MACHEnergy

Mount Pleasant Operation

Monthly Environmental Monitoring Report

May 2024

1. Introduction

The Mount Pleasant Operation (MPO) is located within Upper Hunter Valley of New South Wales, approximately three kilometres (km) north-west of Muswellbrook and approximately 50 km north-west of Singleton. The villages of Aberdeen and Kayuga are located 12 km north-northeast and 3 km north of the operations, respectively.

The purpose of this report is to provide a monthly update of monitoring data in accordance with the requirements of NSW Environmental Protection Licence (EPL) 20850, Section 66(6) of the *Protection of the Environment Operations Act 1997* (*POEO Act*), the MPO Development Approval (DA 92/97) and the MPO Development Consent (SSD 10418).

Table 1-1 – Mount Pleasant Operation

Name of Operation	Mount Pleasant Operation
Name of Licensee	MACH Energy Australia Pty Ltd
Environmental Protection Licence	20850
Project Approval	DA 92/97 & SSD 10418
Reporting Period Start Date	1 May 2024
Reporting Period End Date	31 May 2024
Date All Data Received	11 July 2024

Links to three key regulatory documents are provided here:

- MACH Energy Environment Protection Licence EPL 20850; and
- Mount Pleasant Operation Development Application Approval DA 92/97; and
- Mount Pleasant Operation Development Consent SSD 10418.

2. Monitoring Requirements

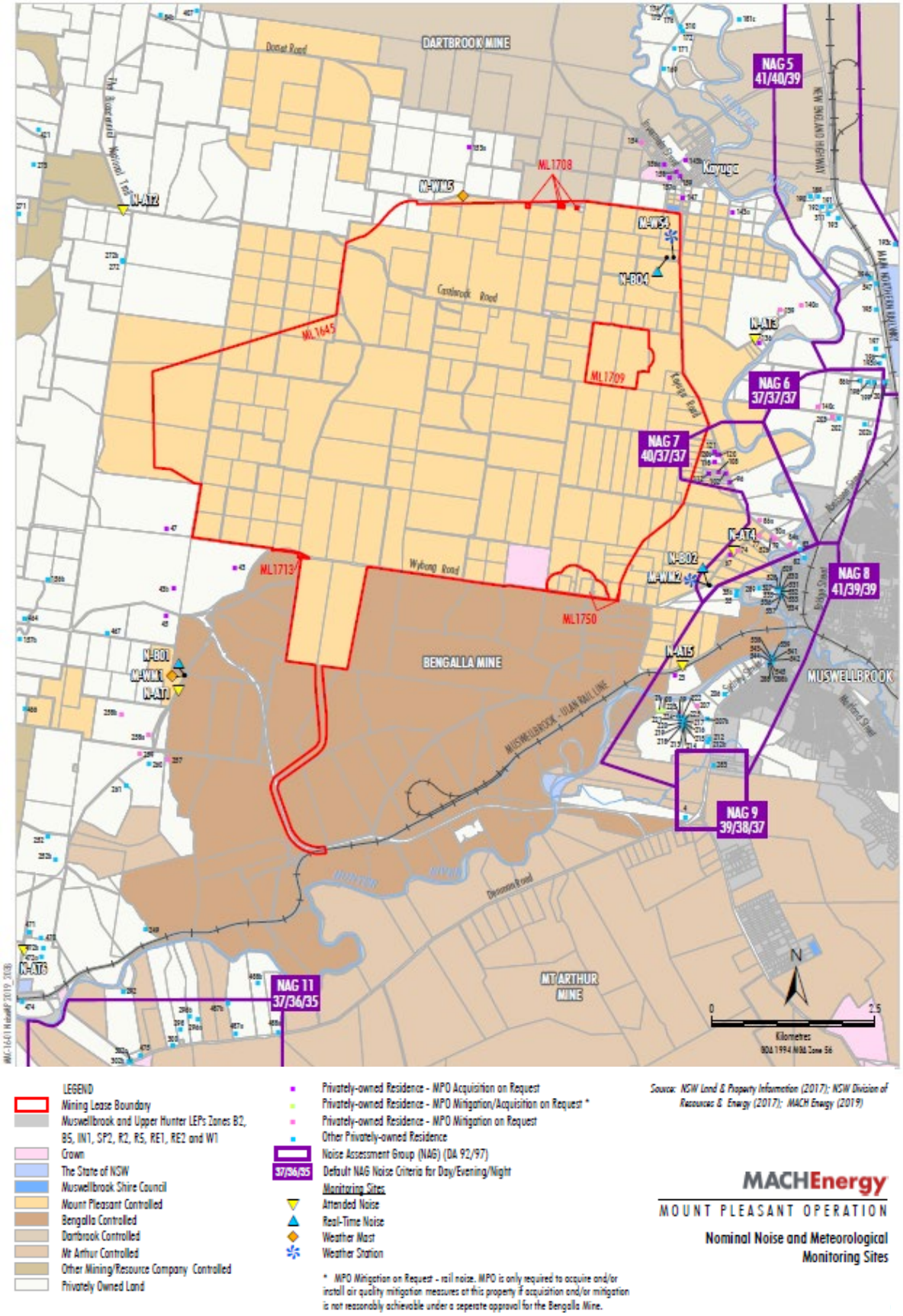
The MPO EPL 20850 specifically requires the monitoring of:

- 2 x Palas Fidas Air Quality Monitoring sites.
- Noise monitoring.
- Blast monitoring; and
- Meteorological monitoring.

Monitoring of sites not required by the EPL are conducted in accordance with *MPO Environmental Monitoring Program* (*EMP*), Project Approval (DA 92/97) and Development Consent (SSD 10418).

All monitoring is undertaken by suitably qualified and experienced person(s). The MPO Environmental Monitoring Network is shown in the following figures**:**

- **Figure 2-1** shows MPO attended noise monitoring locations and Noise Assessment Groups (NAGs).
- **Figure 2-2** shows the MPO Air Quality Monitoring network.
- **Figure 2-3** shows the MPO Blast Monitoring Locations.
- **Figure 2-4** shows the MPO Groundwater Monitoring network; and
- **Figure 2-5** shows the MPO Surface Water Monitoring network.



LEGEND

- Mining Lease Boundary
- Muswellbrook and Upper Hunter LEPs Zones B2, B5, IN1, SP2, R2, R5, RE1, RE2 and W1
- Crown
- The State of NSW
- Muswellbrook Shire Council
- Mount Pleasant Controlled
- Bengalla Controlled
- Dartbrook Controlled
- Mt Arthur Controlled
- Other Mining/Resource Company Controlled
- Privately Owned Land

- Privately-owned Residence - MPO Acquisition on Request
- Privately-owned Residence - MPO Mitigation/Acquisition on Request *
- Privately-owned Residence - MPO Mitigation on Request
- Other Privately-owned Residence
- Noise Assessment Group (NAG) (DA 92/97)
- 37/36/35 Default NAG Noise Criteria for Day/Evening/Night

Monitoring Sites

- Attended Noise
- Real-Time Noise
- Weather Mast
- Weather Station

* MPO Mitigation on Request - rail noise. MPO is only required to acquire and/or install air quality mitigation measures at this property if acquisition and/or mitigation is not reasonably achievable under a seperate approval for the Bengalla Mine.

Source: NSW Land & Property Information (2017); NSW Division of Resources & Energy (2017); MACH Energy (2019)

