



# Monthly Environmental Monitoring Report

Yancoal Mount Thorley Warkworth

March 2024

## CONTENTS

1.0	INTRODUCTION.....	5
2.0	AIR QUALITY.....	5
2.1	Meteorological Monitoring.....	5
2.1.1	Rainfall.....	5
2.1.2	Wind Speed and Direction.....	5
2.2	Depositional Dust.....	7
2.3	Suspended Particulates.....	7
2.3.1	HVAS PM <sub>10</sub> Results.....	7
2.3.3	Real Time PM <sub>10</sub> Results.....	8
2.3.4	Real Time Alarms for Air Quality.....	8
3.0	WATER QUALITY.....	10
3.1	Surface Water.....	10
3.1.1	Surface Water Monitoring results.....	10
3.1.2	Surface Water Trigger Tracking.....	14
3.2	HRSTS Discharge.....	14
3.3	Groundwater Monitoring.....	16
3.3.1	Groundwater Trigger Tracking.....	41
4.0	BLAST MONITORING.....	43
4.1	Blast Monitoring Results.....	43
5.0	NOISE.....	46
5.1	Attended Noise Monitoring Results.....	46
5.1.1	WML Noise Assessment.....	46
5.1.2	MTO Noise Assessment.....	47
5.1.3	NPfI Low Frequency Assessment.....	48
5.2	Noise Management Measures.....	51
6.0	OPERATIONAL DOWNTIME.....	51
7.0	REHABILITATION.....	52
8.0	ENVIRONMENTAL INCIDENTS.....	52
9.0	COMPLAINTS.....	52
	Appendix A: Meteorological Data.....	53

## Figures

Figure 1: Rainfall Trend YTD	5
Figure 2: Charlton Ridge Wind Rose – March 2024	5
Figure 3: Air Quality Monitoring Locations	6
Figure 4: Depositional Dust – March 2024	7
Figure 5: Individual PM10 Results – March 2024	7
Figure 6: Annual Average PM10 – March 2024	8
Figure 7: Annual Average Total Suspended Particulates – March 2024	8
Figure 8: Real Time PM10 daily 24hr average (line graphs) and YTD annual average (column graphs) – March 2024	9
Figure 9: Site Dams Electrical Conductivity Field Trend – March 2024	10
Figure 10: Site Dams pH Field Trend – March 2024	11
Figure 11: Site Dams Total Suspended Solids Trend – March 2024	11
Figure 12: Watercourse pH Field Trend – March 2024	12
Figure 13: Watercourse Electrical Conductivity Field Trend – March 2024	12
Figure 14: Watercourse Total Suspended Solids Trend – March 2024	13
Figure 15: Surface Water Monitoring Location Plan	15
Figure 16: Bayswater Seam Electrical Conductivity Field Trend – March 2024	16
Figure 17: Bayswater Seam pH Field Trend – March 2024	17
Figure 18: Bayswater Seam Standing Water Level Trend – March 2024	17
Figure 19: Blakefield Seam Electrical Conductivity Field Trend –March 2024	18
Figure 20: Blakefield Seam pH Field Trend – March 2024	18
Figure 21: Blakefield Seam Standing Water Level Trend – March 2024	19
Figure 22: Bowfield Seam Electrical Conductivity Field Trend – March 2024	19
Figure 23: Bowfield Seam pH Field Trend - March 2024	20
Figure 24: Bowfield Seam Standing Water Level Trend – March 2024	20
Figure 25: Redbank Seam Electrical Conductivity Field Trend – March 2024	21
Figure 26: Redbank Seam pH Field Trend – March 2024	21
Figure 27: Redbank Seam Standing Water Level Trend –March 2024	22
Figure 28: Shallow Overburden Electrical Conductivity Field Trend – March 2024	22
Figure 29: Shallow Overburden pH Field Trend – March 2024	23
Figure 30: Shallow Overburden Standing Water Level Trend – March 2024	23
Figure 31: Vaux Seam Electrical Conductivity Field Trend – March 2024	24
Figure 32: Vaux Seam pH Field Trend – March 2024	24
Figure 33: Vaux Seam Standing Water Level Trend –March 2024	25
Figure 34: Wambo Seam Electrical Conductivity Field Trend – March 2024	25
Figure 35: Wambo Seam pH Field Trend – March 2024	26
Figure 36: Wambo Seam Standing Water Level Trend – March 2024	26
Figure 37: Warkworth Seam Electrical Conductivity Field Trend – March 2024	27
Figure 38: Warkworth Seam pH Field Trend – March 2024	27
Figure 39: Warkworth Seam Standing Water Level Trend – March 2024	28
Figure 40: Wollombi Alluvium 1 Electrical Conductivity Field Trend – March 2024	28
Figure 41: Wollombi Alluvium 1 pH Field Trend – March 2024	29
Figure 42: Wollombi Alluvium 2 Electrical Conductivity Field Trend – March 2024	29
Figure 43: Wollombi Alluvium 2 pH Field Trend – March 2024	30
Figure 44: Wollombi Alluvium Standing Water Level Trend – March 2024	30
Figure 45: Woodlands Hill Seam Electrical Conductivity Field Trend – March 2024	31
Figure 46: Woodlands Hill Seam pH Field Trend – March 2024	31
Figure 47: Woodlands Hill Seam Standing Water Level Trend - March 2024	32
Figure 48: Aeolian Warkworth Sands Electrical Conductivity Field Trend – March 2024	32

Figure 49: Aeolian Warkworth Sands pH Field Trend - March 2024	33
Figure 50: Aeolian Warkworth Sands Standing Water Level Trend – March 2024	33
Figure 51: Hunter River Alluvium 1 Electrical Conductivity Field Trend – March 2024	34
Figure 52: Hunter River Alluvium 1 pH Field Trend – March 2024	34
Figure 53: Hunter River Alluvium 2 Electrical Conductivity Field Trend - March 2024	35
Figure 54: Hunter River Alluvium 2 pH Field Trend – March 2024	35
Figure 55: Hunter River Alluvium 3 Electrical Conductivity Field Trend – March 2024	36
Figure 56: Hunter River Alluvium 3 pH Field Trend – March 2024	36
Figure 57: Hunter River Alluvium 4 Electrical Conductivity Field Trend – March 2024	37
Figure 58: Hunter River Alluvium 4 pH Field Trend – March 2024	37
Figure 59: Hunter River Alluvium 5 Electrical Conductivity Field Trend – March 2024	38
Figure 60: Hunter River Alluvium 5 pH Field Trend – March 2024	38
Figure 61: Hunter River Alluvium Standing Water Level Trend – March 2024	39
Figure 62: Whynot Seam Electrical Conductivity Field Trend – March 2024	39
Figure 63: Whynot Seam pH Field Trend – March 2024	40
Figure 64: Whynot Seam Standing Water Level Trend – March 2024	40
Figure 65: Groundwater Monitoring Location Plan	42
Figure 66: Abbey Green Blast Monitoring Results – March 2024	43
Figure 67: Bulga Village Blast Monitoring Results – March 2024	43
Figure 68: MTIE Blast Monitoring Results – March 2024	44
Figure 69: Wambo Road Blast Monitoring Results – March 2024	44
Figure 70: Warkworth Blast Monitoring Results – March 2024	44
Figure 71: Wollemi Peak Road Blast Monitoring Results – March 2024	44
Figure 72: MTW Blast Monitoring Location Plan	45
Figure 73: Noise Monitoring Location Plan	50
Figure 74: Operational Downtime by Equipment Type – March 2024	51
Figure 75: Rehabilitation YTD – March 2024	52

## Tables

Table 1: Monthly Rainfall MTW	5
Table 2: Surface Water Trigger Tracking – March 2024	14
Table 3: Groundwater Trigger Tracking – March 2024	41
Table 4: Blasting Limits	43
Table 5: $L_{Aeq, 15 \text{ minute}}$ Warkworth Impact Assessment Criteria – March 2024	46
Table 6: $L_{A1, 1 \text{ minute}}$ Warkworth - Impact Assessment Criteria – March 2024	46
Table 7: $L_{Aeq, 15 \text{ minute}}$ Mount Thorley - Impact Assessment Criteria – March 2024	47
Table 8: $L_{A1, 1 \text{ Minute}}$ Mount Thorley - Impact Assessment Criteria – March 2024	47
Table 9: Warkworth Low Frequency Noise Assessment – March 2024	48
Table 10: Mount Thorley Operations Low Frequency Noise Assessment – March 2024	49
Table 11: Supplementary Attended Noise Monitoring Data – March 2024	51
Table 12: Complaints Summary YTD	52
Table 13: Meteorological Data – Charlton Ridge Meteorological Station – March 2024	54

## Revision History

Version No.	Version Details	Date
1.0	Final	05/08/2024

## 1.0 INTRODUCTION

This report has been compiled to provide a monthly summary of environmental monitoring results for Mount Thorley Warkworth (MTW). This report includes all monitoring data collected for the period 1 March to 31 March 2024.

## 2.0 AIR QUALITY

### 2.1 Meteorological Monitoring

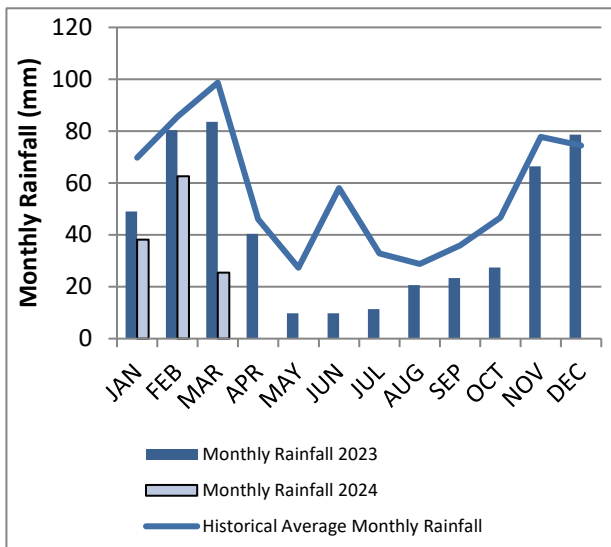
Meteorological data is collected at MTW’s ‘Charlton Ridge’ meteorological station (refer to **Figure 3**).

#### 2.1.1 Rainfall

Rainfall for the reporting period is summarised in **Table 1**. The year-to-date monthly rainfall totals, 2024 monthly rainfall totals and historical average monthly rainfall trend are shown in **Figure 1**.

**Table 1: Monthly Rainfall MTW**

2024	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
March	25.4	126.2

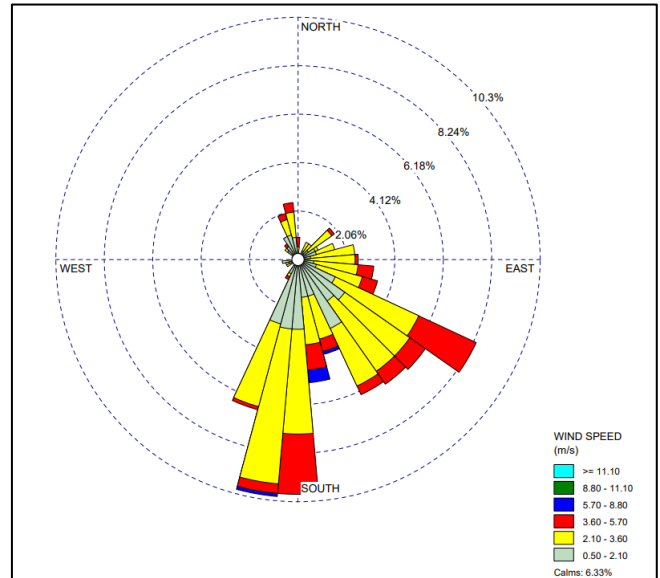


**Figure 1: Rainfall Trend YTD**

*Note: The historical average monthly rainfall is calculated from 2007 to 2023 monthly totals*

### 2.1.2 Wind Speed and Direction

Winds from the South and Southeast were dominant during the reporting period as shown in **Figure 2**.



**Figure 2: Charlton Ridge Wind Rose – March 2024**

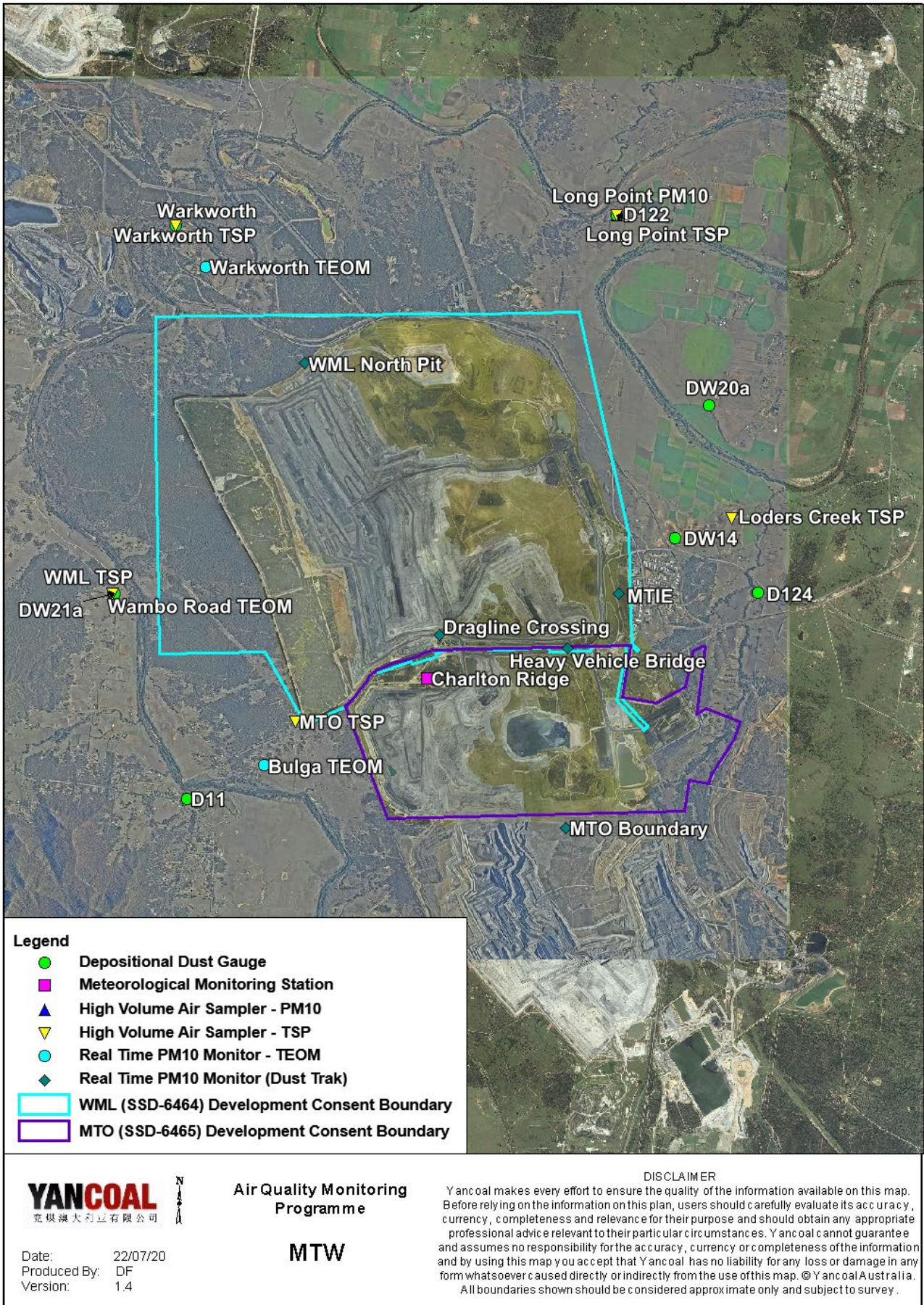


Figure 3: Air Quality Monitoring Locations

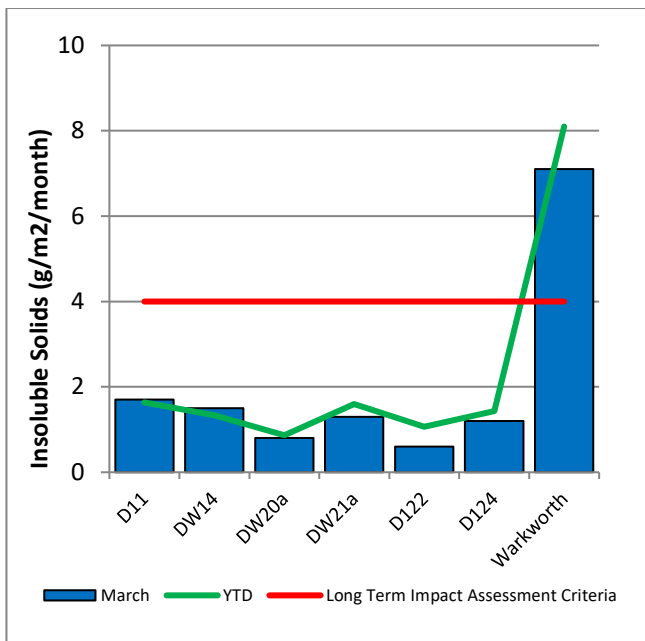
## 2.2 Depositional Dust

To monitor air quality, MTW operates and maintains a network of seven depositional dust gauges, situated on private and mine owned land surrounding MTW.

During the reporting period the Warkworth monitor recorded a monthly result above the long-term impact assessment criteria of 4.0 g/m<sup>2</sup> per month. There is no evidence to suggest that the result is contaminated. Accordingly, the result will be included in the annual average calculation.

**Figure 4** displays insoluble solids results from depositional dust gauges during the reporting period compared against the year-to-date average and the annual impact assessment criteria.

An annual assessment of MTW’s compliance with the Long-Term Impact Assessment Criteria will be provided in the 2024 Annual Review Report.



**Figure 4: Depositional Dust – March 2024**

## 2.3 Suspended Particulates

Suspended particulates are measured by a network of High Volume Air Samplers (HVAS) measuring Total Suspended Particulates (TSP) and Particulate Matter <10µm (PM<sub>10</sub>). The location of these monitors can be found in **Figure 3**. Each HVAS was run for 24 hours on a six-day cycle in accordance with EPA requirements.

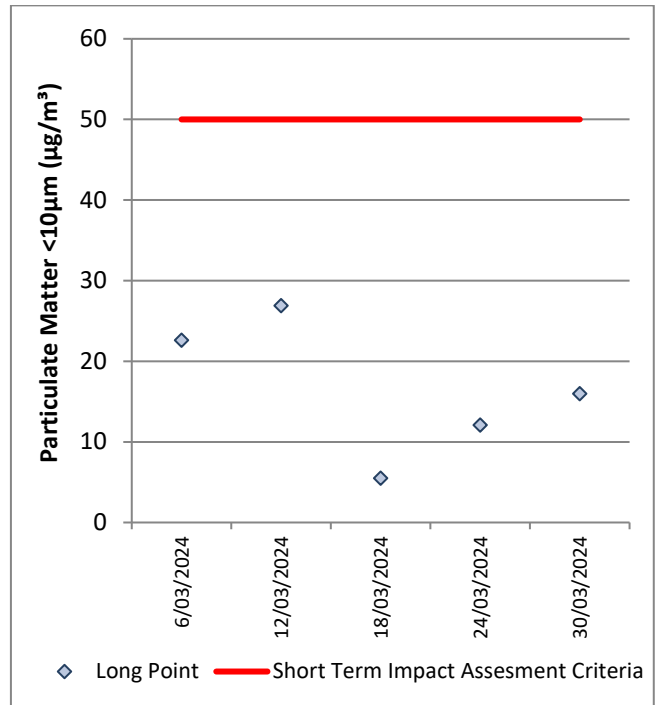
### 2.3.1 HVAS PM<sub>10</sub> Results

**Figure 5** shows the individual PM<sub>10</sub> results at each monitoring station against the short-term impact assessment criteria of 50µg/m<sup>3</sup>.

There were no exceedances of the short term (24hr) PM<sub>10</sub> impact assessment criteria during March 2024

**Figure 6** shows the annual average PM<sub>10</sub> result against the long-term impact assessment criteria.

An assessment of MTW’s compliance with the Long-Term Impact Assessment Criteria will be provided in the 2024 Annual Review Report.



**Figure 5: Individual PM<sub>10</sub> Results – March 2024**

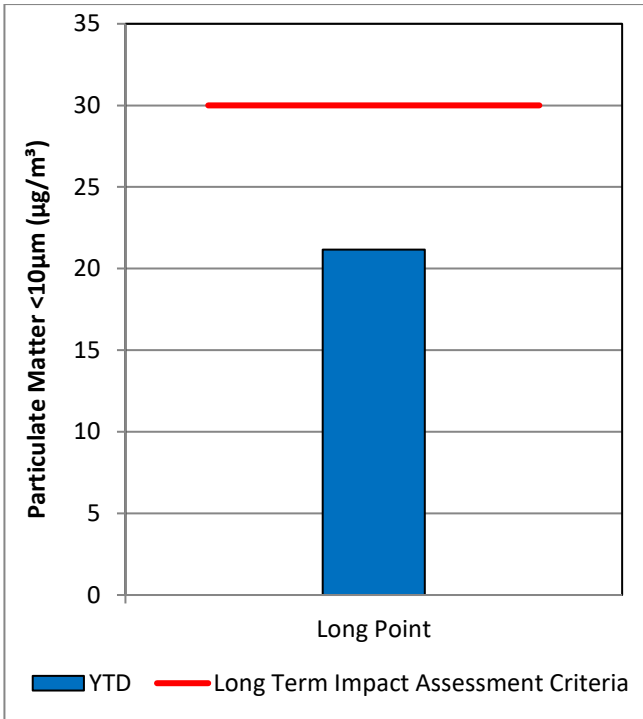


Figure 6: Annual Average PM<sub>10</sub> – March 2024

### 2.3.2 TSP Results

Figure 7 shows the annual average TSP results compared against the long-term impact assessment criteria of 90µg/m<sup>3</sup>.

An assessment of MTW’s compliance with the Long-Term Impact Assessment Criteria will be provided in the 2024 Annual Review Report.

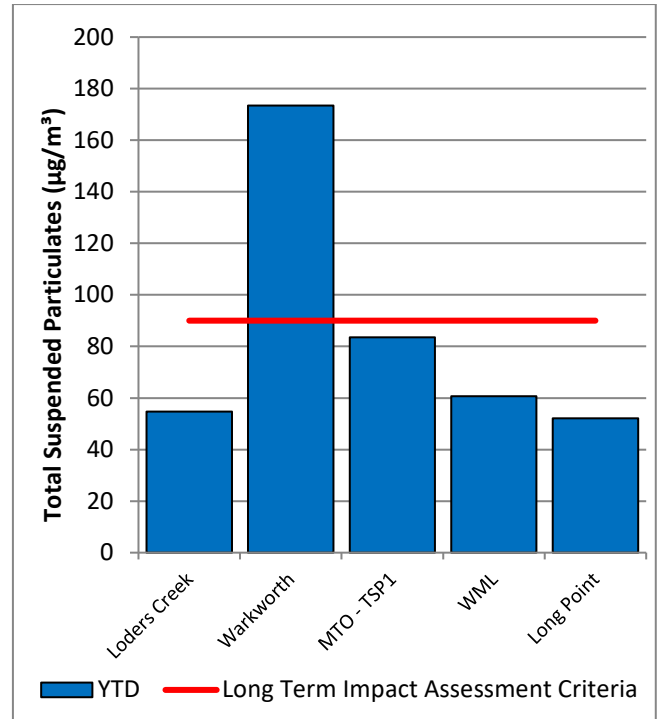


Figure 7: Annual Average Total Suspended Particulates – March 2024

### 2.3.3 Real Time PM<sub>10</sub> Results

MTW maintains a network of real time PM<sub>10</sub> monitors. The real time air quality monitoring stations continuously log information and transmit data to a central database, generating internal alerts when particulate matter levels exceed internal trigger limits.

Results for real time dust sampling are shown in Figure 8, including the daily 24-hour average PM<sub>10</sub> result and the annual PM<sub>10</sub> average.

### 2.3.4 Real Time Alarms for Air Quality

During March, the real time monitoring system generated 67 automated air quality related alerts, including 3 alerts for adverse meteorological conditions and 64 alerts for elevated PM<sub>10</sub> levels.



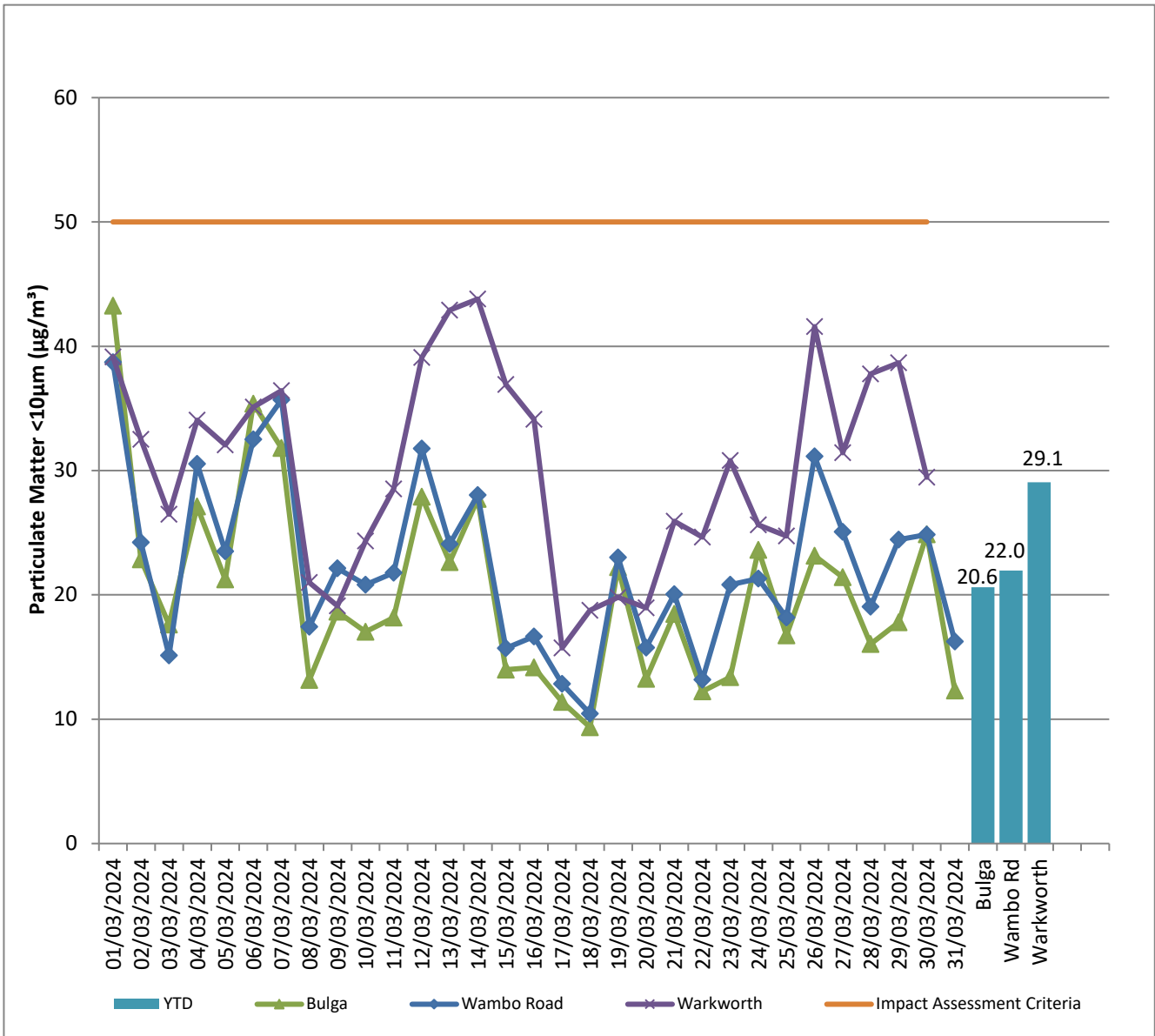


Figure 8: Real Time  $PM_{10}$  daily 24hr average (line graphs) and YTD annual average (column graphs) – March 2024

### 3.0 WATER QUALITY

MTW maintains a network of surface water and groundwater monitoring sites.

#### 3.1 Surface Water

Monitoring is conducted at mine site dams and surrounding natural watercourses. The surface water monitoring locations are outlined in Figure 15.

Surface water courses are sampled on a monthly or quarterly sampling regime. Water quality is evaluated through the parameters of pH, Electrical Conductivity (EC) and Total Suspended Solids (TSS). The Hunter River and the Wollombi Brook are sampled both upstream and downstream of mining operations, to record background water quality and to monitor the potential impact of mining on the river system. Other Hunter River tributaries are also monitored.

##### 3.1.1 Surface Water Monitoring results

Figure 9 to Figure 11 show the long-term surface water trend (2021 – current) within MTW mine dams. Figure 12 to Figure 14 show the long-term surface water trend (2021 – current) in surrounding watercourses.

