NEWCASTLE SAND

Newcastle Sand Environmental Monthly Report:

June 2025

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1. INTRODUCTION

This report has been prepared in accordance with the *Protection of the Environment Operations Act 1997* (POEO Act), Environment Protection Licence (EPL) 21264 and the reporting requirements of Development Consent SSD-6125 and associated management plans for the Cabbage Tree Road Sand Quarry. It provides a summary of environmental monitoring results and performance for the reporting month.

The monthly report includes noise, water and air monitoring required by EPL 21264 and internal monitoring undertaken and reported in accordance with:

- EPL 21264 (Conditions M1–M8, R1–R4)
- Development Consent SSD-6125 (Conditions B1–C15)
- NSW EPA's 2013 *Requirements for publishing pollution monitoring data*
- DPE's *Web-Based Reporting Guideline – State Significant Mining Developments (2023)*

A summary of the EPL licence details and Development Consent details for Cabbage Tree Road Sand Quarry are provided in **Table 1** and **Table 2** below. Tables throughout this report provide key monitoring information from the EPL and the Consent requirements, including:

- location of monitoring;
- pollutant;
- unit of measurement; and
- monitoring frequency required.

Refer to NSW EPA publishing guidelines at https://www.epa.nsw.gov.au/licensing-and-regulation/licensing/environment-protection-licences/licensing-under-poeo-act-1997/publishing-and-providing-pollution-monitoring-data for details of licence reporting requirements.

Table 1 Licensee EPL Summary

Licence Details	
Licence Number	**21264**
Anniversary Date	31 July
Licence Review	2024
Licensee	Williamtown Sand Syndicate PTY LTD
Licensee Address	PO Box 186 Waratah NSW 2298
Premises	Cabbage Tree Road Sand Quarry, 298 Cabbage Tree Road WILLIAMTOWN 2318
Scheduled Activity	Crushing, grinding or separating. Extractive activities.
Fee Based Activity	Crushing, grinding or separating. Extractive activities.
Link to Licence (EPA)	**EPL 21264**

Table 2 Development Consent Summary

Development Consent Details	
Development	**Cabbage Tree Road Sand Quarry**
Consent Authority	The Independent Planning Commission NSW
Applicant	Williamtown Sand Syndicate
Applicant Number and Link to Consent	**SSD-6125**

Table 3 and **Table 4** below outline the Quarry hours of operation for quarrying, loading and dispatching limits.

Table 3 Hours of Operation – Quarry Operations

Hours of Operation
Quarrying Operations
7am – 5pm Mon – Fri
7am – 4pm Saturday
At no time on Sundays or public holidays

Table 4 Hours of Operation - Loading and Dispatching

Hours of Operation
Loading and Dispatching of laden trucks
6am – 6pm Monday to Friday
7am – 4pm Saturday
At no time on Sundays or public holidays

2. NOISE & VIBRATION MONITORING

Noise monitoring is undertaken quarterly in accordance with EPL 21264 (Condition M8.1) and Development Consent SSD-6125. Locations of the receivers surrounding the project area is provided within **Appendix 1**.

2.1 CRITERIA

Table 5 Noise EPL Monitoring Criteria

Receiver	Day LAeq(15min)	Shoulder LAeq(15min)	Shoulder LA Max(1min)
Any resident receiver	43	39	45

2.2 RESULTS

Noise monitoring is undertaken in accordance with the EPL which states in Condition M8.1 that noise monitoring is to occur quarterly. Where quarry noise is inaudible or below thresholds, compliance is considered achieved. **Table 6** and **Table 7** below outline the day and morning shoulder monitoring results for June. See **Appendix 2** for the full noise monitoring report.

Table 6 June 2025 Monitoring Results - Day

Date	Location	Time	dB(A), Leq	Criterion dB(A) Leq	Identified Noise Sources, LAeq
4 June 2025	R14	7:00am	49	43	Traffic (47), birds and insects (45), **NS (IA)**
5 June 2025	R14	7:00am	49	43	Traffic (48), birds & insects (43), **NS (IA)**
6 June 2025	R14	7:00am	48	43	Traffic (47), birds & insects (42), **NS (IA)**
Note: All measurements were made under compliant meteorological conditions. Where operational noise was inaudible, no exceedance is deemed to have occurred.					

Table 7 June Monitoring Results - Morning Shoulder

Date	Location	Time	dB(A), Leq	Criterion dB(A) Leq	dB(A), L1 (1min)1	Criterion dB(A), L1 (1min)1	Identified Noise Sources, LAeq
4 June 2025	R14	6:30am	51	39	<20	45	Traffic (50), birds and insects (45), NS (IA)
5 June 2025	R14	6:30am	50	39	<20	45	Traffic (49), birds and insects (44), **NS (IA)**
6 June 2025	R14	6:30am	49	39	<20	45	Traffic (47), birds and insects (44), **NS (IA)**
Note: All measurements were made under compliant meteorological conditions. Where operational noise was inaudible, no exceedance is deemed to have occurred.							

The results in **Table 6** and **Table 7** show that, under the operating and meteorological conditions at the times, for the 30-minute (morning-shoulder) and 1.5-hour (day) compliance measurement periods, the quarry noise from Newcastle Sand was inaudible at the monitoring location.

3. WATER MONITORING

Water monitoring is undertaken in accordance with EPL 21264 (Conditions M2 and M3) and Development Consent SSD-7332 (Conditions B30–B32). This includes monthly groundwater sampling from a network of monitoring bores and, where applicable, surface water monitoring from sediment basins or natural watercourses. Parameters monitored are selected based on potential impacts to the Tomago Sandbeds and surrounding environments.

Monthly surface and groundwater results are compared to site-specific trigger levels from the Soil and Water Management Plan (SWMP, currently version 3 approved). Water monitoring locations are provided in **Appendix 3**. Surface water locations (SW1–SW4) are not listed in EPL 21264 and are therefore not subject to NSW EPA public reporting requirements. Monitoring at these locations is conducted to meet SSD-6125 and SWMP obligations and is reported internally and through the Annual Environmental Management Review (AEMR).

3.1 GROUNDWATER

In accordance with the SWMP, an exceedance of the trigger value does not necessarily indicate that there is an unacceptable risk on site, but rather a trigger for further investigation or evaluation of management options.

Error! Reference source not found. and **Figure 1** Groundwater Level Monitoring Tarp Rules (Watershed HydroGeo, 2019) below present the results of the June groundwater monitoring period and the Trigger Action Response Plan associated. Error! Reference source not found. shows the groundwater monitoring results for June. During the June monitoring period, BH6 and BH11 were not tested due to inaccessible tracks caused by deep water.

Level 3 TARP for groundwater levels were triggered at monitoring bore BH1A and BH2. Level 1 TARP was triggered at monitoring bore BH9A. This enacted a response for Newcastle Sand to report to the DPHI, DoI Water and HWC and triggered a review by a hydrogeologist. These actions are being completed by Newcastle Sand. As an operational response the site has left an additional 1m floor until BH2 groundwater levels stabilise.

No exceedances for water quality were recorded for this month. A groundwater review is undertaken quarterly and is included in **Appendix 4**.

Table 7 EPL Groundwater Criteria and Monitoring Results

Monitoring Well	Groundwater Quality						Groundwater Levels			
	Arsenic	Iron	Manganese	Field EC (µS/cm)	Field pH (pH units)	Field Turbidity (NTU)	Depth to Water (mbTOC)	GWE	Max inferred	Max inferred
Site Trigger Values	**0.003**	**4.1**	**0.136**	**500**	**4.2-6.5**	**N/A**	**Refer to Figure 1**			
BH2	<0.001	0.48	0.011	102	4.8	8.3	3.65	4.02	3.8	**-0.22**
BH4	<0.001	0.03	0.007	120	4.8	0.8	0.63	2.43	3.0	**0.57**
BH6	NT	NT	NT	NT	NT	NT	NT	NT	NT	**NT**
BH7	<0.001	0.42	0.011	141	5.0	1.4	0.79	2.19	3.7	**1.51**
BH9A	<0.001	0.26	0.023	177	4.9	28	8.02	2.73	3.0	**0.27**
BH11	NT	NT	NT	NT	NT	NT	NT	NT	NT	**NT**
MW239S	<0.001	0.39	0.006	174	4.8	45	0.37	2.67	3.9	**1.23**

Level	Trigger	Action and Response	Report / Response Actions
0	Groundwater levels more than 0.5 m below *inferred* maximum historical level.	Standard operations – monthly dipping of operational on-site monitoring bores.	N/A
1	Groundwater levels within 0.5 m below *inferred* maximum historical level at any on-site bore.	Weekly (or more frequent) monitoring (dipping) of groundwater levels until water level declines to below high frequency level bores.	Internal and environmental consultant. Include note in Annual Report.
2	Groundwater levels within 0.25 m of *inferred* maximum historical level 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.	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.

Figure 1 Groundwater Level Monitoring Tarp Rules (Watershed HydroGeo, 2019)

3.2 PFAS

PFAS (Per- and Polyfluoroalkyl Substances) monitoring is conducted in accordance with the requirements of the Soil and Water Management Plan (2021) and Development Consent SSD-6125. Routine water sampling was undertaken in June across the full monitoring suite, including:

- Groundwater bores
- Surface water sites
- Wash plant process water
- Wash plant fines

Monitoring is carried out in accordance with relevant national standards, including the PFAS National Environmental Management Plan (HEPA NEMP 2.0) trigger values.

All PFAS analytes were either below detection limits or well below applicable trigger thresholds, with no exceedances recorded in any location during the sampling round. The results further demonstrate that the site's PFAS mitigation and management systems are operating effectively, with no risk posed to downstream water users or the surrounding environment.

A surface water review is undertaken quarterly at the Site. The review has been completed in June 2025 and is included in **Appendix 5**.

4. AIR QUALITY

Air quality monitoring at the Newcastle Sand site is undertaken in accordance with EPL 21264 (Conditions M2 and M3) and the NSW *Approved Methods for Sampling and Analysis of Air Pollutants*. The focus is on particulate matter (PM10 and TSP) to assess compliance with ambient air quality criteria and to monitor potential off-site impacts.

Real-time data informs Trigger Action Response Plan (TARP) interventions, while HVAS results feed into compliance assessment and trend reporting. Monitoring locations are displayed in **Appendix 6**. The BAM quarterly review report is attached as **Appendix 7.**

4.1 AIR QUALITY CRITERIA

Table 8 EPL P1.1 Air Monitoring

EPL ID Number	Type of Monitoring	Location Description
13	Ambient Air Monitoring	RT1
14	Ambient Air Monitoring	RT2
15	Ambient Air Monitoring	HVAS-1 PM10
16	Ambient Air Monitoring	TSP

Table 9 EPL Air Monitoring Requirements

Air Monitoring Requirements			
Point 13,14			
Pollutant	**Unit of Measure**	**Frequency**	**Sampling Method**
PM10	micrograms per cubic	Continuous	Australian Standard
Point 15			
Pollutant	**Unit of Measure**	**Frequency**	**Sampling Method**
PM10	micrograms per cubic	Every 6 days	AM-18
Point 16			
Pollutant	**Unit of Measure**	**Frequency**	**Sampling Method**
Total suspended	micrograms per cubic	Every 6 days	AM-15

4.2 AIR QUALITY RESULTS

Air quality for PM10 and TSP levels recorded for June were within compliance limits.

Table 10 HVAS Air Monitoring Results

Sample Date	HVAS 1 (PM10) Paddock	Rolling Average	HVAS 2 (TSP) Sampson	Rolling Average
	Criteria 50 µg/m³	Criteria 25µg/m³	-	Criteria 90 µg/m³
5 June 2025	11	14.3	26	25.3
11 June 2025	7	14.6	24	25.2
17 June 2025	7	14.6	34	25.2
23 June 2025	4	14.4	27	25.2
29 June 2025	7	14.5	13	25.2

Table 11 BAM Monitoring Results

Month	RT1 Average (24 hour)	Rolling Average (Annual)	RT2 Average (24 hour)	Rolling Average (Annual)
	Criteria 50µg/m³	Criteria 25µg/m³		Criteria 90 µg/m³
June	7.77	9.97	2.31	5.76

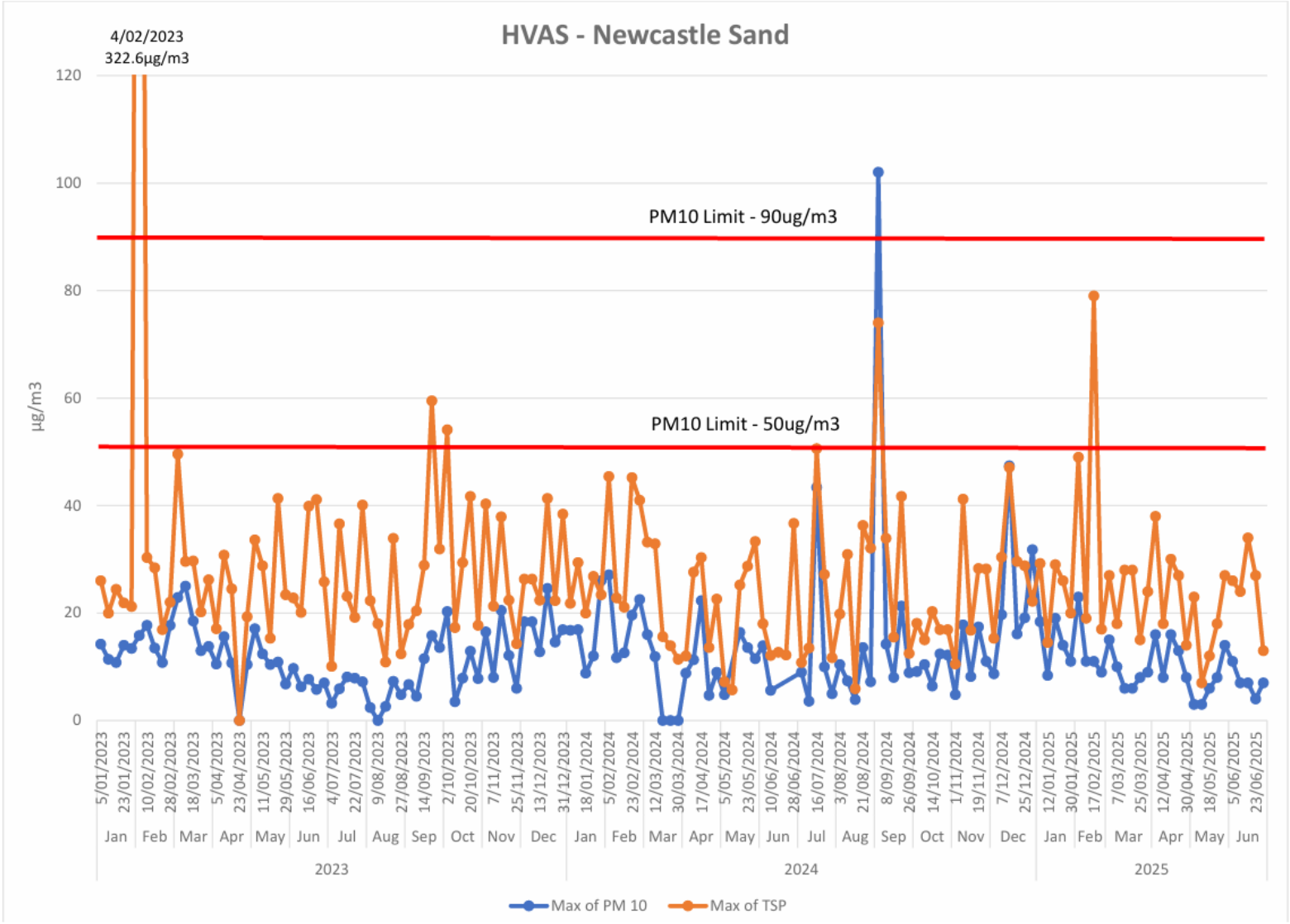

Figure 2 HVAS Long Term Results for TSP and PM10

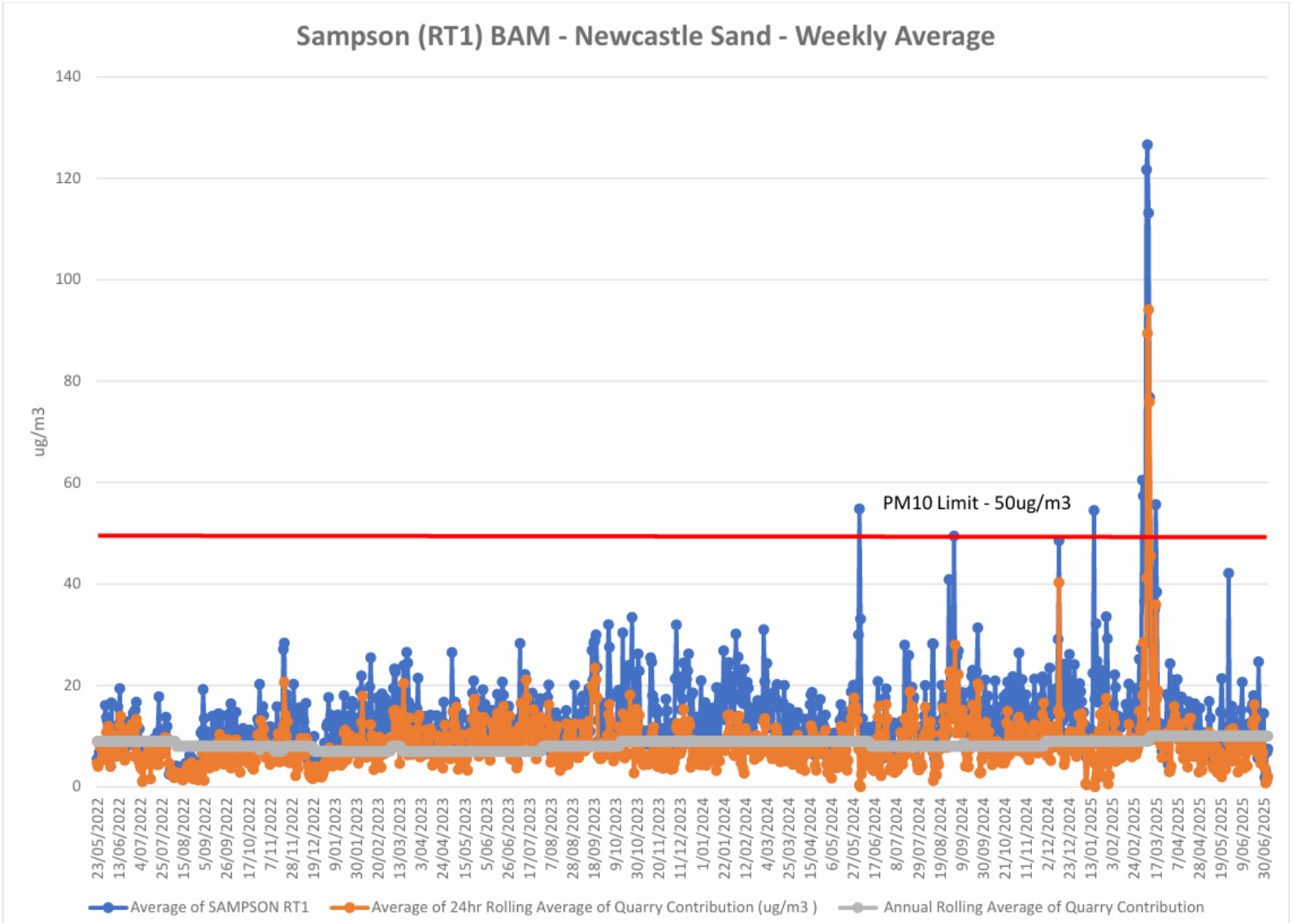

Figure 3 Sampson (RT1) BAM Long Term Results

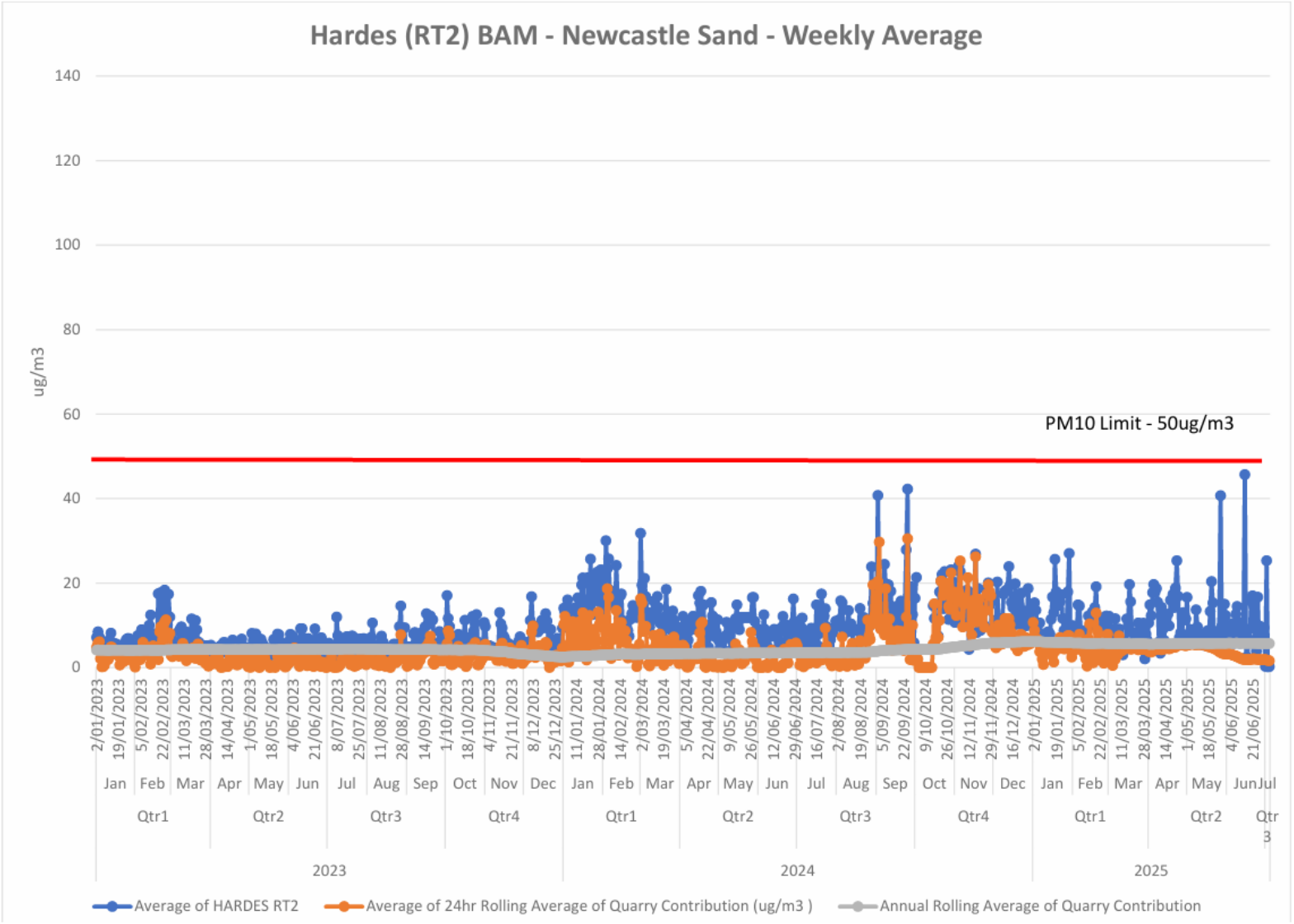

Figure 4 Hardes (RT1) BAM Long Term Results

Trigger Response Framework		
Trigger Stage	**Conditions**	**Action**
1	a) **Wind towards residents.** Where wind is directed towards surrounding residences,, that is the weather station indicates winds are blowing from the quatrants west (270°), THROUGH North (0°) to East (90°). **OR** b) **PM10 above background.** Continuous PM10 minotor shows rolling PM10 24-hour average exceeds the acerage background concentration of 22ug/m3.	Review operations and ensure water dust suppression is active (e.g. haul roads and stock-pile sprays)
2	a) Wind is directed toward surrounding residences; **AND** b) Rolling PM10 24-hour average axceeds 35ug/m3	No topsoil stripping or dozer pushing
3	a) Wind is directed toward surrounding residences; AND b) Rolling PM10 24-hour average exceeds 40ug/m3	No sand processing. **In addition to Stage 1 & 2 actions.**
4	a) Levels ontinue to increase after two hours since last action; AND **b) Wind is directed towards surrounding residences;** AND c) Rolling PM10 24-hour average exceeds 42.5 ug/m3	Suspend sand extraction. **In addition to Stage 1, 2, & 3 actions.**
5	a) PM10 levels continue to increase after two hours since last actions; **AND** b) Wind is directed towards surrounding residences; **AND** c) rolling PM10 24-hour average exceeds 45ug/m3	Suspend loading trucks (i.e. no machinery operating - except water carts and product haulage trucks already loaded). **In addition to Stage 1, 2, 3 & 4 actions.**
6	a) Rolling PM10 24-hour average exceeds 50ug/m3.	**All activities suspended (except dust control measures)** Complete Incident Notification to DPE within 24 hours. Complete Incident Investigation and Corrective Action Report.

Table sourced: Newcastle Sand, Air Quality Management Plan, 26th March, 2019, Ref: Air QMP V3 20190326

Figure 5 Air Quality Trigger Framework (AQMP, 2019)

5. METEROLOGICAL

5.1 METEOROLOGICAL CRITERIA

Meteorological observations for June 2025 were sourced from the Williamtown RAAF station (ID: 061078), located approximately 7.5 m above ground level and representative of local conditions at Newcastle Sand.

Table 12 and **Table 13** below outline the location and criteria associated with EPL 21264 (Conditions M5 and M6), the Air Quality Management Plan (AQMP), and the NSW EPA Approved Methods for Sampling of Air Pollutants (2016) require data to be used to support the validity of air and noise monitoring events and inform real-time responses to dust risks via the AQMP Trigger Action Response Plan (TARP).

Table 12 Meteorological Monitoring Location

EPL ID number	Type of Monitoring	Location description
17	Meteorological Station	Williamtown Bureau of Meteorology Station

Table 13 Meteorological Monitoring Criteria

Parameter	Sampling method	Units of measure	Averaging period	Frequency
Temperature at 2 meters	AM-4	Degrees Celsius	1 hour	Continuous
Wind direction at 10 meters	AM-2 & AM-4	Degrees	15 minutes	Continuous
Wind speed at 10 meters	AM-2 & AM-4	Meters per second	15 minutes	Continuous
Sigma Theta	AM-2 & AM-4	Degrees	15 minutes	Continuous
Rainfall	AM-4	Millimetres	15 minutes	Continuous
Relative Humidity	AM-4	Percent	1 hour	Continuous

5.2 METEOROLOGICAL RESULTS

Rainfall data was obtained from the Bureau of Meteorology Williamtown RAAF AWS (Station No. 061078, Williamtown, NSW - Daily Weather Observations (bom.gov.au)). A total of **65.6mm** of rainfall was recorded over the June period.

Meteorological conditions during the month were typical for the season. Wind direction is used to assess the relevance of elevated PM10 events recorded by BAM. No anomalies were observed in rainfall or humidity that would invalidate monitoring results.

Table 14 Meteorological Results

Month	**Max mean temperature at 2 meters (Degrees** Celsius)	**Wind direction at 10 meters** (Degrees)	**Highest wind speed at 10 meters** (Km/h)	**Rainfall** (Millimetres)	**Mean Relative Humidity at 3pm** (Percent)
June	17.5	NW	80	65.6	60

6. TRAFFIC

Table 15 shows the monthly summary of traffic movements as per Schedule 3 Condition 26 of Development Consent. The weighbridge and ticketing system is routinely calibrated and managed by an accredited external business to ensure the sale and transport of sand from the quarry is consistent with approved haulage limits and operational times. Full daily vehicle logs are retained on-site and are available for inspection upon request by regulators.

6.1 TRUCK MOVEMENT CRITERIA

Truck movements are monitored daily at the site entry point. The data ensures compliance with the approved hourly vehicle limits under Development Consent and supports broader compliance with noise and air quality management objectives. The maximum approved haulage as per Condition 23 of Consent SSD 6125 is outlined in **Table 15** below.

Table 15 Approved Movement Criteria

Time Period	Limits (Trucks/Hour)
6:00am – 7:00am	6
7:00am – 6:00pm (Monday to Friday)	10
7:00am – 4:00pm (Saturday)	10
Sundays / Public Holidays	No truck movements permitted

6.2 TRUCK MONITORING RESULTS

Table 16 below outlines the Newcastle sand truck movement compliance for June.

DAY (Date)	HOUR	DAY OF WEEK	LIMIT	P/F
2	6	Monday	6	PASS
2	7	Monday	10	PASS
2	8	Monday	10	PASS
2	9	Monday	10	PASS
2	10	Monday	10	PASS
2	11	Monday	10	PASS
2	12	Monday	10	PASS
2	13	Monday	10	PASS
2	14	Monday	10	PASS
2	15	Monday	10	PASS
3	6	Tuesday	6	PASS
3	7	Tuesday	10	PASS
3	8	Tuesday	10	PASS
3	9	Tuesday	10	PASS
3	10	Tuesday	10	PASS
3	11	Tuesday	10	PASS
3	12	Tuesday	10	PASS
3	13	Tuesday	10	PASS
3	14	Tuesday	10	PASS
3	15	Tuesday	10	PASS
3	16	Tuesday	10	PASS
4	6	Wednesday	6	PASS
4	7	Wednesday	10	PASS
4	8	Wednesday	10	PASS
4	9	Wednesday	10	PASS
4	10	Wednesday	10	PASS
4	11	Wednesday	10	PASS
4	12	Wednesday	10	PASS
4	13	Wednesday	10	PASS
4	14	Wednesday	10	PASS
4	16	Wednesday	10	PASS
4	17	Wednesday	10	PASS
5	6	Thursday	6	PASS
5	7	Thursday	10	PASS

DAY (Date)	HOUR	DAY OF WEEK	LIMIT	P/F
5	8	Thursday	10	PASS
5	9	Thursday	10	PASS
5	10	Thursday	10	PASS
5	11	Thursday	10	PASS
5	12	Thursday	10	PASS
5	13	Thursday	10	PASS
5	14	Thursday	10	PASS
5	15	Thursday	10	PASS
5	16	Thursday	10	PASS
6	6	Friday	6	PASS
6	7	Friday	10	PASS
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6	12	Friday	10	PASS
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10	14	Tuesday	10	PASS
10	15	Tuesday	10	PASS
10	16	Tuesday	10	PASS
10	17	Tuesday	10	PASS
11	6	Wednesday	6	PASS
11	7	Wednesday	10	PASS
11	8	Wednesday	10	PASS
11	9	Wednesday	10	PASS

DAY (Date)	HOUR	DAY OF WEEK	LIMIT	P/F
11	10	Wednesday	10	PASS
11	11	Wednesday	10	PASS
11	12	Wednesday	10	PASS
11	13	Wednesday	10	PASS
11	14	Wednesday	10	PASS
11	16	Wednesday	10	PASS
12	6	Thursday	6	PASS
12	7	Thursday	10	PASS
12	8	Thursday	10	PASS
12	9	Thursday	10	PASS
12	10	Thursday	10	PASS
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13	15	Friday	10	PASS
14	7	Saturday	10	PASS
14	8	Saturday	10	PASS
14	9	Saturday	10	PASS
14	11	Saturday	10	PASS
16	6	Monday	6	PASS
16	7	Monday	10	PASS
16	8	Monday	10	PASS
16	9	Monday	10	PASS
16	10	Monday	10	PASS
16	11	Monday	10	PASS
16	12	Monday	10	PASS
16	13	Monday	10	PASS

DAY (Date)	HOUR	DAY OF WEEK	LIMIT	P/F
16	14	Monday	10	PASS
16	16	Monday	10	PASS
17	6	Tuesday	6	PASS
17	7	Tuesday	10	PASS
17	8	Tuesday	10	PASS
17	9	Tuesday	10	PASS
17	10	Tuesday	10	PASS
17	11	Tuesday	10	PASS
17	12	Tuesday	10	PASS
17	13	Tuesday	10	PASS
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19	15	Thursday	10	PASS
20	6	Friday	6	PASS
20	7	Friday	10	PASS
20	8	Friday	10	PASS
20	9	Friday	10	PASS
20	10	Friday	10	PASS

DAY (Date)	HOUR	DAY OF WEEK	LIMIT	P/F
20	11	Friday	10	PASS
20	12	Friday	10	PASS
20	13	Friday	10	PASS
20	14	Friday	10	PASS
20	15	Friday	10	PASS
20	16	Friday	10	PASS
21	8	Saturday	10	PASS
21	9	Saturday	10	PASS
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24	15	Tuesday	10	PASS
24	16	Tuesday	10	PASS
25	7	Wednesday	10	PASS
25	8	Wednesday	10	PASS
25	9	Wednesday	10	PASS
25	10	Wednesday	10	PASS
25	11	Wednesday	10	PASS
25	12	Wednesday	10	PASS
25	13	Wednesday	10	PASS
25	14	Wednesday	10	PASS

DAY (Date)	HOUR	DAY OF WEEK	LIMIT	P/F
25	15	Wednesday	10	PASS
25	16	Wednesday	10	PASS
26	6	Thursday	6	PASS
26	7	Thursday	10	PASS
26	8	Thursday	10	PASS
26	9	Thursday	10	PASS
26	10	Thursday	10	PASS
26	11	Thursday	10	PASS
26	12	Thursday	10	PASS
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30	8	Monday	10	PASS
30	9	Monday	10	PASS
30	10	Monday	10	PASS
30	11	Monday	10	PASS
30	12	Monday	10	PASS
30	13	Monday	10	PASS
30	14	Monday	10	PASS
30	15	Monday	10	PASS
30	17	Monday	10	PASS

7. COMMUNITY & COMPLIANCE

7.1 COMPLAINTS

There were no community complaints in the reporting period.