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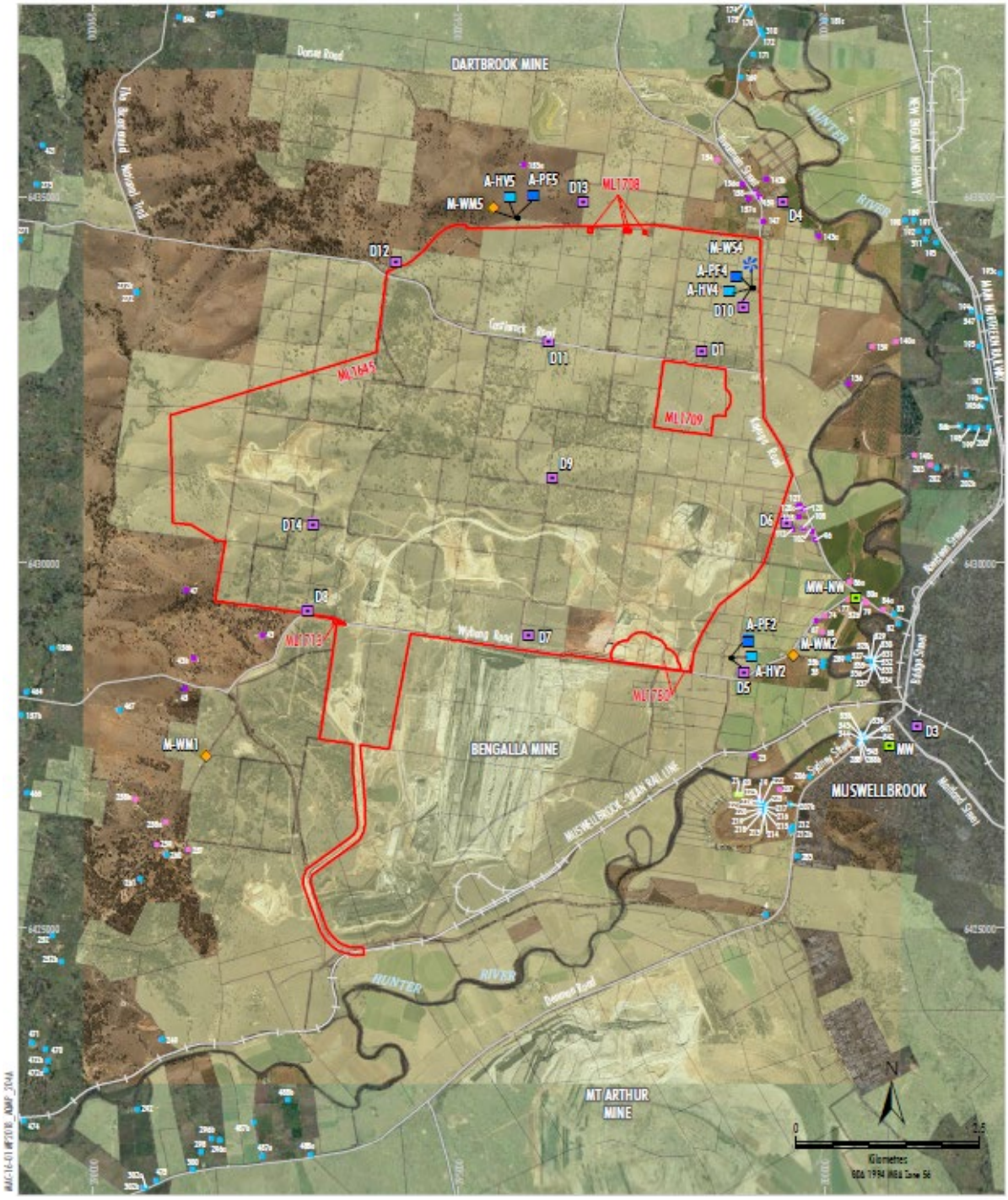
MOUNT PLEASANT OPERATION

Nominal Noise and Meteorological Monitoring Sites

Figure 2-1 – MPO Attended Noise Monitoring Assessment Groups and Locations



LEGEND

Mining Lease Boundary
Mine Owned
Privately-owned Residence - MPO Acquisition on Request
Privately-owned Residence - MPO Mitigation/Acquisition on Request *
Privately-owned Residence - MPO Mitigation on Request
Other Privately-owned Residence

Monitoring Sites:
Air Quality - High Volume Sampler
Air Quality - Palas Fidas
Dust Deposition Gauge
Upper Hunter Air Quality Monitoring Network
Weather Mast
Weather Station

* MPO Mitigation on Request - rail noise. MPO is only required to acquire and/or install air quality mitigation measures at this property if acquisition and/or mitigation is not reasonably achievable under a separate approval for the Bengalla Mine.

Source: NSW Land & Property Information (2017); NSW Division of Resources & Energy (2017); MACH Energy (2019)
Orthophoto: MACH Energy (July 2018); NSW Department of Finance & Innovation (2018)

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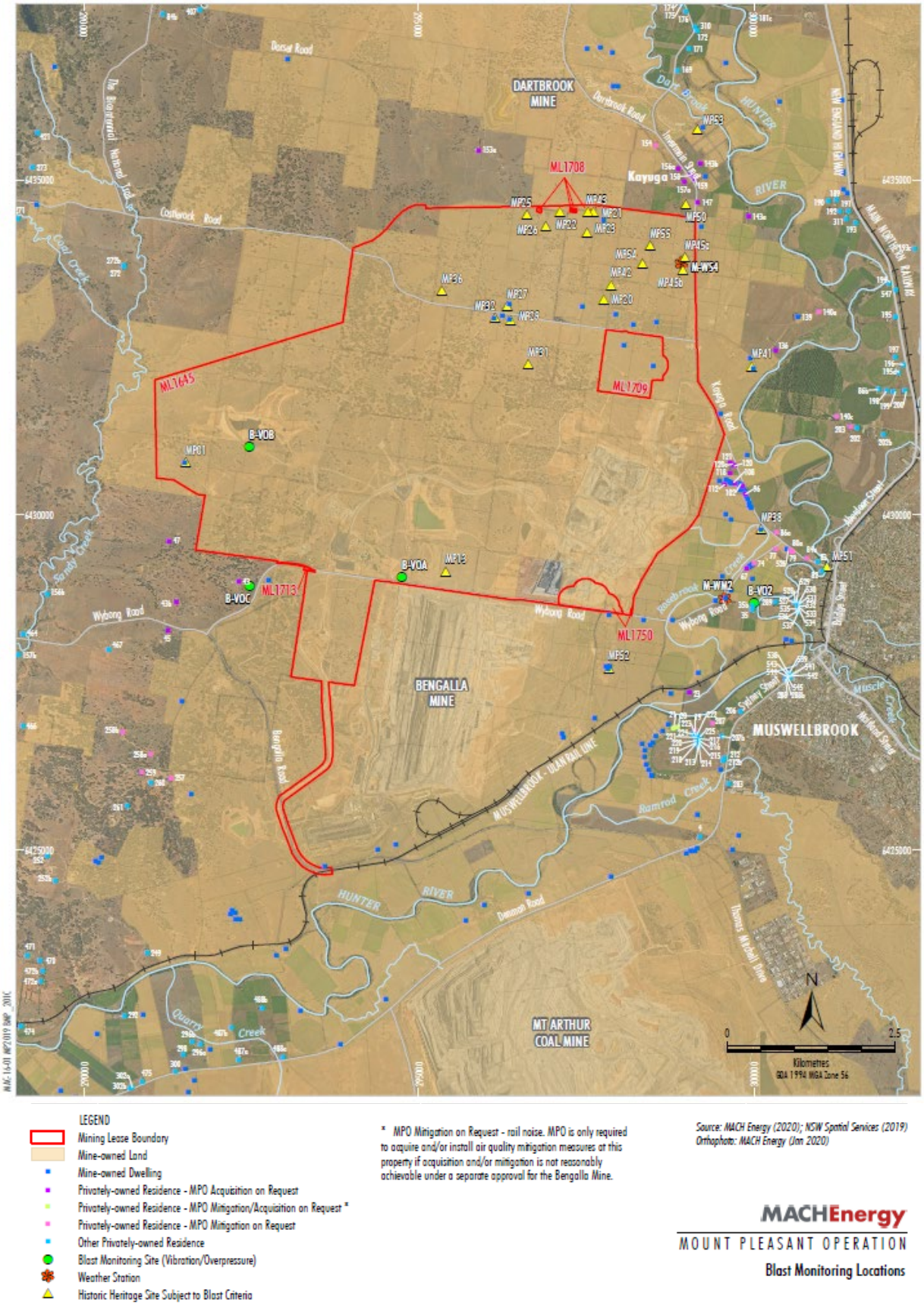
Air Quality and Meteorological Monitoring Sites

Figure 2-2 – MPO Air Quality and Meteorological Monitoring Network



LEGEND

- Mining Lease Boundary
- Mine-owned Land
- Mine-owned Dwelling
- Privately-owned Residence - MPO Acquisition on Request
- Privately-owned Residence - MPO Mitigation/Acquisition on Request *
- Privately-owned Residence - MPO Mitigation on Request
- Other Privately-owned Residence
- Blast Monitoring Site (Vibration/Overpressure)
- Weather Station
- Historic Heritage Site Subject to Blast Criteria

* MPO Mitigation on Request - rail noise. MPO is only required to acquire and/or install air quality mitigation measures at this property if acquisition and/or mitigation is not reasonably achievable under a separate approval for the Bengalla Mine.

