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

December 2023 Monitoring Event

NCA24R163657

2 February 2024

KLEINFELDER
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2 February 2024
NCA24R163657

Williamtown Sand Syndicate (WSS)
PO Box 898
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Attention: Darren Williams

Subject: Quarterly Water Quality Monitoring Results, Cabbage Tree Road Sand Quarry, NSW
December 2023 Monitoring Event

Please find enclosed the monthly water quality monitoring results for the December 2023 monitoring event undertaken by Kleinfelder Australia Pty Ltd (Kleinfelder) at the Cabbage Tree Road Sand Quarry, NSW (herein referred to as the 'site').

1 SCOPE OF WORK

The scope of work presented in this report includes the results from the quarterly water monitoring event 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 site. **Figure 1** of **Attachment 1** presents the groundwater and surface water sampling locations.

The scheduled quarterly 2023 monitoring event included gauging of all 14 available monitoring wells, recording of field parameters for groundwater and surface water, and sampling from 10 groundwater monitoring wells, 4 surface water locations, one Wash Plant Water (WPW) sample and one Wash Plant Fines (WPF) sample as outlined in the Soil and Water Management Plan (SWMP, 2021) for the site. It is noted that the scheduled November 2023 quarterly event was conducted this month (December 2023).

2 SITE WORK

The quarterly monitoring round was conducted on the 19th of December 2023 and comprised:

- Gauging of all 14 available monitoring wells (BH1A, BH2, BH4, BH5, BH6, BH7, BH8, BH9, BH9A, BH10, BH11, BH12A, MW239S & MW239D). as summarised in **Table 4** and detailed in **Attachment 2.**
- Groundwater sampling from ten monitoring wells (BH1A, BH2, BH4, BH6, BH7, BH8, BH9A, BH11, BH12A & MW239S) as summarised in **Table 5** and detailed in **Attachment 2**.
- Surface water sampling from three locations (SW1, SW3 & SW4), as summarised in **Table 6** and detailed in **Attachment 2**. It was noted that SW2 was found to be dry during the sampling event.
- One WPW sample as summarised in **Table 7** and detailed in **Attachment 2.**
- One WPF samples as summarised in **Table 8** and detailed in **Attachment 2.**

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 were taken.

Surface water, WPF, and WPW samples were collected directly into laboratory supplied sample containers using a nitrile-gloved hand. Where access was deemed unsafe, a telescopic sampling pole was used.

All collected samples were placed into an ice chilled esky and submitted to a National Association of Testing Authorities (NATA) accredited laboratory under a chain of custody (COC) within specified holding times for the analytical schedule as per **Table 1**.

Table 1: Summary of Monthly Water Quality Analysis (December 2023)

Analysis	Number of Samples				
	Primary	Intra-lab (Duplicate)	Inter-lab (Triplicate)	Transport Blank	Rinsate Blank
TRH, BTEXN (Water)[1]	14	1	1	1	1
Metals[2] (Groundwater)	10	0	0	0	0
Metals[3] (Surface water)	3	1	1	1	1
Metals[4] (Wash plant water)	1	0	0	0	0
Metals[5] (Wash plant fines)	1	0	0	0	0
PFAS (28 analytes, standard level)	15 (Water), 1 (Soil)	1	1	1	1

[1] TRH (C6 – C40) & BTEXN, (Silica Gel Clean-up)
[2] 8 Metals (dissolved) for groundwater – As, Ba, Cr, Cu, Fe, Mg, Ni & Zn
[3] 10 Metals (dissolved) for Surface Water – As, B, Ba, Cr, Co, Cu, Fe, Mg, Ni & Zn
[4] 3 Metals (dissolved) for Wash plant water – As, Fe, Mn
[5] 8 Metals for wash plant fines - As, Ba, Cr, Cu, Fe, Mg, Ni & Zn

Table 2 provides a summary of the gauging data for December 2023. 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.** There were no instances of TARP Level Exceedances during the December monitoring event.

Table 2: Summary of Gauging Data (December 2023)

Well ID	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
BH1A	8.98	5.835	3.145	12.230	N/A	4.5[2]	1.355	Clear, no odour, no sheen
BH2	7.79	5.512	2.278	8.832	9.45	3.8	1.522	Brown, organic odour, no sheen
BH4	3.06	1.717	1.343	6.110	6.45	3.0[3]	1.657	Light brown, no odour, no sheen
BH5	7.36	5.824	1.536	8.723	9.28	4.0	2.464	Gauge only
BH6	3.62	1.656*	1.964	4.521	4.95	4.4	1.436	Clear, Sulphur odour, no sheen
BH7	2.98	1.691	1.289	4.506	4.95	3.7	2.411	Light brown, Sulphur odour, no sheen
BH8	3.88	2.545	1.335	6.200	6.28	4.0	2.665	Light brown, Sulphur odour, no sheen
BH9	17.75	Dry	N/A	16.082	18.8	3.0[3]	N/A	Gauge only
BH9A	10.75	9.3	1.45	12.186	16.16	3.0[3]	1.55	Light brown, no odour, no sheen
BH10	6.69	Dry	N/A	3.452	5.45	4.9	N/A	Gauge only
BH11	6.63	2.915	3.715	5.290	5.95	5.5	1.785	Clear, no odour, no sheen
BH12A	5.62	3.313	2.307	7.313	NA	4.0[5]	1.693	Light brown, low Sulphur odour, no sheen
MW239S	3.04	1.298	1.742	3.780	4.0	3.9[4]	2.158	Light brown, Sulphur odour, no sheen
MW239D	3.04	1.278*	1.762	20.371	20.49	3.9[3]	1.138	Gauge only
SW1	N/A	N/A	N/A	0.2	N/A	N/A	N/A	Light brown, sulphur odour, slight sheen
SW2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Dry
SW3	N/A	N/A	N/A	0.2	N/A	N/A	N/A	Light brown. organic odour, biofilm
SW4	N/A	N/A	N/A	0.4	N/A	N/A	N/A	Brown, organic odour, biofilm

Well ID	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
WPW2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Brown, earthy odour, no sheen

[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 former adjacent well (BH1).
[3] – Inferred Max Groundwater level based on adjacent wells (BH4 & BH9).
[4] – Inferred Max Groundwater level based on adjacent well (MW239S).
[5] – Inferred Max Groundwater level based on former adjacent well (BH12).
* equipment error result updated post fieldworks.

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 *inferred* maximum historical level (**Table 2**).	Standard operations – monthly dipping of operational on-site monitoring bores.	N/A
1	Groundwater levels within 0.5 m below *inferred* 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 *inferred* 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 *inferred* 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, DoI 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 December 2023 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 (^{0}C)	DO (mg/L)	EC (µc/cm)	TDS (mg/L)	pH	Redox (mV)
BH1A	27.8	25	6.33	114.7	75	4.28	214.6
BH2	398	22.4	7.11	299.6	68	4.64	173.9
BH4	35	21.9	2.38	99.9	69	4.76	196.4
BH5	ND	ND	ND	ND	ND	ND	ND
BH6	25.7	25.5	2.44	319.8	206	4.64	-55.5
BH7	38.22	24	2.97	145.7	96	4.38	-0.6
BH8	238.93	26.2	2.39	221.4	140	4.27	-129
BH9A	51.52	23.1	3.52	167.4	113	4.78	192.7
BH10	ND	ND	ND	ND	ND	ND	ND
BH11	4.23	23.3	3.5	124	83	4.62	-15.4
BH12A	30.65	24.1	2.69	151	100	4.50	168.5
MW239S	120	25	3.07	212	138	4.41	-60.7
SW1	28.17	27.2	6.88	112.2	73	6.70	103.3
SW2	ND	ND	ND	ND	ND	ND	ND
SW3	20	20.4	0.7	316.5	225	5.54	-120
SW4	70.1	23.4	0.18	506	340	6.57	-147
WPW2	180	30.4	7.87	372.2	219	4.69	174

ND: No Data – no sample taken

Table 5 below presents a summary of the water monitoring results for key analytes found to be reported above the laboratory limit of reporting (LOR) for groundwater. No exceedances occurred at groundwater locations during this monitoring round.

Table 6 presents the summary of surface water monitoring results for key analytes found to be elevated above the LOR. One analyte exceedance occurred at surface water locations during this monitoring round, Iron at SW4 (45.1mg/L) exceedance the location specific trigger value (32mg/L), this is the highest recording of Iron at the site and the first exceedance at SW4 since April 2021.

Table 7 presents a summary of the wash plant sample results for key PFAS analytes in water. **Table 8** presents a summary of the wash plant fines soil sample results for key PFAS analytes reported above the LOR. The site-specific groundwater criteria outlined in the SWMP (2021) has been applied to this monthly report including a comparison of results with previous data.

The WPW2 sample recorded two detections for PFAS compounds above the LOR during this monitoring round, PFOS (0.1µ/L) and PFHxS (0.1µ/L). These concentrations are below the site-specific trigger values and in line with previous reported concentrations.

The WPF sample recorded one detection of PFOS (0.0007mg/kg) above the LOR during this monitoring round. This concentration was below the site-specific trigger value and in line with previously reported concentrations.

Full results summary tables, including Quality Assurance/Quality Control (QA/QC) sample analyses, are provided in **Attachment 2**. Toluene was reported between <2 µg/L to 7 µg/L in all samples analysed, including detections reported within field rinsate and trip blank samples. These results indicate that the collected samples, including QA/QC samples, were impacted with toluene after sample collection and may be resultant of contamination during sample transport or laboratory analysis. Obtained results for toluene are therefore not reflective of site conditions

and have been excluded from this report. Toluene will be reanalysed during the next monitoring event to ensure that accurate reliable results are obtained for this analyte.

Field rinsate and trip blank samples collected by Kleinfelder did not detect any other analytes above the laboratory LOR, indicating that results obtained (excluding toluene) are representative of site conditions. Based on a review of the QA/QC Compliance Assessment provided by ALS, the overall data quality is considered acceptable for interpretive use. Copies of the final NATA endorsed laboratory reports, including internal QA/QC results and chain-of-custody documentation for both laboratories are provided in **Attachment 3**.

Table 5: Groundwater Results and Screening Criteria (December 2023)

Analyte	Metals									Discussion of results relative to previous monitoring (details on specific data trends provided in Section 4 below)
	Arsenic	Barium	Chromium	Copper	Manganese	Nickel	Zinc	Iron	Magnesium	
LOR	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.05	1	
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	0.136	0.02	0.085	4.1	11	
	Samples									
BH1A	<0.001	0.005	<0.001	0.003	0.006	0.002	0.021	<0.05	<1	Metals for BH1A were below the adopted criteria. BH1A is located approximately 30 m north of the current quarry operations.
BH2	<0.001	0.002	<0.001	0.002	0.003	<0.001	0.015	0.21	<1	Metal concentrations were generally consistent with historical results and remain below the adopted criteria. BH2 is located marginally down hydraulic gradient from the current quarry operations footprint.
BH4	<0.001	0.008	<0.001	0.003	0.007	<0.001	<0.005	0.12	<1	Metal concentrations were generally consistent with historical variations and remain below the adopted criteria. BH4 is located down hydraulic gradient approximately 700 m from current quarry operations and is on the southernmost boundary of the site adjacent to Cabbage Tree Road.
BH6	<0.001	0.011	<0.001	<0.001	0.004	<0.001	0.040	1.7	7	Metal concentrations are generally consistent with historical results and remain below the adopted criteria. BH6 is considered up hydraulic gradient, approximately 860 m from current quarry operations and is at the north-eastern corner of the site.
BH7	<0.001	0.004	0.003	<0.001	0.004	0.002	0.054	0.4	2	Metal concentrations were generally consistent with historical results and are below the adopted criteria. BH7 is located approximately 960 m east of the current quarry operations.
BH8	0.002	0.011	0.002	<0.001	0.006	0.002	0.029	2.03	2	Metal concentrations for BH8 were generally consistent with historical results and are below

Analyte	Metals									Discussion of results relative to previous monitoring (details on specific data trends provided in Section 4 below)
	Arsenic	Barium	Chromium	Copper	Manganese	Nickel	Zinc	Iron	Magnesium	
LOR	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.05	1	
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	0.136	0.02	0.085	4.1	11	
	Samples									
										the adopted criteria. BH8 is located approximately 974m east of the current quarry operations.
BH9A	<0.001	0.007	<0.001	0.002	0.032	0.003	0.05	0.4	2	Metal concentrations were generally consistent with historical results and below the adopted criteria. BH9A is down gradient (approximately 700m) from current quarry operations and is on the southern-most boundary of the site adjacent to Cabbage Tree Road.
BH11	<0.001	0.003	0.002	<0.001	0.004	0.001	0.019	0.68	3	Metal concentrations were generally consistent with historical results and below the adopted criteria. BH11 is located approximately 460 m from current quarry operations and at the most north-western point of the site.
BH12A	<0.001	0.004	0.003	0.001	0.017	<0.001	0.046	1.41	2	Metals for BH12A were below the adopted criteria. BH12A is located directly adjacent to current quarry operations.
MW239S	<0.001	0.006	0.002	<0.001	0.003	0.002	0.02	1.06	2	Metal concentrations were generally consistent with historical results and below the adopted criteria. MW239S is located approximately 800 m east of the current quarry operations.

Notes:
< - Less than laboratory limit of reporting; NS – No Sample

Table 6: Surface water results and performance criteria (December 2023)

Analyte	Metals											Discussion of results relative to previous monitoring (details on specific data trends provided in Section 4 below)
	Arsenic	Barium	Boron	Cobalt	Chromium	Copper	Manganese	Iron	Nickel	Zinc	Magnesium	
LOR	**0.001**	**0.001**	**0.05**	**0.001**	**0.001**	**0.001**	**0.001**	**0.05**	**0.001**	0.005	**1**	
Units	**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	-	0.006	0.004	0.033	0.136	7.25 (32 for SW3 & SW4)	0.02	0.535	52	
Samples												
SW1	<0.001	0.016	<0.05	<0.001	<0.001	0.001	0.074	0.70	<0.001	0.006	2	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	SW2 was found to be dry during this event, consistent with all sampling periods from 2019 – February 2021. Metal concentrations were generally consistent with historical variations and were below the site-specific trigger values. SW2 is the most northern located surface water monitoring point directly adjacent or central to current quarry operations.
SW3	0.002	0.013	<0.05	<0.001	0.001	0.003	0.023	8.6	0.001	0.006	3	Analyte concentrations were generally consistent with historical variations and were below the site-specific trigger values. 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	0.006	0.009	<0.05	<0.001	0.003	<0.001	0.017	45.1	<0.001	0.006	3	Metal concentrations at SW4 appear to be stable across all analytes, except for Iron which exceeds the site-specific criteria. SW4 is located downstream of SW3 on the eastern most perimeter of the quarry.

Notes:
< - Less than laboratory limit of reporting; ND – No data. No sample taken.

Table 7: Wash Plant Water Sample Results and Screening Criteria

Analyte	PFAS				Discussion of results
	PFOA	PFOS	PFHxS	Sum of PFOS + PFHxS	
LOR	0.01	0.01	0.01	0.01	
Units	µg/L	µg/L	µg/L	µg/L	
Site Specific Trigger Values (SWMP 2021)	0.56	N/A	N/A	0.07	
Sample Name					Sand Wash Plant
WPW2	<0.01	0.01	0.01	0.02	Concentrations of PFAS compounds in the WPW were not detected above the site-specific trigger values during this sampling event.

Notes:
< - Less than laboratory limit of reporting

Table 8: Wash Plant Fines Sample Results and Screening Criteria

Analyte	PFAS			Discussion of results
	PFOA	PFOS	Sum of PFOS + PFHxS	
LOR	0.0002	0.0002	0.0002	
Units	mg/kg	mg/kg	mg/kg	
Site Specific Trigger Values (SWMP 2021)	0.1	-	0.01	
Sample Name				Sand Wash Plant
WPF	<0.0002	0.0007	0.0007	PFOS was detected in the WPF sample during this monitoring round. The concentration of PFOS was found to be in-line with previously reported results which are presented in **Attachment 2.**

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 2023. The monthly rainfall totals for May-November 2023 were recorded to be below the monthly means. Based on current rainfall data (mean and monthly totals) for Nov - Dec 2023, it is expected that groundwater elevations will continue to decrease during the subsequent months due to a lag in groundwater response, consistent with current groundwater trend data.

Table 9: 2023 Rainfall data (12-month period)

Date	Jan (23)	Feb (23)	Mar (23)	Apr (23)	May (23)	Jun (23)	Jul (23)	Aug (23)	Sep (23)	Oct (23)	Nov (23)	DEC (23)
1st	0	0	0.2	0	0	0	0	0	0	0	0	0
2nd	0	0	0	11.2	0	0	0	0	4.2	0	0	2.4
3rd	0	0	0	2.4	0	0	0	0	0	0	2.4	11.6
4th	0	0.6	1	3.4	0	0	2.2	0	0	0	0	0.2
5th	13.8	0	0	ND	0	0.2	5	0	0.2	7	0	0
6th	5.6	0	0	6.8	0	0.8	0	12.6	0	0	19.4	0
7th	21.2	0	0	3	0	0	0	8.8	0	3	0.2	0
8th	4.8	0	0	10.6	4.6	0	0	1.6	4.4	0.2	0	0
9th	ND	0	0	0.2	0	0.6	0	0.4	3.8	0	0	0
10th	0	0	0	0	0	0	0	0	0	0	16	0.2
11th	0	0.2	0	0	0	0	0	0	0	0	0.2	0
12th	0	0	0	0	0	0	0	0	0	0	0	0
13th	0	0	4.2	11.6	0	1.2	ND	0	0	1.2	0	0
14th	0	21.2	1.6	25.4	0.2	0.6	0	4.6	0	0.2	0	0.2
15th	ND	1	7.4	2	0	0	0	8.4	0	0	0	0
16th	0	0.2	0.2	0	0	0	0	ND	0	0	0	0
17th	0	0	0	0	11.4	0	5.4	0	0	0.2	8.2	0
18th	0	0	0	0	22.2	0	0.2	ND	0	0	0.2	0
19th	0.2	1.8	0	0	2.2	0	0.8	0	0.6	0.6	0	0
20th	21.4	0.2	0	3.2	0	0	0	0	0	0	0	-
21st	0.8	0	0.6	29.4	0	0	0.4	0	0	0	0.6	-
22nd	9.0	45.6	0	0.8	0	0	1	0	0	0	0.4	-
23rd	4.4	35	0	0	0	3.6	0	1.8	0	0	0	-
24th	0	1.2	25.6	0.2	0	0.2	22	2.4	0	0	5.4	-
25th	0	0	31.4	0	0	0	1	0	0	0	0.2	-
26th	0	0	1.8	0	0.2	0	0.2	0	0	7.2	0	-
27th	3.6	0	0	0	45.8	0	0.2	0	0	35	0.2	-
28th	0	0.4	22.4	0	0	0	0	0	3.2	4.8	1.2	-
29th	0	-	8.8	0	0	1.6	0	0	0	0.2	5.6	-
30th	3.4	-	0.8	8.2	0	0	ND	ND	0.2	0	5.2	-

Date	Jan (23)	Feb (23)	Mar (23)	Apr (23)	May (23)	Jun (23)	Jul (23)	Aug (23)	Sep (23)	Oct (23)	Nov (23)	DEC (23)
31st	18.0	-	0	-	0	-	ND	7	-	0	-	-
Total	106.2	107.4	106	118.4	86.6	8.8	38.4	47.6	16.6	59.6	65.4	-
Historical Mean	99.4	118.8	128.0	109.6	108.2	121.5	75.2	71.7	60.1	75.9	82.7	77.1

Notes:
ND – no data retrieved.

4 DATA TRENDS

Data trends, based on analyses undertaken throughout the duration of the sampling program (January 2019 – present), are provided as **Attachment 4**. Generally, groundwater elevations have increased over the last four years with a notable spike in elevation following the March 2021 and February 2022 water monitoring events. A general increase in groundwater elevations across the site occurred during 2022 and is predominantly due to above average rainfall recorded for most months during 2022. Since October 2022, groundwater elevations have decreased across the site, with a minor rebound across the March and April 2023 monitoring events coinciding with the above average rainfall received during this period as noted in **Section 3**. Site wide groundwater elevations since June 2023 have shown a generally steady decreasing trend.

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

- Iron – The reported iron concentrations at BH6 (1.7 mg/L) have been on a generally decreasing trend since June 2023, with concentrations reported below the site-specific criteria for the past 2 months. Concentrations reported during this monitoring event was found to be above the site-specific trigger value (32mg/L) at SW4, this is the highest recording of Iron at this location and the first exceedance at SW4 since April 2021.
- Field pH – Field pH results recorded at SW1 and SW4 (6.7 & 6.57) were found to be outside of the site-specific trigger value range during this monitoring event. Generally, pH was found to have marginally decreased site wide during this monitoring event except at SW1 and SW4.
- PFAS – PFAS compounds were not detected in ground or surface water samples during this monitoring event. WPF reported one detection of PFOS (0.0007mg/kg) and WPW2 detected PFOS (0.1µg/L) and PFHxS (0.1µg/L) during this monitoring round with the concentration in line with previously reported results at these locations.

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. Groundwater level monitoring TARP rules, outlined in **Section 2,** recorded no exceedances at any locations during the December 2023 monitoring event.

One analyte exceedance was reported during this monitoring event as outlined in **Table** 5**6**:

- Iron at SW4 (45.1mg/L) exceeded the location-specific criteria (32mg/L), located downstream of SW3 on the easternmost perimeter of the quarry. SW3 is located within a drainage channel that travels from west to east along the south-eastern perimeter of the quarry. This result is the first exceedance at this location since April 2021, and may be reflective of increases in iron concentrations at other locations at the site during 2023. The concentration of iron recorded in the December 2023 groundwater monitoring event is significantly higher than the reported concentration from August 2023 (0.26 mg/L).

There is no cause to suggest that the elevated Iron concentrations at SW4 are related to quarrying activities due to the significantly lower concentrations of iron detected at surface water locations closer to the site (SW3), as well as the distance of this sampling location from the site, Iron concentrations have been on an increasing trend since monitoring commenced at this location in April 2019; however, this increase does not appear to have been reflected in any of the wells or surface water bodies assessed downgradient of quarrying activities. SW1 will continue to be monitored during future sampling rounds.

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

Sincerely,

Kleinfelder Australia Pty Ltd

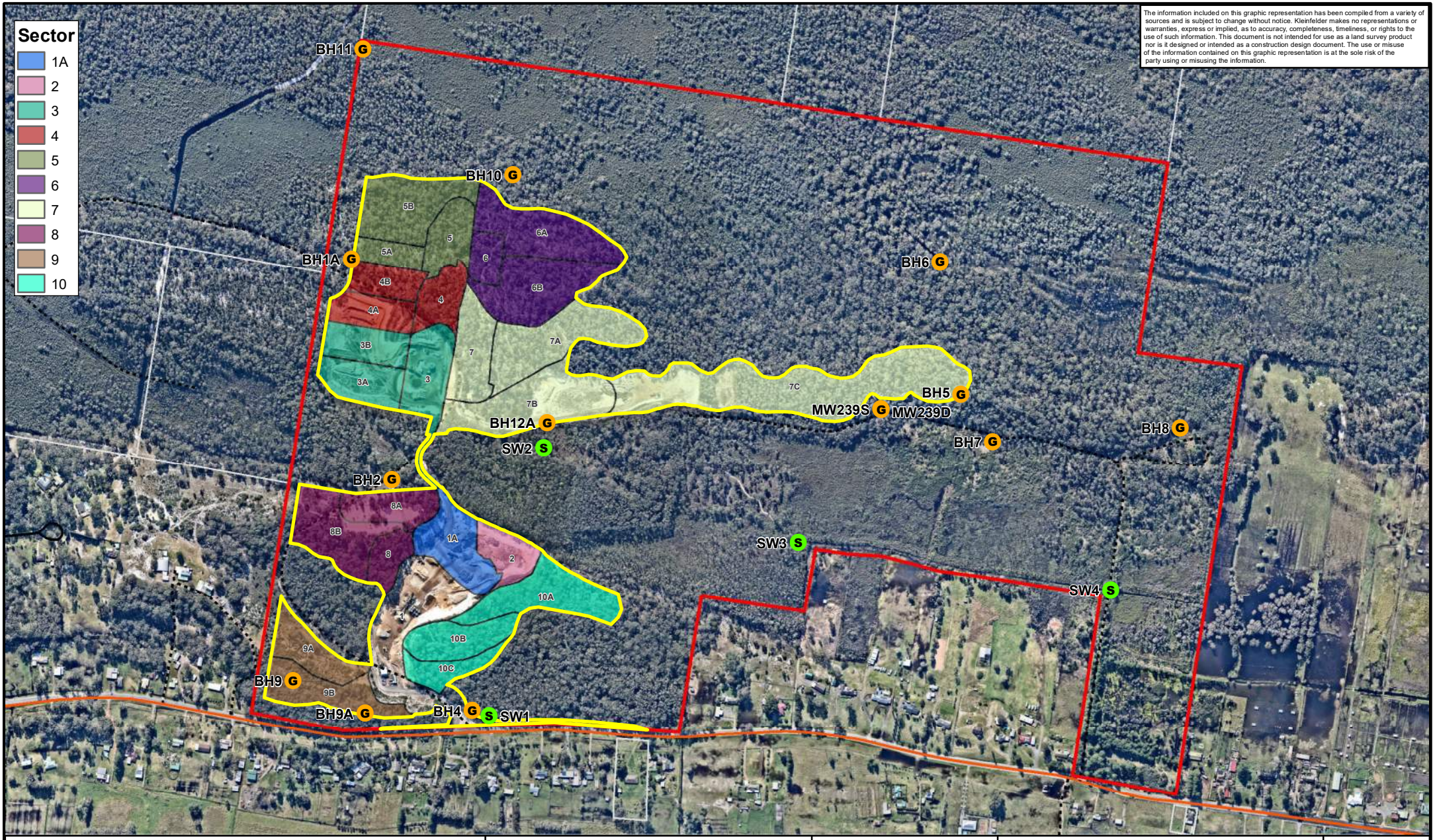
Thomas Jeffery

Graduate Environmental Scientist
Contaminated Land Management
Tjeffery@kleinfelder.com
Mobile: 0421 887 830

Attachments

Attachment 1: Figures
Attachment 2: Results Tables and Field Records
Attachment 3: Laboratory Documentation and COCs
Attachment 4: Data Trends

ATTACHMENT 1: FIGURES



Legend

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

Metres
0 50 100 200 300 400 500
N

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PROJECT REFERENCE: 20232071
DATE DRAWN: 7/10/2022 14:16 Version 1
DRAWN BY: CMiskell

DATA SOURCE:
NSW DFSI - 2017
Nearmap - 2022

Monthly Monitoring Locations

Williamtown Sand Syndicate
Proposed Sand Quarry
398 Cabbage Tree Road, Williamtown

FIGURE:
1

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ATTACHMENT 2: RESULTS TABLES AND FIELD RECORDS

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 1
Groundwater Analytical Results - Hydrocarbons
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte		BTEXN								Total Petroleum Hydrocarbons					Total Petroleum 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}	C_{15} - C_{28}	C_{29} - C_{36}	C_{10} - C_{36} sum	C_{10}-C_{14} - Silica Cleanup	C_{15}-C_{28} - Silica Cleanup	C_{29}-C_{36} - Silica Cleanup	C_{10}-C_{36} Sum - 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
WSS - Groundwater		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sample Name	Sample Date																	
BH1	15-Mar-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	**1,710**	-	-	-	-	< 50	< 100	< 50	< 50
	23-Apr-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	**40**	< 50	< 100	< 50	< 50	-	-	-	-
	16-May-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-	-
	14-Jun-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Jul-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	15-Aug-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-	-
	16-Sep-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	15-Oct-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	18-Nov-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Sep-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Oct-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Nov-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Dec-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	14-Jan-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Feb-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	17-Mar-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	19-Aug-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	22-Sep-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 100	< 100	< 50	< 50
	13-Oct-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Nov-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	24-Feb-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
BH1A	15-Feb-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	14-Aug-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	19-Dec-23	< 1.0	**5.0**	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	**5.0**	< 20	-	-	-	-	< 50	< 100	< 50	< 50
BH2	22-Feb-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	15-Mar-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	23-Apr-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-	-
	16-May-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-	-
	14-Jun-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Jul-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	15-Aug-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-	-
	16-Sep-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	15-Oct-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	18-Nov-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Sep-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Oct-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Nov-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Dec-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	14-Jan-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Feb-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	17-Mar-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	19-Aug-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Nov-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	24-Feb-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	27-May-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	12-Aug-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	18-Nov-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	15-Feb-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-May-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	14-Aug-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	19-Dec-23	< 1.0	**6.0**	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	**6.0**	< 20	-	-	-	-	< 50	< 100	< 50	< 50
BH3	21-Feb-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
BH4	21-Feb-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	15-Mar-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	23-Apr-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	**250**	< 50	**250**	-	-	-	-
	16-May-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-	-
	14-Jun-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Jul-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	15-Aug-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-	-
	16-Sep-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	**130**	< 50	**130**
	15-Oct-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	18-Nov-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Sep-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Oct-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 1
Groundwater Analytical Results - Hydrocarbons
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte		BTEXN								Total Petroleum Hydrocarbons					Total Petroleum 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}	C_{15} - C_{28}	C_{29} - C_{36}	C_{10} - C_{36} sum	C_{10}-C_{14} - Silica Cleanup	C_{15}-C_{28} - Silica Cleanup	C_{29}-C_{36} - Silica Cleanup	C_{10}-C_{36} Sum - 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
WSS - Groundwater		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sample Name	Sample Date																	
BH4	16-Nov-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Dec-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	14-Jan-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Feb-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	17-Mar-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	19-Aug-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Nov-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	24-Feb-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	**340**	< 50	**340**
	27-May-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	12-Aug-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	18-Nov-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	15-Feb-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-May-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	14-Aug-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	19-Dec-23	< 1.0	**4.0**	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	**4.0**	< 20	-	-	-	-	< 50	< 100	< 50	< 50
BH5	22-Feb-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	24-Feb-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	15-Feb-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
BH6	22-Feb-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	14-Mar-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	23-Apr-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-	-
	16-May-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-	-
	14-Jun-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Jul-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	15-Aug-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-	-
	16-Sep-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	15-Oct-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	18-Nov-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Sep-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Oct-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Nov-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Dec-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	14-Jan-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Feb-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	17-Mar-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	19-Aug-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Nov-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	24-Feb-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	27-May-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	12-Aug-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	18-Nov-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	15-Feb-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-May-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	14-Aug-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	19-Dec-23	< 1.0	**6.0**	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	**6.0**	< 20	-	-	-	-	< 50	< 100	< 50	< 50
BH7	22-Feb-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	14-Mar-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	23-Apr-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-	-
	16-May-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-	-
	14-Jun-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Jul-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	15-Aug-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-	-
	16-Sep-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	15-Oct-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	18-Nov-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Sep-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Oct-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Nov-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Dec-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	14-Jan-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Feb-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	17-Mar-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	19-Aug-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Nov-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 1
Groundwater Analytical Results - Hydrocarbons
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte		BTEXN								Total Petroleum Hydrocarbons					Total Petroleum 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}	C_{15} - C_{28}	C_{29} - C_{36}	C_{10} - C_{36} sum	C_{10}-C_{14} - Silica Cleanup	C_{15}-C_{28} - Silica Cleanup	C_{29}-C_{36} - Silica Cleanup	C_{10}-C_{36} Sum - 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
WSS - Groundwater		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sample Name	Sample Date																	
	24-Feb-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	27-May-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	12-Aug-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	18-Nov-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	15-Feb-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-May-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	14-Aug-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	19-Dec-23	< 1.0	**6.0**	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	**6.0**	< 20	-	-	-	-	< 50	< 100	< 50	< 50
BH8	21-Feb-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	14-Mar-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	23-Apr-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-	-
	16-May-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-	-
	14-Jun-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Jul-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	15-Aug-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-	-
	16-Sep-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	15-Oct-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	18-Nov-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Sep-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Oct-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Nov-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Dec-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	14-Jan-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Feb-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	17-Mar-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	19-Aug-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Nov-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	24-Feb-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	27-May-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	12-Aug-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	18-Nov-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	15-Feb-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-May-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	14-Aug-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	19-Dec-23	< 1.0	**4.0**	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	**4.0**	< 20	-	-	-	-	< 50	< 100	< 50	< 50
BH9A	16-Sep-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Oct-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Nov-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Dec-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	14-Jan-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Feb-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	17-Mar-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	19-Aug-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	22-Sep-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	13-Oct-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Nov-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	24-Feb-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	27-May-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	12-Aug-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	18-Nov-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	15-Feb-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-May-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	14-Aug-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	19-Dec-23	< 1.0	**7.0**	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	**7.0**	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	21-Feb-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	15-Mar-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	23-Apr-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-	-
	16-May-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-	-
	14-Jun-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Jul-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	15-Aug-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-	-
	16-Sep-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	15-Oct-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	18-Nov-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 1
Groundwater Analytical Results - Hydrocarbons
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte		BTEXN								Total Petroleum Hydrocarbons					Total Petroleum 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}	C_{15} - C_{28}	C_{29} - C_{36}	C_{10} - C_{36} sum	C_{10}-C_{14} - Silica Cleanup	C_{15}-C_{28} - Silica Cleanup	C_{29}-C_{36} - Silica Cleanup	C_{10}-C_{36} Sum - 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
WSS - Groundwater		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sample Name	Sample Date																	
BH11	16-Sep-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Oct-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Nov-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Dec-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	14-Jan-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Feb-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	17-Mar-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	19-Aug-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	22-Sep-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	13-Oct-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Nov-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	24-Feb-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	06-Mar-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	18-Nov-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	15-Feb-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-May-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	14-Aug-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	19-Dec-23	< 1.0	**6.0**	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	**6.0**	< 20	-	-	-	-	< 50	< 100	< 50	< 50
BH12	16-Sep-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Nov-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Dec-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	14-Jan-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Feb-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	17-Mar-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	19-Aug-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	22-Sep-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	13-Oct-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	16-Nov-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	24-Feb-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
BH12A	15-Feb-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	14-Aug-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50	< 50
	19-Dec-23	< 1.0	**3.0**	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	**3.0**	< 20	-	-	-	-	< 50	< 100	< 50	< 50

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

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 1
Groundwater Analytical Results - Hydrocarbons
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte		Total Recoverable Hydrocarbons							Total Recoverable Hydrocarbons - Silica Clean-up				
		C_6 - C_{10}	C_6 - C_{10} minus BTEX (F1)	$>C_{10}$ - C_{16}	$>C_{10}$ - C_{16} minus Naphthalene (F2)	$>C_{16}$ - C_{34}	$>C_{34}$ - C_{40}	$>C_{10}$ - C_{40} (sum)	$>C_{10}$-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
WSS - Groundwater		20	20	100	--	100	100	--	--	--	--	--	--
Sample Name	Sample Date												
BH1	15-Mar-19	**1,690**	**1,690**	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	23-Apr-19	**30**	**30**	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	16-May-19	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	14-Jun-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Jul-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Aug-19	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	16-Sep-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Oct-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	18-Nov-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Sep-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Oct-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Nov-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Dec-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Jan-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Feb-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Mar-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	19-Aug-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	22-Sep-21	< 20	< 20	-	-	-	-	-	-	< 100	< 100	< 100	< 100
	13-Oct-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Nov-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	24-Feb-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
BH1A	15-Feb-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Aug-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	19-Dec-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
BH2	22-Feb-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Mar-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	23-Apr-19	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	16-May-19	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	14-Jun-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Jul-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Aug-19	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	16-Sep-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Oct-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	18-Nov-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Sep-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Oct-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Nov-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Dec-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Jan-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Feb-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	17-Mar-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	19-Aug-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Nov-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	24-Feb-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	27-May-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	12-Aug-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	18-Nov-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Feb-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-May-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Aug-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	19-Dec-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
BH3	21-Feb-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	21-Feb-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Mar-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	23-Apr-19	< 20	< 20	< 100	< 100	**280**	< 100	**280**	-	-	-	-	-
	16-May-19	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	14-Jun-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Jul-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Aug-19	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	16-Sep-19	< 20	< 20	-	-	-	-	-	< 100	< 100	**140**	< 100	**140**
	15-Oct-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	18-Nov-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Sep-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Oct-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 1
Groundwater Analytical Results - Hydrocarbons
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte		Total Recoverable Hydrocarbons							Total Recoverable Hydrocarbons - Silica Clean-up				
		C_6 - C_{10}	C_6 - C_{10} minus BTEX (F1)	$>C_{10}$ - C_{16}	$>C_{10}$ - C_{16} minus Naphthalene (F2)	$>C_{16}$ - C_{34}	$>C_{34}$ - C_{40}	$>C_{10}$ - C_{40} (sum)	$>C_{10}$-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
WSS - Groundwater		20	20	100	--	100	100	--	--	--	--	--	--
Sample Name	Sample Date												
BH4	16-Nov-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Dec-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Jan-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Feb-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	17-Mar-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	19-Aug-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Nov-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	24-Feb-22	< 20	< 20	-	-	-	-	-	< 100	< 100	**370**	< 100	**370**
	27-May-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	12-Aug-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	18-Nov-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Feb-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-May-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Aug-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	19-Dec-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
BH5	22-Feb-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	24-Feb-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Feb-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
BH6	22-Feb-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Mar-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	23-Apr-19	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	16-May-19	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	14-Jun-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Jul-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Aug-19	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	16-Sep-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Oct-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	18-Nov-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Sep-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Oct-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Nov-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Dec-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Jan-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Feb-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	17-Mar-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	19-Aug-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Nov-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	24-Feb-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	27-May-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	12-Aug-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	18-Nov-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Feb-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-May-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Aug-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	19-Dec-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
BH7	22-Feb-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Mar-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	23-Apr-19	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	16-May-19	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	14-Jun-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Jul-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Aug-19	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	16-Sep-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Oct-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	18-Nov-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Sep-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Oct-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Nov-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Dec-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Jan-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Feb-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	17-Mar-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	19-Aug-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Nov-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 1
Groundwater Analytical Results - Hydrocarbons
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte		Total Recoverable Hydrocarbons							Total Recoverable Hydrocarbons - Silica Clean-up				
		C_6 - C_{10}	C_6 - C_{10} minus BTEX (F1)	$>C_{10}$ - C_{16}	$>C_{10}$ - C_{16} minus Naphthalene (F2)	$>C_{16}$ - C_{34}	$>C_{34}$ - C_{40}	$>C_{10}$ - C_{40} (sum)	$>C_{10}$-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
WSS - Groundwater		20	20	100	--	100	100	--	--	--	--	--	--
Sample Name	Sample Date												
	24-Feb-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	27-May-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	12-Aug-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	18-Nov-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Feb-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-May-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Aug-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	19-Dec-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	21-Feb-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Mar-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	23-Apr-19	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	16-May-19	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	14-Jun-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Jul-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Aug-19	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	16-Sep-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Oct-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	18-Nov-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Sep-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Oct-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Nov-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
BH8	16-Dec-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Jan-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Feb-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	17-Mar-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	19-Aug-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Nov-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	24-Feb-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	27-May-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	12-Aug-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	18-Nov-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Feb-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-May-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Aug-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	19-Dec-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Sep-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Oct-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Nov-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Dec-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Jan-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Feb-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	17-Mar-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	19-Aug-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	22-Sep-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
BH9A	13-Oct-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Nov-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	24-Feb-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	27-May-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	12-Aug-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	18-Nov-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Feb-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-May-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Aug-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	19-Dec-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	21-Feb-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Mar-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	23-Apr-19	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	16-May-19	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	14-Jun-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Jul-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Aug-19	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	16-Sep-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Oct-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	18-Nov-19	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 1
Groundwater Analytical Results - Hydrocarbons
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte		Total Recoverable Hydrocarbons							Total Recoverable Hydrocarbons - Silica Clean-up				
		C_6 - C_{10}	C_6 - C_{10} minus BTEX (F1)	$>C_{10}$ - C_{16}	$>C_{10}$ - C_{16} minus Naphthalene (F2)	$>C_{16}$ - C_{34}	$>C_{34}$ - C_{40}	$>C_{10}$ - C_{40} (sum)	$>C_{10}$-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
WSS - Groundwater		20	20	100	--	100	100	--	--	--	--	--	--
Sample Name	Sample Date												
BH11	16-Sep-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Oct-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Nov-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Dec-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Jan-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Feb-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	17-Mar-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	19-Aug-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	22-Sep-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	13-Oct-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Nov-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	24-Feb-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	06-Mar-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	18-Nov-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Feb-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-May-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Aug-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	19-Dec-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
BH12	16-Sep-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Nov-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Dec-20	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Jan-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Feb-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	17-Mar-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	19-Aug-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	22-Sep-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	13-Oct-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Nov-21	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	24-Feb-22	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
BH12A	15-Feb-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Aug-23	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	19-Dec-23	< 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 x
Bold indicates a detection above the laboratory
Highlighting indicates an exceedance of the corr