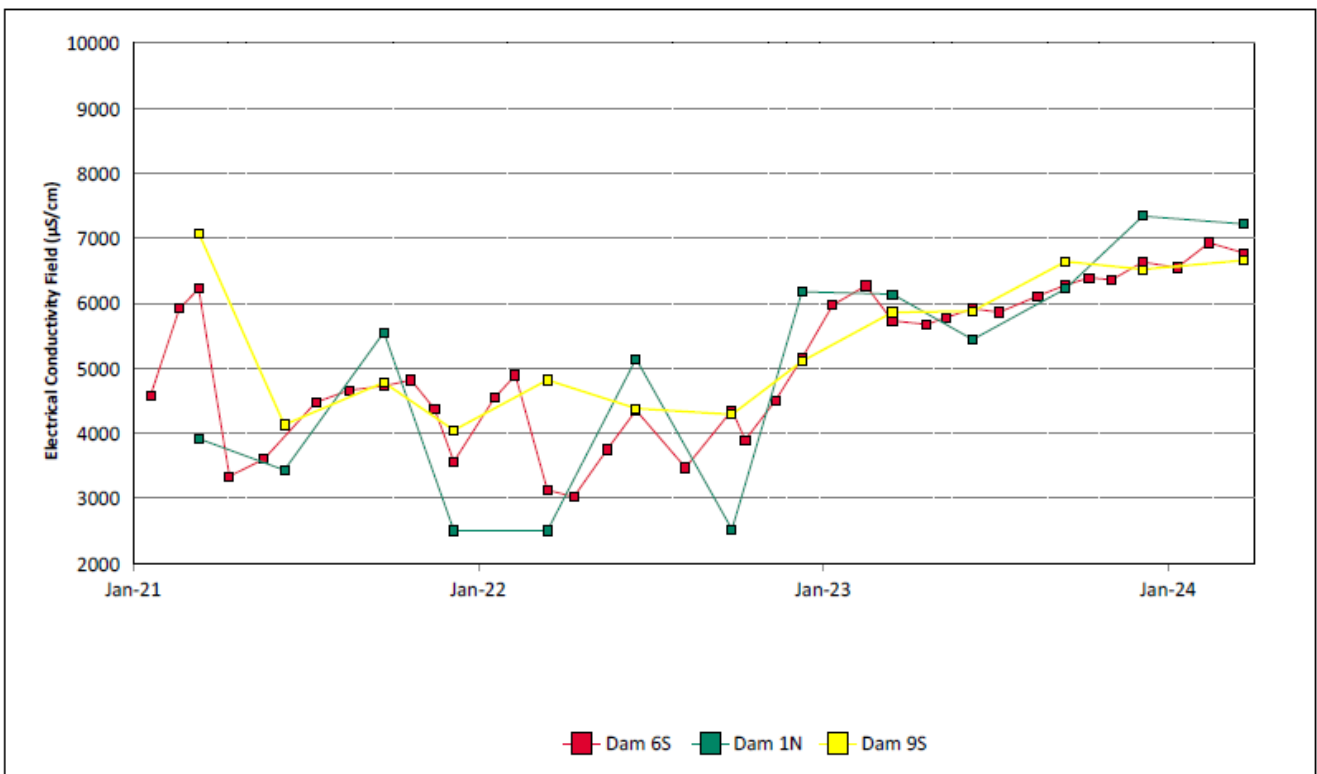


Figure 9: Site Dams Electrical Conductivity Field Trend – March 2024

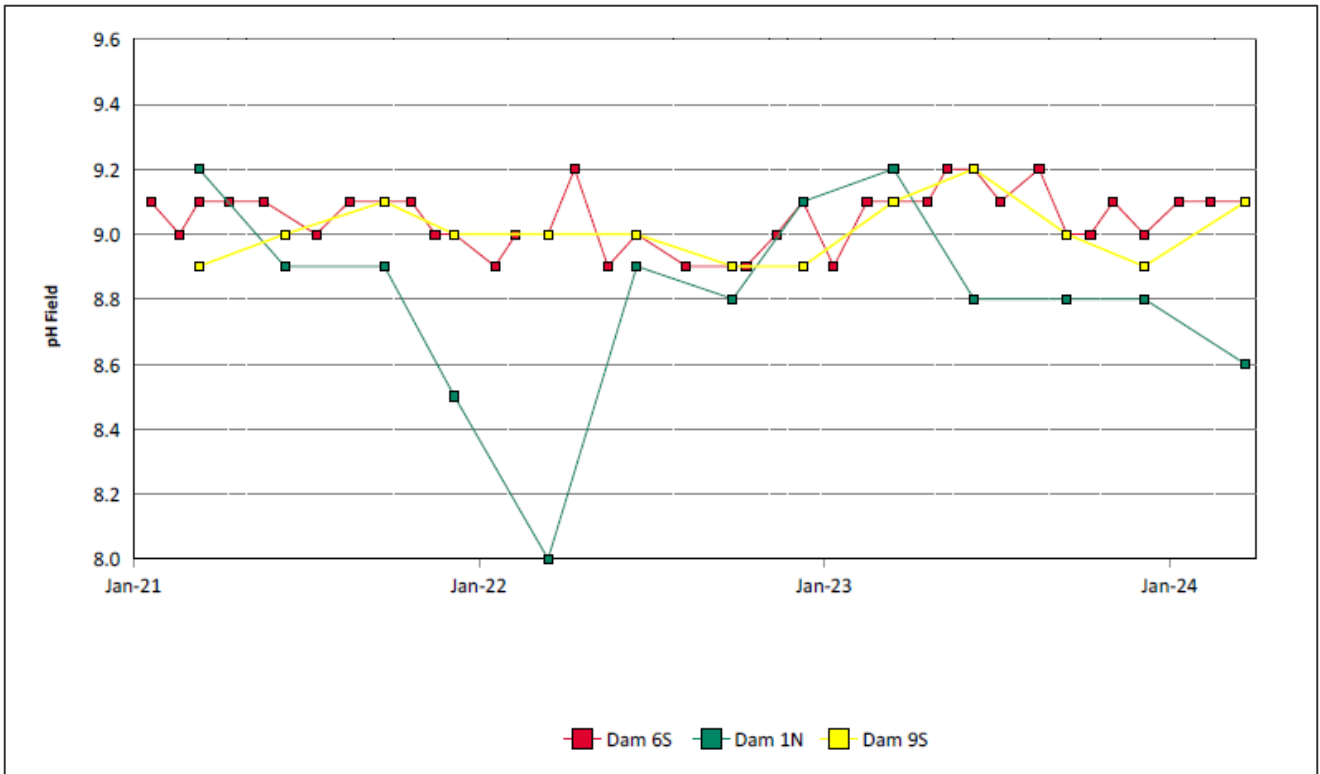


Figure 10: Site Dams pH Field Trend – March 2024

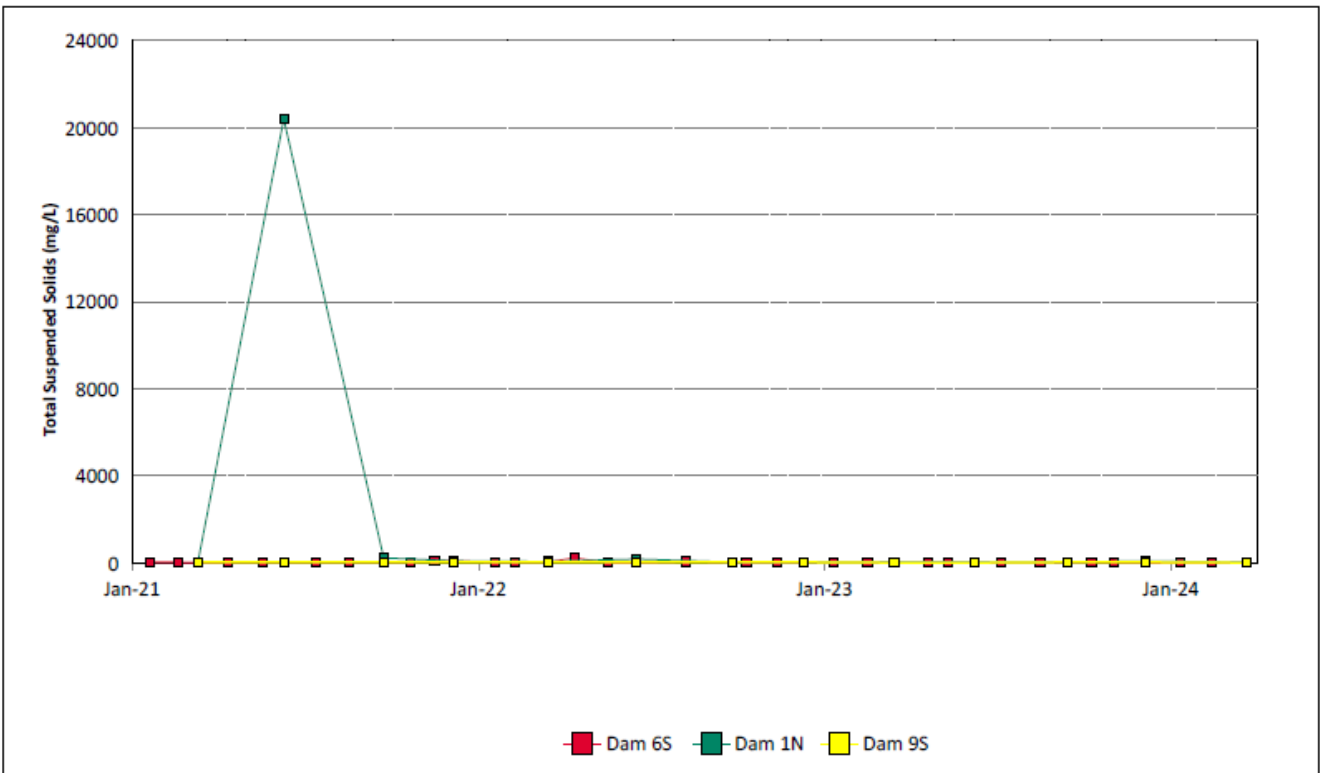


Figure 11: Site Dams Total Suspended Solids Trend – March 2024

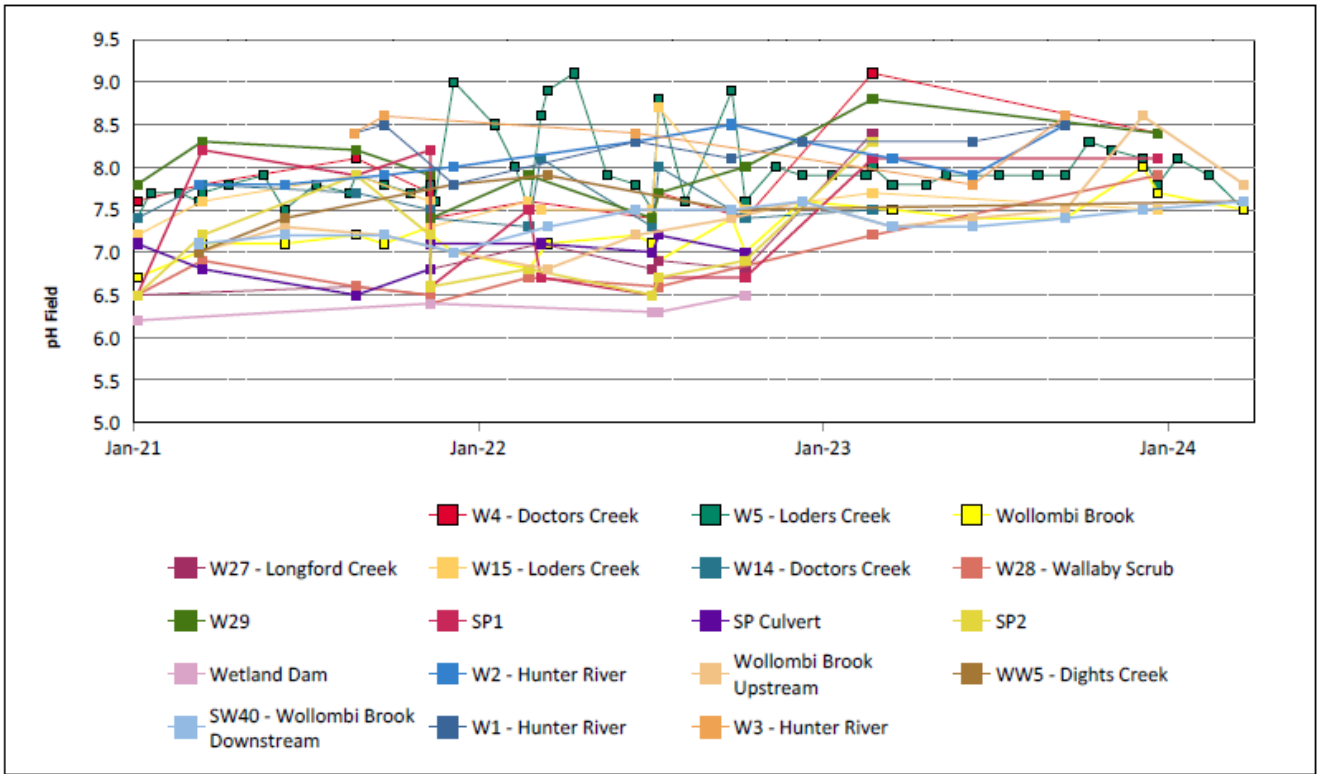


Figure 12: Watercourse pH Field Trend – March 2024

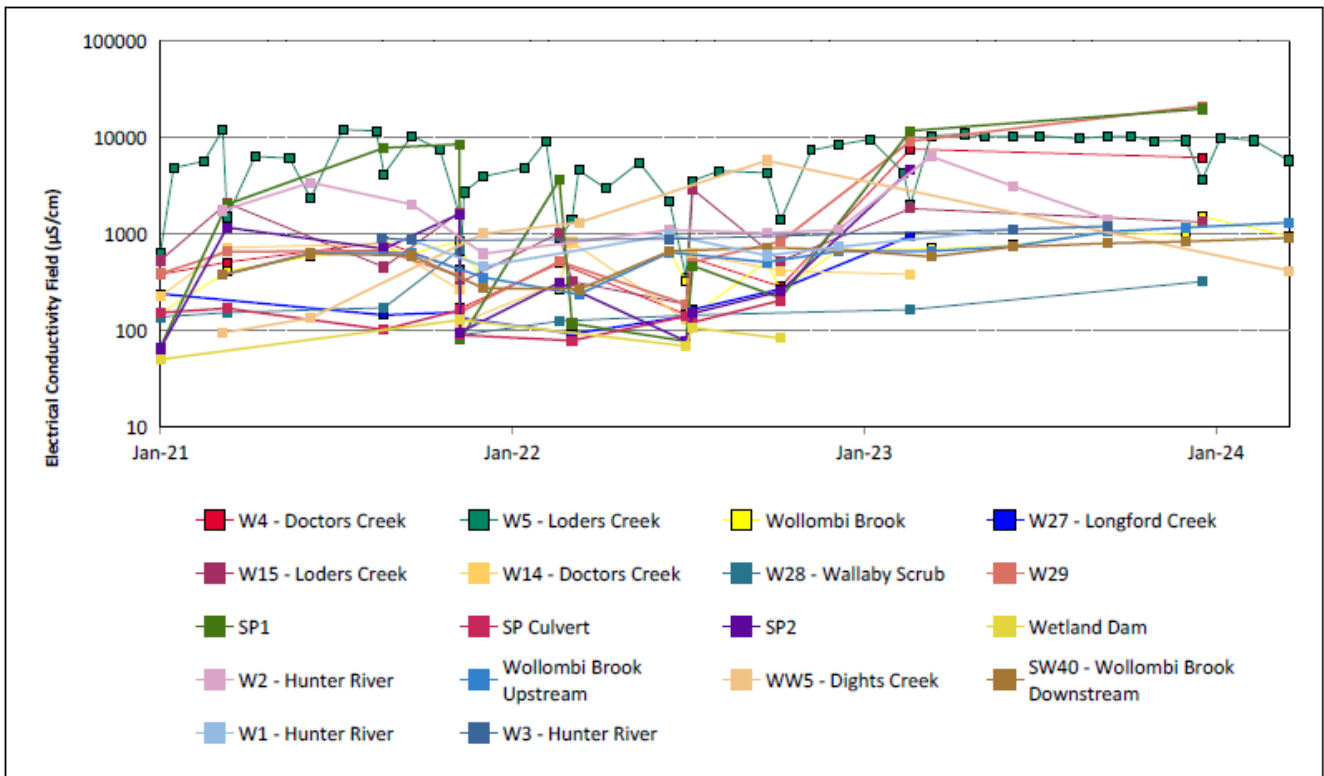


Figure 13: Watercourse Electrical Conductivity Field Trend – March 2024

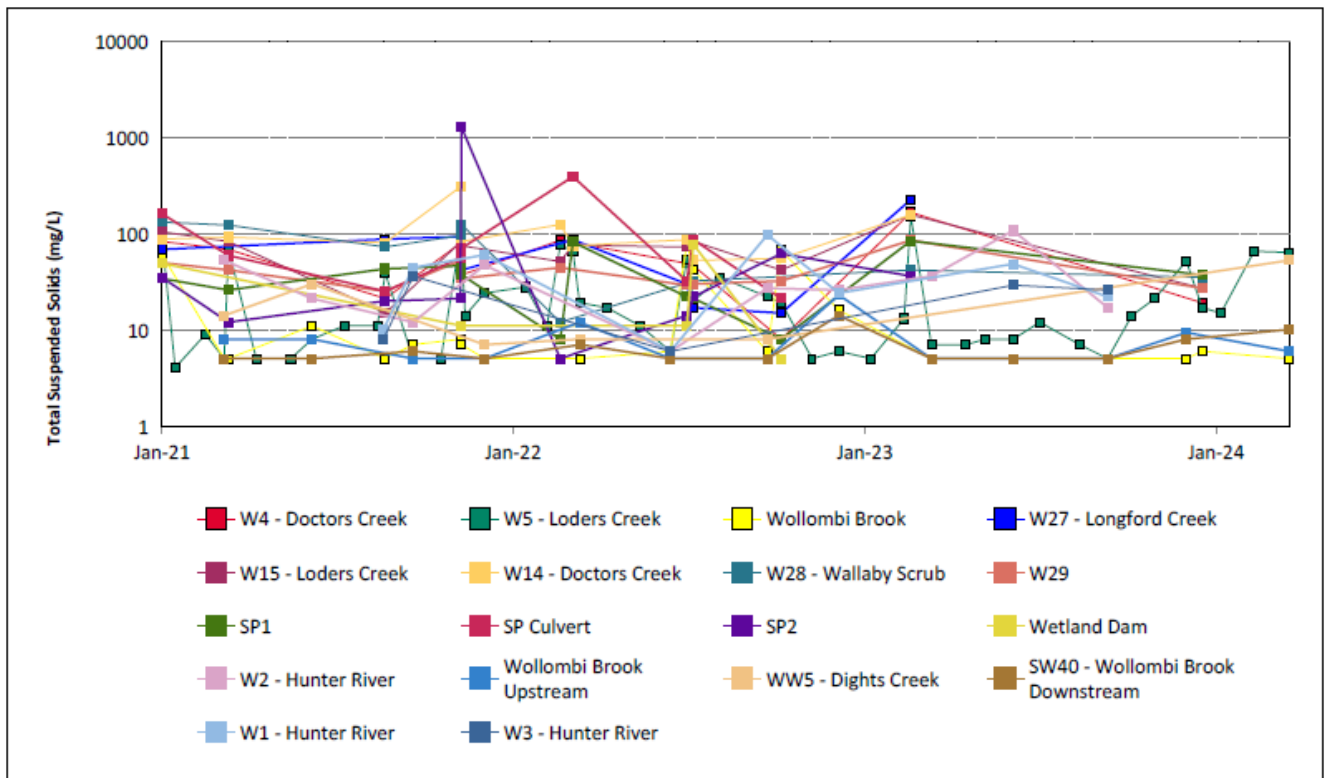


Figure 14: Watercourse Total Suspended Solids Trend – March 2024

### 3.1.2 Surface Water Trigger Tracking

Internal trigger limits have been developed to assess monitoring data on an on-going basis, and to highlight potentially adverse surface water impacts. The process for evaluating monitoring results against the internal triggers and subsequent responses are outlined in the MTW Water Management Plan.

Current internal surface water trigger limit breaches are summarised in **Table 2**.

**Table 2: Surface Water Trigger Tracking – March 2024**

Site	Date	Trigger Limit Breached	Action Taken in Response
SW40	21/03/2024	EC – 95 <sup>th</sup> Percentile	Watching Brief*
W5	13/02/2024	TSS – 50mg/L (ANZECC criteria)	Watching Brief* Unlikely to be associated with MTW mining related impacts. Elevated TSS results most likely attributable to sampling from water with no flow (pool of water). Note: Result is not considered to be a valid representation given that there was no flow at the time of sampling.
W5	21/03/2024	TSS – 50mg/L (ANZECC criteria)	Watching Brief* Unlikely to be associated with MTW mining related impacts. Elevated TSS results most likely attributable to sampling from water with no flow (pool of water). Note: Result is not considered to be a valid representation given that there was no flow at the time of sampling.
WW5	21/03/2024	TSS – 50mg/L (ANZECC criteria)	Watching Brief* Unlikely to be associated with MTW mining related impacts. Elevated TSS results most likely attributable to sampling from water with no flow (pool of water). Note: Result is not considered to be a valid representation given that there was no flow at the time of sampling.

\* = Watching brief established pending outcomes of subsequent monitoring events. No specific actions required.

### 3.2 HRSTS Discharge

MTW participates in the Hunter River Salinity Trading Scheme (HRSTS), allowing discharge from licensed discharge points located at Dam 1N and Dam 9S. Discharges can only take place subject to HRSTS regulations.

No HRSTS discharge occurred during the reporting period.



Figure 15: Surface Water Monitoring Location Plan

### 3.3 Groundwater Monitoring

Groundwater monitoring is undertaken on a quarterly basis in accordance with the MTW Groundwater Monitoring Programme.

Figure 16 to Figure 64 show the long-term water quality trends (2021 - current) for groundwater bores monitored at MTW.