The last community complaint was on the 28 February 2024 regarding truck movements. The matter has since been resolved and closed out, details of this can be found on the Newcastle Sand website: https://www.newcastlesand.com.au/complaints-register/

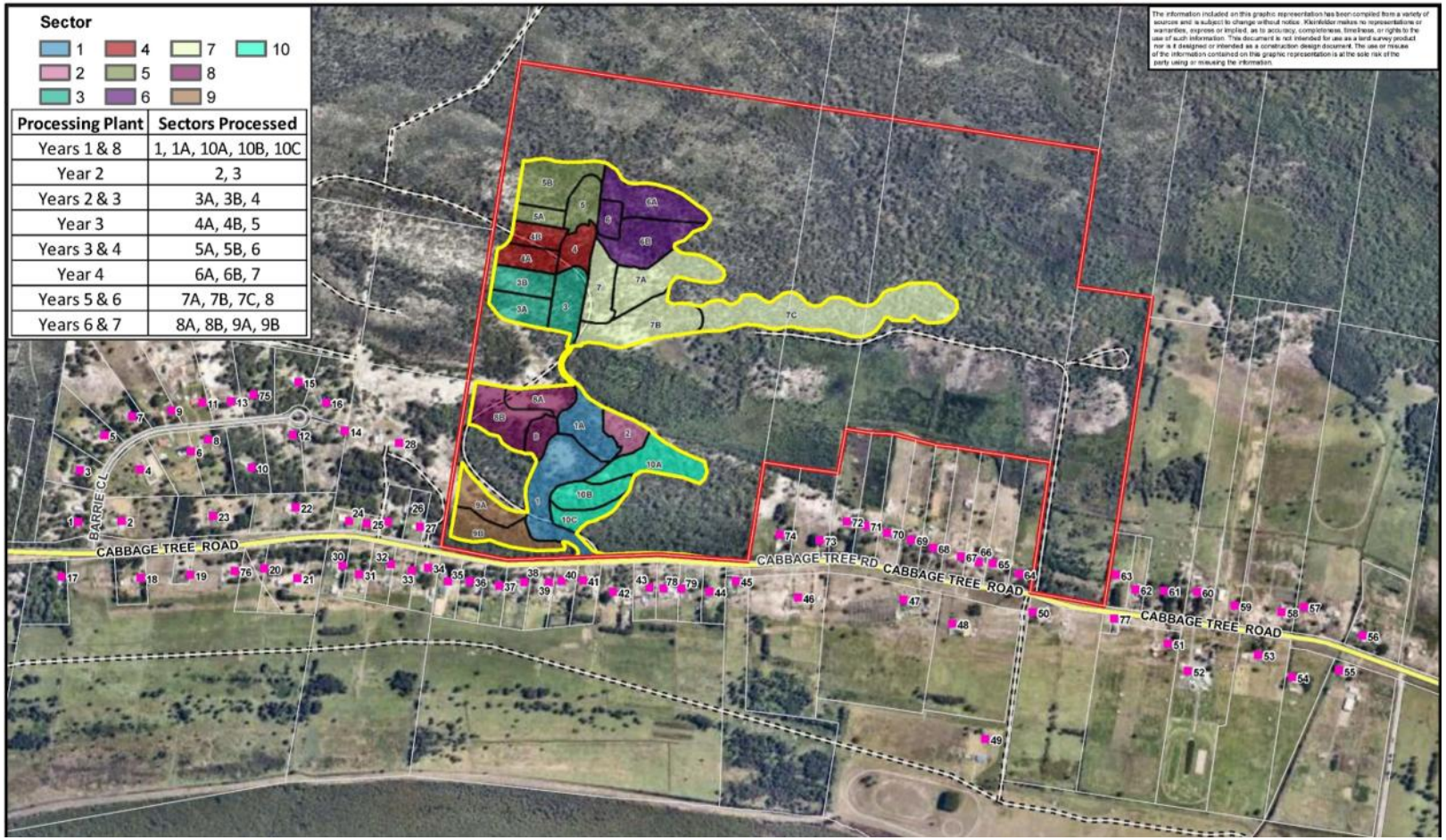
7.2 INCIDENTS

There were no incidents in the reporting period.

7.3 NON-COMPLIANCES

There were no non-compliances within the reporting period.

APPENDIX 1. Noise Monitoring Locations (NMP, 2019)



APPENDIX 2. NOISE MONITORING REPORT

Document No: 161267/10869

ATTENDED NOISE MONITORING
QUARTER 2 – JUNE 2025
Newcastle Sands
Williamtown, NSW

Prepared for:
Williamtown Sand Syndicate Pty Ltd
Cabbage Tree Road
WILLIAMTOWN NSW 2318

Author:

……
Neil Pennington
B. Sc., B.Math. (Hons) MAIP, MAAS, MASA
Principal / Director

July 2025

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EXECUTIVE SUMMARY

Attended noise monitoring has been carried out for the Newcastle Sand (NS) mine on 4, 5 and 6 June 2025. Monitoring was carried out in accordance with requirements of Development Consent (SSD-6125), EPL21264, the Newcastle Sand Noise Management Plan and other relevant Australian Standards and guidelines.

Monitoring was conducted by Matthew Pennington (Project Consultant, Spectrum Acoustics).

The site was in full operation during the entire survey period.

The site-specific operational criteria were not exceeded at any location or at any time throughout the monitoring period.

Data from those times where noise from NS operations was audible and measurable were analysed using Bruel & Kjaer *"Evaluator"* software. This analysis showed the noise did not contain any tonal, impulsive and low frequency components as per definitions of "modifying factor corrections" in the NSW Noise Policy for Industry. It is acknowledged that the general area is impacted by low and mid-range frequency noise from Cabbage Tree Road and identification of individual sources requires subjective assessment.

NS was compliant with Environmental Protection Licence (EPL) 21264 and Newcastle Sand Development Consent (SSD-6125) for Quarter 2 (June) 2025.

1.0 INTRODUCTION

This report presents the results of attended noise compliance monitoring and measurements conducted for Newcastle Sand (NS) on 4, 5, and 6 June 2025. Monitoring was undertaken in accordance with requirements of Newcastle Sand Noise Management Plan (NMP) dated March 2019. The noise monitoring programme and procedures in the NMP have been developed in accordance with the NS Environmental Protection Licence (EPL) no 21264 and the Newcastle Sand Development Consent (SSD-6125). To aid in the understanding of this report a description of acoustical terms is attached as **Appendix A**.

1.1 Noise Monitoring Locations

The NMP (Section 8.1) contains a table (Table 8) detailing recommended locations for attended noise monitoring and corresponding identification numbers for each boundary of the site, as follows.

Table 8: Noise monitoring locations

Generalised Location	Recommended Receptor ID
Nearest residence to west (at road level)	27
Nearest residence to west elevated on hill crest	14[1]
Residence due south of quarry	38
Nearest residence to the south east	74

Condition M8.1 of the EPL states that attended noise monitoring is to be undertaken at a location representative of the most affected residences in the noise limit conditions. Monitoring was conducted at receiver number 14 which is representative of receivers west of the site, elevated on the hill crest. The monitoring location is also shown on **Figure 1**.

1.2 Monitoring Frequency and Duration

EPL21264 indicates that the attended noise monitoring must be conducted quarterly during the morning-shoulder and day periods only. Each quarterly survey is to consist of 30 minute morning-shoulder measurements and 1.5 hour day measurements at one location representative of the most affected residences in the noise limit conditions (in accordance with EPL21264 to be done over a minimum of three consecutive 24 hour periods).

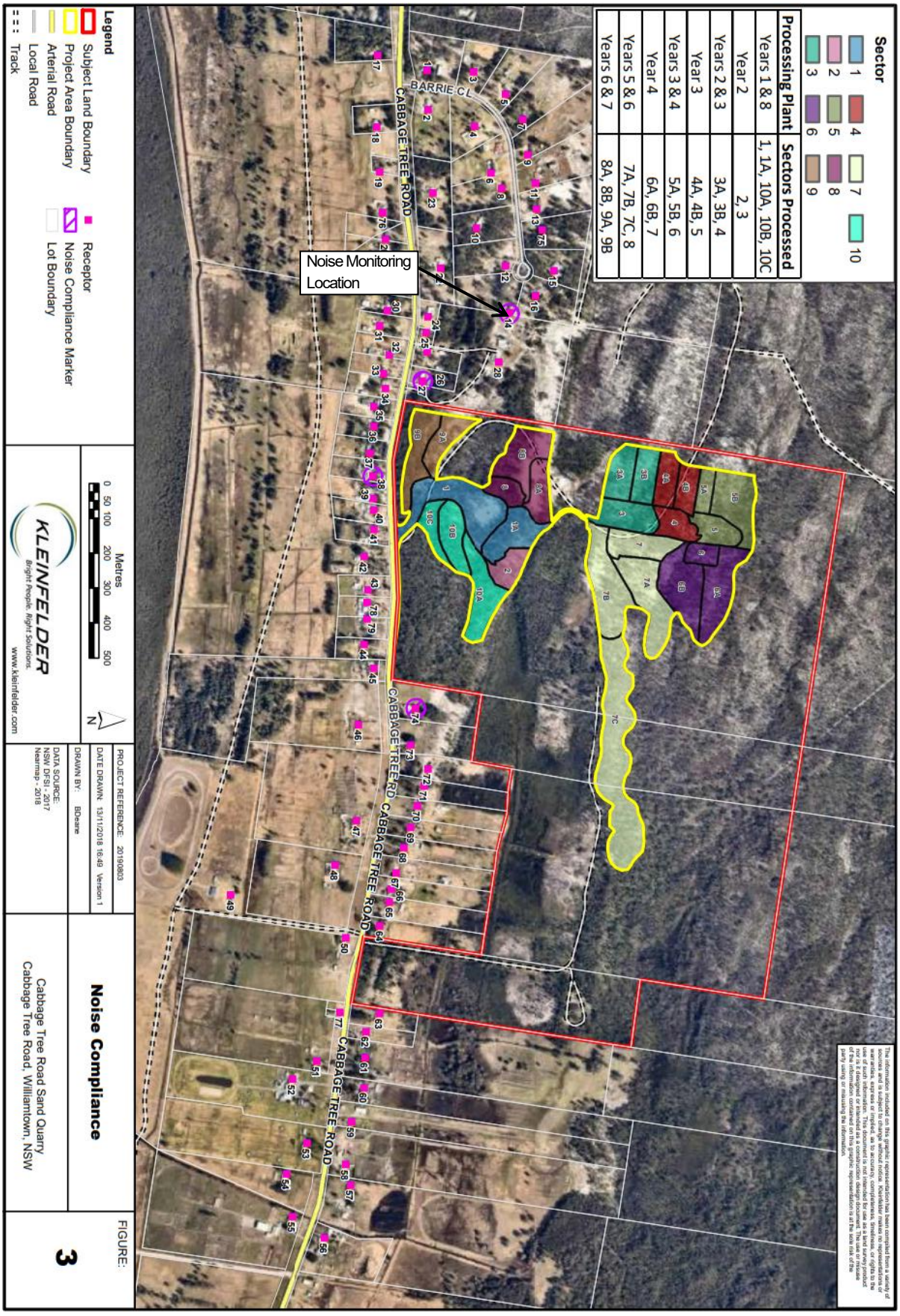


Figure 1
Noise Monitoring Location

2.0 CRITERIA AND CONDITIONS

2.1 Noise Assessment Criteria

The noise assessment criteria are detailed in Condition L3.1 of the. The criteria vary for each receiver monitoring location. The applicable morning-shoulder and day criterion is shown in the tables of results (**Tables 1 - 6** in **Section 4.1**). Noise criteria for all residences listed in the EPL are as shown below. The above noise criteria include the requirement that noise levels at day shoulder must not exceed **45 dB(A) L1 (1 min)** (sleep disturbance criterion) at any residence.

Receiver	Day LAeq(15 Min)	Shoulder LAeq(15 Min)	Shoulder LA Max(1 Min)
Any residential reciever	43	39	45

Operational noise generated at the premises must not exceed the noise limits shown in the table above.

2.2 Monitoring Location Definition

Condition L3.7 of the EPL states that to determine compliance with the Leq (15 min) operational noise limits the noise measurement equipment must be measured at the most affected point on or within the residential boundary, or at the most affected point within 30m of the dwelling where the dwelling is more than 30m from the boundary.

2.3 Applicable Meteorological Conditions

The noise limits apply under all meteorological conditions except for any one of the following;

1. Wind speeds greater than 3m/s at 10m above ground level; or
2. Stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or
3. Stability category G temperature inversion conditions.

2.4 Other Conditions

To determine compliance with the Leq (15 min) operational noise criteria the modification factors in Fact Sheet C of the NSW Noise Policy for Industry must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

3.0 NOISE MONITORING PROCEDURE

3.1 Monitoring Equipment

Attended noise monitoring was conducted by Matthew Pennington (Spectrum Acoustics) with a Brüel & Kjær Type 2250 Precision Sound Analyser. This instrument has Class 1 characteristics as defined in AS IEC61672.1-2019 and has current NATA calibration. Calibration certificates are included in Appendix B. Field calibration is carried out at the start and end of each monitoring period.

A-weighted noise levels were measured over the 15-minute monitoring periods with data acquired at 1 or 2 second statistical intervals and the meter set to “fast” response. Each 1 or 2 second measurement is accompanied by a third-octave band spectrum from 20 - 20k Hz which is required for analysing NPI ‘modifying factors’. Time based field notes allow for determination of the relative contributions to the overall noise level of all significant noise sources.

3.2 Measurement Analysis

The 15 minute Leq noise level for each monitoring period is shown in the tables below. Where the noise from NS was audible, Bruel & Kjaer “Evaluator” analysis software was used to quantify the contributions of NS and other significant noise sources to the overall noise level. Mine noise from NS is shown in the tables in bold type. Where noise from NS was inaudible during the lowest period of overall noise during each measurement, the NS contribution is given as “IA”.

3.3 Meteorological Data

Meteorological data used in this report were taken from the Williamtown Bureau of Meteorology Station.

4.0 RESULTS AND DISCUSSION

4.1 Measured Noise Levels

4.1.1 NS Operations

Measured noise levels at the monitoring location are summarised in **Tables 1 - 6**.

Table 1
NS Operational Noise Monitoring Results – 4 June 2025 (Morning-Shoulder)

Location	Time	dB(A), Leq	Criterion dB(A) Leq	dB(A), L1 (1min)[1]	Criterion dB(A), L1 (1min)[1]	Identified Noise Sources, LAeq
R14	6:30am	51	39	<20	45	Traffic (50), birds & insects (45), **NS (IA)**

1. L1 (1 min) from NS mine noise only.

Table 2
NS Operational Noise Monitoring Results – 4 June 2025 (Day)

Location	Time	dB(A), Leq	Criterion dB(A) Leq	Identified Noise Sources, LAeq
R14	7:00am	49	43	Traffic (47), birds & insects (45), **NS (IA)**

Table 3 NS Operational Noise Monitoring Results – 5 June 2025 (Morning-Shoulder)						
Location	**Time**	**dB(A), Leq**	**Criterion dB(A) Leq**	**dB(A), L1 (1min)[1]**	**Criterion dB(A), L1 (1min)[1]**	**Identified Noise Sources, LAeq**
R14	6:30am	50	39	<20	45	Traffic (49), birds & insects (44), **NS (IA)**

1. L1 (1 min) from NS mine noise only.

Table 4 NS Operational Noise Monitoring Results – 5 June 2025 (Day)				
Location	**Time**	**dB(A), Leq**	**Criterion dB(A) Leq**	**Identified Noise Sources, LAeq**
R14	7:00am	49	43	Traffic (48), birds & insects (43), **NS (IA)**

Table 5 NS Operational Noise Monitoring Results – 6 June 2025 (Morning-Shoulder)						
Location	**Time**	**dB(A), Leq**	**Criterion dB(A) Leq**	**dB(A), L1 (1min)[1]**	**Criterion dB(A), L1 (1min)[1]**	**Identified Noise Sources, LAeq**
R14	6:30am	49	39	<20	45	Traffic (47), birds & insects (44), **NS (IA)**

1. L1 (1 min) from NS mine noise only.

Table 6 NS Operational Noise Monitoring Results – 6 June 2025 (Day)				
Location	**Time**	**dB(A), Leq**	**Criterion dB(A) Leq**	**Identified Noise Sources, LAeq**
R14	7:00am	48	43	Traffic (47), birds & insects (42), **NS (IA)**

4.2 Discussion of Results

The results in **Tables 1-6** show that, under the operating and meteorological conditions at the times, for the 30 minute (morning-shoulder) and 1.5 hour (day) compliance measurement periods, the mine noise from NS was inaudible at the monitoring location. All noise measurements were made under compliant meteorological conditions, except for both monitoring periods on the 4th of June.

4.2.1 L1 (1 min)

The noise measurements results in **Tables 1, 3, & 5** (and site observations) show that noise from the operation of NS under the operating and meteorological conditions at the times, did not exceed the L1 (1 min) criterion at the monitoring location. Since L1 (1 min) levels were significantly lower than the criterion, at the operational noise monitoring location, measurements at the residential facade was not considered necessary as compliance was assured.

APPENDIX A

DESCRIPTION OF ACOUSTICAL TERMS

Table A1
Definition of acoustical terms

Term	Description
dB(A)	The quantitative measure of sound heard by the human ear, measured by the A-Scale Weighting Network of a sound level meter expressed in decibels (dB).
SPL	Sound Pressure Level. The incremental variation of sound pressure above and below atmospheric pressure and expressed in decibels. The human ear responds to pressure fluctuations, resulting in sound being heard.
STL	Sound Transmission Loss. The ability of a partition to attenuate sound, in dB.
Lw	Sound Power Level radiated by a noise source per unit time re 1pW.
Leq	Equivalent Continuous Noise Level - taking into account the fluctuations of noise over time. The time-varying level is computed to give an equivalent dB(A) level that is equal to the energy content and time period.
L1	Average Peak Noise Level - the level exceeded for 1% of the monitoring period.
L90	“Background” Noise Level - the level exceeded for 90% of the monitoring period.

APPENDIX B

CALIBRATION CERTIFICATE

NVMS

Sydney Calibration Laboratory
Unit 21, 1 Talavera Road, Macquarie Park NSW 2113, Australia
Accredited for compliance with ISO/IEC 17025 - Calibration. Laboratory No. 1301

NATA
WORLD RECOGNISED ACCREDITATION

CERTIFICATE OF CALIBRATION

Certificate No: CAU2401038

CALIBRATION OF:

Sound Level Meter:	Brüel & Kjær	2250	No: 3030460
Microphone:	Brüel & Kjær	4189	No: 3318407
Preamplifier:	Brüel & Kjær	ZC-0032	No: 31079
Supplied Calibrator:	Brüel & Kjær	4231	No: 2466354
Software version:	BZ7223 Version 4.7.6	Pattern Approval:	-
Instruction manual:	BE1712-22	Identification:	N/A

CUSTOMER:

Spectrum Acoustics Pty Ltd
8 Panylan St
Cardiff NSW 2285

CALIBRATION CONDITIONS:

Preconditioning:	4 hours at 23 °C
Environment conditions:	*see actual values in **Environmental conditions** sections*

SPECIFICATIONS:

The Sound Level Meter has been calibrated in accordance with the requirements as specified in IEC61672-1:2013 class 1. Procedures from IEC 61672-3:2013 were used to perform the periodic tests. The measurements included in this document are traceable to Australian / International standards through accredited calibration of all relevant reference equipment.

PROCEDURE:

The measurements have been performed with the assistance of Brüel & Kjær Sound Level Meter Calibration System B&K 3630 with application software type 7763 (version 8.6 - DB: 8.60) and test procedure 2250-4189.

RESULTS:

	Initial calibration		Calibration prior to repair/adjustment
X	Calibration without repair/adjustment		Calibration after repair/adjustment

The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor $k = 2$ providing a level of confidence of approximately 95 %. The uncertainty evaluation has been carried out in accordance with EA-4/02 from elements originating from the standards, calibration method, effect of environmental conditions and any short time contribution from the device under calibration.

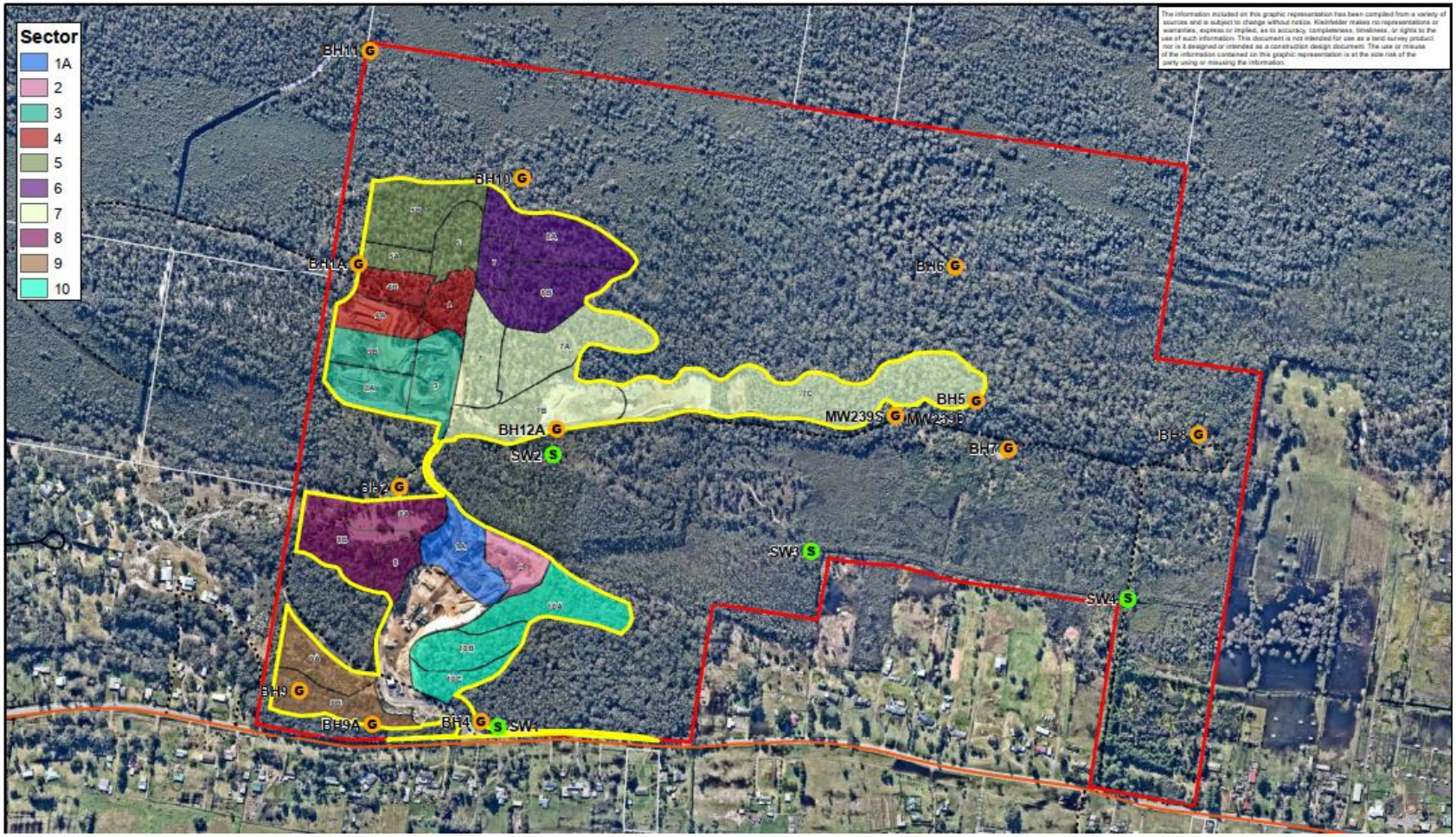
Date of Calibration: 04/11/2024

Certificate issued: 06/11/2024

Barath Chandar Rajendran
Calibration Technician

Sajeeb Tharayil
Approved signatory

APPENDIX 3. WATER MONITORING LOCATIONS (SWMP, 2021)



APPENDIX 4. GROUNDWATER QUARTLEY REVIEW REPORT

Newcastle Sand Groundwater Monitoring	
June	**2025**
Report issued:	10/07/2025
Licence Information	
Environmental Protection Licence Number (EPL)	21264
Licence Holder	Williamtown Sand Syndicate Pty Ltd
Licensee Address	Cabbage Tree Road Sand Quarry 298 Cabbage Tree Road Williamtown NSW, 2318
Link to full licence on the EPA Website	https://app.epa.nsw.gov.au/prpoeoapp/ViewPOEOLicence.aspx?DOCID=167636&SYSUID=1&LICID=21264
Anniversary date:	31-Jul
Information Last Obtained:	2/06/2025
Information Published:	

Newcastle Sand Groundwater Monitoring

Review of TARP Triggers:	June	2025

TARP Action determined by SWMP, Section 8.6: Trigger Response Actions

Sample Point	Exceedance	Date	Analyte	Exceedance Value	Trigger Value	Observed Trends	Comments and Actions
BH1A	**Yes**	2/06/2025	GWE	5.62	4.3	**GWE increased**	GWE Increased due to recent heavy rainfall. Level 3 triggered. Continue to monitor.
BH2	**Yes**	2/06/2025	GWE	4.14	3.3	**GWE increased**	GWE Increased due to recent heavy rainfall. Level 3 triggered. Continue to monitor.
BH4	No	2/06/2025				No notable trends	
BH6	No	2/06/2025				No notable trends	
BH7	No	2/06/2025				No notable trends	
BH9	**Yes**	2/06/2025	GWE	2.97	2.5	**GWE increased**	GWE Increased due to recent heavy rainfall. Level 2 triggered. Continue to monitor.
BH9A	**Yes**	2/06/2025	GWE	2.73	2.5	**GWE increased**	GWE Increased due to recent heavy rainfall. Level 1 triggered. Continue to monitor.
BH11	No	2/06/2025				No notable trends	
BH12A	**Yes**	2/06/2025	GWE	3.73	3.5	**GWE increased**	GWE Increased due to recent heavy rainfall. Level 1 triggered. Continue to monitor.
MW239S	No	2/06/2025				No notable trends	

Quality Data Review

QC Type	Within Acceptance Criteria	Analyte	Exceendance Value	Acceptance Criteria	Comments	Actions
Sample Duplicate	Yes					
Trip Blank	Yes					
Rinsate Blank	Yes					
Internal QC	Yes					

Newcastle Sand Groundwater Monitoring

Review of Depths		June		2025
Sample	Date	Groundwater Elevation (GWE) m(AHD)	Max Inferred*	Difference Between Max Inferred and Depth (mAHD)
BH1A	14/04/2025	3.62	4.8	1.180
BH2	14/04/2025	2.71	3.8	1.090
BH4	14/04/2025	1.89	3	1.110
BH6	14/04/2025	2.48	4.4	1.920
BH7	14/04/2025	1.74	3.7	1.960
BH9	14/04/2025	1.92	3	1.080
BH9A	14/04/2025	1.88	3	1.120
BH11	14/04/2025	4.27	5.5	1.230
BH12A	14/04/2025	3.26	4	0.740
MW239S	14/04/2025	0.68	3.9	3.220
BH1A	12/05/2025	4.44	4.8	0.360
BH2	12/05/2025	3.36	3.8	0.440
BH4	12/05/2025	2.29	3	0.710
BH5	12/05/2025	2.44	4	1.560
BH6	12/05/2025	2.93	4.4	1.470
BH7	12/05/2025	2.14	3.7	1.560
BH8	12/05/2025	2.25	4	1.750
BH9	12/05/2025	2.4	3	0.600
BH9A	12/05/2025	2.4	3	0.600
BH10	12/05/2025	4.44	4.9	0.460
BH11	12/05/2025	5.18	5.5	0.320
BH12A	12/05/2025	3.28	4	0.720
MW239S	12/05/2025	2.53	3.9	1.370
MW239D	12/05/2025	2.55		
BH1A	2/06/2025	5.62	4.8	-0.820
BH2	2/06/2025	4.14	3.8	-0.340
BH4	2/06/2025	2.43	3	0.570
BH6	2/06/2025		4.4	
BH7	2/06/2025	2.19	3.7	1.510
BH9	2/06/2025	2.97	3	0.030
BH9A	2/06/2025	2.73	3	0.270
BH11	2/06/2025		5.5	
BH12A	2/06/2025	3.73	4	0.270
MW239S	2/06/2025	2.67	3.9	1.230

Level	Trigger*
0	Groundwater levels more than 0.5 m below inferred maximum historical level.
1	Groundwater levels within 0.5 m below inferred maximum historical level at any on-site bore.
2	Groundwater levels within 0.25 m of inferred maximum historical level at any on-site bore.
3	Groundwater levels within resource area rise above previously inferred maximum groundwater level.

