

Mount Pleasant Operation Monthly Environmental Monitoring Report

November 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 and SSD 10418
Reporting Period Start Date	1 November 2024
Reporting Period End Date	30 November 2024
Date All Data Received	7 January 2025

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.

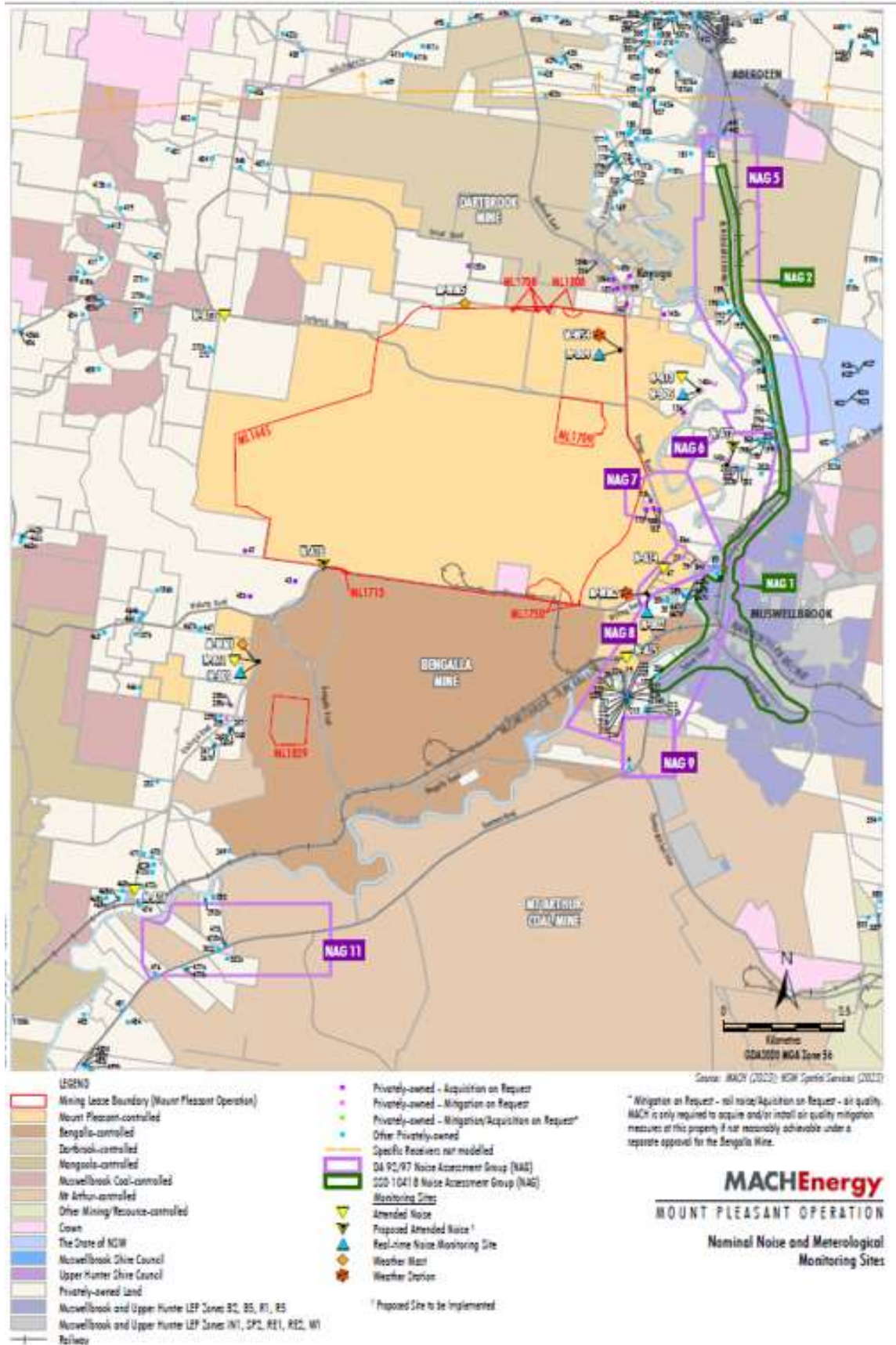
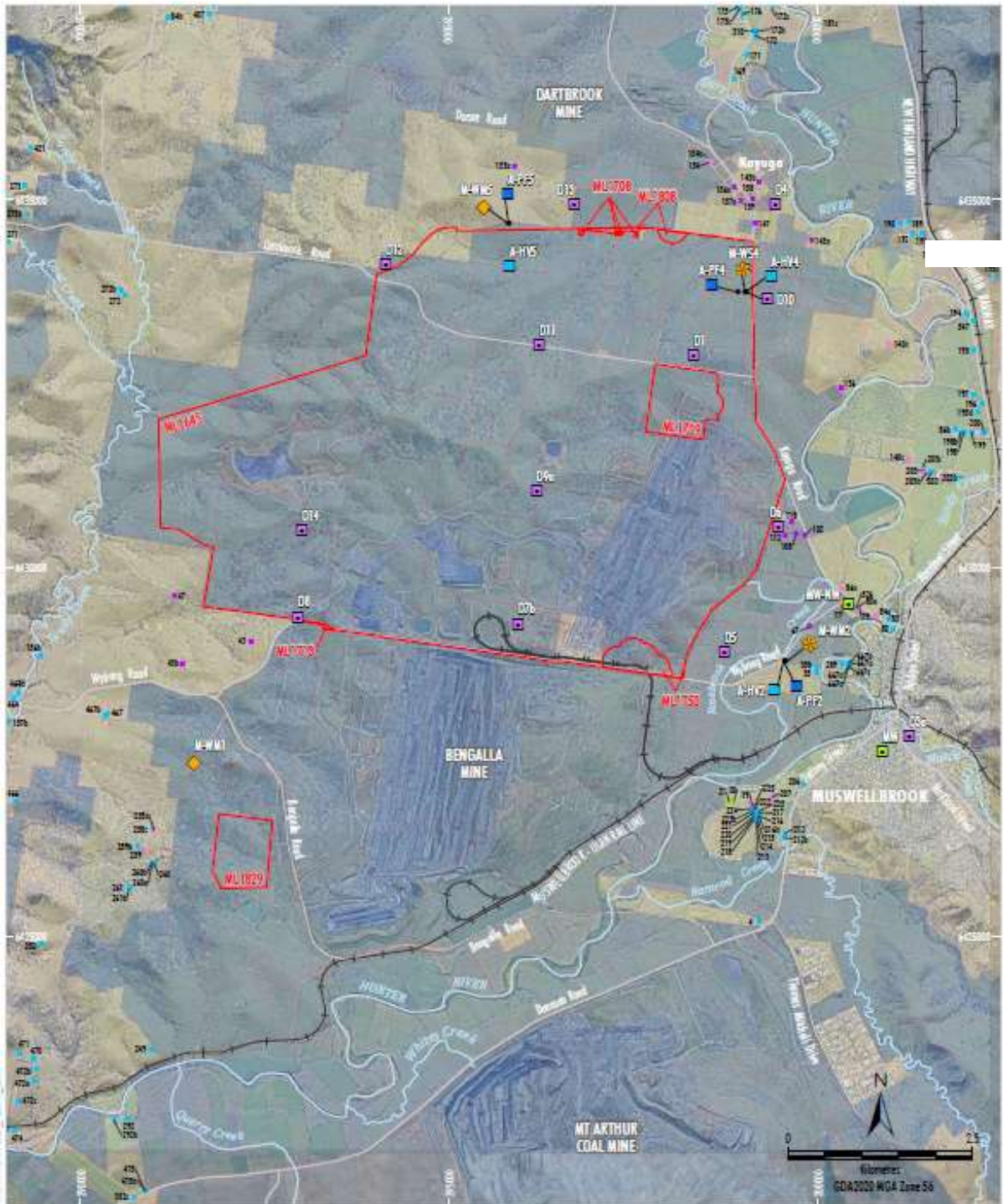