Source: MACH Energy (2020); NSW Spatial Services (2019)
Orthophoto: MACH Energy (Jan 2020)

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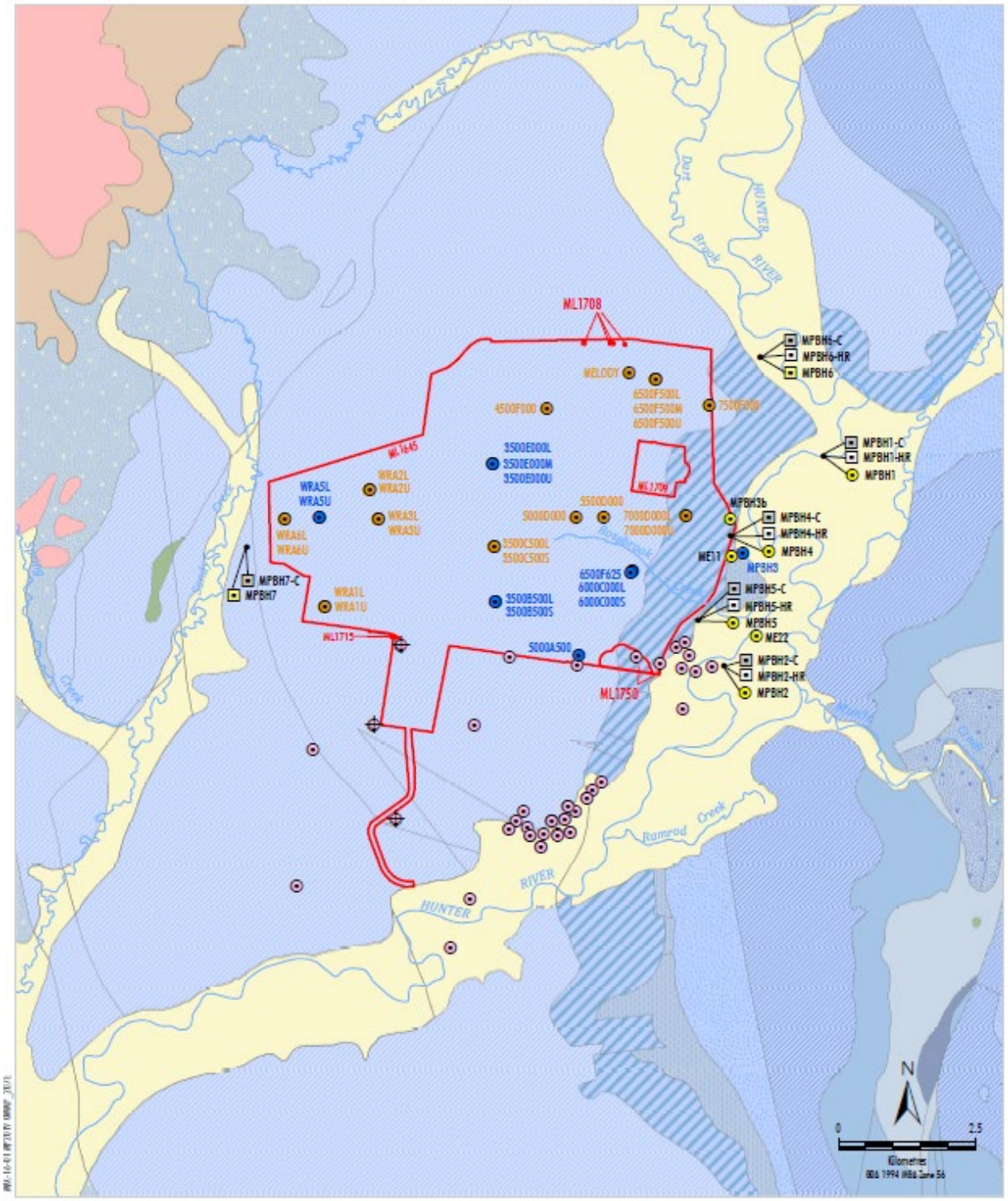
Blast Monitoring Locations

Figure 2-3 – MPO Blast Monitoring Locations



LEGEND

Mining Lease Boundary

Mount Pleasant Monitoring

- Standpipe
- Standpipe - Alluvium
- Standpipe - Historical

Planned Mount Pleasant Monitoring

- Standpipe - Coal Seam
- Standpipe - Interburden
- Standpipe - Alluvium

Bengalla Monitoring

- Standpipe
- Vibrating Wire Piezometer

Source: NSW Land & Property Information (2019); NSW Division of Resources & Energy (2019); MACH Energy (2019)

Note: Refer Figure 3 for geology legend

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Augmentations to the Groundwater Monitoring Network

Figure 2-4 – MPO Groundwater Monitoring Network

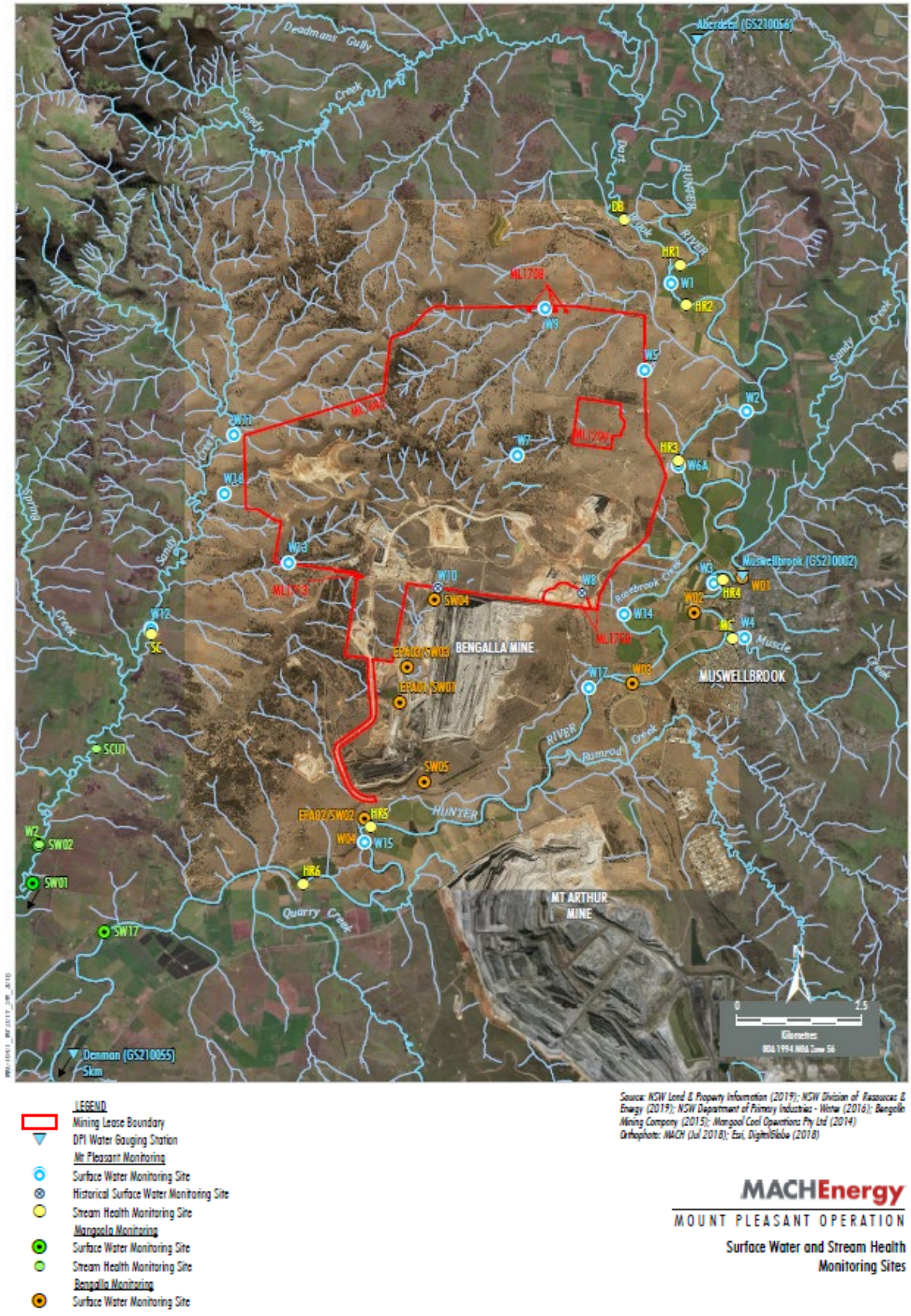

Figure 2-5 – MPO Surface Water Monitoring Network

3. Meteorological Monitoring

Weather data is measured continuously at the Kayuga Road (M-WS4) and the Wybong Road (M-WS2) meteorological stations. In addition to air quality parameters (PM_{10} and $PM_{2.5}$), the weather stations measure wind speed and direction, temperature (at 2 metres (m) and 10m), temperature inversion (using the sigma theta method), solar radiation, relative humidity, rainfall, and atmospheric pressure.

