



# Monthly Environmental Monitoring Report

Yancoal Mount Thorley Warkworth

August 2024

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## Revision History

Version No.	Version Details	Date
1.0	Final	8/11/2024

## 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 August to 31 August 2024.

## 2.0 AIR QUALITY

### 2.1 Meteorological Monitoring

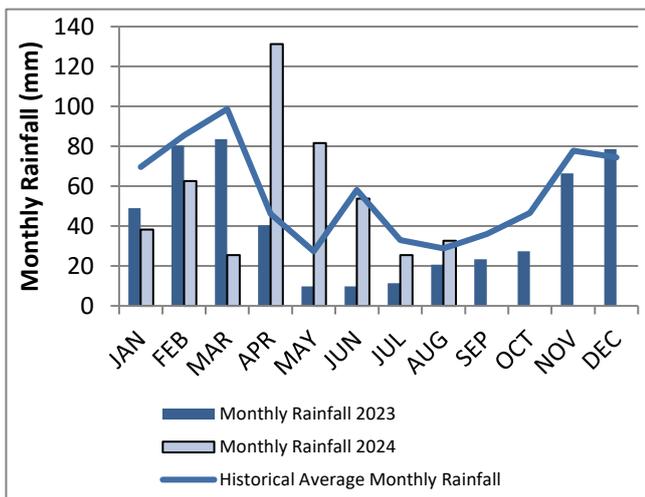
Meteorological data is collected at MTW’s ‘Charlton Ridge’ meteorological station (refer to **Figure 3**).

