

**Mount Pleasant Operation
Monthly Environmental Monitoring Report**

August 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 August 2022
Reporting Period End Date	31 August 2022
Date All Data Received	18 November 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.

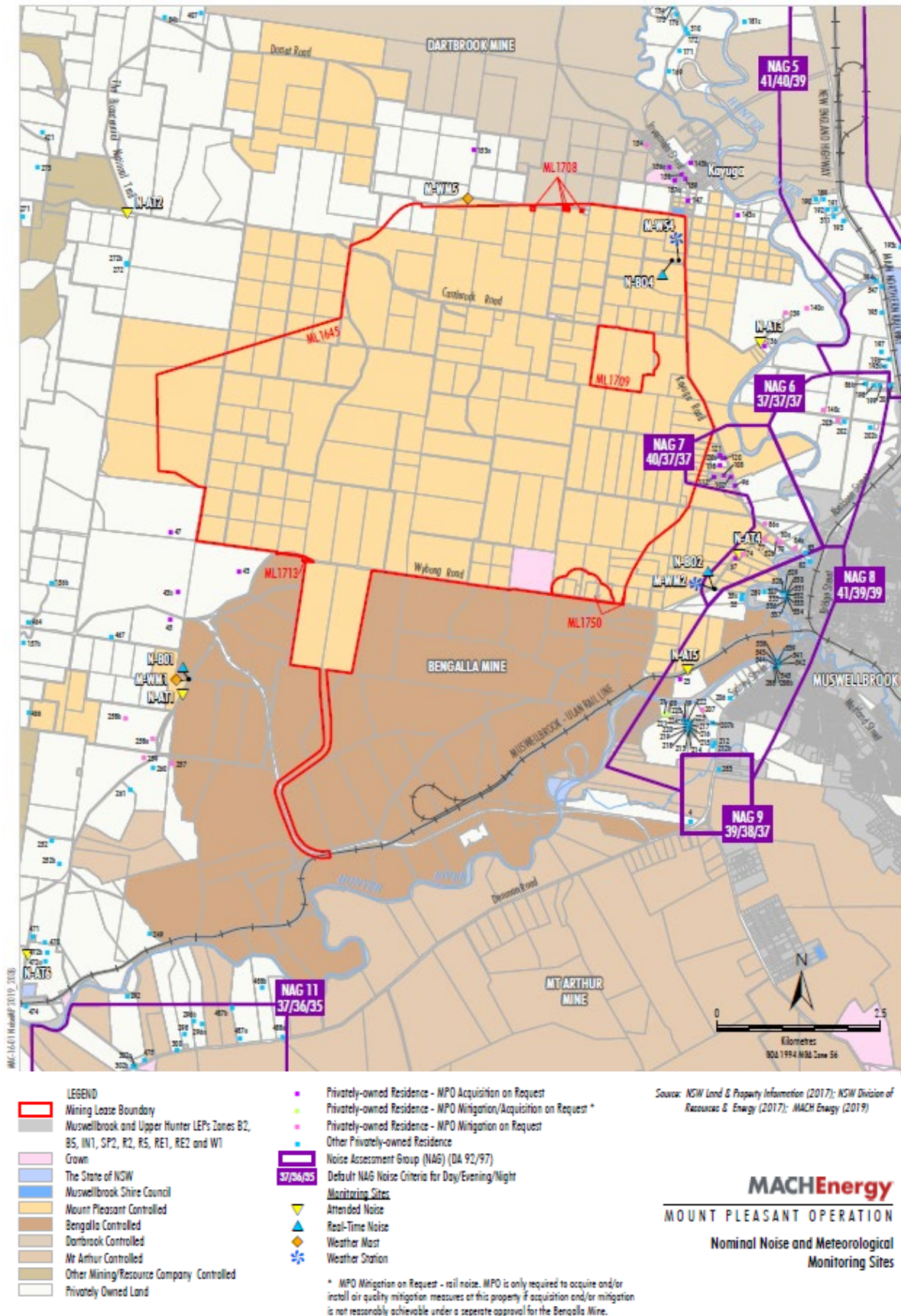


Figure 2-1 – MPO Attended Noise Monitoring Assessment Groups and Locations



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



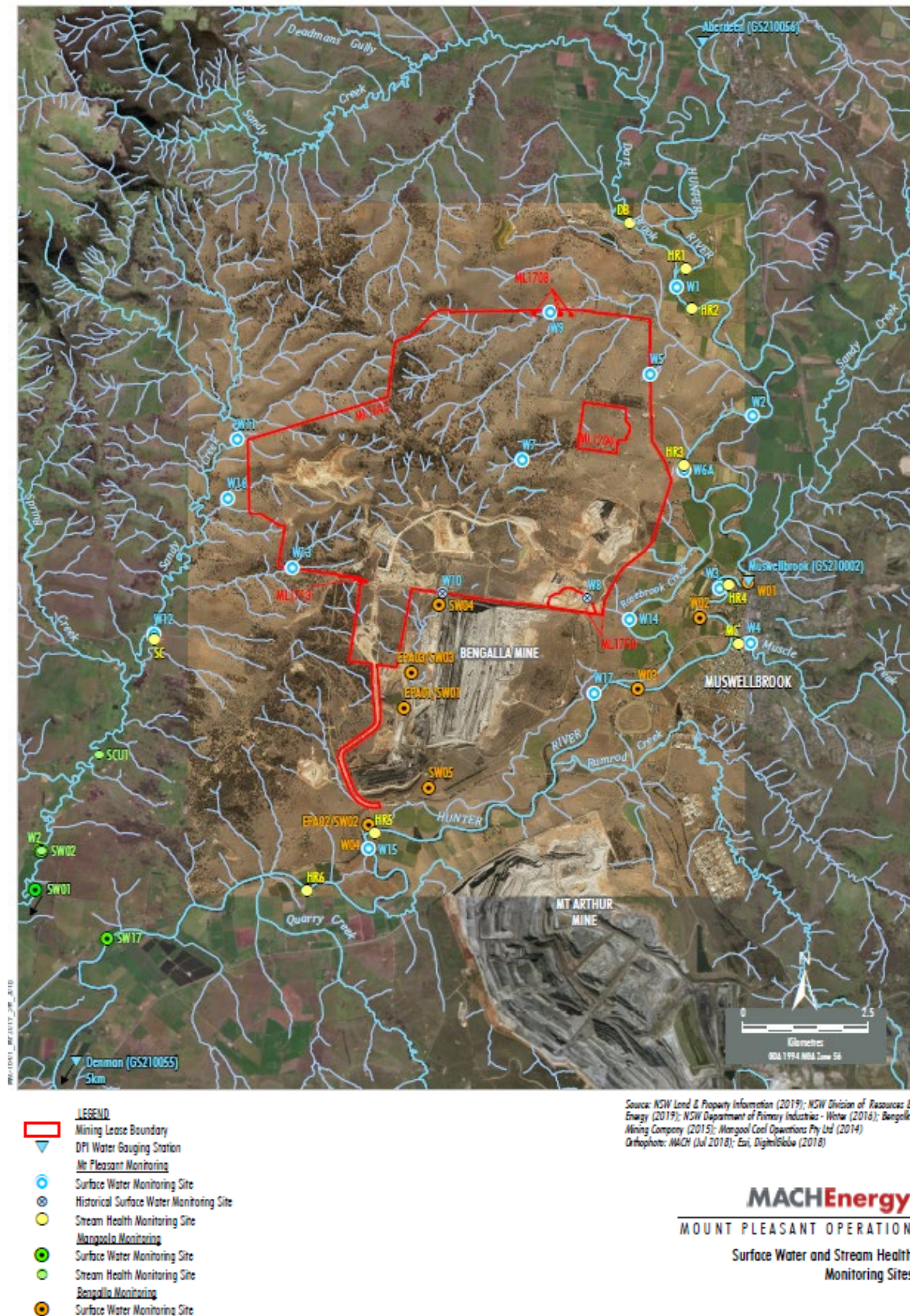


Figure 2-5 – MPO Surface Water Monitoring Network

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 (PM₁₀ and PM_{2.5}), 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-WS4 (>96.5%) during August 2022 (the monitoring period).

Throughout August 2022, there was 87.8mm and 77.4mm 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 18 July 2022. Sample collection was undertaken on 18 August 2022 by AECOM with sample analysis performed by ALS, a NATA accredited laboratory. Results are summarised in **Table 4-1**. Annual rolling averages for August 2022 have been provided as an indication of performance between August 2021 – August 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 – August 2022

Location	YTD Insoluble Solids (g/m ² .month)	Insoluble Solids Annual Rolling Average (g/m ² .month)
D1	2.4	2.5
D3a	_*	_*
D4	1.0	1.3
D5	2.2	2.4
D6	1.4	2.0
D7b ¹	7.5	8.0
D8	3.3	3.2
D9a	2.0	1.9
D10	1.0	1.0
D11	1.8	1.7
D12	0.6	0.7
D13	1.1	1.1
D14	3.0	3.0
<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 August sampling event noted that all the gauges contained insects and one gauge contained bird droppings. There was insufficient evidence of contamination in all

depositional dust gauges to justify any being deemed contaminated. All August 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.