*Sourced from Watershed HydroGeo, 2019, *Maximum Extraction Depth Management Plan, Cabbage Tree Road Sand Quarry,* May 2019, p16,18

Newcastle Sand Groundwater Monitoring

Sampling and Report Comments

Sample	Date	Sampling Method	Sampling Comments	General Comments/Non Compliance
BH1A	2/06/2025	AS5667.11 Depth		
BH2	2/06/2025	AS5667.11, Pump		
BH4	2/06/2025	AS5667.11, Pump		
BH6	2/06/2025		No access - deep water on track	No access - deep water on track
BH7	2/06/2025	AS5667.11, Pump		
BH9	2/06/2025	AS5667.11 Depth		
BH9A	2/06/2025	AS5667.11, Bail		
BH11	2/06/2025		No access - deep water on track	No access - deep water on track
BH12A	2/06/2025	AS5667.11 Depth		
MW239S	2/06/2025	AS5667.11, Pump		

Newcastle Sand Groundwater Monitoring

Borehole ID: BH2

Anniversary Date: 31- July

EPL Point : 21264-1

Well Parameters

Sample	Date	Distance to Water	Depth to Water	Groundwater Elevation (GWE)
Units		m(bTOC)	m(bgl)	m(AHD)
Trigger Values				**3.3**
BH2	18/01/2024	5.636		2.154
BH2	16/02/2024	5.789		2.001
BH2	12/03/2024			
BH2	14/03/2024	5.75		2.04
BH2	19/04/2024	5.213		2.577
BH2	21/05/2024	4.749		3.041
BH2	19/06/2024	4.483		**3.307**
BH2	22/07/2024	4.423		**3.367**
BH2	20/08/2024	4.589		3.201
BH2	24/09/2024	4.849		NT
BH2	30/10/2024	4.94	4.56	2.85
BH2	25/11/2024	4.99	4.61	2.8
BH2	18/12/2024	5.15	4.77	2.64
BH2	20/01/2025	4.73	4.35	3.06
BH2	10/02/2025	4.87	4.49	2.92
BH2	17/03/2025	5.13	4.75	2.66
BH2	14/04/2025	5.08	4.7	2.71
BH2	12/05/2025	4.43	4.05	**3.36**
BH2	2/06/2025	3.65	3.27	**4.14**

BH2 Annual Average		Distance to Water	Depth to Water	Groundwater Elevation (GWE)
01/01/2025-31/12/2025	Count	6	6	6
	Min	3.65	3.27	2.66
	Average	4.65	4.27	3.14
	Max	5.13	4.75	4.14

BH2 Current Annual Return		Distance to Water	Depth to Water	Groundwater Elevation (GWE)
31/07/2024-30/07/2025	Count	11	9	10
	Min	3.65	3.27	2.64
	Average	4.76	4.39	3.03
	Max	5.15	4.77	4.14

Newcastle Sand Groundwater Monitoring

Borehole ID: BH4

Anniversary Date: 31- July

EPL Point : 21264-2

Well Parameters

Sample	Date	Distance to Water	Depth to Water	Groundwater Elevation (GWE)
Units		**m(bTOC)**	**m(bgl)**	**m(AHD)**
Trigger Values				**2.5**
BH4	18/01/2024	1.816		1.244
BH4	16/02/2024	1.758		1.302
BH4	12/03/2024	1.837		1.223
BH4	19/04/2024	1.366		1.694
BH4	21/05/2024	0.822		2.238
BH4	19/06/2024	0.845		2.215
BH4	22/07/2024	0.876		2.184
BH4	20/08/2024	0.944		2.116
BH4	24/09/2024	1.148		NT
BH4	30/10/2024	1.16	0.93	1.9
BH4	25/11/2024	1.24	1.01	1.82
BH4	18/12/2024	1.43	1.2	1.63
BH4	20/01/2025	0.95	0.72	2.11
BH4	10/02/2025	1.17	0.94	1.89
BH4	17/03/2025	1.36	1.13	1.7
BH4	14/04/2025	1.17	0.94	1.89
BH4	12/05/2025	0.77	0.54	2.29
BH4	2/06/2025	0.63	0.4	2.43

BH4 Annual Average		Distance to Water	Depth to Water	Groundwater Elevation (GWE)
01/01/2025-31/12/2025	Count	6	6	6
	Min	0.63	0.40	1.70
	Average	1.01	0.78	2.05
	Max	1.36	1.13	2.43

BH4 Current Annual Return		Distance to Water	Depth to Water	Groundwater Elevation (GWE)
31/07/2024-30/07/2025	Count	11	9	10
	Min	0.63	0.40	1.63
	Average	1.09	0.87	1.98
	Max	1.43	1.20	2.43

Newcastle Sand Groundwater Monitoring

Borehole ID: BH6

Anniversary Date: 31- July

EPL Point : 21264-3

Well Parameters

Sample	Date	Distance to Water	Depth to Water	Groundwater Elevation (GWE)
Units		m(bTOC)	m(bgl)	m(AHD)
Trigger Values				**3.9**
BH6	18/01/2024	1.696		1.924
BH6	16/02/2024	1.66		1.96
BH6	12/03/2024	1.742		1.878
BH6	19/04/2024	1.36		2.26
BH6	21/05/2024	0.716		2.904
BH6	19/06/2024	0.972		2.678
BH6	22/07/2024	0.783		2.837
BH6	20/08/2024	0.799		2.821
BH6	24/09/2024	1.406		
BH6	30/10/2024	1.05	0.45	2.57
BH6	25/11/2024	1.16	0.56	2.46
BH6	18/12/2024	1.33	0.73	2.29
BH6	20/01/2025	0.75	0.15	2.87
BH6	10/02/2025	1.1	0.5	2.52
BH6	17/03/2025	1.32	0.72	2.3
BH6	14/04/2025	1.14	0.54	2.48
BH6	12/05/2025	0.69	0.09	2.93
BH6	2/06/2025	[NT]		

BH6 Annual Average		Distance to Water	Depth to Water	Groundwater Elevation (GWE)
01/01/2025-31/12/2025	Count	5	5	5
	Min	0.69	0.09	2.30
	Average	1.00	0.40	2.62
	Max	1.32	0.72	2.93

BH6 Current Annual Return

BH6 Current Annual Return		Distance to Water	Depth to Water	Groundwater Elevation (GWE)
31/07/2024-30/07/2025	Count	11	8	9
	Min	0.000	0.090	2.290
	Average	0.977	0.468	2.582
	Max	1.406	0.730	2.930

Newcastle Sand Groundwater Monitoring

Borehole ID: BH7

Anniversary Date: 31- July

EPL Point : 21264-4

Well Parameters

Sample	Date	Distance to Water	Depth to Water	Groundwater Elevation (GWE)
Units		**m(bTOC)**	**m(bgl)**	**m(AHD)**
Trigger Values				**3.2**
BH7	18/01/2024	1.781		1.199
BH7	16/02/2024	1.727		1.253
BH7	12/03/2024	1.781		1.199
BH7	19/04/2024	1.338		1.642
BH7	21/05/2024	0.918		2.062
BH7	19/06/2024	0.754		2.226
BH7	22/07/2024	1.603		1.377
BH7	20/08/2024	1.08		1.9
BH7	24/09/2024	1.221		NT
BH7	30/10/2024	1.17	0.79	1.81
BH7	25/11/2024	1.24	0.86	1.74
BH7	18/12/2024	1.47	1.09	1.51
BH7	20/01/2025	0.9	0.52	2.08
BH7	10/02/2025	1.26	0.88	1.72
BH7	17/03/2025	1.42	1.04	1.56
BH7	14/04/2025	1.24	0.86	1.74
BH7	12/05/2025	0.84	0.46	2.14
BH7	2/06/2025	0.79	0.41	2.19

BH7 Annual Average		Distance to Water	Depth to Water	Groundwater Elevation (GWE)
01/01/2025-31/12/2025	Count	6	6	6
	Min	0.79	0.41	1.56
	Average	1.08	0.70	1.91
	Max	1.42	1.04	2.19

BH7 Current Annual Return		Distance to Water	Depth to Water	Groundwater Elevation (GWE)
31/07/2024-30/07/2025	Count	11	9	10
	Min	0.79	0.41	1.51
	Average	1.15	0.77	1.84
	Max	1.47	1.09	2.19

Newcastle Sand Groundwater Monitoring

Borehole ID: BH9

Anniversary Date: 31- July

EPL Point : 21264-5

Well Parameters

Sample	Date	Distance to Water	Depth to Water	Groundwater Elevation (GWE)
Units		m(bTOC)	m(bgl)	m(AHD)
Trigger Values				**2.5**
BH9	22/07/2024			
BH9	20/08/2024			
BH9	24/09/2024			
BH9	30/10/2024	15.75	15.09	2
BH9	25/11/2024	15.83	15.17	1.92
BH9	18/12/2024	16	15.34	1.75
BH9	20/01/2025	15.62	14.96	2.13
BH9	10/02/2025	15.79	15.13	1.96
BH9	17/03/2025	15.93	15.27	1.82
BH9	14/04/2025	15.83	15.17	1.92
BH9	12/05/2025	15.35	14.69	2.4
BH9	2/06/2025	14.78	14.12	**2.97**

BH9 Annual Average

BH9 Annual Average		Distance to Water	Depth to Water	Groundwater Elevation (GWE)
01/01/2025-31/12/2025	Count	6	6	6
	Min	14.78	14.12	1.82
	Average	15.55	14.89	2.20
	Max	15.93	15.27	2.97

BH9 Current Annual Return

BH9 Current Annual Return		Distance to Water	Depth to Water	Groundwater Elevation (GWE)
31/07/2024-30/07/2025	Count	9	9	9
	Min	14.78	14.12	1.75
	Average	15.65	14.99	2.10
	Max	16.00	15.34	2.97

Newcastle Sand Groundwater Monitoring

Borehole ID: BH9A

Anniversary Date: 31- July

EPL Point : 21264-5

Well Parameters

Sample	Date	Distance to Water	Depth to Water	Groundwater Elevation (GWE)
Units		m(bTOC)	m(bgl)	m(AHD)
Trigger Values				**2.5**
BH9A	18/01/2024			
BH9A	23/01/2024	9.408		1.342
BH9A	16/02/2024	9.405		1.345
BH9A	12/03/2024	9.432		1.318
BH9A	19/04/2024	8.996		1.754
BH9A	21/05/2024	8.464		2.286
BH9A	19/06/2024	8.398		2.352
BH9A	22/07/2024	8.423		2.327
BH9A	20/08/2024	8.53		2.22
BH9A	24/09/2024	8.723		NT
BH9A	30/10/2024	8.75	8.15	2
BH9A	25/11/2024	8.82	8.22	1.93
BH9A	18/12/2024	9	8.4	1.75
BH9A	20/01/2025	8.58	7.98	2.17
BH9A	10/02/2025	8.75	8.15	2
BH9A	17/03/2025	9.02	8.42	1.73
BH9A	14/04/2025	8.87	8.27	1.88
BH9A	12/05/2025	8.35	7.75	2.4
BH9A	2/06/2025	8.02	7.42	**2.73**

BH9A Annual Average		Distance to Water	Depth to Water	Groundwater Elevation (GWE)
01/01/2025-31/12/2025	Count	6	6	6
	Min	8.02	7.42	1.73
	Average	8.60	8.00	2.15
	Max	9.02	8.42	2.73

BH9A Current Annual Return		Distance to Water	Depth to Water	Groundwater Elevation (GWE)
31/07/2024-30/07/2025	Count	11	9	10
	Min	8.02	7.42	1.73
	Average	8.67	8.08	2.08
	Max	9.02	8.42	2.73

Newcastle Sand Groundwater Monitoring

Borehole ID: BH11

Anniversary Date: 31- July

EPL Point : 21264-6

Well Parameters

Sample	Date	Distance to Water	Depth to Water	Groundwater Elevation (GWE)
Units		m(bTOC)	m(bgl)	m(AHD)
Trigger Values				**5**
BH11	18/01/2024	3.072		3.558
BH11	16/02/2024	3.226		3.404
BH11	12/03/2024	3.298		3.332
BH11	19/04/2024	2.982		3.648
BH11	21/05/2024	2.237		4.393
BH11	19/06/2024	1.705		4.925
BH11	22/07/2024	1.579		**5.051**
BH11	20/08/2024	1.664		4.966
BH11	24/09/2024	1.932		NT
BH11	30/10/2024	2.06	1.48	4.57
BH11	25/11/2024	2.2	1.62	4.43
BH11	18/12/2024	2.37	1.79	4.26
BH11	20/01/2025	1.87	1.29	4.76
BH11	10/02/2025	2.15	1.57	4.48
BH11	17/03/2025	2.38	1.8	4.25
BH11	14/04/2025	2.36	1.78	4.27
BH11	12/05/2025	1.45	0.87	**5.18**
BH11	2/06/2025	[NT]		

BH11 Annual Average		Distance to Water	Depth to Water	Groundwater Elevation (GWE)
01/01/2025-31/12/2025	Count	5	5	5
	Min	1.45	0.87	4.25
	Average	2.04	1.46	4.59
	Max	2.38	1.80	5.18

BH11 Current Annual Return		Distance to Water	Depth to Water	Groundwater Elevation (GWE)
31/07/2024-30/07/2025	Count	10	8	9
	Min	1.45	0.87	4.25
	Average	2.04	1.53	4.57
	Max	2.38	1.80	5.18

Newcastle Sand Groundwater Monitoring

Borehole ID: MW239S

Anniversary Date: 31- July

EPL Point : 21264-7

Well Parameters

Sample	Date	Distance to Water	Depth to Water	Groundwater Elevation (GWE)
Units		m(bTOC)	m(bgl)	m(AHD)
Trigger Values				**3.4**
MW239S	18/01/2024	1.391		1.649
MW239S	16/02/2024	1.375		1.665
MW239S	12/03/2024	1.415		1.625
MW239S	19/04/2024	1.699		1.341
MW239S	21/05/2024	0.521		2.519
MW239S	19/06/2024	0.639		2.401
MW239S	22/07/2024	0.718		2.322
MW239S	20/08/2024	0.745		2.295
MW239S	24/09/2024	0.868		NT
MW239S	30/10/2024	0.85	0.95	2.19
MW239S	25/11/2024	0.91	1.01	2.13
MW239S	18/12/2024	1.1	1.2	1.94
MW239S	20/01/2025	0.57	0.67	2.47
MW239S	10/02/2025	0.93	1.03	2.11
MW239S	17/03/2025	1.07	1.17	1.97
MW239S	14/04/2025	2.36	2.46	0.68
MW239S	12/05/2025	0.51	0.61	2.53
MW239S	2/06/2025	0.37	0.47	2.67

MW239S Annual Average		Distance to Water	Depth to Water	Groundwater Elevation (GWE)
01/01/2025-31/12/2025	Count	6	6	6
	Min	0.37	0.47	0.68
	Average	0.97	1.07	2.07
	Max	2.36	2.46	2.67

MW239S Current Annual Return		Distance to Water	Depth to Water	Groundwater Elevation (GWE)
31/07/2024-30/07/2025	Count	11	9	10
	Min	0.37	0.47	0.68
	Average	0.93	1.06	2.10
	Max	2.36	2.46	2.67

Newcastle Sand Groundwater Monitoring

Borehole ID: BH2

Anniversary Date: 31- July

EPL Point : 21264-1

Field Analysis

Sample	Date	Temperature	pH	Electrical Conductivity	Dissolved Oxygen	Oxidation Reduction Potential	Turbidity	Total Dissolved Solids by EC
Units		°C	pH Units	µS/cm	mg/L	mV	NTU	mg/L
Trigger Values			**4.2-6.5**	**500**				
BH2	24/07/2023	17.4	4.57	84	4.14	103.7	40	64
BH2	14/08/2023	18.1	4.38	102.5	64	187.8	164	67
BH2	13/09/2023	17	4.72		3.13	209.2		
BH2	14/09/2023			71.9			44.01	55
BH2	23/10/2023	21.3	5.69	79.5	3.87	177	50.58	56
BH2	22/11/2023	19.3	5.34	55.6	5.32	183.4	85	43
BH2	19/12/2023	22.4	4.64	299.6	7.11	173.9	398	68
BH2	18/01/2024	22.1	4.75	70.9	4.01	168.8	87	49
BH2	16/02/2024	22.3	4.67	79	2.7	179.2	176.5	51
BH2	12/03/2024	24.7			3.95	188.6		
BH2	14/03/2024		4.93	81			103.5	54
BH2	19/04/2024	20.3	4.45	80.3	2.75	163.7	565	57
BH2	21/05/2024	17.5	4.71	37.7	5.78	7.2	21.9	29
BH2	19/06/2024	18.4	4.43	74.8	2.88	25.7	90.12	56
BH2	22/07/2024	18.2	4.45	77.8	2.55	215.7	100.99	58
BH2	20/08/2024	19	4.6	84.8	2.4	188.6	185.48	62
BH2	24/09/2024	20.3	4.25	88.3	5.17	200.6	21.81	63
BH2	30/10/2024	19.5	4.8	95	1.3	286	1000	59
BH2	25/11/2024	19.6	4.9	100	0.8	206	55	62
BH2	18/12/2024	19	4.7	108	0.8	230	100	67
BH2	20/01/2025	20.1	5.2	129	0.8	100	1000	81
BH2	10/02/2025	20.8	4.8	110	0.7	219	1000	69
BH2	17/03/2025	20.5	4.9	115	1.1	175	150	72
BH2	14/04/2025	20.4	4.8	114	1	140	33	71
BH2	12/05/2025	19.6	4.8	117	0.9	153	4.4	73
BH2	2/06/2025	19	4.8	102	1.2	178	8.3	64

BH2 Annual Average		pH	Electrical Conductivity µS/cm	Dissolved Oxygen mg/L	Oxidation Reduction Potential# mV	Turbidity NTU	Total Dissolved Solids by EC mg/L
01/01/2025-31/12/2025	Count	6	6	6	6	6	6
	Min	4.80	102.00	0.70	100.00	4.40	64.00
	Average	4.88	114.50	0.95	160.83	8.30	71.67
	Max	5.20	129.00	1.20	219.00	> 1000	81.00

BH2 Current Annual Return		pH	Electrical Conductivity µS/cm	Dissolved Oxygen mg/L	Oxidation Reduction Potential# mV	Turbidity NTU	Total Dissolved Solids by EC mg/L
31/07/2024-30/07/2025	Count	11	11	11	11	11	11
	Min	4.25	84.80	0.70	100.00	4.40	59.00
	Average	4.78	105.74	1.47	188.75	323.45	67.55
	Max	5.20	129.00	5.17	286.00	> 1000	81.00

Newcastle Sand Groundwater Monitoring

Borehole ID: BH4

Anniversary Date: 31- July

EPL Point : 21264-2

Field Analysis

Sample	Date	Temperature	pH	Electrical Conductivity	Dissolved Oxygen	Oxidation Reduction Potential	Turbidity	Total Dissolved Solids by EC
Units		°C	pH Units	µS/cm	mg/L	mV	NTU	mg/L
Trigger Values			**4.2-6.5**	**500**				
BH4	24/07/2023	15.3	5.18	66	3.41	215.7	7.71	53
BH4	14/08/2023	15.6	5.11	87.7	4.9	143.9	18.06	57
BH4	13/09/2023							
BH4	14/09/2023	15.2	5.06	70.8	4.53	213	27.65	56
BH4	23/10/2023	18.1	6.16	126.4	3.58	155.7	29.4	95
BH4	22/11/2023	20	5.93	69.2	3.35	200	24	50
BH4	19/12/2023	21.9	4.76	99.9	2.38	196.4	35	69
BH4	18/01/2024	21	5.35	85.1	3.92	182.4	12.43	60
BH4	16/02/2024	20.5	5.22	102	4.43	190.5	29.61	102
BH4	12/03/2024	20.4	6.68	88	2.66	153.9	4.4	63
BH4	19/04/2024	19.3	5.61	93	4.03	168	8	61
BH4	21/05/2024	16.6	5.02	104.2	2.75	160.2	15.6	81
BH4	19/06/2024	15.7	5.02	77.3	2.32	156.2	15.24	61
BH4	22/07/2024	15.1	6.39	69	4.91	158.5	31.4	55
BH4	20/08/2024	15.8	5.18	80.7	3	143.6	37.2	64
BH4	24/09/2024	18.5	5.03	106.1	3.67	173.2	17.16	79
BH4	30/10/2024	19.1	4.7	126	1.4	385	7.3	79
BH4	25/11/2024	21.3	4.9	121	0.7	358	1.5	76
BH4	18/12/2024	19.1	4.7	118	0.8	260	2.6	74
BH4	20/01/2025	20.5	4.8	130	0.7	91	1	81
BH4	10/02/2025	20.9	4.7	129	1	152	5.4	81
BH4	17/03/2025	20.6	4.8	133	1.1	152	2.6	83
BH4	14/04/2025	20.9	4.6	134	0.9	181	3.1	84
BH4	12/05/2025	19.3	4.7	144	1.3	94	2.6	90
BH4	2/06/2025	18.8	4.8	120	1.8	168	0.8	75

BH4 Annual Average		pH	Electrical Conductivity µS/cm	Dissolved Oxygen mg/L	Oxidation Reduction Potential# mV	Turbidity NTU	Total Dissolved Solids by EC mg/L
01/01/2025-31/12/2025	Count	6	6	6	6	6	6
	Min	4.60	120.00	0.70	91.00	0.80	75.00
	Average	4.73	131.67	1.13	139.67	2.58	82.33
	Max	4.80	144.00	1.80	181.00	5.40	90.00

BH4 Current Annual Return

BH4 Current Annual Return		pH	Electrical Conductivity µS/cm	Dissolved Oxygen mg/L	Oxidation Reduction Potential# mV	Turbidity NTU	Total Dissolved Solids by EC mg/L
31/07/2024-30/07/2025	Count	11	11	11	11	11	11
	Min	4.60	80.70	0.70	91.00	0.80	64.00
	Average	4.81	121.98	1.49	196.16	7.39	78.73
	Max	5.18	144.00	3.67	385.00	37.20	90.00

Newcastle Sand Groundwater Monitoring

Borehole ID: BH6

Anniversary Date: 31- July

EPL Point : 21264-3

Field Analysis

Sample	Date	Temperature	pH	Electrical Conductivity	Dissolved Oxygen	Oxidation Reduction Potential#	Turbidity	Total Dissolved Solids by EC
Units		°C	pH Units	µS/cm	mg/L	mV	NTU	mg/L
Trigger Values			**4.2-6.5**	**500**				
BH6	24/07/2023	17.7	4.91	230.2	8.84	97	230	174
BH6	14/08/2023	14.6	4.36	275.9	1.9	38.3	39	179
BH6	13/09/2023							
BH6	14/09/2023	15.6	4.79	207.7	3.6	11	30.2	164
BH6	23/10/2023	20.7	**7.68**	2.8	3.9	2.8	107.4	150
BH6	22/11/2023	20.9	5.38	202.2	3.24	90.4	31	142
BH6	19/12/2023	25.5	4.46	319.8	2.44	55.5	25.7	206
BH6	18/01/2024	26.6	4.86	243.7	2.62	100	12	154
BH6	16/02/2024	24.3	5.09	231	2.65	75	15.2	150
BH6	12/03/2024	24.3	5.1	215.9	3.2	94.8	19.47	142
BH6	19/04/2024	21.4	4.65	203.3	2.52	166.9	12.71	142
BH6	21/05/2024	18.5	4.86	168.5	2.52	87	33.8	125
BH6	19/06/2024							
BH6	22/07/2024	16.1	4.71	150.9	5.53	123.5	47.1	118
BH6	20/08/2024	15.8	4.94	248.9	2.9	40.1	52.25	195
BH6	24/09/2024	18.2	4.25	327.5	4.41	97.2	15.99	244
BH6	30/10/2024	18.4	5.2	315	0.5	12	9.2	200
BH6	25/11/2024	20.3	5.2	280	0.8	40	85	170
BH6	18/12/2024	19.3	5.2	272	0.6	-64	15	170
BH6	20/01/2025	21.2	5.2	294	0.7	-13	7.8	180
BH6	10/02/2025	21.3	5.1	263	0.7	-52	2.9	160
BH6	17/03/2025	21.1	5.2	204	1	-67	2.3	130
BH6	14/04/2025	21.6	5.1	215	0.9	-78	2.9	130
BH6	12/05/2025	19.5	5.2	220	0.8	-23	7.6	140
BH6	2/06/2025	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

BH6 Annual Average		pH	Electrical Conductivity µS/cm	Dissolved Oxygen mg/L	Oxidation Reduction Potential# mV	Turbidity NTU	Total Dissolved Solids by EC mg/L
01/01/2025-31/12/2025	Count	6	6	6	6	6	6
	Min	5.10	204.00	0.70	-78.00	2.30	130.00
	Average	5.16	239.20	0.82	-46.60	4.70	148.00
	Max	5.20	294.00	1.00	-13.00	7.80	180.00

BH6 Current Annual Return		pH	Electrical Conductivity µS/cm	Dissolved Oxygen mg/L	Oxidation Reduction Potential# mV	Turbidity NTU	Total Dissolved Solids by EC mg/L
31/07/2024-30/07/2025	Count	11	11	11	11	12	11
	Min	0.00	0.00	0.00	-78.00	2.30	0.00
	Average	4.60	239.95	1.21	-9.79	22.55	156.27
	Max	5.20	327.50	4.41	97.20	85.00	244.00

Newcastle Sand Groundwater Monitoring

Borehole ID: BH7

Anniversary Date: 31- July

EPL Point : 21264-4

Field Analysis

Sample	Date	Temperature	pH	Electrical Conductivity	Dissolved Oxygen	Oxidation Reduction Potential	Turbidity	Total Dissolved Solids by EC
Units		°C	pH Units	µS/cm	mg/L	mV	NTU	mg/L
Trigger Values			**4.2-6.5**	**500**				
BH7	24/07/2023	16.3	4.83	90.6	5.6	159.2	58	71
BH7	14/08/2023	15.3	4.45	102.8	3.5	123.5	55	67
BH7	13/09/2023							
BH7	14/09/2023	15.8	4.87	81.5	3.26	26.6	49	64
BH7	23/10/2023	21.1	**6.88**	5.3	5.91	5.3	110	71
BH7	22/11/2023	20.5	5.3	86.6	2.19	78	66	62
BH7	19/12/2023	24.9	4.38	145.7	2.97	0.6	38.22	96
BH7	18/01/2024	25	4.5	105.4	2.49	64.6	17	69
BH7	16/02/2024	23.3	4.43	103	1.9	51.8	26.09	67
BH7	12/03/2024	24.3	4.66	97.4	2.44	71.8	12.54	64
BH7	19/04/2024	20.9	4.69	**1114**	3.21	201	17.9	784
BH7	21/05/2024	17.5	4.33	102.2	2.42	97.7	3.4	77
BH7	19/06/2024	15.9	4.48	81.3	3.25	135.5	20.09	64
BH7	22/07/2024	16.1	4.55	74.3	2.1	192.9	179.86	58
BH7	20/08/2024	16.4	4.79	99.9	2	36.6	94.21	78
BH7	24/09/2024	19.1	4.27	123.9	2.17	164.7	42.17	91
BH7	30/10/2024	18.3	5	134	1.4	6	55	84
BH7	25/11/2024	20.8	5	117	0.7	19	31	73
BH7	18/12/2024	18.6	4.9	118	0.8	-2	9	74
BH7	20/01/2025	20.9	5	116	0.8	26	9.3	72
BH7	10/02/2025	20.8	5	113	0.8	-1	38	71
BH7	17/03/2025	21.3	5.1	126	1.6	-28	28	79
BH7	14/04/2025	21.3	4.9	145	1.1	-33	100	91
BH7	12/05/2025	19.1	4.7	135	0.9	14	2.2	84
BH7	2/06/2025	18.7	5	141	0.9	45	1.4	88

BH7 Annual Average		pH	Electrical Conductivity µS/cm	Dissolved Oxygen mg/L	Oxidation Reduction Potential# mV	Turbidity NTU	Total Dissolved Solids by EC mg/L
01/01/2025-31/12/2025	Count	6	6	6	6	6	6
	Min	4.70	113.00	0.80	-33.00	1.40	71.00
	Average	4.95	129.33	1.02	3.83	29.82	80.83
	Max	5.10	145.00	1.60	45.00	100.00	91.00

BH7 Current Annual Return		pH	Electrical Conductivity µS/cm	Dissolved Oxygen mg/L	Oxidation Reduction Potential# mV	Turbidity NTU	Total Dissolved Solids by EC mg/L
31/07/2024-30/07/2025	Count	11	11	11	11	11	11
	Min	4.27	99.90	0.70	-33.00	1.40	71.00
	Average	4.88	124.44	1.20	22.48	37.30	80.45
	Max	5.10	145.00	2.17	164.70	100.00	91.00

Newcastle Sand Groundwater Monitoring

Borehole ID: BH9A

Anniversary Date: 31- July

EPL Point : 21264-5

Field Analysis

Sample	Date	Temperature	pH	Electrical Conductivity	Dissolved Oxygen	Oxidation Reduction Potential	Turbidity	Total Dissolved Solids by EC
Units		°C	pH Units	µS/cm	mg/L	mV	NTU	mg/L
Trigger Values			**4.2-6.5**	**500**				
BH9A	24/07/2023	17.8	4.69	125.6	4.13	195.5	55.5	95
BH9A	14/08/2023	17.9	4.33	164.1	2.6	77.5	121.51	107
BH9A	13/09/2023							
BH9A	14/09/2023	17.6	4.7	96.2	3.85	37.3	55.55	73
BH9A	23/10/2023	20.2	5.63	32.5	4.18	32.5	94	51
BH9A	22/11/2023	19.9	5.3	162.9	2.3	1	85	117
BH9A	19/12/2023	23.1	4.78	167.4	3.52	167.4	51.52	113
BH9A	18/01/2024		4.8	169				110
BH9A	23/01/2024	21.2	4.76	162.9	2.97	96.1	85	114
BH9A	16/02/2024	21.5	4.81	155.3	6.94	95.7	107.75	108
BH9A	12/03/2024	20.4	5.01	142	3.16	193.1	63.5	101
BH9A	19/04/2024	19	4.59	124.5	3.01	159.7	36.4	91
BH9A	21/05/2024	15.2	4.92	84.2	17	89.1	15.2	65
BH9A	19/06/2024	17.7	4.61	101.8	2.53	97.4	36.46	77
BH9A	22/07/2024	17.4	4.6	104.4	3.08	210.1	45.39	80
BH9A	20/08/2024	17.9	4.65	128.2	2.2	104.7	36.76	96
BH9A	24/09/2024	20.2	4.4	153.2	4.44	191.1	30.1	110
BH9A	30/10/2024	21.1	4.9	178	1.8	49	310	110
BH9A	25/11/2024	21.6	4.9	185	1.6	64	360	120
BH9A	18/12/2024	19.4	5.1	177	2.6	12	270	110
BH9A	20/01/2025	20.7	5	140	1.8	31	290	87
BH9A	10/02/2025	20.7	4.9	143	1.4	45	110	89
BH9A	17/03/2025	20.5	5	152	2.2	23	120	95
BH9A	14/04/2025	20.6	4.9	138	1.6	53	120	86
BH9A	12/05/2025	19.5	5	137	2.1	33	50	86
BH9A	2/06/2025	18.8	4.9	177	2.1	118	28	110

BH9A Annual Average		pH	Electrical Conductivity µS/cm	Dissolved Oxygen mg/L	Oxidation Reduction Potential# mV	Turbidity NTU	Total Dissolved Solids by EC mg/L
	Count	6	6	6	6	6	6
	Min	4.90	137.00	1.40	23.00	28.00	86.00
	Average	4.95	147.83	1.87	50.50	119.67	92.17
01/01/2025-31/12/2025	Max	5.00	177.00	2.20	118.00	290.00	110.00

BH9A Current Annual Return		pH	Electrical Conductivity µS/cm	Dissolved Oxygen mg/L	Oxidation Reduction Potential# mV	Turbidity NTU	Total Dissolved Solids by EC mg/L
	Count	11	11	11	11	11	11
31/07/2024-30/07/2025	Min	4.40	128.20	1.40	12.00	28.00	86.00
	Average	4.88	155.31	2.17	65.80	156.81	99.91
	Max	5.10	185.00	4.44	191.10	360.00	120.00

Newcastle Sand Groundwater Monitoring

Borehole ID: BH11

Anniversary Date: 31- July

EPL Point : 21264-6

Field Analysis

Sample	Date	Temperature	pH	Electrical Conductivity	Dissolved Oxygen	Oxidation Reduction Potential	Turbidity	Total Dissolved Solids by EC
Units		**°C**	**pH Units**	**µS/cm**	**mg/L**	**mV**	**NTU**	**mg/L**
Trigger Values			**4.2-6.5**	**500**				
BH11	24/07/2023	16	4.45	102.2	5.69	35.6	133	80
BH11	14/08/2023	16.5	4.26	125.2	3	16	75	81
BH11	13/09/2023							
BH11	14/09/2023	15.8	4.77	91	3.34	83.7	104.53	72
BH11	23/10/2023	20.6	6.07	93.6	3.43	4.3	47.66	66
BH11	22/11/2023	19.1	5.45	79.5	4.19	94	45	58
BH11	19/12/2023	23.3	4.62	124	3.5	15.4	4.23	83
BH11	18/01/2024	23.1	4.87	146.7	3.51	62.4	17	95
BH11	16/02/2024	21.4	4.92	133	2.23	94.1	11	86
BH11	12/03/2024	22.8	4.93	149	2.85	102.1	7.63	7.63
BH11	19/04/2024							
BH11	21/05/2024	17.9	4.21	82	3.77	139	5.78	82
BH11	19/06/2024	16.3	4.24	93.6	2.41	107.3	16.88	73
BH11	22/07/2024	16	4.47	98.7	2.46	158.9	48.44	78
BH11	20/08/2024	17.5	4.29	127.4	2.8	106.7	47.89	97
BH11	24/09/2024	18.9	4.33	133.4	2.66	166.4	27.71	98
BH11	30/10/2024	17.8	4.6	140	1.1	20	9.2	87
BH11	25/11/2024	19.1	4.6	128	1.2	27	10	80
BH11	18/12/2024	18.7	4.5	138	1.4	-73	7.4	86
BH11	20/01/2025	19.9	4.8	135	1.1	17	3.7	84
BH11	10/02/2025	20.9	4.6	153	1.5	40	4.3	96
BH11	17/03/2025	20.1	4.6	170	1.2	6	4.1	110
BH11	14/04/2025	20.8	4.4	196	1.5	25	3	120
BH11	12/05/2025	18.6	4.5	193	1.2	24	3.5	120
BH11	2/06/2025	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

BH11 Annual Average

BH11 Annual Average		pH	Electrical Conductivity µS/cm	Dissolved Oxygen mg/L	Oxidation Reduction Potential# mV	Turbidity NTU	Total Dissolved Solids by EC mg/L
01/01/2025-31/12/2025	Count	6	6	6	6	6	6
	Min	4.40	135.00	1.10	6.00	3.00	84.00
	Average	4.58	169.40	1.30	22.40	3.72	106.00
	Max	4.80	196.00	1.50	40.00	4.30	120.00