#### 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)
August	32.6	450.8

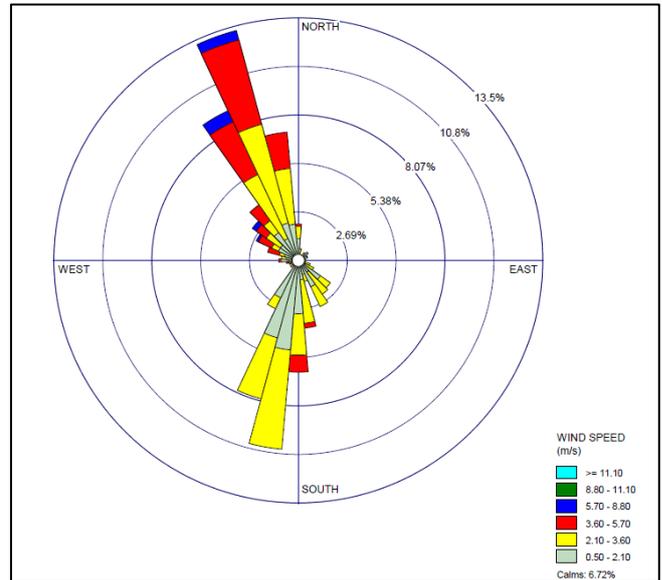


**Figure 1: Rainfall Trend YTD**

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

### 2.1.2 Wind Speed and Direction

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



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

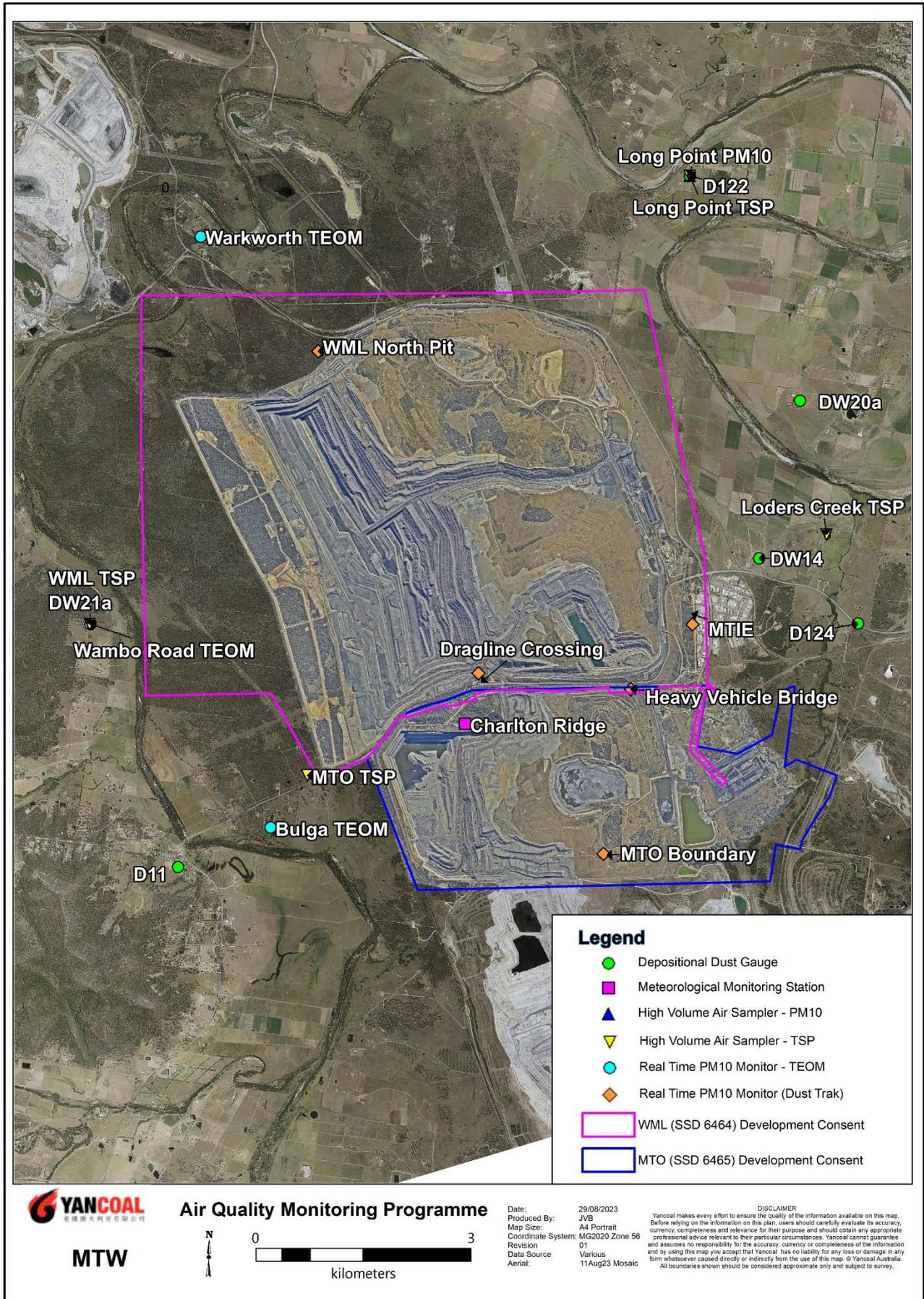


Figure 3: Air Quality Monitoring Locations

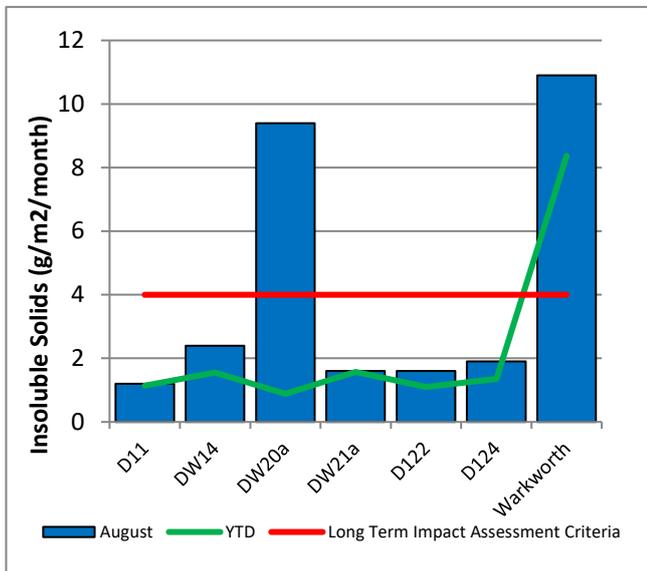
## 2.2 Depositional Dust

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, monitors at the Warkworth and DW20a monitoring locations recorded a monthly result above the long-term impact assessment criteria of 4.0 g/m<sup>2</sup> per month. Field notes associated with the result at DW20a (9.4 g/m<sup>2</sup>) confirm the presence of insects, vegetation, and bird droppings. As such this result is considered contaminated and will be excluded from calculation of the annual average. There is no evidence to suggest that the result at Warkworth (10.7 g/m<sup>2</sup>) is contaminated, as such 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 – August 2024**

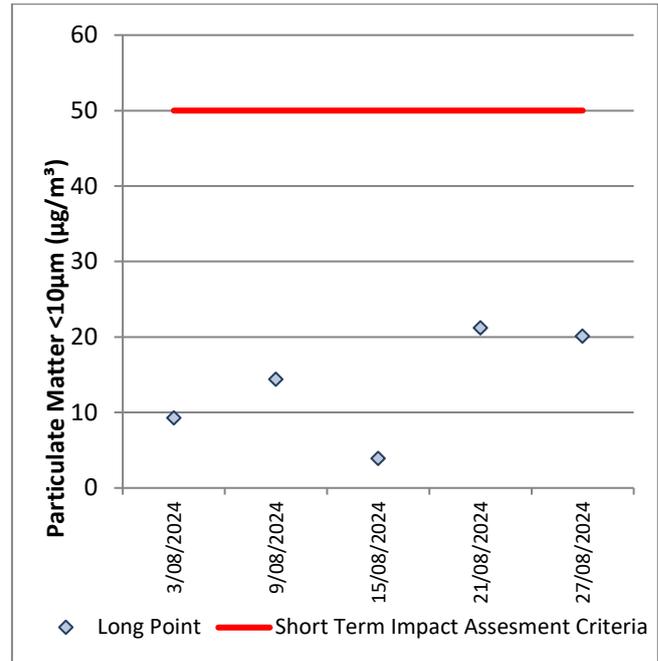
## 2.3 Suspended Particulates

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>.



**Figure 5: Individual PM<sub>10</sub> Results – August 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.

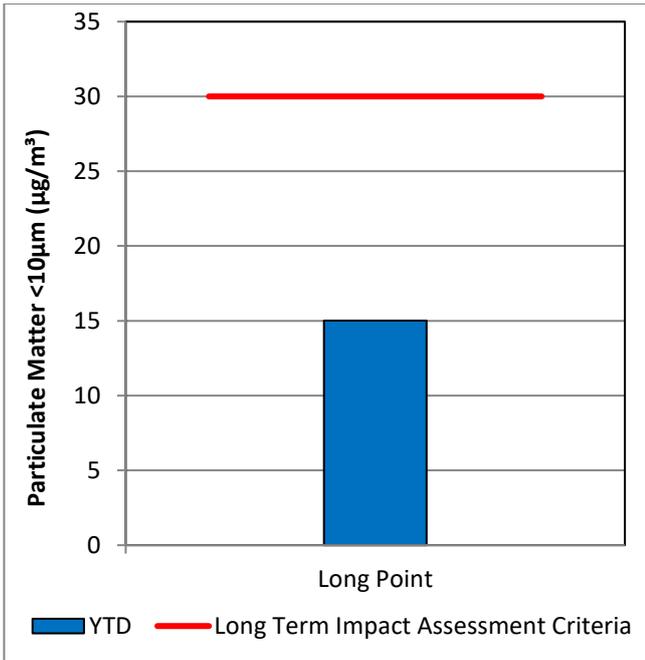


Figure 7: Annual Average PM<sub>10</sub> – August 2024

### 2.3.2 TSP Results

Figure 7 shows the annual average TSP results compared against the long-term impact assessment criteria of 90 $\mu\text{g}/\text{m}^3$ .