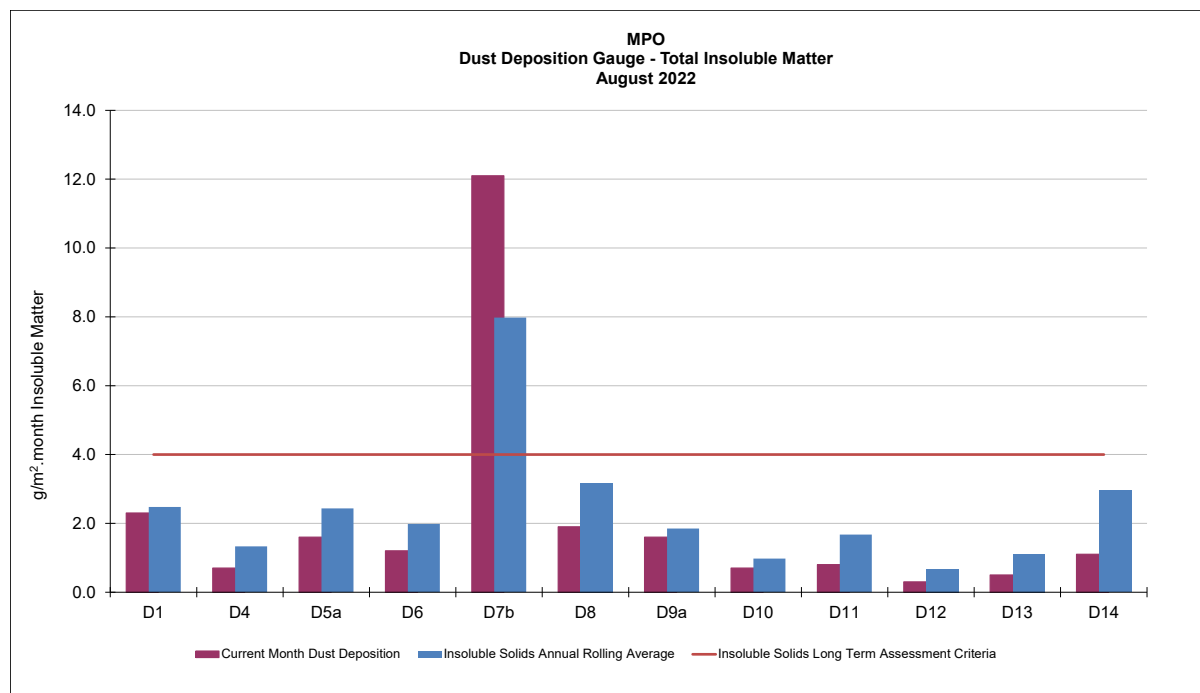


Figure 4-1: MPO Dust Deposition Monthly Results and Annual Rolling Average – August 2022

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 August 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 August 2022 have been provided as an indication of performance between August 2021 – August 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 – August 2022

Run Date	Assessment Criterion	TSP µg/m ³		
		HVAS A-PF2	HVAS M-WS4	HVAS A-PF5
2/08/2022	-	17.0	2.5	5.6
8/08/2022	-	18.3	13.2	18.1
14/08/2022	-	12.6	1.5	2.6
20/08/2022	-	28.9	3.0	5.0
26/08/2022	-	25.5	26.9	22.3
Monthly Mean	-	20.5	9.4	10.7
Annual Rolling Average	90	40	29	26

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 August 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 August 2022 have been provided in Section 6.2 and 6.4 respectively, as an indication of performance between August 2021 – August 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 August 2022. Real time PM₁₀ 24 hour rolling average results for August 2022 are presented in **Table 6-1**.

Table 6-1: MPO Palas Fidas PM₁₀ Data – August 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					
1/07/2022	19	13	14	20	44	50
2/07/2022	13	12	7	11.5	44	50
3/07/2022	9	8	5	7	44	50
4/07/2022	7	7	5	5.4	44	50
5/07/2022	7	6	5	5.7	44	50
6/07/2022	5	5	4	2.8	44	50
7/07/2022	7	6	-	5.5	44	50
8/07/2022	9	6	-	8.9	44	50
9/07/2022	8	6	-	8.3	44	50
10/07/2022	8	9	-	7.7	44	50
11/07/2022	11	11	-	10.2	44	50
12/07/2022	8	7	-	7.1	44	50
13/07/2022	10	5	5	7.7	44	50
14/07/2022	11	11	12	13.4	44	50
15/07/2022	9	8	-	8.5	44	50
16/07/2022	11	7	-	11.2	44	50
17/07/2022	13	8	-	10.9	44	50
18/07/2022	13	6	-	15	44	50
19/07/2022	10	8	-	12.2	44	50
20/07/2022	10	9	-	9.9	44	50
21/07/2022	11	9	-	12.8	44	50
22/07/2022	11	9	-	12.8	44	50
23/07/2022	11	11	-	12.3	44	50
24/07/2022	14	12	-	12.8	44	50
25/07/2022	14	12	-	9.9	44	50
26/07/2022	15	8	-	16.3	44	50
27/07/2022	13	7	-	12.9	44	50
28/07/2022	9	6	-	9.9	44	50
29/07/2022	10	9	-	11.9	44	50
30/07/2022	13	12	-	14.9	44	50
31/07/2022	16	11	-	15	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)

- Data capture affected by technical issue and equipment malfunction

Figure 6-1 below shows the results of real-time PM₁₀ 24 hour rolling average results at MPO air quality monitoring sites August 2022.

