

## **Monthly Environmental Monitoring Report**

**February 2019**

## Table of Contents

1. Introduction .....	2
2. Monitoring Requirements .....	2
3. Dust Depositional Monitoring .....	7
4. Total Suspended Particulates .....	9
5. Real Time PM <sub>10</sub> Monitoring .....	10
6. Surface Water Monitoring .....	12
7. Groundwater Monitoring .....	14
8. Noise Monitoring .....	14
9. Blast Monitoring .....	17
10. Meteorological Monitoring .....	18

## 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 Environmental Protection Licence (EPL) 20850, Section 66(6) of the *Planning of the Environment Operations Act 1997* (POEO Act) and the MPO Project Approval Development Approval (DA) 92/97.

**Table 1-1 – Mount Pleasant Operation**

<b>Name of Operation</b>	Mount Pleasant Operation
<b>Name of Licensee</b>	MACH Energy Australia Pty Ltd
<b>Environmental Protection Licence</b>	20850
<b>Reporting Period Start Date</b>	1 February 2019
<b>Reporting Period End Date</b>	28 February 2019
<b>Date Data Received</b>	21 March 2019

To view MPO EPL 20850 in full please refer to the link below.

<https://machenergyaustralia.com.au/mount-pleasant/documentation/>

## 2. Monitoring Requirements

The MPO EPL 20850 specifically requires the monitoring of:

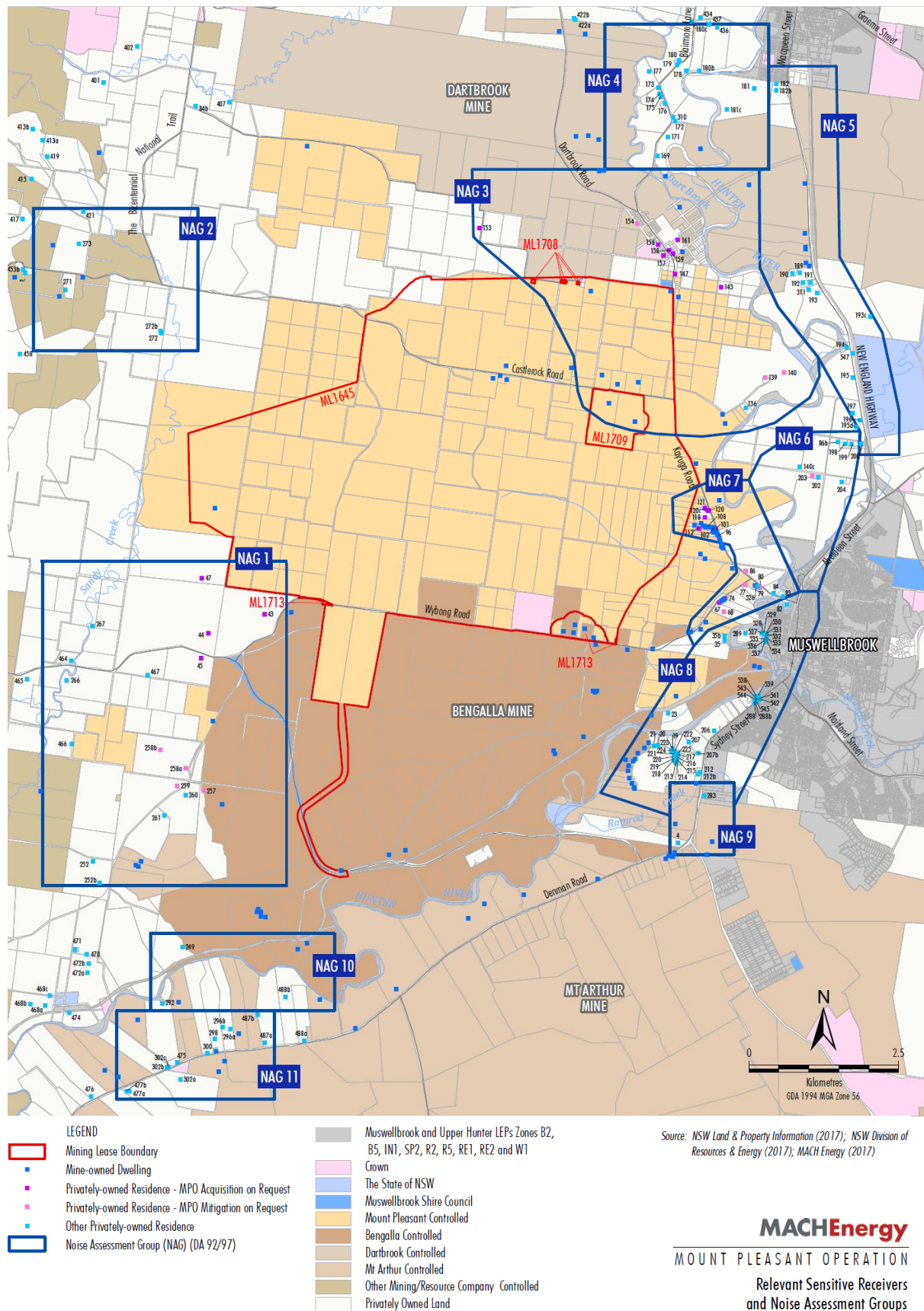
- 2 x Palas Fidas or TEOM Particulate Monitor PM10 sites;
- Noise monitoring;
- Blast monitoring; and
- Meteorological monitoring.