Figure 2-1 – MPO Attended Noise Monitoring Assessment Groups and Locations - Approved (SSD 10418) Water Management Plan



Source: MACH (2023); NSW Spatial Services (2023)
 Orthophoto: MACH (Dec 2022)

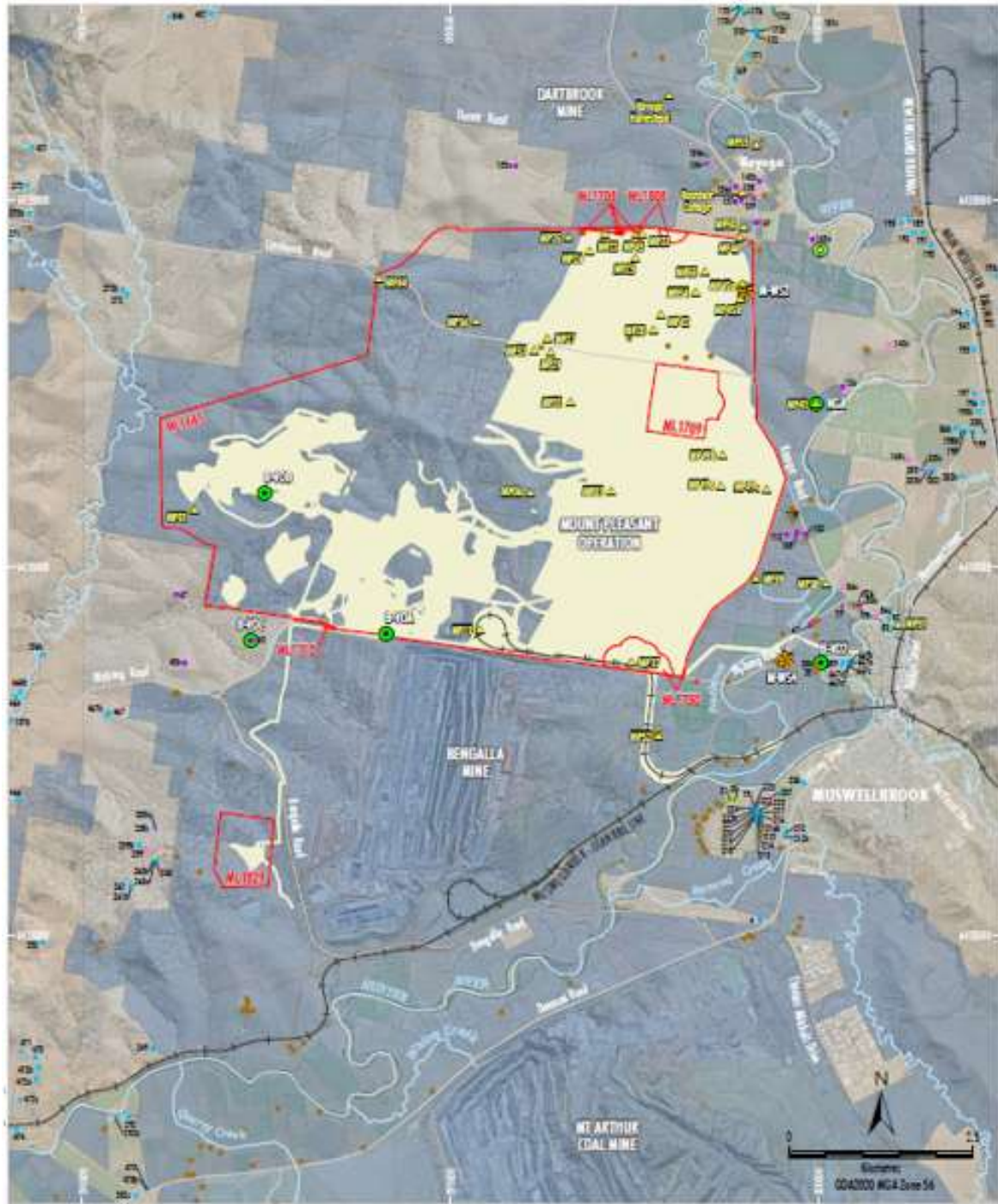
- LEGEND**
- Mining Lease Boundary (Mount Pleasant Operation)
 - Mine-owned Land
 - Railway
 - Monitoring Sites:**
 - Air Quality - High Volume Sampler
 - Air Quality - Poles Fidas
 - Dust Deposition Gauge
 - Upper Hunter Air Quality Monitoring Network
 - Weather Mast
 - Weather Station

- Category of Rural Residence under DARP/97**
- Privately-owned - Acquisition on Request
 - Privately-owned - Mitigation on Request
 - Privately-owned - Mitigation/Acquisition on Request*
 - Other Privately-owned

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

MACHEnergy
MOUNT PLEASANT OPERATION
Air Quality and Meteorological
Monitoring Sites

Figure 2-2 – MPO Air Quality and Meteorological Monitoring Network - Approved (SSD 10418) Water Management Plan



LEGEND

- Mine-owned Land
- Mining Lease Boundary (Mount Pleasant Operation)
- Project Continuation of Existing/Approved Surface Development (SA 92/07)¹
- Weather Station
- Blast Monitoring Site (Vibration/Overpressure)
- Proposed Blast Monitoring Site (Vibration/Overpressure)
- Historic Heritage Site Subject to Blast Criteria²

Category of Rural Residence under SA 92/07

- Mine-owned
- Privately-owned - Acquisition on Request
- Privately-owned - Mitigation on Request
- Privately-owned - Mitigation/Acquisition on Request³
- Other Privately-owned

³ Mitigation on Request - rail noise/Acquisition on Request - air quality. MACH is only required to acquire and/or install air quality mitigation measures at this property if not reasonably achievable under a separate approval for the Bengalla Mine.

