jun-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	16-Jul-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	15-Aug-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	16-Sep-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	15-Oct-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	18-Nov-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	17-Dec-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	16-Jan-20	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	27-Feb-20	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
MW239S	22-Feb-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
SW1	16-May-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	16-Sep-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	18-Nov-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	27-Jan-20	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	**0.02**	**0.02**	**0.02**
SW3	22-Feb-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	16-May-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	16-Sep-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	18-Nov-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	27-Feb-20	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
SW4	16-May-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	16-Sep-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	**0.03 ***	**0.01**	**0.01**
	25-Sep-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	**0.05**	**0.05**	**0.05**
	18-Nov-19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
	27-Feb-20	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	**0.01**	**0.01**	**0.01**

Notes:
- - Not analysed
< - Less than laboratory limit of report
µg/L - Micrograms per litre

*** 99% Level of protection in freshwa
[4] Recreation water

Table 4
Groundwater Analytical Data - Inorganics
Williamtown Sand Syndicate

Analyte		Anions and Cations																			
		Sodium	Calcium	Magnesium	Potassium	Sulphate	Chloride	Fluoride	Reactive phosphorus as P	Total Phosphorus	Nitrite as N	Nitrate as N	Nitrite + Nitrate as N	Ammonia as N	Total Nitrogen as N	Total Kjeldahl Nitrogen as N	Total Cations	Total Anions	Ionic Balance	Sodium Adsorption Ratio	Bicarbonate Alkalinity as CaCO3
LOR		1	1	1	1	1	1	0.1	0.01	0.01	0.01	0.01	0.01	0.01	0.1	0.1	0.01	0.01		0.01	1
Units		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	%	-	mg/L
ANZECC 2000 Trigger Values									0.02*	0.025*		0.7**		0.9**	0.35*						
NHMRC ADWG 6		180[3]				250[3]	250[3]	1.5			3	50		0.5[3]							
Sample Name	Sample Date																				
BH1	15-Mar-19	11	2.0	1.0	< 1.0	< 1.0	25	< 0.1	-	-	-	-	-	-	-	-	0.66	0.88	-	-	9.0
	23-Apr-19	14	1.0	2.0	< 1.0	4.0	25	< 0.1	-	-	-	-	-	-	-	-	0.82	0.99	-	-	10
	16-May-19	12	< 1.0	2.0	< 1.0	5.0	25	< 0.1	0.03	< 0.01	< 0.01	< 0.01	< 0.01	0.11	0.3	0.3	0.69	1.01	-	1.7	10
	14-Jun-19	10	< 1.0	2.0	< 1.0	3.0	24	< 0.1	-	-	-	-	-	-	-	-	0.6	0.94	-	-	10
	16-Jul-19	15	< 1.0	2.0	< 1.0	4.0	23	< 0.1	-	-	-	-	-	-	-	-	0.82	0.95	-	-	11
	15-Aug-19	14	< 1.0	2.0	< 1.0	2.0	21	< 0.1	-	-	-	-	-	-	-	-	0.77	0.91	-	-	14
	16-Sep-19	13	< 1.0	2.0	< 1.0	2.0	20	< 0.1	< 0.01	0.06	< 0.01	< 0.01	< 0.01	0.12	0.3	0.3	0.73	0.76	-	1.84	8.0
	15-Oct-19	13	< 1.0	2.0	< 1.0	2.0	21	< 0.1	-	-	-	-	-	-	-	-	0.73	0.71	-	-	4.0
	18-Nov-19	16	< 1.0	2.0	< 1.0	3.0	23	0.1	< 0.01	< 0.01	< 0.01	0.01	0.01	0.13	0.3	0.3	0.86	1.19	-	2.26	24
	17-Dec-19	14	<1	2	<1	5	23	<0.1	-	-	-	-	-	-	-	-	0.77	1.05	-	-	15
	16-Jan-20	16	<1	3	<1	3	25	<0.1	-	-	-	-	-	-	-	-	0.94	1.21	-	-	22
	27-Feb-20	14	<1	2	<1	4	24	<0.1	<0.01	0.02	<0.01	0.02	0.02	0.22	0.4	0.4	0.77	0.94	-	1.98	9
BH11	21-Feb-19	48	< 1.0	10	< 1.0	24	80	0.1	< 0.01	0.03	< 0.01	0.04	0.04	0.06	1.8	1.8	2.91	2.76	-	3.21	< 1.0
	15-Mar-19	26	< 1.0	2.0	< 1.0	2.0	52	< 0.1	-	-	-	-	-	-	-	-	1.3	1.51	-	-	< 1.0
	23-Apr-19	32	< 1.0	5.0	< 1.0	2.0	57	< 0.1	-	-	-	-	-	-	-	-	1.8	1.65	-	-	< 1.0
	16-May-19	29	< 1.0	4.0	< 1.0	2.0	55	< 0.1	< 0.01	0.01	< 0.01	< 0.01	< 0.01	0.12	0.4	0.4	1.59	1.59	-	3.0	< 1.0
	14-Jun-19	26	< 1.0	3.0	< 1.0	< 1.0	53	< 0.1	-	-	-	-	-	-	-	-	1.38	1.5	-	-	< 1.0
	16-Jul-19	49	< 1.0	8.0	< 1.0	8.0	73	0.2	-	-	-	-	-	-	-	-	2.79	2.22	-	-	< 1.0
	15-Aug-19	28	< 1.0	3.0	< 1.0	4.0	47	< 0.1	-	-	-	-	-	-	-	-	1.46	1.41	-	-	< 1.0
	16-Sep-19	27	< 1.0	3.0	< 1.0	5.0	46	< 0.1	< 0.01	0.12	< 0.01	< 0.01	< 0.01	0.15	0.7	0.7	1.42	1.4	-	3.18	< 1.0
	15-Oct-19	28	< 1.0	3.0	< 1.0	3.0	44	< 0.1	-	-	-	-	-	-	-	-	1.46	1.3	-	-	< 1.0
	18-Nov-19	28	< 1.0	3.0	< 1.0	< 1.0	53	< 0.1	< 0.01	2.11	< 0.01	0.06	0.06	0.18	5.9	5.8	1.46	1.5	-	3.3	< 1.0
	17-Dec-19	26	<1	4	<1	<1	48	<0.1	-	-	-	-	-	-	-	-	1.46	1.39	-	-	2
	16-Jan-20	25	<1	3	<1	<1	46	<0.1	-	-	-	-	-	-	-	-	1.33	1.34	-	-	2
	27-Feb-20	20	<1	3	<1	<1	41	<0.1	<0.01	1.09	<0.01	0.02	0.02	0.16	3.3	3.3	1.12	1.16	-	2.36	<1
BH2	22-Feb-19	12	2.0	2.0	< 1.0	6.0	22	0.1	< 0.01	0.28	< 0.01	2.76	2.76	0.05	4.0	1.2	0.79	0.74	-	1.44	< 1.0
	15-Mar-19	10	3.0	2.0	< 1.0	7.0	23	< 0.1	-	-	-	-	-	-	-	-	0.75	0.79	-	-	< 1.0
	23-Apr-19	14	2.0	2.0	< 1.0	6.0	23	< 0.1	-	-	-	-	-	-	-	-	0.87	0.77	-	-	< 1.0
	16-May-19	12	2.0	2.0	< 1.0	21	22	< 0.1	< 0.01	0.26	< 0.01	0.38	0.38	0.01	1.3	0.9	0.79	1.06	-	1.44	< 1.0
	14-Jun-19	11	1.0	2.0	< 1.0	5.0	23	< 0.1	-	-	-	-	-	-	-	-	0.69	0.75	-	-	< 1.0
	16-Jul-19	13	2.0	2.0	< 1.0	9.0	20	< 0.1	-	-	-	-	-	-	-	-	0.83	0.75	-	-	< 1.0
	15-Aug-19	12	1.0	2.0	< 1.0	8.0	20	< 0.1	-	-	-	-	-	-	-	-	0.74	0.73	-	-	< 1.0
	16-Sep-19	11	2.0	2.0	< 1.0	8.0	18	< 0.1	< 0.01	0.28	< 0.01	1.07	1.07	0.04	2.7	1.6	0.74	0.67	-	1.32	< 1.0
	15-Oct-19	12	2.0	2.0	< 1.0	5.0	20	< 0.1	-	-	-	-	-	-	-	-	0.79	0.67	-	-	< 1.0
	18-Nov-19	14	2.0	1.0	< 1.0	7.0	19	< 0.1	< 0.01	0.21	< 0.01	1.01	1.01	0.05	2.1	1.1	0.79	0.68	-	2.02	< 1.0
	17-Dec-19	13	2	2	<1	8	17	<0.1	-	-	-	-	-	-	-	-	0.83	0.69	-	-	2
	16-Jan-20	13	2	2	<1	6	17	<0.1	-	-	-	-	-	-	-	-	0.83	0.72	-	-	6
	27-Feb-20	11	2	2	<1	6	16	0.1	<0.01	0.09	<0.01	2.18	2.18	0.04	2.8	0.6	0.74	0.60	-	1.32	1
BH3	21-Feb-19	4.0	4.0	1.0	< 1.0	4.0	10	< 0.1	< 0.01	2.76	< 0.01	0.78	0.78	0.3	5.9	5.1	0.46	0.54	-	0.46	9.0
BH4	21-Feb-19	8.0	2.0	1.0	1.0	5.0	17	< 0.1	< 0.01	0.19	< 0.01	0.35	0.35	0.04	0.6	0.3	0.56	0.7	-	1.15	6.0
	15-Mar-19	9.0	2.0	< 1.0	< 1.0	5.0	18	< 0.1	-	-	-	-	-	-	-	-	0.49	0.61	-	-	< 1.0
	23-Apr-19	10	2.0	1.0	1.0	3.0	19	< 0.1	-	-	-	-	-	-	-	-	0.64	0.6	-	-	< 1.0
	16-May-19	9.0	2.0	1.0	1.0	22	19	< 0.1	< 0.01	0.97	< 0.01	0.29	0.29	< 0.01	1.0	0.7	0.6	0.99	-	1.3	< 1.0
	14-Jun-19	6.0	1.0	1.0	< 1.0	4.0	18	< 0.1	-	-	-	-	-	-	-	-	0.39	0.59	-	-	< 1.0
	16-Jul-19	10	2.0	2.0	1.0	6.0	18	< 0.1	-	-	-	-	-	-	-	-	0.72	0.63	-	-	< 1.0
	15-Aug-19	8.0	2.0	1.0	1.0	5.0	16	< 0.1	-	-	-	-	-	-	-	-	0.56	0.56	-	-	< 1.0
	16-Sep-19	11	2.0	2.0	< 1.0	8.0	19	< 0.1	< 0.01	0.4	< 0.01	0.24	0.24	0.02	0.6	0.4	0.74	0.7	-	1.32	< 1.0
	15-Oct-19	10	1.0	1.0	< 1.0	4.0	18	< 0.1	-	-	-	-	-	-	-	-	0.57	0.59	-	-	< 1.0
	18-Nov-19	11	1.0	1.0	< 1.0	6.0	18	< 0.1	< 0.01	0.08	< 0.01	0.29	0.29	< 0.01	0.3	< 0.1	0.61	0.63	-	1.86	< 1.0
	17-Dec-19	9	1	1	1	6	16	<0.1	-	-	-	-	-	-	-	-	0.55	0.64	-	-	3
	16-Jan-20	13	2	2	2	6	18	<0.1	-	-	-	-	-	-	-	-	0.88	0.71	-	-	4
	27-Feb-20	14	2	2	<1	9	26	<0.1	<0.01	0.18	<0.01	0.41	0.41	0.01	0.7	0.3	0.87	0.96	-	1.67	2
BH5	22-Feb-19	42	< 1.0	6.0	1.0	19	69	0.2	< 0.01	0.34	< 0.01	< 0.01	< 0.01	0.09	3.0	3.0	2.35	2.34	-	3.59	< 1.0
BH6	22-Feb-19	28	3.0	4.0	1.0	28	42	< 0.1	< 0.01	0.05	< 0.01	0.09	0.09	0.14	0.5	0.4	1.72	1.77	-	2.49	< 1.0
	14-Mar-19	23	2.0	4.0	1.0	17	37	< 0.1	-	-	-	-	-	-	-	-	1.46	1.44	-	-	2.0
	23-Apr-19	25	3.0	4.0	1.0	18	42	< 0.1	-	-	-	-	-	-	-	-	1.59	1.56	-	-	< 1.0
	16-May-19	23	3.0	4.0	1.0	18	45	< 0.1	< 0.01	0.13	< 0.01	< 0.01	< 0.01	0.14	0.6	0.6	1.5	1.64	-	2.04	< 1.0
	14-Jun-19	20	2.0	4.0	1.0	16	42	< 0.1	-	-	-	-	-	-	-	-	1.32	1.52	-	-	< 1.0
	16-Jul-19	23	2.0	4.0	1.0	20	35	< 0.1	-	-	-	-	-	-	-	-	1.46	1.4	-	-	< 1.0
	15-Aug-19	23	2.0	3.0	1.0	21	38	< 0.1	-	-	-	-	-	-	-	-	1.37	1.51	-	-	< 1.0
	16-Sep-19	25	3.0	3.0	1.0	21	38	< 0.1	< 0.01	0.15	< 0.01	0.07	0.07	0.19	0.8	0.7	1.51	1.55	-	2.44	2.0
	15-Oct-19	25	2.0	4.0	1.0	13	41	< 0.1	-	-	-	-	-	-	-	-	1.54	1.43	-	-	< 1.0
	18-Nov-19	27	3.0	3.0	1.0	18	45	< 0.1	< 0.01	0.06	< 0.01	< 0.01	< 0.01	0.23	0.4	0.4	1.6	1.64	-	2.64	< 1.0
	17-Dec-19	26	2	4	1	16	42	<0.1	-	-	-	-	-	-	-	-	1.58	1.62	-	-	5
	16-Jan-20	30	3	4	2	15	50	0.2	-	-	-	-	-	-	-	-	1.83	1.86	-	-	7
	27-Feb-20	27	2	4	1	16	46	<0.1	< 0.01	0.3	< 0.01	0.03	0.03	0.27	1	1	1.63	1.63	-	2.54	< 1.0
BH7	22-Feb-19	34	< 1.0	5.0	2.0	12	64	0.2	< 0.01	0.13	< 0.01	0.02	0.02	0.34	2.2	2.2	1.94	2.06	-	3.16	< 1.0
	14-Mar-19	36	< 1.0	6.0	2.0	16	61	< 0.1	-	-	-	-	-	-	-	-	2.11	2.05	1.37	-	< 1.0
	23-Apr-19	38	< 1.0	6.0	2.0	17	62	< 0.1	-	-	-	-	-	-	-	-	2.2	2.1	-	-	< 1.0
	16-May-19	35	< 1.0	5.0	2.0	15	68	0.2	< 0.01	0.06	< 0.01	< 0.01	< 0.01	0.27	0.9	0.9	1.98	2.23	-	3.26	< 1.0
	14-Jun-19	31	< 1.0	4.0	2.0	11	56	0.1	-	-	-	-	-	-	-	-	1.73	1.81	-	-	< 1.0
	16-Jul-19	36	< 1.0	5.0	2.0	12	46	< 0.1	-	-	-	-	-	-	-	-	2.03	1.55	-	-	< 1.0
	15-Aug-19	32	< 1.0	4.0	2.0	15	49	0.1	-	-	-	-	-	-	-	-	1.77	1.85	-	-	8.0
	16-Sep-19	27	< 1.0	4.0	1.0	13	53	< 0.1	< 0.01	0.09	< 0.01	0.06	0.06	0.2	1.2	1.1	1.53	1.86	-	2.79	5.0
	15-Oct-19	34	< 1.0	5.0	2.0	12	53	< 0.1	-	-	-	-	-	-	-	-	1.94	1.74	-	-	< 1.0
	18-Nov-19	31	< 1.0	5.0	1.0	15	56	0.1	< 0.01	0.02	< 0.01	< 0.01	< 0.01	0.17	0.5	0.5	1.78	1.89	-	2.89	< 1.0
	17-Dec-19	26	<1	5	1	15	44	<0.1	-	-	-	-	-	-	-	-	1.57	1.59	-	-	2.0
	16-Jan-20	27	<1	4	1	13	46	0.2	-	-	-	-	-	-	-	-	1.53	1.63	-	-	3.0
	27-Feb-20	23	<1	4	1	11	42	<0.1	< 0.01	0.06	< 0.01	< 0.01	< 0.01	0.22	0.8	0.8	1.36	1.41	-	2.38	<1