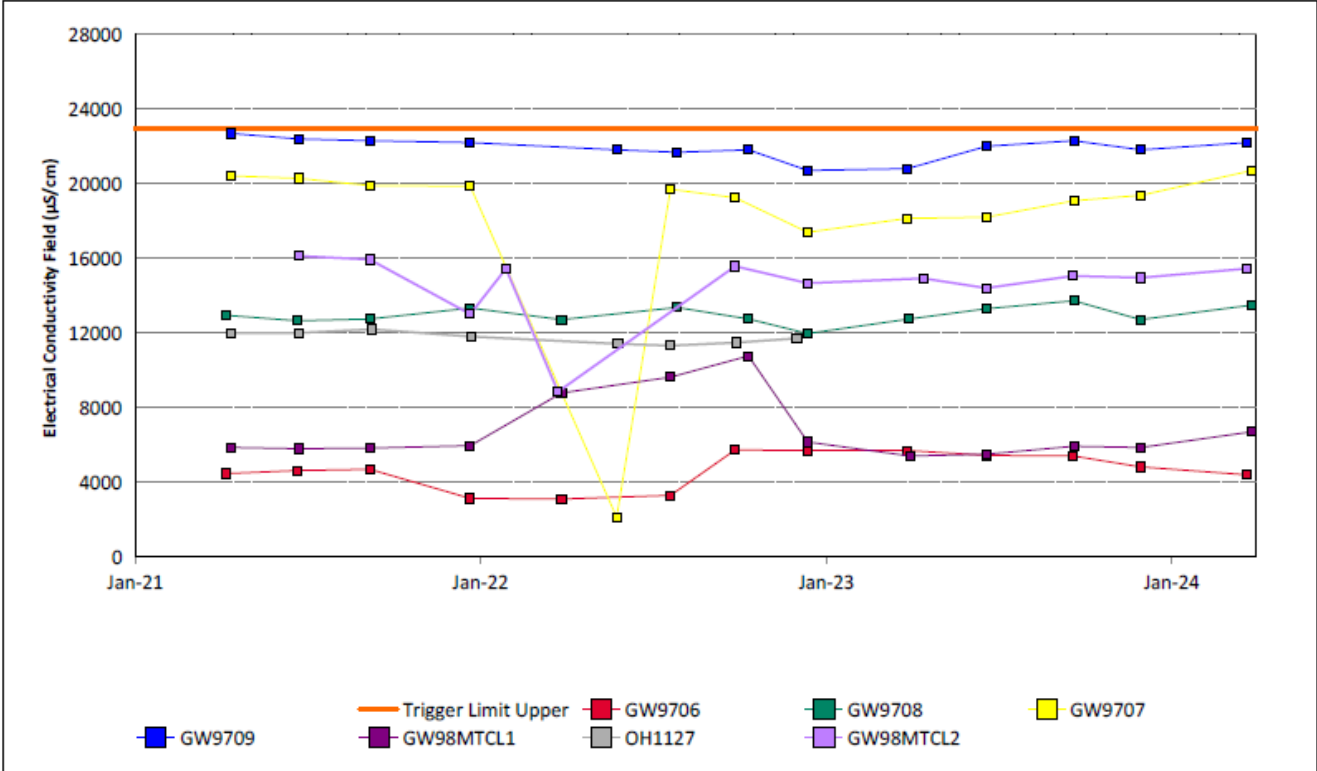


Figure 16: Bayswater Seam Electrical Conductivity Field Trend – March 2024



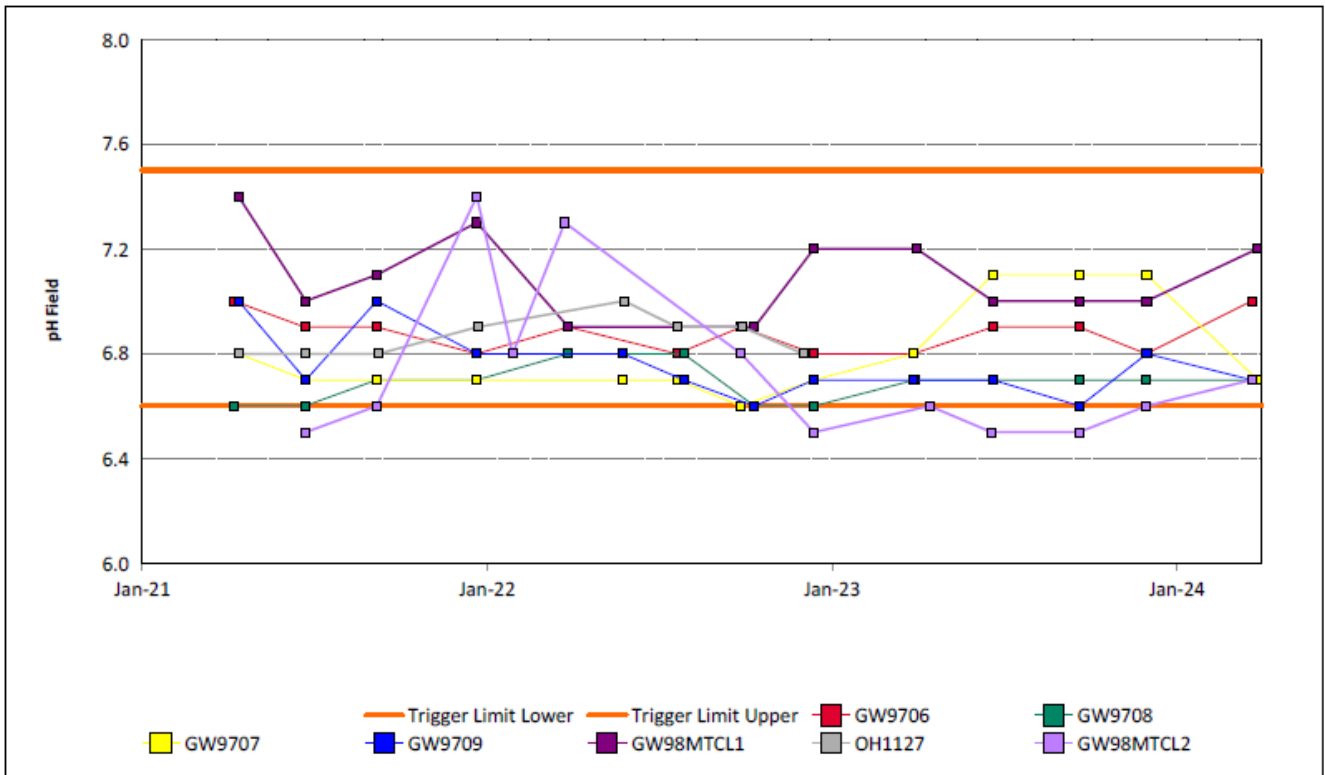


Figure 17: Bayswater Seam pH Field Trend – March 2024

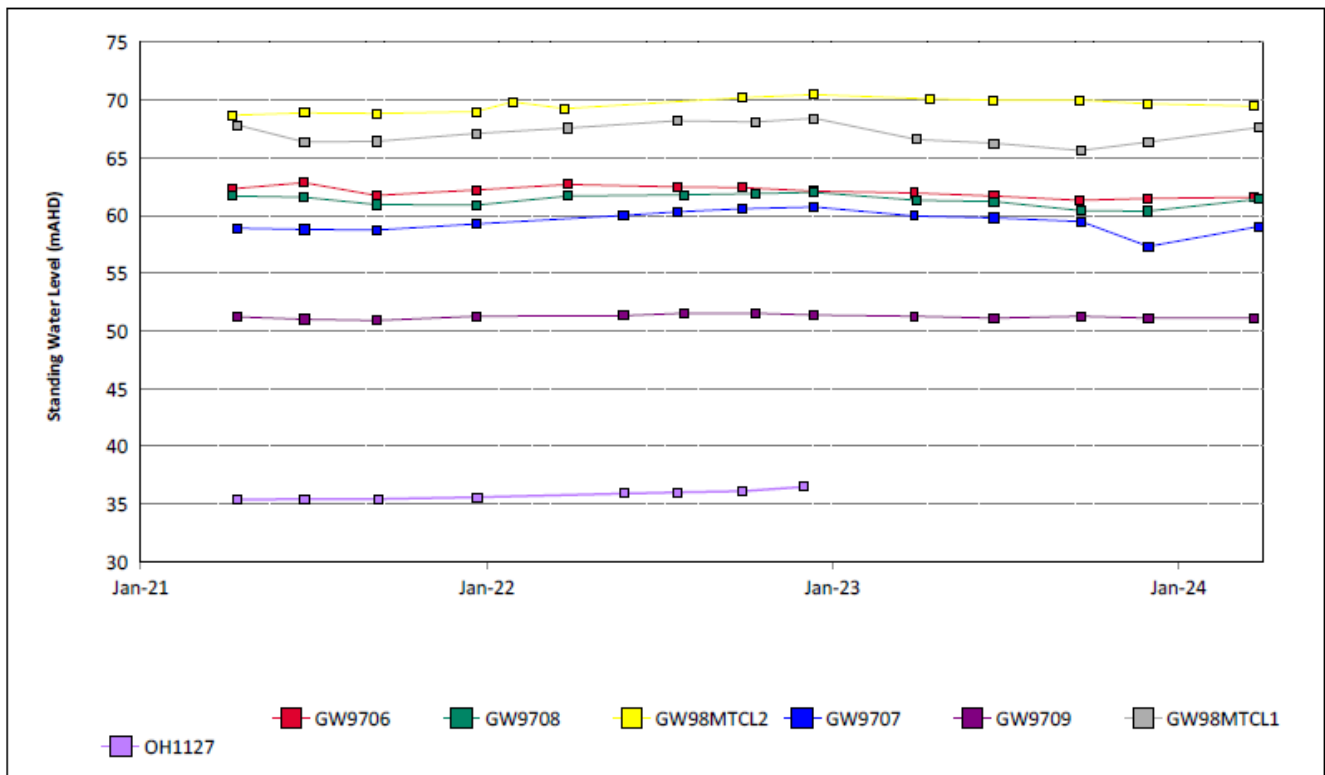


Figure 18: Bayswater Seam Standing Water Level Trend – March 2024

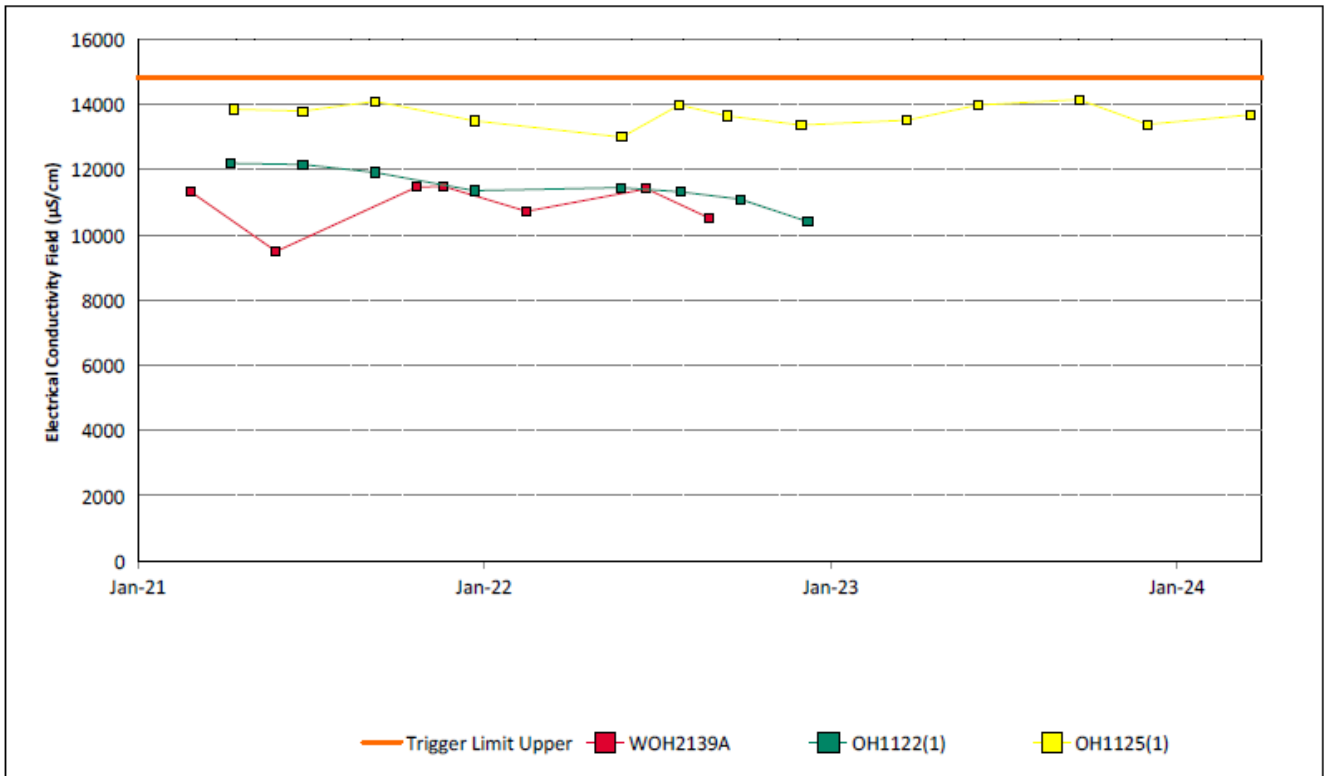


Figure 19: Blakefield Seam Electrical Conductivity Field Trend –March 2024

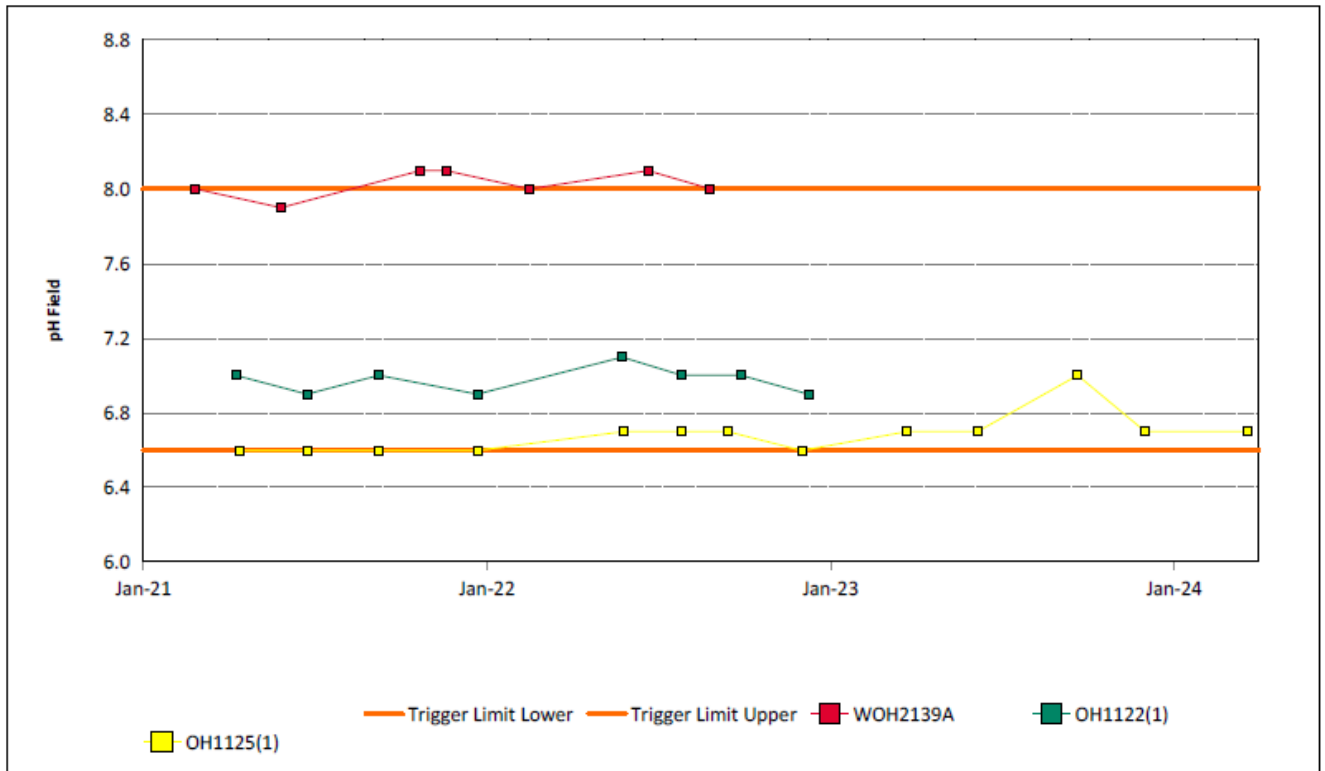


Figure 20: Blakefield Seam pH Field Trend – March 2024

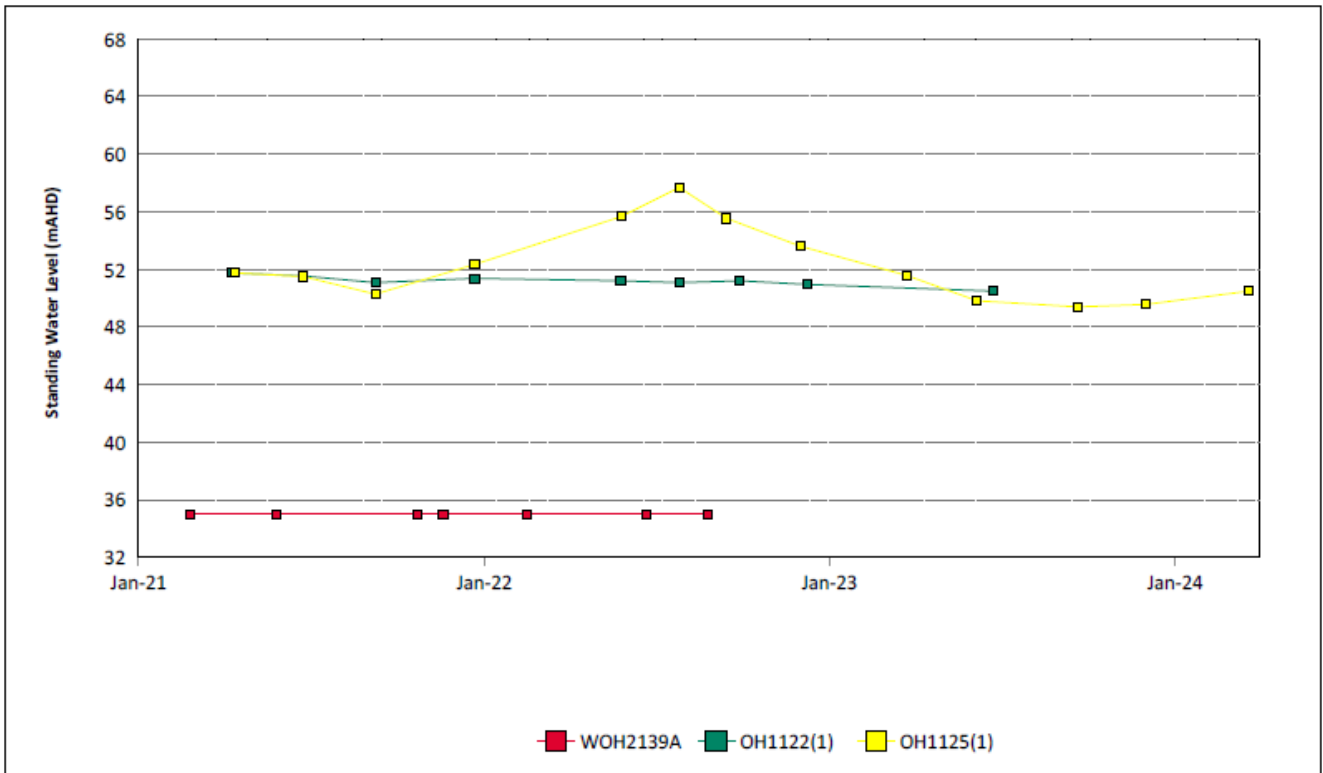


Figure 21: Blakefield Seam Standing Water Level Trend – March 2024

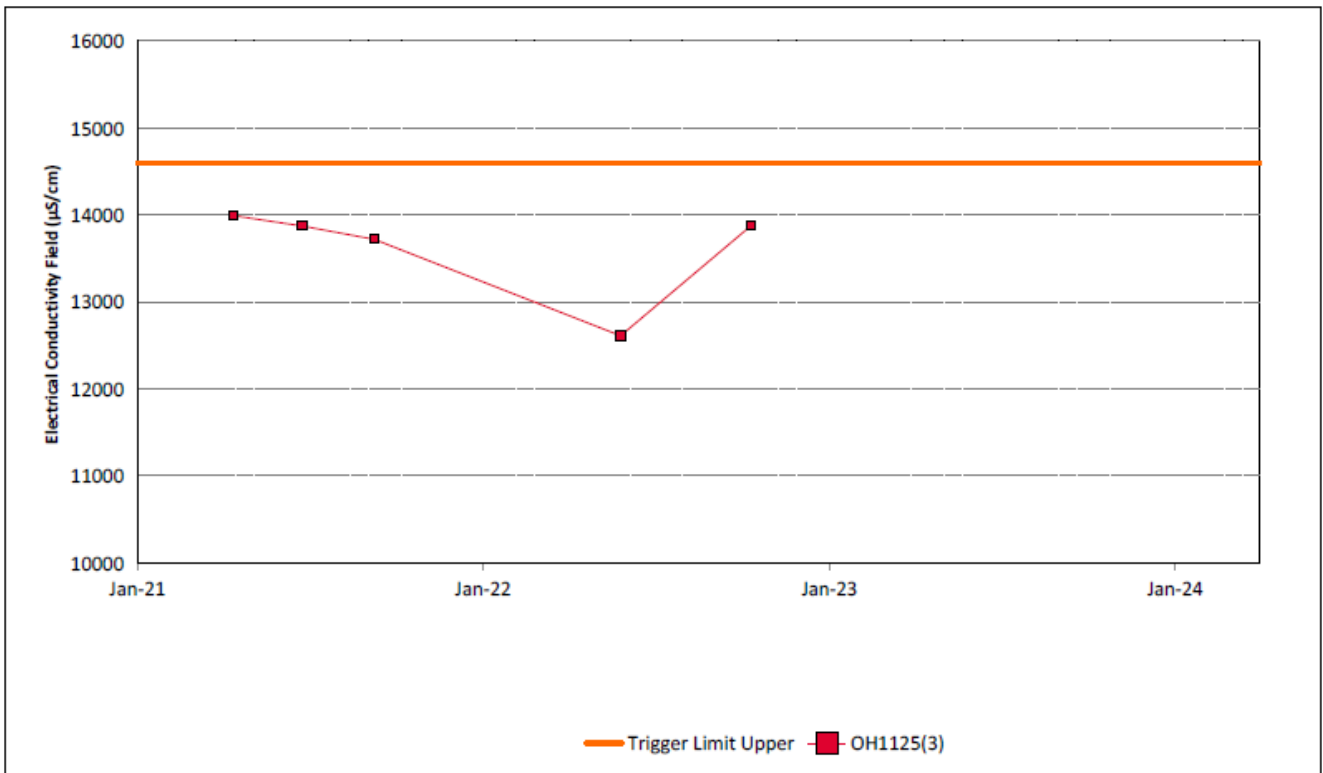


Figure 22: Bowfield Seam Electrical Conductivity Field Trend – March 2024

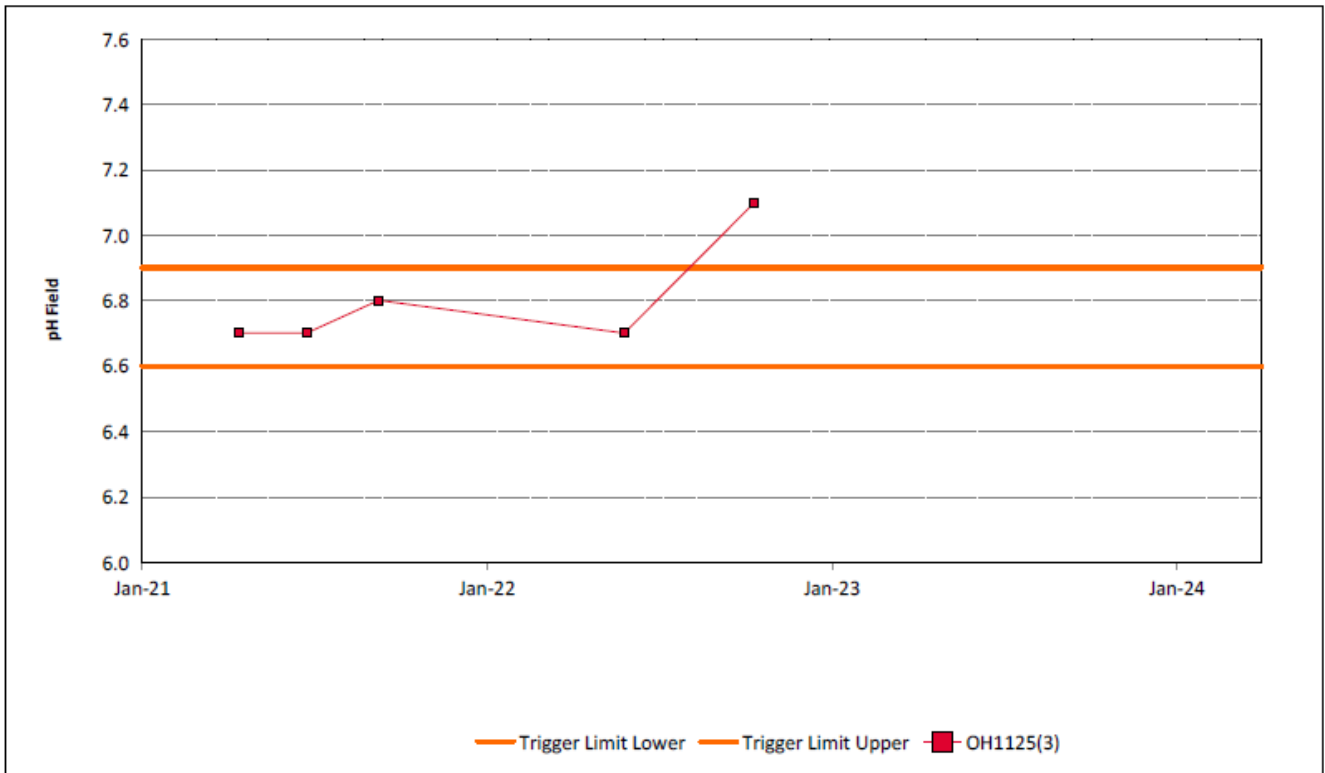


Figure 23: Bowfield Seam pH Field Trend - March 2024

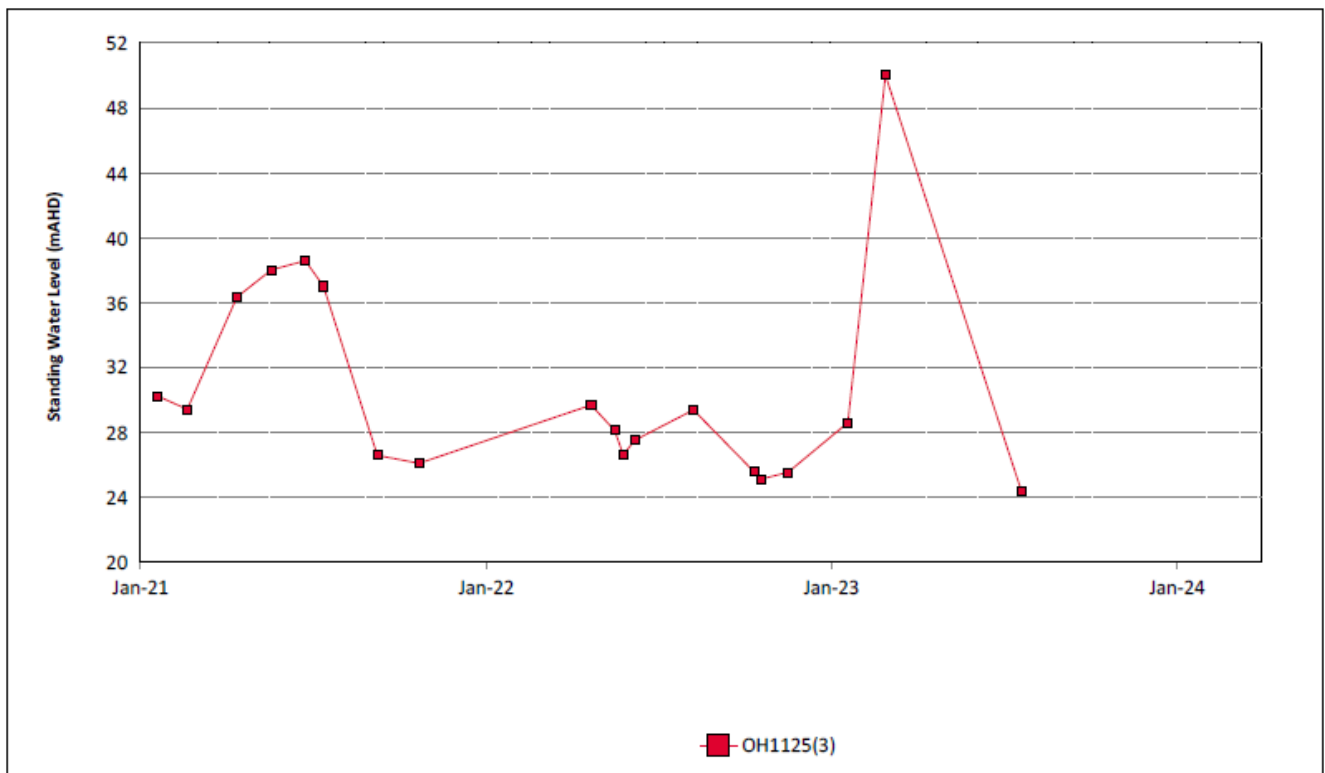


Figure 24: Bowfield Seam Standing Water Level Trend – March 2024

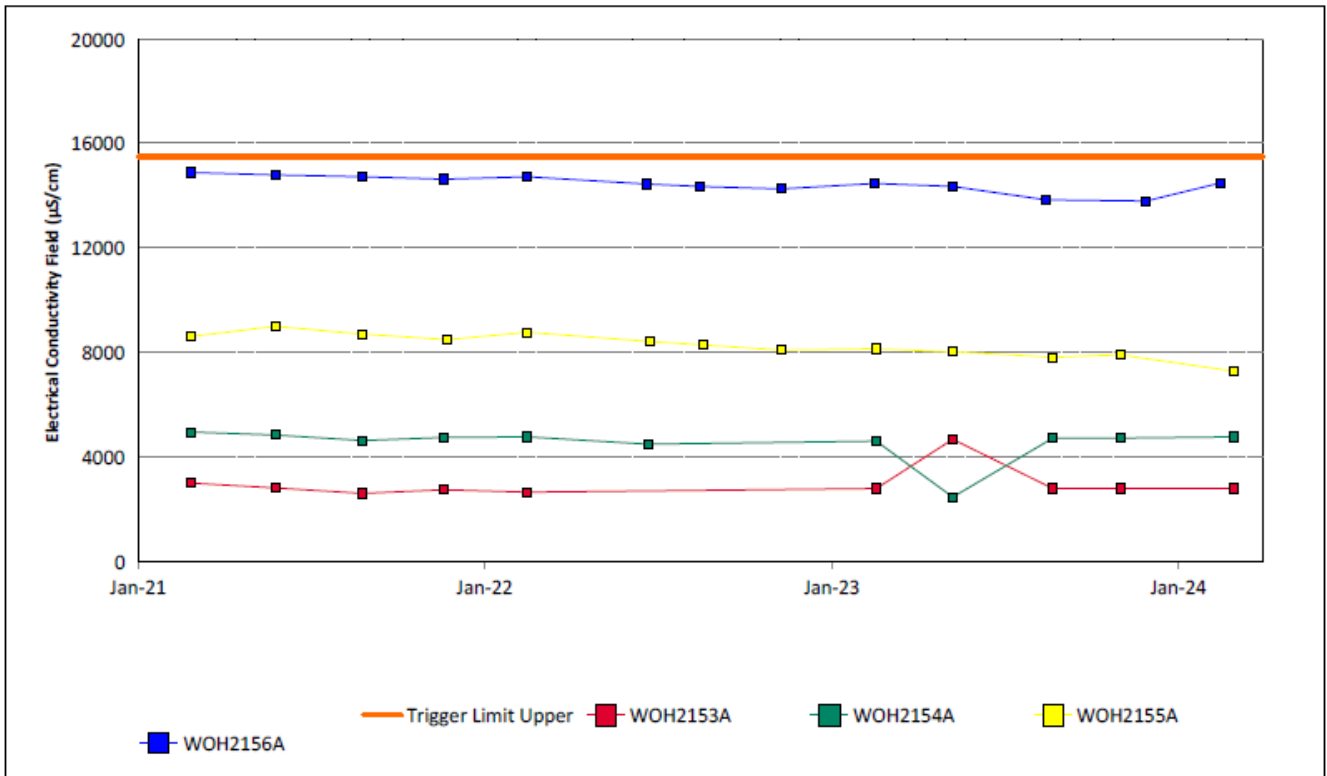


Figure 25: Redbank Seam Electrical Conductivity Field Trend – March 2024

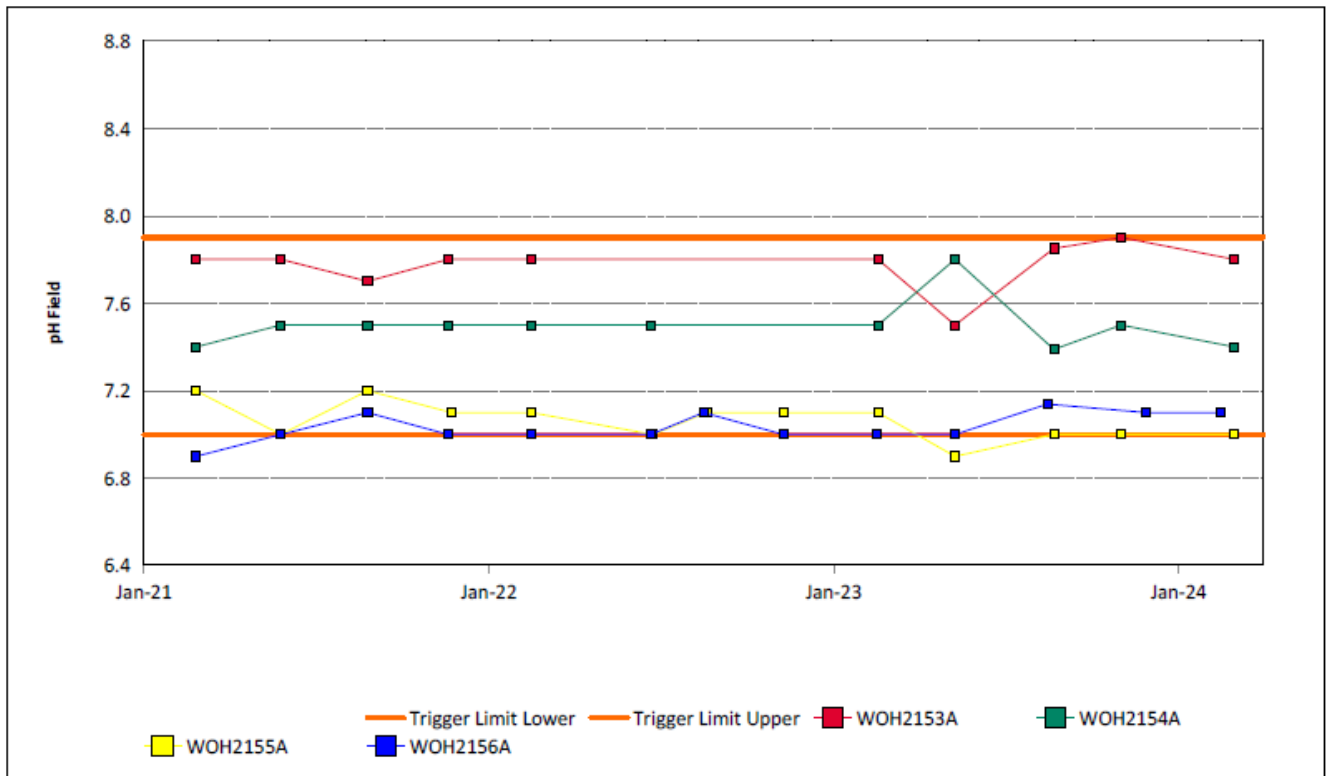


Figure 26: Redbank Seam pH Field Trend – March 2024