Most meteorological data was captured at M-WS4 (>98.6%) during May 2024.

Throughout May 2024, there was 59.0mm and 48.8mm of rainfall recorded at M-WS2 and M-WS4, respectively.

4. Dust Depositional Monitoring

4.1 Methodology

Dust deposition was monitored according to the OEH's *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* (DECC 2007), which references *Australian Standard (AS)/New Zealand Standard (NZS) 3580.10.1:2016 Methods for Sampling and Analysis of Ambient Air: Determination of particulate matter – Deposited matter – Gravimetric Method*. The dust deposition monitoring network comprises of 13 dust deposition gauges (DDG). Details of the monitoring locations are shown in **Figure 2-2**.

DDG samples can be contaminated by a variety of means, notably by the presence of insects and bird droppings. Results for contaminated gauges were not included in the calculation of the annual averages as this would result in skewed or misleading results for the purpose of dust deposition assessment. The Australian Standard does not provide criteria for the determination of contamination of a DDG. AECOM determines a gauge sample to be contaminated only after reference to field observation sheets, historical monitoring location data, laboratory notes and results, prevailing atmospheric conditions, and feedback from field technicians. For example, a gauge sample with a statistically abnormally high insoluble solids result, a low ash residue result (indicating an elevated level of organic matter) and field notation that bird droppings or insects were present is likely to be considered contaminated.

While the new SSD 10418 does not explicitly mention dust deposition gauges, there is a notable shift in regulations towards embracing high volume air sampler results and continuous air quality monitoring programs, with a specific focus on total particulate matter, PM10, and PM2.5. These modern monitoring techniques offer a more comprehensive approach to environmental surveillance, furnishing real-time data and insights into air quality conditions. By harnessing these advanced methods, MPO can ensure the implementation of robust monitoring practices, effectively supplanting the older dust deposition gauges. This transition from the previous development consent DA92/97 (which is yet to be surrendered) to SSD 10418 signifies an initiative-taking measure towards upholding environmental compliance. Therefore, Dust Depositional Monitoring will continue to be included in monthly reporting as per DA92/97 up until surrender where it will be discontinued.

4.2 Results

The dust deposition exposure period for gauges began on April 29, 2024. Samples were collected on May 30, 2024, by AECOM and analysed by ALS, a laboratory accredited by the National Association of Testing Authorities (NATA). Results are summarised in **Table 4-1**.

Annual rolling averages for May 2024 have been provided to indicate performance from June 2023 to May 2024. These do not represent the annual average results for 2024 as specified in Schedule 3, Condition 20 of DA 92/97 and Schedule 2, Condition B28 of SSD 10418.

Table 4-1: Dust Depositional Results – May 2024

Location	YTD Insoluble Solids (g/m^2.month)	Insoluble Solids Annual Rolling Average (g/m^2.month)
D1	1.7	1.8
D3a	0.6	1.6
D4	0.9	1.3
D5a	1.6	2.6
D6	0.7	2.3
D7b	25.1c	**9.9**
D8	3.5	**4.6**
D9a	4.0	**4.3**
D10	0.6	1.1
D11	3.7	3.6
D12	0.7	1.0
D13	1.0	1.3
D14	1.8	3.1
Criterion	--	**4**

Notes:
*Results in **bold** indicate an elevated measurement of adopted assessment criteria.*
** Insufficient monthly results to calculate annual average*
c – Field technician deems the result contaminated due to insects, bird droppings and a variety of other reasons. This determination is made only after reviewing field observation sheets, laboratory notes, historical monitoring of the location, and previous results. Contaminated samples are not included in the annual average calculation for DDG.

Contaminated results, as described in Section 4.1, are not included in the 12-month rolling average. Site D7b is located within proximity to the northern boundary of a neighbouring mining operation and thus can be influenced by this site. D7b will continue to be monitored, however will not be used to assess compliance or to represent residential receivers in the area. Additionally, there are no privately-owned receivers in the vicinity of D8, and D9a. Whilst these sites do not represent residence(s) on privately-owned land, they will continue to be

monitored in accordance with the *MPO Air Quality and Greenhouse Gas Management Plan* (MACH Energy, 2019).

Field notes from the May sampling event noted that all the gauges contained insects, one contained vegetation and bird droppings. Field notes indicated that D3a contained suspended solids. It was noted the bird ring at D14 was damaged. Annual average dust deposition results (insoluble solids) were below the annual average criterion of four g/m2.month at all sites except D7b, D8 and D9a.

Figure 4-1 compares the monthly insoluble solids results to the annual averages for each dust gauge and the assessment criterion.

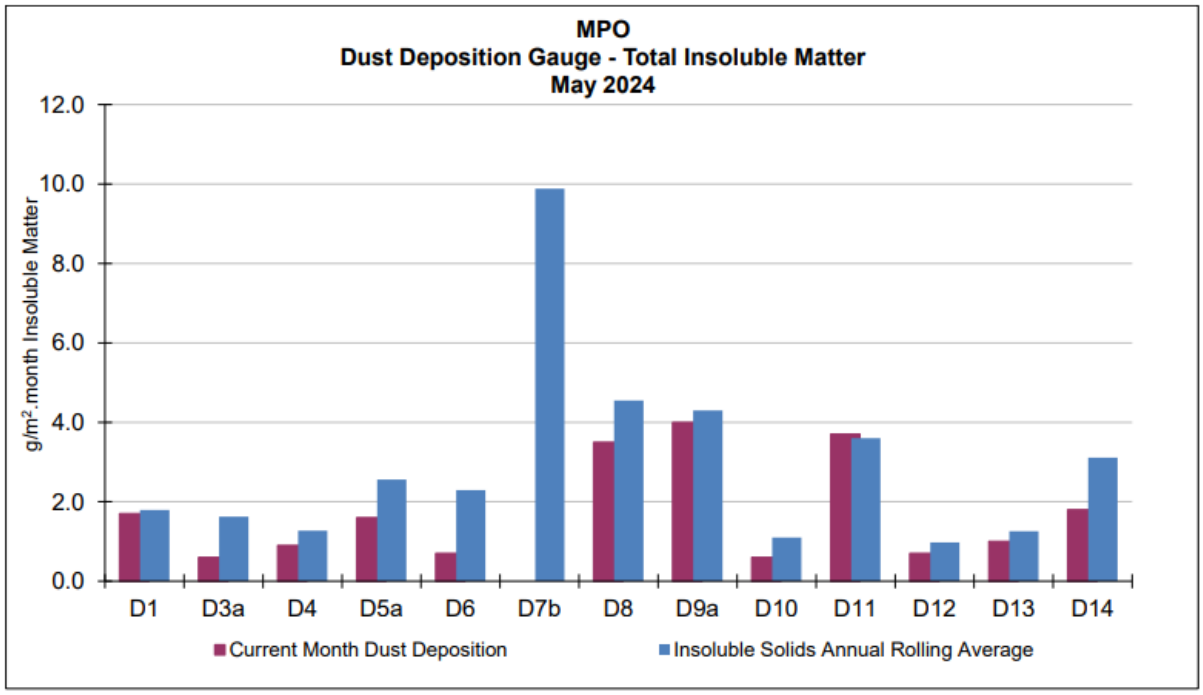

Figure 4-1: MPO Dust Deposition Monthly Results and Annual Rolling Average – May 2024

5. Total Suspended Particulates

All High-Volume Air Samplers (HVAS) are run for 24 hours every six days in accordance with *AM-15 of Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* (DECC, 2007), referencing *AS/NZS 3580.9.3:2015 Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – Total suspended particulate matter (TSP) - High volume sampler gravimetric method*, for the monitoring of TSP.

Three TSP HVAS units are included in the MPO air quality monitoring network and are displayed in **Table 5-1** below. These units were commissioned in May 2017.

Table 5-1 Total Suspended Particulate Monitoring Sites

ID	Description
A-PF2	Reilly's
M-WS4	Kayuga Road Met Station
A-PF5	Athlone

5.1 Assessment Criteria

TSP is assessed against the guidelines defined in the *EPA Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (EPA 2016), Project Approval DA 92/97 and Development Consent SSD 10418. The DA 92/97 and SSD 10418 both specify an annual average project contribution plus background criterion of 90 µg/m^3.