BH11 Current Annual Return		pH	Electrical Conductivity µS/cm	Dissolved Oxygen mg/L	Oxidation Reduction Potential# mV	Turbidity NTU	Total Dissolved Solids by EC mg/L
31/07/2024-30/07/2025	Count	10	10	10	10	11	10
	Min	4.29	127.40	1.10	-73.00	3.00	80.00
	Average	4.52	151.38	1.57	35.91	12.08	97.80
	Max	4.80	196.00	2.80	166.40	47.89	120.00

Newcastle Sand Groundwater Monitoring

Borehole ID: MW239S

Anniversary Date: 31- July

EPL Point : 21264-7

Field Analysis

Sample	Date	Temperature	pH	Electrical Conductivity	Dissolved Oxygen	Oxidation Reduction Potential	Turbidity	Total Dissolved Solids by EC
Units		°C	pH Units	µS/cm	mg/L	mV	NTU	mg/L
Trigger Values			**4.2-6.5**	**500**				
MW239S	24/07/2023	15.6	4.53	84.6	4.37	57	217	67
MW239S	14/08/2023				3.3	34		
MW239S	15/08/2023	15.1	4.77	105.9			223	69
MW239S	13/09/2023							
MW239S	14/09/2023	17	4.69	93.1	3.22	68.1	339	72
MW239S	23/10/2023	22.9	**7.72**	87.6	3.29	2.9	132	59
MW239S	22/11/2023	20.9	5.26	79.6	3.07	78.8	180	56
MW239S	19/12/2023	25	4.41	212	3.07	60.7	120	138
MW239S	18/01/2024	25.3	4.37	144.9	2.52	89.4	83	129
MW239S	16/02/2024	24.4	4.62	213	2.41	76.1	74.44	138
MW239S	12/03/2024	24.6		134.2	3.11	104.9	71.13	88
MW239S	19/04/2024	20.6	4.41	131.3	3.21	52.1	53.7	93
MW239S	21/05/2024	17.7	4.46	100.4	2.97	25.4	27.9	76
MW239S	19/06/2024	16.3	4.4	102	3.13	127.8	133.76	80
MW239S	22/07/2024	15.9	4.36	148.5	2.6	78.1	37.85	117
MW239S	20/08/2024	16.8	4.57	126.9	1.3	104.2	67.35	98
MW239S	24/09/2024	17.9	4.28	126.3	4.58	68.2	97.36	95
MW239S	30/10/2024	19.3	4.8	135	1.4	6	1000	84
MW239S	25/11/2024	20.6	4.7	139	0.9	35	22	87
MW239S	18/12/2024	20.4	4.6	153	0.6	-62	39	96
MW239S	20/01/2025	21.6	4.8	168	0.8	5	26	100
MW239S	10/02/2025	21.5	4.7	168	0.5	-436	50	100
MW239S	17/03/2025	21	4.8	167	1	-30	22	100
MW239S	14/04/2025	20.9	4.7	176	0.9	-55	18	110
MW239S	12/05/2025	18.7	4.7	161	0.9	2	3.8	100
MW239S	2/06/2025	18.1	4.8	174	1.1	66	45	110

MW239S Annual Average		pH	Electrical Conductivity µS/cm	Dissolved Oxygen mg/L	Oxidation Reduction Potential# mV	Turbidity NTU	Total Dissolved Solids by EC mg/L
01/01/2025-31/12/2025	Count	6	6	6	6	6	6
	Min	4.70	161.00	0.50	-436.00	3.80	100.00
	Average	4.75	169.00	0.87	-74.67	27.47	103.33
	Max	4.80	176.00	1.10	66.00	50.00	110.00

MW239S Current Annual Return		pH	Electrical Conductivity µS/cm	Dissolved Oxygen mg/L	Oxidation Reduction Potential# mV	Turbidity NTU	Total Dissolved Solids by EC mg/L
31/07/2024-30/07/2025	Count	12	12	12	12	11	12
	Min	4.28	126.30	0.50	-436.00	3.80	84.00
	Average	4.68	154.02	1.27	-26.96	126.41	98.18
	Max	4.80	176.00	4.58	104.20	> 1000	110.00

Newcastle Sand Groundwater Monitoring

Borehole ID: BH2

Anniversary Date: 31- July

EPL Point : 21264-1

Dissolved Metals

Sample	Date	Arsenic	Barium	Boron	Beryllium	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
Trigger Values		**0.003**	**0.07**	**0.10**	**0.002**	**0.0002**	**0.004**	**0.006**	**0.083**	**4.1**	**0.001**	**0.136**	**0.0001**	**0.02**	**0.01**	**0.01**	**0.085**
BH2	18/01/2024	<0.001	<0.001				<0.001		<0.001	<0.05		<0.001		0.001			0.009
BH2	16/02/2024	<0.001	0.002	<0.05	<0.001	<0.0001	<0.001	<0.001	0.003	0.07	<0.001	0.003	<0.0001	<0.001	<0.01	<0.01	0.009
BH2	12/03/2024	<0.001								0.22		0.005					
BH2	14/03/2024																
BH2	19/04/2024	<0.001								0.06		<0.001					
BH2	21/05/2024	<0.001	0.001				<0.001		<0.001	<0.05		<0.001		0.001			0.022
BH2	19/06/2024	<0.001								0.06		0.002					
BH2	22/07/2024	<0.001								0.08		<0.001					
BH2	20/08/2024	<0.001	0.002				<0.001		0.004	0.11		0.004		<0.001			<0.005
BH2	24/09/2024	<0.001								<0.05		0.003					
BH2	30/10/2024	<0.001								0.43		0.009					
BH2	25/11/2024	<0.001	0.043				<0.001		<0.001	0.49		0.02		<0.001			0.053
BH2	18/12/2024	<0.001								0.29		0.009					
BH2	20/01/2025	0.001								1.2		0.02					
BH2	10/02/2025	<0.001	**0.077**	0.05	<0.0005	<0.0001	<0.001	<0.001	<0.001	0.48	<0.001	0.012	<0.00005	<0.001	<0.001	<0.001	0.05
BH2	17/03/2025	<0.001								0.47		0.01					
BH2	14/04/2025	<0.001								0.75		0.02					
BH2	12/05/2025	<0.001	0.045				<0.001		<0.001	0.76		0.01		<0.001			0.044
BH2	2/06/2025	<0.001								0.48		0.011					

BH2 Annual Average		Arsenic	Barium	Boron	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Vanadium	Zinc
01/01/2025-31/12/2025	Count	6	2	1	1	1	2	1	2	6	1	6	1	2	1	1	2
	Min	0.000	0.045	0.050	0.000	0.000	0.000	0.000	0.000	0.470	0.000	0.010	0.000	0.000	0.000	0.000	0.044
	Average	0.000	0.061	0.050	0.000	0.000	0.000	0.000	0.000	0.690	0.000	0.014	0.000	0.000	0.000	0.000	0.047
	Max	0.001	0.077	0.050	0.000	0.000	0.000	0.000	0.000	1.200	0.000	0.020	0.000	0.000	0.000	0.000	0.050

BH2 Current Annual Return		Arsenic	Barium	Boron	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Vanadium	Zinc
31/07/2024-30/07/2025	Count	11	4	1	1	1	4	1	4	11	1	11	1	4	1	1	4
	Min	0.000	0.002	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000
	Average	0.000	0.042	0.050	0.000	0.000	0.000	0.000	0.001	0.496	0.000	0.012	0.000	0.000	0.000	0.000	0.037
	Max	0.001	0.077	0.050	0.000	0.000	0.000	0.000	0.004	1.200	0.000	0.020	0.000	0.000	0.000	0.000	0.053

Newcastle Sand Groundwater Monitoring

Borehole ID: BH4

Anniversary Date: 31- July

EPL Point : 21264-2

Dissolved Metals

Sample	Date	Arsenic	Barium	Boron	Beryllium	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
Trigger Values		**0.003**	**0.07**	**0.10**	**0.002**	**0.0002**	**0.004**	**0.006**	**0.083**	**4.1**	**0.001**	**0.136**	**0.0001**	**0.02**	**0.01**	**0.01**	**0.085**
BH4	18/01/2024	<0.001	0.011				<0.001		0.014	<0.05		0.01		<0.001			0.012
BH4	16/02/2024	<0.001	0.01	<0.05	<0.001	<0.0001	<0.001	<0.001	0.047	0.08	<0.001	0.009	<0.0001	<0.001	<0.01	<0.01	<0.005
BH4	12/03/2024	<0.001								0.08		0.012					
BH4	19/04/2024	<0.001								0.05		0.01					
BH4	21/05/2024	<0.001	0.007				<0.001		0.09	0.1		0.009		<0.001			<0.005
BH4	19/06/2024	<0.001								0.08		0.012					
BH4	22/07/2024	<0.001								0.1		0.007					
BH4	20/08/2024	<0.001	0.01				<0.001		0.056	0.14		0.012		<0.001			0.005
BH4	24/09/2024	<0.001								0.17		0.012					
BH4	30/10/2024	<0.001								0.03		0.008					
BH4	25/11/2024	<0.001	0.039				<0.001		0.02	0.04		0.01		<0.001			0.042
BH4	18/12/2024	<0.001								0.04		0.011					
BH4	20/01/2025	<0.001								0.07		0.01					
BH4	10/02/2025	<0.001	<0.0010	<0.02	<0.0005	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001
BH4	17/03/2025	<0.001								0.03		0.01					
BH4	14/04/2025	<0.001								0.04		0.01					
BH4	12/05/2025	<0.001	0.048				<0.001		<0.001	0.05		0.01		<0.001			0.05
BH4	2/06/2025	<0.001								0.03		0.007					

BH4 Annual Average		Arsenic	Barium	Boron	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Vanadium	Zinc
01/01/2025-31/12/2025	Count	6	2	1	1	1	2	1	2	6	1	6	1	2	1	1	2
	Min	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Average	0.000	0.024	0.000	0.000	0.000	0.000	0.000	0.000	0.037	0.000	0.008	0.000	0.000	0.000	0.000	0.025
	Max	0.000	0.048	0.000	0.000	0.000	0.000	0.000	0.000	0.070	0.000	0.010	0.000	0.000	0.000	0.000	0.050

BH4 Current Annual Return		Arsenic	Barium	Boron	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Vanadium	Zinc
31/07/2024-30/07/2025	Count	11	4	1	1	1	4	1	4	11	1	11	1	4	1	1	4
	Min	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Average	0.000	0.024	0.000	0.000	0.000	0.000	0.000	0.019	0.058	0.000	0.009	0.000	0.000	0.000	0.000	0.024
	Max	0.000	0.048	0.000	0.000	0.000	0.000	0.000	0.056	0.170	0.000	0.012	0.000	0.000	0.000	0.000	0.050

Newcastle Sand Groundwater Monitoring

Borehole ID: BH6

Anniversary Date: 31- July

EPL Point : 21264-3

Dissolved Metals

Sample	Date	Arsenic	Barium	Boron	Beryllium	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
Trigger Values		**0.003**	**0.07**	**0.10**	**0.002**	**0.0002**	**0.004**	**0.006**	**0.083**	**4.1**	**0.001**	**0.136**	**0.0001**	**0.02**	**0.01**	**0.01**	**0.085**
BH6	18/01/2024	<0.001	0.014				<0.001		<0.001	1.48		0.002		<0.001			0.02
BH6	16/02/2024	<0.001	0.015	<0.05	<0.001	<0.0001	<0.001	<0.001	<0.001	1.62	<0.001	0.006	<0.0001	<0.001	<0.01	<0.01	0.009
BH6	12/03/2024	<0.001								1.38		0.008					
BH6	19/04/2024	<0.001								1.34		0.007					
BH6	21/05/2024	<0.001	0.013				<0.001		<0.001	1.4		0.003		<0.001			<0.005
BH6	19/06/2024	<0.001								0.47		0.001					
BH6	22/07/2024	<0.001								1.75		<0.001					
BH6	20/08/2024	0.001	0.017				<0.001		0.002	**4.23**		0.043		<0.001			0.006
BH6	24/09/2024	<0.001								3.42		0.012					
BH6	30/10/2024	<0.001								2.5		0.02					
BH6	25/11/2024	<0.001	0.046				<0.001		<0.001	2.8		0.01		<0.001			0.031
BH6	18/12/2024	<0.001								1.9		0.006					
BH6	20/01/2025	<0.001								2.4		0.02					
BH6	10/02/2025	<0.001	0.056	0.04	<0.0005	<0.0001	0.002	<0.001	<0.001	1.4	<0.001	0.008	<0.00005	<0.001	0.005	0.002	0.017
BH6	17/03/2025	<0.001								1.9		0.005					
BH6	14/04/2025	<0.001								2.3		0.009					
BH6	12/05/2025	<0.001	0.048				<0.001		<0.001	2.3		0.005		<0.001			0.025
BH6	2/06/2025																

BH6 Annual Average		Arsenic	Barium	Boron	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Vanadium	Zinc
01/01/2025-31/12/2025	Count	5	2	1	1	1	2	1	2	5	1	5	1	2	1	1	2
	Min	0.000	0.048	0.040	0.000	0.000	0.000	0.000	0.000	1.400	0.000	0.005	0.000	0.000	0.005	0.002	0.017
	Average	0.000	0.052	0.040	0.000	0.000	0.001	0.000	0.000	2.060	0.000	0.009	0.000	0.000	0.005	0.002	0.021
	Max	0.000	0.056	0.040	0.000	0.000	0.002	0.000	0.000	2.400	0.000	0.020	0.000	0.000	0.005	0.002	0.025

BH6 Current Annual Return		Arsenic	Barium	Boron	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Vanadium	Zinc
31/07/2024-30/07/2025	Count	10	4	1	1	1	4	1	4	10	1	10	1	4	1	1	4
	Min	0.000	0.017	0.040	0.000	0.000	0.000	0.000	0.000	1.400	0.000	0.005	0.000	0.000	0.005	0.002	0.006
	Average	0.000	0.042	0.040	0.000	0.000	0.001	0.000	0.001	2.515	0.000	0.014	0.000	0.000	0.005	0.002	0.020
	Max	0.001	0.056	0.040	0.000	0.000	0.002	0.000	0.002	4.230	0.000	0.043	0.000	0.000	0.005	0.002	0.031

Newcastle Sand Groundwater Monitoring

Borehole ID: BH7

Anniversary Date: 31- July

EPL Point : 21264-4

Dissolved Metals

Sample	Date	Arsenic	Barium	Boron	Beryllium	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
Trigger Values		**0.003**	**0.07**	**0.10**	**0.002**	**0.0002**	**0.004**	**0.006**	**0.083**	**4.1**	**0.001**	**0.136**	**0.0001**	**0.02**	**0.01**	**0.01**	**0.085**
BH7	18/01/2024	<0.001	0.002				0.002		<0.001	0.34		0.001		<0.001			0.005
BH7	16/02/2024	<0.001	0.002	<0.05	<0.001	<0.0001	0.002	<0.001	<0.001	0.42	<0.001	0.003	<0.0001	<0.001	<0.01	<0.01	0.007
BH7	12/03/2024	<0.001								0.38		0.003					
BH7	19/04/2024	<0.001								0.83		0.071					
BH7	21/05/2024	<0.001	0.024				<0.001		<0.001	0.5		0.088		0.005			**0.25**
BH7	19/06/2024	<0.001								0.81		0.067					0.083
BH7	22/07/2024	<0.001								0.71		0.032					
BH7	20/08/2024	<0.001	0.004				0.002		0.002	0.39		0.015		0.002			0.019
BH7	24/09/2024	<0.001								0.52		0.014					
BH7	30/10/2024	<0.001								0.5		0.007					
BH7	25/11/2024	<0.001	0.038				0.002		<0.001	0.76		0.01		0.002			0.035
BH7	18/12/2024	<0.001								0.54		0.007					
BH7	20/01/2025	<0.001								0.53		0.03					
BH7	10/02/2025	<0.001	0.043	0.03	<0.0005	<0.0001	<0.001	<0.001	<0.001	2.5	<0.001	0.01	<0.00005	<0.001	0.009	0.002	0.016
BH7	17/03/2025	<0.001								0.56		0.01					
BH7	14/04/2025	<0.001								0.71		0.01					
BH7	12/05/2025	<0.001	0.052				0.002		<0.001	0.56		0.03		0.003			0.084
BH7	2/06/2025	<0.001								0.42		0.011					

BH7 Annual Average		Arsenic	Barium	Boron	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Vanadium	Zinc
01/01/2025-31/12/2025	Count	6	2	1	1	1	2	1	2	6	1	6	1	2	1	1	2
	Min	0.000	0.043	0.030	0.000	0.000	0.000	0.000	0.000	0.420	0.000	0.010	0.000	0.000	0.009	0.002	0.016
	Average	0.000	0.048	0.030	0.000	0.000	0.001	0.000	0.000	0.880	0.000	0.017	0.000	0.002	0.009	0.002	0.050
	Max	0.000	0.052	0.030	0.000	0.000	0.002	0.000	0.000	2.500	0.000	0.030	0.000	0.003	0.009	0.002	0.084

BH7 Current Annual Return		Arsenic	Barium	Boron	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Vanadium	Zinc
31/07/2024-30/07/2025	Count	11	4	1	1	1	4	1	4	11	1	11	1	4	1	1	4
	Min	0.000	0.004	0.030	0.000	0.000	0.000	0.000	0.000	0.390	0.000	0.007	0.000	0.000	0.009	0.002	0.016
	Average	0.000	0.034	0.030	0.000	0.000	0.002	0.000	0.001	0.726	0.000	0.014	0.000	0.002	0.009	0.002	0.039
	Max	0.000	0.052	0.030	0.000	0.000	0.002	0.000	0.002	2.500	0.000	0.030	0.000	0.003	0.009	0.002	0.084

Newcastle Sand Groundwater Monitoring

Borehole ID: BH9A

Anniversary Date: 31- July

EPL Point : 21264-5

Dissolved Metals

Sample	Date	Arsenic	Barium	Boron	Beryllium	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
Trigger Values		**0.003**	**0.07**	**0.10**	**0.002**	**0.0002**	**0.004**	**0.006**	**0.083**	**4.1**	**0.001**	**0.136**	**0.0001**	**0.02**	**0.01**	**0.01**	**0.085**
BH9A	24/07/2023	<0.001								0.67		0.045					
BH9A	14/08/2023	<0.001	0.006				<0.001		0.003	0.63		0.041		0.003			0.038
BH9A	13/09/2023																
BH9A	14/09/2023	<0.001								0.21		0.023					
BH9A	23/10/2023	<0.001								0.63		0.051					
BH9A	22/11/2023	<0.001								0.8		0.061					
BH9A	19/12/2023	<0.001	0.007				<0.001		0.002	0.4		0.032		0.003			0.05
BH9A	18/01/2024	<0.001	0.006				<0.001		0.003	0.38		0.029		0.003			0.012
BH9A	23/01/2024																
BH9A	16/02/2024	<0.001	0.01	<0.05	<0.001	<0.0001	<0.001	0.001	<0.001	0.96	<0.001	0.068	<0.0001	0.004	<0.01	<0.01	0.012
BH9A	12/03/2024	<0.001								0.59		0.049					
BH9A	19/04/2024	<0.001								0.33		0.034					
BH9A	21/05/2024	<0.001	0.003				<0.001		<0.001	0.48		0.021		0.001			0.017
BH9A	19/06/2024	<0.001								0.34		0.02					
BH9A	22/07/2024	<0.001								0.38		0.024					
BH9A	20/08/2024	<0.001	0.007				0.001		<0.001	0.51		0.034		0.003			0.021
BH9A	24/09/2024	<0.001								0.75		0.05					
BH9A	30/10/2024	<0.001								0.45		0.04					
BH9A	25/11/2024	<0.001	**0.1**				<0.001		<0.001	0.45		0.04		0.004			0.071
BH9A	18/12/2024	<0.001								0.31		0.03					
BH9A	20/01/2025	<0.001								0.55		0.04					
BH9A	10/02/2025	<0.001	<0.0010	<0.02	<0.0005	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001
BH9A	17/03/2025	<0.001								0.39		0.03					
BH9A	14/04/2025	<0.001								0.34		0.03					
BH9A	12/05/2025	<0.001	0.041				0.001		<0.001	0.28		0.02		0.003			0.042
BH9A	2/06/2025	<0.001								0.26		0.023					

BH9A Annual Average		Arsenic	Barium	Boron	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Vanadium	Zinc
	Count	6	2	1	1	1	2	1	2	6	1	6	1	2	1	1	2
01/01/2025-	Min	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
31/12/2025	Average	0.000	0.021	0.000	0.000	0.000	0.001	0.000	0.000	0.303	0.000	0.024	0.000	0.002	0.000	0.000	0.021
	Max	0.000	0.041	0.000	0.000	0.000	0.001	0.000	0.000	0.550	0.000	0.040	0.000	0.003	0.000	0.000	0.042

BH9A Current Annual Return		Arsenic	Barium	Boron	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Vanadium	Zinc
	Count	11	4	1	1	1	4	1	4	11	1	11	1	4	1	1	4
31/07/2024-	Min	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30/07/2025	Average	0.000	0.037	0.000	0.000	0.000	0.001	0.000	0.000	0.390	0.000	0.031	0.000	0.003	0.000	0.000	0.034
	Max	0.000	0.100	0.000	0.000	0.000	0.001	0.000	0.000	0.750	0.000	0.050	0.000	0.004	0.000	0.000	0.071

Newcastle Sand Groundwater Monitoring

Borehole ID: BH11

Anniversary Date: 31- July

EPL Point : 21264-6

Dissolved Metals

Sample	Date	Arsenic	Barium	Boron	Beryllium	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
Trigger Values		**0.003**	**0.07**	**0.10**	**0.002**	**0.0002**	**0.004**	**0.006**	**0.083**	**4.1**	**0.001**	**0.136**	**0.0001**	**0.02**	**0.01**	**0.01**	**0.085**
BH11	18/01/2024	<0.001	0.003				0.002		<0.001	0.79		0.004		<0.001			0.006
BH11	16/02/2024	<0.001	0.003	<0.05	<0.001	<0.0001	0.001	<0.001	<0.001	0.96	<0.001	0.004	<0.0001	<0.001	<0.01	<0.01	0.006
BH11	12/03/2024	<0.001								0.9		0.004					
BH11	19/04/2024	<0.001								0.61		0.002					
BH11	21/05/2024	<0.001	0.003				0.002		0.003	0.32		0.001		0.002			0.043
BH11	19/06/2024	<0.001								0.23		0.002					
BH11	22/07/2024	<0.001								0.53		<0.001					
BH11	20/08/2024	<0.001	0.002				0.002		0.003	0.77		0.002		0.004			0.042
BH11	24/09/2024	<0.001								0.71		0.001					
BH11	30/10/2024	<0.001								0.8		<0.005					
BH11	25/11/2024	<0.001	0.042				0.002		<0.001	1		0.006		0.003			0.084
BH11	18/12/2024	<0.001								0.88		<0.005					
BH11	20/01/2025	<0.001								0.89		0.007					
BH11	10/02/2025	<0.001	<0.0010	<0.02	<0.0005	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001
BH11	17/03/2025	<0.001								1.3		<0.005					
BH11	14/04/2025	<0.001								1.8		<0.005					
BH11	12/05/2025	<0.001	0.045				0.002		<0.001	1.7		0.007		0.003			0.061
BH11	2/06/2025																

BH11 Annual Average		Arsenic	Barium	Boron	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Vanadium	Zinc
01/01/2025-31/12/2025	Count	5	2	1	1	1	2	1	2	5	1	5	1	2	1	1	2
	Min	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Average	0.000	0.023	0.000	0.000	0.000	0.001	0.000	0.000	1.138	0.000	0.003	0.000	0.002	0.000	0.000	0.031
	Max	0.000	0.045	0.000	0.000	0.000	0.002	0.000	0.000	1.800	0.000	0.007	0.000	0.003	0.000	0.000	0.061

BH11 Current Annual Return		Arsenic	Barium	Boron	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Vanadium	Zinc
31/07/2024-30/07/2025	Count	10	4	1	1	1	4	1	4	10	1	10	1	4	1	1	4
	Min	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Average	0.000	0.022	0.000	0.000	0.000	0.002	0.000	0.001	0.985	0.000	0.002	0.000	0.003	0.000	0.000	0.047
	Max	0.000	0.045	0.000	0.000	0.000	0.002	0.000	0.003	1.800	0.000	0.007	0.000	0.004	0.000	0.000	0.084