Table 4
Groundwater Analytical Data - Inorganics
Williamtown Sand Syndicate

Alkalinity					Inorganics		
Carbonate Alkalinity as CaCO3	Hydroxide Alkalinity as CaCO3	Total Alkalinity as CaCO3	Total Hardness as CaCO3	Electrical Conductivity @ 25°C*	Total Dissolved Solids	Total Dissolved Solids	pH
1	1	1	1	1	1	10	0.01
mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	pH units
				125-2200			6.5 - 8.0*
			200[3]		600[3]		6.5-8.5[3]
< 1.0	< 1.0	**9.0**	**9.0**	**104**	**68**	**129**	**5.67**
< 1.0	< 1.0	**10**	**11**	**84**	**55**	**97**	**5.83**
< 1.0	< 1.0	**10**	**8.0**	**105**	**68**	**164**	**5.82**
< 1.0	< 1.0	**10**	**8.0**	**99**	**64**	**72**	**5.52**
< 1.0	< 1.0	**11**	**8.0**	**102**	**66**	**84**	**5.62**
< 1.0	< 1.0	**14**	**8.0**	**128**	**83**	**82**	**6.22**
< 1.0	< 1.0	**8.0**	**8.0**	**102**	**66**	**88**	**5.44**
< 1.0	< 1.0	**4.0**	**8.0**	**98**	**64**	-	**5.5**
< 1.0	< 1.0	**24**	**8.0**	**126**	**82**	-	**6.29**
<1	<1	**15**	**8**	**118**	**77**	-	**6.05**
<1	<1	**22**	**12**	**112**	**73**	-	**6.23**
<1	<1	**9**	**8**	**103**	**67**	-	**6.2**
< 1.0	< 1.0	< 1.0	**41**	**346**	**278**	-	**4.67**
< 1.0	< 1.0	< 1.0	**8.0**	**186**	**121**	**144**	**4.82**
< 1.0	< 1.0	< 1.0	**20**	**150**	**98**	**135**	**4.99**
< 1.0	< 1.0	< 1.0	**16**	**188**	**122**	**216**	**4.91**
< 1.0	< 1.0	< 1.0	**12**	**175**	**114**	**107**	**4.84**
< 1.0	< 1.0	< 1.0	**33**	**318**	**207**	**192**	**4.68**
< 1.0	< 1.0	< 1.0	**12**	**197**	**128**	**135**	**4.88**
< 1.0	< 1.0	< 1.0	**12**	**195**	**127**	**140**	**4.66**
< 1.0	< 1.0	< 1.0	**12**	**194**	**126**	-	**4.92**
< 1.0	< 1.0	< 1.0	**12**	**193**	**125**	-	**5.12**
<1	<1	**2**	**16**	**196**	**127**	-	**5.03**
<1	<1	**2**	**12**	**168**	**109**	-	**5.09**
<1	<1	<1	**12**	**165**	**107**	-	**4.35**
< 1.0	< 1.0	< 1.0	**13**	**91**	**128**	-	**4.87**
< 1.0	< 1.0	< 1.0	**16**	**101**	**66**	**90**	**4.71**
< 1.0	< 1.0	< 1.0	**13**	**70**	**46**	**84**	**4.82**
< 1.0	< 1.0	< 1.0	**13**	**94**	**61**	**144**	**4.85**
< 1.0	< 1.0	< 1.0	**11**	**91**	**59**	**51**	**4.76**
< 1.0	< 1.0	< 1.0	**13**	**90**	**58**	**63**	**4.84**
< 1.0	< 1.0	< 1.0	**11**	**110**	**72**	**61**	**5.2**
< 1.0	< 1.0	< 1.0	**13**	**96**	**62**	**60**	**4.72**
< 1.0	< 1.0	< 1.0	**13**	**102**	**66**	-	**5.06**
< 1.0	< 1.0	< 1.0	**9.0**	**102**	**66**	-	**5.47**
<1	<1	**2**	**13**	**106**	**69**	-	**5.43**
<1	<1	**6**	**13**	**102**	**66**	-	**5.61**
<1	<1	**1**	**13**	**98**	**64**	-	**5.23**
< 1.0	< 1.0	**9.0**	**14**	**60**	**438**	-	**5.55**
< 1.0	< 1.0	**6.0**	**9.0**	**73**	**96**	-	**5.4**
< 1.0	< 1.0	< 1.0	**5.0**	**77**	**50**	**70**	**5.12**
< 1.0	< 1.0	< 1.0	**9.0**	**54**	**35**	**61**	**5.05**
< 1.0	< 1.0	< 1.0	**9.0**	**73**	**47**	**100**	**4.99**
< 1.0	< 1.0	< 1.0	**7.0**	**69**	**45**	**36**	**4.84**
< 1.0	< 1.0	< 1.0	**13**	**75**	**49**	**42**	**4.96**
< 1.0	< 1.0	< 1.0	**9.0**	**85**	**55**	**49**	**5.01**
< 1.0	< 1.0	< 1.0	**13**	**95**	**62**	**58**	**4.83**
< 1.0	< 1.0	< 1.0	**7.0**	**85**	**55**	-	**4.93**
< 1.0	< 1.0	< 1.0	**7.0**	**86**	**56**	-	**5.34**
<1	<1	**3**	**7**	**85**	**55**	-	**5.44**
<1	<1	**4**	**13**	**85**	**55**	-	**5.5**
<1	<1	**2**	**13**	**123**	**80**	-	**5.57**
< 1.0	< 1.0	< 1.0	**25**	**250**	**211**	-	**4.87**
< 1.0	< 1.0	< 1.0	**24**	**177**	**144**	-	**4.37**
< 1.0	< 1.0	**2.0**	**21**	**179**	**116**	**146**	**4.95**
< 1.0	< 1.0	< 1.0	**24**	**136**	**88**	**115**	**4.64**
< 1.0	< 1.0	< 1.0	**24**	**175**	**114**	**214**	**4.88**
< 1.0	< 1.0	< 1.0	**21**	**174**	**113**	**90**	**4.82**
< 1.0	< 1.0	< 1.0	**21**	**161**	**105**	**82**	**4.73**
< 1.0	< 1.0	< 1.0	**17**	**201**	**131**	**104**	**4.87**
< 1.0	< 1.0	**2.0**	**20**	**197**	**128**	**124**	**4.68**
< 1.0	< 1.0	< 1.0	**21**	**202**	**131**	-	**5.17**
< 1.0	< 1.0	< 1.0	**20**	**204**	**133**	-	**5.32**
<1	<1	5	**21**	**207**	**134**	-	**5.58**
<1	<1	7	**24**	**218**	**142**	-	**5.51**
< 1.0	< 1.0	< 1.0	**21**	**220**	**143**	-	**4.72**
< 1.0	< 1.0	< 1.0	**20**	**213**	**196**	-	**4.76**
< 1.0	< 1.0	< 1.0	**25**	**271**	**176**	**212**	**4.73**
< 1.0	< 1.0	< 1.0	**25**	**205**	**133**	**185**	**4.51**
< 1.0	< 1.0	< 1.0	**20**	**235**	**153**	**310**	**4.87**
< 1.0	< 1.0	< 1.0	**16**	**213**	**138**	**145**	**4.91**
< 1.0	< 1.0	< 1.0	**20**	**202**	**131**	**164**	**5.0**
< 1.0	< 1.0	**8.0**	**16**	**232**	**151**	**168**	**5.53**
< 1.0	< 1.0	**5.0**	**16**	**222**	**144**	**181**	**5.07**
< 1.0	< 1.0	< 1.0	**20**	**252**	**164**	-	**4.95**
< 1.0	< 1.0	< 1.0	**20**	**239**	**155**	-	**4.97**
<1	<1	**2.0**	**20**	**210**	**136**	-	**5.14**
<1	<1	**3.0**	**16**	**202**	**131**	-	**5.27**
<1	<1	<1	**16**	**194**	**126**	-	**4.77**

Table 4
Groundwater Analytical Data - Inorganics
Williamtown Sand Syndicate

Analyte		Anions and Cations																			
		Sodium	Calcium	Magnesium	Potassium	Sulphate	Chloride	Fluoride	Reactive phosphorus as P	Total Phosphorus	Nitrite as N	Nitrate as N	Nitrite + Nitrate as N	Ammonia as N	Total Nitrogen as N	Total Kjeldahl Nitrogen as N	Total Cations	Total Anions	Ionic Balance	Sodium Adsorption Ratio	Bicarbonate Alkalinity as CaCO3
LOR		1	1	1	1	1	1	0.1	0.01	0.01	0.01	0.01	0.01	0.01	0.1	0.1	0.01	0.01		0.01	1
Units		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	%	-	mg/L
ANZECC 2000 Trigger Values									0.02*	0.025*		0.7**		0.9**	0.35*						
NHMRC ADWG 6		180[3]				250[3]	250[3]	1.5			3	50		0.5[3]							
BH8	21-Feb-19	52	< 1.0	6.0	< 1.0	11	90	< 0.1	< 0.01	1.97	< 0.01	< 0.01	< 0.01	0.5	2.4	2.4	2.76	2.77	-	4.44	< 1.0
	14-Mar-19	45	< 1.0	6.0	< 1.0	6.0	76	< 0.1	-	-	-	-	-	-	-	-	2.45	2.27	-	-	< 1.0
	23-Apr-19	53	< 1.0	7.0	< 1.0	8.0	89	< 0.1	-	-	-	-	-	-	-	-	2.88	2.68	-	-	< 1.0
	16-May-19	47	< 1.0	4.0	< 1.0	6.0	81	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.12	0.4	0.4	2.37	2.43	-	4.86	1.0
	14-Jun-19	47	< 1.0	5.0	< 1.0	4.0	89	< 0.1	-	-	-	-	-	-	-	-	2.46	2.59	-	-	< 1.0
	16-Jul-19	57	< 1.0	5.0	< 1.0	70	121	0.1	-	-	-	-	-	-	-	-	2.89	4.87	26	-	< 1.0
	15-Aug-19	42	< 1.0	3.0	< 1.0	4.0	63	< 0.1	-	-	-	-	-	-	-	-	2.07	1.86	-	-	< 1.0
	16-Sep-19	46	< 1.0	3.0	< 1.0	4.0	70	< 0.1	< 0.01	0.43	< 0.01	< 0.01	< 0.01	0.13	1.1	1.1	2.25	2.06	-	5.43	< 1.0
	15-Oct-19	45	< 1.0	4.0	< 1.0	4.0	70	< 0.1	-	-	-	-	-	-	-	-	2.29	2.06	-	-	< 1.0
	18-Nov-19	49	< 1.0	4.0	< 1.0	8.0	80	< 0.1	< 0.01	0.58	< 0.01	0.01	0.01	0.17	1.3	1.3	2.46	2.42	-	5.06	< 1.0
	17-Dec-19	50	<1	4	<1	10	75	<0.1	-	-	-	-	-	-	-	-	2.5	2.36	-	-	2
	16-Jan-20	49	<1	4	<1	13	78	<0.1	-	-	-	-	-	-	-	-	2.46	6.61	-	-	7
	27-Feb-20	34	<1	3	<1	14	54	<0.1	< 0.01	0.14	< 0.01	< 0.01	< 0.01	0.05	0.6	0.6	1.72	1.81	-	4.01	< 1.0
MW239S	22-Feb-19	61	< 1.0	6.0	< 1.0	6.0	104	< 0.1	< 0.01	0.56	< 0.01	< 0.01	< 0.01	0.18	3.9	3.9	3.15	3.06	1.43	5.21	< 1.0
	14-Mar-19	64	< 1.0	6.0	< 1.0	2.0	126	< 0.1	-	-	-	-	-	-	-	-	3.28	3.64	5.18	-	2.0
	23-Apr-19	64	< 1.0	7.0	1.0	9.0	97	< 0.1	-	-	-	-	-	-	-	-	3.38	2.92	7.32	-	< 1.0
	16-May-19	52	< 1.0	6.0	< 1.0	13	88	< 0.1	< 0.01	0.43	< 0.01	< 0.01	< 0.01	0.09	1.7	1.7	2.76	2.75	-	4.44	< 1.0
	14-Jun-19	50	< 1.0	6.0	< 1.0	13	87	< 0.1	-	-	-	-	-	-	-	-	2.67	2.86	-	-	7.0
	16-Jul-19	52	< 1.0	7.0	1.0	16	73	< 0.1	-	-	-	-	-	-	-	-	2.86	2.39	-	-	< 1.0
	15-Aug-19	54	< 1.0	7.0	< 1.0	11	88	< 0.1	-	-	-	-	-	-	-	-	2.92	2.71	-	-	< 1.0
	16-Sep-19	55	< 1.0	6.0	1.0	14	85	< 0.1	< 0.01	0.32	< 0.01	< 0.01	< 0.01	0.1	1.4	1.4	2.91	2.69	-	4.7	< 1.0
	15-Oct-19	58	< 1.0	6.0	< 1.0	8.0	108	< 0.1	-	-	-	-	-	-	-	-	3.02	3.21	3.15	-	< 1.0
	18-Nov-19	63	< 1.0	6.0	1.0	8.0	118	< 0.1	< 0.01	0.23	< 0.01	< 0.01	< 0.01	0.17	1.2	1.2	3.26	3.5	3.48	5.38	< 1.0
	17-Dec-19	65	<1	8	<1	6	127	<0.1	-	-	-	-	-	-	-	-	3.48	3.75	3.62	-	2
	16-Jan-20	67	<1	8	<1	7	120	<0.1	-	-	-	-	-	-	-	-	3.57	3.57	0.03	-	2
	27-Feb-20	64	<1	7	<1	11	126	<0.1	< 0.01	1.05	< 0.01	0.02	0.02	0.14	4.5	4.5	3.36	3.78	5.93	5.08	< 1.0
SW1	23-Apr-19	94	34	52	6.0	310	95	0.5	-	-	-	-	-	-	-	-	10	9.13	5.6	-	< 1.0
	16-May-19	86	24	42	6.0	324	112	0.3	< 0.01	0.13	< 0.01	< 0.01	< 0.01	< 0.01	1.8	1.8	8.94	9.9	5.13	2.45	< 1.0
	14-Jun-19	77	20	34	5.0	182	112	0.4	-	-	-	-	-	-	-	-	7.27	6.95	2.28	-	< 1.0
	16-Jul-19	90	20	35	4.0	240	130	0.4	-	-	-	-	-	-	-	-	7.9	8.66	4.64	-	< 1.0
	15-Aug-19	97	18	32	4.0	212	134	0.4	-	-	-	-	-	-	-	-	7.85	8.19	2.12	-	< 1.0
	16-Sep-19	117	21	39	4.0	244	193	0.7	< 0.01	0.05	< 0.01	0.02	0.02	< 0.01	1.2	1.2	9.45	11	5.38	3.49	< 1.0
	15-Oct-19	124	16	31	3.0	127	191	0.6	-	-	-	-	-	-	-	-	8.82	8.03	4.68	-	< 1.0
	18-Nov-19	142	14	30	4.0	165	234	0.5	< 0.01	0.02	< 0.01	< 0.01	< 0.01	0.03	1.1	1.1	9.45	10	3.03	4.91	< 1.0
	27-Feb-20	56	34	10	8.0	73	64	0.4	< 0.01	0.17	<0.05	<0.05	<0.05	0.16	2.4	2.4	5.16	4.58	5.91	2.17	63
SW3	22-Feb-19	40	4.0	4.0	1.0	16	82	< 0.1	< 0.01	0.06	< 0.01	< 0.01	< 0.01	0.16	1.0	1.0	2.55	2.87	-	3.38	11
	14-Mar-19	45	6.0	6.0	2.0	44	64	< 0.1	-	-	-	-	-	-	-	-	2.8	2.8	-	-	4.0
	23-Apr-19	37	8.0	6.0	1.0	42	53	< 0.1	-	-	-	-	-	-	-	-	2.53	2.37	-	-	< 1.0
	16-May-19	35	7.0	5.0	< 1.0	34	54	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.1	0.1	2.28	2.25	-	2.47	1.0
	14-Jun-19	32	7.0	6.0	< 1.0	41	55	< 0.1	-	-	-	-	-	-	-	-	2.24	2.4	-	-	< 1.0
	16-Jul-19	46	8.0	12	< 1.0	104	57	0.2	-	-	-	-	-	-	-	-	3.39	3.77	5.38	-	< 1.0
	15-Aug-19	38	6.0	7.0	< 1.0	54	56	0.1	-	-	-	-	-	-	-	-	2.53	2.7	-	-	< 1.0
	16-Sep-19	42	7.0	8.0	< 1.0	48	57	0.1	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.01	0.1	0.1	2.83	2.61	-	2.57	< 1.0
	15-Oct-19	40	5.0	7.0	< 1.0	42	57	0.2	-	-	-	-	-	-	-	-	2.56	2.48	-	-	< 1.0
	18-Nov-19	36	5.0	5.0	< 1.0	29	56	< 0.1	< 0.01	0.04	< 0.01	0.01	0.01	0.03	0.6	0.6	2.23	2.18	-	2.72	< 1.0
	17-Dec-19	40	4	7	1	25	57	<0.1	-	-	-	-	-	-	-	-	2.54	2.25	-	-	6
	27-Feb-20	38	8	8	< 1.0	73	56	<0.1	< 0.01	0.01	< 0.01	0.1	0.1	0.02	0.3	0.2	2.71	3.1	-	2.27	< 1.0
SW4	23-Apr-19	39	5.0	5.0	< 1.0	60	64	0.1	-	-	-	-	-	-	-	-	2.36	3.05	13	-	< 1.0
	16-May-19	41	5.0	5.0	< 1.0	41	59	< 0.1	0.01	< 0.01	< 0.01	0.05	0.05	< 0.01	0.2	0.2	2.44	2.52	-	3.1	< 1.0
	14-Jun-19	40	5.0	5.0	< 1.0	39	60	< 0.1	-	-	-	-	-	-	-	-	2.4	2.5	-	-	< 1.0
	16-Jul-19	46	7.0	7.0	< 1.0	67	56	0.2	-	-	-	-	-	-	-	-	2.93	2.97	-	-	< 1.0
	15-Aug-19	40	5.0	5.0	< 1.0	43	55	0.1	-	-	-	-	-	-	-	-	2.4	2.45	-	-	< 1.0
	16-Sep-19	45	7.0	6.0	< 1.0	45	58	0.1	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.1	0.1	2.8	2.57	-	3.01	< 1.0
	15-Oct-19	44	6.0	6.0	< 1.0	38	57	0.1	-	-	-	-	-	-	-	-	2.71	2.4	-	-	< 1.0
	18-Nov-19	41	4.0	5.0	< 1.0	41	64	0.2	< 0.01	< 0.01	< 0.01	0.02	0.02	< 0.01	0.2	0.2	2.76	2.66	-	3.22	< 1.0
	27-Feb-20	44	9.0	6.0	1.0	68	59	<0.1	< 0.01	< 0.01	< 0.01	0.01	0.01	< 0.01	0.2	0.2	2.88	3.08	-	2.79	< 1.0