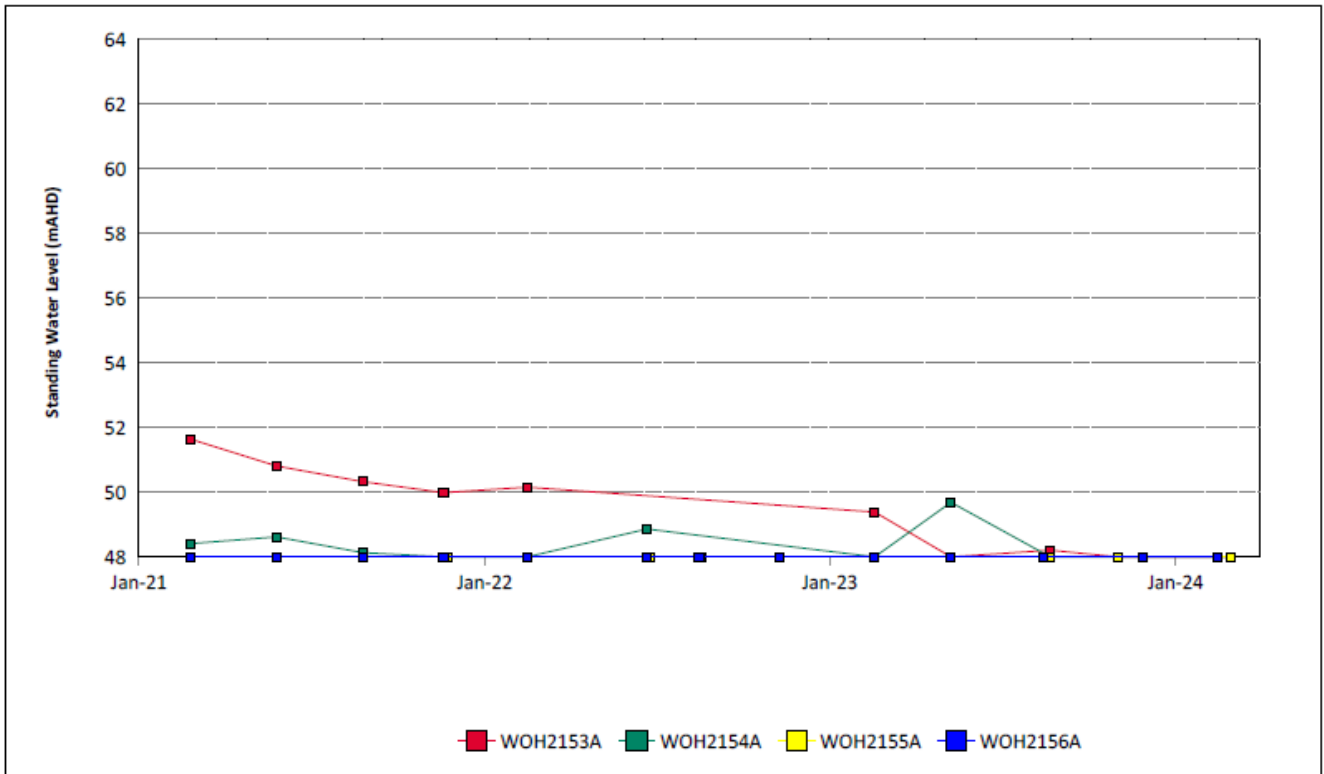


Figure 27: Redbank Seam Standing Water Level Trend –March 2024

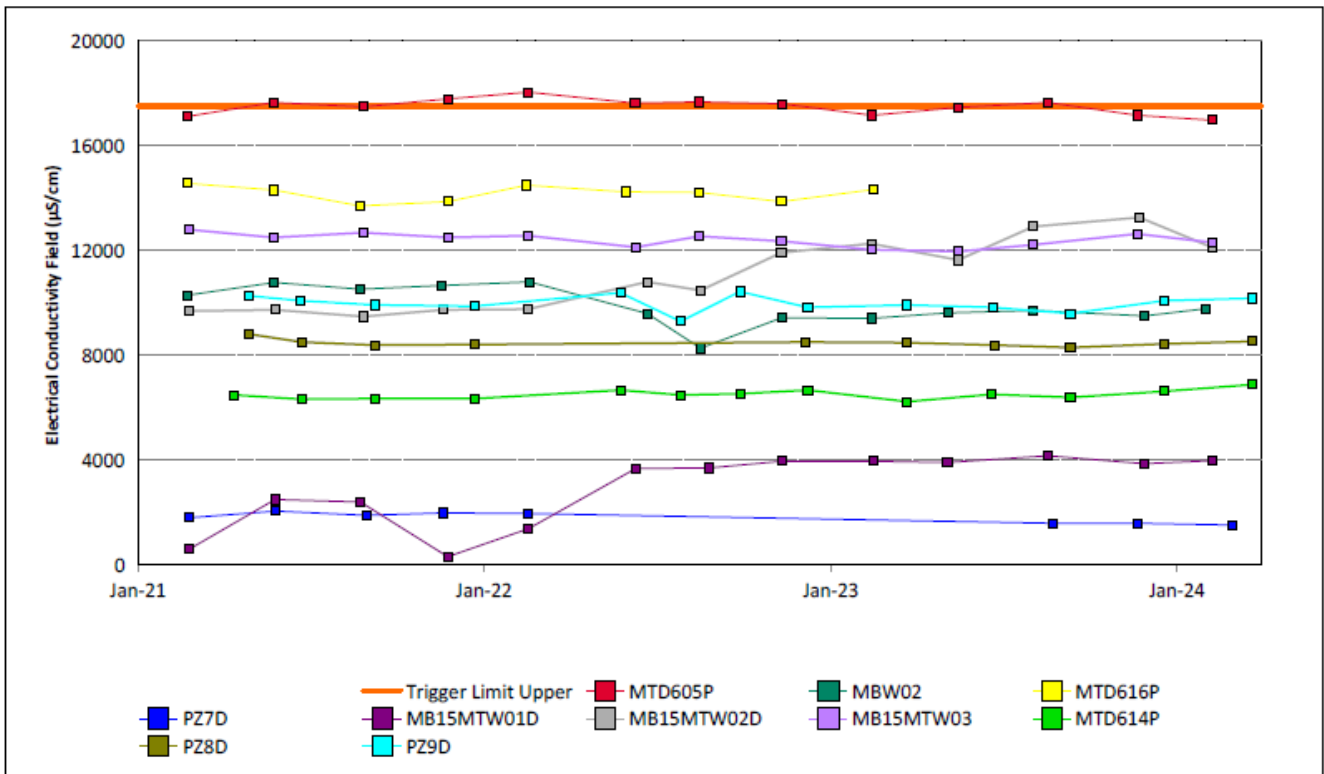


Figure 28: Shallow Overburden Electrical Conductivity Field Trend – March 2024

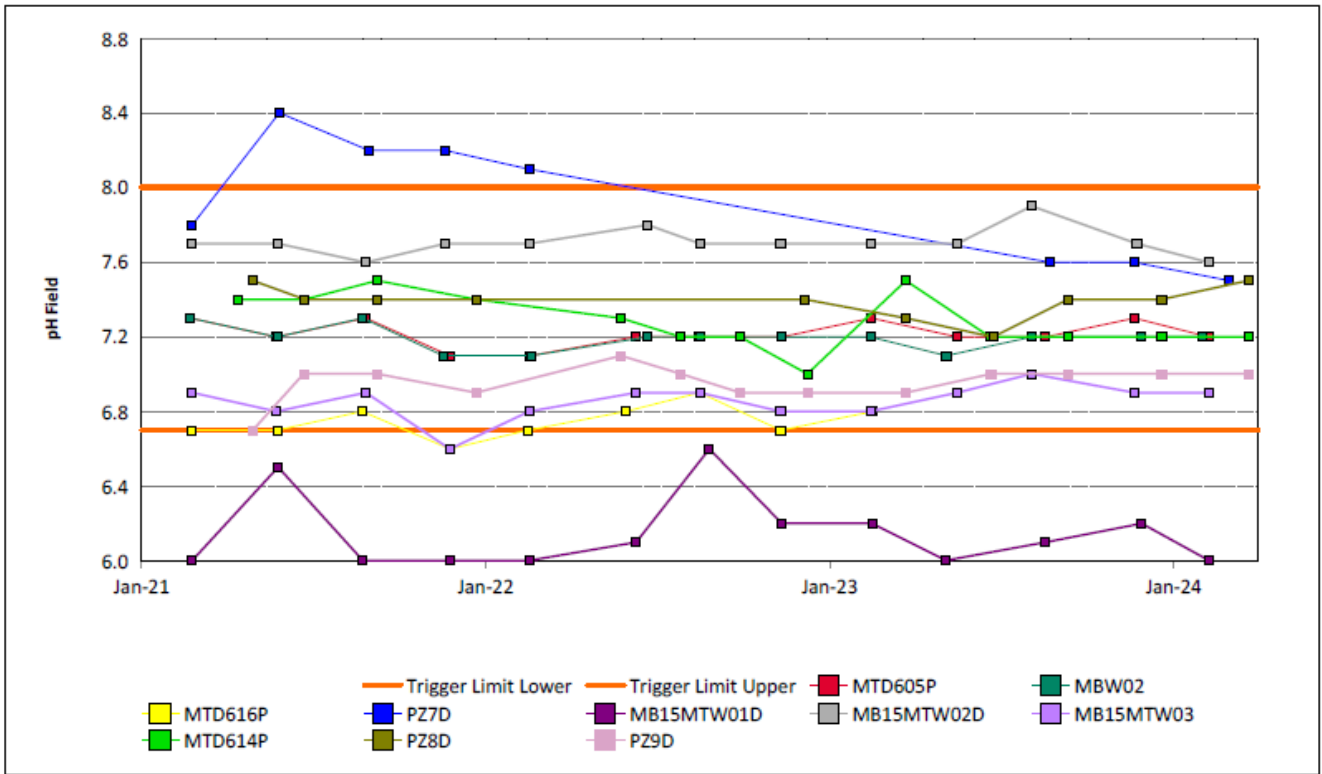


Figure 29: Shallow Overburden pH Field Trend – March 2024

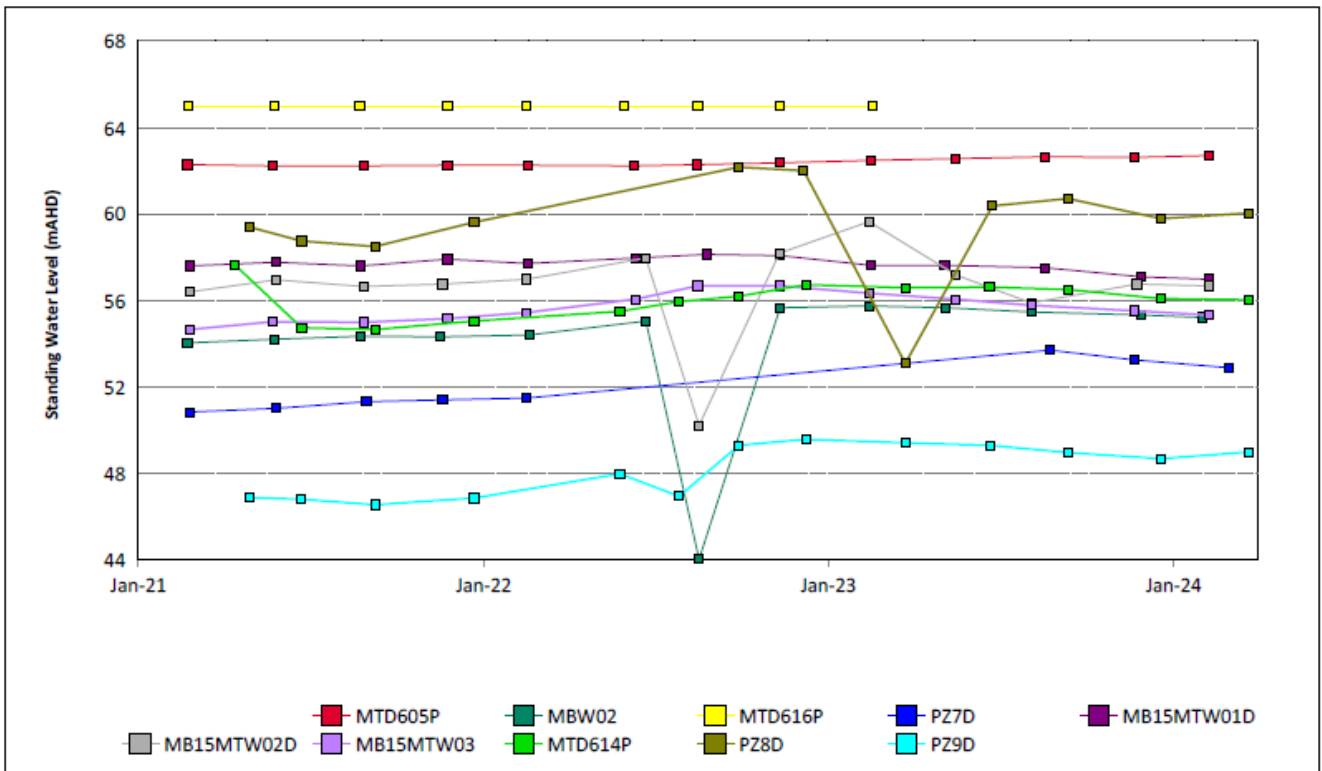


Figure 30: Shallow Overburden Standing Water Level Trend – March 2024

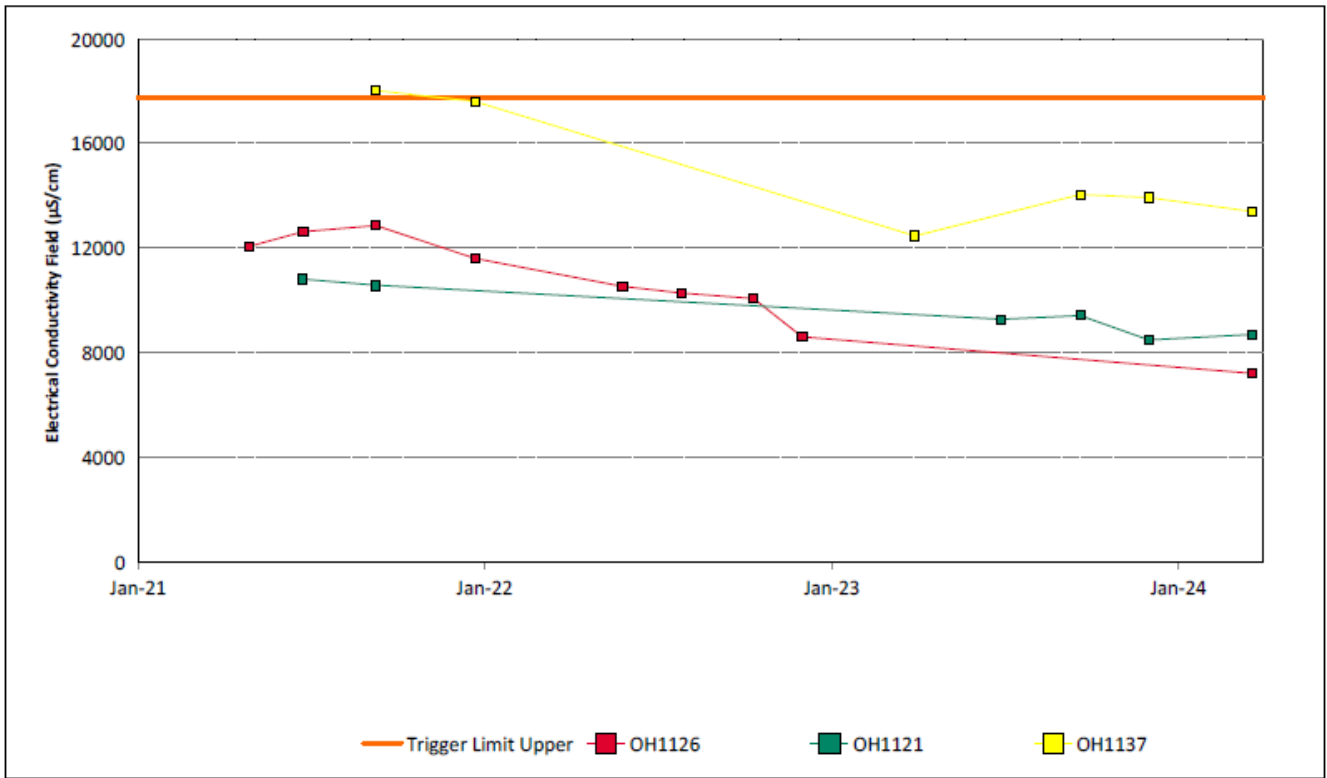


Figure 31: Vaux Seam Electrical Conductivity Field Trend – March 2024

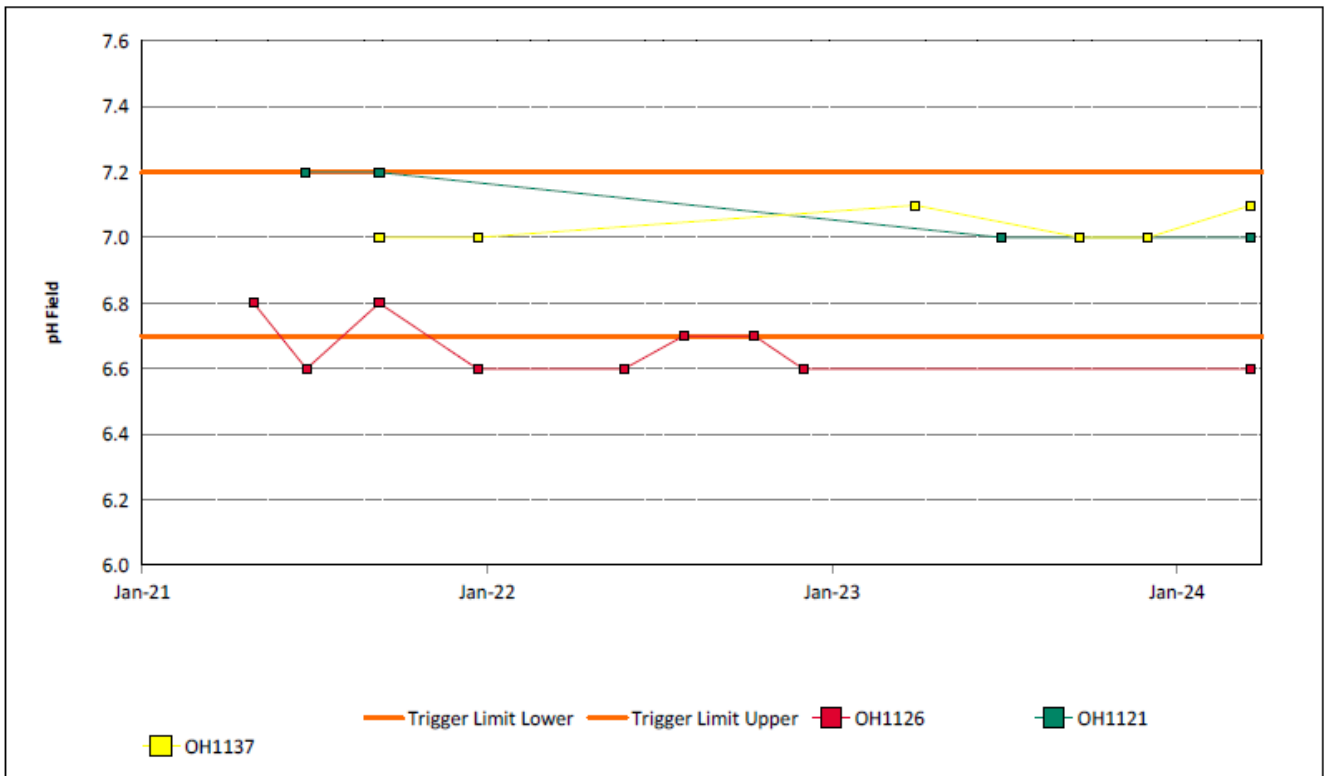


Figure 32: Vaux Seam pH Field Trend – March 2024



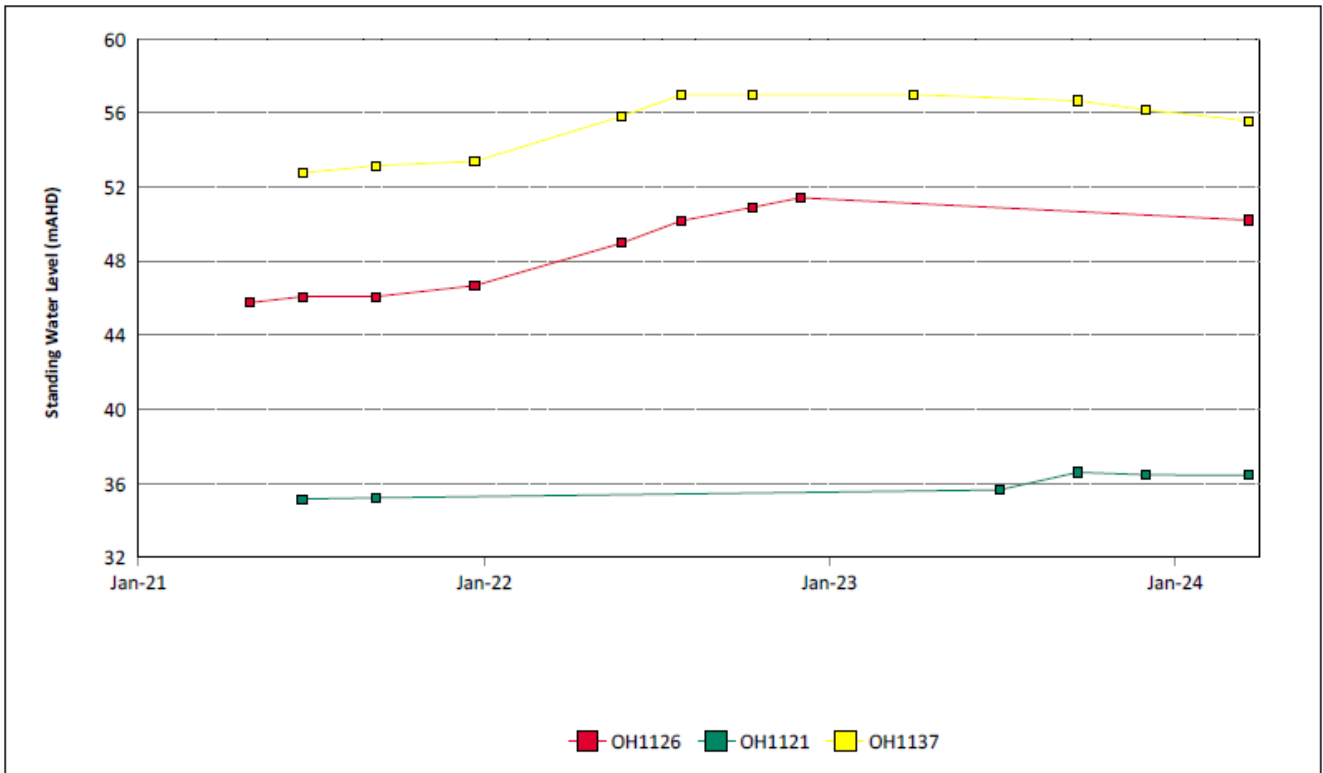


Figure 33: Vaux Seam Standing Water Level Trend –March 2024

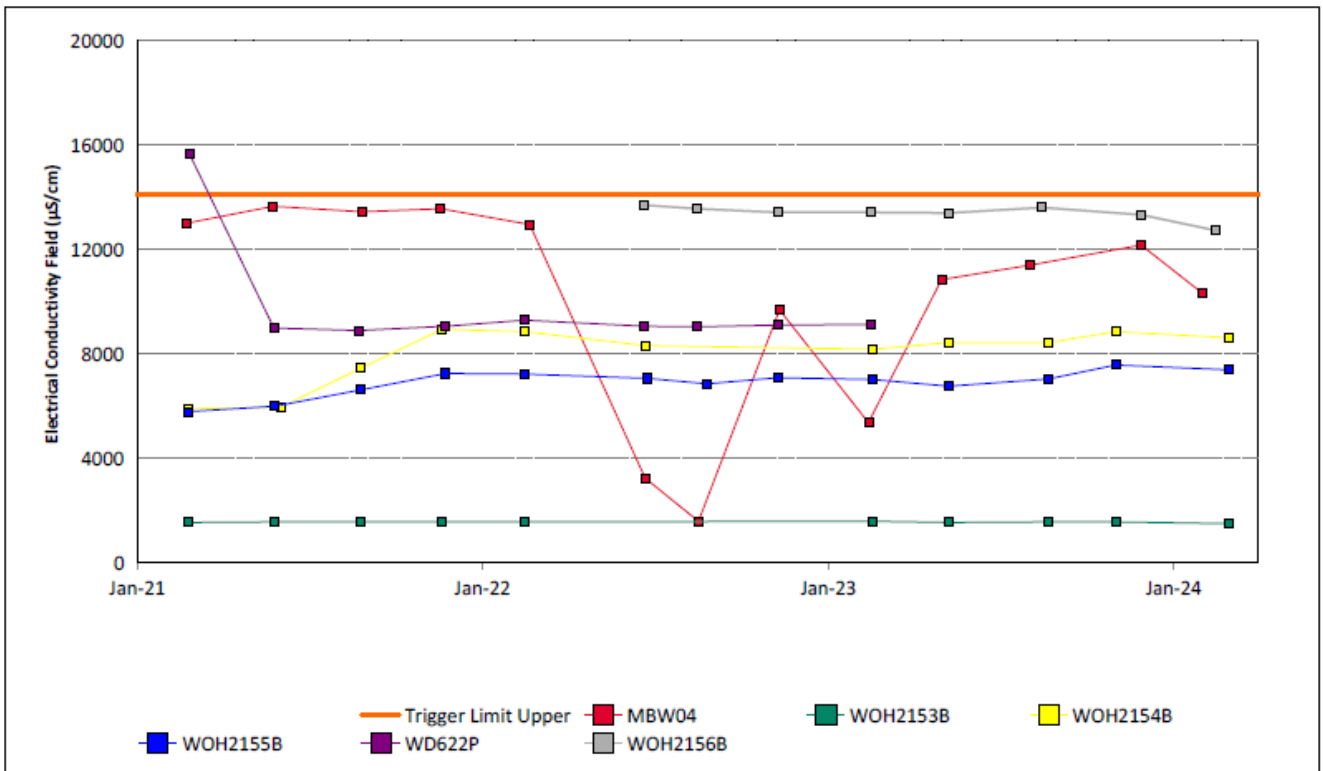


Figure 34: Wambo Seam Electrical Conductivity Field Trend – March 2024

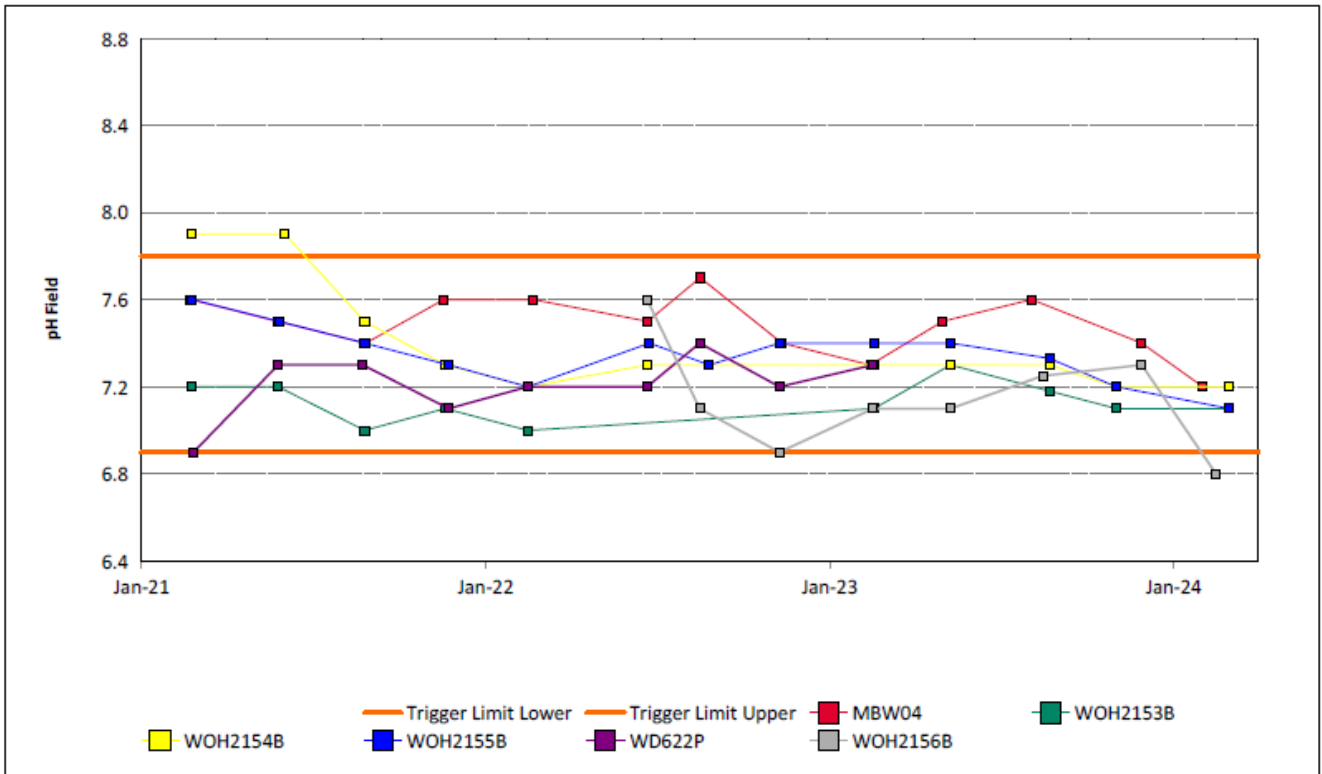


Figure 35: Wambo Seam pH Field Trend – March 2024

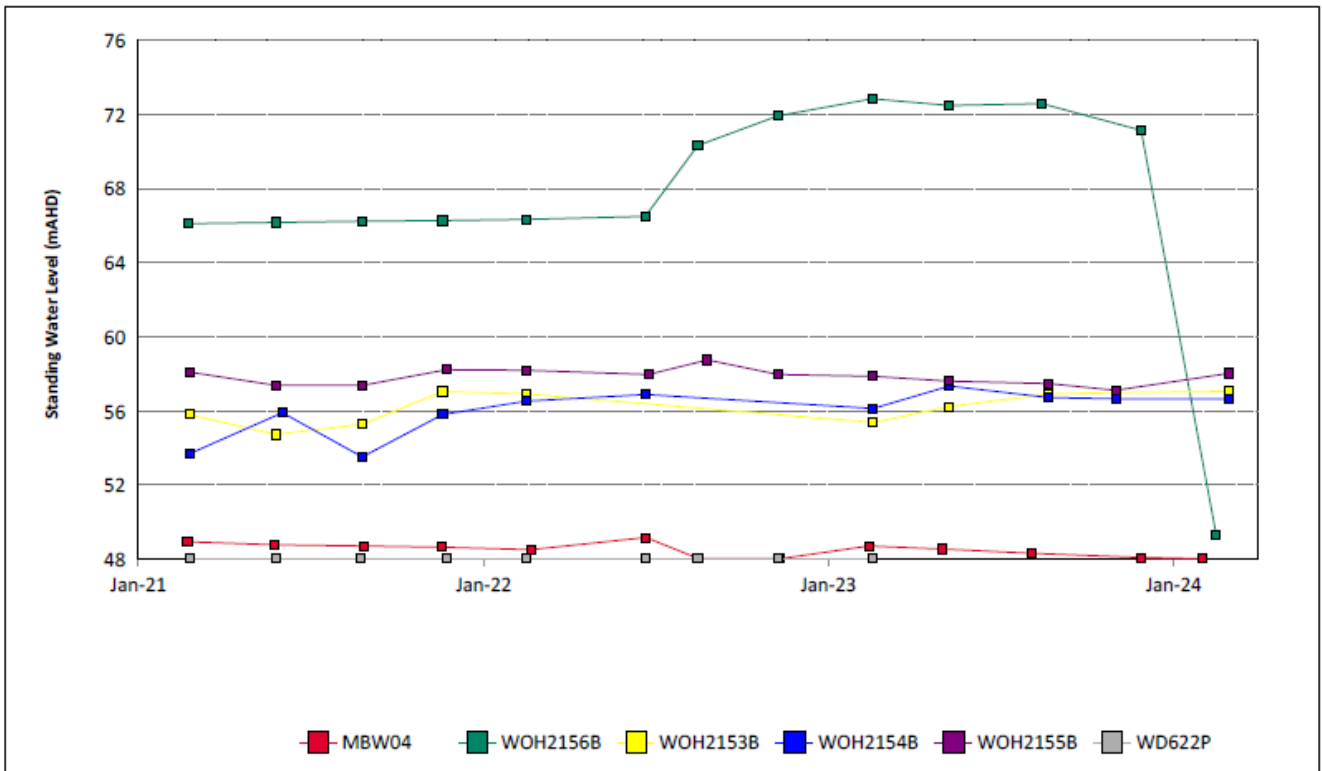


Figure 36: Wambo Seam Standing Water Level Trend – March 2024

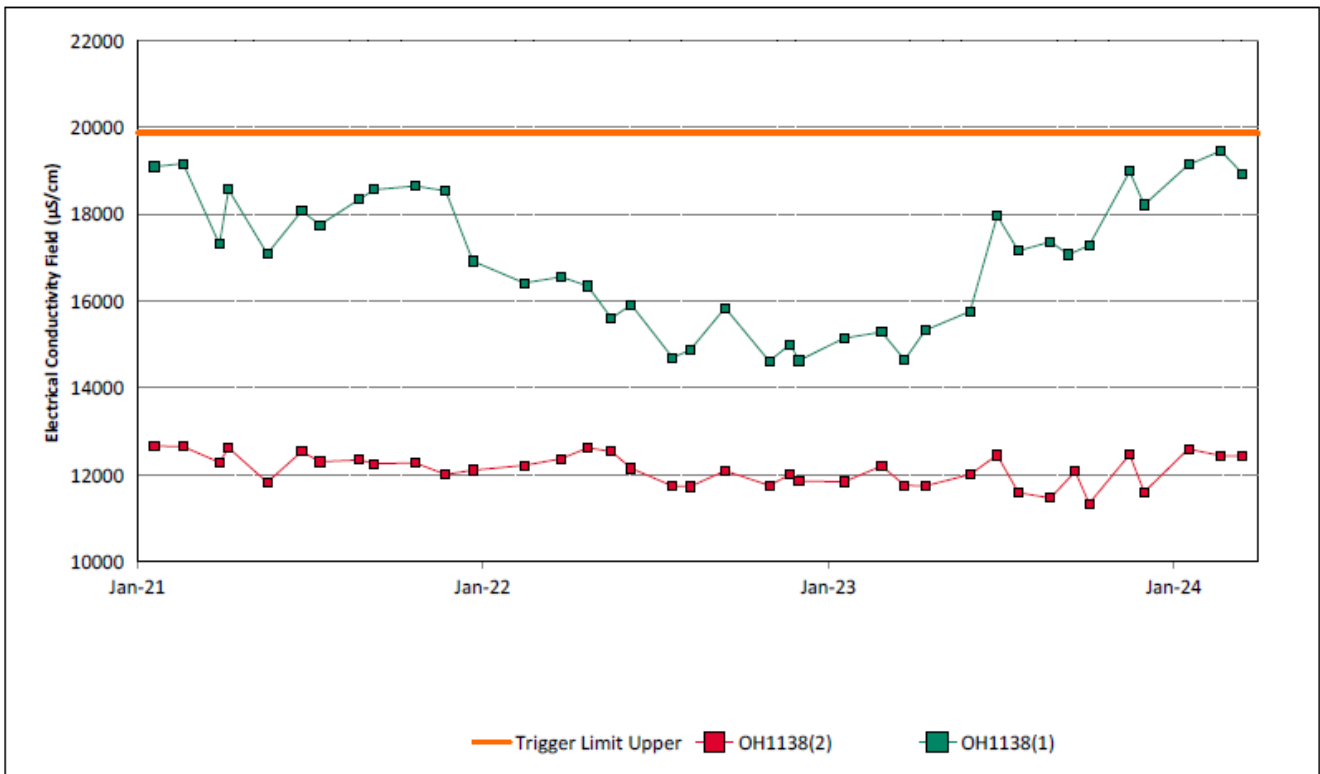


Figure 37: Warkworth Seam Electrical Conductivity Field Trend – March 2024

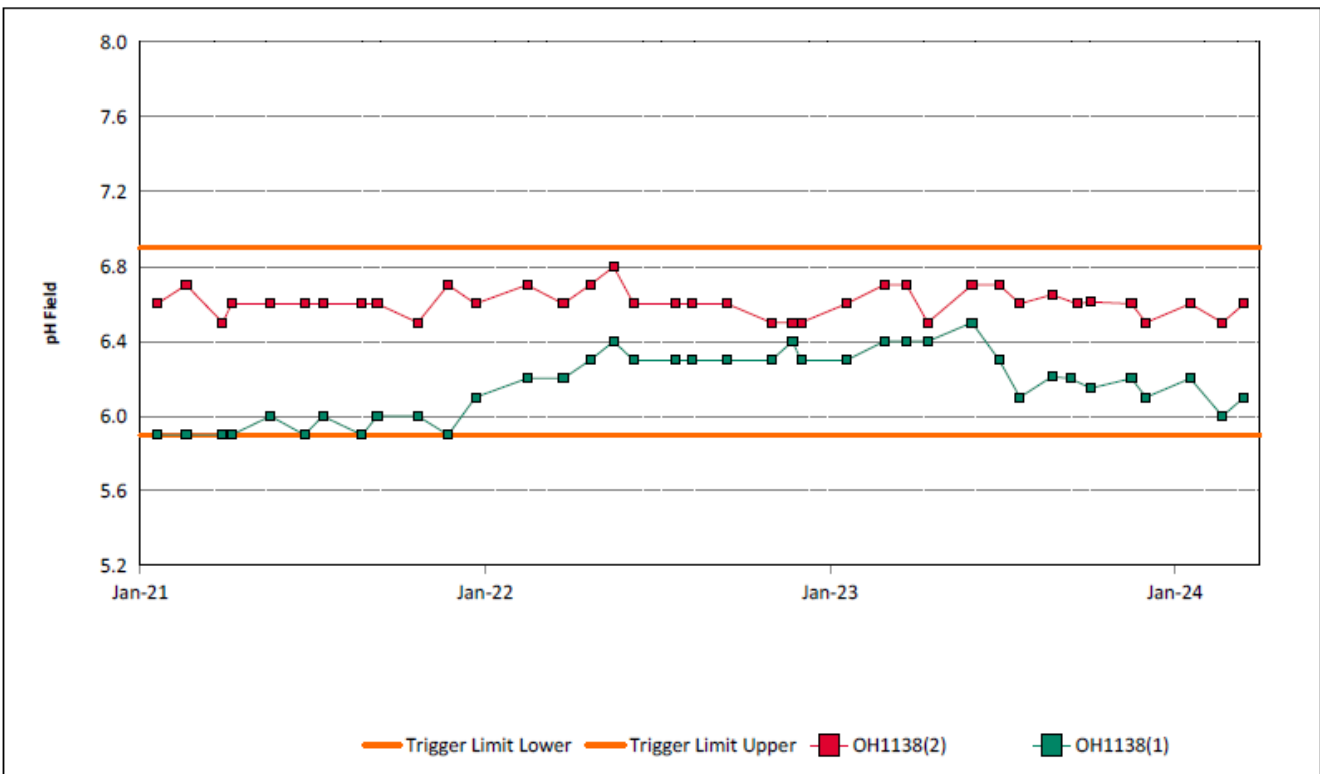