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 a suitability qualified and experienced person.

The MPO Environmental Monitoring Network is shown in **Figure 2-1, Figure 2-2, Figure 2-3 and Figure 2-4.**

**Figure 2-1** shows MPO attended noise monitoring assessment groups. **Figure 2-2** shows the MPO air quality monitoring network. **Figure 2-3** shows the MPO ground water monitoring network. **Figure 2-4** shows the MPO surface water monitoring network.



**Figure 2-1 – MPO Attended Noise Monitoring Assessment Groups**





- LEGEND**
- Mining Lease Boundary
  - Mine Owned
  - Privately-owned Residence - MPO Acquisition on Request
  - Privately-owned Residence - MPO Mitigation on Request
  - Other Privately-owned Residence
  - Monitoring Sites**
  - Air Quality - High Volume Sampler
  - Air Quality - Palas Fidas
  - Dust Deposition Gauge
  - ◆ Upper Hunter Air Quality Monitoring Network
  - ◆ Weather Mast
  - ★ Weather Station

Source: NSW Land & Property Information (2017); NSW Division of Resources & Energy (2017); MACH Energy (2017)  
Orthophoto: MACH Energy (Aug 2016)

**MACHEnergy**  
MOUNT PLEASANT OPERATION  
Air Quality and Meteorological  
Monitoring Sites

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



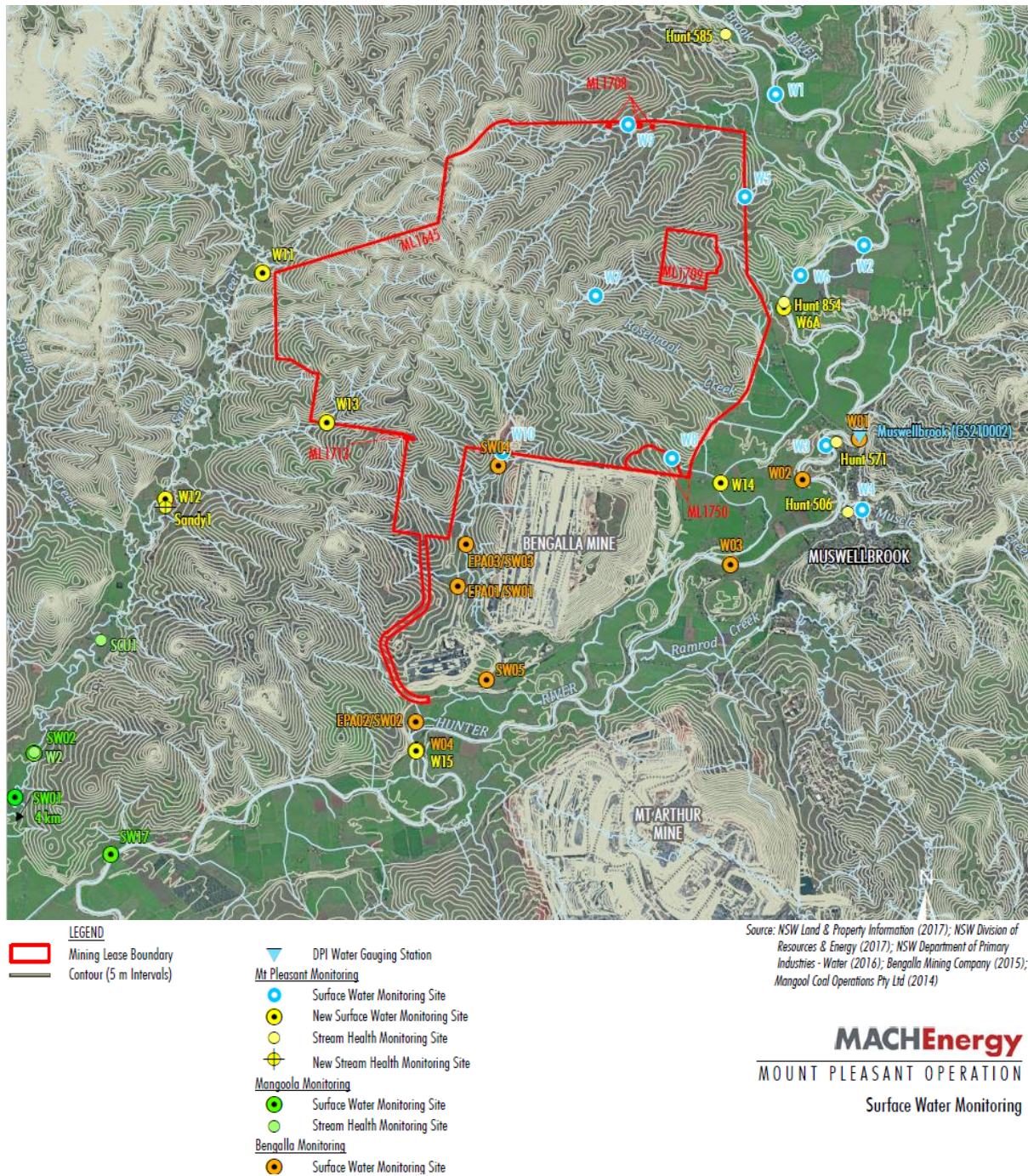
Note: Refer Figure 3 for geology legend

## MOUNT PLEASANT OPERATION

## Augmentations to the Groundwater Monitoring Network

### Figure 2-3 – MPO Groundwater Monitoring Network





**Figure 2-4 – MPO Surface Water Monitoring Network**

## 3. Dust Depositional Monitoring

### 3.1 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.

### 3.2 Results

The dust deposition exposure period for all gauges commenced on 16 January 2019. Sample collection was undertaken on 15 February 2019 by AECOM with sample analysis performed by SRT NATA accredited laboratory. Results are summarised in **Table 3-1**.

**Table 3-1: Dust Depositional Results – February 2019**

Location	YTD Insoluble Solids (g/m <sup>2</sup> .month)	Insoluble Solids Annual Rolling Average (g/m <sup>2</sup> .month)
D1	2.4	1.7
D3	4.9	3.2
D4	2.4	1.9
D5	1.4	2.2
D6	4.3	3.2
D7 <sup>1</sup>	5.7	<b>7.5</b>
D8	3.8	3.9
D9	**	2.0
D10	1.3	1.4