Notes:
- - Not analysed
< - Less than laboratory limit of reporting
LOR - Laboratory limit of reporting
mg/L - Milligrams per litre
µS/cm - Microsiemens per centimeter
Bold indicates a detection above the laboratory limit of reporting

* Default trigger values for physical and chemical stressors, for slightly disturbed ecosystems in lowland rivers, Southeast Australia (value is for base flow and not storm event)
** 95% Level of protection in freshwater
[3] Aesthetic

Table 4
Groundwater Analytical Data - Inorganics
Williamtown Sand Syndicate

Alkalinity					Inorganics		
Carbonate Alkalinity as CaCO3	Hydroxide Alkalinity as CaCO3	Total Alkalinity as CaCO3	Total Hardness as CaCO3	Electrical Conductivity @ 25°C*	Total Dissolved Solids	Total Dissolved Solids	pH
1	1	1	1	1	1	10	0.01
mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	pH units
				125-2200			6.5 - 8.0*
			200[3]		600[3]		6.5-8.5[3]
< 1.0	< 1.0	< 1.0	25	352	258	-	4.46
< 1.0	< 1.0	< 1.0	25	319	207	253	4.77
< 1.0	< 1.0	< 1.0	29	264	172	223	4.76
< 1.0	< 1.0	1.0	16	302	196	354	4.9
< 1.0	< 1.0	< 1.0	20	315	205	194	4.82
< 1.0	< 1.0	< 1.0	20	353	229	226	4.78
< 1.0	< 1.0	< 1.0	12	260	169	140	5.0
< 1.0	< 1.0	< 1.0	12	293	190	206	4.85
< 1.0	< 1.0	< 1.0	16	303	197	-	5.02
< 1.0	< 1.0	< 1.0	16	316	205	-	5.12
<1	<1	2	16	328	213	-	5.02
<1	<1	7	16	318	207	-	5.55
< 1.0	< 1.0	< 1.0	12	250	162	-	4.57
< 1.0	< 1.0	< 1.0	25	329	234	-	4.89
< 1.0	< 1.0	2.0	25	410	266	232	5.02
< 1.0	< 1.0	< 1.0	29	294	191	208	4.92
< 1.0	< 1.0	< 1.0	25	327	212	320	4.87
< 1.0	< 1.0	7.0	25	334	217	220	5.39
< 1.0	< 1.0	< 1.0	29	353	229	188	4.85
< 1.0	< 1.0	< 1.0	29	359	233	195	4.83
< 1.0	< 1.0	< 1.0	25	373	242	224	4.66
< 1.0	< 1.0	< 1.0	25	404	263	-	4.86
< 1.0	< 1.0	< 1.0	25	419	272	-	4.76
<1	<1	2	33	439	285	-	5.01
<1	<1	2	33	423	275	-	5.02
< 1.0	< 1.0	< 1.0	29	475	309	-	4.45
< 1.0	< 1.0	< 1.0	299	893	580	707	4.01
< 1.0	< 1.0	< 1.0	233	947	616	715	4.6
< 1.0	< 1.0	< 1.0	190	847	550	512	4.5
< 1.0	< 1.0	< 1.0	194	876	569	568	4.42
< 1.0	< 1.0	< 1.0	177	813	528	548	4.53
< 1.0	< 1.0	< 1.0	213	1,080	702	689	4.32
< 1.0	< 1.0	< 1.0	168	1,050	682	-	5.32
< 1.0	< 1.0	< 1.0	158	1,090	708	-	5.06
< 1.0	< 1.0	63	126	550	358	-	6.83
< 1.0	< 1.0	11	26	262	228	-	6.21
< 1.0	< 1.0	4.0	40	344	224	279	5.42
< 1.0	< 1.0	< 1.0	45	220	143	190	5.2
< 1.0	< 1.0	1.0	38	271	176	300	5.24
< 1.0	< 1.0	< 1.0	42	300	195	170	4.58
< 1.0	< 1.0	< 1.0	69	451	293	246	4.47
< 1.0	< 1.0	< 1.0	44	338	220	192	4.47
< 1.0	< 1.0	< 1.0	50	374	243	201	4.3
< 1.0	< 1.0	< 1.0	41	383	249	-	4.75
< 1.0	< 1.0	< 1.0	33	278	181	-	5.39
<1	<1	6	39	301	196		5.75
< 1.0	< 1.0	< 1.0	53	437	284	-	4.6
< 1.0	< 1.0	< 1.0	33	293	190	198	4.0
< 1.0	< 1.0	< 1.0	33	331	215	288	4.08
< 1.0	< 1.0	< 1.0	33	316	205	163	4.31
< 1.0	< 1.0	< 1.0	46	367	238	207	4.46
< 1.0	< 1.0	< 1.0	33	308	200	160	4.48
< 1.0	< 1.0	< 1.0	42	360	234	208	4.35
< 1.0	< 1.0	< 1.0	40	365	237	-	4.48
< 1.0	< 1.0	< 1.0	30	348	226	-	4.48
< 1.0	< 1.0	< 1.0	47	479	311	-	3.82

Table 5
Quality Control Sample Analysis - BTEXN
Williamtown Sand Syndicate

Analyte			BTEXN								Total Petroleum Hydrocarbons					Total Petroleum Hydrocar	
			Benzene	Toluene	Ethylbenzene	meta- & para-Xylene	ortho-Xylene	Total Xylenes	Naphthalene	Sum of BTEX	C_6 - C_9	C_{10} - C_{14}	C_{15} - C_{28}	C_{29} - C_{36}	C_{10} - C_{36} sum	C_{10}-C_{14} - Silica Cleanup	C_{15}-C_{28} - Silica Cleanup
Units			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Sample Name	Sample Date	Sample Type															
TRIP BLANK_13022019	13-Feb-19	Trip Blank	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
RINSATE01_21022019	21-Feb-19	Rinsate	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
BH8_21022019	21-Feb-19	Primary	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
DUP01_21022019	21-Feb-19	Duplicate	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
Relative Percentage Difference			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
BH8_21022019	21-Feb-19	Primary	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
TRIP01_21022019	21-Feb-19	Triplicate	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 3.0	< 10	-	< 20	< 50	< 100	< 100	< 100	< 50	< 100
Relative Percentage Difference			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
TRIP BLANK_130319	13-Mar-19	Trip Blank	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	-	-
RINSATE02_140319	14-Mar-19	Rinsate	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
BH7_140319	14-Mar-19	Primary	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
DUP02_140319	14-Mar-19	Duplicate	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
Relative Percentage Difference			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
TRIP BLANK_03	23-Apr-19	Trip Blank	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	-	-
RINSATE_03	23-Apr-19	Rinsate	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
TRIP BLANK_04	16-May-19	Trip Blank	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	-	-
RINSATE_04	16-May-19	Rinsate	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
TRIP BLANK 05_14062019	14-Jun-19	Trip Blank	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
RINSATE 05_14062019	14-Jun-19	Rinsate	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
SW3_14062019	14-Jun-19	Primary	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
DUP05_14062019	14-Jun-19	Duplicate	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
Relative Percentage Difference			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
SW3_14062019	14-Jun-19	Primary	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
TRIP05_140619	14-Jun-19	Triplicate	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 3.0	< 10	-	< 20	-	-	-	-	< 50	< 100
Relative Percentage Difference			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
TRIP BLANK 06_16072019	16-Jul-19	Trip Blank	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
RINSATE06_16072019	16-Jul-19	Rinsate	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
RINSATE07	15-Aug-19	Rinsate	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-
TRIP BLANK 08_16092019	16-Sep-19	Trip Blank	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
RINSATE 08_16092019	16-Sep-19	Rinsate	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
SW4_16092019	16-Sep-19	Primary	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
DUP08_16092019	16-Sep-19	Duplicate	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
Relative Percentage Difference			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
SW4_16092019	16-Sep-19	Primary	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
TRIP08_16092019	16-Sep-19	Triplicate	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 3.0	< 10	-	< 20	200	400	200	800	< 50	< 100
Relative Percentage Difference			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
TRIP BLANK_15102019	15-Oct-19	Trip Blank	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
RINSATE_15102019	15-Oct-19	Rinsate	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
TRIPBLANK09_181119	18-Nov-19	Trip Blank	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
RINSATE09_181119	18-Nov-19	Rinsate	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
SW4_181119	18-Nov-19	Primary	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
DUP09_181119	18-Nov-19	Duplicate	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
Relative Percentage Difference			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
SW4_181119	18-Nov-19	Primary	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
TRIP09_18112019	18-Nov-19	Triplicate	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 3.0	< 10	-	< 20	< 50	< 100	< 100	< 100	< 50	< 100
Relative Percentage Difference			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
TRIPBLANK10_171219	17-Dec-19	Trip Blank	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
RINSATE10_171219	17-Dec-19	Rinsate	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
RIP BLANK 13_20013330(	16-Jan-20	Trip Blank	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
RINSATE 13_2001333009	16-Jan-20	Rinsate	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
BH6_2001333004	16-Jan-20	Primary	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
QW12_2001333012	16-Jan-20	Duplicate	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
Relative Percentage Difference			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
BH6_2001333004	16-Jan-20	Primary	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100
QW13_14392	16-Jan-20	Triplicate	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 3.0	< 10	-	< 20	250	300	100	650	< 50	< 100
Relative Percentage Difference			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Notes:
- - Not analysed
< - Less than laboratory limit of reporting
NC - Not calculated
µg/L - Micrograms per litre
BTEXN - Benzene, toluene, ethylbenzene, xylenes, naphthalene

Table 5
Quality Control Sample Analysis - BTEXN
Williamtown Sand Syndicate

bons - Silcia Clean up		Total Recoverable Hydrocarbons						Total Recoverable Hydrocarbons - Silcia Clean up				
C_{29}-C_{36} - Silica Cleanup	C_{10}-C_{36} Sum - Silica Cleanup	C_6 - C_{10}	C_6 - C_{10} minus BTEX (F1)	>C_{10} - C_{16}	>C_{10} - C_{16} minus Naphthalene (F2)	>C_{16} - C_{34}	>C_{34} - C_{40}	>C_{10}-C_{16} - Silica Cleanup	F2 - Silica Cleanup	>C_{16}-C_{34} - Silica Cleanup	>C_{34}-C_{40} - Silica Cleanup	>C_{10}-C_{40} - Silica Cleanup
µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
< 100	< 400	< 20	< 20	< 50	< 50	< 100	< 100	< 50	-	< 100	< 100	< 100
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
-	-	< 20	< 20					-	-	-	-	-
< 50	< 50	< 20	< 20					< 100	< 100	< 100	< 100	< 100
< 50	< 50	< 20	< 20					< 100	< 100	< 100	< 100	< 100
< 50	< 50	< 20	< 20					< 100	< 100	< 100	< 100	< 100
NC	NC	NC	NC					NC	NC	NC	NC	NC
-	-	< 20	< 20					-	-	-	-	-
< 50	< 50	< 20	< 20					< 100	< 100	< 100	< 100	< 100
-	-	< 20	< 20					-	-	-	-	-
< 50	< 50	< 20	< 20					< 100	< 100	< 100	< 100	< 100
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
< 100	< 100	< 20	< 20	-	-	-	-	< 50	< 50	< 100	< 100	< 100
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
-	-	< 20	< 20	< 100	< 100	< 100	< 100	-	-	-	-	-
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
< 100	< 400	< 20	< 20	180	180	400	100	< 50	-	< 100	< 100	-
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
< 100	< 100	< 20	< 20	< 50	< 50	< 100	< 100	< 50	-	< 100	< 100	-
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
< 50	< 50	< 20	< 20	-	-	-	-	< 100	< 100	< 100	< 100	< 100
< 100	< 400	< 20	< 20	210	210	400	<100	< 50	-	< 100	< 100	-
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Table 6
Quality Control Sample Analysis - Metals
Williamtown Sand Syndicate