Criteria:
SWMP 2021 - Soil and Water Management Plan,

Williamtown Sand Syndicate
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Table 2
Groundwater Analytical Results - Anions, Cations, and Inorganics
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte		Anions and Cations																Anions and Cations			
		Sodium	Calcium	Magnesium	Potassium	Sulphate	Chloride	Fluoride	Phosphorus	Reactive phosphorus as P	Total Phosphorus	Nitrite	Nitrite as N	Nitrate	Nitrate as N	Nitrite + Nitrate as N	Ammonia as N	Total Ammonia as Nitrogen	Total Nitrogen as N	Total Kjeldahl Nitrogen as N	Total Cations
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	mg/L	mg/L	meq/L
WSS - Groundwater		77	5.0	11	2.0	70	148	0.2	--	--	2.0	--	--	--	--	--	--	0.5	5.9	--	--
Sample Name	Sample Date																				
BH1	15-Mar-19	**11**	**2.0**	**1.0**	< 1.0	< 1.0	**25**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.66**
	23-Apr-19	**14**	**1.0**	**2.0**	< 1.0	**4.0**	**25**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.82**
	16-May-19	**12**	< 1.0	**2.0**	< 1.0	**5.0**	**25**	< 0.1	-	**0.03**	< 0.01	-	< 0.01	-	< 0.01	< 0.01	**0.11**	-	**0.3**	**0.3**	**0.69**
	14-Jun-19	**10**	< 1.0	**2.0**	< 1.0	**3.0**	**24**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.6**
	16-Jul-19	**15**	< 1.0	**2.0**	< 1.0	**4.0**	**23**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.82**
	15-Aug-19	**14**	< 1.0	**2.0**	< 1.0	**2.0**	**21**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.77**
	16-Sep-19	**13**	< 1.0	**2.0**	< 1.0	**2.0**	**20**	< 0.1	-	< 0.01	**0.06**	-	< 0.01	-	< 0.01	< 0.01	**0.12**	-	**0.3**	**0.3**	**0.73**
	15-Oct-19	**13**	< 1.0	**2.0**	< 1.0	**2.0**	**21**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.73**
	18-Nov-19	**16**	< 1.0	**2.0**	< 1.0	**3.0**	**23**	**0.1**	< 0.01	< 0.01	-	-	< 0.01	**0.01**	-	**0.01**	-	**0.13**	**0.3**	**0.3**	**0.86**
	16-Sep-20	**13**	< 1.0	**2.0**	< 1.0	**2.0**	**21**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.73**
	16-Oct-20	**14**	< 1.0	**2.0**	< 1.0	**4.0**	**21**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.77**
	16-Nov-20	**11**	< 1.0	**2.0**	< 1.0	**5.0**	**18**	< 0.1	-	< 0.01	**0.02**	-	< 0.01	-	< 0.01	< 0.01	-	**0.07**	**0.2**	**0.2**	**1.02**
	16-Dec-20	**13**	< 1.0	**2.0**	**1.0**	**6.0**	**22**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.93**
	14-Jan-21	**12**	< 1.0	**2.0**	< 1.0	**5.0**	**23**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.96**
	16-Feb-21	**14**	< 1.0	**2.0**	**1.0**	**5.0**	**25**	< 0.1	-	< 0.01	< 0.01	-	< 0.01	-	**0.02**	**0.02**	-	**0.05**	< 0.1	< 0.1	**0.8**
	17-Mar-21	**14**	**1.0**	**2.0**	< 1.0	**4.0**	**23**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.82**
	13-Oct-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	24-Feb-22	**14**	**1.0**	**3.0**	< 1.0	**10**	**23**	< 0.1	-	-	< 0.01	< 0.01	-	**0.02**	-	**0.02**	**0.11**	-	**0.2**	**0.2**	**0.9**
BH1A	15-Feb-23	**9.0**	< 1.0	< 1.0	< 1.0	**7.0**	**13**	< 0.1	-	< 0.01	< 0.01	-	< 0.01	-	**0.26**	**0.26**	-	**0.04**	**0.5**	**0.2**	**0.39**
	14-Aug-23	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	19-Dec-23	-	-	< 1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH2	22-Feb-19	**12**	**2.0**	**2.0**	< 1.0	**6.0**	**22**	**0.1**	-	< 0.01	**0.28**	-	< 0.01	-	**2.76**	**2.76**	**0.05**	-	**4.0**	**1.2**	**0.79**
	15-Mar-19	**10**	**3.0**	**2.0**	< 1.0	**7.0**	**23**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.75**
	23-Apr-19	**14**	**2.0**	**2.0**	< 1.0	**6.0**	**23**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.87**
	16-May-19	**12**	**2.0**	**2.0**	< 1.0	**21**	**22**	< 0.1	-	< 0.01	**0.26**	-	< 0.01	-	**0.38**	**0.38**	**0.01**	-	**1.3**	**0.9**	**0.79**
	14-Jun-19	**11**	**1.0**	**2.0**	< 1.0	**5.0**	**23**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.69**
	16-Jul-19	**13**	**2.0**	**2.0**	< 1.0	**9.0**	**20**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.83**
	15-Aug-19	**12**	**1.0**	**2.0**	< 1.0	**8.0**	**20**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.74**
	16-Sep-19	**11**	**2.0**	**2.0**	< 1.0	**8.0**	**18**	< 0.1	-	< 0.01	**0.28**	-	< 0.01	-	**1.07**	**1.07**	**0.04**	-	**2.7**	**1.6**	**0.74**
	15-Oct-19	**12**	**2.0**	**2.0**	< 1.0	**5.0**	**20**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.79**
	18-Nov-19	**14**	**2.0**	**1.0**	< 1.0	**7.0**	**19**	< 0.1	**0.21**	< 0.01	-	-	< 0.01	**1.01**	-	**1.01**	-	**0.05**	**2.1**	**1.1**	**0.79**
	16-Sep-20	**11**	**2.0**	**2.0**	< 1.0	**7.0**	**17**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.74**
	16-Oct-20	**11**	**2.0**	**2.0**	< 1.0	**6.0**	**16**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.74**
	16-Nov-20	**11**	**2.0**	**2.0**	< 1.0	**9.0**	**16**	< 0.1	-	< 0.01	**0.48**	-	< 0.01	-	**2.88**	**2.88**	-	< 0.01	**4.8**	**1.9**	**0.74**
	16-Dec-20	**11**	**2.0**	**2.0**	< 1.0	**7.0**	**15**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.74**
	14-Jan-21	**9.0**	**2.0**	**2.0**	< 1.0	**7.0**	**13**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.66**
	16-Feb-21	**12**	**1.0**	**1.0**	< 1.0	**8.0**	**12**	< 0.1	-	< 0.01	**0.15**	-	< 0.01	-	**2.58**	**2.58**	-	< 0.01	**3.5**	**0.9**	**0.65**
	17-Mar-21	**10**	**2.0**	**2.0**	< 1.0	**7.0**	**13**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.7**
	19-Aug-21	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	13-Oct-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	16-Nov-21	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	24-Feb-22	**8.0**	**2.0**	**1.0**	< 1.0	**7.0**	**14**	< 0.1	-	-	**0.06**	< 0.01	-	**0.05**	-	**0.05**	**0.01**	-	**0.4**	**0.3**	**0.53**
	12-Apr-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	27-May-22	-	-	**1.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12-Aug-22	-	-	**1.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	18-Nov-22	-	-	**1.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	15-Feb-23	**9.0**	< 1.0	**1.0**	< 1.0	**6.0**	**16**	< 0.1	-	< 0.01	**0.22**	-	< 0.01	-	**0.04**	**0.04**	-	**0.01**	**1.4**	**1.4**	**0.47**
	16-May-23	-	-	**1.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	14-Aug-23	-	-	**1.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	19-Dec-23	-	-	< 1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH3	21-Feb-19	**4.0**	**4.0**	**1.0**	< 1.0	**4.0**	**10**	< 0.1	-	< 0.01	**2.76**	-	< 0.01	-	**0.78**	**0.78**	**0.3**	-	**5.9**	**5.1**	**0.46**
BH4	21-Feb-19	**8.0**	**2.0**	**1.0**	**1.0**	**5.0**	**17**	< 0.1	-	< 0.01	**0.19**	-	< 0.01	-	**0.35**	**0.35**	**0.04**	-	**0.6**	**0.3**	**0.56**
	15-Mar-19	**9.0**	**2.0**	< 1.0	< 1.0	**5.0**	**18**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.49**
	23-Apr-19	**10**	**2.0**	**1.0**	**1.0**	**3.0**	**19**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.64**
	16-May-19	**9.0**	**2.0**	**1.0**	**1.0**	**22**	**19**	< 0.1	-	< 0.01	**0.97**	-	< 0.01	-	**0.29**	**0.29**	< 0.01	-	**1.0**	**0.7**	**0.6**
	14-Jun-19	**6.0**	**1.0**	**1.0**	< 1.0	**4.0**	**18**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.39**
	16-Jul-19	**10**	**2.0**	**2.0**	**1.0**	**6.0**	**18**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.72**
	15-Aug-19	**8.0**	**2.0**	**1.0**	**1.0**	**5.0**	**16**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.56**
	16-Sep-19	**11**	**2.0**	**2.0**	< 1.0	**8.0**	**19**	< 0.1	-	< 0.01	**0.4**	-	< 0.01	-	**0.24**	**0.24**	**0.02**	-	**0.6**	**0.4**	**0.74**
	15-Oct-19	**10**	**1.0**	**1.0**	< 1.0	**4.0**	**18**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**0.57**
	18-Nov-19	**11**	**1.0**	**1.0**	< 1.0	**6.0**	**18**	< 0.1	**0.08**	< 0.01	-	-	< 0.01	**0.29**	-	**0.29**	-	< 0.01	**0.3**	< 0.1	**0.61**
	16-Sep-20	**20**	< 1.0	**2.0**	< 1.0	**11**	**31**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.03**
	16-Oct-20	**19**	**1.0**	**3.0**	< 1.0	**10**	**34**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.12**
	16-Nov-20	**18**	< 1.0	**2.0**	< 1.0	**12**	**27**	< 0.1	-	< 0.01	**0.06**	-	< 0.01	-	**0.1**	**0.1**	-	< 0.01	**0.1**	< 0.1	**0.95**
	16-Dec-20	**25**	**1.0**	**4.0**	< 1.0	**15**	**43**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.47**
	14-Jan-21	**36**	**1.0**	**4.0**	< 1.0	**23**	**54**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.94**
	16-Feb-21	**69**	**2.0**	**9.0**	**1.0**	**32**	**111**	< 0.1	-	< 0.01	**0.11**	-	< 0.01	-	< 0.01	< 0.01	-	**0.03**	< 0.1	< 0.1	**3.87**
	17-Mar-21	**77**	**2.0**	**11**	**1.0**	**26**	**128**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**4.38**
	19-Aug-21	-	-	**3.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	13-Oct-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	24-Feb-22	**7.0**	**1.0**	**2.0**	< 1.0	**7.0**	**15**	< 0.1	-	-	**0.3**	< 0.01	-	**0.21**	-	**0.21**	**0.01**	-	**0.6**	**0.4**	**0.52**
	12-Apr-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	27-May-22	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12-Aug-22	-	-	**1.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	18-Nov-22	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	15-Feb-23	**10**	**1.0**	**1.0**	**1.0**	**7.0**	**18**	< 0.1	-	< 0.01	**0.11**	-	< 0.01	-	**0.33**	**0.33**	-	**0.02**	**0.7**	**0.4**	**0.59**
	16-May-23	-	-	**1.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	14-Aug-23	-	-	**1.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 2
Groundwater Analytical Results - Anions, Cations, and Inorganics
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte		Anions and Cations																Anions and Cations			
		Sodium	Calcium	Magnesium	Potassium	Sulphate	Chloride	Fluoride	Phosphorus	Reactive phosphorus as P	Total Phosphorus	Nitrite	Nitrite as N	Nitrate	Nitrate as N	Nitrite + Nitrate as N	Ammonia as N	Total Ammonia as Nitrogen	Total Nitrogen as N	Total Kjeldahl Nitrogen as N	Total Cations
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	mg/L	mg/L	meq/L
WSS - Groundwater		77	5.0	11	2.0	70	148	0.2	--	--	2.0	--	--	--	--	--	--	0.5	5.9	--	--
Sample Name	Sample Date																				
	19-Dec-23	-	-	< 1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH5	22-Feb-19	**42**	< 1.0	**6.0**	**1.0**	**19**	**69**	**0.2**	-	< 0.01	**0.34**	-	< 0.01	-	< 0.01	< 0.01	**0.09**	-	**3.0**	**3.0**	**2.35**
	24-Feb-22	**40**	< 1.0	**8.0**	< 1.0	**42**	**60**	< 0.1	-	-	**0.29**	< 0.01	-	**0.02**	-	**0.02**	**0.21**	-	**1.2**	**1.2**	**2.4**
	15-Feb-23	**18**	< 1.0	**2.0**	< 1.0	**17**	**24**	< 0.1	-	< 0.01	**0.32**	-	< 0.01	-	**0.01**	**0.01**	-	**0.06**	**3.9**	**3.9**	**0.95**
BH6	22-Feb-19	**28**	**3.0**	**4.0**	**1.0**	**28**	**42**	< 0.1	-	< 0.01	**0.05**	-	< 0.01	-	**0.09**	**0.09**	**0.14**	-	**0.5**	**0.4**	**1.72**
	14-Mar-19	**23**	**2.0**	**4.0**	**1.0**	**17**	**37**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.46**
	23-Apr-19	**25**	**3.0**	**4.0**	**1.0**	**18**	**42**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.59**
	16-May-19	**23**	**3.0**	**4.0**	**1.0**	**18**	**45**	< 0.1	-	< 0.01	**0.13**	-	< 0.01	-	< 0.01	< 0.01	**0.14**	-	**0.6**	**0.6**	**1.5**
	14-Jun-19	**20**	**2.0**	**4.0**	**1.0**	**16**	**42**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.32**
	16-Jul-19	**23**	**2.0**	**4.0**	**1.0**	**20**	**35**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.46**
	15-Aug-19	**23**	**2.0**	**3.0**	**1.0**	**21**	**38**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.37**
	16-Sep-19	**25**	**3.0**	**3.0**	**1.0**	**21**	**38**	< 0.1	-	< 0.01	**0.15**	-	< 0.01	-	**0.07**	**0.07**	**0.19**	-	**0.8**	**0.7**	**1.51**
	15-Oct-19	**25**	**2.0**	**4.0**	**1.0**	**13**	**41**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.54**
	18-Nov-19	**27**	**3.0**	**3.0**	**1.0**	**18**	**45**	< 0.1	**0.06**	< 0.01	-	-	< 0.01	< 0.01	-	< 0.01	-	**0.23**	**0.4**	**0.4**	**1.6**
	16-Sep-20	**36**	**2.0**	**4.0**	**1.0**	**16**	**55**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**2.02**
	16-Oct-20	**36**	**2.0**	**5.0**	**1.0**	**12**	**64**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**2.1**
	16-Nov-20	**37**	**3.0**	**5.0**	**2.0**	**23**	**61**	< 0.1	-	**0.01**	**0.08**	-	< 0.01	-	**0.01**	**0.01**	-	**0.22**	**0.3**	**0.3**	**2.22**
	16-Dec-20	**46**	**3.0**	**6.0**	**2.0**	**15**	**75**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**2.7**
	14-Jan-21	**39**	**3.0**	**5.0**	**2.0**	**21**	**73**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**2.31**
	16-Feb-21	**43**	**3.0**	**6.0**	**2.0**	**18**	**72**	< 0.1	-	< 0.01	**0.1**	-	< 0.01	-	< 0.01	< 0.01	-	**0.25**	< 0.1	< 0.1	**2.56**
	17-Mar-21	**51**	**4.0**	**9.0**	**1.0**	**25**	**80**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**3.18**
	19-Aug-21	-	-	**5.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	13-Oct-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	24-Feb-22	**30**	< 1.0	**4.0**	< 1.0	**10**	**61**	< 0.1	-	-	**0.11**	< 0.01	-	**0.02**	-	**0.02**	**0.04**	-	**0.4**	**0.4**	**1.63**
	12-Apr-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	27-May-22	-	-	**4.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12-Aug-22	-	-	**4.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	18-Nov-22	-	-	**3.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	15-Feb-23	**32**	< 1.0	**4.0**	< 1.0	**21**	**59**	< 0.1	-	< 0.01	**0.03**	-	< 0.01	-	< 0.01	< 0.01	-	**0.03**	**0.4**	**0.4**	**1.93**
	16-May-23	-	-	**3.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	14-Aug-23	-	-	**7.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	19-Dec-23	-	-	**7.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH7	22-Feb-19	**34**	< 1.0	**5.0**	**2.0**	**12**	**64**	**0.2**	-	< 0.01	**0.13**	-	< 0.01	-	**0.02**	**0.02**	**0.34**	-	**2.2**	**2.2**	**1.94**
	14-Mar-19	**36**	< 1.0	**6.0**	**2.0**	**16**	**61**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**2.11**
	23-Apr-19	**38**	< 1.0	**6.0**	**2.0**	**17**	**62**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**2.2**
	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**
	14-Jun-19	**31**	< 1.0	**4.0**	**2.0**	**11**	**56**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	**1.73**
	16-Jul-19	**36**	< 1.0	**5.0**	**2.0**	**12**	**46**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**2.03**
	15-Aug-19	**32**	< 1.0	**4.0**	**2.0**	**15**	**49**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	**1.77**
	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**
	15-Oct-19	**34**	< 1.0	**5.0**	**2.0**	**12**	**53**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.94**
	18-Nov-19	**31**	< 1.0	**5.0**	**1.0**	**15**	**56**	**0.1**	**0.02**	< 0.01	-	-	< 0.01	< 0.01	-	< 0.01	-	**0.17**	**0.5**	**0.5**	**1.78**
	16-Sep-20	**33**	< 1.0	**5.0**	**2.0**	**12**	**62**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	**1.9**
	16-Oct-20	**34**	< 1.0	**5.0**	**2.0**	**9.0**	**64**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.94**
	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	-	**0.3**	**0.6**	**0.6**	**1.77**
	16-Dec-20	**30**	< 1.0	**6.0**	**2.0**	**9.0**	**58**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	**1.85**
	14-Jan-21	**31**	< 1.0	**5.0**	**2.0**	**10**	**63**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	**1.81**
	16-Feb-21	**34**	< 1.0	**6.0**	**2.0**	**12**	**64**	< 0.1	-	< 0.01	< 0.01	-	< 0.01	-	< 0.01	< 0.01	-	**0.3**	**0.6**	**0.6**	**2.02**
	17-Mar-21	**36**	< 1.0	**7.0**	**2.0**	**11**	**68**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**2.19**
	19-Aug-21	-	-	**3.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	13-Oct-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	24-Feb-22	**17**	< 1.0	**2.0**	**1.0**	**8.0**	**25**	< 0.1	-	-	**0.12**	< 0.01	-	**0.02**	-	**0.02**	**0.08**	-	**1.0**	**1.0**	**0.93**
	12-Apr-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	27-May-22	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12-Aug-22	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	18-Nov-22	-	-	**1.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	15-Feb-23	**10**	< 1.0	**1.0**	< 1.0	**1.0**	**14**	< 0.1	-	< 0.01	**0.23**	-	< 0.01	-	< 0.01	< 0.01	-	**0.03**	**1.6**	**1.6**	**0.52**
	16-May-23	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	14-Aug-23	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	19-Dec-23	-	-	**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	< 0.01	**0.5**	-	**2.4**	**2.4**	**2.76**
	14-Mar-19	**45**	< 1.0	**6.0**	< 1.0	**6.0**	**76**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**2.45**
	23-Apr-19	**53**	< 1.0	**7.0**	< 1.0	**8.0**	**89**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**2.88**
	16-May-19	**47**	< 1.0	**4.0**	< 1.0	**6.0**	**81**	< 0.1	-	< 0.01	< 0.01	-	< 0.01	-	< 0.01	< 0.01	**0.12**	-	**0.4**	**0.4**	**2.37**
	14-Jun-19	**47**	< 1.0	**5.0**	< 1.0	**4.0**	**89**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**2.46**
	16-Jul-19	**57**	< 1.0	**5.0**	< 1.0	**70**	**121**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	**2.89**
	15-Aug-19	**42**	< 1.0	**3.0**	< 1.0	**4.0**	**63**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**2.07**
	16-Sep-19	**46**	< 1.0	**3.0**	< 1.0	**4.0**	**70**	< 0.1	-	< 0.01	**0.43**	-	< 0.01	-	< 0.01	< 0.01	**0.13**	-	**1.1**	**1.1**	**2.25**
	15-Oct-19	**45**	< 1.0	**4.0**	< 1.0	**4.0**	**70**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**2.29**
	18-Nov-19	**49**	< 1.0	**4.0**	< 1.0	**8.0**	**80**	< 0.1	**0.58**	< 0.01	-	-	< 0.01	**0.01**	-	**0.01**	-	**0.17**	**1.3**	**1.3**	**2.46**
	16-Sep-20	**58**	< 1.0	**4.0**	< 1.0	**9.0**	**109**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**3.1**
	16-Oct-20	**43**	< 1.0	**4.0**	< 1.0	**12**	**70**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**2.2**
	16-Nov-20	**48**	< 1.0	**6.0**	< 1.0	**10**	**76**	< 0.1	-	< 0.01	**0.14**	-	< 0.01	-	< 0.01	< 0.01	-	**0.13**	**0.6**	**0.6**	**2.58**
	16-Dec-20	**35**	< 1.0	**4.0**	< 1.0	**14**	**56**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.85**
	14-Jan-21	**44**	< 1.0	**5.0**	< 1.0	**13**	**77**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**2.32**
	16-Feb-21	**50**	< 1.0	**6.0**	< 1.0	**17**	**79**	< 0.1	-	< 0.01	**0.14**	-	< 0.01	-	< 0.01	< 0.01	-	**0.12**	< 0.1	< 0.1	**2.67**
	17-Mar-21	**50**	< 1.0	**6.0**	< 1.0	**19**	**75**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**2.67**
	19-Aug-21	-	-	**7.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 2
Groundwater Analytical Results - Anions, Cations, and Inorganics
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte		Anions and Cations																Anions and Cations			
		Sodium	Calcium	Magnesium	Potassium	Sulphate	Chloride	Fluoride	Phosphorus	Reactive phosphorus as P	Total Phosphorus	Nitrite	Nitrite as N	Nitrate	Nitrate as N	Nitrite + Nitrate as N	Ammonia as N	Total Ammonia as Nitrogen	Total Nitrogen as N	Total Kjeldahl Nitrogen as N	Total Cations
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	mg/L	mg/L	meq/L
WSS - Groundwater		77	5.0	11	2.0	70	148	0.2	--	--	2.0	--	--	--	--	--	--	0.5	5.9	--	--
Sample Name	Sample Date																				
	16-Nov-21	-	-	**8.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	24-Feb-22	**55**	< 1.0	**5.0**	< 1.0	**54**	**70**	< 0.1	-	-	**0.3**	< 0.01	-	**0.72**	-	**0.72**	**0.13**	-	**1.7**	**1.0**	**2.8**
	27-May-22	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12-Aug-22	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	18-Nov-22	-	-	**1.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	15-Feb-23	**16**	< 1.0	**1.0**	< 1.0	**15**	**22**	< 0.1	-	< 0.01	**0.19**	-	< 0.01	-	< 0.01	< 0.01	-	**0.06**	**1.7**	**1.7**	**0.78**
	16-May-23	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	14-Aug-23	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	19-Dec-23	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH9A	16-Sep-20	**35**	**5.0**	**5.0**	**1.0**	**41**	**38**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**2.21**
	16-Oct-20	**32**	**3.0**	**6.0**	**1.0**	**33**	**48**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**2.06**
	16-Nov-20	**23**	**2.0**	**4.0**	**1.0**	**23**	**35**	< 0.1	-	< 0.01	**0.11**	-	< 0.01	-	**2.35**	**2.35**	-	< 0.01	**2.8**	**0.5**	**1.46**
	16-Dec-20	**23**	**1.0**	**3.0**	**1.0**	**9.0**	**37**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.32**
	14-Jan-21	**24**	**1.0**	**3.0**	**1.0**	**15**	**43**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.37**
	16-Feb-21	**25**	**1.0**	**3.0**	**1.0**	**12**	**40**	< 0.1	-	< 0.01	**1.74**	-	< 0.01	-	< 0.01	< 0.01	-	**0.15**	**5.1**	**5.1**	**1.41**
	17-Mar-21	**25**	**1.0**	**3.0**	< 1.0	**12**	**35**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.38**
	19-Aug-21	**25**	**1.0**	**3.0**	**1.0**	**14**	**37**	< 0.1	-	< 0.01	< 0.01	-	< 0.01	-	< 0.01	< 0.01	-	< 0.01	**0.8**	**0.8**	**1.41**
	22-Sep-21	**22**	**1.0**	**2.0**	**1.0**	**12**	**35**	< 0.1	-	< 0.01	**0.16**	-	< 0.01	-	**0.03**	**0.03**	-	**0.25**	**1.0**	**1.0**	**1.2**
	13-Oct-21	**24**	< 1.0	**2.0**	**1.0**	**11**	**38**	< 0.1	-	< 0.01	**0.13**	-	< 0.01	-	< 0.01	< 0.01	-	**0.31**	**0.9**	**0.9**	**1.23**
	16-Nov-21	**24**	**2.0**	**3.0**	**1.0**	**17**	**32**	< 0.1	-	< 0.01	**0.05**	-	< 0.01	-	**0.04**	**0.04**	-	**0.21**	**1.1**	**1.1**	**1.42**
	24-Feb-22	**21**	**2.0**	**4.0**	**1.0**	**17**	**32**	< 0.1	-	-	**0.19**	< 0.01	-	< 0.01	-	< 0.01	**0.25**	-	**1.0**	**1.0**	**1.37**
	12-Apr-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	27-May-22	-	-	**3.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12-Aug-22	-	-	**3.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	18-Nov-22	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	15-Feb-23	**18**	< 1.0	**2.0**	**1.0**	**20**	**19**	< 0.1	-	< 0.01	**0.13**	-	< 0.01	-	< 0.01	< 0.01	-	**0.27**	**2.0**	**2.0**	**0.97**
	16-May-23	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	14-Aug-23	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	19-Dec-23	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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**
	15-Mar-19	**26**	< 1.0	**2.0**	< 1.0	**2.0**	**52**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.3**
	23-Apr-19	**32**	< 1.0	**5.0**	< 1.0	**2.0**	**57**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.8**
	16-May-19	**29**	< 1.0	**4.0**	< 1.0	**2.0**	**55**	< 0.1	-	< 0.01	**0.01**	-	< 0.01	-	< 0.01	< 0.01	**0.12**	-	**0.4**	**0.4**	**1.59**
	14-Jun-19	**26**	< 1.0	**3.0**	< 1.0	< 1.0	**53**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.38**
	16-Jul-19	**49**	< 1.0	**8.0**	< 1.0	**8.0**	**73**	**0.2**	-	-	-	-	-	-	-	-	-	-	-	-	**2.79**
	15-Aug-19	**28**	< 1.0	**3.0**	< 1.0	**4.0**	**47**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.46**
	16-Sep-19	**27**	< 1.0	**3.0**	< 1.0	**5.0**	**46**	< 0.1	-	< 0.01	**0.12**	-	< 0.01	-	< 0.01	< 0.01	**0.15**	-	**0.7**	**0.7**	**1.42**
	15-Oct-19	**28**	< 1.0	**3.0**	< 1.0	**3.0**	**44**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.46**
	18-Nov-19	**28**	< 1.0	**3.0**	< 1.0	< 1.0	**53**	< 0.1	**2.11**	< 0.01	-	-	< 0.01	**0.06**	-	**0.06**	-	**0.18**	**5.9**	**5.8**	**1.46**
	16-Sep-20	**29**	< 1.0	**5.0**	< 1.0	**6.0**	**48**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.67**
	16-Oct-20	**29**	< 1.0	**6.0**	< 1.0	**4.0**	**61**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.76**
	16-Nov-20	**27**	< 1.0	**5.0**	< 1.0	**5.0**	**50**	< 0.1	-	< 0.01	**0.06**	-	< 0.01	-	< 0.01	< 0.01	-	**0.08**	**0.5**	**0.5**	**1.58**
	16-Dec-20	**31**	< 1.0	**6.0**	< 1.0	**7.0**	**60**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.84**
	14-Jan-21	**32**	< 1.0	**6.0**	< 1.0	**12**	**63**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.88**
	16-Feb-21	**32**	< 1.0	**5.0**	**1.0**	**12**	**55**	< 0.1	-	< 0.01	< 0.01	-	< 0.01	-	< 0.01	< 0.01	-	**0.08**	< 0.1	< 0.1	**1.83**
	17-Mar-21	**29**	< 1.0	**6.0**	< 1.0	**17**	**48**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.76**
	19-Aug-21	**58**	< 1.0	**7.0**	< 1.0	**9.0**	**110**	**0.1**	-	< 0.01	**0.08**	-	< 0.01	-	< 0.01	< 0.01	-	< 0.01	**1.4**	**1.4**	**3.1**
	22-Sep-21	**49**	< 1.0	**6.0**	< 1.0	**12**	**101**	**0.1**	-	< 0.01	**0.01**	-	< 0.01	-	**0.01**	**0.01**	-	**0.01**	**0.8**	**0.8**	**3.01**
	13-Oct-21	**51**	< 1.0	**8.0**	< 1.0	**29**	**90**	< 0.1	-	< 0.01	**0.03**	-	< 0.01	-	< 0.01	< 0.01	-	< 0.01	**0.8**	**0.8**	**2.88**
	16-Nov-21	**37**	< 1.0	**8.0**	< 1.0	**24**	**55**	< 0.1	-	< 0.01	**0.03**	-	< 0.01	-	< 0.01	< 0.01	-	< 0.01	**0.9**	**0.9**	**2.27**
	24-Feb-22	**41**	< 1.0	**6.0**	< 1.0	**4.0**	**80**	< 0.1	-	-	< 0.01	< 0.01	-	< 0.01	-	< 0.01	**0.02**	-	**0.6**	**0.6**	**2.28**
	06-Mar-22	-	-	**3.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12-Apr-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	18-Nov-22	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	15-Feb-23	**17**	< 1.0	**2.0**	< 1.0	< 1.0	**29**	< 0.1	-	< 0.01	**0.04**	-	< 0.01	-	< 0.01	< 0.01	-	**0.07**	**1.0**	**1.0**	**0.9**
	16-May-23	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	14-Aug-23	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	19-Dec-23	-	-	**3.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH12	16-Sep-20	**24**	< 1.0	**7.0**	**1.0**	**22**	**38**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.64**
	16-Nov-20	**22**	< 1.0	**4.0**	**1.0**	**11**	**41**	< 0.1	-	< 0.01	< 0.01	-	< 0.01	-	**0.02**	**0.02**	-	< 0.01	**0.2**	**0.2**	**1.31**
	13-Oct-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	24-Feb-22	**20**	< 1.0	**4.0**	**2.0**	**18**	**28**	< 0.1	-	-	**0.12**	< 0.01	-	**0.01**	-	**0.01**	**0.01**	-	**0.4**	**0.4**	**1.25**
BH12A	15-Feb-23	**16**	< 1.0	**2.0**	< 1.0	**8.0**	**29**	< 0.1	-	< 0.01	**1.74**	-	**0.02**	-	**0.02**	**0.04**	-	**0.21**	**3.2**	**3.2**	**0.86**
	14-Aug-23	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	19-Dec-23	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 2
Groundwater Analytical Results - Anions, Cations, and Inorganics
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte				Anions and Cations		Alkalinity								Inorganics					
		Total Anions	Ionic Balance	Sodium Adsorption Ratio	Sodium Adsorption Ratio	Bicarbonate	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Hydroxide Alkalinity as CaCO3	Total Alkalinity as CaCO3	Total Hardness as CaCO3	Hardness	Electrical Conductivity @ 25°C	Total Dissolved Solids	Total suspended solids	pH	Turbidity	Phosphate Total (as P)
Units		meq/L	%		-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	pH units	NTU	mg/L
WSS - Groundwater		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sample Name	Sample Date																	
BH1	15-Mar-19	**0.88**	-	-	-	-	**9.0**	< 1.0	< 1.0	**9.0**	**9.0**	-	**104**	**68**	**78**	**5.67**	-	-
	23-Apr-19	**0.99**	-	-	-	-	**10**	< 1.0	< 1.0	**10**	**11**	-	**84**	**55**	**248**	**5.83**	-	-
	16-May-19	**1.01**	-	-	**1.7**	-	**10**	< 1.0	< 1.0	**10**	**8.0**	-	**105**	**68**	**80**	**5.82**	-	-
	14-Jun-19	**0.94**	-	-	-	-	**10**	< 1.0	< 1.0	**10**	**8.0**	-	**99**	**64**	**39**	**5.52**	-	-
	16-Jul-19	**0.95**	-	-	-	-	**11**	< 1.0	< 1.0	**11**	**8.0**	-	**102**	**66**	**26**	**5.62**	-	-
	15-Aug-19	**0.91**	-	-	-	-	**14**	< 1.0	< 1.0	**14**	**8.0**	-	**128**	**83**	**181**	**6.22**	-	-
	16-Sep-19	**0.76**	-	-	**1.84**	-	**8.0**	< 1.0	< 1.0	**8.0**	**8.0**	-	**102**	**66**	**108**	**5.44**	-	-
	15-Oct-19	**0.71**	-	-	-	-	**4.0**	< 1.0	< 1.0	**4.0**	**8.0**	-	**98**	**64**	-	**5.5**	-	-
	18-Nov-19	**1.19**	-	-	**2.26**	-	**24**	< 1.0	< 1.0	**24**	**8.0**	-	**126**	**82**	-	**6.29**	-	-
	16-Sep-20	**0.81**	-	-	-	-	**9.0**	< 1.0	< 1.0	**9.0**	**8.0**	-	**95**	**81**	**58**	**5.87**	-	-
	16-Oct-20	**0.84**	-	-	-	-	**8.0**	< 1.0	< 1.0	**8.0**	**8.0**	-	**88**	**57**	-	**5.7**	-	-
	16-Nov-20	**1.05**	-	-	**1.55**	-	**22**	< 1.0	< 1.0	**22**	**8.0**	-	**120**	**78**	**41**	**5.98**	-	-
	16-Dec-20	**1.16**	-	-	-	-	**21**	< 1.0	< 1.0	**21**	**8.0**	-	**134**	**87**	-	**5.76**	-	-
	14-Jan-21	**1.07**	-	-	-	-	**16**	< 1.0	< 1.0	**16**	**8.0**	-	**124**	**81**	-	**5.63**	-	-
	16-Feb-21	**1.05**	-	-	**1.98**	-	**12**	< 1.0	< 1.0	**12**	**8.0**	-	**116**	**75**	**20**	**5.57**	-	-
	17-Mar-21	**0.95**	-	-	-	-	**11**	< 1.0	< 1.0	**11**	**11**	-	**111**	**72**	-	**6.02**	-	-
	13-Oct-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**5.66**	**98**	-
	24-Feb-22	**1.18**	-	-	-	**16**	-	< 1.0	< 1.0	**16**	**15**	-	**127**	**82**	-	**5.95**	-	< 0.01
BH1A	15-Feb-23	**0.51**	-	-	**2.15**	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	**70**	**46**	-	**4.49**	-	-
	14-Aug-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	19-Dec-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH2	22-Feb-19	**0.74**	-	-	**1.44**	-	< 1.0	< 1.0	< 1.0	< 1.0	**13**	-	**91**	**59**	**376**	**4.87**	-	-
	15-Mar-19	**0.79**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**16**	-	**101**	**66**	**352**	**4.71**	-	-
	23-Apr-19	**0.77**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**13**	-	**70**	**46**	**575**	**4.82**	-	-
	16-May-19	**1.06**	-	-	**1.44**	-	< 1.0	< 1.0	< 1.0	< 1.0	**13**	-	**94**	**61**	**111**	**4.85**	-	-
	14-Jun-19	**0.75**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**11**	-	**91**	**59**	**215**	**4.76**	-	-
	16-Jul-19	**0.75**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**13**	-	**90**	**58**	**92**	**4.84**	-	-
	15-Aug-19	**0.73**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**11**	-	**110**	**72**	**310**	**5.2**	-	-
	16-Sep-19	**0.67**	-	-	**1.32**	-	< 1.0	< 1.0	< 1.0	< 1.0	**13**	-	**96**	**62**	**216**	**4.72**	-	-
	15-Oct-19	**0.67**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**13**	-	**102**	**66**	-	**5.06**	-	-
	18-Nov-19	**0.68**	-	-	**2.02**	-	< 1.0	< 1.0	< 1.0	< 1.0	**9.0**	-	**102**	**66**	-	**5.47**	-	-
	16-Sep-20	**0.62**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**13**	-	**99**	**76**	**356**	**4.85**	-	-
	16-Oct-20	**0.58**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**13**	-	**90**	**58**	-	**5.07**	-	-
	16-Nov-20	**0.7**	-	-	**1.32**	-	**3.0**	< 1.0	< 1.0	**3.0**	**13**	-	**119**	**77**	**952**	**5.09**	-	-
	16-Dec-20	**0.57**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**13**	-	**105**	**68**	-	**4.66**	-	-
	14-Jan-21	**0.57**	-	-	-	-	**3.0**	< 1.0	< 1.0	**3.0**	**13**	-	**93**	**60**	-	**5.04**	-	-
	16-Feb-21	**0.5**	-	-	**2.03**	-	< 1.0	< 1.0	< 1.0	< 1.0	**7.0**	-	**89**	**58**	**86**	**4.84**	-	-
	17-Mar-21	**0.53**	-	-	-	-	**1.0**	< 1.0	< 1.0	**1.0**	**13**	-	**88**	**57**	-	**5.28**	-	-
	19-Aug-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	13-Oct-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**5.09**	**101**	-
	16-Nov-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	24-Feb-22	**0.6**	-	-	-	**3.0**	-	< 1.0	< 1.0	**3.0**	**9.0**	-	**70**	**46**	-	**5.18**	-	< 0.01
	12-Apr-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**462**	-
	27-May-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12-Aug-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	18-Nov-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	15-Feb-23	**0.62**	-	-	**1.69**	-	**2.0**	< 1.0	< 1.0	**2.0**	**4.0**	-	**73**	**47**	-	**4.67**	-	-
	16-May-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	14-Aug-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	19-Dec-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH3	21-Feb-19	**0.54**	-	-	**0.46**	-	**9.0**	< 1.0	< 1.0	**9.0**	**14**	-	**60**	**39**	**3,800**	**5.55**	-	-
BH4	21-Feb-19	**0.7**	-	-	**1.15**	-	**6.0**	< 1.0	< 1.0	**6.0**	**9.0**	-	**73**	**47**	**122**	**5.4**	-	-
	15-Mar-19	**0.61**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**5.0**	-	**77**	**50**	**45**	**5.12**	-	-
	23-Apr-19	**0.6**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**9.0**	-	**54**	**35**	**147**	**5.05**	-	-
	16-May-19	**0.99**	-	-	**1.3**	-	< 1.0	< 1.0	< 1.0	< 1.0	**9.0**	-	**73**	**47**	**44**	**4.99**	-	-
	14-Jun-19	**0.59**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**7.0**	-	**69**	**45**	**186**	**4.84**	-	-
	16-Jul-19	**0.63**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**13**	-	**75**	**49**	**74**	**4.96**	-	-
	15-Aug-19	**0.56**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**9.0**	-	**85**	**55**	**30**	**5.01**	-	-
	16-Sep-19	**0.7**	-	-	**1.32**	-	< 1.0	< 1.0	< 1.0	< 1.0	**13**	-	**95**	**62**	**49**	**4.83**	-	-
	15-Oct-19	**0.59**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**7.0**	-	**85**	**55**	-	**4.93**	-	-
	18-Nov-19	**0.63**	-	-	**1.86**	-	< 1.0	< 1.0	< 1.0	< 1.0	**7.0**	-	**86**	**56**	-	**5.34**	-	-
	16-Sep-20	**1.1**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**8.0**	-	**148**	**74**	**24**	**4.66**	-	-
	16-Oct-20	**1.21**	-	-	-	-	**2.0**	< 1.0	< 1.0	**2.0**	**15**	-	**133**	**86**	-	**5.21**	-	-
	16-Nov-20	**1.03**	-	-	**2.54**	-	**1.0**	< 1.0	< 1.0	**1.0**	**8.0**	-	**146**	**95**	**15**	**4.98**	-	-
	16-Dec-20	**1.58**	-	-	-	-	**3.0**	< 1.0	< 1.0	**3.0**	**19**	-	**193**	**125**	-	**4.81**	-	-
	14-Jan-21	**2.02**	-	-	-	-	**1.0**	< 1.0	< 1.0	**1.0**	**19**	-	**258**	**168**	-	**5.23**	-	-
	16-Feb-21	**3.82**	**0.65**	-	**4.63**	-	**1.0**	< 1.0	< 1.0	**1.0**	**42**	-	**445**	**289**	**56**	**4.86**	-	-
	17-Mar-21	**4.21**	**1.96**	-	-	-	**3.0**	< 1.0	< 1.0	**3.0**	**50**	-	**501**	**326**	-	**5.07**	-	-
	19-Aug-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	13-Oct-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**4.51**	**56**	-
	24-Feb-22	**0.61**	-	-	-	**2.0**	-	< 1.0	< 1.0	**2.0**	**11**	-	**74**	**48**	-	**5.07**	-	< 0.01
	12-Apr-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**61**	-
	27-May-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12-Aug-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	18-Nov-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	15-Feb-23	**0.65**	-	-	**1.69**	-	< 1.0	< 1.0	< 1.0	< 1.0	**7.0**	-	**84**	**55**	-	**5.06**	-	-
	16-May-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	14-Aug-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 2
Groundwater Analytical Results - Anions, Cations, and Inorganics
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte				Anions and Cations		Alkalinity								Inorganics					
		Total Anions	Ionic Balance	Sodium Adsorption Ratio	Sodium Adsorption Ratio	Bicarbonate	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Hydroxide Alkalinity as CaCO3	Total Alkalinity as CaCO3	Total Hardness as CaCO3	Hardness	Electrical Conductivity @ 25°C	Total Dissolved Solids	Total suspended solids	pH	Turbidity	Phosphate Total (as P)
Units		meq/L	%		-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	pH units	NTU	mg/L
WSS - Groundwater		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sample Name	Sample Date																	
	19-Dec-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH5	22-Feb-19	**2.34**	-	-	**3.59**	-	< 1.0	< 1.0	< 1.0	< 1.0	**25**	-	**250**	**162**	**458**	**4.87**	-	-
	24-Feb-22	**2.63**	-	-	-	**3.0**	-	< 1.0	< 1.0	**3.0**	**33**	-	**276**	**179**	-	**4.67**	-	< 0.01
	15-Feb-23	**1.07**	-	-	**2.54**	-	**2.0**	< 1.0	< 1.0	**2.0**	**8.0**	-	**126**	**82**	-	**4.64**	-	-
BH6	22-Feb-19	**1.77**	-	-	**2.49**	-	< 1.0	< 1.0	< 1.0	< 1.0	**24**	-	**177**	**115**	**41**	**4.37**	-	-
	14-Mar-19	**1.44**	-	-	-	-	**2.0**	< 1.0	< 1.0	**2.0**	**21**	-	**179**	**116**	**144**	**4.95**	-	-
	23-Apr-19	**1.56**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**24**	-	**136**	**88**	**62**	**4.64**	-	-
	16-May-19	**1.64**	-	-	**2.04**	-	< 1.0	< 1.0	< 1.0	< 1.0	**24**	-	**175**	**114**	**106**	**4.88**	-	-
	14-Jun-19	**1.52**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**21**	-	**174**	**113**	**32**	**4.82**	-	-
	16-Jul-19	**1.4**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**21**	-	**161**	**105**	**23**	**4.73**	-	-
	15-Aug-19	**1.51**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**17**	-	**201**	**131**	**16**	**4.87**	-	-
	16-Sep-19	**1.55**	-	-	**2.44**	-	**2.0**	< 1.0	< 1.0	**2.0**	**20**	-	**197**	**128**	**71**	**4.68**	-	-
	15-Oct-19	**1.43**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**21**	-	**202**	**131**	-	**5.17**	-	-
	18-Nov-19	**1.64**	-	-	**2.64**	-	< 1.0	< 1.0	< 1.0	< 1.0	**20**	-	**204**	**133**	-	**5.32**	-	-
	16-Sep-20	**1.9**	-	-	-	-	**1.0**	< 1.0	< 1.0	**1.0**	**21**	-	**273**	**121**	**49**	**4.98**	-	-
	16-Oct-20	**2.14**	-	-	-	-	**4.0**	< 1.0	< 1.0	**4.0**	**26**	-	**249**	**162**	-	**5.3**	-	-
	16-Nov-20	**2.2**	-	-	**3.04**	-	< 1.0	< 1.0	< 1.0	< 1.0	**28**	-	**321**	**205**	**12**	**4.45**	-	-
	16-Dec-20	**2.43**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**32**	-	**321**	**209**	-	**4.63**	-	-
	14-Jan-21	**2.5**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**28**	-	**332**	**216**	-	**4.33**	-	-
	16-Feb-21	**2.46**	-	-	**3.3**	-	**3.0**	< 1.0	< 1.0	**3.0**	**32**	-	**316**	**205**	**20**	**4.89**	-	-
	17-Mar-21	**2.82**	-	-	-	-	**2.0**	< 1.0	< 1.0	**2.0**	**47**	-	**358**	**233**	-	**5.07**	-	-
	19-Aug-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	13-Oct-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**6.1**	**51**	-
	24-Feb-22	**1.93**	-	-	-	< 1.0	-	< 1.0	< 1.0	< 1.0	**16**	-	**241**	**157**	-	**3.92**	-	< 0.01
	12-Apr-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**33**	-
	27-May-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12-Aug-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	18-Nov-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	15-Feb-23	**2.1**	-	-	**3.31**	-	< 1.0	< 1.0	< 1.0	< 1.0	**16**	-	**265**	**172**	-	**3.95**	-	-
	16-May-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	14-Aug-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	19-Dec-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH7	22-Feb-19	**2.06**	-	-	**3.16**	-	< 1.0	< 1.0	< 1.0	< 1.0	**20**	-	**213**	**138**	**152**	**4.76**	-	-
	14-Mar-19	**2.05**	**1.37**	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**25**	-	**271**	**176**	**149**	**4.73**	-	-
	23-Apr-19	**2.1**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**25**	-	**205**	**133**	**20**	**4.51**	-	-
	16-May-19	**2.23**	-	-	**3.26**	-	< 1.0	< 1.0	< 1.0	< 1.0	**20**	-	**235**	**153**	**29**	**4.87**	-	-
	14-Jun-19	**1.81**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**16**	-	**213**	**138**	**39**	**4.91**	-	-
	16-Jul-19	**1.55**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**20**	-	**202**	**131**	**61**	**5.0**	-	-
	15-Aug-19	**1.85**	-	-	-	-	**8.0**	< 1.0	< 1.0	**8.0**	**16**	-	**232**	**151**	**44**	**5.53**	-	-
	16-Sep-19	**1.86**	-	-	**2.79**	-	**5.0**	< 1.0	< 1.0	**5.0**	**16**	-	**222**	**144**	**44**	**5.07**	-	-
	15-Oct-19	**1.74**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**20**	-	**252**	**164**	-	**4.95**	-	-
	18-Nov-19	**1.89**	-	-	**2.89**	-	< 1.0	< 1.0	< 1.0	< 1.0	**20**	-	**239**	**155**	-	**4.97**	-	-
	16-Sep-20	**2.0**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**20**	-	**248**	**140**	**24**	**4.81**	-	-
	16-Oct-20	**1.99**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**20**	-	**243**	**158**	-	**4.87**	-	-
	16-Nov-20	**1.71**	-	-	**2.79**	-	< 1.0	< 1.0	< 1.0	< 1.0	**20**	-	**245**	**159**	**6.0**	**4.57**	-	-
	16-Dec-20	**1.82**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**25**	-	**265**	**172**	-	**4.34**	-	-
	14-Jan-21	**1.98**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**20**	-	**267**	**174**	-	**4.62**	-	-
	16-Feb-21	**2.06**	-	-	**2.9**	-	< 1.0	< 1.0	< 1.0	< 1.0	**25**	-	**270**	**176**	**9.0**	**4.54**	-	-
	17-Mar-21	**2.15**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**29**	-	**279**	**181**	-	**4.9**	-	-
	19-Aug-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	13-Oct-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**5.22**	**170**	-
	24-Feb-22	**0.87**	-	-	-	< 1.0	-	< 1.0	< 1.0	< 1.0	**8.0**	-	**124**	**81**	-	**4.43**	-	< 0.01
	12-Apr-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**33**	-
	27-May-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12-Aug-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	18-Nov-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	15-Feb-23	**0.46**	-	-	**1.88**	-	**2.0**	< 1.0	< 1.0	**2.0**	**4.0**	-	**66**	**43**	-	**4.83**	-	-
	16-May-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	14-Aug-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	19-Dec-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH8	21-Feb-19	**2.77**	-	-	**4.44**	-	< 1.0	< 1.0	< 1.0	< 1.0	**25**	-	**352**	**229**	**438**	**4.46**	-	-
	14-Mar-19	**2.27**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**25**	-	**319**	**207**	**138**	**4.77**	-	-
	23-Apr-19	**2.68**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**29**	-	**264**	**172**	**121**	**4.76**	-	-
	16-May-19	**2.43**	-	-	**4.86**	-	**1.0**	< 1.0	< 1.0	**1.0**	**16**	-	**302**	**196**	**312**	**4.9**	-	-
	14-Jun-19	**2.59**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**20**	-	**315**	**205**	**83**	**4.82**	-	-
	16-Jul-19	**4.87**	**26**	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**20**	-	**353**	**229**	**145**	**4.78**	-	-
	15-Aug-19	**1.86**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**12**	-	**260**	**169**	**98**	**5.0**	-	-
	16-Sep-19	**2.06**	-	-	**5.43**	-	< 1.0	< 1.0	< 1.0	< 1.0	**12**	-	**293**	**190**	**79**	**4.85**	-	-
	15-Oct-19	**2.06**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**16**	-	**303**	**197**	-	**5.02**	-	-
	18-Nov-19	**2.42**	-	-	**5.06**	-	< 1.0	< 1.0	< 1.0	< 1.0	**16**	-	**316**	**205**	-	**5.12**	-	-
	16-Sep-20	**3.26**	**2.57**	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**16**	-	**391**	**216**	**34**	**4.79**	-	-
	16-Oct-20	**2.22**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**16**	-	**268**	**174**	-	**5.01**	-	-
	16-Nov-20	**2.35**	-	-	**4.1**	-	< 1.0	< 1.0	< 1.0	< 1.0	**25**	-	**341**	**222**	**14**	**4.75**	-	-
	16-Dec-20	**1.87**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**16**	-	**256**	**166**	-	**4.82**	-	-
	14-Jan-21	**2.44**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**20**	-	**317**	**206**	-	**4.76**	-	-
	16-Feb-21	**2.58**	-	-	**4.27**	-	< 1.0	< 1.0	< 1.0	< 1.0	**25**	-	**335**	**218**	**63**	**4.68**	-	-
	17-Mar-21	**2.51**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**25**	-	**329**	**214**	-	**4.57**	-	-
	19-Aug-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 2
Groundwater Analytical Results - Anions, Cations, and Inorganics
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte				Anions and Cations		Alkalinity								Inorganics				
		Total Anions	Ionic Balance	Sodium Adsorption Ratio	Sodium Adsorption Ratio	Bicarbonate	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Hydroxide Alkalinity as CaCO3	Total Alkalinity as CaCO3	Total Hardness as CaCO3	Hardness	Electrical Conductivity @ 25°C	Total Dissolved Solids	Total suspended solids	pH	Turbidity	Phosphate Total (as P)
Units		meq/L	%		-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	pH units	NTU	mg/L
WSS - Groundwater		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sample Name	Sample Date																	
BH9A	16-Nov-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	24-Feb-22	**3.2**	**6.58**	-	-	**5.0**	-	< 1.0	< 1.0	**5.0**	**20**	-	**329**	**214**	-	**4.67**	-	< 0.01
	27-May-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12-Aug-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	18-Nov-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	15-Feb-23	**0.93**	-	-	**3.0**	-	< 1.0	< 1.0	< 1.0	< 1.0	**4.0**	-	**135**	**88**	-	**4.93**	-	-
	16-May-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	14-Aug-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	19-Dec-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	16-Sep-20	**2.06**	-	-	-	-	**7.0**	< 1.0	< 1.0	**7.0**	**33**	-	**276**	**310**	**1,060**	**5.78**	-	-
	16-Oct-20	**2.06**	-	-	-	-	**1.0**	< 1.0	< 1.0	**1.0**	**32**	-	**237**	**154**	-	**5.15**	-	-
	16-Nov-20	**1.51**	-	-	**2.16**	-	**2.0**	< 1.0	< 1.0	**2.0**	**21**	-	**195**	**127**	**2,220**	**4.93**	-	-
	16-Dec-20	**1.23**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**15**	-	**175**	**114**	-	**4.83**	-	-
	14-Jan-21	**1.52**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**15**	-	**196**	**127**	-	**4.96**	-	-
	16-Feb-21	**1.42**	-	-	**2.82**	-	**2.0**	< 1.0	< 1.0	**2.0**	**15**	-	**181**	**118**	**2,030**	**4.72**	-	-
	17-Mar-21	**1.32**	-	-	-	-	**4.0**	< 1.0	< 1.0	**4.0**	**15**	-	**164**	**107**	-	**5.23**	-	-
	19-Aug-21	**1.42**	-	-	**2.82**	-	**4.0**	< 1.0	< 1.0	**4.0**	**15**	-	**180**	**117**	-	**5.03**	-	-
	22-Sep-21	**1.36**	-	-	**2.92**	-	**6.0**	< 1.0	< 1.0	**6.0**	**11**	-	**172**	**112**	-	**4.99**	-	-
	13-Oct-21	**1.46**	-	-	**3.39**	-	**8.0**	< 1.0	< 1.0	**8.0**	**8.0**	-	**156**	**101**	-	**5.21**	**105**	-
	16-Nov-21	**1.36**	-	-	**2.51**	-	**5.0**	< 1.0	< 1.0	**5.0**	-	**17**	**163**	**106**	-	**5.51**	-	-
	24-Feb-22	**1.26**	-	-	-	< 1.0	-	< 1.0	< 1.0	< 1.0	**21**	-	**164**	**107**	-	**4.85**	-	< 0.01
	12-Apr-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**289**	-
	27-May-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12-Aug-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	18-Nov-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	15-Feb-23	**1.01**	-	-	**2.54**	-	**3.0**	< 1.0	< 1.0	**3.0**	**8.0**	-	**141**	**92**	-	**4.65**	-	-
	16-May-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	14-Aug-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	19-Dec-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11	21-Feb-19	**2.76**	-	-	**3.21**	-	< 1.0	< 1.0	< 1.0	< 1.0	**41**	-	**346**	**225**	**144**	**4.67**	-	-
	15-Mar-19	**1.51**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**8.0**	-	**186**	**121**	**152**	**4.82**	-	-
	23-Apr-19	**1.65**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**20**	-	**150**	**98**	**112**	**4.99**	-	-
	16-May-19	**1.59**	-	-	**3.0**	-	< 1.0	< 1.0	< 1.0	< 1.0	**16**	-	**188**	**122**	**156**	**4.91**	-	-
	14-Jun-19	**1.5**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**12**	-	**175**	**114**	**136**	**4.84**	-	-
	16-Jul-19	**2.22**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**33**	-	**318**	**207**	**223**	**4.68**	-	-
	15-Aug-19	**1.41**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**12**	-	**197**	**128**	**303**	**4.88**	-	-
	16-Sep-19	**1.4**	-	-	**3.18**	-	< 1.0	< 1.0	< 1.0	< 1.0	**12**	-	**195**	**127**	**533**	**4.66**	-	-
	15-Oct-19	**1.3**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**12**	-	**194**	**126**	-	**4.92**	-	-
	18-Nov-19	**1.5**	-	-	**3.3**	-	< 1.0	< 1.0	< 1.0	< 1.0	**12**	-	**193**	**125**	-	**5.12**	-	-
	16-Sep-20	**1.48**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**20**	-	**223**	**111**	**136**	**4.61**	-	-
	16-Oct-20	**1.8**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**25**	-	**218**	**142**	-	**4.8**	-	-
	16-Nov-20	**1.51**	-	-	**2.51**	-	< 1.0	< 1.0	< 1.0	< 1.0	**20**	-	**217**	**141**	**100**	**4.81**	-	-
	16-Dec-20	**1.84**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**25**	-	**249**	**162**	-	**4.74**	-	-
	14-Jan-21	**2.03**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**25**	-	**264**	**172**	-	**4.41**	-	-
	16-Feb-21	**1.8**	-	-	**2.98**	-	< 1.0	< 1.0	< 1.0	< 1.0	**20**	-	**235**	**153**	**386**	**4.73**	-	-
	17-Mar-21	**1.71**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**25**	-	**223**	**145**	-	**4.66**	-	-
	19-Aug-21	**3.29**	**3.0**	-	**4.6**	-	< 1.0	< 1.0	< 1.0	< 1.0	**29**	-	**403**	**262**	-	**4.38**	-	-
	22-Sep-21	**3.1**	**1.54**	-	**4.18**	-	< 1.0	< 1.0	< 1.0	< 1.0	**25**	-	**382**	**248**	-	**4.47**	-	-
	13-Oct-21	**3.14**	**4.42**	-	**3.79**	-	< 1.0	< 1.0	< 1.0	< 1.0	**33**	-	**373**	**242**	-	**4.27**	**18**	-
	16-Nov-21	**2.05**	-	-	**2.75**	-	< 1.0	< 1.0	< 1.0	< 1.0	-	**33**	**268**	**174**	-	**4.54**	-	-
	24-Feb-22	**2.4**	-	-	-	**3.0**	-	< 1.0	< 1.0	**3.0**	**25**	-	**260**	**169**	-	**4.57**	-	< 0.01
	06-Mar-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12-Apr-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**24**	-
	18-Nov-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	15-Feb-23	**0.82**	-	-	**2.4**	-	< 1.0	< 1.0	< 1.0	< 1.0	**8.0**	-	**118**	**77**	-	**4.54**	-	-
	16-May-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	14-Aug-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	19-Dec-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH12	16-Sep-20	**1.57**	-	-	-	-	**2.0**	< 1.0	< 1.0	**2.0**	**29**	-	**206**	**118**	**446**	**5.37**	-	-
	16-Nov-20	**1.52**	-	-	**2.27**	-	**7.0**	< 1.0	< 1.0	**7.0**	**16**	-	**190**	**124**	**438**	**5.92**	-	-
	13-Oct-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**5.75**	**398**	-
	24-Feb-22	**1.2**	-	-	-	**2.0**	-	< 1.0	< 1.0	**2.0**	**16**	-	**148**	**96**	-	**5.03**	-	< 0.01
BH12A	15-Feb-23	**0.98**	-	-	**2.26**	-	< 1.0	< 1.0	< 1.0	< 1.0	**8.0**	-	**129**	**84**	-	**4.91**	-	-
	14-Aug-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	19-Dec-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