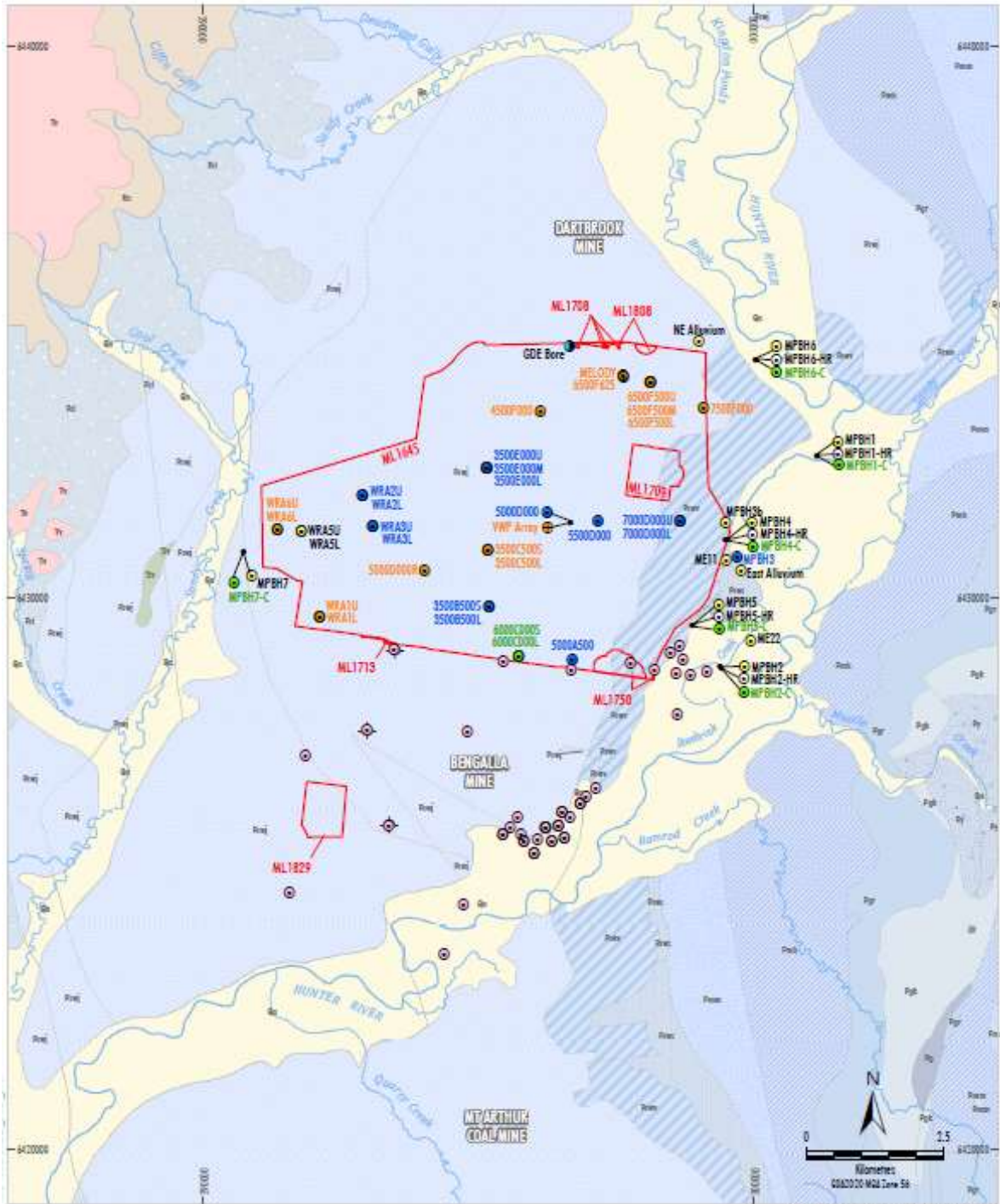
¹ Excludes some incidental Project components such as water management infrastructure, access roads, topsoil stockpiles, power supply, temporary offices, other ancillary works and construction disturbance.

² Blast criteria only apply until the heritage site is excavated, salvaged or demolished in accordance with the Historic Heritage Management Plan.

Source: MACH (2024); NSW Spatial Services (2024)
 Orthophoto: MACH (Dec 2023)

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 MOUNT PLEASANT OPERATION
 Blast Monitoring Locations

Figure 2-3 – MPO Blast Monitoring Locations

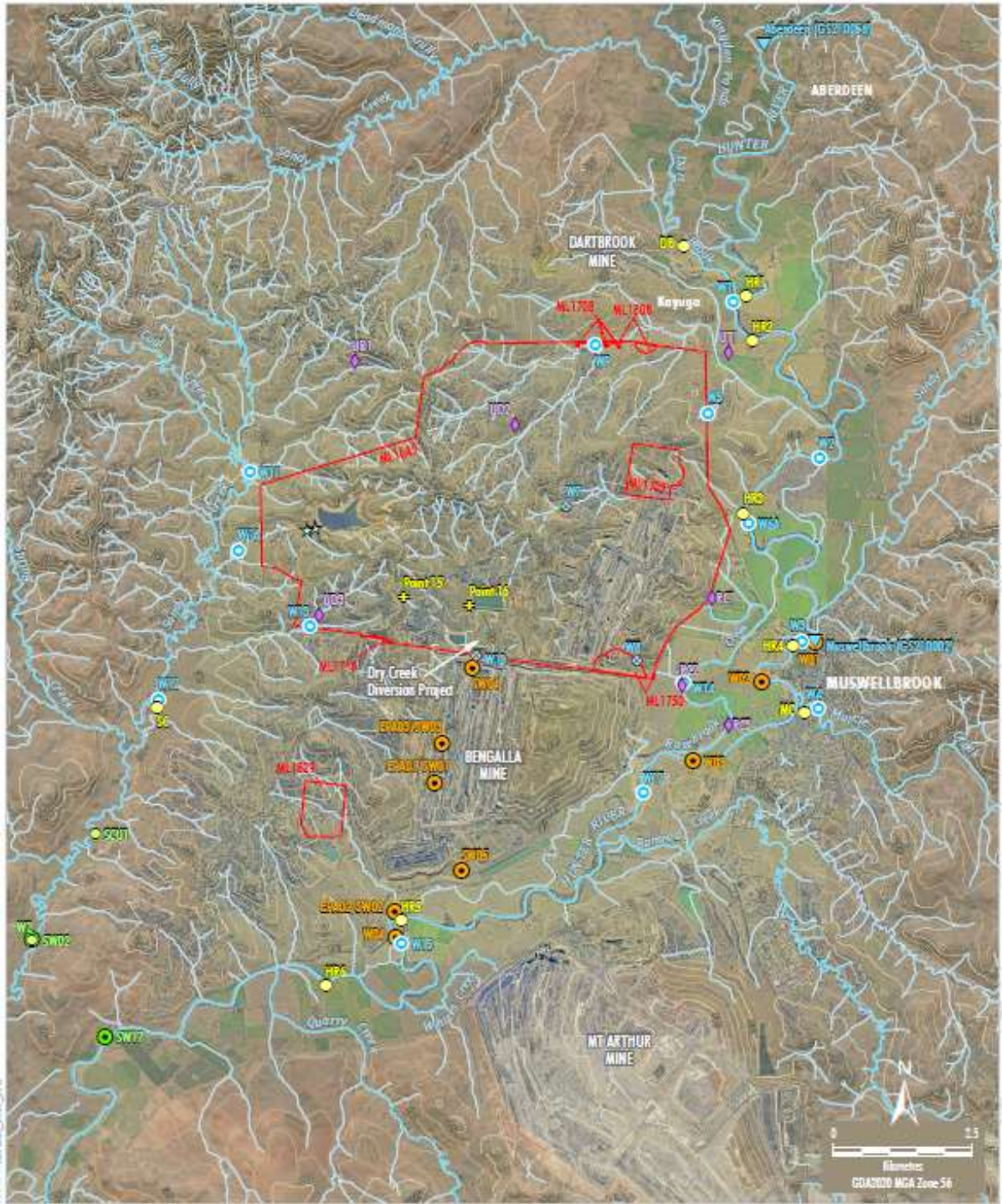


- LEGEND**
- Mining Lease Boundary (Mount Pleasant Operation)
 - Mount Pleasant Monitoring**
 - GDE Bore
 - Vibrating Wire Piezometer
 - Standpipe
 - Standpipe - Alluvium
 - Standpipe - Coal Seam
 - Standpipe - Interburden
 - Standpipe - Historical
 - Bengalla Monitoring**
 - Bengalla Standpipe
 - Bengalla Vibrating Wire Piezometer

Source: NSW Spatial Services (2023); Department of Planning and Environment (2019)

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MOUNT PLEASANT OPERATION
Groundwater Monitoring Network

Figure 2-4 – MPO Groundwater Monitoring Network – Approved (SSD 10418) Water Management Plan