Analyte			Metals															
			Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Vanadium	Zinc
Units			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Sample Name	Sample Date	Sample Type																
TRIP BLANK_13022019	13-Feb-19	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
RINSATE01_21022019	21-Feb-19	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
BH8_21022019	21-Feb-19	Primary	< 0.001	0.011	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	< 0.001	4.1	< 0.001	0.012	< 0.0001	0.002	< 0.01	< 0.01	0.005
DUP01_21022019	21-Feb-19	Duplicate	0.001	0.014	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	< 0.001	4.09	< 0.001	0.012	< 0.0001	0.003	< 0.01	< 0.01	0.015
Relative Percentage Difference			**67%**	24%	NC	NC	NC	0%	NC	NC	0%	NC	0%	NC	40%	NC	NC	**100%**
BH8_21022019	21-Feb-19	Primary	< 0.001	0.011	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	< 0.001	4.1	< 0.001	0.012	< 0.0001	0.002	< 0.01	< 0.01	0.005
TRIP01_21022019	21-Feb-19	Triplicate	0.001	< 0.02	< 0.001	< 0.05	< 0.0002	< 0.005	< 0.001	< 0.001	4.5	< 0.001	0.012	< 0.0001	0.003	-	< 0.005	0.006
Relative Percentage Difference			**67%**	10%	NC	NC	NC	**86%**	NC	NC	9%	NC	0%	NC	40%	NC	NC	18%
TRIP BLANK_130319	13-Mar-19	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	-	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
TRIP BLANK02_150319	15-Mar-19	Trip Blank	< 0.001	**0.002**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
RINSATE02_140319	14-Mar-19	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
BH7_140319	14-Mar-19	Primary	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	0.001	0.003	< 0.001	1.8	< 0.001	0.02	< 0.0001	0.004	< 0.01	< 0.01	0.009
DUP02_140319	14-Mar-19	Duplicate	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	0.001	0.002	< 0.001	2.51	< 0.001	0.021	< 0.0001	0.004	< 0.01	< 0.01	0.007
Relative Percentage Difference			NC	0%	NC	NC	NC	0%	**40%**	NC	33%	NC	5%	NC	0%	NC	NC	25%
BH7_140319	14-Mar-19	Primary	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	0.001	0.003	< 0.001	1.8	< 0.001	0.02	< 0.0001	0.004	< 0.01	< 0.01	0.009
TRIP02_14032019	14-Mar-19	Triplicate	< 0.001	< 0.02	< 0.001	< 0.05	< 0.0002	0.001	0.002	< 0.001	1.7	< 0.001	0.019	< 0.0001	< 0.001	-	< 0.005	< 0.005
Relative Percentage Difference			NC	0%	NC	NC	NC	0%	**40%**	NC	6%	NC	5%	NC	**156%**	NC	NC	**113%**
TRIP BLANK_03	23-Apr-19	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
RINSATE_03	23-Apr-19	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
TRIP BLANK_04	16-May-19	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
RINSATE_04	16-May-19	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
TRIP BLANK 05_14062019	14-Jun-19	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
RINSATE 05_14062019	14-Jun-19	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
SW3_14062019	14-Jun-19	Primary	< 0.001	0.035	< 0.001	< 0.05	< 0.0001	< 0.001	0.003	< 0.001	1.68	< 0.001	0.038	< 0.0001	0.003	< 0.01	< 0.01	0.016
DUP05_14062019	14-Jun-19	Duplicate	< 0.001	0.036	< 0.001	< 0.05	< 0.0001	< 0.001	0.003	< 0.001	1.63	< 0.001	0.039	< 0.0001	0.003	< 0.01	< 0.01	0.013
Relative Percentage Difference			NC	3%	NC	NC	NC	NC	0%	NC	3%	NC	3%	NC	0%	NC	NC	21%
SW3_14062019	14-Jun-19	Primary	< 0.001	0.035	< 0.001	< 0.05	< 0.0001	< 0.001	0.003	< 0.001	1.68	< 0.001	0.038	< 0.0001	0.003	< 0.01	< 0.01	0.016
TRIP05_140619	14-Jun-19	Triplicate	< 0.001	-	-	-	< 0.0002	0.001	-	< 0.001	1.6	< 0.001	-	< 0.0001	0.003	-	-	0.01
Relative Percentage Difference			NC	NC	NC	NC	NC	**67%**	NC	NC	5%	NC	NC	NC	0%	NC	NC	46%
TRIP BLANK 06_16072019	16-Jul-19	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
RINSATE06_16072019	16-Jul-19	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
RINSATE07	15-Aug-19	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
TRIP BLANK 08_16092019	16-Sep-19	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
RINSATE 08_16092019	16-Sep-19	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
SW4_16092019	16-Sep-19	Primary	< 0.001	0.046	< 0.001	< 0.05	< 0.0001	< 0.001	0.002	0.02	0.7	0.001	0.039	< 0.0001	0.017	< 0.01	< 0.01	0.085
DUP08_16092019	16-Sep-19	Duplicate	< 0.001	0.041	< 0.001	< 0.05	< 0.0001	< 0.001	0.002	< 0.001	0.76	< 0.001	0.036	< 0.0001	0.003	< 0.01	< 0.01	0.012
Relative Percentage Difference			NC	11%	NC	NC	NC	NC	0%	**190%**	8%	**67%**	8%	NC	**140%**	NC	NC	**151%**
SW4_16092019	16-Sep-19	Primary	< 0.001	0.046	< 0.001	< 0.05	< 0.0001	< 0.001	0.002	0.02	0.7	0.001	0.039	< 0.0001	0.017	< 0.01	< 0.01	0.085
TRIP08_16092019	16-Sep-19	Triplicate	< 0.001	0.04	< 0.001	< 0.05	< 0.0002	< 0.001	0.002	< 0.001	0.69	< 0.001	0.037	< 0.0001	0.003	-	< 0.005	0.012
Relative Percentage Difference			NC	14%	NC	NC	NC	NC	0%	**190%**	1%	**67%**	5%	NC	**140%**	NC	NC	**151%**
TRIP BLANK_15102019	15-Oct-19	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	-	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
RINSATE_15102019	15-Oct-19	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	-	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
TRIPBLANK09_181119	18-Nov-19	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
RINSATE09_181119	18-Nov-19	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
SW4_181119	18-Nov-19	Primary	< 0.001	0.035	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	6.32	< 0.001	0.032	< 0.0001	0.002	< 0.01	< 0.01	< 0.005
DUP09_181119	18-Nov-19	Duplicate	< 0.001	0.034	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	5.9	< 0.001	0.036	< 0.0001	0.002	< 0.01	< 0.01	< 0.005
Relative Percentage Difference			NC	3%	NC	NC	NC	NC	NC	NC	7%	NC	12%	NC	0%	NC	NC	NC
SW4_181119	18-Nov-19	Primary	< 0.001	0.035	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.001	6.32	< 0.001	0.032	< 0.0001	0.002	< 0.01	< 0.01	< 0.005
TRIP09_18112019	18-Nov-19	Triplicate	< 0.001	0.04	< 0.001	< 0.05	< 0.0002	< 0.001	< 0.001	0.01	-	< 0.001	0.035	< 0.0001	0.007	-	< 0.005	0.033
Relative Percentage Difference			NC	13%	NC	NC	NC	NC	NC	2%	NC	NC	9%	NC	**111%**	NC	NC	**172%**
TRIPBLANK10_171219	17-Dec-19	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
RINSATE10_171219	17-Dec-19	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
RIP BLANK 13_2001333008	16-Jan-20	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
RINSATE 13_2001333009	16-Jan-20	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
BH6_2001333004	16-Jan-20	Primary	<0.001	0.032	<0.001	<0.05	<0.0001	<0.001	<0.001	<0.001	2.15	<0.001	0.01	<0.0001	<0.001	<0.01	<0.01	<0.005
QW12_2001333012	16-Jan-20	Duplicate	<0.001	0.035	<0.001	<0.05	<0.0001	<0.001	<0.001	<0.001	2.18	<0.001	0.009	<0.0001	0.001	<0.01	<0.01	<0.005
Relative Percentage Difference			NC	9%	NC	NC	NC	NC	NC	NC	1%	NC	11%	NC	**67%**	NC	NC	NC
BH6_2001333004	16-Jan-20	Primary	<0.001	0.032	<0.001	<0.05	<0.0001	<0.001	<0.001	<0.001	2.15	<0.001	0.01	<0.0001	<0.001	<0.01	<0.01	<0.005
QW13_14392	16-Jan-20	Triplicate	< 0.001	0.03	< 0.001	< 0.05	< 0.0002	< 0.001	< 0.001	0.004	1.6	< 0.001	0.009	< 0.0001	< 0.001	-	< 0.005	0.012
Relative Percentage Difference			NC	6%	NC	NC	NC	NC	NC	**156%**	29%	NC	11%	NC	NC	NC	NC	**131%**

Notes:
- - Not analysed
< - Less than laboratory limit of reporting
NC - Not calculated
mg/L - Milligrams per litre
Half the laboratory limit of reporting used when calculating RPD
RPD - Relative Percentage Difference

Table 7
Quality Control Sample Analysis - PFAS
Williamtown Sand Syndicate

Analyte			Perfluoroalkyl Sulfonic Acids						Perf				
			Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonate (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)
Units			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Sample Name	Sample Date	Sample Type											
TRIP BLANK_13022019	13-Feb-19	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
RINSATE01_21022019	21-Feb-19	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
BH8_21022019	21-Feb-19	Primary	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
DUP01_21022019	21-Feb-19	Duplicate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
Relative Percentage Difference			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
BH8_21022019	21-Feb-19	Primary	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
TRIP01_21022019	21-Feb-19	Triplicate	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.02	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01
Relative Percentage Difference			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
TRIP BLANK_130319	13-Mar-19	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
TRIP BLANK02_150319	15-Mar-19	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
RINSATE02_140319	14-Mar-19	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
BH7_140319	14-Mar-19	Primary	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
DUP02_140319	14-Mar-19	Duplicate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
Relative Percentage Difference			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
BH7_140319	14-Mar-19	Primary	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
TRIP02_14032019	14-Mar-19	Triplicate	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.02	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01
Relative Percentage Difference			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
TRIP BLANK 03	23-Apr-19	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
RINSATE 03	23-Apr-19	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
TRIP BLANK 04	16-May-19	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
RINSATE 04	16-May-19	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
TRIP BLANK 05_14062019	14-Jun-19	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
RINSATE 05_14062019	14-Jun-19	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
TRIP BLANK 06_16072019	16-Jul-19	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
RINSATE06_16072019	16-Jul-19	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
RINSATE07	15-Aug-19	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
TRIP BLANK 08_16092019	16-Sep-19	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
RINSATE 08_16092019	16-Sep-19	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
SW4_16092019	16-Sep-19	Primary	< 0.02	< 0.02	< 0.02	< 0.02	0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
DUP08_16092019	16-Sep-19	Duplicate	< 0.02	< 0.02	< 0.02	< 0.02	0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
Relative Percentage Difference			NC	NC	NC	NC	0%	NC	NC	NC	NC	NC	NC
SW4_16092019	16-Sep-19	Primary	< 0.02	< 0.02	< 0.02	< 0.02	0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
TRIP08_16092019	16-Sep-19	Triplicate	< 0.01	< 0.01	< 0.01	< 0.01	0.03	< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01
Relative Percentage Difference			NC	NC	NC	NC	**100%**	NC	NC	NC	NC	NC	NC
TRIP BLANK 09_1931069	25-Sep-19	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
RINSATE 09_1931069	25-Sep-19	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
TRIPBLANK09_181119	18-Nov-19	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
RINSATE09_181119	18-Nov-19	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
SW4_181119	18-Nov-19	Primary	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
DUP09_181119	18-Nov-19	Duplicate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
Relative Percentage Difference			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
SW4_181119	18-Nov-19	Primary	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
TRIP09_18112019	18-Nov-19	Triplicate	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01
Relative Percentage Difference			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
TRIPBLANK10_171219	17-Dec-19	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
RINSATE10_171219	17-Dec-19	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
TRIP BLANK 13_2001333008	16-Jan-20	Trip Blank	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
RINSATE 13_2001333009	16-Jan-20	Rinsate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
BH6_2001333004	16-Jan-20	Primary	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
QW12_2001333012	16-Jan-20	Duplicate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
Relative Percentage Difference			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
BH6_2001333004	16-Jan-20	Primary	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01
QW13_14392	16-Jan-20	Triplicate	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01
Relative Percentage Difference			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Notes:
< - Less than laboratory limit of reporting
NC - Not calculated
µg/L - Micrograms per litre

luoroalkyl Carboxylic Acids						Perfluoroalkyl Sulfonamides						
Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl-perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)
µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.05	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02
< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

(n:2) Fluorotelomer Sulfonic Acids				Sum of PFAS		
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
NC	NC	NC	NC	NC	NC	NC
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	< 0.05	< 0.1
NC	NC	NC	NC	NC	NC	NC
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
NC	NC	NC	NC	NC	NC	NC
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	< 0.05	< 0.1
NC	NC	NC	NC	NC	NC	NC
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	0.01	0.01	0.01
< 0.05	< 0.05	< 0.05	< 0.05	0.01	0.01	0.01
NC	NC	NC	NC	0%	0%	0%
< 0.05	< 0.05	< 0.05	< 0.05	0.01	0.01	0.01
< 0.01	< 0.05	< 0.01	< 0.01	0.03	< 0.05	< 0.1
NC	NC	NC	NC	**100%**	**86%**	**133%**
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
NC	NC	NC	NC	NC	NC	NC
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	< 0.05	< 0.1
NC	NC	NC	NC	NC	NC	NC
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
NC	NC	NC	NC	NC	NC	NC
< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	< 0.05	< 0.1
NC	NC	NC	NC	NC	NC	NC

ATTACHMENT A: LABORATORY REPORTS

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2006858**	Page	: 1 of 23
Client	: **KLEINFELDER AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: DANIEL KOUSBROEK	Contact	: Shirley LeCornu
Address	: 95 MITCHELL ROAD CARDIFF NSW 2285	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +6138549 9630
Project	: Williamtown SS	Date Samples Received	: 27-Feb-2020 15:40
Order number	: 20193820	Date Analysis Commenced	: 28-Feb-2020
C-O-C number	: 8677	Issue Date	: 05-Mar-2020 16:55
Sampler	: DANIEL KOUSBROEK		
Site	: WILLIAMTOWN SS-1		
Quote number	: ME/114/19 ALS Compass		
No. of samples received	: 14		
No. of samples analysed	: 14		

ilac-MRA NATA
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. 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*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Ashesh Patel	Senior Chemist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, 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.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic Balance out of acceptable limits for samples 3, 5 &14 due to analytes not quantified in this report.
- EK057G/EK059G:LOR raised for Nitrite/NOx analysis due to sample matrix.
- EG035: Poor matrix spike recovery was obtained for Mercury on sample EM2003277 # 2. Confirmed by re-analysis.
- EG020: Aluminium results for samples ES2006858-#007 confirmed by reanalysis.
- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- 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.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)			Client sample ID	BH-1	BH-2	SW1	BH-4	SW3
			Client sampling date / time	27-Feb-2020 12:19	27-Feb-2020 12:07	27-Feb-2020 11:15	27-Feb-2020 14:32	27-Feb-2020 11:22
Compound	CAS Number	LOR	Unit	ES2006858-001	ES2006858-002	ES2006858-003	ES2006858-004	ES2006858-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	6.20	5.23	----	5.57	----
EA006: Sodium Adsorption Ratio (SAR)								
^ Sodium Adsorption Ratio	----	0.01	-	1.98	1.32	----	1.67	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	103	98	----	123	----
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	67	64	----	80	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	8	13	----	13	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	9	1	----	2	----
Total Alkalinity as CaCO3	----	1	mg/L	9	1	----	2	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	4	6	----	9	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	24	16	----	26	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	<1	2	----	2	----
Magnesium	7439-95-4	1	mg/L	2	2	----	2	----
Sodium	7440-23-5	1	mg/L	14	11	----	14	----
Potassium	7440-09-7	1	mg/L	<1	<1	----	<1	----
EG005(ED093)F: Dissolved Metals by ICP-AES								
Iron	7439-89-6	0.05	mg/L	4.08	0.06	----	0.10	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.14	0.16	----	0.46	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	----	<0.001	----
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	----	<0.05	----
Barium	7440-39-3	0.001	mg/L	0.005	0.005	----	0.009	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	----	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	----	<0.0001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	----	<0.001	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)			Client sample ID	BH-1	BH-2	SW1	BH-4	SW3
			Client sampling date / time	27-Feb-2020 12:19	27-Feb-2020 12:07	27-Feb-2020 11:15	27-Feb-2020 14:32	27-Feb-2020 11:22
Compound	CAS Number	LOR	Unit	ES2006858-001	ES2006858-002	ES2006858-003	ES2006858-004	ES2006858-005
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Chromium	7440-47-3	0.001	mg/L	**0.002**	<0.001	----	**0.001**	----
Copper	7440-50-8	0.001	mg/L	**0.022**	**0.008**	----	**0.006**	----
Manganese	7439-96-5	0.001	mg/L	**0.008**	**0.012**	----	**0.013**	----
Nickel	7440-02-0	0.001	mg/L	**0.004**	**0.003**	----	**0.001**	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	<0.001	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	----	<0.01	----
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	----	<0.01	----
Zinc	7440-66-6	0.005	mg/L	**0.075**	**0.021**	----	**0.009**	----
Iron	7439-89-6	0.05	mg/L	**4.10**	**0.07**	----	**0.09**	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	----	<0.0001	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	**0.1**	----	<0.1	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.22**	**0.04**	----	**0.01**	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	----	<0.01	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**0.02**	**2.18**	----	**0.41**	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.02**	**2.18**	----	**0.41**	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**0.4**	**0.6**	----	**0.3**	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	**0.4**	**2.8**	----	**0.7**	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**0.02**	**0.09**	----	**0.18**	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	----	<0.01	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**0.94**	**0.60**	----	**0.96**	----
ø Total Cations	----	0.01	meq/L	**0.77**	**0.74**	----	**0.87**	----
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup								