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

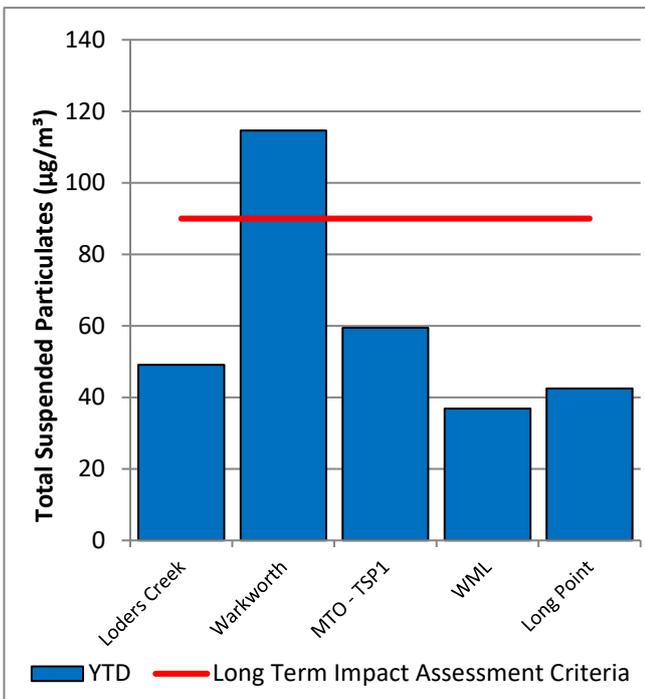


Figure 8: Annual Average Total Suspended Particulates – August 2024

### 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.

On 31 August 2024, the Warkworth TEOM (70.6  $\mu\text{g}/\text{m}^3$ ) exceeded the short term (24hr) criteria. The measurement was assessed for MTW’s potential contribution based on meteorological conditions on this day. It was determined that the wind direction was not from MTW’s angle of influence and so that MTW was not a contributor to the result. Accordingly, no further action is required (as per approved Air Quality Monitoring Programme).

Data from the Warkworth Monitor was not available on 13, 15, 28 and 29 August due to equipment issues.

### 2.3.4 Real Time Alarms for Air Quality

During August, the real time monitoring system generated 124 automated air quality related alerts, including 8 alerts for adverse meteorological conditions and 116 alerts for elevated PM<sub>10</sub> levels.