Source: MACH (2023); NSW Spatial Services (2023); NSW Department of Primary Industries - Water (2014); Bengalla Mining Company (2015); Mungool Coal Operations Pty Ltd (2014) Orthophoto: MACH (Jun 2022, 2020)

- | | |
|--|-------------------------------|
| Mining Lease Boundary (Mount Pleasant Operation) | Manassala Monitoring |
| Contour (20 m Interval) | Surface Water Monitoring Site |
| DPI Water Gauging Station | Stream Health Monitoring Site |
| Mount Pleasant Monitoring | Bengalla Monitoring |
| Aquatic Ecology Habitat Assessment Site | Surface Water Monitoring Site |
| Surface Water Monitoring Site | |
| Historical Surface Water Monitoring Site | |
| Stream Health Monitoring Site | |
| V-notch Weir | |
| Water Discharge/Monitoring Point (EPL 20850) | |

MACH Energy
MOUNT PLEASANT OPERATION
 Surface Water and Stream Health
 Monitoring Sites

Figure 2-5 – MPO Surface Water Monitoring Network - Approved (SSD 10418) Water Management Plan

3. Meteorological Monitoring

Weather data is measured continuously¹ at the Kayuga Road (M-WS4) and the Wybong Road (M-WS2) meteorological stations. In addition to air quality parameters (particulate matter less than 10 µm and less than 2.5 µm (PM₁₀ 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.

Meteorological data was captured at M-WS2 (>58.2%) during November 2024 (the monitoring period). An additional monitor (E-BAM) is located at M-WS2 to provide additional capture for air quality. Additional meteorological data was collected at M-WS4 (>16.4%).

Throughout November 2024, there was 99.3mm and 100.0mm 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 PM_{2.5}. 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 a proactive 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.

¹ The EPA's Ambient air monitoring guidance note (Guidance Note) states that after allowing sufficient down time for routine maintenance and calibrations a continuous monitoring system should be able to achieve at least a 95% availability.

4.2 Results

The dust deposition exposure period for gauges commenced on 28 October 2024. Sample collection was undertaken on 29 November 2024 by AECOM with sample analysis performed by ALS, a National Accreditation and Testing Authority (NATA) accredited laboratory. Results are summarised in **Table 4-1**. Annual rolling averages for November 2024 have been provided as an indication of performance between November 2023 – November 2024 and does 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 4-1: Dust Depositional Results – November 2024

Location	YTD Insoluble Solids (g/m ² .month)	Insoluble Solids Annual Rolling Average (g/m ² .month)
D1	2.0	2.0
D3	1.2	1.3
D4	1.1	1.1
D5a	2.1	2.0
D6	1.7	1.8
D7b	8.8	8.8
D8	4.5	4.3
D9a	3.5	3.4
D10	1.1	1.1
D11	3.3	3.2
D12	0.9	0.9
D13	1.3	1.3
D14	2.8	2.7
Criterion	-	4

Notes:

Results in **bold** indicate an elevated measurement of adopted assessment criteria.

* Insufficient monthly results to calculate annual average

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. Furthermore, there are no privately-owned receivers in the vicinity of D8, D9 and D14. 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 November sampling event noted that all the gauges contained insects, four also contained vegetation and one contained bird droppings. All insoluble solid results were included in the annual rolling average calculations. Annual average dust deposition results were below the annual average criterion of 4 g/m².month at all sites except D7b (8.8 g/m²) and D8 (4.3 g/m²).

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

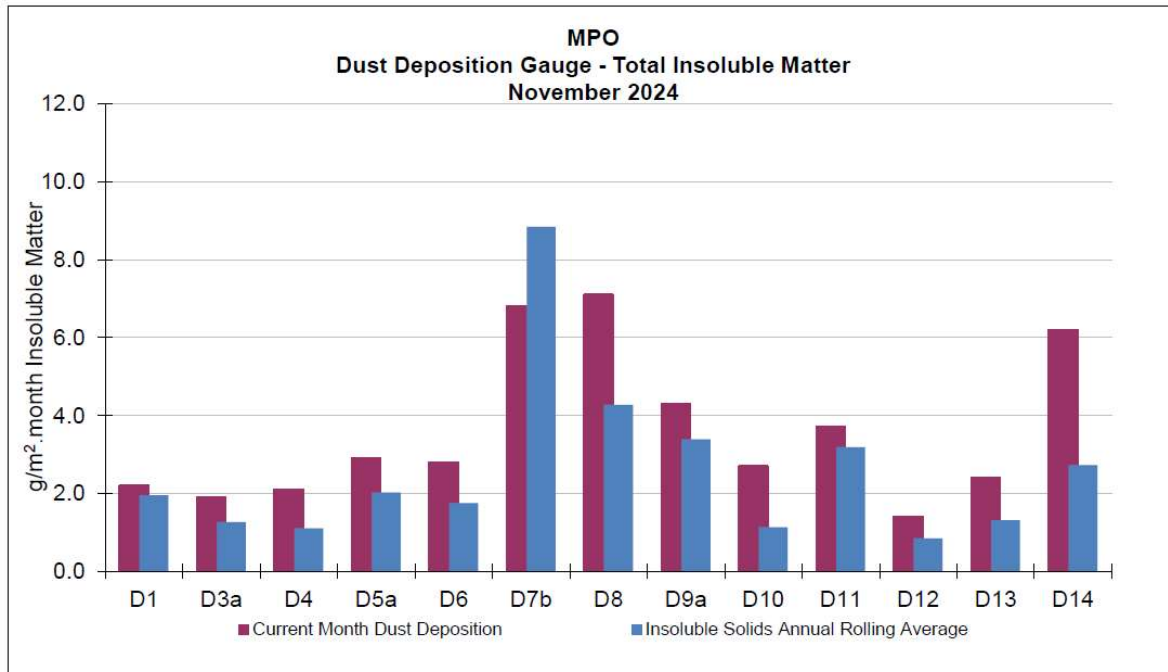


Figure 4-1: MPO Dust Deposition Monthly Results and Annual Rolling Average – November 2024

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 March 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/m³.

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 November 2024 have been provided as an indication of performance between November 2023 – November 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 – November 2024

Run Date	Assessment Criterion	TSP µg/m ³		
		HVAS A-PF2	HVAS A-PF5	HVAS M-WS4
1/11/2024	-	48.3	72.2	49.3
7/11/2024	-	27.9 [^]	67.7	118.0
13/11/2024	-	40.9	44.0	31.7
19/11/2024	-	40.0	51.2	27.0
25/11/2024	-	67.4	72.1	52.0
*Monthly Mean	-	49.2	61.4	55.6
Annual Rolling Average	90	49	45	33

Notes:

* Results have been rounded to one decimal place for reporting purposes where applicable.

[^] Indicates makeup run results for run date 11/11/2024.

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/m³.

6. Real Time Air Quality Monitoring

Continuous particulate matter less than 10 µm (PM₁₀) 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 November 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 PM₁₀ and PM_{2.5} 12-month rolling averages for November 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 PM₁₀ 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 November 2024. Real time PM₁₀ 24 hour daily average results for November 2024 are presented in **Table 6-1**.