5.2 Results

Sample collection was undertaken by AECOM with sample analysis performed by ALS, a NATA accredited laboratory. TSP results for the monitoring period are provided in **Table 5-2**. Annual rolling averages for May 2024 have been provided as an indication of performance between May 2023 – May 2024 and do not represent annual average results for 2024 as per Schedule 3, Condition 20 of DA 92/97 and Schedule 2, Condition B28 of SSD 10418.

Table 5-2 Total Suspended Particulate Monitoring Data – May 2024

Run Date	Assessment Criterion	TSP µg/m^3		
		HVAS A-PF2	HVAS A-PF5	HVAS M-WS4
5/05/2024	-	11.0	31.1	13.0
11/05/2024	-	9.6	30.9	10.5
17/05/2024	-	27.0	18.4	23.6
23/05/2024	-	22.6	33.0	23.0
29/05/2024	-	35.6	51.3	39.1
*Monthly Mean	-	21.2	32.9	21.8
Annual Rolling Average	*90*	55	55	37

Notes:
*Results in **bold** indicate an elevated reading.*
Results have been rounded to one decimal place for reporting purposes where applicable.
^ Timer modification prevented the 11/04/24 run. Makeup run was performed on 12/04/24. Results for Makeup run were not included in the monthly mean or Annual Rolling Average.

5.3 Discussion

For the reporting period, the annual rolling average TSP data at all sites was below the annual average criterion of 90 µg/m^3.

6. Real Time Air Quality Monitoring

Continuous particulate matter less than 10 µm (PM_{10}) and particulate matter less than 2.5 µm ($PM_{2.5}$) monitoring was conducted by three Palas Fidas units (one utilised for management only) at MPO during May 2024.

The EPA identification numbers 1 and 2 refer to Palas Fidas units installed on Wybong Road (A-PF2) and Dorset Road (A-PF5), respectively. In addition, a third unit (A-PF4) is installed on Kayuga Road with data used for management purposes only.

Real time PM_{10} and $PM_{2.5}$ 12-month rolling averages for May 2024 have been provided in Section 6.2 and 6.4 respectively, as an indication of performance during 2024 as per Schedule 3, Condition 20 of DA 92/97 and Schedule 2, Condition B28 of SSD 10418.

6.1 PM_{10} Results – 24 Hour Rolling Average

In accordance with the DA 92/97 and SSD 10418 limit of 50 µg/m3 for the 24-hour daily average, there were no elevated readings in May 2024. Real time PM_{10} 24 hour daily average results for May 2024 are presented in **Table 6-1.**

Figure 6-1 below shows the results of real-time PM_{10} 24 hour daily average results at MPO air quality monitoring sites May 2024.

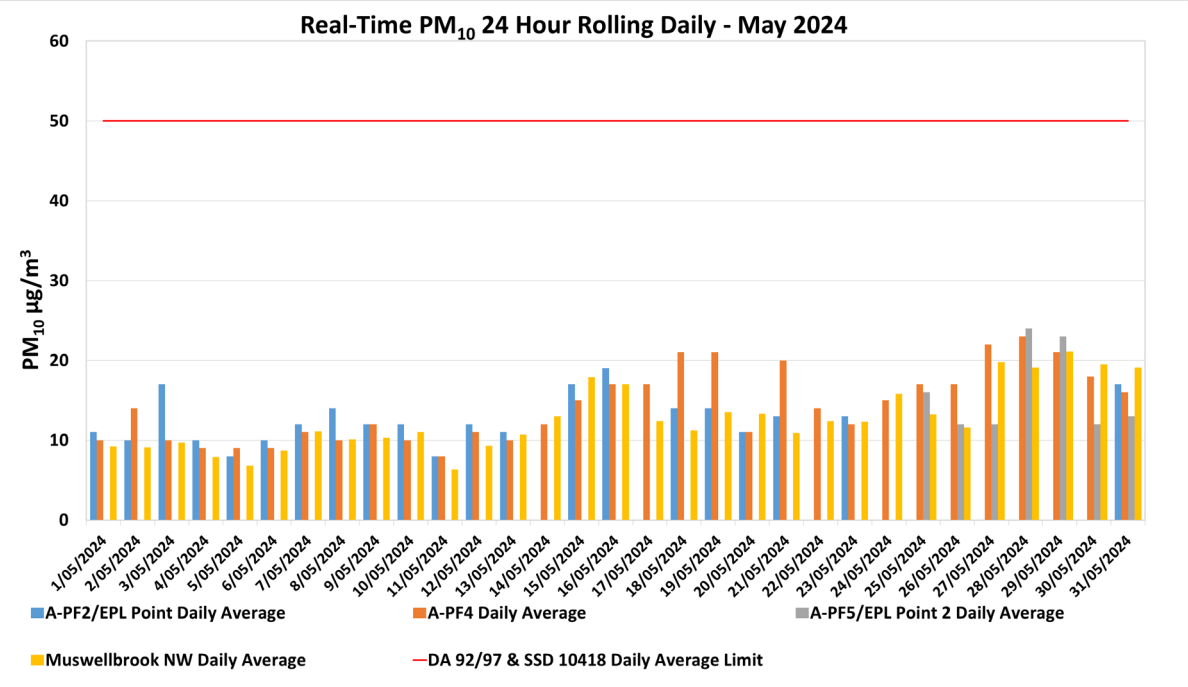

Figure 6-1: Real-time PM_{10} 24 Daily Average Results for May 2024.

Table 6-1: MPO Palas Fidas PM_{10} Data – May 2024

Date	A-PF2 EPA ID 1	A-PF4	A-PF5 EPA ID 2	Muswellbrook NW	A-PF2, A-PF4, A-PF5 24 Hour Average Limit (µg/m³)
	24-hour Average Result				
1/05/2024	11	10	-	9.2	50
2/05/2024	10	14	-	9.1	50
3/05/2024	17	10	-	9.7	50
4/05/2024	10	9	-	7.9	50
5/05/2024	8	9	-	6.8	50
6/05/2024	10	9	-	8.7	50
7/05/2024	12	11	-	11.1	50
8/05/2024	14	10	-	10.1	50
9/05/2024	12	12	-	10.3	50
10/05/2024	12	10	-	11	50
11/05/2024	8	8	-	6.3	50
12/05/2024	12	11	-	9.3	50
13/05/2024	11	10	-	10.7	50
14/05/2024	-	12	-	13	50
15/05/2024	17	15	-	17.9	50
16/05/2024	19	17	-	17	50
17/05/2024	-	17	-	12.4	50
18/05/2024	14	21	-	11.2	50
19/05/2024	14	21	-	13.5	50
20/05/2024	11	11	-	13.3	50
21/05/2024	13	20	-	10.9	50
22/05/2024	-	14	-	12.4	50
23/05/2024	13	12	-	12.3	50
24/05/2024	-	15	-	15.8	50
25/05/2024	-	17	16	13.2	50
26/05/2024	-	17	12	11.6	50
27/05/2024	-	22	12	19.8	50
28/05/2024	-	23	24	19.1	50
29/05/2024	-	21	23	21.1	50
30/05/2024	-	18	12	19.5	50
31/05/2024	17	16	13	19.1	50

Notes:
*Results in **bold** indicate elevated readings during adverse weather conditions.*
Results with "- "indicate dates where data was affected by maintenance or servicing (scheduled and unscheduled)

6.2 PM_{10} Results – Annual Rolling Average

There was no exceedance of the PM_{10} annual rolling average reported at MPO during May 2024. Real time PM_{10} annual rolling averages during the reporting period are presented in **Figure 6-2** below.