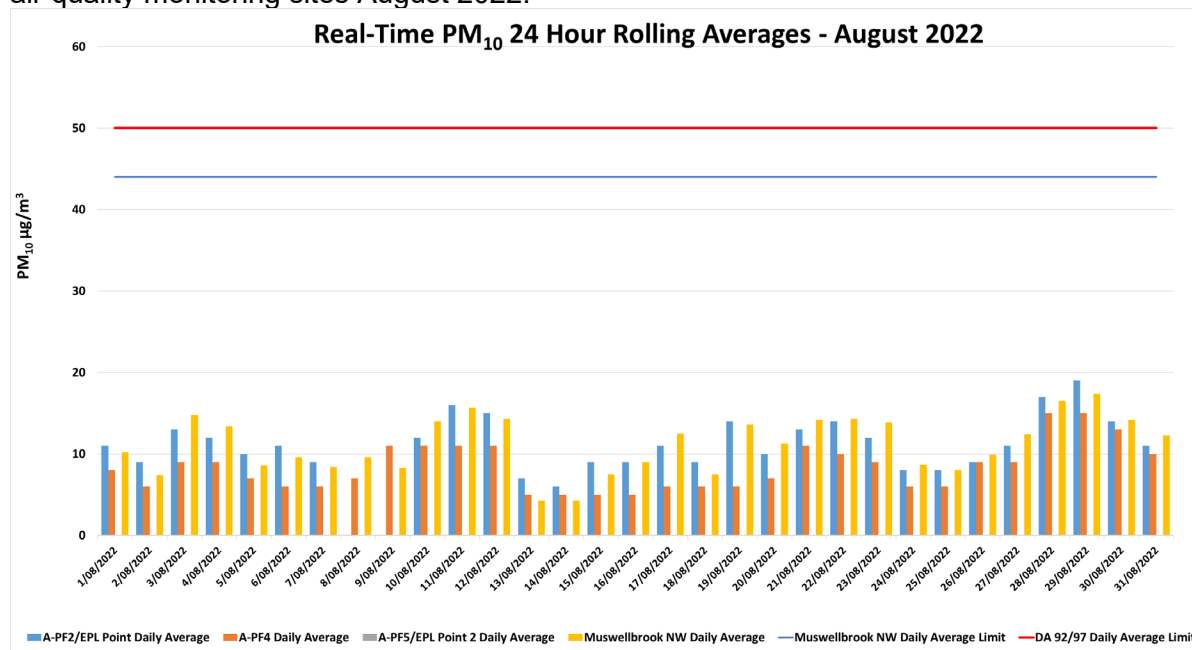


Figure 6-1: Real-time PM₁₀ 24 hour rolling average results for August 2022.

6.2 PM₁₀ Results – Annual rolling average

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

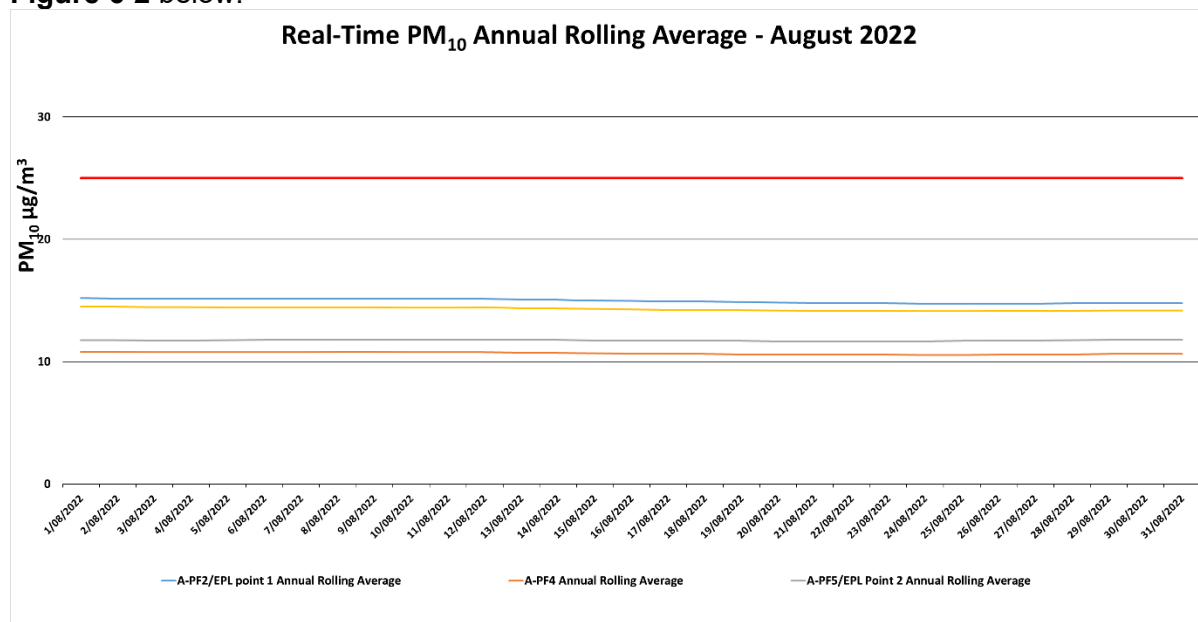


Figure 6-2: Real-time PM₁₀ Annual Rolling average results for August 2022.