Newcastle Sand Groundwater Monitoring

Borehole ID: MW239S

Anniversary Date: 31- July

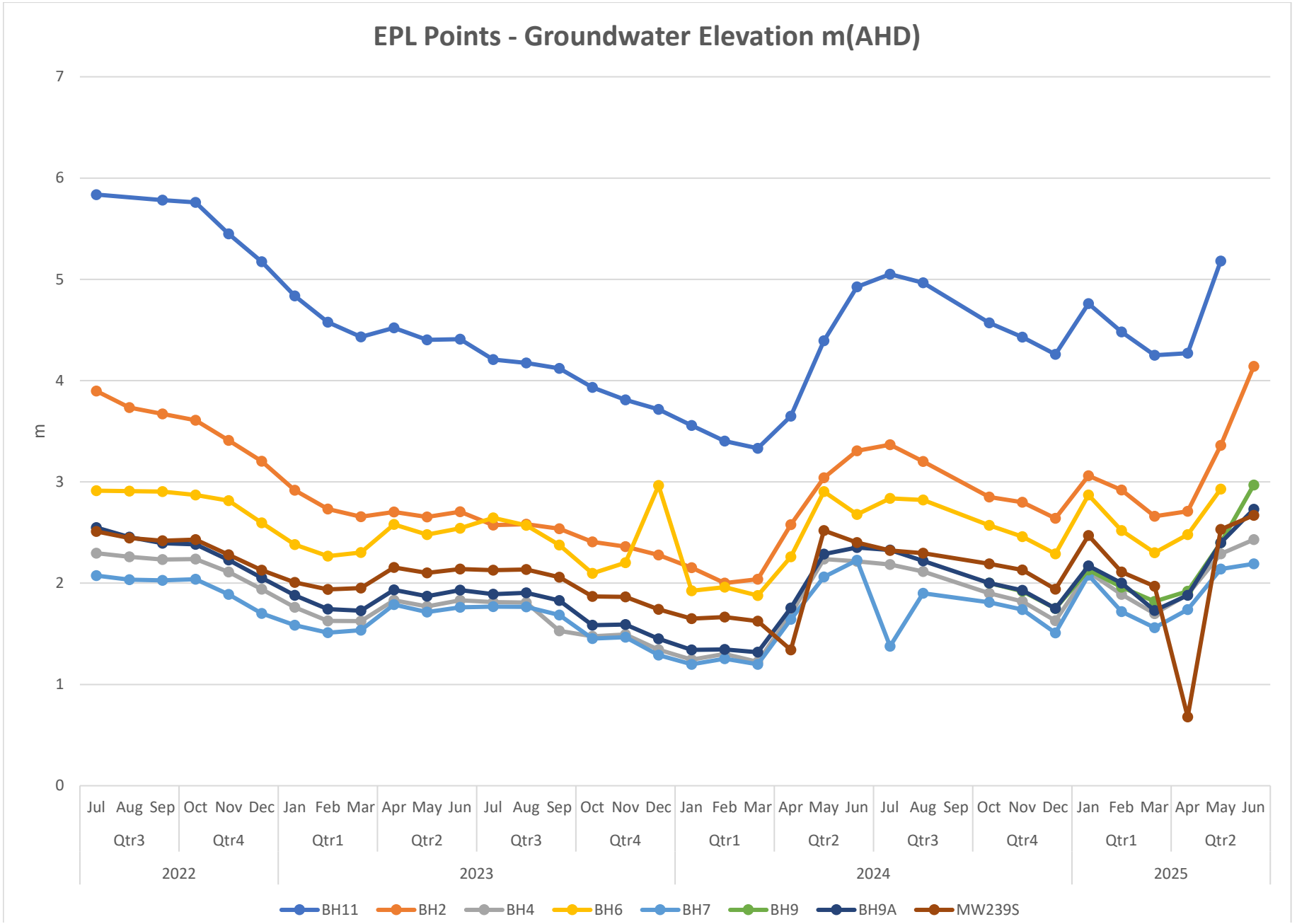
EPL Point : 21269-7

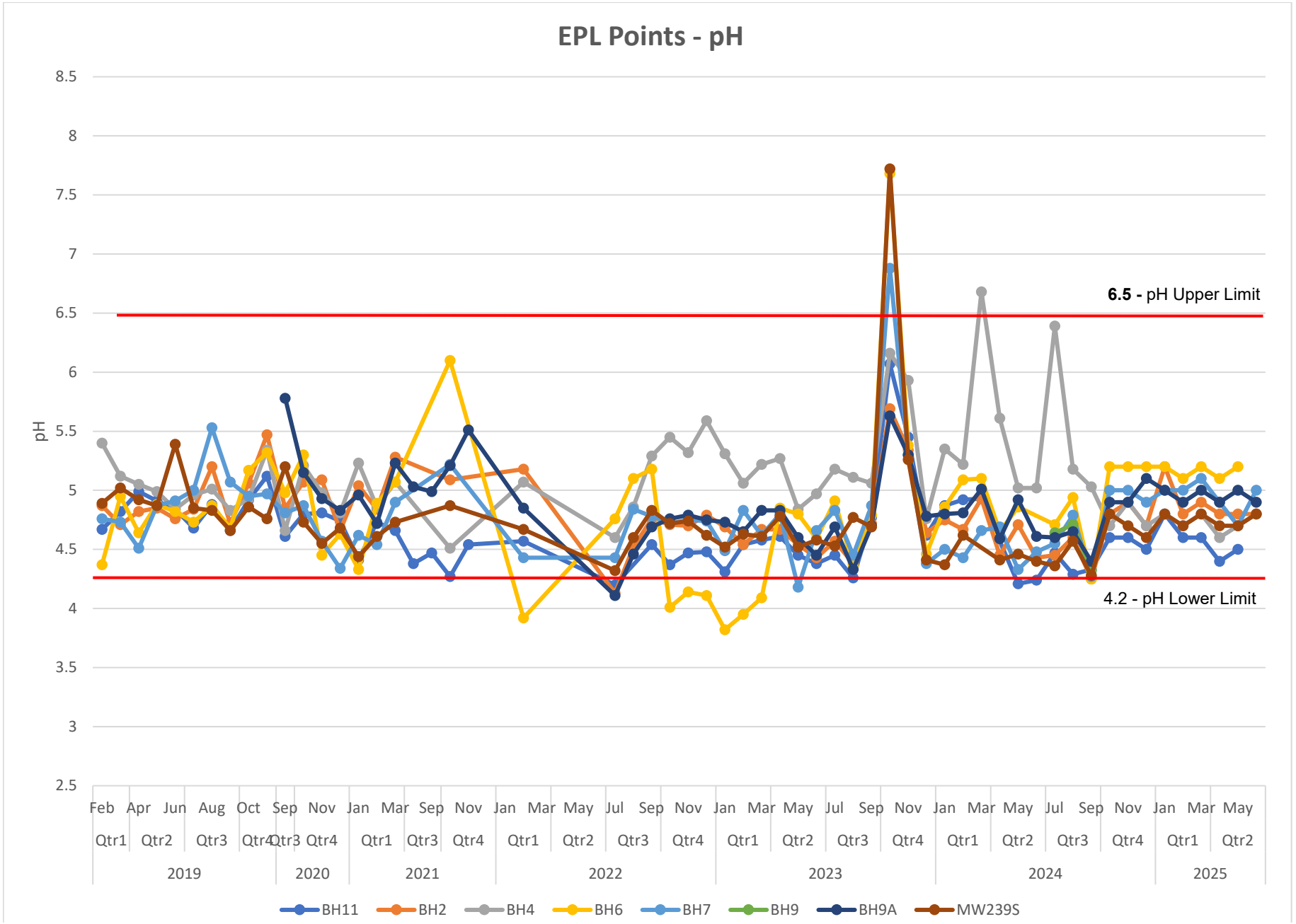
Dissolved Metals

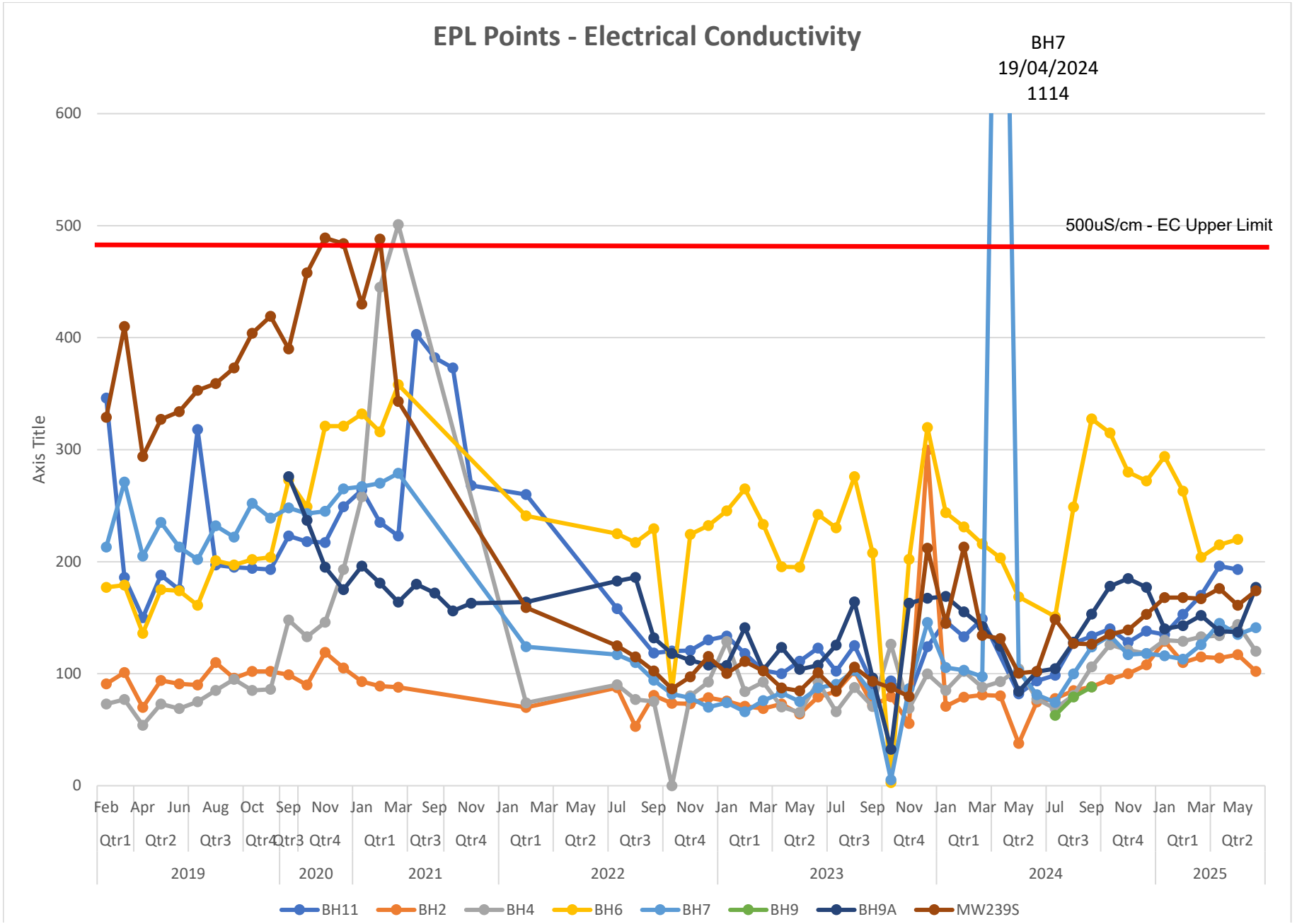
Sample	Date	Arsenic	Barium	Boron	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Vanadium	Zinc
Units		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Trigger Values		**0.003**	**0.07**	**0.10**	**0.002**	**0.0002**	**0.004**	**0.006**	**0.083**	**4.1**	**0.001**	**0.136**	**0.0001**	**0.02**	**0.01**	**0.01**	**0.085**
MW239S	24/07/2023	<0.001								0.25		0.005					
MW239S	14/08/2023	<0.001	0.002				0.002		<0.001	0.28		0.004		0.001			0.013
MW239S	15/08/2023																
MW239S	13/09/2023	<0.001								0.3		0.004					
MW239S	14/09/2023																
MW239S	23/10/2023	<0.001								0.22		0.005					
MW239S	22/11/2023	<0.001								0.14		0.005					
MW239S	19/12/2023	<0.001	0.006				0.002		<0.001	1.06		0.003		0.002			0.02
MW239S	18/01/2024	<0.001	0.006				0.002		<0.001	1.49		0.001		0.002			0.009
MW239S	16/02/2024	<0.001	0.007	<0.05	<0.001	<0.0001	0.001	<0.001	<0.001	1.87	<0.001	0.002	<0.0001	0.001	<0.01	<0.01	0.008
MW239S	12/03/2024	<0.001								1.13		0.002					
MW239S	19/04/2024	<0.001								0.56		0.003					
MW239S	21/05/2024	<0.001	0.002				0.002		<0.001	0.24		0.004		0.002			0.064
MW239S	19/06/2024	<0.001								0.22		0.004					
MW239S	22/07/2024	<0.001								0.28		0.004					
MW239S	20/08/2024	<0.001	0.003				0.001		<0.001	0.28		0.006		0.002			0.014
MW239S	24/09/2024	<0.001								0.2		0.003					
MW239S	30/10/2024	<0.001								0.47		0.009					
MW239S	25/11/2024	<0.001	0.053				0.002		<0.001	0.79		0.006		0.001			0.031
MW239S	18/12/2024	<0.001								0.64		<0.005					
MW239S	20/01/2025	<0.001								0.59		0.008					
MW239S	10/02/2025	<0.001	<0.0010	<0.02	<0.0005	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001
MW239S	17/03/2025	<0.001								0.54		<0.005					
MW239S	14/04/2025	<0.001								0.49		<0.005					
MW239S	12/05/2025	<0.001	0.038				0.002		<0.001	0.37		0.005		<0.001			0.04
MW239S	2/06/2025	<0.001								0.39		0.006					

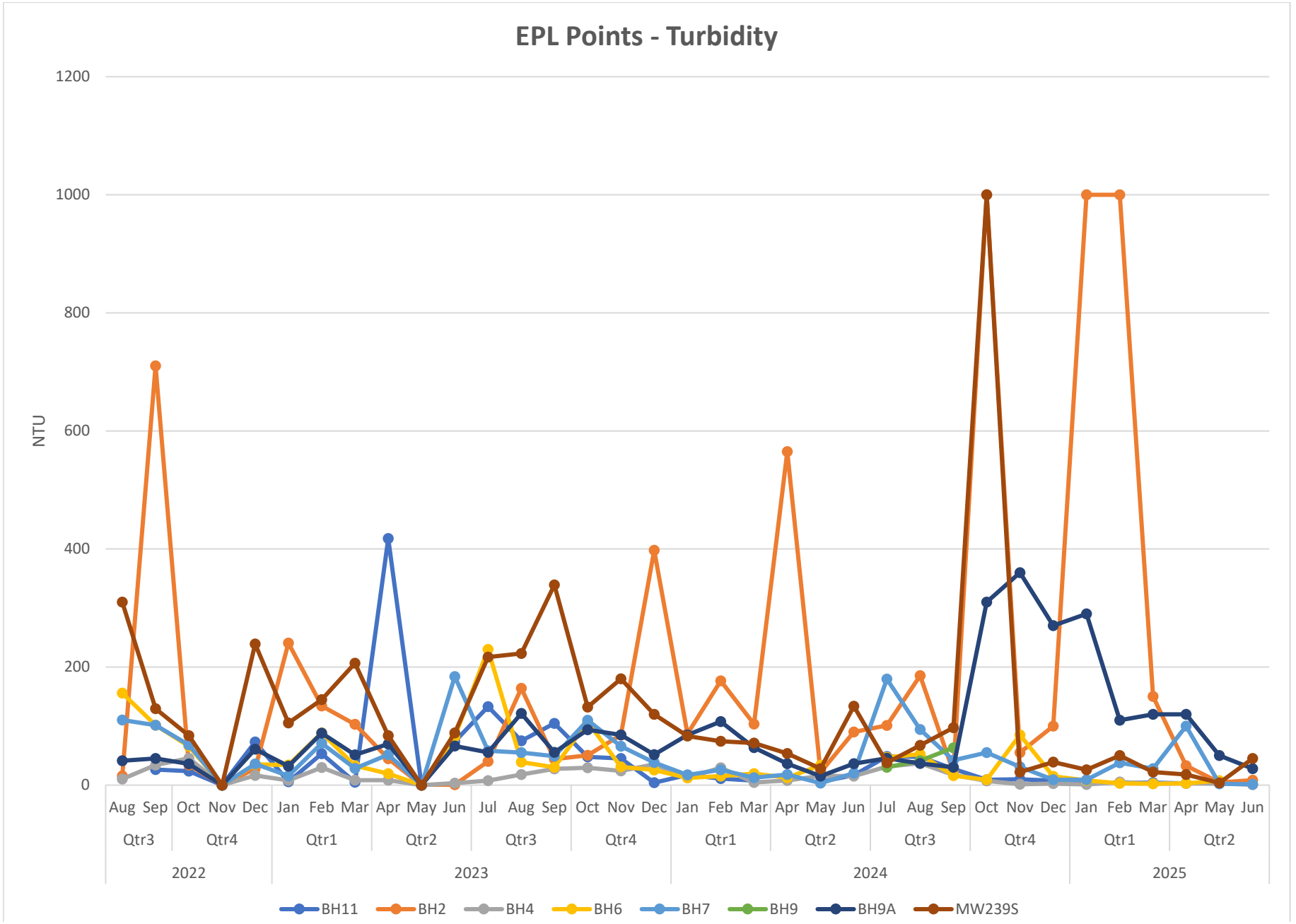
MW239S Annual Average		Arsenic	Barium	Boron	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Vanadium	Zinc
	Count	6	2	1	1	1	2	1	2	6	1	6	1	2	1	1	2
01/01/2025-	Min	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
31/12/2025	Average	0.000	0.019	0.000	0.000	0.000	0.001	0.000	0.000	0.397	0.000	0.003	0.000	0.000	0.000	0.000	0.020
	Max	0.000	0.038	0.000	0.000	0.000	0.002	0.000	0.000	0.590	0.000	0.008	0.000	0.000	0.000	0.000	0.040

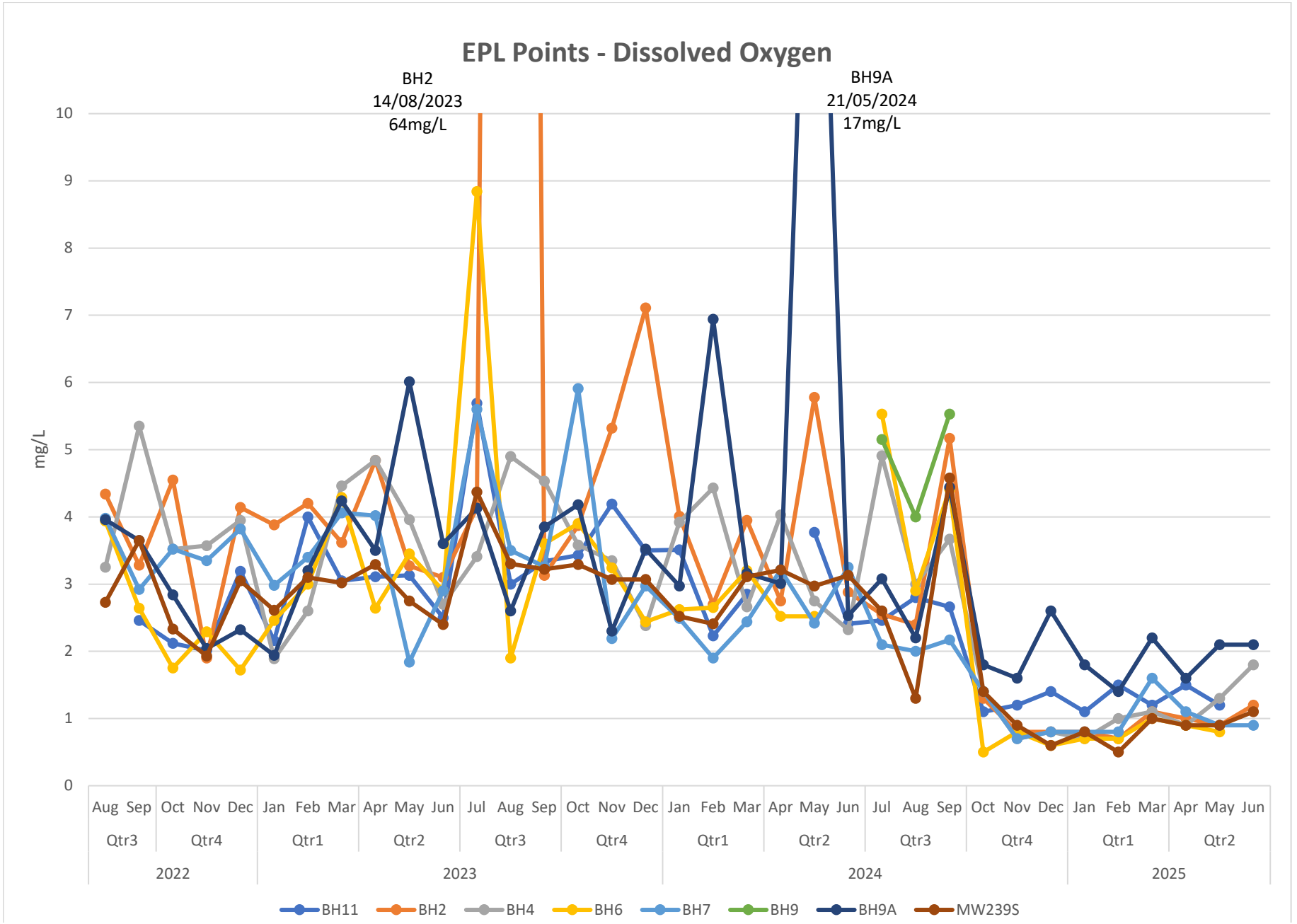
MW239S Current Annual		Arsenic	Barium	Boron	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Vanadium	Zinc
	Count	11	4	1	1	1	4	1	4	11	1	11	1	4	1	1	4
31/07/2024-	Min	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30/07/2025	Average	0.000	0.024	0.000	0.000	0.000	0.001	0.000	0.000	0.433	0.000	0.004	0.000	0.001	0.000	0.000	0.021
	Max	0.000	0.053	0.000	0.000	0.000	0.002	0.000	0.000	0.790	0.000	0.009	0.000	0.002	0.000	0.000	0.040

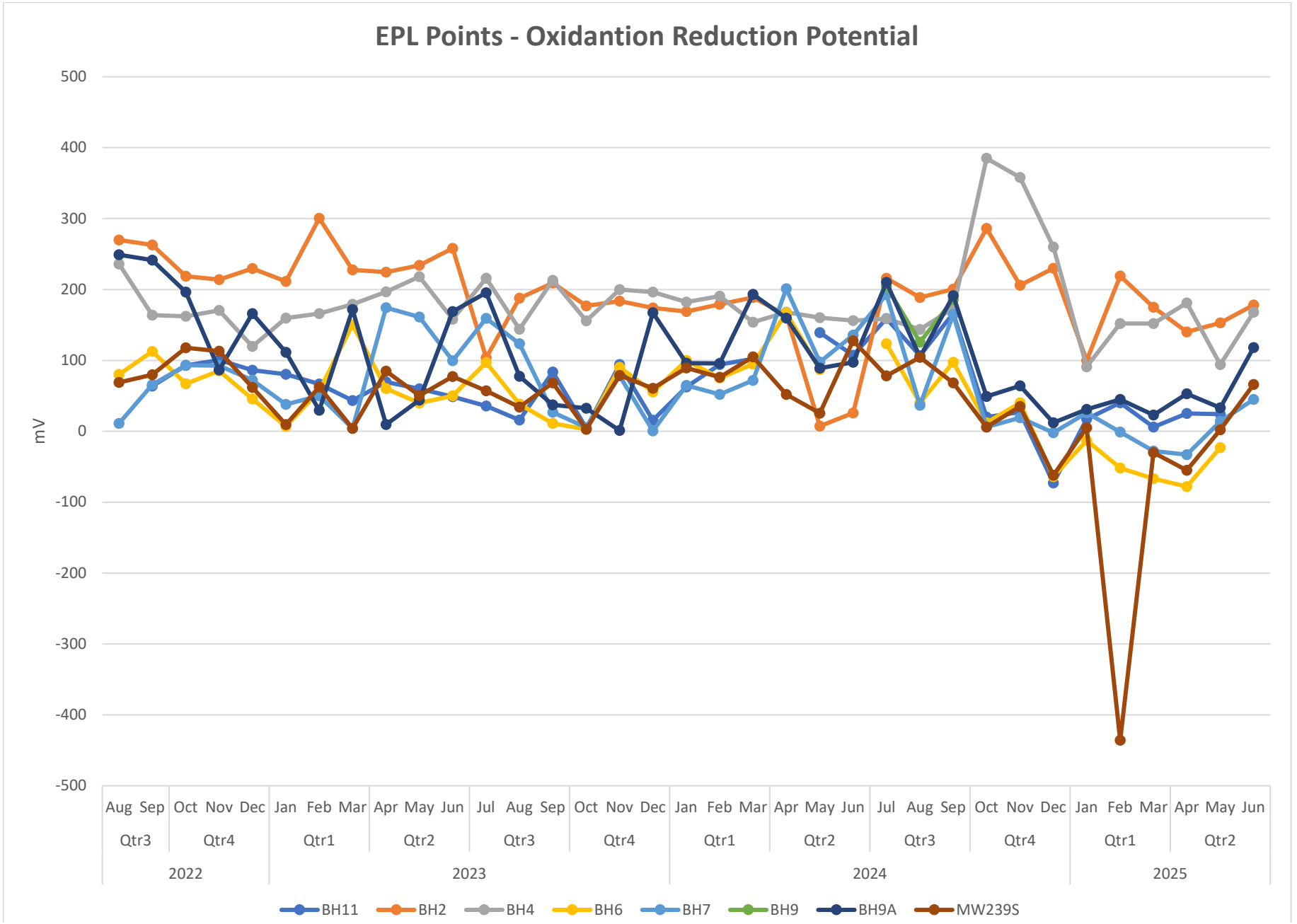

EPL Points - Groundwater Elevation m(AHD)
m
7
6
5
4
3
2
1
0
Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun
Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2
2022 2023 2024 2025
BH11 BH2 BH4 BH6 BH7 BH9 BH9A MW239S

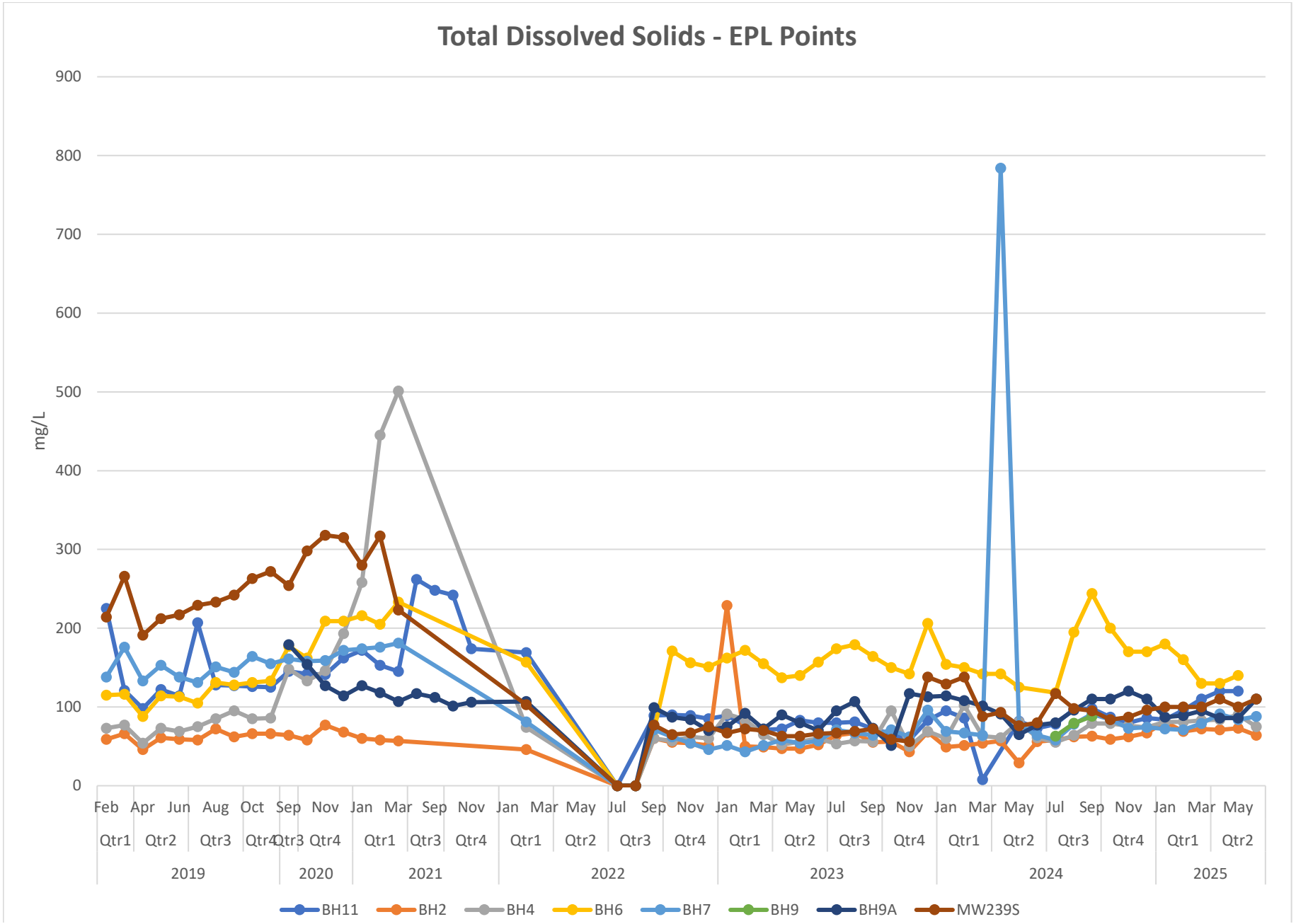

EPL Points - pH
pH
8.5
8
7.5
7
6.5
6
5.5
5
4.5
4
3.5
3
2.5
6.5 - pH Upper Limit
4.2 - pH Lower Limit
Feb Apr Jun Aug Oct Sep Nov Jan Mar Sep Nov Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan Mar May
Qtr1 Qtr2 Qtr3 Qtr4 Qtr3 Qtr4 Qtr1 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2
2019 2020 2021 2022 2023 2024 2025
BH11 BH2 BH4 BH6 BH7 BH9 BH9A MW239S

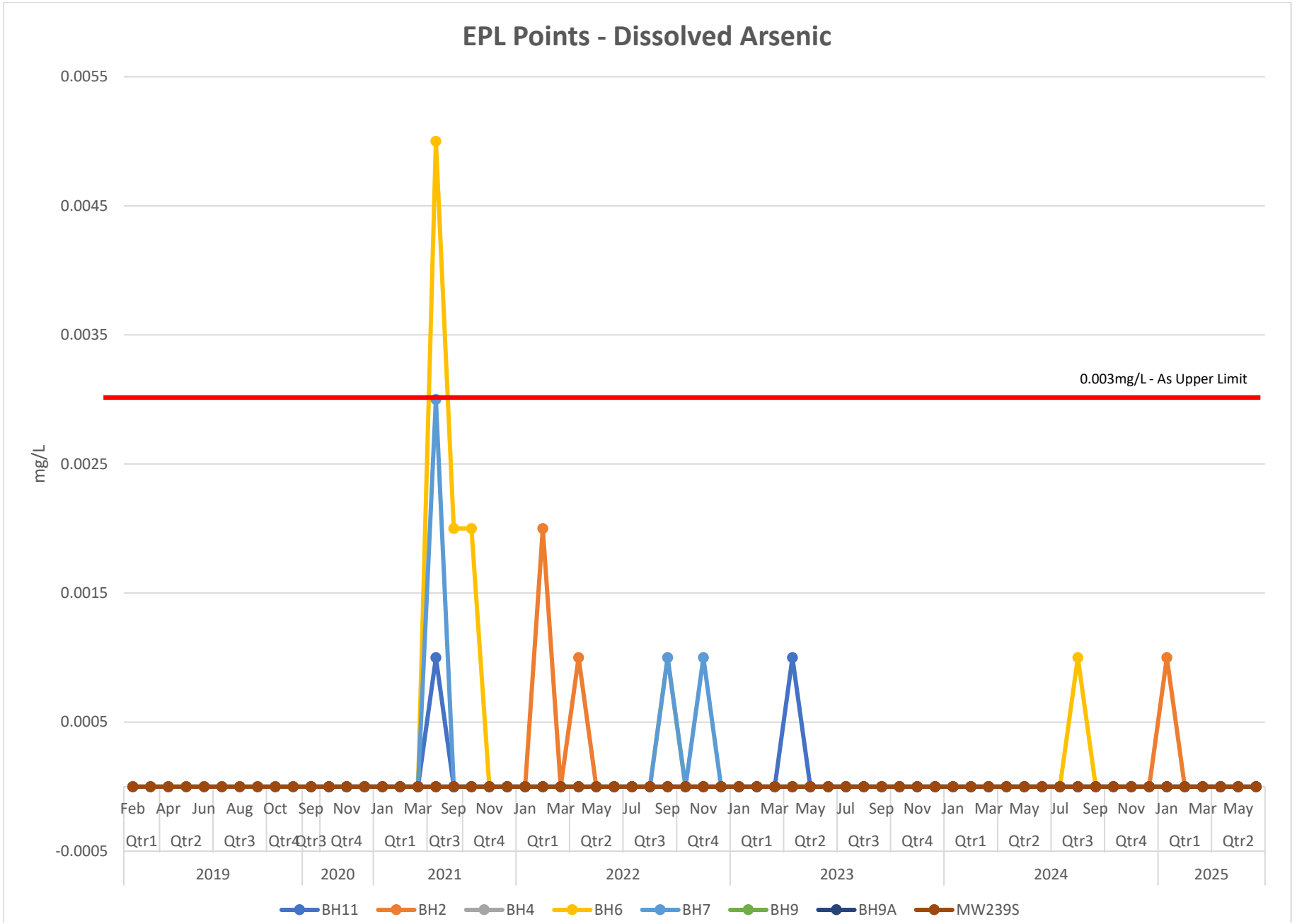

EPL Points - Electrical Conductivity
BH7
19/04/2024
1114
500uS/cm - EC Upper Limit
Axis Title
600
500
400
300
200
100
0
Feb Apr Jun Aug Oct Sep Nov Jan Mar Sep Nov Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan Mar May
Qtr1 Qtr2 Qtr3 Qtr4 Qtr3 Qtr4 Qtr1 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2
2019 2020 2021 2022 2023 2024 2025
BH11 BH2 BH4 BH6 BH7 BH9 BH9A MW239S

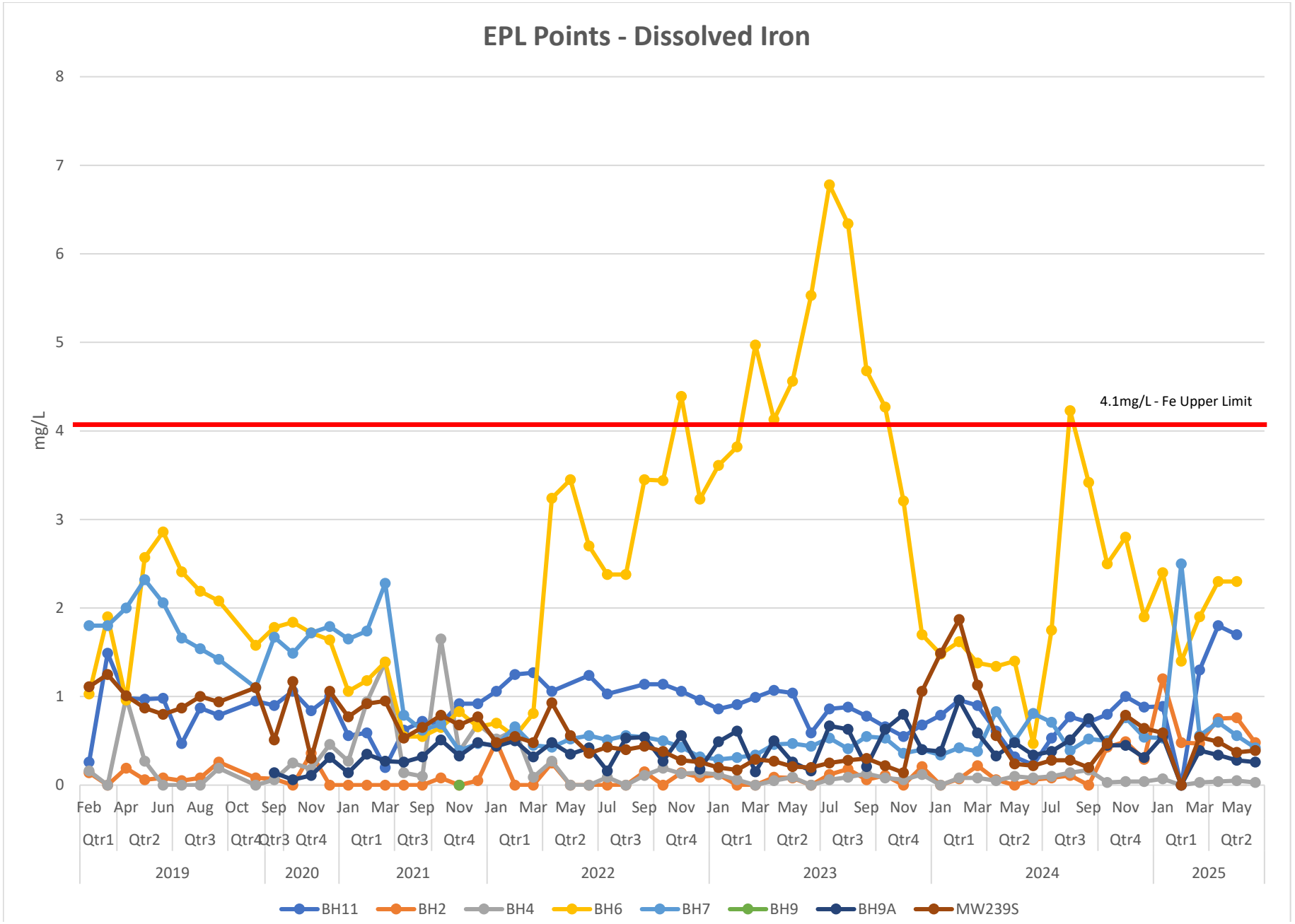

EPL Points - Turbidity
NTU
1200
1000
800
600
400
200
0
Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun
Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2
2022 2023 2024 2025
BH11 BH2 BH4 BH6 BH7 BH9 BH9A MW239S