Figure 38: Warkworth Seam pH Field Trend – March 2024

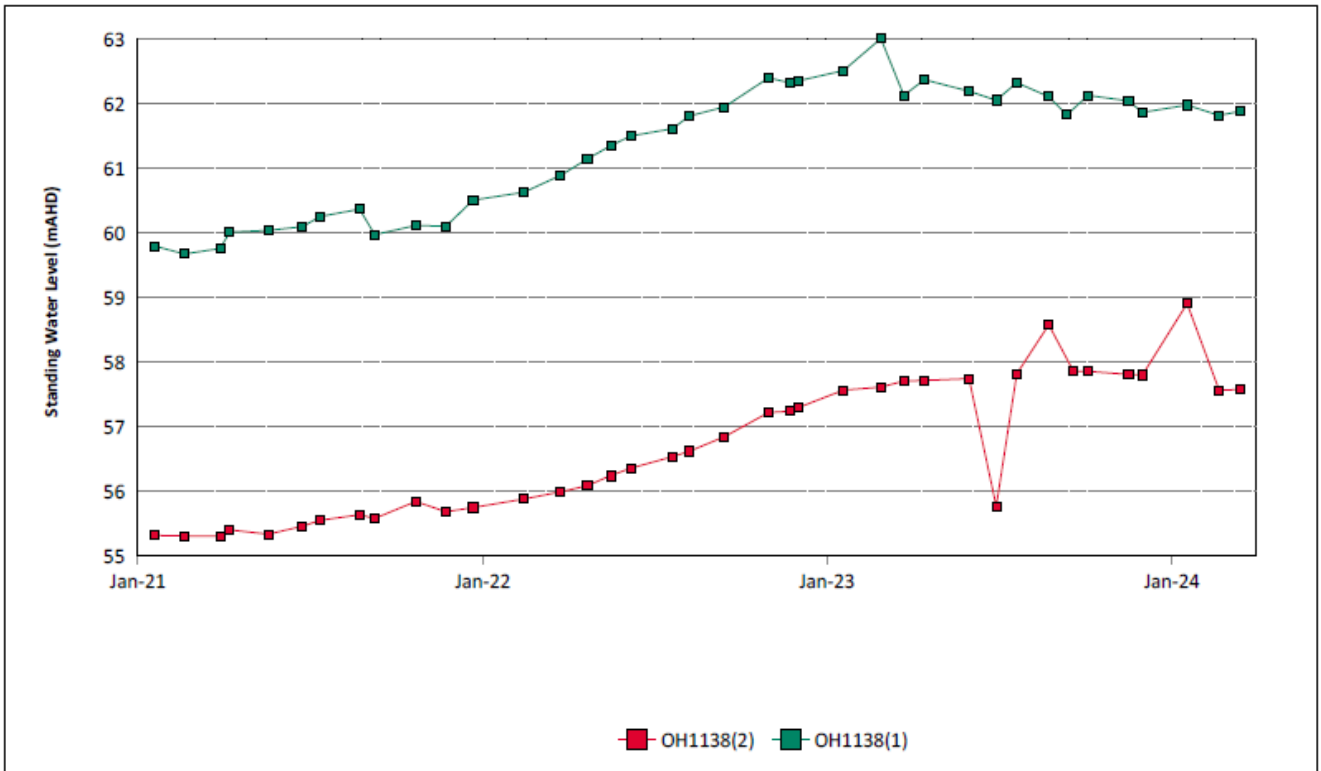


Figure 39: Warkworth Seam Standing Water Level Trend – March 2024

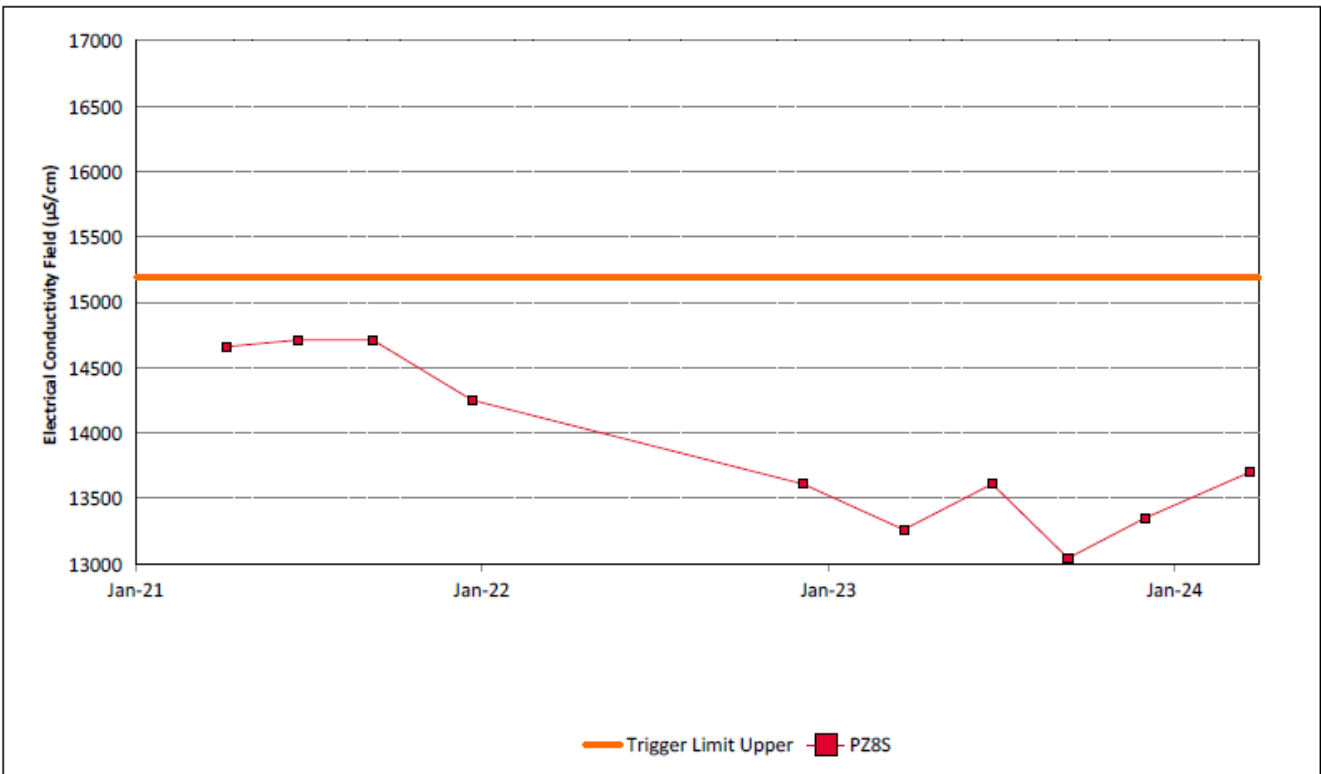


Figure 40: Wollombi Alluvium 1 Electrical Conductivity Field Trend – March 2024

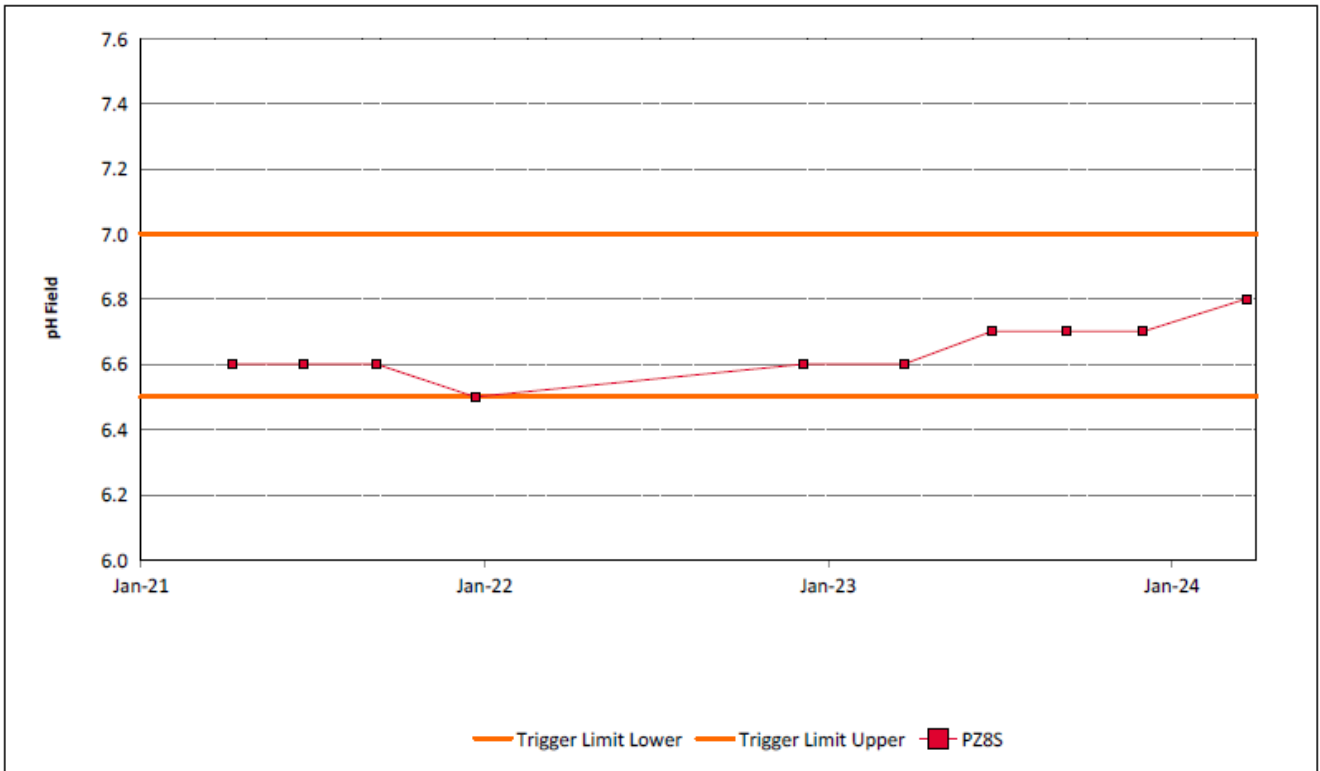


Figure 41: Wollombi Alluvium 1 pH Field Trend – March 2024

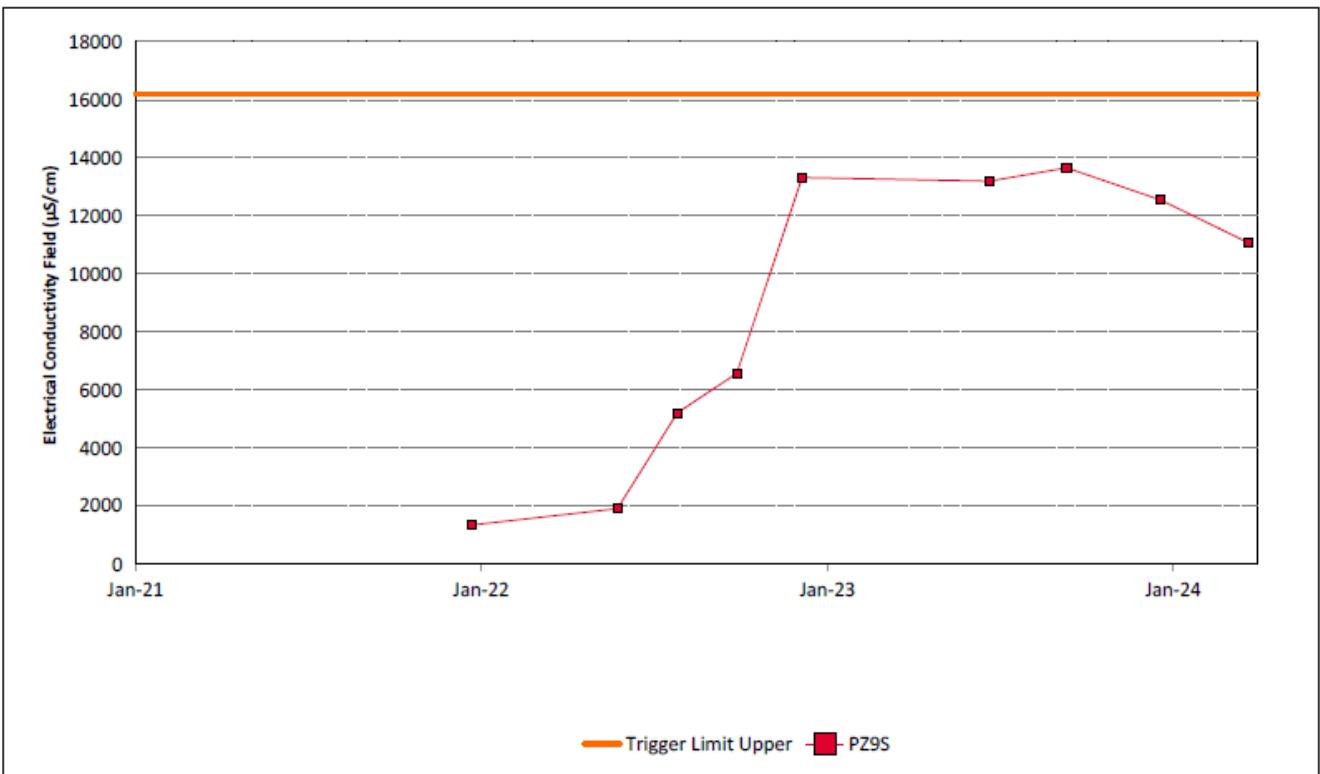


Figure 42: Wollombi Alluvium 2 Electrical Conductivity Field Trend – March 2024

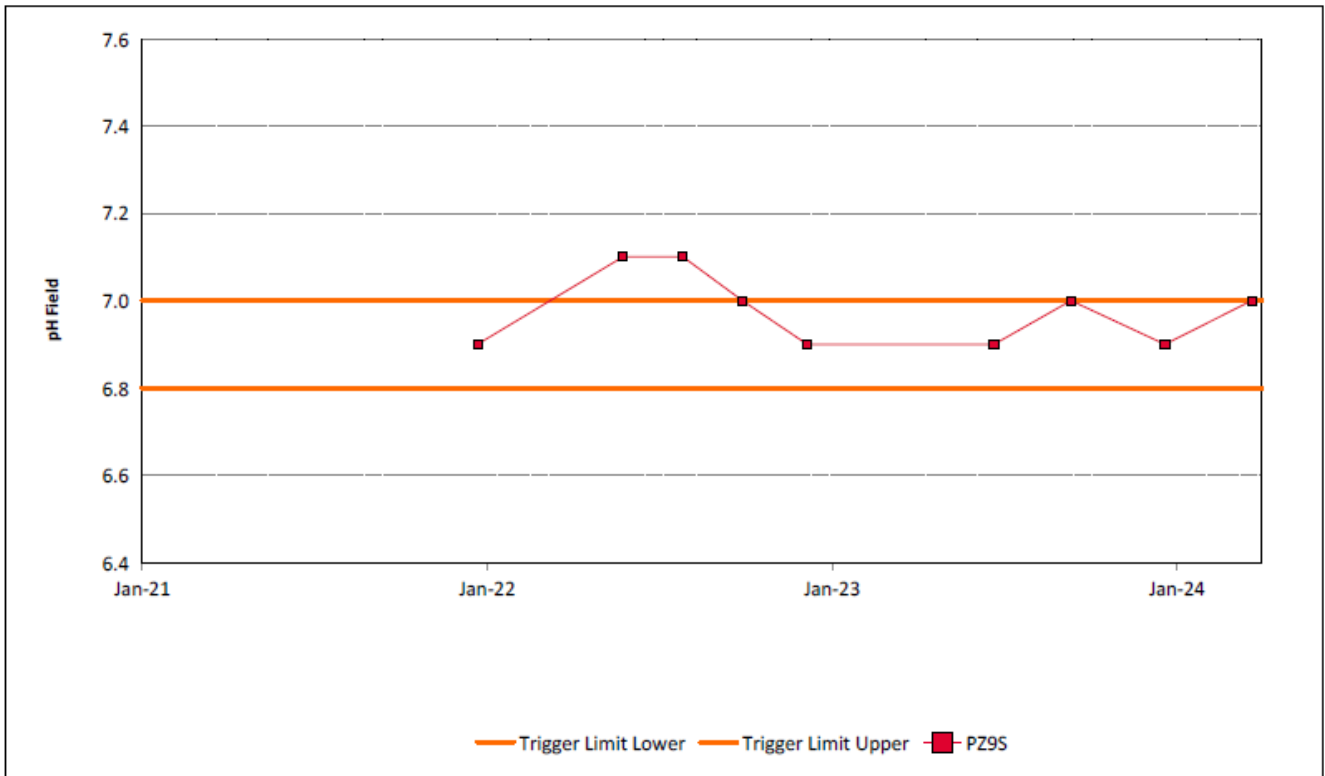


Figure 43: Wollombi Alluvium 2 pH Field Trend – March 2024

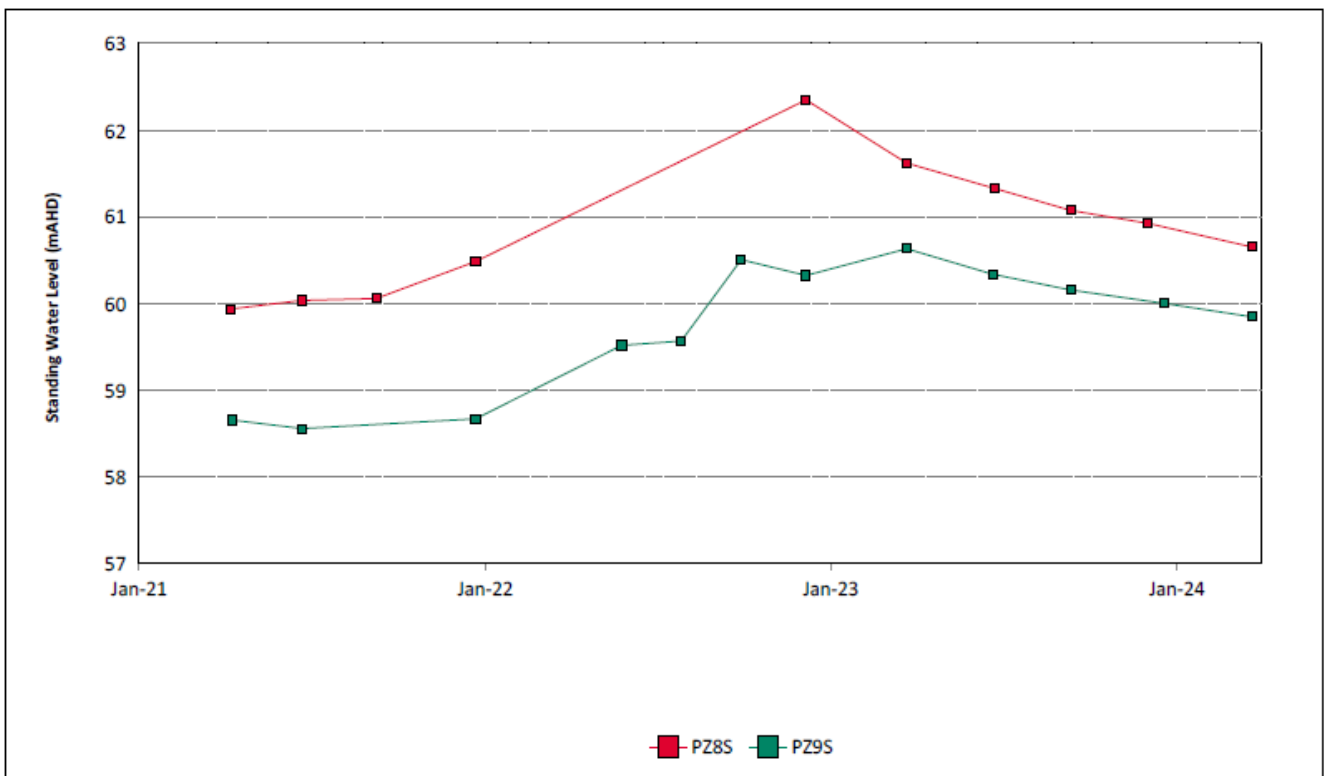


Figure 44: Wollombi Alluvium Standing Water Level Trend – March 2024

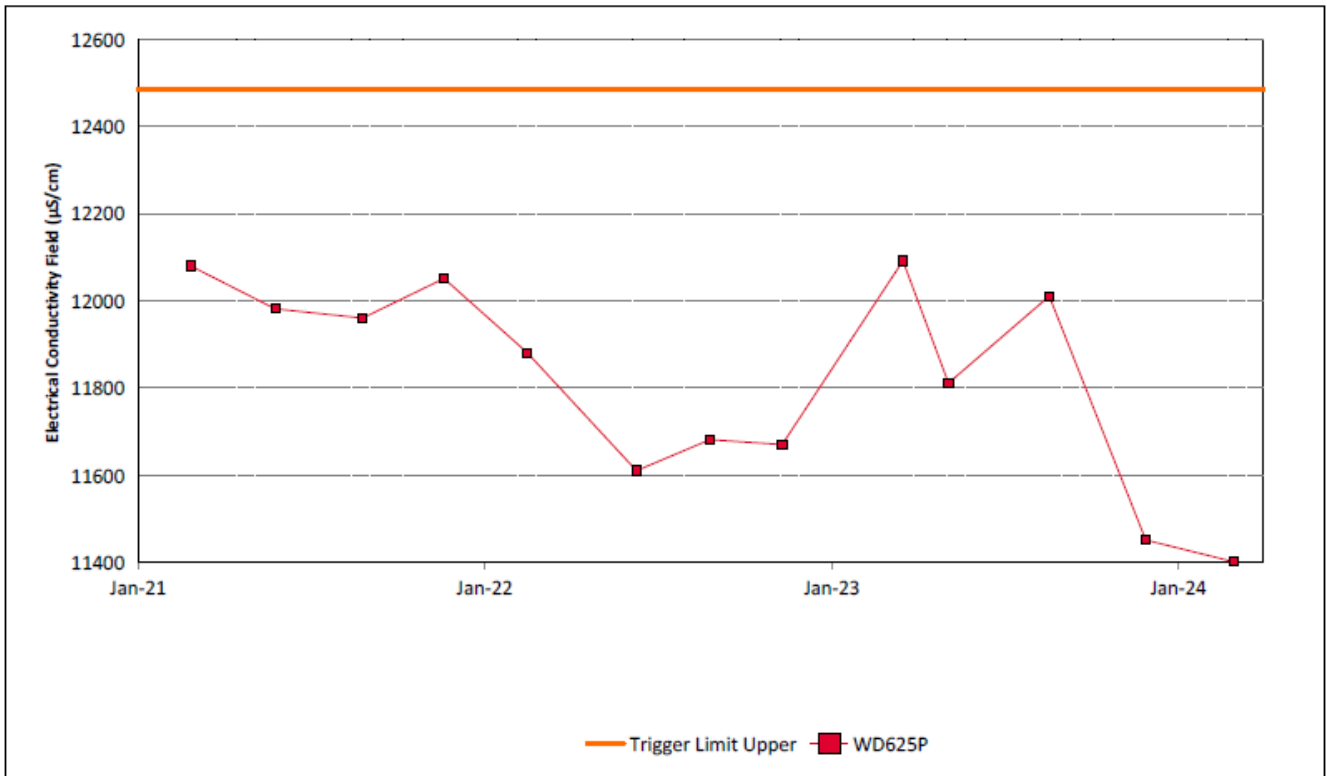


Figure 45: Woodlands Hill Seam Electrical Conductivity Field Trend – March 2024

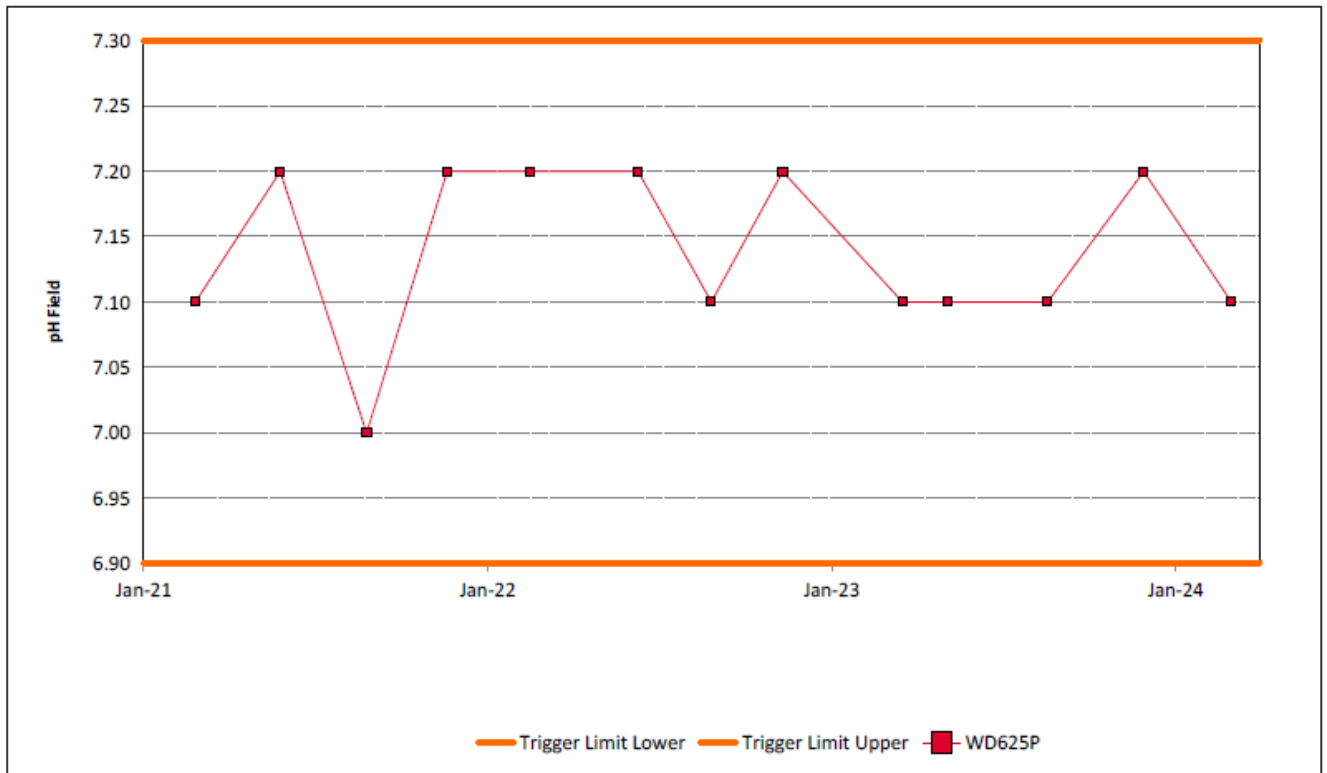


Figure 46: Woodlands Hill Seam pH Field Trend – March 2024

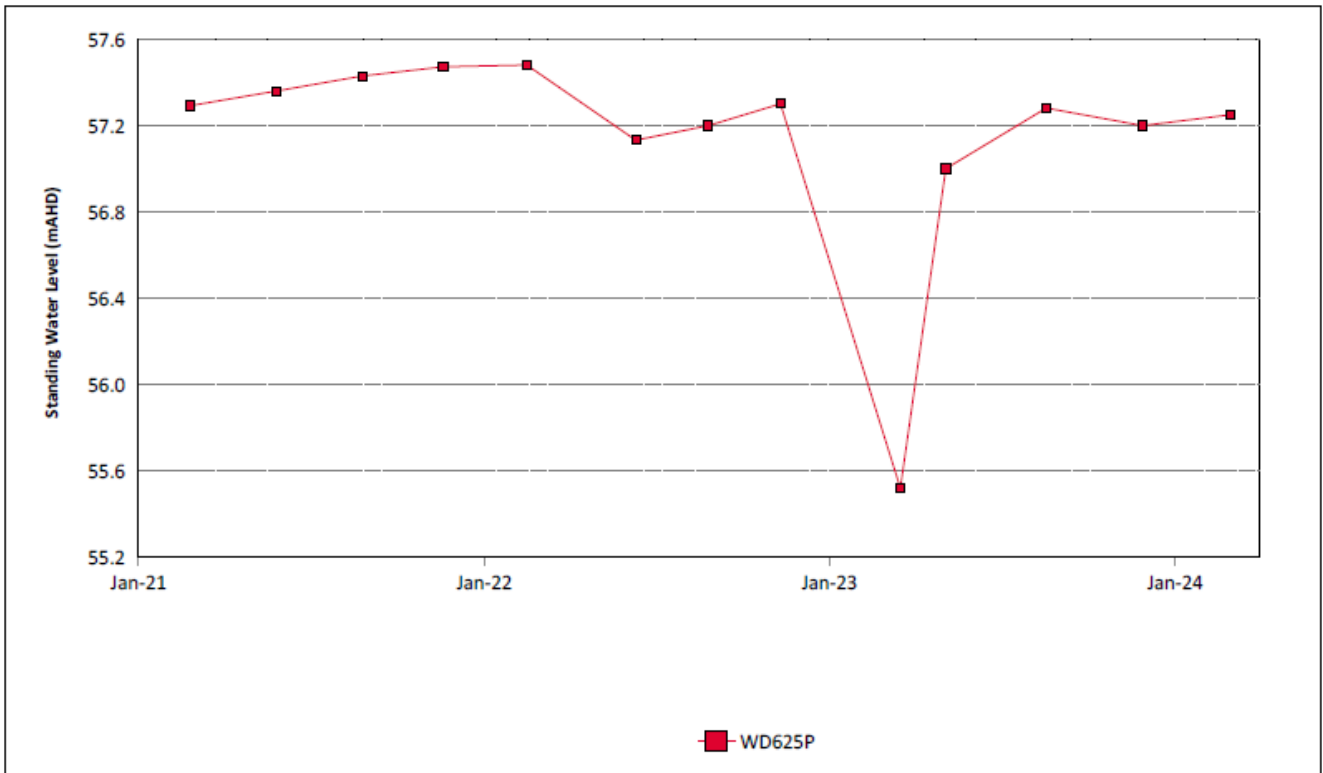


Figure 47: Woodlands Hill Seam Standing Water Level Trend - March 2024

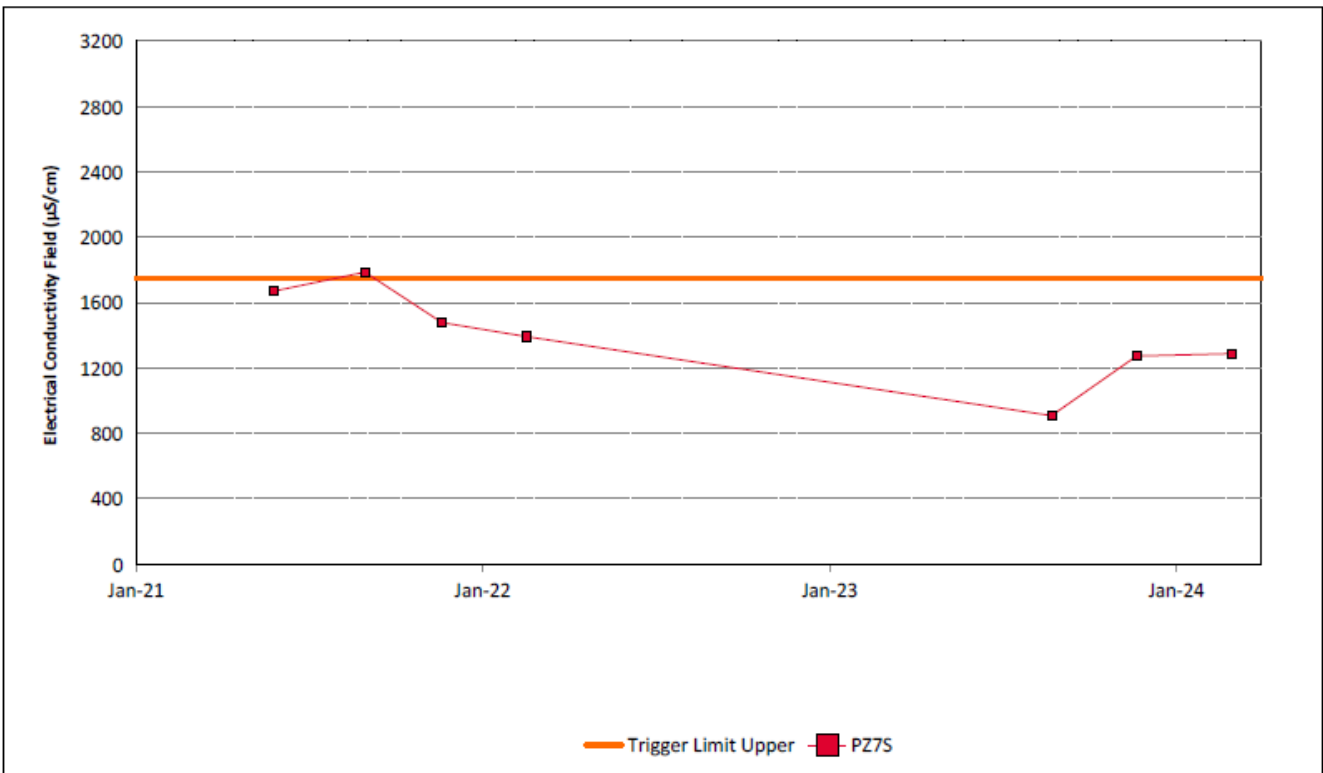


Figure 48: Aeolian Warkworth Sands Electrical Conductivity Field Trend – March 2024



