

Mount Pleasant Operation Monthly Environmental Monitoring Report

May 2022

1. Introduction

The Mount Pleasant Operation (MPO) is located in the 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) and the MPO Development Approval (DA 92/97).

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
Reporting Period Start Date	1 May 2022
Reporting Period End Date	31 May 2022
Date All Data Received	19 July 2022

Links to two key regulatory documents are provided here:

- [MACH Energy Environment Protection Licence EPL 20850; and](#)
- [Mount Pleasant Operation Development Application Approval DA 92/97.](#)

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 carried out in accordance with MPO Environmental Monitoring Program (EMP) and Project Approval (DA 92/97).

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.

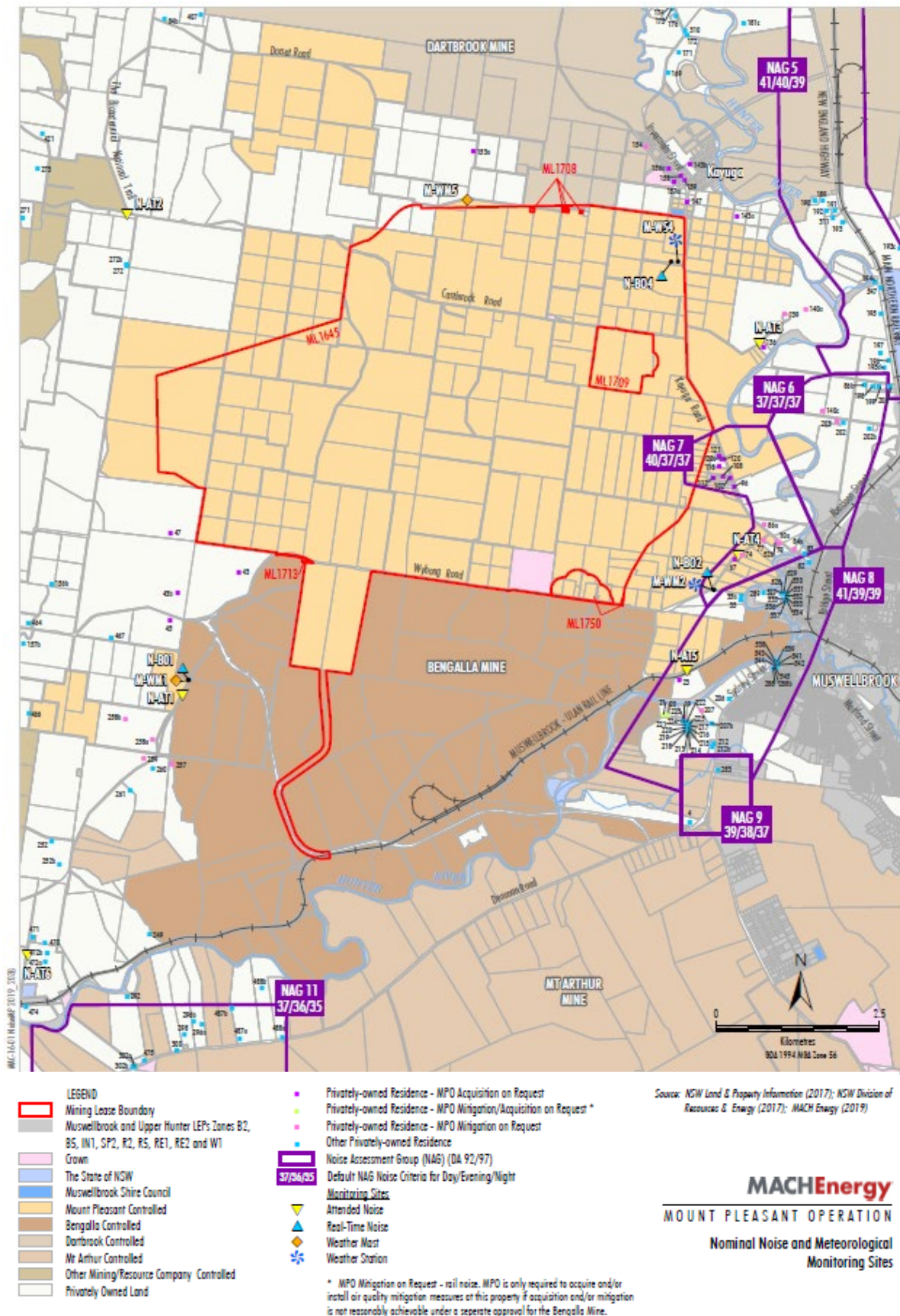


Figure 2-1 – MPO Attended Noise Monitoring Assessment Groups and Locations



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

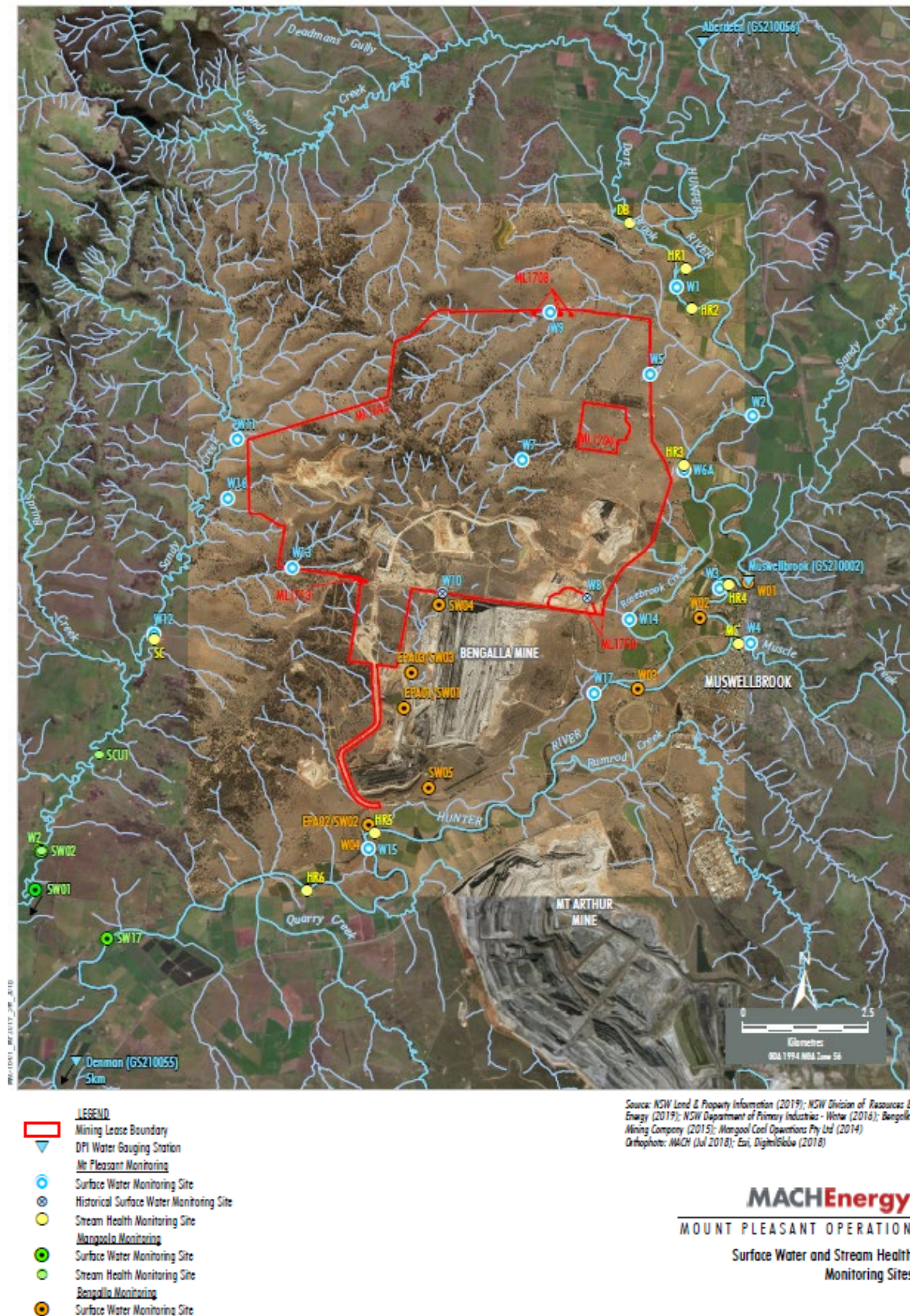


Figure 2-5 – MPO Surface Water Monitoring Network

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, the weather stations measure wind speed and direction, temperature (at 2 m and 10 m), temperature inversion (using the sigma theta method), solar radiation, relative humidity, rainfall, and atmospheric pressure.

The majority of meteorological data was captured at M-WS2 (>99.9%) during May 2022 (the monitoring period), with the exception of solar radiation parameters (90.9%). The majority of data for these meteorological parameters was captured at M-WS4 (97.2%) during the monitoring period.

Throughout May 2022, there was 38.6mm and 41.0mm 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. A gauge sample is determined by AECOM 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 a high level of organic matter) and field notation that bird droppings or insects were present is likely to be considered contaminated.

4.2 Results