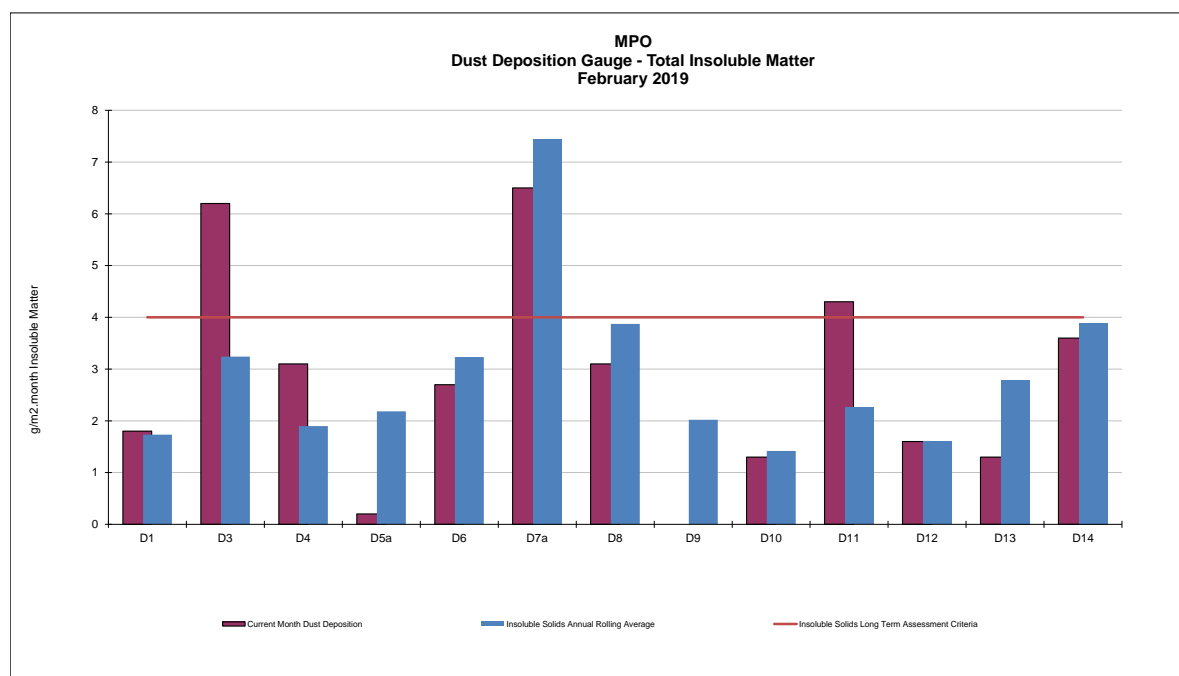


Location	YTD Insoluble Solids (g/m <sup>2</sup> .month)	Insoluble Solids Annual Rolling Average (g/m <sup>2</sup> .month)
D11	3.1	2.3
D12	1.5	1.6
D13	2.5	2.8
D14	4.2	3.9
Criterion	-	4
Note: Results in <b>bold</b> indicate elevated reading of adopted assessment criteria **Indicates result unavailable due to contaminated depositional dust gauges for YTD		

**Note 1:** Site D7 is located within close proximity to the northern boundary of Bengalla Mine main pit and is heavily influenced by Bengalla Mine operations. This site will continue to be monitored however, will not be used to assess compliance or to represent residential receivers in the area.

Contaminated results are not included in the 12 month rolling average. Year to date insoluble solid results are unavailable at depositional dust gauge D9 as the dust gauge was deemed contaminated for both January and February 2019. Field notes from the February sampling event noted that all the gauges contained insects.

**Figure 3-1** compares the monthly insoluble solids results to the annual averages for each dust gauge and the assessment criterion.



**Figure 3-1: MPO Dust Deposition Monthly Result and Annual Rolling Average – February 2019**

The results from **Figure 3-1** show an elevated reading of February dust deposition at site D3, and D11 for February 2019. This is likely a result of the high number of days that the region experienced adverse regional air quality events such as hot, dry weather in much of February 2019. However, the annual average criterion has not been exceeded.

## 4. 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 4-1** below. These units were commissioned in March 2017.

**Table 4-1 Total suspended Particulate Monitoring Sites**

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

### 4.1 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 EPA specifies an annual average criterion of 90 mg/m<sup>3</sup>.

### 4.2 Results

In February 2019 sample collection was undertaken by AECOM with sample analysis performed by SRT NATA accredited laboratory. TSP results for the monitoring period are provided in **Table 4-2**.