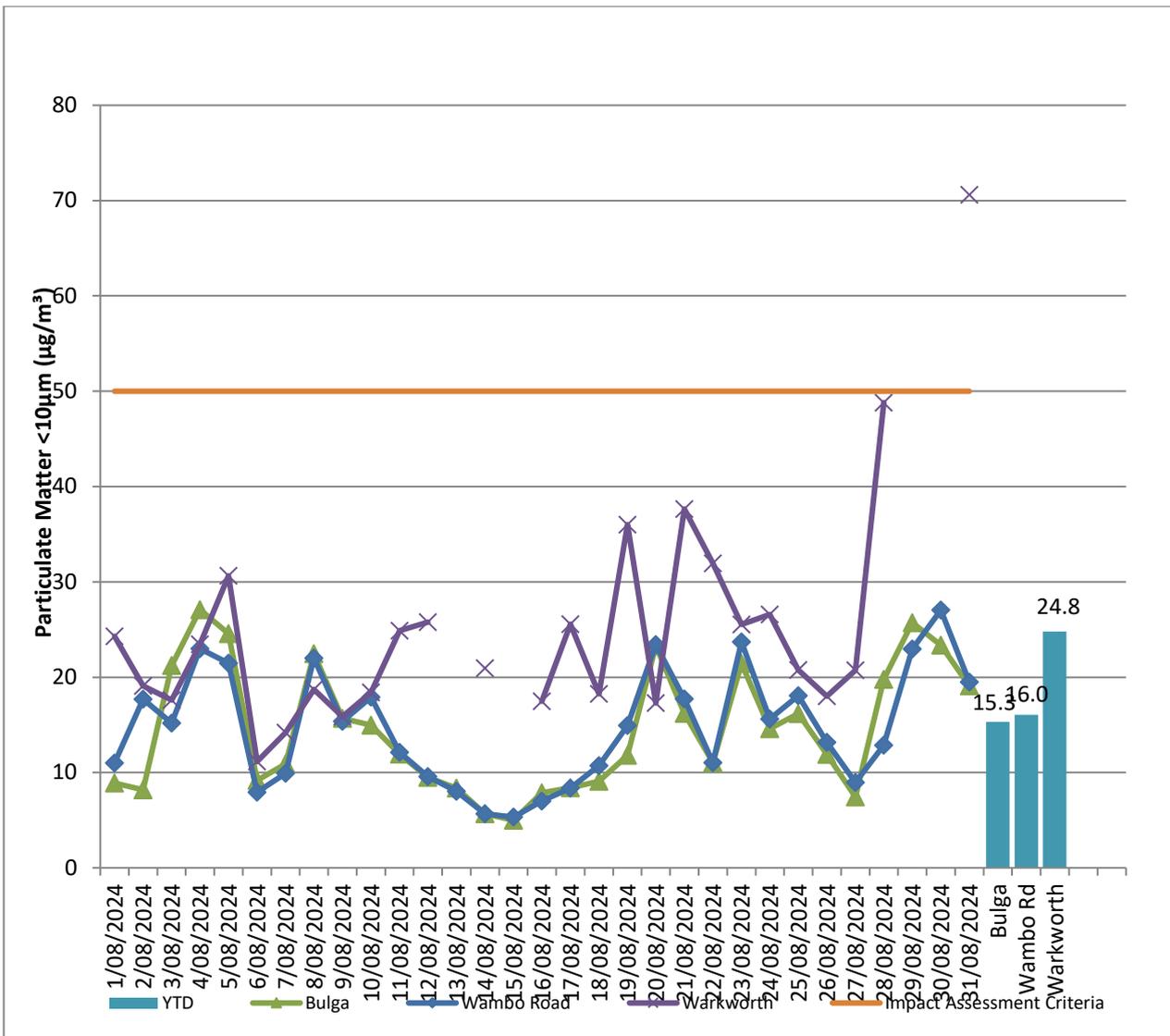


Figure 9: Real Time PM<sub>10</sub> daily 24hr average (line graphs) and YTD annual average (column graphs) – August 2024

### 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.

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.

Results of monitoring are reported quarterly, next available in the September 2024 report.

#### 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.

MTW did not undertake any HRSTS discharges in the reporting period.

### 3.3 Groundwater Monitoring

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

Groundwater results are reported quarterly, next available in the September 2024 report.

### 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 15**.

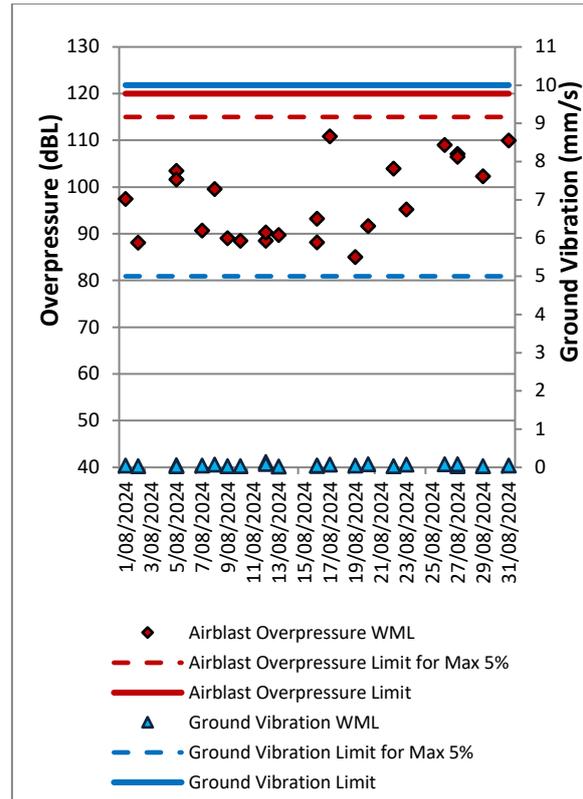
#### 4.1 Blast Monitoring Results

During August 2024, 23 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 2**.

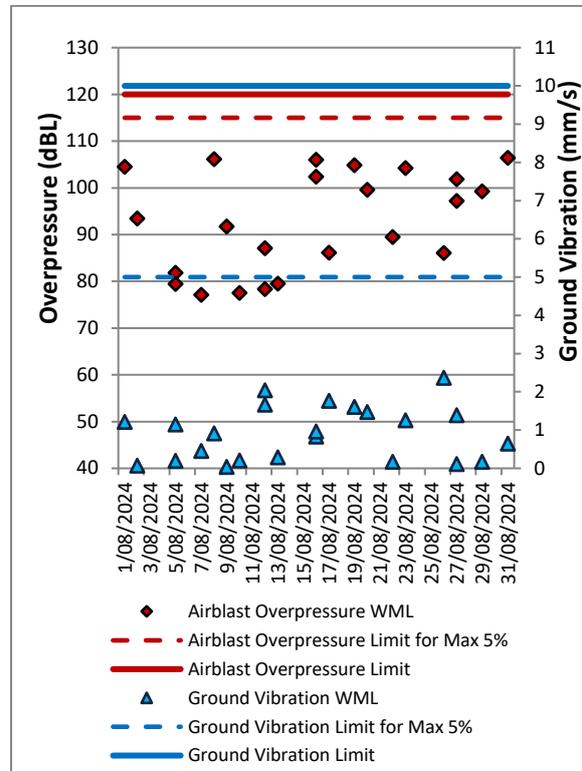
**Table 2: Blasting Limits**

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 blast exceeded the 115dB(L) threshold for airblast overpressure. One blast exceeded the 5 mm/s criteria (permissible for 5% of blasts in 12 month period) for ground vibration at the Warkworth monitoring location.