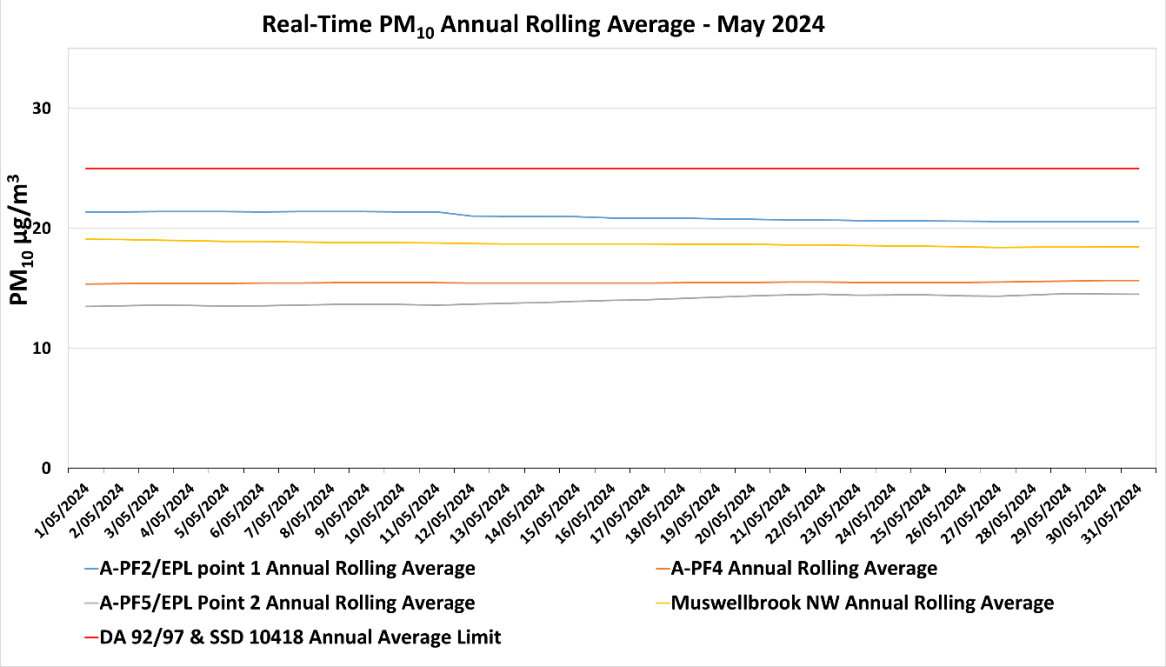

Figure 6-2: Real-time PM_{10} Annual Rolling Average Results for May 2024.

6.3 $PM_{2.5}$ Results – 24 Hour Daily Average

There was no exceedance of the $PM_{2.5}$ annual rolling average reported at MPO during May 2024. Real time $PM_{2.5}$ 24 hour rolling average results for May 2024 are presented in **Table 6-2.**

Table 6-2: MPO Palas Fidas $PM_{2.5}$ Data – May 2024

Date	A-PF2/EPA ID 1	A-PF4	A-PF5/EPA ID 2	A-PF2, A-PF4, A-PF5 24 Hour Average Limit (µg/m³)
	24-hour Average Result			
1/05/2024	4	4	-	25
2/05/2024	4	4	-	25
3/05/2024	5	4	-	25
4/05/2024	4	4	-	25
5/05/2024	4	4	-	25
6/05/2024	4	4	-	25
7/05/2024	4	4	-	25
8/05/2024	5	4	-	25
9/05/2024	5	5	-	25
10/05/2024	4	4	-	25
11/05/2024	4	4	-	25
12/05/2024	5	5	-	25

13/05/2024	4	4	-	25
14/05/2024	-	5	-	25
15/05/2024	6	6	-	25
16/05/2024	8	7	-	25
17/05/2024	-	8	-	25
18/05/2024	6	8	-	25
19/05/2024	5	6	-	25
20/05/2024	4	4	-	25
21/05/2024	5	6	-	25
22/05/2024	-	6	-	25
23/05/2024	5	5	-	25
24/05/2024	-	6	-	25
25/05/2024	-	9	7	25
26/05/2024	-	10	6	25
27/05/2024	-	8	5	25
28/05/2024	-	11	8	25
29/05/2024	-	8	6	25
30/05/2024	-	7	5	25
31/05/2024	6	5	4	25

Notes:
*Results in **bold** indicate elevated readings during adverse weather conditions.*
Results with "- "indicate dates where data was affected by maintenance or servicing (scheduled and unscheduled)

Real time $PM_{2.5}$ 24-hour average results for May 2024 are presented in **Figure 6-3** below.

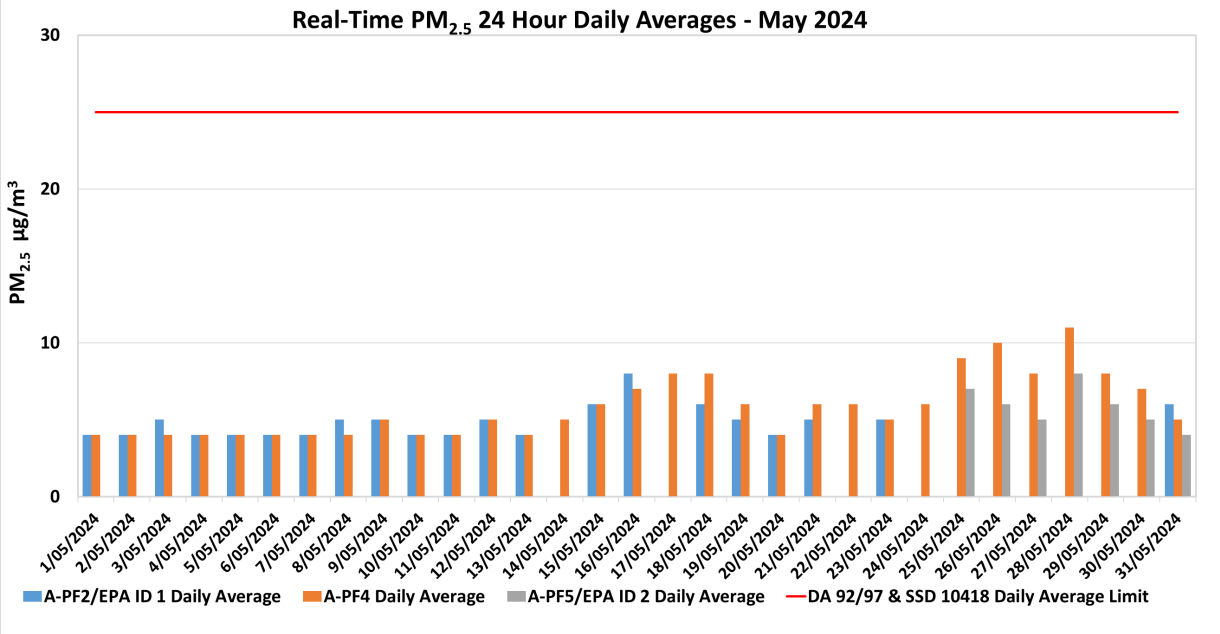

Figure 6-3: Real-time $PM_{2.5}$ 24 hour Daily Average Results for May 2024.

6.4 $PM_{2.5}$ Results - Annual Rolling Average

There was no exceedance of the $PM_{2.5}$ annual rolling average reported at MPO during May 2024. Real time $PM_{2.5}$ annual rolling averages during the reporting period are presented in **Figure 6-4** below.

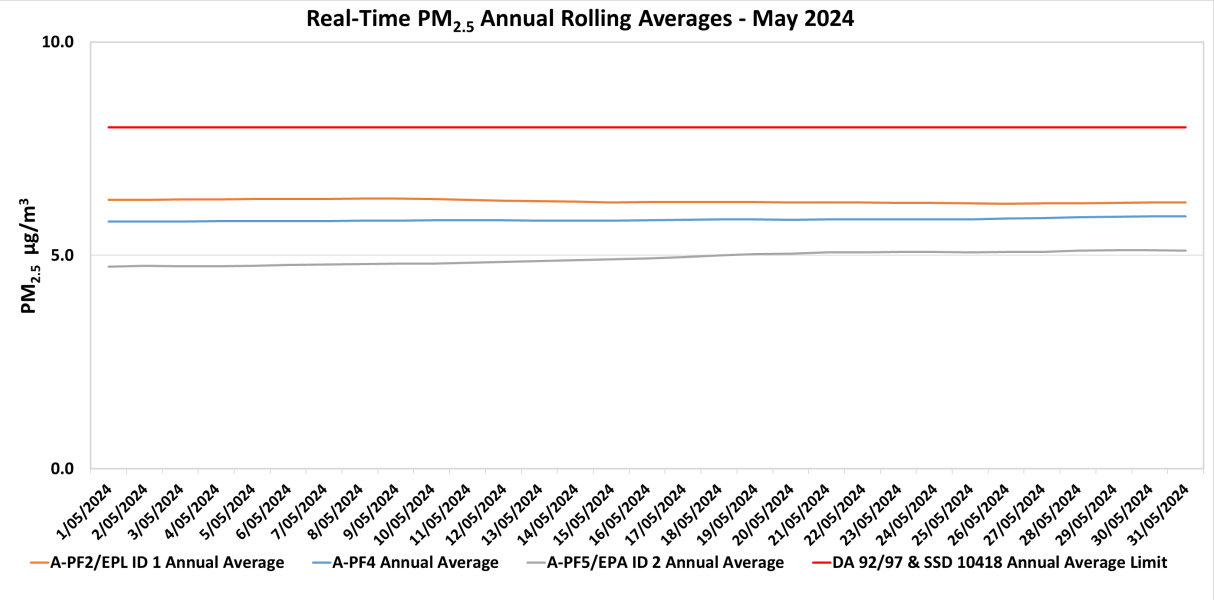

Figure 6-4: Real-time $PM_{2.5}$ Annual Rolling Average Results for May 2024.

