Monthly Environmental Monitoring Report

Yancoal Mount Thorley Warkworth

May 2025

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Revision History

Version No.	Version Details	Date
1.0	**Final**	**19/08/2025**

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 May to 31 May 2025.

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, 2025 monthly rainfall totals and historical average monthly rainfall trend are shown in **Figure 1**.

Table 1: Monthly Rainfall MTW

2025	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
May	101.6	377.6

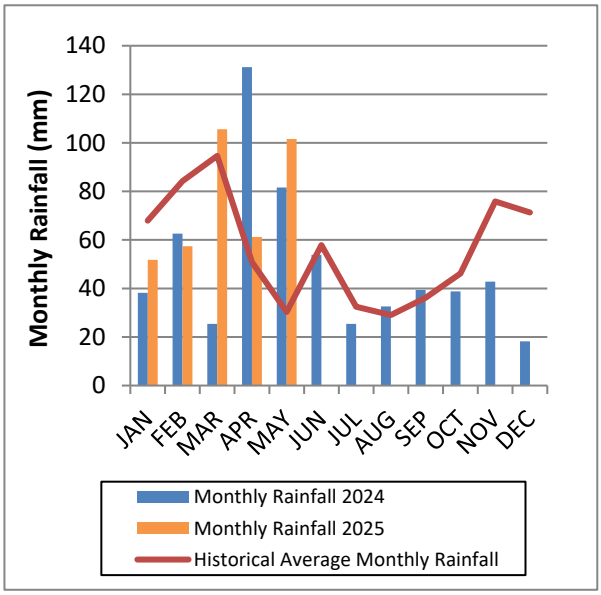


Figure 1: Rainfall Trend YTD

Note: The historical average monthly rainfall is calculated from 2007 to 2024 monthly totals.

2.1.2 Wind Speed and Direction

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

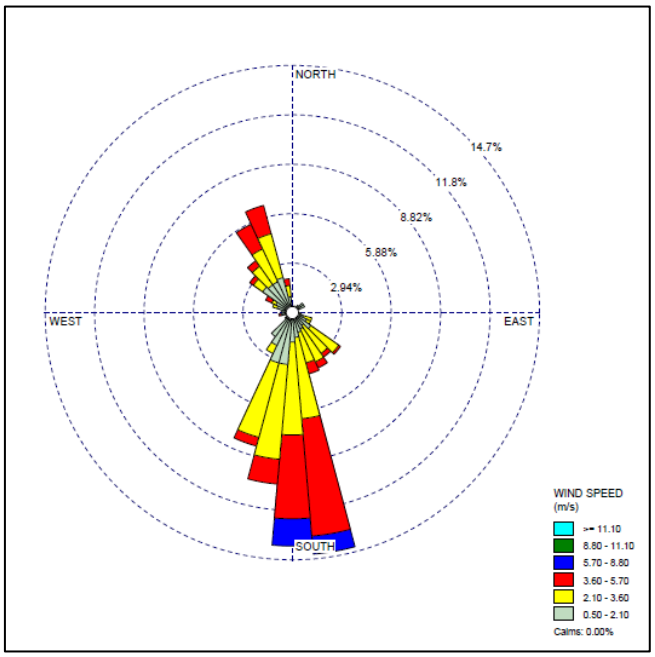


Figure 2: Charlton Ridge Wind Rose – May 2025

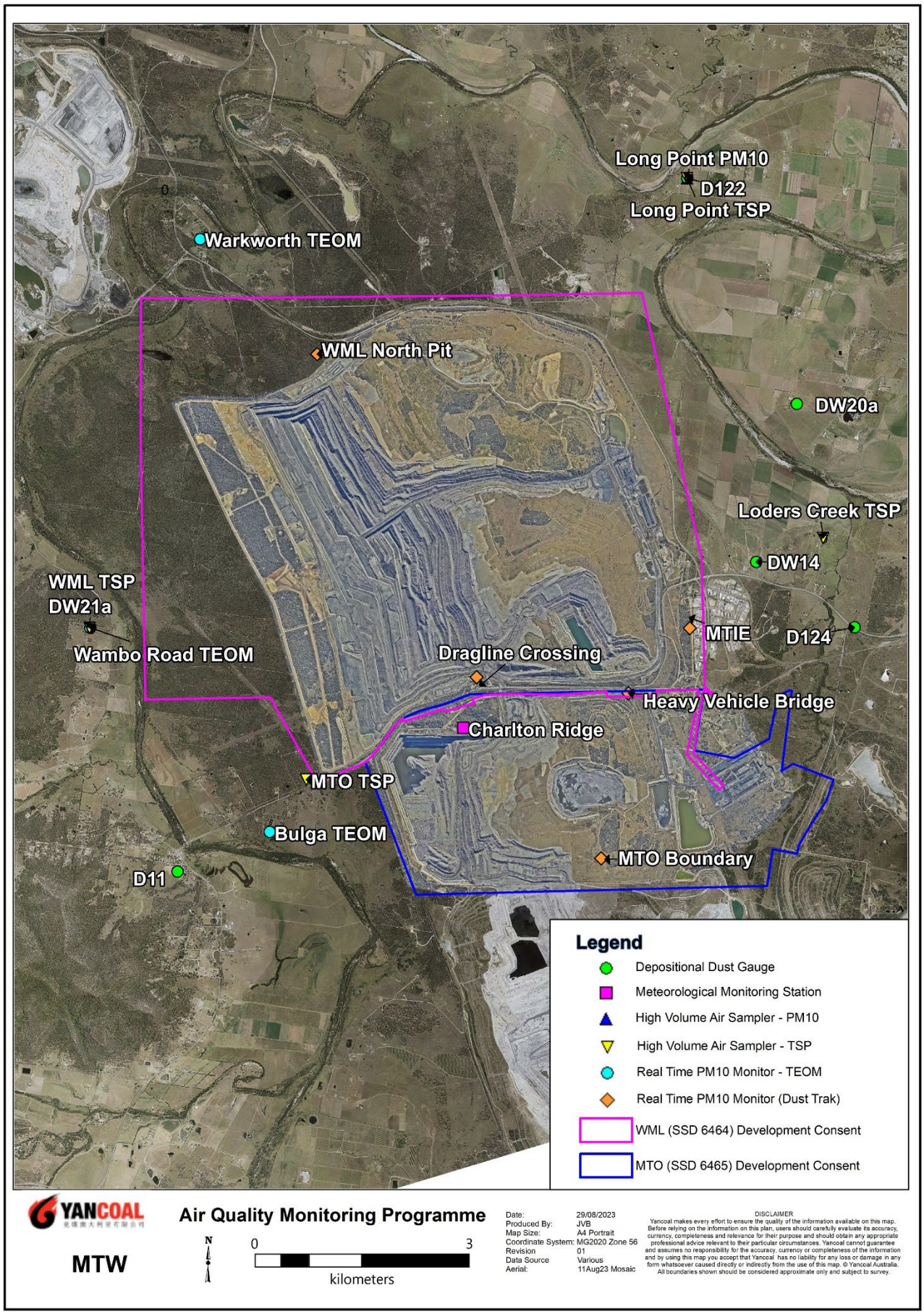


Figure 3: Air Quality Monitoring Locations

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/m2 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 2025 Annual Review Report.

