

Quarterly Water Quality Monitoring Results Cabbage Tree Road Sand Quarry, NSW

August 2022 Monitoring Event

NCA22R144273

24 August 2022



Williamtown Sand Syndicate (WSS)
PO Box 898
Newcastle, NSW 2300

Attention: Darren Williams

Subject: Quarterly Water Quality Monitoring Results Cabbage Tree
Road Sand Quarry, NSW
August 2022 Monitoring Event

Please find enclosed the quarterly water quality monitoring results for the August 2022 monitoring event undertaken by Kleinfelder at the Cabbage Tree Road Sand Quarry, NSW.

1 SCOPE OF WORK

The scope of work presented in this report includes the results from the monthly surface and groundwater monitoring event with the additional quarterly scope undertaken in accordance with the NSW Environment Protection Authority (EPA) and Department of Planning and Environment (DPE) requirements for monthly water quality monitoring at the quarry. **Figure 1 (Attachment 1)** presents the surface water and groundwater sampling locations.

The scheduled August 2022 quarterly monitoring event included gauging of all available monitoring wells (a total of 13 wells), recording of field parameters for groundwater and surface water, and sampling from eight monitoring wells and four surface water locations. Furthermore, a wash plant fines and wash plant water sample were taken as part of the quarterly water monitoring program outlined in the Soil and Water Management Plan (SWMP, 2021).

2 SITE WORK

The quarterly monitoring round was conducted on 12 August 2022 and comprised:

- Gauging of 11 monitoring wells (BH2, BH4, BH5, BH6, BH7, BH8, BH9, BH9A, BH10, MW239S & MW239D). BH1 was destroyed during clearing works for the expansion of Area 7, therefore, was not gauged during the August monitoring event. BH1 will be replaced during upcoming well installation works so that groundwater monitoring can continue in the area in subsequent rounds. Additionally, BH11 was inaccessible on the day of sampling due to interference of sand excavation works. An alternate path will be cleared to allow access to BH11 prior to any subsequent monitoring rounds.
- Groundwater sampling from seven monitoring wells (BH1, BH2, BH4, BH6, BH7, BH8, BH9, BH9A, BH12 & MW239S) as summarised in **Table 5** and detailed in **Attachment 2**.
- Surface water sampling from four locations (SW1, SW2, SW3 & SW4) as summarised in **Table 6** and detailed in **Attachment 2**.
- One wash plant fines sample (WPF) as summarised in **Table 7** and detailed in **Attachment 2**.
- One wash plant water sample (WPW) as summarised in **Table 8** and detailed in **Attachment 2**.

Elevated zinc concentrations exceeding the Site-specific Trigger Value were reported at BH2 during the August groundwater monitoring event. As a result, repeat sampling took place on 26 August 2022 at this location, as per the SWMP, confirming concentrations of zinc to be elevated above the Site-specific Trigger Value. Results for the additional analysis are also presented in **Table 5**.

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 determine potential sand/silt inundation and potential maintenance requirements. Following gauging, a HydraSleeve was placed into the well, ensuring the top of the sleeve was located below the water column to be sampled, and suspended in place while all remaining wells were gauged. Each HydraSleeve was then removed from the well and representative groundwater samples taken.



Surface and wash plant water samples were taken directly into laboratory supplied sample containers using a gloved hand. Where access was deemed unsafe, a telescopic sampling pole was used.

Wash plant fines were collected directly into laboratory supplied sample containers. All samples collected were placed into an ice chilled esky and then submitted to a NATA accredited laboratory under a chain of custody (COC) for the analytical schedule as per **Table 1**.

Table 1: Summary of Quarterly Water Quality Analysis (August 2022)

Analysis	Number of Samples				
	Primary	Intra-lab (Duplicate)	Inter-lab (Triplicate)	Transport Blank	Rinsate Blank
Hydrocarbons*	11	1	1	1	1
Metals**	13 (7 x GW, 4 x SW, 1 x WPW & 1 x WPF)	1	1	1	1
PFAS (28 analytes, standard level)	13	2	2	1	1

* TRH (C6 – C40) (Silica Gel)

** Metals Suite (dissolved) –

- Groundwater (GW)- Arsenic (As), Barium (Ba), Chromium (Cr), Copper (Cu), Iron (Fe), Manganese (Mn), Nickel (Ni), Zinc (Zn).
- Surface Water (SW) – As, Ba, Boron (B), Cr, Cobalt (Co), Cu, Fe, Mn, Ni, Zn.
- Wash Plant Water (WPW) – As, Fe, Mn
- Wash Plant Fines (WPF) – As, Ba, Cr, Cu, Fe, Mn, Ni, Zn

Table 2 provides a summary of the gauging data. The full set of gauging data for each monitoring location is provided in **Table 14, Attachment 2**. Additionally, Watershed HydroGeo (2019) outlined a Trigger Action and Response Plan (TARP) to mitigate groundwater elevations that may potentially impact Cabbage Tree Road Sand Quarry operations (primarily sand excavation depths). Based on these recommendations, groundwater elevation has been shaded to correspond to triggers and actions outlined in **Table 3**.

As monitoring wells BH2, BH9 and BH10 have triggered TARP rules outlined in **Table 3**, weekly monitoring of groundwater levels is required at these locations until water levels decline to below high frequency level bores listed in **Table 2**. WSS have taken over the weekly gauging of the affected wells as of 17 June 2022, therefore, groundwater elevation data is being collected by WSS directly. It is also recommended that the Minimum Extraction Level (MEL) be re-analysed and reviewed for BH2 and BH10, in accordance with the TARP Level 2 and Level 3 trigger response, respectively.

Table 2: Summary of Gauging Data

Borehole	Top of Casing (mAHD)	Depth to Water (mBTOC)	Ground-water Elevation (mAHD)	Well Total Depth Current (mBTOC)	Well Total Depth 2014 (mBTOC)	Inferred Max GW Elevation (mAHD) ¹	Difference Between Inferred Max and Measured GW Elevation (mAHD)	Comment
BH1	8.64	-	-	-	9.45	4.5	-	Well decommissioned
BH2	7.79	4.055	3.735	8.94	9.45	3.8	0.065	Clear, no odour / sheen, well in good condition
BH3	-	-	-	-	-	-	-	Well decommissioned



Borehole	Top of Casing (mAHD)	Depth to Water (mBTOC)	Ground-water Elevation (mAHD)	Well Total Depth Current (mBTOC)	Well Total Depth 2014 (mBTOC)	Inferred Max GW Elevation (mAHD) ¹	Difference Between Inferred Max and Measured GW Elevation (mAHD)	Comment
BH4	3.06	0.799	2.261	5.98	6.45	3.0	0.739	Clear, no odour / sheen, well in good condition
BH5	7.36	5.04	2.32	8.80	9.28	4.0	1.68	Gauge only – no sample taken
BH6	3.62	0.711	2.909	4.51	4.95	4.4	1.491	Clear, moderate sulphur odour, no sheen, well in good condition
BH7	2.98	0.945	2.035	4.50	4.95	3.7	1.665	Light yellow, no odour / sheen, well in good condition
BH8	3.88	1.689	2.191	6.10	6.28	4.0	1.809	Milky white, strong sulphur odour, no sheen, well in good condition
BH9	17.75	15.150	2.6	16.19	18.8	3.0	0.4	Gauge only – no sample taken
BH9A	10.25	8.295	1.955	12.44	16.16	3.0 ²	1.045	Light yellow, no odour / sheen, well in good condition
BH10	6.69	1.699	4.991	3.43	5.45	4.9	-0.091	Gauge only – no sample taken
BH11	6.63	-	-	-	5.95	5.5	-	Well inaccessible
BH12	8.67	-	-	-	8.39	4.0	-	Well decommissioned
MW239S	3.04	0.595	2.445	3.80	4.0	3.9	1.455	Cloudy yellow, moderate sulphur odour, no sheen, well in good condition
MW239D	3.04	0.579	2.461	20.58	20.49	3.9 ³	1.439	Gauge only – no sample taken
SW01*	N/A	0.3	N/A	N/A	N/A	N/A	N/A	Natural tannin orange / yellow, moderate sulphur odour, no sheen



Borehole	Top of Casing (mAHD)	Depth to Water (mBTOC)	Ground-water Elevation (mAHD)	Well Total Depth Current (mBTOC)	Well Total Depth 2014 (mBTOC)	Inferred Max GW Elevation (mAHD) ¹	Difference Between Inferred Max and Measured GW Elevation (mAHD)	Comment
SW02*	N/A	0.4	N/A	N/A	N/A	N/A	N/A	Light yellow, no odour / sheen
SW03*	N/A	0.5	N/A	N/A	N/A	N/A	N/A	Clear, no odour / sheen
SW04*	N/A	0.4	N/A	N/A	N/A	N/A	N/A	Clear, no odour / sheen

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

¹ – Sourced from Watershed HydroGeo ,2019, *Maximum Extraction Depth Management Plan, Cabbage Tree Road Sand Quarry*, May 2019.

² – Inferred Max Groundwater level based on adjacent wells (BH4 & BH9).

³ – Inferred Max Groundwater level based on adjacent well (MW239S).

N/A – Not applicable.

Table 3: Groundwater Level Monitoring TARP Rules (Watershed HydroGeo, 2019)

Level	Trigger	Action and Response	Report / Response Actions
0	Groundwater levels more than 0.5 m below <i>inferred</i> maximum historical level at BH1 and BH10. (Table 2).	Standard operations – monthly dipping of operational on-site monitoring bores.	n/a
1	Groundwater levels within 0.5 m below <i>inferred</i> maximum historical level (Table 2) at any on-site bore.	Weekly (or more frequent) monitoring (dipping) of groundwater levels until water level declines to below high frequency level bores listed in Table 2 .	Internal and environmental consultant. Include note in Annual Report.
2	Groundwater levels within 0.25 m of <i>inferred</i> maximum historical level (Table 2) at any on-site bore.	Weekly (or more frequent) monitoring (dipping) of groundwater levels. Re-analysis and review of Minimum Extraction Level (MEL).	WSS to issue letter to DPIE, documenting groundwater level and rainfall trends, review and make recommendations regarding MEL.
3	Groundwater levels within resource area rise above previously <i>inferred</i> maximum groundwater level (Table 2).	Analysis of recent data by hydrogeologist, including site data and data from local HWC wells and local Defence wells (if available). Revision of MEL. Remediation of earlier excavations to revised MEL if required by DPIE.	WSS to issue letter to DPIE, Dol Water and HWC, documenting groundwater level trends, and revision (if necessary) of MEL. Letter to outline remedial options, considering access, vegetation condition in previously rehabilitated areas. Re-grading of previously rehabilitated areas if required by DPIE.

Table 4 provides a summary of the field parameters taken during the August monitoring event. All field parameters for each monitoring location are detailed in the field sheets provided in **Attachment 2**.

Table 4: Summary of Field Measurements

Borehole	Turbidity (NTU)	Temp (°C)	DO (mg/L)	EC (µc/cm)	TDS (mg/L)	pH	Redox (mV)
BH1	ND	ND	ND	ND	ND	ND	ND
BH2	15.58	16.7	4.34	53	34	4.52	269.7



Borehole	Turbidity (NTU)	Temp (°C)	DO (mg/L)	EC (µc/cm)	TDS (mg/L)	pH	Redox (mV)
BH4	10.2	15.5	3.25	77	50	4.86	236
BH5	ND	ND	ND	ND	ND	ND	ND
BH6	156	14.2	3.94	217	141	5.10	-80
BH7	110.4	14.9	3.98	110	72	4.84	11
BH8	782	14.7	4.20	135	88	4.81	-67.9
BH9	ND	ND	ND	ND	ND	ND	ND
BH9A	41.5	17.6	3.96	186	121	4.46	249
BH10	ND	ND	ND	ND	ND	ND	ND
BH11	ND	ND	ND	ND	ND	ND	ND
BH12	ND	ND	ND	ND	ND	ND	ND
MW239S	310	15.2	2.73	115	75	4.60	-69
MW239D	ND	ND	ND	ND	ND	ND	ND
SW1	4.3	12.6	2.97	140	91	5.18	182
SW2	23	12.9	1.11	88.2	57	4.95	-40
SW3	2.80	11.9	1.40	259.8	169	3.99	41.1
SW4	1.34	11.3	3.75	214	140	4.57	224
WPW	205	14.7	10.09	255	166	5.06	210

ND: No Data – no sample taken

Table 5 and **Table 6** below present a summary of the water monitoring results for key analytes found to be elevated above the laboratory limit of reporting (LOR) for groundwater and surface water. **Table 7** and **Table 8** present a summary of the wash plant sampling results for PFAS analytes in both water and fines. Approved and updated groundwater and surface water criteria outlined in the SWMP (7 July 2021) have been applied to this quarterly report including a comment on comparison of results with previous data.

Non-detects for analytes BTEXN, TRH, TPH and PFAS were reported at all groundwater and surface water locations and are therefore not included in the below summary tables. Full results summary tables, including quality control sample analyses, are provided in **Tables 1 – 13, Attachment 2**. Full Laboratory certificates of analysis (COA), including copies of chain of custody (COC), are provided in **Attachment 3**.



Table 5: Groundwater Results and Screening Criteria

Analyte	Metals										Discussion of results relative to previous monitoring (details on specific data trends provided in Section 4 below)
	Arsenic	Barium	Chromium**1	Copper**	Cobalt	Iron	Manganese**	Nickel	Zinc**		
LOR	0.001	0.001	0.001	0.001	0.001	0.05	0.001	0.001	0.005		
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		
Adopted Site Specific Trigger Values (SWMP 2021)	0.003	0.07	0.004	0.083	0.006	4.1 (8.84 for BH1)	0.136	0.02	0.085 (0.1 for BH1)		
Sample ID	Groundwater										
BH1	NS	NS	NS	NS	NS	NS	NS	NS	NS	Metals for BH1 were not analysed, no sample collected.	
BH2	<0.001	0.005	<0.001	0.012	NS	<0.05	NS	0.001	0.169 0.151 (repeat sample)	Metal concentrations were generally consistent with historical results and remain below adopted criteria, except for zinc (0.169 mg/L) which has increased since the previous May sampling round (0.005 mg/L) to concentrations above the adopted criteria (0.085 mg/L). This exceeds the previous site wide maximum of 0.043 mg/L recorded in June 2020. Repeat sampling confirmed the zinc exceedance (0.151 mg/L) yet shows a slight decrease since the August monitoring event took place. BH2 is located marginally down hydraulic gradient from the current quarry operations footprint.	
BH4	<0.001	0.013	<0.001	0.050	NS	<0.05	NS	<0.001	0.013	Metal concentrations were generally consistent with historical variations and remain below adopted criteria. Copper (0.050 mg/L) concentrations have further decreased since June 2022 (0.082 mg/L) when sampling last occurred, confirming a decreasing trend. This follows a prior exceedance of copper (0.097 mg/L) during the May monitoring round. BH4 is located down hydraulic gradient (approximately 140 m) from current quarry operations and on the southernmost boundary of the site adjacent to Cabbage Tree Road.	



Analyte	Metals									Discussion of results relative to previous monitoring (details on specific data trends provided in Section 4 below)
	Arsenic	Barium	Chromium**1	Copper**	Cobalt	Iron	Manganese**	Nickel	Zinc**	
LOR	0.001	0.001	0.001	0.001	0.001	0.05	0.001	0.001	0.005	
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
Adopted Site Specific Trigger Values (SWMP 2021)	0.003	0.07	0.004	0.083	0.006	4.1 (8.84 for BH1)	0.136	0.02	0.085 (0.1 for BH1)	
BH6	<0.001	0.008	<0.001	<0.001	NS	2.38	NS	<0.001	0.008	
BH7	<0.001	0.003	0.002	0.003	NS	0.56	NS	0.002	<0.005	
BH8	0.001	0.006	0.002	<0.001	NS	1.54	NS	0.001	0.007	
BH9	NS	NS	NS	NS	NS	NS	NS	NS	NS	
BH9A	<0.001	0.009	<0.001	0.004	NS	0.53	NS	0.004	0.008	
BH10	NS	NS	NS	NS	NS	NS	NS	NS	NS	
MW239S	<0.001	0.002	0.002	<0.001	NS	0.40	NS	0.004	0.008	



Analyte	Metals									Discussion of results relative to previous monitoring (details on specific data trends provided in Section 4 below)
	Arsenic	Barium	Chromium**1	Copper**	Cobalt	Iron	Manganese**	Nickel	Zinc**	
LOR	0.001	0.001	0.001	0.001	0.001	0.05	0.001	0.001	0.005	
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
Adopted Site Specific Trigger Values (SWMP 2021)	0.003	0.07	0.004	0.083	0.006	4.1 (8.84 for BH1)	0.136	0.02	0.085 (0.1 for BH1)	
										MW239S is located approximately 426 m east and upgradient of the current quarry operations.
BH11	NS	NS	NS	NS	NS	NS	NS	NS	NS	Metals for BH11 were not analysed as no sample was collected.
BH12	NS	NS	NS	NS	NS	NS	NS	NS	NS	Metals for BH12 were not analysed as no sample was collected.

Notes:

< - Less than laboratory limit of reporting

NS – No Sample

NA – No Site specific trigger value assigned



Table 6: Surface Water Results and Screening Criteria

Analyte	Metals										Discussion of results relative to previous monitoring (details on specific data trends provided in Section 4 below)
	Arsenic	Barium	Chromium**1	Copper**	Cobalt	Iron	Manganese**	Nickel	Zinc**		
LOR	0.001	0.001	0.001	0.001	0.001	0.05	0.001	0.001	0.005		
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		
Site Specific Trigger Values (SWMP 2021)	0.006	0.08	0.004	0.033	0.017	7.25 (32 for SW3 & SW4)	0.841	0.02	0.535		
Sample Name	Surface Water										
SW1	<0.001	0.007	0.003	0.001	<0.001	2.92	NS	0.002	0.019	Metal concentrations were generally in line with historical variations and below the Site Specific Trigger Values. SW1 is located on the southernmost boundary of the quarry adjacent to Cabbage Tree Road.	
SW2	<0.001	0.005	0.001	<0.001	<0.001	2.79	NS	0.001	0.090	SW2 was previously dry during all sampling periods from 2019 – February 2021. Metal concentrations detected at SW2 during the August monitoring event were all below the Site Specific Trigger Values, consistent with the previous May 2022 GME. SW2 is the most northern located surface water monitoring point directly adjacent or central to current quarry operations.	
SW3	<0.001	0.012	0.001	<0.001	0.003	9.73	NS	0.004	0.007	Metal concentrations were generally consistent with historical variations. SW3 is located within a drainage channel that travels from west to east along the south-eastern perimeter of the quarry. SW3 is approximately 476 m east of the current quarry operations.	
SW4	<0.001	0.022	0.002	<0.001	0.003	0.39	NS	0.004	0.011	Metal concentrations at SW4 appear to be stable across all analytes. SW4 is located downstream of SW3 on the eastern most perimeter of the quarry.	



Notes:

< - Less than laboratory limit of reporting

NS – No Sample



Table 7: Wash Plant Fines Sample Results and Screening Criteria

Analyte	PFAS		Discussion of results
	PFOA	Sum of PFOS + PFHxS	
LOR	0.0002	0.0002	
Units	mg/kg	mg/kg	
Site Specific Trigger Values (SWMP 2021)	0.1	0.01	
Sample Name	Sand Wash Plant		
WPF	<0.0002	0.0006	Non-detect for PFOA was reported at this location, in line with the previous May 2022 monitoring event. PFOS (0.0006 mg/kg) was reported for a fifth time during the August 2022 monitoring round at decreased concentrations compared to the previous detection in May 2022 (0.0012 mg/kg). Concentrations have not exceeded the Site Specific Trigger Value (0.01 mg/kg) in any instance.

Notes:

< - Less than laboratory limit of reporting

Table 8: Wash Plant Water Sample Results and Screening Criteria

Analyte	PFAS		Discussion of results
	PFOA	Sum of PFOS + PFHxS	
LOR	0.01	0.01	
Units	µg/L	µg/L	
Site Specific Trigger Values (SWMP 2021)	0.56	0.07	
Sample Name	Sand Wash Plant		
WPW	<0.01	<0.01	PFOA and the Sum of PFOS + PFHxS were not detected at this location during the August 2022 GME, despite reported concentrations above the LOR during the previous July 2022 monitoring round.

Notes:

< - Less than laboratory limit of reporting

3 RAINWATER DATA

Table 9 presents the rainfall data from Williamtown RAAF base (Station Number: 061078, Latitude: 32.79°S; Longitude: 151.84°E; Elevation: 8 m) for the period 2021/22. The total monthly rainfall for August 2022 fell below the monthly mean, a significant decrease in comparison to the previous July 2022 rainfall data. Based on current rainfall data (mean and monthly totals) for August 2022, it is expected that surface and groundwater elevations will begin to decrease which is consistent with groundwater trend data.

Table 9: 2021-2022 Rainfall data (12-month period)

Date	Sep (21)	Oct (21)	Nov (21)	Dec (21)	Jan (22)	Feb (22)	Mar (22)	Apr (22)	May (22)	Jun (22)	Jul (22)	Aug (22)



Date	Sep (21)	Oct (21)	Nov (21)	Dec (21)	Jan (22)	Feb (22)	Mar (22)	Apr (22)	May (22)	Jun (22)	Jul (22)	Aug (22)
1st	0	0	0.2	0	0	0	18.2	13.6	2.0	0	0	0
2nd	0	5.4	0	0.2	0	7.6	25.2	1.4	0	0	14.6	0.2
3rd	0	0	0	0	0	13.0	32.2	0	0	0	42.0	0
4th	0	0	0	0.2	1.0	32.8	55.4	ND	0	1.6	59.8	0
5th	3.0	0	4.0	0	7.6	7.2	0.2	0.2	4.0	0	49.8	12.0
6th	0	0	0	0	2.2	4.4	11.6	0.2	ND	0	36.6	0
7th	0	0	0	2.8	1.0	1.4	5.4	0	0	0	37.0	0
8th	0	0	21.0	0.6	10.4	2.0	11.8	36.2	0	0	0	0
9th	0	0	0	10.0	9.2	0.6	68.0	1.2	0	0	0	1.4
10th	12.6	0	0.4	0.8	0	0	0.6	2.0	1.8	0	3.2	18.4
11th	0	23.6	20.2	0	0	0	3.8	0.2	15.8	0	44.2	0.2
12th	0	10.2	56.8	0	0	39.4	0.6	8.4	8.8	0	0.2	0
13th	0	19.8	0.2	0	0.4	1.0	0.2	15.8	5.8	0	0	5.2
14th	0	1.2	0	0	0	0	0	10.8	4.0	0	12.4	0.2
15th	0	3.0	0	0	0	0	0.8	1.2	0	0	12.0	0
16th	0	0.2	0.2	0.2	5.4	0	0.8	0.2	0	0	0	0
17th	0	0	0	1.8	0.2	0	0.2	0	0	0	0	0
18th	0.4	0	0.6	0	0	8.6	0	0	0	1.0	0	0
19th	0	0	0	0	32.0	0.2	2.2	0	0	18.4	0.2	0
20th	2.2	3.4	0	0.6	13.2	0	0.4	0.2	2.6	7.4	7.8	0
21st	8.8	0.2	5.0	0.2	0.2	0	0	0	15.0	0.2	0.4	0
22nd	0.4	0.2	27.6	0	0	0	0	14.6	4.4	0	2.0	0
23rd	0	0	9.4	0	0	25.2	0	6.4	33.0	0	0	0
24th	0	5.4	0.6	0.4	6.8	3.2	35.6	10.0	8.0	0	1.8	0.6
25th	0	0.2	3.4	0	0	6.0	29.4	0.2	4.6	0	1.4	0
26th	0.6	0	31.2	0	0	6.0	14.4	0.2	0	0	1.2	0
27th	0	0	16.4	0	0	2.6	6.8	0.2	0	0	0.6	0
28th	0	0	15.8	2.4	0	0.2	0.8	0.6	0.2	0	0	0.2
29th	0	0	0.8	-	0	-	2.4	0.2	0	0	0	0
30th	0	0	0	0.2	0	-	12.2	0	0	0	0.2	0
31st	-	1.6	-	0	0	-	14.8	-	4.2	-	0	0
Total	28.0	74.4	213.8	20.4	89.6	161.4	354.0	124.0	114.2	28.6	327.4	38.4
Mean	60.6	75.9	81.9	78.6	99.5	118.3	125.2	109.5	108.6	124.6	72.6	72.8

Notes:

ND – no data retrieved.



4 DATA TRENDS

Data trends, taken from analyses undertaken throughout the duration of the sampling program (January 2019 – current), are provided as **Attachment 4**. Generally, the trends indicate a steady decrease in groundwater elevations from April 2021 to January 2022. This is likely due to a continuation of reduced rainfall following the March 2021 monitoring event. More recently, the groundwater elevations have shown a rapid increase since February 2022 as a result of above-average rainfall recorded over the past four months.

Groundwater elevations have historically triggered the Groundwater Level Monitoring TARP Rules (**Table 3**) at BH1, BH2, BH9, BH9A, BH10 and BH11 between the months of April 2022 to July 2022. As a result, weekly gauging has been carried out at the affected locations to closely monitor elevation changes. During the current month, BH9, BH2 and BH10 have recorded groundwater elevations that trigger the Level 1, Level 2 and Level 3 TARP Rules, respectively. It is recommended that the Minimum Extraction Level (MEL) be re-analysed and reviewed for BH2 and BH10, in accordance with the TARP trigger response.

Overall, groundwater levels for the current month generally appear to be decreasing, in line with the recent below-average rainfall noted in **Section 3**. Based on these trends, groundwater elevations are likely to stabilise across the quarry.