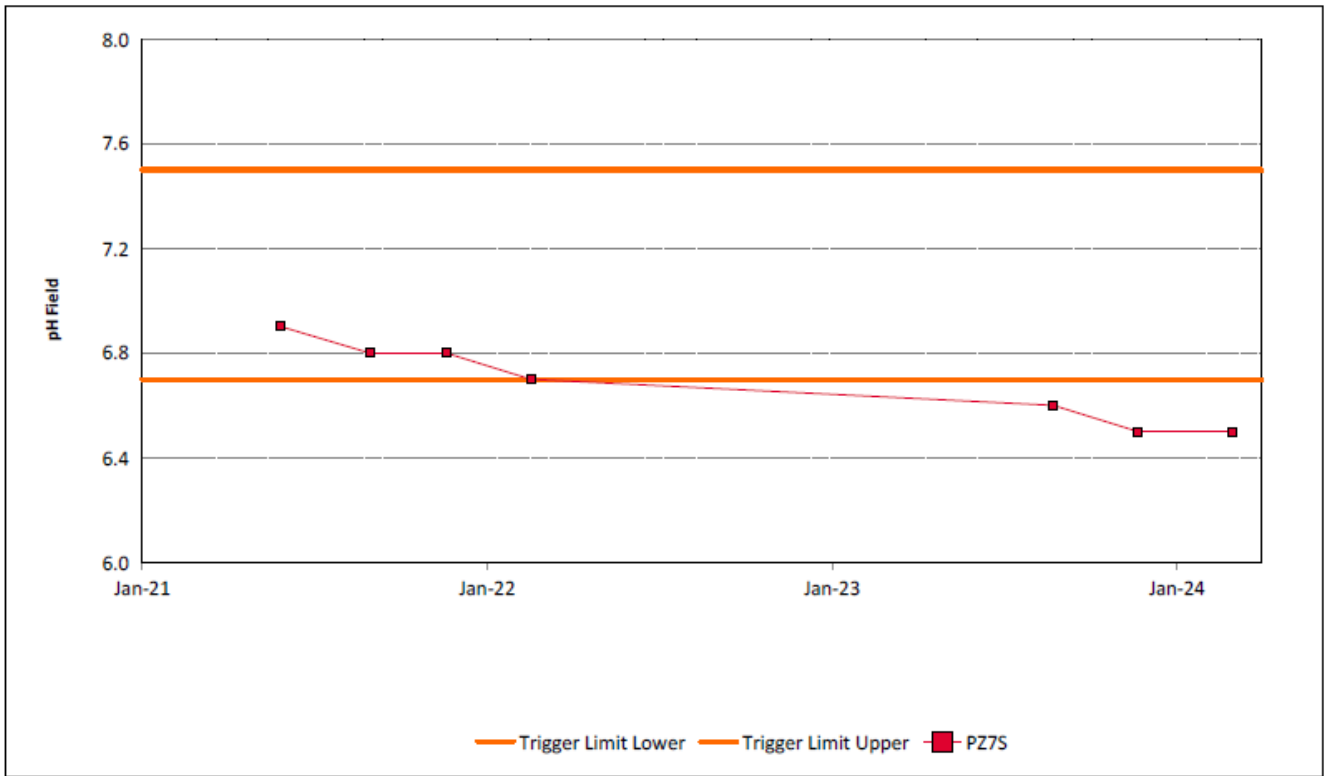


Figure 49: Aeolian Warkworth Sands pH Field Trend - March 2024

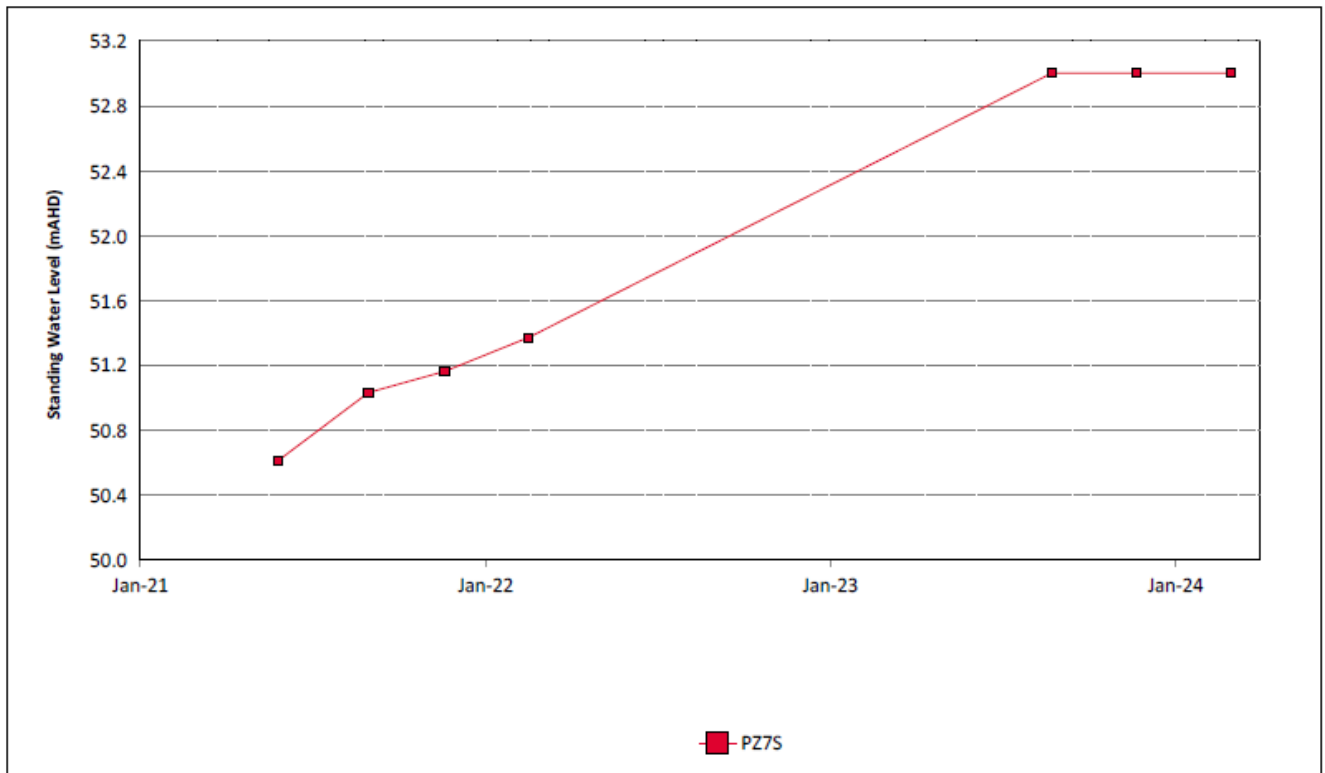


Figure 50: Aeolian Warkworth Sands Standing Water Level Trend – March 2024

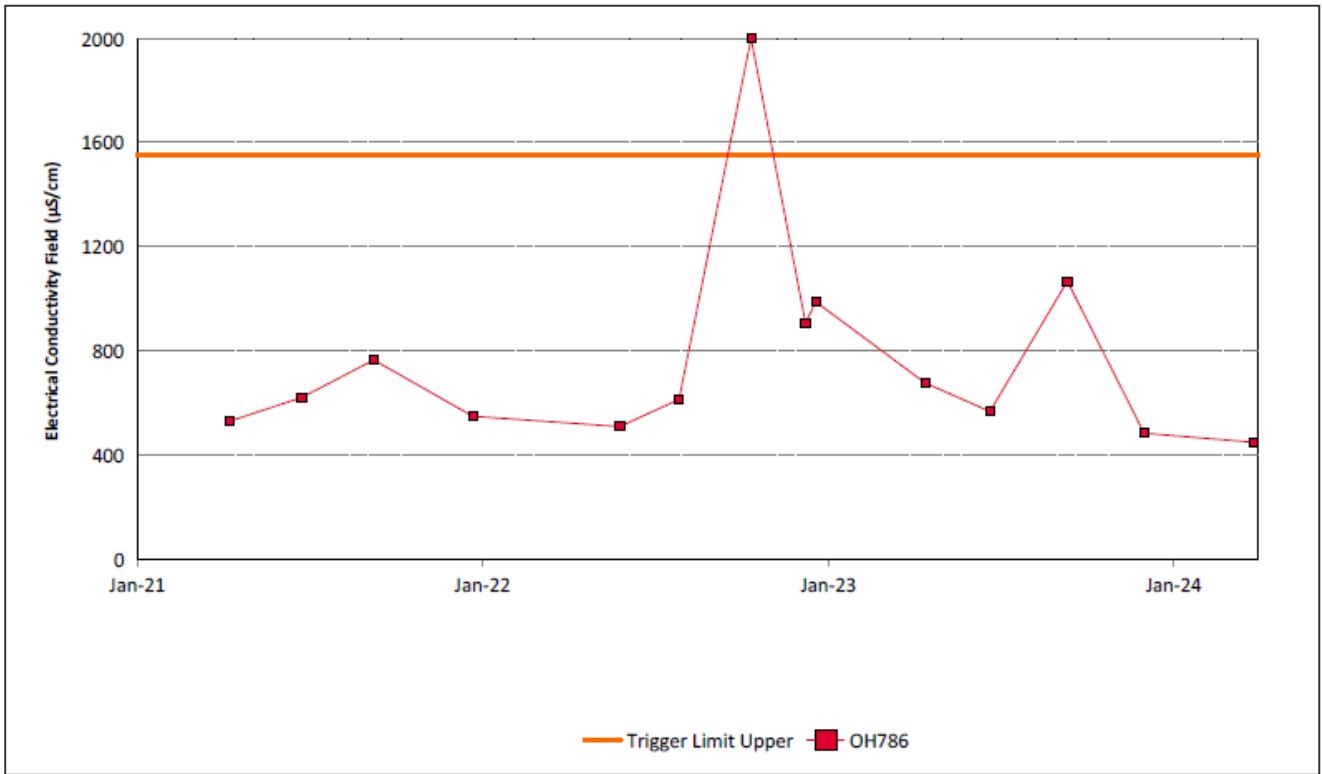


Figure 51: Hunter River Alluvium 1 Electrical Conductivity Field Trend – March 2024

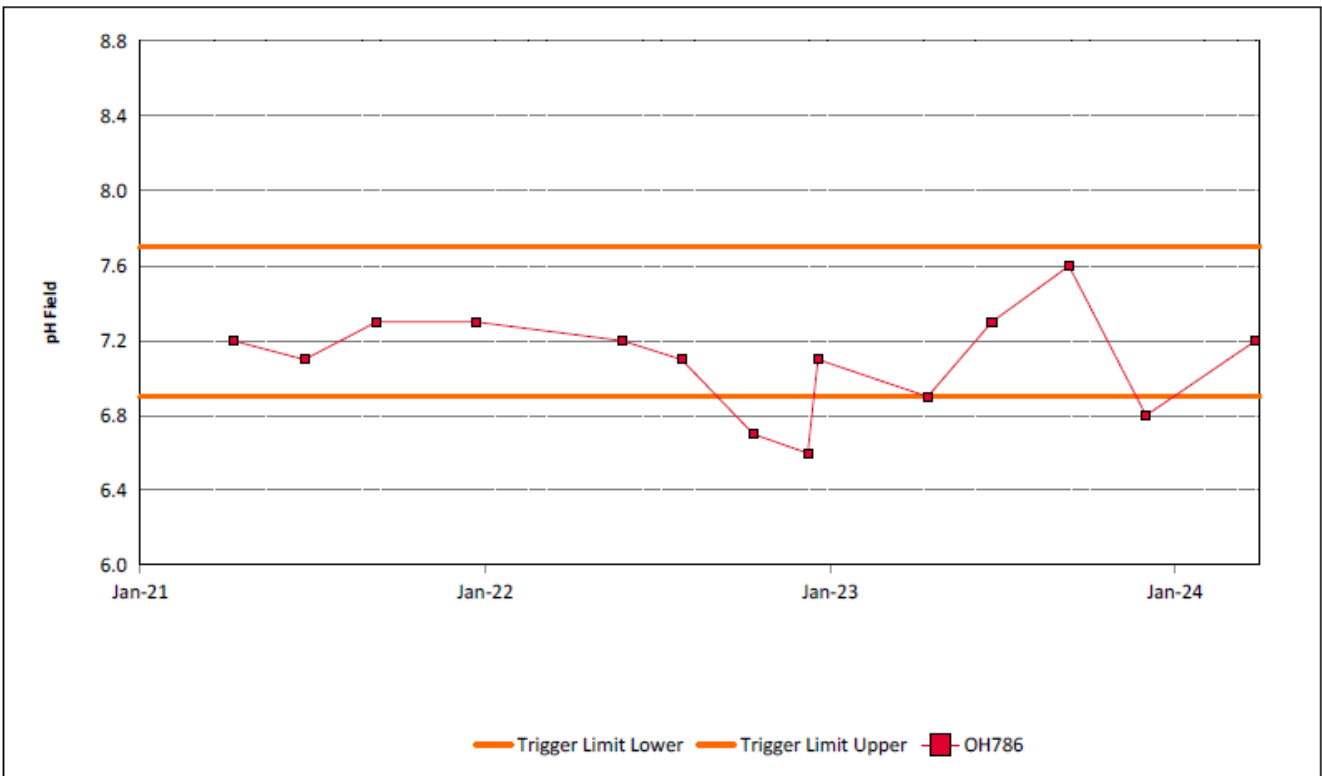


Figure 52: Hunter River Alluvium 1 pH Field Trend – March 2024

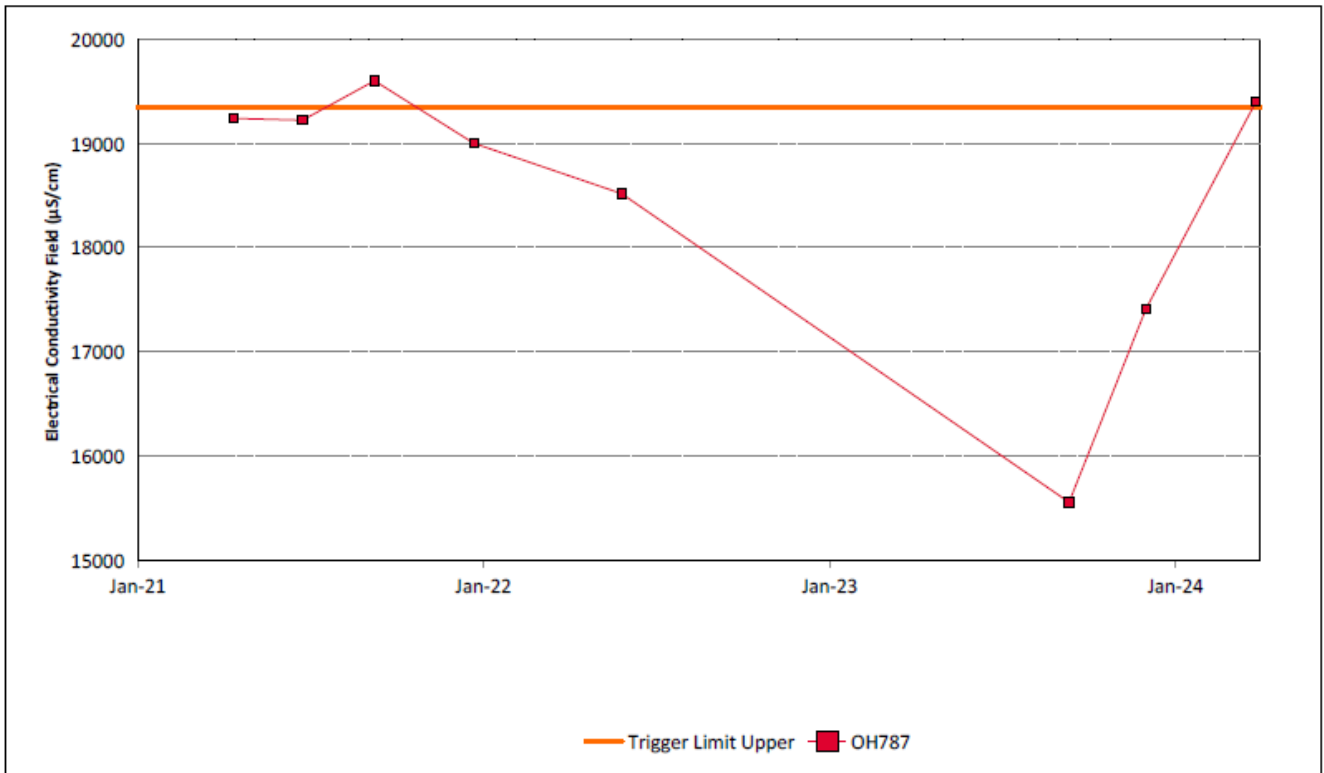


Figure 53: Hunter River Alluvium 2 Electrical Conductivity Field Trend - March 2024

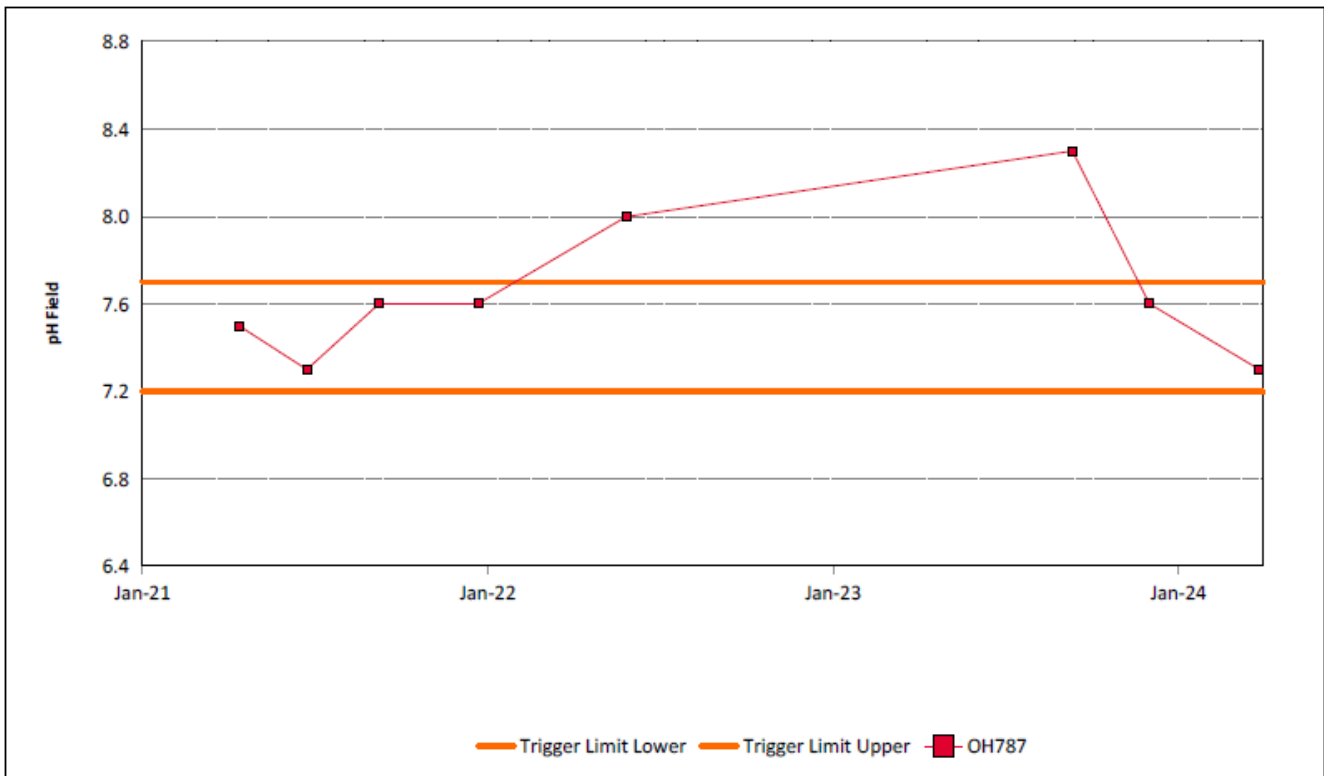


Figure 54: Hunter River Alluvium 2 pH Field Trend – March 2024

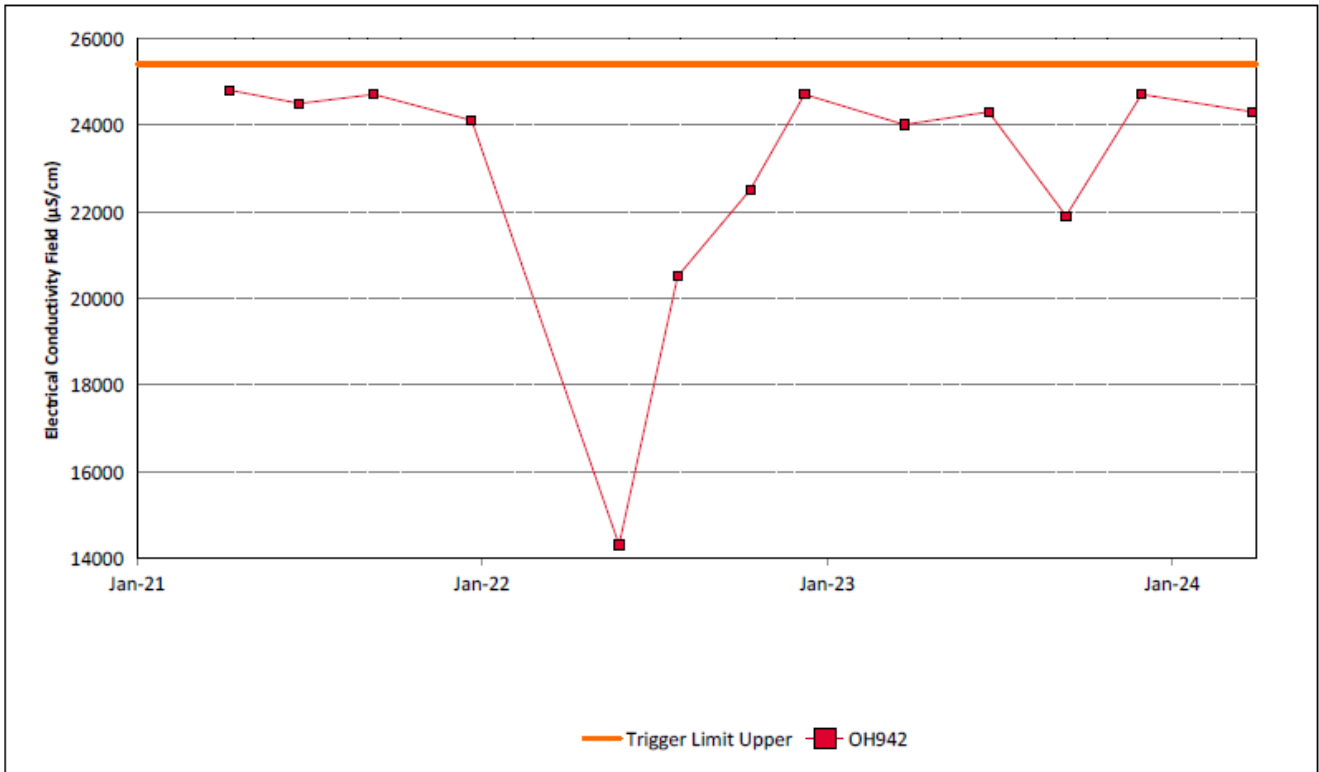


Figure 55: Hunter River Alluvium 3 Electrical Conductivity Field Trend – March 2024

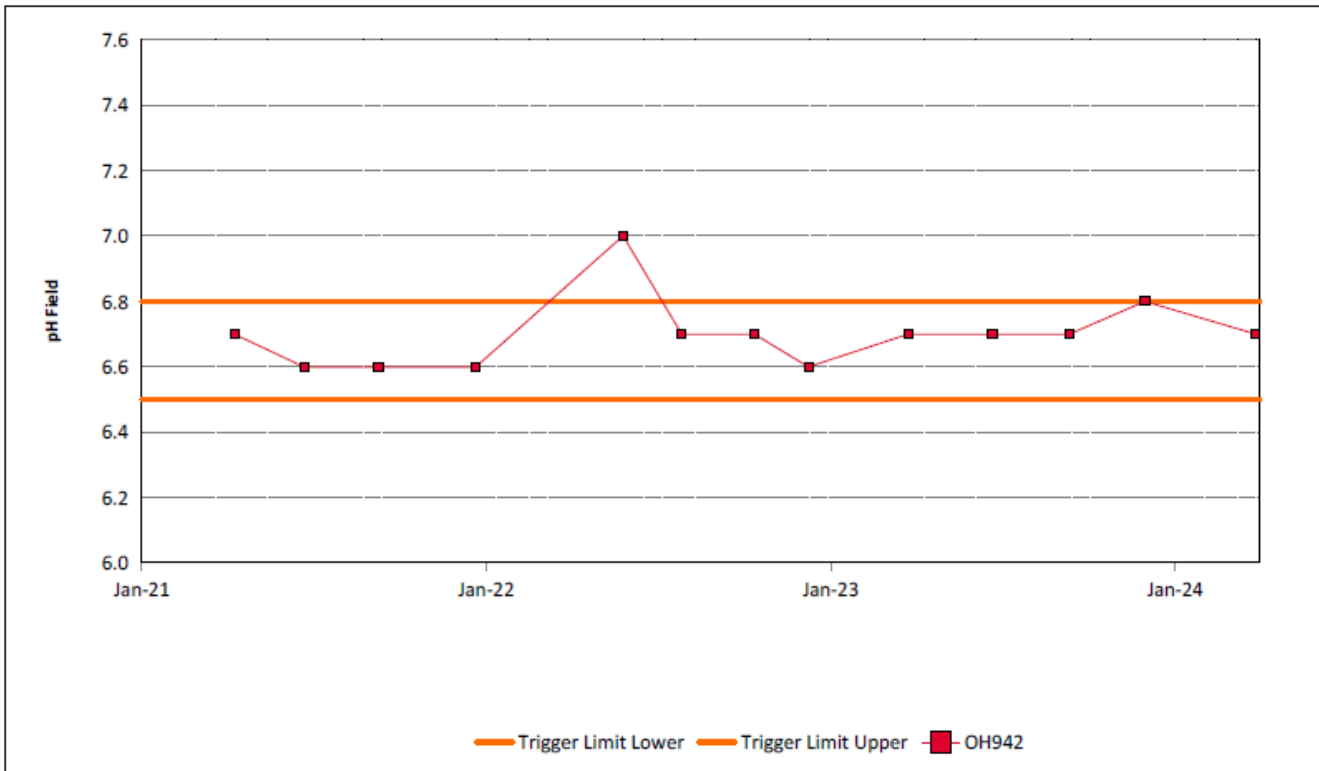


Figure 56: Hunter River Alluvium 3 pH Field Trend – March 2024

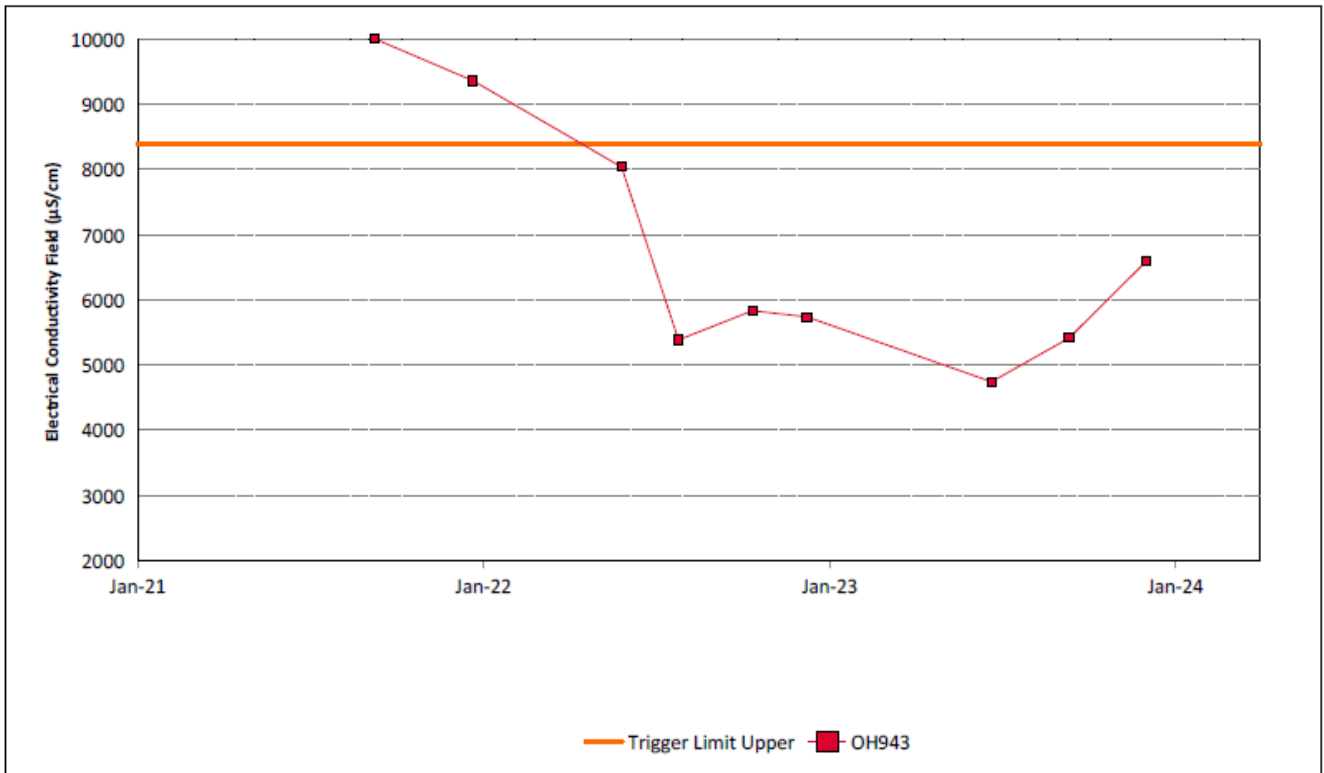


Figure 57: Hunter River Alluvium 4 Electrical Conductivity Field Trend – March 2024