Criteria:
SWMP 2021 - Soil and Water Managemen

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 3
Groundwater Analytical Results - Dissolved Metals
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

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
WSS - Groundwater		0.003	0.07	0.002	0.1	0.0002	0.004	0.006	0.083	4.1	0.001	0.136	0.0001	0.02	0.01	0.01	0.085
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**
BH1A	15-Feb-23	< 0.001	**0.004**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.001	**0.003**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.013**
	14-Aug-23	< 0.001	**0.003**	-	-	-	**0.003**	-	**0.004**	**0.45**	-	**0.011**	-	< 0.001	-	-	**0.015**
	19-Dec-23	< 0.001	**0.005**	-	-	-	< 0.001	-	**0.003**	< 0.05	-	**0.006**	-	**0.002**	-	-	**0.021**
BH2	22-Feb-19	< 0.001	**0.005**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.002**	**0.14**	< 0.001	**0.021**	< 0.0001	**0.015**	< 0.01	< 0.01	**0.006**
	15-Mar-19	< 0.001	**0.004**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.003**	< 0.05	< 0.001	**0.02**	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
	23-Apr-19	< 0.001	**0.005**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.004**	**0.19**	< 0.001	**0.018**	< 0.0001	**0.001**	< 0.01	< 0.01	**0.008**
	16-May-19	< 0.001	**0.004**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.001**	**0.06**	< 0.001	**0.014**	< 0.0001	**0.001**	< 0.01	< 0.01	< 0.005
	14-Jun-19	< 0.001	**0.004**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.004**	**0.08**	< 0.001	**0.009**	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
	16-Jul-19	< 0.001	**0.004**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.008**	**0.05**	< 0.001	**0.013**	< 0.0001	**0.001**	< 0.01	< 0.01	**0.006**
	15-Aug-19	< 0.001	**0.004**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.012**	**0.08**	< 0.001	**0.011**	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
	16-Sep-19	< 0.001	**0.004**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.008**	**0.26**	< 0.001	**0.014**	< 0.0001	**0.001**	< 0.01	< 0.01	**0.007**
	15-Oct-19	< 0.001	**0.004**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.006**	-	< 0.001	**0.011**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.007**
	18-Nov-19	< 0.001	**0.007**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.013**	**0.08**	< 0.001	**0.011**	< 0.0001	**0.007**	< 0.01	< 0.01	**0.028**
	16-Sep-20	< 0.001	**0.012**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.026**	**0.07**	< 0.001	**0.016**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.006**
	16-Oct-20	< 0.001	**0.005**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.013**	< 0.05	< 0.001	**0.015**	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
	16-Nov-20	< 0.001	**0.005**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.02**	**0.36**	< 0.001	**0.015**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.018**
	16-Dec-20	< 0.001	**0.004**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.011**	< 0.05	< 0.001	**0.014**	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
	14-Jan-21	< 0.001	**0.002**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.006**	< 0.05	< 0.001	**0.016**	< 0.0001	< 0.001	< 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**
	19-Aug-21	< 0.001	**0.003**	-	-	-	< 0.001	-	**0.007**	< 0.05	-	**0.015**	-	< 0.001	-	-	< 0.005
	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
	17-Mar-22	< 0.001	-	-	-	-	-	-	-	< 0.05	-	**0.01**	-	-	-	-	-
	12-Apr-22	**0.001**	-	-	-	-	-	-	-	**0.25**	-	**0.009**	-	-	-	-	-
	27-May-22	< 0.001	**0.002**	-	-	-	< 0.001	-	**0.004**	< 0.05	-	-	-	< 0.001	-	-	**0.005**
	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**
	16-Sep-22	< 0.001	-	-	-	-	-	-	-	**0.15**	-	**0.009**	-	-	-	-	**0.125**
	24-Oct-22	< 0.001	-	-	-	-	-	-	-	< 0.05	-	**0.005**	-	-	-	-	**0.086**
	18-Nov-22	< 0.001	**0.004**	-	-	-	< 0.001	**0.001**	**0.002**	**0.14**	-	**0.005**	-	< 0.001	-	-	**0.086**
	14-Dec-22	< 0.001	-	-	-	-	-	-	-	**0.09**	-	**0.004**	-	-	-	-	-
	17-Jan-23	< 0.001	-	-	-	-	-	-	-	**0.12**	-	**0.005**	-	-	-	-	-
	15-Feb-23	< 0.001	**0.002**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.002**	< 0.05	< 0.001	**0.002**	< 0.0001	**0.001**	< 0.01	< 0.01	**0.048**
	15-Mar-23	< 0.001	-	-	-	-	-	-	-	< 0.05	-	**0.003**	-	-	-	-	-

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 3
Groundwater Analytical Results - Dissolved Metals
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

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
WSS - Groundwater		0.003	0.07	0.002	0.1	0.0002	0.004	0.006	0.083	4.1	0.001	0.136	0.0001	0.02	0.01	0.01	0.085
Sample Name	Sample Date																
	18-Apr-23	< 0.001	**0.003**	< 0.001	**0.05**	< 0.0001	< 0.001	< 0.001	**0.003**	**0.09**	< 0.001	**0.004**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.039**
	16-May-23	< 0.001	**0.002**	-	-	-	< 0.001	-	**0.004**	**0.08**	-	-	-	**0.001**	-	-	**0.05**
	14-Jun-23	< 0.001	-	-	-	-	-	-	-	< 0.05	-	**0.002**	-	-	-	-	-
	24-Jul-23	< 0.001	-	-	-	-	-	-	-	**0.12**	-	**0.007**	-	-	-	-	-
	14-Aug-23	< 0.001	**0.004**	-	-	-	< 0.001	-	**0.008**	**0.18**	-	**0.009**	-	< 0.001	-	-	**0.164**
	13-Sep-23	< 0.001	-	-	-	-	-	-	-	**0.06**	-	**0.005**	-	-	-	-	-
	23-Oct-23	< 0.001	-	-	-	-	-	-	-	**0.11**	-	**0.007**	-	-	-	-	-
	22-Nov-23	< 0.001	-	-	-	-	-	-	-	< 0.05	-	**0.002**	-	-	-	-	-
	19-Dec-23	< 0.001	**0.002**	-	-	-	< 0.001	-	**0.002**	**0.21**	-	**0.003**	-	**0.001**	-	-	**0.015**
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
	21-Feb-19	< 0.001	**0.014**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.002**	**0.16**	< 0.001	**0.039**	< 0.0001	**0.018**	< 0.01	< 0.01	**0.014**
	15-Mar-19	< 0.001	**0.014**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.001**	< 0.05	< 0.001	**0.014**	< 0.0001	**0.022**	< 0.01	< 0.01	**0.043**
	23-Apr-19	< 0.001	**0.013**	< 0.001	**0.05**	< 0.0001	< 0.001	< 0.001	**0.002**	**0.99**	< 0.001	**0.045**	< 0.0001	**0.007**	< 0.01	< 0.01	**0.008**
	16-May-19	< 0.001	**0.013**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**0.27**	< 0.001	**0.022**	< 0.0001	**0.022**	< 0.01	< 0.01	**0.011**
	14-Jun-19	< 0.001	**0.012**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.038**	< 0.05	< 0.001	**0.014**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.005**
	16-Jul-19	< 0.001	**0.013**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.046**	< 0.05	< 0.001	**0.019**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.007**
	15-Aug-19	< 0.001	**0.013**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.026**	< 0.05	< 0.001	**0.018**	< 0.0001	**0.001**	< 0.01	< 0.01	**0.007**
	16-Sep-19	< 0.001	**0.012**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.051**	**0.19**	< 0.001	**0.026**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.005**
	15-Oct-19	< 0.001	**0.01**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.011**	-	< 0.001	**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**
	19-Aug-21	< 0.001	**0.011**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.001**	**0.198**	**0.14**	< 0.001	**0.022**	< 0.0001	**0.001**	< 0.01	< 0.01	**0.013**
	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**	-	-	-	-	-
	18-Jan-22	< 0.001	-	-	-	-	-	-	-	**0.52**	-	**0.018**	-	-	-	-	-
BH4	24-Feb-22	< 0.001	**0.009**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**0.62**	< 0.001	**0.017**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.008**
	17-Mar-22	< 0.001	-	-	-	-	-	-	-	**0.09**	-	**0.018**	-	-	-	-	-
	12-Apr-22	< 0.001	-	-	-	-	-	-	-	**0.27**	-	**0.017**	-	-	-	-	-
	27-May-22	< 0.001	**0.011**	-	-	-	< 0.001	-	**0.097**	< 0.05	-	-	-	< 0.001	-	-	< 0.005
	17-Jun-22	< 0.001	-	-	-	-	-	-	**0.082**	< 0.05	-	**0.014**	-	-	-	-	-
	27-Jul-22	< 0.001	-	-	-	-	-	-	-	**0.09**	-	**0.014**	-	-	-	-	-
	12-Aug-22	< 0.001	**0.013**	-	-	-	< 0.001	-	**0.05**	< 0.05	-	-	-	< 0.001	-	-	**0.013**
	16-Sep-22	< 0.001	-	-	-	-	-	-	-	**0.11**	-	**0.014**	-	-	-	-	-
	24-Oct-22	< 0.001	-	-	-	-	-	-	-	**0.19**	-	**0.016**	-	-	-	-	-
	18-Nov-22	< 0.001	**0.012**	-	-	-	< 0.001	< 0.001	**0.006**	**0.13**	-	**0.016**	-	< 0.001	-	-	**0.011**
	14-Dec-22	< 0.001	-	-	-	-	-	-	-	**0.14**	-	**0.015**	-	-	-	-	-
	17-Jan-23	< 0.001	-	-	-	-	-	-	-	**0.12**	-	**0.022**	-	-	-	-	-
	15-Feb-23	< 0.001	**0.011**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.012**	**0.06**	< 0.001	**0.012**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.015**
	15-Mar-23	< 0.001	-	-	-	-	-	-	-	< 0.05	-	**0.022**	-	-	-	-	-
	18-Apr-23	< 0.001	**0.011**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.059**	**0.05**	< 0.001	**0.012**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.008**
	16-May-23	< 0.001	**0.008**	-	-	-	< 0.001	-	**0.135**	**0.09**	-	-	-	< 0.001	-	-	**0.017**
	14-Jun-23	< 0.001	-	-	-	-	-	-	**0.067**	< 0.05	-	**0.009**	-	-	-	-	-
	24-Jul-23	< 0.001	-	-	-	-	-	-	-	**0.06**	-	**0.013**	-	-	-	-	-
	14-Aug-23	< 0.001	**0.009**	-	-	-	< 0.001	-	**0.119**	**0.09**	-	**0.015**	-	< 0.001	-	-	**0.028**
	13-Sep-23	< 0.001	-	-	-	-	-	-	-	**0.13**	-	**0.013**	-	-	-	-	-
	23-Oct-23	< 0.001	-	-	-	-	-	-	-	**0.08**	-	**0.013**	-	-	-	-	-
	22-Nov-23	< 0.001	-	-	-	-	-	-	-	**0.06**	-	**0.013**	-	-	-	-	-
	19-Dec-23	< 0.001	**0.008**	-	-	-	< 0.001	-	**0.003**	**0.12**	-	**0.007**	-	< 0.001	-	-	< 0.005
	22-Feb-19	< 0.001	**0.01**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	< 0.001	**1.4**	< 0.001	**0.005**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.008**

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 3
Groundwater Analytical Results - Dissolved Metals
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

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
WSS - Groundwater		0.003	0.07	0.002	0.1	0.0002	0.004	0.006	0.083	4.1	0.001	0.136	0.0001	0.02	0.01	0.01	0.085
Sample Name	Sample Date																
BH5	24-Feb-22	< 0.001	**0.024**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	< 0.001	**1.64**	< 0.001	**0.005**	< 0.0001	**0.002**	< 0.01	< 0.01	< 0.005
	15-Feb-23	< 0.001	**0.006**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**0.47**	< 0.001	**0.002**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.018**
	22-Feb-19	< 0.001	**0.03**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**1.03**	< 0.001	**0.014**	< 0.0001	**0.001**	< 0.01	< 0.01	**0.019**
	14-Mar-19	< 0.001	**0.027**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**1.9**	< 0.001	**0.01**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.012**
	23-Apr-19	< 0.001	**0.03**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.001**	**0.96**	< 0.001	**0.01**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.022**
	16-May-19	< 0.001	**0.029**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**2.57**	< 0.001	**0.009**	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
	14-Jun-19	< 0.001	**0.027**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.001**	**2.86**	< 0.001	**0.008**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.008**
	16-Jul-19	< 0.001	**0.026**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.002**	**2.41**	< 0.001	**0.008**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.005**
	15-Aug-19	< 0.001	**0.026**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.001**	**2.19**	< 0.001	**0.008**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.007**
	16-Sep-19	< 0.001	**0.034**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.008**	**2.08**	< 0.001	**0.012**	< 0.0001	**0.007**	< 0.01	< 0.01	**0.035**
	15-Oct-19	< 0.001	**0.026**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	-	< 0.001	**0.009**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.006**
	18-Nov-19	< 0.001	**0.03**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**1.58**	< 0.001	**0.009**	< 0.0001	**0.008**	< 0.01	< 0.01	**0.073**
	16-Sep-20	< 0.001	**0.047**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.002**	**1.78**	< 0.001	**0.01**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.006**
	16-Oct-20	< 0.001	**0.04**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**1.84**	< 0.001	**0.011**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.007**
	16-Nov-20	< 0.001	**0.061**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**1.72**	< 0.001	**0.014**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.01**
	16-Dec-20	< 0.001	**0.07**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**1.64**	< 0.001	**0.014**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.007**
	14-Jan-21	< 0.001	**0.054**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.011**	**1.06**	< 0.001	**0.014**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.025**
	16-Feb-21	< 0.001	**0.048**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.013**	**1.18**	< 0.001	**0.012**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.012**
	17-Mar-21	< 0.001	**0.068**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**1.39**	< 0.001	**0.012**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.006**
	19-Aug-21	**0.005**	**0.037**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**0.55**	< 0.001	**0.004**	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
	22-Sep-21	**0.002**	**0.02**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**0.55**	< 0.001	**0.005**	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
	13-Oct-21	**0.002**	**0.014**	< 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
	16-Nov-21	< 0.001	**0.013**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**0.83**	< 0.001	**0.004**	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
	15-Dec-21	< 0.001	-	-	-	-	-	-	-	**0.66**	-	**0.002**	-	-	-	-	-
	18-Jan-22	< 0.001	-	-	-	-	-	-	-	**0.7**	-	**0.003**	-	-	-	-	-
BH6	24-Feb-22	< 0.001	**0.011**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**0.55**	< 0.001	**0.001**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.031**
	17-Mar-22	< 0.001	-	-	-	-	-	-	-	**0.81**	-	**0.002**	-	-	-	-	-
	12-Apr-22	< 0.001	-	-	-	-	-	-	-	**3.24**	-	**0.016**	-	-	-	-	-
	27-May-22	< 0.001	**0.007**	-	-	-	< 0.001	-	< 0.001	**3.45**	-	-	-	< 0.001	-	-	< 0.005
	17-Jun-22	< 0.001	-	-	-	-	-	-	-	**2.7**	-	**0.005**	-	-	-	-	-
	27-Jul-22	< 0.001	-	-	-	-	-	-	-	**2.38**	-	**0.001**	-	-	-	-	-
	12-Aug-22	< 0.001	**0.008**	-	-	-	< 0.001	-	< 0.001	**2.38**	-	-	-	< 0.001	-	-	**0.008**
	16-Sep-22	**0.001**	-	-	-	-	-	-	-	**3.45**	-	**0.002**	-	-	-	-	-
	24-Oct-22	< 0.001	-	-	-	-	-	-	-	**3.44**	-	**0.002**	-	-	-	-	-
	18-Nov-22	< 0.001	**0.009**	-	-	-	< 0.001	< 0.001	< 0.001	**4.39**	-	**0.006**	-	**0.002**	-	-	**0.005**
	14-Dec-22	< 0.001	-	-	-	-	-	-	-	**3.23**	-	**0.012**	-	-	-	-	-
	17-Jan-23	< 0.001	-	-	-	-	-	-	-	**3.61**	-	**0.014**	-	-	-	-	-
	15-Feb-23	< 0.001	**0.009**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	**0.002**	**3.82**	< 0.001	**0.009**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.032**
	15-Mar-23	< 0.001	-	-	-	-	-	-	-	**4.97**	-	**0.006**	-	-	-	-	-
	18-Apr-23	< 0.001	**0.007**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**4.13**	< 0.001	**0.003**	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
	16-May-23	< 0.001	**0.007**	-	-	-	< 0.001	-	< 0.001	**4.56**	-	-	-	< 0.001	-	-	**0.024**
	14-Jun-23	< 0.001	-	-	-	-	-	-	-	**5.53**	-	< 0.001	-	-	-	-	-
	24-Jul-23	< 0.001	-	-	-	-	-	-	-	**6.78**	-	**0.005**	-	-	-	-	-
	14-Aug-23	< 0.001	**0.008**	-	-	-	< 0.001	-	**0.001**	**6.34**	-	**0.006**	-	< 0.001	-	-	**0.062**
	13-Sep-23	< 0.001	-	-	-	-	-	-	-	**4.68**	-	**0.004**	-	-	-	-	-
	23-Oct-23	< 0.001	-	-	-	-	-	-	-	**4.27**	-	**0.006**	-	-	-	-	-
	22-Nov-23	< 0.001	-	-	-	-	-	-	-	**3.21**	-	**0.006**	-	-	-	-	-
	19-Dec-23	< 0.001	**0.011**	-	-	-	< 0.001	-	< 0.001	**1.7**	-	**0.004**	-	< 0.001	-	-	**0.04**
	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**

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 3
Groundwater Analytical Results - Dissolved Metals
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

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
WSS - Groundwater		0.003	0.07	0.002	0.1	0.0002	0.004	0.006	0.083	4.1	0.001	0.136	0.0001	0.02	0.01	0.01	0.085
Sample Name	Sample Date																
BH7	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
	19-Aug-21	**0.003**	**0.004**	< 0.001	< 0.05	< 0.0001	**0.003**	**0.001**	< 0.001	**0.79**	< 0.001	**0.006**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.006**
	22-Sep-21	< 0.001	**0.004**	< 0.001	< 0.05	< 0.0001	**0.003**	< 0.001	< 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**	< 0.001	< 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**	< 0.001	< 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
	17-Mar-22	< 0.001	-	-	-	-	-	-	-	**0.45**	-	**0.003**	-	-	-	-	-
	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
	16-Sep-22	**0.001**	-	-	-	-	-	-	-	**0.54**	-	**0.004**	-	-	-	-	-
	24-Oct-22	< 0.001	-	-	-	-	-	-	-	**0.5**	-	**0.003**	-	-	-	-	-
	18-Nov-22	**0.001**	**0.002**	-	-	-	**0.002**	< 0.001	< 0.001	**0.43**	-	**0.001**	-	**0.001**	-	-	**0.009**
	14-Dec-22	< 0.001	-	-	-	-	-	-	-	**0.32**	-	**0.002**	-	-	-	-	-
	17-Jan-23	< 0.001	-	-	-	-	-	-	-	**0.29**	-	**0.002**	-	-	-	-	-
	15-Feb-23	< 0.001	**0.002**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	< 0.001	**0.31**	< 0.001	**0.003**	< 0.0001	**0.001**	< 0.01	< 0.01	**0.011**
	15-Mar-23	< 0.001	-	-	-	-	-	-	-	**0.34**	-	**0.003**	-	-	-	-	-
	18-Apr-23	< 0.001	**0.002**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	**0.002**	**0.46**	< 0.001	**0.003**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.011**
	16-May-23	< 0.001	**0.002**	-	-	-	**0.002**	-	**0.001**	**0.47**	-	-	-	**0.002**	-	-	**0.025**
	14-Jun-23	< 0.001	-	-	-	-	-	-	-	**0.44**	-	**0.003**	-	-	-	-	-
	24-Jul-23	< 0.001	-	-	-	-	-	-	-	**0.53**	-	**0.004**	-	-	-	-	-
	14-Aug-23	< 0.001	**0.002**	-	-	-	**0.002**	-	**0.003**	**0.41**	-	**0.003**	-	**0.002**	-	-	**0.024**
	13-Sep-23	< 0.001	-	-	-	-	-	-	-	**0.55**	-	**0.004**	-	-	-	-	-
	23-Oct-23	< 0.001	-	-	-	-	-	-	-	**0.53**	-	**0.004**	-	-	-	-	-
	22-Nov-23	< 0.001	-	-	-	-	-	-	-	**0.36**	-	**0.004**	-	-	-	-	-
	19-Dec-23	< 0.001	**0.004**	-	-	-	**0.003**	-	< 0.001	**0.4**	-	**0.004**	-	**0.002**	-	-	**0.054**
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**	**0.008**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	< 0.001	**1.72**	< 0.001	**0.004**	< 0.0001	**0.001**	< 0.01	< 0.01	< 0.005
	16-Sep-19	**0.001**	**0.01**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	< 0.001	**2.06**	< 0.001	**0.005**	< 0.0001	**0.002**	< 0.01	< 0.01	< 0.005
	15-Oct-19	< 0.001	**0.007**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	**0.002**	-	< 0.001	**0.009**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.011**
	18-Nov-19	< 0.001	**0.012**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	**0.002**	**2.49**	< 0.001	**0.01**	< 0.0001	**0.013**	< 0.01	< 0.01	**0.053**
	16-Sep-20	< 0.001	**0.014**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	**0.035**	**3.35**	**0.001**	**0.009**	< 0.0001	**0.009**	< 0.01	< 0.01	**0.039**
	16-Oct-20	**0.001**	**0.009**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	< 0.001	**3.03**	< 0.001	**0.007**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.012**
	16-Nov-20	< 0.001	**0.013**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**3.48**	< 0.001	**0.008**	< 0.0001	**0.002**	< 0.01	< 0.01	< 0.005
	16-Dec-20	< 0.001	**0.006**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	**0.001**	**2.98**	< 0.001	**0.01**	< 0.0001	**0.001**	< 0.01	< 0.01	< 0.005
	14-Jan-21	< 0.001	**0.007**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	**0.002**	**2.71**	< 0.001	**0.01**	< 0.0001	**0.005**	< 0.01	< 0.01	**0.009**
	16-Feb-21	**0.001**	**0.009**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	**0.004**	**2.99**	< 0.001	**0.01**	< 0.0001	**0.006**	< 0.01	< 0.01	**0.013**
	17-Mar-21	< 0.001	**0.012**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	< 0.001	**3.86**	< 0.001	**0.01**	< 0.0001	**0.002**	< 0.01	< 0.01	< 0.005
	19-Aug-21	**0.003**	**0.008**	-	-	-	**0.002**	-	< 0.001	**3.72**	-	-	-	**0.002**	-	-	< 0.005
	16-Nov-21	**0.001**	**0.01**	-	-	-	**0.002**	-	< 0.001	**4.23**	-	-	-	**0.002**	-	-	< 0.005
	16-Dec-21	-	-	-	-	-	-	-	-	**3.78**	-	-	-	-	-	-	-

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 3
Groundwater Analytical Results - Dissolved Metals
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

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
WSS - Groundwater		0.003	0.07	0.002	0.1	0.0002	0.004	0.006	0.083	4.1	0.001	0.136	0.0001	0.02	0.01	0.01	0.085
Sample Name	Sample Date																
	24-Feb-22	**0.001**	**0.009**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	< 0.001	**2.98**	< 0.001	**0.007**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.012**
	27-May-22	**0.001**	**0.004**	-	-	-	**0.002**	-	< 0.001	**1.1**	-	-	-	**0.001**	-	-	< 0.005
	12-Aug-22	**0.001**	**0.006**	-	-	-	**0.002**	-	< 0.001	**1.54**	-	-	-	**0.001**	-	-	**0.007**
	18-Nov-22	**0.002**	**0.004**	-	-	-	**0.002**	< 0.001	< 0.001	**1.16**	-	**0.001**	-	< 0.001	-	-	**0.008**
	15-Feb-23	**0.001**	**0.004**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	**0.001**	**0.96**	< 0.001	**0.002**	< 0.0001	**0.001**	< 0.01	< 0.01	**0.034**
	16-May-23	**0.002**	**0.004**	-	-	-	**0.003**	-	< 0.001	**1.37**	-	-	-	**0.001**	-	-	**0.015**
	14-Aug-23	**0.002**	**0.005**	-	-	-	**0.003**	-	< 0.001	**1.78**	-	**0.006**	-	**0.001**	-	-	**0.024**
	19-Dec-23	**0.002**	**0.011**	-	-	-	**0.002**	-	< 0.001	**2.03**	-	**0.006**	-	**0.002**	-	-	**0.029**
BH9	16-Nov-21	< 0.001	-	-	-	-	-	-	-	< 0.05	-	**0.014**	-	-	-	-	-
BH9A	16-Sep-20	< 0.001	**0.028**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.002**	**0.004**	**0.14**	< 0.001	**0.076**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.02**
	16-Oct-20	< 0.001	**0.001**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.001**	**0.001**	**0.06**	< 0.001	**0.042**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.016**
	16-Nov-20	< 0.001	**0.001**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.001**	**0.001**	**0.11**	< 0.001	**0.03**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.011**
	16-Dec-20	< 0.001	**0.001**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.001**	**0.31**	< 0.001	**0.024**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.006**
	14-Jan-21	< 0.001	**0.002**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	**0.017**	**0.14**	< 0.001	**0.025**	< 0.0001	**0.004**	< 0.01	< 0.01	**0.011**
	16-Feb-21	< 0.001	**0.001**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.001**	< 0.001	**0.35**	< 0.001	**0.024**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.006**
	17-Mar-21	< 0.001	**0.006**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**0.27**	< 0.001	**0.024**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.01**
	19-Aug-21	< 0.001	**0.003**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**0.26**	< 0.001	**0.03**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.006**
	22-Sep-21	< 0.001	**0.003**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**0.32**	< 0.001	**0.027**	< 0.0001	**0.003**	< 0.01	< 0.01	< 0.005
	13-Oct-21	< 0.001	**0.003**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**0.51**	< 0.001	**0.033**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.021**
	16-Nov-21	< 0.001	**0.007**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.001**	< 0.001	**0.33**	< 0.001	**0.025**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.031**
	15-Dec-21	< 0.001	-	-	-	-	-	-	-	**0.48**	-	**0.025**	-	-	-	-	-
	18-Jan-22	< 0.001	-	-	-	-	-	-	-	**0.44**	-	**0.03**	-	-	-	-	-
	24-Feb-22	< 0.001	**0.008**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.001**	< 0.001	**0.5**	< 0.001	**0.042**	< 0.0001	**0.004**	< 0.01	< 0.01	**0.006**
	17-Mar-22	< 0.001	-	-	-	-	-	-	-	**0.32**	-	**0.036**	-	-	-	-	-
	12-Apr-22	< 0.001	-	-	-	-	-	-	-	**0.48**	-	**0.038**	-	-	-	-	-
	27-May-22	< 0.001	**0.007**	-	-	-	< 0.001	-	< 0.001	**0.35**	-	-	-	**0.003**	-	-	< 0.005
	17-Jun-22	< 0.001	-	-	-	-	-	-	-	**0.42**	-	**0.032**	-	-	-	-	-
	27-Jul-22	< 0.001	-	-	-	-	-	-	-	**0.16**	-	**0.019**	-	-	-	-	-
	12-Aug-22	< 0.001	**0.009**	-	-	-	< 0.001	-	**0.004**	**0.53**	-	-	-	**0.004**	-	-	**0.008**
	16-Sep-22	< 0.001	-	-	-	-	-	-	-	**0.54**	-	**0.031**	-	-	-	-	-
	24-Oct-22	< 0.001	-	-	-	-	-	-	-	**0.27**	-	**0.022**	-	-	-	-	-
	18-Nov-22	< 0.001	**0.007**	-	-	-	< 0.001	< 0.001	< 0.001	**0.56**	-	**0.034**	-	**0.002**	-	-	**0.012**
	14-Dec-22	< 0.001	-	-	-	-	-	-	-	**0.18**	-	**0.023**	-	-	-	-	-
	17-Jan-23	< 0.001	-	-	-	-	-	-	-	**0.49**	-	**0.035**	-	-	-	-	-
	15-Feb-23	< 0.001	**0.007**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.001**	**0.61**	< 0.001	**0.041**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.015**
	15-Mar-23	< 0.001	-	-	-	-	-	-	-	**0.15**	-	**0.02**	-	-	-	-	-
	18-Apr-23	< 0.001	**0.006**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	**0.004**	**0.5**	< 0.001	**0.033**	< 0.0001	**0.004**	< 0.01	< 0.01	**0.038**
	16-May-23	< 0.001	**0.004**	-	-	-	< 0.001	-	< 0.001	**0.26**	-	-	-	**0.002**	-	-	**0.029**
	14-Jun-23	< 0.001	-	-	-	-	-	-	-	**0.16**	-	**0.013**	-	-	-	-	-
	24-Jul-23	< 0.001	-	-	-	-	-	-	-	**0.67**	-	**0.045**	-	-	-	-	-
	14-Aug-23	< 0.001	**0.006**	-	-	-	< 0.001	-	**0.003**	**0.63**	-	**0.041**	-	**0.003**	-	-	**0.038**
	13-Sep-23	< 0.001	-	-	-	-	-	-	-	**0.21**	-	**0.023**	-	-	-	-	-
	23-Oct-23	< 0.001	-	-	-	-	-	-	-	**0.63**	-	**0.051**	-	-	-	-	-
	22-Nov-23	< 0.001	-	-	-	-	-	-	-	**0.8**	-	**0.061**	-	-	-	-	-
	19-Dec-23	< 0.001	**0.007**	-	-	-	< 0.001	-	**0.002**	**0.4**	-	**0.032**	-	**0.003**	-	-	**0.05**
	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-Sep-20	< 0.001	**0.014**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	**0.005**	**0.9**	< 0.001	**0.008**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.009**
	16-Oct-20	< 0.001	**0.007**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	< 0.001	**1.06**	< 0.001	**0.009**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.01**

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 3
Groundwater Analytical Results - Dissolved Metals
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

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
WSS - Groundwater		0.003	0.07	0.002	0.1	0.0002	0.004	0.006	0.083	4.1	0.001	0.136	0.0001	0.02	0.01	0.01	0.085
Sample Name	Sample Date																
BH11	16-Nov-20	< 0.001	**0.007**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	< 0.001	**0.84**	< 0.001	**0.011**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.016**
	16-Dec-20	< 0.001	**0.008**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	< 0.001	**1.0**	< 0.001	**0.009**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.008**
	14-Jan-21	< 0.001	**0.008**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	**0.025**	**0.56**	< 0.001	**0.006**	< 0.0001	**0.004**	< 0.01	< 0.01	**0.018**
	16-Feb-21	< 0.001	**0.008**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	**0.018**	**0.59**	< 0.001	**0.008**	< 0.0001	**0.007**	< 0.01	< 0.01	**0.03**
	17-Mar-21	< 0.001	**0.01**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	< 0.001	**0.2**	< 0.001	**0.002**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.014**
	19-Aug-21	**0.001**	**0.009**	< 0.001	< 0.05	< 0.0001	**0.003**	< 0.001	< 0.001	**0.62**	< 0.001	**0.003**	< 0.0001	**0.004**	< 0.01	< 0.01	**0.047**
	22-Sep-21	< 0.001	**0.007**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	< 0.001	**0.72**	< 0.001	**0.003**	< 0.0001	**0.004**	< 0.01	< 0.01	**0.042**
	13-Oct-21	< 0.001	**0.007**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	< 0.001	**0.69**	< 0.001	**0.005**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.037**
	16-Nov-21	< 0.001	**0.005**	< 0.001	< 0.05	< 0.0001	**0.003**	< 0.001	< 0.001	**0.92**	< 0.001	**0.002**	< 0.0001	**0.004**	< 0.01	< 0.01	**0.036**
	15-Dec-21	< 0.001	-	-	-	-	-	-	-	**0.92**	-	**0.003**	-	-	-	-	-
	18-Jan-22	< 0.001	-	-	-	-	-	-	-	**1.06**	-	**0.003**	-	-	-	-	-
	24-Feb-22	< 0.001	**0.007**	< 0.001	< 0.05	< 0.0001	**0.003**	< 0.001	< 0.001	**1.25**	< 0.001	**0.003**	< 0.0001	**0.004**	< 0.01	< 0.01	**0.036**
	06-Mar-22	< 0.001	**0.004**	-	-	-	**0.002**	-	< 0.001	**1.27**	-	-	-	**0.002**	-	-	**0.028**
	17-Mar-22	< 0.001	-	-	-	-	-	-	-	**1.06**	-	**0.004**	-	-	-	-	-
	12-Apr-22	< 0.001	-	-	-	-	-	-	-	**1.06**	-	**0.004**	-	-	-	-	-
	17-Jun-22	< 0.001	-	-	-	-	-	-	-	**1.24**	-	**0.004**	-	-	-	-	-
	27-Jul-22	< 0.001	-	-	-	-	-	-	-	**1.03**	-	**0.004**	-	-	-	-	-
	16-Sep-22	< 0.001	-	-	-	-	-	-	-	**1.14**	-	**0.004**	-	-	-	-	-
	24-Oct-22	< 0.001	-	-	-	-	-	-	-	**1.14**	-	**0.003**	-	-	-	-	-
	18-Nov-22	< 0.001	**0.002**	-	-	-	**0.003**	< 0.001	< 0.001	**1.06**	-	**0.003**	-	**0.003**	-	-	**0.042**
	14-Dec-22	< 0.001	-	-	-	-	-	-	-	**0.96**	-	**0.003**	-	-	-	-	-
	17-Jan-23	< 0.001	-	-	-	-	-	-	-	**0.86**	-	**0.003**	-	-	-	-	-
	15-Feb-23	< 0.001	**0.002**	< 0.001	< 0.05	< 0.0001	**0.003**	< 0.001	**0.008**	**0.91**	< 0.001	**0.003**	< 0.0001	**0.005**	< 0.01	< 0.01	**0.076**
	15-Mar-23	< 0.001	-	-	-	-	-	-	-	**0.99**	-	**0.002**	-	-	-	-	-
	18-Apr-23	**0.001**	**0.001**	< 0.001	< 0.05	< 0.0001	**0.004**	< 0.001	< 0.001	**1.07**	< 0.001	**0.003**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.029**
	16-May-23	< 0.001	**0.002**	-	-	-	**0.003**	-	**0.001**	**1.04**	-	-	-	**0.003**	-	-	**0.065**
	14-Jun-23	< 0.001	-	-	-	-	-	-	-	**0.59**	-	**0.001**	-	-	-	-	-
	24-Jul-23	< 0.001	-	-	-	-	-	-	-	**0.86**	-	**0.002**	-	-	-	-	-
	14-Aug-23	< 0.001	**0.002**	-	-	-	**0.003**	-	**0.001**	**0.88**	-	**0.004**	-	**0.002**	-	-	**0.081**
	13-Sep-23	< 0.001	-	-	-	-	-	-	-	**0.78**	-	**0.002**	-	-	-	-	-
	23-Oct-23	< 0.001	-	-	-	-	-	-	-	**0.66**	-	**0.003**	-	-	-	-	-
	22-Nov-23	< 0.001	-	-	-	-	-	-	-	**0.55**	-	**0.004**	-	-	-	-	-
	19-Dec-23	< 0.001	**0.003**	-	-	-	**0.002**	-	< 0.001	**0.68**	-	**0.004**	-	**0.001**	-	-	**0.019**
BH12	16-Nov-20	< 0.001	-	-	-	< 0.0001	**0.002**	-	**0.002**	-	< 0.001	-	< 0.0001	**0.002**	-	-	**0.017**
	24-Feb-22	< 0.001	**0.004**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	< 0.001	**0.33**	< 0.001	**0.006**	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
BH12A	15-Feb-23	< 0.001	**0.002**	< 0.001	< 0.05	< 0.0001	**0.003**	< 0.001	**0.003**	**3.64**	< 0.001	**0.019**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.015**
	14-Aug-23	< 0.001	**0.006**	-	-	-	< 0.001	-	**0.001**	< 0.05	-	**0.006**	-	< 0.001	-	-	**0.025**
	19-Dec-23	< 0.001	**0.004**	-	-	-	**0.003**	-	**0.001**	**1.41**	-	**0.017**	-	< 0.001	-	-	**0.046**

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

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 4
Groundwater Analytical Results - PFAS
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte		Perfluoroalkyl Sulfonamides							Perfluoroalkyl Carboxylic Acids		Perfluoroalkyl Carboxylic Acids			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 aicd (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoate (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)
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
WSS - Groundwater		--	--	--	--	--	--	--	--	--	--	--	0.56	--	--	--	--	--
Sample Name	Sample Date																	
BH1	17-Mar-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	< 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	< 0.02	< 0.02
BH1A	15-Feb-23	< 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	< 0.02	< 0.02
	14-Aug-23	< 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	< 0.02	< 0.02
	19-Dec-23	< 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	< 0.02	< 0.02
BH2	22-Feb-19	< 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	< 0.02	< 0.02
	16-Sep-20	< 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	< 0.02	< 0.02
	16-Oct-20	< 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	< 0.02	< 0.02
	16-Nov-20	< 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	< 0.02	< 0.02
	16-Dec-20	< 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	< 0.02	< 0.02
	14-Jan-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	< 0.02	< 0.02
	16-Feb-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	< 0.02	< 0.02
	17-Mar-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	< 0.02	< 0.02
	19-Aug-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	< 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	< 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	< 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	< 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	< 0.02	< 0.02
	18-Nov-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	< 0.02	< 0.02
	15-Feb-23	< 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	< 0.02	< 0.02
	16-May-23	< 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	< 0.02	< 0.02
	14-Aug-23	< 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	< 0.02	< 0.02
	19-Dec-23	< 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	< 0.02	< 0.02
BH3	21-Feb-19	< 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	< 0.02	< 0.02
BH4	21-Feb-19	< 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	< 0.02	< 0.02
	15-Mar-19	< 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	< 0.02	< 0.02
	23-Apr-19	< 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	< 0.02	< 0.02
	16-May-19	< 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	< 0.02	< 0.02
	14-Jun-19	< 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	< 0.02	< 0.02
	16-Jul-19	< 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	< 0.02	< 0.02
	15-Aug-19	< 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	< 0.02	< 0.02
	16-Sep-19	< 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	< 0.02	< 0.02
	15-Oct-19	< 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	< 0.02	< 0.02
	18-Nov-19	< 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	< 0.02	< 0.02
	16-Sep-20	< 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	< 0.02	< 0.02
	16-Oct-20	< 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	< 0.02	< 0.02
	16-Nov-20	< 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	< 0.02	< 0.02
	16-Dec-20	< 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	< 0.02	< 0.02
	14-Jan-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	< 0.02	< 0.02
	16-Feb-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	< 0.02	< 0.02
	17-Mar-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	< 0.02	< 0.02
	19-Aug-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	< 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	< 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	< 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	< 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	< 0.02	< 0.02
	18-Nov-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	< 0.02	< 0.02
	15-Feb-23	< 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	< 0.02	< 0.02
	16-May-23	< 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	< 0.02	< 0.02
	14-Jun-23	< 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	< 0.02	< 0.02
	14-Aug-23	< 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	< 0.02	< 0.02
	19-Dec-23	< 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	< 0.02	< 0.02
BH5	22-Feb-19	< 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	< 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	< 0.02	< 0.02
	15-Feb-23	< 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	< 0.02	< 0.02
BH6	22-Feb-19	< 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	< 0.02	< 0.02
	14-Mar-19	< 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	< 0.02	< 0.02
	23-Apr-19	< 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	< 0.02	< 0.02
	16-May-19	< 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	< 0.02	< 0.02
	14-Jun-19	< 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	< 0.02	< 0.02
	16-Jul-19	< 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	< 0.02	< 0.02
	15-Aug-19	< 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	< 0.02	< 0.02
	16-Sep-19	< 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	< 0.02	< 0.02
	15-Oct-19	< 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	< 0.02	< 0.02
	18-Nov-19	< 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	< 0.02	< 0.02
	16-Sep-20	< 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	< 0.02	< 0.02
	16-Oct-20	< 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	< 0.02	< 0.02
	16-Nov-20	< 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	< 0.02	< 0.02
	16-Dec-20	< 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	< 0.02	< 0.02

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 4
Groundwater Analytical Results - PFAS
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte		Perfluoroalkyl Sulfonamides							Perfluoroalkyl Carboxylic Acids		Perfluoroalkyl Carboxylic Acids			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 aicd (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoate (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)
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
WSS - Groundwater		--	--	--	--	--	--	--	--	--	--	--	0.56	--	--	--	--	--
Sample Name	Sample Date																	
	14-Jan-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	< 0.02	< 0.02
	16-Feb-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	< 0.02	< 0.02
	17-Mar-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	< 0.02	< 0.02
	19-Aug-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	< 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	< 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	< 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	< 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	< 0.02	< 0.02
	18-Nov-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	< 0.02	< 0.02
	15-Feb-23	< 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	< 0.02	< 0.02
	16-May-23	< 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	< 0.02	< 0.02
	14-Aug-23	< 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	< 0.02	< 0.02
	19-Dec-23	< 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	< 0.02	< 0.02
	22-Feb-19	< 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	< 0.02	< 0.02
	14-Mar-19	< 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	< 0.02	< 0.02
	23-Apr-19	< 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	< 0.02	< 0.02
	16-May-19	< 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	< 0.02	< 0.02
	14-Jun-19	< 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	< 0.02	< 0.02
	16-Jul-19	< 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	< 0.02	< 0.02
	15-Aug-19	< 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	< 0.02	< 0.02
	16-Sep-19	< 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	< 0.02	< 0.02
	15-Oct-19	< 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	< 0.02	< 0.02
	18-Nov-19	< 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	< 0.02	< 0.02
	16-Sep-20	< 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	< 0.02	< 0.02
	16-Oct-20	< 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	< 0.02	< 0.02
	16-Nov-20	< 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	< 0.02	< 0.02
BH7	16-Dec-20	< 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	< 0.02	< 0.02
	14-Jan-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	< 0.02	< 0.02
	16-Feb-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	< 0.02	< 0.02
	17-Mar-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	< 0.02	< 0.02
	19-Aug-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	< 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	< 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	< 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	< 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	< 0.02	< 0.02
	18-Nov-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	< 0.02	< 0.02
	15-Feb-23	< 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	< 0.02	< 0.02
	16-May-23	< 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	< 0.02	< 0.02
	14-Aug-23	< 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	< 0.02	< 0.02
	19-Dec-23	< 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	< 0.02	< 0.02
	21-Feb-19	< 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	< 0.02	< 0.02
	14-Mar-19	< 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	< 0.02	< 0.02
	23-Apr-19	< 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	< 0.02	< 0.02
	16-May-19	< 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	< 0.02	< 0.02
	14-Jun-19	< 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	< 0.02	< 0.02
	16-Jul-19	< 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	< 0.02	< 0.02
	15-Aug-19	< 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	< 0.02	< 0.02
	16-Sep-19	< 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	< 0.02	< 0.02
	15-Oct-19	< 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	< 0.02	< 0.02
	18-Nov-19	< 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	< 0.02	< 0.02
	16-Sep-20	< 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	< 0.02	< 0.02
	16-Oct-20	< 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	< 0.02	< 0.02
	16-Nov-20	< 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	< 0.02	< 0.02
BH8	16-Dec-20	< 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	< 0.02	< 0.02
	14-Jan-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	< 0.02	< 0.02
	16-Feb-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	< 0.02	< 0.02
	17-Mar-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	< 0.02	< 0.02
	19-Aug-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	< 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	< 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	< 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	< 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	< 0.02	< 0.02
	18-Nov-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	< 0.02	< 0.02
	15-Feb-23	< 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	< 0.02	< 0.02
	16-May-23	< 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	< 0.02	< 0.02
	14-Aug-23	< 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	< 0.02	< 0.02
	19-Dec-23	< 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	< 0.02	< 0.02
	16-Oct-20	< 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	< 0.02	< 0.02
	16-Dec-20	< 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	< 0.02	< 0.02
	14-Jan-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	< 0.02	< 0.02