Notable changes in data trends were observed for the following analytes:

- Copper – Concentrations of copper have remained stable across the quarry, with several locations below the LOR. Copper concentrations at BH4 have further decreased since June 2022 when sampling last occurred, confirming a decreasing trend. This follows a prior exceedance of the Site Specific Trigger Value during the May 2022 monitoring round. Historical variations beginning in 2019 show a seasonal trend where concentrations begin to rise in May, peak during August/September and fall back to stable levels by October 2021. These increased concentrations may be attributed to the decrease in rainfall associated with the winter months. Overall trends also show a long-term temporal increase, where the peak concentrations are increasing with each seasonal event. Notwithstanding, copper concentrations remain below the drinking water criteria.
- Zinc – Concentrations of zinc have remained stable or slightly increased across the quarry, including at BH2 where concentrations have risen above the adopted criteria. This exceeds the previous site-wide maximum last recorded in June 2020. Repeat sampling was undertaken at this location two weeks later and confirmed the elevated zinc concentrations.
- PFAS – The Sum of PFOS + PFHxS was reported in the WPF sample for the fifth time during the August 2022 monitoring round at decreased concentrations compared to the previous detection in May 2022. Concentrations have not exceeded the Site Specific Trigger Value in any instance. PFAS was not detected in the WPW sample during the current August 2022 sampling round, despite reported concentrations of PFOA and Sum of PFOS + PFHxS above the LOR during the previous July monitoring event.

5 CLOSING

Overall, the results suggest that since quarry operations began in August 2019, there has been negligible change in analytical results across the sampled locations. Concentrations of zinc at BH2 have increased since May 2022 when sampling last occurred, to concentrations now above the Site Specific Trigger Value. Repeat sampling carried out two weeks later confirmed the elevated zinc levels, however, shows a slight decrease since the original August monitoring event took place. According to the SWMP:

"Where two consecutive samples are:

- a. ABOVE the adopted trigger value, BUT LESS than previous data, this may suggest an incorrectly set trigger value that does not fully account for seasonal changes. Consider updating trigger value at next management plan update.*
- b. ABOVE the adopted trigger value AND previous data this may indicate a more significant change in water quality and a Water Trigger Investigation will be undertaken in accordance with Section 8.6.4."*

Since the zinc concentrations at BH2 were significantly higher than previously reported in the historical data, it is suggested that a Water Trigger Investigation be undertaken to address the exceedance, in accordance with the SWMP.



We trust that the above report meets with your requirements. If you have any questions, please do not hesitate to contact the undersigned.

Sincerely,

Kleinfelder Australia Pty Ltd

Megan Ferguson

Environmental Consultant

Contaminated Land Management

MFerguson@kleinfelder.com

Mobile: 0455 981 953

Attachments

Attachment: 1 Figures

Attachment 2: Results tables and field records

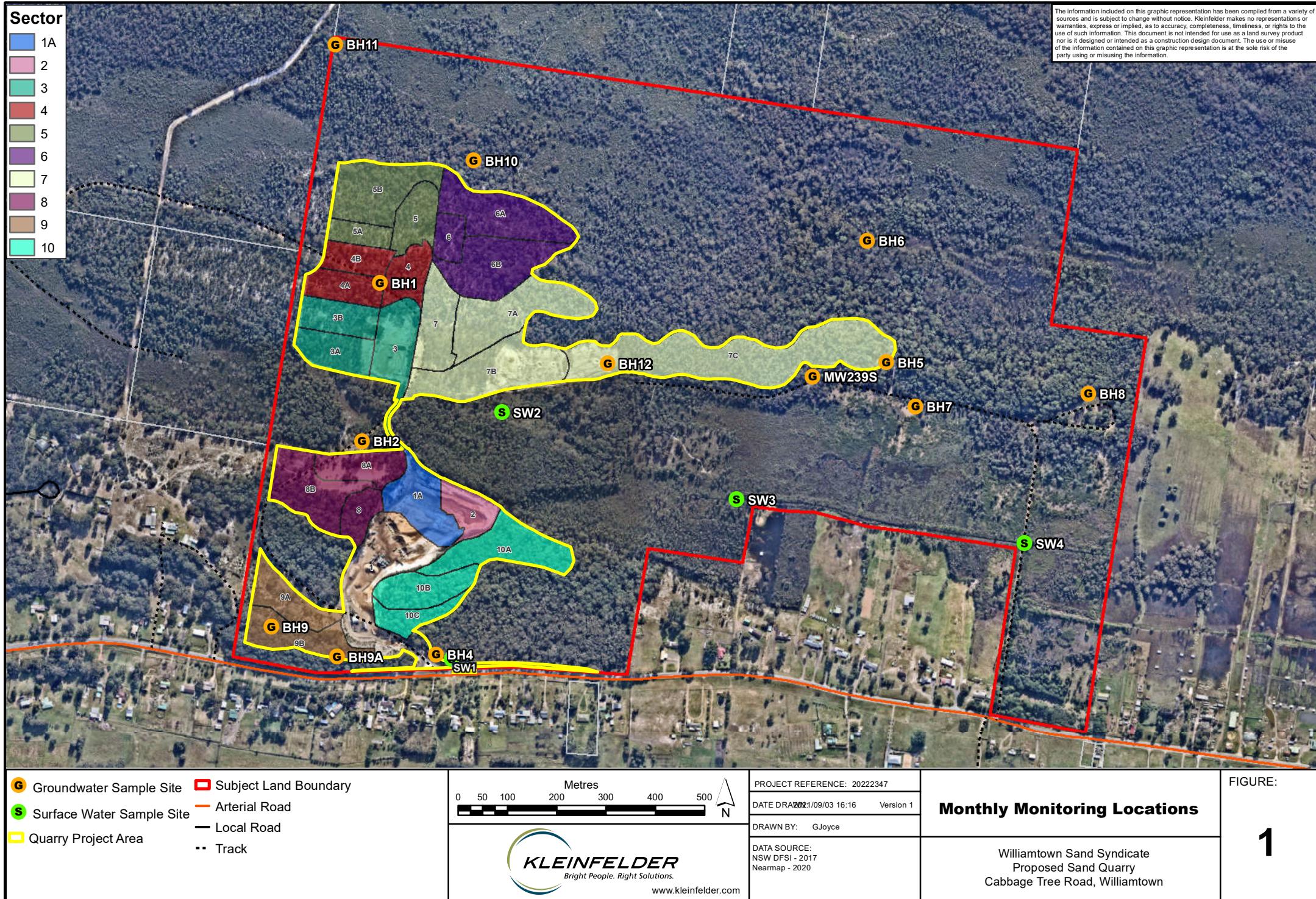
Attachment 3: Lab results

Attachment 4: Data Trends



ATTACHMENT 1: FIGURES





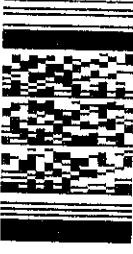


ATTACHMENT 2: RESULTS TABLES AND FIELD RECORDS



SITE, COC AND CONTACT DATA									
Client: Kleinfelder Australia Pty Ltd Suite 3, 240-244 Pacific Hwy Charlestown, NSW 2290 Phone: 02 4949 5200	Site Name: WISS - Cabbarine Tree Rd Water Monitoring August 2022	Sampler Name: Megan Ferguson	Contract Number: 0455 981 953	Contract Email: mferguson@kleinfelder.com	Laboratory: ALS	5585 Mailand Rd Mayfield West, Newcastle NSW 2304 Phone: (02) 4014 2500			
QUOTE NUMBER ME/114/19 Job No.: 2022247	Received TAT: 24 hrs	Days: 3 days	5 days	7 days EDD Format	Sent Results to: mferguson@kleinfelder.com.au dkousholt@kleinfelder.com	Suite 3, 240-244 Pacific Hwy Charlestown, NSW 2290 newcastle@kleinfelder.com Phone: 02 4949 5200			
Data QA Level: LAB minimum unless specified:									
CHAIN OF CUSTODY									
Reinquished by (print): <i>Megan Ferguson</i>	Received by (print): <i>Megan Ferguson</i>	Reinquished by (print): <i>Megan Ferguson</i>	Date / Time: 14/5/22	Date / Time: 17/5/22	Date / Time: -	Received By: (sign)	Date / Time: -	Date / Time: -	Comments
Date / Time: 12/08/22 2:44 PM	Date / Time: -	Date / Time: 2:50	Temp. (°C): -	Notes: Ice present / no ice seals intact / no seal	Notes: -	Notes: -	Temp. (°C): -	Notes: Ice present / no ice seals intact / no seal	
Sample ID	Lab ID	Sample Point	Sample Type	Date	Start Depth	End Depth	Latitude	# Contaminants	Other Analytes
									EF231X PEAS (28 elements, extended water sulfate, extended standard solution)
BH2		Water	Water	12/08/2022				6	Fe & Mn 3 metals only (As, Zn, B & Co)
BH4		Water	Water	12/08/2022				6	NT 14 - Extended Water Sulfate
BH6		Water	Water	12/08/2022				6	EFPM 15 W-03 Metals - Total Dissolved Metals (As, B, Cu, Fe, Mg, Ni, Zn, B & Co)
BH7		Water	Water	12/08/2022				6	EFPM 060 / EP071SG TRH With Silica Gel Filter (dissolved metals)
BH8		Water	Water	12/08/2022				6	EFPM 060 / EP071SG TRH With Silica Gel Filter (dissolved metals)
BH9A		Water	Water	12/08/2022				6	EFPM 060 / EP071SG TRH With Silica Gel Filter (dissolved metals)
BH44		Water	Water	12/08/2022				8	EFPM 060 / EP071SG TRH With Silica Gel Filter (dissolved metals)
MW239S		Water	Water	12/08/2022				6	EFPM 060 / EP071SG TRH With Silica Gel Filter (dissolved metals)
SW1		Water	Water	12/08/2022				6	EFPM 060 / EP071SG TRH With Silica Gel Filter (dissolved metals)
SW2		Water	Water	12/08/2022				6	EFPM 060 / EP071SG TRH With Silica Gel Filter (dissolved metals)
SW3		Water	Water	12/08/2022				6	EFPM 060 / EP071SG TRH With Silica Gel Filter (dissolved metals)
SW4		Water	Water	12/08/2022				3	EFPM 060 / EP071SG TRH With Silica Gel Filter (dissolved metals)
WPW		Sediment	Sediment	12/08/2022				2	EFPM 060 / EP071SG TRH With Silica Gel Filter (dissolved metals)
NPW									

 W-03 Metals (NEPM 15) - As, Ba, B, Cd, Cr, Co, Cu, Fe, Pb, Mn, Hg, Ni, Se, V, Zn
 NT14 - Extended water sulfate B

 Environmental Division
 Sydney
 Work Order Reference
ES2228800






QA/QC SAMPLE REGISTERS

11

10

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Date:	12/8	Field Manager:	MF
Site Address:	Cabbage Tree Rd, Williamsburg.		
Site Name:	20222347	Lat:	35

COMMENTS:

PERMIT TO WORK



DETAILS PTW

Work Location	WSS - across site	Date: <i>12/8/22</i>	Permit Ref No:
		Time Start: <i>7:45</i>	Finish:
Details	Scope of the work: <i>Groundwater & surface water monitoring / sampling</i>		
Description of Work	Equipment to be worked on:		
	Expected duration and other relevant information:		

TYPE OF WORK REQUESTED (all applicable)

		<u>Permit Status</u>	THE JOB IS BEING DONE BY:
<input type="checkbox"/> Energy Isolation	→	<input type="checkbox"/> LIVE <input type="checkbox"/> Closed	<input type="checkbox"/> Newcastle Sand
<input type="checkbox"/> Hot Work	→	<input type="checkbox"/> LIVE <input type="checkbox"/> Closed	<input checked="" type="checkbox"/> Contractor – Company name: <i>MF</i>
<input type="checkbox"/> Work at Heights	→	<input type="checkbox"/> LIVE <input type="checkbox"/> Closed	<i>ICleinfielder</i>
<input type="checkbox"/> Excavation	→	<input type="checkbox"/> LIVE <input type="checkbox"/> Closed	Permit Authoriser must sign with his initials, verifying that:
<input type="checkbox"/> Confined Space	→	<input type="checkbox"/> LIVE <input type="checkbox"/> Closed	<ul style="list-style-type: none"> • A SWMS is attached (or suitable SWP) • The SWMS (or suitable SWP) covers all types of work requested on the left; and • The SWMS (or suitable SWP) was reviewed by the workers
<input checked="" type="checkbox"/> OTHER: <i>groundwater sampling</i>			<input type="checkbox"/>



WHEN A WORK PERMIT REQUIRES AN ADDITIONAL DOCUMENTATION, IT MUST BE ATTACHED AS PART OF THE PTW AUTHORISATION.

E.g. for work on High Voltage equipment, work above water, other.

The PERMIT AUTHORISER signs with their initials, VERIFYING that the required additional HRW(s) is ATTACHED, together with the relevant SWMS / SWP.

AUTHORISATION TO PROCEED

PERMIT HOLDER - Signs acknowledging that they are responsible for the work described in this PTW and has ensured that:

Risk controls described throughout this PTW (including following pages) and attached SWMS/SWP have been implemented.

Date: *12/8/22* Time: *7:45*

Signed: *Megan*

Name: *Megan Ferguson*

PERMIT AUTHORISER - Signs authorising the work to proceed after having:

Inspected the work area; and

Verified that risk controls indicated throughout this PTW (including following pages) and attached SWMS/SWP have been implemented.

Date: *12/8/22* Time: *8:00am*

Signed: *Eliott*

Name: *Eliott Lauer*



HYDRASLEEVE™ SAMPLING LOG

Project Number:	Date:	Site Address:
2022-2347	12/8	Cabage Tree Rd, Williamsburg
WSS	MF	

Well ID	Sample Time	Field Measurements						Redox (mV)	Turbidity (NTU)	Description (Odour, Colour, Sheen)
		Total Depth (mbTOC)	Sample Depth (mbTOC)	Temp (°C)	DO (mg/L)	EC (µc/cm)	TDS (mg/L)			
BH1	-	-	-	16.7	4.34	53	34	4.52	269.7	15.58
BH2	4.055	-	-	15.5	3.25	77	50	4.86	236	10.2
BH4	0.745	0.745	-	14.2	3.94	217	141	5.10	-80	156
BH5	-	5.04	-	14.9	3.98	110	72	4.34	11	110.4
BH6	0.711	-	-	14.7	4.20	135	88	4.81	-67.9	782
BH7	0.945	-	-	17.6	3.96	186	121	4.46	249	41.5
BH8	1.689	-	-	17.6	3.96	186	121	4.46	249	41.5
BH9	-	15.150	-	17.6	3.96	186	121	4.46	249	41.5
BH9A	8.295	-	-	15.2	2.73	115	75	4.00	-69	310
BH10	-	1.619	-	15.2	2.73	115	75	4.00	-69	310
BH11	-	-	-	12.6	2.97	140	91	5.18	182	4.3
BH12	-	-	-	12.9	1.1	88.2	57	4.95	-40	23
BH3	-	-	-	11.9	1.40	259.8	169	3.99	41.1	280
BH4	-	-	-	11.3	3.75	214	140	4.57	224	1.34
WPW	-	-	-	14.7	10.09	265	166	5.06	210	205

KENNARDS

HIRE

EQUIPMENT CERTIFICATION REPORT

PGN9003871 WATER QUALITY METER – MULTIFUNCTION (YSI)

Plant Number: 1090142

SENSOR	CONCENTRATION	SPAN 1	SPAN 2	TRACEABILITY	PASS
pH	pH 4	pH 4		# 371300	<input checked="" type="checkbox"/>
pH	pH 7	pH 7		# 384001	<input checked="" type="checkbox"/>
Conductivity	12.88 mS/cm	12.88 mS/cm		# 381242	<input checked="" type="checkbox"/>
Dissolved Oxygen	Sodium Sulphite / Air	0.0ppm in Sodium Sulphite	ppm Saturation in Air	# 11897	<input checked="" type="checkbox"/>
ORP	240mV	240mV	Zobell Part A	# 375760	<input checked="" type="checkbox"/>
Turbidity	0 NTU	0 NTU		# 374424	<input checked="" type="checkbox"/>
Turbidity	90 NTU	90 NTU		# 386473	<input checked="" type="checkbox"/>

Battery Status <input checked="" type="checkbox"/> (%)	Temperature 20.4 °C
Electrical Test & Tag (AS/NZS 3760)	Electrodes Cleaned and Checked

Note: Calibration solution traceability information is available upon request.

Please clean/decontaminate instrument and accessories before returning. A minimum 'Cleaning Fee' \$55.00 (Inc GST) may apply if instrument is returned contaminated.

Checked By: Jacob Arnott Date: 05/08/22 Signed: 

Accessories List:

User's Manual	pH and ORP Storage Solution	Transit Case



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Analyte		Anions and Cations															Alkalinity							Inorganics				
		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	Sodium Adsorption Ratio	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Hydroxide Alkalinity as CaCO3	Total Alkalinity as CaCO3	Total Hardness as CaCO3	Electrical Conductivity @ 25°C	Total Dissolved Solids	pH	
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	meq/L	meq/L	-	mg/L	mg/L	mg/L	mg/L	mg/L	μS/cm	mg/L	pH units		
Adopted Site Specific Trigger Values (SWMP 2021)		77	5.0	11	2.0	70	148	0.2	--	2.0	--	--	0.5	5.9	--	--	--	--	--	--	--	--	--	500	--	4.2-6.5		
NHMRC ADWG - HEALTH GUIDELINES		--	--	--	--	--	--	1.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Sample Name	Sample Date	15-Mar-19	11	2.0	1.0	< 1.0	< 1.0	25	< 0.1	-	-	-	-	-	-	-	0.66	0.88	-	9.0	< 1.0	9.0	9.0	104	68	5.67		
BH1	23-Apr-19	14	1.0	2.0	< 1.0	4.0	25	< 0.1	-	-	-	-	-	-	-	-	0.82	0.99	-	10	< 1.0	10	11	84	97	5.83		
	16-May-19	12	< 1.0	2.0	< 1.0	5.0	25	< 0.1	0.03	< 0.01	< 0.01	< 0.01	0.11	0.3	0.3	0.69	1.01	1.7	10	< 1.0	< 1.0	10	8.0	105	164	5.82		
	14-Jun-19	10	< 1.0	2.0	< 1.0	3.0	24	< 0.1	-	-	-	-	-	-	-	0.6	0.94	-	10	< 1.0	< 1.0	10	8.0	99	72	5.52		
	16-Jul-19	15	< 1.0	2.0	< 1.0	4.0	23	< 0.1	-	-	-	-	-	-	-	0.82	0.95	-	11	< 1.0	< 1.0	11	8.0	102	84	5.62		
	15-Aug-19	14	< 1.0	2.0	< 1.0	2.0	21	< 0.1	-	-	-	-	-	-	-	0.77	0.91	-	14	< 1.0	< 1.0	14	8.0	128	82	6.22		
	16-Sep-19	13	< 1.0	2.0	< 1.0	2.0	20	< 0.1	0.06	< 0.01	< 0.01	< 0.01	0.12	0.3	0.3	0.73	0.76	1.84	8.0	< 1.0	< 1.0	8.0	8.0	102	88	5.44		
	15-Oct-19	13	< 1.0	2.0	< 1.0	2.0	21	< 0.1	-	-	-	-	-	-	-	0.73	0.71	-	4.0	< 1.0	< 1.0	4.0	8.0	98	64	5.5		
	18-Nov-19	16	< 1.0	2.0	< 1.0	3.0	23	< 0.1	< 0.01	-	< 0.01	-	-	-	-	0.3	0.86	1.19	2.26	24	< 1.0	< 1.0	24	8.0	126	82	6.29	
	16-Sep-20	13	< 1.0	2.0	< 1.0	2.0	21	< 0.1	-	-	-	-	-	-	-	0.73	0.81	-	9.0	< 1.0	< 1.0	9.0	8.0	95	81	5.87		
	16-Oct-20	14	< 1.0	2.0	< 1.0	4.0	21	< 0.1	-	-	-	-	-	-	-	0.77	0.84	-	8.0	< 1.0	< 1.0	8.0	8.0	88	57	5.7		
	16-Nov-20	11	< 1.0	2.0	< 1.0	5.0	18	< 0.1	< 0.01	0.02	< 0.01	< 0.01	-	-	-	0.2	1.02	1.05	1.55	22	< 1.0	< 1.0	22	8.0	120	78	5.98	
	16-Dec-20	13	< 1.0	2.0	< 1.0	1.0	6.0	22	< 0.1	-	-	-	-	-	-	0.93	1.16	-	21	< 1.0	< 1.0	21	8.0	134	87	5.76		
	14-Jan-21	12	< 1.0	2.0	< 1.0	5.0	23	< 0.1	-	-	-	-	-	-	-	0.96	1.07	-	16	< 1.0	< 1.0	16	8.0	124	81	5.63		
	16-Feb-21	14	< 1.0	2.0	< 1.0	5.0	25	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	0.02	0.02	-	-	< 0.1	0.8	1.05	1.98	12	< 1.0	< 1.0	12	8.0	116	75	5.57
	17-Mar-21	14	1.0	2.0	< 1.0	4.0	23	< 0.1	-	-	-	-	-	-	-	0.82	0.95	-	11	< 1.0	< 1.0	11	11	111	72	6.02		
	13-Oct-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.66			
	24-Feb-22	14	1.0	3.0	< 1.0	10	23	< 0.1	-	< 0.01	-	-	0.02	0.11	0.2	0.2	0.9	1.18	-	< 1.0	< 1.0	16	15	127	82	5.95		
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	< 1.0	< 1.0	41	346	278	4.67		
	15-Mar-19	26	< 1.0	2.0	< 1.0	2.0	52	< 0.1	-	-	-	-	-	-	-	1.3	1.51	-	< 1.0	< 1.0	< 1.0	8.0	186	121	4.82			
	23-Apr-19	32	< 1.0	5.0	< 1.0	2.0	57	< 0.1	-	-	-	-	-	-	-	1.8	1.65	-	< 1.0	< 1.0	< 1.0	20	150	135	4.99			
	16-May-19	29	< 1.0	4.0	< 1.0	2.0	55	< 0.1	< 0.01	0.01	< 0.01	< 0.01	0.12	0.4	0.4	1.59	1.59	3.0	< 1.0	< 1.0	< 1.0	16	188	216	4.91			
	14-Jun-19	26	< 1.0	3.0	< 1.0	53	< 0.1	-	-	-	-	-	-	-	-	1.38	1.5	-	< 1.0	< 1.0	< 1.0	12	175	107	4.84			
	16-Jul-19	49	< 1.0	8.0	< 1.0	8.0	73	0.2	-	-	-	-	-	-	-	2.79	2.22	-	< 1.0	< 1.0	< 1.0	33	318	192	4.68			
	15-Aug-19	28	< 1.0	3.0	< 1.0	4.0	47	< 0.1	-	-	-	-	-	-	-	1.46	1.41	-	< 1.0	< 1.0	< 1.0	12	197	135	4.88			
	16-Sep-19	27	< 1.0	3.0	< 1.0	5.0	46	< 0.1	< 0.01	0.12	< 0.01	< 0.01	0.15	0.7	0.7	1.42	1.4	3.18	< 1.0	< 1.0	< 1.0	12	195	140	4.66			
	15-Oct-19	28	< 1.0	3.0	< 1.0	3.0	44	< 0.1	-	-	-	-	-	-	-	1.46	1.3	-	< 1.0	< 1.0	< 1.0	12	194	126	4.92</			