**Figure 10: Abbey Green Blast Monitoring Results – August 2024**



**Figure 11: Bulga Village Blast Monitoring Results – August 2024**

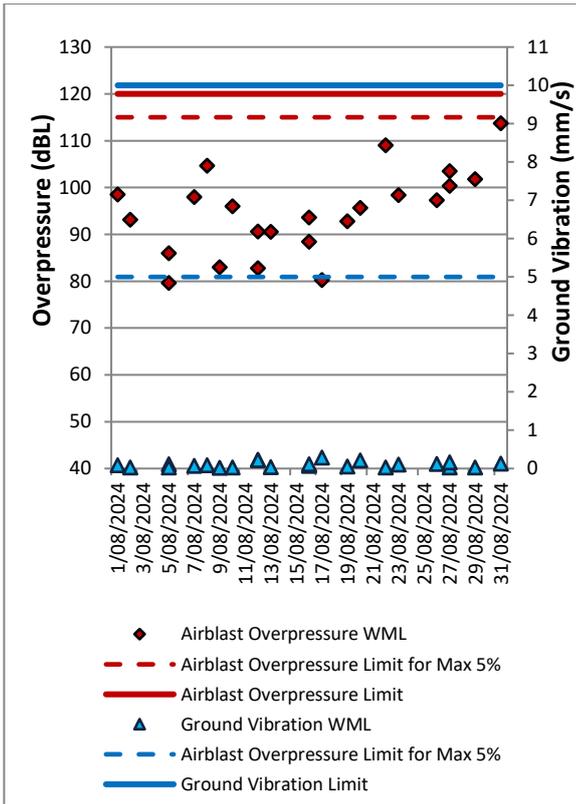


Figure 12: MTIE Blast Monitoring Results – August 2024

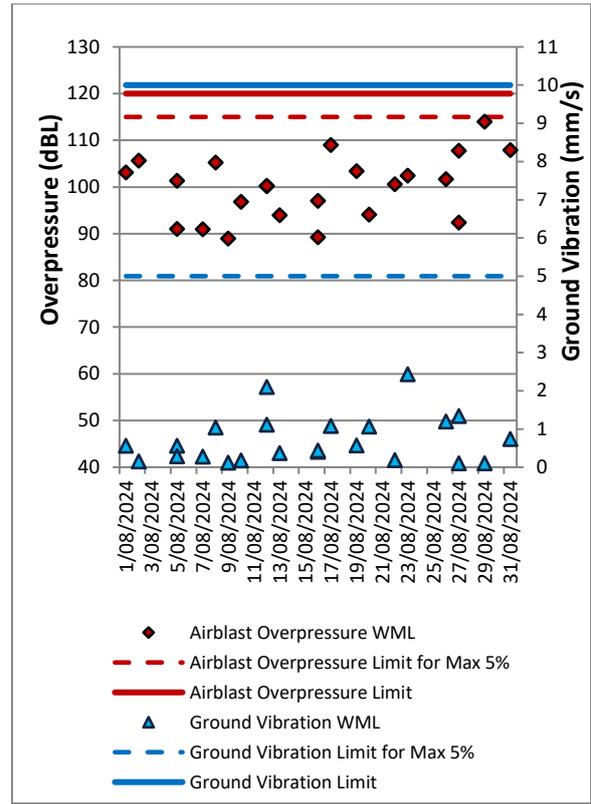


Figure 14: Wambo Road Blast Monitoring Results – August 2024

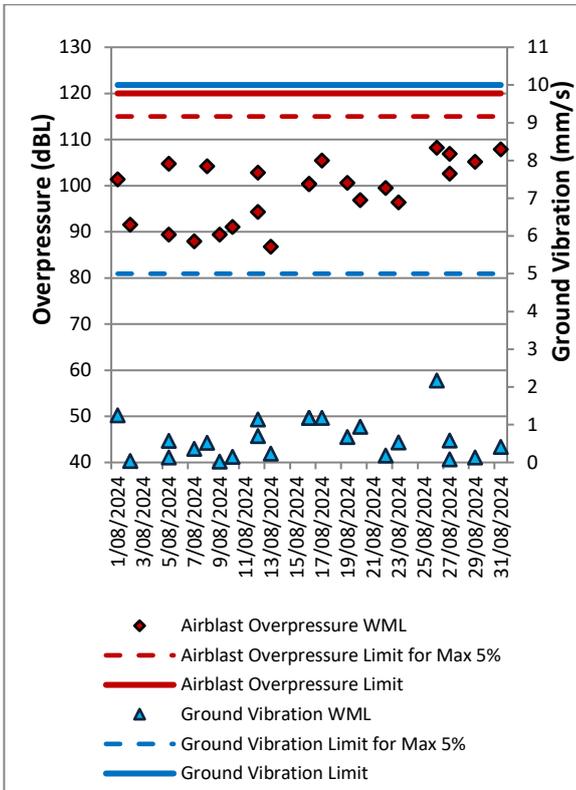


Figure 13: Wollemi Peak Road Blast Monitoring Results – August 2024

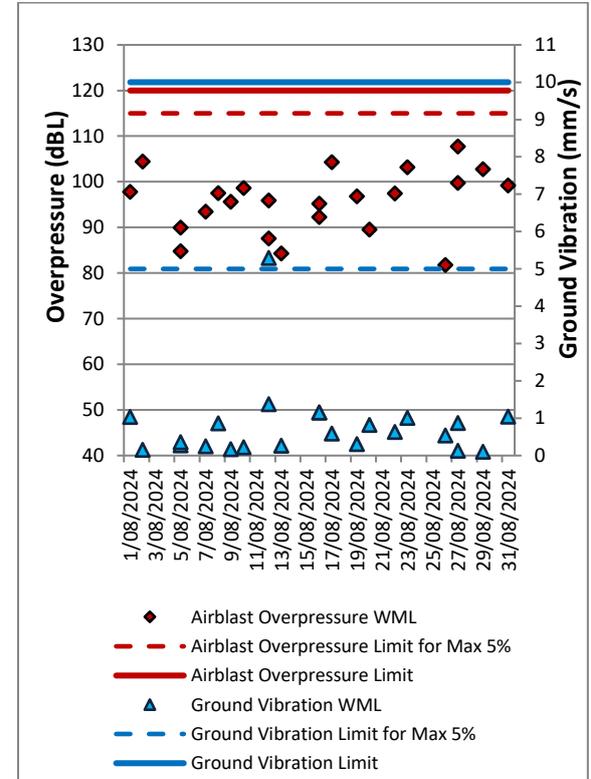


Figure 15: Warkworth Blast Monitoring Results – August 2024



Figure 16: 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 16**.