Table 6-1: MPO Palas Fidas PM₁₀ Data – November 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/m ³)
	24-hour Average Result				
1/11/2024	16	-	17	19.6	50
2/11/2024	14	-	18	15.7	50
3/11/2024	27	-	22	26.5	50
4/11/2024	35	-	26	39.1	50
5/11/2024	21	-	20	23	50
6/11/2024	26	-	15	22.7	50
7/11/2024	-	-	-	39.8	50
8/11/2024	28	-	-	25.4	50
9/11/2024	22	-	23	28.7	50
10/11/2024	24	-	29	28.2	50
11/11/2024	20	-	21	24.1	50
12/11/2024	14	-	13	10.3	50
13/11/2024	15	-	14	13.4	50
14/11/2024	-	-	14	15.5	50
15/11/2024	-	-	12	12.6	50
16/11/2024	-	-	14	13.8	50
17/11/2024	-	-	14	18	50
18/11/2024	-	-	11	13.5	50
19/11/2024	-	13	17	19.8	50
20/11/2024	-	13	17	15.2	50
21/11/2024	-	9	13	13.3	50
22/11/2024	-	11	24	14.2	50
23/11/2024	-	-	16	19	50
24/11/2024	-	-	20	22.9	50
25/11/2024	-	-	25	23.5	50
26/11/2024	-	-	24	26.1	50
27/11/2024	30	-	14	33.7	50
28/11/2024	23	-	14	22	50
29/11/2024	26	-	23	24.1	50
30/11/2024	14	-	13	11.5	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)

Figure 6-1 below shows the results of real-time PM₁₀ 24 hour daily average results at MPO air quality monitoring sites November 2024.

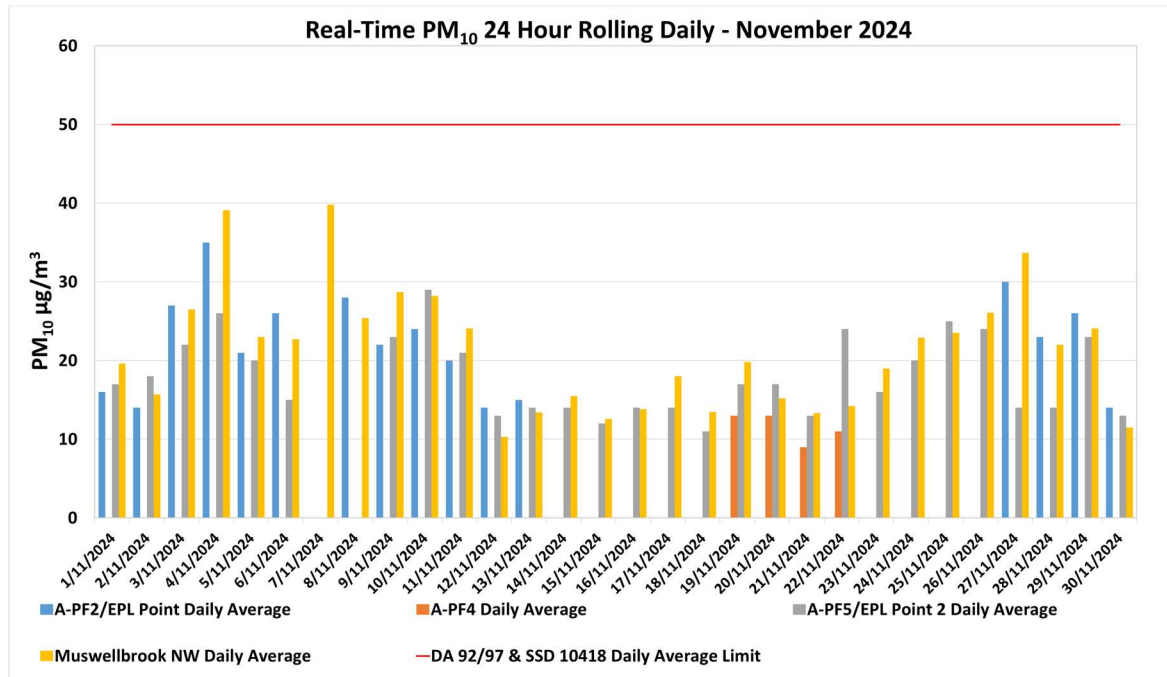


Figure 6-1: Real-time PM₁₀ 24 Daily Average Results for November 2024.

6.2 PM₁₀ Results – Annual Rolling Average

There was no exceedance of the PM₁₀ annual rolling average reported at MPO during November 2024. Real time PM₁₀ annual rolling averages during the reporting period are presented in Figure 6-2 below.

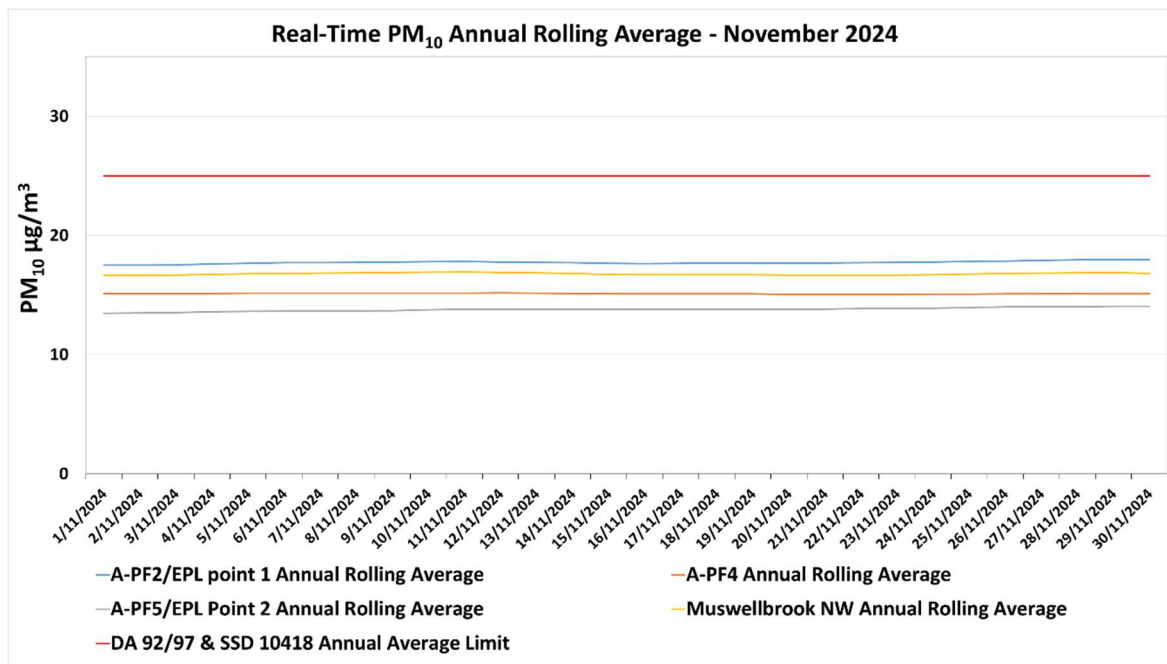


Figure 6-2: Real-time PM₁₀ Annual Rolling Average Results for November 2024.

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 November 2024. Real time PM_{2.5} 24 hour rolling average results for November 2024 are presented in **Table 6-2**.

Table 6-2: MPO Palas Fidas PM_{2.5} Data – November 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/m ³)
	24-hour Average Result			
1/11/2024	6	-	6	25
2/11/2024	5	-	5	25
3/11/2024	7	-	6	25
4/11/2024	8	-	7	25
5/11/2024	8	-	8	25
6/11/2024	7	-	6	25
7/11/2024	-	-	-	25
8/11/2024	6	-	-	25
9/11/2024	6	-	6	25
10/11/2024	7	-	7	25
11/11/2024	8	-	8	25
12/11/2024	6	-	6	25
13/11/2024	6	-	5	25
14/11/2024	-	-	6	25
15/11/2024	-	-	5	25
16/11/2024	-	-	5	25
17/11/2024	-	-	4	25
18/11/2024	-	-	4	25
19/11/2024	-	5	6	25
20/11/2024	-	5	6	25
21/11/2024	-	4	4	25
22/11/2024	-	4	5	25
23/11/2024	-	-	5	25
24/11/2024	-	-	5	25
25/11/2024	-	-	6	25
26/11/2024	-	-	6	25
27/11/2024	7	-	5	25
28/11/2024	7	-	6	25
29/11/2024	12	-	11	25
30/11/2024	5	-	5	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 November 2024 are presented in **Figure 6-3** below.