BH6	16-Sep-20	36	2.0	4.0	1.0	16	55	< 0.1	-	-	-	-	-	-	-	2.02	1.9	-	1.0	< 1.0	< 1.0	1.0	21	273	121	4.98		
	16-Oct-20	36	2.0	5.0	1.0	12	64	< 0.1	-	-	-	-	-	-	-	2.1	2.14	-	4.0	< 1.0	< 1.0	4.0	26	249	162	5.3		
BH7	16-Nov-20	37	3.0	5.0	2.0	23	61	< 0.1	0.01	0.08	< 0.01	0.01	0.01	-	-	0.3	2.22	2.2	3.04	< 1.0	< 1.0	< 1.0	28	321	209	4.45		
	16-Dec-20	46	3.0	6.0	2.0	15	75	< 0.1	-	-	-	-	-	-	-	2.7	2.43	-	< 1.0	< 1.0	< 1.0	32	321	209	4.63			
	14-Jan-21	39	3.0	5.0	2.0	21	73	< 0.1	-	-	-	-	-	-	-	2.31	2.5	-	< 1.0	< 1.0	< 1.0	28	332	216	4.33			
	16-Feb-21	43	3.0	6.0	2.0	18	72	< 0.1	0.1	< 0.01	< 0.01	< 0.01	-	-	-	2.56	2.46	3.3	3.0	< 1.0	< 1.0	3.0	32	316	205	4.89		
	17-Mar-21	51	4.0	9.0	1.0	25	80	< 0.1	-	-	-	-	-	-	-	3.18	2.82	-	2.0	< 1.0	< 1.0	2.0	47	358	233	5.07		
	13-Oct-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.1		
	24-Feb-22	30	< 1.0	4.0	< 1.0	10	61	< 0.1	-	0.11	-	-	0.02	0.04	0.4	0.4	1.63	1.93	-	-	< 1.0	< 1.0	< 1.0	16	241	157	3.92	
	12-Apr-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	27-May-22	-	-	4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	12-Aug-22	-	-	4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
BH8	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	< 1.0	< 1.0	20	213	196	4.76		
	14-Mar-19	36	< 1.0	6.0	2.0	16	61	< 0.1	-	-	-	-	-	-	-	2.11	2.05	-	< 1.0	< 1.0	< 1.0	25	271	176	4.73			
	23-Apr-19	38	< 1.0	6.0	2.0	17	62	< 0.1	-	-	-	-	-	-	-	2.2	2.1	-	< 1.0	< 1.0	< 1.0	25	205	185	4.51			
	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	< 1.0	< 1.0	20	235	310	4.87		
	14-Jun-19	31	< 1.0	4.0	2.0	11	56	0.1	-	-	-	-	-	-	-	1.73	1.81	-	< 1.0	< 1.0	< 1.0	16	213	145	4.91			
	16-Jul-19	36	< 1.0	5.0	2.0	12	46	< 0.1	-	-	-	-	-	-	-	2.03	1.55	-	< 1.0	< 1.0	< 1.0	20	202	164	5.0			
	15-Aug-19	32	< 1.0	4.0	2.0	15	49	0.1	-	-	-	-	-	-	-	1.77	1.85	8.0	< 1.0	< 1.0	8.0	16	232	168	5.53			
	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	< 1.0	< 1.0	5.0	16	222	181	5.07	
	15-Oct-19	34	< 1.0	5.0	2.0	12	53	< 0.1	-	-	-	-	-	-	-	1.94	1.74	-	< 1.0	< 1.0	< 1.0	20	252	164	4.95			
	18-Nov-19	31	< 1.0	5.0	1.0	15	56	0.1	< 0.01	-	< 0.01	-	-	-	-	0.5	1.78	1.89	2.89	< 1.0	< 1.0	< 1.0	20	239	155	4.97		
	16-Sep-20	33	< 1.0	5.0	2.0	12	62	0.1	-	-	-	-	-	-	-	1.9	2.0	-	< 1.0	< 1.0	< 1.0	20	248	140	4.81			
	16-Oct-20	34	< 1.0	5.0	2.0	9.0	64	< 0.1	-	-	-	-	-	-	-	1.94	1.99	-	< 1.0	< 1.0	< 1.0	20	243	158	4.87			
	16-Nov-20	30	< 1.0	5.0	2.0	9.0	54	0.1	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	-	0.6	1.77	1.71	2.79	< 1.0	< 1.0	< 1.0	20	245	159	4.57		
	16-Dec-20	30	< 1.0	6.0	2.0	9.0	58	0.1	-	-	-	-	-	-	-	1.85	1.82	-	< 1.0	< 1.0	< 1.0	25	265	172	4.34			
	14-Jan-21	31	< 1.0	5.0	2.0	10	63	0.1	-	-	-	-	-	-	-	1.81	1.98	-	< 1.0	< 1.0	< 1.0	20	267	174	4.62			
	16-Feb-21	34	< 1.0	6.0	2.0	12	64	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	-	0.6	2.02	2.06	2.9	< 1.0	< 1.0	< 1.0	25	270	176	4.54		
	17-Mar-21	36	< 1.0	7.0	2.0	11	68	< 0.1	-	-	-	-	-	-	-	2.19	2.15	-	< 1.0	< 1.0	< 1.0	29	279	181	4.9			
	13-Oct-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.22				
	24-Feb-22	17	< 1.0	2.0	1.0	8.0	25	< 0.1	-	0.12	-	-	0.02	0.08	1.0	1.0	0.93	0.87	-	-	< 1.0	< 1.0	< 1.0	8.0	124	81	4.43	
	12-Apr-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	27-May-22	-	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	12-Aug-22	-	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
BH8	21-Feb-19	52	< 1.0	6.0	< 1.0	11	90	< 0.1	< 0.01	1.97	< 0.01	< 0.01	-	-	-	0.5	2.4	2.4	2.76	2.77	4.44	< 1.0	< 1.0	< 1.0	25	352	258	4.46
	14-Mar-19	45	< 1.0	6.0	< 1.0	6.0	76	< 0.1	-	-	-	-	-	-	-	2.45	2.27	-	< 1.0	< 1.0	< 1.0	25	319	207	4.77			
	23-Apr-19	53																										

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
Adopted Site Specific Trigger Values (SWMP 2021)		0.003	0.07	0.002	0.1	0.0002	0.004	0.006	0.083	4.1 (8.84 for BH1)	0.001	0.136	0.0001	0.02	0.01	0.01	0.085 (0.1 for BH1)
NHMRC ADWG - HEALTH GUIDELINES		0.01	2	0.06	4	0.002	--	--	2	--	0.01	0.5	0.001	0.02	0.01	--	--
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	-	< 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
	16-Sep-20	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	0.005	5.48	< 0.001	0.01	< 0.0001	< 0.001	< 0.01	< 0.01	0.016
	16-Oct-20	< 0.001	0.006	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	0.001	5.55	< 0.001	0.009	< 0.0001	< 0.001	< 0.01	< 0.01	0.017
	16-Nov-20	< 0.001	0.002	< 0.001	< 0.05	< 0.0001	0.003	< 0.001	0.001	7.05	< 0.001	0.012	< 0.0001	< 0.001	< 0.01	< 0.01	0.045
	16-Dec-20	< 0.001	0.006	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	0.008	3.21	< 0.001	0.011	< 0.0001	0.001	< 0.01	< 0.01	0.077
	14-Jan-21	< 0.001	0.002	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	0.001	5.21	< 0.001	0.013	< 0.0001	< 0.001	< 0.01	< 0.01	0.032
	16-Feb-21	< 0.001	0.003	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	0.001	3.24	< 0.001	0.015	< 0.0001	< 0.001	< 0.01	< 0.01	0.652
	17-Mar-21	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	< 0.001	4.0	< 0.001	0.027	< 0.0001	< 0.001	< 0.01	< 0.01	0.596
	24-Feb-22	< 0.001	0.003	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	< 0.001	7.7	< 0.001	0.018	< 0.0001	< 0.001	< 0.01	< 0.01	0.106
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	-	< 0.001	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

16-Feb-21	< 0.001	0.003	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.021	< 0.05	< 0.001	0.009	< 0.0001	0.007	< 0.01	< 0.01	0.017				
17-Mar-21	< 0.001	0.005	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	0.003	< 0.05	< 0.001	0.016	< 0.0001	< 0.001	< 0.01	< 0.01	0.006				
22-Sep-21	< 0.001	-	-	-	-	-	-	-	< 0.05	-	0.013	-	-	-	-	-	-	-		
13-Oct-21	< 0.001	-	-	-	-	-	-	-	0.08	-	0.012	-	-	-	-	-	-	-		
16-Nov-21	< 0.001	0.003	-	-	-	< 0.001	-	0.006	< 0.05	-	-	< 0.001	-	-	-	-	< 0.005	-		
15-Dec-21	< 0.001	-	-	-	-	-	-	-	0.05	-	0.008	-	-	-	-	-	-	-		
18-Jan-22	< 0.001	-	-	-	-	-	-	-	0.49	-	0.012	-	-	-	-	-	-	-		
24-Feb-22	0.002	0.003	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.001	0.009	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005				
12-Apr-22	0.001	-	-	-	-	-	-	-	0.25	-	0.009	-	-	-	-	-	-	-		
27-May-22	< 0.001	0.002	-	-	-	< 0.001	-	0.004	< 0.05	-	-	< 0.001	< 0.001	-	-	0.005				
17-Jun-22	< 0.001	-	-	-	-	-	-	-	< 0.05	-	0.007	-	-	-	-	-	-	-		
27-Jul-22	< 0.001	-	-	-	-	-	-	-	< 0.05	-	0.008	-	-	-	-	-	-	-		
12-Aug-22	< 0.001	0.005	-	-	-	< 0.001	-	0.012	< 0.05	-	-	-	-	-	0.001	-	-	0.169		
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	0.27	< 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	-	< 0.001	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			
	16-Sep-20	< 0.001	0.013	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.078	0.06	< 0.001	0.012	< 0.0001	< 0.001	< 0.01	< 0.01	0.006			
	16-Oct-20	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.003	0.25	< 0.001	0.021	< 0.0001	0.001	< 0.01	< 0.01	0.018			
	16-Nov-20	< 0.001	0.008	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.005	0.18	< 0.001	0.008	< 0.0001	0.001	< 0.01	< 0.01	0.005			
	16-Dec-20	< 0.001	0.011	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.002	0.46	< 0.001	0.027	< 0.0001	0.003	< 0.01	< 0.01	< 0.005			
	14-Jan-21	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.012	0.27	< 0.001	0.012	< 0.0001	0.002	< 0.01	< 0.01	0.006			
	16-Feb-21	< 0.001	0.02	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.002	0.94	< 0.001	0.023	< 0.0001	0.003	< 0.01	< 0.01	0.008			
	17-Mar-21	< 0.001	0.027	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.006	1.39	< 0.001	0.029	< 0.0001	0.002	< 0.01	< 0.01	0.019			
	22-Sep-21	< 0.001	0.009	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.172	0.1	< 0.001	0.02	< 0.0001	< 0.001	< 0.01	< 0.01	0.006			
	13-Oct-21	< 0.001	0.009	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.026	1.65	< 0.001	0.019	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005			
	16-Nov-21	< 0.001	0.009	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.012	0.38	< 0.001	0.021	< 0.0001	0.001	< 0.01	< 0.01	0.006			
	15-Dec-21	< 0.001	-	-	-	-	-	-	0.69	-	0.016									

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	-	< 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
	16-Sep-20	< 0.001	0.013	< 0.001	< 0.05	< 0.0001	0.002	0.002	< 0.001	1.67	< 0.001	0.021	< 0.0001	0.003	< 0.01	< 0.01	0.006
	16-Oct-20	< 0.001	0.009	< 0.001	< 0.05	< 0.0001	0.002	0.002	< 0.001	1.49	< 0.001	0.015	< 0.0001	0.003	< 0.01	< 0.01	0.015
	16-Nov-20	< 0.001	0.006	< 0.001	< 0.05	< 0.0001	0.002	0.003	< 0.001	1.72	< 0.001	0.023	< 0.0001	0.003	< 0.01	< 0.01	0.006
	16-Dec-20	< 0.001	0.003	< 0.001	< 0.05	< 0.0001	0.002	0.002	< 0.001	1.79	< 0.001	0.024	< 0.0001	0.003	< 0.01	< 0.01	< 0.005
	14-Jan-21	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.002	0.002	0.004	1.65	< 0.001	0.025	< 0.0001	0.004	< 0.01	< 0.01	0.017
	16-Feb-21	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.002	0.002	0.002	1.74	< 0.001	0.025	< 0.0001	0.004	< 0.01	< 0.01	0.013
	17-Mar-21	< 0.001	0.009	< 0.001	< 0.05	< 0.0001	0.002	0.003	< 0.001	2.28	< 0.001	0.028	< 0.0001	0.005	< 0.01	< 0.01	< 0.005
	22-Sep-21	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.003	0.003	< 0.001	0.62	< 0.001	0.005	< 0.0001	0.002	< 0.01	< 0.01	< 0.005
	13-Oct-21	< 0.001	0.006	< 0.001	< 0.05	< 0.0001	0.003	0.003	< 0.001	0.69	0.002	0.005	< 0.0001	0.002	< 0.01	< 0.01	< 0.005
	16-Nov-21	< 0.001	0.002	< 0.001	< 0.05	< 0.0001	0.003	0.003	< 0.001	0.39	< 0.001	0.003	< 0.0001	0.002	< 0.01	< 0.01	0.007
	15-Dec-21	< 0.001	-	-	-	-	-	-	-	0.47	-	0.002	-	-	-	-	
	18-Jan-22	< 0.001	-	-	-	-	-	-	-	0.45	-	0.002	-	-	-	-	
	24-Feb-22	< 0.001	0.002	< 0.001	< 0.05	< 0.0001	0.003	< 0.001	< 0.001	0.66	< 0.001	0.003	< 0.0001	0.002	< 0.01	< 0.01	< 0.005
	12-Apr-22	< 0.001	-	-	-	-	-	-	-	0.43	-	0.004	-	-	-	-	
	27-May-22	< 0.001	0.003	-	-	-	0.003	-	< 0.001	0.52	-	-	-	0.002	-	0.005	
	17-Jun-22	< 0.001	-	-	-	-	-	-	-	0.56	-	0.004	-	-	-	-	
	27-Jul-22	< 0.001	-	-	-	-	-	-	-	0.51	-	0.004	-	-	-	-	
	12-Aug-22	< 0.001	0.003	-	-	-	0.002	-	0.003	0.56	-	-	-	0.002	-	< 0.005	
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	0.005
	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															

MW239S	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	-	< 0.001	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
	16-Sep-20	< 0.001	0.016	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	0.002	0.51	< 0.001	0.008	< 0.0001	0.002	< 0.01	< 0.01	0.006
	16-Oct-20	< 0.001	0.009	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	< 0.001	1.17	< 0.001	0.009	< 0.0001	0.002	< 0.01	< 0.01	0.005
	16-Nov-20	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	0.001	0.3	< 0.001	0.011	< 0.0001	0.003	< 0.01	< 0.01	0.021
	16-Dec-20	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	< 0.001	1.06	< 0.001	0.011	< 0.0001	0.002	< 0.01	< 0.01	< 0.005
	14-Jan-21	< 0.001	0.011	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	0.005	0.77	< 0.001	0.012	< 0.0001	0.004	< 0.01	< 0.01	0.011
	16-Feb-21	< 0.001	0.011	< 0.001	< 0.05	< 0.0001	0.002	0.001	0.01	0.92	< 0.001	0.012	< 0.0001	0.009	< 0.01	< 0.01	0.014
	17-Mar-21	< 0.001	0.011	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	< 0.001	0.95	< 0.001	0.01	< 0.0001	0.004	< 0.01	< 0.01	0.009
	22-Sep-21	< 0.001	0.005	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	< 0.001	0.65	< 0.001	0.004	< 0.0001	0.001	< 0.01	< 0.01	0.005
	13-Oct-21	< 0.001	0.003	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	< 0.001	0.79	< 0.001	0.008	< 0.0001	0.002	< 0.01	< 0.01	0.016
	16-Nov-21	< 0.001	0.005	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	< 0.001	0.68	< 0.001	0.006	< 0.0001	0.002	< 0.01	< 0.01	0.01
	15-Dec-21	< 0.001	-	-	-	-	-	-	-	0.77	-	0.005	-	-	-	-	
	18-Jan-22	< 0.001	-	-	-	-	-	-	-	0.48	-	0.003	-	-	-	-	
	24-Feb-22	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	0.002	< 0.001	< 0.001	0.55	< 0.001	0.004	< 0.0001	0.002	< 0.01	< 0.01	0.006
	12-Apr-22	< 0.001	-	-	-	-	-	-	-	0.93	-	0.007	-	-	-	-	
	27-May-22	< 0.001	0.004	-	-	-	0.002	-	< 0.001	0.56	-	-	-	0.001	-	-	0.009
	17-Jun-22	< 0.001	-	-	-	-	-	-	-	0.36	-	0.004	-	-	-	-	
	27-Jul-22	< 0.001	-	-	-	-	-	-	-	0.43	-	0.004	-	-	-	-	
	12-Aug-22	< 0.001	0.002	-	-	-	0.002	-	< 0.001	0.4	-	-	-	0.001	-	-	< 0.005

Notes:

- - Not analysed

< - Less than laboratory limit of reporting

mg/L - Milligrams per litre

Bold indicates a detection above the laboratory limit of reporting

Highlighting indicates an exceedance of the corresponding criteria (highlighting corresponds to the guideline with the highest criteria value where analytical result exceeds more than one guideline)

Criteria:

SWMP 2021 - Soil and Water Management Plan, July 2021

National Health and Medical Research Council - Australian Drinking Water Guidelines 6 - Version 3.7 Updated January 2022 - Health Guidelines

Analyte	BTEXN								Total Petroleum Hydrocarbons		Total Petroleum Hydrocarbons - Silica Clean-up				Total Recoverable Hydrocarbons		Total Recoverable Hydrocarbons - Silica 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
	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
Adopted Site Specific Trigger Values (SWMP 2021)	--	--	--	--	--	--	--	--	1,710	< 50	< 100	< 50	< 50	1,690	1,690	< 100	< 100	< 100	< 100	< 100
NHMR ADWG - HEALTH GUIDELINES	1	800	300	--	--	600	--	--	40	-	-	-	-	30	30	-	-	-	-	-
Sample Name	Sample Date								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
BH1	15-Mar-19	< 1.0	< 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	< 5.0	< 1.0	40	-	-	-	-	30	30	-	-	-	-	-
	16-May-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 20	< 20	-	-	-	-	-
	14-Jun-19	< 1.0	< 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	< 5.0	< 1.0	< 20	-	-	-	-	< 20	< 20	-	-	-	-	-
	15-Oct-19	< 1.0	< 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-Dec-19	< 1.0	< 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-Feb-20	< 1.0	< 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-Mar-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	22-Sep-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 100	< 100	< 50	< 50	< 20	< 20	-	-	-	-	-
	13-Oct-21	< 1.0	< 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-Nov-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	24-Feb-22	< 1.0	< 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-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
	21-Feb-19	< 1.0	< 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
	15-Mar-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	40	-	-	-	-	30	30	-	-	-	-	-
	16-May-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 20	< 20	-	-	-	-	-
	14-Jun-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 20	< 20	-	-	-	-	-
	15-Aug-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 20	< 20	-	-	-	-	-
	16-Sep-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 20	< 20	-	-	-	-	-
	15-Oct-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 20	< 20	-	-	-	-	-
	18-Nov-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 20	< 20	-	-	-	-	-
	16-Sep-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 20	< 20	-	-	-	-	-
	16-Oct-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 20	< 20	-	-	-	-	-
	16-Nov-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 20	< 20	-	-	-	-	-
	16-Dec-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 20	< 20	-	-	-	-	-
	14-Jan-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 20	< 20	-	-	-	-	-
	17-Mar-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-</td							

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	-	-	-	-	< 20	< 20	-	-	-	-	-
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
16-Sep-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-Oct-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-Nov-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-Dec-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
14-Jan-21	< 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-Feb-21	< 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-Mar-21	< 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-Nov-21	< 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
24-Feb-22	< 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-May-22	< 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
12-Aug-22	< 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, total xylenes, naphthalene

Bold Indicates a detection above the laboratory limit of reporting

Highlighting indicates an exceedance of the corresponding criteria (highlighting corresponds to the guideline with the highest criteria value where analytical result exceeds more than one guideline)

Criteria:

SWMP 2021 - Soil and Water Management Plan, July 2021

National Health and Medical Research Council - Australian Drinking Water Guidelines 6 - Version 3.7 Updated January 2022 - Health Guidelines

Analyte		Anions and Cations																Alkalinity								Inorganics	
		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	Sodium Adsorption Ratio	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Hydroxide Alkalinity as CaCO3	Total Alkalinity as CaCO3	Total Hardness as CaCO3	Electrical Conductivity @ 25°C	Total Dissolved Solids	pH
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	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	pH units
Adopted Site Specific Trigger Values (SWMP 2021)		142	40	52	8.0	324	234	0.8	--	0.17	--	--	--	0.2	5.9	--	--	--	--	--	--	--	--	500	--	4.2-6.5	
NHMRC ADWG - HEALTH GUIDELINES		--	--	--	--	--	--	1.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
SW1	Sample Name	Sample Date																									
	23-Apr-19	94	34	52	6.0	310	95	0.5	-	-	-	-	-	-	-	-	10	9.13	-	< 1.0	< 1.0	< 1.0	< 1.0	299	893	707	4.01
	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	8.94	9.9	2.45	< 1.0	< 1.0	< 1.0	< 1.0	233	947	715	4.6	
	14-Jun-19	77	20	34	5.0	182	112	0.4	-	-	-	-	-	-	-	7.27	6.95	-	< 1.0	< 1.0	< 1.0	< 1.0	190	847	512	4.5	
	16-Jul-19	90	20	35	4.0	240	130	0.4	-	-	-	-	-	-	-	7.9	8.66	-	< 1.0	< 1.0	< 1.0	< 1.0	194	876	568	4.42	
	15-Aug-19	97	18	32	4.0	212	134	0.4	-	-	-	-	-	-	-	7.85	8.19	-	< 1.0	< 1.0	< 1.0	< 1.0	177	813	548	4.53	
	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	3.49	< 1.0	< 1.0	< 1.0	< 1.0	213	1,080	689	4.32
	15-Oct-19	124	16	31	3.0	127	191	0.6	-	-	-	< 0.01	-	-	-	8.82	8.03	-	< 1.0	< 1.0	< 1.0	< 1.0	168	1,050	682	5.32	
	18-Nov-19	142	14	30	4.0	165	234	0.5	< 0.01	-	< 0.01	-	-	-	-	1.1	9.45	10	4.91	< 1.0	< 1.0	< 1.0	< 1.0	158	1,090	708	5.06
	16-Sep-20	9.0	16	3.0	< 1.0	< 1.0	0.1	-	-	-	-	-	-	-	-	1.51	1.1	-	55	< 1.0	< 1.0	55	52	137	152	6.5	
	16-Oct-20	12	40	4.0	< 1.0	16	0.2	-	-	-	-	-	-	-	-	2.95	2.69	-	112	< 1.0	< 1.0	112	116	268	174	7.29	
	16-Nov-20	8.0	13	2.0	3.0	< 1.0	10	< 0.1	0.03	< 0.01	0.04	0.04	-	-	-	0.6	1.24	1.12	0.54	42	< 1.0	< 1.0	42	41	127	82	6.5
	16-Dec-20	10	19	2.0	3.0	5.0	12	0.1	-	-	-	-	-	-	-	1.62	1.68	-	62	< 1.0	< 1.0	62	56	171	111	7.01	
	14-Jan-21	10	18	2.0	3.0	< 1.0	13	0.1	-	-	-	-	-	-	-	1.57	1.46	-	55	< 1.0	< 1.0	55	53	154	100	6.71	
	16-Feb-21	10	15	2.0	3.0	< 1.0	12	0.1	< 0.01	0.02	< 0.01	< 0.01	< 0.01	-	-	0.5	1.42	1.36	0.64	51	< 1.0	< 1.0	51	46	141	92	6.93
	17-Mar-21	10	15	2.0	2.0	< 1.0	13	0.1	-	-	-	-	-	-	-	1.4	1.26	-	45	< 1.0	< 1.0	45	46	139	90	6.63	
	13-Oct-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.82		
	16-Nov-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	24-Feb-22	6.0	9.0	2.0	2.0	< 1.0	10	< 0.1	-	0.11	< 0.01	0.02	1.0	1.0	0.92	0.8	-	-	< 1.0	< 1.0	26	31	89	58	6.38		
	27-May-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	12-Aug-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
SW2	17-Mar-21	12	2.0	2.0	< 1.0	6.0	16	0.2	-	-	-	-	-	-	-	0.79	0.58	-	< 1.0	< 1.0	< 1.0	< 1.0	13	83	54	5.08	
	22-Sep-21	14	2.0	2.0	2.0	16	30	0.1	< 0.01	0.08	< 0.01	1.77	1.77	-	-	1.2	0.92	1.18	1.67	< 1.0	< 1.0	< 1.0	< 1.0	13	235	153	3.55
	13-Oct-21	10	< 1.0	1.0	< 1.0	6.0	18	< 0.1	< 0.01	0.03	< 0.01	0.02	-	-	-	0.6	0.52	0.63	1.88	< 1.0	< 1.0	< 1.0	< 1.0	4.0	77	50	4.58
	16-Nov-21	10	2.0	2.0	< 1.0	7.0	16	0.1	< 0.01	0.09	< 0.01	< 0.01	< 0.01	-	-	1.8	0.7	0.6	1.2	< 1.0	< 1.0	< 1.0	< 1.0	-	93	60	4.39
	24-Feb-22	10	1.0	1.0	< 1.0	2.0	21	0.1	-	0.63	-	< 0.01	0.31	7.5	7.5	0.57	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	7.0	97	63	4.32
	12-Aug-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	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	< 1.0	< 1.0	11	26	262	228	6.21
SW3	14-Mar-19	45	6.0</																								

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	mg/L
Adopted Site Specific Trigger Values (SWMP 2021)		0.006	0.08	0.002	0.1	0.0002	0.004	0.006	0.033	7.25 (32 for SW3 & SW4)	0.003	0.841	0.0001	0.02	0.01	0.01	0.535	
NHMRC ADWG - HEALTH GUIDELINES		0.01	2	0.06	4	0.002	--	--	2	--	0.01	0.5	0.001	0.02	0.01	--	--	
Sample Name	Sample Date																	
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	-	< 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	
	16-Sep-20	< 0.001	0.021	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.001	0.76	< 0.001	0.15	< 0.0001	0.001	< 0.01	< 0.01	0.061	
	16-Oct-20	0.001	0.021	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.005	0.18	< 0.001	0.017	< 0.0001	< 0.001	< 0.01	< 0.01	0.005	
	16-Nov-20	< 0.001	0.02	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.003	0.18	< 0.001	0.058	< 0.0001	< 0.001	< 0.01	< 0.01	0.013	
	16-Dec-20	< 0.001	0.015	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.003	0.18	< 0.001	0.058	< 0.0001	< 0.001	< 0.01	< 0.01	0.013	
	14-Jan-21	< 0.001	0.012	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.02	0.35	< 0.001	0.04	< 0.0001	0.006	< 0.01	< 0.01	0.037	
	16-Feb-21	< 0.001	0.011	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.12	< 0.001	0.028	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.01	0.024	
	17-Mar-21	< 0.001	0.013	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.16	< 0.001	0.036	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.01	0.04	
	16-Nov-21	< 0.001	0.006	-	< 0.05	-	< 0.001	< 0.001	0.002	1.0	-	-	-	0.001	-	-	0.036	
	24-Feb-22	< 0.001	0.01	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.12	< 0.001	0.025	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.01	0.014	
	27-May-22	< 0.001	0.01	-	< 0.05	-	0.003	0.001	< 0.001	4.39	-	-	-	0.002	-	-	0.047	
	12-Aug-22	< 0.001	0.007	-	< 0.05	-	0.003	< 0.001	0.001	2.92	-	-	-	0.002	-	-	0.019	
SW2	17-Mar-21	< 0.001	0.005	< 0.001	< 0.05	< 0.0001	0.001	0.002	< 0.001	0.62	< 0.001	0.11	< 0.0001	0.004	< 0.01	< 0.01	0.097	
	22-Sep-21	< 0.001	0.007	< 0.001	< 0.05	< 0.0001	< 0.001	0.003	< 0.001	1.11	< 0.001	0.087	< 0.0001	0.005	< 0.01	< 0.01	0.134	
	13-Oct-21	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.88	< 0.001	0.049	< 0.0001	0.002	< 0.01	< 0.01	0.06		
	16-Nov-21	0.001	0.005	< 0.001	< 0.05	< 0.0001	0.001	0.002	< 0.001	5.59	< 0.001	0.064	< 0.0001	0.004	< 0.01	< 0.01	0.083	
	24-Feb-22	< 0.001	0.008	< 0.001	< 0.05	< 0.0001	0.002	0.002	< 0.001	16	< 0.001	0.032	< 0.0001	0.006	< 0.01	< 0.01	0.099	
	27-May-22	< 0.001	0.005	-	< 0.05	-	0.001	0.001	< 0.001	1.7	-	-	-	0.002	-	-	0.111	
	12-Aug-22	< 0.001	0.005	-	< 0.05	-	0.001	< 0.001	2.79	-	-	-	-	0.001	-	-	0.09	
SW3	22-Feb-19	0.003	0.075	< 0.001	< 0.05	< 0.0001	< 0.001	0.001	0.002	< 0.001	0.62	< 0.001	0.11	< 0.0001	0.004	< 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												

Notes:

- - Not analysed

< - Less than laboratory limit of reporting

$\mu\text{g/L}$ - Micrograms per litre

Bold indicates a detection above the laboratory limit of reporting.