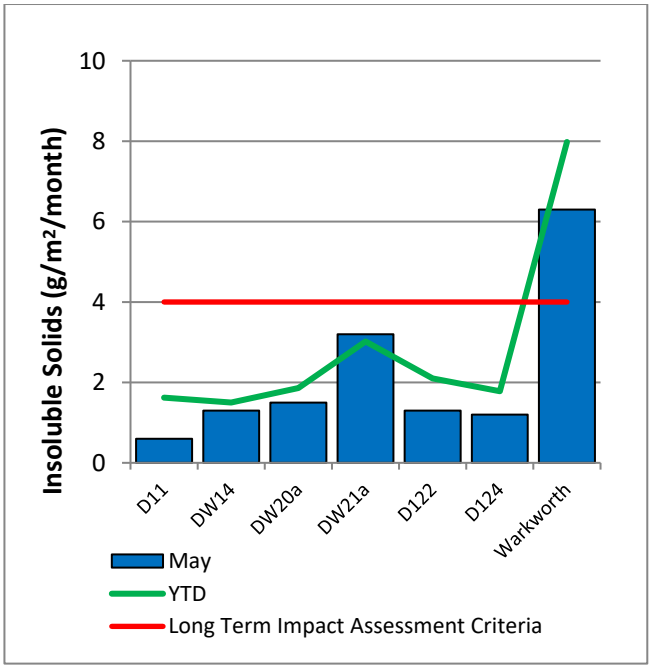


Figure 4: Depositional Dust – May 2025

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_{10}). 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_{10} Results

Figure 5 shows the individual PM_{10} results at each monitoring station against the short-term impact assessment criteria of 50µg/m³.

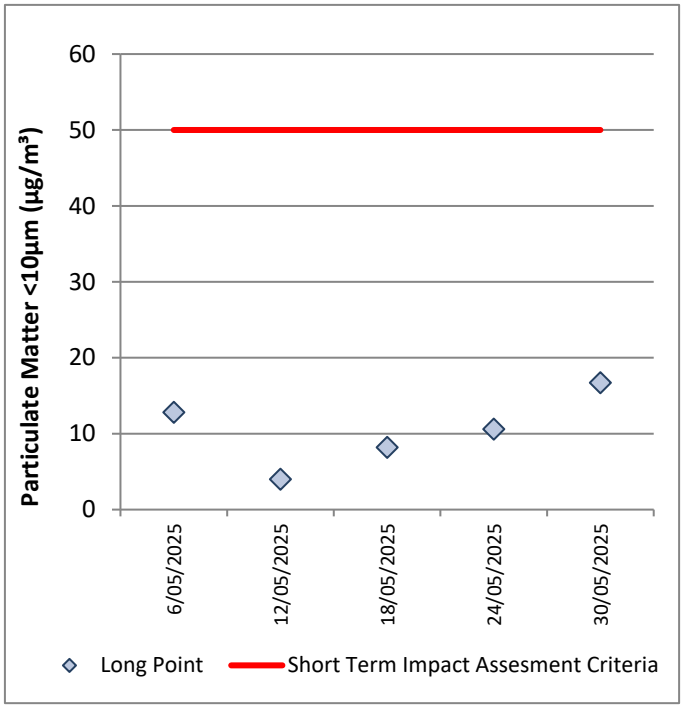


Figure 5: Individual PM10 Results – May 2025

Figure 6 shows the annual average PM10 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 2025 Annual Review Report.