The dust deposition exposure period for gauges commenced on 14 April 2022. Sample collection was undertaken on 16 and 17 May 2022 by AECOM with sample analysis performed by ALS, a NATA accredited laboratory. Results are summarised in **Table 4-1**. Annual rolling averages for May 2022 have been provided as an indication of performance between May 2021 – May 2022 and does not represent annual average results for 2022 as per Schedule 3, Condition 20 of DA 92/97.

Table 4-1: Dust Depositional Results – May 2022

Location	YTD Insoluble Solids (g/m ² .month)	Insoluble Solids Annual Rolling Average (g/m ² .month)
D1	2.6	2.6
D3a	1.7	1.8
D4	1.4	1.4
D5	2.6	3.0
D6	1.5	2.4
D7b ¹	5.3	7.8
D8	4.1	3.5
D9a	2.3	1.8
D10	1.2	1.0
D11	2.4	1.8
D12	0.8	0.7
D13	1.3	1.2
D14	4.0	3.2
<i>Criterion</i>	-	4

Notes:

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

**Indicates result unavailable due to contaminated depositional dust gauges for YTD

*** annual rolling average not available as new site location

¹Site D7b is located within close proximity to the northern boundary of a neighbouring mining company's main pit and thus is influenced by activities there. This site will continue to be monitored, however will not be used to assess compliance or to represent residential receivers in the area.

* No data due to dust gauge removed during construction activities

Contaminated results, as described in Section 4.1, are not included in the 12 month rolling average. Site D7b is located within close 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 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 May sampling event noted that all the gauges contained insects and one gauge contained bird droppings. Site D3a was unable to be collected due to construction in

the area. There was insufficient evidence of contamination in all depositional dust gauges to justify any being deemed contaminated. All May 2022 insoluble solid results were included in the annual rolling average calculations.