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 4
Groundwater Analytical Results - PFAS
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte		Perfluoroalkyl Sulfonamides							Perfluoroalkyl Carboxylic Acids		Perfluoroalkyl Carboxylic Acids			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 aicd (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoate (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)
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
WSS - Groundwater		--	--	--	--	--	--	--	--	--	--	--	0.56	--	--	--	--	--
Sample Name	Sample Date																	
BH9A	16-Feb-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	< 0.02	< 0.02
	17-Mar-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	< 0.02	< 0.02
	19-Aug-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	< 0.02	< 0.02
	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	< 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	< 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	< 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	< 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	< 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	< 0.02	< 0.02
	18-Nov-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	< 0.02	< 0.02
	15-Feb-23	< 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	< 0.02	< 0.02
	16-May-23	< 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	< 0.02	< 0.02
	14-Aug-23	< 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	< 0.02	< 0.02
	19-Dec-23	< 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	< 0.02	< 0.02
BH11	21-Feb-19	< 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	< 0.02	< 0.02
	16-Sep-20	< 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	< 0.02	< 0.02
	16-Oct-20	< 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	< 0.02	< 0.02
	16-Nov-20	< 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	< 0.02	< 0.02
	16-Dec-20	< 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	< 0.02	< 0.02
	14-Jan-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	< 0.02	< 0.02
	16-Feb-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	< 0.02	< 0.02
	17-Mar-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	< 0.02	< 0.02
	19-Aug-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	< 0.02	< 0.02
	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	< 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	< 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	< 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	< 0.02	< 0.02
	06-Mar-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	< 0.02	< 0.02
	18-Nov-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	< 0.02	< 0.02
	15-Feb-23	< 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	< 0.02	< 0.02
	16-May-23	< 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	< 0.02	< 0.02
	14-Aug-23	< 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	< 0.02	< 0.02
	19-Dec-23	< 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	< 0.02	< 0.02
BH12	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	< 0.02	< 0.02
BH12A	15-Feb-23	< 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	< 0.02	< 0.02
	14-Aug-23	< 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	< 0.02	< 0.02
	19-Dec-23	< 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	< 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

Criteria:
SWMP 2021 - Soil and Water Management Plan, July 2021

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 4
Groundwater Analytical Results - PFAS
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte				Perfluoroalkyl Sulfonic Acids		Perfluoroalkyl Sulfonic Acids						(n:2) Fluorotelomer Sulfonic Acids	Sum of PFAS		
		Perfluorotetradecanoic acid (PFTeDA)	Perfluorobutanesulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexanesulfonic acid (PFHxS)	Perfluoroheptane sulfonate (PFHpS)	Perfluorooctanesulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	4:2 Fluorotelomer Sulfonate (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 (WADER List)	Sum of PFAS
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
WSS - Groundwater		--	--	--	--	--	--	--	--	--	--	--	0.07	--	--
Sample Name	Sample Date														
BH1	17-Mar-21	< 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
	24-Feb-22	< 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
BH1A	15-Feb-23	< 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
	14-Aug-23	< 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
	19-Dec-23	< 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
BH2	22-Feb-19	< 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
	16-Sep-20	< 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
	16-Oct-20	< 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
	16-Nov-20	< 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
	16-Dec-20	< 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
	14-Jan-21	< 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
	16-Feb-21	< 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
	17-Mar-21	< 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
	19-Aug-21	< 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
	16-Nov-21	< 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
	24-Feb-22	< 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
	27-May-22	< 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
	12-Aug-22	< 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
	18-Nov-22	< 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
	15-Feb-23	< 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
	16-May-23	< 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
	14-Aug-23	< 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
	19-Dec-23	< 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
BH3	21-Feb-19	< 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
BH4	21-Feb-19	< 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
	15-Mar-19	< 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
	23-Apr-19	< 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
	16-May-19	< 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
	14-Jun-19	< 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
	16-Jul-19	< 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
	15-Aug-19	< 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
	16-Sep-19	< 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	**0.02**
	15-Oct-19	< 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
	18-Nov-19	< 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
	16-Sep-20	< 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
	16-Oct-20	< 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
	16-Nov-20	< 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
	16-Dec-20	< 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
	14-Jan-21	< 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
	16-Feb-21	< 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
	17-Mar-21	< 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
	19-Aug-21	< 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
	16-Nov-21	< 0.05	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01	< 0.02	< 0.05	**0.15**	< 0.05	< 0.05	< 0.01	**0.15**	**0.15**
	24-Feb-22	< 0.05	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01	< 0.02	< 0.05	**0.06**	< 0.05	< 0.05	< 0.01	**0.06**	**0.06**
	27-May-22	< 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
	12-Aug-22	< 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
	18-Nov-22	< 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
	15-Feb-23	< 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
	16-May-23	< 0.05	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01	< 0.02	< 0.05	**0.05**	< 0.05	< 0.05	< 0.01	**0.05**	**0.05**
	14-Jun-23	< 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
	14-Aug-23	< 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
	19-Dec-23	< 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
BH5	22-Feb-19	< 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
	24-Feb-22	< 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
	15-Feb-23	< 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
BH6	22-Feb-19	< 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
	14-Mar-19	< 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
	23-Apr-19	< 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
	16-May-19	< 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
	14-Jun-19	< 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
	16-Jul-19	< 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
	15-Aug-19	< 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
	16-Sep-19	< 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
	15-Oct-19	< 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
	18-Nov-19	< 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
	16-Sep-20	< 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
	16-Oct-20	< 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
	16-Nov-20	< 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
	16-Dec-20	< 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

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 4
Groundwater Analytical Results - PFAS
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte				Perfluoroalkyl Sulfonic Acids		Perfluoroalkyl Sulfonic Acids						(n:2) Fluorotelomer Sulfonic Acids	Sum of PFAS		
		Perfluorotetradecanoic acid (PFTeDA)	Perfluorobutanesulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexanesulfonic acid (PFHxS)	Perfluoroheptane sulfonate (PFHpS)	Perfluorooctanesulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	4:2 Fluorotelomer Sulfonate (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 (WADER List)	Sum of PFAS
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
WSS - Groundwater		--	--	--	--	--	--	--	--	--	--	--	0.07	--	--
Sample Name	Sample Date														
	14-Jan-21	< 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
	16-Feb-21	< 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
	17-Mar-21	< 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
	19-Aug-21	< 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
	16-Nov-21	< 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
	24-Feb-22	< 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
	27-May-22	< 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
	12-Aug-22	< 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
	18-Nov-22	< 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
	15-Feb-23	< 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
	16-May-23	< 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
	14-Aug-23	< 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
	19-Dec-23	< 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
	22-Feb-19	< 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
	14-Mar-19	< 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
	23-Apr-19	< 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
	16-May-19	< 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
	14-Jun-19	< 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
	16-Jul-19	< 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
	15-Aug-19	< 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
	16-Sep-19	< 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
	15-Oct-19	< 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
	18-Nov-19	< 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
	16-Sep-20	< 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
	16-Oct-20	< 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
	16-Nov-20	< 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
BH7	16-Dec-20	< 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
	14-Jan-21	< 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
	16-Feb-21	< 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
	17-Mar-21	< 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
	19-Aug-21	< 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
	16-Nov-21	< 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
	24-Feb-22	< 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
	27-May-22	< 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
	12-Aug-22	< 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
	18-Nov-22	< 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
	15-Feb-23	< 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
	16-May-23	< 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
	14-Aug-23	< 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
	19-Dec-23	< 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
	21-Feb-19	< 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
	14-Mar-19	< 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
	23-Apr-19	< 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
	16-May-19	< 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
	14-Jun-19	< 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
	16-Jul-19	< 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
	15-Aug-19	< 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
	16-Sep-19	< 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
	15-Oct-19	< 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
	18-Nov-19	< 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
	16-Sep-20	< 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
	16-Oct-20	< 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
	16-Nov-20	< 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
BH8	16-Dec-20	< 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
	14-Jan-21	< 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
	16-Feb-21	< 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
	17-Mar-21	< 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
	19-Aug-21	< 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
	16-Nov-21	< 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
	24-Feb-22	< 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
	27-May-22	< 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
	12-Aug-22	< 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
	18-Nov-22	< 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
	15-Feb-23	< 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
	16-May-23	< 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
	14-Aug-23	< 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
	19-Dec-23	< 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
	16-Oct-20	< 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
	16-Dec-20	< 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
	14-Jan-21	< 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

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 4
Groundwater Analytical Results - PFAS
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte				Perfluoroalkyl Sulfonic Acids		Perfluoroalkyl Sulfonic Acids						(n:2) Fluorotelomer Sulfonic Acids	Sum of PFAS		
		Perfluorotetradecanoic acid (PFTeDA)	Perfluorobutanesulfonic acid (PFBS)	Perfluoropentanesulfonic acid (PFPeS)	Perfluorohexanesulfonic acid (PFHxS)	Perfluoroheptanesulfonate (PFHpS)	Perfluorooctanesulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	4:2 Fluorotelomer Sulfonate (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 (WADER List)	Sum of PFAS
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
WSS - Groundwater		--	--	--	--	--	--	--	--	--	--	--	0.07	--	--
Sample Name	Sample Date														
BH9A	16-Feb-21	< 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
	17-Mar-21	< 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
	19-Aug-21	< 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
	22-Sep-21	< 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
	13-Oct-21	< 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
	16-Nov-21	< 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
	24-Feb-22	< 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
	27-May-22	< 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
	12-Aug-22	< 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
	18-Nov-22	< 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
	15-Feb-23	< 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
	16-May-23	< 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
	14-Aug-23	< 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
	19-Dec-23	< 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
BH11	21-Feb-19	< 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
	16-Sep-20	< 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
	16-Oct-20	< 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
	16-Nov-20	< 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
	16-Dec-20	< 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
	14-Jan-21	< 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
	16-Feb-21	< 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
	17-Mar-21	< 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
	19-Aug-21	< 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
	22-Sep-21	< 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
	13-Oct-21	< 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
	16-Nov-21	< 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
	24-Feb-22	< 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
	06-Mar-22	< 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
	18-Nov-22	< 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
	15-Feb-23	< 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
	16-May-23	< 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
	14-Aug-23	< 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
	19-Dec-23	< 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
BH12	24-Feb-22	< 0.05	< 0.02	< 0.02	< 0.01	< 0.02	< 0.01	< 0.02	< 0.05	**0.07**	< 0.05	< 0.05	< 0.01	**0.07**	**0.07**
BH12A	15-Feb-23	< 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
	14-Aug-23	< 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
	19-Dec-23	< 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

Notes:
- - Not analysed
< - Less than laboratory limit of reporting
µg/L - Micrograms per litre
Bold indicates a detection above the labc

Criteria:
SWMP 2021 - Soil and Water Managemen

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 5
Surface Water Analytical Results - Hydrocarbons
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte		BTEXN								Total Petroleum Hydrocarbons					Total Petroleum Hydrocarbons - Silica		
		Benzene	Toluene	Ethylbenzene	meta- & para-Xylene	ortho-Xylene	Total Xylenes	Naphthalene	Sum of BTEX	C_6 - C_9	C_{10} - C_{14}	C_{15} - C_{28}	C_{29} - C_{36}	C_{10} - C_{36} sum	C_{10}-C_{14} - Silica Cleanup	C_{15}-C_{28} - Silica Cleanup	C_{29}-C_{36} - 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
WSS - Surface Water		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sample Name	Sample Date																
SW1	23-Apr-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-
	16-May-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-
	14-Jun-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	16-Jul-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	15-Aug-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-
	16-Sep-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	15-Oct-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	18-Nov-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	16-Sep-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	16-Oct-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	16-Nov-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	16-Dec-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	14-Jan-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	16-Feb-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	17-Mar-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	19-Aug-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	16-Nov-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	24-Feb-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	27-May-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	12-Aug-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	18-Nov-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	15-Feb-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	16-May-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	14-Aug-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	19-Dec-23	< 1.0	**4.0**	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	**4.0**	< 20	-	-	-	-	< 50	< 100	< 50
SW2	17-Mar-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	19-Aug-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	22-Sep-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	13-Oct-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	16-Nov-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	24-Feb-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	27-May-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	12-Aug-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	18-Nov-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	15-Feb-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	16-May-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	14-Aug-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
SW3	22-Feb-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	14-Mar-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	23-Apr-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-
	16-May-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-
	14-Jun-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	16-Jul-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	15-Aug-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-
	16-Sep-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	15-Oct-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	18-Nov-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	16-Sep-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	16-Oct-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	16-Nov-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	16-Dec-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	14-Jan-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	16-Feb-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	17-Mar-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	19-Aug-21	< 1.0	**2.0**	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	**2.0**	< 20	-	-	-	-	< 50	< 100	< 50
	16-Nov-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	24-Feb-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	27-May-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	12-Aug-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	18-Nov-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	15-Feb-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 5
Surface Water Analytical Results - Hydrocarbons
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte		BTEXN								Total Petroleum Hydrocarbons					Total Petroleum Hydrocarbons - Silica		
		Benzene	Toluene	Ethylbenzene	meta- & para-Xylene	ortho-Xylene	Total Xylenes	Naphthalene	Sum of BTEX	C_6 - C_9	C_{10} - C_{14}	C_{15} - C_{28}	C_{29} - C_{36}	C_{10} - C_{36} sum	C_{10}-C_{14} - Silica Cleanup	C_{15}-C_{28} - Silica Cleanup	C_{29}-C_{36} - 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
WSS - Surface Water		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sample Name	Sample Date																
	16-May-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	14-Aug-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	19-Dec-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
SW4	23-Apr-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-
	16-May-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-
	14-Jun-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	16-Jul-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	15-Aug-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	< 50	< 100	< 50	< 50	-	-	-
	16-Sep-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	15-Oct-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	18-Nov-19	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	16-Sep-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	16-Oct-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	16-Nov-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	16-Dec-20	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	14-Jan-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	16-Feb-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	17-Mar-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	19-Aug-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	16-Nov-21	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	24-Feb-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	27-May-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	12-Aug-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	18-Nov-22	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	15-Feb-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	16-May-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	14-Aug-23	< 1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	< 1.0	< 20	-	-	-	-	< 50	< 100	< 50
	19-Dec-23	< 1.0	**6.0**	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	**6.0**	< 20	-	-	-	-	< 50	< 100	< 50

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

Criteria:
SWMP 2021 - Soil and Water Management Plan, July 2021

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 5
Surface Water Analytical Results - Hydrocarbons
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte		Clean-up	Total Recoverable Hydrocarbons							Total Recoverable Hydrocarbons - Silica Clean-up				
		C_{10}-C_{36} Sum - Silica Cleanup	C_6 - C_{10}	C_6 - C_{10} minus BTEX (F1)	$>C_{10}$ - C_{16}	$>C_{10}$ - C_{16} minus Naphthalene (F2)	$>C_{16}$ - C_{34}	$>C_{34}$ - C_{40}	$>C_{10}$ - C_{40} (sum)	$>C_{10}$-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
WSS - Surface Water		--	20	20	100	--	100	100	--	--	--	--	--	--
Sample Name	Sample Date													
SW1	23-Apr-19	-	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	16-May-19	-	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	14-Jun-19	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Jul-19	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Aug-19	-	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	16-Sep-19	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Oct-19	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	18-Nov-19	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Sep-20	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Oct-20	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Nov-20	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Dec-20	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Jan-21	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Feb-21	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	17-Mar-21	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	19-Aug-21	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Nov-21	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	24-Feb-22	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	27-May-22	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	12-Aug-22	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	18-Nov-22	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Feb-23	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-May-23	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Aug-23	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	19-Dec-23	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
SW2	17-Mar-21	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	19-Aug-21	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	22-Sep-21	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	13-Oct-21	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Nov-21	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	24-Feb-22	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	27-May-22	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	12-Aug-22	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	18-Nov-22	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Feb-23	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-May-23	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Aug-23	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
SW3	22-Feb-19	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Mar-19	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	23-Apr-19	-	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	16-May-19	-	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	14-Jun-19	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Jul-19	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Aug-19	-	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	16-Sep-19	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Oct-19	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	18-Nov-19	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Sep-20	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Oct-20	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Nov-20	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Dec-20	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Jan-21	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Feb-21	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	17-Mar-21	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	19-Aug-21	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Nov-21	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	24-Feb-22	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	27-May-22	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	12-Aug-22	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	18-Nov-22	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Feb-23	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100

Table 5
Surface Water Analytical Results - Hydrocarbons
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte		Clean-up	Total Recoverable Hydrocarbons							Total Recoverable Hydrocarbons - Silica Clean-up				
		C_{10}-C_{36} Sum - Silica Cleanup	C_6 - C_{10}	C_6 - C_{10} minus BTEX (F1)	$>C_{10}$ - C_{16}	$>C_{10}$ - C_{16} minus Naphthalene (F2)	$>C_{16}$ - C_{34}	$>C_{34}$ - C_{40}	$>C_{10}$ - C_{40} (sum)	$>C_{10}$-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
WSS - Surface Water		--	20	20	100	--	100	100	--	--	--	--	--	--
Sample Name	Sample Date													
	16-May-23	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Aug-23	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	19-Dec-23	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
SW4	23-Apr-19	-	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	16-May-19	-	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	14-Jun-19	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Jul-19	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Aug-19	-	< 20	< 20	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	16-Sep-19	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Oct-19	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	18-Nov-19	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Sep-20	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Oct-20	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Nov-20	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Dec-20	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Jan-21	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Feb-21	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	17-Mar-21	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	19-Aug-21	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-Nov-21	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	24-Feb-22	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	27-May-22	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	12-Aug-22	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	18-Nov-22	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	15-Feb-23	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	16-May-23	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	14-Aug-23	< 50	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
	19-Dec-23	< 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,
Bold indicates a detection above the labc

Criteria:
SWMP 2021 - Soil and Water Managemen

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 6
Surface Water Analytical Results - Anions, Cations, and Inorganics
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte		Anions and Cations																	Anions and Cations		
		Sodium	Calcium	Magnesium	Potassium	Sulphate	Chloride	Fluoride	Phosphorus	Reactive phosphorus as P	Total Phosphorus	Nitrite	Nitrite as N	Nitrate	Nitrate as N	Nitrite + Nitrate as N	Ammonia as N	Total Ammonia as Nitrogen	Total Nitrogen as N	Total Kjeldahl Nitrogen as N	Total Cations
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	mg/L	mg/L	meq/L
WSS - Surface Water		142	40	52	8.0	324	234	0.8	--	--	0.17	--	--	--	--	--	--	0.2	5.9	--	--
Sample Name	Sample Date																				
SW1	23-Apr-19	**94**	**34**	**52**	**6.0**	**310**	**95**	**0.5**	-	-	-	-	-	-	-	-	-	-	-	-	**10**
	16-May-19	**86**	**24**	**42**	**6.0**	**324**	**112**	**0.3**	-	< 0.01	**0.13**	-	< 0.01	-	< 0.01	< 0.01	< 0.01	-	**1.8**	**1.8**	**8.94**
	14-Jun-19	**77**	**20**	**34**	**5.0**	**182**	**112**	**0.4**	-	-	-	-	-	-	-	-	-	-	-	-	**7.27**
	16-Jul-19	**90**	**20**	**35**	**4.0**	**240**	**130**	**0.4**	-	-	-	-	-	-	-	-	-	-	-	-	**7.9**
	15-Aug-19	**97**	**18**	**32**	**4.0**	**212**	**134**	**0.4**	-	-	-	-	-	-	-	-	-	-	-	-	**7.85**
	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**
	15-Oct-19	**124**	**16**	**31**	**3.0**	**127**	**191**	**0.6**	-	-	-	-	-	-	-	-	-	-	-	-	**8.82**
	18-Nov-19	**142**	**14**	**30**	**4.0**	**165**	**234**	**0.5**	**0.02**	< 0.01	-	-	< 0.01	< 0.01	-	< 0.01	-	**0.03**	**1.1**	**1.1**	**9.45**
	16-Sep-20	**9.0**	**16**	**3.0**	**3.0**	< 1.0	< 1.0	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	**1.51**
	16-Oct-20	**12**	**40**	**4.0**	**4.0**	< 1.0	**16**	**0.2**	-	-	-	-	-	-	-	-	-	-	-	-	**2.95**
	16-Nov-20	**8.0**	**13**	**2.0**	**3.0**	< 1.0	**10**	< 0.1	-	< 0.01	**0.03**	-	< 0.01	-	**0.04**	**0.04**	-	< 0.01	**0.6**	**0.6**	**1.24**
	16-Dec-20	**10**	**19**	**2.0**	**3.0**	**5.0**	**12**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	**1.62**
	14-Jan-21	**10**	**18**	**2.0**	**3.0**	< 1.0	**13**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	**1.57**
	16-Feb-21	**10**	**15**	**2.0**	**3.0**	< 1.0	**12**	**0.1**	-	< 0.01	**0.02**	-	< 0.01	-	< 0.01	< 0.01	-	< 0.01	**0.5**	**0.5**	**1.42**
	17-Mar-21	**10**	**15**	**2.0**	**2.0**	< 1.0	**13**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	**1.4**
	19-Aug-21	-	-	**3.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	13-Oct-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	16-Nov-21	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	24-Feb-22	**6.0**	**9.0**	**2.0**	**2.0**	< 1.0	**10**	< 0.1	-	-	**0.11**	< 0.01	-	< 0.01	-	< 0.01	**0.02**	-	**1.0**	**1.0**	**0.92**
	27-May-22	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12-Aug-22	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	18-Nov-22	-	-	**1.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	15-Feb-23	**15**	**10**	**2.0**	< 1.0	**6.0**	**22**	**0.1**	-	**0.06**	**0.06**	-	< 0.01	-	< 0.01	< 0.01	-	**0.03**	**1.1**	**1.1**	**1.32**
	16-May-23	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	14-Aug-23	-	-	**1.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	19-Dec-23	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SW2	17-Mar-21	**12**	**2.0**	**2.0**	< 1.0	**6.0**	**16**	**0.2**	-	-	-	-	-	-	-	-	-	-	-	-	**0.79**
	19-Aug-21	**12**	< 1.0	**1.0**	< 1.0	**6.0**	**22**	< 0.1	-	< 0.01	**0.07**	-	< 0.01	-	< 0.01	< 0.01	-	**0.17**	**1.2**	**1.2**	**0.6**
	22-Sep-21	**14**	**2.0**	**2.0**	**2.0**	**16**	**30**	**0.1**	-	< 0.01	**0.08**	-	< 0.01	-	**1.77**	**1.77**	-	< 0.01	**3.0**	**1.2**	**0.92**
	13-Oct-21	**10**	< 1.0	**1.0**	< 1.0	**6.0**	**18**	< 0.1	-	< 0.01	**0.03**	-	< 0.01	-	**0.02**	**0.02**	-	< 0.01	**0.6**	**0.6**	**0.52**
	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	-	< 0.01	**1.8**	**1.8**	**0.7**
	24-Feb-22	**10**	**1.0**	**1.0**	< 1.0	**2.0**	**21**	**0.1**	-	-	**0.63**	< 0.01	-	< 0.01	-	< 0.01	**0.31**	-	**7.5**	**7.5**	**0.57**
	17-Mar-22	-	-	-	-	-	-	-	-	-	< 0.01	-	-	-	-	**0.04**	-	**0.13**	**0.4**	**0.4**	-
	27-May-22	-	-	< 1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12-Aug-22	-	-	**1.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	18-Nov-22	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	15-Feb-23	**14**	**2.0**	**3.0**	< 1.0	**6.0**	**36**	**0.4**	-	< 0.01	**0.16**	-	< 0.01	-	< 0.01	< 0.01	-	**0.05**	**5.4**	**5.4**	**0.96**
	16-May-23	-	-	**3.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	14-Aug-23	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SW3	22-Feb-19	**40**	**4.0**	**4.0**	**1.0**	**16**	**82**	< 0.1	-	< 0.01	**0.06**	-	< 0.01	-	< 0.01	< 0.01	**0.16**	-	**1.0**	**1.0**	**2.55**
	14-Mar-19	**45**	**6.0**	**6.0**	**2.0**	**44**	**64**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**2.8**
	23-Apr-19	**37**	**8.0**	**6.0**	**1.0**	**42**	**53**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**2.53**
	16-May-19	**35**	**7.0**	**5.0**	< 1.0	**34**	**54**	< 0.1	-	< 0.01	< 0.01	-	< 0.01	-	< 0.01	< 0.01	< 0.01	-	**0.1**	**0.1**	**2.28**
	14-Jun-19	**32**	**7.0**	**6.0**	< 1.0	**41**	**55**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**2.24**
	16-Jul-19	**46**	**8.0**	**12**	< 1.0	**104**	**57**	**0.2**	-	-	-	-	-	-	-	-	-	-	-	-	**3.39**
	15-Aug-19	**38**	**6.0**	**7.0**	< 1.0	**54**	**56**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	**2.53**
	16-Sep-19	**42**	**7.0**	**8.0**	< 1.0	**48**	**57**	**0.1**	-	< 0.01	< 0.01	-	< 0.01	-	< 0.01	< 0.01	**0.01**	-	**0.1**	**0.1**	**2.83**
	15-Oct-19	**40**	**5.0**	**7.0**	< 1.0	**42**	**57**	**0.2**	-	-	-	-	-	-	-	-	-	-	-	-	**2.56**
	18-Nov-19	**36**	**5.0**	**5.0**	< 1.0	**29**	**56**	< 0.1	**0.04**	< 0.01	-	-	< 0.01	**0.01**	-	**0.01**	-	**0.03**	**0.6**	**0.6**	**2.23**
	16-Sep-20	**39**	**3.0**	**8.0**	< 1.0	**65**	**55**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	**3.12**
	16-Oct-20	**40**	**4.0**	**6.0**	< 1.0	**40**	**63**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**2.73**
	16-Nov-20	**34**	**2.0**	**5.0**	< 1.0	**67**	**53**	< 0.1	-	< 0.01	< 0.01	-	< 0.01	-	< 0.01	< 0.01	-	< 0.01	**0.3**	**0.3**	**2.6**
	16-Dec-20	**36**	**1.0**	**5.0**	**1.0**	**27**	**61**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**2.05**
	14-Jan-21	**27**	< 1.0	**2.0**	< 1.0	**26**	**54**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.82**
	16-Feb-21	**30**	**2.0**	**3.0**	< 1.0	**21**	**56**	< 0.1	-	< 0.01	< 0.01	-	< 0.01	-	< 0.01	< 0.01	-	< 0.01	**0.5**	**0.5**	**1.65**
	17-Mar-21	**29**	< 1.0	**2.0**	< 1.0	**15**	**51**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**1.43**
	19-Aug-21	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	16-Nov-21	-	-	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	24-Feb-22	**27**	< 1.0	**2.0**	< 1.0	**8.0**	**53**	< 0.1	-	-	**0.03**	< 0.01	-	< 0.01	-	< 0.01	**0.02**	-	**0.9**	**0.9**	**1.34**
	27-May-22	-	-	**3.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12-Aug-22	-	-	**3.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	18-Nov-22	-	-	**3.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	15-Feb-23	**33**	< 1.0	**2.0**	**1.0**	**20**	**76**	< 0.1	-	< 0.01	< 0.01	-	**0.02**	-	< 0.01	**0.02**	-	**0.21**	**2.8**	**2.8**	**2.13**
	16-May-23	-	-	**3.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	14-Aug-23	-	-	**3.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	19-Dec-23	-	-	**3.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	23-Apr-19	**39**	**5.0**	**5.0**	< 1.0	**60**	**64**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	**2.36**
	16-May-19	**41**	**5.0**	**5.0**	< 1.0	**41**	**59**	< 0.1	-	**0.01**	< 0.01	-	< 0.01	-	**0.05**	**0.05**	< 0.01	-	**0.2**	**0.2**	**2.44**
	14-Jun-19	**40**	**5.0**	**5.0**	< 1.0	**39**	**60**	< 0.1	-	-	-	-	-	-	-	-	-	-	-	-	**2.4**
	16-Jul-19	**46**	**7.0**	**7.0**	< 1.0	**67**	**56**	**0.2**	-	-	-	-	-	-	-	-	-	-	-	-	**2.93**
	15-Aug-19	**40**	**5.0**	**5.0**	< 1.0	**43**	**55**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	**2.4**
	16-Sep-19	**45**	**7.0**	**6.0**	< 1.0	**45**	**58**	**0.1**	-	< 0.01	**0.01**	-	< 0.01	-	< 0.01	< 0.01	< 0.01	-	**0.1**	**0.1**	**2.8**
	15-Oct-19	**44**	**6.0**	**6.0**	< 1.0	**38**	**57**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	**2.71**
	18-Nov-19	**41**	**4.0**	**5.0**	< 1.0	**41**	**64**	**0.2**	< 0.01	< 0.01	-	-	< 0.01	**0.02**	-	**0.02**	-	< 0.01	**0.2**	**0.2**	**2.76**
	16-Sep-20	**45**	**6.0**	**7.0**	< 1.0	**58**	**59**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	**2.83**
	16-Oct-20	**43**	**5.0**	**5.0**	< 1.0	**40**	**67**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	**2.53**
	16-Nov-20	**37**	**8.0**	**6.0**	**2.0**	**42**	**54**	**0.2**	-	< 0.01	< 0.01	-	< 0.01	-	< 0.01	< 0.01	-	< 0.01	**0.1**	**0.1**	**2.55**
	16-Dec-20	**43**	**4.0**	**4.0**	**2.0**	**24**	**70**	**0.2**	-	-	-	-	-	-	-	-	-	-	-	-	**2.45**

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 6
Surface Water Analytical Results - Anions, Cations, and Inorganics
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte		Anions and Cations																Anions and Cations			
		Sodium	Calcium	Magnesium	Potassium	Sulphate	Chloride	Fluoride	Phosphorus	Reactive phosphorus as P	Total Phosphorus	Nitrite	Nitrite as N	Nitrate	Nitrate as N	Nitrite + Nitrate as N	Ammonia as N	Total Ammonia as Nitrogen	Total Nitrogen as N	Total Kjeldahl Nitrogen as N	Total Cations
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	mg/L	mg/L	meq/L
WSS - Surface Water		142	40	52	8.0	324	234	0.8	--	--	0.17	--	--	--	--	--	--	0.2	5.9	--	--
Sample Name	Sample Date																				
SW4	14-Jan-21	**36**	**16**	**4.0**	**2.0**	**15**	**58**	**0.8**	-	-	-	-	-	-	-	-	-	-	-	-	**2.74**
	16-Feb-21	**37**	**6.0**	**4.0**	**2.0**	**14**	**61**	**0.3**	-	< 0.01	**0.03**	-	< 0.01	-	< 0.01	< 0.01	-	**0.02**	**1.2**	**1.2**	**2.29**
	17-Mar-21	**36**	**10**	**4.0**	**2.0**	**10**	**54**	**0.4**	-	-	-	-	-	-	-	-	-	-	-	-	**2.44**
	19-Aug-21	-	-	**4.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	13-Oct-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	16-Nov-21	-	-	**4.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	24-Feb-22	**35**	**3.0**	**4.0**	< 1.0	**27**	**63**	< 0.1	-	-	< 0.01	< 0.01	-	< 0.01	-	< 0.01	< 0.01	-	**0.3**	**0.3**	**2.0**
	27-May-22	-	-	**4.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12-Aug-22	-	-	**3.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	18-Nov-22	-	-	**3.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	15-Feb-23	**34**	**1.0**	**3.0**	< 1.0	**9.0**	**63**	< 0.1	-	< 0.01	**0.02**	-	< 0.01	-	< 0.01	< 0.01	-	**0.04**	**0.7**	**0.7**	**1.78**
	16-May-23	-	-	**4.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	14-Aug-23	-	-	**4.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	19-Dec-23	-	-	**3.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 6
Surface Water Analytical Results - Anions, Cations, and Inorganics
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte				Anions and Cations		Alkalinity								Inorganics				
		Total Anions	Ionic Balance	Sodium Adsorption Ratio	Sodium Adsorption Ratio	Bicarbonate	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Hydroxide Alkalinity as CaCO3	Total Alkalinity as CaCO3	Total Hardness as CaCO3	Hardness	Electrical Conductivity @ 25°C	Total Dissolved Solids	Total suspended solids	pH	Turbidity	Phosphate Total (as P)
Units		meq/L	%		-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	pH units	NTU	mg/L
WSS - Surface Water		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sample Name	Sample Date																	
SW1	23-Apr-19	**9.13**	**5.6**	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**299**	-	**893**	**580**	**32**	**4.01**	-	-
	16-May-19	**9.9**	**5.13**	-	**2.45**	-	< 1.0	< 1.0	< 1.0	< 1.0	**233**	-	**947**	**616**	**59**	**4.6**	-	-
	14-Jun-19	**6.95**	**2.28**	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**190**	-	**847**	**550**	**26**	**4.5**	-	-
	16-Jul-19	**8.66**	**4.64**	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**194**	-	**876**	**569**	**17**	**4.42**	-	-
	15-Aug-19	**8.19**	**2.12**	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**177**	-	**813**	**528**	**5.0**	**4.53**	-	-
	16-Sep-19	**11**	**5.38**	-	**3.49**	-	< 1.0	< 1.0	< 1.0	< 1.0	**213**	-	**1,080**	**702**	**15**	**4.32**	-	-
	15-Oct-19	**8.03**	**4.68**	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**168**	-	**1,050**	**682**	-	**5.32**	-	-
	18-Nov-19	**10**	**3.03**	-	**4.91**	-	< 1.0	< 1.0	< 1.0	< 1.0	**158**	-	**1,090**	**708**	-	**5.06**	-	-
	16-Sep-20	**1.1**	-	-	-	-	**55**	< 1.0	< 1.0	**55**	**52**	-	**137**	**152**	**8.0**	**6.5**	-	-
	16-Oct-20	**2.69**	-	-	-	-	**112**	< 1.0	< 1.0	**112**	**116**	-	**268**	**174**	-	**7.29**	-	-
	16-Nov-20	**1.12**	-	-	**0.54**	-	**42**	< 1.0	< 1.0	**42**	**41**	-	**127**	**82**	< 5.0	**6.5**	-	-
	16-Dec-20	**1.68**	-	-	-	-	**62**	< 1.0	< 1.0	**62**	**56**	-	**171**	**111**	-	**7.01**	-	-
	14-Jan-21	**1.46**	-	-	-	-	**55**	< 1.0	< 1.0	**55**	**53**	-	**154**	**100**	-	**6.71**	-	-
	16-Feb-21	**1.36**	-	-	**0.64**	-	**51**	< 1.0	< 1.0	**51**	**46**	-	**141**	**92**	**6.0**	**6.93**	-	-
	17-Mar-21	**1.26**	-	-	-	-	**45**	< 1.0	< 1.0	**45**	**46**	-	**139**	**90**	-	**6.63**	-	-
	19-Aug-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	13-Oct-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**6.82**	**3.3**	-
	16-Nov-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	24-Feb-22	**0.8**	-	-	-	**26**	-	< 1.0	< 1.0	**26**	**31**	-	**89**	**58**	-	**6.38**	-	< 0.01
	27-May-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12-Aug-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	18-Nov-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	15-Feb-23	**1.36**	-	-	**1.13**	-	**31**	< 1.0	< 1.0	**31**	**33**	-	**141**	**92**	-	**6.59**	-	-
	16-May-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	14-Aug-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	19-Dec-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SW2	17-Mar-21	**0.58**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**13**	-	**83**	**54**	-	**5.08**	-	-
	19-Aug-21	**0.74**	-	-	**2.25**	-	< 1.0	< 1.0	< 1.0	< 1.0	**4.0**	-	**103**	**67**	-	**4.21**	-	-
	22-Sep-21	**1.18**	-	-	**1.67**	-	< 1.0	< 1.0	< 1.0	< 1.0	**13**	-	**235**	**153**	-	**3.55**	-	-
	13-Oct-21	**0.63**	-	-	**1.88**	-	< 1.0	< 1.0	< 1.0	< 1.0	**4.0**	-	**77**	**50**	-	**4.58**	**4.7**	-
	16-Nov-21	**0.6**	-	-	**1.2**	-	< 1.0	< 1.0	< 1.0	< 1.0	-	**13**	**93**	**60**	-	**4.39**	-	-
	24-Feb-22	**0.63**	-	-	-	< 1.0	-	< 1.0	< 1.0	< 1.0	**7.0**	-	**97**	**63**	-	**4.32**	-	< 0.01
	17-Mar-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	27-May-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12-Aug-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	18-Nov-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	15-Feb-23	**1.14**	-	-	**1.46**	-	< 1.0	< 1.0	< 1.0	< 1.0	**17**	-	**150**	**98**	-	**4.2**	-	-
	16-May-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	14-Aug-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SW3	22-Feb-19	**2.87**	-	-	**3.38**	-	**11**	< 1.0	< 1.0	**11**	**26**	-	**262**	**170**	**58**	**6.21**	-	-
	14-Mar-19	**2.8**	-	-	-	-	**4.0**	< 1.0	< 1.0	**4.0**	**40**	-	**344**	**224**	**34**	**5.42**	-	-
	23-Apr-19	**2.37**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**45**	-	**220**	**143**	**9.0**	**5.2**	-	-
	16-May-19	**2.25**	-	-	**2.47**	-	**1.0**	< 1.0	< 1.0	**1.0**	**38**	-	**271**	**176**	**14**	**5.24**	-	-
	14-Jun-19	**2.4**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**42**	-	**300**	**195**	**12**	**4.58**	-	-
	16-Jul-19	**3.77**	**5.38**	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**69**	-	**451**	**293**	**7.0**	**4.47**	-	-
	15-Aug-19	**2.7**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**44**	-	**338**	**220**	< 5.0	**4.47**	-	-
	16-Sep-19	**2.61**	-	-	**2.57**	-	< 1.0	< 1.0	< 1.0	< 1.0	**50**	-	**374**	**243**	**7.0**	**4.3**	-	-
	15-Oct-19	**2.48**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**41**	-	**383**	**249**	-	**4.75**	-	-
	18-Nov-19	**2.18**	-	-	**2.72**	-	< 1.0	< 1.0	< 1.0	< 1.0	**33**	-	**278**	**181**	-	**5.39**	-	-
	16-Sep-20	**2.9**	**3.5**	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**40**	-	**402**	**224**	**6.0**	**4.41**	-	-
	16-Oct-20	**2.61**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**35**	-	**333**	**216**	-	**4.15**	-	-
	16-Nov-20	**2.89**	-	-	**2.92**	-	< 1.0	< 1.0	< 1.0	< 1.0	**26**	-	**460**	**299**	< 5.0	**3.95**	-	-
	16-Dec-20	**2.3**	-	-	-	-	**1.0**	< 1.0	< 1.0	**1.0**	**23**	-	**303**	**197**	-	**4.8**	-	-
	14-Jan-21	**2.06**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**8.0**	-	**301**	**196**	-	**4.06**	-	-
	16-Feb-21	**2.02**	-	-	**3.13**	-	< 1.0	< 1.0	< 1.0	< 1.0	**17**	-	**273**	**177**	< 5.0	**4.15**	-	-
	17-Mar-21	**1.75**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**8.0**	-	**237**	**154**	-	**4.65**	-	-
	19-Aug-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	16-Nov-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	24-Feb-22	**1.7**	-	-	-	**2.0**	-	< 1.0	< 1.0	**2.0**	**8.0**	-	**183**	**119**	-	**4.59**	-	< 0.01
	27-May-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12-Aug-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	18-Nov-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	15-Feb-23	**2.56**	-	-	**4.66**	-	< 1.0	< 1.0	< 1.0	< 1.0	**8.0**	-	**247**	**160**	-	**4.08**	-	-
	16-May-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	14-Aug-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	19-Dec-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	23-Apr-19	**3.05**	**13**	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**33**	-	**293**	**190**	< 5.0	**4.0**	-	-
	16-May-19	**2.52**	-	-	**3.1**	-	< 1.0	< 1.0	< 1.0	< 1.0	**33**	-	**331**	**215**	**13**	**4.08**	-	-
	14-Jun-19	**2.5**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**33**	-	**316**	**205**	< 5.0	**4.31**	-	-
	16-Jul-19	**2.97**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**46**	-	**367**	**238**	**6.0**	**4.46**	-	-
	15-Aug-19	**2.45**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**33**	-	**308**	**200**	< 5.0	**4.48**	-	-
	16-Sep-19	**2.57**	-	-	**3.01**	-	< 1.0	< 1.0	< 1.0	< 1.0	**42**	-	**360**	**234**	< 5.0	**4.35**	-	-
	15-Oct-19	**2.4**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**40**	-	**365**	**237**	-	**4.48**	-	-
	18-Nov-19	**2.66**	-	-	**3.22**	-	< 1.0	< 1.0	< 1.0	< 1.0	**30**	-	**348**	**226**	-	**4.48**	-	-
	16-Sep-20	**2.87**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**44**	-	**421**	**228**	< 5.0	**4.16**	-	-
	16-Oct-20	**2.72**	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	**33**	-	**355**	**231**	-	**3.94**	-	-
	16-Nov-20	**2.4**	-	-	**2.41**	-	< 1.0	< 1.0	< 1.0	< 1.0	**45**	-	**338**	**220**	**6.0**	**4.21**	-	-
	16-Dec-20	**2.79**	-	-	-	-	**16**	< 1.0	< 1.0	**16**	**26**	-	**323**	**210**	-	**6.15**	-	-

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 6
Surface Water Analytical Results - Anions, Cations, and Inorganics
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte				Anions and Cations		Alkalinity								Inorganics				
		Total Anions	Ionic Balance	Sodium Adsorption Ratio	Sodium Adsorption Ratio	Bicarbonate	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Hydroxide Alkalinity as CaCO3	Total Alkalinity as CaCO3	Total Hardness as CaCO3	Hardness	Electrical Conductivity @ 25°C	Total Dissolved Solids	Total suspended solids	pH	Turbidity	Phosphate Total (as P)
Units		meq/L	%		-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	pH units	NTU	mg/L
WSS - Surface Water		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sample Name	Sample Date																	
SW4	14-Jan-21	**2.69**	-	-	-	-	**37**	< 1.0	< 1.0	**37**	**56**	-	**316**	**205**	-	**6.38**	-	-
	16-Feb-21	**2.15**	-	-	**2.87**	-	**7.0**	< 1.0	< 1.0	**7.0**	**31**	-	**267**	**174**	**48**	**5.91**	-	-
	17-Mar-21	**2.25**	-	-	-	-	**26**	< 1.0	< 1.0	**26**	**41**	-	**271**	**176**	-	**6.23**	-	-
	19-Aug-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	13-Oct-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**5.86**	**8.6**	-
	16-Nov-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	24-Feb-22	**2.34**	-	-	-	< 1.0	-	< 1.0	< 1.0	< 1.0	**24**	-	**275**	**179**	-	**3.96**	-	< 0.01
	27-May-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12-Aug-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	18-Nov-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	15-Feb-23	**2.02**	-	-	**3.84**	-	**3.0**	< 1.0	< 1.0	**3.0**	**15**	-	**250**	**162**	-	**5.44**	-	-
	16-May-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	14-Aug-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	19-Dec-23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

Criteria:
SWMP 2021 - Soil and Water Managemen

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 7
Surface Water Analytical Results - Dissolved Metals
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

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
WSS - Surface Water		0.006	0.08	0.002	0.1	0.0002	0.004	0.006	0.033	7.25	0.003	0.841	0.0001	0.02	0.01	0.01	0.535
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	**0.005**	**0.87**	**0.001**	**0.096**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.061**
	16-Oct-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	**0.005**
	16-Nov-20	< 0.001	**0.02**	< 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	**0.03**
	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	< 0.001	**0.12**	< 0.001	**0.028**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.024**
	17-Mar-21	< 0.001	**0.013**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**0.16**	< 0.001	**0.036**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.04**
	19-Aug-21	< 0.001	**0.011**	-	< 0.05	-	**0.001**	< 0.001	**0.002**	**0.86**	-	-	-	**0.002**	-	-	**0.056**
	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	< 0.001	**0.12**	< 0.001	**0.025**	< 0.0001	< 0.001	< 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**
	18-Nov-22	< 0.001	**0.01**	-	< 0.05	-	< 0.001	**0.001**	< 0.001	**2.89**	-	**0.038**	-	< 0.001	-	-	**0.022**
	15-Feb-23	< 0.001	**0.002**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.005**	**0.51**	< 0.001	**0.06**	< 0.0001	**0.001**	< 0.01	< 0.01	**0.007**
	16-May-23	< 0.001	< 0.001	-	< 0.05	-	< 0.001	< 0.001	**0.001**	**0.39**	-	-	-	< 0.001	-	-	**0.013**
	14-Aug-23	< 0.001	**0.004**	-	< 0.05	-	< 0.001	< 0.001	**0.003**	**0.16**	-	**0.026**	-	< 0.001	-	-	**0.013**
	19-Dec-23	< 0.001	**0.016**	-	< 0.05	-	< 0.001	< 0.001	**0.001**	**0.7**	-	**0.074**	-	< 0.001	-	-	**0.006**
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**
	19-Aug-21	< 0.001	**0.004**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.001**	< 0.001	**0.55**	< 0.001	**0.045**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.022**
	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	< 0.001	**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**
	17-Mar-22	-	-	-	-	-	-	-	-	**1.62**	-	-	-	-	-	-	-
	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	< 0.001	**2.79**	-	-	-	**0.001**	-	-	**0.09**
	18-Nov-22	< 0.001	**0.004**	-	< 0.05	-	< 0.001	< 0.001	< 0.001	**0.45**	-	**0.011**	-	< 0.001	-	-	**0.031**
	15-Feb-23	< 0.001	**0.013**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.002**	**0.003**	**2.37**	< 0.001	**0.056**	< 0.0001	**0.004**	< 0.01	< 0.01	**0.063**
	16-May-23	< 0.001	**0.018**	-	< 0.05	-	< 0.001	**0.004**	**0.003**	**0.87**	-	-	-	**0.005**	-	-	**0.284**
	14-Aug-23	< 0.001	**0.01**	-	< 0.05	-	**0.001**	**0.003**	< 0.001	**6.48**	-	**0.061**	-	**0.004**	-	-	**0.062**
SW3	22-Feb-19	**0.003**	**0.075**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**4.84**	< 0.001	**0.033**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.016**
	14-Mar-19	**0.006**	**0.08**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.003**	< 0.001	**9.26**	< 0.001	**0.048**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.009**
	23-Apr-19	< 0.001	**0.043**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.003**	**0.001**	**2.01**	< 0.001	**0.046**	< 0.0001	**0.004**	< 0.01	< 0.01	**0.016**
	16-May-19	< 0.001	**0.034**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.002**	< 0.001	**1.78**	< 0.001	**0.038**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.012**
	14-Jun-19	< 0.001	**0.035**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.003**	< 0.001	**1.68**	< 0.001	**0.038**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.016**
	16-Jul-19	< 0.001	**0.055**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.007**	**0.002**	**1.25**	< 0.001	**0.043**	< 0.0001	**0.006**	< 0.01	< 0.01	**0.029**
	15-Aug-19	< 0.001	**0.035**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.003**	**0.002**	**1.16**	< 0.001	**0.036**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.013**
	16-Sep-19	< 0.001	**0.045**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.004**	**0.02**	**0.69**	**0.001**	**0.036**	< 0.0001	**0.017**	< 0.01	< 0.01	**0.094**
	15-Oct-19	< 0.001	**0.034**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.005**	**0.002**	-	< 0.001	**0.027**	< 0.0001	**0.005**	< 0.01	< 0.01	**0.022**
	18-Nov-19	< 0.001	**0.031**	< 0.001	< 0.05	< 0.0001	**0.001**	< 0.001	< 0.001	**2.6**	< 0.001	**0.026**	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
	16-Sep-20	< 0.001	**0.034**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.007**	**0.007**	**3.49**	< 0.001	**0.029**	< 0.0001	**0.007**	< 0.01	< 0.01	**0.031**
	16-Oct-20	< 0.001	**0.028**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.004**	**0.003**	**7.09**	< 0.001	**0.027**	< 0.0001	**0.004**	< 0.01	< 0.01	**0.019**
	16-Nov-20	< 0.001	**0.029**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.009**	**0.002**	**4.79**	< 0.001	**0.032**	< 0.0001	**0.009**	< 0.01	< 0.01	**0.03**
	16-Dec-20	**0.002**	**0.015**	< 0.001	< 0.05	< 0.0001	**0.001**	**0.002**	**0.005**	**16**	< 0.001	**0.023**	< 0.0001	**0.004**	< 0.01	< 0.01	**0.054**
	14-Jan-21	**0.002**	**0.015**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.004**	**0.02**	**8.28**	< 0.001	**0.026**	< 0.0001	**0.01**	< 0.01	< 0.01	**0.025**
	16-Feb-21	**0.004**	**0.014**	< 0.001	< 0.05	< 0.0001	**0.002**	**0.003**	**0.001**	**11**	< 0.001	**0.015**	< 0.0001	**0.004**	< 0.01	< 0.01	**0.011**
	17-Mar-21	**0.004**	**0.013**	< 0.001	< 0.05	< 0.0001	**0.001**	**0.002**	< 0.001	**12**	< 0.001	**0.016**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.007**
	19-Aug-21	**0.001**	**0.005**	-	< 0.05	-	< 0.001	< 0.001	< 0.001	**7.14**	-	-	-	< 0.001	-	-	< 0.005