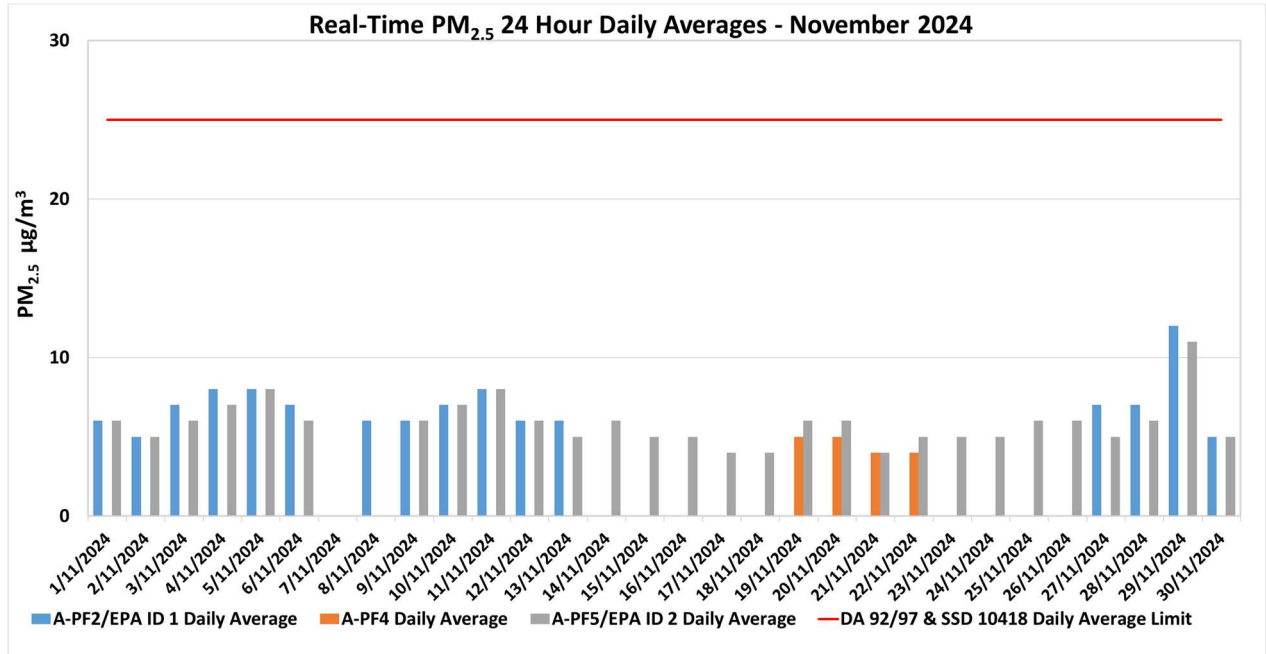


Figure 6-3: Real-time PM_{2.5} 24 hour Daily Average Results for November 2024.

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 November 2024. Real time PM_{2.5} annual rolling averages during the reporting period are presented in **Figure 6-4** below.

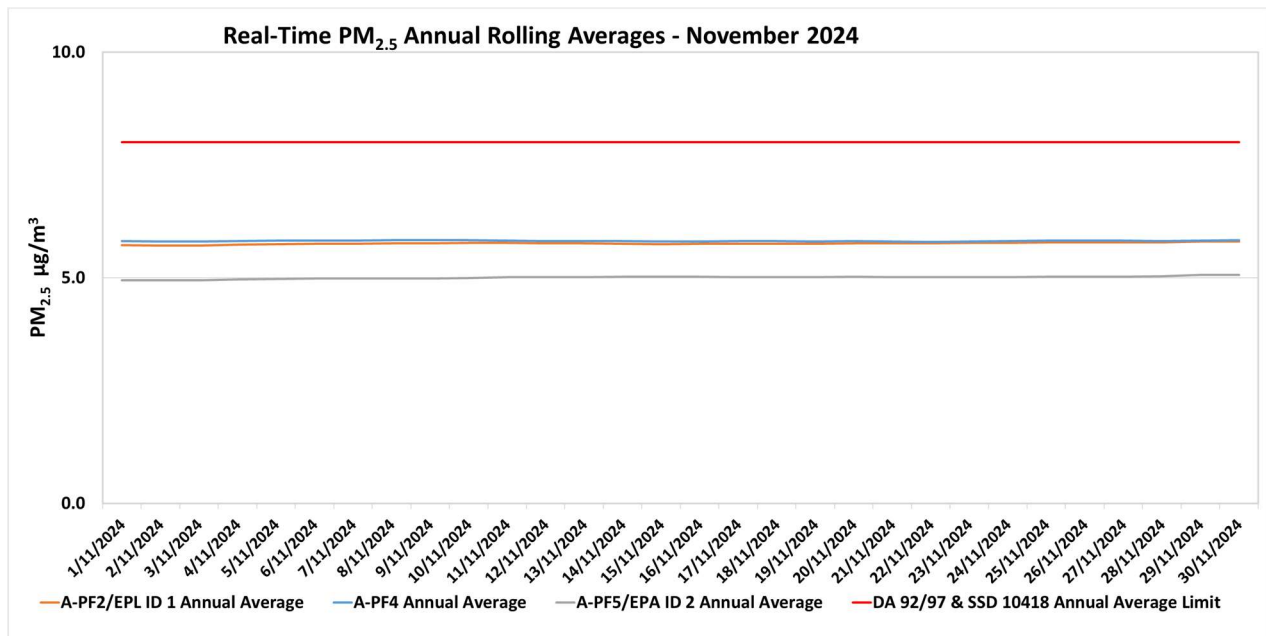


Figure 6-4: Real-time PM_{2.5} Annual Rolling Average Results for November 2024.

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, 2024) 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 25 November 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 – 25 November 2024

Station	pH	Electrical Conductivity (EC) ($\mu\text{s}/\text{cm}$) ¹	Total Dissolved Solids (TDS) (mg/L)	Total Suspended Solids (TSS) (mg/L)
W1	8.1	610	330	18
W2	8.2	750	390	18
W3	8.1	870	490	19
W4	7.8	2350	1400	9
W5	*	*	*	*
W6A	8.3	750	400	21
W9	*	*	*	*
W11	8.2	3850	2100	5.2
W12	8.0	5200	3000	6.6
W13	*	*	*	*
W14	*	*	*	*
W15	**	**	**	**
W16	8.3	7950	4600	17
W17	8.1	950	580	22

Note: Results in **bold** indicate exceedances of adopted assessment criteria.

*Dry or insufficient water to sample.

** No access due to track conditions.

¹ Results have been rounded in accordance with the In-house method Q4AN(EV)-332-W12 (EC).

During the 25 November 2024 monitoring event, four (4) sites were dry, and one (1) site was unable to be accessed due to track conditions. Sites W1, W2, W6A, W16 and W17 were above their respective EC trigger levels. Site W6A was above its respective trigger level for TSS. Sites W11 and W16 were above their respective pH trigger levels.

Site W6A was above the respective EC trigger level for four consecutive monitoring events during the last monthly environmental report (October 2024) and continues to be above trigger levels for November 2024. Results also showed site W6A is above its trigger level for TSS for four consecutive monitoring events (August, September, October, and November 2024).