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)			Client sample ID	BH-1	BH-2	SW1	BH-4	SW3
			Client sampling date / time	27-Feb-2020 12:19	27-Feb-2020 12:07	27-Feb-2020 11:15	27-Feb-2020 14:32	27-Feb-2020 11:22
Compound	CAS Number	LOR	Unit	ES2006858-001	ES2006858-002	ES2006858-003	ES2006858-004	ES2006858-005
				Result	Result	Result	Result	Result
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup - Continued								
C10 - C14 Fraction	----	50	µg/L	<50	<50	----	<50	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	----	**160**	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	----	<50	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	----	**160**	----
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup								
>C10 - C16 Fraction	----	100	µg/L	<100	<100	----	<100	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	----	**160**	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	----	<100	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	----	**160**	----
>C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	----	<100	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	----	<20	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	----	<20	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	----	<20	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	----	<1	----
Toluene	108-88-3	2	µg/L	<2	<2	----	<2	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	----	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	----	<2	----
ortho-Xylene	95-47-6	2	µg/L	<2	<2	----	<2	----
^ Total Xylenes	----	2	µg/L	<2	<2	----	<2	----
^ Sum of BTEX	----	1	µg/L	<1	<1	----	<1	----
Naphthalene	91-20-3	5	µg/L	<5	<5	----	<5	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	----	----	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	----	----	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	----	----	<0.02	<0.02	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	----	----	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)			Client sample ID	BH-1	BH-2	SW1	BH-4	SW3
			Client sampling date / time	27-Feb-2020 12:19	27-Feb-2020 12:07	27-Feb-2020 11:15	27-Feb-2020 14:32	27-Feb-2020 11:22
Compound	CAS Number	LOR	Unit	ES2006858-001	ES2006858-002	ES2006858-003	ES2006858-004	ES2006858-005
				Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	----	----	**0.02**	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	----	----	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	----	----	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	----	----	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	----	----	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	----	----	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	----	----	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	----	----	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	----	----	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	----	----	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	----	----	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	----	----	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	----	----	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	----	----	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	----	----	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	----	----	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	----	----	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	----	----	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	----	----	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)			Client sample ID	BH-1	BH-2	SW1	BH-4	SW3
			Client sampling date / time	27-Feb-2020 12:19	27-Feb-2020 12:07	27-Feb-2020 11:15	27-Feb-2020 14:32	27-Feb-2020 11:22
Compound	CAS Number	LOR	Unit	ES2006858-001	ES2006858-002	ES2006858-003	ES2006858-004	ES2006858-005
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	----	----	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	----	----	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	----	----	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	----	----	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	----	----	<0.05	<0.05	<0.05
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	----	----	**0.02**	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	----	----	**0.02**	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L	----	----	**0.02**	<0.01	<0.01
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**89.6**	**88.4**	----	**94.4**	----
Toluene-D8	2037-26-5	2	%	**116**	**111**	----	**116**	----
4-Bromofluorobenzene	460-00-4	2	%	**105**	**102**	----	**105**	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	----	----	**103**	**112**	**100**
13C8-PFOA	----	0.02	%	----	----	**82.5**	**84.2**	**82.5**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)			Client sample ID	BH-6	BH-7	BH-8	SW4	DUP13
			Client sampling date / time	27-Feb-2020 13:17	27-Feb-2020 13:39	27-Feb-2020 14:05	27-Feb-2020 11:24	27-Feb-2020 13:43
Compound	CAS Number	LOR	Unit	ES2006858-006	ES2006858-007	ES2006858-008	ES2006858-009	ES2006858-010
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	4.72	4.77	4.57	----	----
EA006: Sodium Adsorption Ratio (SAR)								
^ Sodium Adsorption Ratio	----	0.01	-	2.54	2.38	4.01	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	220	194	250	----	----
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	143	126	162	----	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	21	16	12	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	<1	<1	----	----
Total Alkalinity as CaCO3	----	1	mg/L	<1	<1	<1	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	16	11	14	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	46	42	54	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	2	<1	<1	----	----
Magnesium	7439-95-4	1	mg/L	4	4	3	----	----
Sodium	7440-23-5	1	mg/L	27	23	34	----	----
Potassium	7440-09-7	1	mg/L	1	1	<1	----	----
EG005(ED093)F: Dissolved Metals by ICP-AES								
Iron	7439-89-6	0.05	mg/L	1.83	1.27	2.76	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.09	1.04	0.42	----	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	----	----
Barium	7440-39-3	0.001	mg/L	0.030	0.010	0.007	----	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)			Client sample ID	BH-6	BH-7	BH-8	SW4	DUP13
			Client sampling date / time	27-Feb-2020 13:17	27-Feb-2020 13:39	27-Feb-2020 14:05	27-Feb-2020 11:24	27-Feb-2020 13:43
Compound	CAS Number	LOR	Unit	ES2006858-006	ES2006858-007	ES2006858-008	ES2006858-009	ES2006858-010
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Chromium	7440-47-3	0.001	mg/L	<0.001	**0.003**	**0.002**	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Manganese	7439-96-5	0.001	mg/L	**0.010**	**0.008**	**0.010**	----	----
Nickel	7440-02-0	0.001	mg/L	**0.004**	**0.004**	**0.005**	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	----	----
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	----	----
Zinc	7440-66-6	0.005	mg/L	**0.019**	**0.027**	**0.032**	----	----
Iron	7439-89-6	0.05	mg/L	**1.69**	**1.18**	**2.56**	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	<0.1	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.27**	**0.22**	**0.05**	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**0.03**	<0.01	<0.01	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.03**	<0.01	<0.01	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**1.0**	**0.8**	**0.6**	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	**1.0**	**0.8**	**0.6**	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**0.30**	**0.06**	**0.14**	----	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	<0.01	----	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**1.63**	**1.41**	**1.81**	----	----
ø Total Cations	----	0.01	meq/L	**1.63**	**1.36**	**1.72**	----	----
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup								

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)			Client sample ID	BH-6	BH-7	BH-8	SW4	DUP13
			Client sampling date / time	27-Feb-2020 13:17	27-Feb-2020 13:39	27-Feb-2020 14:05	27-Feb-2020 11:24	27-Feb-2020 13:43
Compound	CAS Number	LOR	Unit	ES2006858-006	ES2006858-007	ES2006858-008	ES2006858-009	ES2006858-010
				Result	Result	Result	Result	Result
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup - Continued								
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	----	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	----	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	----	----
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup								
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	----	----
>C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	----	----
Toluene	108-88-3	2	µg/L	<2	<2	<2	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	----	----
^ Total Xylenes	----	2	µg/L	<2	<2	<2	----	----
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	----	----
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)			Client sample ID	BH-6	BH-7	BH-8	SW4	DUP13
			Client sampling date / time	27-Feb-2020 13:17	27-Feb-2020 13:39	27-Feb-2020 14:05	27-Feb-2020 11:24	27-Feb-2020 13:43
Compound	CAS Number	LOR	Unit	ES2006858-006	ES2006858-007	ES2006858-008	ES2006858-009	ES2006858-010
				Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	**0.01**	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)			Client sample ID	BH-6	BH-7	BH-8	SW4	DUP13
			Client sampling date / time	27-Feb-2020 13:17	27-Feb-2020 13:39	27-Feb-2020 14:05	27-Feb-2020 11:24	27-Feb-2020 13:43
Compound	CAS Number	LOR	Unit	ES2006858-006	ES2006858-007	ES2006858-008	ES2006858-009	ES2006858-010
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	<0.01	**0.01**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	**0.01**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	<0.01	**0.01**	<0.01
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**84.3**	**98.3**	**86.8**	**----**	**----**
Toluene-D8	2037-26-5	2	%	**103**	**125**	**107**	**----**	**----**
4-Bromofluorobenzene	460-00-4	2	%	**98.3**	**112**	**103**	**----**	**----**
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	**99.4**	**99.1**	**98.7**	**103**	**106**
13C8-PFOA	----	0.02	%	**81.4**	**80.3**	**80.7**	**81.8**	**77.6**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)			Client sample ID	BH-11	TRIP13	TRIP BLANK 13	MW239S	----
			Client sampling date / time	27-Feb-2020 12:40	27-Feb-2020 13:48	27-Feb-2020 14:13	27-Feb-2020 13:02	----
Compound	CAS Number	LOR	Unit	ES2006858-011	ES2006858-012	ES2006858-013	ES2006858-014	--------
				Result	Result	Result	Result	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	4.35	----	----	4.45	----
EA006: Sodium Adsorption Ratio (SAR)								
^ Sodium Adsorption Ratio	----	0.01	-	2.36	----	----	5.08	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	165	----	----	475	----
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	107	----	----	309	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	12	----	----	29	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	<1	----
Total Alkalinity as CaCO3	----	1	mg/L	<1	----	----	<1	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	----	----	11	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	41	----	----	126	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	<1	----	----	<1	----
Magnesium	7439-95-4	1	mg/L	3	----	----	7	----
Sodium	7440-23-5	1	mg/L	20	----	----	64	----
Potassium	7440-09-7	1	mg/L	<1	----	----	<1	----
EG005(ED093)F: Dissolved Metals by ICP-AES								
Iron	7439-89-6	0.05	mg/L	0.60	----	----	1.12	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.35	----	----	0.70	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	<0.001	----
Boron	7440-42-8	0.05	mg/L	<0.05	----	----	<0.05	----
Barium	7440-39-3	0.001	mg/L	0.004	----	----	0.008	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	----	----	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	<0.0001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	----	----	<0.001	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)			Client sample ID	BH-11	TRIP13	TRIP BLANK 13	MW239S	----
			Client sampling date / time	27-Feb-2020 12:40	27-Feb-2020 13:48	27-Feb-2020 14:13	27-Feb-2020 13:02	----
Compound	CAS Number	LOR	Unit	ES2006858-011	ES2006858-012	ES2006858-013	ES2006858-014	--------
				Result	Result	Result	Result	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Chromium	7440-47-3	0.001	mg/L	**0.002**	----	----	**0.002**	----
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	<0.001	----
Manganese	7439-96-5	0.001	mg/L	**0.003**	----	----	**0.002**	----
Nickel	7440-02-0	0.001	mg/L	**0.002**	----	----	**0.002**	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	<0.001	----
Selenium	7782-49-2	0.01	mg/L	<0.01	----	----	<0.01	----
Vanadium	7440-62-2	0.01	mg/L	<0.01	----	----	<0.01	----
Zinc	7440-66-6	0.005	mg/L	**0.027**	----	----	**0.019**	----
Iron	7439-89-6	0.05	mg/L	**0.60**	----	----	**1.03**	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	<0.0001	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	----	----	<0.1	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.16**	----	----	**0.14**	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	----	----	<0.01	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**0.02**	----	----	**0.02**	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.02**	----	----	**0.02**	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**3.3**	----	----	**4.5**	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	**3.3**	----	----	**4.5**	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**1.09**	----	----	**1.05**	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	----	----	<0.01	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**1.16**	----	----	**3.78**	----
ø Total Cations	----	0.01	meq/L	**1.12**	----	----	**3.36**	----
ø Ionic Balance	----	0.01	%	**----**	----	----	**5.93**	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)			Client sample ID	BH-11	TRIP13	TRIP BLANK 13	MW239S	----
			Client sampling date / time	27-Feb-2020 12:40	27-Feb-2020 13:48	27-Feb-2020 14:13	27-Feb-2020 13:02	----
Compound	CAS Number	LOR	Unit	ES2006858-011	ES2006858-012	ES2006858-013	ES2006858-014	--------
				Result	Result	Result	Result	----
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup								
C10 - C14 Fraction	----	50	µg/L	<50	----	----	<50	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	<100	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	<50	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	<50	----
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup								
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	<100	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	<100	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	<100	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	----	<100	----
>C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	----	----	<100	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	<20	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	<20	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	----	----	<20	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	<1	----
Toluene	108-88-3	2	µg/L	<2	----	----	<2	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	<2	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	<2	----
^ Total Xylenes	----	2	µg/L	<2	----	----	<2	----
^ Sum of BTEX	----	1	µg/L	<1	----	----	<1	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	<5	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	----	<0.02	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	----	<0.02	<0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	----	<0.02	<0.02	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	----	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)			Client sample ID	BH-11	TRIP13	TRIP BLANK 13	MW239S	----
			Client sampling date / time	27-Feb-2020 12:40	27-Feb-2020 13:48	27-Feb-2020 14:13	27-Feb-2020 13:02	----
Compound	CAS Number	LOR	Unit	ES2006858-011	ES2006858-012	ES2006858-013	ES2006858-014	--------
				Result	Result	Result	Result	----
EP231A: Perfluoroalkyl Sulfonic Acids - Continued								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	----	<0.01	<0.01	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	----	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	----	<0.1	<0.1	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	----	<0.02	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	----	<0.02	<0.02	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	----	<0.02	<0.02	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	----	<0.01	<0.01	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	----	<0.02	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	----	<0.02	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	----	<0.02	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	----	<0.02	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	----	<0.02	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	----	<0.05	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	----	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	----	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	----	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	----	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	----	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	----	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)			Client sample ID	BH-11	TRIP13	TRIP BLANK 13	MW239S	----
			Client sampling date / time	27-Feb-2020 12:40	27-Feb-2020 13:48	27-Feb-2020 14:13	27-Feb-2020 13:02	----
Compound	CAS Number	LOR	Unit	ES2006858-011	ES2006858-012	ES2006858-013	ES2006858-014	--------
				Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	----	<0.02	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	----	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	----	<0.05	<0.05	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	----	<0.05	<0.05	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	----	<0.05	<0.05	----	----
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	----	<0.01	<0.01	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	----	<0.01	<0.01	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	----	<0.01	<0.01	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	104	----	----	106	----
Toluene-D8	2037-26-5	2	%	122	----	----	116	----
4-Bromofluorobenzene	460-00-4	2	%	108	----	----	111	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	----	101	104	----	----
13C8-PFOA	----	0.02	%	----	82.0	83.2	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Client sample ID	SW1	SW3	SW4	----	----
			Client sampling date / time	27-Feb-2020 11:15	27-Feb-2020 11:22	27-Feb-2020 11:24	----	----
Compound	CAS Number	LOR	Unit	ES2006858-003	ES2006858-005	ES2006858-009	--------	--------
				Result	Result	Result	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	6.83	4.60	3.82	----	----
EA006: Sodium Adsorption Ratio (SAR)								
^ Sodium Adsorption Ratio	----	0.01	-	2.17	2.27	2.79	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	550	437	479	----	----
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	358	284	311	----	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	126	53	47	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	63	<1	<1	----	----
Total Alkalinity as CaCO3	----	1	mg/L	63	<1	<1	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	73	73	68	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	64	56	59	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	34	8	9	----	----
Magnesium	7439-95-4	1	mg/L	10	8	6	----	----
Sodium	7440-23-5	1	mg/L	56	38	44	----	----
Potassium	7440-09-7	1	mg/L	8	<1	1	----	----
EG005(ED093)F: Dissolved Metals by ICP-AES								
Iron	7439-89-6	0.05	mg/L	1.82	6.55	2.57	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.93	2.44	0.62	----	----
Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	<0.001	----	----
Boron	7440-42-8	0.05	mg/L	0.06	<0.05	<0.05	----	----
Barium	7440-39-3	0.001	mg/L	0.029	0.051	0.054	----	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
Cobalt	7440-48-4	0.001	mg/L	0.002	0.006	0.002	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Client sample ID	SW1	SW3	SW4	----	----
			Client sampling date / time	27-Feb-2020 11:15	27-Feb-2020 11:22	27-Feb-2020 11:24	----	----
Compound	CAS Number	LOR	Unit	ES2006858-003	ES2006858-005	ES2006858-009	--------	--------
				Result	Result	Result	----	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Chromium	7440-47-3	0.001	mg/L	**0.006**	<0.001	<0.001	----	----
Copper	7440-50-8	0.001	mg/L	**0.026**	**0.008**	**0.018**	----	----
Manganese	7439-96-5	0.001	mg/L	**0.211**	**0.054**	**0.050**	----	----
Nickel	7440-02-0	0.001	mg/L	**0.009**	**0.010**	**0.009**	----	----
Lead	7439-92-1	0.001	mg/L	**0.002**	<0.001	<0.001	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	----	----
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	----	----
Zinc	7440-66-6	0.005	mg/L	**0.061**	**0.049**	**0.060**	----	----
Iron	7439-89-6	0.05	mg/L	**1.67**	**6.00**	**2.52**	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**0.4**	<0.1	<0.1	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.16**	**0.02**	<0.01	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.05	<0.01	<0.01	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.05	**0.10**	**0.01**	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.05	**0.10**	**0.01**	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**2.4**	**0.2**	**0.2**	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	**2.4**	**0.3**	**0.2**	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**0.17**	**0.01**	<0.01	----	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	<0.01	----	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**4.58**	**3.10**	**3.08**	----	----
ø Total Cations	----	0.01	meq/L	**5.16**	**2.71**	**2.88**	----	----
ø Ionic Balance	----	0.01	%	**5.91**	----	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Client sample ID	SW1	SW3	SW4	----	----
			Client sampling date / time	27-Feb-2020 11:15	27-Feb-2020 11:22	27-Feb-2020 11:24	----	----
Compound	CAS Number	LOR	Unit	ES2006858-003	ES2006858-005	ES2006858-009	--------	--------
				Result	Result	Result	----	----
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup								
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	----	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	----	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	----	----
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup								
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	----	----
>C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	----	----
Toluene	108-88-3	2	µg/L	<2	<2	<2	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	----	----
^ Total Xylenes	----	2	µg/L	<2	<2	<2	----	----
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	----	----
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**99.3**	**92.8**	**89.9**	----	----
Toluene-D8	2037-26-5	2	%	**127**	**117**	**112**	----	----
4-Bromofluorobenzene	460-00-4	2	%	**117**	**109**	**106**	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	DUP13	TRIP13	TRIP BLANK 13	----	----
			Client sampling date / time	27-Feb-2020 13:43	27-Feb-2020 13:48	27-Feb-2020 14:13	----	----
Compound	CAS Number	LOR	Unit	ES2006858-010	ES2006858-012	ES2006858-013	--------	--------
				Result	Result	Result	----	----
EG005(ED093)F: Dissolved Metals by ICP-AES								
Iron	7439-89-6	0.05	mg/L	**1.38**	**1.44**	<0.05	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**1.48**	**1.60**	<0.01	----	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	----	----
Barium	7440-39-3	0.001	mg/L	**0.009**	**0.009**	<0.001	----	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	**0.001**	<0.001	----	----
Chromium	7440-47-3	0.001	mg/L	**0.003**	**0.002**	<0.001	----	----
Copper	7440-50-8	0.001	mg/L	**0.003**	<0.001	<0.001	----	----
Manganese	7439-96-5	0.001	mg/L	**0.011**	**0.008**	<0.001	----	----
Nickel	7440-02-0	0.001	mg/L	**0.003**	**0.002**	<0.001	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	----	----
Vanadium	7440-62-2	0.01	mg/L	**0.01**	**0.01**	<0.01	----	----
Zinc	7440-66-6	0.005	mg/L	**0.010**	**0.009**	<0.005	----	----
Iron	7439-89-6	0.05	mg/L	**1.25**	**1.33**	<0.05	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup								
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	----	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	----	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	----	----
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup								
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	----	----
>C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	DUP13	TRIP13	TRIP BLANK 13	----	----
			Client sampling date / time	27-Feb-2020 13:43	27-Feb-2020 13:48	27-Feb-2020 14:13	----	----
Compound	CAS Number	LOR	Unit	ES2006858-010	ES2006858-012	ES2006858-013	--------	--------
				Result	Result	Result	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	----	----
Toluene	108-88-3	2	µg/L	<2	<2	<2	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	----	----
^ Total Xylenes	----	2	µg/L	<2	<2	<2	----	----
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	----	----
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	98.9	114	104	----	----
Toluene-D8	2037-26-5	2	%	123	124	110	----	----
4-Bromofluorobenzene	460-00-4	2	%	113	114	105	----	----