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 7
Surface Water Analytical Results - Dissolved Metals
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

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
WSS - Surface Water		0.006	0.08	0.002	0.1	0.0002	0.004	0.006	0.033	7.25	0.003	0.841	0.0001	0.02	0.01	0.01	0.535
Sample Name	Sample Date																
	16-Nov-21	**0.001**	**0.006**	-	< 0.05	-	< 0.001	< 0.001	< 0.001	**4.89**	-	-	-	< 0.001	-	-	< 0.005
	24-Feb-22	**0.004**	**0.004**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	< 0.001	**10**	< 0.001	**0.015**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.005**
	27-May-22	< 0.001	**0.01**	-	< 0.05	-	**0.001**	**0.002**	< 0.001	**13**	-	-	-	**0.002**	-	-	< 0.005
	12-Aug-22	< 0.001	**0.012**	-	< 0.05	-	**0.001**	**0.003**	< 0.001	**9.73**	-	-	-	**0.004**	-	-	**0.007**
	18-Nov-22	**0.001**	**0.012**	-	< 0.05	-	< 0.001	**0.002**	**0.002**	**7.82**	-	**0.05**	-	< 0.001	-	-	< 0.005
	15-Feb-23	< 0.001	**0.004**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	< 0.001	**5.16**	< 0.001	**0.01**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.009**
	16-May-23	**0.001**	**0.004**	-	< 0.05	-	< 0.001	< 0.001	< 0.001	**4.81**	-	-	-	< 0.001	-	-	**0.008**
	14-Aug-23	< 0.001	**0.005**	-	< 0.05	-	< 0.001	< 0.001	< 0.001	**4.72**	-	**0.034**	-	< 0.001	-	-	< 0.005
	19-Dec-23	**0.002**	**0.013**	-	< 0.05	-	**0.001**	< 0.001	**0.003**	**8.6**	-	**0.023**	-	**0.001**	-	-	**0.005**
SW4	23-Apr-19	< 0.001	**0.059**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.003**	**0.003**	**2.09**	< 0.001	**0.037**	< 0.0001	**0.005**	< 0.01	< 0.01	**0.03**
	16-May-19	< 0.001	**0.047**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.002**	< 0.001	**1.12**	< 0.001	**0.03**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.019**
	14-Jun-19	< 0.001	**0.041**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.002**	**0.003**	**0.79**	< 0.001	**0.034**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.014**
	16-Jul-19	< 0.001	**0.044**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.002**	**0.002**	**0.96**	< 0.001	**0.043**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.014**
	15-Aug-19	< 0.001	**0.04**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.001**	**0.001**	**0.57**	< 0.001	**0.032**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.009**
	16-Sep-19	< 0.001	**0.046**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.002**	**0.02**	**0.7**	**0.001**	**0.039**	< 0.0001	**0.017**	< 0.01	< 0.01	**0.085**
	15-Oct-19	< 0.001	**0.037**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.002**	**0.004**	-	< 0.001	**0.031**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.018**
	18-Nov-19	< 0.001	**0.035**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.003**	**6.32**	< 0.001	**0.032**	< 0.0001	**0.002**	< 0.01	< 0.01	< 0.005
	16-Sep-20	< 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**
	16-Oct-20	< 0.001	**0.03**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.002**	**0.001**	**2.26**	< 0.001	**0.042**	< 0.0001	**0.003**	< 0.01	< 0.01	**0.007**
	16-Nov-20	< 0.001	**0.031**	< 0.001	< 0.05	< 0.0001	< 0.001	**0.004**	**0.001**	**1.93**	< 0.001	**0.074**	< 0.0001	**0.005**	< 0.01	< 0.01	**0.016**
	16-Dec-20	< 0.001	**0.017**	< 0.001	< 0.05	< 0.0001	**0.002**	**0.001**	**0.002**	**32**	< 0.001	**0.035**	< 0.0001	**0.002**	< 0.01	< 0.01	< 0.005
	14-Jan-21	**0.002**	**0.028**	< 0.001	< 0.05	< 0.0001	**0.002**	**0.003**	**0.026**	**20**	< 0.001	**0.171**	< 0.0001	**0.005**	< 0.01	< 0.01	**0.013**
	16-Feb-21	**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**
	17-Mar-21	**0.002**	**0.02**	< 0.001	< 0.05	< 0.0001	**0.002**	< 0.001	< 0.001	**16**	< 0.001	**0.057**	< 0.0001	< 0.001	< 0.01	< 0.01	< 0.005
	19-Aug-21	< 0.001	**0.022**	-	< 0.05	-	< 0.001	**0.001**	< 0.001	**2.13**	-	-	-	**0.001**	-	-	**0.005**
	16-Nov-21	< 0.001	**0.016**	-	< 0.05	-	< 0.001	**0.001**	< 0.001	**6.59**	-	-	-	< 0.001	-	-	< 0.005
	24-Feb-22	< 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**
	27-May-22	< 0.001	**0.021**	-	< 0.05	-	< 0.001	**0.001**	< 0.001	**0.68**	-	-	-	**0.001**	-	-	< 0.005
	12-Aug-22	< 0.001	**0.022**	-	< 0.05	-	**0.002**	**0.003**	< 0.001	**0.39**	-	-	-	**0.004**	-	-	**0.011**
	18-Nov-22	**0.002**	**0.013**	-	< 0.05	-	**0.002**	**0.001**	**0.003**	**20**	-	**0.084**	-	**0.001**	-	-	< 0.005
	15-Feb-23	**0.001**	**0.01**	< 0.001	< 0.05	< 0.0001	**0.001**	**0.001**	< 0.001	**12**	< 0.001	**0.017**	< 0.0001	**0.001**	< 0.01	< 0.01	< 0.005
	16-May-23	< 0.001	**0.025**	-	< 0.05	-	< 0.001	**0.003**	**0.004**	**0.38**	-	-	-	**0.003**	-	-	**0.018**
	14-Aug-23	< 0.001	**0.028**	-	< 0.05	-	< 0.001	**0.002**	< 0.001	**0.26**	-	**0.022**	-	**0.003**	-	-	**0.021**
	19-Dec-23	**0.006**	**0.009**	-	< 0.05	-	**0.003**	< 0.001	**2.0 ***	**45**	-	**0.017**	-	< 0.001	-	-	**0.006**

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

Criteria:
SWMP 2021 - Soil and Water Management Plan, July 2021

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 8
Surface Water Analytical Results - Dissolved Metals
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte		Perfluoroalkyl Sulfonamides							Perfluoroalkyl Carboxylic Acids		Perfluoroalkyl Carboxylic Acids			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 aicd (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoate (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)
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
WSS - Surface Water		--	--	--	--	--	--	--	--	--	--	--	0.56	--	--	--	--	--
Sample Name	Sample Date																	
SW1	16-May-19	< 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	< 0.02	< 0.02
	16-Sep-19	< 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	< 0.02	< 0.02
	18-Nov-19	< 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	< 0.02	< 0.02
	16-Sep-20	< 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	< 0.02	< 0.02
	16-Oct-20	< 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	< 0.02	< 0.02
	16-Nov-20	< 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	< 0.02	< 0.02
	16-Dec-20	< 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	< 0.02	< 0.02
	14-Jan-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	< 0.02	< 0.02
	16-Feb-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	< 0.02	< 0.02
	17-Mar-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	< 0.02	< 0.02
	19-Aug-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	< 0.02	< 0.02
	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	< 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	< 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	< 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	< 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	< 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	< 0.02	< 0.02
	18-Nov-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	< 0.02	< 0.02
	15-Feb-23	< 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	< 0.02	< 0.02
	16-May-23	< 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	< 0.02	< 0.02
	14-Aug-23	< 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	< 0.02	< 0.02
	19-Dec-23	< 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	< 0.02	< 0.02
SW2	17-Mar-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	< 0.02	< 0.02
	19-Aug-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	< 0.02	< 0.02
	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	< 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	< 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	< 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	< 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	< 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	< 0.02	< 0.02
	18-Nov-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	< 0.02	< 0.02
	15-Feb-23	< 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	< 0.02	< 0.02
	16-May-23	< 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	< 0.02	< 0.02
	14-Aug-23	< 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	< 0.02	< 0.02
	19-Dec-23	< 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	< 0.02	< 0.02
SW3	22-Feb-19	< 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	< 0.02	< 0.02
	16-May-19	< 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	< 0.02	< 0.02
	16-Sep-19	< 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	< 0.02	< 0.02
	18-Nov-19	< 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	< 0.02	< 0.02
	16-Sep-20	< 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	< 0.02	< 0.02
	16-Oct-20	< 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	< 0.02	< 0.02
	16-Nov-20	< 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	< 0.02	< 0.02
	16-Dec-20	< 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	< 0.02	< 0.02
	14-Jan-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	< 0.02	< 0.02
	16-Feb-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	< 0.02	< 0.02
	17-Mar-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	< 0.02	< 0.02
	19-Aug-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	< 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	< 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	< 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	< 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	< 0.02	< 0.02
	18-Nov-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	< 0.02	< 0.02
	15-Feb-23	< 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	< 0.02	< 0.02
	16-May-23	< 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	< 0.02	< 0.02
	14-Aug-23	< 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	< 0.02	< 0.02
	19-Dec-23	< 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	< 0.02	< 0.02
SW4	16-May-19	< 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	< 0.02	< 0.02
	16-Sep-19	< 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	< 0.02	< 0.02
	18-Nov-19	< 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	< 0.02	< 0.02
	16-Sep-20	< 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	< 0.02	< 0.02
	16-Oct-20	< 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	< 0.02	< 0.02
	16-Nov-20	< 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	< 0.02	< 0.02
	16-Dec-20	< 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	< 0.02	< 0.02
	14-Jan-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	< 0.02	< 0.02
	16-Feb-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	< 0.02	< 0.02
	17-Mar-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	< 0.02	< 0.02
	19-Aug-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	< 0.02	< 0.02
	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	< 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	< 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	< 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	< 0.02	< 0.02

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 8
Surface Water Analytical Results - Dissolved Metals
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte		Perfluoroalkyl Sulfonamides							Perfluoroalkyl Carboxylic Acids		Perfluoroalkyl Carboxylic Acids			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 aicd (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoate (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)
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
WSS - Surface Water		--	--	--	--	--	--	--	--	--	--	--	0.56	--	--	--	--	--
Sample Name	Sample Date																	
	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	< 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	< 0.02	< 0.02
	18-Nov-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	< 0.02	< 0.02
	15-Feb-23	< 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	< 0.02	< 0.02
	16-May-23	< 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	< 0.02	< 0.02
	14-Aug-23	< 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	< 0.02	< 0.02
	19-Dec-23	< 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	< 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

Criteria:
SWMP 2021 - Soil and Water Management Plan, July 2021

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 8
Surface Water Analytical Results - Dissolved Metals
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte				Perfluoroalkyl Sulfonic Acids		Perfluoroalkyl Sulfonic Acids						(n:2) Fluorotelomer Sulfonic Acids	Sum of PFAS		
		Perfluorotetradecanoic acid (PFTeDA)	Perfluorobutanesulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexanesulfonic acid (PFHxS)	Perfluoroheptane sulfonate (PFHpS)	Perfluorooctanesulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	4:2 Fluorotelomer Sulfonate (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
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
WSS - Surface Water		--	--	--	--	--	--	--	--	--	--	--	0.07	--	--
Sample Name	Sample Date														
SW1	16-May-19	< 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
	16-Sep-19	< 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
	18-Nov-19	< 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
	16-Sep-20	< 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
	16-Oct-20	< 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
	16-Nov-20	< 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
	16-Dec-20	< 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
	14-Jan-21	< 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
	16-Feb-21	< 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**
	17-Mar-21	< 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
	19-Aug-21	< 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
	22-Sep-21	< 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
	13-Oct-21	< 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
	16-Nov-21	< 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
	24-Feb-22	< 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
	27-May-22	< 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
	12-Aug-22	< 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
	18-Nov-22	< 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
	15-Feb-23	< 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
	16-May-23	< 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
	14-Aug-23	< 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
	19-Dec-23	< 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
SW2	17-Mar-21	< 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
	19-Aug-21	< 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
	22-Sep-21	< 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
	13-Oct-21	< 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
	16-Nov-21	< 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
	24-Feb-22	< 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
	27-May-22	< 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
	12-Aug-22	< 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
	18-Nov-22	< 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
	15-Feb-23	< 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
	16-May-23	< 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
	14-Aug-23	< 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
SW3	22-Feb-19	< 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
	16-May-19	< 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
	16-Sep-19	< 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
	18-Nov-19	< 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
	16-Sep-20	< 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
	16-Oct-20	< 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
	16-Nov-20	< 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
	16-Dec-20	< 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
	14-Jan-21	< 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
	16-Feb-21	< 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
	17-Mar-21	< 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
	19-Aug-21	< 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
	16-Nov-21	< 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
	24-Feb-22	< 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
	27-May-22	< 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
	12-Aug-22	< 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
	18-Nov-22	< 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
	15-Feb-23	< 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
	16-May-23	< 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
	14-Aug-23	< 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
	19-Dec-23	< 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
SW4	16-May-19	< 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
	16-Sep-19	< 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**
	18-Nov-19	< 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
	16-Sep-20	< 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
	16-Oct-20	< 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
	16-Nov-20	< 0.05	< 0.02	< 0.02	< 0.02	< 0.02	**0.02**	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	**0.02**	**0.02**	**0.02**
	16-Dec-20	< 0.05	< 0.02	< 0.02	< 0.02	< 0.02	**0.02**	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	**0.02**	**0.02**	**0.02**
	14-Jan-21	< 0.05	< 0.02	< 0.02	**0.03**	< 0.02	**0.04**	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	**0.07**	**0.07**	**0.07**
	16-Feb-21	< 0.05	< 0.02	< 0.02	< 0.02	< 0.02	**0.03**	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	**0.03**	**0.03**	**0.03**
	17-Mar-21	< 0.05	< 0.02	< 0.02	**0.02**	< 0.02	**0.02**	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	**0.04**	**0.04**	**0.04**
	19-Aug-21	< 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
	22-Sep-21	< 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
	13-Oct-21	< 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
	16-Nov-21	< 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
	24-Feb-22	< 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

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 8
Surface Water Analytical Results - Dissolved Metals
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte				Perfluoroalkyl Sulfonic Acids		Perfluoroalkyl Sulfonic Acids						(n:2) Fluorotelomer Sulfonic Acids	Sum of PFAS		
		Perfluorotetradecanoic acid (PFTeDA)	Perfluorobutanesulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexanesulfonic acid (PFHxS)	Perfluoroheptane sulfonate (PFHpS)	Perfluorooctanesulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	4:2 Fluorotelomer Sulfonate (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 (WADER List)	Sum of PFAS
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
WSS - Surface Water		--	--	--	--	--	--	--	--	--	--	--	0.07	--	--
Sample Name	Sample Date														
	27-May-22	< 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
	12-Aug-22	< 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
	18-Nov-22	< 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
	15-Feb-23	< 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
	16-May-23	< 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
	14-Aug-23	< 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
	19-Dec-23	< 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

Notes:
- - Not analysed
< - Less than laboratory limit of reportin
µg/L - Micrograms per litre
Bold indicates a detection above the lab

Criteria:
SWMP 2021 - Soil and Water Manageme

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 9
Wash Plant Water Analytical Results - Dissolved Metals
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte		Metals																
		Aluminum	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																	
WPW	19-Aug-21	-	< 0.001	-	-	-	-	-	-	-	< 0.05	-	**0.062**	-	-	-	-	-
	22-Sep-21	-	< 0.001	-	-	-	-	-	-	-	**0.08**	-	**0.051**	-	-	-	-	-
	13-Oct-21	-	< 0.001	-	-	-	-	-	-	-	**0.22**	-	**0.079**	-	-	-	-	-
	16-Nov-21	-	< 0.001	-	-	-	-	-	-	-	**0.29**	-	**0.045**	-	-	-	-	-
	15-Dec-21	-	< 0.001	-	-	-	-	-	-	-	**0.2**	-	**0.078**	-	-	-	-	-
	18-Jan-22	-	< 0.001	-	-	-	-	-	-	-	**0.56**	-	**0.038**	-	-	-	-	-
	24-Feb-22	-	< 0.001	-	-	-	-	-	-	-	**1.02**	-	**0.084**	-	-	-	-	-
	17-Mar-22	-	< 0.001	-	-	-	-	-	-	-	**0.97**	-	**0.05**	-	-	-	-	-
	12-Apr-22	-	< 0.001	-	-	-	-	-	-	-	**0.44**	-	**0.042**	-	-	-	-	-
	27-May-22	-	< 0.001	-	-	-	-	-	-	-	**0.07**	-	**0.038**	-	-	-	-	-
	17-Jun-22	-	< 0.001	-	-	-	-	-	-	-	**0.94**	-	**0.061**	-	-	-	-	-
	27-Jul-22	-	< 0.001	-	-	-	-	-	-	-	**0.27**	-	**0.038**	-	-	-	-	-
	12-Aug-22	-	< 0.001	-	-	-	-	-	-	-	**0.17**	-	**0.026**	-	-	-	-	-
	16-Sep-22	-	< 0.001	-	-	-	-	-	-	-	**0.58**	-	**0.069**	-	-	-	-	-
	24-Oct-22	-	**0.002**	-	-	-	-	-	-	-	**2.22**	-	**0.118**	-	-	-	-	-
	18-Nov-22	-	< 0.001	-	-	-	-	-	-	-	**0.56**	-	**0.066**	-	-	-	-	-
	14-Dec-22	-	< 0.001	-	-	-	-	-	-	-	**0.42**	-	**0.062**	-	-	-	-	-
	17-Jan-23	-	< 0.001	-	-	-	-	-	-	-	**0.36**	-	**0.05**	-	-	-	-	-
WPW2	15-Feb-23	-	< 0.001	**0.015**	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	**0.003**	< 0.05	< 0.001	**0.004**	< 0.0001	< 0.001	< 0.01	< 0.01	**0.115**
	15-Mar-23	-	< 0.001	-	-	-	-	-	-	-	**0.15**	-	**0.061**	-	-	-	-	-
	18-Apr-23	-	< 0.001	**0.009**	< 0.001	< 0.05	< 0.0001	**0.001**	**0.001**	**0.004**	**0.6**	< 0.001	**0.049**	< 0.0001	**0.002**	< 0.01	< 0.01	**0.053**
	16-May-23	-	< 0.001	-	-	-	-	-	-	-	**0.28**	-	**0.07**	-	-	-	-	-
	14-Jun-23	-	< 0.001	-	-	-	-	-	-	-	**0.33**	-	**0.047**	-	-	-	-	-
	24-Jul-23	-	< 0.001	-	-	-	-	-	-	-	**0.39**	-	**0.08**	-	-	-	-	-
	14-Aug-23	-	< 0.001	-	-	-	-	-	-	-	**0.88**	-	**0.058**	-	-	-	-	-
	13-Sep-23	-	< 0.001	-	-	-	-	-	-	-	**0.2**	-	**0.047**	-	-	-	-	-
	23-Oct-23	-	< 0.001	-	-	-	-	-	-	-	**0.26**	-	**0.062**	-	-	-	-	-
	22-Nov-23	-	< 0.001	-	-	-	-	-	-	-	**0.31**	-	**0.055**	-	-	-	-	-
	19-Dec-23	**0.1**	-	-	-	-	-	-	-	-	**0.07**	-	**0.063**	-	-	-	-	-

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

Criteria:
SWMP 2021 - Soil and Water Management Plan, July 2021

Table 10
Wash Plant Water Analytical Results - PFAS
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte		Perfluoroalkyl Sulfonamides							Perfluoroalkyl Carboxylic Acids		Perfluoroalkyl Carboxylic Acids			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 aicd (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoate (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)
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
Sample Name	Sample Date																	
WPW	19-Aug-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	< 0.02	< 0.02
	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	< 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	< 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	< 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	< 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	< 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	< 0.02	< 0.02
	17-Mar-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	< 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	< 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	< 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	< 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	< 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	< 0.02	< 0.02
	16-Sep-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	< 0.02	< 0.02
	24-Oct-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	< 0.02	< 0.02
	18-Nov-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	< 0.02	< 0.02
	14-Dec-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	< 0.02	< 0.02
	17-Jan-23	< 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	< 0.02	< 0.02
WPW2	15-Feb-23	< 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	< 0.02	< 0.02
	15-Mar-23	< 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	< 0.02	< 0.02
	18-Apr-23	< 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	< 0.02	< 0.02
	16-May-23	< 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	< 0.02	< 0.02
	14-Jun-23	< 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	< 0.02	< 0.02
	24-Jul-23	< 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	< 0.02	< 0.02
	14-Aug-23	< 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	< 0.02	< 0.02
	13-Sep-23	< 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	< 0.02	< 0.02
	23-Oct-23	< 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	< 0.02	< 0.02
	22-Nov-23	< 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	< 0.02	< 0.02
	19-Dec-23	< 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	< 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
Criteria:
SWMP 2021 - Soil and Water Management Plan, July 2021

Table 10
Wash Plant Water Analytical Results - PFAS
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte				Perfluoroalkyl Sulfonic Acids		Perfluoroalkyl Sulfonic Acids						(n:2) Fluorotelomer Sulfonic Acids	Sum of PFAS		
		Perfluorotetradecanoic acid (PFTeDA)	Perfluorobutanesulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexanesulfonic acid (PFHxS)	Perfluoroheptane sulfonate (PFHpS)	Perfluorooctanesulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	4:2 Fluorotelomer Sulfonate (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 (WADER List)	Sum of PFAS
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
Sample Name	Sample Date														
WPW	19-Aug-21	< 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
	22-Sep-21	< 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
	13-Oct-21	< 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**
	16-Nov-21	< 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
	15-Dec-21	< 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**
	18-Jan-22	< 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**
	24-Feb-22	< 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**
	17-Mar-22	< 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**
	12-Apr-22	< 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
	27-May-22	< 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
	17-Jun-22	< 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
	27-Jul-22	< 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**
	12-Aug-22	< 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
	16-Sep-22	< 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
	24-Oct-22	< 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**
	18-Nov-22	< 0.05	< 0.02	< 0.02	**0.02**	< 0.02	**0.02**	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	**0.04**	**0.05**	**0.05**
	14-Dec-22	< 0.05	< 0.02	< 0.02	**0.01**	< 0.02	**0.02**	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	**0.03**	**0.04**	**0.04**
	17-Jan-23	< 0.05	< 0.02	< 0.02	**0.01**	< 0.02	**0.01**	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	**0.02**	**0.02**	**0.02**
WPW2	15-Feb-23	< 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
	15-Mar-23	< 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**
	18-Apr-23	< 0.05	< 0.02	< 0.02	**0.02**	< 0.02	**0.02**	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	**0.04**	**0.05**	**0.05**
	16-May-23	< 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**
	14-Jun-23	< 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**
	24-Jul-23	< 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**
	14-Aug-23	< 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
	13-Sep-23	< 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
	23-Oct-23	< 0.05	< 0.02	< 0.02	< 0.01	< 0.02	**0.02**	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	**0.02**	**0.02**	**0.02**
	22-Nov-23	< 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
	19-Dec-23	< 0.05	< 0.02	< 0.02	**0.01**	< 0.02	**0.01**	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	**0.02**	**0.03**	**0.03**

Notes:
- - Not analysed
< - Less than laboratory limit of reporting
µg/L - Micrograms per litre
Bold indicates a detection above the laboratory limit of reporting
Criteria:
SWMP 2021 - Soil and Water Management Plan, July 2021

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Table 11
QA/QC Analytical Results - Dissolved Metals, Anions, and Cations
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte			Metals											Anions and Cations
			Aluminum	Arsenic	Barium	Boron	Chromium	Cobalt	Copper	Iron	Manganese	Nickel	Zinc	Magnesium
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
Sample Name	Sample Date	Sample Type												
TB_19/12/23_19122023	19-Dec-23	Trip Blank	-	< 1.0	< 1.0	< 50	< 1.0	< 1.0	< 1.0	< 50	< 1.0	< 1.0	< 5.0	< 1,000
RB_19/12/23_19122023	19-Dec-23	Rinsate	-	< 1.0	< 1.0	< 50	< 1.0	< 1.0	< 1.0	< 50	< 1.0	< 1.0	< 5.0	< 1,000
SW4_19122023	19-Dec-23	Primary	-	**6.0**	**9.0**	< 50	**3.0**	< 1.0	< 1.0	**45,100**	**17**	< 1.0	**6.0**	**3,000**
QC01_19122023	19-Dec-23	Duplicate	-	**6.0**	**9.0**	< 50	**3.0**	< 1.0	< 1.0	**45,900**	**17**	< 1.0	< 5.0	**3,000**
Relative Percentage Difference			NC	**0%**	**0%**	NC	**0%**	NC	NC	**2%**	**0%**	NC	**18%**	**0%**
SW4_19122023	19-Dec-23	Primary	-	**6.0**	**9.0**	< 50	**3.0**	< 1.0	< 1.0	**45,100**	**17**	< 1.0	**6.0**	**3,000**
QC01A_19122023	19-Dec-23	Triplicate	-	**4.0**	< 20	-	**3.0**	-	**2.0**	**41,000**	**17**	**1.0**	< 5.0	**3,400**
Relative Percentage Difference			NC	**40%**	**76%**	NC	**0%**	NC	**67%**	**10%**	**0%**	**0%**	**18%**	**13%**

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

Table 12
QA/QC Analytical Results - PFAS
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte			Perfluoroalkyl Sulfonamides							Perfluoroalkyl Carboxylic Acids		Perfluoroalkyl Carboxylic Acids			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 aicd (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoate (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorobutanesulfonic acid (PFBS)
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
Sample Name	Sample Date	Sample Type																			
TB_19/12/23_19122023	19-Dec-23	Trip Blank	< 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	< 0.02	< 0.02	< 0.05	< 0.02
RB_19/12/23_19122023	19-Dec-23	Rinsate	< 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	< 0.02	< 0.02	< 0.05	< 0.02
SW4_19122023	19-Dec-23	Primary	< 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	< 0.02	< 0.02	< 0.05	< 0.02
QC01_19122023	19-Dec-23	Duplicate	< 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	< 0.02	< 0.02	< 0.05	< 0.02
Relative Percentage Difference			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
SW4_19122023	19-Dec-23	Primary	< 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	< 0.02	< 0.02	< 0.05	< 0.02
QC01A_19122023	19-Dec-23	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	< 0.01
Relative Percentage Difference			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
EPA - Environment Protection Authority
NC - Not calculated
µg/L - Micrograms per litre

Table 12
QA/QC Analytical Results - PFAS
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte				Perfluoroalkyl Sulfonic Acids		Perfluoroalkyl Sulfonic Acids						(n:2) Fluorotelomer Sulfonic Acids	Sum of PFAS			Sum of PFAS		
			Perfluoropropanesulfonic acid (PFPrS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexanesulfonic acid (PFHxS)	Perfluoroheptane sulfonate (PFHpS)	Perfluorooctanesulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	4:2 Fluorotelomer Sulfonate (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 US EPA PFAS (PFOS + PFOA)*	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	Sum of PFAS (WADER List)	Sum of PFAS	Perfluorononanesulfonic acid (PFNS)
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
Sample Name	Sample Date	Sample Type																
TB_19/12/23_19122023	19-Dec-23	Trip Blank	-	< 0.02	< 0.01	< 0.02	< 0.01	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	-	-	< 0.01	< 0.01	-
RB_19/12/23_19122023	19-Dec-23	Rinsate	-	< 0.02	< 0.01	< 0.02	< 0.01	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	-	-	< 0.01	< 0.01	-
SW4_19122023	19-Dec-23	Primary	-	< 0.02	< 0.01	< 0.02	< 0.01	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	-	-	< 0.01	< 0.01	-
QC01_19122023	19-Dec-23	Duplicate	-	< 0.02	< 0.01	< 0.02	< 0.01	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 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
SW4_19122023	19-Dec-23	Primary	-	< 0.02	< 0.01	< 0.02	< 0.01	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	-	-	< 0.01	< 0.01	-
QC01A_19122023	19-Dec-23	Triplicate	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.1	< 0.01
Relative Percentage Difference			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
EPA - Environment Protection Authority
NC - Not calculated
µg/L - Micrograms per litre

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Table 13
QA/QC Analytical Results - Hydrocarbons
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte			BTEXN								Total Petroleum Hydrocarbons					Total Petroleum 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}	C_{15} - C_{28}	C_{29} - C_{36}	C_{10} - C_{36} sum	C_{10}-C_{14} - Silica Cleanup	C_{15}-C_{28} - Silica Cleanup	C_{29}-C_{36} - Silica Cleanup	C_{10}-C_{36} Sum - 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
Sample Name	Sample Date	Sample Type																	
TB_19/12/23_19122023	19-Dec-23	Trip Blank	< 1.0	**3.0**	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	**3.0**	< 20	-	-	-	-	< 50	< 100	< 50	< 50
RB_19/12/23_19122023	19-Dec-23	Rinsate	< 1.0	**5.0**	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	**5.0**	< 20	-	-	-	-	< 50	< 100	< 50	< 50
SW4_19122023	19-Dec-23	Primary	< 1.0	**6.0**	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	**6.0**	< 20	-	-	-	-	< 50	< 100	< 50	< 50
QC01_19122023	19-Dec-23	Duplicate	< 1.0	**6.0**	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	**6.0**	< 20	-	-	-	-	< 50	< 100	< 50	< 50
Relative Percentage Difference			NC	**0%**	NC	NC	NC	NC	NC	**0%**	NC	NC	NC	NC	NC	NC	NC	NC	NC
SW4_19122023	19-Dec-23	Primary	< 1.0	**6.0**	< 2.0	< 2.0	< 2.0	< 2.0	< 5.0	**6.0**	< 20	-	-	-	-	< 50	< 100	< 50	< 50
QC01A_19122023	19-Dec-23	Triplicate	< 1.0	**6.0**	< 1.0	< 2.0	< 1.0	< 3.0	< 10	-	< 20	< 50	< 100	< 100	< 100	< 50	< 100	< 100	< 100
Relative Percentage Difference			NC	**0%**	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

Williamtown Sand Syndicate
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Table 13
QA/QC Analytical Results - Hydrocarbons
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Analyte			Total Recoverable Hydrocarbons							Total Recoverable Hydrocarbons - Silica Clean-up				
			C_6 - C_{10}	C_6 - C_{10} minus BTEX (F1)	$>C_{10}$ - C_{16}	$>C_{10}$ - C_{16} minus Naphthalene (F2)	$>C_{16}$ - C_{34}	$>C_{34}$ - C_{40}	$>C_{10}$ - C_{40} (sum)	$>C_{10}$-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
Sample Name	Sample Date	Sample Type												
TB_19/12/23_19122023	19-Dec-23	Trip Blank	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
RB_19/12/23_19122023	19-Dec-23	Rinsate	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
SW4_19122023	19-Dec-23	Primary	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
QC01_19122023	19-Dec-23	Duplicate	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
Relative Percentage Difference			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
SW4_19122023	19-Dec-23	Primary	< 20	< 20	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100
QC01A_19122023	19-Dec-23	Triplicate	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 50	-	< 100	< 100	< 100
Relative Percentage Difference			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

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Table 14
Gauging Data
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Well ID	Date	TOC (mAHD)	Water Table Elevation (mAHD)	Well Depth (m)	DTW (mBTOC)	Dry Indicator (Y/N)	Remark
BH1	27-Jul-22	NM	NM	8.210	3.836	N	--
	12-Aug-22	NM	NM	NM	NC	--	--
BH1A	16-Sep-22	8.980	5.030	12.400	3.950	N	--
	24-Oct-22	8.980	5.034	12.266	3.946	N	--
	18-Nov-22	8.980	4.810	12.290	4.170	N	Gauge only
	14-Dec-22	8.980	4.513	12.163	4.467	N	--
	17-Jan-23	8.980	4.142	12.181	4.838	N	--
	15-Feb-23	8.980	3.885	12.190	5.095	N	Clear
	15-Mar-23	8.980	3.766	12.160	5.214	N	--
	18-Apr-23	8.980	3.764	12.155	5.216	N	Gauge only
	16-May-23	8.980	3.688	12.160	5.292	N	Gauge only
	14-Jun-23	8.980	3.792	12.160	5.188	N	--
	24-Jul-23	8.980	3.522	12.150	5.458	N	--
	14-Aug-23	8.980	3.501	12.150	5.479	N	Clear, no odor, no sheen
	13-Sep-23	8.980	3.451	12.160	5.529	N	--
	23-Oct-23	8.980	3.310	12.160	5.670	N	Gauge only
	22-Nov-23	8.980	3.231	12.153	5.749	N	Gauge only
	19-Dec-23	NM	NM	12.230	5.833	N	Clear, no odor, no sheen
BH2	27-Jul-22	7.790	3.897	8.940	3.893	N	Clear
	12-Aug-22	7.790	3.735	8.000	4.055	N	Clear
	16-Sep-22	7.790	3.671	8.997	4.119	N	Dark brown
	24-Oct-22	7.790	3.608	9.952	4.182	N	Clear
	18-Nov-22	7.790	3.410	9.450	4.380	N	Light brown, NO, NS
	14-Dec-22	7.790	3.203	8.879	4.587	N	Very light brown
	17-Jan-23	7.790	2.917	8.930	4.873	N	Brown
	15-Feb-23	7.790	2.732	8.871	5.058	N	Odor, Light brown
	15-Mar-23	7.790	2.655	8.842	5.135	N	Light brown
	18-Apr-23	7.790	2.703	8.861	5.087	N	Light brown, no odour, no sheen
	16-May-23	7.790	2.654	8.850	5.136	N	Brown, no odour / sheen, well in good condition
	14-Jun-23	7.790	2.706	8.840	5.084	N	Clear
	24-Jul-23	7.790	2.574	8.840	5.216	N	Lt brown
	14-Aug-23	7.790	2.582	8.825	5.208	N	Brown, no odour, no sheen
	14-Sep-23	7.790	2.538	8.840	5.252	N	Lt brown
	23-Oct-23	7.790	2.407	8.836	5.383	N	Light brown, no odour, no sheen
	22-Nov-23	7.790	2.361	8.803	5.429	N	Brown, no odour, no sheen
	19-Dec-23	NM	NM	8.832	5.512	N	Brown, organic odour, no sheen
BH4	27-Jul-22	3.060	2.296	5.980	0.764	N	Clear
	12-Aug-22	3.060	2.261	5.000	0.799	N	Clear
	16-Sep-22	3.060	2.234	5.990	0.826	N	Light brown
	24-Oct-22	3.060	2.239	6.050	0.821	N	Clear
	18-Nov-22	3.060	2.110	6.010	0.950	N	Clear, NO/NS
	14-Dec-22	3.060	1.941	6.025	1.119	N	Clear
	17-Jan-23	3.060	1.761	6.006	1.299	N	Clear
	15-Feb-23	3.060	1.627	6.015	1.433	N	Clear
	15-Mar-23	3.060	1.625	6.015	1.435	N	Clear
	18-Apr-23	3.060	1.832	6.018	1.228	N	Clear, no odour, no sheen
	16-May-23	3.060	1.771	5.992	1.289	N	Clear, no odour / sheen, well in good condition
	14-Jun-23	3.060	1.832	5.990	1.228	N	Slightly cloudy/clear
	24-Jul-23	3.060	1.814	5.995	1.246	N	Clear

Williamtown Sand Syndicate
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Table 14
Gauging Data
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Well ID	Date	TOC (mAHD)	Water Table Elevation (mAHD)	Well Depth (m)	DTW (mBTOC)	Dry Indicator (Y/N)	Remark
	14-Aug-23	3.060	1.809	6.010	1.251	N	Clear, low Sulphur odor, no sheen
	14-Sep-23	3.060	1.529	6.020	1.531	N	Clear
	23-Oct-23	3.060	1.475	6.014	1.585	N	Clear, no odour, no sheen
	22-Nov-23	3.060	1.493	6.010	1.567	N	Clear, no odour, no sheen
	19-Dec-23	NM	NM	6.110	1.717	N	Light brown, no odor, no sheen
BH5	12-Aug-22	7.360	2.320	0.000	5.040	N	--
	18-Nov-22	7.360	2.169	8.820	5.191	N	Gauge only
	15-Feb-23	7.360	-1.375	5.612	8.735	N	Odor, Light brown
	14-Aug-23	7.360	2.013	8.700	5.347	N	Gauge only
	19-Dec-23	NM	NM	8.723	5.824	N	Gauge only
BH6	27-Jul-22	3.620	2.914	4.510	0.706	N	Odor, Clear
	12-Aug-22	3.620	2.909	4.000	0.711	N	Odor, Clear
	16-Sep-22	3.620	2.904	4.580	0.716	N	Odor, Clear
	24-Oct-22	3.620	2.870	4.554	0.750	N	Odor, Clear
	18-Nov-22	3.620	2.815	4.540	0.805	N	Cloudy, low sulfur odour, NS
	14-Dec-22	3.620	2.596	4.530	1.024	N	Odor, Light yellow
	17-Jan-23	3.620	2.381	4.520	1.239	N	--
	15-Feb-23	3.620	2.267	4.529	1.353	N	Odor, Clear
	15-Mar-23	3.620	2.303	4.535	1.317	N	Odor, Clear
	18-Apr-23	3.620	2.580	4.535	1.040	N	Clear, no odour, no sheen
	16-May-23	3.620	2.480	4.515	1.140	N	Clear, low Sulphur odour, no sheen, well in good condition
	14-Jun-23	3.620	2.542	4.490	1.078	N	Odor, Clear
	24-Jul-23	3.620	2.645	4.920	0.975	N	Odor, Cloudy white
	14-Aug-23	3.620	2.572	4.525	1.048	N	Clear, low Sulphur odor, no sheen
	14-Sep-23	3.620	2.376	4.530	1.244	N	Odor, Clear
	23-Oct-23	3.620	2.097	4.528	1.523	N	Clear, no odour, no sheen
	22-Nov-23	3.620	2.203	4.537	1.417	N	Clear, Sulphur odour, no sheen
	19-Dec-23	NM	NM	4.521	0.656	N	Clear, Sulphur odor, no sheen
BH7	27-Jul-22	2.980	2.074	4.500	0.906	N	Weak Odor, Light yellow
	12-Aug-22	2.980	2.035	4.000	0.945	N	Light yellow
	16-Sep-22	2.980	2.027	4.499	0.953	N	Yello
	24-Oct-22	2.980	2.040	4.530	0.940	N	Odor, Brown
	18-Nov-22	2.980	1.890	5.500	1.090	N	Light brown, low sulfur odour, NS
	14-Dec-22	2.980	1.702	4.520	1.278	N	Odor, Light yellow
	17-Jan-23	2.980	1.584	4.510	1.396	N	Odor, Light yellow, almost clear
	15-Feb-23	2.980	1.511	4.520	1.469	N	Odor, Light brown
	15-Mar-23	2.980	1.535	4.505	1.445	N	Odor, Lght yeloow
	18-Apr-23	2.980	1.789	4.520	1.191	N	Light yellow, no odour, no sheen
	16-May-23	2.980	1.715	4.520	1.265	N	Light yellow, low sulphur odour, no sheen, well in good condition
	14-Jun-23	2.980	1.762	4.520	1.218	N	Light yellow
	24-Jul-23	2.980	1.769	4.520	1.211	N	Weak Odor, Lt yellow
	14-Aug-23	2.980	1.766	4.510	1.214	N	Light brown, moderate Sulphur odor, no sheen
	14-Sep-23	2.980	1.685	4.519	1.295	N	Odor, Lt yellow
	23-Oct-23	2.980	1.453	4.526	1.527	N	Clear, low sulphur odour, no sheen
	22-Nov-23	2.980	1.467	4.525	1.513	N	Clear, Sulphur odour, no sheen
	19-Dec-23	NM	NM	4.506	1.691	N	Light brown, Sulphur odor, no sheen
BH8	12-Aug-22	3.880	2.191	0.000	1.689	N	Strong Odor, Milky white
	18-Nov-22	3.880	2.055	6.040	1.825	N	Cloudy, low sulfur odour, NS
	15-Feb-23	3.880	1.540	6.055	2.340	N	Odor, Light brown

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Table 14
Gauging Data
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Well ID	Date	TOC (mAHD)	Water Table Elevation (mAHD)	Well Depth (m)	DTW (mBTOC)	Dry Indicator (Y/N)	Remark
BH8	16-May-23	3.880	1.858	6.025	2.022	N	Yellow, strong sulphur odour, no sheen, well in good condition
	14-Aug-23	3.880	1.964	3.490	1.916	N	Yellow, moderate Sulphur odor, no sheen, white suspended sediment
	19-Dec-23	NM	NM	6.200	2.545	N	light brown, Sulphur odor, no sheen
BH9	27-Jul-22	17.750	2.709	16.190	15.041	N	--
	12-Aug-22	17.750	2.600	16.000	15.150	N	--
	16-Sep-22	17.750	2.494	16.145	15.256	N	--
	24-Oct-22	17.750	2.471	16.000	15.279	N	--
	18-Nov-22	17.750	2.291	16.320	15.459	N	Gauge only
	14-Dec-22	17.750	2.091	16.110	15.659	N	--
	17-Jan-23	17.750	1.895	16.240	15.855	N	--
	15-Feb-23	17.750	1.747	16.108	16.003	N	--
	15-Mar-23	17.750	1.707	16.090	16.043	N	--
	18-Apr-23	17.750	1.904	16.095	15.846	N	Gauge only
	16-May-23	17.750	1.832	16.075	15.918	N	Gauge only
	14-Jun-23	17.750	1.872	16.100	15.878	N	--
	24-Jul-23	17.750	1.834	1616.099	15.916	N	--
	14-Aug-23	17.750	1.864	16.090	15.886	N	Gauge only
	14-Sep-23	17.750	11.797	16.070	5.953	N	--
	23-Oct-23	17.750	NM	16.070	NC	Y	Gauge only, Dry
	22-Nov-23	17.750	NM	16.085	NC	Y	Gauge only
	19-Dec-23	NM	NM	16.082	NC	Y	Gauge only
BH9A	27-Jul-22	10.750	2.548	12.440	8.202	N	Weak Odor, Clear
	12-Aug-22	10.750	2.455	12.000	8.295	N	Light yellow
	16-Sep-22	10.750	2.395	12.283	8.355	N	Odor, Light brown
	24-Oct-22	10.750	2.384	12.420	8.366	N	Clear
	18-Nov-22	10.750	2.229	12.430	8.521	N	Brown, NO/NS
	14-Dec-22	10.750	2.053	12.295	8.697	N	Light yellow
	17-Jan-23	10.750	1.881	12.264	8.869	N	Weak Odor, Light brown
	15-Feb-23	10.750	1.744	12.235	9.006	N	Odor, Light bown
	15-Mar-23	10.750	1.727	12.241	9.023	N	Light brown
	18-Apr-23	10.750	1.934	12.215	8.816	N	Light brown, moderate sulfur odour, no sheen
	16-May-23	10.750	1.871	12.235	8.879	N	Light brown, low sulphur odour, no sheen, well in good condition
	14-Jun-23	10.750	1.931	12.230	8.819	N	Weak Odor, Light yellow/clear
	24-Jul-23	10.750	1.891	12.270	8.859	N	Strong Odor, Lt yellow
	14-Aug-23	10.750	1.905	12.195	8.845	N	Brown, strong Sulphur odor, no sheen
	14-Sep-23	10.750	1.828	12.290	8.922	N	Odor, Brown
	23-Oct-23	10.750	1.586	12.225	9.164	N	Light brown, Moderate Sulphur odour, no sheen
	22-Nov-23	10.750	1.592	12.200	9.158	N	Brown, moderate sulphur odour, no sheen
	19-Dec-23	NM	NM	12.186	9.300	N	Light brown, no odor, no sheen
BH10	12-Aug-22	6.690	4.991	0.000	1.699	N	--
	18-Nov-22	6.690	4.600	3.480	2.090	N	Gauge only
	15-Feb-23	6.690	3.771	3.486	2.919	N	--
	14-Aug-23	6.690	3.473	3.490	3.217	N	Gauge only
	19-Dec-23	NM	NM	3.452	NC	Y	Gauge only
	27-Jul-22	6.630	5.837	5.280	0.793	N	Strong Odor, Light yellow
	16-Sep-22	6.630	5.783	5.304	0.847	N	Odor, Yellow
	24-Oct-22	6.630	5.760	4.315	0.870	N	Odor, Yellow
	18-Nov-22	6.630	5.450	5.290	1.180	N	Yellow, moderate sulfur odour, NS
	14-Dec-22	6.630	5.174	5.302	1.456	N	Odor, Light yellow

Williamtown Sand Syndicate
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Table 14
Gauging Data
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Well ID	Date	TOC (mAHD)	Water Table Elevation (mAHD)	Well Depth (m)	DTW (mBTOC)	Dry Indicator (Y/N)	Remark
BH11	17-Jan-23	6.630	4.836	5.300	1.794	N	Odor, Light yellow
	15-Feb-23	6.630	4.577	5.309	2.053	N	Odor, Yellow light
	15-Mar-23	6.630	4.431	5.300	2.199	N	Odor, Yellow
	18-Apr-23	6.630	4.520	5.300	2.110	N	Light yellow, strong sulfur odour, no sheen
	16-May-23	6.630	4.402	5.295	2.228	N	Light yellow, strong sulphur odour, no sheen, well in good condition
	14-Jun-23	6.630	4.410	5.280	2.220	N	Strong Odor, Yellow
	24-Jul-23	6.630	4.209	5.305	2.421	N	Strong Odor, Yellow
	14-Aug-23	6.630	4.174	5.280	2.456	N	Light yellow, strong Sulphur odor, no sheen
	14-Sep-23	6.630	4.120	5.300	2.510	N	Odor, Light yellow
	23-Oct-23	6.630	3.932	5.313	2.698	N	Clear, High Sulphur odour, no sheen
	22-Nov-23	6.630	3.810	5.230	2.820	N	Clear, Sulphur odour, no sheen
	19-Dec-23	NM	NM	5.290	2.915	N	Clear, no odor, no sheen
BH12A	16-Sep-22	5.620	3.322	7.337	2.298	N	--
	24-Oct-22	5.620	3.329	7.340	2.291	N	Light brown
	18-Nov-22	5.620	3.190	7.390	2.430	N	Gauge only
	14-Dec-22	5.620	3.033	7.370	2.587	N	--
	17-Jan-23	5.620	2.907	7.327	2.713	N	--
	15-Feb-23	5.620	2.717	7.335	2.903	N	Brown
	15-Mar-23	5.620	2.664	7.310	2.956	N	--
	18-Apr-23	5.620	2.746	7.312	2.874	N	Gauge only
	16-May-23	5.620	2.698	7.300	2.922	N	Gauge only
	14-Jun-23	5.620	2.724	7.300	2.896	N	--
	24-Jul-23	5.620	2.640	7.290	2.980	N	--
	14-Aug-23	5.620	2.631	7.290	2.989	N	Light brown, low Sulphur odor, no sheen
	14-Sep-23	5.620	3.584	7.290	2.036	N	--
	23-Oct-23	5.620	2.443	7.309	3.177	N	Gauge only
	22-Nov-23	5.620	2.418	7.310	3.202	N	Gauge only
	19-Dec-23	NM	NM	7.313	3.313	N	Light brown, low Sulphur odor, no sheen
MW239D	18-Nov-22	3.040	2.300	20.490	0.740	N	Gauge only
	15-Feb-23	3.040	1.964	20.500	1.076	N	--
	15-Aug-23	3.040	2.161	20.275	0.879	N	Gauge only
	19-Dec-23	NM	NM	20.371	0.278	N	Gauge only
MW239S	27-Jul-22	3.040	2.510	3.800	0.530	N	Strong Odor, Light yellow
	12-Aug-22	3.040	2.445	3.000	0.595	N	Odor, Cloudy yellow
	16-Sep-22	3.040	2.420	3.820	0.620	N	Odor, Yellow
	24-Oct-22	3.040	2.430	3.620	0.610	N	Odor, Clear
	18-Nov-22	3.040	2.280	3.820	0.760	N	Cloudy, low sulfur odour, NS
	14-Dec-22	3.040	2.129	3.810	0.911	N	Odor, Light brown
	17-Jan-23	3.040	2.008	3.618	1.032	N	Strong Odor, Brown
	15-Feb-23	3.040	1.939	3.815	1.101	N	Odor, Light brown
	15-Mar-23	3.040	1.952	3.805	1.088	N	Odor, Orange brown
	18-Apr-23	3.040	2.155	3.827	0.885	N	Light brown, moderate sulfur odour, no sheen
	16-May-23	3.040	2.102	3.787	0.938	N	Light brown, moderate sulphur odour, no sheen, well in good condition
	14-Jun-23	3.040	2.139	3.760	0.901	N	Odor, Clear
	24-Jul-23	3.040	2.128	3.790	0.912	N	Odor, Light brown
	15-Aug-23	3.040	2.136	3.790	0.904	N	Light yellow, strong Sulphur odor, no sheen
	14-Sep-23	3.040	2.060	3.786	0.980	N	Odor, Brown
	23-Oct-23	3.040	1.870	3.775	1.170	N	Light brown, no odour, no sheen
	22-Nov-23	3.040	1.865	3.785	1.175	N	Brown to clear, Sulphur odour, no sheen