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

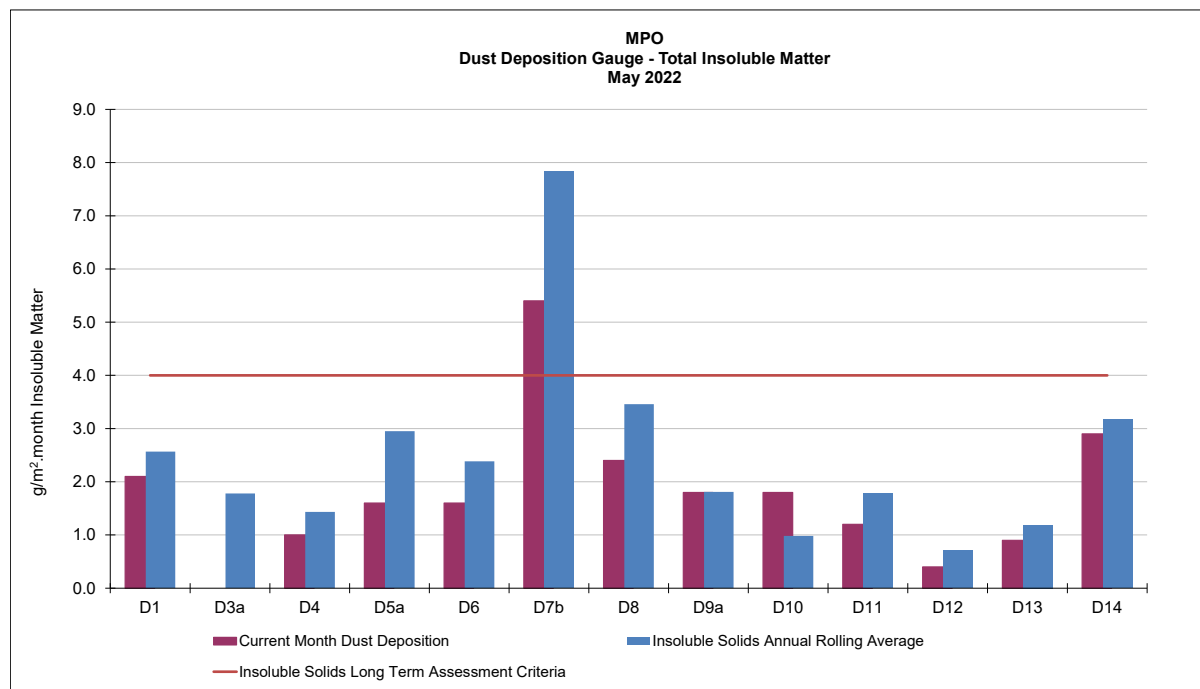


Figure 4-1: MPO Dust Deposition Monthly Results and Annual Rolling Average – May 2022

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) and Project

Approval DA 92/97. The DA 92/97 specifies an annual average project contribution plus background criterion of 90 µg/m³.

5.2 Results

In May 2022, 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 2022 have been provided as an indication of performance between May 2021 – May 2022 and do not represent annual average results for 2022 as per Schedule 3, Condition 20 of DA 92/97.

Table 5-2 Total Suspended Particulate Monitoring Data – May 2022

Run Date	Assessment Criterion	TSP µg/m ³		
		HVAS A-PF2	HVAS M-WS4	HVAS A-PF5
4/05/2022	-	32.3	17.0	23.2
10/05/2022	-	49.0	44.0	26.0
16/05/2022	-	29.9	11.4	12.5
22/05/2022	-	22.7	28.7	24.6
28/05/2022	-	26.6	12.4	15.6
Monthly Mean	-	32.1	22.7	20.4
Annual Rolling Average	90	45	30	28

Note: Results in **bold** indicate an elevated reading

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 May 2022.

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 May 2022 have been provided in Section 6.2 and 6.4 respectively, as an indication of performance between May 2021 – May 2022 and do not represent annual average results for 2022 as per Schedule 3, Condition 20 of DA 92/97.

6.1 PM₁₀ Results – 24 hour rolling average

In accordance with the DA 92/97 limit of 50 µg/m³ for the 24 hour rolling average, there was no elevated readings measured for May 2022. Real time PM₁₀ 24 hour rolling average results for May 2022 are presented in **Table 6-1**.

Table 6-1: MPO Palas Fidas PM₁₀ Data – May 2022

Date	A-PF2/EPA ID 1	A-PF4	A-PF5/EPA ID 2	Muswellbrook NW	Muswellbrook NW 24 Hour Average Limit (µg/m³)	A-PF2, A-PF4, A-PF5 24 Hour Average Limit (µg/m³)
	24 hour Average Result					
1/05/2022	13	10	10	10.9	44	50
2/05/2022	14	12	10	14	44	50
3/05/2022	14	12	15	11.5	44	50
4/05/2022	14	10	9	12.2	44	50
5/05/2022	11	9	8	9.7	44	50
6/05/2022	12	8	7	10.5	44	50
7/05/2022	8	6	6	9.2	44	50
8/05/2022	11	8	-	10	44	50
9/05/2022	13	10	10	15.5	44	50
10/05/2022	16	11	10	14.2	44	50
11/05/2022	12	11	12	14.3	44	50
12/05/2022	13	13	12	11.7	44	50
13/05/2022	11	11	9	9.9	44	50
14/05/2022	14	13	11	9.9	44	50
15/05/2022	13	13	10	11.4	44	50
16/05/2022	11	7	7	12	44	50
17/05/2022	13	8	7	11	44	50
18/05/2022	10	7	6	9.5	44	50
19/05/2022	16	12	11	17.9	44	50
20/05/2022	17	17	13	19.6	44	50
21/05/2022	13	11	8	13.1	44	50
22/05/2022	13	10	8	11	44	50
23/05/2022	11	9	7	10	44	50
24/05/2022	12	10	8	11.3	44	50
25/05/2022	13	11	8	10.3	44	50
26/05/2022	16	13	11	13.8	44	50
27/05/2022	16	15	11	17.4	44	50
28/05/2022	14	9	6	9.3	44	50
29/05/2022	10	6	5	5.8	44	50
30/05/2022	12	9	8	10	44	50
31/05/2022	9	7	7	11.7	44	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 rolling average results at MPO air quality monitoring sites May 2022.