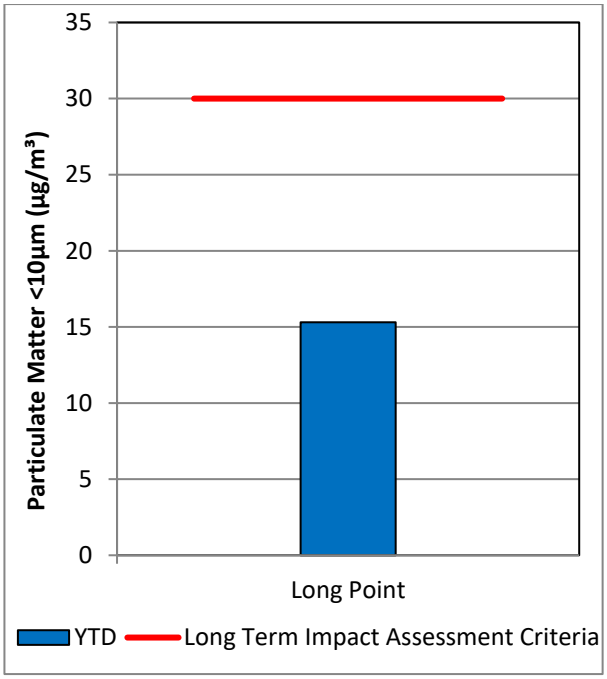


Figure 6: Annual Average PM_{10} – May 2025

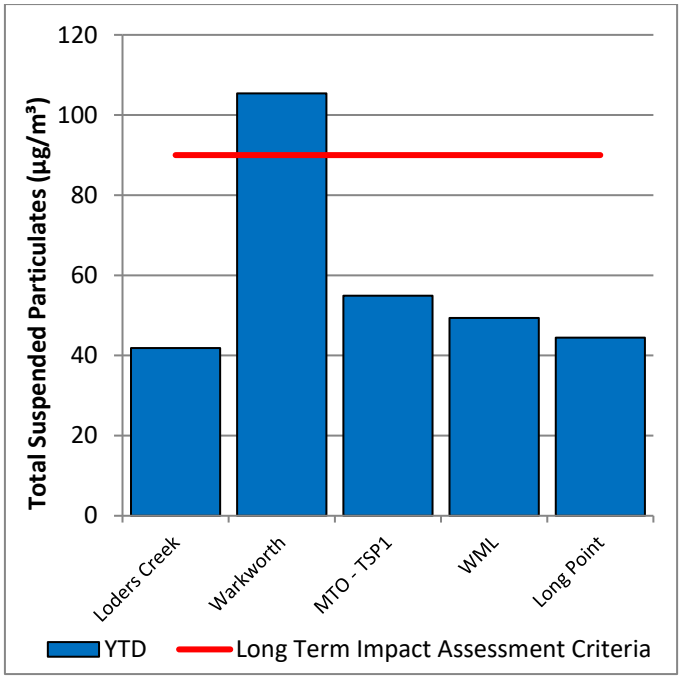


Figure 7: Annual Average Total Suspended Particulates – May 2025

2.3.2 TSP Results

Figure 7 shows the annual average TSP results compared against the long-term impact assessment criteria of 90µg/m³.

An assessment of MTW's compliance with the Long-Term Impact Assessment Criteria will be provided in the 2025 Annual Review Report.

2.3.3 Real Time PM_{10} Results

MTW maintains a network of real time PM_{10} 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_{10} result and the annual PM_{10} average.

A regional dust event occurred on 27 May, coinciding with three monitors exceeding the short term (24hr) criteria for PM10:

The Bulga TEOM Data measurement (54.6 ug/m3) was assessed for MTW's potential contribution based on meteorological conditions and background PM_{10} levels on the day resulting in a maximum estimated contribution of 5.9 ug/m3, less than 11% contribution to the result. Accordingly, no further action is required (as per the approved Air Quality Monitoring Programme).

The Wambo TEOM Data measurement (58.3 ug/m3) was assessed for MTW's potential contribution based on meteorological conditions and background PM_{10} levels on the day resulting in a maximum estimated contribution of 0.7

ug/m3, less than 2% contribution to the result. Accordingly, no further action is required (as per the approved Air Quality Monitoring Programme).

The Warkworth TEOM Data measurement (62.0 ug/m3) was assessed for MTW's potential contribution based on meteorological conditions and background PM_{10} levels on the day resulting in a maximum estimated contribution of 5.7 ug/m3, less than 10% contribution to the result. Accordingly, no further action is required (as per the approved Air Quality Monitoring Programme).

Data from the Bulga monitor was not available on 1 May and data from the Wambo monitor was not available on 14 May due to equipment issues.

2.3.4 Real Time Alarms for Air Quality

During May, the real time monitoring system generated 61 automated air quality related alerts, including 8 alerts for adverse meteorological conditions and 53 alerts for elevated PM_{10} levels.

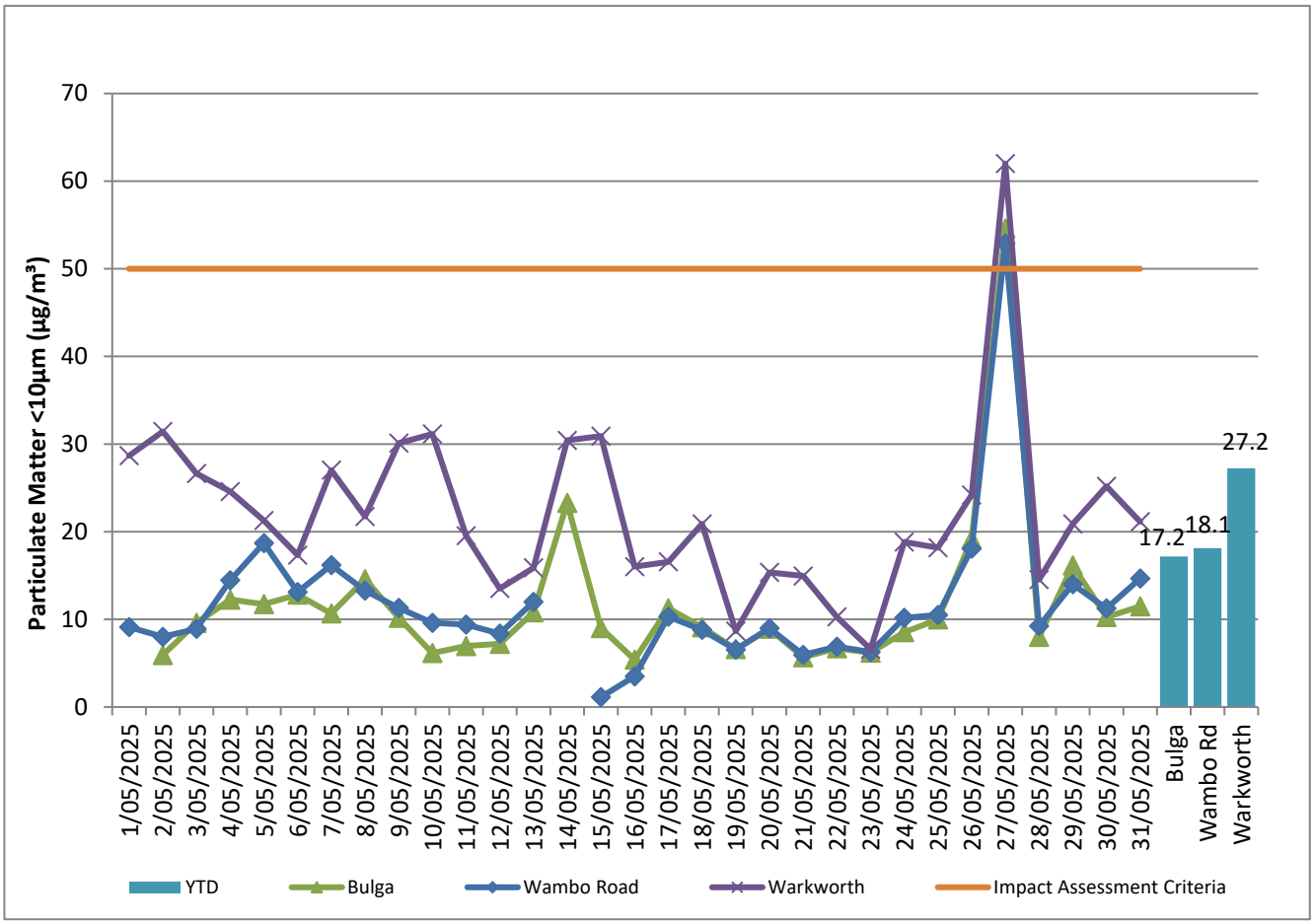


Figure 8: Real Time PM_{10} daily 24hr average (line graphs) and YTD annual average (column graphs) – May 2025

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 June 2025 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 June 2025 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 May 2025, 16 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 one blast exceeded the 120 dB(L) threshold for airblast overpressure at the Bulga Village monitoring location and was reported to the Department of Planning, Housing and Infrastructure and the Environment Protection Authority on 26 May 2025 and investigated (refer to section 8.0 below). One blast also exceeded the 115dB(L) threshold for airblast overpressure at the Wambo Road monitoring location. One blast exceeded the 5mm/s criteria (permissible for 5% of blasts in 12 month period) for ground vibration at the Warkworth monitoring location (5.01 mm/s).