Surrogate Control Limits

Sub-Matrix: GROUNDWATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

QUALITY CONTROL REPORT

Work Order	: **ES2006858**	Page	: 1 of 15
Client	: **KLEINFELDER AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: DANIEL KOUSBROEK	Contact	: Shirley LeCornu
Address	: 95 MITCHELL ROAD CARDIFF NSW 2285	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +6138549 9630
Project	: Williamtown SS	Date Samples Received	: 27-Feb-2020
Order number	: 20193820	Date Analysis Commenced	: 28-Feb-2020
C-O-C number	: 8677	Issue Date	: 05-Mar-2020
Sampler	: DANIEL KOUSBROEK		
Site	: WILLIAMTOWN SS-1		
Quote number	: ME/114/19 ALS Compass		
No. of samples received	: 14		
No. of samples analysed	: 14		

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. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

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*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Ashesh Patel	Senior Chemist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, 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

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
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
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG005(ED093)F: Dissolved Metals by ICP-AES (QC Lot: 2885232)									
ES2006858-001	BH-1	EG005F: Iron	7439-89-6	0.05	mg/L	4.08	4.10	0.533	0% - 20%
ES2006858-014	MW239S	EG005F: Iron	7439-89-6	0.05	mg/L	1.12	1.14	1.50	0% - 20%
EG005(ED093)F: Dissolved Metals by ICP-AES (QC Lot: 2887439)									
ES2006858-012	TRIP13	EG005F: Iron	7439-89-6	0.05	mg/L	1.44	1.48	3.01	0% - 20%
EG005(ED093)F: Dissolved Metals by ICP-AES (QC Lot: 2892038)									
ES2006858-010	DUP13	EG005F: Iron	7439-89-6	0.05	mg/L	1.38	1.37	0.756	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 2884702)									
ES2006858-001	BH-1	EA005-P: pH Value	----	0.01	pH Unit	6.20	5.61	9.99	0% - 20%
ES2006858-011	BH-11	EA005-P: pH Value	----	0.01	pH Unit	4.35	4.59	5.37	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 2884701)									
ES2006858-001	BH-1	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	103	101	2.19	0% - 20%
ES2006858-011	BH-11	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	165	164	0.00	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 2884704)									
ES2006858-001	BH-1	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	9	4	79.8	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	9	4	79.8	No Limit
ES2006858-011	BH-11	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	<1	0.00	No Limit
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 2884708)									
ES2006858-001	BH-1	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	4	4	0.00	No Limit
ES2006858-011	BH-11	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	1	0.00	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
ED045G: Chloride by Discrete Analyser (QC Lot: 2884710)									
ES2006858-001	BH-1	ED045G: Chloride	16887-00-6	1	mg/L	24	24	0.00	0% - 20%
ES2006858-011	BH-11	ED045G: Chloride	16887-00-6	1	mg/L	41	41	0.00	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 2885230)									
ES2006858-001	BH-1	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.00	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	2	2	0.00	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	14	13	11.7	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.00	No Limit
ES2006858-014	MW239S	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.00	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	7	7	0.00	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	64	65	0.00	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.00	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2885231)									
ES2006858-001	BH-1	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Barium	7440-39-3	0.001	mg/L	0.005	0.005	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.022	0.022	0.00	0% - 20%
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.008	0.008	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.004	0.005	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.075	0.075	0.00	0% - 50%
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.14	0.14	0.00	0% - 50%
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.05	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	4.10	4.10	0.00	0% - 20%
ES2006858-014	MW239S	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Barium	7440-39-3	0.001	mg/L	0.008	0.009	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.002	0.003	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.002	0.003	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.019	0.020	7.34	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.70	0.71	1.81	0% - 20%

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2885231) - continued									
ES2006858-014	MW239S	EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	1.03	1.05	1.40	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2887437)									
ES2006475-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Barium	7440-39-3	0.001	mg/L	0.045	0.043	3.59	0% - 20%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.007	0.007	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.011	0.011	0.00	0% - 50%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.18	0.17	6.70	0% - 50%
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.09	0.08	0.00	No Limit
ES2006858-012	TRIP13	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Barium	7440-39-3	0.001	mg/L	0.009	0.009	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.002	0.003	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.008	0.009	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.002	0.003	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.009	0.008	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	1.60	1.56	2.60	0% - 20%
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Vanadium	7440-62-2	0.01	mg/L	0.01	0.01	0.00	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	1.33	1.34	0.00	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2892035)									
ES2007180-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2892035) - continued									
ES2007180-001	Anonymous	EG020A-F: Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Barium	7440-39-3	0.001	mg/L	0.055	0.052	4.28	0% - 20%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.001	<0.001	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	0.24	0.24	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EM2003277-002	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0002	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.004	0.004	0.00	No Limit
		EG020A-F: Beryllium	7440-41-7	0.001	mg/L	0.001	<0.001	0.00	No Limit
		EG020A-F: Barium	7440-39-3	0.001	mg/L	0.016	0.016	0.00	0% - 50%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	0.007	0.007	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.013	0.013	0.00	0% - 50%
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	1.28	1.26	1.84	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.036	0.036	0.00	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.022	0.024	10.6	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.03	0.01	77.9	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	1.04	1.07	2.50	0% - 20%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.16	0.14	10.8	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 2885227)									
ES2006584-003	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
ES2006780-002	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 2885233)									
ES2006858-009	SW4	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 2887438)									
ES2006852-010	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
ES2006930-005	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 2892037)									

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG035F: Dissolved Mercury by FIMS (QC Lot: 2892037) - continued									
EM2003277-003	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
ES2007297-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 2884703)									
ES2006858-001	BH-1	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.00	No Limit
ES2006858-011	BH-11	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.00	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 2887744)									
ES2006624-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	43.3	45.8	5.61	0% - 20%
ES2006752-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	183	183	0.109	0% - 20%
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 2887745)									
ES2006858-002	BH-2	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.03	46.1	No Limit
ES2006858-014	MW239S	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.14	0.12	15.0	0% - 50%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 2884709)									
ES2006858-001	BH-1	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
ES2006858-011	BH-11	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 2887743)									
ES2006624-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.00	No Limit
ES2006752-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.35	0.34	0.00	0% - 20%
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 2887746)									
ES2006858-002	BH-2	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	2.18	2.18	0.00	0% - 20%
ES2006858-014	MW239S	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.02	0.00	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 2887739)									
ES2006624-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	95.0	98.3	3.37	0% - 20%
ES2006755-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.2	0.2	0.00	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 2887741)									
ES2006858-004	BH-4	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.3	0.2	0.00	No Limit
ES2006908-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.3	0.3	0.00	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 2887738)									
ES2006624-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	12.8	13.5	5.20	0% - 20%
ES2006755-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.03	0.03	0.00	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 2887740)									
ES2006858-004	BH-4	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.18	0.19	0.00	0% - 50%
ES2006908-002	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 2884707)									
ES2006856-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
ES2006858-009	SW4	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2886852)									
ES2006858-001	BH-1	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
ES2006858-011	BH-11	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2886852)									
ES2006858-001	BH-1	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
ES2006858-011	BH-11	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 2886852)									
ES2006858-001	BH-1	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
ES2006858-011	BH-11	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)F: Dissolved Metals by ICP-AES (QCLot: 2885232)								
EG005F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	105	82.0	114
EG005(ED093)F: Dissolved Metals by ICP-AES (QCLot: 2887439)								
EG005F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	103	82.0	114
EG005(ED093)F: Dissolved Metals by ICP-AES (QCLot: 2892038)								
EG005F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	99.3	82.0	114
EA005P: pH by PC Titrator (QCLot: 2884702)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	101	98.0	102
				----	7 pH Unit	100	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 2884701)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	96.6	95.0	113
ED037P: Alkalinity by PC Titrator (QCLot: 2884704)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	101	81.0	111
				----	50 mg/L	122	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2884708)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	89.2	82.0	122
				<1	500 mg/L	90.9	82.0	122
ED045G: Chloride by Discrete Analyser (QCLot: 2884710)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	105	80.9	127
				<1	1000 mg/L	93.4	80.9	127
ED093F: Dissolved Major Cations (QCLot: 2885230)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	114	80.0	114
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	90.0	116
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	97.8	82.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.8	85.0	113
EG020F: Dissolved Metals by ICP-MS (QCLot: 2885231)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	90.1	80.0	116
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	93.4	85.0	114
EG020A-F: Beryllium	7440-41-7	0.001	mg/L	<0.001	0.1 mg/L	93.2	85.0	115
EG020A-F: Barium	7440-39-3	0.001	mg/L	<0.001	0.1 mg/L	93.4	82.0	110
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	94.3	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	93.6	85.0	111
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	87.5	82.0	112
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	90.7	81.0	111

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 2885231) - continued								
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	90.5	83.0	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	94.7	82.0	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	88.7	82.0	112
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	88.4	85.0	115
EG020A-F: Vanadium	7440-62-2	0.01	mg/L	<0.01	0.1 mg/L	91.3	83.0	109
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	89.2	81.0	117
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	85.4	85.0	115
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	99.6	82.0	112
EG020F: Dissolved Metals by ICP-MS (QCLot: 2887437)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	97.0	80.0	116
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	90.2	85.0	114
EG020A-F: Beryllium	7440-41-7	0.001	mg/L	<0.001	0.1 mg/L	91.3	85.0	115
EG020A-F: Barium	7440-39-3	0.001	mg/L	<0.001	0.1 mg/L	91.9	82.0	110
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	91.5	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	94.6	85.0	111
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	86.8	82.0	112
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	88.3	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	90.4	83.0	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	98.9	82.0	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	88.7	82.0	112
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	85.4	85.0	115
EG020A-F: Vanadium	7440-62-2	0.01	mg/L	<0.01	0.1 mg/L	94.7	83.0	109
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	90.8	81.0	117
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	89.3	85.0	115
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	100	82.0	112
EG020F: Dissolved Metals by ICP-MS (QCLot: 2892035)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	95.6	80.0	116
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	94.6	85.0	114
EG020A-F: Beryllium	7440-41-7	0.001	mg/L	<0.001	0.1 mg/L	89.8	85.0	115
EG020A-F: Barium	7440-39-3	0.001	mg/L	<0.001	0.1 mg/L	96.6	82.0	110
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	95.1	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	92.5	85.0	111
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	94.3	82.0	112
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	92.8	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	92.9	83.0	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	98.5	82.0	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	94.5	82.0	112
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	91.6	85.0	115
EG020A-F: Vanadium	7440-62-2	0.01	mg/L	<0.01	0.1 mg/L	95.0	83.0	109

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020F: Dissolved Metals by ICP-MS (QCLot: 2892035) - continued								
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	92.1	81.0	117
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	89.1	85.0	115
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	95.0	82.0	112
EG035F: Dissolved Mercury by FIMS (QCLot: 2885227)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	99.3	83.0	105
EG035F: Dissolved Mercury by FIMS (QCLot: 2885233)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	98.6	83.0	105
EG035F: Dissolved Mercury by FIMS (QCLot: 2887438)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	97.9	83.0	105
EG035F: Dissolved Mercury by FIMS (QCLot: 2892037)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	98.2	83.0	105
EK040P: Fluoride by PC Titrator (QCLot: 2884703)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	102	82.0	116
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2887744)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	99.5	90.0	114
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2887745)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	94.1	90.0	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2884709)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	95.0	82.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2887743)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	97.4	91.0	113
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2887746)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	99.0	91.0	113
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2887739)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	98.1	69.0	101
				<0.1	1 mg/L	100	70.0	118
				<0.1	5 mg/L	100	74.0	118
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2887741)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	92.8	69.0	101
				<0.1	1 mg/L	90.4	70.0	118
				<0.1	5 mg/L	101	74.0	118
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2887738)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	90.5	71.0	101
				<0.01	0.442 mg/L	98.3	72.0	108
				<0.01	1 mg/L	106	78.0	118
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2887740)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2887740) - continued								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	95.1	71.0	101
				<0.01	0.442 mg/L	99.4	72.0	108
				<0.01	1 mg/L	107	78.0	118
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2884707)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	100	85.0	117
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup (QCLot: 2884928)								
EP071SG: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	74.9	55.8	112
EP071SG: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	90.9	71.6	113
EP071SG: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	85.5	56.0	121
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup (QCLot: 2884928)								
EP071SG: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	82.4	57.9	119
EP071SG: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	90.0	62.5	110
EP071SG: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	75.9	61.5	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2886852)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	79.9	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2886852)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	80.6	75.0	127
EP080: BTEXN (QCLot: 2886852)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	97.7	70.0	122
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	95.6	69.0	123
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	96.1	70.0	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	94.3	69.0	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	93.6	72.0	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	84.6	70.0	120
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 2884734)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	85.8	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	91.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.25 µg/L	85.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	84.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	97.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	127	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 2884734)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	90.5	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	99.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	100	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	98.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	116	71.0	133

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 2884734) - continued								
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	95.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	95.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	117	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	123	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	91.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 2884734)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	96.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	103	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	94.6	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	102	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	76.3	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	99.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	93.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 2884734)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	92.6	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	92.6	67.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	99.0	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	104	70.0	130

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2884708)							
ES2006858-001	BH-1	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	5 mg/L	88.1	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 2884710)							
ES2006858-001	BH-1	ED045G: Chloride	16887-00-6	250 mg/L	90.8	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 2885231)							
ES2006780-002	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	87.4	70.0	130
		EG020A-F: Beryllium	7440-41-7	1 mg/L	100	70.0	130