**Table 4-2 Total Suspended Particulate Monitoring Data – February 2019**

Run Date	Assessment Criterion	TSP µg/m <sup>3</sup>		
		HVAS A-PF2	HVAS M-WS4	HVAS A-PF5
1/02/2019	-	77	55	64
7/02/2019	-	74	50	55
13/02/2019	-	255	196	184
19/02/2019	-	142	102	120
25/02/2019	-	62	45	60
Monthly Mean	-	122	90	97
<b>Annual Rolling Average</b>	90	89	47	47

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

## 4.3 Discussion

For the reporting period, the annual rolling average TSP data at all sites were below the annual average criterion of 90  $\mu\text{g}/\text{m}^3$ .

## 5. Real Time PM<sub>10</sub> Monitoring

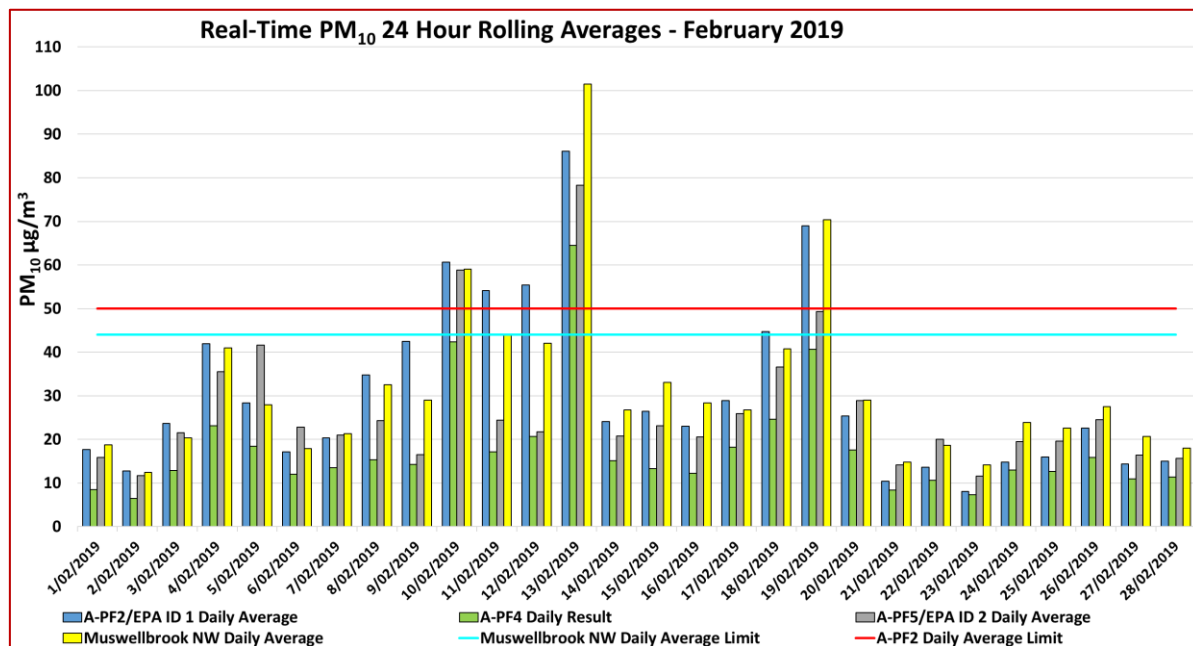
Continuous particulate matter less than 10  $\mu\text{m}$  (PM<sub>10</sub>) monitoring was conducted by three Palas Fidas (one utilised for management only) units at MPO during February 2019.

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. The third unit at A-PF4 is currently under maintenance, and has been temporarily replaced by a TEOM unit for the February 2019 monitoring period.

### 5.1 Results

On 10, 11, 12, 13, and 19 February 2019, monitoring location A-PF2 resulted in elevated readings in line with the EPL condition limit of 50  $\mu\text{g}/\text{m}^3$  for the 24 hour rolling average. The Muswellbrook NW monitor also resulted in elevated readings on 10, 13, and 19 February. These high PM<sub>10</sub> levels on the mentioned dates were associated with wider regional air quality events and adverse weather conditions (hot and windy) and were not directly related to mining activities at MPO.