Table 14
Gauging Data
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

Well ID	Date	TOC (mAHD)	Water Table Elevation (mAHD)	Well Depth (m)	DTW (mBTOC)	Dry Indicator (Y/N)	Remark
	19-Dec-23	NM	NM	3.780	1.298	N	Light brown, Sulphur odor, no sheen
SW1	12-Aug-22	NM	NM	NM	NC	--	Odor, Yellow
	15-Feb-23	NM	NM	NM	NC	--	Odor, Clear
	14-Aug-23	NM	NM	NM	NC	N	Clear, Green algae, no odor, no sheen
	19-Dec-23	NM	NM	NM	NC	N	Light brown, sulpher odor, slight sheen
SW2	12-Aug-22	NM	NM	NM	NC	--	Light yellow
	15-Feb-23	NM	NM	NM	NC	--	Odor, Light brown
	14-Aug-23	NM	NM	NM	NC	N	Clear, low Sulphur odor, no sheen
	19-Dec-23	NM	NM	NM	NC	N	Dy
SW3	12-Aug-22	NM	NM	NM	NC	--	Clear
	15-Feb-23	NM	NM	NM	NC	--	Odor, Yellow tanins
	14-Aug-23	NM	NM	NM	NC	N	Clear, no odor, no sheen
	19-Dec-23	NM	NM	NM	NC	N	Light brown, biofilm, organic odor
SW4	12-Aug-22	NM	NM	NM	NC	--	Clear
	15-Feb-23	NM	NM	NM	NC	--	Odor, Yellow tanins
	14-Aug-23	NM	NM	NM	NC	N	Clear, no odor, no sheen
	19-Dec-23	NM	NM	NM	NC	N	Brown, Bio film, organic odour
WPW	27-Jul-22	NM	NM	NM	NC	--	Dark cloudy brown
	12-Aug-22	NM	NM	NM	NC	--	Light brown
	16-Sep-22	NM	NM	NM	NC	--	Brown
	24-Oct-22	NM	NM	NM	NC	--	Dark brown
	14-Dec-22	NM	NM	NM	NC	--	Brown
	17-Jan-23	NM	NM	NM	NC	--	Weak Odor, Brown
	15-Feb-23	NM	NM	NM	NC	--	Clear
	15-Mar-23	NM	NM	NM	NC	--	Odor, Brown
WPW2	18-Apr-23	NM	NM	NM	NC	--	Light brown, low earthy odour, no sheen
	14-Jun-23	NM	NM	NM	NC	--	Turbid muddy brown
	24-Jul-23	NM	NM	NM	NC	--	Odor, Dark brown
	14-Aug-23	NM	NM	NM	NC	N	Light brown, earthy odor, no sheen
	14-Sep-23	NM	NM	NM	NC	--	Odor, Brown
	23-Oct-23	NM	NM	NM	NC	N	Brown, earthy odour, no sheen
	19-Dec-23	NM	NM	NM	NC	N	Brown, earthy odor, no sheen

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 15
Field Parameters
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

	Parameters	DO	ORP	PH	SC	TDS	TEMP	TURB
	Unit	mg/L	mV	pH units	uS/cm	mg/L	deg C	NTU
Sample Name	Date							
BH1A	15-Feb-23	5.8	192.5	4.33	82.6	55	23.8	--
	14-Aug-23	4.1	252.3	4.05	101.5	66	18.4	72
	19-Dec-23	6.33	214.6	4.28	114.7	75	25	27.8
BH2	27-Jul-22	5.85	223	4.13	87.6	--	15.6	131
	12-Aug-22	4.34	269.7	4.52	53	--	16.7	15.58
	16-Sep-22	3.28	262.7	4.76	80.7	60	18.1	710.34
	24-Oct-22	4.55	218.8	4.71	73.6	55	18.5	33.87
	18-Nov-22	1.9	213.9	4.7	73.2	54	19	--
	14-Dec-22	4.14	229.7	4.79	78.6	51	19.3	27.86
	17-Jan-23	3.88	211.3	4.69	75.6	228.72	21.7	240.6
	15-Feb-23	4.2	300.5	4.54	70.9	50	21	133.94
	15-Mar-23	3.62	227.7	4.67	69	49	20.8	103
	18-Apr-23	4.84	224.5	4.88	64.6	4.6	20.2	44.8
	16-May-23	3.27	234	4.54	64.1	47	18.6	--
	14-Jun-23	3.1	258	4.43	79.2	52	17.9	0.86
	14-Jun-23	3.1	258	4.43	79.2	52	17.9	0.86
	24-Jul-23	4.14	103.7	4.57	84	64	17.4	40
	14-Aug-23	64	187.8	4.38	102.5	67	18.1	164
	14-Sep-23	3.13	209.2	4.72	71.9	55	17	44.01
	23-Oct-23	3.87	177	5.69	79.5	56	21.3	50.58
	22-Nov-23	5.32	183.4	5.34	55.6	43	19.3	85
	19-Dec-23	7.11	173.9	4.64	299.6	68	22.4	398
BH4	27-Jul-22	3	190.7	4.6	90.2	--	14.1	121
	12-Aug-22	3.25	236	4.86	77	--	15.5	10.2
	16-Sep-22	5.35	163.8	5.29	75.2	60	15.4	34.07
	24-Oct-22	3.52	162.3	5.45	--	57	17.8	45.42
	18-Nov-22	3.57	170.6	5.32	80.2	62	16.8	--
	14-Dec-22	3.95	119.8	5.59	92.5	60	18.1	16.36
	17-Jan-23	1.89	159.5	5.31	128.8	91	20.9	8
	15-Feb-23	2.6	166	5.47	115.5	82	20.8	29.64
	15-Mar-23	4.46	179	5.22	92.5	65	21	8.26
	18-Apr-23	4.84	196.7	5.27	70.3	52	18.7	8.45
	16-May-23	3.96	217.9	4.84	65.5	56	16.8	--
	14-Jun-23	2.7	157.9	4.97	92.8	60	16.4	3.33
	14-Jun-23	2.7	157.9	4.97	92.8	60	16.4	3.33
	24-Jul-23	3.41	215.7	5.18	66	53	15.3	7.71
	14-Aug-23	4.9	143.9	5.11	87.7	57	15.6	18.06
	14-Sep-23	4.53	213	5.06	70.8	56	15.2	27.65
	23-Oct-23	3.58	155.7	6.16	126.4	95	18.1	29.4
	22-Nov-23	3.35	200	5.93	69.2	50	20	24
	19-Dec-23	2.38	196.4	4.76	99.9	69	21.9	35
BH5	15-Feb-23	3	15.6	4.64	132.9	88	23.9	75.75
	27-Jul-22	4.75	-104	4.76	225	--	14.2	16.8
	12-Aug-22	3.94	-80	5.1	217	--	14.2	156
	16-Sep-22	2.64	-112.5	5.18	229.4	71	18.1	101.53
	24-Oct-22	1.75	-66.8	4.01	84.3	171	18.3	65.7

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 15
Field Parameters
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

	Parameters	DO	ORP	PH	SC	TDS	TEMP	TURB
	Unit	mg/L	mV	pH units	uS/cm	mg/L	deg C	NTU
Sample Name	Date							
BH6	18-Nov-22	2.29	-85.2	4.14	224.4	156	21.7	--
	14-Dec-22	1.72	-45.6	4.11	232.3	151	21.1	35
	17-Jan-23	2.46	-7	3.82	245.5	162	24.5	34.06
	15-Feb-23	3	-57.2	4.55	233.8	148	26.4	88.41
	15-Mar-23	4.29	150.2	4.09	233.2	155	23.9	32.96
	18-Apr-23	2.64	-60.1	4.85	195.4	137	21	19.48
	16-May-23	3.45	-39.9	4.8	195.1	140	20.2	--
	14-Jun-23	2.9	-49.9	4.59	242.1	157	15.7	82.08
	14-Jun-23	2.9	-49.9	4.59	242.1	157	15.7	82.08
	24-Jul-23	8.84	97	4.91	230.2	174	17.7	230
	14-Aug-23	1.9	38.3	4.36	275.9	179	14.6	39
	14-Sep-23	3.6	-11	4.79	207.7	164	15.6	30.2
	23-Oct-23	3.9	2.8	7.68	2.8	150	20.7	107.4
	22-Nov-23	3.24	-90.4	5.38	202.2	142	20.9	31
	19-Dec-23	2.44	-55.5	4.46	319.8	206	25.5	25.7
BH7	27-Jul-22	4.21	26	4.43	117	--	14.3	489
	12-Aug-22	3.98	11	4.84	110	--	14.9	110.4
	16-Sep-22	2.92	65.6	4.78	94.1	71	17.6	101.6
	24-Oct-22	3.52	-93.2	4.72	81.9	62	17.7	68.09
	18-Nov-22	3.35	-92.5	4.75	78.4	54	22.1	--
	14-Dec-22	3.82	-72.2	4.74	70.1	46	21.6	35.8
	17-Jan-23	2.98	38	4.49	74.1	51	22	15.49
	15-Feb-23	3.4	-50.1	4.68	70.4	45	25.4	70.91
	15-Mar-23	4.06	4	4.62	75.9	51	23.2	28.4
	18-Apr-23	4.02	174.3	4.8	82.9	58	21	51.83
	16-May-23	1.84	161.2	4.18	75.2	54	20	--
	14-Jun-23	2.9	99.5	4.66	87.2	57	16.1	184
	14-Jun-23	2.9	99.5	4.66	87.2	57	16.1	184
	24-Jul-23	5.6	159.2	4.83	90.6	71	16.3	58
	14-Aug-23	3.5	123.5	4.45	102.8	67	15.3	55
	14-Sep-23	3.26	26.6	4.87	81.5	64	15.8	49
	23-Oct-23	5.91	5.3	6.88	5.3	71	21.1	110
	22-Nov-23	2.19	-78	5.3	86.6	62	20.5	66
	19-Dec-23	2.97	-0.6	4.38	145.7	96	24.9	38.22
BH8	12-Aug-22	4.2	-67.9	4.81	135	--	14.7	782
	18-Nov-22	3.4	-97.2	4.66	98.5	69	20.7	--
	15-Feb-23	1.7	-108.51	4.81	129.9	82	26.7	45.25
	16-May-23	2.72	-85.5	4.81	113.1	84	18.6	--
	14-Aug-23	3.4	-19.2	4.26	163.3	106	15.3	271
	19-Dec-23	2.39	-12.9	4.27	221.4	140	26.2	238.93
	27-Jul-22	4.93	208.5	4.11	182.8	--	16.6	52
	12-Aug-22	3.96	249	4.46	186	--	17.6	41.5
	16-Sep-22	3.65	241.4	4.69	132	99	18	45.22
	24-Oct-22	2.84	196.2	4.76	118	87	19	36.09
	18-Nov-22	2.04	86.3	4.79	112	84	18.1	--
	14-Dec-22	2.32	166	4.75	107.7	70	18.7	61

Table 15
Field Parameters
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

	Parameters	DO	ORP	PH	SC	TDS	TEMP	TURB
	Unit	mg/L	mV	pH units	uS/cm	mg/L	deg C	NTU
Sample Name	Date							
BH9A	17-Jan-23	1.94	111.5	4.73	107.4	75	21.4	32.2
	15-Feb-23	3.2	29.5	3.83	171.6	119	21.6	87.9
	15-Mar-23	4.24	171.7	4.83	103.3	72	21.9	51.32
	18-Apr-23	3.5	9.5	4.83	123.5	90	19.5	69.85
	16-May-23	6.01	44.1	4.6	103.9	80	17.1	--
	14-Jun-23	3.6	168.9	4.45	107.6	70	18.2	66.18
	14-Jun-23	3.6	168.9	4.45	107.6	70	18.2	66.18
	24-Jul-23	4.13	195.5	4.69	125.6	95	17.8	55.5
	14-Aug-23	2.6	77.5	4.33	164.1	107	17.9	121.51
	14-Sep-23	3.85	37.3	4.7	96.2	73	17.6	55.55
	23-Oct-23	4.18	32.5	5.63	32.5	51	20.2	94
	22-Nov-23	2.3	1	5.3	162.9	117	19.9	85
	19-Dec-23	3.52	167.4	4.78	167.4	113	23.1	51.52
BH11	27-Jul-22	4.74	-39	4.2	158	--	14	9.7
	16-Sep-22	2.46	-63.9	4.54	118.4	89	18	26.3
	24-Oct-22	2.12	-92.9	4.37	120.3	90	18.1	23.72
	18-Nov-22	2.01	-100.5	4.47	120.7	89	18.8	--
	14-Dec-22	3.19	-86	4.48	130.2	85	19.1	73
	17-Jan-23	2.16	-80.5	4.31	133.5	89	23.9	5.8
	15-Feb-23	4	-66.5	4.45	110.1	76	22.1	53.17
	15-Mar-23	3.05	-43.4	4.58	102.9	71	21.6	4.83
	18-Apr-23	3.11	-69.5	4.61	100.1	72	20.1	417.6
	16-May-23	3.13	-60	4.45	111.1	83	18.4	--
	14-Jun-23	2.5	-48.9	4.38	122.9	80	16.6	74.09
	14-Jun-23	2.5	-48.9	4.38	122.9	80	16.6	74.09
	24-Jul-23	5.69	-35.6	4.45	102.2	80	16	133
	14-Aug-23	3	16	4.26	125.2	81	16.5	75
	14-Sep-23	3.34	-83.7	4.77	91	72	15.8	104.53
	23-Oct-23	3.43	4.3	6.07	93.6	66	20.6	47.66
	22-Nov-23	4.19	-94	5.45	79.5	58	19.1	45
	19-Dec-23	3.5	-15.4	4.62	124	83	23.3	4.23
BH12A	24-Oct-22	2.94	141.5	4.95	120.8	89	18.8	146
	15-Feb-23	2.5	167.5	4.93	138.4	90	24.9	287.01
	14-Aug-23	2.9	166.6	3.82	137.5	89	16.5	21
	19-Dec-23	2.69	168.5	4.5	151	100	24.1	30.65
MW239S	27-Jul-22	4	-71	4.32	125	--	14.2	175
	12-Aug-22	2.73	-69	4.6	115	--	15.2	310
	16-Sep-22	3.65	-79.71	4.83	102.4	77	17.9	129.37
	24-Oct-22	2.33	-117.7	4.72	86.5	65	18	83.71
	18-Nov-22	1.93	-113	4.74	97.3	67	22	--
	14-Dec-22	3.05	-62	4.62	115.4	75	21.5	239
	17-Jan-23	2.61	-9.4	4.52	100.2	67	23.6	105.4
	15-Feb-23	3.1	-62.6	4.51	114.2	72	26.6	145
	15-Mar-23	3.02	-4.1	4.61	102.4	70	22.5	206.44
	18-Apr-23	3.29	-85	4.78	87.2	63	20.1	84.02
	16-May-23	2.75	-50.4	4.52	84.7	63	18.6	--

Table 15
Field Parameters
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

	Parameters	DO	ORP	PH	SC	TDS	TEMP	TURB
	Unit	mg/L	mV	pH units	uS/cm	mg/L	deg C	NTU
Sample Name	Date							
	14-Jun-23	2.4	-77.3	4.58	100.8	66	17.4	88.4
	14-Jun-23	2.4	-77.3	4.58	100.8	66	17.4	88.4
	24-Jul-23	4.37	-57	4.53	84.6	67	15.6	217
	15-Aug-23	3.3	-34	4.77	105.9	69	15.1	223
	14-Sep-23	3.22	-68.1	4.69	93.1	72	17	339
	23-Oct-23	3.29	2.9	7.72	87.6	59	22.9	132
	22-Nov-23	3.07	-78.8	5.26	79.6	56	20.9	180
	19-Dec-23	3.07	-60.7	4.41	212	138	25	120
SW1	12-Aug-22	2.97	182	5.18	140	--	12.6	4.3
	18-Nov-22	0.89	154.6	5.45	99.5	78	15.9	--
	15-Feb-23	4	117.8	6.37	138.5	97	21.1	20.69
	16-May-23	3.58	75.7	6.34	82.4	69	13.3	--
	14-Aug-23	2.8	0.8	6.31	114.5	74	12.5	5.67
	19-Dec-23	6.88	103.3	6.7	112.2	73	25.2	28.17
SW2	12-Aug-22	1.11	-40	4.95	88.2	--	12.9	23
	18-Nov-22	2.49	122	4.62	82.5	61	18.4	--
	15-Feb-23	2.5	-27.9	4.39	137.7	90	23.9	80.7
	16-May-23	3.62	206.2	4.02	147.8	116	15.8	--
	14-Aug-23	1.7	52.7	4.15	203.9	133	14	0.5
SW3	12-Aug-22	1.4	41.1	3.99	259.8	--	11.9	2.8
	18-Nov-22	3.09	80.4	5.62	227.1	164	19.5	--
	15-Feb-23	3	-72	4.72	215.5	138	25.6	43.33
	16-May-23	0.98	-24	4.36	176	143	14.7	--
	14-Aug-23	2.8	0.8	6.31	114.5	74	12.5	5.67
	19-Dec-23	0.7	-120	5.54	316.5	225	20.4	20
SW4	12-Aug-22	3.75	224	4.57	214	--	11.3	1.34
	18-Nov-22	3.5	130.2	4.43	217.9	149	22.4	--
	15-Feb-23	0.7	-74	5.75	253.3	172	22.7	4.1
	16-May-23	3.74	292.9	3.96	209.7	172	14	--
	14-Aug-23	4.3	281.1	3.84	258.6	168	10.9	1.4
	19-Dec-23	0.18	-147	6.57	506	340	23.4	70.1
WPW	12-Aug-22	10.09	210	5.06	255	--	14.7	205
	16-Sep-22	9.42	174.5	4.7	208.2	149	20	1000.34
	24-Oct-22	9.11	145.4	4.73	199.4	143	20.2	4120.3
	18-Nov-22	8.57	209.5	4.77	253.6	167	24.3	--
	14-Dec-22	8.64	189.5	4.97	267.8	174	22.1	3055.6
	17-Jan-23	8.24	195.3	4.69	264.1	167	26.5	415
	15-Mar-23	8.29	171.9	4.83	297.2	195	24.7	468.5
WPW2	15-Feb-23	8.2	470.7	6.1	272	164	29	4.88
	18-Apr-23	8.61	203.3	5	226.3	163	20	56.08
	16-May-23	9.61	249.7	4.71	230.1	173	17.8	--
	14-Jun-23	10.7	168.3	4.46	263.5	171	14.6	1037
	14-Jun-23	10.7	168.3	4.46	263.5	171	14.6	1037
	24-Jul-23	11.79	448	2.65	1207	980	14.5	1300
	14-Aug-23	10.2	205.6	4.41	242.8	158	15.9	42
	14-Sep-23	9.94	156.3	4.8	208.8	162	16.6	483

Williamtown Sand Syndicate
December 2023
Monthly Water Monitoring Event

Table 15
Field Parameters
WSS Cabbage Tree Road Sand Quarry
Cabbage Tree Road, Wiliamtown, NSW

	Parameters	DO	ORP	PH	SC	TDS	TEMP	TURB
	Unit	mg/L	mV	pH units	uS/cm	mg/L	deg C	NTU
Sample Name	Date							
	23-Oct-23	8.52	130.2	6.35	116.7	78	23.9	498
	22-Nov-23	8.4	151.3	5.06	200	136	22.8	360
	19-Dec-23	7.87	174	4.69	372.2	219	30.4	180

Calibration Date 8/12/23 **Technician:** AK

Handheld Serial Number: 23F105150 **Handheld Software Version:** 1.3.35

Cable Serial Number: 23L103080

Temperature

Reading when sensor is dry and in room temp air: 29.6 *Accurate?* (Y) N ✓

Conductivity

Reading when sensor is dry and in room temp air: 6.9 *Acceptable value is less than* **1 µS/cm**

Actual Reading in solution before calibration is accepted: 1032

Reading in calibration solution after calibration is completed: 1418

Conductivity Cell Constant in GLP record after calibration:* 6.408 ✓

Acceptable range for ProDSS conductivity/temperature sensors (626902) is **4.5** *to* **6.5**

Acceptable range for integral (i.e. built-in) sensors on ODO/CT assemblies is **4.4** *to* **6.4**

Optical Dissolved Oxygen

Barometric pressure: 759.1

Actual Reading before DO% calibration is accepted: 95.0

Reading in DO% calibration environment after calibration is completed: 100.0

ODO gain in GLP record after calibration: 1.020 *Acceptable range is* **0.75** *to* **1.50** ✓

pH

		Actual Readings during calibration		
Buffer	Calibration Value	pH	pH mV**	Acceptable pH mV in buffer
7	7.08	7.72	-20.6	-50 mV to 50 mV
4	4.0	4.63	148.4	+165 to +180 from pH 7 buffer mV value
10	10.15	10.70	-185.0	-165 to -180 from pH 7 buffer mV value

pH slope in GLP record after calibration: 56.85 *Acceptable range is ~* **55** *to* **60** *pH/mV* ✓

(Ideal is 59.16 mV/pH)

ORP

Actual Reading in solution before calibration is accepted: 242.2

Reading in calibration solution after calibration is completed: 242.2

ORP Cal Offset in GLP record after calibration: 0 *Acceptable range is* **-100** *to* **50** ✓

**GLP stands for Good Laboratory Practice file. This calibration record contains important information about the calibration result.*

***The pH mV at the time of calibration (Sensor Value) can also be seen in the final pH GLP record.*

Turbidity

Calibration value (FNU)*	Actual Reading during calibration
0	-0.40
12.4*	
124*	127.07
1010	1306.63

*Acceptable range for **Actual Reading** during calibration of the first point is **-10** to **10** FNU*

***Note:** The turbidity sensor can be calibrated to 3 points. Either 12.4 or 124 FNU standard can be used for the second point, but not both. Other calibration values can be used when calibrating.*

Depth (Completed in Air)

*Actual Reading before calibration is accepted:*_____

*Reading in air after calibration is completed:*_____

Ammonium

	Actual Readings during calibration		
Concentration** (i.e. Calibration Value)	mg/L	mV***	Acceptable mV when the sensor is new
1st point: 1 mg/L			-20 mV to 20 mV
2nd point: 100 mg/L			+90 to +130 from mV value in 1 mg/L standard

Nitrate

	Actual Readings during calibration		
Concentration** (i.e. Calibration Value)	mg/L	mV***	Acceptable mV when the sensor is new
1st point: 1 mg/L			180 mV to 220 mV
2nd point: 100 mg/L			-90 to -130 from mV value in 1 mg/L standard

Chloride

	Actual Readings during calibration		
Concentration** (i.e. Calibration Value)	mg/L	mV***	Acceptable mV when the sensor is new
1st point: 10 mg/L			205 mV to 245 mV
2nd point: 1,000 mg/L			-80 to -130 from mV value in 10 mg/L standard

***Other standard concentrations can be used. A 2 point calibration without chilling a third calibration solution is extremely accurate and is the preferred method. However, if there is a large temperature variation during sampling, a chilled third calibration point is recommended.*

****The mV at the time of calibration (Sensor Value) for each point can also be seen in the GLP record after a calibration is complete.*

KLEINFELDER

HYDRASLEEVE™ SAMPLING LOG

Project Number:	Date:	Site Address:
24001956	19/12/23	Cabbage Tree Road

Site Name:	Field Manager:	Weather Observations:
WSS	TJ	Sunny, high humidity, 35°C

Field Measurements													
Well ID	Sample Time	DTW (mbTOC)	Total Depth (mbTOC)	Sample Depth (mbTOC)	Temp (°C)	DO (mg/L)	EC (µc/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Description (Odour, Colour, Sheen)
BH1A	10:33	5.832	12.050	7.0	25.0	6.53	114.7	75	4.28	214.6	27.8	clear, NIS N/O
BH2	10:35	5.512	~~5.512~~	6.70	22.4	2.11	94.6	68	4.64	173.9	398	Brown, NS, ~~Dam~~ odour was locked
BH4	9:40	1.717	~~1.717~~	2.9	21.9	2.38	99.9	69	4.76	196.4	35.00	Lbrow, NS, NO
BH5	1:55	5.924	8.773									
BH6	2:10	0.656	4.524	2.00	25.5	2.44	319.8	208	4.64	~~55.5~~	25.7	Brown, HS odour, NS
BH7	1:50	1.691	4.506	2.70	24.0	2.97	145.7	96	4.38	-0.6	38.22	
BH8	1:30	2.545	6.200	3.70	26.2	2.39	221.4	140	4.27	-12.9	238.4	light brown, NIS HS odor
BH9	10:13	Dry	16.682									
BH9A	09:00	9.300	12.186	10.50	23.1	3.52	167.4	113	4.28	192.7	51.52	light brown, NIS, N/O
BH10	11:34	Dry	3.452	Dry								
BH11	11:10	2.915	5.290	4.0	23.3	3.5	1240	83	4.62	-15.4	4.23	Clear, NIS, HS odour
BH12A		3.313	7.313	3.5	24.1	2.69	151.0	100	4.58	168.5	30.65	
MW239S	2:20	1.248	5.180	2.5	25	3.07	212	138	4.41	-66.7	120	Lbr, HS odour, NIS
MW239D	2:20	0.278	20.57									
WPW2	12:10	–	–	–	30.4	7.87	372.2	249	4.69	174.0	180	Brown, NS, Earthy odour
WPF	12:10	–	–	–								Brown, Saturated

Damaged wells (identify how damaged): _____

*Sample Depth is reported as bottom of hydrasleeve depth

KLEINFELDER

HYDRASLEEVE™ SAMPLING LOG

Project Number:	Date:	Site Address:
24001956	9/11/23	Cabbage Tree Road.

Site Name:	Field Manager:	Weather Observations:
WSS	RS	Sunny 35°C

Field Measurements												
Well ID	Sample Time	DTW (mbTOC)	Total Depth (mbTOC)	Sample Depth (mbTOC)	Temp (°C)	DO (mg/L)	EC (µc/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Description (Odour, Colour, Sheen)
SW1	10.00		0.2	0.1	25.2	6.58	112.2	73	6.70	102.3	28.17	Sulpher smell, light sheen
SW2	3:00	PD										PD
SW3	2:31		0.2	0.1	20.4	0.7	367	225	5.54	-120	20	light brown, biofilm, organic odour
SW4	12:30		0.4	0.2	25.4	0.13	506	340	6.57	-147.0	20.1	Brown, Biofilm, organic odour

QL01 & QL01A

Damaged wells (identify how damaged): _____

*Sample Depth is reported as bottom of hydrasleeve depth

QL01

KLEINFELDER
Bright People. Right Solutions.

QA/QC SAMPLE REGISTER

Project Number:	Site Name:	Site Address:
240019SG	WSS	Cabbage Tree Passage

Date:	Field Manager:
19/12/23	TS

Date Sampled	Field Staff	QC Sample ID	QC Sample Type	Primary Sample	Rinsate Item (Hand auger, low flow pump etc.)	Rinsate Water Batch	Analysing Lab	Analysis Requested
19/12/23	TS	QC01	Duplicate	SW4	—	—	ALS	See COC
		QC01A	Triplicate	SW4	—	—	Eurofins	
		TB_191223	Trip Blank	—	IP	—	ALS	
		RB_191223	Rinsate	—	IP	—	ALS	

COMMENTS:

ATTACHMENT 3: LABORATORY DOCUMENTATION AND COCS

CERTIFICATE OF ANALYSIS

Work Order	: **ES2344095**	Page	: 1 of 22
Client	: **KLEINFELDER AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: Mr Tom Jeffery	Contact	: Jason Dighton
Address	: 95 MITCHELL ROAD CARDIFF NSW 2285	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 2400956	Date Samples Received	: 19-Dec-2023 15:40
Order number	: ----	Date Analysis Commenced	: 20-Dec-2023
C-O-C number	: ----	Issue Date	: 02-Jan-2024 15:13
Sampler	: Tom Jeffery		
Site	: WSS Cabbage Tree Road		
Quote number	: EN/222		
No. of samples received	: 18		
No. of samples analysed	: 18		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
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

General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- 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: LORs have been raised for some samples due to high moisture content.
- EP080: Batch ES2344095 toluene results have been confirmed by re-analysis.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	WPF	----	----	----	----
			Sampling date / time	19-Dec-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2344095-014	--------	--------	--------	--------
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**85.6**	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**6**	----	----	----	----
Barium	7440-39-3	10	mg/kg	<30	----	----	----	----
Chromium	7440-47-3	2	mg/kg	**85**	----	----	----	----
Copper	7440-50-8	5	mg/kg	<5	----	----	----	----
Iron	7439-89-6	50	mg/kg	**44500**	----	----	----	----
Manganese	7439-96-5	5	mg/kg	**40**	----	----	----	----
Nickel	7440-02-0	2	mg/kg	**6**	----	----	----	----
Zinc	7440-66-6	5	mg/kg	**17**	----	----	----	----
Magnesium	7439-95-4	50	mg/kg	**480**	----	----	----	----
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	**0.0007**	----	----	----	----
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	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	WPF	----	----	----	----
				Sampling date / time	19-Dec-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2344095-014	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
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	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		**0.0003**	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0006	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0006	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0006	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0006	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0006	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	WPF	----	----	----	----
				Sampling date / time	19-Dec-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2344095-014	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0010**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0007**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0007**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**100**	----	----	----	----
13C8-PFOA	----	0.0002	%		**104**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BH1A	BH2	BH4	BH6	BH7
				Sampling date / time	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		ES2344095-001	ES2344095-002	ES2344095-003	ES2344095-004	ES2344095-005
					Result	Result	Result	Result	Result
ED093F: Dissolved Major Cations									
Magnesium	7439-95-4	1	mg/L		<1	<1	<1	**7**	**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
Barium	7440-39-3	0.001	mg/L		**0.005**	**0.002**	**0.008**	**0.011**	**0.004**
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	**0.003**
Copper	7440-50-8	0.001	mg/L		**0.003**	**0.002**	**0.003**	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L		**0.006**	**0.003**	**0.007**	**0.004**	**0.004**
Nickel	7440-02-0	0.001	mg/L		**0.002**	**0.001**	<0.001	<0.001	**0.002**
Zinc	7440-66-6	0.005	mg/L		**0.021**	**0.015**	<0.005	**0.040**	**0.054**
Iron	7439-89-6	0.05	mg/L		<0.05	**0.21**	**0.12**	**1.70**	**0.40**
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup									
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
^ **C10 - C36 Fraction (sum)**	----	50	µg/L		<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
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L		<100	<100	<100	<100	<100
>C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	<100	<100
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<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
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	<20

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BH1A	BH2	BH4	BH6	BH7
				Sampling date / time	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		ES2344095-001	ES2344095-002	ES2344095-003	ES2344095-004	ES2344095-005
					Result	Result	Result	Result	Result
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L		**5**	**6**	**4**	**6**	**6**
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
^ **Total Xylenes**	----	2	µg/L		<2	<2	<2	<2	<2
^ **Sum of BTEX**	----	1	µg/L		**5**	**6**	**4**	**6**	**6**
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
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

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BH1A	BH2	BH4	BH6	BH7
				Sampling date / time	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		ES2344095-001	ES2344095-002	ES2344095-003	ES2344095-004	ES2344095-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
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									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BH1A	BH2	BH4	BH6	BH7
				Sampling date / time	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		ES2344095-001	ES2344095-002	ES2344095-003	ES2344095-004	ES2344095-005
					Result	Result	Result	Result	Result
EP231P: PFAS Sums - Continued									
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	%		**122**	**85.8**	**122**	**111**	**113**
Toluene-D8	2037-26-5	2	%		**99.0**	**80.2**	**97.1**	**100**	**101**
4-Bromofluorobenzene	460-00-4	2	%		**115**	**97.8**	**110**	**124**	**124**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**106**	**106**	**108**	**110**	**115**
13C8-PFOA	----	0.02	%		**104**	**101**	**102**	**106**	**101**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BH8	BH9A	BH11	BH12A	MW239S
				Sampling date / time	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		ES2344095-006	ES2344095-007	ES2344095-008	ES2344095-009	ES2344095-010
					Result	Result	Result	Result	Result
ED093F: Dissolved Major Cations									
Magnesium	7439-95-4	1	mg/L		**2**	**2**	**3**	**2**	**2**
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		**0.002**	<0.001	<0.001	<0.001	<0.001
Barium	7440-39-3	0.001	mg/L		**0.011**	**0.007**	**0.003**	**0.004**	**0.006**
Chromium	7440-47-3	0.001	mg/L		**0.002**	<0.001	**0.002**	**0.003**	**0.002**
Copper	7440-50-8	0.001	mg/L		<0.001	**0.002**	<0.001	**0.001**	<0.001
Manganese	7439-96-5	0.001	mg/L		**0.006**	**0.032**	**0.004**	**0.017**	**0.003**
Nickel	7440-02-0	0.001	mg/L		**0.002**	**0.003**	**0.001**	<0.001	**0.002**
Zinc	7440-66-6	0.005	mg/L		**0.029**	**0.050**	**0.019**	**0.046**	**0.020**
Iron	7439-89-6	0.05	mg/L		**2.03**	**0.40**	**0.68**	**1.41**	**1.06**
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup									
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
^ **C10 - C36 Fraction (sum)**	----	50	µg/L		<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
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L		<100	<100	<100	<100	<100
>C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	<100	<100
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<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
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	<20

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BH8	BH9A	BH11	BH12A	MW239S
				Sampling date / time	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		ES2344095-006	ES2344095-007	ES2344095-008	ES2344095-009	ES2344095-010
					Result	Result	Result	Result	Result
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L		**4**	**7**	**6**	**3**	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
^ **Total Xylenes**	----	2	µg/L		<2	<2	<2	<2	<2
^ **Sum of BTEX**	----	1	µg/L		**4**	**7**	**6**	**3**	<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
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

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BH8	BH9A	BH11	BH12A	MW239S
				Sampling date / time	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		ES2344095-006	ES2344095-007	ES2344095-008	ES2344095-009	ES2344095-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
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									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BH8	BH9A	BH11	BH12A	MW239S
				Sampling date / time	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		ES2344095-006	ES2344095-007	ES2344095-008	ES2344095-009	ES2344095-010
					Result	Result	Result	Result	Result
EP231P: PFAS Sums - Continued									
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	%		**110**	**117**	**110**	**116**	**108**
Toluene-D8	2037-26-5	2	%		**103**	**101**	**96.7**	**95.6**	**101**
4-Bromofluorobenzene	460-00-4	2	%		**122**	**121**	**120**	**118**	**122**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**105**	**104**	**106**	**105**	**100**
13C8-PFOA	----	0.02	%		**99.4**	**101**	**104**	**103**	**102**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	SW3	SW4	WPW2	TB_19/12/23	RB_19/12/23
				Sampling date / time	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		ES2344095-011	ES2344095-012	ES2344095-013	ES2344095-015	ES2344095-016
					Result	Result	Result	Result	Result
ED093F: Dissolved Major Cations									
Magnesium	7439-95-4	1	mg/L		**3**	**3**	----	<1	<1
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		----	----	**0.10**	----	----
Arsenic	7440-38-2	0.001	mg/L		**0.002**	**0.006**	----	<0.001	<0.001
Barium	7440-39-3	0.001	mg/L		**0.013**	**0.009**	----	<0.001	<0.001
Chromium	7440-47-3	0.001	mg/L		**0.001**	**0.003**	----	<0.001	<0.001
Cobalt	7440-48-4	0.001	mg/L		<0.001	<0.001	----	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L		**0.003**	<0.001	----	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L		**0.023**	**0.017**	**0.063**	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L		**0.001**	<0.001	----	<0.001	<0.001
Zinc	7440-66-6	0.005	mg/L		**0.005**	**0.006**	----	<0.005	<0.005
Boron	7440-42-8	0.05	mg/L		<0.05	<0.05	----	<0.05	<0.05
Iron	7439-89-6	0.05	mg/L		**8.60**	**45.1**	**0.07**	<0.05	<0.05
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup									
C10 - C14 Fraction	----	50	µg/L		<50	<50	----	<50	<50
C15 - C28 Fraction	----	100	µg/L		<100	<100	----	<100	<100
C29 - C36 Fraction	----	50	µg/L		<50	<50	----	<50	<50
^ **C10 - C36 Fraction (sum)**	----	50	µg/L		<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
>C16 - C34 Fraction	----	100	µg/L		<100	<100	----	<100	<100
>C34 - C40 Fraction	----	100	µg/L		<100	<100	----	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L		<100	<100	----	<100	<100
>C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	----	<100	<100
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	<20	<20
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	SW3	SW4	WPW2	TB_19/12/23	RB_19/12/23
				Sampling date / time	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		ES2344095-011	ES2344095-012	ES2344095-013	ES2344095-015	ES2344095-016
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	----	<20	<20
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L		<20	<20	----	<20	<20
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	----	<1	<1
Toluene	108-88-3	2	µg/L		<2	**6**	----	**3**	**5**
Ethylbenzene	100-41-4	2	µg/L		<2	<2	----	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	----	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	----	<2	<2
^ **Total Xylenes**	----	2	µg/L		<2	<2	----	<2	<2
^ **Sum of BTEX**	----	1	µg/L		<1	**6**	----	**3**	**5**
Naphthalene	91-20-3	5	µg/L		<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
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

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	SW3	SW4	WPW2	TB_19/12/23	RB_19/12/23
				Sampling date / time	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		ES2344095-011	ES2344095-012	ES2344095-013	ES2344095-015	ES2344095-016
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
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

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	SW3	SW4	WPW2	TB_19/12/23	RB_19/12/23
				Sampling date / time	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00	19-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		ES2344095-011	ES2344095-012	ES2344095-013	ES2344095-015	ES2344095-016
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**0.03**	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	**0.02**	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	**0.03**	<0.01	<0.01
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**106**	**114**	**----**	**113**	**118**
Toluene-D8	2037-26-5	2	%		**98.1**	**97.6**	**----**	**91.6**	**99.9**
4-Bromofluorobenzene	460-00-4	2	%		**120**	**121**	**----**	**119**	**123**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**111**	**107**	**105**	**105**	**106**
13C8-PFOA	----	0.02	%		**103**	**108**	**101**	**102**	**106**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	QC01	SW1	----	----	----
			Sampling date / time	19-Dec-2023 00:00	19-Dec-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES2344095-017	ES2344095-018	--------	--------	--------
				Result	Result	----	----	----
ED093F: Dissolved Major Cations								
Magnesium	7439-95-4	1	mg/L	**3**	**2**	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	**0.006**	<0.001	----	----	----
Barium	7440-39-3	0.001	mg/L	**0.009**	**0.016**	----	----	----
Chromium	7440-47-3	0.001	mg/L	**0.003**	<0.001	----	----	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	**0.001**	----	----	----
Manganese	7439-96-5	0.001	mg/L	**0.017**	**0.074**	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	**0.006**	----	----	----
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	----	----	----
Iron	7439-89-6	0.05	mg/L	**45.9**	**0.70**	----	----	----
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup								
C10 - C14 Fraction	----	50	µg/L	<50	<50	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	<50	<50	----	----	----
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup								
>C10 - C16 Fraction	----	100	µg/L	<100	<100	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	<100	<100	----	----	----
>C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	QC01	SW1	----	----	----
				Sampling date / time	19-Dec-2023 00:00	19-Dec-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2344095-017	ES2344095-018	--------	--------	--------
					Result	Result	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L		<20	<20	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	----	----	----
Toluene	108-88-3	2	µg/L		**6**	**4**	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	----	----	----
^ **Total Xylenes**	----	2	µg/L		<2	<2	----	----	----
^ **Sum of BTEX**	----	1	µg/L		**6**	**4**	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	QC01	SW1	----	----	----
				Sampling date / time	19-Dec-2023 00:00	19-Dec-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2344095-017	ES2344095-018	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	QC01	SW1	----	----	----
				Sampling date / time	19-Dec-2023 00:00	19-Dec-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2344095-017	ES2344095-018	--------	--------	--------
					Result	Result	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**123**	**130**	----	----	----
Toluene-D8	2037-26-5	2	%		**103**	**104**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**123**	**125**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**105**	**109**	----	----	----
13C8-PFOA	----	0.02	%		**104**	**101**	----	----	----

Surrogate Control Limits

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

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72	143
Toluene-D8	2037-26-5	75	131
4-Bromofluorobenzene	460-00-4	73	137
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

QUALITY CONTROL REPORT

Work Order	: **ES2344095**	Page	: 1 of 14
Client	: **KLEINFELDER AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: Mr Tom Jeffery	Contact	: Jason Dighton
Address	: 95 MITCHELL ROAD CARDIFF NSW 2285	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 2400956	Date Samples Received	: 19-Dec-2023
Order number	: ----	Date Analysis Commenced	: 20-Dec-2023
C-O-C number	: ----	Issue Date	: 02-Jan-2024
Sampler	: Tom Jeffery		
Site	: WSS Cabbage Tree Road		
Quote number	: EN/222		
No. of samples received	: 18		
No. of samples analysed	: 18		

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

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

This 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

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
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

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: 5512075)									
EP2318003-011	Anonymous	EG005T: Barium	7440-39-3	10	mg/kg	30	30	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	7	8	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	3	2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	9	8	0.0	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	62	58	6.9	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	13	13	0.0	No Limit
		EG005T: Iron	7439-89-6	50	mg/kg	3680	3410	7.7	0% - 20%
ES2344006-003	Anonymous	EG005T: Barium	7440-39-3	10	mg/kg	110	110	0.0	0% - 50%
		EG005T: Chromium	7440-47-3	2	mg/kg	8	8	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	5	5	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	5	<5	0.0	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	206	251	19.9	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	22	20	9.2	No Limit
		EG005T: Iron	7439-89-6	50	mg/kg	15100	13400	11.9	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5512078)									
ES2343514-002	Anonymous	EA055: Moisture Content	----	0.1 (1.0)*	%	12.9	12.4	3.6	0% - 50%
ES2344096-001	Anonymous	EA055: Moisture Content	----	0.1 (1.0)*	%	6.8	6.8	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5506925)									

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: 5506925) - continued									
ES2343390-001	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 (PFHpS)	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	0.0052	0.0048	8.0	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	0.0008	0.0008	0.0	No Limit
ES2344096-001	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 (PFHpS)	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	<0.0002	<0.0002	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: 5506925)									
ES2343390-001	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: Perfluorooctanoic 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
ES2344096-001	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: Perfluorooctanoic 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: 5506925)									
ES2343390-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	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 (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5506925) - continued									
ES2343390-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2344096-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane 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: 5506925)									
ES2343390-001	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
ES2344096-001	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

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5506925) - continued									
ES2344096-001	Anonymous	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 sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED093F: Dissolved Major Cations (QC Lot: 5514439)									
ES2343968-001	Anonymous	ED093F: Magnesium	7439-95-4	1	mg/L	19	19	0.0	0% - 50%
ES2344095-001	BH1A	ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 5514441)									
ES2344411-002	Anonymous	ED093F: Magnesium	7439-95-4	1	mg/L	37	36	0.0	0% - 20%
ES2344095-011	SW3	ED093F: Magnesium	7439-95-4	1	mg/L	3	3	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 5514440)									
ES2344095-001	BH1A	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	0.005	0.004	0.0	No Limit
		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	0.003	0.003	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.006	0.005	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	0.021	0.018	12.9	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.09	0.09	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
ES2344095-011	SW3	EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Barium	7440-39-3	0.001	mg/L	0.013	0.013	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	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.003	0.002	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.023	0.023	0.0	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.005	0.009	50.4	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.30	0.30	0.0	0% - 20%
		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	8.60	8.68	0.9	0% - 20%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5513484)									
ES2344095-001	BH1A	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES2344095-009	BH12A	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5513484)									

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 (%)*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5513484) - continued									
ES2344095-001	BH1A	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES2344095-009	BH12A	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 5513484)									
ES2344095-001	BH1A	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	5	5	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
ES2344095-009	BH12A	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	3	3	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
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5507295)									
ES2344055-005	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane 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: 5507295)									
ES2344055-005	Anonymous	EP231X: Perfluorooctanoic 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
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5507295)									

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 (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5507295) - continued									
ES2344055-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane 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: 5507295)									
ES2344055-005	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
		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: 5507295)									
ES2344055-005	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			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5512075)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	102	88.0	113
EG005T: Barium	7440-39-3	10	mg/kg	<10	90.5 mg/kg	104	65.0	136
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	116	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	108	89.0	111
EG005T: Iron	7439-89-6	50	mg/kg	<50	31660 mg/kg	92.4	89.0	112
EG005T: Manganese	7439-96-5	5	mg/kg	<5	534 mg/kg	97.7	83.0	117
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	99.0	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	88.9	66.0	133
EG005T: Magnesium	7439-95-4	----	mg/kg	----	7894 mg/kg	110	87.0	113
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5506925)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.4	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	93.6	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.8	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5506925)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	88.6	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.4	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	117	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5506925)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	67.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5506925) - continued								
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.0	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	107	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5506925)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	104	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	115	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	105	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	106	69.2	143

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED093F: Dissolved Major Cations (QCLot: 5514439)								
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	90.0	116
ED093F: Dissolved Major Cations (QCLot: 5514441)								
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	103	90.0	116
EG020F: Dissolved Metals by ICP-MS (QCLot: 5514440)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	99.4	80.0	116
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	99.6	85.0	114
EG020A-F: Barium	7440-39-3	0.001	mg/L	<0.001	0.1 mg/L	99.8	82.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	95.8	85.0	111
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	95.6	82.0	112
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	95.3	81.0	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	98.3	82.0	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	96.1	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	106	81.0	117
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	90.4	85.0	115
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	100	82.0	112
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup (QCLot: 5506923)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)
				Result	Concentration	LCS	Low	High
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup (QCLot: 5506923) - continued								
EP071SG: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	62.6	55.8	112
EP071SG: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	85.4	71.6	113
EP071SG: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	98.7	56.0	121
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup (QCLot: 5506923)								
EP071SG: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	68.3	57.9	119
EP071SG: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	78.2	62.5	110
EP071SG: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	69.7	61.5	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5513484)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	99.2	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5513484)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	99.1	75.0	127
EP080: BTEXN (QCLot: 5513484)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	117	68.3	119
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	113	73.5	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	110	73.8	122
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	116	73.0	122
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	116	76.4	123
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	109	75.5	124
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5507295)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	85.7	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	89.3	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	88.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	91.8	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	86.5	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	88.9	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5507295)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	86.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	95.3	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	96.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	90.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	94.0	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	98.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	102	71.0	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5507295) - continued								
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.3	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	99.3	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	96.8	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5507295)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	90.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	79.0	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	71.5	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	99.3	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	98.3	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	97.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	88.9	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5507295)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	91.6	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	90.7	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	100	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	95.3	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 Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5512075)							
EP2318003-011	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	102	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	97.5	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	101	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	92.4	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	92.9	66.0	133
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5506925)							
ES2343390-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	97.5	72.0	128

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5506925) - continued							
ES2343390-001	Anonymous	EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	108	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	95.7	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	101	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	74.0	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	107	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5506925)							
ES2343390-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	89.9	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	110	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	112	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	106	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	110	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	99.2	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	102	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	94.9	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	96.8	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	97.8	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	117	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5506925)							
ES2343390-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	112	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	95.9	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	103	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	103	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	95.9	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	100	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	97.5	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5506925)							
ES2343390-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	102	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	129	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	114	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	91.3	69.2	143

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 5514440)							
ES2344095-002	BH2	EG020A-F: Arsenic	7440-38-2	1 mg/L	119	70.0	130
		EG020A-F: Barium	7440-39-3	1 mg/L	119	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	118	70.0	130
		EG020A-F: Cobalt	7440-48-4	1 mg/L	120	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	123	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	122	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	122	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	121	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5513484)							
ES2344095-001	BH1A	EP080: C6 - C9 Fraction	----	325 µg/L	109	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5513484)							
ES2344095-001	BH1A	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	112	70.0	130
EP080: BTEXN (QCLot: 5513484)							
ES2344095-001	BH1A	EP080: Benzene	71-43-2	25 µg/L	116	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	114	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	111	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	115	70.0	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	113	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	98.8	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5507295)							
ES2344055-005	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	89.1	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	85.1	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	83.0	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	93.0	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	94.2	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	79.5	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5507295)							
ES2344055-005	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	82.6	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	92.6	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	92.6	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	88.4	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	93.6	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	90.0	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	100.0	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	91.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	96.2	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	89.6	65.0	144

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5507295) - continued							
ES2344055-005	Anonymous	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	91.5	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5507295)							
ES2344055-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	92.3	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	81.4	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	77.4	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	96.6	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	96.9	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	93.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	90.7	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5507295)							
ES2344055-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	88.0	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	109	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	98.7	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	79.9	71.4	144

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2344095**	Page	: 1 of 10
Client	: **KLEINFELDER AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: Mr Tom Jeffery	Telephone	: +61-2-8784 8555
Project	: 2400956	Date Samples Received	: 19-Dec-2023
Site	: WSS Cabbage Tree Road	Issue Date	: 02-Jan-2024
Sampler	: Tom Jeffery	No. of samples received	: 18
Order number	: ----	No. of samples analysed	: 18

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

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

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	5.56	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	EP071SG	0	16	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	EP071SG	0	16	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	**19-Dec-2023**	**----**	----	----	**22-Dec-2023**	02-Jan-2024	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) WPF	**19-Dec-2023**	**23-Dec-2023**	16-Jun-2024	✓	**24-Dec-2023**	16-Jun-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X) WPF	**19-Dec-2023**	**20-Dec-2023**	16-Jun-2024	✓	**22-Dec-2023**	29-Jan-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X) WPF	**19-Dec-2023**	**20-Dec-2023**	16-Jun-2024	✓	**22-Dec-2023**	29-Jan-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) WPF	**19-Dec-2023**	**20-Dec-2023**	16-Jun-2024	✓	**22-Dec-2023**	29-Jan-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) WPF	**19-Dec-2023**	**20-Dec-2023**	16-Jun-2024	✓	**22-Dec-2023**	29-Jan-2024	✓

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
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
WPF	**19-Dec-2023**	**20-Dec-2023**	16-Jun-2024	✓	**22-Dec-2023**	29-Jan-2024	✓

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)							
BH1A, BH2, BH4, BH6, BH7, BH8, BH9A, BH11, BH12A, MW239S, SW3, SW4, TB_19/12/23, RB_19/12/23, QC01, SW1	**19-Dec-2023**	**----**	----	----	**24-Dec-2023**	16-Jan-2024	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
BH1A, BH2, BH4, BH6, BH7, BH8, BH9A, BH11, BH12A, MW239S, SW3, SW4, WPW2, TB_19/12/23, RB_19/12/23, QC01, SW1	**19-Dec-2023**	**----**	----	----	**24-Dec-2023**	16-Jun-2024	✓
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup							
Amber Glass Bottle - Unpreserved (EP071SG)							
BH1A, BH2, BH4, BH6, BH7, BH8, BH9A, BH11, BH12A, MW239S, SW3, SW4, TB_19/12/23, RB_19/12/23, QC01, SW1	**19-Dec-2023**	**21-Dec-2023**	26-Dec-2023	✓	**29-Dec-2023**	30-Jan-2024	✓

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)							
BH1A, BH2, BH4, BH6, BH7, BH8, BH9A, BH11, BH12A, MW239S, SW3, SW4, TB_19/12/23, RB_19/12/23, QC01, SW1	**19-Dec-2023**	**21-Dec-2023**	26-Dec-2023	✓	**29-Dec-2023**	30-Jan-2024	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP080)							
BH1A, BH2, BH4, BH6, BH7, BH8, BH9A, BH11, BH12A, MW239S, SW3, SW4, TB_19/12/23, RB_19/12/23, QC01, SW1	**19-Dec-2023**	**29-Dec-2023**	02-Jan-2024	✓	**29-Dec-2023**	02-Jan-2024	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber VOC Vial - Sulfuric Acid (EP080)							
BH1A, BH2, BH4, BH6, BH7, BH8, BH9A, BH11, BH12A, MW239S, SW3, SW4, TB_19/12/23, RB_19/12/23, QC01, SW1	**19-Dec-2023**	**29-Dec-2023**	02-Jan-2024	✓	**29-Dec-2023**	02-Jan-2024	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080)							
BH1A, BH2, BH4, BH6, BH7, BH8, BH9A, BH11, BH12A, MW239S, SW3, SW4, TB_19/12/23, RB_19/12/23, QC01, SW1	**19-Dec-2023**	**29-Dec-2023**	02-Jan-2024	✓	**29-Dec-2023**	02-Jan-2024	✓

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)							
BH1A, BH2, BH4, BH6, BH7, BH8, BH9A, BH11, BH12A, MW239S, SW3, SW4, WPW2, TB_19/12/23, RB_19/12/23, QC01, SW1	**19-Dec-2023**	**21-Dec-2023**	16-Jun-2024	✓	**27-Dec-2023**	16-Jun-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
BH1A, BH2, BH4, BH6, BH7, BH8, BH9A, BH11, BH12A, MW239S, SW3, SW4, WPW2, TB_19/12/23, RB_19/12/23, QC01, SW1	**19-Dec-2023**	**21-Dec-2023**	16-Jun-2024	✓	**27-Dec-2023**	16-Jun-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
BH1A, BH2, BH4, BH6, BH7, BH8, BH9A, BH11, BH12A, MW239S, SW3, SW4, WPW2, TB_19/12/23, RB_19/12/23, QC01, SW1	**19-Dec-2023**	**21-Dec-2023**	16-Jun-2024	✓	**27-Dec-2023**	16-Jun-2024	✓

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
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
BH1A, BH2, BH4, BH6, BH7, BH8, BH9A, BH11, BH12A, MW239S, SW3, SW4, WPW2, TB_19/12/23, RB_19/12/23, QC01, SW1	**19-Dec-2023**	**21-Dec-2023**	16-Jun-2024	✓	**27-Dec-2023**	16-Jun-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
BH1A, BH2, BH4, BH6, BH7, BH8, BH9A, BH11, BH12A, MW239S, SW3, SW4, WPW2, TB_19/12/23, RB_19/12/23, QC01, SW1	**19-Dec-2023**	**21-Dec-2023**	16-Jun-2024	✓	**27-Dec-2023**	16-Jun-2024	✓

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**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	36	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	5.56	10.00	×	NEPM 2013 B3 & ALS QC Standard
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	EP071SG	0	16	0.00	10.00	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	36	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	EP071SG	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	36	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	EP071SG	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
TRH Volatiles/BTEX	EP080	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	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	EP071SG	0	16	**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.
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)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	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).
QuECheRS Extraction of Solids	ORG71	SOIL	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.
Separatory Funnel Extraction of Liquids	ORG14	WATER	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.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

KLEINFELDER AUSTRALIA PTY LTD

Page 1 of 2

COC number:

KLEINFELDER
Bright People. Right Solutions.