6.3 PM_{2.5} Results – 24 hour rolling average

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

Table 6-2: MPO Palas Fidas PM_{2.5} Data – August 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			
1/08/2022	5	3	-	25
2/08/2022	4	3	-	25
3/08/2022	6	4	-	25
4/08/2022	5	4	-	25
5/08/2022	4	3	-	25
6/08/2022	3	3	-	25
7/08/2022	4	3	-	25
8/08/2022	-	3	-	25
9/08/2022	-	4	-	25
10/08/2022	4	4	-	25
11/08/2022	6	5	-	25
12/08/2022	8	6	-	25
13/08/2022	3	2	-	25
14/08/2022	2	2	-	25
15/08/2022	3	2	-	25
16/08/2022	3	2	-	25
17/08/2022	4	3	-	25
18/08/2022	3	3	-	25
19/08/2022	3	3	-	25
20/08/2022	3	3	-	25
21/08/2022	5	4	-	25
22/08/2022	5	5	-	25
23/08/2022	5	5	-	25
24/08/2022	3	3	-	25
25/08/2022	3	3	-	25
26/08/2022	4	4	-	25
27/08/2022	5	4	-	25
28/08/2022	8	7	-	25
29/08/2022	9	7	-	25
30/08/2022	6	6	-	25
31/08/2022	4	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)

- Data capture affected by technical issue and equipment malfunction

Real time PM_{2.5} 24 hour average results for August 2022 are presented in **Figure 6-3** below.

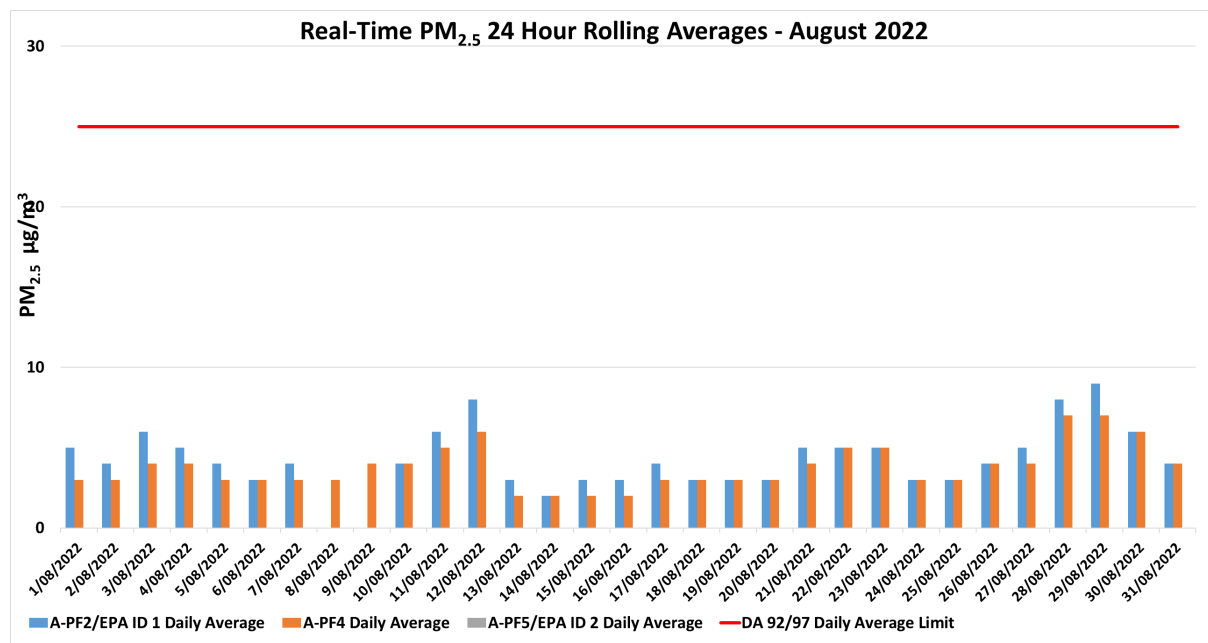


Figure 6-3: Real-time PM_{2.5} 24 hour rolling average results for August 2022.