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 2885231) - continued							
ES2006780-002	Anonymous	EG020A-F: Barium	7440-39-3	1 mg/L	88.5	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	90.1	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	91.9	70.0	130
		EG020A-F: Cobalt	7440-48-4	1 mg/L	88.8	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	94.6	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	89.9	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	92.2	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	84.1	70.0	130
		EG020A-F: Vanadium	7440-62-2	1 mg/L	89.7	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	87.0	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 2887437)							
ES2006475-002	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	84.6	70.0	130
		EG020A-F: Beryllium	7440-41-7	1 mg/L	96.4	70.0	130
		EG020A-F: Barium	7440-39-3	1 mg/L	90.8	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	90.4	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	89.2	70.0	130
		EG020A-F: Cobalt	7440-48-4	1 mg/L	90.0	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	84.9	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	81.8	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	98.1	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	88.9	70.0	130
		EG020A-F: Vanadium	7440-62-2	1 mg/L	85.0	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	89.9	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 2892035)							
EM2003173-002	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	95.0	70.0	130
		EG020A-F: Beryllium	7440-41-7	1 mg/L	91.7	70.0	130
		EG020A-F: Barium	7440-39-3	1 mg/L	77.6	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	# Not Determined	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	88.8	70.0	130
		EG020A-F: Cobalt	7440-48-4	1 mg/L	# Not Determined	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	# Not Determined	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	85.0	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	# Not Determined	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	# Not Determined	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 2892035) - continued							
EM2003173-002	Anonymous	EG020A-F: Vanadium	7440-62-2	1 mg/L	88.1	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	# Not Determined	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 2885227)							
ES2006584-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	82.8	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 2885233)							
ES2006858-008	BH-8	EG035F: Mercury	7439-97-6	0.01 mg/L	84.5	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 2887438)							
ES2006852-009	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	80.6	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 2892037)							
EM2003277-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	# 58.0	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 2884703)							
ES2006858-001	BH-1	EK040P: Fluoride	16984-48-8	5 mg/L	92.0	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2887744)							
ES2006624-001	Anonymous	EK055G: Ammonia as N	7664-41-7	1 mg/L	# Not Determined	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2887745)							
ES2006858-002	BH-2	EK055G: Ammonia as N	7664-41-7	1 mg/L	104	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2884709)							
ES2006858-001	BH-1	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	96.0	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2887743)							
ES2006624-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	89.2	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2887746)							
ES2006858-002	BH-2	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	# Not Determined	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2887739)							
ES2006640-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	98.5	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2887741)							
ES2006858-005	SW3	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	96.6	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2887738)							
ES2006640-001	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	104	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2887740)							
ES2006858-005	SW3	EK067G: Total Phosphorus as P	----	1 mg/L	104	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2884707)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2884707) - continued							
ES2006856-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	96.0	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2886852)							
ES2006858-001	BH-1	EP080: C6 - C9 Fraction	----	325 µg/L	87.6	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2886852)							
ES2006858-001	BH-1	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	86.1	70.0	130
EP080: BTEXN (QCLot: 2886852)							
ES2006858-001	BH-1	EP080: Benzene	71-43-2	25 µg/L	101	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	97.2	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	103	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	101	70.0	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	97.7	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	90.4	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2006858**	Page	: 1 of 15
Client	: **KLEINFELDER AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: DANIEL KOUSBROEK	Telephone	: +6138549 9630
Project	: Williamtown SS	Date Samples Received	: 27-Feb-2020
Site	: WILLIAMTOWN SS-1	Issue Date	: 05-Mar-2020
Sampler	: DANIEL KOUSBROEK	No. of samples received	: 14
Order number	: 20193820	No. of samples analysed	: 14

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EG020F: Dissolved Metals by ICP-MS	EM2003173--002	Anonymous	**Cadmium**	7440-43-9	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG020F: Dissolved Metals by ICP-MS	EM2003173--002	Anonymous	**Cobalt**	7440-48-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG020F: Dissolved Metals by ICP-MS	EM2003173--002	Anonymous	**Copper**	7440-50-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG020F: Dissolved Metals by ICP-MS	EM2003173--002	Anonymous	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG020F: Dissolved Metals by ICP-MS	EM2003173--002	Anonymous	**Nickel**	7440-02-0	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG020F: Dissolved Metals by ICP-MS	EM2003173--002	Anonymous	**Zinc**	7440-66-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG035F: Dissolved Mercury by FIMS	EM2003277--002	Anonymous	**Mercury**	7439-97-6	58.0 %	70.0-130%	**Recovery less than lower data quality objective**
EK055G: Ammonia as N by Discrete Analyser	ES2006624--001	Anonymous	**Ammonia as N**	7664-41-7	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Ar	ES2006858--002	BH-2	**Nitrite + Nitrate as N**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method		*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)		*Date extracted*	*Due for extraction*	***Days overdue***	*Date analysed*	*Due for analysis*	***Days overdue***
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural							
BH-1,	BH-2,	----	----	----	28-Feb-2020	27-Feb-2020	**1**
SW1,	BH-4,						
SW3,	BH-6,						
BH-7,	BH-8,						
SW4,	BH-11,						
MW239S							

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	10	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	0	15	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Dissolved Metals by ICP-AES	0	16	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	10	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	0	15	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container / Client Sample ID(s)*	*Sample Date*	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
BH-1, BH-2, SW1, BH-4, SW3, BH-6, BH-7, BH-8, SW4, BH-11, MW239S	**27-Feb-2020**	**----**	----	----	**28-Feb-2020**	27-Feb-2020	×
EA006: Sodium Adsorption Ratio (SAR)							
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)							
BH-1, BH-2, SW1, BH-4, SW3, BH-6, BH-7, BH-8, SW4, BH-11, MW239S	**27-Feb-2020**	**----**	----	----	**28-Feb-2020**	26-Mar-2020	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P) BH-1, BH-2, SW1, BH-4, SW3, BH-6, BH-7, BH-8, SW4, BH-11, MW239S	**27-Feb-2020**	**----**	----	----	**28-Feb-2020**	26-Mar-2020	✓
EA065: Total Hardness as CaCO3							
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F) BH-1, BH-2, SW1, BH-4, SW3, BH-6, BH-7, BH-8, SW4, BH-11, MW239S	**27-Feb-2020**	**----**	----	----	**28-Feb-2020**	26-Mar-2020	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) BH-1, BH-2, SW1, BH-4, SW3, BH-6, BH-7, BH-8, SW4, BH-11, MW239S	**27-Feb-2020**	**----**	----	----	**28-Feb-2020**	12-Mar-2020	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) BH-1, BH-2, SW1, BH-4, SW3, BH-6, BH-7, BH-8, SW4, BH-11, MW239S	**27-Feb-2020**	**----**	----	----	**28-Feb-2020**	26-Mar-2020	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G) BH-1, BH-2, SW1, BH-4, SW3, BH-6, BH-7, BH-8, SW4, BH-11, MW239S	**27-Feb-2020**	**----**	----	----	**28-Feb-2020**	26-Mar-2020	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)								
BH-1,	BH-2,	**27-Feb-2020**	**----**	----	----	**28-Feb-2020**	26-Mar-2020	✓
SW1,	BH-4,							
SW3,	BH-6,							
BH-7,	BH-8,							
SW4,	BH-11,							
MW239S								
EG005(ED093)F: Dissolved Metals by ICP-AES								
Clear Plastic Bottle - Nitric Acid; Filtered (EG005F)								
TRIP13,	TRIP BLANK 13	**27-Feb-2020**	**----**	----	----	**03-Mar-2020**	25-Aug-2020	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG005F)								
DUP13		**27-Feb-2020**	**----**	----	----	**04-Mar-2020**	25-Aug-2020	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG005F)								
BH-1,	BH-2,	**27-Feb-2020**	**----**	----	----	**28-Feb-2020**	25-Aug-2020	✓
SW1,	BH-4,							
SW3,	BH-6,							
BH-7,	BH-8,							
SW4,	BH-11,							
MW239S								
EG020F: Dissolved Metals by ICP-MS								
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)								
TRIP13,	TRIP BLANK 13	**27-Feb-2020**	**----**	----	----	**03-Mar-2020**	25-Aug-2020	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)								
DUP13		**27-Feb-2020**	**----**	----	----	**04-Mar-2020**	25-Aug-2020	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)								
BH-1,	BH-2,	**27-Feb-2020**	**----**	----	----	**28-Feb-2020**	25-Aug-2020	✓
SW1,	BH-4,							
SW3,	BH-6,							
BH-7,	BH-8,							
SW4,	BH-11,							
MW239S								

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035F: Dissolved Mercury by FIMS								
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)								
BH-1,	BH-2,	**27-Feb-2020**	**----**	----	----	**02-Mar-2020**	26-Mar-2020	✓
SW1,	BH-4,							
SW3,	BH-6,							
BH-7,	BH-8,							
SW4,	BH-11,							
MW239S								
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)								
TRIP13,	TRIP BLANK 13	**27-Feb-2020**	**----**	----	----	**03-Mar-2020**	26-Mar-2020	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)								
DUP13		**27-Feb-2020**	**----**	----	----	**04-Mar-2020**	26-Mar-2020	✓
EK040P: Fluoride by PC Titrator								
Clear Plastic Bottle - Natural (EK040P)								
BH-1,	BH-2,	**27-Feb-2020**	**----**	----	----	**28-Feb-2020**	26-Mar-2020	✓
SW1,	BH-4,							
SW3,	BH-6,							
BH-7,	BH-8,							
SW4,	BH-11,							
MW239S								
EK055G: Ammonia as N by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK055G)								
BH-1,	BH-2,	**27-Feb-2020**	**----**	----	----	**02-Mar-2020**	26-Mar-2020	✓
SW1,	BH-4,							
SW3,	BH-6,							
BH-7,	BH-8,							
SW4,	BH-11,							
MW239S								
EK057G: Nitrite as N by Discrete Analyser								
Clear Plastic Bottle - Natural (EK057G)								
BH-1,	BH-2,	**27-Feb-2020**	**----**	----	----	**28-Feb-2020**	29-Feb-2020	✓
SW1,	BH-4,							
SW3,	BH-6,							
BH-7,	BH-8,							
SW4,	BH-11,							
MW239S								

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK059G)								
BH-1,	BH-2,	**27-Feb-2020**	**----**	----	----	**02-Mar-2020**	26-Mar-2020	✓
SW1,	BH-4,							
SW3,	BH-6,							
BH-7,	BH-8,							
SW4,	BH-11,							
MW239S								
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK061G)								
BH-1,	BH-2,	**27-Feb-2020**	**02-Mar-2020**	26-Mar-2020	✓	**02-Mar-2020**	26-Mar-2020	✓
SW1,	BH-4,							
SW3,	BH-6,							
BH-7,	BH-8,							
SW4,	BH-11,							
MW239S								
EK067G: Total Phosphorus as P by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK067G)								
BH-1,	BH-2,	**27-Feb-2020**	**02-Mar-2020**	26-Mar-2020	✓	**02-Mar-2020**	26-Mar-2020	✓
SW1,	BH-4,							
SW3,	BH-6,							
BH-7,	BH-8,							
SW4,	BH-11,							
MW239S								
EK071G: Reactive Phosphorus as P by discrete analyser								
Clear Plastic Bottle - Natural (EK071G)								
BH-1,	BH-2,	**27-Feb-2020**	**----**	----	----	**28-Feb-2020**	29-Feb-2020	✓
SW1,	BH-4,							
SW3,	BH-6,							
BH-7,	BH-8,							
SW4,	BH-11,							
MW239S								
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup								
Amber Glass Bottle - Unpreserved (EP071SG)								
BH-1,	BH-2,	**27-Feb-2020**	**28-Feb-2020**	05-Mar-2020	✓	**04-Mar-2020**	08-Apr-2020	✓
SW1,	BH-4,							
SW3,	BH-6,							
BH-7,	BH-8,							
SW4,	DUP13,							
BH-11,	TRIP13,							
TRIP BLANK 13,	MW239S							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup								
Amber Glass Bottle - Unpreserved (EP071SG)								
BH-1,	BH-2,	**27-Feb-2020**	**28-Feb-2020**	05-Mar-2020	✓	**04-Mar-2020**	08-Apr-2020	✓
SW1,	BH-4,							
SW3,	BH-6,							
BH-7,	BH-8,							
SW4,	DUP13,							
BH-11,	TRIP13,							
TRIP BLANK 13,	MW239S							
EP080/071: Total Petroleum Hydrocarbons								
Amber VOC Vial - Sulfuric Acid (EP080)								
BH-1,	BH-2,	**27-Feb-2020**	**02-Mar-2020**	12-Mar-2020	✓	**02-Mar-2020**	12-Mar-2020	✓
SW1,	BH-4,							
SW3,	BH-6,							
BH-7,	BH-8,							
SW4,	DUP13,							
BH-11,	TRIP13,							
TRIP BLANK 13,	MW239S							
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Amber VOC Vial - Sulfuric Acid (EP080)								
BH-1,	BH-2,	**27-Feb-2020**	**02-Mar-2020**	12-Mar-2020	✓	**02-Mar-2020**	12-Mar-2020	✓
SW1,	BH-4,							
SW3,	BH-6,							
BH-7,	BH-8,							
SW4,	DUP13,							
BH-11,	TRIP13,							
TRIP BLANK 13,	MW239S							
EP080: BTEXN								
Amber VOC Vial - Sulfuric Acid (EP080)								
BH-1,	BH-2,	**27-Feb-2020**	**02-Mar-2020**	12-Mar-2020	✓	**02-Mar-2020**	12-Mar-2020	✓
SW1,	BH-4,							
SW3,	BH-6,							
BH-7,	BH-8,							
SW4,	DUP13,							
BH-11,	TRIP13,							
TRIP BLANK 13,	MW239S							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
SW1,	BH-4,	**27-Feb-2020**	**28-Feb-2020**	25-Aug-2020	✓	**03-Mar-2020**	25-Aug-2020	✓
SW3,	BH-6,							
BH-7,	BH-8,							
SW4,	DUP13,							
TRIP13,	TRIP BLANK 13							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
SW1,	BH-4,	**27-Feb-2020**	**28-Feb-2020**	25-Aug-2020	✓	**03-Mar-2020**	25-Aug-2020	✓
SW3,	BH-6,							
BH-7,	BH-8,							
SW4,	DUP13,							
TRIP13,	TRIP BLANK 13							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
SW1,	BH-4,	**27-Feb-2020**	**28-Feb-2020**	25-Aug-2020	✓	**03-Mar-2020**	25-Aug-2020	✓
SW3,	BH-6,							
BH-7,	BH-8,							
SW4,	DUP13,							
TRIP13,	TRIP BLANK 13							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
SW1,	BH-4,	**27-Feb-2020**	**28-Feb-2020**	25-Aug-2020	✓	**03-Mar-2020**	25-Aug-2020	✓
SW3,	BH-6,							
BH-7,	BH-8,							
SW4,	DUP13,							
TRIP13,	TRIP BLANK 13							
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
SW1,	BH-4,	**27-Feb-2020**	**28-Feb-2020**	25-Aug-2020	✓	**03-Mar-2020**	25-Aug-2020	✓
SW3,	BH-6,							
BH-7,	BH-8,							
SW4,	DUP13,							
TRIP13,	TRIP BLANK 13							

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	4	33	**12.12**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	7	58	**12.07**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-AES	EG005F	4	16	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	6	58	**10.34**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	4	33	**12.12**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	10	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	4	34	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	4	37	**10.81**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	EP071SG	0	15	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	4	58	**6.90**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-AES	EG005F	3	16	**18.75**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	3	58	**5.17**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Control Samples (LCS) - Continued							
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	6	34	**17.65**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	6	37	**16.22**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	EP071SG	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	4	58	**6.90**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-AES	EG005F	3	16	**18.75**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	3	58	**5.17**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	EP071SG	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	4	58	**6.90**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-AES	EG005F	0	16	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	3	58	**5.17**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	10	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	EP071SG	0	15	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Matrix Spikes (MS) - Continued							
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH by PC Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM (2013) Schedule B(3)
Conductivity by PC Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM (2013) Schedule B(3)
Calculated TDS (from Electrical Conductivity)	EA016	WATER	In house: Calculation from Electrical Conductivity (APHA 2510 B) using a conversion factor specified in the analytical report. This method is compliant with NEPM (2013) Schedule B(3)
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM (2013) Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM (2013) Schedule B(3)
Dissolved Metals by ICP-AES	EG005F	WATER	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. The ICPAES technique ionises the 0.45µm filtered samples, emitting a characteristic spectrum which is compared against matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.