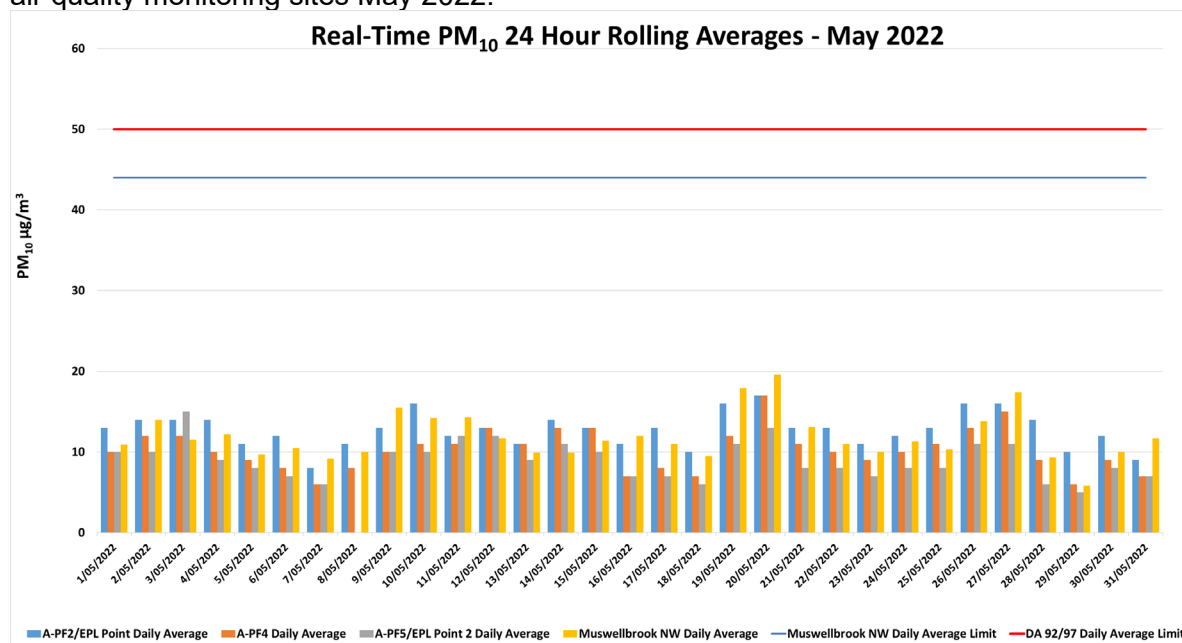


Figure 6-1: Real-time PM₁₀ 24 hour rolling average results for May 2022.

6.2 PM₁₀ Results – Annual rolling average

There were no elevated PM₁₀ measurements reported at MPO for the May 2022 annual rolling average. Real time PM₁₀ annual rolling averages for May 2022 are presented in **Figure 6-2** below.

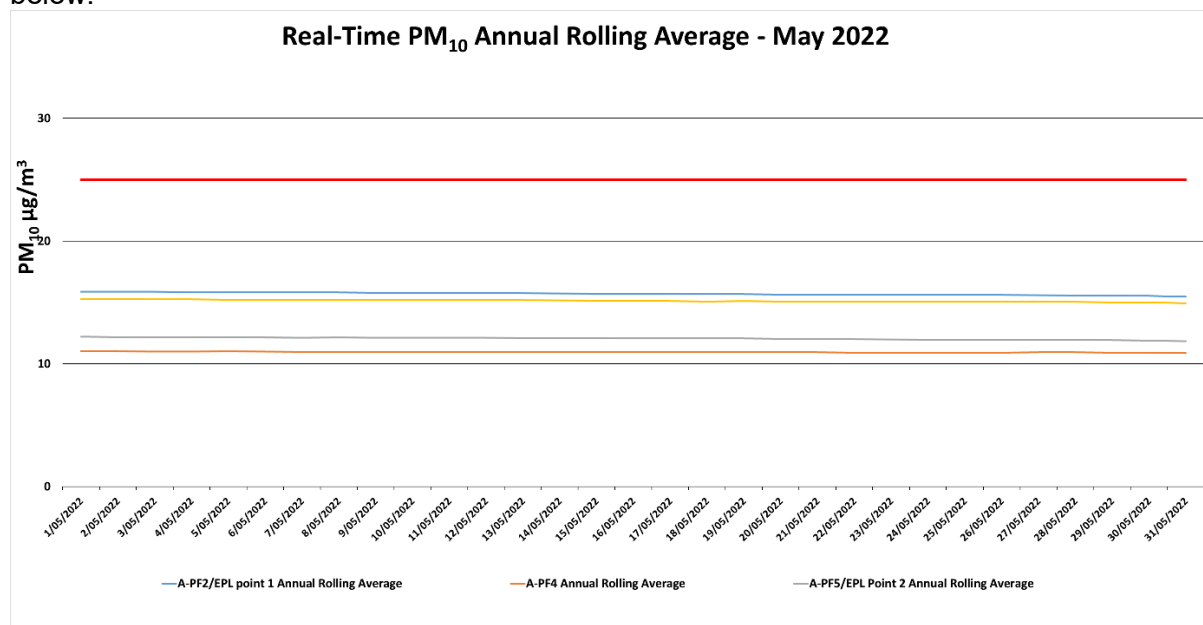


Figure 6-2: Real-time PM₁₀ Annual Rolling average results for May 2022.