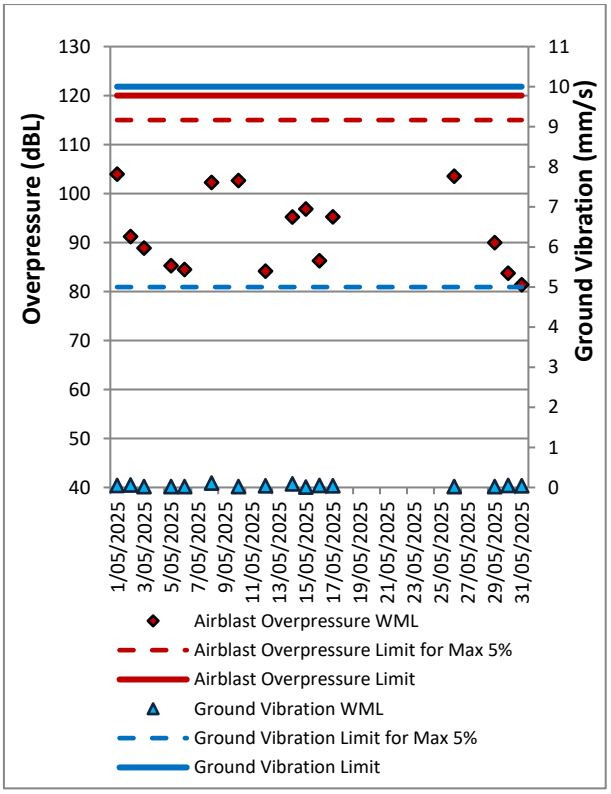


Figure 9: Abbey Green Blast Monitoring Results – May 2025

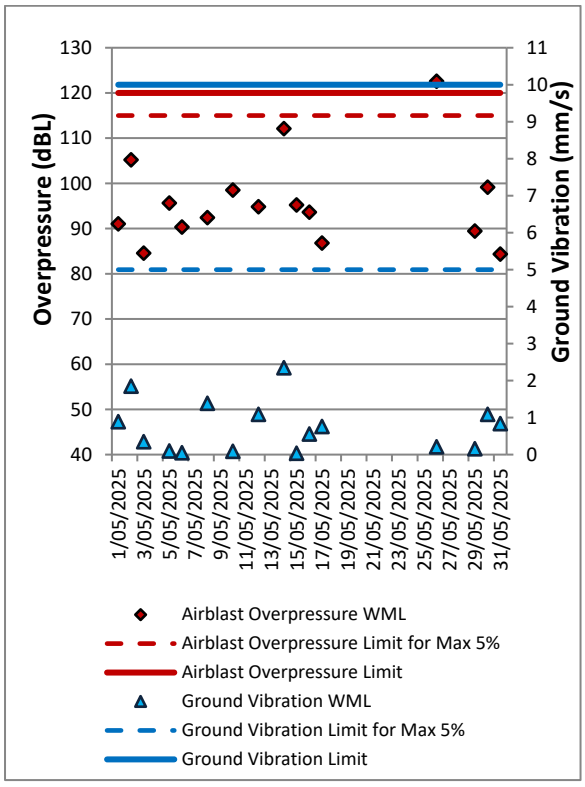


Figure 10: Bulga Village Blast Monitoring Results – May 2025

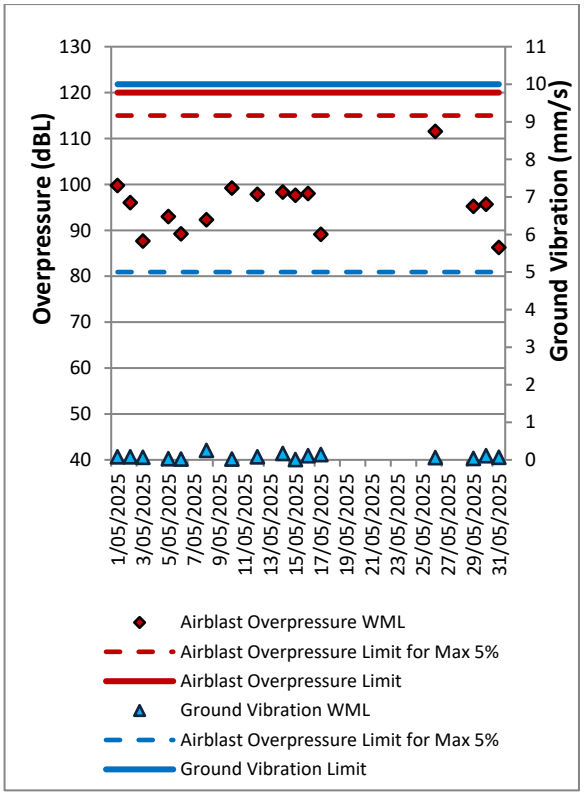


Figure 11: Putty Road MTIE Blast Monitoring Results – May 2025

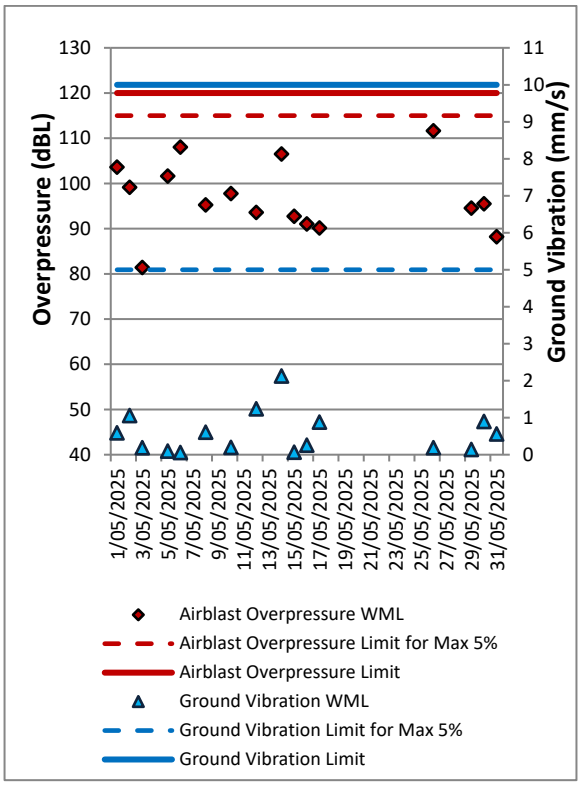


Figure 12: Wollemi Peak Road Blast Monitoring Results – May 2025

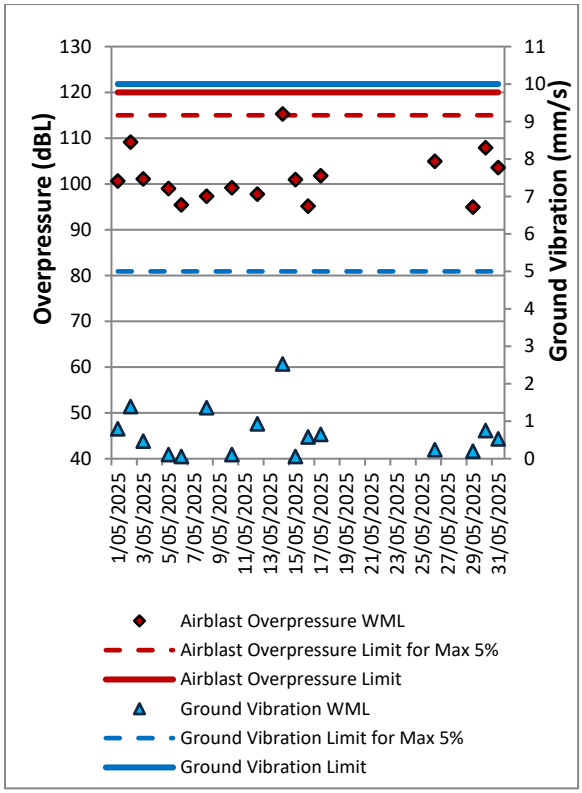


Figure 13: Wambo Road Blast Monitoring Results – May 2025

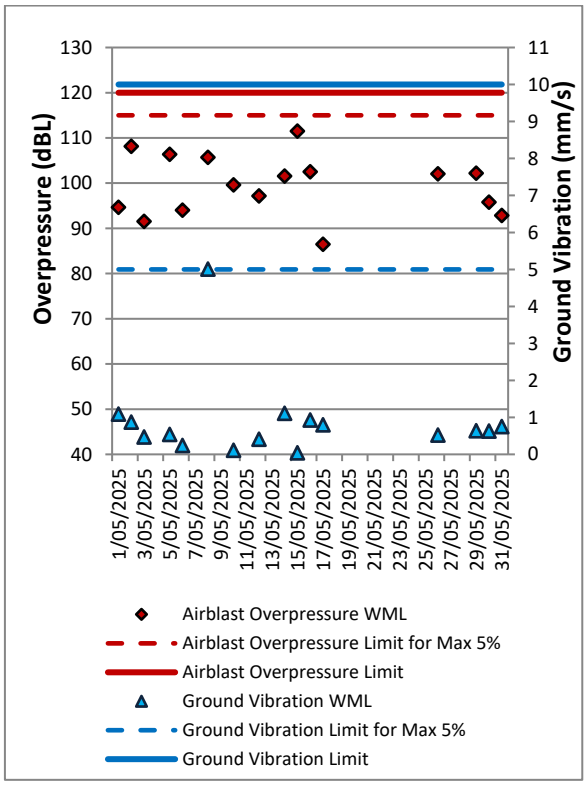


Figure 14: Warkworth Blast Monitoring Results – May 2025

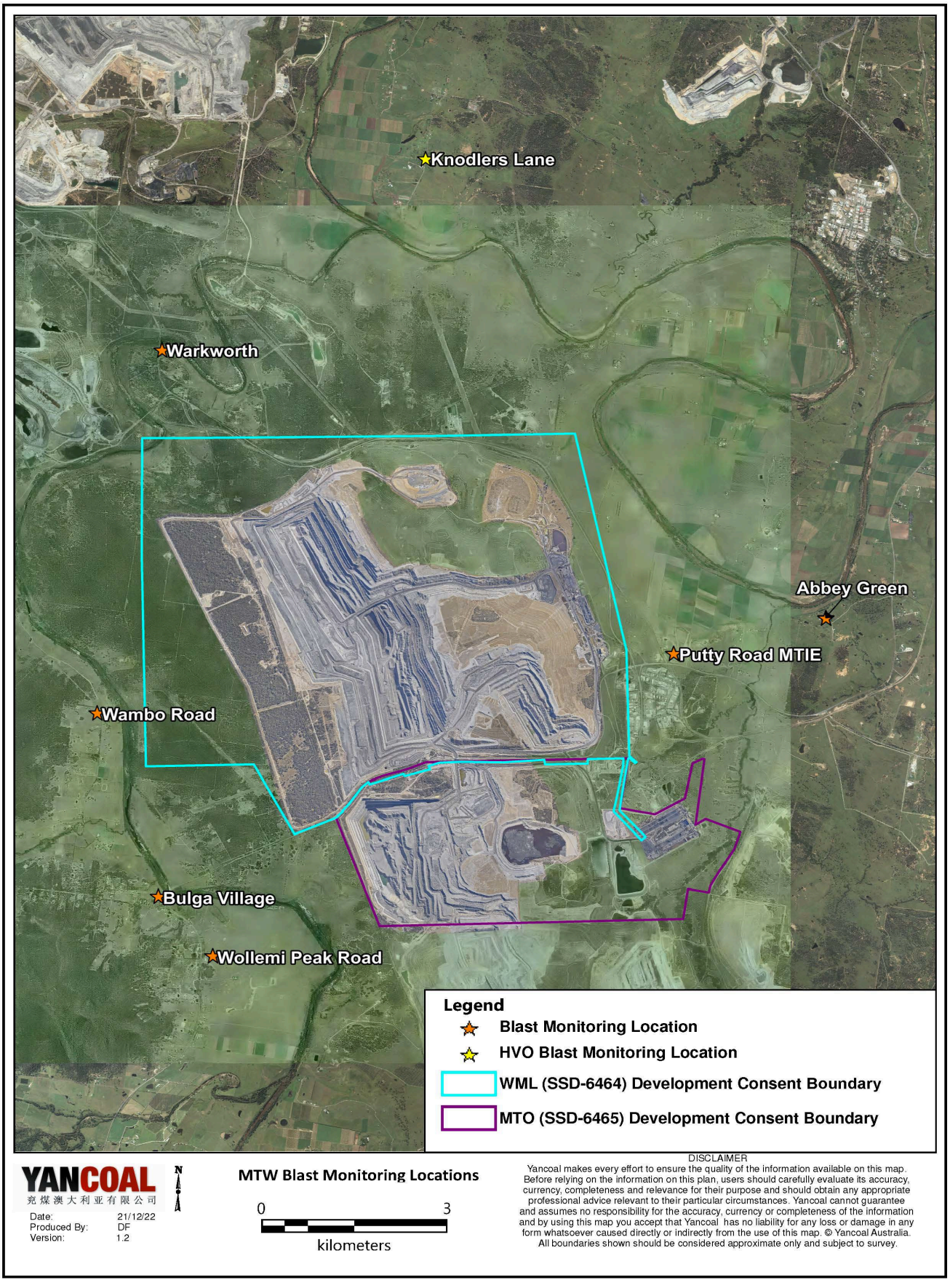


Figure 15: MTW Blast Monitoring Location Plan

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 29 May 2025. 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: $L_{Aeq,\ 15\ minute}$ Warkworth Impact Assessment Criteria – May 2025

Location[5]	Date and Time	Wind Speed (m/s)	Stability Class	Criterion dB(A)	Criterion Applies?[1]	WML L_{Aeq} dB[2,3]	Exceedance[3,4]
Bulga RFS	29/05/2025 23:41	1.6	F	37	Yes	<20	Nil
Bulga Village	29/05/2025 22:16	2.3	E	38	Yes	27	Nil
Gouldsville	29/05/2025 21:21	1.3	D	38	Yes	33	Nil
Inlet Road	29/05/2025 21:29	1.6	D	37	Yes	<20	Nil
Inlet Road West	29/05/2025 21:09	1.3	D	35	Yes	IA	Nil
Long Point	29/05/2025 21:00	1.7	D	35	Yes	IA	Nil