Client:	SITE, COC AND CONTACT DATA				Laboratory:
Kleinfelder Australia Pty Ltd Suite 3, 240 - 244 Pacific Highway Charlestown NSW 2290 Phone: 02 4949 5200	Site Name:	WSS Cabbage Tree Road	Sampler Name:	Tom Jeffery	ALS 5/585 Maitland Rd Mayfield West, Newcastle NSW 2304 Phone: 02 4014 2500
	QUOTE NUMBER		Contact Number:	421887830	
	Job No.:	24001956	Contact e-mail:	tjeffery@kleinfelder.com	
	Required TAT:	48 hrs 3 days 5 days 7 days	PM e-mail:	Dkousbroek@kleinfelder.com	
	Data QA level:	LAB minimum unless specified:	EDD Format	KLF_EFWEDD	

CHAIN OF CUSTODY								Send Results to:
Relinquished by (print):	T Jeffery	Received by (print):	B.M	Relinquished:		Received by:	Sonstyle	dkousbroek@kleinfelder.com, tjeffery@kleinfelder.com
(sign)		(sign)	B.M	(sign)		(sign)		
Date / Time:	19/12 1540	Date / Time:	19/12	Date / Time:	19/12/23	Date / Time:	19/12/23	
Notes:		Temp. (°C)	22.1	Notes:		Temp. (°C)	1935	Suite 3, 240-244 Pacific Highway Charlestown, NSW 2290 Phone: 02 4949 5200
		Notes:	3.45					
			ice present / no ice seals intact / no seal				ice present / no ice seals intact / no seal	

Sample ID	Lab ID	Sample Point	Sample Type	Date	Start Depth	End Depth	Units	# Containers	Organic Analytes: TRH, TPH, BTEXN (Silica Gel, Clean up)	Metals: Dissolved Metals - As, Fe, Mn	Metals: Dissolved Metals - See below *	Other Analytes: PFAS (23 analytes standard Level)	Other Analytes: Extended Water Quality Suite B	Other Analytes: HOLD	
BH1A			Water	19/12/2023					X		X	X			
BH2			Water	19/12/2023					X		X	X			
BH4			Water	19/12/2023					X		X	X			
BH6			Water	19/12/2023					X		X	X			
BH7			Water	19/12/2023					X		X	X			
BH8			Water	19/12/2023					X		X	X			
BH9A			Water	19/12/2023					X		X	X			
BH11			Water	19/12/2023					X		X	X			
BH12A			Water	19/12/2023					X		X	X			
MW239S			Water	19/12/2023					X		X	X			
SW1			Water	19/12/2023					X		X	X			Additional Metals B&Co
SW2			Water	19/12/2023					X		X	X			
SW3			Water	19/12/2023					X		X	X			Additional Metals B&Co
SW4			Water	19/12/2023					X		X	X			" "
WPW2			Water	19/12/2023						X		X			
WPF			Sediment	19/12/2023							X	X			
TB_19/12/23			W	1					X		X	X			Additional Metals (B&Co) for TB Please.
RB_19/12/23			W	1					X		X	X			" "

* Metals: As, Ba, Cr, Cu, Fe. Mg, Mn, Ni and Zn. Additional metals for SW (B & CO)

Environmental Division
Sydney
Work Order Reference
ES2344095

Telephone : +61-2-8784 8555

KLEINFELDER AUSTRALIA PTY LTD

Page 2 of 2

COC number:

KLEINFELDER
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Client:	SITE, COC AND CONTACT DATA				Laboratory:
Kleinfelder Australia Pty Ltd Suite 3, 240 - 244 Pacific Highway Charlestown NSW 2290 Phone: 02 4949 5200	Site Name:	WSS Cabbage Tree Road	Sampler Name:	Tom Jeffery	ALS 5/585 Maitland Rd Mayfield West, Newcastle NSW 2304 Phone: 02 4014 2500
	QUOTE NUMBER		Contact Number:	421887830	
	Job No.:	24001956	Contact e-mail:	tjeffery@kleinfelder.com	
	Required TAT:	48 hrs 3 days 5 days 7 days	PM e-mail:	Dkousbroek@kleinfelder.com	
	Data QA level:	LAB minimum unless specified:	EDD Format	KLF_EFWEDD	

CHAIN OF CUSTODY

								Send Results to:
Relinquished by (print):	T.Jeffery	Received by (print):		Relinquished:		Received by:		dkousbroek@kleinfelder.com, tjeffery@kleinfelder.com
(sign)	19/12 1540	(sign)		(sign)		(sign)		
Date / Time:		Date / Time:		Date / Time:		Date / Time:	19/12/23 1935	
Notes:		Temp. (°C)		Notes:		Temp. (°C)		Suite 3, 240-244 Pacific Highway Charlestown, NSW 2290 Phone: 02 4949 5200
		Notes:	ice present / no ice seals intact / no seal			Notes:	ice present / no ice seals intact / no seal	

Sample ID	Lab ID	Sample Point	Sample Type	Date	Start Depth	End Depth	Units	# Containers	Organic Analytes: TRH, TPH, BTEXN (Silica Gel, Clean up)	Metals: Dissolved Metals - As, Fe, Mn	Metals: Dissolved Metals - See below *	Other Analytes: PFAS (23 analytes standard Level)	Other Analytes: Extended Water Quality Suite B	Other Analytes:	Other Analytes:	Other Analytes: HOLD	Comments
QC01			W	19/12/23					X		X	X					Additional Metals (B & CO) for QC01 & QC01A Please Send to Eurofins
QC01A			W	"					X		X	X					

* Metals: As, Ba, Cr, Cu, Fe. Mg, Mn, Ni and Zn. Additional metals for SW (B & CO)

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

Attention: **Tom Jeffery**

Report **1056450-W**
Project name WSS CABBAGE TREE ROAD
Project ID 24001956
Received Date Dec 21, 2023

Client Sample ID			**QC01A**
Sample Matrix			**Water**
Eurofins Sample No.			**S23-De0053246**
Date Sampled			**Dec 19, 2023**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons			
TRH C6-C9	0.02	mg/L	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1
TRH C6-C10	0.02	mg/L	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	0.006
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	95
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.01	mg/L	< 0.01
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
Alkali Metals			
Magnesium (filtered)	0.5	mg/L	3.4

Client Sample ID			QC01A
Sample Matrix			Water
Eurofins Sample No.			S23-De0053246
Date Sampled			Dec 19, 2023
Test/Reference	LOR	Unit	
Heavy Metals			
Arsenic (filtered)	0.001	mg/L	0.004
Barium (filtered)	0.02	mg/L	< 0.02
Chromium (filtered)	0.001	mg/L	0.003
Copper (filtered)	0.001	mg/L	0.002
Iron (filtered)	0.05	mg/L	41
Manganese (filtered)	0.005	mg/L	0.017
Nickel (filtered)	0.001	mg/L	0.001
Zinc (filtered)	0.005	mg/L	< 0.005
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01
13C4-PFBA (surr.)	1	%	104
13C5-PFPeA (surr.)	1	%	110
13C5-PFHxA (surr.)	1	%	109
13C4-PFHpA (surr.)	1	%	110
13C8-PFOA (surr.)	1	%	124
13C5-PFNA (surr.)	1	%	100
13C6-PFDA (surr.)	1	%	88
13C2-PFUnDA (surr.)	1	%	85
13C2-PFDoDA (surr.)	1	%	82
13C2-PFTeDA (surr.)	1	%	33
Perfluoroalkyl sulfonamido substances			
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05
13C8-FOSA (surr.)	1	%	93
D3-N-MeFOSA (surr.)	1	%	83
D5-N-EtFOSA (surr.)	1	%	92
D7-N-MeFOSE (surr.)	1	%	85
D9-N-EtFOSE (surr.)	1	%	86
D5-N-EtFOSAA (surr.)	1	%	72
D3-N-MeFOSAA (surr.)	1	%	75

Client Sample ID			QC01A
Sample Matrix			Water
Eurofins Sample No.			S23-De0053246
Date Sampled			Dec 19, 2023
Test/Reference	LOR	Unit	
Perfluoroalkyl sulfonic acids (PFSAs)			
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01
13C3-PFBS (surr.)	1	%	127
18O2-PFHxS (surr.)	1	%	125
13C8-PFOS (surr.)	1	%	113
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01
13C2-4:2 FTSA (surr.)	1	%	160
13C2-6:2 FTSA (surr.)	1	%	92
13C2-8:2 FTSA (surr.)	1	%	93
13C2-10:2 FTSA (surr.)	1	%	71
PFASs Summations			
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 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
Eurofins Suite B1			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jan 04, 2024	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jan 04, 2024	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jan 04, 2024	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Jan 04, 2024	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
TRH - 2013 NEPM Fractions (after silica gel clean-up)	Sydney	Jan 04, 2024	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
TRH - 1999 NEPM Fractions (after silica gel clean-up)	Sydney	Jan 04, 2024	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Alkali Metals (filtered)	Sydney	Jan 04, 2024	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Heavy Metals (filtered)	Sydney	Jan 04, 2024	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Sydney	Jan 04, 2024	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Sydney	Jan 04, 2024	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Sydney	Jan 04, 2024	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Sydney	Jan 04, 2024	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Sydney	Dec 22, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

eurofins

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Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	Site# 25079 & 25289

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Company Name: Kleinfelder Aust Pty Ltd (NEWCASTLE)
Address: Suite 3, 240-244 Pacific Hwy
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NSW 2290

Order No.:
Report #: 1056450
Phone: 02 4949 5200
Fax:

Received: Dec 21, 2023 6:10 PM
Due: Jan 10, 2024
Priority: 10 Day
Contact Name: Tom Jeffery

Project Name: WSS CABBAGE TREE ROAD
Project ID: 24001956

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Arsenic (filtered)	Barium (filtered)	Chromium (filtered)	Copper (filtered)	Iron (filtered)	Magnesium (filtered)	Manganese (filtered)	Nickel (filtered)	Zinc (filtered)	Per- and Polyfluoroalkyl Substances (PFASs)
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X	X	X	X	X
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	QC01A	Dec 19, 2023		Water	S23-De0053246	X	X	X	X	X	X	X	X	X	X
Test Counts						1	1	1	1	1	1	1	1	1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They 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 weight basis unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion unless otherwise stated.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with blue colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the '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 before sample receipt deadlines as stated on the SRA.

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

Holding times apply from the date of sampling; therefore, compliance with 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, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ppm:** parts per million
µg/L: micrograms per litre	**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
CFU: Colony forming unit	**Colour:** Pt-Co Units	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
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 moisture has been determined on a solid sample, the result is expressed on a dry weight 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 represents 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 similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-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 only be used as a guide 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. SVOCs recoveries 20 – 150%, VOC recoveries 70 – 130%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 5.4, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as 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 are 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							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
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							
Alkali Metals							
Magnesium (filtered)	mg/L	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Barium (filtered)	mg/L	< 0.02			0.02	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Iron (filtered)	mg/L	< 0.05			0.05	Pass	
Manganese (filtered)	mg/L	< 0.005			0.005	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	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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							
Perfluorooctane 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	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
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 FTSAs)							
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	
Method Blank							
PFASs Summations							
Sum of US EPA PFAS (PFOS + PFOA)*	ug/L	-			0.01	N/A	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	85			70-130	Pass	
TRH C10-C14	%	88			70-130	Pass	
TRH C6-C10	%	84			70-130	Pass	
TRH >C10-C16	%	76			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	88			70-130	Pass	
Toluene	%	89			70-130	Pass	
Ethylbenzene	%	88			70-130	Pass	
m&p-Xylenes	%	93			70-130	Pass	
o-Xylene	%	88			70-130	Pass	
Xylenes - Total*	%	92			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	86			70-130	Pass	
LCS - % Recovery							
TRH - 2013 NEPM Fractions (after silica gel clean-up)							
TRH >C10-C16 (after silica gel clean-up)	%	73			70-130	Pass	
LCS - % Recovery							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH - 1999 NEPM Fractions (after silica gel clean-up)							
TRH C10-C14 (after silica gel clean-up)	%	83			70-130	Pass	
LCS - % Recovery							
Alkali Metals							
Magnesium (filtered)	%	98			80-120	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic (filtered)	%	100			80-120	Pass	
Barium (filtered)	%	98			80-120	Pass	
Chromium (filtered)	%	98			80-120	Pass	
Copper (filtered)	%	98			80-120	Pass	
Iron (filtered)	%	92			80-120	Pass	
Manganese (filtered)	%	100			80-120	Pass	
Nickel (filtered)	%	98			80-120	Pass	
Zinc (filtered)	%	97			80-120	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	80			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	77			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	78			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	79			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	77			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	78			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	84			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	83			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	83			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	70			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	82			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	74			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	73			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	83			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	75			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	72			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	68			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	73			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	78			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	67			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	72			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	60			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	80			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	76			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	74			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	56			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	78			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	72			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	89			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	60			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C6-C9	N23-De0050658	NCP	%	80			70-130	Pass	
TRH C10-C14	S23-De0046071	NCP	%	82			70-130	Pass	
TRH C6-C10	N23-De0050658	NCP	%	80			70-130	Pass	
TRH >C10-C16	S23-De0046071	NCP	%	76			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	N23-De0050658	NCP	%	87			70-130	Pass	
Toluene	N23-De0050658	NCP	%	89			70-130	Pass	
Ethylbenzene	N23-De0050658	NCP	%	88			70-130	Pass	
m&p-Xylenes	N23-De0050658	NCP	%	93			70-130	Pass	
o-Xylene	N23-De0050658	NCP	%	90			70-130	Pass	
Xylenes - Total*	N23-De0050658	NCP	%	92			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	N23-De0050658	NCP	%	82			70-130	Pass	
Spike - % Recovery									
TRH - 2013 NEPM Fractions (after silica gel clean-up)				Result 1					
TRH >C10-C16 (after silica gel clean-up)	S23-De0044147	NCP	%	81			70-130	Pass	
Spike - % Recovery									
TRH - 1999 NEPM Fractions (after silica gel clean-up)				Result 1					
TRH C10-C14 (after silica gel clean-up)	S23-De0044147	NCP	%	91			70-130	Pass	
Spike - % Recovery									
Alkali Metals				Result 1					
Magnesium (filtered)	S24-Ja0000470	NCP	%	108			75-125	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	S23-De0053236	NCP	%	95			75-125	Pass	
Barium (filtered)	S23-De0053236	NCP	%	81			75-125	Pass	
Chromium (filtered)	S23-De0053236	NCP	%	90			75-125	Pass	
Copper (filtered)	S23-De0053236	NCP	%	89			75-125	Pass	
Iron (filtered)	S23-De0049373	NCP	%	92			75-125	Pass	
Manganese (filtered)	S23-De0049373	NCP	%	93			75-125	Pass	
Nickel (filtered)	S23-De0053236	NCP	%	89			75-125	Pass	
Zinc (filtered)	S23-De0053236	NCP	%	89			75-125	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	S23-De0053780	NCP	%	104			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	S23-De0053780	NCP	%	110			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	S23-De0053780	NCP	%	115			50-150	Pass	
Perfluorooctanoic acid (PFOA)	S23-De0053780	NCP	%	110			50-150	Pass	
Perfluorononanoic acid (PFNA)	S23-De0053780	NCP	%	118			50-150	Pass	
Perfluorodecanoic acid (PFDA)	S23-De0053780	NCP	%	123			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	S23-De0053780	NCP	%	107			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	S23-De0053780	NCP	%	114			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S23-De0053780	NCP	%	113			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	S23-De0053780	NCP	%	95			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S23-De0053780	NCP	%	84			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S23-De0053780	NCP	%	99			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	S23-De0053780	NCP	%	102			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	S23-De0053780	NCP	%	86			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S23-De0053780	NCP	%	98			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S23-De0053780	NCP	%	99			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	S23-De0053780	NCP	%	100			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	S23-De0053780	NCP	%	91			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	S23-De0053780	NCP	%	98			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	S23-De0053780	NCP	%	93			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S23-De0053780	NCP	%	106			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	S23-De0053780	NCP	%	111			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	S23-De0053780	NCP	%	98			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	S23-De0053780	NCP	%	76			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	S23-De0053780	NCP	%	112			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	S23-De0053780	NCP	%	117			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S23-De0053780	NCP	%	118			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S23-De0053780	NCP	%	116			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	S24-Ja0002882	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	S24-Ja0002881	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	S24-Ja0002881	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	S24-Ja0002881	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C6-C10	S24-Ja0002882	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH >C10-C16	S24-Ja0002881	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	S24-Ja0002881	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	S24-Ja0002881	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	

Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S24-Ja0002882	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S24-Ja0002882	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S24-Ja0002882	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S24-Ja0002882	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S24-Ja0002882	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	S24-Ja0002882	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S24-Ja0002882	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
TRH - 2013 NEPM Fractions (after silica gel clean-up)				Result 1	Result 2	RPD			
TRH >C10-C16 (after silica gel clean-up)	S23-De0044145	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34 (after silica gel clean-up)	S23-De0044145	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40 (after silica gel clean-up)	S23-De0044145	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
TRH - 1999 NEPM Fractions (after silica gel clean-up)				Result 1	Result 2	RPD			
TRH C10-C14 (after silica gel clean-up)	S23-De0044145	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28 (after silica gel clean-up)	S23-De0044145	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36 (after silica gel clean-up)	S23-De0044145	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C10-C36 (Total) (after silica gel clean-up)	S23-De0044145	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Alkali Metals				Result 1	Result 2	RPD			
Magnesium (filtered)	S24-Ja0000140	NCP	mg/L	12	12	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	S23-De0049686	NCP	mg/L	0.002	0.002	4.6	30%	Pass	
Barium (filtered)	N23-De0050721	NCP	mg/L	0.04	0.04	5.5	30%	Pass	
Chromium (filtered)	S24-Ja0000140	NCP	mg/L	0.026	0.027	1.9	30%	Pass	
Copper (filtered)	S24-Ja0000140	NCP	mg/L	0.76	0.75	1.7	30%	Pass	
Iron (filtered)	S24-Ja0000140	NCP	mg/L	1.2	1.1	8.1	30%	Pass	
Manganese (filtered)	S24-Ja0000140	NCP	mg/L	1.0	1.0	<1	30%	Pass	
Nickel (filtered)	S24-Ja0000140	NCP	mg/L	0.64	0.63	1.5	30%	Pass	
Zinc (filtered)	S24-Ja0000140	NCP	mg/L	10	10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	X24-Ja0000729	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	X24-Ja0000729	NCP	ug/L	0.08	0.08	2.5	30%	Pass	
Perfluorohexanoic acid (PFHxA)	X24-Ja0000729	NCP	ug/L	0.21	0.21	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	X24-Ja0000729	NCP	ug/L	0.05	0.05	6.1	30%	Pass	
Perfluorooctanoic acid (PFOA)	X24-Ja0000729	NCP	ug/L	0.10	0.11	8.7	30%	Pass	
Perfluorononanoic acid (PFNA)	X24-Ja0000729	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	X24-Ja0000729	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	X24-Ja0000729	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	X24-Ja0000729	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	X24-Ja0000729	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	X24-Ja0000729	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	S24-Ja0002795	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	X24-Ja0000729	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	X24-Ja0000729	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	X24-Ja0000729	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	X24-Ja0000729	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	X24-Ja0000729	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	X24-Ja0000729	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	X24-Ja0000729	NCP	ug/L	0.05	0.05	2.8	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	S24-Ja0002795	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	X24-Ja0000729	NCP	ug/L	0.01	0.01	2.4	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	X24-Ja0000729	NCP	ug/L	0.06	0.06	3.4	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	X24-Ja0000729	NCP	ug/L	1.2	1.1	8.0	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	X24-Ja0000729	NCP	ug/L	0.14	0.13	8.7	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	X24-Ja0000729	NCP	ug/L	12	9.6	19	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	S24-Ja0002795	NCP	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)	X24-Ja0000729	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	X24-Ja0000729	NCP	ug/L	0.06	0.06	3.3	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	X24-Ja0000729	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	X24-Ja0000729	NCP	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
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
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:

Ursula Long	Analytical Services Manager
Fang Yee Tan	Senior Analyst-Metal
Roopesh Rangarajan	Senior Analyst-Organic
Roopesh Rangarajan	Senior Analyst-Volatile

Glenn Jackson
Managing Director

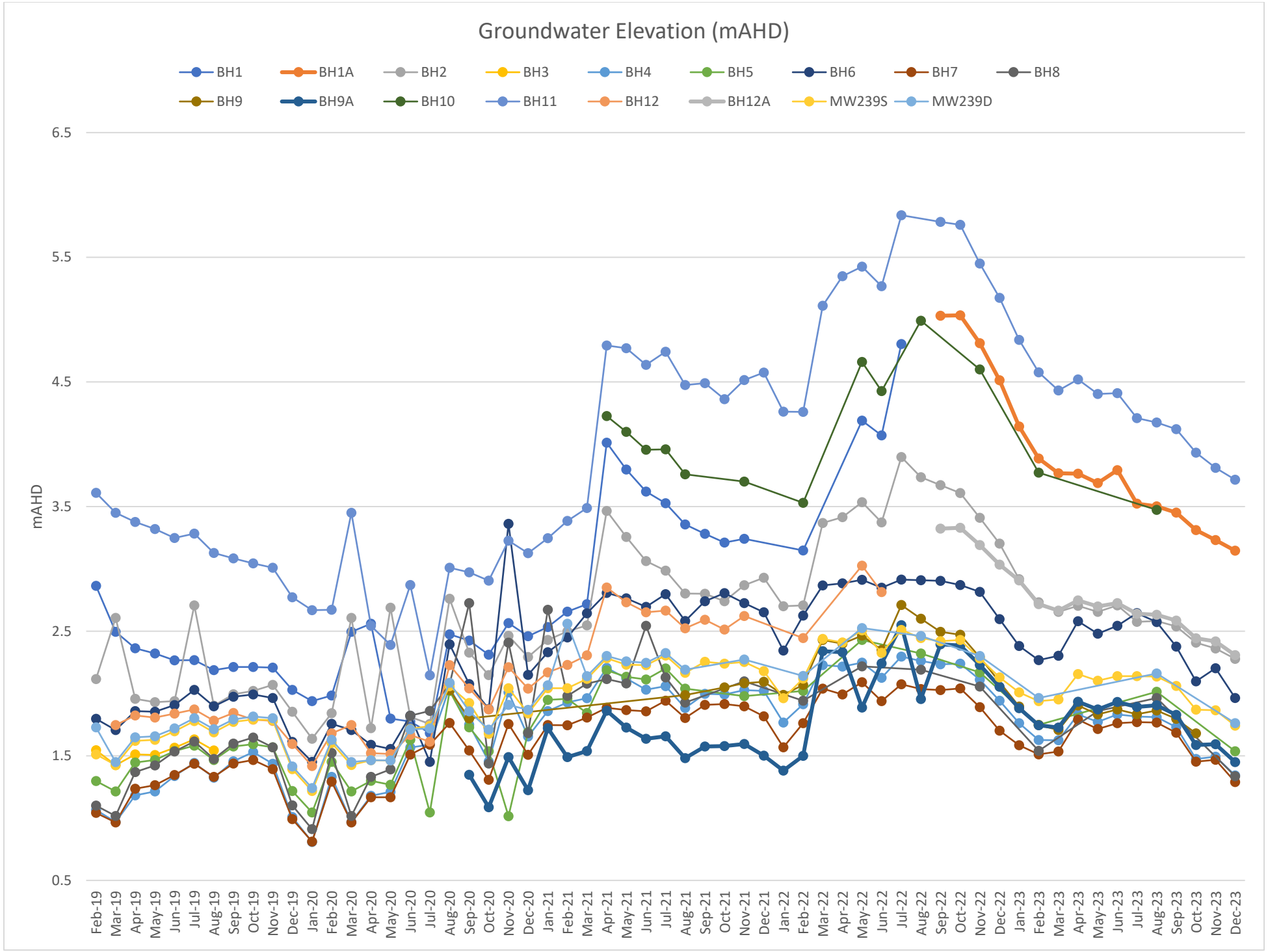
Final Report – this report replaces any previously issued Report

- 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.

ATTACHMENT 4: DATA TRENDS


Groundwater Elevation (mAHD)
BH1
BH1A
BH2
BH3
BH4
BH5
BH6
BH7
BH8
BH9
BH9A
BH10
BH11
BH12
BH12A
MW239S
MW239D
mAHD
6.5
5.5
4.5
3.5
2.5
1.5
0.5
Feb-19
Mar-19
Apr-19
May-19
Jun-19
Jul-19
Aug-19
Sep-19
Oct-19
Nov-19
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Mar-20
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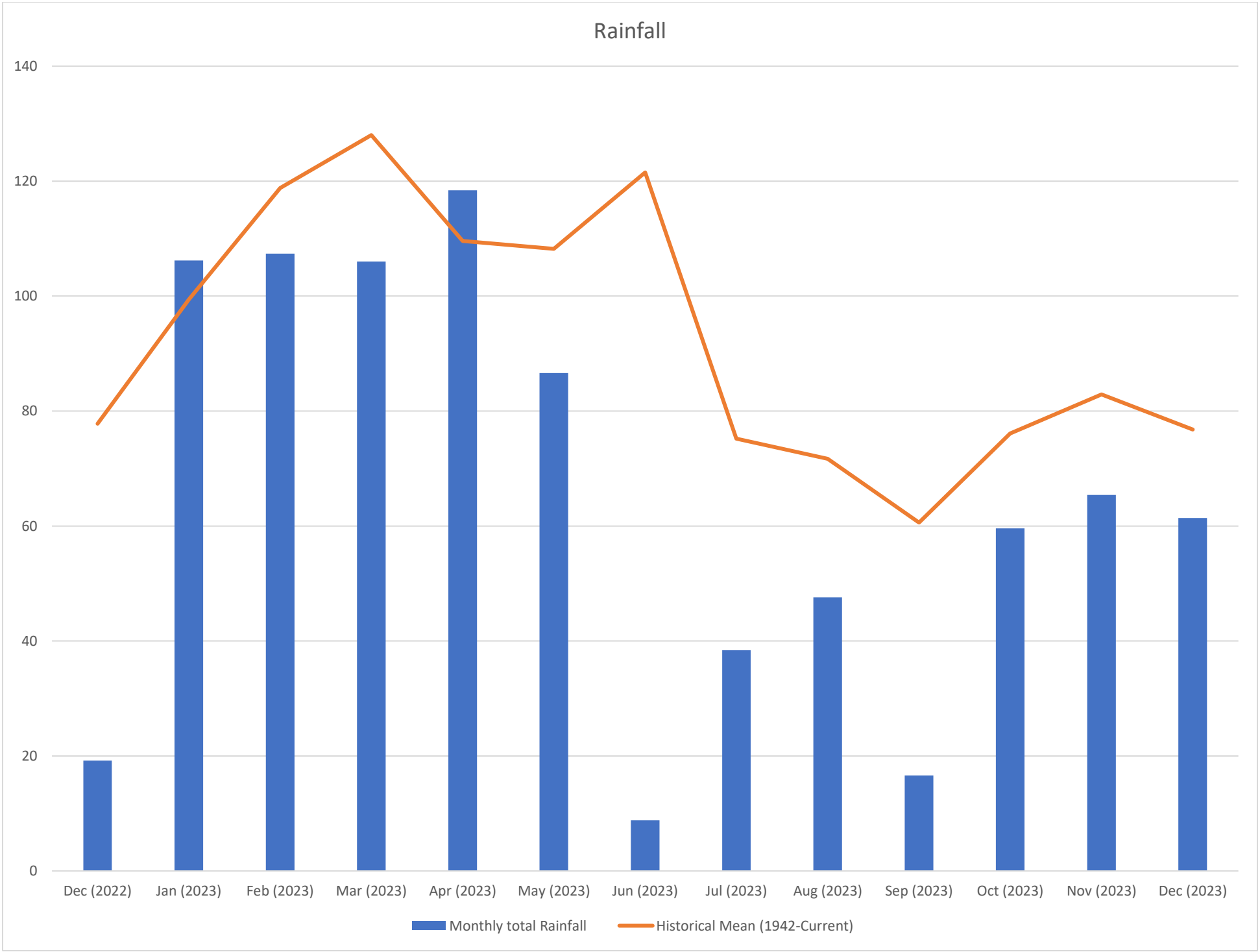
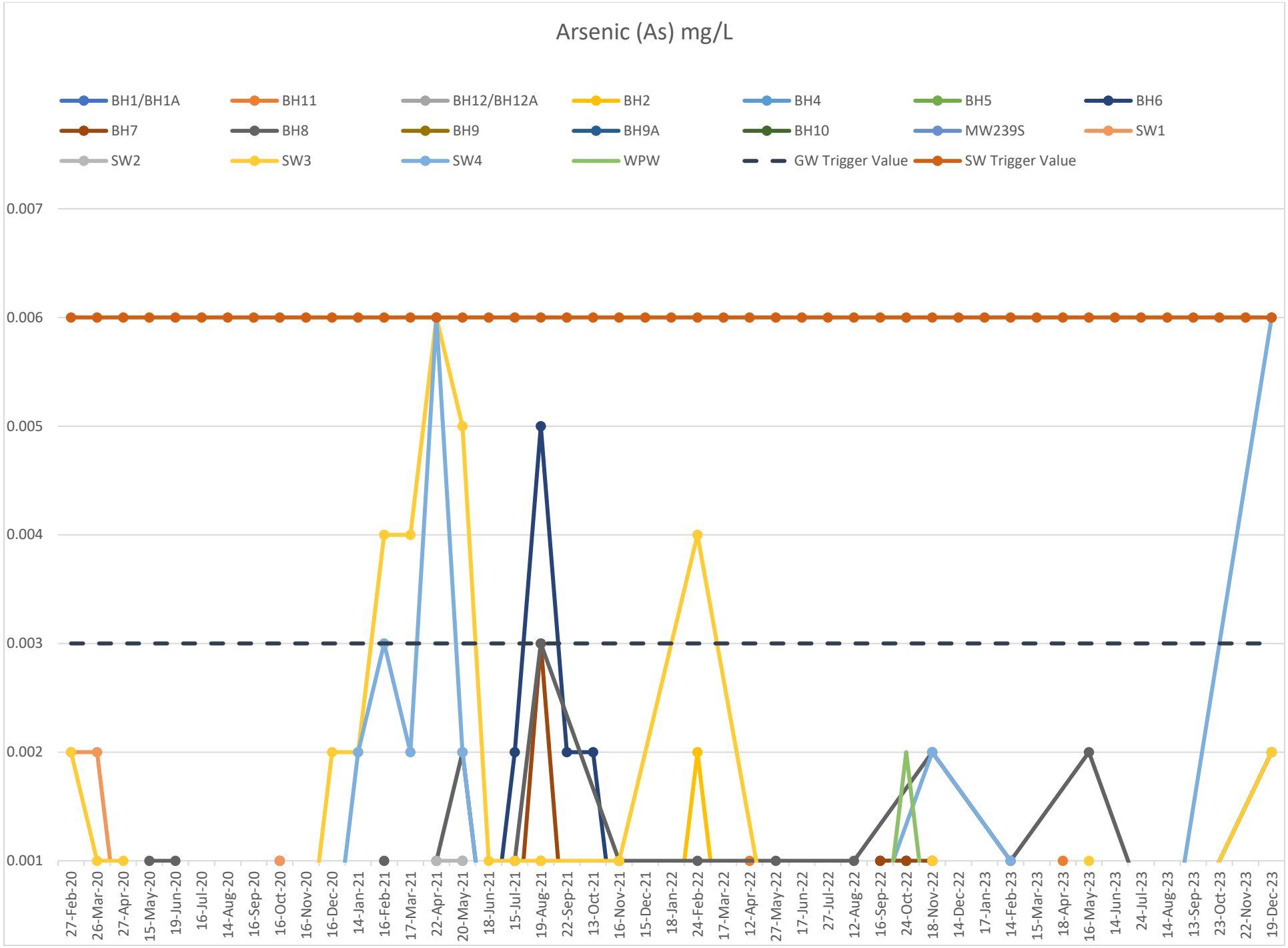
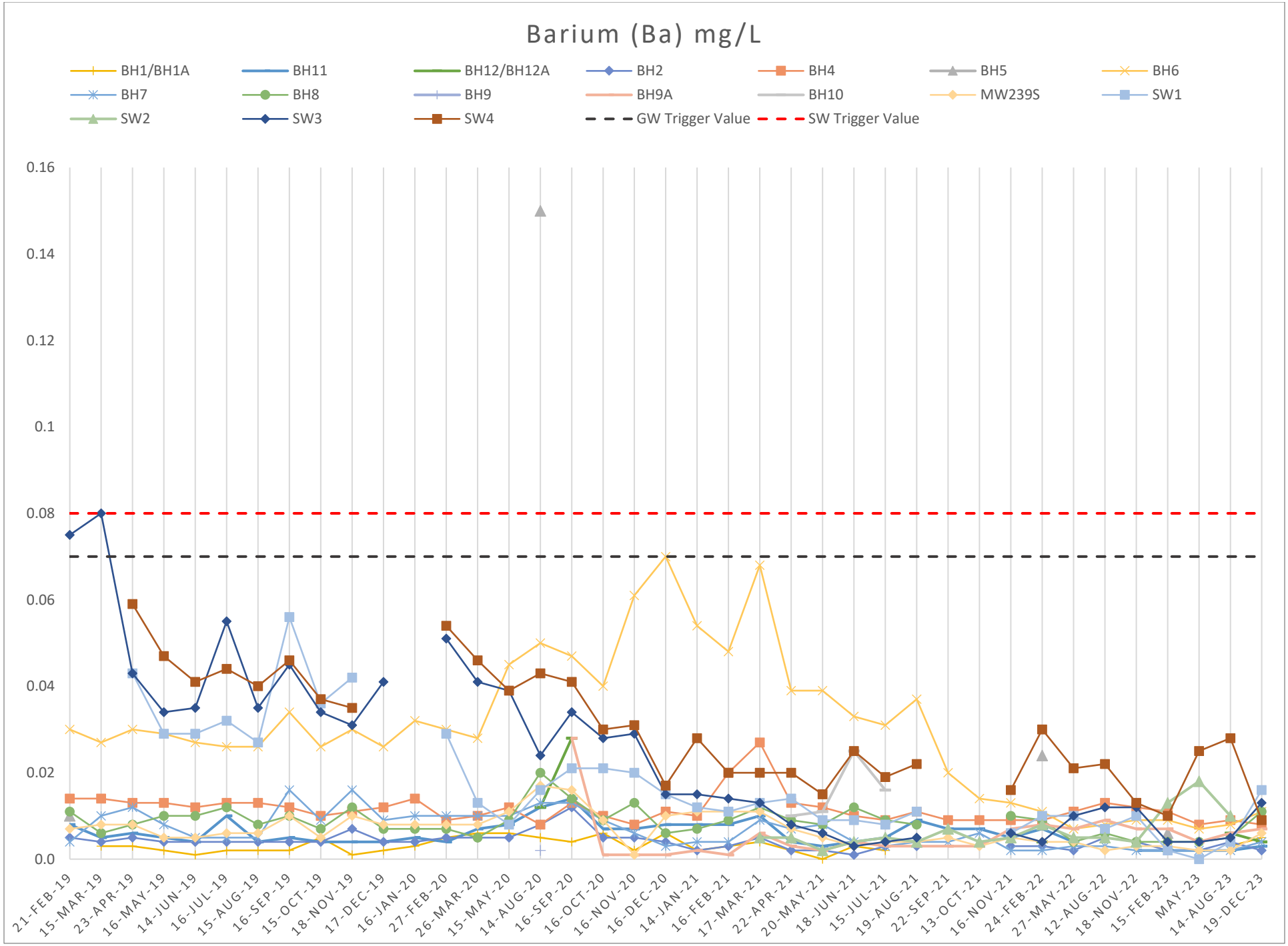
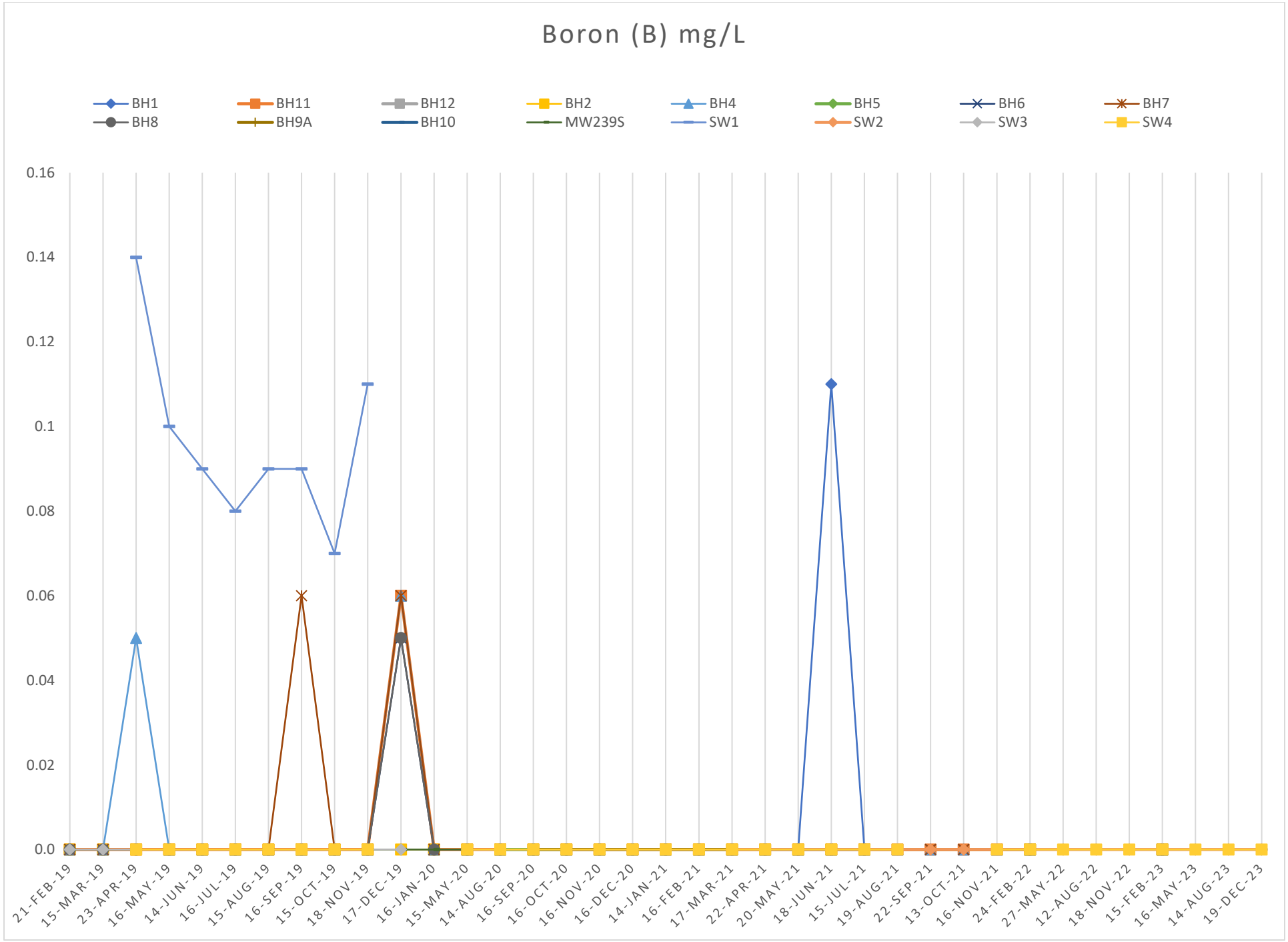
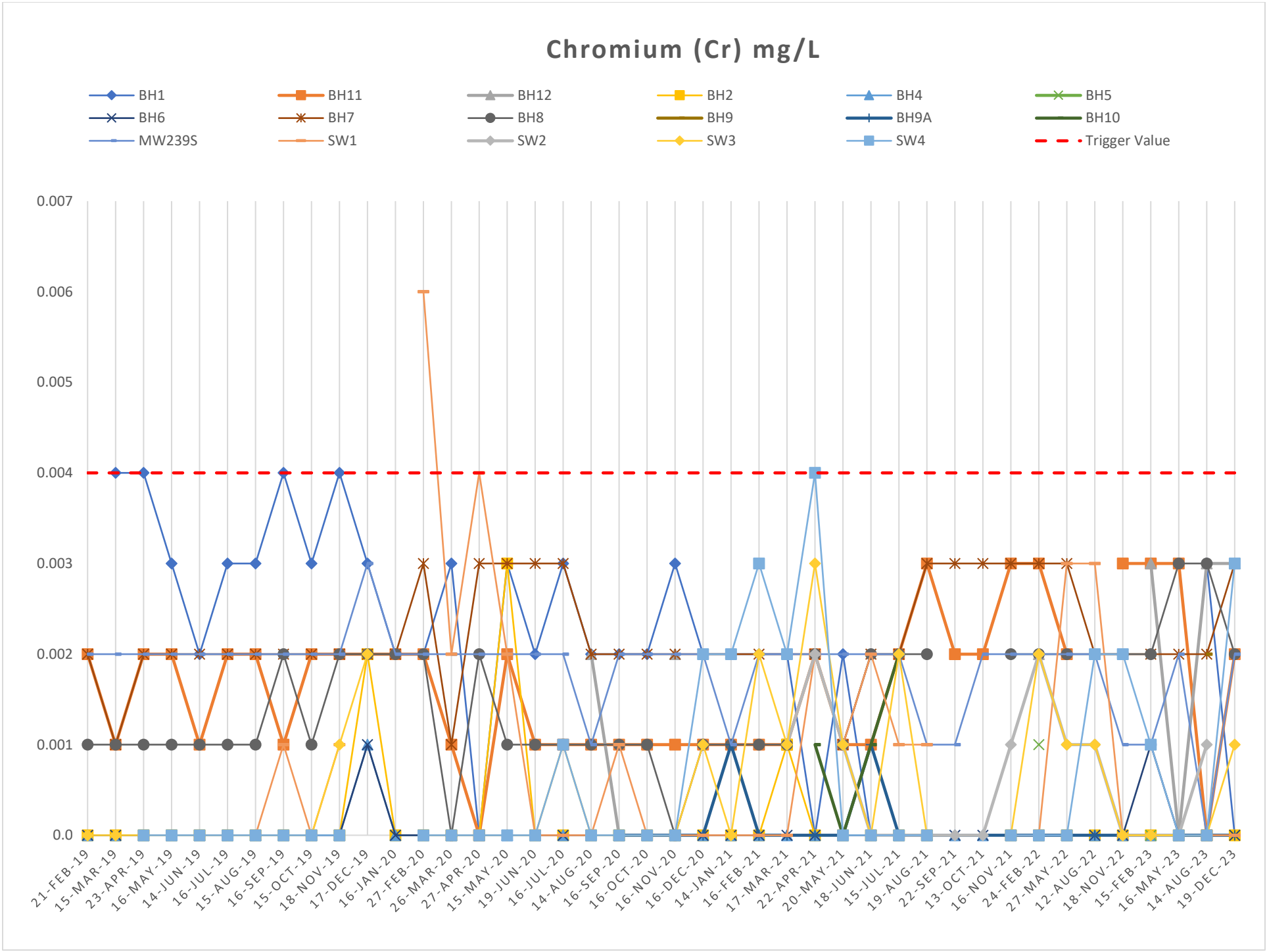
Oct-23
Nov-23
Dec-23