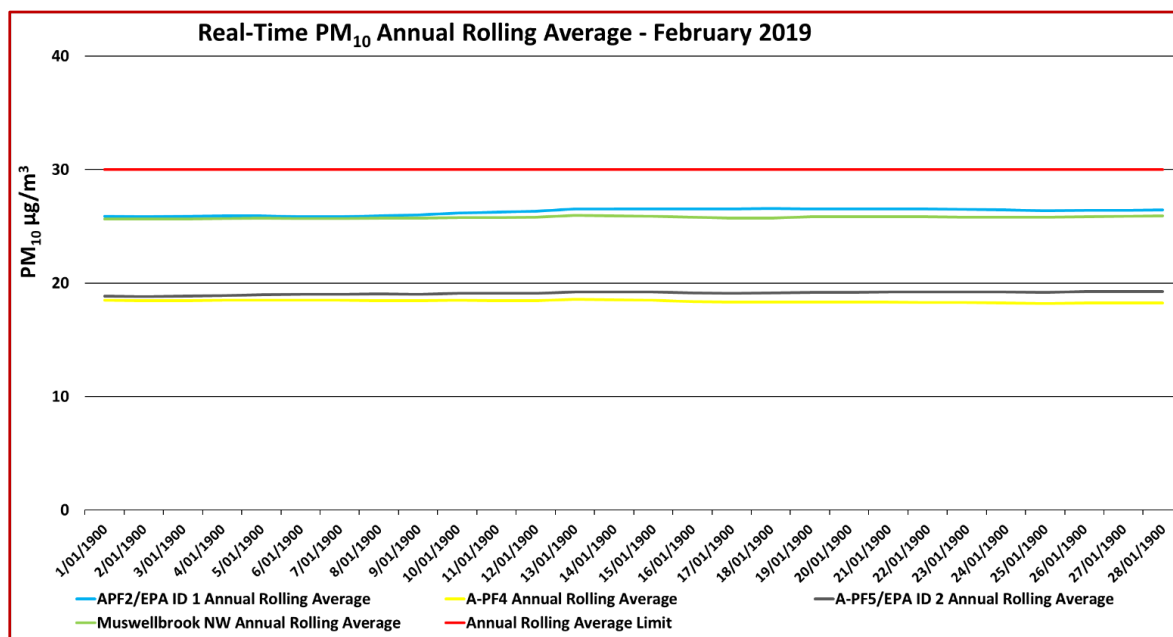
Real time PM<sub>10</sub> daily average results and annual rolling averages for February 2019 are presented in Figure 5-1 below.



**Figure 5-1: Real-time PM<sub>10</sub> 24 Hour Rolling average results for February 2019.**



**Figure 5-1** shows the results of real-time PM<sub>10</sub> 24 hour rolling average results at MPO air quality monitoring sites for February 2019. On 10 and 13 February, winds were predominantly from the south-east (blowing away from Muswellbrook towards MPO) therefore not triggering a shutdown in accordance to the MPO Environmental Protection Licence conditions. Dust shutdowns were executed by MPO on 11, 12 and 19 February as a result of adverse air quality conditions over these days. For example, the total time of machinery shutdown hours for 10, 11, 12, 13, and 19 February were 12.32, 25.72, 85.42, 5.13, and 75.15 hours respectively. Watercarts are in use each day during both day and night shifts at MPO, and continue to run during shutdown events



**Figure 5-1: Real-time PM<sub>10</sub> Annual Rolling average results for February 2019.**

Real time PM<sub>10</sub> daily average results for February 2019 are presented in **Table 5- 1**.

**Table 5-1: MPO Palas Fidas Data – February 2019**

Date	A-PF2/EPA ID 1	A-PF4	A-PF5/EPA ID 2	Muswellbrook NW	A-PF2 24 Hour Average Limit (µg/m³)	Muswellbrook NW 24 Hour Average Limit (µg/m³)
	24 hour Average Result					
1/02/2019	18	9	16	19	50	44
2/02/2019	13	6	12	12	50	44
3/02/2019	24	13	21	20	50	44
4/02/2019	42	23	35	41	50	44
5/02/2019	28	18	42	28	50	44
6/02/2019	17	12	23	18	50	44
7/02/2019	20	14	21	21	50	44
8/02/2019	35	15	24	33	50	44
9/02/2019	43	14	16	29	50	44
10/02/2019	61	42	59	59	50	44