6.3 PM_{2.5} Results – 24 hour rolling average

There were no elevated PM_{2.5} measurements reported throughout May 2022. Real time PM_{2.5} 24 hour rolling average results for May 2022 are presented in **Table 6-2**.

Table 6-2: MPO Palas Fidas PM_{2.5} Data – May 2022

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			
1/05/2022	5	5	-	25
2/05/2022	6	5	3	25
3/05/2022	5	5	4	25
4/05/2022	4	4	3	25
5/05/2022	4	4	3	25
6/05/2022	4	3	3	25
7/05/2022	3	3	-	25
8/05/2022	4	3	-	25
9/05/2022	5	4	-	25
10/05/2022	5	5	3	25
11/05/2022	4	4	4	25
12/05/2022	5	6	5	25
13/05/2022	5	5	4	25
14/05/2022	6	6	4	25
15/05/2022	4	4	3	25
16/05/2022	4	3	3	25
17/05/2022	4	3	3	25
18/05/2022	3	3	-	25
19/05/2022	4	4	-	25
20/05/2022	5	5	-	25
21/05/2022	5	5	3	25
22/05/2022	5	4	3	25
23/05/2022	4	4	3	25
24/05/2022	5	4	3	25
25/05/2022	6	5	3	25
26/05/2022	7	6	3	25
27/05/2022	6	5	3	25
28/05/2022	6	4	2	25
29/05/2022	4	3	-	25
30/05/2022	4	3	-	25
31/05/2022	3	3	-	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 2022 are presented in **Figure 6-3** below.

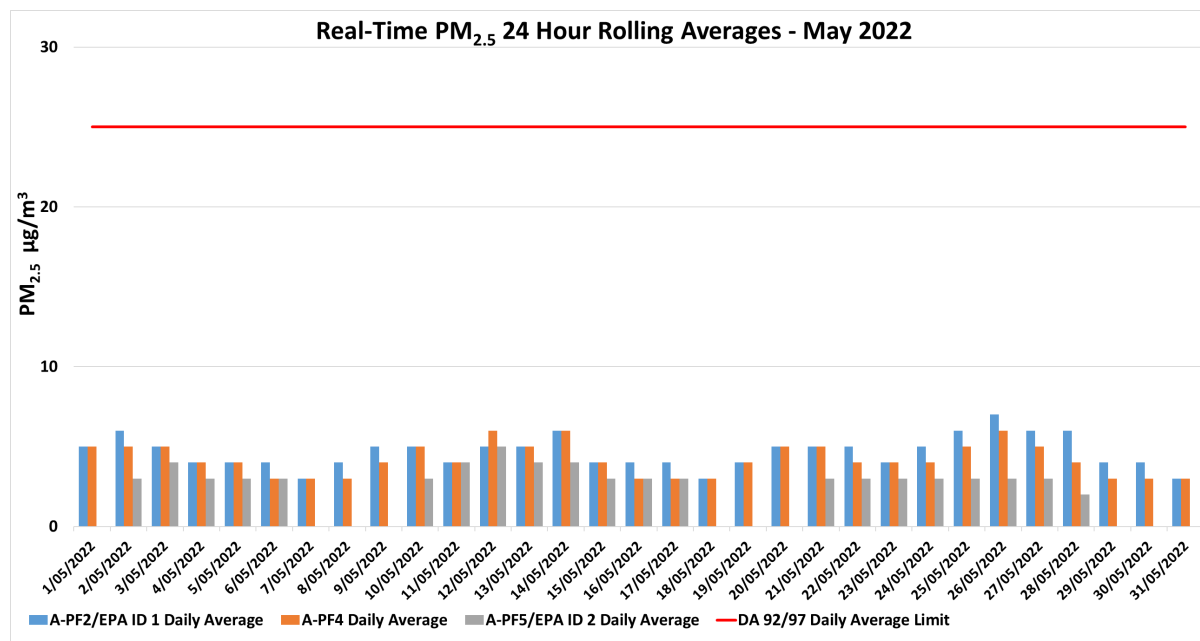


Figure 6-3: Real-time PM_{2.5} 24 hour rolling average results for May 2022.

6.4 PM_{2.5} Results - Annual rolling average

There were no elevated PM_{2.5} measurements reported at MPO for the May 2022 annual rolling average. Real time PM_{2.5} annual rolling averages for May 2022 are presented in **Figure 6-4** below.