Highlighting indicates an exceedance of the corresponding criteria (highlighting corresponds to the guideline with the highest criteria value where analytical result exceeds more than one guideline)

Criteria

SWMP 2021 - Soil and Water Management Plan, July 2021

National Health and Medical Research Council - Australian Drinking Water Guidelines 6 - Version 3.7 Updated January 2022 - Health Guidelines

Per- and Por-Fluoroalkyl Substances National Environment Protection Measures - Human Health Guideline Values - Recreational Water Quality Guideline Value (NHMRC 2019)

Per- and Poly-Fluoroalkyl Substances National Environment Protection Measures Freshwater 99% Species Protection - High Conservation Value Systems

Notes

- - Not analysed

< - Less than laboratory limit of reporting

$\mu\text{g/L}$ - Micrograms per litre
BTEXN - Benzene, toluene

BTEXN - Benzene, toluene, ethylbenzene, total xylenes, naphthalene

Criteria:

SWMP 2021 - Soil and Water Management Plan, July 2021
National Health and Medical Research Council - Australian

National Health and Medical Research Council - Australian Drinking Water Guidelines 6 - Version 3.7 Updated January 2022 - Health Guidelines

Analyte		Perfluoroalkyl Sulfonamides							Perfluoroalkyl Carboxylic Acids							
		Perfluoroctane sulfonamide (FOSA)	N-Methyl-perfluoroctane sulfonamide (MeFOSA)	N-Ethyl perfluoroctane sulfonamide (EtFOSA)	N-Methyl perfluoroctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluoroctane sulfonamidoethanol (EtFOSE)	N-Ethyl perfluoroctane sulfonamidoacetic acid (EtFOSAA)	N-Methyl perfluoroctane sulfonamidoacetic acid (MeFOSAA)	Perfluorobutanoic acid (PFBA)	Perfluoro-n-pentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluoroctanoate (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluorotridecanoic acid (PFTrDA)
LOR		0.02	0.05	0.05	0.05	0.05	0.02	0.02	0.1	0.02	0.02	0.02	0.01	0.02	0.02	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
Adopted Site Specific Trigger Values (SWMP 2021)		--	--	--	--	--	--	--	--	--	--	--	0.56	--	--	--
PFAS NEMP 2020 - HUMAN HEALTH RECREATION		--	--	--	--	--	--	--	--	--	--	--	10	--	--	--
PFAS NEMP 2020 FRESHWATER 99% LOSP		--	--	--	--	--	--	--	--	--	--	--	19	--	--	--
Sample Name	Sample Date															
INPUT	22-Sep-21	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02
WPW	22-Sep-21	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02
	13-Oct-21	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02
	16-Nov-21	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02
	15-Dec-21	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02
	18-Jan-22	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02
	24-Feb-22	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02
	12-Apr-22	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02
	27-May-22	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02
	17-Jun-22	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02
	27-Jul-22	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02
	12-Aug-22	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02

Notes:

-- Not analysed
< - Less than laboratory limit of reporting

µg/L - Micrograms per litre

Bold indicates a detection above the laboratory limit of reporting

Highlighting indicates an exceedance of the corresponding criteria (highlighting corresponds to the guideline with the highest criteria value where analytical result exceeds more than one guideline)

Criteria:

SWMP 2021 - Soil and Water Management Plan, July 2021

Per- and Por-Fluoroalkyl Substances National Environment Protection Measures - Human Health Guideline Values - Recreational Water Quality Guideline Value (NHMRC 2019)

Per- and Por-Fluoroalkyl Substances National Environment Protection Measures Freshwater 99% Species Protection - High Conservation Value Systems

			Perfluoroalkyl Sulfonic Acids										(n:2) Fluorotelomer Sulfonic Acids			Sum of PFAS		
Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorobutanesulfonic acid (PFBs)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexanesulfonic acid (PFHxS)	Perfluorohexanesulfonic acid (PFHxS)	Perfluoroheptane sulfonate (PFHpS)	Perfluoroctanesulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FtS)	8:2 Fluorotelomer sulfonate (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		
0.02	0.02	0.05	0.02	0.02	0.01	0.02	0.02	0.01	0.02	0.05	0.05	0.05	0.05	0.01	0.01	0.01		
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	
--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.07	--	--	--	
--	--	--	--	--	2	2	--	2	--	--	--	--	--	2	--	--	--	
--	--	--	--	--	--	--	--	0.00023	--	--	--	--	--	--	--	--	--	
< 0.02	< 0.02	< 0.05	< 0.02	< 0.02	-	< 0.02	< 0.02	< 0.01	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	
< 0.02	< 0.02	< 0.05	< 0.02	< 0.02	-	< 0.02	< 0.02	< 0.01	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	
< 0.02	< 0.02	< 0.05	< 0.02	< 0.02	-	< 0.02	< 0.02	0.01	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	0.01	0.01	0.01	0.01	
< 0.02	< 0.02	< 0.05	< 0.02	< 0.02	< 0.01	-	< 0.02	< 0.01	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	
< 0.02	< 0.02	< 0.05	< 0.02	< 0.02	< 0.01	-	< 0.02	0.03	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	0.03	0.03	0.03	0.03	
< 0.02	< 0.02	< 0.05	< 0.02	< 0.02	< 0.01	-	< 0.02	0.03	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	0.03	0.03	0.03	0.03	
< 0.02	< 0.02	< 0.05	< 0.02	< 0.02	0.01	-	< 0.02	< 0.01	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	0.01	0.01	0.01	0.01	
< 0.02	< 0.02	< 0.05	< 0.02	< 0.02	< 0.01	-	< 0.02	< 0.01	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	
< 0.02	< 0.02	< 0.05	< 0.02	< 0.02	< 0.01	-	< 0.02	< 0.01	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	
< 0.02	< 0.02	< 0.05	< 0.02	< 0.02	0.01	-	< 0.02	0.02	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	0.03	0.03	0.03	0.03	
< 0.02	< 0.02	< 0.05	< 0.02	< 0.02	< 0.01	-	< 0.02	< 0.01	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	

Analyte		Perfluoroalkyl Sulfonamides							Perfluoroalkyl Carboxylic Acids						
		Perfluorooctane sulfonamide (FOSA)	N-Methyl-perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	Perfluorobutanoic acid (PFBA)	Perfluoro-n-pentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluoroctanoate (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)
LOR		0.0002	0.0005	0.0005	0.0005	0.0005	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Units		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Sample Name	Sample Date														
WPF	22-Sep-21	< 0.0002	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0002	< 0.0002	< 0.001	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	24-Feb-22	< 0.0002	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0002	< 0.0002	< 0.001	0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	27-May-22	< 0.0002	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0002	< 0.0002	< 0.001	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	12-Aug-22	< 0.0002	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0002	< 0.0002	< 0.001	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002

Notes:

< - Less than laboratory limit of reporting

mg/kg - Milligrams per kilogram

Bold indicates a detection above the laboratory limit of reporting

			Perfluoroalkyl Sulfonic Acids								(n:2) Fluorotelomer Sulfonic Acids			Sum of PFAS		
Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorobutanesulfonic acid (PFBs)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexanesulfonic acid (PFHxS)	Perfluoroheptane sulfonate (PFHpS)	Perfluorooctanesulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FtS)	8:2 Fluorotelomer sulfonate (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	
0.0002	0.0002	0.0005	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0005	0.0005	0.0005	0.0002	0.0002	0.0002	
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
< 0.0002	< 0.0002	< 0.0005	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0002	< 0.0002	< 0.0002	
< 0.0002	< 0.0002	< 0.0005	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.001	< 0.0002	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.001	0.0012	0.0012	
< 0.0002	< 0.0002	< 0.0005	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0012	< 0.0002	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0012	0.0012	0.0012	
< 0.0002	< 0.0002	< 0.0005	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0006	< 0.0002	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0006	0.0006	0.0006	

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	mg/L
Sample Name	Sample Date	Sample Type																	
BH8_21022019	21-Feb-19	Primary	< 0.001	0.011	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	4.1	< 0.001	0.012	< 0.0001	0.002	< 0.01	< 0.01	0.015 *		
DUP01_21022019	21-Feb-19	Duplicate	0.001	0.014	< 0.001	< 0.05	< 0.0001	0.001	< 0.001	4.09	< 0.001	0.012	< 0.0001	0.003	< 0.01	< 0.01	0.015		
Relative Percentage Difference			0%	24%	NC	NC	0%	NC	0%	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	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	4.5	< 0.001	0.012	< 0.0001	0.003	-	< 0.005	0.006		
Relative Percentage Difference			0%	58%	NC	NC	133%	NC	NC	9%	NC	0%	NC	40%	NC	NC	18%		
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	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_140319	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	67%	NC	NC	0%	40%	NC	6%	NC	5%	NC	120%	NC	NC	57%		
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	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	0%	NC	NC	5%	NC	NC	0%	NC	NC	NC	46%		
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	0%	181%	8%	0%	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	0%	181%	1%	0%	5%	NC	140%	NC	NC	151%		
SW4_181119	18-Nov-19	Primary	< 0.001	0.035	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.01 *	6.32	< 0.001	0.032	< 0.0001	0.007 *	< 0.01	< 0.01	0.033 *	
DUP09_181119	18-Nov-19	Duplicate	< 0.001	0.034	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	0.01	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	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	0.01	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	164%	NC	NC	9%	NC	111%	NC	NC	147%		
SW4_160920	16-Sep-20	Primary	< 0.001	0.041	< 0.001	0.09 *	< 0.0001	< 0.001	0.004	0.005	0.97	< 0.001	0.053	< 0.0001	0.005	< 0.01	< 0.01	0.02	
QW28_160920	16-Sep-20	Duplicate	< 0.001	0.042	< 0.001	< 0.05	< 0.0001	< 0.001	0.004	0.006	0.97	< 0.001	0.054	< 0.0001	0.005	< 0.01	< 0.01	0.024	
Relative Percentage Difference			NC	2%	NC	NC	NC	NC	0%	18%	0%	2%	NC	0%	NC	NC	18%		
SW4_160920	16-Sep-20	Primary	< 0.001	0.041	< 0.001	< 0.05	< 0.0001	< 0.001	0.004	0.005	0.97	< 0.001	0.053	< 0.0001	0.005	< 0.01	< 0.01	0.02	
QW29_16092020	16-Sep-20	TriPLICATE	< 0.001	0.04	< 0.001	0.09	< 0.0002	< 0.001	0.004	0.001	0.93	< 0.001	0.053	< 0.0001	0.003	< 0.01	< 0.005	0.017	
Relative Percentage Difference			NC	2%	NC	57%	NC</												

QW34_160221	16-Feb-21	Duplicate	0.003	0.019	< 0.001	< 0.05	< 0.0001	0.004	0.001	< 0.001	27	< 0.001	0.054	< 0.0001	0.002	< 0.01	< 0.01	0.008
	Relative Percentage Difference		0%	5%	NC	NC	29%	0%	NC	0%	NC	0%	NC	0%	NC	NC	22%	
SW4_160221	16-Feb-21	Primary	0.003	0.02	< 0.001	< 0.05	< 0.0001	0.003	0.001	< 0.001	27	< 0.001	0.054	< 0.0001	0.002	< 0.01	< 0.01	0.01
QW35_16022021	16-Feb-21	Triplicate	0.004	< 0.02	< 0.001	< 0.05	< 0.0002	0.003	0.002	0.002	32	< 0.001	0.065	< 0.0001	< 0.001	-	0.012	0.005
	Relative Percentage Difference		29%	0%	NC	NC	0%	67%	67%	17%	NC	18%	NC	67%	NC	18%	67%	
SW2_220921	22-Sep-21	Primary	< 0.001	0.007	< 0.001	< 0.05	< 0.0001	< 0.001	0.003	0.002 *	1.11	< 0.001	0.087	< 0.0001	0.005	< 0.01	< 0.01	0.134
QW64_220921	22-Sep-21	Duplicate	< 0.001	0.007	< 0.001	< 0.05	< 0.0001	< 0.001	0.003	< 0.001	1.34	< 0.001	0.085	< 0.0001	0.005	< 0.01	< 0.01	0.126
	Relative Percentage Difference		NC	0%	NC	NC	NC	0%	NC	19%	NC	2%	NC	0%	NC	NC	6%	
SW2_220921	22-Sep-21	Primary	< 0.001	0.007	< 0.001	< 0.05	< 0.0001	< 0.001	0.003	< 0.001	1.11	< 0.001	0.087	< 0.0001	0.005	< 0.01	< 0.01	0.134
QW65_22092021	22-Sep-21	Triplicate	< 0.001	< 0.02	< 0.001	< 0.05	< 0.0002	< 0.001	0.003	0.002	1.4	< 0.001	0.083	< 0.0001	0.005	< 0.001	< 0.005	0.12
	Relative Percentage Difference		NC	96%	NC	NC	NC	0%	67%	23%	NC	5%	NC	0%	NC	NC	11%	
SW2_131021	13-Oct-21	Primary	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	< 0.001	0.002 *	< 0.001	0.88	< 0.001	0.049	< 0.0001	0.002	< 0.01	< 0.01	0.06
QW66_131021	13-Oct-21	Duplicate	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	1.02	< 0.001	0.05	< 0.0001	0.002	< 0.01	< 0.01	0.065	
	Relative Percentage Difference		NC	0%	NC	NC	NC	NC	NC	15%	NC	2%	NC	0%	NC	NC	8%	
SW2_131021	13-Oct-21	Primary	< 0.001	0.004	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	0.88	< 0.001	0.049	< 0.0001	0.002	< 0.01	< 0.01	0.06
QW67_13102021	13-Oct-21	Triplicate	< 0.001	< 0.02	< 0.001	< 0.05	< 0.0002	< 0.001	0.002	< 0.001	1.3	< 0.001	0.058	< 0.0001	0.003	< 0.001	< 0.005	0.064
	Relative Percentage Difference		NC	133%	NC	NC	NC	NC	67%	NC	39%	NC	17%	NC	40%	NC	NC	6%
SW4_161121	16-Nov-21	Primary	< 0.001	0.016	-	< 0.05	-	< 0.001	0.002 *	< 0.001	6.59	-	-	-	< 0.001	-	-	< 0.005
QW68_161121	16-Nov-21	Duplicate	< 0.001	0.016	< 0.001	< 0.05	< 0.0001	< 0.001	0.001	< 0.001	6.84	< 0.001	0.056	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
	Relative Percentage Difference		NC	0%	NC	NC	NC	NC	0%	NC	4%	NC	NC	NC	NC	NC	NC	
SW4_161121	16-Nov-21	Primary	< 0.001	0.016	-	< 0.05	-	< 0.001	0.001	< 0.001	6.59	-	-	-	< 0.001	-	-	< 0.005
QW69_16112021	16-Nov-21	Triplicate	< 0.001	< 0.02	< 0.001	< 0.05	< 0.0002	< 0.001	0.002	< 0.001	7.7	< 0.001	0.056	< 0.0001	< 0.001	-	< 0.005	< 0.005
	Relative Percentage Difference		NC	22%	NC	NC	NC	NC	67%	NC	16%	NC	NC	NC	NC	NC	NC	
SW4_24022022	24-Feb-22	Primary	< 0.001	0.03	< 0.001	< 0.05	< 0.0001	< 0.001	0.002	< 0.001	1.19	< 0.001	0.034	< 0.0001	0.002	< 0.01	< 0.01	0.011
QW76_24022022	24-Feb-22	Duplicate	< 0.001	0.03	< 0.001	< 0.05	< 0.0001	< 0.001	0.002	< 0.001	1.22	< 0.001	0.034	< 0.0001	0.003	< 0.01	< 0.01	0.011
	Relative Percentage Difference		NC	0%	NC	NC	NC	NC	0%	NC	2%	NC	0%	NC	NC	NC	0%	
SW4_24022022	24-Feb-22	Primary	< 0.001	0.03	< 0.001	< 0.05	< 0.0001	< 0.001	0.002	< 0.001	1.19	< 0.001	0.034	< 0.0001	0.002	< 0.01	< 0.01	0.011
QW77_23022022	23-Feb-22	Triplicate	< 0.001	0.03	< 0.001	< 0.05	< 0.0002	< 0.001	0.002	< 0.001	1.3	< 0.001	0.034	< 0.0001	0.003	< 0.001	< 0.005	0.011
	Relative Percentage Difference		NC	0%	NC	NC	NC	NC	0%	NC	9%	NC	0%	NC	40%	NC	NC	0%
SW4_05272022	27-May-22	Primary	< 0.001	0.021	-	< 0.05	-	< 0.001	0.002 *	< 0.001	0.68	-	-	-	0.002 *	-	-	< 0.005
QW84_05272022	27-May-22	Duplicate	< 0.001	0.02	-	< 0.05	-	< 0.001	0.001	< 0.001	0.66	-	-	-	0.001	-	-	< 0.005
	Relative Percentage Difference		NC	5%	NC	NC	NC	NC	0%	NC	3%	NC	NC	NC	0%	NC	NC	NC
SW4_05272022	27-May-22	Primary	< 0.001	0.021	-	< 0.05	-	< 0.001	0.001	< 0.001	0.68	-	-	-	0.001	-	-	< 0.005
QW85_05272022	27-May-22	Triplicate	< 0.001	< 0.02	-	< 0.05	-	< 0.001	0.002	0.001	0.55	-	-	-	0.002	-	-	0.007
	Relative Percentage Difference		NC	5%	NC	NC	NC	NC	67%	0%	21%	NC	NC	NC	67%	NC	NC	33%
SW4_12082022	12-Aug-22	Primary	< 0.001	0.022	-	< 0.05	-	0.002	0.003	0.003 *	0.39	-	-	-	0.00			

Relative Percentage Difference	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	
SW4_12082022	12-Aug-22	Primary	< 0.02	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	
QC01A_08122022	12-Aug-22	Triplicate	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.1
Relative Percentage Difference	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	
BH2_12082022	12-Aug-22	Primary	< 0.02	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
QC02_12082022	12-Aug-22	Duplicate	< 0.02	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01
Relative Percentage Difference	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	
BH2_12082022	12-Aug-22	Primary	< 0.02	< 0.05	< 0.05	< 0.05	< 0.02	< 0.02	< 0.1	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
QC02A_08122022	12-Aug-22	Triplicate	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.1
Relative Percentage Difference	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	

Notes:

- NC = Not analysed

< - Less than laboratory limit of reporting

EPA - Environment Protection Authority

NC - Not calculated

µg/L - Micrograms 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%

Orange highlighting indicates an RPD in excess of 50%

RPD - Relative Percentage Difference

< 0.01

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Relative Percentage Difference			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
SW4_05272022			27-May-22	Primary	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100
QW84_05272022			27-May-22	Duplicate	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100
Relative Percentage Difference			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
SW4_05272022			27-May-22	Primary	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100
QW85_05272022			27-May-22	TriPLICATE	-	-	-	-	-	< 10	-	< 20	< 50	< 100	< 100	< 100	< 20	< 20	< 50	-	< 100	< 100
Relative Percentage Difference			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
SW4_12082022			12-Aug-22	Primary	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100
QC01_12082022			12-Aug-22	Duplicate	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100
Relative Percentage Difference			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
SW4_12082022			12-Aug-22	Primary	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100
QC01A_08122022			12-Aug-22	TriPLICATE	-	-	-	-	-	-	-	< 50	< 100	< 100	< 100	< 100	-	-	< 50	-	< 100	< 100
Relative Percentage Difference			NC	NC	NC	NC	NC	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, total xylenes, naphthalene

BOLD indicates a detection above the laboratory limit of reporting

"**" denotes duplicate/triplicate sample result adopted for analytical use due to RPD >50%

Orange highlighting indicates an RPD in excess of 50%

RPD - Relative Percentage Difference

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	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005	
TRIP BLANK_130319	13-Mar-19	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.05	< 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	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005	
TRIP BLANK 03_23042019	23-Apr-19	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005	
TRIP BLANK 04_16052019	16-May-19	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 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	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005	
TRIP BLANK 06_16072019	16-Jul-19	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 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	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005	
TRIP BLANK_15102019	15-Oct-19	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.05	< 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	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005	
QW33_160920	16-Sep-20	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005	
QW39_161020	16-Oct-20	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005	
QW39_161120	16-Nov-20	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005	
QW39_140121	14-Jan-21	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005	
QW40_170321	17-Mar-21	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005	
TRIP BLANK_SEP_220921	22-Sep-21	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005	
TRIP BLANK_131021	13-Oct-21	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005	
QC02_161121	16-Nov-21	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005	
QC02_15122021	15-Dec-21	Trip Blank	< 0.001	-	-	-	-	-	-	< 0.05	-	< 0.001	-	-	-	-	-	
QC02_180122	18-Jan-22	Trip Blank	< 0.001	-	-	-	-	-	-	< 0.05	-	< 0.001	-	-	-	-	-	
QC02_24022022	24-Feb-22	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005	
QC02_12042022	12-Apr-22	Trip Blank	< 0.001	-	-	-	-	-	-	< 0.05	-	< 0.001	-	-	-	-	-	
QC02_05272022	27-May-22	Trip Blank	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005	
QC02_17062022	17-Jun-22	Trip Blank	< 0.001	-	-	-	-	-	-	< 0.05	-	< 0.001	-	-	-	-	-	
TB_120822_12082022	12-Aug-22	Trip Blank	< 0.001	-	-	-	< 0.0001	< 0.001	-	< 0.001	< 0.05	< 0.001	-	< 0.0001	< 0.001	< 0.01	-	< 0.005
RINSATE01_21022019	21-Feb-19	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.05	< 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	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005	
RINSATE_03_23042019	23-Apr-19	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005	
RINSATE_04_16052019	16-May-19	Rinsate	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0001	< 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	< 0.05	< 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	< 0.05	< 0.001	< 0.001	< 0.0001</td					

Notes:

< - Less than laboratory limit of reporting

µg/L - Micrograms per litre

Analyte			BTEXN								Total Petroleum Hydrocarbons	Total Petroleum Hydrocarbons - Silica Clean-up				Total Recoverable Hydrocarbons		Total Recoverable Hydrocarbons - Silica Clean-up				
			Benzene	Toluene	Ethylbenzene	meta- & para-Xylene	ortho-Xylene	Total Xylenes	Naphthalene	Sum of BTEX		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 ₄₀ -C ₄₀ - 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	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	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
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	-	-	-	-	< 20	< 20	-	-	-	-	-
TRIP BLANK_03_23042019	23-Apr-19	Trip Blank	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 20	< 20	-	-	-	-	-
TRIP BLANK_04_16052019	16-May-19	Trip Blank	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 20	< 20	-	-	-	-	-
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	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
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	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
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	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
TRIP BLANK_15_102019	15-Oct-19	Trip Blank	< 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
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	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
QW33_160920	16-Sep-20	Trip Blank	< 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
QW39_161020	16-Oct-20	Trip Blank	< 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
QW39_161120	16-Nov-20	Trip Blank	< 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
QW39_140121	14-Jan-21	Trip Blank	< 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
QW40_170321	17-Mar-21	Trip Blank	< 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
TRIP BLANK SEP_220921	22-Sep-21	Trip Blank	< 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
TRIP BLANK_131021	13-Oct-21	Trip Blank	< 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
QC02_161121	16-Nov-21	Trip Blank	< 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
QC02_24022022	24-Feb-22	Trip Blank	< 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
QC02_05272022	27-May-22	Trip Blank	< 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
TB_120822_12082022	12-Aug-22	Trip Blank	< 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
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	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
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	< 50	< 50	< 20	< 20	< 100	< 100	< 100	< 100	< 100
RINSATE03_23042019	23-Apr-19	Rinsate	< 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
RINSATE04_16052019	16-May-19	Rinsate	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 20	< 20	-	-	-	-	-
RINSATE05_14062019	14-Jun-19	Rinsate	< 1.0	< 2.0	< 2.0	< 2.																