### 5.1 Attended Noise Monitoring Results

Attended monitoring was conducted at receiver locations surrounding MTW on the night of 6 August 2024. All measurements complied with the relevant criteria. Results are detailed in **Table 3** to **Table 6**.

#### 5.1.1 WML Noise Assessment

Compliance assessments undertaken against the WML noise criteria are presented in **Tables 3** and **4**.

**Table 3: L<sub>Aeq</sub>, 15 minute Warkworth Impact Assessment Criteria – August 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</sup>	Exceedance <sup>3,4</sup>
Bulga RFS	6/08/2024 22:57	1.9	E	37	Yes	<30	Nil
Bulga Village	6/08/2024 22:13	1.4	E	38	Yes	33	Nil
Gouldsville	6/08/2024 21:20	0.1	F	38	Yes	IA	Nil
Inlet Road	6/08/2024 21:24	0.1	E	37	Yes	36	Nil
Inlet Road West	6/08/2024 21:00	1.0	D	35	Yes	30	Nil
Long Point	6/08/2024 21:00	1.0	D	35	Yes	IA	Nil
South Bulga	6/08/2024 23:40	2.2	E	35	Yes	IA	Nil
Wambo Road	6/08/2024 21:48	0.1	E	38	Yes	33	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.

5. Follow up measurement within one week of measured exceedance.

**Table 4: L<sub>A1</sub>, 1 minute Warkworth - Impact Assessment Criteria – August 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</sup>	Exceedance <sup>3,4</sup>
Bulga RFS	6/08/2024 22:57	1.9	E	47	Yes	<30	Nil
Bulga Village	6/08/2024 22:13	1.4	E	48	Yes	42	Nil
Gouldsville	6/08/2024 21:20	0.1	F	48	Yes	IA	Nil
Inlet Road	6/08/2024 21:24	0.1	E	47	Yes	36	Nil
Inlet Road West	6/08/2024 21:00	1.0	D	45	Yes	32	Nil
Long Point	6/08/2024 21:00	1.0	D	45	Yes	IA	Nil
South Bulga	6/08/2024 23:40	2.2	E	45	Yes	IA	Nil
Wambo Road	6/08/2024 21:48	0.1	E	48	Yes	40	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. Follow up measurement within one week of measured exceedance.

## 5.1.2 MTO Noise Assessment

Compliance assessments undertaken against the MTO noise criteria are presented in **Table 5** and **6**.

**Table 5: LAeq, 15minute Mount Thorley - Impact Assessment Criteria – August 2024**

Location	Date and Time	Wind Speed (m/s)	Stability Class	Criterion dB	Criterion Applies? <sup>1</sup>	MTO LAeq dB <sup>2,3</sup>	Exceedance <sup>3,4</sup>
Bulga RFS	6/08/2024 22:57	1.9	E	37	Yes	35	Nil
Bulga Village	6/08/2024 22:13	1.4	E	38	Yes	<30	Nil
Gouldsville	6/08/2024 21:20	0.1	F	35	Yes	IA	Nil
Inlet Road	6/08/2024 21:24	0.1	E	37	Yes	<30	Nil
Inlet Road West	6/08/2024 21:00	1.0	D	35	Yes	<25	Nil
Long Point	6/08/2024 21:00	1.0	D	35	Yes	IA	Nil
South Bulga	6/08/2024 23:40	2.2	E	36	Yes	33	Nil
Wambo Road	6/08/2024 21:48	0.1	E	38	Yes	<30	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 LAeq,15minute 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.

5. Follow up measurement within one week of measured exceedance.

**Table 6: LA1, 1Minute Mount Thorley - Impact Assessment Criteria – August 2024**

Location	Date and Time	Wind Speed (m/s)	Stability Class	Criterion dB	Criterion Applies? <sup>1</sup>	MTO LA1, 1min dB <sup>2,3</sup>	Exceedance <sup>3,4</sup>
Bulga RFS	6/08/2024 22:57	1.9	E	47	Yes	38	Nil
Bulga Village	6/08/2024 22:13	1.4	E	48	Yes	<30	Nil
Gouldsville	6/08/2024 21:20	0.1	F	45	Yes	IA	Nil
Inlet Road	6/08/2024 21:24	0.1	E	47	Yes	<30	Nil
Inlet Road West	6/08/2024 21:00	1.0	D	45	Yes	<25	Nil
Long Point	6/08/2024 21:00	1.0	D	45	Yes	IA	Nil
South Bulga	6/08/2024 23:40	2.2	E	46	Yes	35	Nil
Wambo Road	6/08/2024 21:48	0.1	E	48	Yes	35	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 LA1,1minute 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. Follow up measurement within one week of measured exceedance.

### 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. This resulted in the application of a 2dB penalty to the site only LAeq for the measurements taken at Inlet Road on 6 August 2024. Resulting LAeq noise levels did not exceed the WML impact assessment criteria at Inlet Road. The WML assessment for low frequency noise is shown in **Table 7** and the MTO assessment for low frequency noise is shown in **Table 8**.