6.4 PM_{2.5} Results - Annual rolling average

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

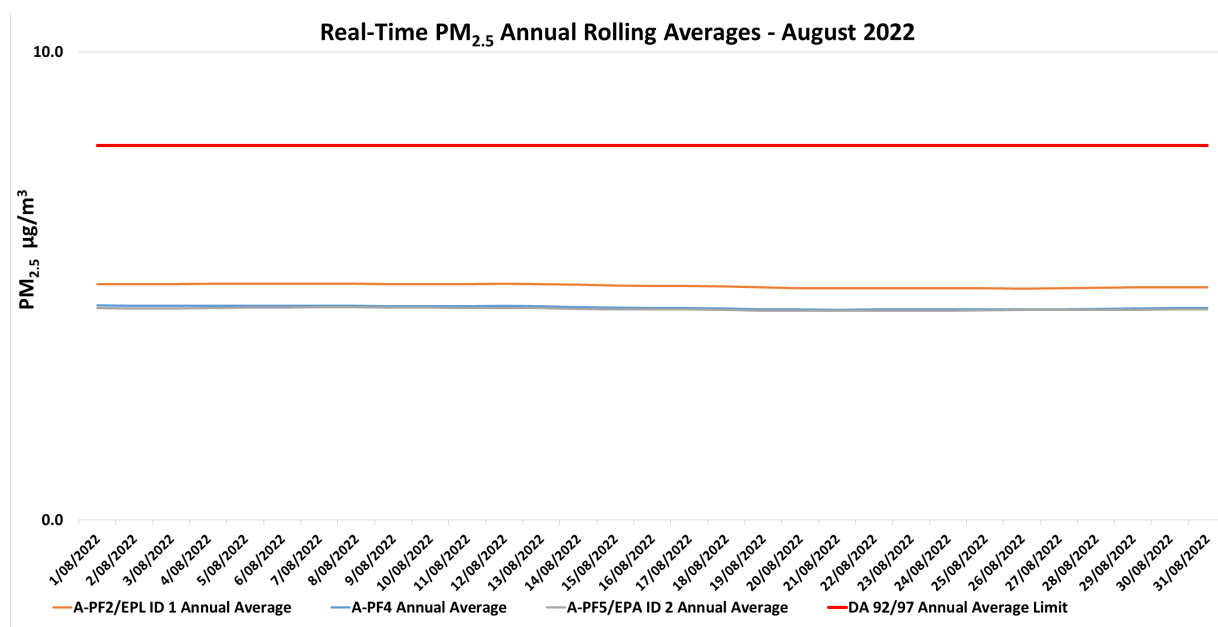


Figure 6-4: Real-time PM_{2.5} Annual Rolling average results for August 2022.

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 5 August 2022. Additional rain event monitoring occurred on 15 August 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** and **Table 7-2**.

Table 7-1 – MPO Monthly Surface Water Monitoring Results – 5 August 2022

Station	pH	Electrical Conductivity (EC) (µs/cm) ¹	Total Dissolved Solids (TDS) (mg/L)	Total Suspended Solids (TSS) (mg/L)
W1	7.9	360	245	118
W2	^	^	^	^
W3	7.9	300	226	276
W4	7.4	180	101**	62
W5	*	*	*	*
W6A	7.8	220	123**	437
W9	7.6	190	108**	33
W11	^	^	^	^
W12	7.9	420	237**	126
W13	7.4	400	229**	39
W14	^	^	^	^
W15	7.8	440	289	243
W16	7.6	75	43**	30
W17	8.0	360	248	201

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

** Calculated result due to interference from fine colloidal material

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).

Table 7-2 – MPO Monthly Surface Water Monitoring Results – 15 August 2022

Station	pH	Electrical Conductivity (EC) (µs/cm) ¹	Total Dissolved Solids (TDS) (mg/L)	Total Suspended Solids (TSS) (mg/L)
W1	8.2	370	254	50
W2	^	^	^	^
W3	8.1	380	257	47
W4	7.7	560	391	33
W5	*	*	*	*
W6A	8.2	370	252	145
W9	7.5	590	497	36
W11	^	^	^	^
W12	8.0	1100	669	27
W13	7.6	1150	672	7
W14	*	*	*	*
W15	8.1	380	272	57
W16	8.2	2800	1520	30
W17	8.1	370	319	52