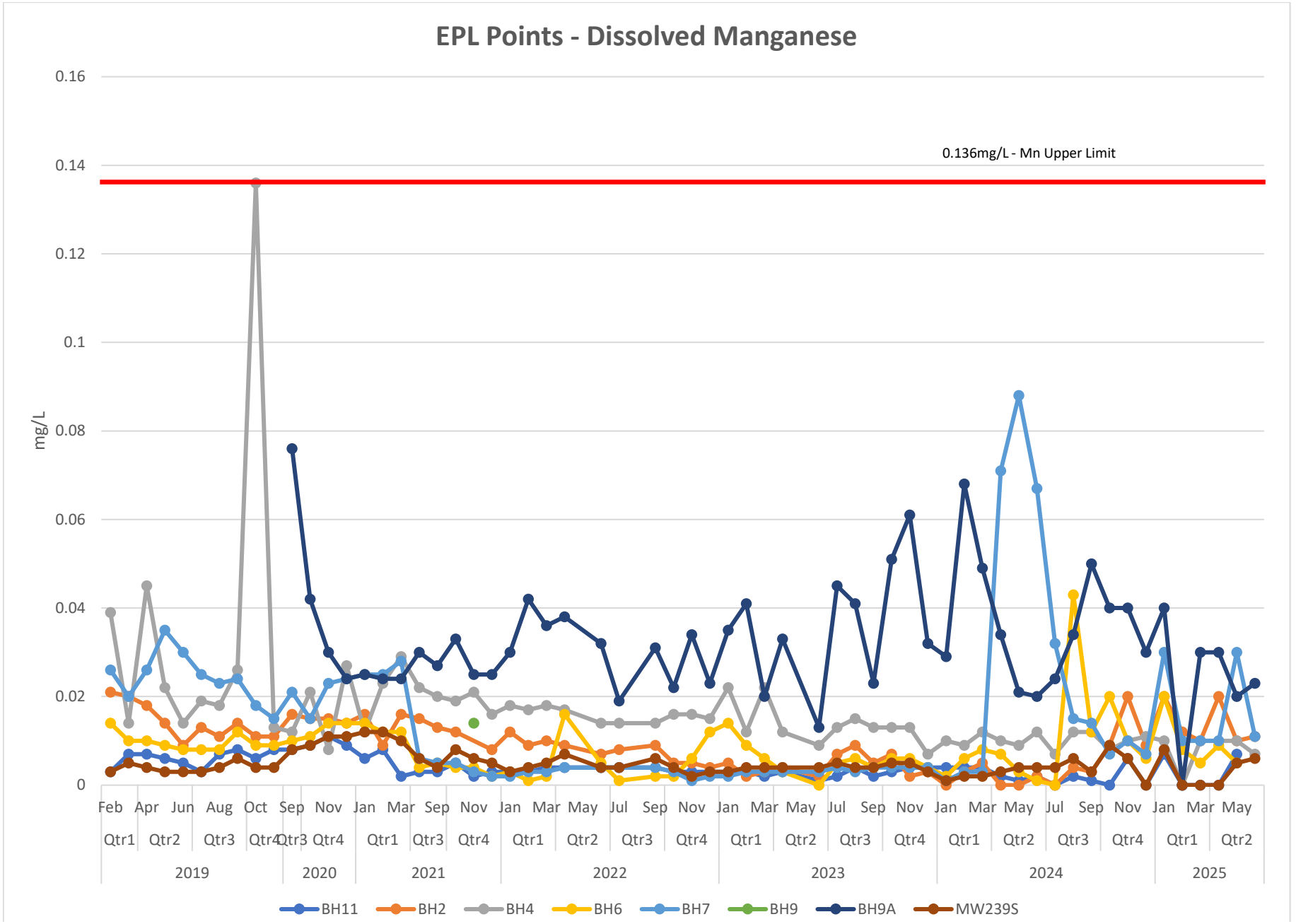

EPL Points - Dissolved Oxygen
BH2
14/08/2023
64mg/L
BH9A
21/05/2024
17mg/L
mg/L
10
9
8
7
6
5
4
3
2
1
0
Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun
Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2
2022 2023 2024 2025
BH11 BH2 BH4 BH6 BH7 BH9 BH9A MW239S


EPL Points - Oxidantion Reduction Potential
500
400
300
200
100
0
-100
-200
-300
-400
-500
mV
Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun
Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2
2022 2023 2024 2025
BH11 BH2 BH4 BH6 BH7 BH9 BH9A MW239S


Total Dissolved Solids - EPL Points
mg/L
900
800
700
600
500
400
300
200
100
0
Feb Apr Jun Aug Oct Sep Nov Jan Mar Sep Nov Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan Mar May
Qtr1 Qtr2 Qtr3 Qtr4 Qtr3 Qtr4 Qtr1 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2
2019 2020 2021 2022 2023 2024 2025
BH11 BH2 BH4 BH6 BH7 BH9 BH9A MW239S


EPL Points - Dissolved Arsenic
0.0055
0.0045
0.0035
0.0025
0.0015
0.0005
-0.0005
mg/L
0.003mg/L - As Upper Limit
Feb Apr Jun Aug Oct Sep Nov Jan Mar Sep Nov Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan Mar May
Qtr1 Qtr2 Qtr3 Qtr4 Qtr3 Qtr4 Qtr1 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2
2019 2020 2021 2022 2023 2024 2025
BH11 BH2 BH4 BH6 BH7 BH9 BH9A MW239S


EPL Points - Dissolved Iron
mg/L
8
7
6
5
4
3
2
1
0
4.1mg/L - Fe Upper Limit
Feb Apr Jun Aug Oct Sep Nov Jan Mar Sep Nov Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan Mar May
Qtr1 Qtr2 Qtr3 Qtr4 Qtr3 Qtr4 Qtr1 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2
2019 2020 2021 2022 2023 2024 2025
BH11 BH2 BH4 BH6 BH7 BH9 BH9A MW239S


EPL Points - Dissolved Manganese
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
mg/L
0.136mg/L - Mn Upper Limit
Feb Apr Jun Aug Oct Sep Nov Jan Mar Sep Nov Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan Mar May
Qtr1 Qtr2 Qtr3 Qtr4 Qtr3 Qtr4 Qtr1 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2
2019 2020 2021 2022 2023 2024 2025
BH11 BH2 BH4 BH6 BH7 BH9 BH9A MW239S

APPENDIX 5. SURFACE WATER QUARTERLY REPORT

Newcastle Sand Surface Water	
June	**2025**
Report issued:	10/07/2025
Licence Information	
Environmental Protection Licence Number (EPL)	21264
Licence Holder	Williamtown Sand Syndicate Pty Ltd
Licencsee Address	Cabbage Tree Road Sand Quarry 298 Cabbage Tree Road Williamtown NSW, 2318
Link to full licence on the EPA Website	https://app.epa.nsw.gov.au/prpoeoapp/ViewPOEOLicence.aspx?DOCID=167636&SYSUID=1&LICID=21264
Anniversary date:	31-Jul
Information Last Obtained:	2/06/2025
Information Published:	

Newcastle Sand Surface Water Monitoring

Review of TARP Triggers:	June	2025

TARP Action determined by SWMP, Section 8.6: Trigger Response Actions

Sample Point	Exceedance	Date	Analyte	Exceedance Value	Trigger Value	Observed Trends	Actions
WPW	No	2/06/2025				No notable tends	

Newcastle Sand Surface Water Monitoring

Quality Data Review

QC Type	Within Acceptance Criteria	Analyte	Exceendance Value	Acceptance Criteria	Comments	Actions
Sample Duplicate	Yes					
Trip Blank	Yes					
Rinsate Blank	Yes					
Internal QC	Yes					

Newcastle Sand Surface Water Monitoring

Sampling and Report Comments

Sample	Date	Sampling Method	Sampling Comments	General Comments/Non Compliance
WPW	2/06/2025	Tap		

Newcastle Sand Surface Water Monitoring

Wash Plant Water (WPW)

Field Analysis

Sample	Date	Temperature	pH	Electrical Conductivity	Dissolved Oxygen	Oxidation Reduction Potential#	Turbidity	Total Dissolved Solids by EC
Units		°C	pH Units	µS/cm	mg/L	mV	NTU	mg/L
Trigger Values			**4.2-6.5**	**500**			**1826**	
Wash Plant Water	24/07/2023	14.5	**2.65**	**1207**	11.79	448	1300	980
Wash Plant Water	14/08/2023	15.9	4.41	242.8	10.2	205.6	42	158
Wash Plant Water	13/09/2023							
Wash Plant Water	14/09/2023	16.6	4.8	208.8	9.94	156.3	483	162
Wash Plant Water	23/10/2023	23.9	6.35	116.7	8.52	130.2	498	78
Wash Plant Water	22/11/2023	22.8	5.06	200	8.4	151.3	360	136
Wash Plant Water	19/12/2023	30.4	4.69	372.2	7.87	174	180	219
Wash Plant Water	18/01/2024	27.6	4.47	236.1	7.53	76.7	360	146
Wash Plant Water	12/03/2024	25.9	4.65	271.4	7.97	71.2	466	173
Wash Plant Water	19/04/2024	21.5	4.43	229.6	8.97	187.1	142	160
Wash Plant Water	19/06/2024							
Wash Plant Water	22/07/2024	14.5	4.31	160.7	10.16	201.8	617.33	131
Wash Plant Water	20/08/2024							
Wash Plant Water	24/09/2024							
Wash Plant Water	30/10/2024	22.7	5.1	284	9.2	211	25	180
Wash Plant Water	25/11/2024	24.8	4.5	323	5.4	269	23	200
Wash Plant Water	18/12/2024	24.6	4.8	306	8	42	65	190
Wash Plant Water	20/01/2025	22.8	4.4	289	9.2	201	110	180
Wash Plant Water	10/02/2025	27.1	4.4	305	4.4	252	13	190
Wash Plant Water	17/03/2025	24.8	4.6	273	9.6	234	75	170
Wash Plant Water	14/04/2025	23.6	4.5	274	5.6	215	14	170
Wash Plant Water	12/05/2025	18.6	5	217	8.9	202	110	140
Wash Plant Water	2/06/2025	16.1	5	205	9.9	214	45	130

Wash Plant Water Annual Average		pH	Electrical Conductivity	Dissolved Oxygen	Oxidation Reduction Potential#	Turbidity	Total Dissolved Solids by EC
01/01/2025-31/12/2025	Count	6	6	6	6	6	6
	Min	4.4	205.0	4.4	201.0	13.0	130.0
	Average	4.7	260.5	7.9	219.7	61.2	163.3
	Max	5.0	305.0	9.9	252.0	110.0	190.0

Newcastle Sand Surface Water Monitoring

Wash Plant Water (WPW)

Dissolved Metals

Sample	Date	Aluminium	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
Trigger Values			**0.006**	**0.08**	**0.002**	**0.10**	**0.0002**	**0.004**	**0.006**	**0.033**	**7.25**	**0.003**	**0.841**	**0.0001**	**0.02**	**0.01**	**0.01**	**0.535**
Wash Plant Water	24/07/2023		<0.001								0.39		0.08					
Wash Plant Water	14/08/2023		<0.001								0.88		0.058					
Wash Plant Water	13/09/2023		<0.001								0.2		0.047					
Wash Plant Water	14/09/2023																	
Wash Plant Water	23/10/2023		<0.001								0.26		0.062					
Wash Plant Water	22/11/2023		<0.001								0.31		0.055					
Wash Plant Water	19/12/2023	0.1									0.07		0.063					
Wash Plant Water	18/01/2024		<0.001	0.007				<0.001		0.006	0.16		0.031		0.002			0.023
Wash Plant Water	12/03/2024		<0.001								0.29		0.059					
Wash Plant Water	19/04/2024		<0.001								0.14		0.055					
Wash Plant Water	19/06/2024		<0.001								0.1		0.035					
Wash Plant Water	22/07/2024		<0.001								0.36		0.063					
Wash Plant Water	20/08/2024		<0.001								0.15		0.046					
Wash Plant Water	24/09/2024		<0.001								0.29		0.059					
Wash Plant Water	30/10/2024		<0.001								0.22		0.061					
Wash Plant Water	25/11/2024		<0.001								0.11		0.094					
Wash Plant Water	18/12/2024		<0.001								0.27		0.064					
Wash Plant Water	20/01/2025		<0.001								0.29		0.04					
Wash Plant Water	10/02/2025		<0.001								0.16		0.091					
Wash Plant Water	17/03/2025		<0.001								0.2		0.068					
Wash Plant Water	14/04/2025		<0.001								0.04		0.05					
Wash Plant Water	12/05/2025		<0.001								0.2		0.066					
Wash Plant Water	2/06/2025		<0.001								0.1		0.067					

Wash Plant Water Annual Average		Aluminium	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Vanadium	Zinc
01/01/2025-31/12/2025	Count	0	6	0	0	0	0	0	0	0	6	0	6	0	0	0	0	0
	Min	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.040	0.000	0.000	0.000	0.000	0.000
	Average	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.165	0.000	0.064	0.000	0.000	0.000	0.000	0.000
	Max	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.290	0.000	0.091	0.000	0.000	0.000	0.000	0.000

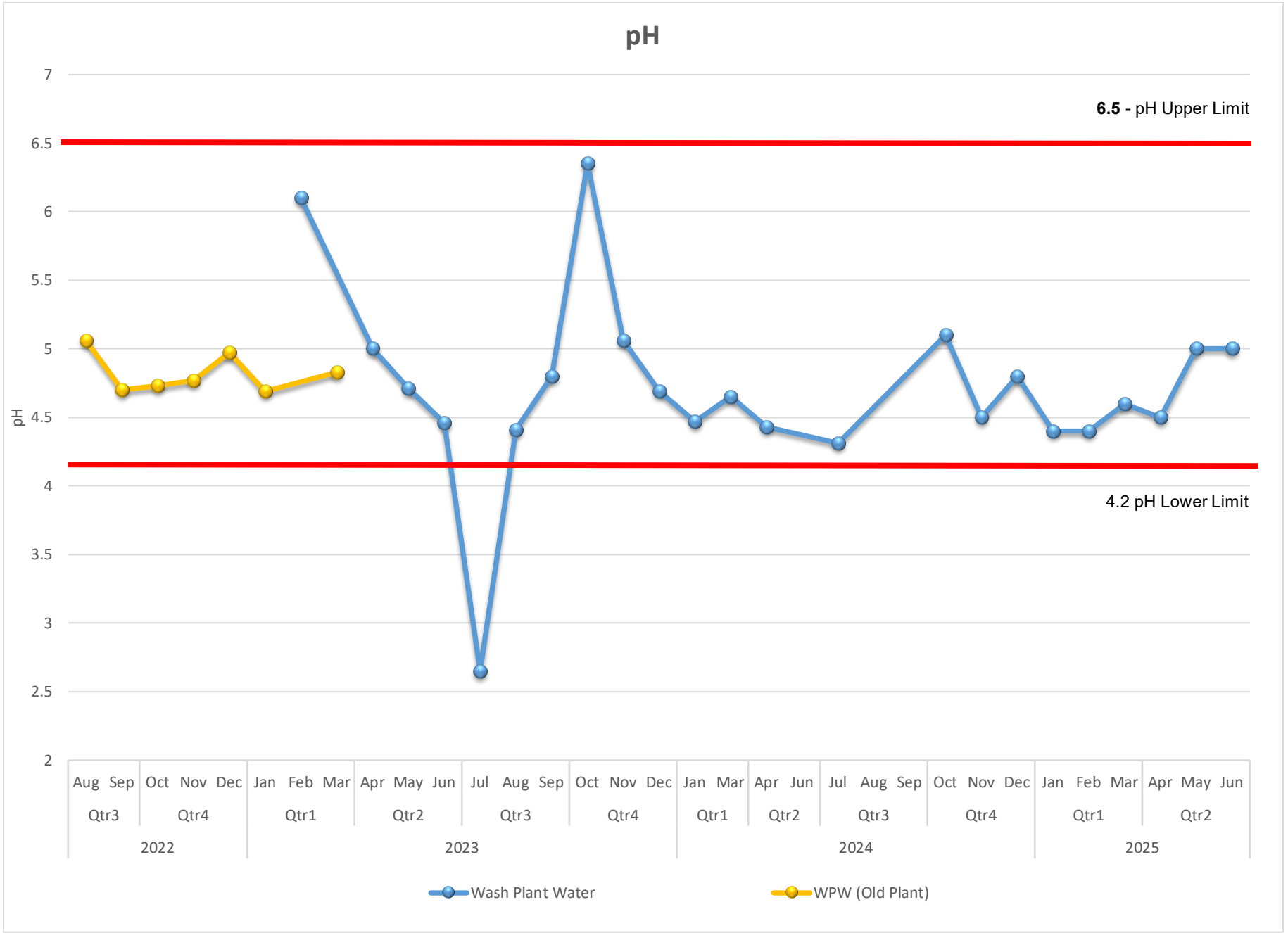
Newcastle Sand Surface Water Monitoring

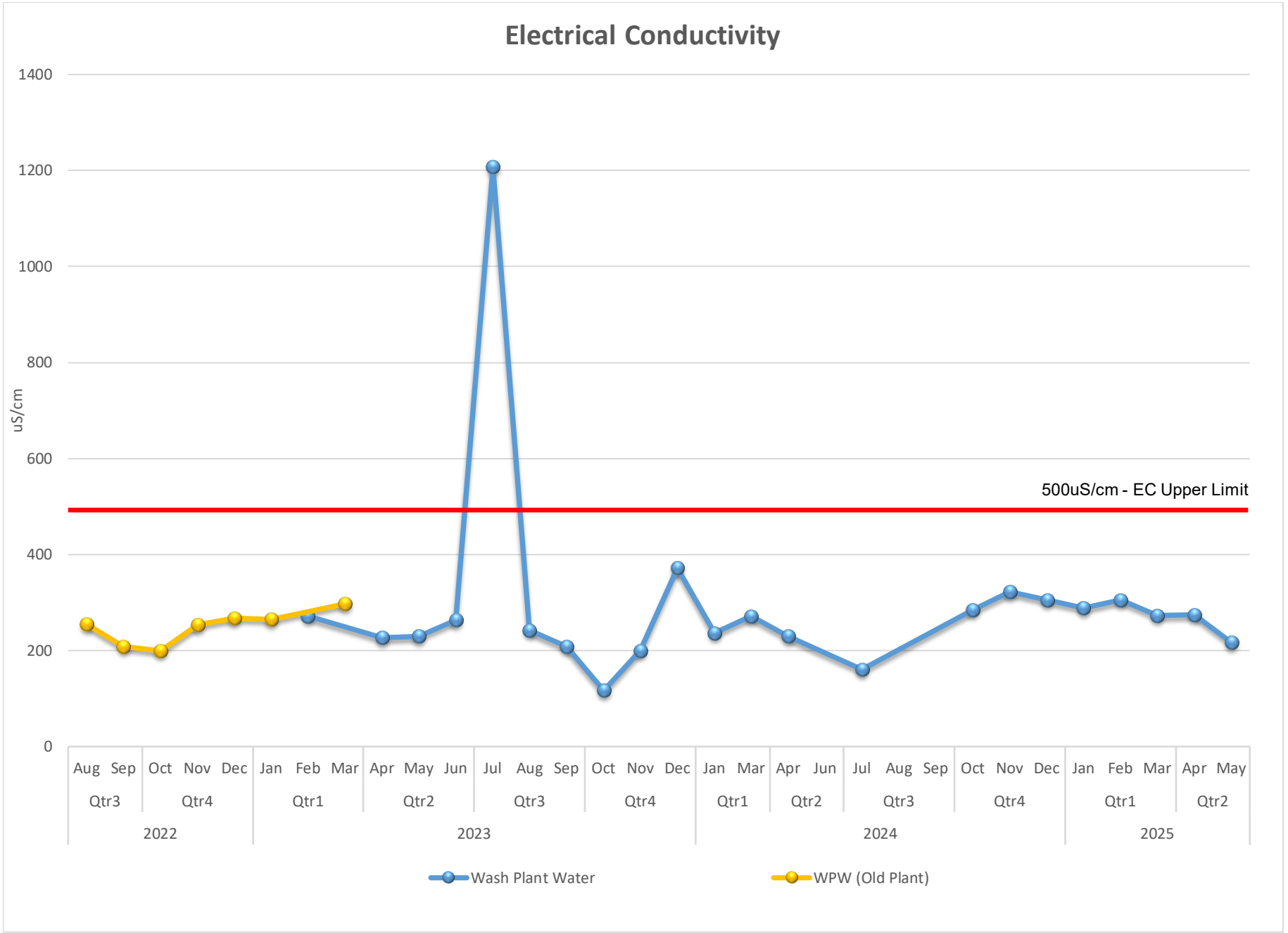
Wash Plant Water (WPW)

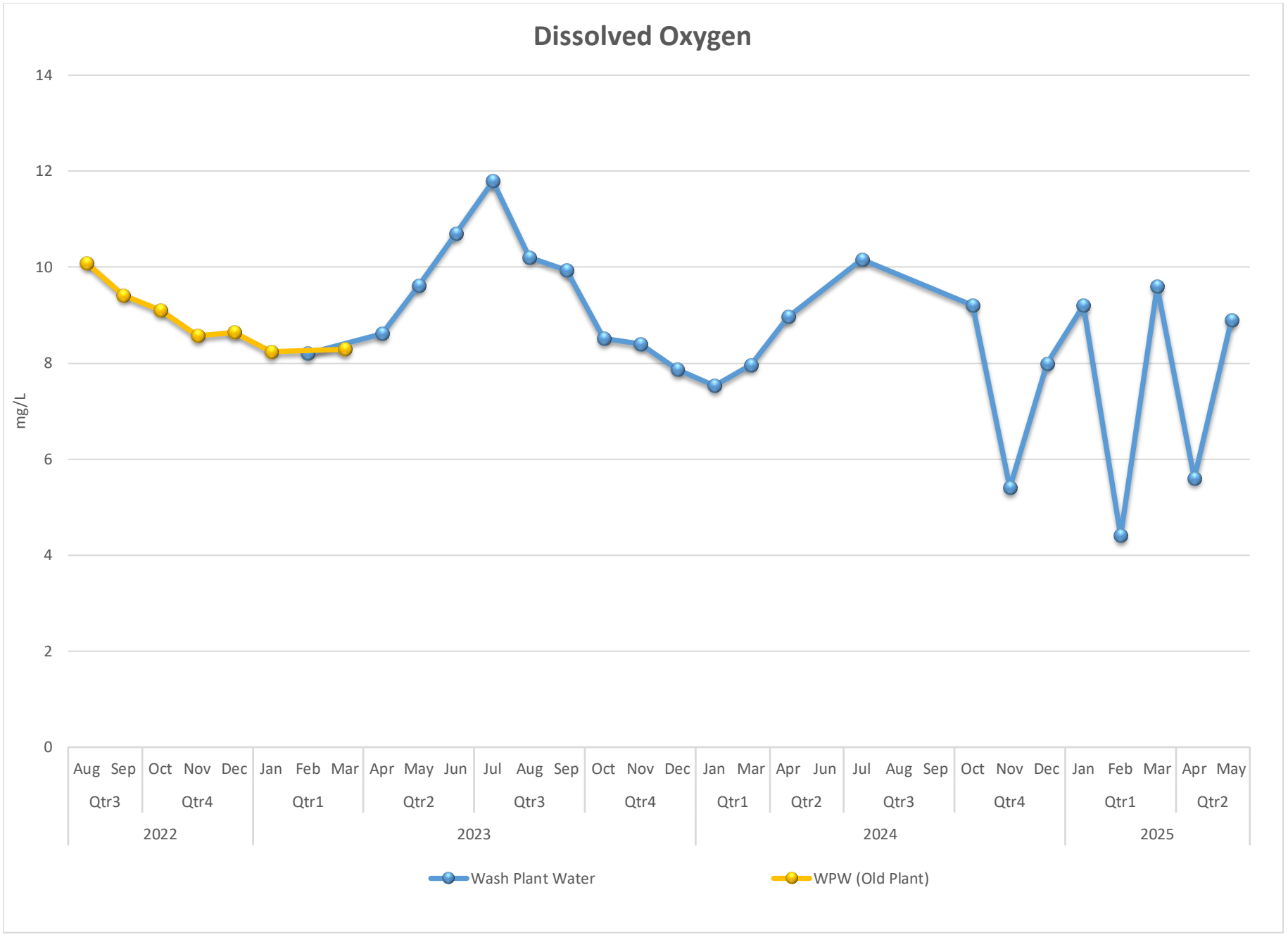
PFAS

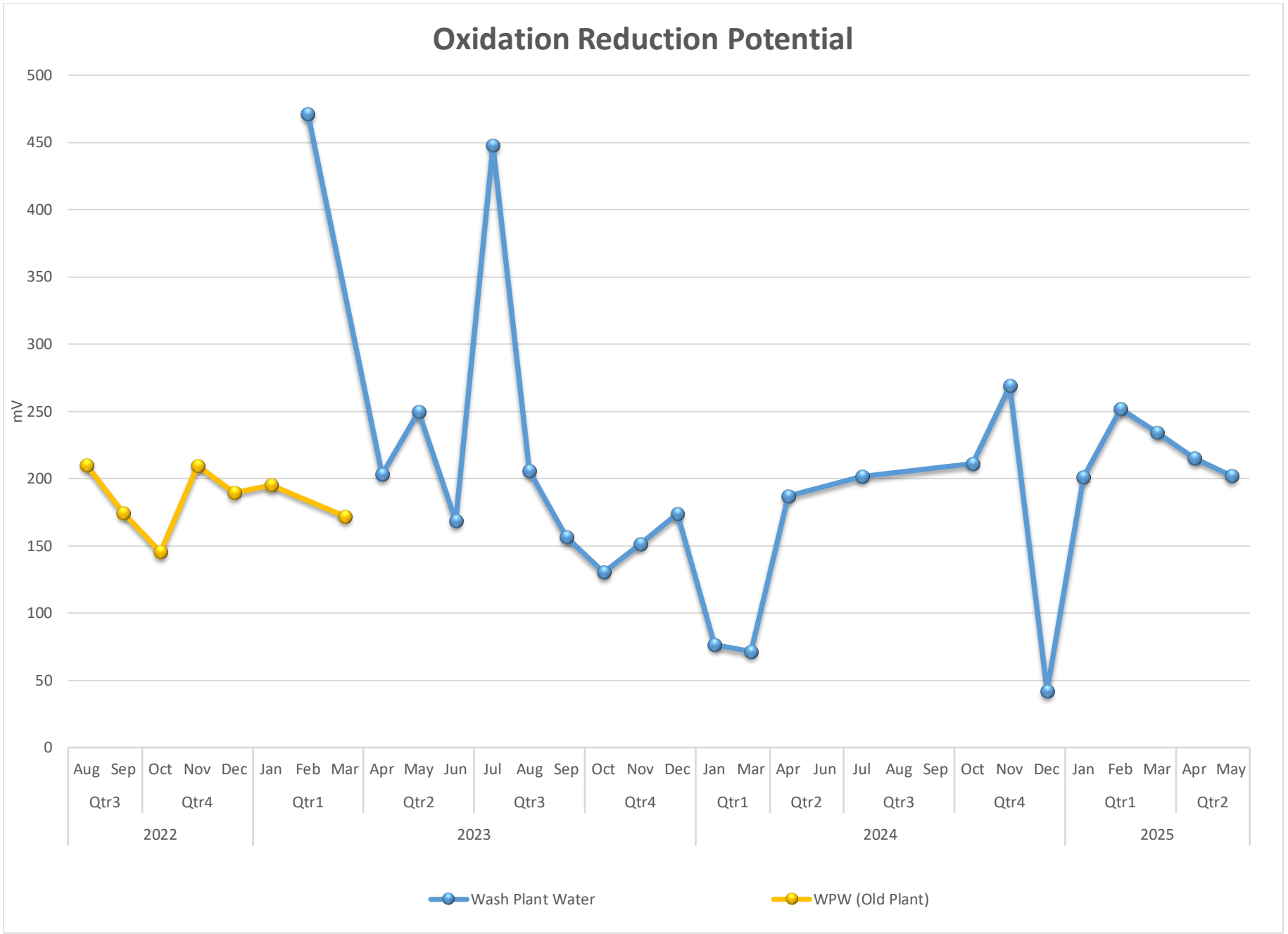
Sample	Date	Perfluorooctanoic acid PFOA	Total Positive PFHxS & PFOS	Total Positive PFAS
Units		ug/L	ug/L	ug/L
Trigger Values		**0.56**	**0.07**	
Wash Plant Water (Old	17/01/2023	<0.01	0.02	0.02
Wash Plant Water	15/02/2023	<0.01	<0.01	<0.01
Wash Plant Water (Old	15/03/2023			
Wash Plant Water	15/03/2023	<0.01	0.03	0.03
Wash Plant Water	18/04/2023	0.01	0.04	0.05
Wash Plant Water	16/05/2023	<0.01	0.03	0.03
Wash Plant Water	14/06/2023	<0.01	0.03	0.03
Wash Plant Water	24/07/2023	<0.01	0.03	0.03
Wash Plant Water	14/08/2023	<0.01	<0.01	<0.01
Wash Plant Water	13/09/2023	<0.01	<0.01	<0.01
Wash Plant Water	14/09/2023			
Wash Plant Water	23/10/2023	<0.01	0.02	0.02
Wash Plant Water	22/11/2023	<0.01	<0.01	<0.01
Wash Plant Water	19/12/2023	0.01	0.02	0.03
Wash Plant Water	18/01/2024	<0.01	0.01	0.01
Wash Plant Water	12/03/2024	<0.01	<0.01	<0.01
Wash Plant Water	19/04/2024	<0.01	<0.01	<0.01
Wash Plant Water	19/06/2024	<0.01	<0.01	<0.01
Wash Plant Water	22/07/2024	<0.01	0.04	0.04
Wash Plant Water	20/08/2024	0.02	0.05	0.07
Wash Plant Water	24/09/2024	<0.01	<0.01	<0.01
Wash Plant Water	30/10/2024	<0.01	<0.01	<0.01
Wash Plant Water	25/11/2024	<0.01	<0.01	<0.01
Wash Plant Water	18/12/2024	<0.01	<0.01	<0.01
Wash Plant Water	20/01/2025	<0.01	<0.01	<0.01
Wash Plant Water	10/02/2025	<0.01	<0.01	<0.01
Wash Plant Water	17/03/2025	<0.01	<0.01	<0.01
Wash Plant Water	14/04/2025	<0.01	<0.01	<0.01
Wash Plant Water	12/05/2025	<0.01	<0.01	<0.01
Wash Plant Water	2/06/2025	<0.01	<0.01	<0.01

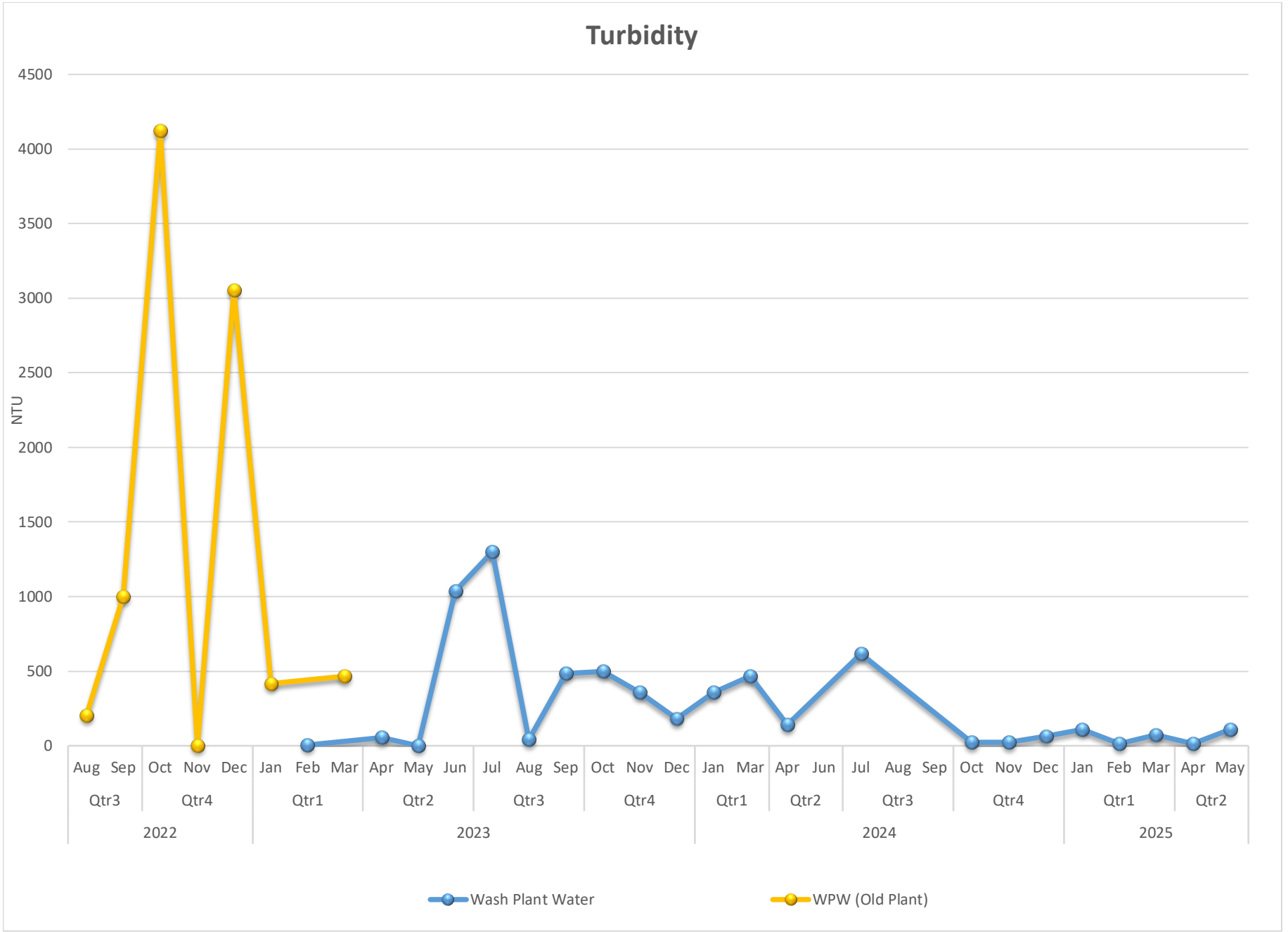
Wash Plant Water Annual Average		Perfluorooctanoic acid PFOA	Total Positive PFHxS & PFOS	Total Positive PFAS
01/01/2025-31/12/2025	Count	6	6	6
	Min	0.000	0.000	0.000
	Average	0.000	0.000	0.000
	Max	0.000	0.000	0.000