**Table 7: Warkworth Low Frequency Noise Assessment – August 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	6/08/2024 22:57	<30	Yes	No	No	N/A	No	N/A	Nil
Bulga Village	6/08/2024 22:13	33	Yes	No	No	N/A	No	N/A	Nil
Gouldsville	6/08/2024 21:20	IA	Yes	No	No	N/A	No	N/A	Nil
Inlet Road	6/08/2024 21:24	34	Yes	No	No	N/A	Yes	<b>1 dB @ 80Hz</b>	<b>2</b>
Inlet Road West	6/08/2024 21:00	30	No	No	No	N/A	No	N/A	Nil
Long Point	6/08/2024 21:00	IA	No	No	No	N/A	No	N/A	Nil
South Bulga	6/08/2024 23:40	IA	No	No	No	N/A	No	N/A	Nil
Wambo Road	6/08/2024 21:48	33	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.
3. Follow up measurement within one week of measured exceedance.

**Table 8: Mount Thorley Operations Low Frequency Noise Assessment – August 2024**

Location	Date and Time	Measured MTO 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	6/08/2024 22:57	35	Yes	No	No	N/A	No	N/A	Nil
Bulga Village	6/08/2024 22:13	<30	Yes	No	No	N/A	No	N/A	Nil
Gouldsville	6/08/2024 21:20	IA	Yes	No	No	N/A	No	N/A	Nil
Inlet Road	6/08/2024 21:24	<30	Yes	No	No	N/A	No	N/A	Nil
Inlet Road West	6/08/2024 21:00	<25	No	No	No	N/A	No	N/A	Nil
Long Point	6/08/2024 21:00	IA	No	No	No	N/A	No	N/A	Nil
South Bulga	6/08/2024 23:40	33	No	No	No	N/A	No	N/A	Nil
Wambo Road	6/08/2024 21:48	<30	Yes	No	No	N/A	No	N/A	Nil
Bulga RFS	6/08/2024 22:57	35	Yes	No	No	N/A	No	N/A	Nil