In accordance with the MPO Water Management Plan (WMP) Table 26 (MACH Energy, 2024) if a water quality indicator at a potential impact monitoring location or at a downstream receiving water monitoring location is above (or outside the range) of the site-specific trigger value for three consecutive sampling events an investigation is required.

Site W6A continued to exceed the respective EC trigger level (750 $\mu\text{S}/\text{cm}$) for November 2024; however, according to Table 26 of the WMP no further investigation is required as the upstream site W1 (Hunter River reference site) was also found to be exceeding trigger levels.

Site W6A exceeded its trigger level for TSS (21 mg/L). An investigation relating to recent environmental conditions (ACT Williams, January 2024) concluded that prevailing climatic factors, combined with increased contributions of naturally high EC (Electrical Conductivity) water from tributary inflows, have influenced water quality at several monitoring locations including W6A.

8. Groundwater Monitoring

Quarterly groundwater monitoring was conducted between 19, 20 and 28 of November 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		Nov 2024 Water Level (DTW)	Aug 2024 Water Level (DTW)	May 2024 Water Level (DTW)	Triggered (Yes/No)
	80 th Percentile (DTW)	Trigger				
WRA1L	-	>± 0.5m	2.36	3.75	4.07	
WRA1U	-	>± 0.5m	*	*	*	
WRA3L-R**	-	>± 0.5m	93.72	-	-	
WRA3U-R**	-	>± 0.5m	30.75	-	-	
WRA5L-R**	-	>± 0.5m	^^	-	-	
WRA5U-R**	-	>± 0.5m	^^	-	-	
WRA6L	-	>± 0.5m	1.04	0.8	0.88	
WRA6U	-	>± 0.5m	1.87	1.74	1.83	
MPBH1	9.71	10.70	10.1	9.73	9.99	No
MPBH2	12.20	13.59	12.17	12.07	12	No
MPBH3b	13.04	Dry (or 14.0m)	12.2	12.18	12.28	No
MPBH4	-	>± 0.5m	12.12	12.09	12.19	
MPBH5	-	>± 0.5m	*	*	*	
MPBH1-C	-	>± 0.5m	10.25	9.83	10.16	
MPBH1-HR	-	>± 0.5m	35.28	38.93	22.48	
MPBH2-C	-	>± 0.5m	12.46	12.36	12.29	
MPBH2-HR	-	>± 0.5m	12.41	12.34	12.2	
MPBH4-C	-	>± 0.5m	11.71	11.66	11.74	
MPBH4-HR	-	>± 0.5m	50.69	50.83	50.66	
MPBH5-C	-	>± 0.5m	11.96	12.3	11.62	
MPBH5-HR	-	>± 0.5m	12.03	11.95	11.82	
MPBH6	-	>± 0.5m	10.2	10.04	10.22	
MPBH6-C	-	>± 0.5m	11.61	11.82	11.86	
MPBH6-HR	-	>± 0.5m	11.05	10.95	11.18	
MPBH7	10.1	>± 0.5m	5.84	5.31	6.55	No
MPBH7-C	-	>± 0.5m	18.23	15.62	15.84	
3500C500L	-	>± 0.5m	26.67	26.53	25.78	
3500C500S	-	>± 0.5m	25.61	25.41	26.23	
4500F000	-	>± 0.5m	^	22.53	22.63	

Monitoring Location/ ID	Water Level Trigger Range		Nov 2024 Water Level (DTW)	Aug 2024 Water Level (DTW)	May 2024 Water Level (DTW)	Triggered (Yes/No)
	80 th Percentile (DTW)	Trigger				
5000D000-R	-	>± 0.5m	139.17	139.19	139.02	
5500D000	-	>± 0.5m	41.9	41.45	40.89	
6000C000L-R**	-	>± 0.5m	^^	-	-	
6000C000U-R**	-	>± 0.5m	^^	-	-	
6500F500L	-	>± 0.5m	51.43	50.66	51.12	
6500F500M	-	>± 0.5m	52.32	51.64	51.9	
6500F500U	-	>± 0.5m	31.92	32.22	30.25	
6500F625	-	>± 0.5m	16.04	15.93	15.78	
Melody	-	>± 0.5m	13.05	12.81	13.09	
7500F000	-	>± 0.5m	36.3	36.11	35.91	
GDE Bore Shallow**	-	>± 0.5m	*	-	-	
GDE Bore Deep**	-	>± 0.5m	10.67	-	-	
NE Alluvium**	-	>± 0.5m	^^	-	-	
East Alluvium**	-	>± 0.5m	*	-	-	

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

* Dry/insufficient water to sample.

**New site.

^Unsafe access.

^^ Site to be visited in December 2024.

Table 8-2 - MPO Quarterly Groundwater pH Results

Monitoring Location/ ID	pH Trigger Range		Nov 2024 pH	Aug 2024 pH	May 2024 pH	Triggered (Yes/No)
	Lower	Upper				
WRA1L	6.0	8.5	7.1	7.2	7.1	No
WRA1U			*	*	*	-
WRA3L-R**			7.6	-	-	-
WRA3U-R**			*	-	-	-
WRA5L-R**			^^	-	-	-
WRA5U-R**			^^	-	-	-
WRA6L			7	7	6.9	No
WRA6U			6.9	6.7	6.8	No
MPBH1			7	7.1	6.9	No
MPBH2			6.8	7	6.9	No
MPBH3b			7.8	7.8	7.4	No
MPBH4			7	6.9	7.1	No
MPBH5			*	*	*	-
MPBH1-C			8.7	7.9	8.6	No
MPBH1-HR			8	8.1	7.8	No
MPBH2-C			7.7	8.2	10.7	No
MPBH2-HR			7.5	7.9	7.5	No
MPBH4-C			8	8	7.9	No
MPBH4-HR			7.2	7.3	7.3	No
MPBH5-C			9.8	9.3	10.3	Yes
MPBH5-HR			7.5	7.6	7.6	No
MPBH6			7	7.1	7.1	No
MPBH6-C			7	7.1	7.7	No
MPBH6-HR			7.3	7.3	7.4	No
MPBH7			7	7	7	No
MPBH7-C			7	7.1	7	No
3500C500L			7.5	7.6	7.6	No
3500C500S			7.1	6.9	6.9	No
4500F000			^	6.8	6.8	No
5000D000-R			7.4	7.5	7.5	No
5500D000			6.9	7	7	No
6000C000L-R**			^^	-	-	-
6000C000U-R**	^^	-	-	-		
6500F500L	7.2	7.2	7.2	No		
6500F500M	7.3	7.3	7.3	No		

Monitoring Location/ ID	pH Trigger Range		Nov 2024 pH	Aug 2024 pH	May 2024 pH	Triggered (Yes/No)
	Lower	Upper				
6500F500U			6.8	6.8	6.7	No
6500F625			6.9	7	6.9	No
Melody			6.9	6.9	6.9	No
7500F000			7.7	7.8	7.8	No
GDE Bore Shallow**			*	-	-	-
GDE Bore Deep**			7.5	-	-	-
NE Alluvium**			^^	-	-	-
East Alluvium**			*	-	-	-

* Dry/insufficient water to sample.

**New site.

^Unsafe access.

^^ Site to be visited in December 2024.