7. Surface Water Monitoring

7.1 Methodology

Surface water quality is monitored at 14 sites monthly, with additional monitoring conducted if triggered by a rain event. A more comprehensive suite of analysis is performed at these sites on a quarterly basis.

7.2 Assessment Criteria

Surface waters were assessed as per the *MPO Water Management Plan* (MACH Energy, 2022) in accordance with site specific trigger values that have been developed using the ANZECC (2000) guidelines for sites that contain a minimum of two years of monthly data. Sites with insufficient data are assessed on default trigger values adopted from ANZECC (2000) guidelines.

7.3 Results

Surface water monitoring was conducted by AECOM on 29 May 2024. Laboratory analysis was performed by ALS NATA accredited laboratory. Monthly monitoring results for pH, EC, TSS and Total Dissolved Solids (TDS) are presented in **Table 7-1.**

Table 7-1 – MPO Monthly Surface Water Monitoring Results – 29 May 2024

Station	pH	Electrical Conductivity (EC) (µs/cm)[1]	Total Dissolved Solids (TDS) (mg/L)	Total Suspended Solids (TSS) (mg/L)
W1	7.9	380	280	19
W2	7.8	400	270	**21**
W3	7.9	390	290	24
W4	7.6	2250	1600	12
W5	*	*	*	*
W6A	8.2	390	250	19
W9	*	*	*	*
W11	8.2	4150	2800	< 5
W12	7.8	5700	3900	13
W13	**8.1**	**6350**	4700	33
W14	*	*	*	*
W15	8.1	450	260	26
W16	**8.1**	**8600**	5800	15
W17	8,0	410	250	32

*Note: Results in **bold** indicate exceedances of adopted assessment criteria.*
**Dry or insufficient water to sample.*
*** Unsafe access/ground condition.*
[1] Results have been rounded in accordance with the In-house method Q4AN(EV)-332-WI2 (EC).

During the 29 May monitoring event, three (3) sites were dry - W5, W9, W14. Sites W13 and W16 were above their respective EC and pH trigger levels. Site W2 was above the respective TSS trigger levels. All other sites were within their respective trigger levels.

An investigation is triggered if elevated measurements occur for three consecutive sampling events in accordance MPO Water Management Plan (MACH Energy, 2022).

8. Groundwater Monitoring

Quarterly groundwater monitoring was conducted on 1st, 2nd, 6th, 8th, 9th, and 14th of May 2024. Water level results for the groundwater bores are presented in **Table 8-1**. The quarterly pH and EC results are presented in **Table 8-2** and **Table 8-3**, respectively.

Table 8-1 - MPO Quarterly Groundwater Water Level Results

Monitoring Location/ ID	Water Level Trigger Range		May 2024 Water Level (DTW)	Feb 2024 Water Level (DTW)	Nov 2023 Water Level (DTW)	Triggered (Yes/No)
	80th Percentile (DTW)	Trigger				
WRA1L	-	>± 0.5m	**4.07**	**3.30**	2.71	
WRA1U	-	>± 0.5m	*	*	*	
WRA6L	-	>± 0.5m	0.88	1.24	1.21	
WRA6U	-	>± 0.5m	1.83	2.05	2.19	
MPBH1	9.71	10.70	9.99	9.90	10.05	No
MPBH2	12.20	14.20	12.00	14.20	11.82	No
MPBH3b	12.00	Dry (or 14.0m)	12.28	12.18	12.11	No
MPBH4	-	>± 0.5m	12.19	12.15	12.08	
MPBH5	-	>± 0.5m	*	*	*	
MPBH1-C	-	>± 0.5m	10.16	10.08	10.21	
MPBH1-HR	-	>± 0.5m	**22.48**	25.59	**29.72**	
MPBH2-C	-	>± 0.5m	12.29	12.10	11.89	
MPBH2-HR	-	>± 0.5m	12.2	12.05	11.85	
MPBH4-C	-	>± 0.5m	11.74	11.67	11.59	
MPBH4-HR	-	>± 0.5m	50.66	50.68	50.70	
MPBH5-C	-	>± 0.5m	11.62	11.41	11.18	
MPBH5-HR	-	>± 0.5m	11.82	11.61	11.39	
MPBH6	-	>± 0.5m	10.22	10.14	10.05	
MPBH6-C	-	>± 0.5m	11.86	11.72	11.56	
MPBH6-HR	-	>± 0.5m	11.18	11.11	11.14	
MPBH7	-	>± 0.5m	6.55	6.45	6.25	
MPBH7-C	-	>± 0.5m	**15.84**	**17.13**	**14.22**	
3500C500L	-	>± 0.5m	25.78	**25.44**	**24.94**	
3500C500S	-	>± 0.5m	26.23	25.78	**25.43**	
4500F000	-	>± 0.5m	22.63	22.45	22.22	
5000D000	-	>± 0.5m	**129.96**	**127.04**	**127.57**	
5000D000-R**	-	>± 0.5m	139.02	138.77	138.33	
5500D000	-	>± 0.5m	**40.89**	**40.26**	39.83	
6500F500L	-	>± 0.5m	**51.12**	**53.36**	53.24	
6500F500M	-	>± 0.5m	**51.90**	53.83	53.65	
6500F500U	-	>± 0.5m	30.25	30.24	30.29	
6500F625	-	>± 0.5m	15.78	15.50	15.18	
Melody	-	>± 0.5m	13.09	13.07	12.96	
7500F000	-	>± 0.5m	35.91	36.00	35.80	

* Dry/insufficient water to sample
Results in **bold** indicate that the bore has exceeded the adopted assessment criterion for changes in standing water level from the previous measurement.

Table 8-2 - MPO Quarterly Groundwater pH Results

Monitoring Location/ ID	pH Trigger Range		May 2024 pH	Feb 2024 pH	Nov 2024 pH	Triggered (Yes/No)
	Lower	Upper				
WRA1L	6.0	8.5	7.1	7.1	7.1	No
WRA1U			*	*	*	No
WRA6L			7.0	6.9	7.0	No
WRA6U			7.0	6.8	6.9	No
MPBH1			7.0	6.9	6.7	No
MPBH2			6.9	6.9	6.9	No
MPBH3b			7.8	7.4	7.8	No
MPBH4			7.0	7.1	6.9	No
MPBH5			*	*	*	-
MPBH1-C			8.0	**8.6**	8.5	No
MPBH1-HR			8.0	7.8	8.0	No
MPBH2-C			7.1	**10.7**	**11.1**	No
MPBH2-HR			7.9	7.5	8.5	No
MPBH4-C			8.0	7.9	7.8	No
MPBH4-HR			7.3	7.3	7.3	No
MPBH5-C			**9.2**	**10.3**	**9.7**	Yes
MPBH5-HR			7.4	7.6	7.5	No
MPBH6			7.1	7.1	7.1	No
MPBH6-C			7.3	7.7	7.1	No
MPBH6-HR			7.3	7.4	7.3	No
MPBH7			7.2	7.0	7.0	No
MPBH7-C			7.2	7.0	7.1	No
3500C500L			7.5	7.6	7.5	No
3500C500S			6.9	6.9	6.9	No
4500F000			Depth to Water only.			
5000D000-R			7.5	7.5	7.5	No
5500D000			7.1	7.0	6.9	No
6500F500L			7.6	7.2	7.1	No
6500F500M			7.3	7.3	7.2	No
6500F500U			6.8	6.7	6.6	No
6500F625			7.0	6.9	7.0	No
Melody			6.9	6.9	6.9	No
7500F000			7.8	7.8	7.7	No

** Dry/insufficient water to sample*
*An investigation is triggered when pH values are recorded outside the baseline range (20th – 80th percentile). Results shown in **bold** are outside of this range.*