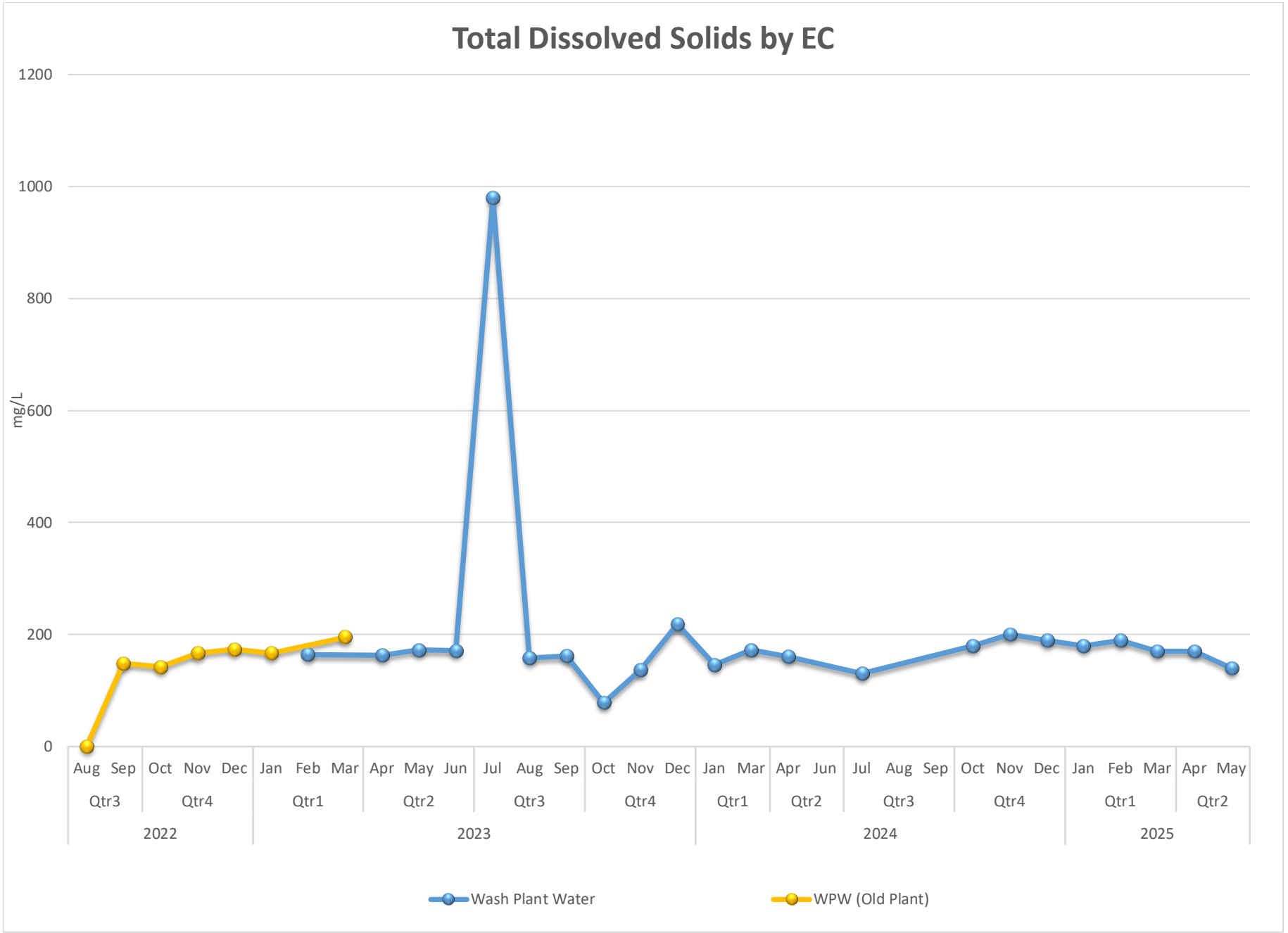

pH
7
6.5
6
5.5
5
4.5
4
3.5
3
2.5
2
pH
6.5 - pH Upper Limit
4.2 pH Lower Limit
Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Mar Apr Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun
Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2
2022 2023 2024 2025
Wash Plant Water
WPW (Old Plant)

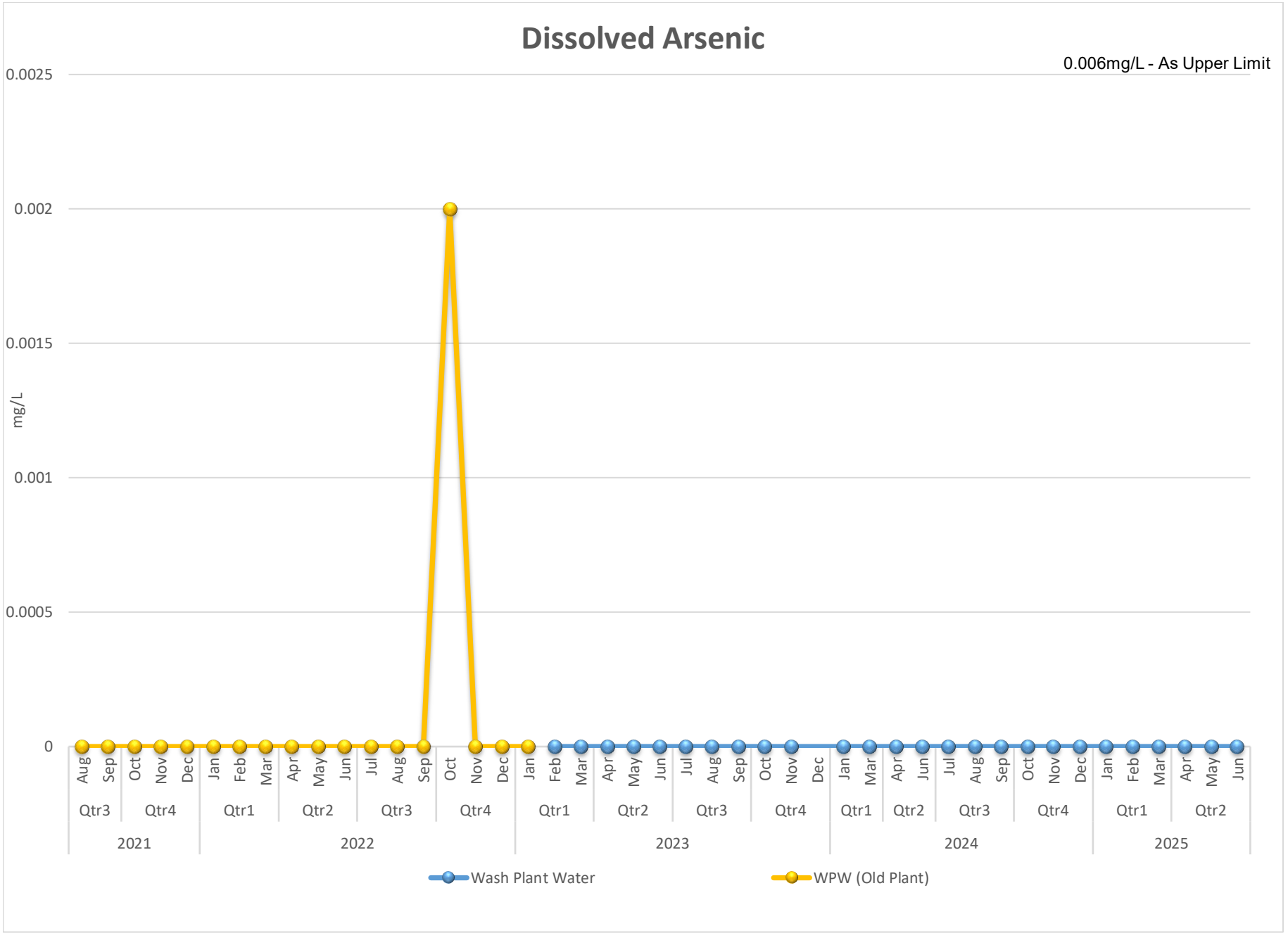

Electrical Conductivity
1400
1200
1000
800
600
400
200
0
uS/cm
500uS/cm - EC Upper Limit
Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Mar Apr Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May
Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2
2022 2023 2024 2025
Wash Plant Water
WPW (Old Plant)

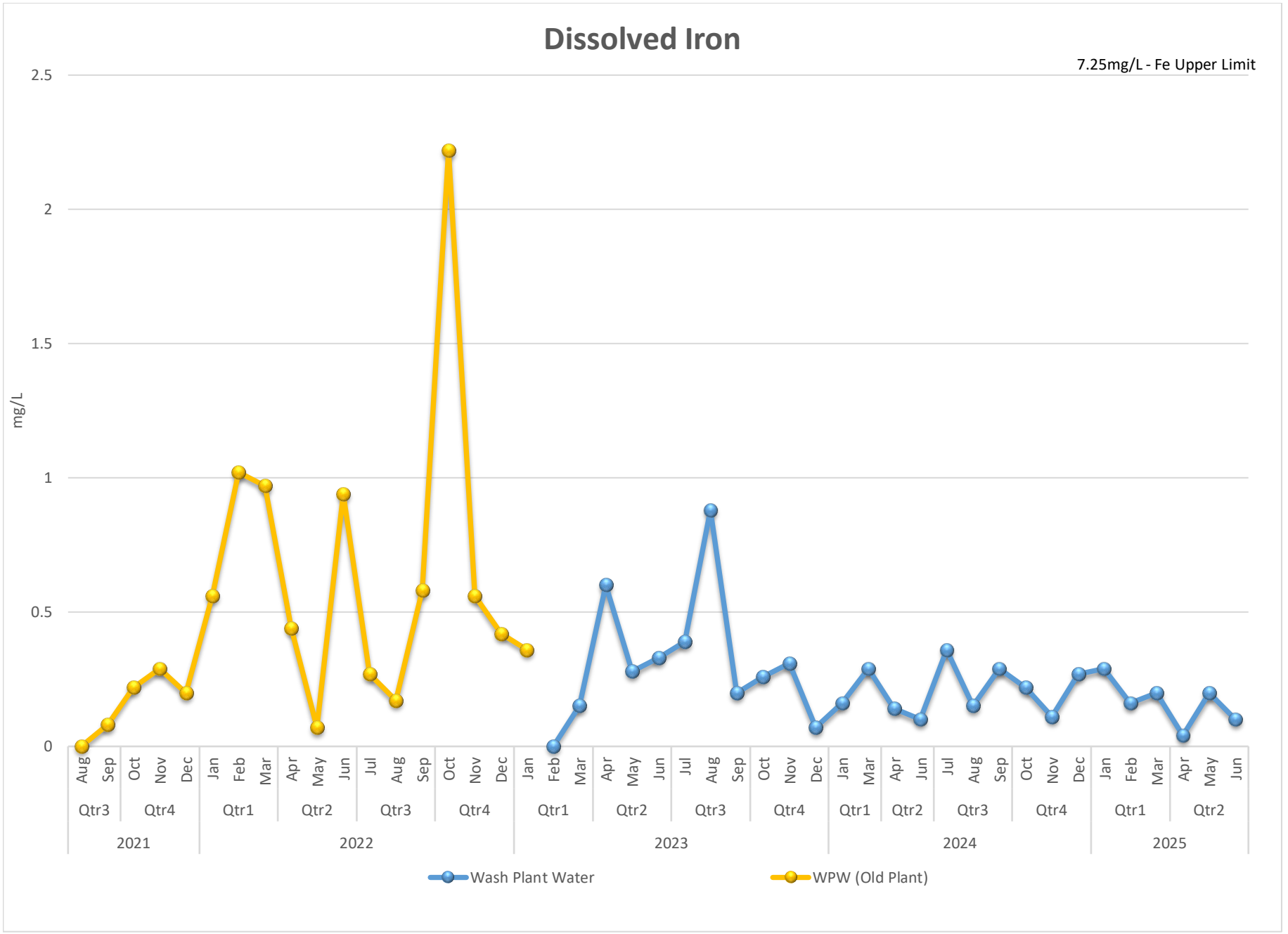

Dissolved Oxygen
14
12
10
8
6
4
2
0
mg/L
Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Mar Apr Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May
Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2
2022 2023 2024 2025
Wash Plant Water
WPW (Old Plant)

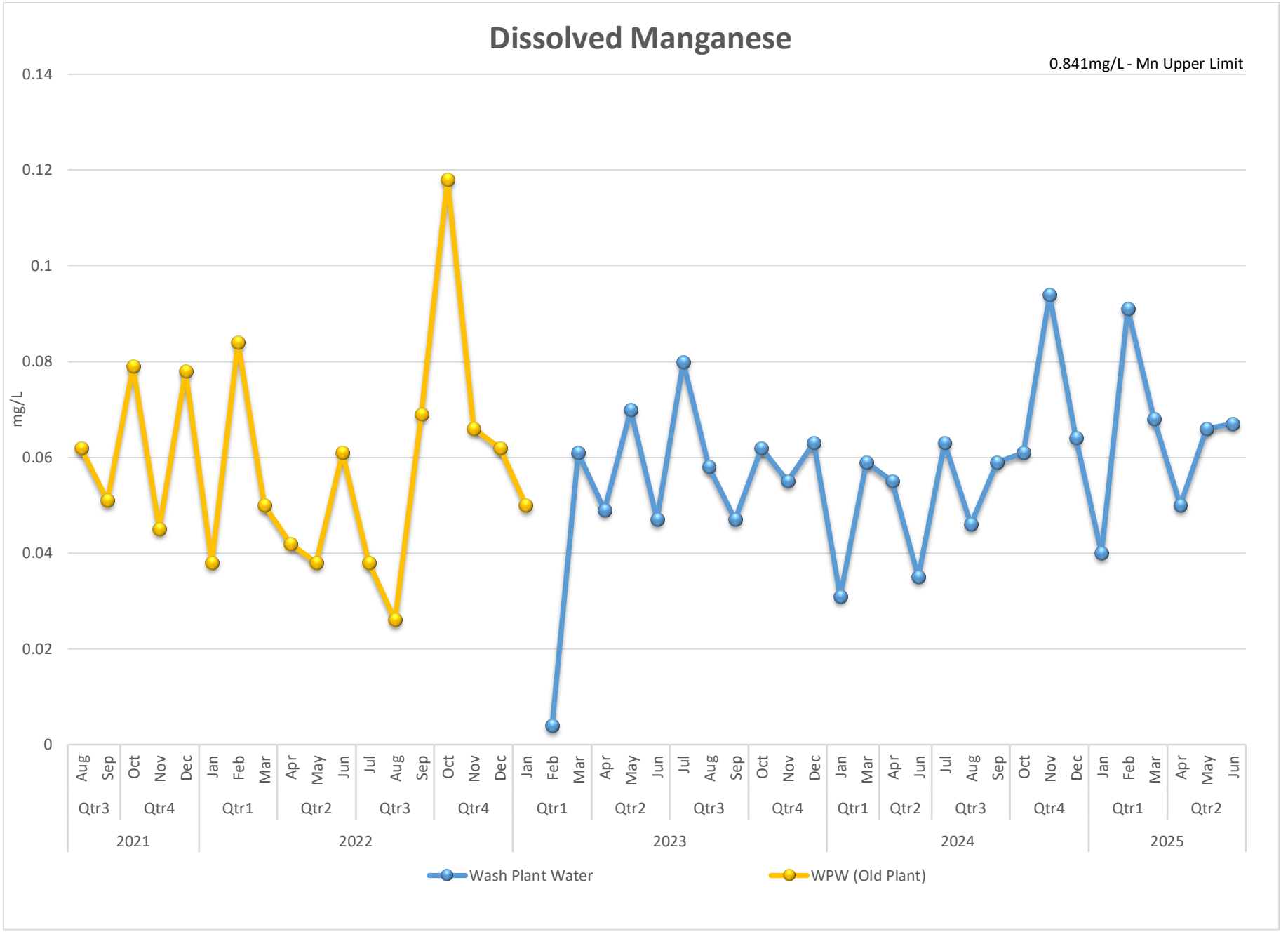

Oxidation Reduction Potential
500
450
400
350
300
250
200
150
100
50
0
mV
Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Mar Apr Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May
Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2
2022 2023 2024 2025
Wash Plant Water
WPW (Old Plant)

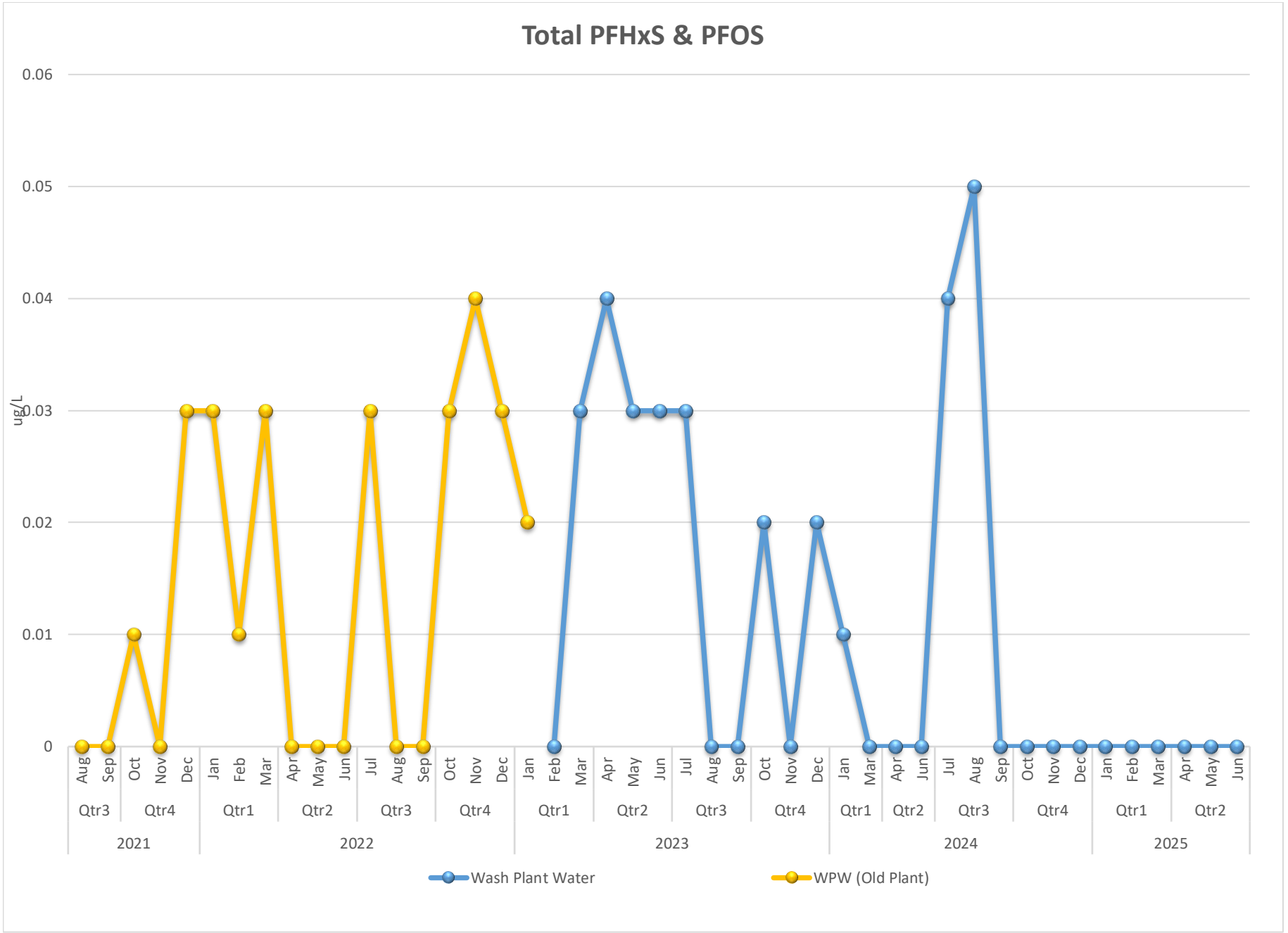

Turbidity
4500
4000
3500
3000
2500
2000
1500
1000
500
0
NTU
Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Mar Apr Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May
Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2
2022 2023 2024 2025
Wash Plant Water
WPW (Old Plant)

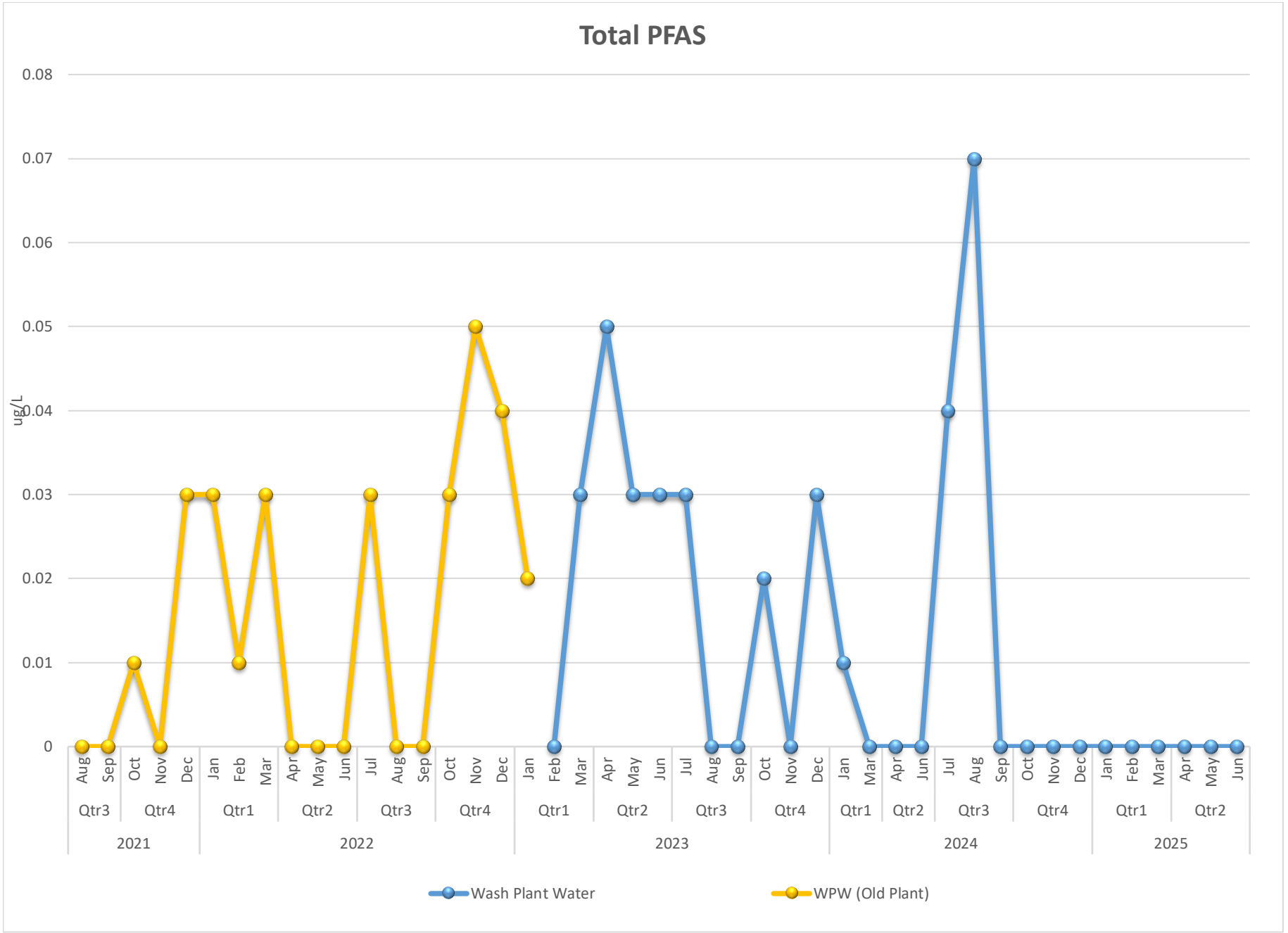

Total Dissolved Solids by EC
1200
1000
800
600
400
200
0
mg/L
Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Mar Apr Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May
Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2
2022 2023 2024 2025
Wash Plant Water
WPW (Old Plant)

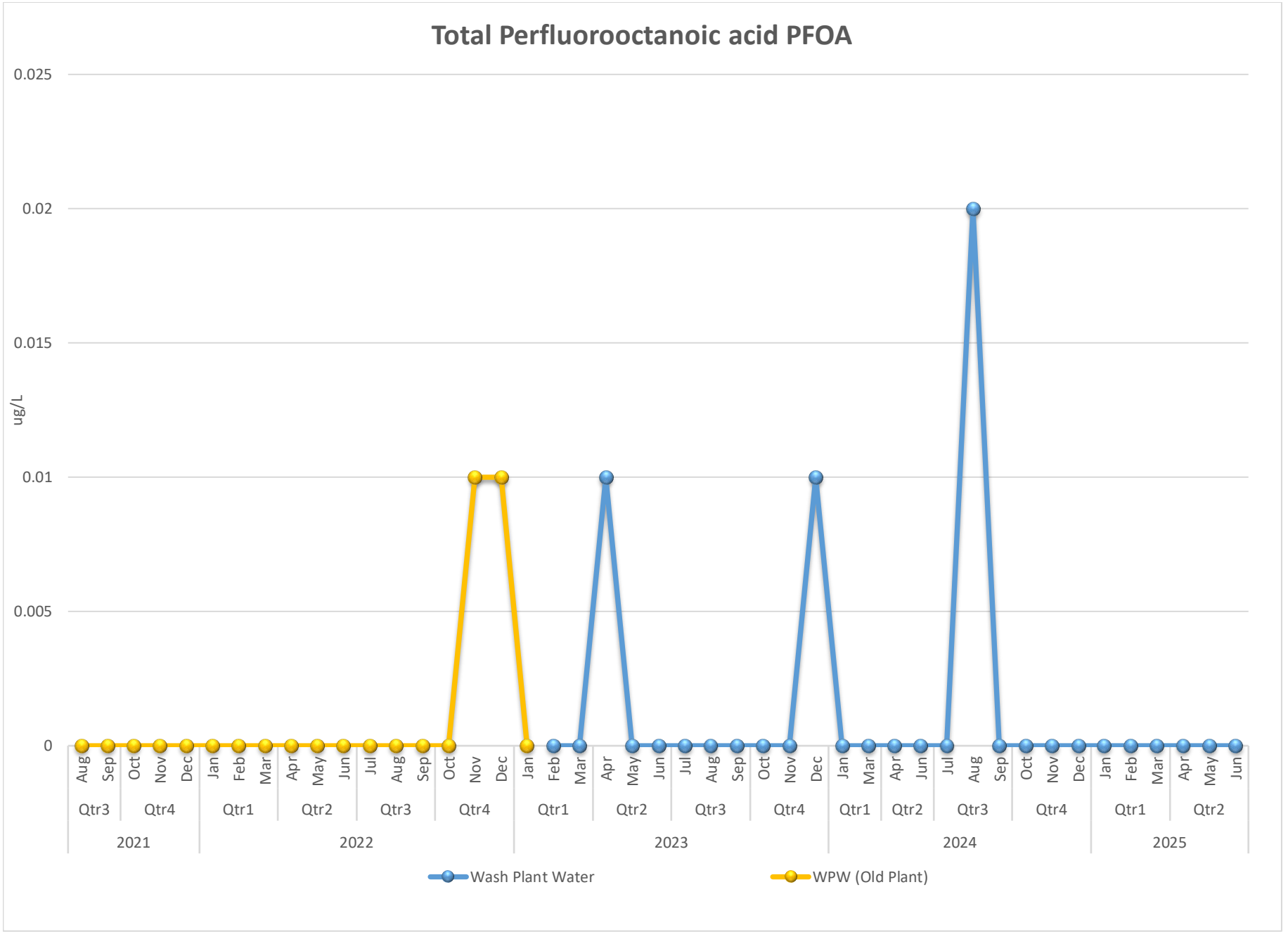

Dissolved Arsenic
0.006mg/L - As Upper Limit
0.0025
0.002
0.0015
0.001
0.0005
0
mg/L
Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Mar Apr Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun
Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2
2021 2022 2023 2024 2025
Wash Plant Water
WPW (Old Plant)


Dissolved Iron
7.25mg/L - Fe Upper Limit
2.5
2
1.5
1
0.5
0
mg/L
Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Mar Apr Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun
Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2
2021 2022 2023 2024 2025
Wash Plant Water
WPW (Old Plant)

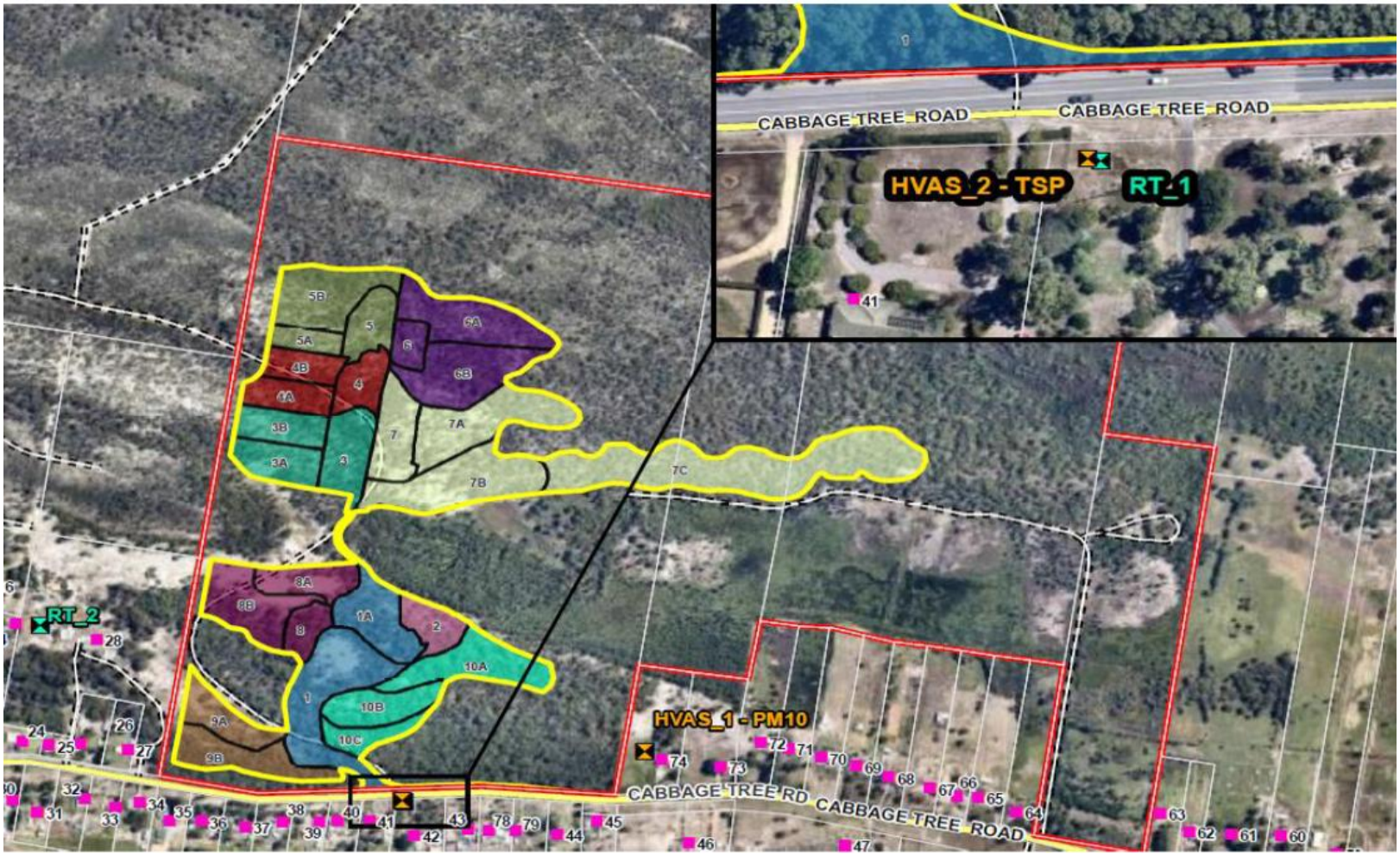

Dissolved Manganese
0.841mg/L - Mn Upper Limit
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
mg/L
Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Mar Apr Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun
Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2
2021 2022 2023 2024 2025
Wash Plant Water
WPW (Old Plant)


Total PFHxS & PFOS
0.06
0.05
0.04
0.03
0.02
0.01
0
ug/L
Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Mar Apr Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun
Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2
2021 2022 2023 2024 2025
Wash Plant Water
WPW (Old Plant)


Total PFAS
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
ug/L
Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Mar Apr Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun
Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2
2021 2022 2023 2024 2025
Wash Plant Water
WPW (Old Plant)


Total Perfluorooctanoic acid PFOA
0.025
0.02
0.015
0.01
0.005
0
ug/L
Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Mar Apr Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun
Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2
2021 2022 2023 2024 2025
Wash Plant Water
WPW (Old Plant)

APPENDIX 6. AIR MONITORING LOCATIONS (AQMP, 2019)



APPENDIX 7. AIR QUARTERLY REVIEW REPORT

Newcastle Sand Air Quality	
June	**2025**
Report Issued:	10/07/2025
Licence Information	
Environmental Protection Licence Number (EPL)	21264
Licence Holder	Williamtown Sand Syndicate Pty Ltd
Licencsee Address	Cabbage Tree Road Sand Quarry 298 Cabbage Tree Road Williamtown NSW, 2318
Link to full licence on the EPA Website	https://app.epa.nsw.gov.au/prpoeoapp/ViewPOEOLicence.aspx?DOCID=167636&SYSUID=1&LICID=21264
Anniversary date:	31-Jul
Information Last Obtained:	29/06/2025
Information Published:	

Newcastle Sand Air Quality Monitoring

Monthly TARP Review	June	2025

HVAS

TSP

Exceedance	Date	Exceedance Value (µg/m3)	Trigger Value (µg/m3)*	Comments
No	5/06/2025		90	
No	11/06/2025		90	
No	17/06/2025		90	
No	23/06/2025		90	
No	29/06/2025		90	

PM10

Exceedance	Date	Exceedance Value (µg/m3)	Trigger Value (µg/m3)*	Comments
No	5/06/2025		50	
No	11/06/2025		50	
No	17/06/2025		50	
No	23/06/2025		50	
No	29/06/2025		50	

*Based on standard air quality assessment criteria in the Approved Methods of Modelling and Assessment of Air Pollutants in NSW 2007

Newcastle Sand Air Quality Monitoring

Review of TARP Triggers:	June	2025

Beta Attenuation Monitoring (BAM) Real-Time Monitoring

Sampson (RT1)

Trigger Response **	Start Date	Start Time	End Date	End Time	Trigger Stage	Comments
No	Jun-25					No exceedances for the month of June

Hardes (RT2)

Trigger Response **	Start Date	Start Time	End Date	End Time	Trigger Stage	Comments
No	Jun-25					No exceedances for the month of June

**Based on 24-hour Rolling Average of Quarry Contribution

#Williamtown, New South Wales: http://www.bom.gov.au/climate/dwo/IDCJDW2145.latest.shtml
April 2025 Daily Weather Observations

Trigger Response Framework		
Trigger Stage	**Conditions**	**Action**
1	a) **Wind towards residents.** Where wind is directed towards surrounding residences,, that is the weather station indicates winds are blowing from the quatrants west (270°), THROUGH North (0°) to East (90°). **OR** b) **PM10 above background.**Continuous PM10 minotor shows rolling PM10 24-hour average exceeds the acerage background concentration of 22ug/m3.	Review operations and ensure water dust suppression is active (e.g. haul roads and stock-pile sprays)
2	a) Wind is directed toward surrounding residences; **AND** b) Rolling PM10 24-hour average axceeds 35ug/m3	No topsoil stripping or dozer pushing
3	a) Wind is directed toward surrounding residences; AND b) Rolling PM10 24-hour average exceeds 40ug/m3	No sand processing. **In addition to Stage 1 & 2 actions.**
4	a) Levels ontinue to increase after two hours since last action; AND **b) Wind is directed towards surrounding residences;** AND c) Rolling PM10 24-hour average exceeds 42.5 ug/m3	Suspend sand extraction. **In addition to Stage 1, 2, & 3 actions.**
5	a) PM10 levels continue to increase after two hours since last actions; **AND** b) Wind is directed towards surrounding residences; **AND** c) rolling PM10 24-hour average exceeds 45ug/m3	Suspend loading trucks (i.e. no machinery operating - except water carts and product haulage trucks already loaded). **In addition to Stage 1, 2, 3 & 4 actions.**
6	a) Rolling PM10 24-hour average exceeds 50ug/m3.	**All activities suspended (except dust control measures)** Complete Incident Notification to DPE within 24 hours. Complete Incident Investigation and Corrective Action Report.