Sample Name	Date	DO mg/L	ORP mV	PH pH units	SC mS/cm	TEMP deg C	TURB NTU
BH2	27/07/2022	5.85	223	4.13	0.0876	15.6	131
	12/08/2022	4.34	269.7	4.52	0.053	16.7	15.58
BH4	27/07/2022	3	190.7	4.6	0.0902	14.1	121
	12/08/2022	3.25	236	4.86	0.077	15.5	10.2
BH6	27/07/2022	4.75	-104	4.76	0.225	14.2	16.8
	12/08/2022	3.94	-80	5.1	0.217	14.2	156
BH7	27/07/2022	4.21	26	4.43	0.117	14.3	489
	12/08/2022	3.98	11	4.84	0.11	14.9	110.4
BH8	12/08/2022	4.2	-67.9	4.81	0.135	14.7	782
BH9A	27/07/2022	4.93	208.5	4.11	0.1828	16.6	52
	12/08/2022	3.96	249	4.46	0.186	17.6	41.5
MW239S	27/07/2022	4	-71	4.32	0.125	14.2	175
	12/08/2022	2.73	-69	4.6	0.115	15.2	310
BH11	27/07/2022	4.74	-39	4.2	0.158	14	9.7



ATTACHMENT 3: LAB RESULTS

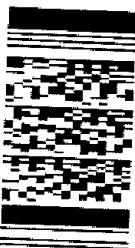


SITE, COC AND CONTACT DATA							Laboratory:																																																																																																																																																																																																																																															
Client: Kleinfielder Australia Pty Ltd Suite 3, 240-244 Pacific Hwy Charlestown, NSW 2290 Phone: (02) 4949 5200		Site Name: WSS - Cabibus Tug Rd Water Monitoring August 2022		Sampler Name: Megan Ferguson		ALS																																																																																																																																																																																																																																																
QUOTE NUMBER: ME114719		Contact Number: 0455 981 983		Contact E-mail: mferguson@kleinfelder.com		5958 Matildad Rd Maitland West, Newcastle NSW 2304 Phone: (02) 4014 2500																																																																																																																																																																																																																																																
Job No.: 20222347		Required TAT: 24 hrs		48 hrs		3 days	5 days																																																																																																																																																																																																																																															
Data QA (log):		LAB minimum sample specified		EDD Format:		KLF_EPMEDO																																																																																																																																																																																																																																																
CHAIN OF CUSTODY							Send Results to:																																																																																																																																																																																																																																															
Relinquished by (print): (sign)		Received by (print): (sign)		Relinquished by: (sign)		mferguson@kleinfelder.com, jroby@kleinfelder.com...																																																																																																																																																																																																																																																
Date / Time: 12/08/22 24:00 Date / Time: 14:57		Temp. (°C): 25°		Date / Time: 12/08/22		droustprosk@kleinfelder.com																																																																																																																																																																																																																																																
Notes:		Notes: ice present / no ice seals intact / no seal		Temp. (°C): 5°		Suite 3, 240-244 Pacific Hwy Charlestown, NSW 2290 Info@kleinfelder.com Phone: (02) 4014 2500																																																																																																																																																																																																																																																
<table border="1"> <thead> <tr> <th rowspan="2">Sample ID</th> <th rowspan="2">Lab ID</th> <th rowspan="2">Sample Point</th> <th rowspan="2">Sample Type</th> <th rowspan="2">Date</th> <th rowspan="2">Start Depth</th> <th rowspan="2">End Depth</th> <th colspan="3">Organic Analyses</th> <th colspan="3">Inorganic Analyses</th> <th colspan="3">Other Analyses</th> </tr> <tr> <th># Containers</th> <th>W-04 SG TRH SG/BTEX</th> <th>TRH with silica gel (EP080 / EP071SG)</th> <th>W-03 Metals - NEPM 15</th> <th>Iron (dissolved)</th> <th>8 Metals (As, Ba, Cr, Cu, Fe, Mg, Ni and Zn)</th> <th>10 metals (As, Ba, Cr, Cu, Fe, Mg, Ni, Zn, B & Co)</th> <th>3 metals only (As, Fe & Mn)</th> <th>NT 14 - Extended Water Suite</th> <th>EP231X PFAS (28 analytes, standard level)</th> <th>Sulfur / Chloride / Lab / Analysis:</th> <th>Attached By PO / Internal Sheet:</th> </tr> </thead> <tbody> <tr> <td>1 BH2</td> <td></td> <td>Water</td> <td>12/08/2022</td> <td></td> <td>6</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2 BH4</td> <td></td> <td>Water</td> <td>12/08/2022</td> <td></td> <td>6</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3 BH6</td> <td></td> <td>Water</td> <td>12/08/2022</td> <td></td> <td>6</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4 BH7</td> <td></td> <td>Water</td> <td>12/08/2022</td> <td></td> <td>6</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5 BH8</td> <td></td> <td>Water</td> <td>12/08/2022</td> <td></td> <td>6</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>6 BH9A</td> <td></td> <td>Water</td> <td>12/08/2022</td> <td></td> <td>6</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>7 BH14</td> <td></td> <td>Water</td> <td>12/08/2022</td> <td></td> <td>8</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>7 MN239S</td> <td></td> <td>Water</td> <td>12/08/2022</td> <td></td> <td>6</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>8 SW1</td> <td></td> <td>Water</td> <td>12/08/2022</td> <td></td> <td>6</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>9 SW2</td> <td></td> <td>Water</td> <td>12/08/2022</td> <td></td> <td>6</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>10 SW3</td> <td></td> <td>Water</td> <td>12/08/2022</td> <td></td> <td>6</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>11 SW4</td> <td></td> <td>Water</td> <td>12/08/2022</td> <td></td> <td>6</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>12 WPW</td> <td></td> <td>Water</td> <td>12/08/2022</td> <td></td> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>13 WPF</td> <td></td> <td>Sediment</td> <td>12/08/2022</td> <td></td> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>							Sample ID	Lab ID	Sample Point	Sample Type	Date	Start Depth	End Depth	Organic Analyses			Inorganic Analyses			Other Analyses			# Containers	W-04 SG TRH SG/BTEX	TRH with silica gel (EP080 / EP071SG)	W-03 Metals - NEPM 15	Iron (dissolved)	8 Metals (As, Ba, Cr, Cu, Fe, Mg, Ni and Zn)	10 metals (As, Ba, Cr, Cu, Fe, Mg, Ni, Zn, B & Co)	3 metals only (As, Fe & Mn)	NT 14 - Extended Water Suite	EP231X PFAS (28 analytes, standard level)	Sulfur / Chloride / Lab / Analysis:	Attached By PO / Internal Sheet:	1 BH2		Water	12/08/2022		6	X									2 BH4		Water	12/08/2022		6	X									3 BH6		Water	12/08/2022		6	X									4 BH7		Water	12/08/2022		6	X									5 BH8		Water	12/08/2022		6	X									6 BH9A		Water	12/08/2022		6	X									7 BH14		Water	12/08/2022		8	X									7 MN239S		Water	12/08/2022		6	X									8 SW1		Water	12/08/2022		6	X									9 SW2		Water	12/08/2022		6	X									10 SW3		Water	12/08/2022		6	X									11 SW4		Water	12/08/2022		6	X									12 WPW		Water	12/08/2022		3										13 WPF		Sediment	12/08/2022		2										Send Results to: mferguson@kleinfelder.com, jroby@kleinfelder.com...	
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NT14 - Extended water suite B

WQ3 Matrix (NEPM 15) - As, Ba, B, Ca, Cr, Co, Cu, Fe, Pb, Mn, Hg, Ni, Sr, V, Zn

LAB OF ORIGIN:
NEWCASTLE





Nt14 - Extended water built B

LAB OF ORIGIN:
NEWCASTLE

CERTIFICATE OF ANALYSIS

Work Order	: ES2228800	Page	: 1 of 21
Client	: KLEINFELDER AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: Megan Ferguson	Contact	: Shirley LeCornu
Address	: 95 MITCHELL ROAD CARDIFF NSW 2285	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +6138549 9630
Project	: 20222347	Date Samples Received	: 12-Aug-2022 14:50
Order number	: ----	Date Analysis Commenced	: 15-Aug-2022
C-O-C number	: ----	Issue Date	: 22-Aug-2022 12:17
Sampler	: Megan Ferguson		
Site	: WSS - Cabbage Tree Rd Water Monitoring August 2022		
Quote number	: ME/114/19 ALS Compass		
No. of samples received	: 17		
No. of samples analysed	: 17		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

∅ = 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.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EG005T: Poor precision was obtained for Manganese and Zinc on sample ES2228765 # 007. Confirmed by re-digestion and reanalysis.
- 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, PFTDA 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: SEDIMENT (Matrix: SOIL)		Sample ID	WPF	---	---	---	---	---
Compound	CAS Number	LOR	Sampling date / time	12-Aug-2022 00:00	---	---	---	---
			Unit	ES2228800-013	-----	-----	-----	-----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	---	0.1	%	82.7	---	---	---	---
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	6	---	---	---	---
Barium	7440-39-3	10	mg/kg	<20	---	---	---	---
Chromium	7440-47-3	2	mg/kg	64	---	---	---	---
Copper	7440-50-8	5	mg/kg	5	---	---	---	---
Iron	7439-89-6	50	mg/kg	42100	---	---	---	---
Nickel	7440-02-0	2	mg/kg	6	---	---	---	---
Zinc	7440-66-6	5	mg/kg	24	---	---	---	---
Magnesium	7439-95-4	50	mg/kg	410	---	---	---	---
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	---	---	---	---
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	---	---	---	---
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	---	---	---	---
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	---	---	---	---
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0006	---	---	---	---
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	---	---	---	---
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	---	---	---	---
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	---	---	---	---
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	---	---	---	---
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	---	---	---	---
Perfluoroctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	---	---	---	---
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	---	---	---	---
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	---	---	---	---
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	---	---	---	---
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	---	---	---	---

Analytical Results

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	WPF	---	---	---	---	---
			Sampling date / time	12-Aug-2022 00:00	---	---	---	---	---
Compound	CAS Number	LOR	Unit	ES2228800-013	-----	-----	-----	-----	-----
EP231S: PFAS Surrogate - Continued									
13C4-PFOS	---	0.0002	%	87.0	---	---	---	---	---
13C8-PFOA	---	0.0002	%	97.5	---	---	---	---	---

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	BH2	BH4	BH6	BH7	BH8	
Compound	CAS Number	LOR	Unit	Sampling date / time	12-Aug-2022 00:00				
					Result	Result	Result	Result	Result
ED093F: Dissolved Major Cations									
Magnesium	7439-95-4	1	mg/L		1	1	4	2	2
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	0.001	0.001
Barium	7440-39-3	0.001	mg/L	0.005	0.013	0.008	0.003	0.006	0.006
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	0.002	0.002	0.002
Copper	7440-50-8	0.001	mg/L	0.012	0.050	<0.001	0.003	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L	0.001	<0.001	<0.001	0.002	0.001	0.001
Zinc	7440-66-6	0.005	mg/L	0.169	0.013	0.008	<0.005	0.007	0.007
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	2.38	0.56	1.54	
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup									
C10 - C14 Fraction	---	50	µg/L	<50	<50	<50	<50	<50	<50
C15 - C28 Fraction	---	100	µg/L	<100	<100	<100	<100	<100	<100
C29 - C36 Fraction	---	50	µg/L	<50	<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	---	50	µg/L	<50	<50	<50	<50	<50	<50
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup									
>C10 - C16 Fraction	---	100	µg/L	<100	<100	<100	<100	<100	<100
>C16 - C34 Fraction	---	100	µg/L	<100	<100	<100	<100	<100	<100
>C34 - C40 Fraction	---	100	µg/L	<100	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	---	100	µg/L	<100	<100	<100	<100	<100	<100
>C10 - C16 Fraction minus Naphthalene (F2)	---	100	µg/L	<100	<100	<100	<100	<100	<100
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	---	20	µg/L	<20	<20	<20	<20	<20	<20
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20	<20
EP080: BTEXN									
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2	<2
^ Total Xylenes	----	2	µg/L	<2	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID	BH2	BH4	BH6	BH7	BH8	
Compound	CAS Number	LOR	Sampling date / time	12-Aug-2022 00:00				
			Unit	ES2228800-001	ES2228800-002	ES2228800-003	ES2228800-004	ES2228800-005
EP080: BTEXN - Continued								
[^] Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<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	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroctane 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
Perfluoroctanoic 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								
Perfluoroctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID	BH2	BH4	BH6	BH7	BH8	
Compound	CAS Number	LOR	Sampling date / time	12-Aug-2022 00:00				
			Unit	ES2228800-001	ES2228800-002	ES2228800-003	ES2228800-004	ES2228800-005
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Methyl perfluoroctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluoroctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluoroctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluoroctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluoroctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluoroctane 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	%	93.2	92.7	102	99.5	92.6
Toluene-D8	2037-26-5	2	%	104	98.9	115	119	95.8
4-Bromofluorobenzene	460-00-4	2	%	110	107	123	123	107
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	104	100	108	110	102
13C8-PFOA	----	0.02	%	98.2	102	98.0	87.7	85.9

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID	BH9A	MW239S	SW1	SW2	SW3		
Compound	CAS Number	LOR	Unit	Sampling date / time	12-Aug-2022 00:00				
					ES2228800-006	ES2228800-007	ES2228800-008	ES2228800-009	ES2228800-010
ED093F: Dissolved Major Cations									
Magnesium	7439-95-4	1	mg/L		3	2	2	1	3
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	7440-39-3	0.001	mg/L	0.009	0.002	0.007	0.005	0.012	
Chromium	7440-47-3	0.001	mg/L	<0.001	0.002	0.003	0.001	0.001	
Cobalt	7440-48-4	0.001	mg/L	----	----	<0.001	<0.001	0.003	
Copper	7440-50-8	0.001	mg/L	0.004	<0.001	0.001	<0.001	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L	0.004	0.001	0.002	0.001	0.004	
Zinc	7440-66-6	0.005	mg/L	0.008	<0.005	0.019	0.090	0.007	
Boron	7440-42-8	0.05	mg/L	----	----	<0.05	<0.05	<0.05	<0.05
Iron	7439-89-6	0.05	mg/L	0.53	0.40	2.92	2.79	9.73	
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup									
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50	<50
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup									
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100	<100
>C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100	<100
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20	<20
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20	<20
EP080: BTEXN									
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2	<2

Analytical Results

Analytical Results

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	BH9A	MW239S	SW1	SW2	SW3
			Sampling date / time	12-Aug-2022 00:00				
Compound	CAS Number	LOR	Unit	ES2228800-006	ES2228800-007	ES2228800-008	ES2228800-009	ES2228800-010
				Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued								
13C4-PFOS	---	0.02	%	92.0	93.8	95.4	105	103
13C8-PFOA	---	0.02	%	95.9	92.0	94.1	99.1	98.5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	SW4	WPW	QC01	QC02	RB01	
Compound	CAS Number	LOR	Unit	Sampling date / time	12-Aug-2022 00:00				
					ES2228800-011	ES2228800-012	ES2228800-014	ES2228800-015	ES2228800-016
ED093F: Dissolved Major Cations									
Magnesium	7439-95-4	1	mg/L	3	---	3	---	---	---
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L	---	---	---	---	---	<0.01
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	---	---	<0.001
Barium	7440-39-3	0.001	mg/L	0.022	---	0.025	---	---	---
Cadmium	7440-43-9	0.0001	mg/L	---	---	---	---	---	<0.0001
Chromium	7440-47-3	0.001	mg/L	0.002	---	<0.001	---	---	<0.001
Cobalt	7440-48-4	0.001	mg/L	0.003	---	0.003	---	---	---
Copper	7440-50-8	0.001	mg/L	<0.001	---	0.003	---	---	<0.001
Lead	7439-92-1	0.001	mg/L	---	---	---	---	---	<0.001
Selenium	7782-49-2	0.01	mg/L	---	---	---	---	---	<0.01
Manganese	7439-96-5	0.001	mg/L	---	0.026	---	---	---	---
Nickel	7440-02-0	0.001	mg/L	0.004	---	0.003	---	---	<0.001
Zinc	7440-66-6	0.005	mg/L	0.011	---	0.016	---	---	<0.005
Boron	7440-42-8	0.05	mg/L	<0.05	---	<0.05	---	---	---
Iron	7439-89-6	0.05	mg/L	0.39	0.17	0.36	---	---	<0.05
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L	---	---	---	---	---	<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
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	---	<20	---	---	<20

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID	SW4	WPW	QC01	QC02	RB01	
Compound	CAS Number	LOR	Sampling date / time	12-Aug-2022 00:00				
			Unit	ES2228800-011	ES2228800-012	ES2228800-014	ES2228800-015	ES2228800-016
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued								
[^] C6 - C10 Fraction minus BTEX	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	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
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

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID	SW4	WPW	QC01	QC02	RB01	
Compound	CAS Number	LOR	Sampling date / time	12-Aug-2022 00:00				
			Unit	ES2228800-011	ES2228800-012	ES2228800-014	ES2228800-015	ES2228800-016
EP231B: Perfluoroalkyl Carboxylic Acids - Continued								
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 (FOUSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOUSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOUSA)	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
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

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	SW4	WPW	QC01	QC02	RB01	
			Sampling date / time	12-Aug-2022 00:00					
Compound	CAS Number	LOR	Unit	ES2228800-011	ES2228800-012	ES2228800-014	ES2228800-015	ES2228800-016	
				Result	Result	Result	Result	Result	
EP231P: PFAS Sums - Continued									
Sum of PFAS (WA DER List)		---	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%	92.4	---	89.9	---	95.7	
Toluene-D8	2037-26-5	2	%	103	---	96.9	---	105	
4-Bromofluorobenzene	460-00-4	2	%	112	---	107	---	111	
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%	96.1	99.4	98.8	101	91.7	
13C8-PFOA	---	0.02	%	98.6	95.3	101	96.9	92.1	

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID	TB_120822	---	---	---	---	---
Compound	CAS Number	LOR	Sampling date / time	12-Aug-2022 00:00	---	---	---	---
			Unit	ES2228800-017	-----	-----	-----	-----
			Result	---	---	---	---	---
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	---	---	---	---
Arsenic	7440-38-2	0.001	mg/L	<0.001	---	---	---	---
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	---	---	---	---
Chromium	7440-47-3	0.001	mg/L	<0.001	---	---	---	---
Copper	7440-50-8	0.001	mg/L	<0.001	---	---	---	---
Lead	7439-92-1	0.001	mg/L	<0.001	---	---	---	---
Selenium	7782-49-2	0.01	mg/L	<0.01	---	---	---	---
Nickel	7440-02-0	0.001	mg/L	<0.001	---	---	---	---
Zinc	7440-66-6	0.005	mg/L	<0.005	---	---	---	---
Iron	7439-89-6	0.05	mg/L	<0.05	---	---	---	---
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	---	---	---	---
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup								
C10 - C14 Fraction	---	50	µg/L	<50	---	---	---	---
C15 - C28 Fraction	---	100	µg/L	<100	---	---	---	---
C29 - C36 Fraction	---	50	µg/L	<50	---	---	---	---
^ C10 - C36 Fraction (sum)	---	50	µg/L	<50	---	---	---	---
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup								
>C10 - C16 Fraction	---	100	µg/L	<100	---	---	---	---
>C16 - C34 Fraction	---	100	µg/L	<100	---	---	---	---
>C34 - C40 Fraction	---	100	µg/L	<100	---	---	---	---
^ >C10 - C40 Fraction (sum)	---	100	µg/L	<100	---	---	---	---
>C10 - C16 Fraction minus Naphthalene (F2)	---	100	µg/L	<100	---	---	---	---
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	---	20	µg/L	<20	---	---	---	---
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	---	---	---	---
^ C6 - C10 Fraction minus BTEX	C6_C10-BTEX	20	µg/L	<20	---	---	---	---
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	---	---	---	---
Toluene	108-88-3	2	µg/L	<2	---	---	---	---
Ethylbenzene	100-41-4	2	µg/L	<2	---	---	---	---

Analytical Results

Analytical Results

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID	TB_120822	---	---	---	---	---	
		Sampling date / time	12-Aug-2022 00:00	---	---	---	---	---	
Compound	CAS Number	LOR	Unit	ES2228800-017	-----	-----	-----	-----	
				Result	---	---	---	---	
EP231S: PFAS Surrogate - Continued									
13C4-PFOS		---	0.02	%	96.4	---	---	---	
13C8-PFOA		---	0.02	%	96.1	---	---	---	

Surrogate Control Limits

Sub-Matrix: SEDIMENT

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	---	60	120
13C8-PFOA	---	60	120

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%)	
		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

QUALITY CONTROL REPORT

Work Order	: ES2228800	Page	: 1 of 16
Client	: KLEINFELDER AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: Megan Ferguson	Contact	: Shirley LeCornu
Address	: 95 MITCHELL ROAD CARDIFF NSW 2285	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +6138549 9630
Project	: 20222347	Date Samples Received	: 12-Aug-2022
Order number	: ----	Date Analysis Commenced	: 15-Aug-2022
C-O-C number	: ----	Issue Date	: 22-Aug-2022
Sampler	: Megan Ferguson		
Site	: WSS - Cabbage Tree Rd Water Monitoring August 2022		
Quote number	: ME/114/19 ALS Compass		
No. of samples received	: 17		
No. of samples analysed	: 17		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This 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	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

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: SOIL

Laboratory Duplicate (DUP) Report									
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 4524417)									
ES2228765-007	Anonymous	EG005T: Barium	7440-39-3	10	mg/kg	200	150	27.2	0% - 50%
		EG005T: Chromium	7440-47-3	2	mg/kg	10	10	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	8	10	20.8	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	8	26	109	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	24	# 60	85.3	0% - 50%
		EG005T: Iron	7439-89-6	50	mg/kg	5980	6660	10.7	0% - 20%
ES2228746-001	Anonymous	EG005T: Barium	7440-39-3	10	mg/kg	120	120	0.0	0% - 50%
		EG005T: Chromium	7440-47-3	2	mg/kg	22	25	14.7	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	26	28	9.5	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	20	21	5.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	53	59	9.9	0% - 50%
		EG005T: Iron	7439-89-6	50	mg/kg	8750	10100	14.1	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4524427)									
ES2228746-001	Anonymous	EA055: Moisture Content	---	0.1	%	76.5	75.8	0.9	0% - 20%
ES2228775-001	Anonymous	EA055: Moisture Content	---	0.1	%	3.7	4.2	13.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4526787)									
ES2228310-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHxS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0005	0.0006	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: SOIL			Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4526787) - continued									
ES2228311-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0004	0.0004	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4526787)									
ES2228310-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
ES2228311-003	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4526787)									
ES2228310-001	Anonymous	EP231X: Perfluoroctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluoroctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluoroctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluoroctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluoroctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: SOIL			Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4526787) - continued									
ES2228310-001	Anonymous	EP231X: N-Methyl perfluoroctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluoroctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2228311-003	Anonymous	EP231X: Perfluoroctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluoroctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluoroctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluoroctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluoroctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluoroctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluoroctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4526787)									
ES2228310-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2228311-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
Sub-Matrix: WATER			Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED093F: Dissolved Major Cations (QC Lot: 4522839)									
ES2228714-001	Anonymous	ED093F: Magnesium	7439-95-4	1	mg/L	2	2	0.0	No Limit
ES2228800-004	BH7	ED093F: Magnesium	7439-95-4	1	mg/L	2	2	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 4522837)									
ES2228714-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit

Sub-Matrix: WATER

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 4522837) - continued									
ES2228714-001	Anonymous	EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Barium	7440-39-3	0.001	mg/L	0.022	0.022	0.0	0% - 20%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.049	0.050	0.0	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.001	0.002	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.016	0.017	0.0	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.05	0.05	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	0.24	0.25	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	1.65	1.65	0.0	0% - 20%
ES2228800-004	BH7	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Barium	7440-39-3	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.003	0.001	65.3	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	1.90	1.96	3.0	0% - 20%
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.56	0.56	0.0	0% - 50%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 4522840)									
ES2228956-003	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Barium	7440-39-3	0.001	mg/L	0.102	0.100	1.3	0% - 20%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.008	0.007	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.019	0.020	0.0	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit

Sub-Matrix: WATER

		Laboratory Duplicate (DUP) Report							
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 4522840) - continued									
ES2228956-003	Anonymous	EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
ES2228956-014	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Barium	7440-39-3	0.001	mg/L	0.017	0.017	0.0	0% - 50%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.666	0.677	1.6	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.023	0.024	0.0	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.232	0.244	5.0	0% - 20%
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 4522838)									
ES2228714-004	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2228714-010	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4520937)									
ES2228800-001	BH2	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES2228800-011	SW4	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4520937)									
ES2228800-001	BH2	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES2228800-011	SW4	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 4520937)									
ES2228800-001	BH2	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES2228800-011	SW4	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

Sub-Matrix: WATER

		Laboratory Duplicate (DUP) Report							
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4527251)									
EP2210224-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoroctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4527251)									
EP2210224-001	Anonymous	EP231X: Perfluoroctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4527251)									
EP2210224-001	Anonymous	EP231X: Perfluoroctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluoroctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluoroctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluoroctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluoroctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluoroctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluoroctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4527251)									
EP2210224-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

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Work Order : ES2228800
Client : KLEINFELDER AUSTRALIA PTY LTD
Project : 20222347