11/02/2019	<b>54</b>	17	24	44	50	44
12/02/2019	<b>55</b>	21	22	42	50	44
13/02/2019	<b>86</b>	<b>64</b>	<b>78</b>	<b>102</b>	50	44
14/02/2019	24	15	21	27	50	44
15/02/2019	26	13	23	33	50	44
16/02/2019	23	12	21	28	50	44
17/02/2019	29	18	26	27	50	44
18/01/2019	45	24	33	41	50	44
19/01/2019	<b>69</b>	25	24	41	50	44
20/01/2019	25	9	16	36	50	44
21/01/2019	10	9	17	14	50	44
22/01/2019	14	17	27	28	50	44
23/01/2019	8	16	28	38	50	44
24/01/2019	15	19	29	36	50	44
25/01/2019	16	22	35	37	50	44
26/01/2019	23	26	28	42	50	44
27/01/2019	14	26	32	44	50	44
28/01/2019	15	21	31	37	50	44

Note: Results in bold indicate elevated readings. As a result, MPO executed dust delays/shutdowns of operations and a halt to dust generating activities on 11, 12, and 19, of February 2019.

## 6. Surface Water Monitoring

### 6.1 Methodology

Surface water quality is monitored at 13 sites on a monthly basis, with additional monitoring conducted if triggered by a rain event. A comprehensive suite of analysis is performed at these sites on a quarterly basis.

### 6.2 Assessment Criteria

Surface waters were assessed 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.

### 6.3 Results

Monthly surface water monitoring was conducted by AECOM on 27 February 2019. Laboratory analysis was performed by SRT and SGS NATA accredited laboratories. Monthly monitoring results for pH, EC, TSS and TDS are presented in **Table 6-1**.

**Table 6-1 – MPO Monthly Surface Water Monitoring Results – 27 February 2019**

Station	pH	Electrical Conductivity (EC) (µs/cm) <sup>1</sup>	Total Suspended Solids (TSS) (mg/L)	Total Dissolved Solids (TDS) (mg/L)
W1	8.3	390	11	199
W2	8.0	410	3	221

Station	pH	Electrical Conductivity (EC) (µs/cm) <sup>1</sup>	Total Suspended Solids (TSS) (mg/L)	Total Dissolved Solids (TDS) (mg/L)
W3	8.0	370	7	195
W4	7.6	1200	18	633
W5	*	*	*	*
W6	8.3	390	8	197
W7	*	*	*	*
W9	*	*	*	*
W11	8.0	8400	15	4650
W12	8.1	6350	121	3150
W13	*	*	*	*
W14	*	*	*	*
W15	7.8	420	17	321

Note: 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

<sup>1</sup> 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).

Five of the thirteen monitoring locations were found to be dry on 30 February 2019. All sites sampled were below or inside the trigger level values during February 2019.



## 7. Groundwater Monitoring

Quarterly groundwater monitoring was conducted on 22 and 28 February 2019, with final completion on 1 March 2019. Water level results for the groundwater bores are presented in **Table 7-1**. The pH and EC results are presented in **Table 7-2** and **Table 7-3** respectively.