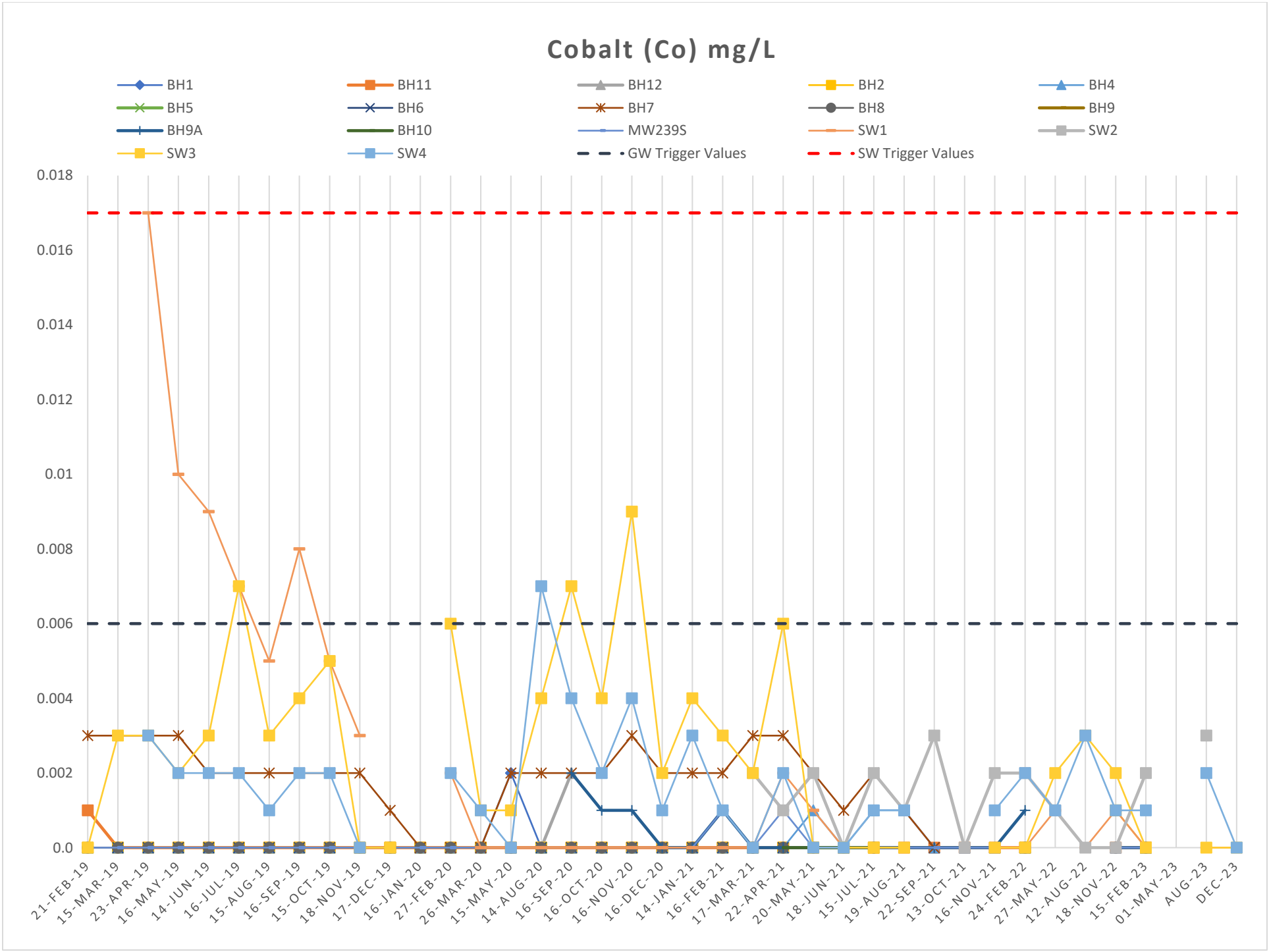

Rainfall
140
120
100
80
60
40
20
0
Dec (2022)
Jan (2023)
Feb (2023)
Mar (2023)
Apr (2023)
May (2023)
Jun (2023)
Jul (2023)
Aug (2023)
Sep (2023)
Oct (2023)
Nov (2023)
Dec (2023)
Monthly total Rainfall
Historical Mean (1942-Current)


Arsenic (As) mg/L
BH1/BH1A
BH11
BH12/BH12A
BH2
BH4
BH5
BH6
BH7
BH8
BH9
BH9A
BH10
MW239S
SW1
SW2
SW3
SW4
WPW
GW Trigger Value
SW Trigger Value
0.007
0.006
0.005
0.004
0.003
0.002
0.001
27-Feb-20
26-Mar-20
27-Apr-20
15-May-20
19-Jun-20
16-Jul-20
14-Aug-20
16-Sep-20
16-Oct-20
16-Nov-20
16-Dec-20
14-Jan-21
16-Feb-21
17-Mar-21
22-Apr-21
20-May-21
18-Jun-21
15-Jul-21
19-Aug-21
22-Sep-21
13-Oct-21
16-Nov-21
15-Dec-21
18-Jan-22
24-Feb-22
17-Mar-22
12-Apr-22
27-May-22
17-Jun-22
27-Jul-22
12-Aug-22
16-Sep-22
24-Oct-22
18-Nov-22
14-Dec-22
17-Jan-23
14-Feb-23
15-Mar-23
18-Apr-23
16-May-23
14-Jun-23
24-Jul-23
14-Aug-23
13-Sep-23
23-Oct-23
22-Nov-23
19-Dec-23

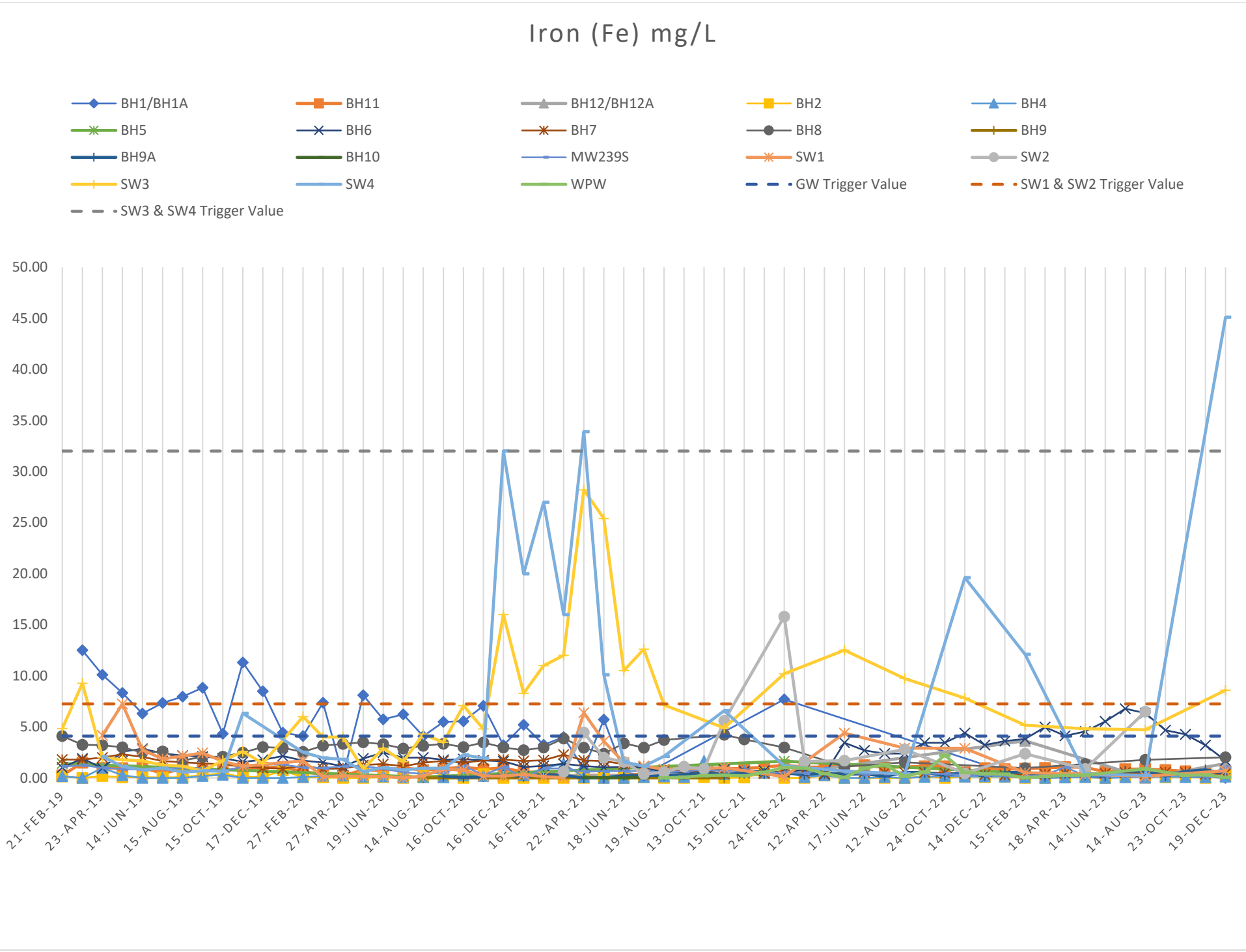

Barium (Ba) mg/L
BH1/BH1A
BH11
BH12/BH12A
BH2
BH4
BH5
BH6
BH7
BH8
BH9
BH9A
BH10
MW239S
SW1
SW2
SW3
SW4
GW Trigger Value
SW Trigger Value
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0.0
21-FEB-19
15-MAR-19
23-APR-19
16-MAY-19
14-JUN-19
16-JUL-19
15-AUG-19
16-SEP-19
15-OCT-19
18-NOV-19
17-DEC-19
16-JAN-20
27-FEB-20
26-MAR-20
15-MAY-20
14-AUG-20
16-SEP-20
16-OCT-20
16-NOV-20
16-DEC-20
14-JAN-21
16-FEB-21
17-MAR-21
22-APR-21
20-MAY-21
18-JUN-21
15-JUL-21
19-AUG-21
22-SEP-21
13-OCT-21
16-NOV-21
24-FEB-22
27-MAY-22
12-AUG-22
18-NOV-22
15-FEB-23
MAY-23
14-AUG-23
19-DEC-23


Boron (B) mg/L
BH1
BH11
BH12
BH2
BH4
BH5
BH6
BH7
BH8
BH9A
BH10
MW239S
SW1
SW2
SW3
SW4
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0.0
21-FEB-19
15-MAR-19
23-APR-19
16-MAY-19
14-JUN-19
16-JUL-19
15-AUG-19
16-SEP-19
15-OCT-19
18-NOV-19
17-DEC-19
16-JAN-20
15-MAY-20
14-AUG-20
16-SEP-20
16-OCT-20
16-NOV-20
16-DEC-20
14-JAN-21
16-FEB-21
17-MAR-21
22-APR-21
20-MAY-21
18-JUN-21
15-JUL-21
19-AUG-21
22-SEP-21
13-OCT-21
16-NOV-21
24-FEB-22
27-MAY-22
12-AUG-22
18-NOV-22
15-FEB-23
16-MAY-23
14-AUG-23
19-DEC-23

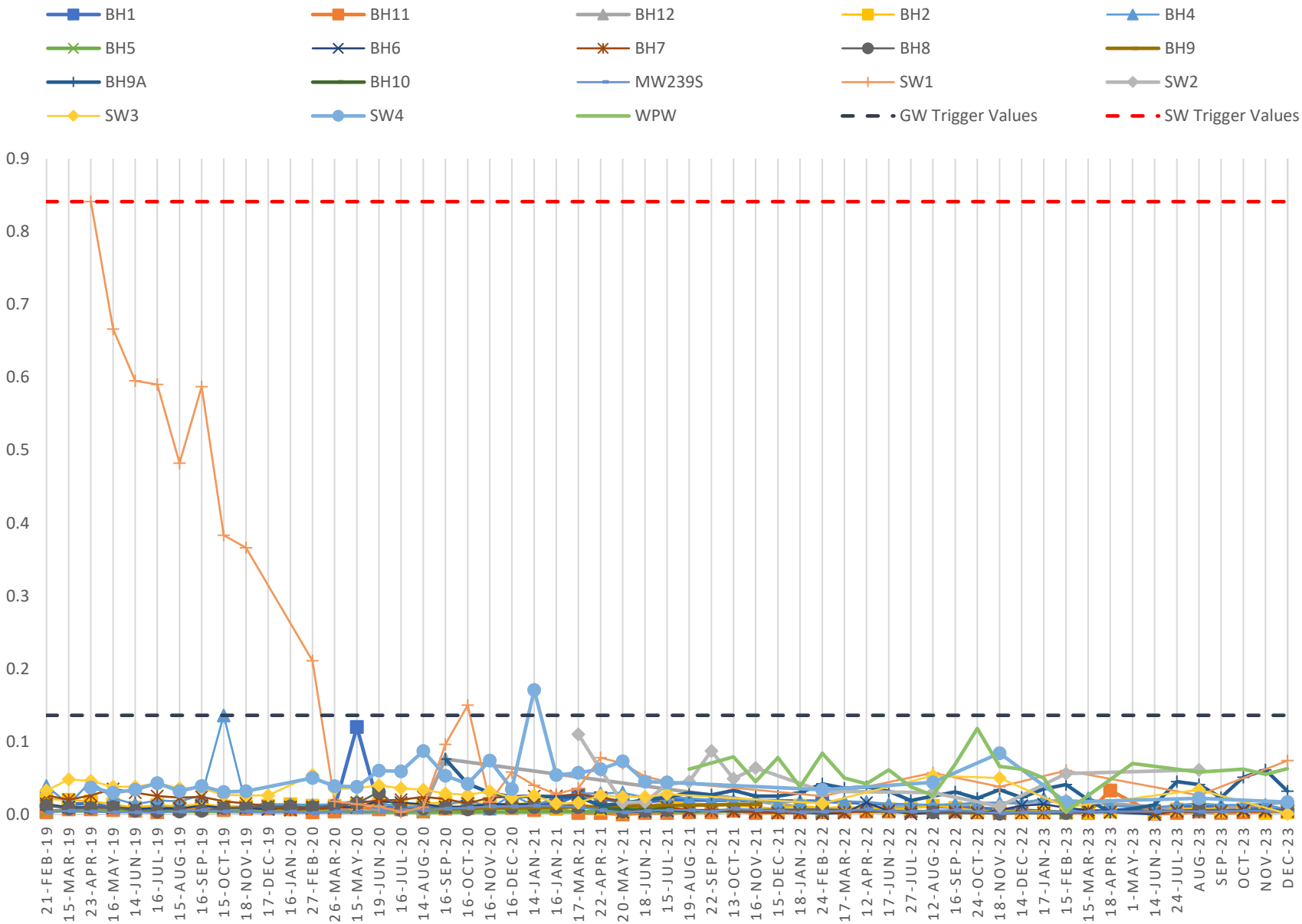

Chromium (Cr) mg/L
BH1
BH11
BH12
BH2
BH4
BH5
BH6
BH7
BH8
BH9
BH9A
BH10
MW239S
SW1
SW2
SW3
SW4
Trigger Value
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0.0
21-FEB-19
15-MAR-19
23-APR-19
16-MAY-19
14-JUN-19
16-JUL-19
15-AUG-19
16-SEP-19
15-OCT-19
18-NOV-19
17-DEC-19
16-JAN-20
27-FEB-20
26-MAR-20
27-APR-20
15-MAY-20
19-JUN-20
16-JUL-20
14-AUG-20
16-SEP-20
16-OCT-20
16-NOV-20
16-DEC-20
14-JAN-21
16-FEB-21
17-MAR-21
22-APR-21
20-MAY-21
18-JUN-21
15-JUL-21
19-AUG-21
22-SEP-21
13-OCT-21
16-NOV-21
24-FEB-22
27-MAY-22
12-AUG-22
18-NOV-22
15-FEB-23
16-MAY-23
14-AUG-23
19-DEC-23

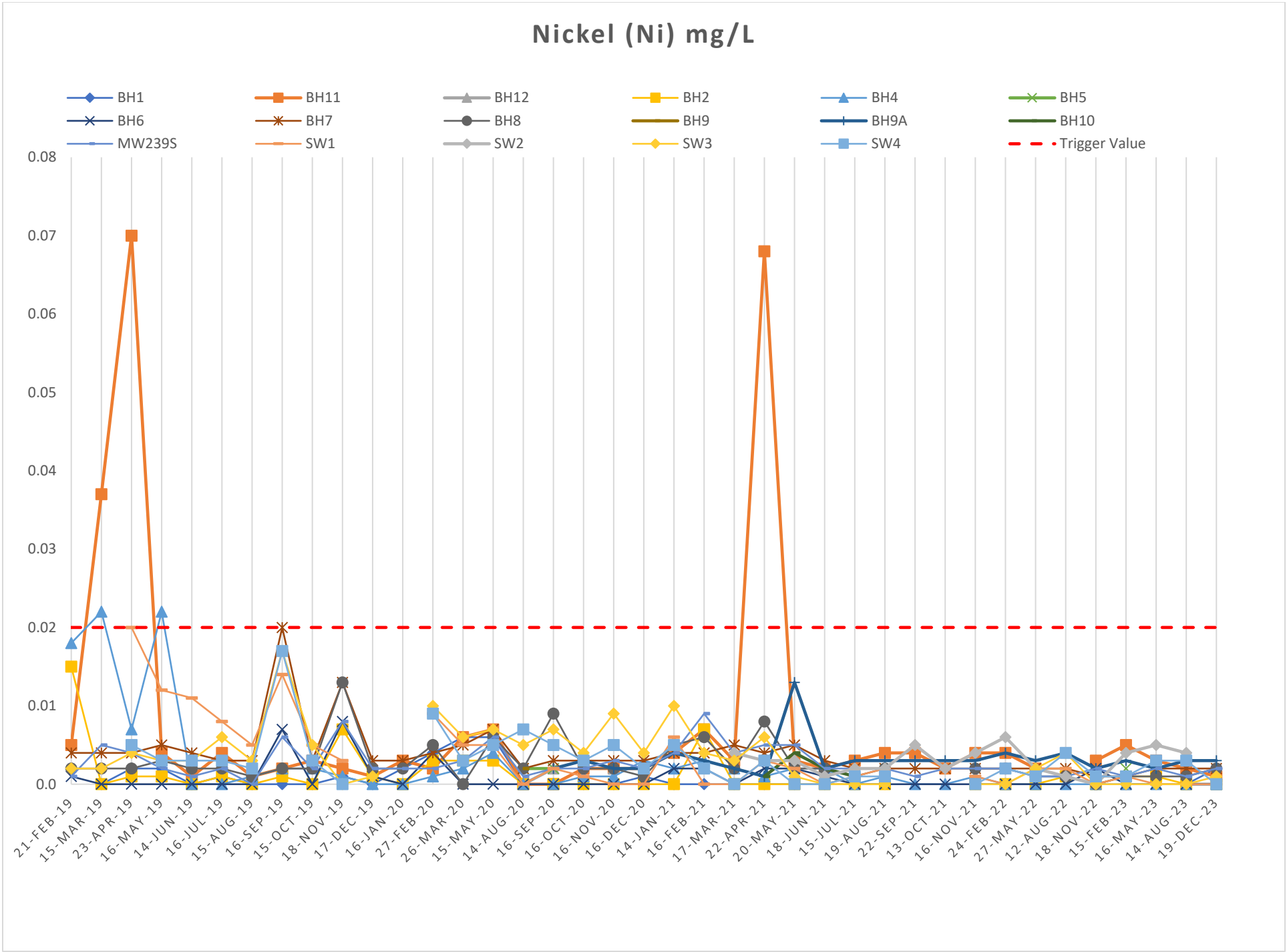

Cobalt (Co) mg/L
BH1
BH11
BH12
BH2
BH4
BH5
BH6
BH7
BH8
BH9
BH9A
BH10
MW239S
SW1
SW2
SW3
SW4
GW Trigger Values
SW Trigger Values
0.018
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0.0
21-FEB-19
15-MAR-19
23-APR-19
16-MAY-19
14-JUN-19
16-JUL-19
15-AUG-19
16-SEP-19
15-OCT-19
18-NOV-19
17-DEC-19
16-JAN-20
27-FEB-20
26-MAR-20
15-MAY-20
14-AUG-20
16-SEP-20
16-OCT-20
16-NOV-20
16-DEC-20
14-JAN-21
16-FEB-21
17-MAR-21
22-APR-21
20-MAY-21
18-JUN-21
15-JUL-21
19-AUG-21
22-SEP-21
13-OCT-21
16-NOV-21
24-FEB-22
27-MAY-22
12-AUG-22
18-NOV-22
15-FEB-23
01-MAY-23
AUG-23
DEC-23

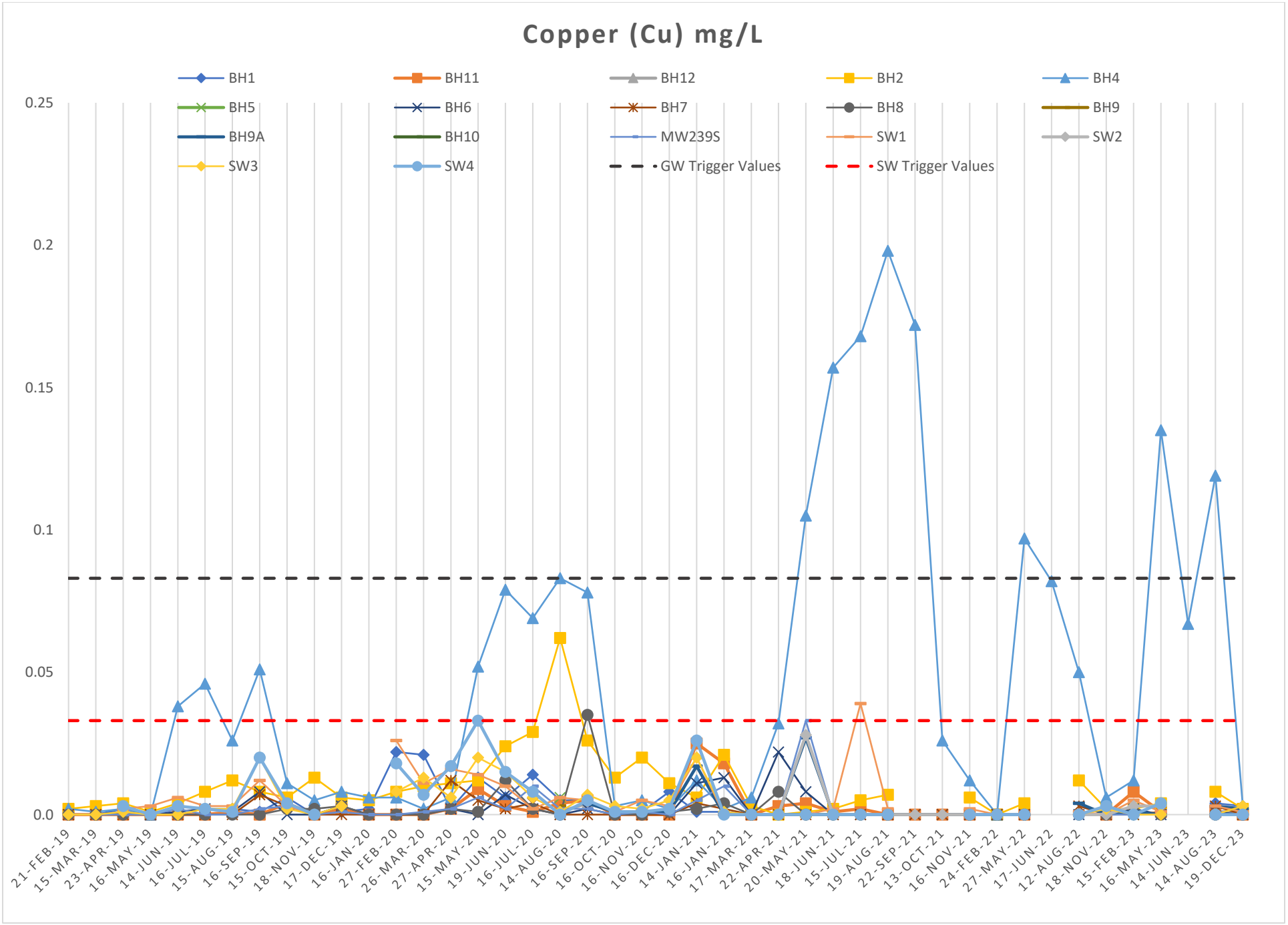
Iron (Fe) mg/L

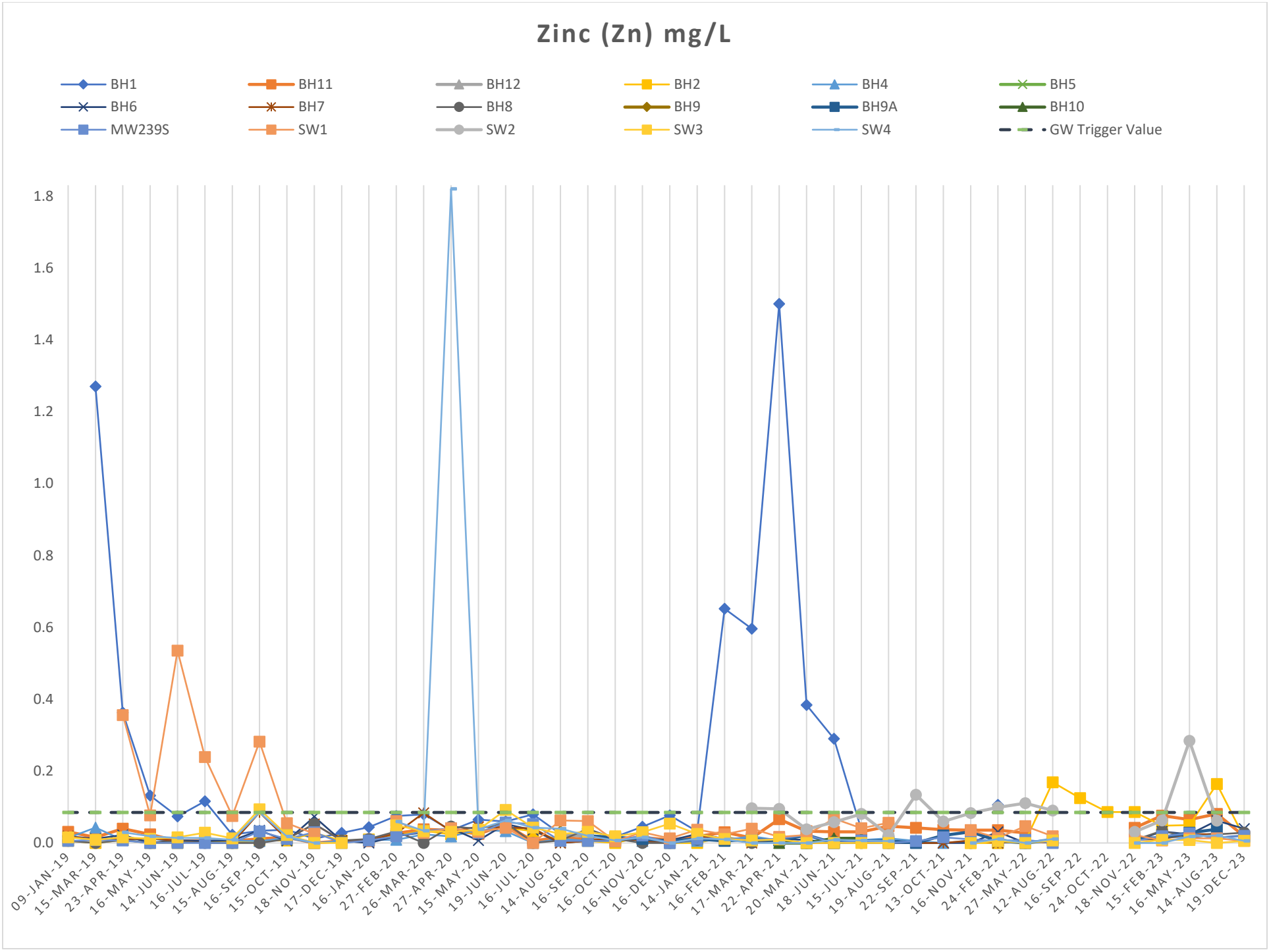

BH1/BH1A
BH11
BH12/BH12A
BH2
BH4
BH5
BH6
BH7
BH8
BH9
BH9A
BH10
MW239S
SW1
SW2
SW3
SW4
WPW
GW Trigger Value
SW1 & SW2 Trigger Value
SW3 & SW4 Trigger Value
50.00
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
21-FEB-19
23-APR-19
14-JUN-19
15-AUG-19
15-OCT-19
17-DEC-19
27-FEB-20
27-APR-20
19-JUN-20
14-AUG-20
16-OCT-20
16-DEC-20
16-FEB-21
22-APR-21
18-JUN-21
19-AUG-21
13-OCT-21
15-DEC-21
24-FEB-22
12-APR-22
17-JUN-22
12-AUG-22
24-OCT-22
14-DEC-22
15-FEB-23
18-APR-23
14-JUN-23
14-AUG-23
23-OCT-23
19-DEC-23

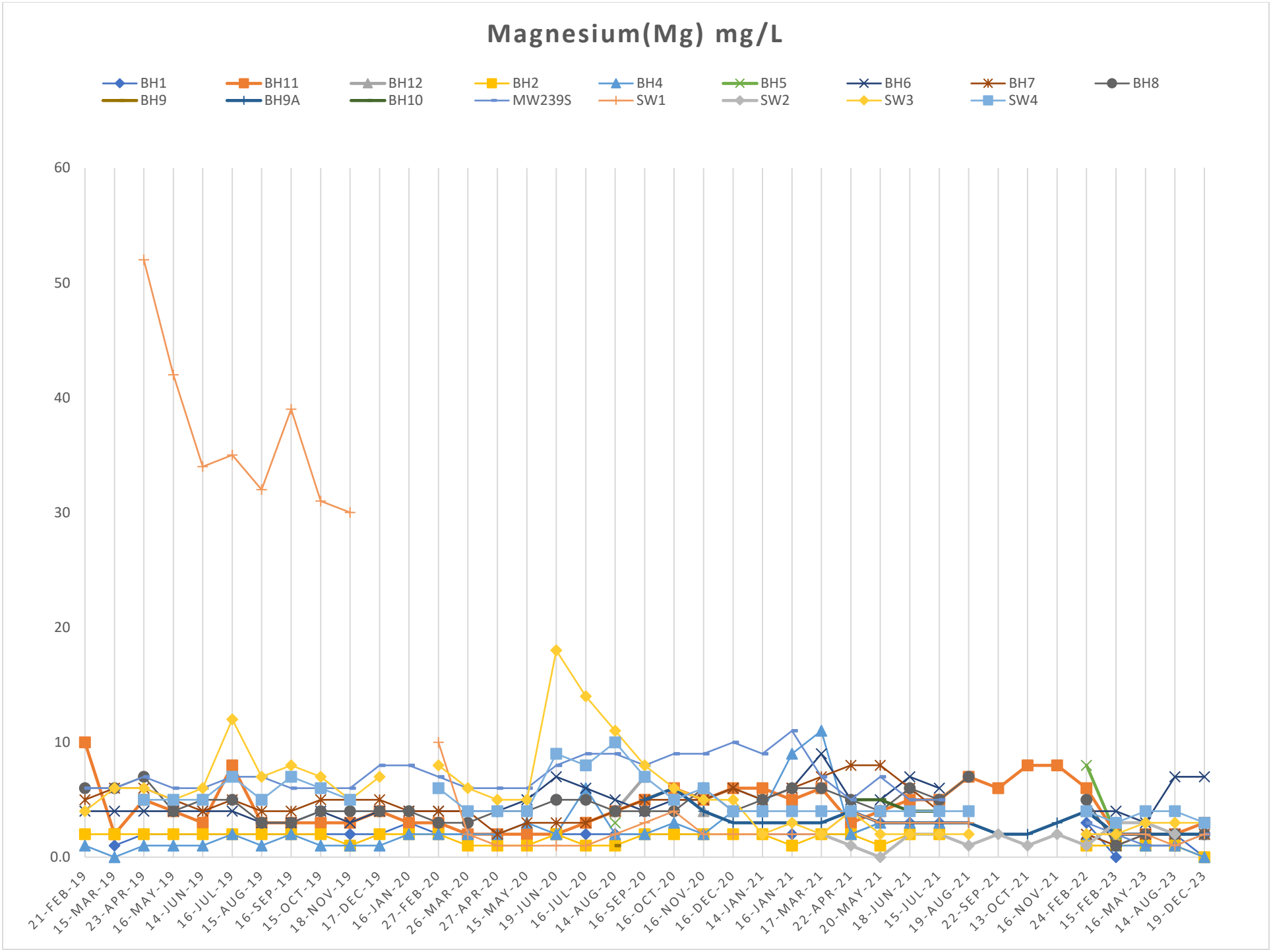
Manganese (Mn) mg/L

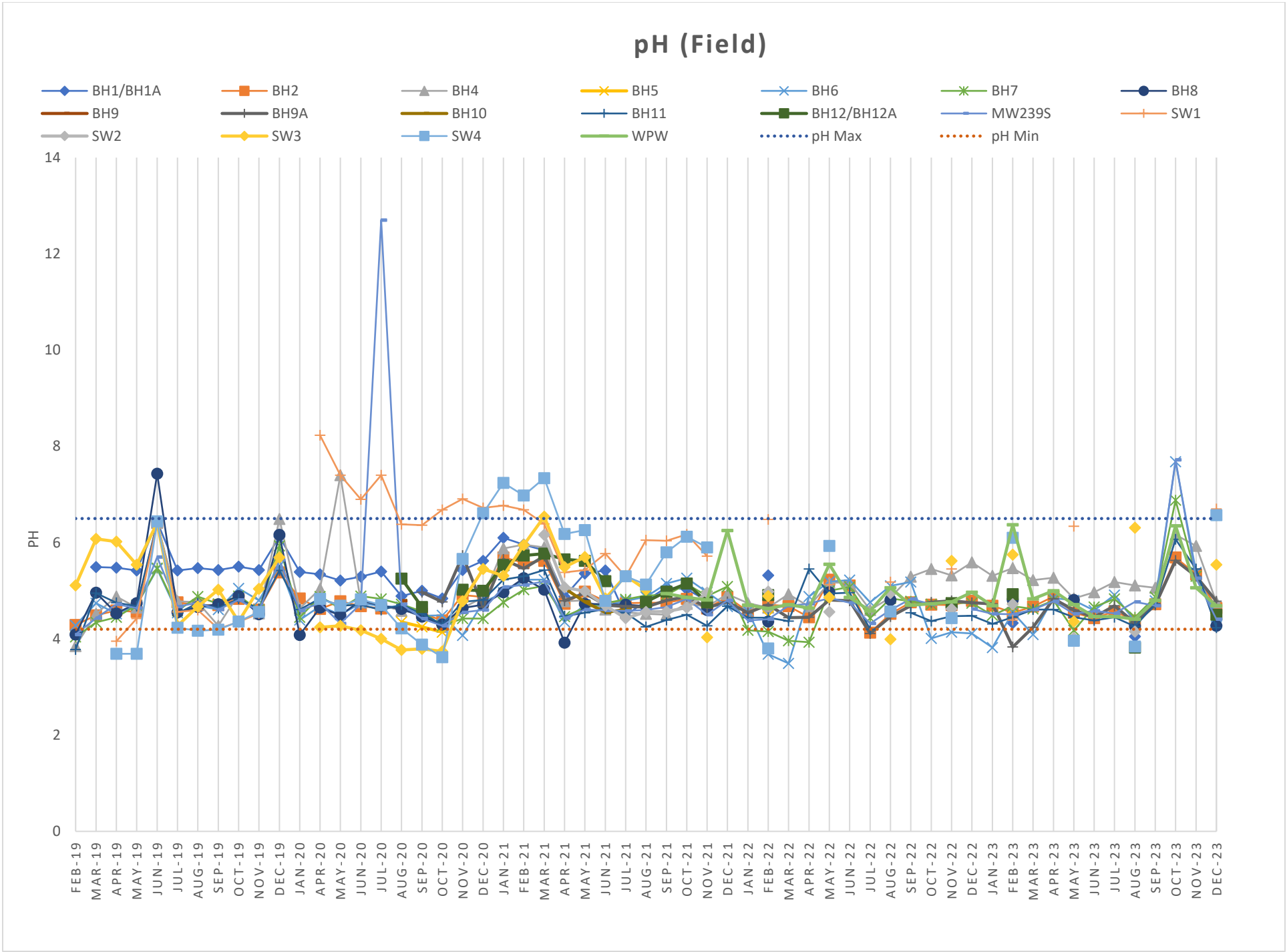


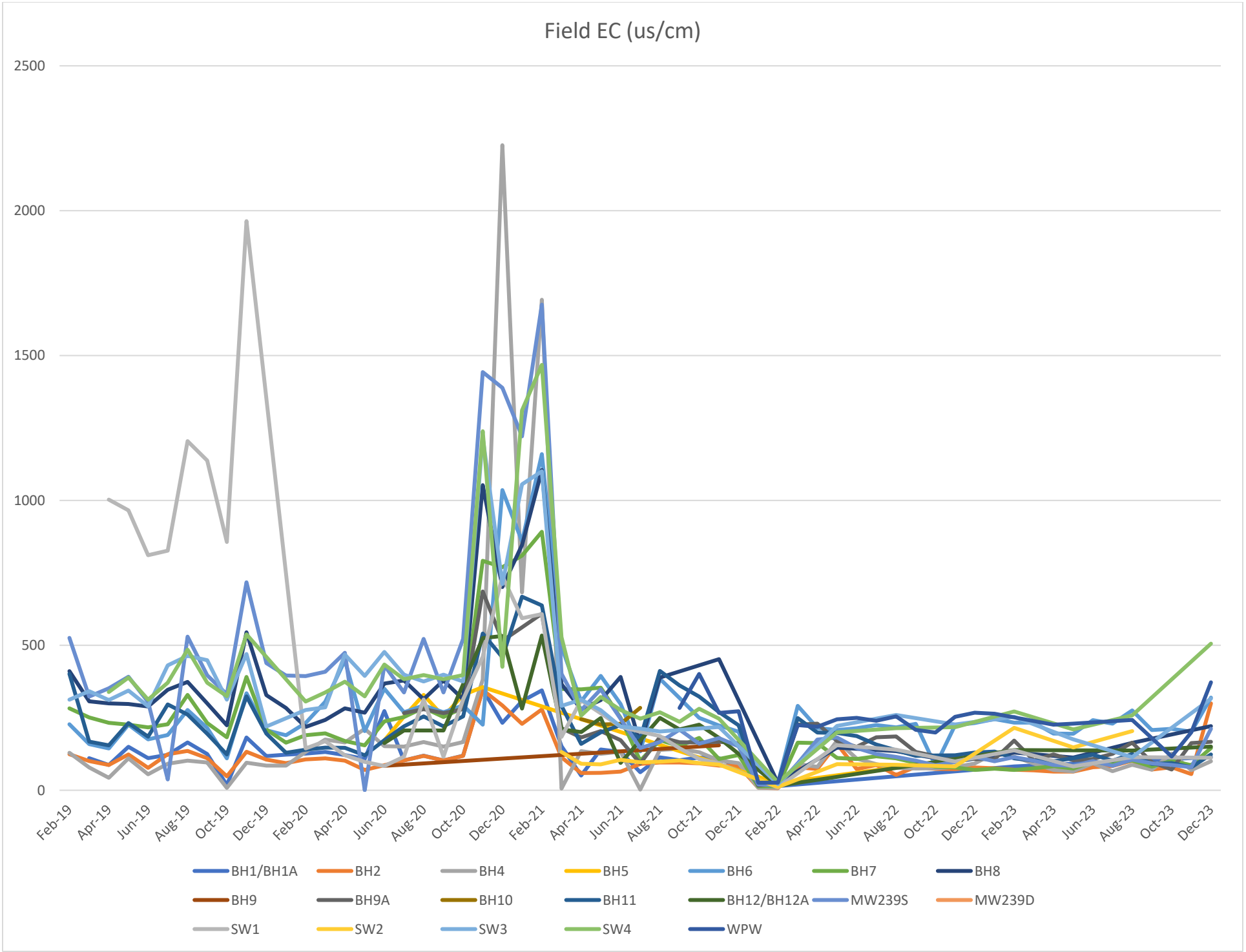

Nickel (Ni) mg/L
BH1
BH11
BH12
BH2
BH4
BH5
BH6
BH7
BH8
BH9
BH9A
BH10
MW239S
SW1
SW2
SW3
SW4
Trigger Value
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.0
21-FEB-19
15-MAR-19
23-APR-19
16-MAY-19
14-JUN-19
16-JUL-19
15-AUG-19
16-SEP-19
15-OCT-19
18-NOV-19
17-DEC-19
16-JAN-20
27-FEB-20
26-MAR-20
15-MAY-20
14-AUG-20
16-SEP-20
16-OCT-20
16-NOV-20
16-DEC-20
14-JAN-21
16-FEB-21
17-MAR-21
22-APR-21
20-MAY-21
18-JUN-21
15-JUL-21
19-AUG-21
22-SEP-21
13-OCT-21
16-NOV-21
24-FEB-22
27-MAY-22
12-AUG-22
18-NOV-22
15-FEB-23
16-MAY-23
14-AUG-23
19-DEC-23


Copper (Cu) mg/L
BH1
BH11
BH12
BH2
BH4
BH5
BH6
BH7
BH8
BH9
BH9A
BH10
MW239S
SW1
SW2
SW3
SW4
GW Trigger Values
SW Trigger Values
0.25
0.2
0.15
0.1
0.05
0.0
21-FEB-19
15-MAR-19
23-APR-19
16-MAY-19
14-JUN-19
16-JUL-19
15-AUG-19
16-SEP-19
15-OCT-19
18-NOV-19
17-DEC-19
16-JAN-20
27-FEB-20
26-MAR-20
27-APR-20
15-MAY-20
19-JUN-20
16-JUL-20
14-AUG-20
16-SEP-20
16-OCT-20
16-NOV-20
16-DEC-20
14-JAN-21
16-JAN-21
17-MAR-21
22-APR-21
20-MAY-21
18-JUN-21
15-JUL-21
19-AUG-21
22-SEP-21
13-OCT-21
16-NOV-21
24-FEB-22
27-MAY-22
17-JUN-22
12-AUG-22
18-NOV-22
15-FEB-23
16-MAY-23
14-JUN-23
14-AUG-23
19-DEC-23


Zinc (Zn) mg/L
BH1
BH11
BH12
BH2
BH4
BH5
BH6
BH7
BH8
BH9
BH9A
BH10
MW239S
SW1
SW2
SW3
SW4
GW Trigger Value
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
09-JAN-19
15-MAR-19
23-APR-19
16-MAY-19
14-JUN-19
16-JUL-19
15-AUG-19
16-SEP-19
15-OCT-19
18-NOV-19
17-DEC-19
16-JAN-20
27-FEB-20
26-MAR-20
27-APR-20
15-MAY-20
19-JUN-20
16-JUL-20
14-AUG-20
16-SEP-20
16-OCT-20
16-NOV-20
16-DEC-20
14-JAN-21
16-FEB-21
17-MAR-21
22-APR-21
20-MAY-21
18-JUN-21
15-JUL-21
19-AUG-21
22-SEP-21
13-OCT-21
16-NOV-21
24-FEB-22
27-MAY-22
12-AUG-22
16-SEP-22
24-OCT-22
18-NOV-22
15-FEB-23
16-MAY-23
14-AUG-23
19-DEC-23


Magnesium(Mg) mg/L
BH1
BH11
BH12
BH2
BH4
BH5
BH6
BH7
BH8
BH9
BH9A
BH10
MW239S
SW1
SW2
SW3
SW4
60
50
40
30
20
10
0.0
21-FEB-19
15-MAR-19
23-APR-19
16-MAY-19
14-JUN-19
16-JUL-19
15-AUG-19
16-SEP-19
15-OCT-19
18-NOV-19
17-DEC-19
16-JAN-20
27-FEB-20
26-MAR-20
27-APR-20
15-MAY-20
19-JUN-20
16-JUL-20
14-AUG-20
16-SEP-20
16-OCT-20
16-NOV-20
16-DEC-20
14-JAN-21
16-JAN-21
17-MAR-21
22-APR-21
20-MAY-21
18-JUN-21
15-JUL-21
19-AUG-21
22-SEP-21
13-OCT-21
16-NOV-21
24-FEB-22
15-FEB-23
16-MAY-23
14-AUG-23
19-DEC-23


pH (Field)
BH1/BH1A
BH2
BH4
BH5
BH6
BH7
BH8
BH9
BH9A
BH10
BH11
BH12/BH12A
MW239S
SW1
SW2
SW3
SW4
WPW
pH Max
pH Min
PH
14
12
10
8
6
4
2
0
FEB-19
MAR-19
APR-19
MAY-19
JUN-19
JUL-19
AUG-19
SEP-19
OCT-19
NOV-19
DEC-19
JAN-20
APR-20
MAY-20
JUN-20
JUL-20
AUG-20
SEP-20
OCT-20
NOV-20
DEC-20
JAN-21
FEB-21
MAR-21
APR-21
MAY-21
JUN-21
JUL-21
AUG-21
SEP-21
OCT-21
NOV-21
DEC-21
JAN-22
FEB-22
MAR-22
APR-22
MAY-22
JUN-22
JUL-22
AUG-22
SEP-22
OCT-22
NOV-22
DEC-22
JAN-23
FEB-23
MAR-23
APR-23
MAY-23
JUN-23
JUL-23
AUG-23
SEP-23
OCT-23
NOV-23
DEC-23


Field EC (us/cm)
2500
2000
1500
1000
500
0
Feb-19
Apr-19
Jun-19
Aug-19
Oct-19
Dec-19
Feb-20
Apr-20
Jun-20
Aug-20
Oct-20
Dec-20
Feb-21
Apr-21
Jun-21
Aug-21
Oct-21
Dec-21
Feb-22
Apr-22
Jun-22
Aug-22
Oct-22
Dec-22
Feb-23
Apr-23
Jun-23
Aug-23
Oct-23
Dec-23
BH1/BH1A
BH2
BH4
BH5
BH6
BH7
BH8
BH9
BH9A
BH10
BH11
BH12/BH12A
MW239S
MW239D
SW1
SW2
SW3
SW4
WPW