Sub-Matrix: WATER

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4527251) - continued									
EP2210224-001	Anonymous	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4527251)									
EP2210224-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (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 Sample (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: SOIL					Method Blank (MB) Report	Laboratory Control Spike (LCS) Report					
	Method: Compound	CAS Number	LOR	Unit		Result	Spike	Spike Recovery (%)	Acceptable Limits (%)		
							Concentration		LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 4524417)											
EG005T: Arsenic	7440-38-2	5	mg/kg	<5		121.1 mg/kg		96.4	88.0	113	
EG005T: Barium	7440-39-3	10	mg/kg	<10		90.5 mg/kg		102	65.0	136	
EG005T: Chromium	7440-47-3	2	mg/kg	<2		19.6 mg/kg		109	68.0	132	
EG005T: Copper	7440-50-8	5	mg/kg	<5		52.9 mg/kg		106	89.0	111	
EG005T: Iron	7439-89-6	50	mg/kg	<50		31660 mg/kg		98.4	89.0	112	
EG005T: Nickel	7440-02-0	2	mg/kg	<2		15.3 mg/kg		99.6	80.0	120	
EG005T: Zinc	7440-66-6	5	mg/kg	<5		139.3 mg/kg		92.4	66.0	133	
EG005T: Magnesium	7439-95-4	----	mg/kg	----		7894 mg/kg		101	87.0	113	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4526787)											
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002		0.00125 mg/kg		93.6	72.0	128	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002		0.00125 mg/kg		100	73.0	123	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002		0.00125 mg/kg		98.0	67.0	130	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002		0.00125 mg/kg		99.2	70.0	132	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002		0.00125 mg/kg		94.0	68.0	136	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002		0.00125 mg/kg		91.6	59.0	134	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4526787)											
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001		0.00625 mg/kg		97.5	71.0	135	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002		0.00125 mg/kg		108	69.0	132	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002		0.00125 mg/kg		110	70.0	132	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002		0.00125 mg/kg		107	71.0	131	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002		0.00125 mg/kg		109	69.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002		0.00125 mg/kg		103	72.0	129	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002		0.00125 mg/kg		109	69.0	133	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002		0.00125 mg/kg		120	64.0	136	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002		0.00125 mg/kg		113	69.0	135	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002		0.00125 mg/kg		106	66.0	139	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005		0.00312 mg/kg		110	69.0	133	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4526787)											
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002		0.00125 mg/kg		102	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005		0.00312 mg/kg		117	71.6	129	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005		0.00312 mg/kg		111	69.8	131	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005		0.00312 mg/kg		116	68.7	130	

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4526787) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	126	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4526787)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	105	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	108	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	118	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	101	69.2	143
Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
ED093F: Dissolved Major Cations (QCLot: 4522839)								
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.4	90.0	116
EG020F: Dissolved Metals by ICP-MS (QCLot: 4522837)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	94.2	80.0	116
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	96.9	85.0	114
EG020A-F: Barium	7440-39-3	0.001	mg/L	<0.001	0.1 mg/L	95.8	82.0	110
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	96.1	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	98.2	85.0	111
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	93.5	82.0	112
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	93.1	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	94.1	83.0	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	93.4	82.0	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	94.6	82.0	112
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	93.4	85.0	115
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	95.9	81.0	117
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	92.2	85.0	115
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	94.9	82.0	112
EG020F: Dissolved Metals by ICP-MS (QCLot: 4522840)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	95.2	80.0	116
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	97.8	85.0	114
EG020A-F: Barium	7440-39-3	0.001	mg/L	<0.001	0.1 mg/L	96.2	82.0	110
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	97.3	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	92.9	85.0	111
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	96.9	82.0	112



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Result	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
					LCS	Low	High	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4527251) - continued								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	108	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	109	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	115	72.0	130
EP231X: Perfluoroctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	114	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	114	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	118	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	108	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	124	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	114	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	110	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4527251)								
EP231X: Perfluoroctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	121	67.0	137
EP231X: N-Methyl perfluoroctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	92.2	68.0	141
EP231X: N-Ethyl perfluoroctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	80.3	62.6	147
EP231X: N-Methyl perfluoroctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	121	66.0	145
EP231X: N-Ethyl perfluoroctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	110	57.6	145
EP231X: N-Methyl perfluoroctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	103	65.0	136
EP231X: N-Ethyl perfluoroctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	118	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4527251)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	104	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	118	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	89.0	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	85.0	71.4	144

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: SOIL

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report		
				Spike	Spike Recovery(%)	Acceptable Limits (%)
				Concentration	MS	Low
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 4524417)						
ES2228746-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	96.2	70.0
		EG005T: Chromium	7440-47-3	50 mg/kg	97.4	68.0
						132

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 4524417) - continued							
ES2228746-001	Anonymous	EG005T: Copper	7440-50-8	250 mg/kg	93.7	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	97.6	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	93.7	66.0	133
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4526787)							
ES2228310-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	87.6	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	88.8	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	98.8	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	92.4	70.0	132
		EP231X: Perfluoroctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	99.2	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	111	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4526787)							
ES2228310-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	94.3	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	104	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	110	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	118	71.0	131
		EP231X: Perfluoroctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	108	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	102	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	114	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	102	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	98.8	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	107	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	121	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4526787)							
ES2228310-001	Anonymous	EP231X: Perfluoroctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	100	67.0	137
		EP231X: N-Methyl perfluoroctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	109	71.6	129
		EP231X: N-Ethyl perfluoroctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	110	69.8	131
		EP231X: N-Methyl perfluoroctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	115	68.7	130
		EP231X: N-Ethyl perfluoroctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	98.2	65.1	134
		EP231X: N-Methyl perfluoroctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	100	63.0	144
		EP231X: N-Ethyl perfluoroctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	107	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4526787)							
ES2228310-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	90.8	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	114	64.0	140

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4526787) - continued							
ES2228310-001	Anonymous	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	113	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	75.6	69.2	143
Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 4522837)							
ES2228714-002	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	100	70.0	130
		EG020A-F: Barium	7440-39-3	1 mg/L	98.8	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	97.6	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	94.4	70.0	130
		EG020A-F: Cobalt	7440-48-4	1 mg/L	98.8	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	97.0	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	97.1	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	92.5	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	97.9	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	98.7	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 4522840)							
ES2228800-012	WPW	EG020A-F: Arsenic	7440-38-2	1 mg/L	95.0	70.0	130
		EG020A-F: Barium	7440-39-3	1 mg/L	95.8	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	98.4	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	92.8	70.0	130
		EG020A-F: Cobalt	7440-48-4	1 mg/L	99.5	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	96.9	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	99.7	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	94.9	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	99.0	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	100	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 4522838)							
ES2228714-003	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	82.9	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4520937)							
ES2228800-001	BH2	EP080: C6 - C9 Fraction	----	325 µg/L	96.0	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4520937)							
ES2228800-001	BH2	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	94.8	70.0	130
EP080: BTEXN (QCLot: 4520937)							
ES2228800-001	BH2	EP080: Benzene	71-43-2	25 µg/L	78.9	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	89.6	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	92.5	70.0	130

Sub-Matrix: WATER

				Matrix Spike (MS) Report			
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Spike	Spike Recovery(%)	Acceptable Limits (%)	
				Concentration	MS	Low	High
EP080: BTEXN (QCLot: 4520937) - continued							
ES2228800-001	BH2	EP080: meta- & para-Xylene	108-38-3	25 µg/L	90.7	70.0	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	25 µg/L	91.6	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4527251)	Anonymous	EP080: Naphthalene	91-20-3	25 µg/L	97.4	70.0	130
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	119	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	108	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	118	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	114	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	113	65.0	140
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4527251)	Anonymous	EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	115	53.0	142
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	108	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	122	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	100	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	122	72.0	130
		EP231X: Perfluoroctanoic acid (PFOA)	335-67-1	0.25 µg/L	113	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	117	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	119	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	111	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	119	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	113	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	115	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4527251)							
EP2210224-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	115	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	124	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	118	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	125	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	117	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	104	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	120	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4527251)							
EP2210224-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	114	63.0	143

Sub-Matrix: WATER

				Matrix Spike (MS) Report			
			CAS Number	Spike	Spike Recovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound		Concentration	MS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4527251) - continued							
EP2210224-001	Anonymous	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	113	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	80.0	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	77.6	71.4	144

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2228800	Page	: 1 of 10
Client	: KLEINFELDER AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: Megan Ferguson	Telephone	: +6138549 9630
Project	: 20222347	Date Samples Received	: 12-Aug-2022
Site	: WSS - Cabbage Tree Rd Water Monitoring August 2022	Issue Date	: 22-Aug-2022
Sampler	: Megan Ferguson	No. of samples received	: 17
Order number	: ----	No. of samples analysed	: 17

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

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

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: SOIL

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EG005(ED093T): Total Metals by ICP-AES	ES2228765--007	Anonymous	Zinc	7440-66-6	85.3 %	0% - 50%	RPD exceeds LOR based limits

Outliers : Frequency of Quality Control Samples

Matrix: WATER

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	19	5.26	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	0	14	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	0	14	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: SOIL

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
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055)	WPF	12-Aug-2022	----	----	---	17-Aug-2022	26-Aug-2022	✓
EG005(ED093T): Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T)	WPF	12-Aug-2022	17-Aug-2022	08-Feb-2023	✓	18-Aug-2022	08-Feb-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)	WPF	12-Aug-2022	18-Aug-2022	08-Feb-2023	✓	18-Aug-2022	27-Sep-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)	WPF	12-Aug-2022	18-Aug-2022	08-Feb-2023	✓	18-Aug-2022	27-Sep-2022	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)	WPF	12-Aug-2022	18-Aug-2022	08-Feb-2023	✓	18-Aug-2022	27-Sep-2022	✓

Matrix: SOIL

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
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X) WPF		12-Aug-2022	18-Aug-2022	08-Feb-2023	✓	18-Aug-2022	27-Sep-2022	✓
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X) WPF		12-Aug-2022	18-Aug-2022	08-Feb-2023	✓	18-Aug-2022	27-Sep-2022	✓

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) BH2, BH6, BH8, MW239S, SW2, SW4,	BH4, BH7, BH9A, SW1, SW3, QC01	12-Aug-2022	----	----	----	17-Aug-2022	09-Sep-2022	✓
EG020F: Dissolved Metals by ICP-MS								
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) BH2, BH6, BH8, MW239S, SW2, SW4, QC01, TB_120822	BH4, BH7, BH9A, SW1, SW3, WPW, RB01,	12-Aug-2022	----	----	----	17-Aug-2022	08-Feb-2023	✓
EG035F: Dissolved Mercury by FIMS								
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) RB01,	TB_120822	12-Aug-2022	----	----	----	17-Aug-2022	09-Sep-2022	✓
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup								
Amber Glass Bottle - Unpreserved (EP071SG) BH2, BH6, BH8, MW239S, SW2, SW4, RB01,	BH4, BH7, BH9A, SW1, SW3, QC01, TB_120822	12-Aug-2022	15-Aug-2022	19-Aug-2022	✓	19-Aug-2022	24-Sep-2022	✓

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)	BH2, BH6, BH8, MW239S, SW2, SW4, RB01,	BH4, BH7, BH9A, SW1, SW3, QC01, TB_120822	12-Aug-2022	15-Aug-2022	19-Aug-2022	✓	19-Aug-2022	24-Sep-2022	✓
EP080/071: Total Petroleum Hydrocarbons									
Amber VOC Vial - Sulfuric Acid (EP080)	BH2, BH6, BH8, MW239S, SW2, SW4, RB01,	BH4, BH7, BH9A, SW1, SW3, QC01, TB_120822	12-Aug-2022	18-Aug-2022	26-Aug-2022	✓	18-Aug-2022	26-Aug-2022	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
Amber VOC Vial - Sulfuric Acid (EP080)	BH2, BH6, BH8, MW239S, SW2, SW4, RB01,	BH4, BH7, BH9A, SW1, SW3, QC01, TB_120822	12-Aug-2022	18-Aug-2022	26-Aug-2022	✓	18-Aug-2022	26-Aug-2022	✓
EP080: BTEXN									
Amber VOC Vial - Sulfuric Acid (EP080)	BH2, BH6, BH8, MW239S, SW2, SW4, RB01,	BH4, BH7, BH9A, SW1, SW3, QC01, TB_120822	12-Aug-2022	18-Aug-2022	26-Aug-2022	✓	18-Aug-2022	26-Aug-2022	✓

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)	BH2, BH6, BH8, MW239S, SW2, SW4, QC01, RB01,	BH4, BH7, BH9A, SW1, SW3, WPW, QC02, TB_120822	12-Aug-2022	19-Aug-2022	08-Feb-2023	✓	19-Aug-2022	08-Feb-2023
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)	BH2, BH6, BH8, MW239S, SW2, SW4, QC01, RB01,	BH4, BH7, BH9A, SW1, SW3, WPW, QC02, TB_120822	12-Aug-2022	19-Aug-2022	08-Feb-2023	✓	19-Aug-2022	08-Feb-2023
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)	BH2, BH6, BH8, MW239S, SW2, SW4, QC01, RB01,	BH4, BH7, BH9A, SW1, SW3, WPW, QC02, TB_120822	12-Aug-2022	19-Aug-2022	08-Feb-2023	✓	19-Aug-2022	08-Feb-2023
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)	BH2, BH6, BH8, MW239S, SW2, SW4, QC01, RB01,	BH4, BH7, BH9A, SW1, SW3, WPW, QC02, TB_120822	12-Aug-2022	19-Aug-2022	08-Feb-2023	✓	19-Aug-2022	08-Feb-2023

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
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)	BH2, BH6, BH8, MW239S, SW2, SW4, QC01, RB01,	BH4, BH7, BH9A, SW1, SW3, WPW, QC02, TB_120822	12-Aug-2022	19-Aug-2022	08-Feb-2023	✓	19-Aug-2022	08-Feb-2023

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: SOIL

Quality Control Sample Type	Analytical Methods	Method	Count		Rate (%)		Quality Control Specification
			QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)							
Moisture Content		EA055	2	15	13.33	10.00	✓
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS		EP231X	2	20	10.00	10.00	✓
Total Metals by ICP-AES		EG005T	2	19	10.53	10.00	✓
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS		EP231X	1	20	5.00	5.00	✓
Total Metals by ICP-AES		EG005T	1	19	5.26	5.00	✓
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS		EP231X	1	20	5.00	5.00	✓
Total Metals by ICP-AES		EG005T	1	19	5.26	5.00	✓
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS		EP231X	1	20	5.00	5.00	✓
Total Metals by ICP-AES		EG005T	1	19	5.26	5.00	✓

Matrix: WATER

Quality Control Sample Type	Analytical Methods	Method	Count		Rate (%)		Quality Control Specification
			QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)							
Dissolved Mercury by FIMS		EG035F	2	12	16.67	10.00	✓
Dissolved Metals by ICP-MS - Suite A		EG020A-F	4	40	10.00	10.00	✓
Major Cations - Dissolved		ED093F	2	20	10.00	10.00	✓
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS		EP231X	1	19	5.26	10.00	✗
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup		EP071SG	0	14	0.00	10.00	✗
TRH Volatiles/BTEX		EP080	2	20	10.00	10.00	✓
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS		EG035F	1	12	8.33	5.00	✓
Dissolved Metals by ICP-MS - Suite A		EG020A-F	2	40	5.00	5.00	✓
Major Cations - Dissolved		ED093F	1	20	5.00	5.00	✓
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS		EP231X	1	19	5.26	5.00	✓
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup		EP071SG	1	14	7.14	5.00	✓
TRH Volatiles/BTEX		EP080	1	20	5.00	5.00	✓
Method Blanks (MB)							
Dissolved Mercury by FIMS		EG035F	1	12	8.33	5.00	✓
Dissolved Metals by ICP-MS - Suite A		EG020A-F	2	40	5.00	5.00	✓
Major Cations - Dissolved		ED093F	1	20	5.00	5.00	✓

Matrix: WATER Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Analytical Methods	Method	Count		Rate (%)		Quality Control Specification
			QC	Regular	Actual	Expected	
Method Blanks (MB) - Continued							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS		EP231X	1	19	5.26	5.00	✓ NEPM 2013 B3 & ALS QC Standard
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup		EP071SG	1	14	7.14	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)							
Dissolved Mercury by FIMS		EG035F	1	12	8.33	5.00	✓ NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A		EG020A-F	2	40	5.00	5.00	✓ NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS		EP231X	1	19	5.26	5.00	✓ NEPM 2013 B3 & ALS QC Standard
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup		EP071SG	0	14	0.00	5.00	✗ NEPM 2013 B3 & ALS QC Standard
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
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.
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 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 Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM 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.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl ₂)(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 SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	EP071SG	WATER	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM Schedule B(3).
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 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 Schedule B(3)

Analytical Methods		Method	Matrix	Method Descriptions
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS		EP231X	WATER	<p>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.</p> <p>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.</p>
Preparation Methods				
Hot Block Digest for metals in soils sediments and sludges		EN69	SOIL	<p>In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).</p>
QuECheRS Extraction of Solids		ORG71	SOIL	<p>In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.</p>
Separatory Funnel Extraction of Liquids		ORG14	WATER	<p>In house: Referenced to USEPA SW 846 - 3510 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 Schedule B(3) . ALS default excludes sediment which may be resident in the container.</p>
Volatile 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 purging.
Solid Phase Extraction (SPE) for PFAS in water		ORG72	WATER	<p>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.</p>

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Sample Receipt Advice

Company name: Kleinfelder Aust Pty Ltd (NEWCASTLE)
Contact name: M Ferguson
Project name: WSS-CABBAGE TREE RD WATER MONITORING AUGUST 2022
Project ID: 20222347
Turnaround time: 5 Day
Date/Time received Aug 15, 2022 5:54 PM
Eurofins reference 915525

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✗ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A** Custody Seals intact (if used).

Notes

Samples received by the laboratory after 5.30pm are deemed to have been received the following working day.

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Andrew Black on phone : (+61) 2 9900 8490 or by email: AndrewBlack@eurofins.com

Results will be delivered electronically via email to M Ferguson - mferguson@kleinfelder.com.

Note: A copy of these results will also be delivered to the general Kleinfelder Aust Pty Ltd (NEWCASTLE) email address.



web: www.eurofins.com.au

email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

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Tel: +61 3 8564 5000 NATA# 1261 Site# 1254	Tel: +61 3 8564 5000 NATA# 1261 Site# 1254	Tel: +61 2 9900 8400 NATA# 1261 Site# 1254	Tel: +61 2 6113 8091 NATA# 1261 Site# 18217	Tel: +61 7 3902 4600 NATA# 1261 Site# 20794	Tel: +61 2 4968 8448 NATA# 1261 Site# 25079

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Company Name: Kleinfelder Aust Pty Ltd (NEWCASTLE)**Address:** Suite 3, 240-244 Pacific Hwy
Charlestown
NSW 2290**Project Name:** WSS-CABBAGE TREE RD WATER MONITORING AUGUST 2022**Project ID:** 20222347**Order No.:****Report #:** 915525
Phone: 02 4949 5200
Fax:**Received:**

Aug 15, 2022 5:54 PM

Due:

Aug 23, 2022

Priority:

5 Day

Contact Name:

M Ferguson

Eurofins Analytical Services Manager : Andrew Black

Sample Detail

Sydney Laboratory - NATA # 1261 Site # 18217		X	X	X	X				
Brisbane Laboratory - NATA # 1261 Site # 20794									X
External Laboratory									
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID				
1	QC01A	Aug 12, 2022		Water	S22-Au0041905	X	X	X	X
2	QC02A	Aug 12, 2022		Water	S22-Au0041906				X
Test Counts						1	1	1	2

Per- and Polyfluoroalkyl Substances (PFASs)
Total Recoverable Hydrocarbons
Metals M/8 filtered
Boron (filtered)
Cobalt (filtered)

Environment Testing

Kleinfelder Australia Pty Ltd (NEWC)
 Suite 3, 240-244 Pacific Hwy
 Charlestown
 NSW 2290



NATA Accredited
 Accreditation Number 1261
 Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
 NATA is a signatory to the ILAC Mutual Recognition
 Arrangement for the mutual recognition of the
 equivalence of testing, medical testing, calibration,
 inspection, proficiency testing scheme providers and
 reference materials producers reports and certificates.

Attention: M Ferguson

Report 915525-W
 Project name WSS-CABBAGE TREE RD WATER MONITORING AUGUST 2022
 Project ID 20222347
 Received Date Aug 15, 2022

Client Sample ID			QC01A	QC02A
Sample Matrix	LOR	Unit	Water S22- Au0041905	Water S22- Au0041906
Eurofins Sample No.			Aug 12, 2022	Aug 12, 2022
Date Sampled				
Test/Reference				
TRH - 2013 NEPM Fractions (after silica gel clean-up)				
TRH >C10-C16 (after silica gel clean-up)	0.05	mg/L	< 0.05	-
TRH >C16-C34 (after silica gel clean-up)	0.1	mg/L	< 0.1	-
TRH >C34-C40 (after silica gel clean-up)	0.1	mg/L	< 0.1	-
TRH >C10-C40 (total) (after silica-gel clean up)*	0.1	mg/L	< 0.1	-
TRH - 1999 NEPM Fractions (after silica gel clean-up)				
TRH C10-C14 (after silica gel clean-up)	0.05	mg/L	< 0.05	-
TRH C15-C28 (after silica gel clean-up)	0.1	mg/L	< 0.1	-
TRH C29-C36 (after silica gel clean-up)	0.1	mg/L	< 0.1	-
TRH C10-C36 (Total) (after silica gel clean-up)	0.1	mg/L	< 0.1	-
Heavy Metals				
Arsenic (filtered)	0.001	mg/L	< 0.001	-
Boron (filtered)	0.05	mg/L	< 0.05	-
Cadmium (filtered)	0.0002	mg/L	< 0.0002	-
Chromium (filtered)	0.001	mg/L	< 0.001	-
Cobalt (filtered)	0.001	mg/L	0.003	-
Copper (filtered)	0.001	mg/L	0.002	-
Lead (filtered)	0.001	mg/L	< 0.001	-
Mercury (filtered)	0.0001	mg/L	< 0.0001	-
Nickel (filtered)	0.001	mg/L	0.003	-
Zinc (filtered)	0.005	mg/L	0.012	-
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA) ^{N11}	0.05	ug/L	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA) ^{N11}	0.01	ug/L	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA) ^{N11}	0.01	ug/L	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.01	ug/L	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA) ^{N11}	0.01	ug/L	< 0.01	< 0.01
Perfluorononanoic acid (PFNA) ^{N11}	0.01	ug/L	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01
Perfluorododecanoic acid (PFDsDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA) ^{N15}	0.01	ug/L	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	78	103
13C5-PFPeA (surr.)	1	%	62	99
13C5-PFHxA (surr.)	1	%	118	118

Client Sample ID			QC01A	QC02A
Sample Matrix			Water S22- Au0041905	Water S22- Au0041906
Eurofins Sample No.			Aug 12, 2022	Aug 12, 2022
Date Sampled				
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCAs)				
13C4-PFH _n A (surr.)	1	%	90	93
13C8-PFOA (surr.)	1	%	92	86
13C5-PFNA (surr.)	1	%	98	82
13C6-PFDA (surr.)	1	%	73	60
13C2-PFU _n DA (surr.)	1	%	58	50
13C2-PFD _n DA (surr.)	1	%	85	72
13C2-PFTeDA (surr.)	1	%	129	117
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE) ^{N11}	0.05	ug/L	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE) ^{N11}	0.05	ug/L	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	0.05	ug/L	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	0.05	ug/L	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	87	98
D3-N-MeFOSA (surr.)	1	%	118	113
D5-N-EtFOSA (surr.)	1	%	56	55
D7-N-MeFOSE (surr.)	1	%	86	85
D9-N-EtFOSE (surr.)	1	%	64	59
D5-N-EtFOSAA (surr.)	1	%	45	40
D3-N-MeFOSAA (surr.)	1	%	56	44
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.01	ug/L	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS) ^{N15}	0.01	ug/L	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS) ^{N15}	0.01	ug/L	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	0.01	ug/L	< 0.01	< 0.01
Perfluorohexamersulfonic acid (PFHxS) ^{N11}	0.01	ug/L	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	0.01	ug/L	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.01	ug/L	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS) ^{N15}	0.01	ug/L	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	99	94
18O2-PFHxS (surr.)	1	%	113	107
13C8-PFOS (surr.)	1	%	100	97
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexamersulfonic acid (4:2 FTSA) ^{N11}	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) ^{N11}	0.01	ug/L	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	28	104
13C2-6:2 FTSA (surr.)	1	%	12	73
13C2-8:2 FTSA (surr.)	1	%	72	50
13C2-10:2 FTSA (surr.)	1	%	68	57

Client Sample ID			QC01A	QC02A
Sample Matrix			Water	Water
Eurofins Sample No.			S22-Au0041905	S22-Au0041906
Date Sampled			Aug 12, 2022	Aug 12, 2022
Test/Reference	LOR	Unit		
PFASs Summations				
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
TRH - 2013 NEPM Fractions (after silica gel clean-up)	Sydney	Aug 19, 2022	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
TRH - 1999 NEPM Fractions (after silica gel clean-up)	Sydney	Aug 19, 2022	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Metals M8 filtered	Sydney	Aug 18, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Heavy Metals (filtered)	Sydney	Aug 18, 2022	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Aug 19, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Aug 19, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Aug 19, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Aug 19, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			



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NSW 2290Project Name: WSS-CABBAGE TREE RD WATER MONITORING AUGUST 2022
Project ID: 20222347

Order No.:

Report #: 915525
Phone: 02 4949 5200
Fax:Received: Aug 15, 2022 5:54 PM
Due: Aug 23, 2022
Priority: 5 Day
Contact Name: M Ferguson