South Bulga	29/05/2025 23:20	1.9	E	35	Yes	<25	Nil
Wambo Road	29/05/2025 21:55	2.2	D	38	Yes	26	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_{Aeq},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 after measured exceedance.

Table 4: $L_{A1,\ 1\ minute}$ Warkworth - Impact Assessment Criteria – May 2025

Location[5]	Date and Time	Wind Speed (m/s)	Stability Class	Criterion dB(A)	Criterion Applies?[1]	WML $L_{A1,\ 1min}$ dB[2,3]	Exceedance[3,4]
Bulga RFS	29/05/2025 23:41	1.6	F	47	Yes	<25	Nil
Bulga Village	29/05/2025 22:16	2.3	E	48	Yes	<30	Nil
Gouldsville	29/05/2025 21:21	1.3	D	48	Yes	39	Nil
Inlet Road	29/05/2025 21:29	1.6	D	47	Yes	<20	Nil
Inlet Road West	29/05/2025 21:09	1.3	D	45	Yes	IA	Nil
Long Point	29/05/2025 21:00	1.7	D	45	Yes	IA	Nil
South Bulga	29/05/2025 23:20	1.9	E	45	Yes	<30	Nil
Wambo Road	29/05/2025 21:55	2.2	D	48	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 LA1,1minute 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 after 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: $L_{Aeq, 15minute}$ Mount Thorley - Impact Assessment Criteria – May 2025

Location[5]	Date and Time	Wind Speed (m/s)	Stability Class	Criterion dB	Criterion Applies?[1]	MTO L_{Aeq} dB[2,3]	Exceedance[3,4]
Bulga RFS	29/05/2025 23:41	1.6	F	37	Yes	<20	Nil
Bulga Village	29/05/2025 22:16	2.3	E	38	Yes	<25	Nil