Table 8-3 - MPO Quarterly Groundwater EC Results

Monitoring Location/ ID	Maximum Beneficial Use Trigger	May 2024 EC[1]	Feb 2024 EC[1]	Nov 2024 EC[1]	Triggered (Yes/No)
WRA1L	7800	3750	3550	3200	No
WRA1U	-	*	*	*	-
WRA6L	7800	6850	6150	6000	No
WRA6U	22000	8950	8500	8750	No
MPBH1	800	800	640	610	No
MPBH2	930	**1300**	**1250**	**1200**	**Yes**
MPBH3b	7800	5650	5700	5700	No
MPBH4	-	5550	5050	5700	-
MPBH5	-	**	**	**	-
MPBH1-C	-	790	1400	1450	
MPBH1-HR	-	1500	1600	1650	
MPBH2-C	-	1300	1750	1900	
MPBH2-HR	-	1250	1100	1600	
MPBH4-C	-	4950	5100	4950	
MPBH4-HR	-	5750	5700	5450	
MPBH5-C	-	4950	5100	4950	
MPBH5-HR	-	800	850	830	
MPBH6	-	1250	1100	1150	
MPBH6-C	-	3200	5500	2650	
MPBH6-HR	-	6150	4950	4100	
MPBH7	-	10900	11200	12000	
MPBH7-C	-	10800	10400	10700	
3500C500L	7800	3750	4200	3800	No
3500C500S	7800	**12000**	**12000**	**11500**	**Yes**
4500F000	22000	8650	8450	8600	No
5000D000-	-	4400	4400	4400	
5500D000	7800	Depth to Water only.			
6500F500L	7800	2600	2850	3000	No
6500F500M	7800	2500	2900	3100	No
6500F500U	7800	5550	5400	5500	No
6500F625	7800	3600	4050	4000	No
Melody	-	5600	5450	5100	
7500F000	7800	6450	6300	6400	No

** Dry/insufficient water to sample*
- Indicates no trigger limit identified
1 Results have been rounded in accordance with the In-house method Q4AN(EV)-332-WI2 (EC).

During the May 2024 monitoring event, site WRA1U and MPBH5 contained insufficient water to sample and 6 sites had changes in standing water level of greater than ± 0.5m from the previous measurement. All monitoring locations were within the pH trigger limits except site MPBH5-C. MPBH5-C has been outside the limits for three consecutive monitoring events. All monitoring locations were below the respective EC triggers limits except sites 3500C500S and MPBH2. Both sites have been outside the limits for three consecutive monitoring events.

An investigation is triggered if elevated measurements occur for three consecutive sampling events in accordance MPO Water Management Plan (MACH Energy, 2022). The next quarterly ground water monitoring event is scheduled for May 2024.

9. Noise Monitoring

Attended noise monitoring was undertaken during the night period of 27th and 28th of May 2024 at eight (8) monitoring locations as per the *MPO Noise Management Plan* (MACH Energy, 2021) in accordance with DA 92/97, SSD 10418 and EPL 20850.

9.1 Results

The results for nighttime attended noise monitoring for noise generated by MPO in May 2024 against noise criteria is shown in **Table 9-1**; **Table 9-2;** and **Table 9-3.**

Table 9-1 – $L_{A1,1min}$ Generated by MPO: Attended Night Monitoring – 27/28 May 2024

Location	Start Date and Time	MPO Only $L_{A1,1min}$ dB[2,4]	Criterion dB	Wind Speed m/s	Criterion Applies[1]	Stability Class	Exceedance dB[3]
N-AT1	28/05/2024 01:37	IA	45	1.9	YES	D	No
N-AT2	27/05/2024 22:55	25	45	1.4	YES	E	No
N-AT3	27/05/2024 23:30	IA	45	0.6	YES	E	No
N-AT4	27/05/2024 23:56	IA	45	0.6	YES	D	No
N-AT5	28/05/2024 00:18	IA	45	1.4	YES	E	No
N-AT6	28/05/2024 01:13	IA	45	2.0	YES	D	No
N-AT7	27/05/2024 22:15	IA	45	0.3	YES	F	No
N-AT8	28/05/2024 00:45	IA	NA[6]	1.3	YES	D	NA[6]

Notes:

1. *As per Condition L2.3 of EPL 20850, noise emission limits do not apply during wind speeds greater than 3m/s at 10m above ground level, or 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.*
2. *Estimated or measured $L_{A1,1minute}$ attributed to MPO.*
3. *NA in exceedance column means meteorological conditions outside those specified in Condition L2.3 of EPL 20850 and thus criterion is not applicable.*
4. *IA = inaudible; and*
5. *Bold results indicate exceedance of criteria.*
6. *This is not a compliance monitoring location.*

Table 9-2 – $L_{Aeq,15min}$ Generated by MPO: Attended Night Monitoring – 27/28th May 2024

Location	Start Date and Time	MPO Only $L_{A1,15min}$ dB[2,4]	Criterion dB	Wind Speed m/s	Criterion Applies[1]	Stability Class	Exceedance dB[3]
N-AT1	28/05/2024 01:37	IA	37	1.9	YES	D	No
N-AT2	27/05/2024 22:55	22	35	1.4	YES	E	No
N-AT3	27/05/2024 23:30	IA	40	0.6	YES	E	No
N-AT4	27/05/2024 23:56	IA	38	0.6	YES	D	No
N-AT5	28/05/2024 00:18	IA	37	1.4	YES	E	No
N-AT6	28/05/2024 01:13	IA	35	2.0	YES	D	No
N-AT7	27/05/2024 22:15	IA	37	0.3	YES	F	No
N-AT8	28/05/2024 00:45	IA	NA[6]	1.3	YES	D	NA[6]

Notes:

1. *As per Condition L2.3 of EPL 20850, noise emission limits do not apply during wind speeds greater than 3m/s at 10m above ground level, or 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.*
2. *Estimated or measured $L_{Aeq,15minute}$ attributed to MPO.*
3. *NA in exceedance column means meteorological conditions outside those specified in Condition L2.3 of EPL 20850 and thus criterion is not applicable.*
4. *IA = inaudible; and*
5. *Bold results indicate exceedance of criteria.*
6. *This is not a compliance monitoring location.*

Table 9-3 – $L_{Aeq,\ period}$ Cumulative Noise: Attended Night Monitoring – 27/28 May 2024

Location	Start Date and Time	Cumulative Noise Criterion LAeq dB	Measured Mining Only $L_{Aeq,\ period}$ dB[1,2]	Exceedance dB[3]
N-AT1	28/05/2024 01:37	40	IA	No
N-AT2	27/05/2024 22:55	40	22	No
N-AT3	27/05/2024 23:30	40	IA	No
N-AT4	27/05/2024 23:56	40	IA	No
N-AT5	28/05/2024 00:18	40	IA	No
N-AT6	28/05/2024 01:13	40	IA	No
N-AT7	27/05/2024 22:15	40	IA	No
N-AT8	28/05/2024 00:45	NA[4]	IA	NA

Notes:

1. *These are the results for MPO and all other mining sources. 15-minute measurements have been assumed to apply across the entire night period as a conservative measure and to represent "worst case" results; and*
2. *Cumulative noise refers to two or more noise sources. If only one other source of mining is audible, or if MPO is inaudible, the measured cumulative noise defined here is 'Nil.'*
3. *NA in exceedance column means criterion was not applicable due to atmospheric conditions.*
4. *This is not a compliance monitoring location.*

The purpose of the noise monitoring is to quantify and describe the existing acoustic environment around the mining operation and compare results with relevant limits as per the *MPO Noise Management Plan* (MACH Energy, 2021).

10. Blast Monitoring

There were nine blast events during May (a total of 36 blasts YTD). Results for May 2024 are presented in **Table 10-1**. All blast results during this monitoring period were below the criteria stated in Schedule 3, Condition 10 of DA 92/97, Schedule 2; Condition B12 of SSD 10418; and L5 of EPL 20850.

Table 10-1 – MPO Blast Monitoring Results - May 2024

Day & Date Fired	Time Fired	BVOC Vibration (mm/s)	BVOC Overpressure (dBL)	BVO2 Vibration (mm/s)	BVO2 Overpressure (dBL)	Blast Fume Compliant
Wednesday 01/05/2024	13:00	0.740	93.1	1.020	101.4	Y
Friday 03/05/2024	12:00	0.400	90.9	0.350	32.6	Y
Friday 10/05/2024	12:05	0.430	96.7	0.440	97.4	Y
Tuesday 14/05/2024	12:40	0.010	76.4	0.180	87.4	Y
Friday 17/05/2024	09:56	1.400	104.0	0.950	104.6	Y
Wednesday 22/05/2024	13:18	0.530	86.1	0.450	89.4	Y
Tuesday 28/05/2024	13:42	0.430	101.8	0.420	93.8	Y
Thursday 30/05/2024	09:09	0.260	106.2	0.390	110.3	Y
Friday 31/05/2024	12:10	0.080	94.8	0.080	111.3	Y

END OF REPORT