Analytical Methods	Method	Matrix	Method Descriptions
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Fluoride by PC Titrator	EK040P	WATER	In house: Referenced to APHA 4500-F C: CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (2013) Schedule B(3)
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3-. This method is compliant with NEPM (2013) Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al (1976), Zhang et al (2006). This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	EP071SG	WATER	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)

Analytical Methods	Method	Matrix	Method Descriptions
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM (2013) Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

Environmental Division
Sydney
Work Order Reference
ES2006858

Telephone : +61-2-8784 8555

ALSCompass
SAMPLING *Intelligence*

Custody Document for Submissions via ALS Compass App

Project: Willantown SS **Client:** Kleinfelder **Project Manager:** Daniel Housbroek
Phone: (0458197676)

ALS Compass COC Reference: 8677 **# Samples:** **Sampler:** As above
Phone: ( )

Turnaround Requirements: Standard Urgent

Special Instructions:	ALS Use Only
PFAS bottles did not scan, logged as non-ALS containers.	Custody seal intact? YES NO (N/A)
	Free ice / frozen ice bricks upon receipt? (YES) NO N/A
	Random sample temperature on receipt? 4.4 °C

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
D. Housbroek			ANO Rtn
Date / Time: 27/2 3.40pm	Date / Time: 27/2/20 15:40	Date / Time: 27/2/20 17:00	Date / Time: 27/2/2020 7:29pm

E-MAILED

CHAIN OF CUSTODY

ALS COC#: **8677** *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: ALLENVENG - KLEINFELDER AUSTRALIA PTY LTD

PROJECT: Williamtown SS

SITE: WILLIAMTOWN SS-1

ORDER NO: 20193820

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

PROJECT MANAGER: Dkousbroek Dkousbroek CONTACT PH: 0458 197 676 SAMPLER MOBILE: 0458 197 676

PRIMARY SAMPLER: Dkousbroek Dkousbroek QUOTE NO: ME/114/19 / EM2019ALLENVENG0 010

EMAIL REPORTS TO: dkousbroek@kleinfelder.com, toverton@kleinfelder.com

EMAIL INVOICES TO: dkousbroek@kleinfelder.com

SAMPLE DETAILS							ANALYSIS REQUIRED							
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Dissolved Iron Only Iron (Dissolved) WATER	EP231X PFAS - Full Suite (28 Analytes) WATER	NT-14 Extended water suite B (incl pH) WATER	W-03 NEPM 15 Metals (dissolved) WATER	W-04 SG TRH/BTEXN incl. Silica Gel Clean Up WATER	W-30 11 Metals (Dissolved) WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	BH-1		27/02/2020 12:19 PM	Water	ALS: 6 Non ALS: 0	No	X		X	X	X	X		
002	BH-2		27/02/2020 12:07 PM	Water	ALS: 6 Non ALS: 0	No	X		X	X	X	X		
003	SW1		27/02/2020 11:15 AM	Water	ALS: 6 Non ALS: 2	No	X	X	X	X	X	X		PFAS bottles could not be scanned
004	BH-4		27/02/2020 02:32 PM	Water	ALS: 6 Non ALS: 2	No	X	X	X	X	X	X		PFAS could not be scanned
005	SW3		27/02/2020 11:22 AM	Water	ALS: 6 Non ALS: 2	No	X	X	X	X	X	X		PFAS bottles could not be scanned
006	BH-6		27/02/2020 01:17 PM	Water	ALS: 6 Non ALS: 2	No	X	X	X	X	X	X		Pfas bottles would not scan
007	BH-7		27/02/2020 01:39 PM	Water	ALS: 6 Non ALS: 2	No	X	X	X	X	X	X		PFAS bottles would not scan
008	BH-8		27/02/2020 02:05 PM	Water	ALS: 6 Non ALS: 2	No	X	X	X	X	X	X		PFAS bottles would not scan
009	SW4		27/02/2020 11:24 AM	Water	ALS: 6 Non ALS: 2	No	X	X	X	X	X	X		PFAS bottles could not be scanned

CHAIN OF CUSTODY

ALS COC#: 8677 ALS Laboratory: ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: ALLENVENG - KLEINFELDER AUSTRALIA PTY LTD

PROJECT: Williamtown SS

SITE: WILLIAMTOWN SS-1

ORDER NO: 20193820

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

PROJECT MANAGER: Dkousbroek Dkousbroek CONTACT PH: 0458 197 676 SAMPLER MOBILE: 0458 197 676

PRIMARY SAMPLER: Dkousbroek Dkousbroek QUOTE NO: ME/114/19 / EM2019ALLENVENG0 010

EMAIL REPORTS TO: dkousbroek@kleinfelder.com, toverton@kleinfelder.com

EMAIL INVOICES TO: dkousbroek@kleinfelder.com

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED							
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Dissolved Iron Only Iron (Dissolved) WATER	EP231X PFAS - Full Suite (28 Analytes) WATER	NT-14 Extended water suite B (incl pH) WATER	W-03 NEPM 15 Metals (dissolved) WATER	W-04 SG TRH/BTEXN incl. Silica Gel Clean Up WATER	W-30 11 Metals (Dissolved) WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	DUP13		27/02/2020 01:43 PM	Water	ALS: 4 Non ALS: 2	No	X	X		X	X	X		PFAS bottles would not scan
011	BH-11		27/02/2020 12:40 PM	Water	ALS: 6 Non ALS: 0	No	X		X	X	X	X		
012	TRIP13		27/02/2020 01:48 PM	Water	ALS: 4 Non ALS: 2	No	X	X		X	X	X		
013	TRIP BLANK 13		27/02/2020 02:13 PM	Water	ALS: 4 Non ALS: 2	No	X	X		X	X	X		PFAS bottles would not scan
014	MW239S		27/02/2020 01:02 PM	Water	ALS: 6 Non ALS: 0	No	X		X	X	X	X		

CHAIN OF CUSTODY

ALS COC#: 8677 ALS Laboratory: ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: ALLENVENG - KLEINFELDER AUSTRALIA PTY LTD

PROJECT: Williamtown SS

SITE: WILLIAMTOWN SS-1

ORDER NO: 20193820

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

PROJECT MANAGER: Dkousbroek Dkousbroek CONTACT PH: 0458 197 676 SAMPLER MOBILE: 0458 197 676

PRIMARY SAMPLER: Dkousbroek Dkousbroek QUOTE NO: ME/114/19 / EM2019ALLENVENG0010

EMAIL REPORTS TO: dkousbroek@kleinfelder.com, toverton@kleinfelder.com

EMAIL INVOICES TO: dkousbroek@kleinfelder.com

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	BH-1	Clear Plastic Bottle - Nitric Acid; Filtered	60 mL	00120219056608	Red	Yes	
001	BH-1	Amber Glass Bottle - Unpreserved	100 mL	00400719019571	Orange	No	
001	BH-1	Amber VOC Vial - Sulfuric Acid	40 mL	00160719116422	Purple	No	
001	BH-1	Amber VOC Vial - Sulfuric Acid	40 mL	00160719116418	Purple	No	
001	BH-1	Clear Plastic Bottle - Sulfuric Acid	60 mL	00101019050425	Purple	No	
001	BH-1	Clear Plastic Bottle - Natural	500 mL	00070719080059	Green	No	
002	BH-2	Clear Plastic Bottle - Natural	500 mL	00070719080153	Green	No	
002	BH-2	Clear Plastic Bottle - Sulfuric Acid	60 mL	00101019050537	Purple	No	
002	BH-2	Clear Plastic Bottle - Nitric Acid; Filtered	60 mL	00120219056620	Red	Yes	
002	BH-2	Amber VOC Vial - Sulfuric Acid	40 mL	00160719118225	Purple	No	
002	BH-2	Amber VOC Vial - Sulfuric Acid	40 mL	00160719118231	Purple	No	
002	BH-2	Amber Glass Bottle - Unpreserved	100 mL	00400719019473	Orange	No	
003	SW1	Clear Plastic Bottle - Natural	500 mL	00070519094054	Green	No	
003	SW1	Clear Plastic Bottle - Nitric Acid; Filtered	60 mL	00120219056581	Red	Yes	
003	SW1	Clear Plastic Bottle - Sulfuric Acid	60 mL	00101019050468	Purple	No	
003	SW1	Amber VOC Vial - Sulfuric Acid	40 mL	00160719118197	Purple	No	
003	SW1	Amber VOC Vial - Sulfuric Acid	40 mL	00160719118233	Purple	No	
003	SW1	Amber Glass Bottle - Unpreserved	100 mL	00400719019479	Orange	No	
004	BH-4	Clear Plastic Bottle - Nitric Acid; Filtered	60 mL	00120219056647	Red	Yes	
004	BH-4	Amber Glass Bottle - Unpreserved	100 mL	00400719019523	Orange	No	
004	BH-4	Clear Plastic Bottle - Sulfuric Acid	60 mL	00101019050523	Purple	No	
004	BH-4	Amber VOC Vial - Sulfuric Acid	40 mL	00160719118173	Purple	No	
004	BH-4	Amber VOC Vial - Sulfuric Acid	40 mL	00160719116374	Purple	No	
004	BH-4	Clear Plastic Bottle - Natural	500 mL	00070519094056	Green	No	
005	SW3	Clear Plastic Bottle - Natural	500 mL	00070719080313	Green	No	
005	SW3	Amber Glass Bottle - Unpreserved	100 mL	00400219056159	Orange	No	

CHAIN OF CUSTODY

ALS COC#: 8677 ALS Laboratory: ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: ALLENVENG - KLEINFELDER AUSTRALIA PTY LTD

PROJECT: Williamtown SS

SITE: WILLIAMTOWN SS-1

ORDER NO: 20193820

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

PROJECT MANAGER: Dkousbroek Dkousbroek CONTACT PH: 0458 197 676 SAMPLER MOBILE: 0458 197 676

PRIMARY SAMPLER: Dkousbroek Dkousbroek QUOTE NO: ME/114/19 / EM2019ALLENVENG0010

EMAIL REPORTS TO: dkousbroek@kleinfelder.com, toverton@kleinfelder.com

EMAIL INVOICES TO: dkousbroek@kleinfelder.com

005	SW3	Clear Plastic Bottle - Sulfuric Acid	60 mL	00101019050484	Purple	No	
005	SW3	Clear Plastic Bottle - Nitric Acid; Filtered	60 mL	00121018022311	Red	Yes	
005	SW3	Amber VOC Vial - Sulfuric Acid	40 mL	00160719118254	Purple	No	
005	SW3	Amber VOC Vial - Sulfuric Acid	40 mL	00160719118088	Purple	No	
006	BH-6	Amber VOC Vial - Sulfuric Acid	40 mL	00160719116135	Purple	No	
006	BH-6	Amber VOC Vial - Sulfuric Acid	40 mL	00160719118209	Purple	No	
006	BH-6	Amber Glass Bottle - Unpreserved	100 mL	00400719019567	Orange	No	
006	BH-6	Clear Plastic Bottle - Sulfuric Acid	60 mL	00101019050629	Purple	No	
006	BH-6	Clear Plastic Bottle - Nitric Acid; Filtered	60 mL	00120219056636	Red	Yes	
006	BH-6	Clear Plastic Bottle - Natural	500 mL	00070519076923	Green	No	
007	BH-7	Clear Plastic Bottle - Natural	500 mL	00070519076934	Green	No	
007	BH-7	Amber Glass Bottle - Unpreserved	100 mL	00400719019568	Orange	No	
007	BH-7	Amber VOC Vial - Sulfuric Acid	40 mL	00160719118181	Purple	No	
007	BH-7	Clear Plastic Bottle - Nitric Acid; Filtered	60 mL	00120219056714	Red	Yes	
007	BH-7	Amber VOC Vial - Sulfuric Acid	40 mL	00160719117983	Purple	No	
007	BH-7	Clear Plastic Bottle - Sulfuric Acid	60 mL	00101019050582	Purple	No	
008	BH-8	Clear Plastic Bottle - Sulfuric Acid	60 mL	00101019050558	Purple	No	
008	BH-8	Amber VOC Vial - Sulfuric Acid	40 mL	00160719118246	Purple	No	
008	BH-8	Amber VOC Vial - Sulfuric Acid	40 mL	00160719118307	Purple	No	
008	BH-8	Amber Glass Bottle - Unpreserved	100 mL	00400719019495	Orange	No	
008	BH-8	Clear Plastic Bottle - Nitric Acid; Filtered	60 mL	00120219056634	Red	Yes	
008	BH-8	Clear Plastic Bottle - Natural	500 mL	00070519094068	Green	No	
009	SW4	Clear Plastic Bottle - Natural	500 mL	00070719080176	Green	No	
009	SW4	Clear Plastic Bottle - Sulfuric Acid	60 mL	00101019050547	Purple	No	
009	SW4	Clear Plastic Bottle - Nitric Acid; Filtered	60 mL	00121018022310	Red	Yes	
009	SW4	Amber Glass Bottle - Unpreserved	100 mL	00400719019461	Orange	No	
009	SW4	Amber VOC Vial - Sulfuric Acid	40 mL	00160719117918	Purple	No	

CHAIN OF CUSTODY

COC#: **8677** *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: ALLENVENG - KLEINFELDER AUSTRALIA PTY LTD

PROJECT: Williamtown SS

SITE: WILLIAMTOWN SS-1

ORDER NO: 20193820

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

PROJECT MANAGER: Dkousbroek Dkousbroek CONTACT PH: 0458 197 676 SAMPLER MOBILE: 0458 197 676

PRIMARY SAMPLER: Dkousbroek Dkousbroek QUOTE NO: ME/114/19 / EM2019ALLENVENG0010

EMAIL REPORTS TO: dkousbroek@kleinfelder.com, toverton@kleinfelder.com

EMAIL INVOICES TO: dkousbroek@kleinfelder.com

009	SW4	Amber VOC Vial - Sulfuric Acid	40 mL	00160719117894	Purple	No	
010	DUP13	Amber Glass Bottle - Unpreserved	100 mL	00400719019555	Orange	No	
010	DUP13	Amber VOC Vial - Sulfuric Acid	40 mL	00160719118199	Purple	No	
010	DUP13	Amber VOC Vial - Sulfuric Acid	40 mL	00160719118258	Purple	No	
010	DUP13	Clear Plastic Bottle - Nitric Acid; Filtered	60 mL	00120219056616	Red	Yes	
011	BH-11	Clear Plastic Bottle - Nitric Acid; Filtered	60 mL	00120219056583	Red	Yes	
011	BH-11	Amber VOC Vial - Sulfuric Acid	40 mL	00160719116396	Purple	No	
011	BH-11	Amber VOC Vial - Sulfuric Acid	40 mL	00160719116366	Purple	No	
011	BH-11	Amber Glass Bottle - Unpreserved	100 mL	00400719019506	Orange	No	
011	BH-11	Clear Plastic Bottle - Natural	500 mL	00070719080312	Green	No	
011	BH-11	Clear Plastic Bottle - Sulfuric Acid	60 mL	00101019050505	Purple	No	
012	TRIP13	Amber Glass Bottle - Unpreserved	100 mL	00400719019492	Orange	No	
012	TRIP13	Amber VOC Vial - Sulfuric Acid	40 mL	00160719118187	Purple	No	
012	TRIP13	Amber VOC Vial - Sulfuric Acid	40 mL	00160719117941	Purple	No	
012	TRIP13	Clear Plastic Bottle - Nitric Acid; Filtered	60 mL	00120219056704	Red	Yes	
013	TRIP BLANK 13	Clear Plastic Bottle - Nitric Acid; Filtered	60 mL	00120219051058	Red	Yes	
013	TRIP BLANK 13	Amber VOC Vial - Sulfuric Acid	40 mL	00160719118174	Purple	No	
013	TRIP BLANK 13	Amber VOC Vial - Sulfuric Acid	40 mL	00160719118256	Purple	No	
013	TRIP BLANK 13	Amber Glass Bottle - Unpreserved	100 mL	00400719019447	Orange	No	
014	MW239S	Clear Plastic Bottle - Natural	500 mL	00070519076931	Green	No	
014	MW239S	Amber VOC Vial - Sulfuric Acid	40 mL	00160719118200	Purple	No	
014	MW239S	Amber VOC Vial - Sulfuric Acid	40 mL	00160719118259	Purple	No	
014	MW239S	Clear Plastic Bottle - Sulfuric Acid	60 mL	00101019050353	Purple	No	
014	MW239S	Amber Glass Bottle - Unpreserved	100 mL	00400719019485	Orange	No	
014	MW239S	Clear Plastic Bottle - Nitric Acid; Filtered	60 mL	00120219056625	Red	Yes	

Total Bottle Count: ALS: 78, Non ALS: 20

ATTACHMENT B: TREND DATA