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

** Calculated result due to interference from fine colloidal material

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 August monthly monitoring, one of the fifteen monitoring location were found to have insufficient water to sample both events. Sites W6A exceeded their respective EC trigger levels and W17 exceeded its TSS trigger levels. Site W9 exceeded pH and EC. 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 10, 11 and 17 August 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		Aug 2022 Water Level (DTW)	May 2022 Water Level (DTW)	Feb 2022 Water Level (DTW)	Water Level Trigger Range
	80th Percentile (DTW)	Trigger				
WRA1L	-	± 0.5m	0.00	0.03	1.08	
WRA1U	-	± 0.5m	5.41	6.34	*	
WRA3L	-	± 0.5m	4.36	5.16	^	
WRA3U	-	± 0.5m	2.20	3.13	^	
WRA6L	-	± 0.5m	0.63	0.85	1.08	
WRA6U	-	± 0.5m	1.57	1.79	2.03	
MPBH1	9.71	10.70	8.89	9.77	9.76	No
MPBH2	12.20	14.20	11.19	11.27	11.49	No
MPBH3b	12.00	Dry (or 14.0m)	11.10	11.24	11.34	No
MPBH4	-	± 0.5m	11.08	11.25	11.31	
MPBH5	-	± 0.5m	*	8.83	*	
MPBH1-C	-	± 0.5m	9.03	9.89	9.89	
MPBH1-HR	-	± 0.5m	44.31	13.33	14.02	
MPBH2-C	-	± 0.5m	11.50	11.57	11.80	
MPBH2-HR	-	± 0.5m	11.89	19.82	22.96	
MPBH4-C	-	± 0.5m	10.64	10.83	10.90	
MPBH4-HR	-	± 0.5m	50.76	50.80	50.85	
MPBH5-C	-	± 0.5m	11.10	10.99	11.44	
MPBH5-HR	-	± 0.5m	11.89	11.01	11.38	
MPBH6	-	± 0.5m	9.37	9.54	^	
MPBH6-C	-	± 0.5m	10.97	11.27	^	
MPBH6-HR	-	± 0.5m	10.61	10.74	^	
MPBH7	-	± 0.5m	4.63	5.95	6.51	
MPBH7-C	-	± 0.5m	12.13	15.00	15.25	
3500C500L	-	± 0.5m	19.30	59.29	59.07	
3500C500S	-	± 0.5m	18.88	24.16	24.32	
4500F000	-	± 0.5m	26.12	29.15	31.22	
5000D000	-	± 0.5m	114.95	115.07	113.14	
5000D000-R**	-	± 0.5m	137.41	-	-	
5500D000	-	± 0.5m	37.83	38.55	39.28	
6500F500L	-	± 0.5m	53.33	53.72	53.66	
6500F500M	-	± 0.5m	54.00	55.05	55.05	

Monitoring Location/ ID	Water Level Trigger Range		Aug 2022 Water Level (DTW)	May 2022 Water Level (DTW)	Feb 2022 Water Level (DTW)	Water Level Trigger Range
	80th Percentile (DTW)	Trigger				
6500F500U	-	± 0.5m	32.36	34.50	*	
6500F625	-	± 0.5m	^	^	^	
Melody	-	± 0.5m	^	^	^	

* 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		Aug 2022 pH	May 2022 pH	Feb 2022 pH	Triggered (Yes/No)
	20 th Percentile	80 th Percentile				
WRA1I	6.0	8.5	7.2	7.1	7.3	No
WRA1U	6.0	8.5	7.1	*	*	-
WRA3L	6.0	8.5	6.7	6.8	^	No
WRA3U	6.0	8.5	7.1	7.2	^	No
WRA6L	6.0	8.5	7.0	7.0	6.9	No
WRA6U	6.0	8.5	7.0	7.0	6.9	No
MPBH1	6.0	8.5	7.0	6.9	6.9	No
MPBH2	6.0	8.5	6.9	6.9	6.9	No
MPBH3b	6.0	8.5	7.4	7.2	7.3	No
MPBH4	6.0	8.5	7.1	6.9	7.0	No
MPBH5	6.0	8.5	*	*	*	-
MPBH1-C	6.0	8.5	8.5	8.1	8.7	No
MPBH1-HR	6.0	8.5	7.8	8.1	8.0	No
MPBH2-C	6.0	8.5	11.2	7.3	11.2	No
MPBH2-HR	6.0	8.5	8.4	7.3	8.4	No
MPBH4-C	6.0	8.5	7.9	7.5	8.4	No
MPBH4-HR	6.0	8.5	7.3	7.5	7.4	No
MPBH5-C	6.0	8.5	9.8	9.9	10.3	Yes
MPBH5-HR	6.0	8.5	7.5	7.4	7.6	No
MPBH6	6.0	8.5	7.1	7.1	^	No
MPBH6-C	6.0	8.5	7.4	7.8	^	No
MPBH6-HR	6.0	8.5	7.4	7.3	^	No
MPBH7	6.0	8.5	7.0	7.0	7.2	No
MPBH7-C	6.0	8.5	7.0	7.2	7.7	No
3500C500L	6.0	8.5	7.5	7.5	7.5	No