Eurofins Analytical Services Manager : Andrew Black

Sample Detail

							Per- and Polyfluoroalkyl Substances (PFASs)
							Total Recoverable Hydrocarbons
							Boron (filtered)
Sydney Laboratory - NATA # 1261 Site # 18217		X	X	X	X		
Brisbane Laboratory - NATA # 1261 Site # 20794							X
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	QC01A	Aug 12, 2022		Water	S22-Au0041905	X X X X X	
2	QC02A	Aug 12, 2022		Water	S22-Au0041906		X
Test Counts						1 1 1 1 2	

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

µg/L: micrograms per litre

ppm: parts per million

ppb: parts per billion

%: Percentage

org/100 mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
TRH - 2013 NEPM Fractions (after silica gel clean-up)							
TRH >C10-C16 (after silica gel clean-up)	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34 (after silica gel clean-up)	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40 (after silica gel clean-up)	mg/L	< 0.1			0.1	Pass	
Method Blank							
TRH - 1999 NEPM Fractions (after silica gel clean-up)							
TRH C10-C14 (after silica gel clean-up)	mg/L	< 0.05			0.05	Pass	
TRH C15-C28 (after silica gel clean-up)	mg/L	< 0.1			0.1	Pass	
TRH C29-C36 (after silica gel clean-up)	mg/L	< 0.1			0.1	Pass	
Method Blank							
Heavy Metals							
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Boron (filtered)	mg/L	< 0.05			0.05	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Cobalt (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluoroctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluoroctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexamersulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
TRH - 2013 NEPM Fractions (after silica gel clean-up)							
TRH >C10-C16 (after silica gel clean-up)	%	107			70-130	Pass	
LCS - % Recovery							
TRH - 1999 NEPM Fractions (after silica gel clean-up)							
TRH C10-C14 (after silica gel clean-up)	%	106			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic (filtered)	%	101			80-120	Pass	
Boron (filtered)	%	85			80-120	Pass	
Cadmium (filtered)	%	101			80-120	Pass	
Chromium (filtered)	%	98			80-120	Pass	
Cobalt (filtered)	%	96			80-120	Pass	
Copper (filtered)	%	95			80-120	Pass	
Lead (filtered)	%	98			80-120	Pass	
Mercury (filtered)	%	89			80-120	Pass	
Nickel (filtered)	%	97			80-120	Pass	
Zinc (filtered)	%	95			80-120	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	122			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	87			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	103			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	87			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	96			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	112			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	99			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	123			50-150	Pass	
Perfluorododecanoic acid (PFDDoDA)	%	133			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	67			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	139			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	92			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	112			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	97			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	114			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	128			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	129			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	130			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFASs)							
Perfluorobutanesulfonic acid (PFBS)	%	91			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	104			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	109			50-150	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluoropentanesulfonic acid (PFPeS)			%	106			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)			%	102			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)			%	108			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)			%	100			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)			%	84			50-150	Pass	
LCS - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)									
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)			%	106			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)			%	113			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)			%	123			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)			%	115			50-150	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	S22-JI0059889	NCP	%	97			75-125	Pass	
Boron (filtered)	S22-JI0047373	NCP	%	104			75-125	Pass	
Cadmium (filtered)	S22-JI0059889	NCP	%	95			75-125	Pass	
Chromium (filtered)	S22-JI0059889	NCP	%	92			75-125	Pass	
Cobalt (filtered)	S22-JI0047373	NCP	%	104			75-125	Pass	
Copper (filtered)	S22-JI0059889	NCP	%	88			75-125	Pass	
Lead (filtered)	S22-JI0059889	NCP	%	91			75-125	Pass	
Mercury (filtered)	S22-JI0059889	NCP	%	90			75-125	Pass	
Nickel (filtered)	S22-JI0059889	NCP	%	89			75-125	Pass	
Zinc (filtered)	S22-JI0059889	NCP	%	87			75-125	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	B22-Au0042518	NCP	%	132			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B22-Au0042518	NCP	%	55			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B22-Au0042518	NCP	%	100			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-Au0042518	NCP	%	99			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B22-Au0042518	NCP	%	97			50-150	Pass	
Perfluorononanoic acid (PFNA)	B22-Au0042518	NCP	%	108			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B22-Au0042518	NCP	%	116			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-Au0042518	NCP	%	115			50-150	Pass	
Perfluorododecanoic acid (PFDsDA)	B22-Au0042518	NCP	%	115			50-150	Pass	
Perfluorotridecanoic acid (PFTsDA)	B22-Au0042518	NCP	%	66			50-150	Pass	
Perfluorotetradecanoic acid (PFTsDA)	B22-Au0042518	NCP	%	90			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	B22-Au0042518	NCP	%	83			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-Au0042518	NCP	%	89			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-Au0042518	NCP	%	93			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-Au0042518	NCP	%	86			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-Au0042518	NCP	%	120			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-Au0042518	NCP	%	91			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-Au0042518	NCP	%	75			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)									
Perfluorobutanesulfonic acid (PFBS)	B22-Au0042518	NCP	%	91			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-Au0042518	NCP	%	107			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-Au0042518	NCP	%	93			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-Au0042518	NCP	%	97			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-Au0042518	NCP	%	60			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-Au0042518	NCP	%	109			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-Au0042518	NCP	%	97			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-Au0042518	NCP	%	68			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)									
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-Au0042518	NCP	%	100			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-Au0042518	NCP	%	110			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-Au0042518	NCP	%	135			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-Au0042518	NCP	%	93			50-150	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
TRH - 2013 NEPM Fractions (after silica gel clean-up)									
TRH >C10-C16 (after silica gel clean-up)	S22-Au0043414	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34 (after silica gel clean-up)	S22-Au0043414	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40 (after silica gel clean-up)	S22-Au0043414	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
TRH - 1999 NEPM Fractions (after silica gel clean-up)									
TRH C10-C14 (after silica gel clean-up)	S22-Au0043414	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28 (after silica gel clean-up)	S22-Au0043414	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36 (after silica gel clean-up)	S22-Au0043414	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Heavy Metals									
Arsenic (filtered)	S22-JI0059885	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Boron (filtered)	S22-Au0041849	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Cadmium (filtered)	S22-JI0059885	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	S22-JI0059885	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cobalt (filtered)	S22-Au0041849	NCP	mg/L	0.046	0.046	<1	30%	Pass	
Copper (filtered)	S22-JI0059885	NCP	mg/L	0.002	0.002	3.7	30%	Pass	
Lead (filtered)	S22-JI0059885	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury (filtered)	S22-JI0059885	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	S22-JI0059885	NCP	mg/L	0.001	< 0.001	19	30%	Pass	
Zinc (filtered)	S22-JI0059885	NCP	mg/L	0.006	0.006	2.1	30%	Pass	

Duplicate								
Perfluoroalkyl carboxylic acids (PFCAs)					Result 1	Result 2	RPD	
Perfluorobutanoic acid (PFBA)	S22-Au0041905	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
Perfluoropentanoic acid (PFPeA)	S22-Au0041905	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorohexanoic acid (PFHxA)	S22-Au0041905	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoroheptanoic acid (PFHpA)	S22-Au0041905	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorooctanoic acid (PFOA)	S22-Au0041905	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorononanoic acid (PFNA)	S22-Au0041905	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorodecanoic acid (PFDA)	S22-Au0041905	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoroundecanoic acid (PFUnDA)	S22-Au0041905	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorododecanoic acid (PFDsDA)	S22-Au0041905	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorotridecanoic acid (PFTsDA)	S22-Au0041905	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorotetradecanoic acid (PFTsDA)	S22-Au0041905	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonamido substances					Result 1	Result 2	RPD	
Perfluoroctane sulfonamide (FOSA)	S22-Au0041905	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S22-Au0041905	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S22-Au0041905	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	S22-Au0041905	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	S22-Au0041905	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethyl-perfluoroctanesulfonamidoacetic acid (N-EtFOSAA)	S22-Au0041905	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methyl-perfluoroctanesulfonamidoacetic acid (N-MeFOSAA)	S22-Au0041905	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonic acids (PFSAs)					Result 1	Result 2	RPD	
Perfluorobutanesulfonic acid (PFBS)	S22-Au0041905	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorononanesulfonic acid (PFNS)	S22-Au0041905	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoropropanesulfonic acid (PFPrS)	S22-Au0041905	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoropentanesulfonic acid (PFPeS)	S22-Au0041905	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorohexanesulfonic acid (PFHxS)	S22-Au0041905	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoroheptanesulfonic acid (PFHpS)	S22-Au0041905	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorooctanesulfonic acid (PFOS)	S22-Au0041905	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorodecanesulfonic acid (PFDS)	S22-Au0041905	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Duplicate								
n:2 Fluorotelomer sulfonic acids (n:2 FTsAs)					Result 1	Result 2	RPD	
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	S22-Au0041905	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	S22-Au0041905	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S22-Au0041905	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S22-Au0041905	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass

Comments**Sample Integrity**

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Hannah Mawbey	Analytical Services Manager
Gabriele Cordero	Senior Analyst-Metal
Jonathon Angell	Senior Analyst-PFAS
Roopesh Rangarajan	Senior Analyst-Organic

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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Client:				Site, COC and Contact Data				Laboratory:		
Kleinfelder Australia Pty Ltd Suite 3, 240 - 244 Pacific Highway, Charlottetown NSW 2330 Phone: 02 4949 5200				Site Name: WJSS ~ Cnr Bridge Tree Renov Site No.: WJSS QUOTE NUMBER: 20232071 Job No.: 20232071 Requested TAT: 24 hrs 3 days 5 days 7 days Lab minimum unless specified				Sampler Name: Joni Ruby Contact Number: 0401 445 275 Contact E-mail: JRuby@kleinfelder.com KLF-EFWEDD		ALS
CHAIN OF CUSTODY Requisitioned by (print): Joni Ruby (sign) TOB Date / Time: 26/8/22 16:30				Received by (print): TOB (sign) Theresa Date / Time: 26/8/22				Received by (print): TOB (sign) Theresa Date / Time: 26/8/22		5/555 Maitland Rd Mayfield West, Newcastle NSW 2304 Phone: (02) 4014 2500
Notes:				Notes:				Notes:		JRuby@kleinfelder.com DKensbroek@kleinfelder.com Cardiff, NSW 2285 Phone: 02 4949 5200
Sample ID	Lab ID	Sample Point	Date	Start Depth	End Depth	Units	# Containers	Organic Analyses		Other Analyses
								EAC03	EAO10	
BH2	Water	Water	26/8/22				3	X X X X		Comments
Environmental Division Sydney Work Order Reference ES2230634										
LAB OF ORIGIN: LAB OF ORIGIN: NEWCASTLE										
Telephone: +61 2 8764 8556										

pH @ WN

P1 26/8/22 16:40

CERTIFICATE OF ANALYSIS

Work Order	: ES2230634	Page	: 1 of 2
Client	: KLEINFELDER AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: J Roby	Contact	: Graeme Jablonskas
Address	: 95 MITCHELL ROAD CARDIFF NSW 2285	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +6138549 9609
Project	: 20232071	Date Samples Received	: 26-Aug-2022 16:31
Order number	: ----	Date Analysis Commenced	: 26-Aug-2022
C-O-C number	: ----	Issue Date	: 02-Sep-2022 11:28
Sampler	: J Roby		
Site	: WSS-Cabbage Tree Rond		
Quote number	: EN/222		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Neil Martin	Team Leader - Chemistry	Chemistry, Newcastle West, NSW



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

∅ = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	BH2	---	---	---	---	---
			Sampling date / time	26-Aug-2022 00:00	---	---	---	---	---
Compound	CAS Number	LOR	Unit	ES2230634-001	-----	-----	-----	-----	-----
				Result	---	---	---	---	---
EA005: pH									
pH Value	---	0.01	pH Unit	4.95	---	---	---	---	---
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	---	1	µS/cm	96	---	---	---	---	---
EA016: Calculated TDS (from Electrical Conductivity)									
Total Dissolved Solids (Calc.)	---	1	mg/L	62	---	---	---	---	---
EA045: Turbidity									
Turbidity	---	0.1	NTU	127	---	---	---	---	---
EG020F: Dissolved Metals by ICP-MS									
Zinc	7440-66-6	0.005	mg/L	0.151	---	---	---	---	---

Inter-Laboratory Testing

Analysis conducted by ALS Newcastle - Water, NATA accreditation no. 825, site no. 1656 (Chemistry) 9854 (Biology).

(WATER) EA005: pH

QUALITY CONTROL REPORT

Work Order	: ES2230634	Page	: 1 of 3
Client	: KLEINFELDER AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: J Roby	Contact	: Graeme Jablonskas
Address	: 95 MITCHELL ROAD CARDIFF NSW 2285	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +6138549 9609
Project	: 20232071	Date Samples Received	: 26-Aug-2022
Order number	: ----	Date Analysis Commenced	: 26-Aug-2022
C-O-C number	: ----	Issue Date	: 02-Sep-2022
Sampler	: J Roby		
Site	: WSS-Cabbage Tree Rond		
Quote number	: EN/222		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This 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	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Neil Martin	Team Leader - Chemistry	Chemistry, Newcastle West, NSW



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

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	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA005: pH (QC Lot: 4546011)									
ES2230546-004	Anonymous	EA005: pH Value	---	0.01	pH Unit	6.97	7.03	0.9	0% - 20%
WN2209073-007	Anonymous	EA005: pH Value	---	0.01	pH Unit	7.38	7.39	0.1	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4549840)									
ES2230508-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	---	1	µS/cm	72	67	7.4	0% - 20%
ES2230508-010	Anonymous	EA010-P: Electrical Conductivity @ 25°C	---	1	µS/cm	1440	1370	5.1	0% - 20%
ES2230652-005	Anonymous	EA010-P: Electrical Conductivity @ 25°C	---	1	µS/cm	6450	6390	0.8	0% - 20%
ES2230717-005	Anonymous	EA010-P: Electrical Conductivity @ 25°C	---	1	µS/cm	355	386	8.4	0% - 20%
ES2230546-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	---	1	µS/cm	11500	11700	1.4	0% - 20%
EA045: Turbidity (QC Lot: 4544932)									
ES2230520-011	Anonymous	EA045: Turbidity	---	0.1	NTU	2.9	3.2	10.9	0% - 20%
ES2230592-003	Anonymous	EA045: Turbidity	---	0.1	NTU	0.7	0.7	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 4553771)									
ES2230608-001	Anonymous	EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.097	0.099	2.0	0% - 50%
ES2230433-001	Anonymous	EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.023	0.024	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (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 Sample (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: Compound	CAS Number	LOR	Unit	Result	Method Blank (MB) Report				Laboratory Control Spike (LCS) Report					
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)						
						LCS	Low	High						
EA005: pH (QCLot: 4546011)			pH Unit	7.6 pH Unit	100	98.5	102							
EA005: pH Value	---	---												
EA010P: Conductivity by PC Titrator (QCLot: 4549840)			μS/cm	<1	220 μS/cm	90.7	89.9	110						
EA010-P: Electrical Conductivity @ 25°C	---	1		<1	2100 μS/cm	99.5	90.2	111						
EA045: Turbidity (QCLot: 4544932)			NTU	<0.1	40 NTU	97.5	91.0	105						
EA045: Turbidity	---	0.1												
EG020F: Dissolved Metals by ICP-MS (QCLot: 4553771)			mg/L	<0.005	0.1 mg/L	98.8	81.0	117						
EG020A-F: Zinc	7440-66-6	0.005												

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	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report				
				Spike Concentration	Spike Recovery(%)		Acceptable Limits (%)	
					MS	Low	High	
EG020F: Dissolved Metals by ICP-MS (QCLot: 4553771)								
ES2230352-002	Anonymous	EG020A-F: Zinc	7440-66-6	1 mg/L	98.3	70.0	130	

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2230634	Page	: 1 of 4
Client	: KLEINFELDER AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: J Roby	Telephone	: +6138549 9609
Project	: 20232071	Date Samples Received	: 26-Aug-2022
Site	: WSS-Cabbage Tree Rond	Issue Date	: 02-Sep-2022
Sampler	: J Roby	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

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.
- **NO** Matrix Spike outliers occur.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.

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
EA005: pH							
Clear Plastic Bottle - Natural (REGIONAL LAB) (EA005) BH2	26-Aug-2022	---	---	---	26-Aug-2022	26-Aug-2022	✓
EA101P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA101-P) BH2	26-Aug-2022	---	---	---	30-Aug-2022	23-Sep-2022	✓
EA045: Turbidity							
Clear Plastic Bottle - Natural (EA045) BH2	26-Aug-2022	---	---	---	27-Aug-2022	28-Aug-2022	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) BH2	26-Aug-2022	---	---	---	01-Sep-2022	22-Feb-2023	✓

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	Analytical Methods	Method	Count		Rate (%)		Quality Control Specification
			QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)							
Conductivity by Auto Titrator		EA010-P	5	46	10.87	10.00	✓ NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A		EG020A-F	2	14	14.29	10.00	✓ NEPM 2013 B3 & ALS QC Standard
pH		EA005	2	20	10.00	10.00	✓ NEPM 2013 B3 & ALS QC Standard
Turbidity		EA045	2	20	10.00	10.00	✓ NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Conductivity by Auto Titrator		EA010-P	4	46	8.70	8.33	✓ NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A		EG020A-F	1	14	7.14	5.00	✓ NEPM 2013 B3 & ALS QC Standard
pH		EA005	1	20	5.00	5.00	✓ NEPM 2013 B3 & ALS QC Standard
Turbidity		EA045	1	20	5.00	5.00	✓ NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Conductivity by Auto Titrator		EA010-P	1	46	2.17	1.67	✓ NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A		EG020A-F	1	14	7.14	5.00	✓ NEPM 2013 B3 & ALS QC Standard
Turbidity		EA045	1	20	5.00	5.00	✓ NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Dissolved Metals by ICP-MS - Suite A		EG020A-F	1	14	7.14	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.

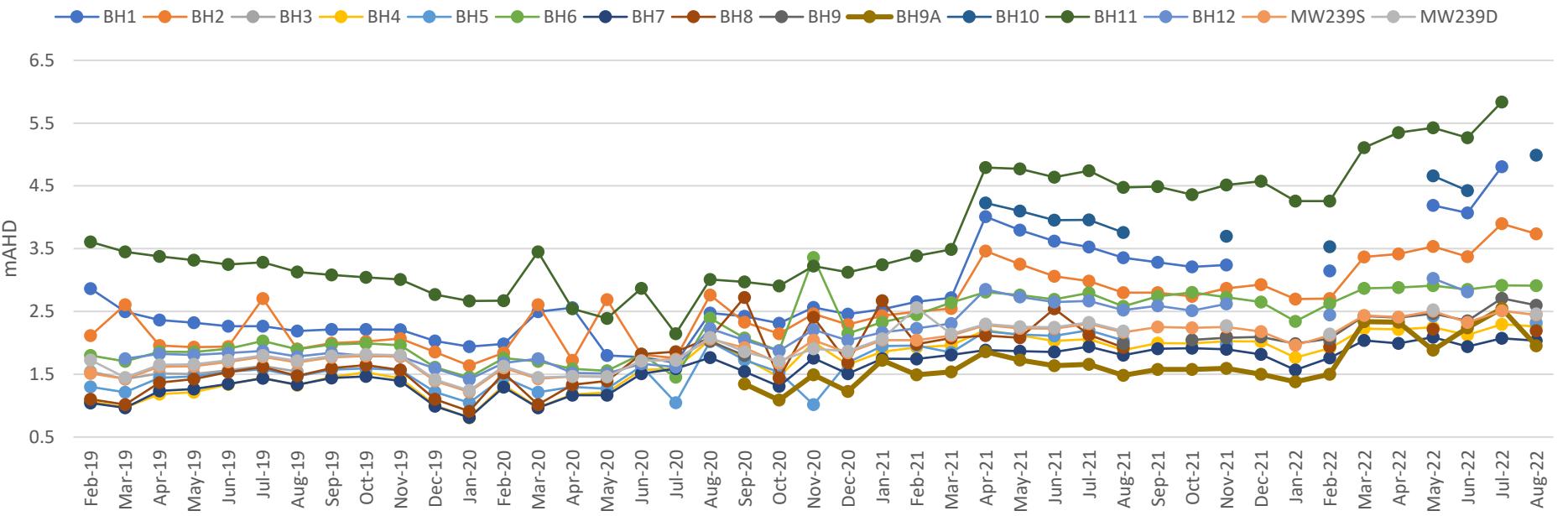
Analytical Methods	Method	Matrix	Method Descriptions
pH	EA005	WATER	In house: Referenced to APHA 4500 H+. pH of water samples is determined by ISE either manually or by automated pH meter. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM 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 Schedule B(3)
Turbidity	EA045	WATER	In house: Referenced to APHA 2130 B. This method is compliant with NEPM 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.



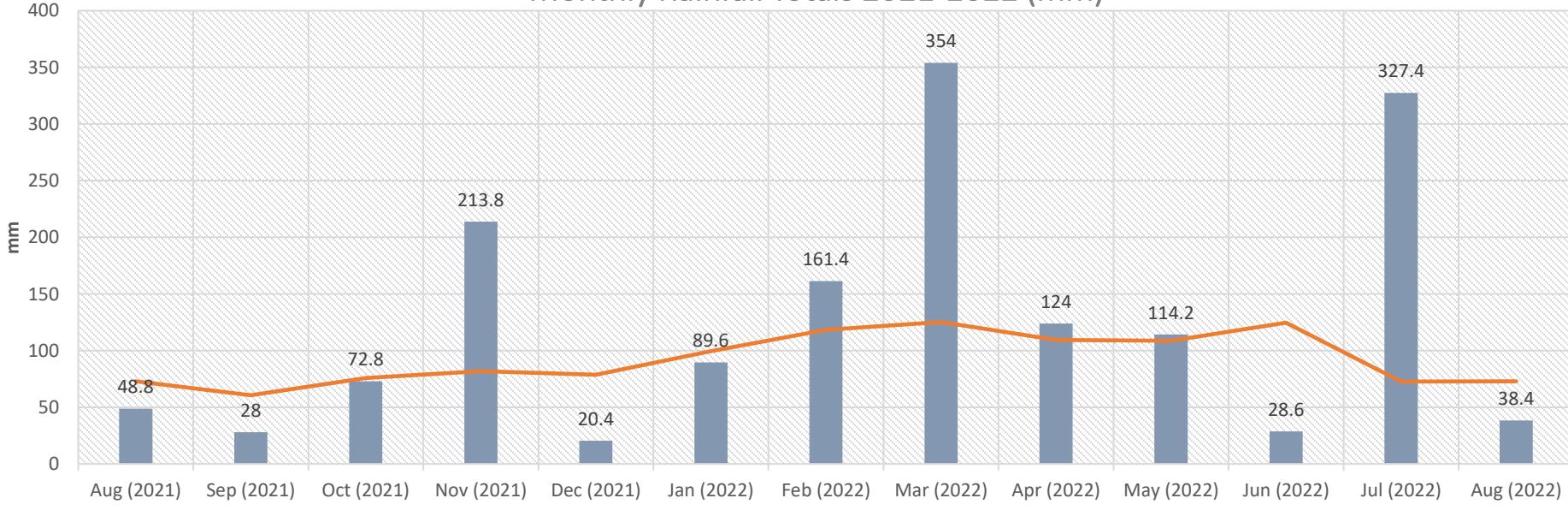
ATTACHMENT 4: DATA TRENDS

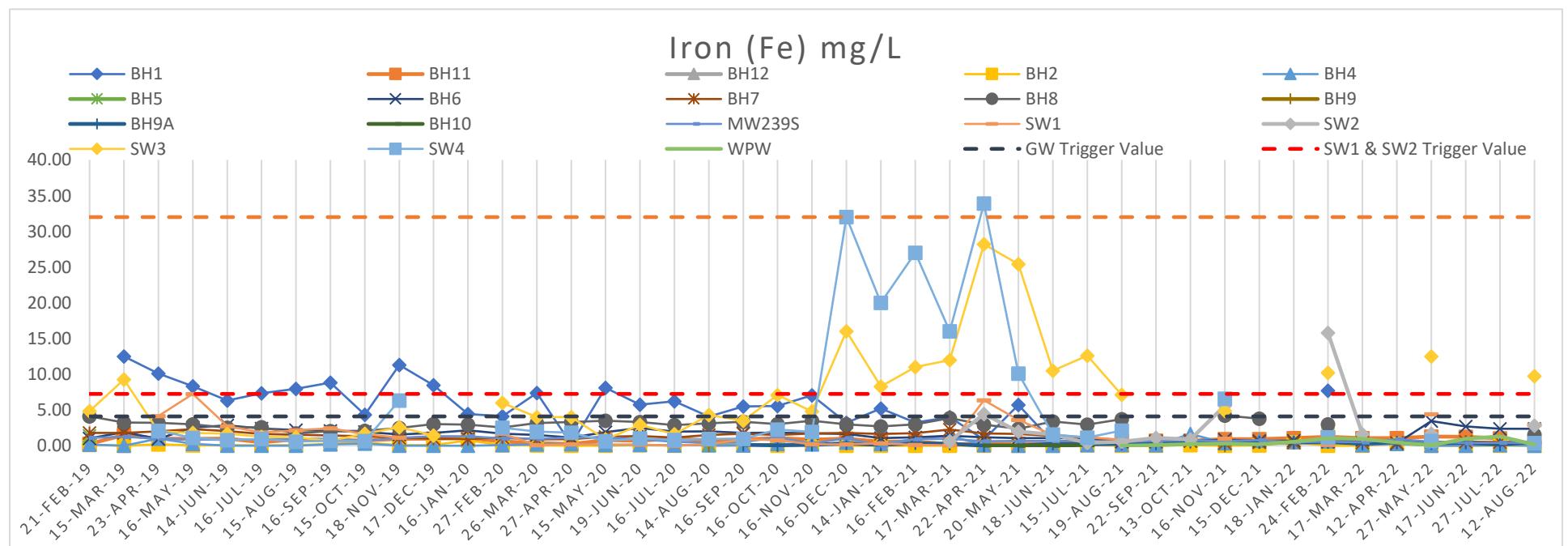
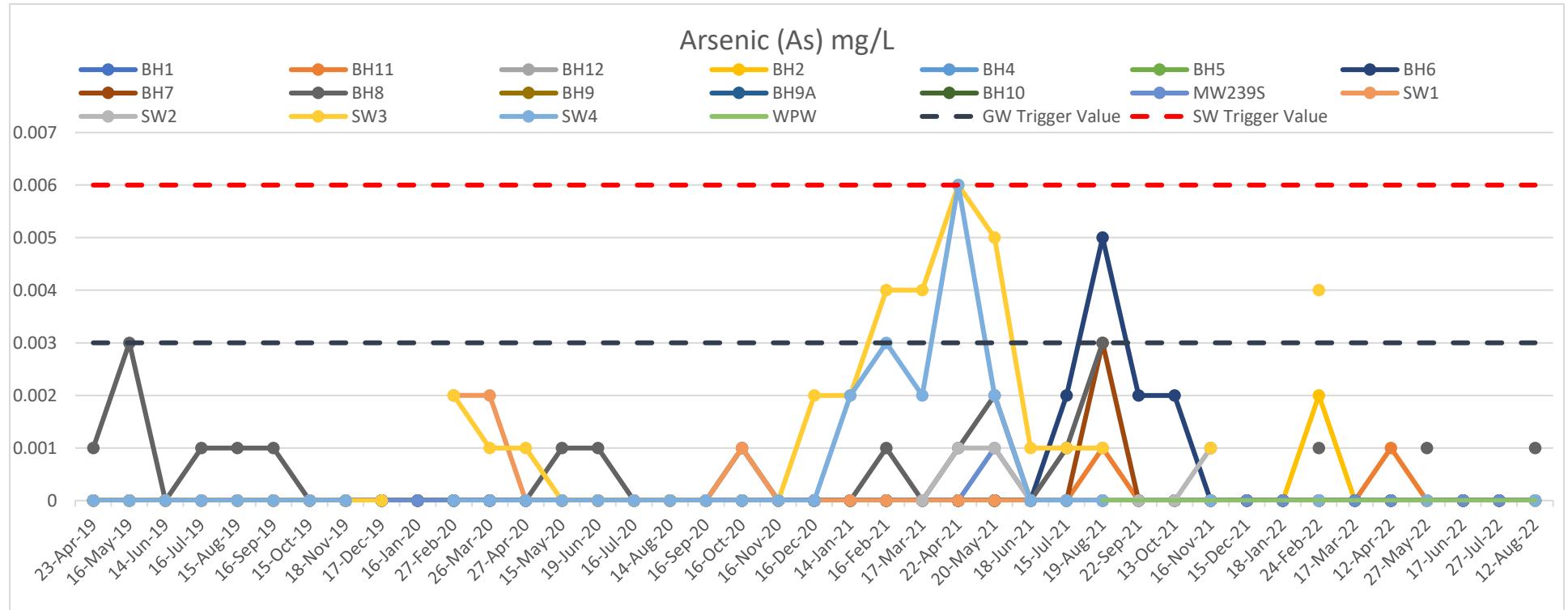