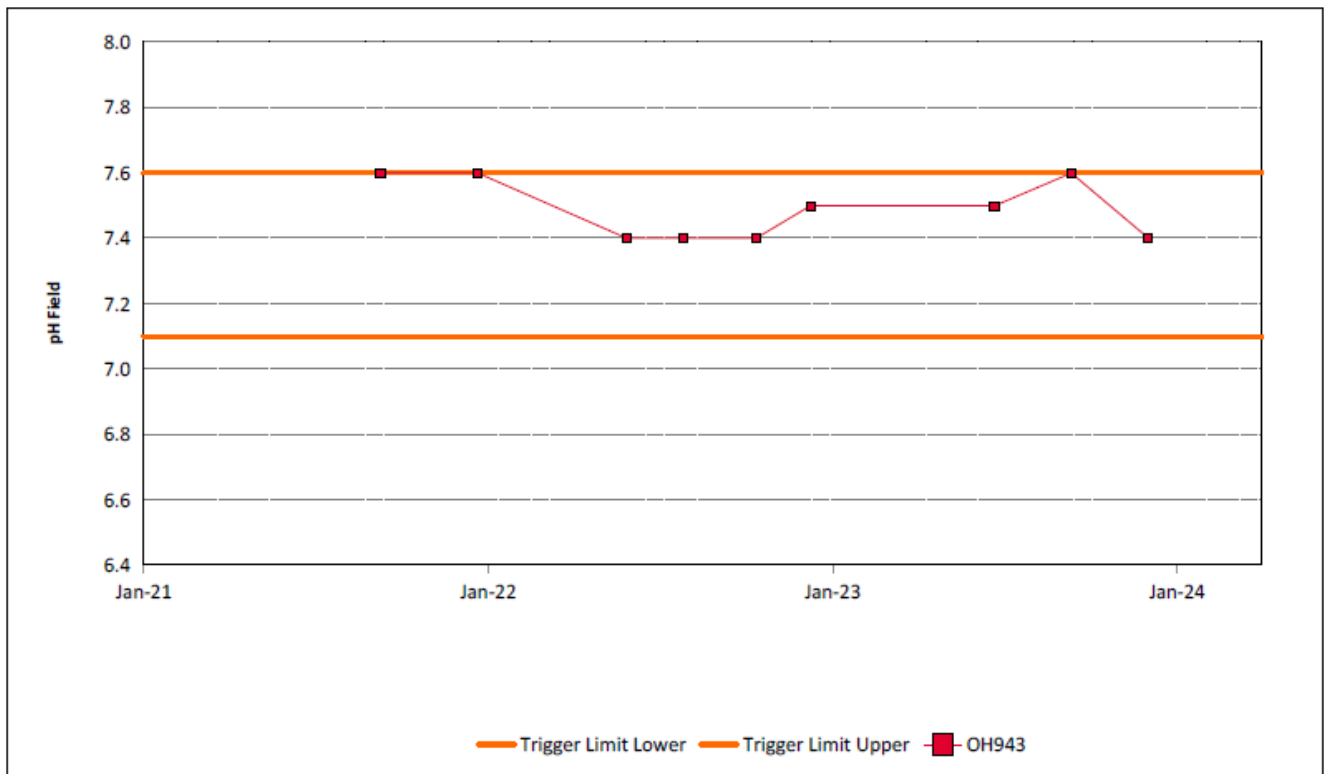


Figure 58: Hunter River Alluvium 4 pH Field Trend – March 2024

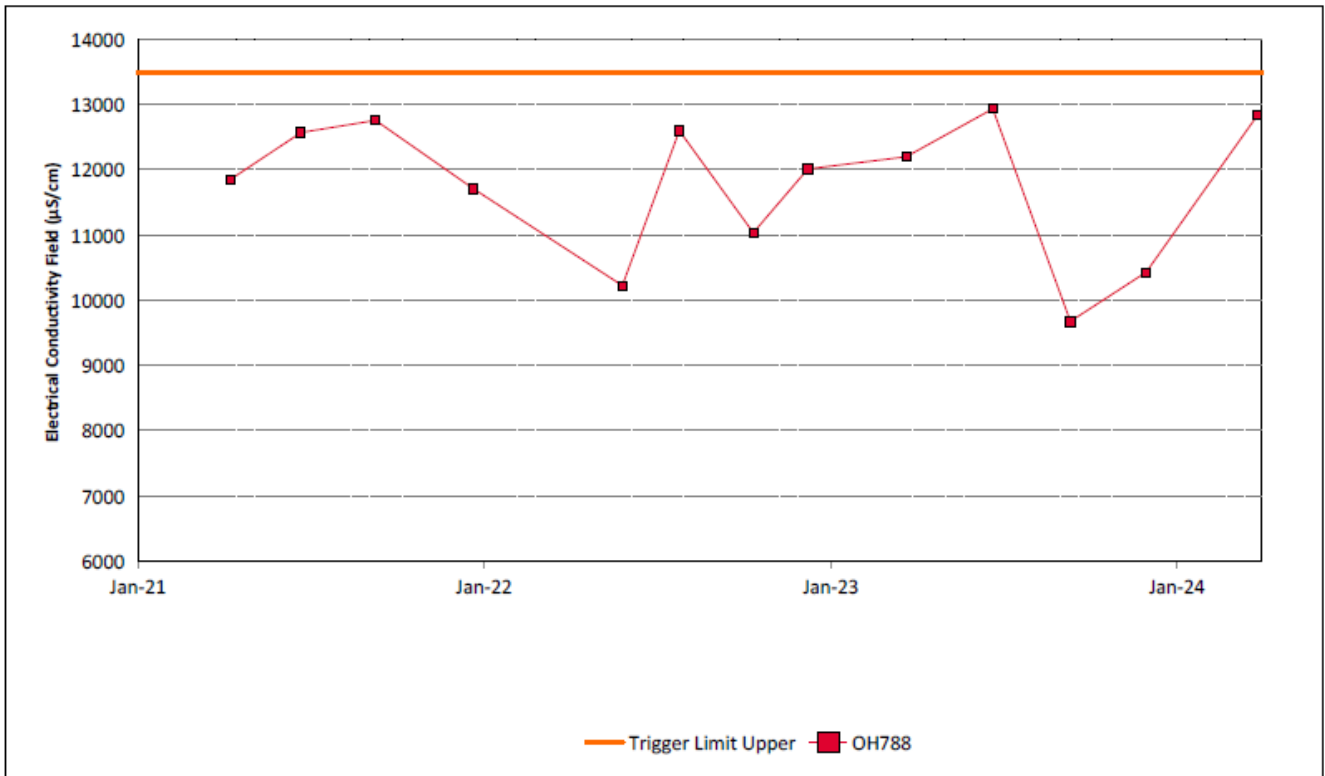


Figure 59: Hunter River Alluvium 5 Electrical Conductivity Field Trend – March 2024

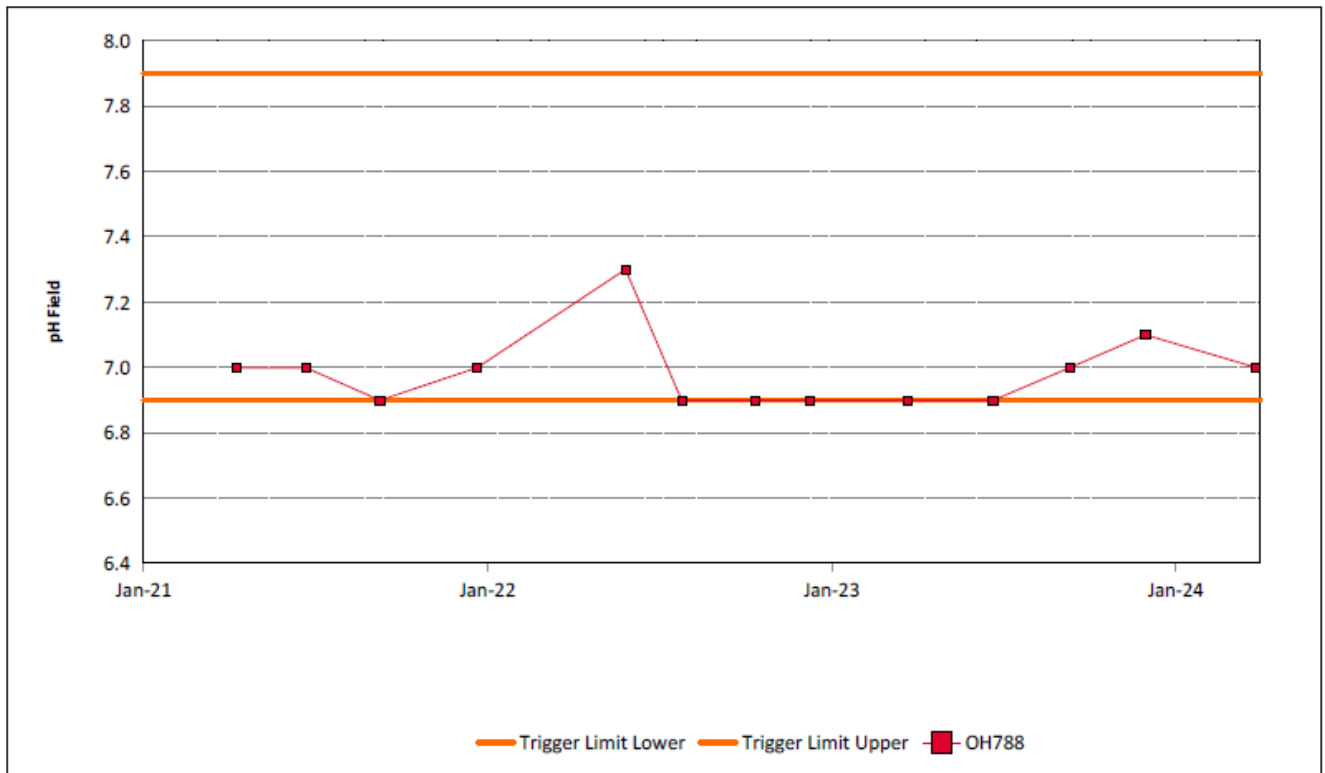


Figure 60: Hunter River Alluvium 5 pH Field Trend – March 2024

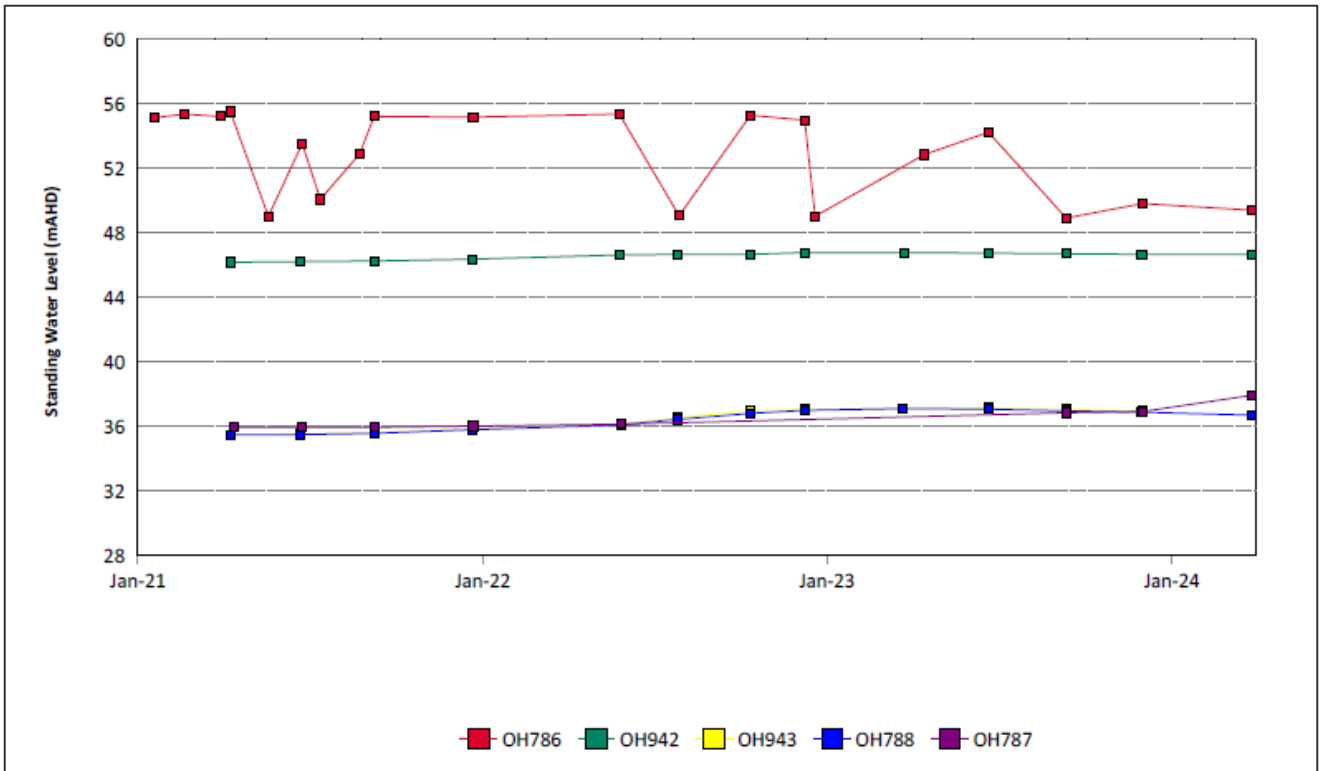


Figure 61: Hunter River Alluvium Standing Water Level Trend – March 2024

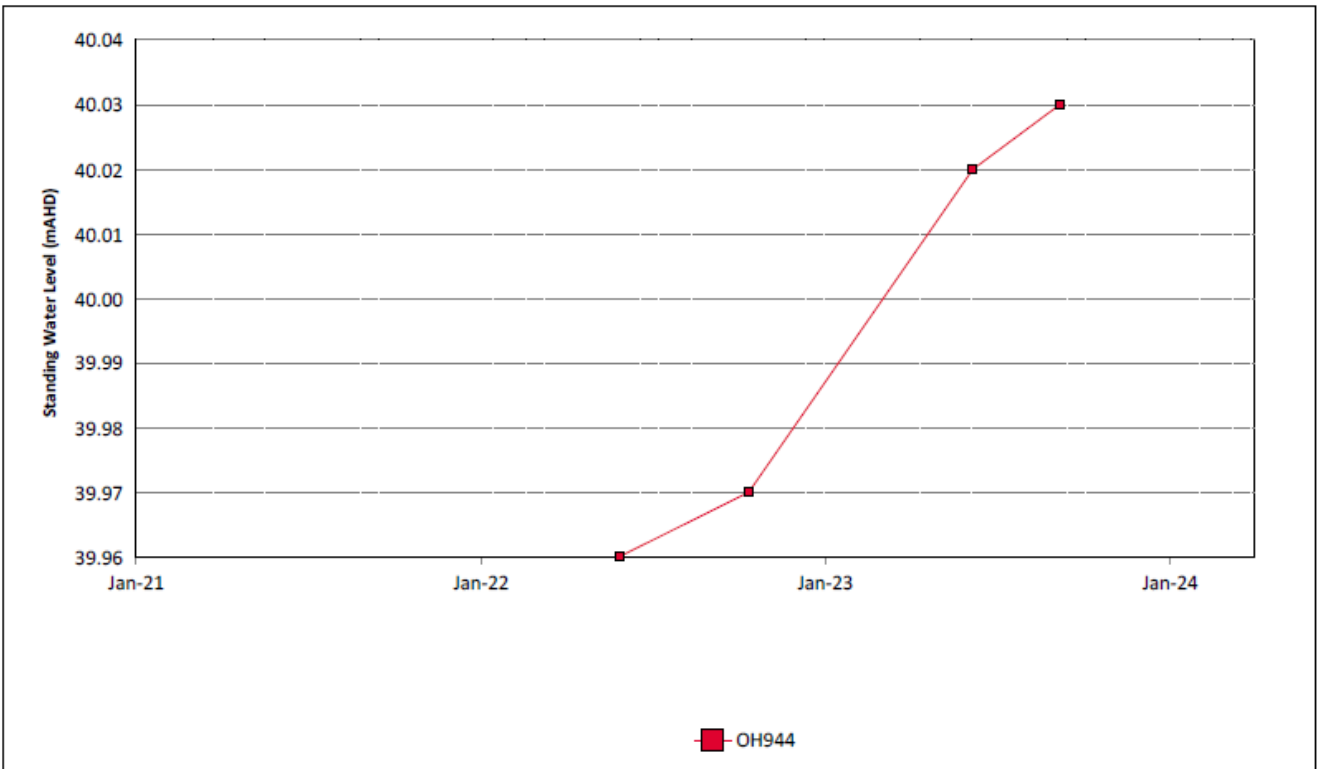


Figure 62: Whynot Seam Electrical Conductivity Field Trend – March 2024

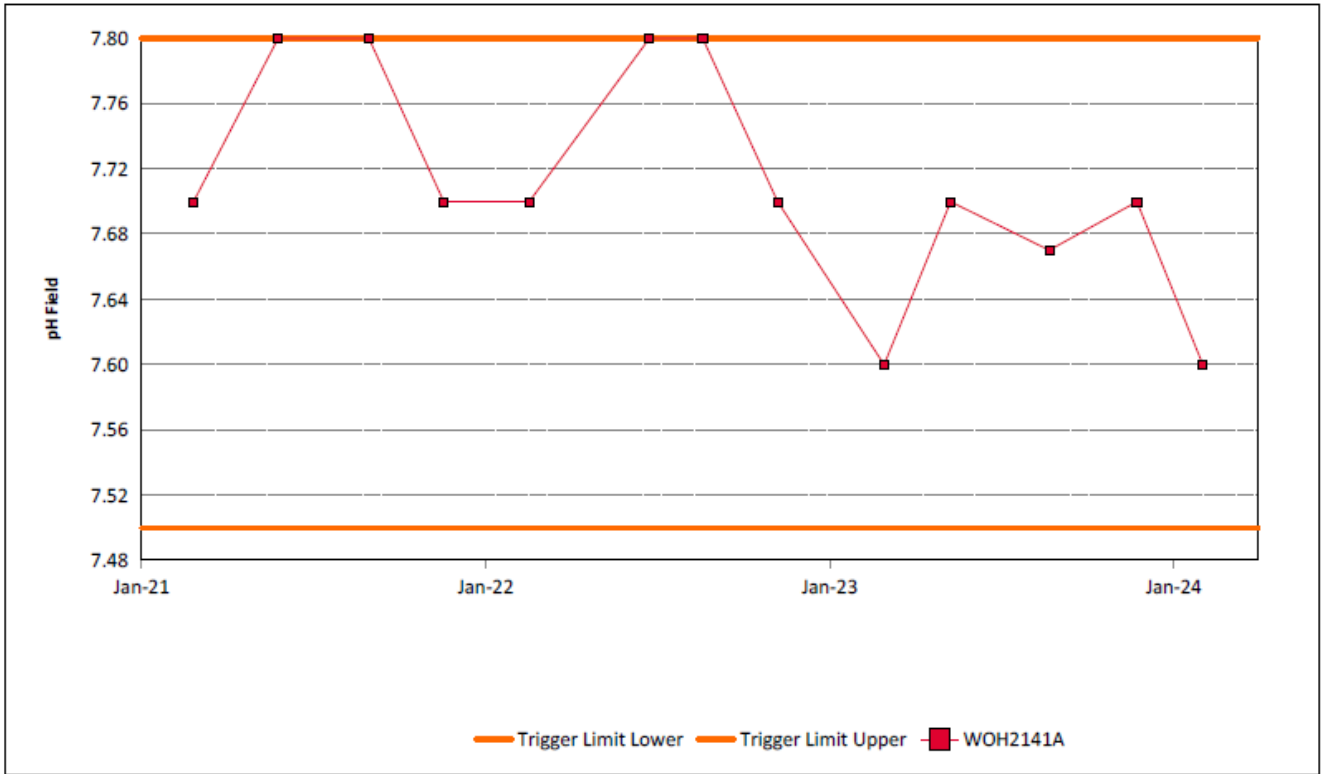


Figure 63: Whynot Seam pH Field Trend – March 2024

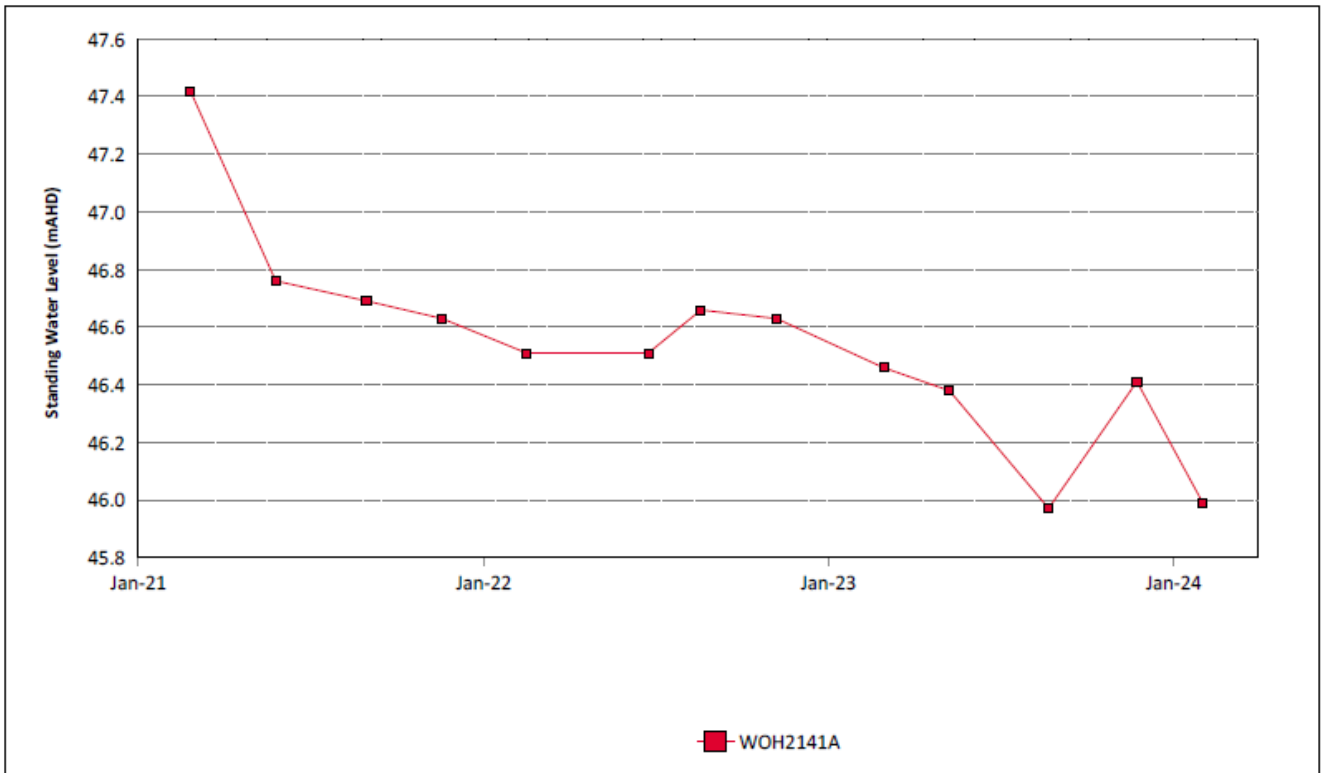


Figure 64: Whynot Seam Standing Water Level Trend – March 2024



### 3.3.1 Groundwater Trigger Tracking

Internal trigger limits have been developed to assess monitoring data on an on-going basis, and to highlight potentially adverse groundwater impacts. The process for evaluating monitoring results against the internal triggers and subsequent responses are outlined in the MTW Water Management Plan. Locations of groundwater bores are shown in **Figure 65**.

Current internal groundwater trigger limit breaches are summarised in **Table 3**

**Table 3: Groundwater Trigger Tracking – March 2024**

Site	Date	Trigger Limit Breached	Action Taken in Response
OH787	26/03/2024	EC – 95 <sup>th</sup> Percentile	Watching brief*
OH788	26/03/2024	EC – 95 <sup>th</sup> Percentile	Watching Brief*
PZ7S	29/02/2024	pH – 5 <sup>th</sup> Percentile	Investigation commenced (note: monitoring results 23/8/2023, 20/11/2023 also below 5 <sup>th</sup> percentile trigger).
OH1126	19/03/2024	pH – 5 <sup>th</sup> Percentile	Watching Brief*
MB15MTW01D	07/02/2024	pH – 5 <sup>th</sup> Percentile	Investigation previously completed. The consultant identified in their report that “it is likely the trigger values derived for shallow overburden bores do not accurately represent in-situ groundwater water quality for MB15MTW01D”. MB15MTW01D is part of a larger dataset from the shallow overburden seam. The 5th percentile of the seam is currently 6.3 while the 5th percentile of MB15MTW01D is 5.5. The result is consistent with previous results and within sample location trigger levels. No further investigation required.
WOH2156B	15/02/2024	pH – 5 <sup>th</sup> Percentile	Watching Brief*

\* = Watching brief established pending outcomes of subsequent monitoring events. No specific actions required.

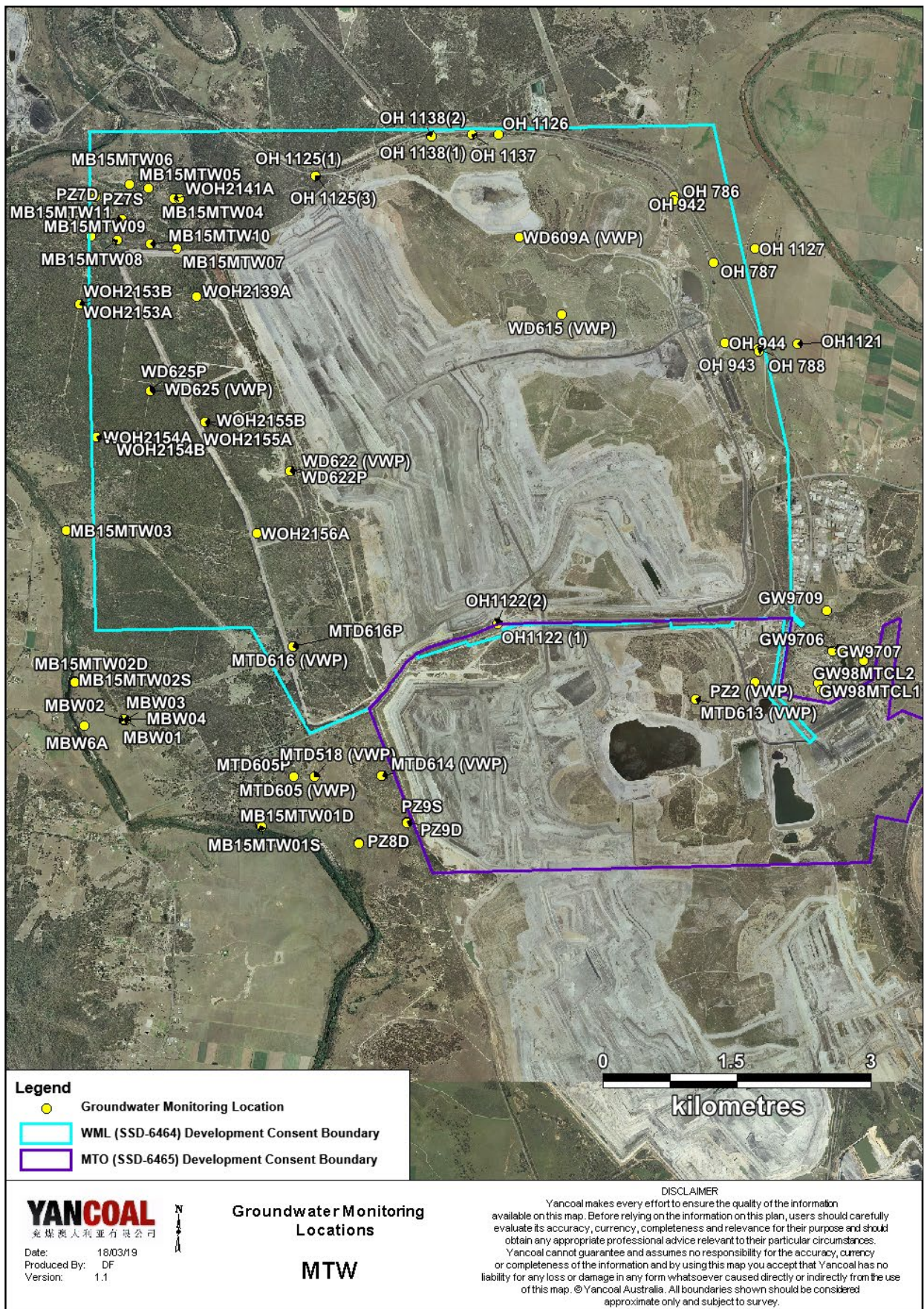


Figure 65: Groundwater Monitoring Location Plan

## 4.0 BLAST MONITORING

MTW have a network of six blast monitoring units. These are located at nearby privately owned residences and function as regulatory compliance monitors.

The location of these monitors can be found in **Figure 72**.

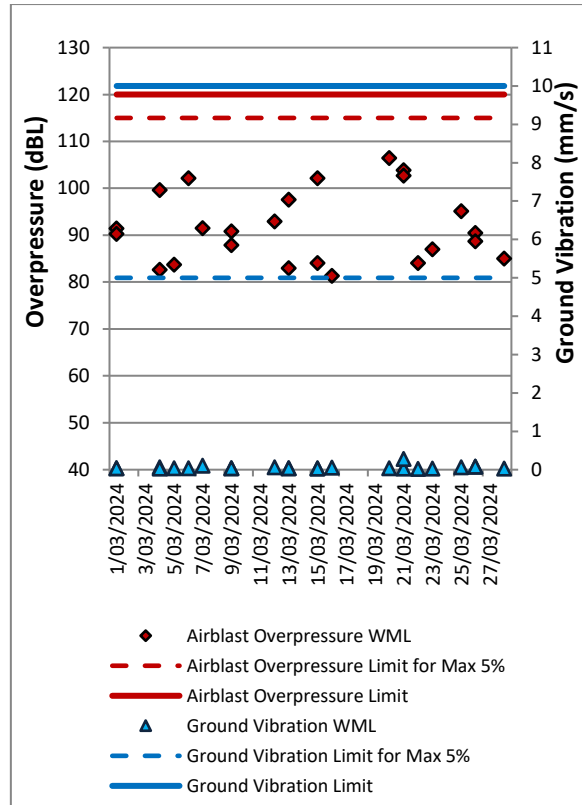
### 4.1 Blast Monitoring Results

During March 2024, 24 blasts were initiated at MTW. **Figure 9** to **Figure 14** show the blast monitoring results for the reporting period against the impact assessment criteria. The criteria are summarised in **Table 4**.

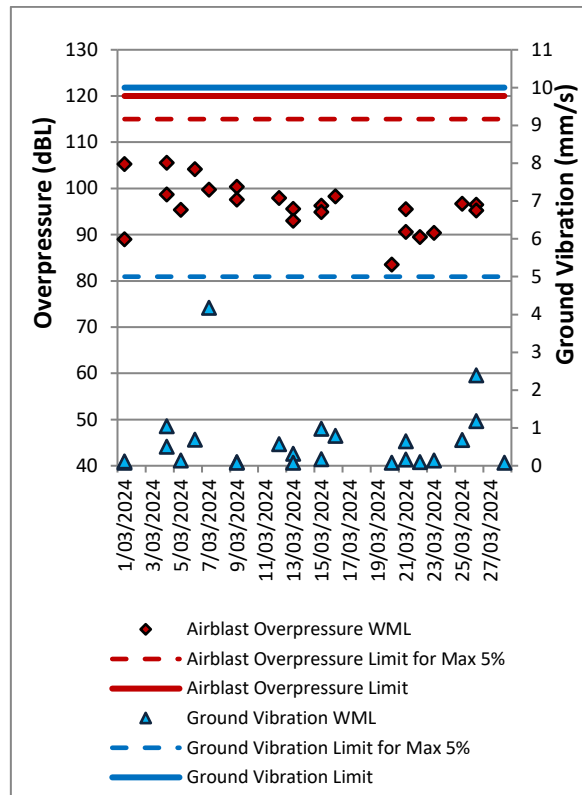
**Table 4: Blasting Limits**

Airblast Overpressure (dB(L))	Comments
115	5% of the total number of blasts in a 12 month period at WML or MTO
120	0%
Ground Vibration (mm/s)	Comments
5	5% of the total number of blasts in a 12 month period at WML or MTO
10	0%

During the reporting period no blasts exceeded the 5mm/s criteria for ground vibration, or the 115dB(L) threshold for airblast overpressure.