Monitoring Location/ ID	pH Trigger Range		Aug 2022 pH	May 2022 pH	Feb 2022 pH	Triggered (Yes/No)
	20 th Percentile	80 th Percentile				
3500C500S	6.0	8.5	7.3	7.3	7.3	No
4500F000	6.0	8.5	6.8	6.8	6.8	No
5000D000-R**	6.0	8.5	7.7	-	-	
5500D000	6.0	8.5	6.9	7.0	6.9	No
6500F500L	6.0	8.5	7.2	7.3	7.4	No
6500F500M	6.0	8.5	7.2	7.3	7.3	No
6500F500U	6.0	8.5	6.6	*	^	-
6500F625	6.0	8.5	^	^	^	-
Melody	6.0	8.5	^	^	^	-
7500F000	6.0	8.5	7.9	7.8	7.8	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	Aug 2022 EC ¹	May 2022 EC ¹	Feb 2022 EC ¹	Triggered (Yes/No)
	Maximum Beneficial Use Trigger				
WRA1L	7800	2650	2800	2900	No
WRA1U	*	900	***	***	-
WRA3L	22000	15000	14800	^	No
WRA3U	22000	1600	1550	^	No
WRA6L	7800	7200	7300	5900	No
WRA6U	22000	8150	8750	10200	No
MPBH1	800	700	650	630	No
MPBH2	930	910	920	800	No
MPBH3b	7800	6500	6650	5600	No
MPBH4	*	5700	5750	5800	-
MPBH5	*	***	***	***	-
MPBH1-C	*	1250	860	1550	-
MPBH1-HR	*	1750	1750	2000	-
MPBH2-C	*	1950	870	1950	-
MPBH2-HR	*	1750	920	1900	-
MPBH4-C	*	4400	3700	3800	-
MPBH4-HR	*	5750	5550	5750	-
MPBH5-C	*	680	770	640	-
MPBH5-HR	*	880	770	950	-

Monitoring Location/ ID	EC Trigger Range	Aug 2022 EC ¹	May 2022 EC ¹	Feb 2022 EC ¹	Triggered (Yes/No)
	Maximum Beneficial Use Trigger				
MPBH6	*	1050	1050	^	-
MPBH6-C	*	3250	7300	^	-
MPBH6-HR	*	5150	6300	^	-
MPBH7	*	11200	10300	13400	-
MPBH7-C	*	10300	10300	11300	-
3500C500L	7800	3600	3700	3800	No
3500C500S	7800	3450	2800	3450	No
4500F000	22000	7950	8450	8500	No
5000D000-R**	*	4250	-	-	-
5500D000	7800	4250	4450	4500	No
6500F500L	7800	3000	3850	3850	No
6500F500M	7800	3000	2950	2950	No
6500F500U	7800	4750	***	***	-
6500F625	7800	^	^	^	No
Melody	*	^	^	^	-
7500F000	7800	6500	6300	6350	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.

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).

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 August 2022 sampling event not previously reported. The next quarterly monitoring event is scheduled for November 2022.

9. Noise Monitoring

Attended noise monitoring was undertaken during the night period of 9/10 August 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 August 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 – 9/10 August 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	9/08/2022 23:48	0.9	E	45	Yes	IA	Nil
N-AT2	9/08/2022 22:00	0.6	F	45	Yes	30	Nil
N-AT3	9/08/2022 22:30	1.2	G	45	No	IA	NA
N-AT4	9/08/2022 22:57	0.8	E	45	Yes	IA	Nil
N-AT5	9/08/2022 23:24	0.9	F	45	Yes	40	Nil
N-AT6	9/08/2022 23:23	0.9	F	45	Yes	IA	Nil

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

Table 9-2 – $L_{Aeq,15min}$ Generated by MPO: Attended Night Monitoring – 9/10 August 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	9/08/2022 23:48	0.9	E	43	Yes	IA	Nil
N-AT2	9/08/2022 22:00	0.6	F	36	Yes	28	Nil
N-AT3	9/08/2022 22:30	1.2	G	41	No	IA	NA
N-AT4	9/08/2022 22:57	0.8	E	42	Yes	IA	Nil
N-AT5	9/08/2022 23:24	0.9	F	40	Yes	28	Nil
N-AT6	9/08/2022 23:23	0.9	F	35	Yes	IA	Nil

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 – 9/10 August 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	9/08/2022 23:48	40	Nil	Nil
N-AT2	9/08/2022 22:00	40	Nil	Nil
N-AT3	9/08/2022 22:30	40	Nil	Nil
N-AT4	9/08/2022 22:57	40	Nil	Nil
N-AT5	9/08/2022 23:24	40	Nil	Nil
N-AT6	9/08/2022 23:23	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 7 blast events during August (a total of 57 blasts YTD). Results for August 2022 are presented in **Table 10-1**. All blast results during the August 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 – August 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
3/08/2022 Wednesday	10:09	2.450	111.3	1.360	1.36	1.100	110.9	Y
4/08/2022 Thursday	13:11	0.020	89.5	0.010	79.8	0.000	99	Y
5/08/2022 Friday	13:34	0.010	86.6	0.010	86.6	0.000	100.1	Y
9/08/2022 Tuesday	13:17	0.020	86	0.010	90.4	0.000	84.7	Y
12/08/2022 Friday	12:15	0.820	107.4	0.650	106.1	0.410	98.3	Y
24/08/2022 Wednesday	13:13	2.710	101.3	1.420	91	1.530	104.3	Y
31/08/2022 Wednesday	13:11	0.520	100.8	0.500	94	0.400	97	Y

END OF REPORT