**Notes:**

1. NA denotes 'not applicable'; and

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

3. Follow up measurement within one week of measured exceedance.

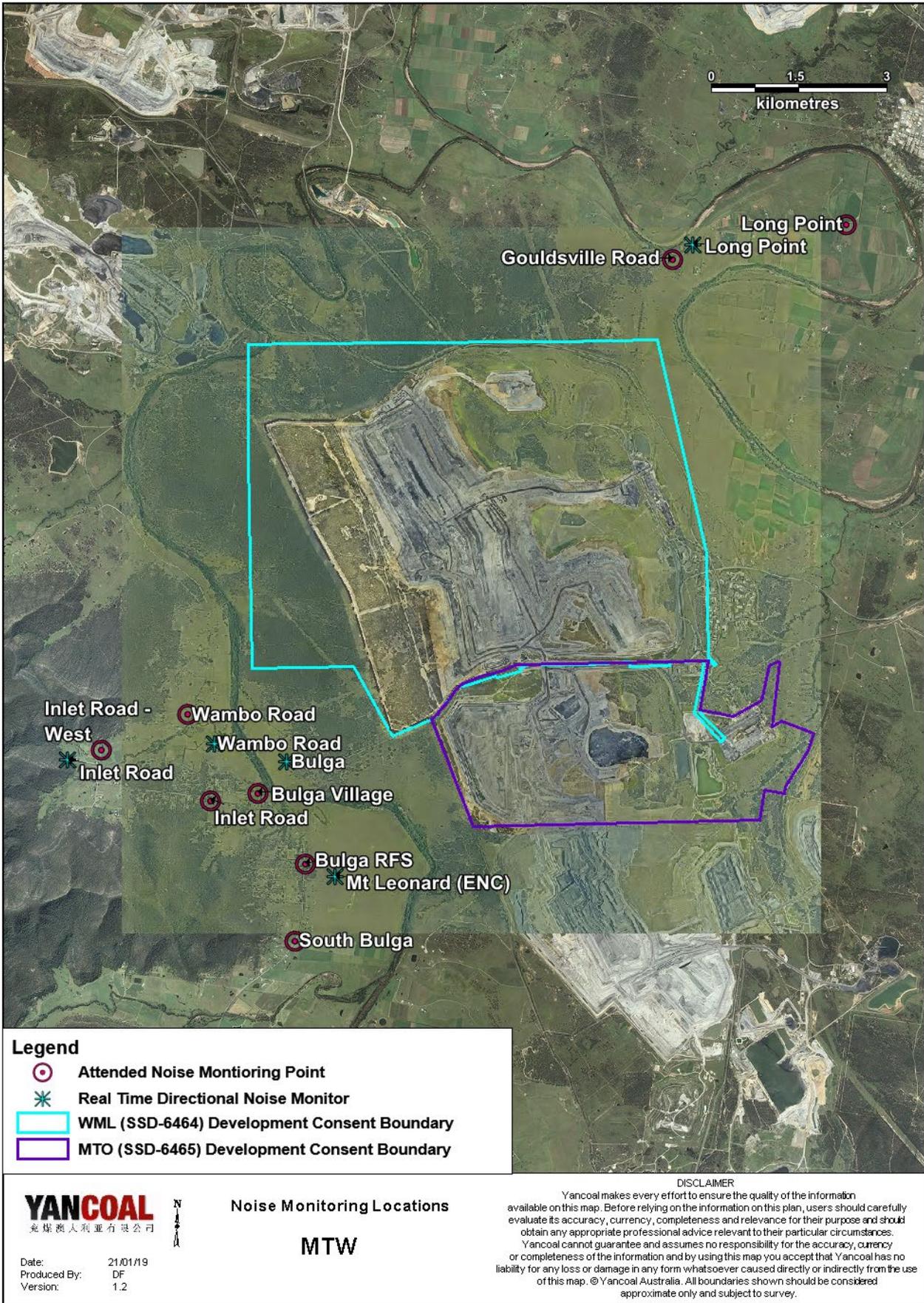


Figure 17: Noise Monitoring Location Plan

## 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 during August are provided in **Table 9**.

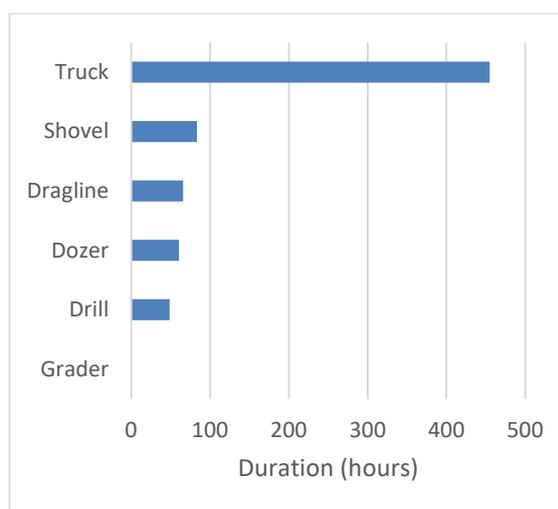
**Table 9: Supplementary Attended Noise Monitoring Data – August 2024**

No. of assessments	No. of assessments > trigger	No. of nights where assessments > trigger	% greater than trigger
641	15	7	2.3

## 6.0 OPERATIONAL DOWNTIME

During August, a total of 713.5 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 17**.

**Figure 18: Operational Downtime by Equipment Type – August 2024**



## 7.0 REHABILITATION

During August 2024, 0.8 Ha of land was released, 13.5 Ha was bulk shaped, 17 Ha was topsoiled and 17 Ha was rehabilitated.

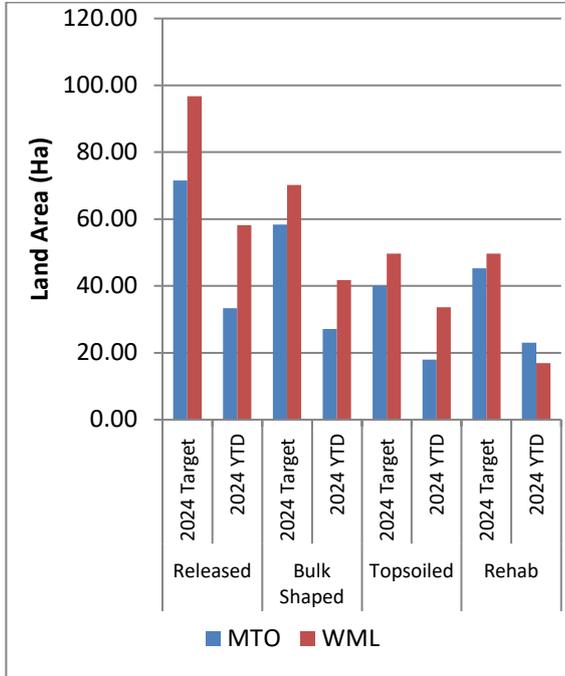


Figure 19: Rehabilitation YTD – August 2024

## 8.0 ENVIRONMENTAL INCIDENTS

There were no environmental incidents recorded during the reporting period.

## 9.0 COMPLAINTS

10 complaints were received during the reporting period. Details of these complaints are shown in

**Table 10.**

**Table 10: 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	7	2	1	5	0	15
May	8	1	5	0	2	16
June	2	1	3	0	0	6
July	1	2	2	1	0	6
August	5	1	3	0	1	10
September						
October						
November						
December						
<b>Total</b>	30	15	22	8	3	78

## **Appendix A: Meteorological Data**

**Table 11: Meteorological Data – Charlton Ridge Meteorological Station – August 2024**

Date	Air Temperature		Relative Humidity		Wind Direction	Wind Speed	Rainfall
	Maximum (°C)	Minimum (°C)	Maximum (%)	Minimum (%)	Average (°)	Average (m/sec)	total (mm)
1/08/2024	16	5	96	52	186	2.2	0.0
2/08/2024	17	5	100	39	182	1.8	0.0
3/08/2024	18	3	100	36	205	1.6	0.0
4/08/2024	17	2	100	40	204	1.1	0.0
5/08/2024	15	5	100	56	205	0.9	12.6
6/08/2024	18	6	100	48	232	0.8	0.4
7/08/2024	19	3	100	36	215	1.6	0.0
8/08/2024	19	4	100	49	176	1.5	0.0
9/08/2024	21	5	100	43	228	1.5	0.0
10/08/2024	19	7	100	58	166	2.0	0.0
11/08/2024	19	9	100	61	175	2.8	2.4
12/08/2024	16	10	100	79	156	2.9	1.6
13/08/2024	19	12	100	73	150	1.9	1.2
14/08/2024	15	13	100	97	175	1.1	5.6
15/08/2024	19	12	100	76	187	2.2	0.2
16/08/2024	21	12	100	64	206	1.6	0.2
17/08/2024	20	11	100	35	280	3.4	0.8
18/08/2024	20	9	98	44	225	2.6	0.0
19/08/2024	19	8	100	50	159	2.0	0.0
20/08/2024	21	6	100	49	176	1.6	0.0
21/08/2024	25	9	100	33	258	3.0	0.0
22/08/2024	22	10	87	39	268	2.4	0.0
23/08/2024	21	5	99	36	178	1.3	0.0
24/08/2024	24	8	100	38	269	3.3	1.4
25/08/2024	19	14	100	56	253	2.9	6.2
26/08/2024	24	10	90	31	273	3.1	0.0
27/08/2024	24	4	100	29	286	2.7	0.0
28/08/2024	28	13	52	18	266	4.2	0.0
29/08/2024	23	11	70	29	258	3.2	0.0
30/08/2024	28	9	69	28	278	4.0	0.0
31/08/2024	23	14	57	21	287	4.2	0.0