Gouldsville	29/05/2025 21:21	1.3	D	35	Yes	IA	Nil
Inlet Road	29/05/2025 21:29	1.6	D	37	Yes	<20	Nil
Inlet Road West	29/05/2025 21:09	1.3	D	35	Yes	IA	Nil
Long Point	29/05/2025 21:00	1.7	D	35	Yes	IA	Nil
South Bulga	29/05/2025 23:20	1.9	E	36	Yes	<20	Nil
Wambo Road	29/05/2025 21:55	2.2	D	38	Yes	26	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 after measured exceedance.

Table 6: $L_{A1, 1Minute}$ Mount Thorley - Impact Assessment Criteria – May 2025

Location[5]	Date and Time	Wind Speed (m/s)	Stability Class	Criterion dB	Criterion Applies?[1]	MTO $L_{A1, 1min}$ dB[2,3]	Exceedance[3,4]
Bulga RFS	29/05/2025 23:41	1.6	F	47	Yes	<20	Nil
Bulga Village	29/05/2025 22:16	2.3	E	48	Yes	<25	Nil
Gouldsville	29/05/2025 21:21	1.3	D	45	Yes	IA	Nil
Inlet Road	29/05/2025 21:29	1.6	D	47	Yes	<20	Nil
Inlet Road West	29/05/2025 21:09	1.3	D	45	Yes	IA	Nil
Long Point	29/05/2025 21:00	1.7	D	45	Yes	IA	Nil
South Bulga	29/05/2025 23:20	1.9	E	46	Yes	<20	Nil
Wambo Road	29/05/2025 21:55	2.2	D	48	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 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 after measured exceedance.

5.1.3 NPfI Low Frequency Assessment

In accordance with the requirements of the EPA's Noise Policy for Industry (NPfI), 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 7** and the MTO assessment for low frequency noise is shown in **Table 8**.