Table sourced: Newcastle Sand, Air Quality Management Plan, 26th March, 2019, Ref: Air QMP_V3_20190326

Newcastle Sand Air Monitoring

HVAS

Each high volume air sampler (HVAS) runs for 24 hours every 6 days

June 2025

TSP (Sampson)

Sample	Date	µg/m3
TSP	4/07/2024	10.8
TSP	10/07/2024	13.5
TSP	16/07/2024	50.6
TSP	22/07/2024	27.2
TSP	28/07/2024	11.7
TSP	3/08/2024	19.8
TSP	9/08/2024	30.9
TSP	15/08/2024	5.9
TSP	21/08/2024	36.3
TSP	27/08/2024	32.1
TSP	2/09/2024	74
TSP	8/09/2024	33.9
TSP	14/09/2024	15.5
TSP	20/09/2024	41.7
TSP	26/09/2024	12.5
TSP	2/10/2024	18.1
TSP	8/10/2024	15
TSP	14/10/2024	20.3
TSP	20/10/2024	16.9
TSP	26/10/2024	16.9
TSP	1/11/2024	10.5
TSP	7/11/2024	41.2
TSP	13/11/2024	16.8
TSP	19/11/2024	28.3
TSP	25/11/2024	28.2
TSP	1/12/2024	15.3
TSP	7/12/2024	30.4
TSP	13/12/2024	47.1
TSP	19/12/2024	29.6
TSP	25/12/2024	28.8
TSP	31/12/2024	22.2
TSP	6/01/2025	29.2
TSP	12/01/2025	14.5
TSP	18/01/2025	29
TSP	24/01/2025	26
TSP	30/01/2025	20
TSP	5/02/2025	49
TSP	11/02/2025	19
TSP	17/02/2025	79
TSP	23/02/2025	17

PM10 (Paddock)

Sample	Date	µg/m3
PM 10	4/07/2024	9
PM 10	10/07/2024	3.6
PM 10	16/07/2024	43.4
PM 10	22/07/2024	10
PM 10	28/07/2024	5
PM 10	3/08/2024	10.4
PM 10	9/08/2024	7.4
PM 10	15/08/2024	3.9
PM 10	21/08/2024	13.6
PM 10	27/08/2024	7.2
PM 10	2/09/2024	**102**
PM 10	8/09/2024	14.2
PM 10	14/09/2024	8
PM 10	20/09/2024	21.3
PM 10	26/09/2024	8.9
PM 10	2/10/2024	9.1
PM 10	8/10/2024	10.4
PM 10	14/10/2024	6.4
PM 10	20/10/2024	12.4
PM 10	26/10/2024	12.2
PM 10	1/11/2024	4.8
PM 10	7/11/2024	17.8
PM 10	13/11/2024	8.2
PM 10	19/11/2024	17.4
PM 10	25/11/2024	11
PM 10	1/12/2024	8.7
PM 10	7/12/2024	19.7
PM 10	13/12/2024	47.4
PM 10	19/12/2024	16.1
PM 10	25/12/2024	19.1
PM 10	31/12/2024	31.8
PM 10	6/01/2025	18.4
PM 10	12/01/2025	8.4
PM 10	18/01/2025	19
PM 10	24/01/2025	14
PM 10	30/01/2025	11
PM 10	5/02/2025	23
PM 10	11/02/2025	11
PM 10	17/02/2025	11
PM 10	23/02/2025	9

TSP	1/03/2025	27
TSP	7/03/2025	18
TSP	13/03/2025	28
TSP	19/03/2025	28
TSP	25/03/2025	15
TSP	31/03/2025	24
TSP	6/04/2025	38
TSP	12/04/2025	18
TSP	18/04/2025	30
TSP	24/04/2025	27
TSP	30/04/2025	14
TSP	6/05/2025	23
TSP	12/05/2025	7
TSP	18/05/2025	12
TSP	24/05/2025	18
TSP	30/05/2025	27
TSP	5/06/2025	26
TSP	11/06/2025	24
TSP	17/06/2025	34
TSP	23/06/2025	27
TSP	29/06/2025	13

PM 10	1/03/2025	15
PM 10	7/03/2025	10
PM 10	13/03/2025	6
PM 10	19/03/2025	6
PM 10	25/03/2025	8
PM 10	31/03/2025	9
PM 10	6/04/2025	16
PM 10	12/04/2025	8
PM 10	18/04/2025	16
PM 10	24/04/2025	13
PM 10	30/04/2025	8
PM 10	6/05/2025	3
PM 10	12/05/2025	3
PM 10	18/05/2025	6
PM 10	24/05/2025	8
PM 10	30/05/2025	14
PM 10	5/06/2025	11
PM 10	11/06/2025	7
PM 10	17/06/2025	7
PM 10	23/06/2025	4
PM 10	29/06/2025	7

TSP	µg/m3
Annual Average	25.36

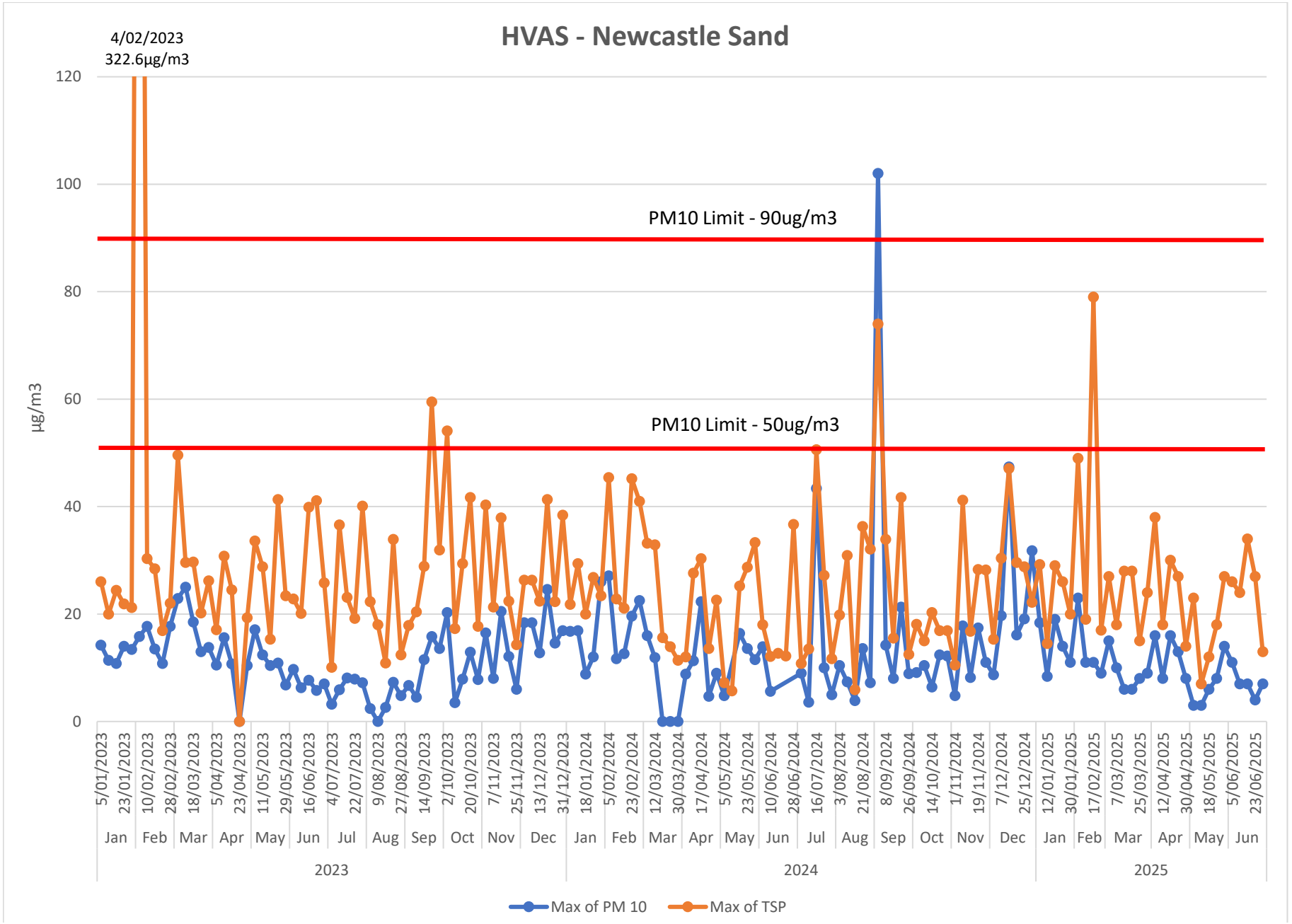
PM10	µg/m3
Annual Average	10.33

TSP Annual Return

31/07/2024-30/07/2025	µg/m3
Count	56
Min	5.9
Average	25.9
Max	79.0

PM10 Annual Return

31/07/2024-30/07/2025	µg/m3
Count	56
Min	3.0
Average	13.6
Max	102.0


HVAS - Newcastle Sand
4/02/2023
322.6µg/m3
PM10 Limit - 90ug/m3
PM10 Limit - 50ug/m3
µg/m3
120
100
80
60
40
20
0
5/01/2023
23/01/2023
10/02/2023
28/02/2023
18/03/2023
5/04/2023
23/04/2023
11/05/2023
29/05/2023
16/06/2023
4/07/2023
22/07/2023
9/08/2023
27/08/2023
14/09/2023
2/10/2023
20/10/2023
7/11/2023
25/11/2023
13/12/2023
31/12/2023
18/01/2024
5/02/2024
23/02/2024
12/03/2024
30/03/2024
17/04/2024
5/05/2024
23/05/2024
10/06/2024
28/06/2024
16/07/2024
3/08/2024
21/08/2024
8/09/2024
26/09/2024
14/10/2024
1/11/2024
19/11/2024
7/12/2024
25/12/2024
12/01/2025
30/01/2025
17/02/2025
7/03/2025
25/03/2025
12/04/2025
30/04/2025
18/05/2025
5/06/2025
23/06/2025
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun
2023
2024
2025
Max of PM 10
Max of TSP

Newcastle Sand Air Monitoring

BAM

Beta Attenuation Monitoring (BAM) Real-Time Monitoring

June 2025

Sampson (RT1)

Due to positioning of RT1 unit in relation to quarry, Quarry contribution is based on readings with a wind direction of 0°-90° and 270°-360°

Quarry Contribution	µg/m3
Min	0.00
Average	7.75
Max	68.60

24hr Rolling Average of Quarry Contribution

24hr Rolling Average	µg/m3
Min	0.93
Average	7.77
Max	17.73

Annual Rolling Average of Quarry Contribution

Annual Rolling Average	µg/m3
Min	9.79
Average	9.97
Max	10.07

Annual Average of Quarry Contribution

01/01/2025-31/12/2025	µg/m3
Min	0.00
Average	10.43
Max	226.80

Current Annual Return of Quarry Contribution

31/07/2024-30/07/2025	µg/m3
Min	0.00
Average	9.57
Max	226.80

Hardes (RT2)

Due to positioning of RT2 unit in relation to quarry, Quarry contribution is based on readings with a wind direction of 0°-90°

Quarry Contribution	µg/m3
Min	0.00
Average	1.86
Max	122.90

24hr Rolling Average of Quarry Contribution

24hr Rolling Average	µg/m3
Min	1.79
Average	2.31
Max	3.30

Annual Rolling Average of Quarry Contribution

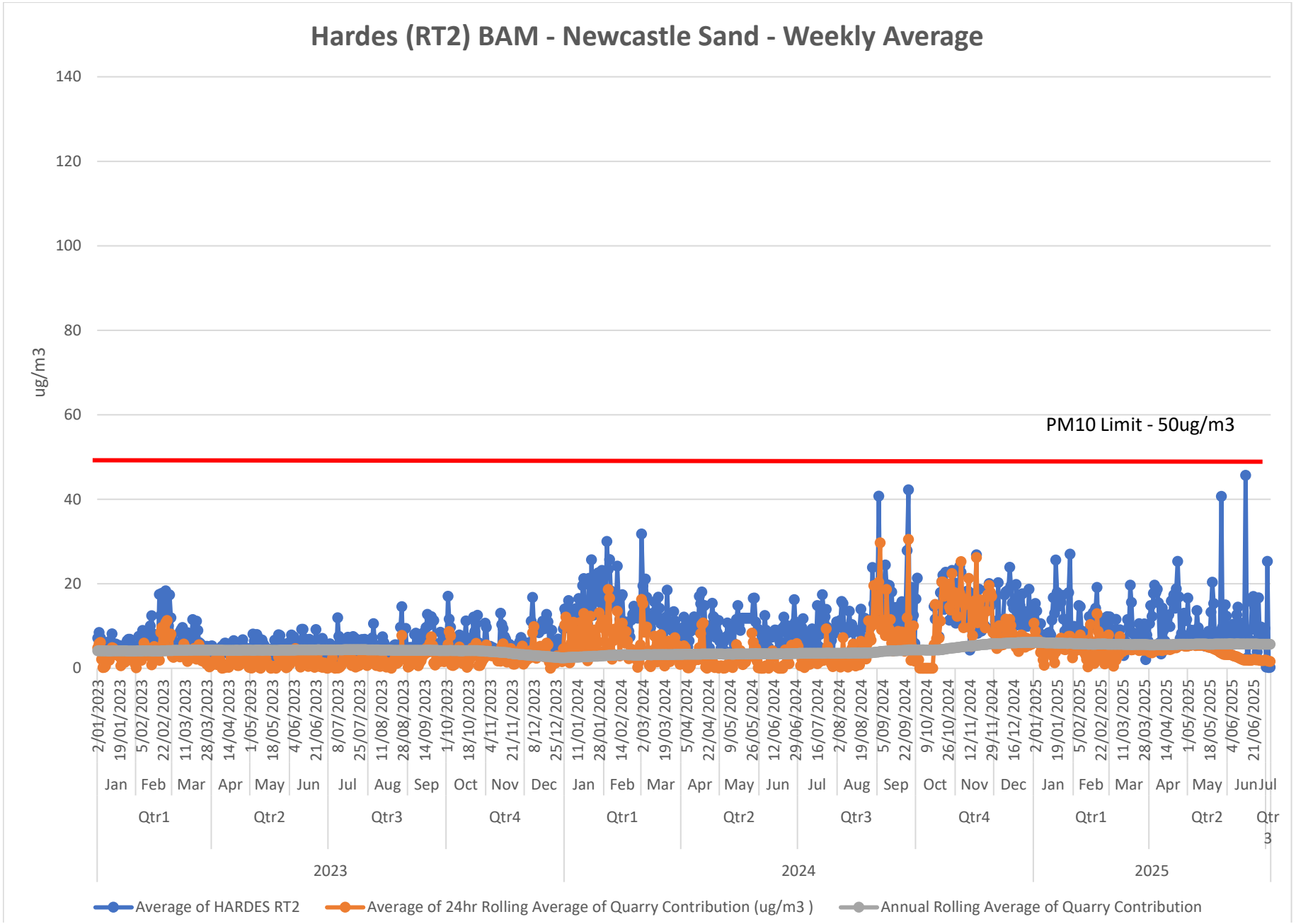
Annual Rolling Average	µg/m3
Min	5.71
Average	5.76
Max	5.79

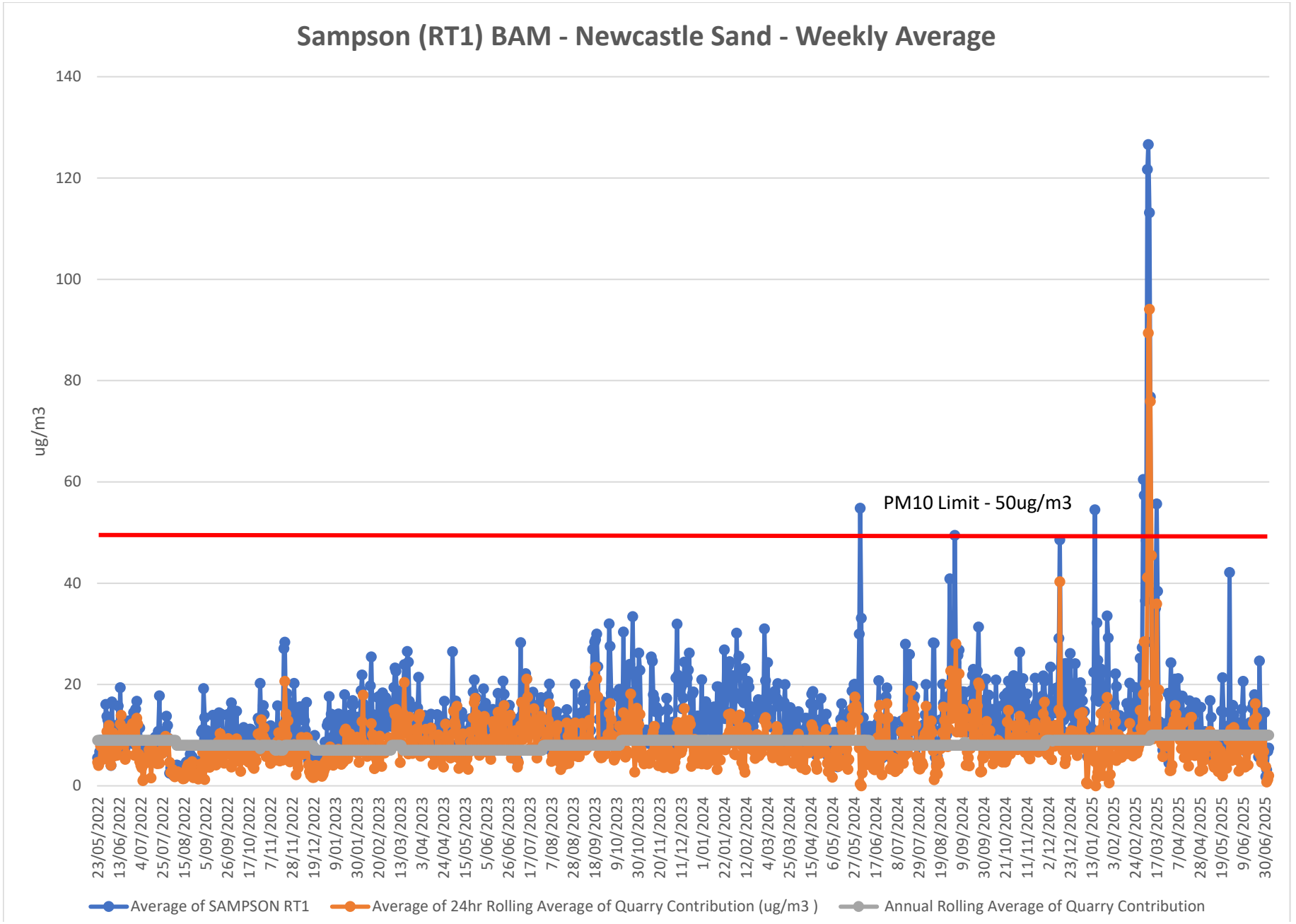
Annual Average of Quarry Contribution

01/01/2025-31/12/2025	µg/m3
Min	-0.03
Average	4.23
Max	122.90

Current Annual Return of Quarry Contribution

01/01/2025-31/12/2025	µg/m3
Min	-8.59
Average	5.83
Max	122.90


Hardes (RT2) BAM - Newcastle Sand - Weekly Average
ug/m3
140
120
100
80
60
40
20
0
PM10 Limit - 50ug/m3
2/01/2023
19/01/2023
5/02/2023
22/02/2023
11/03/2023
28/03/2023
14/04/2023
1/05/2023
18/05/2023
4/06/2023
21/06/2023
8/07/2023
25/07/2023
11/08/2023
28/08/2023
14/09/2023
1/10/2023
18/10/2023
4/11/2023
21/11/2023
8/12/2023
25/12/2023
11/01/2024
28/01/2024
14/02/2024
2/03/2024
19/03/2024
5/04/2024
22/04/2024
9/05/2024
26/05/2024
12/06/2024
29/06/2024
16/07/2024
2/08/2024
19/08/2024
5/09/2024
22/09/2024
9/10/2024
26/10/2024
12/11/2024
29/11/2024
16/12/2024
2/01/2025
19/01/2025
5/02/2025
22/02/2025
11/03/2025
28/03/2025
14/04/2025
1/05/2025
18/05/2025
4/06/2025
21/06/2025
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul
Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3 Qtr4 Qtr1 Qtr2 Qtr3
2023 2024 2025
Average of HARDES RT2
Average of 24hr Rolling Average of Quarry Contribution (ug/m3)
Annual Rolling Average of Quarry Contribution


Sampson (RT1) BAM - Newcastle Sand - Weekly Average
ug/m3
140
120
100
80
60
40
20
0
PM10 Limit - 50ug/m3
23/05/2022
13/06/2022
4/07/2022
25/07/2022
15/08/2022
5/09/2022
26/09/2022
17/10/2022
7/11/2022
28/11/2022
19/12/2022
9/01/2023
30/01/2023
20/02/2023
13/03/2023
3/04/2023
24/04/2023
15/05/2023
5/06/2023
26/06/2023
17/07/2023
7/08/2023
28/08/2023
18/09/2023
9/10/2023
30/10/2023
20/11/2023
11/12/2023
1/01/2024
22/01/2024
12/02/2024
4/03/2024
25/03/2024
15/04/2024
6/05/2024
27/05/2024
17/06/2024
8/07/2024
29/07/2024
19/08/2024
9/09/2024
30/09/2024
21/10/2024
11/11/2024
2/12/2024
23/12/2024
13/01/2025
3/02/2025
24/02/2025
17/03/2025
7/04/2025
28/04/2025
19/05/2025
9/06/2025
30/06/2025
Average of SAMPSON RT1
Average of 24hr Rolling Average of Quarry Contribution (ug/m3)
Annual Rolling Average of Quarry Contribution

Newcastle Sand Air Monitoring

Monthly Meteorological Data

Station ID: 061078
Name: WILLIAMTOWN RAAF
Lat: -32.7, Long: 151.84
Height: 7.5m
http://www.bom.gov.au/climate/dwo/IDCJDW2145.latest.shtml

Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)	Direction of maximum wind gust	9am relative humidity (%)	9am wind speed (km/h)	3pm relative humidity (%)	3pm wind speed (km/h)
1/06/2025	11.3	18.3	0	NNE	83	9	79	2
2/06/2025	9.8	19.7	0.2	WNW	98	13	73	6
3/06/2025	11.7	18.9	0.2	S	87	20	63	17
4/06/2025	10.6	14.7	1.8	SSW	66	30	89	26
5/06/2025	8.7	17.5	26.8		68	15	56	20
6/06/2025	6.7	15.7		NW	82	13	69	7
7/06/2025	8.3	19.6	0	NW	70	9	46	30
8/06/2025	8.2	17	0	NW	50	33	40	33
9/06/2025	7.7	13.8	0	WNW	56	43	51	56
10/06/2025	10.5	17.4	0	NW	66	37	52	33
11/06/2025	9.3	18	0	WNW	65	30	44	22
12/06/2025	7.3	17.1	0	WNW	67	22	54	9
13/06/2025	9.2	13.9	0.8	SSW	86	15	70	15
14/06/2025	8.9	17.4	13.6	SSW	88	13	81	11
15/06/2025	8	18.3	3.4	NW	88	19	56	15
16/06/2025	5.5	17.7	0	W	82	17	47	17
17/06/2025	4.4	17.4	0	WNW	84	19	48	17
18/06/2025	6.1	16.5	0	WNW	69	11	49	2
19/06/2025	4.1	17.7	0	WNW	88	17	59	4
20/06/2025	4.1	18.6	0.2	NW	81	20	49	4
21/06/2025	5.6	19.1	0.2	NW	83	17	58	6
22/06/2025	5.5	20.6	0.2	WNW	92	13	55	6
23/06/2025	5.7	21.8	0	NNE	87	7	50	11
24/06/2025	9.8	21.2	0	WNW	64	6	71	13
25/06/2025	12.6	18.2	1	NW	48	43	38	50
26/06/2025	6.6	15.5	0.2	SW	60	20	48	19
27/06/2025	7	14.2	0	WNW	71	17	86	9
28/06/2025	9.2	15.4	15.8	WNW	91	17	88	7
29/06/2025	8.3	17.9	0.8	NW	96	13	67	6
30/06/2025	6.5	16.4	0.2	S	93	15	68	19

Newcastle Sand Air Monitoring

Meteorological Data

Station ID: 061078
Name: WILLIAMTOWN RAAF
Lat: -32.7, Long: 151.84
Height: 7.5m
http://www.bom.gov.au/climate/dwo/IDCJDW2145.latest.shtml

Temperature (°C)

Date	Long Term Mean (Min°)	Mean Monthly Minimum	Min of Minimum temperature (°C)	Variation from Mean (Min°)	Long Term Mean (Max°)	Mean Monthly Maximum	Max of Maximum temperature (°C)	Variation from Mean (Max°)
Jan-24	20.3	20.3	15.3	0.0	28.3	30.7	42.4	2.4
Feb-24	19.8	19.8	16.1	0.0	27.7	29.2	39.7	1.5
Mar-24	17	17	12.2	0.0	26.4	27.3	35.1	0.9
Apr-24	13.8	13.8	10.3	0.0	23.7	24.3	29.1	0.6
May-24	11.3	11.3	6.5	0.0	20.4	20.3	23.6	-0.1
Jun-24	8.4	8.4	3.0	0.0	17.7	17.5	21.7	-0.2
Jul-24	8.4	8.4	3.0	0.0	17.2	17.4	23.7	0.2
Aug-24	10	10	2.7	0.0	18.8	21.0	30.3	2.2
Sep-24	8.8	10	2.8	1.2	21.5	23.4	30.5	1.9
Oct-24	12.8	12.8	7.0	0.0	23.8	23.7	30.8	-0.1
Nov-24	17.5	17.5	12.7	0.0	25.6	27.0	37.7	1.4
Dec-24	18.7	18.7	12.9	0.0	27.4	29.7	37.6	2.3
Jan-25	18.2	18.7	13.8	0.5	28.3	28.1	40.7	-0.2
Feb-25	18.2	18.7	12.6	0.5	27.7	28.6	36.9	0.9
Mar-25	16.5	19.1	15.0	2.6	26.4	26.8	35.3	0.4
Apr-25	13.3	14.8	11.8	1.5	23.8	24.7	28.9	0.9
May-25	10.1	11.3	8.8	1.2	20.4	20.3	25.9	-0.1
Jun-25	6.5	12.6	4.1	6.1	17.7	17.5	21.8	-0.2

Newcastle Sand Air Monitoring

Meteorological Data

Station ID: 061078
Name: WILLIAMTOWN RAAF
Lat: -32.7, Long: 151.84
Height: 7.5m
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	Rainfall				Wind		
Date	Long Term Mean of Total Monthly Rainfall (mm)	Total Monthly Rainfall (mm)	Average of Rainfall (mm)	Variation From Total Mean Monthly Rainfall	Average of 9am relative humidity (%)	Average of Direction of maximum wind gust (°)	Average of 9am wind speed (km/h)
Jan-24	98.4	20.0	0.6	-78.4	67.6	141.53	17.26
Feb-24	118.7	118.2	4.4	-0.5	80.4	154.17	14.75
Mar-24	126.9	45.4	1.5	-81.5	85.1	134.25	10.50
Apr-24	110.7	195.4	6.5	84.7	80.4	170.25	14.70
May-24	110.8	309.4	10.0	198.6	88.6	207.58	14.37
Jun-24	122.1	167.4	5.6	45.3	78.2	271.55	20.00
Jul-24	75.4	96.0	3.1	20.6	73.9	251.13	23.10
Aug-24	71.5	56.8	1.8	-14.7	79.0	217.02	15.70
Sep-24	60.2	65.8	2.2	5.6	59.3	222.00	20.77
Oct-24	75.6	54.0	1.9	-21.6	70.5	176.12	16.43
Nov-24	82.7	73.8	2.8	-8.9	74.3	168.75	13.41
Dec-24	76.0	12.8	0.4	-63.2	69.7	137.18	13.77
Jan-25	100.3	247.2	8.2	146.9	76.4	141.75	14.03
Feb-25	1176.0	33.2	1.2	-1142.8	76.1	115.31	10.54
Mar-25	127.2	145.0	4.7	17.8	83.4	136.45	12.07
Apr-25	111.6	180.0	6.2	68.4	77.6	201.72	12.59
May-25	115.8	502.0	16.2	386.2	85.5	188.71	11.83
Jun-25	121.4	65.4	2.3	-56.0	77.0	260.69	19.10