**Figure 66: Abbey Green Blast Monitoring Results – March 2024**



**Figure 67: Bulga Village Blast Monitoring Results – March 2024**

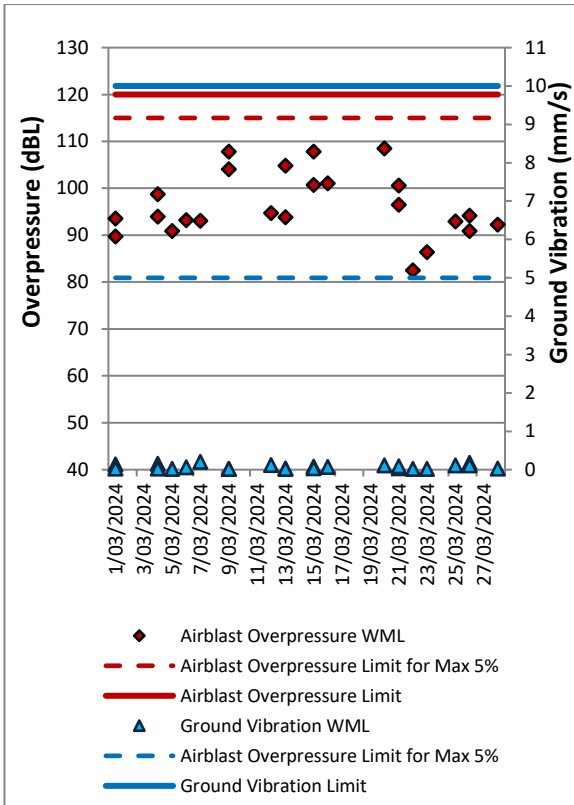


Figure 68: MTIE Blast Monitoring Results – March 2024

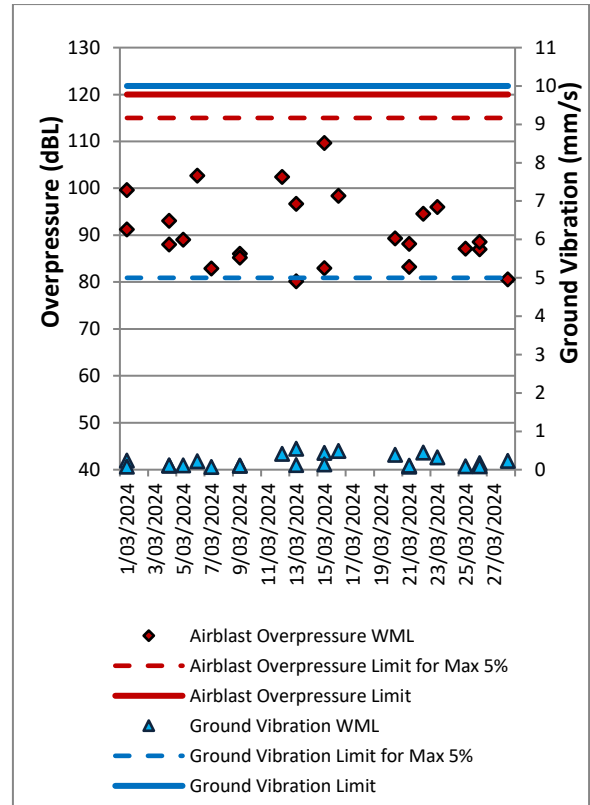


Figure 70: Warkworth Blast Monitoring Results – March 2024

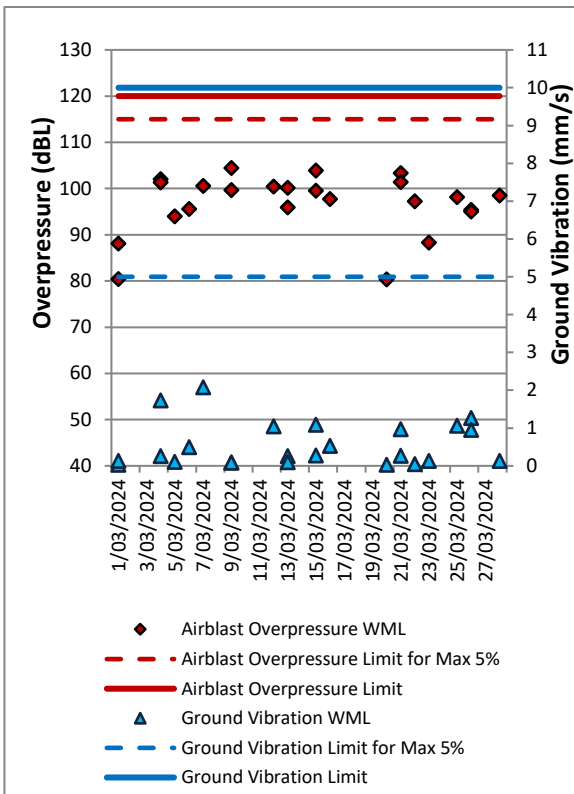


Figure 69: Wambo Road Blast Monitoring Results – March 2024

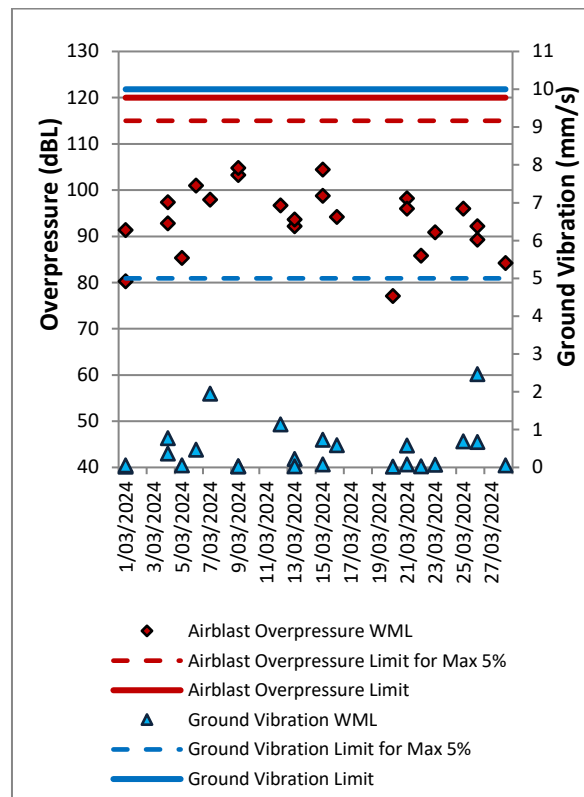


Figure 71: Wollemi Peak Road Blast Monitoring Results – March 2024

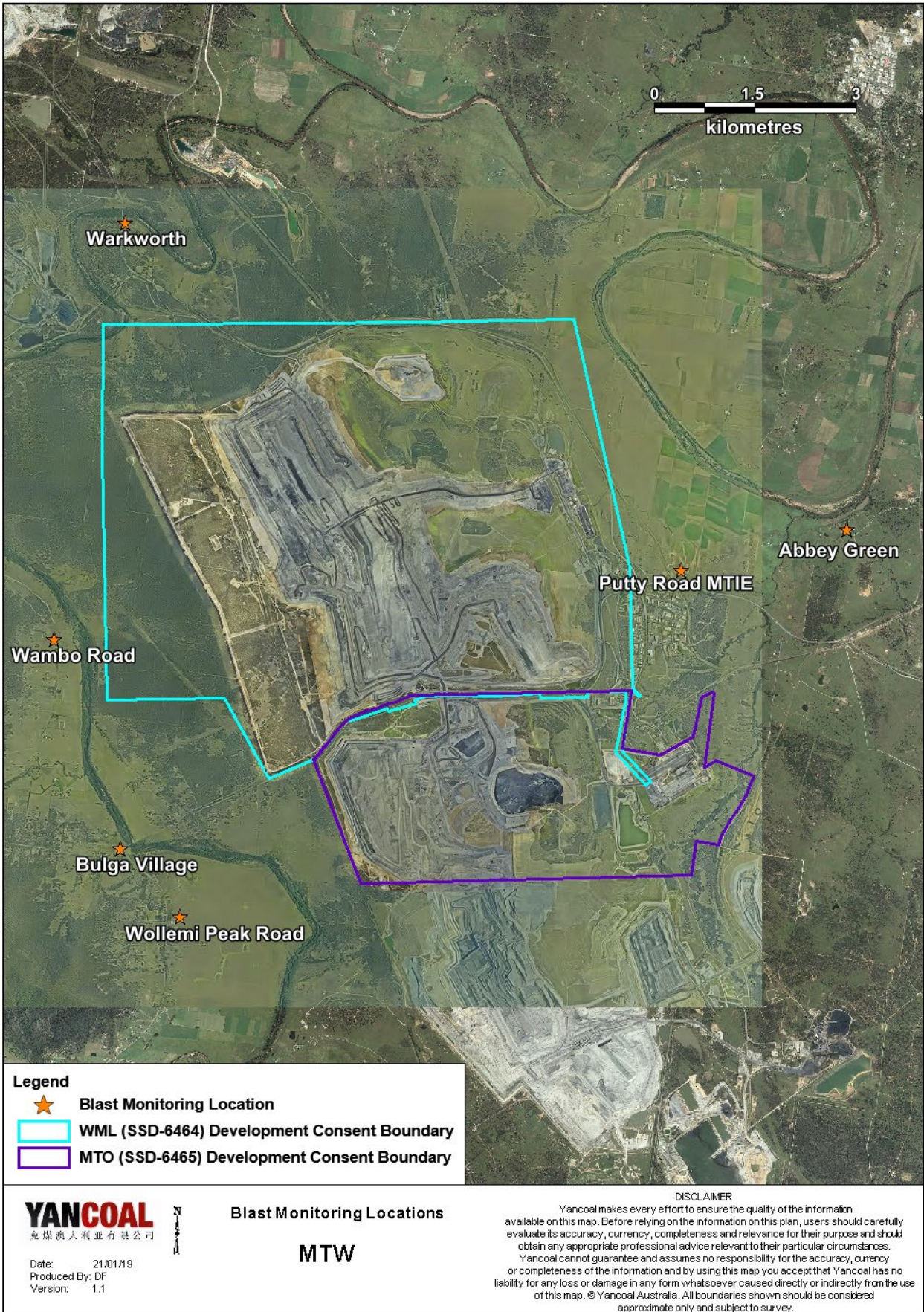


Figure 72: MTW Blast Monitoring Location Plan

## 5.0 NOISE

Routine attended noise monitoring is carried out in accordance with the MTW Noise Management Plan. A review against EIS predictions will be reported in the Annual Review. The purpose of the noise surveys is to quantify and describe the acoustic environment around the site and compare results with specified limits. Real time noise monitoring also occurs at five sites surrounding MTW. Noise monitoring locations are displayed in **Figure 73**.

### 5.1 Attended Noise Monitoring Results

Attended monitoring was conducted at receiver locations surrounding MTW on the night of 13 March 2024. All measurements complied with the relevant criteria. Results are detailed in **Table 5 to Table 8**.

#### 5.1.1 WML Noise Assessment

Compliance assessments undertaken against the WML noise criteria are presented in **Tables 5 and 6**.

**Table 5: L<sub>Aeq</sub>, 15 minute Warkworth Impact Assessment Criteria – March 2024**

Location	Date and Time	Wind Speed (m/s)	Stability Class	Criterion dB(A)	Criterion Applies? <sup>1</sup>	WML L <sub>Aeq</sub> dB <sup>2,3,4</sup>	Exceedance <sup>3,4</sup>
Bulga RFS	13/03/2024 22:52	2.2	F	37	No	<30	N/A
Bulga Village	13/03/2024 22:10	2.5	D	38	Yes	33	Nil
Gouldsville	13/03/2024 21:27	2.7	E	38	Yes	<30	Nil
Inlet Road	13/03/2024 21:22	2.7	E	37	Yes	34	Nil
Inlet Road West	13/03/2024 21:00	2.5	E	35	Yes	31	Nil
Long Point	13/03/2024 21:05	2.5	E	35	Yes	IA	Nil
South Bulga	13/03/2024 23:38	2.4	D	35	Yes	<25	Nil
Wambo Road	13/03/2024 21:48	2.5	D	38	Yes	34	Nil

Notes:

1. Noise criteria apply during all meteorological conditions except the following: wind speeds greater than 3 m/s measured at 10 metres above ground level; stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or stability category G temperature inversion conditions. Criterion may or may not apply due to rounding of meteorological data values;

2. Site-only L<sub>Aeq</sub>,15minute attributed to WML, including modifying factors if applicable;

3. Bold results in red indicate exceedance of relevant criterion; and

4. NA in exceedance column means atmospheric conditions outside conditions specified in consent, therefore criterion was not applicable.

**Table 6: L<sub>A1</sub>, 1 minute Warkworth - Impact Assessment Criteria – March 2024**

Location	Date and Time	Wind Speed (m/s)	Stability Class	Criterion dB(A)	Criterion Applies? <sup>1</sup>	WML L <sub>A1</sub> , 1min dB <sup>2,3,4</sup>	Exceedance <sup>3,4</sup>
Bulga RFS	13/03/2024 22:52	2.2	F	47	No	<30	N/A
Bulga Village	13/03/2024 22:10	2.5	D	48	Yes	36	Nil
Gouldsville	13/03/2024 21:27	2.7	E	48	Yes	<30	Nil
Inlet Road	13/03/2024 21:22	2.7	E	47	Yes	38	Nil
Inlet Road West	13/03/2024 21:00	2.5	E	45	Yes	35	Nil
Long Point	13/03/2024 21:05	2.5	E	45	Yes	IA	Nil
South Bulga	13/03/2024 23:38	2.4	D	45	Yes	<25	Nil
Wambo Road	13/03/2024 21:48	2.5	D	48	Yes	36	Nil

Notes:

1. Noise criteria apply during all meteorological conditions except the following: wind speeds greater than 3 m/s measured at 10 metres above ground level; stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or stability category G temperature inversion conditions. Criterion may or may not apply due to rounding of meteorological data values;

2. Site-only L<sub>A1</sub>,1minute attributed to WML;

3. Bold results in red indicate exceedance of relevant criterion; and

4. NA in exceedance column means atmospheric conditions outside conditions specified in consent, therefore criterion was not applicable.

## 5.1.2 MTO Noise Assessment

Compliance assessments undertaken against the MTO noise criteria are presented in **Table 7** and **8**.

**Table 7: L<sub>Aeq, 15minute</sub> Mount Thorley - Impact Assessment Criteria – March 2024**

Location	Date and Time	Wind Speed (m/s)	Stability Class	Criterion dB	Criterion Applies? <sup>1</sup>	MTO L <sub>Aeq</sub> dB <sup>2,3,4</sup>	Exceedance <sup>3,4</sup>
Bulga RFS	13/03/2024 22:52	2.2	F	37	No	32	N/A
Bulga Village	13/03/2024 22:10	2.5	D	38	Yes	<30	Nil
Gouldsville	13/03/2024 21:27	2.7	E	35	Yes	IA	Nil
Inlet Road	13/03/2024 21:22	2.7	E	37	Yes	30	Nil
Inlet Road West	13/03/2024 21:00	2.5	E	35	Yes	28	Nil
Long Point	13/03/2024 21:05	2.5	E	35	Yes	IA	Nil
South Bulga	13/03/2024 23:38	2.4	D	36	Yes	<30	Nil
Wambo Road	13/03/2024 21:48	2.5	D	38	Yes	27	Nil

Notes:

1. Noise criteria apply during all meteorological conditions except the following: wind speeds greater than 3 m/s measured at 10 metres above ground level; stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or stability category G temperature inversion conditions. Criterion may or may not apply due to rounding of meteorological data values;

2. Site-only L<sub>Aeq, 15minute</sub> attributed to MTO, including modifying factors if applicable;

3. Bold results in red indicate exceedance of relevant criterion; and

4. NA in exceedance column means atmospheric conditions outside conditions specified in consent, therefore criterion was not applicable.

**Table 8: L<sub>A1, 1Minute</sub> Mount Thorley - Impact Assessment Criteria – March 2024**

Location	Date and Time	Wind Speed (m/s)	Stability Class	Criterion dB	Criterion Applies? <sup>1</sup>	MTO L <sub>A1, 1min</sub> dB <sup>2,3,4</sup>	Exceedance <sup>3,4</sup>
Bulga RFS	13/03/2024 22:52	2.2	F	47	No	39	N/A
Bulga Village	13/03/2024 22:10	2.5	D	48	Yes	<30	Nil
Gouldsville	13/03/2024 21:27	2.7	E	45	Yes	IA	Nil
Inlet Road	13/03/2024 21:22	2.7	E	47	Yes	32	Nil
Inlet Road West	13/03/2024 21:00	2.5	E	47	Yes	30	Nil
Long Point	13/03/2024 21:05	2.5	E	47	Yes	IA	Nil
South Bulga	13/03/2024 23:38	2.4	D	45	Yes	<30	Nil
Wambo Road	13/03/2024 21:48	2.5	D	45	Yes	32	Nil

Notes:

1. Noise criteria apply during all meteorological conditions except the following: wind speeds greater than 3 m/s measured at 10 metres above ground level; stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or stability category G temperature inversion conditions. Criterion may or may not apply due to rounding of meteorological data values;

2. Site-only L<sub>A1, 1minute</sub> attributed to MTO;

3. Bold results in red indicate exceedance of relevant criterion; and

4. NA in exceedance column means atmospheric conditions outside conditions specified in consent, therefore criterion was not applicable.

### 5.1.3 NPfl Low Frequency Assessment

In accordance with the requirements of the EPA’s Noise Policy for Industry (NPfl), the applicability of the low frequency modification factor corrections has been assessed. There were no noise measurements taken during the reporting period which required the penalty to be applied. The WML assessment for low frequency noise is shown in **Table 9** and the MTO assessment for low frequency noise is shown in **Table 10**.

**Table 9: Warkworth Low Frequency Noise Assessment – March 2024**

Location	Date and Time	Measured WML LAeq dB	Criterion Applies?	Intermittency Modifying Factor?	Tonality Modifying Factor?	Frequency of Tonality <sup>1</sup>	Low-frequency Modifying Factor?	Maximum Exceedance of Reference Spectrum <sup>1,2</sup>	Penalty dB <sup>2</sup>
Bulga RFS	13/03/2024 22:52	<30	No	N/A	N/A	N/A	N/A	N/A	Nil
Bulga Village	13/03/2024 22:10	33	Yes	No	No	N/A	No	N/A	Nil
Gouldsville	13/03/2024 21:27	<30	Yes	No	No	N/A	No	N/A	Nil
Inlet Road	13/03/2024 21:22	34	Yes	No	No	N/A	No	N/A	Nil
Inlet Road West	13/03/2024 21:00	31	Yes	No	No	N/A	No	N/A	Nil
Long Point	13/03/2024 21:05	1A	Yes	No	No	N/A	No	N/A	Nil
South Bulga	13/03/2024 23:38	<25	Yes	No	No	N/A	No	N/A	Nil
Wambo Road	13/03/2024 21:48	34	Yes	No	No	N/A	No	N/A	Nil

Notes:

1. NA denotes 'not applicable'; and

2. Bold results indicate that application of NPfl modifying factor/s is required.



**Table 10: Mount Thorley Operations Low Frequency Noise Assessment – March 2024**

Location	Date and Time	Measured WML LAeq dB	Criterion Applies?	Intermittency Modifying Factor?	Tonality Modifying Factor?	Frequency of Tonality <sup>1</sup>	Low-frequency Modifying Factor?	Maximum Exceedance of Reference Spectrum <sup>1,2</sup>	Penalty dB <sup>2</sup>
Bulga RFS	13/03/2024 22:52	32	No	N/A	N/A	N/A	N/A	N/A	Nil
Bulga Village	13/03/2024 22:10	<30	Yes	No	No	N/A	No	N/A	Nil
Gouldsville	13/03/2024 21:27	IA	Yes	No	No	N/A	No	N/A	Nil
Inlet Road	13/03/2024 21:22	30	Yes	No	No	N/A	No	N/A	Nil
Inlet Road West	13/03/2024 21:00	28	Yes	No	No	N/A	No	N/A	Nil
Long Point	13/03/2024 21:05	IA	Yes	No	No	N/A	No	N/A	Nil
South Bulga	13/03/2024 23:38	<30	Yes	No	No	N/A	No	N/A	Nil
Wambo Road	13/03/2024 21:48	27	Yes	No	No	N/A	No	N/A	Nil

Notes:

1. NA denotes 'not applicable'; and

2. Bold results indicate that application of NPfI modifying factor/s is required.

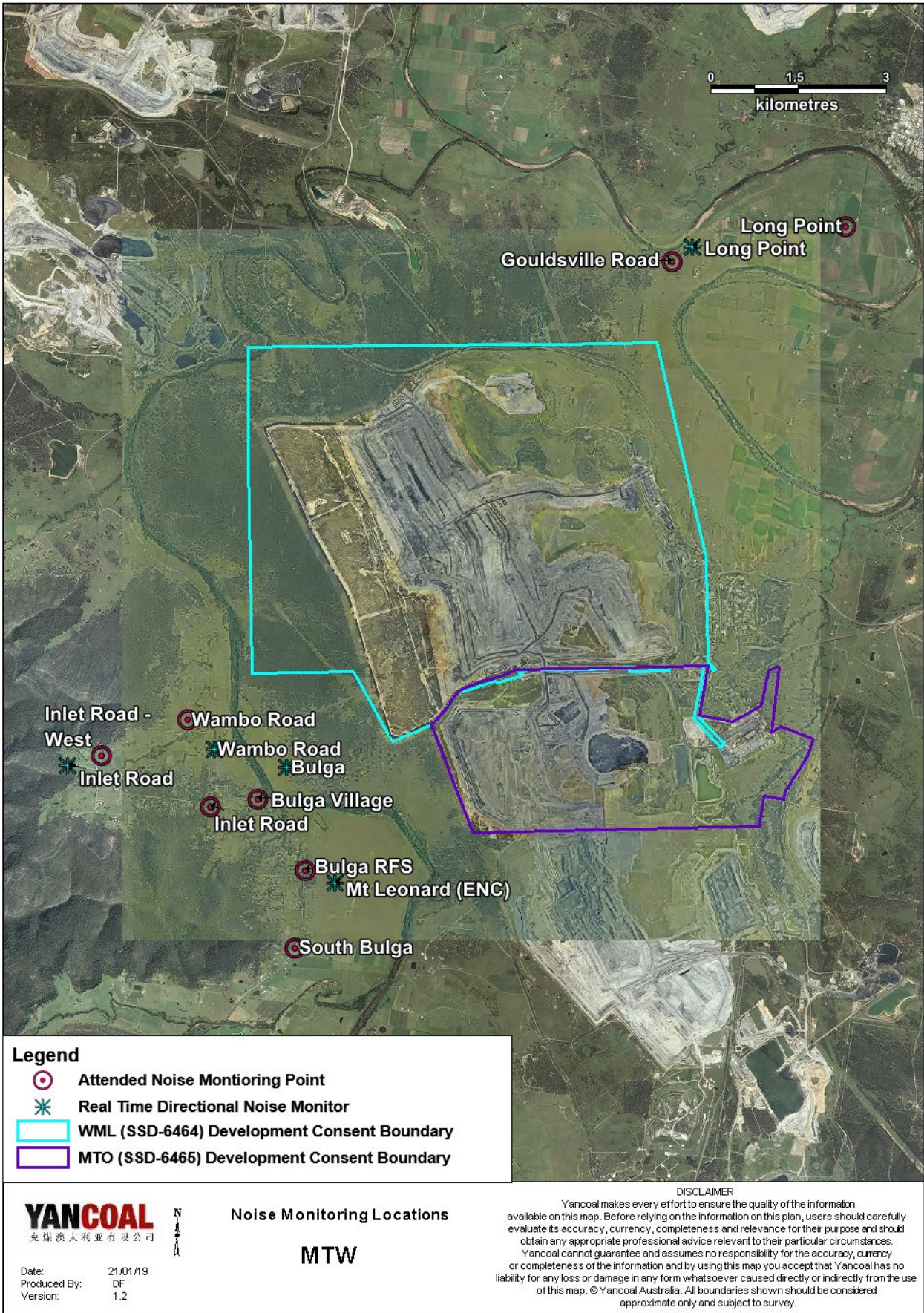


Figure 73: Noise Monitoring Location Plan

## 5.2 Noise Management Measures

A program of targeted supplementary attended noise monitoring is in place at MTW, supported by the real-time directional monitoring network and ensuring the highest level of noise management is maintained. The supplementary program is undertaken by MTW personnel and involves:

- Routine inspections from both inside and outside the mine boundary;
- Routine and as-required handheld noise assessments (undertaken in response to noise alarm and/or community complaint), comparing measured levels against consent noise limits; and
- Validation monitoring following operational modifications to assess the adequacy of the modifications.

Where a noise assessment identifies noise emissions which are exceeding the relevant noise limit(s) for any particular residence, modifications will be made to ensure that the noise event is resolved within 75 minutes of identification. The actions taken are commensurate with the nature and severity of the noise event, but can include:

- Changing the haul route to a less noise sensitive haul;
- Changing dump locations (in-pit or less exposed dump option);
- Reducing equipment numbers;
- Shut down of task; or
- Site shut down.

A summary of these assessments undertaken are provided in **Table 11**.

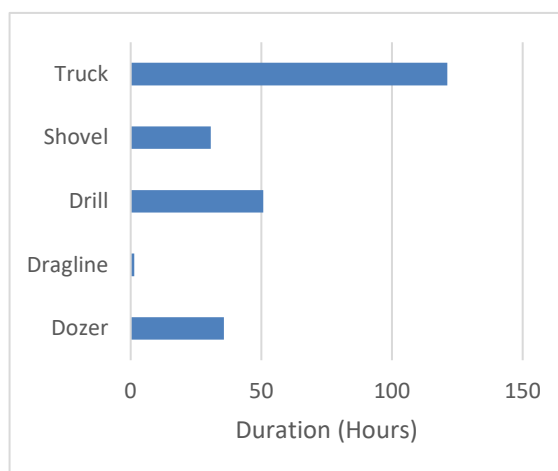
**Table 11: Supplementary Attended Noise Monitoring Data – March 2024**

No. of assessments	No. of assessments > trigger	No. of nights where assessments > trigger	% greater than trigger
648	10	7	1.5

Note: Measurements are taken under all meteorological conditions, including conditions under which the consent noise criteria do not apply.

## 6.0 OPERATIONAL DOWNTIME

During March, a total of 239.7 hours of equipment downtime was logged in response to environmental events such as dust, noise and adverse meteorological conditions. Operational downtime by equipment type is shown in **Figure 74**.



**Figure 74: Operational Downtime by Equipment Type – March 2024**

## 7.0 REHABILITATION

During March 2024, 5.14 Ha of land was released, 6.04 Ha was bulk shaped and 6.80 Ha was topsoiled.

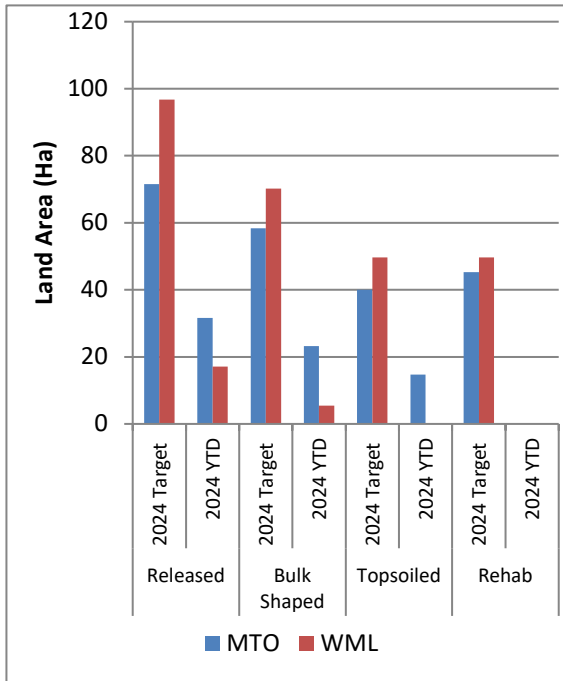


Figure 75: Rehabilitation YTD – March 2024

## 8.0 ENVIRONMENTAL INCIDENTS

There were no environmental incidents during the reporting period.

## 9.0 COMPLAINTS

Six complaints were received during the reporting period. Details of these complaints are shown in **Table 12**.

Table 12: Complaints Summary YTD

	Noise	Dust	Blast	Lighting	Other	Total
January	1	3	5	2	0	11
February	3	4	1	0	0	8
March	3	1	2	0	0	6
April						
May						
June						
July						
August						
September						
October						
November						
December						
<b>Total</b>	<b>7</b>	<b>8</b>	<b>8</b>	<b>2</b>	<b>0</b>	<b>25</b>

## **Appendix A: Meteorological Data**

**Table 13: Meteorological Data – Charlton Ridge Meteorological Station – March 2024**

Date	Air Temperature		Relative Humidity		Wind Direction	Wind Speed	Rainfall
	Maximum (°C)	Minimum (°C)	Maximum (%)	Minimum (%)	Average (°)	Average (m/sec)	total (mm)
1/03/2024	34	21	92	42	156	1.5	0.0
2/03/2024	38	19	98	33	184	2.6	1.0
3/03/2024	34	17	100	19	196	2.1	0.0
4/03/2024	24	17	89	52	140	3.1	0.0
5/03/2024	28	14	88	42	141	2.4	0.0
6/03/2024	33	14	98	34	177	1.6	0.0
7/03/2024	34	18	91	31	162	2.1	0.0
8/03/2024	31	18	96	36	137	2.8	0.0
9/03/2024	30	17	92	38	121	2.6	0.0
10/03/2024	32	16	97	34	135	2.8	0.0
11/03/2024	30	16	96	35	134	2.4	0.0
12/03/2024	35	14	100	23	175	2.1	0.0
13/03/2024	32	16	89	26	155	2.9	0.0
14/03/2024	38	15	100	21	199	2.9	0.0
15/03/2024	24	15	90	44	160	4.2	0.0
16/03/2024	24	14	85	50	151	2.9	0.0
17/03/2024	26	15	100	54	148	1.6	7.8
18/03/2024	26	16	100	59	170	1.9	10.4
19/03/2024	29	18	98	50	144	1.1	0.0
20/03/2024	26	16	100	67	230	2.3	6.2
21/03/2024	23	13	86	33	154	3.2	0.0
22/03/2024	24	13	94	51	164	2.3	0.0
23/03/2024	25	11	100	46	155	1.6	0.0
24/03/2024	29	16	92	39	157	1.7	0.0
25/03/2024	31	14	100	26	200	1.5	0.0
26/03/2024	31	14	86	27	162	2.0	0.0
27/03/2024	28	16	95	44	157	3.0	0.0
28/03/2024	29	15	99	41	160	2.8	0.0
29/03/2024	27	15	95	48	140	2.1	0.0
30/03/2024	29	12	100	40	178	1.6	0.0
31/03/2024	27	13	100	43	150	1.9	0.0