Table 7: Warkworth Low Frequency Noise Assessment – May 2025

Location[3]	Date and Time	Measured WML LAeq dB	Criterion Applies?	Intermittency Modifying Factor? [1]	Tonality Modifying Factor? [1]	Frequency of Tonality [1]	Low-frequency Modifying Factor?	Maximum Exceedance of Reference Spectrum [1,2]	Penalty dB [2]
Bulga RFS	29/05/2025 23:41	<20	Yes	No	No	NA	No	NA	Nil
Bulga Village	29/05/2025 22:16	27	Yes	No	No	NA	No	NA	Nil
Gouldsville	29/05/2025 21:21	33	Yes	No	No	NA	No	NA	Nil
Inlet Road	29/05/2025 21:29	<20	Yes	No	No	NA	No	NA	Nil
Inlet Road West	29/05/2025 21:09	IA	Yes	No	No	NA	No	NA	Nil
Long Point	29/05/2025 21:00	IA	Yes	No	No	NA	No	NA	Nil
South Bulga	29/05/2025 23:20	<25	Yes	No	No	NA	No	NA	Nil
Wambo Road	29/05/2025 21:55	26	Yes	No	No	NA	No	NA	Nil

Notes:
1. Yes/No denote modifying factor was or was not applied. NA denotes 'not applicable'; and
2. Bold results indicate that application of NPfI modifying factor/s is required.
3. Follow up measurement within one week of measured exceedance.

Table 8: Mount Thorley Operations Low Frequency Noise Assessment – May 2025

Location[3]	Date and Time	Measured MTO LAeq dB	Criterion Applies?	Intermittency Modifying Factor? [1]	Tonality Modifying Factor? [1]	Frequency of Tonality[1]	Low-frequency Modifying Factor? [1]	Maximum Exceedance of Reference Spectrum [1,2]	Penalty dB[2]
Bulga RFS	29/05/2025 23:41	<20	Yes	No	No	NA	No	NA	Nil
Bulga Village	29/05/2025 22:16	<25	Yes	No	No	NA	No	NA	Nil
Gouldsville	29/05/2025 21:21	IA	Yes	No	No	NA	No	NA	Nil
Inlet Road	29/05/2025 21:29	<20	Yes	No	No	NA	No	NA	Nil
Inlet Road West	29/05/2025 21:09	IA	Yes	No	No	NA	No	NA	Nil
Long Point	29/05/2025 21:00	IA	Yes	No	No	NA	No	NA	Nil
South Bulga	29/05/2025 23:20	<20	Yes	No	No	NA	No	NA	Nil
Wambo Road	29/05/2025 21:55	26	Yes	No	No	NA	No	NA	Nil

Notes:

1. Yes/No denote modifying factor was or was not applied. NA denotes 'not applicable'; and

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

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

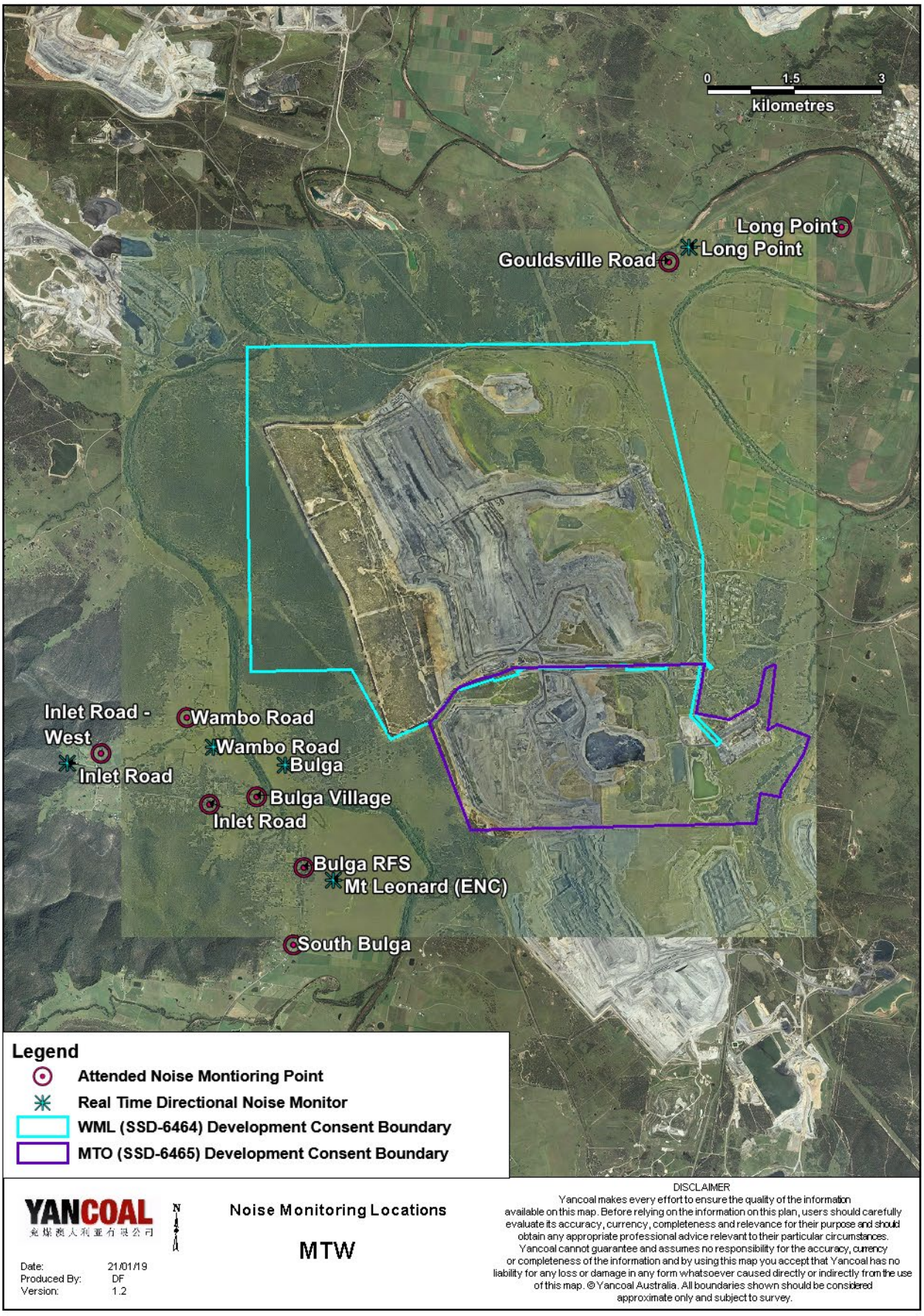


Figure 16: Noise Monitoring Location Plan

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 May are provided in **Table 9**.