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	Nov 2024 EC ¹	Aug 2024 EC ¹	May 2024 EC ¹	Triggered (Yes/No)
WRA1L	7800	3050	3200	3750	No
WRA1U	*	***	***	***	-
WRA3L-R**	*	6100	-	-	-
WRA3U-R**	*	*	-	-	-
WRA5L-R**	*	^^	-	-	-
WRA5U-R**	*	^^	-	-	-
WRA6L	7800	5700	6000	6850	No
WRA6U	22000	8650	8950	8950	No
MPBH1	800	640	620	640	No
MPBH2	930	1300	1200	1300	Yes
MPBH3b	7800	5600	5550	5650	No
MPBH4	*	5650	5550	5550	-
MPBH5	*	***	***	***	-
MPBH1-C	*	1500	820	790	-
MPBH1-HR	*	1550	1500	1500	-
MPBH2-C	*	1050	1050	1300	-
MPBH2-HR	*	1250	1350	1250	-
MPBH4-C	*	4950	4850	4950	-
MPBH4-HR	*	5500	5700	5750	-
MPBH5-C	*	920	760	1400	-
MPBH5-HR	*	860	840	800	-
MPBH6	*	1250	1200	1250	-
MPBH6-C	*	2750	2800	3200	-
MPBH6-HR	*	4750	3600	6150	-
MPBH7	*	9750	10600	10900	-
MPBH7-C	*	10300	10800	10800	-
3500C500L	7800	3900	3810	3750	No
3500C500S	7800	8250	12200	12000	Yes
4500F000	22000	^	8150	8650	No
5000D000-R	*	4500	4400	4400	-
5500D000	7800	4350	4400	4200	No
6000C000L-R**	*	^^	-	-	-
6000C000U-R**	*	^^	-	-	-
6500F500L	7800	2550	2450	2600	No
6500F500M	7800	2600	2450	2500	No
6500F500U	7800	4900	4850	5550	No

Monitoring Location/ ID	Maximum Beneficial Use Trigger	Nov 2024 EC ¹	Aug 2024 EC ¹	May 2024 EC ¹	Triggered (Yes/No)
6500F625	7800	4300	3850	3600	No
Melody	*	5800	5400	5600	-
7500F000	7800	6350	6250	6450	No
GDE Bore Shallow**	*	*	-	-	-
GDE Bore Deep**	*	10700	-	-	-
NE Alluvium**	*	^^	-	-	-
East Alluvium**	*	*	-	-	-

* Indicates no trigger limit identified

** New site

*** Dry/insufficient water to sample

^Unsafe access.

^^ Site to be visited in December 2024.

¹Results have been rounded in accordance with the In-house method Q4AN(EV)-332-WI2 (EC).

An investigation is triggered when EC values recorded exceed the beneficial use quality range (as described in the GWMP) for three successive monitoring rounds. Results outside this range are shown in **bold**.

During the November 2024 monitoring event, sites WRA1U, MPBH5, GDE Bore Shallow and East Alluvium were dry. WRA3U-R contained insufficient water to sample and six (6) sites had changes in standing water level of greater than $\pm 0.5\text{m}$ from the previous measurement. All monitoring locations were within the pH trigger limits except sites MPBH1-C, MPBH5-C. MPBH5-C has been outside the limits for three consecutive monitoring events. All monitoring locations were below their respective EC trigger limits except sites 3500C500S and MPBH2. Both 3500C500S and MPBH2 have been outside these limits for three consecutive monitoring events.

600C00L-R, 600C00U-R, WRA5L-R and WRA5U-R were not sampling in November 2024. Sampling is scheduled to take place in December 2024. NE Alluvium was unable to be accessed.

An investigation is triggered if elevated measurements occur for three consecutive sampling events in accordance MPO Water Management Plan (MACH Energy, 2022). An investigation was triggered (AGE, 2023) examining the cause of elevated EC values in the alluvial zone, specifically MPBH2. The data strongly suggests that the cause of the increase in EC is persistent above-average stage in the adjacent Hunter River, caused by above-average rainfall since 2020, which is causing a rise in groundwater levels in similar alluvial bores. Trigger values have since been reviewed and will be incorporated in future Water management plans. The next quarterly ground water monitoring event is scheduled for February 2025.

9. Noise Monitoring

Attended noise monitoring was undertaken during the night of 27 November 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 November 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 November 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	27/11/2024 23:26	IA	45	1.3	Yes	E	No
N-AT2	27/11/2024 22:49	26	45	2.2	No	F	NA
N-AT3	27/11/2024 22:11	29	45	1.5	Yes	E	No
N-AT4	27/11/2024 22:37	35	45	0.7	Yes	F	No
N-AT5	27/11/2024 22:58	26	45	0.9	Yes	F	No
N-AT6	27/11/2024 23:56	IA	45	1.4	Yes	F	No
N-AT7	27/11/2024 22:11	IA	45	1.5	Yes	E	No
N-AT8	27/11/2024 23:28	37	45	1.4	NA ⁶	E	NA ⁶

Notes:

- 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.
- Estimated or measured $L_{A1,1minute}$ attributed to MPO.
- NA in exceedance column means meteorological conditions outside those specified in Condition L2.3 of EPL 20850 and thus criterion is not applicable.
- IA = inaudible; and
- Bold results indicate exceedance of criteria.
- This is not a compliance monitoring location.

Table 9-2 – $L_{Aeq,15min}$ Generated by MPO: Attended Night Monitoring – 27 November 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	27/11/2024 23:26	IA	37	1.3	Yes	E	No
N-AT2	27/11/2024 22:49	22	35	2.2	No	F	NA
N-AT3	27/11/2024 22:11	26	40	1.5	Yes	E	No
N-AT4	27/11/2024 22:37	29	38	0.7	Yes	F	No
N-AT5	27/11/2024 22:58	23	37	0.9	Yes	F	No
N-AT6	27/11/2024 23:56	IA	35	1.4	Yes	F	No
N-AT7	27/11/2024 22:11	IA	37	1.5	Yes	E	No

N-AT8	27/11/2024 23:28	33	NA ⁵	1.4	NA ⁶	E	NA ⁵
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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. IA = inaudible; and
4. Bold results indicate exceedance of criteria.
5. This is not a compliance monitoring location.

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

Location	Start Date and Time	Measured Mining Only $L_{Aeq, period}$ dB ^{1,2,3}	Cumulative Noise Criterion L_{Aeq} dB	Exceedance dB
N-AT1	27/11/2024 23:26	IA	40	No
N-AT2	27/11/2024 22:49	22	40	No
N-AT3	27/11/2024 22:11	26	40	No
N-AT4	27/11/2024 22:37	29	40	No
N-AT5	27/11/2024 22:58	23	40	No
N-AT6	27/11/2024 23:56	IA	40	No
N-AT7	27/11/2024 22:11	IA	40	No
N-AT8	27/11/2024 23:28	33	NA ⁴	NA ⁴

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

The MPO Blast Management Plan (SSD 10418) is undergoing additional consultation with Council and will be finalised early 2025. There were six (6) blast events during November (a total of 81 blasts YTD). Results for November 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 – November 2024

Day & Date Fired	Time Fired	BVOC Vibration (mm/s)	BVOC Overpressure (dBL)	BVO2 Vibration (mm/s)	BVO2 Overpressure (dBL)	Blast Fume Compliant
Tuesday 05/11/2024	13:14	0.620	104.8	0.620	104.8	N
Tuesday 12/11/2024	15:11	0.540	97.1	0.410	102.2	N
Thursday 14/11/2024	13:09	0.300	102.9	0.460	99.9	N
Wednesday 20/11/2024	13:14	0.030	106.1	0.050	91.5	N
Friday 22/11/2024	09:02	0.520	95.8	0.220	94.1	N
Thursday 28/11/2024	15:40	0.610	98.8	0.870	98.5	N

END OF REPORT