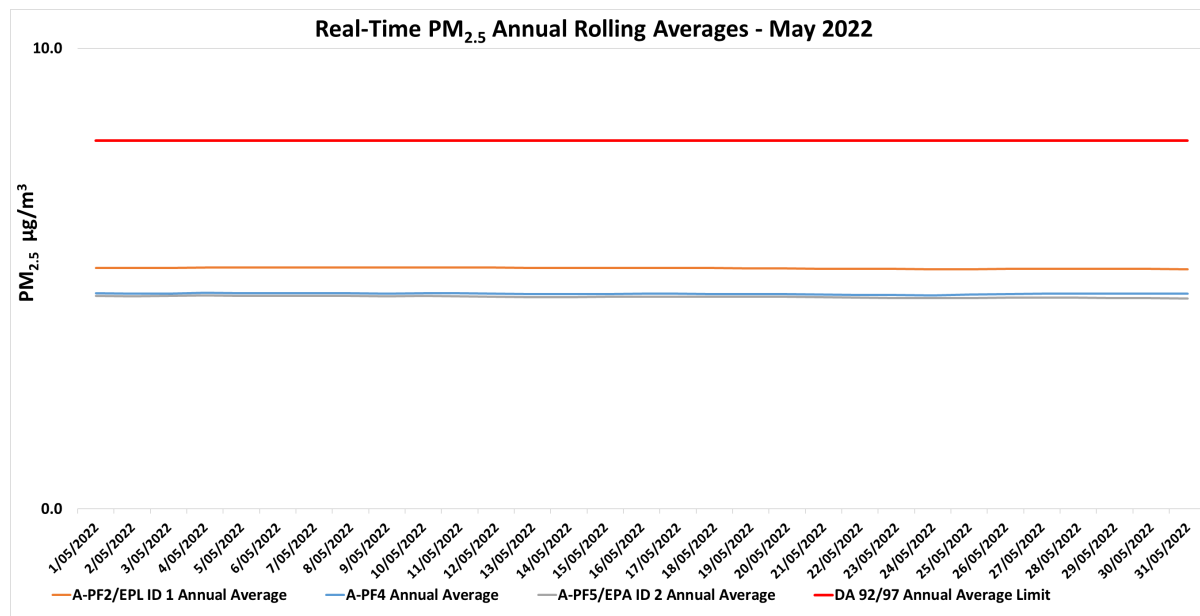


Figure 6-4: Real-time PM_{2.5} Annual Rolling average results for May 2022.

7. Surface Water Monitoring

7.1 Methodology

Surface water quality is monitored at 15 sites on a monthly basis, 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, 2019) 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 event monitoring was conducted by AECOM on 31 May 2022. 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 – 31 May 2022

Station	pH	Electrical Conductivity (EC) (µs/cm) ¹	Total Suspended Solids (TSS) (mg/L)	Total Dissolved Solids (TDS) (mg/L)
W1	8.3	710	406	<5
W2	8.2	790	445	<5
W3	8.2	840	455	6
W4	7.9	2050	1260	8
W5	*	*	*	*
W6A	8.3	790	446	<5
W7	*	*	*	*
W9	^	^	^	^
W11	8.1	4450	2440	6
W12	*	*	*	*
W13	*	*	*	*
W14	8.2	890	540	<5
W15	*	*	*	*
W16	8.2	900	492	16
W17	8.3	710	406	<5

Notes:

Results in **bold** indicate elevated reading of adopted assessment criteria.

*Dry or insufficient water to sample.

^ Indicates no safe access due to wet weather conditions

¹ Results have been rounded in accordance with the In-house method Q4AN(EV)-332-WI3 (pH) and In-house method Q4AN(EV)-332-WI2 (EC).

During the May monthly monitoring, five of the fifteen monitoring location were found to be have insufficient water to sample. Sites W2, W6A and W17 exceeded their respective EC trigger levels and W17 exceeded its pH trigger levels. All other sites were within or below their respective trigger levels. An investigation will be triggered if elevated measurements occur for three consecutive sampling events in accordance MPO Water Management Plan (MACH Energy, 2019). All other sites were below or inside the assessment trigger ranges.

8. Groundwater Monitoring

Quarterly groundwater monitoring was completed on 16, 18, 19, 23, 24, 25 May and 2, 3 June 2022. 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		Current Month Water Level (DTW)	Feb 2022 Water Level (DTW)	Nov 2021 Water Level (DTW)	Triggered (Yes/No)
	80 th Percentile (DTW)	Trigger				
WRA1L	-	± 0.5m	0.03	1.08	3.04	
WRA1U	-	± 0.5m	6.34	*	*	
WRA3L	-	± 0.5m	5.16	^	^	
WRA3U	-	± 0.5m	3.13	^	^	
WRA6L	-	± 0.5m	0.85	1.08	^	
WRA6U	-	± 0.5m	1.79	2.03	^	
MPBH1	9.71	10.70	9.77	9.76	9.46	No
MPBH2	12.20	14.20	11.27	11.49	12.53	No
MPBH3b	12.00	Dry (or 14.0m)	11.24	11.34	12.01	No
MPBH4	-	± 0.5m	11.25	11.31	11.84	
MPBH5	-	± 0.5m	8.83	*	8.83	
MPBH1-C	-	± 0.5m	9.89	9.89	9.64	
MPBH1-HR	-	± 0.5m	13.33	14.02	16.10	
MPBH2-C	-	± 0.5m	11.57	11.80	12.83	
MPBH2-HR	-	± 0.5m	19.82	22.96	36.90	
MPBH4-C	-	± 0.5m	10.83	10.90	11.49	
MPBH4-HR	-	± 0.5m	50.80	50.85	50.78	
MPBH5-C	-	± 0.5m	10.99	11.44	12.47	
MPBH5-HR	-	± 0.5m	11.01	11.38	12.37	
MPBH6	-	± 0.5m	9.54	^	10.17	
MPBH6-C	-	± 0.5m	11.27	^	11.87	
MPBH6-HR	-	± 0.5m	10.74	^	10.97	
MPBH7	-	± 0.5m	5.95	6.51	7.34	

Monitoring Location/ ID	Water Level Trigger Range		Current Month Water Level (DTW)	Feb 2022 Water Level (DTW)	Nov 2021 Water Level (DTW)	Triggered (Yes/No)
	80 th Percentile (DTW)	Trigger				
MPBH7-C	-	± 0.5m	15.00	15.25	18.76	
3500C500 (L)	-	± 0.5m	59.29	59.07	60.07	
3500C500 (S)	-	± 0.5m	24.16	24.32	25.45	
4500F000	-	± 0.5m	29.15	31.22	^	
5000D000	-	± 0.5m	115.07	113.14	118.13	
5500D000	-	± 0.5m	38.55	39.28	40.46	
6500F500L	-	± 0.5m	53.72	53.66	^	
6500F500M	-	± 0.5m	55.05	55.05	^	
6500F500U	-	± 0.5m	34.50	*	^	
6500F625	-	± 0.5m	^	^	^	
Melody	-	± 0.5m	^	^	^	
7500F000	-	± 0.5m	36.61	36.68	36.69	

* Dry/insufficient water to sample

** Bore appeared to be blocked

*** New site – results may not be representative of groundwater conditions at time of sampling due to ongoing well development

- Trigger Levels are not applicable due to non-alluvial bore

Note: An investigation is triggered when the water levels in any **alluvial bores** exceed the 80th percentile and/ or trigger level. Results shown in **bold** indicate that the bore has had a change in standing water level of ± 0.5m from the previous measurement.