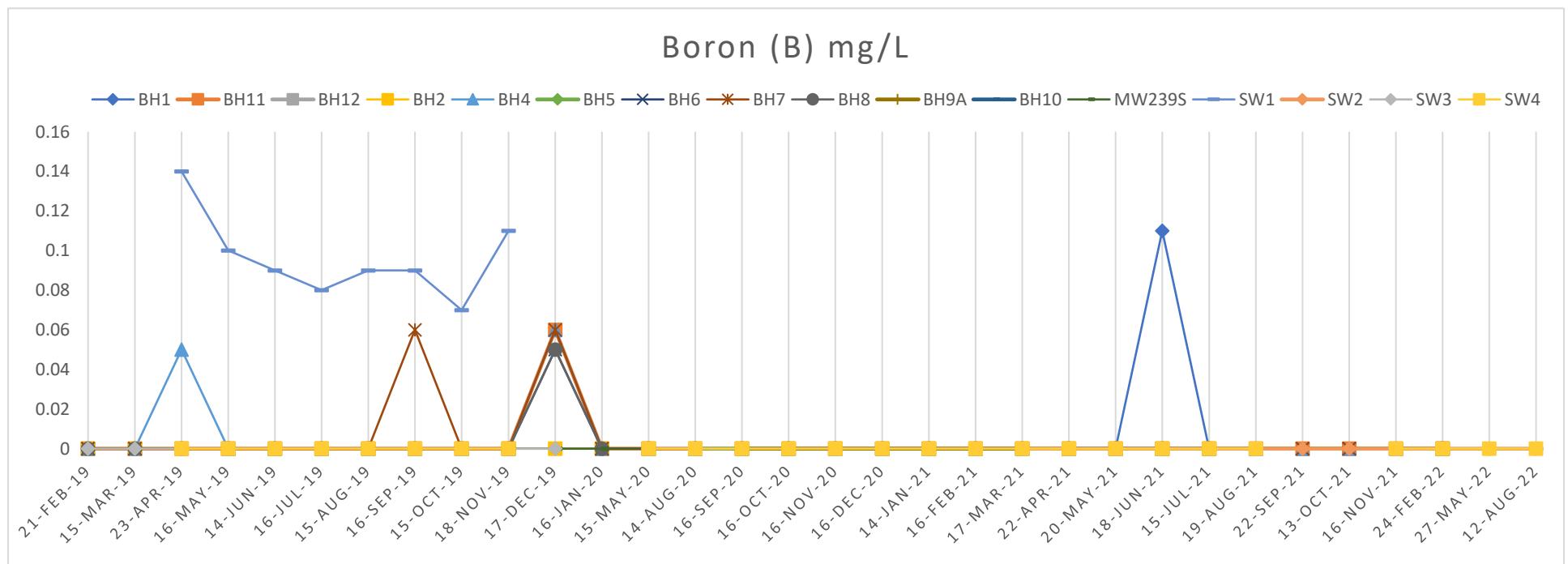
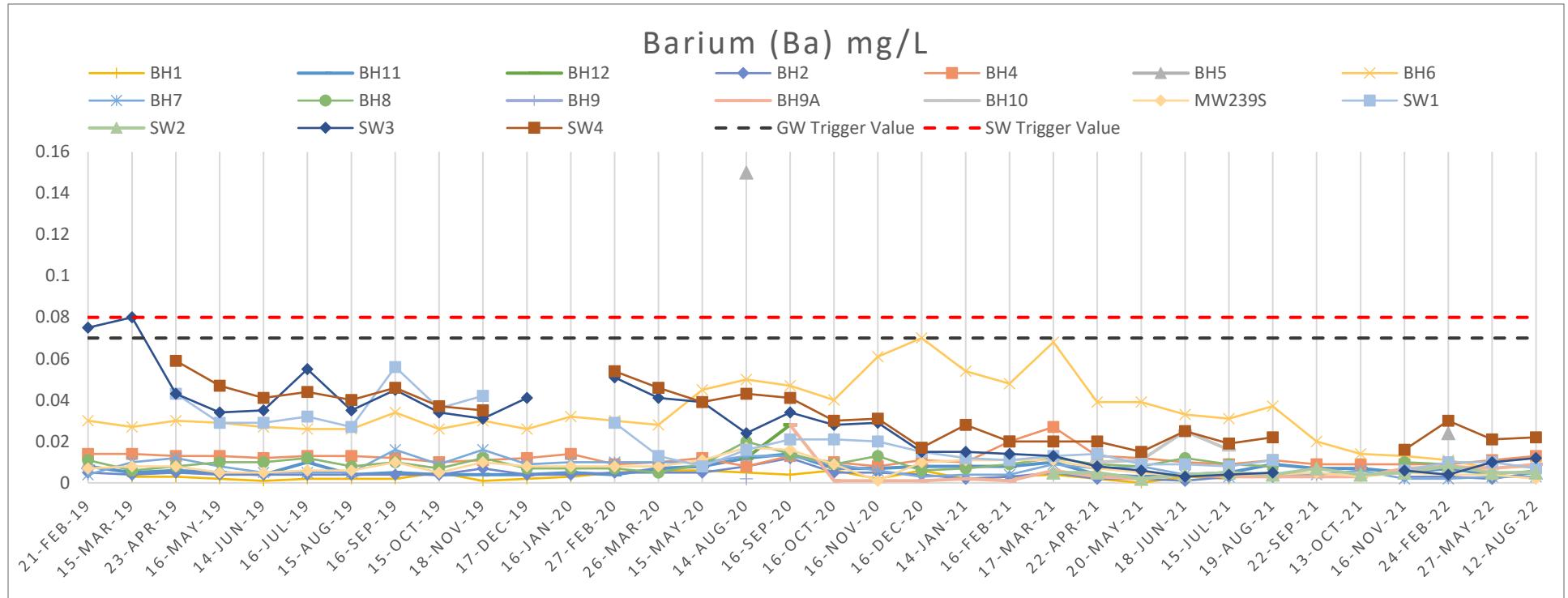
Groundwater Elevation (mAHD)

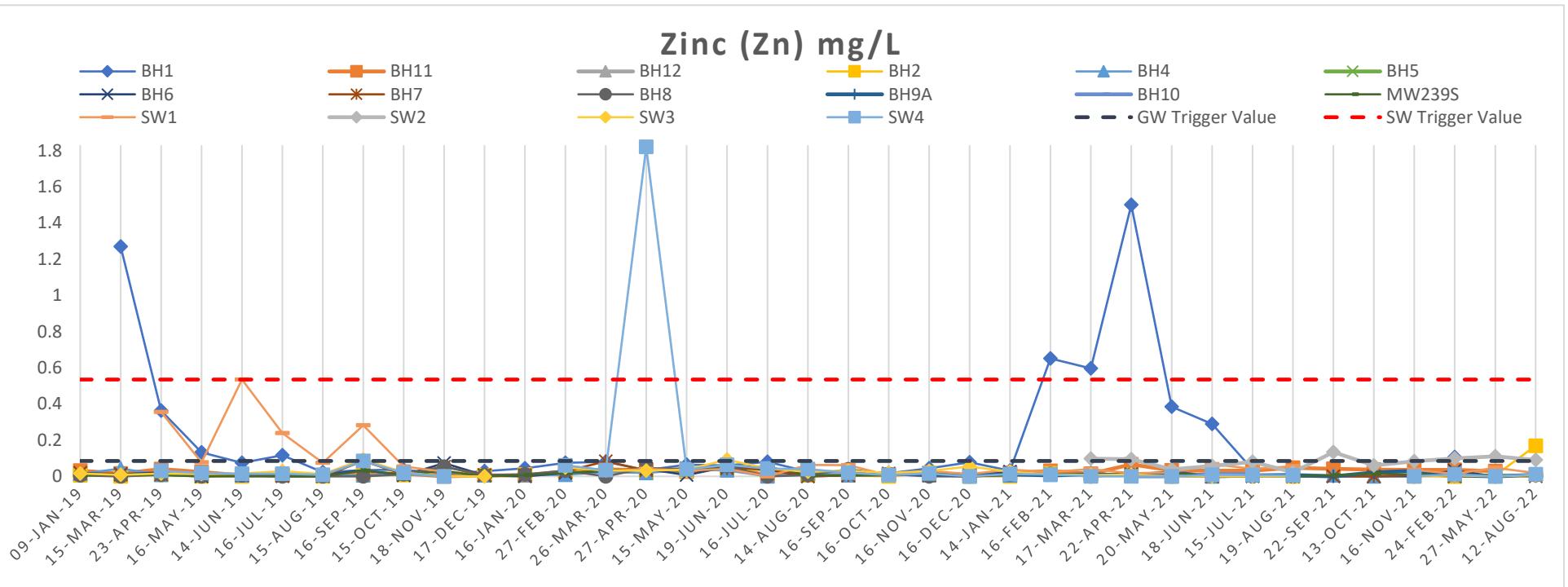
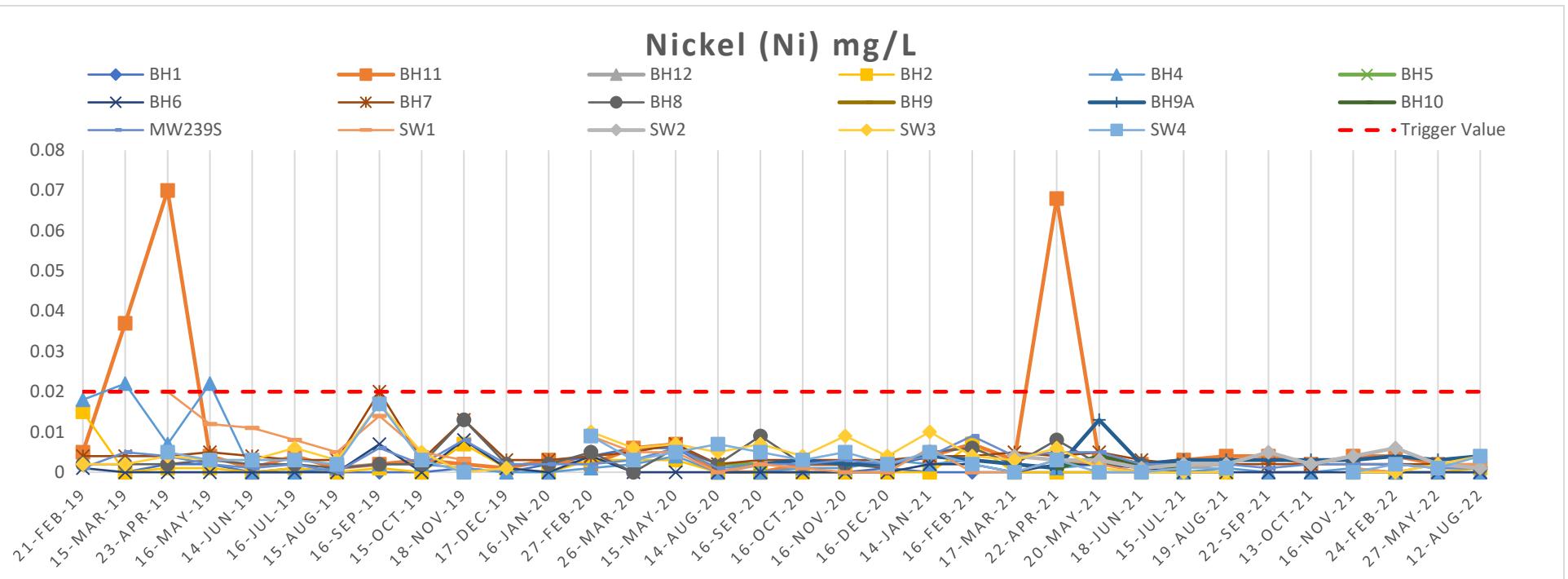


Monthly Rainfall Totals 2021-2022 (mm)

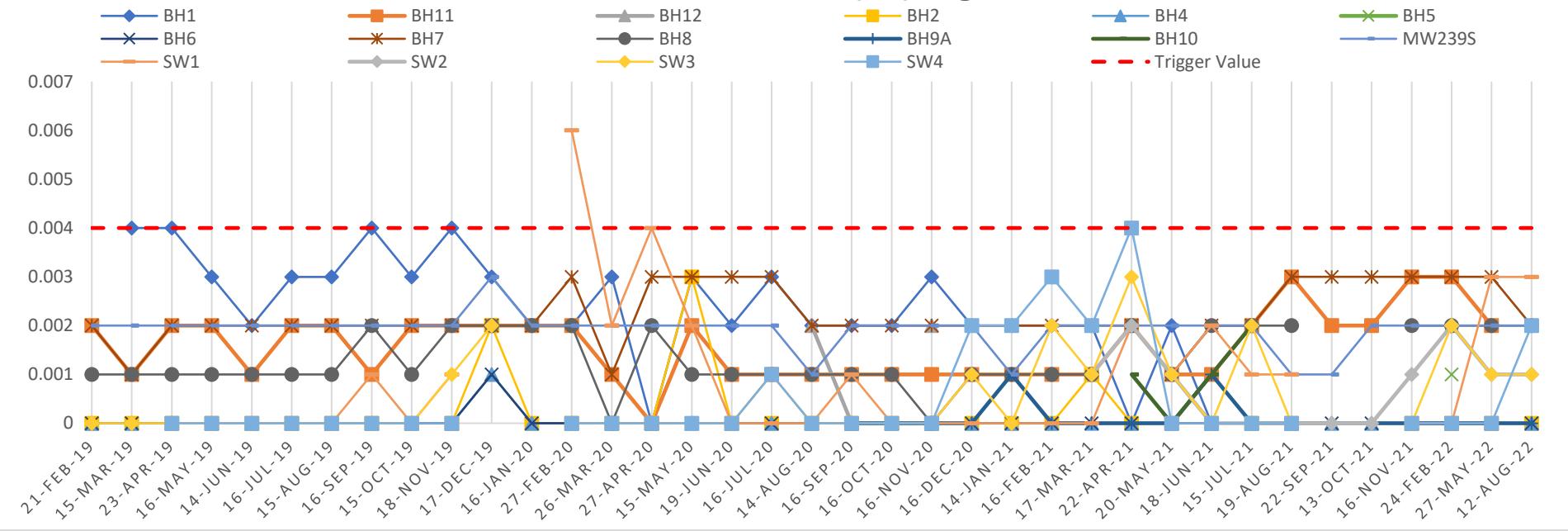




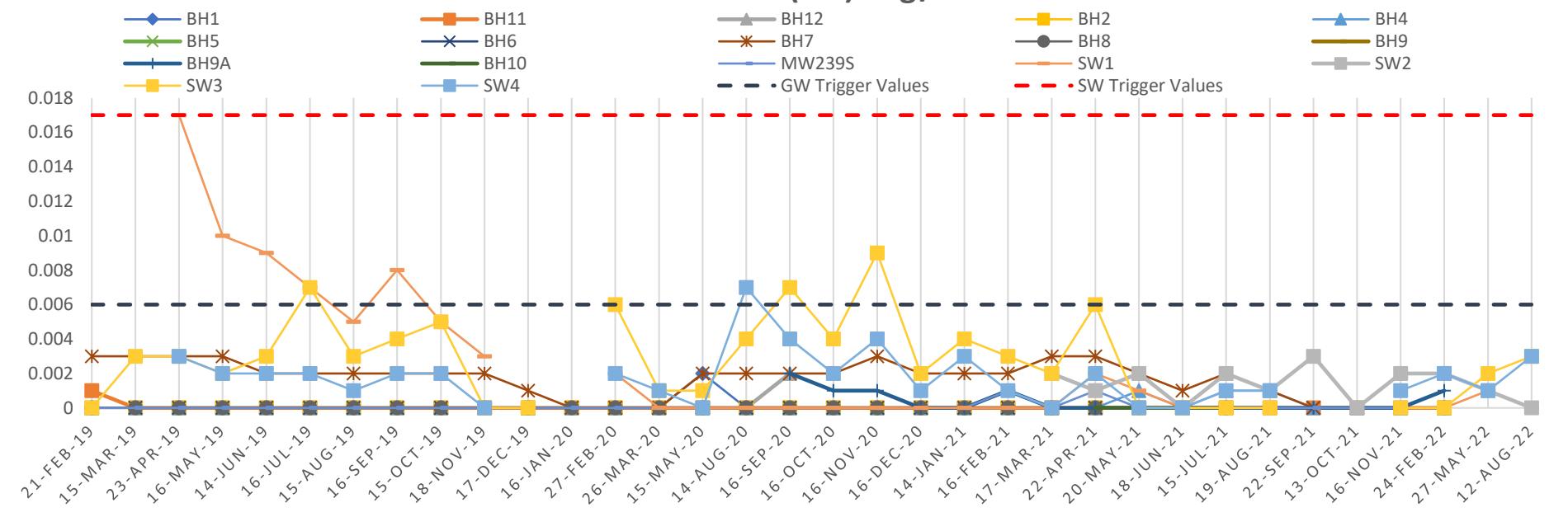




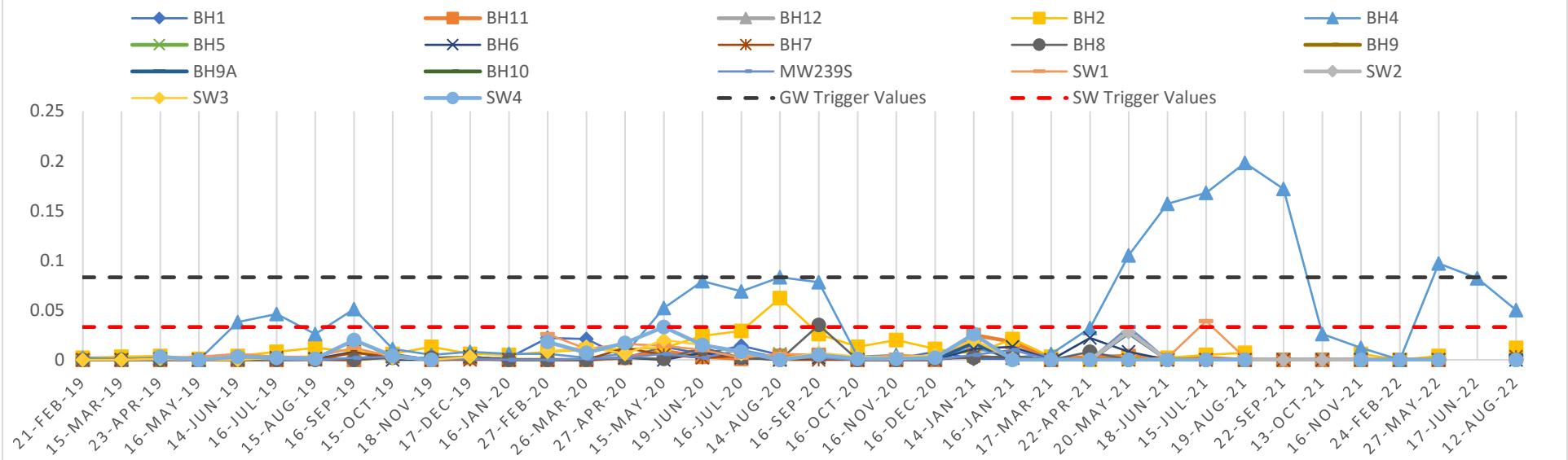
Chromium (Cr) mg/L



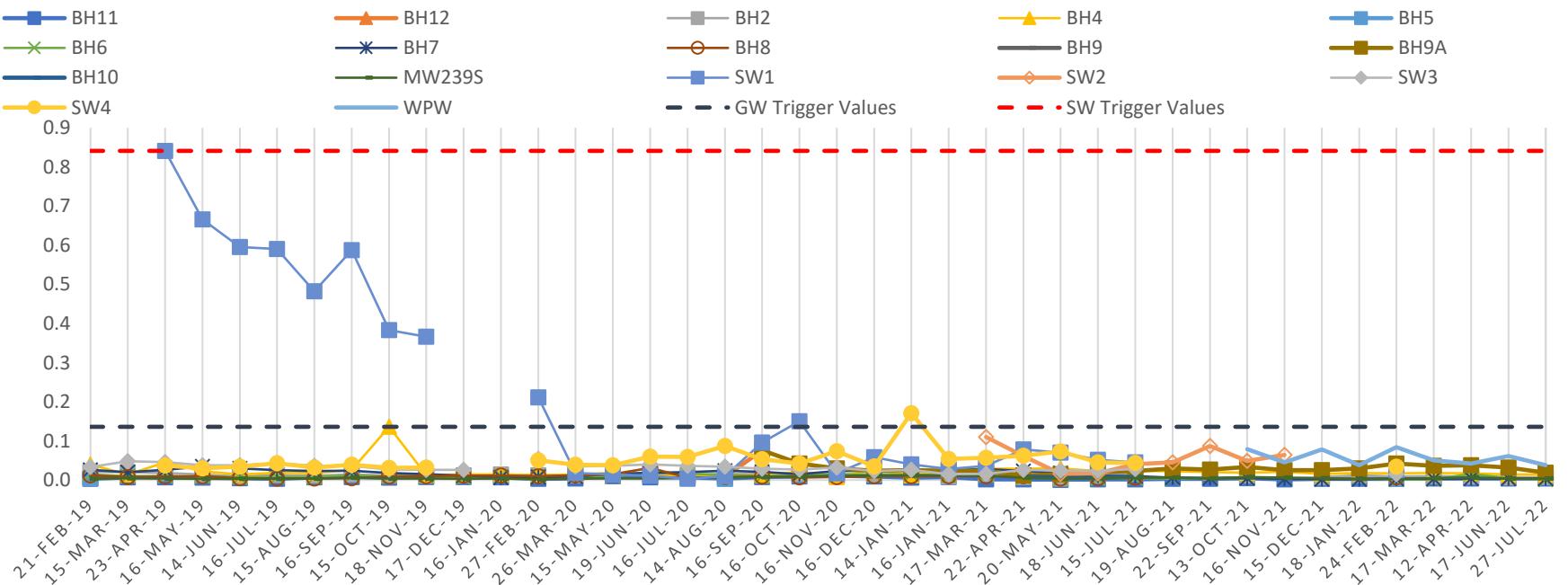
Cobalt (Co) mg/L



Copper (Cu) mg/L



Manganese (Mn) mg/L



pH (Field)