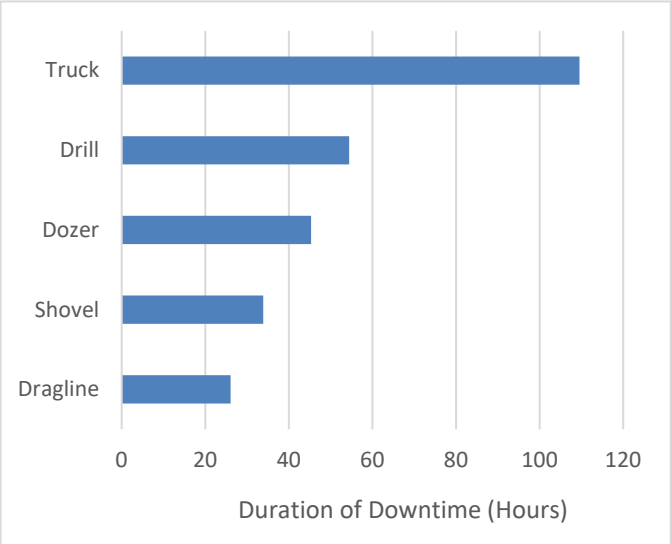
Table 9: Supplementary Attended Noise Monitoring Data – May 2025

No. of assessments	No. of assessments > trigger	No. of nights where assessments > trigger	% greater than trigger
648	20	8	3.1

6.0 OPERATIONAL DOWNTIME

During May, a total of 269.98 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 17: Operational Downtime by Equipment Type – May 2025



7.0 REHABILITATION

During May 2025, 3.1 Ha of land was released, 6.9 Ha was bulk shaped and 6.2 Ha was topsoiled.

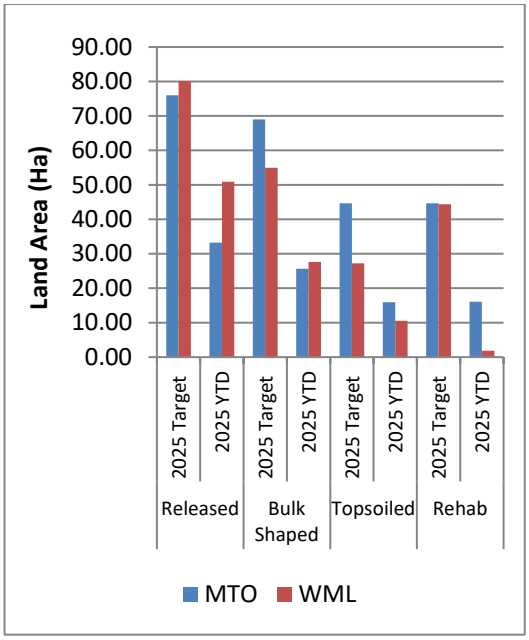


Figure 18: Rehabilitation YTD – May 2025

8.0 ENVIRONMENTAL INCIDENTS

There was one environmental incident recorded during the reporting period.

On 26 May 2025 an airblast overpressure of 122.6 dB was recorded at the "Bulga Village" monitoring location, which exceeded the 120dB(L) threshold for airblast overpressure. All other blast monitors were compliant with the airblast overpressure threshold. The exceedance was reported to the Department of Planning, Housing and Infrastructure (DPHI) and to the Environment Protection Authority (EPA) on 26 May 2025. A written report was also provided to DPHI and to the EPA for this blast on 2 June 2025. The reason for the elevated blast overpressure result at the Bulga Village monitor has not been definitively determined based on the initial investigation, with potential causes including an instrumentation issue, or meteorological conditions differing from that predicted in relation to enhancement conditions yet to be ruled out. An additional blast monitor was installed at the Bulga Village location as part of the equipment investigation.

9.0 COMPLAINTS

Seven 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	0	3	3	2	0	8
February	2	0	3	2	1	8
March	8	2	5	1	0	16
April	6	4	7	0	0	17
May	4	0	3	0	0	7
June						
July						
August						
September						
October						
November						
December						
Total	20	9	21	5	1	56

Appendix A: Meteorological Data

Table 11: Meteorological Data – Charlton Ridge Meteorological Station – May 2025

Date	Air Temperature		Relative Humidity		Wind Direction	Wind Speed	Rainfall
	Maximum (°C)	Minimum (°C)	Maximum (%)	Minimum (%)	Average (°)	Average (m/sec)	total (mm)
1/05/2025	20	10	90	51	178	4.4	0.2
2/05/2025	20	11	100	55	176	3.8	0.4
3/05/2025	21	10	99	49	173	2.6	0.2
4/05/2025	21	8	100	60	183	1.9	0.0
5/05/2025	22	12	100	60	162	1.7	0.0
6/05/2025	25	10	100	48	220	1.5	0.0
7/05/2025	25	10	100	39	284	2.1	0.2
8/05/2025	23	11	100	41	203	2.1	1.2
9/05/2025	20	10	100	57	178	2.8	0.4
10/05/2025	19	10	100	74	170	3.2	0.2
11/05/2025	20	12	100	71	158	2.8	1.0
12/05/2025	22	14	100	60	140	1.6	0.2
13/05/2025	21	12	100	64	151	1.7	0.0
14/05/2025	22	13	100	64	183	1.5	0.0
15/05/2025	18	14	100	81	181	3.2	1.2
16/05/2025	19	13	100	76	204	1.9	1.6
17/05/2025	22	11	100	56	202	1.5	1.6
18/05/2025	15	10	100	68	180	4.0	6.0
19/05/2025	12	9	100	96	179	5.0	23.8
20/05/2025	15	10	100	84	173	5.5	5.8
21/05/2025	16	12	100	97	172	4.0	11.6
22/05/2025	17	14	100	100	149	3.0	21.2
23/05/2025	20	11	100	68	246	2.2	0.6
24/05/2025	20	10	83	45	277	3.3	0.0
25/05/2025	18	7	100	45	266	1.8	0.0
26/05/2025	14	7	100	70	184	1.3	11.4
27/05/2025	18	9	100	40	258	3.2	12.8
28/05/2025	18	7	92	50	295	3.4	0.0
29/05/2025	15	7	92	69	294	1.9	0.0
30/05/2025	20	8	100	52	189	1.9	0.0
31/05/2025	19	9	100	58	181	2.2	0.0