Table 8-2 - MPO Quarterly Groundwater pH results

Monitoring Location/ ID	pH Trigger Range		Current Month pH	Feb 2022 Month pH	Nov2021 pH	Triggered (Yes/No)
	20 th Percentile	80 th Percentile				
WRA1I	6.0	8.5	7.1	7.3	7.4	No
WRA1U	6.0	8.5	*	*	*	-
WRA3L	6.0	8.5	6.8	^	^	No
WRA3U	6.0	8.5	7.2	^	^	No
WRA6L	6.0	8.5	7.0	6.9	^	No
WRA6U	6.0	8.5	7.0	6.9	^	No
MPBH1	6.0	8.5	6.9	6.9	6.9	No
MPBH2	6.0	8.5	6.9	6.9	6.8	No
MPBH3b	6.0	8.5	7.2	7.3	7.4	No
MPBH4	6.0	8.5	6.9	7.0	6.9	No
MPBH5	6.0	8.5	*	*	*	-
MPBH1-C***	6.0	8.5	8.1	8.7	7.4	No
MPBH1-HR***	6.0	8.5	8.1	8.0	7.8	No
MPBH2-C***	6.0	8.5	7.3	11.2	10.3	No
MPBH2-HR***	6.0	8.5	7.3	8.4	8.5	No

Monitoring Location/ ID	pH Trigger Range		Current Month pH	Feb 2022 Month pH	Nov2021 pH	Triggered (Yes/No)
	20 th Percentile	80 th Percentile				
MPBH4-C***	6.0	8.5	7.5	8.4	8.3	No
MPBH4-HR***	6.0	8.5	7.5	7.4	7.4	No
MPBH5-C***	6.0	8.5	9.9	10.3	10.5	Yes
MPBH5-HR***	6.0	8.5	7.4	7.6	7.5	No
MPBH6***	6.0	8.5	7.1	^	7.1	No
MPBH6-C***	6.0	8.5	7.8	^	7.7	No
MPBH6-HR***	6.0	8.5	7.3	^	7.3	No
MPBH7***	6.0	8.5	7.0	7.2	7.1	No
MPBH7-C***	6.0	8.5	7.2	7.7	7.3	No
3500C500 (L)	6.0	8.5	7.5	7.5	7.6	No
3500C500 (S)	6.0	8.5	7.3	7.3	6.9	No
4500F000	6.0	8.5	6.8	6.8	^	No
5000D000	6.0	8.5	**	**	8.0	-
5500D000	6.0	8.5	7.0	6.9	7.0	No
6500F500L	6.0	8.5	7.3	7.4	^	No
6500F500M	6.0	8.5	7.3	7.3	^	No
6500F500U	6.0	8.5	*	^	^	-
6500F625	6.0	8.5	^	^	^	-
Melody	6.0	8.5	^	^	^	-
7500F000	6.0	8.5	7.8	7.8	7.7	No

* Dry/insufficient water to sample

^ Unsafe Access

*** New site – results may not be representative of groundwater conditions at time of sampling due to ongoing well development
- Trigger Levels are not applicable due to non-alluvial bore

Note: An investigation is triggered when the water levels in any alluvial bores exceed the 80th percentile and/ or trigger level.
Results shown in bold indicate that the bore has had a change in standing water level of $\pm 0.5\text{m}$ from the previous measurement.

Table 8-3 - MPO Quarterly Groundwater EC results

Monitoring Location/ ID	EC Trigger Range	Current Month EC	Feb 2022 EC	Nov 2021 EC	Triggered (Yes/No)
	Maximum Beneficial Use Trigger				
WRA1I	7800	2800	2900	2800	No
WRA1U	*	**	**	**	-
WRA3L	22000	14800	^	^	No
WRA3U	22000	1550	^	^	No
WRA6L	7800	7300	5900	^	No
WRA6U	22000	8750	10200	^	No
MPBH1	800	650	630	490	No
MPBH2	930	920	800	770	No
MPBH3b	7800	6650	5600	5050	No

Monitoring Location/ ID	EC Trigger Range	Current Month EC	Feb 2022 EC	Nov 2021 EC	Triggered (Yes/No)
	Maximum Beneficial Use Trigger				
MPBH4	*	5750	5800	6050	-
MPBH5	*	**	**	**	-
MPBH1-C	*	860	1550	650	-
MPBH1-HR	*	1750	2000	1600	-
MPBH2-C	*	870	1950	1250	-
MPBH2-HR	*	920	1900	1800	-
MPBH4-C	*	3700	3800	3800	-
MPBH4-HR	*	5550	5750	5800	-
MPBH5-C	*	770	640	600	-
MPBH5-HR	*	770	950	1050	-
MPBH6	*	1050	^	1000	-
MPBH6-C	*	7300	^	7350	-
MPBH6-HR	*	6300	^	6100	-
MPBH7	*	10300	13400	11900	-
MPBH7-C	*	10300	11300	11700	-
3500C500 (L)	7800	3700	3800	3800	No
3500C500 (S)	7800	2800	3450	1100	No
4500F000	22000	8450	8500	^	No
5000D000	800	***	***	4400	-
5500D000	7800	4450	4500	4500	No
6500F500L	7800	3850	3850	^	No
6500F500M	7800	2950	2950	^	No
6500F500U	7800	**	**	^	-
6500F625	7800	^	^	^	No
Melody	*	^	^	^	-
7500F000	7800	6300	6350	6250	No

* indicates no trigger limit identified

** Dry/insufficient water to sample

^ Unsafe access

*** New site - results may not be representative of groundwater conditions at time of sampling due to ongoing well development

^ indicated no trigger limit identified

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.

Results have been rounded in accordance with the In-house method Q4AN(EV)-332-WI3 (pH) and In-house method Q4AN(EV)-332-WI2 (EC). 1 -

Investigation undertaken into elevated measurements at 5000D000 as per Groundwater Management Plan (MACH Energy, 2019) including suitably qualified hydrogeologist assessment; and amendment to Surface & Groundwater Trigger Response Plan (DA92/97-PA-35)

The were no elevated measurements during the May 2022 sampling event not previously reported. The next quarterly monitoring event is scheduled for August 2022.

9. Noise Monitoring

Attended noise monitoring was undertaken during the night period of 19/20 May 2022 at 6 monitoring locations as per the MPO Noise Management Plan (MACH Energy, 2021) in accordance with DA 92/97 and EPL 20850.

9.1 Results

The results for night time attended noise monitoring for noise generated by MPO in May 2022 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 – 19/20 May 2022

Location	Start Date and Time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies ¹	MPO Only $L_{A1,1min}$ dB ^{2,4}	Exceedance dB ^{3,4}
N-AT1	19/05/2022 23:40	1.4	D	45	Yes	NM	Nil
N-AT2	19/05/2022 22:03	2.2	D	45	Yes	33	Nil
N-AT3	19/05/2022 22:36	1.9	G	45	No	IA	NA
N-AT4	19/05/2022 23:33	1.9	G	45	No	IA	NA
N-AT5	19/05/2022 23:06	2.2	F	45	No	IA	NA
N-AT6	19/05/2022 23:16	2.8	F	45	No	IA	NA

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; and
- NA in exceedance column means meteorological conditions outside those specified in Condition L2.3 of EPL 20850 and thus criterion is not applicable;
- NM Not Measurable. Some noise was audible but could not be quantified;
- Bold results indicate exceedance of criteria; and
- Remeasure

Table 9-2 – $L_{Aeq,15min}$ Generated by MPO: Attended Night Monitoring – 19/20 May 2022

Location	Start Date and Time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies ¹	MPO Only L_{Aeq} dB ^{2,4}	Exceedance dB ^{3,4}
N-AT1	19/05/2022 23:40	1.4	D	43	Yes	NM	Nil
N-AT2	19/05/2022 22:03	2.2	D	36	Yes	25	Nil
N-AT3	19/05/2022 22:36	1.9	G	41	No	IA	NA
N-AT4	19/05/2022 23:33	1.9	G	42	No	IA	NA
N-AT5	19/05/2022 23:06	2.2	F	40	No	IA	NA
N-AT6	19/05/2022 23:16	2.8	F	35	No	IA	NA

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 $L_{Aeq,15minute}$ 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;
- NM Not Measurable. Some noise was audible but could not be quantified;
- Bold results indicate exceedance of criteria; and
- Remeasure

Table 9-3 – $L_{Aeq,period}$ Cumulative Noise: Attended Night Monitoring – 19/20 May 2022

Location	Start Date and Time	Cumulative Noise Criterion L_{Aeq} dB	Measured Mining Only $L_{Aeq,period}$ dB ^{1,2}	Exceedance dB
N-AT1	19/05/2022 23:40	40	Nil	Nil
N-AT2	19/05/2022 22:03	40	Nil	Nil
N-AT3	19/05/2022 22:36	40	Nil	Nil
N-AT4	19/05/2022 23:33	40	Nil	Nil
N-AT5	19/05/2022 23:06	40	Nil	Nil
N-AT6	19/05/2022 23:16	40	Nil	Nil

Notes:

- 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
- By definition, 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'.

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). Noise levels from MPO complied with noise limits at all monitoring locations during the monitoring period.

10. Blast Monitoring

There were 8 blast events during May (a total of 38 blasts YTD). Results for May 2022 are presented in **Table 10-1**. All blast results during the May 2022 monitoring period were below the criteria in Schedule 3, Condition 10 of DA 92/97 and EPL 20850 and therefore compliant.

Table 10-1 – MPO Blast Monitoring Results – May 2022

Day & Date Fired	Time Fired	Vibration (mm/s) BVOA	Overpressure (dBL) BVOA	Vibration (mm/s) BVOC	Overpressure (dBL) BVOC	Vibration (mm/s) BVO2	Overpressure (dBL) BVO2	Blast Fume Compliant
Tuesday 3/05/2022	13:02	0.490	100.1	0.620	90	0.300	96.1	Y
Thursday 5/05/2022	15:17	0.280	95.7	0.150	89	0.390	98.7	Y
Tuesday 10/05/2022	1:10	0.410	102.4	0.360	103.6	0.300	99.2	Y
Thursday 12/05/2022	9:38	1.770	100.2	0.750	95.2	0.960	97.4	Y
Tuesday 17/05/2022	1:10	0.160	96.9	0.150	96	0.270	93.7	Y
Thursday 19/05/2022	1:12	0.870	101.1	0.810	92	0.860	100.5	Y
Wednesday 25/05/2022	1:19	0.410	98.2	0.250	90.9	0.430	95.4	Y
Friday 27/05/2022	12:08	0.570	102.2	0.380	100.5	0.280	103.1	Y

END OF REPORT