**Table 7-1 - MPO Quarterly Groundwater Water Level Results**

Monitoring Location/ ID	Water Level Trigger Range		Current Month Water Level (DTW)	November 2018 Water Level (DTW)	Triggered (Yes/No)
	80 <sup>th</sup> Percentile (DTW)	Trigger			
WRA1L	-	± 0.5m	5.88	5.40	
WRA1U	-	± 0.5m	*	*	
WRA3L	-	± 0.5m	16.92	17.18	
WRA3U	-	± 0.5m	<b>4.04</b>	6.48	
WRA6L	-	± 0.5m	<b>2.84</b>	3.45	
WRA6U	-	± 0.5m	4.30	4.47	
MPBH1	9.71	10.70	9.90	9.95	No
MPBH2	12.20	14.20	12.53	12.43	No
MPBH3b	12.00	Dry			
(or 13.6m)	12.42	12.40	No		
MPBH4***	-	± 0.5m	11.35	-	
MPBH5***	-	± 0.5m	8.82	-	
3500C500 (L)	-	± 0.5m	<b>57.17</b>	56.71	
3500C500 (S)	-	± 0.5m	25.99	25.85	
4500F000	-	± 0.5m	<b>28.00</b>	<b>26.20</b>	
5000D000	-	± 0.5m	84.76	<b>84.66</b>	
5500D000	-	± 0.5m	67.48	<b>67.46</b>	
6500F500L	-	± 0.5m	52.93	52.86	
6500F500M	-	± 0.5m	54.55	54.43	
6500F500U	-	± 0.5m	35.38	<b>35.08</b>	
6500F625	-	± 0.5m	22.33	22.17	
Melody	-	± 0.5m	21.54	21.45	
7000D000L	-	± 0.5m	19.18	19.10	
7000D000U	-	± 0.5m	6.41	6.32	
7500F000	-	± 0.5m	36.13	35.94	

\* Dry/insufficient water to sample

\*\* Bore appeared to be blocked

\*\*\* New site

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 exceeded the adopted assessment criterion for changes in standing water level of  $\pm 0.5\text{m}$  from the previous measurement.

**Table 7-2 - MPO Quarterly Groundwater pH results**

Monitoring Location/ ID	pH Trigger Range		Current Month pH	Nov 2018 pH	Aug 2018 pH	Triggered (Yes/No)
	20 <sup>th</sup> Percentile	80 <sup>th</sup> Percentile				
WRA1L	7.30	7.74	<b>6.9</b>	<b>7.1</b>	<b>7.0</b>	Yes
WRA1U	^	^	*	*	*	
WRA3L	6.60	6.90	6.6	6.8	6.8	No
WRA3U	7.10	7.60	7.4	7.2	7.3	No
WRA6L	7.20	7.70	<b>6.9</b>	<b>6.8</b>	<b>7.0</b>	Yes
WRA6U	6.80	7.00	<b>6.7</b>	<b>6.6</b>	6.9	No
MPBH1	6.80	7.10	7.0	6.8	7.1	No
MPBH2	6.80	7.10	6.9	6.8	6.9	No
MPBH3b	7.40	7.60	<b>7.7</b>	7.5	7.6	No
MPBH4***	^	^	7.0	-	-	-
MPBH5***	^	^	*	-	-	-
3500C500 (L)	7.28	7.50	7.3	7.3	7.4	No
3500C500 (S)	^	^	6.9	6.9	7.0	No
4500F000	6.50	6.90	6.8	6.9	6.9	No
5000D000	6.60	6.98	6.9	6.9	<b>7.0</b>	No
5500D000	6.30	6.80	<b>7.0</b>	<b>7.1</b>	<b>7.0</b>	Yes
6500F500L	6.52	6.80	<b>7.2</b>	<b>7.2</b>	<b>7.1</b>	Yes
6500F500M	6.90	7.20	7.1	<b>7.3</b>	<b>7.4</b>	No
6500F500U	6.82	6.98	*	<b>7.1</b>	<b>7.0</b>	No
6500F625	6.8	7.1	6.9	6.7	-	No
Melody	^	^	7.1	6.9	-	No
7000D000L	6.60	6.80	6.7	<b>6.5</b>	<b>6.9</b>	No
7000D000U	6.60	7.70	6.6	<b>6.5</b>	6.7	No
7500F000	6.70	7.20	<b>7.7</b>	<b>7.7</b>	<b>7.8</b>	Yes

\* Dry/insufficient water to sample

\*\* Bore appeared to be blocked

\*\*\* New site

- indicated no trigger limit identified

An investigation is triggered when pH values are recorded outside the baseline range (20<sup>th</sup> – 80<sup>th</sup> percentile) for three consecutive readings. 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).

Table 7-3 - MPO Quarterly Groundwater EC results

Monitoring Location/ ID	EC Trigger Range		Current Month EC	Nov 2018 EC	Aug 2018 EC	Triggered (Yes/No)
	80 <sup>th</sup> Percentile	Maximum Beneficial Use Trigger				
WRA1L	4500	7800	4500	4200	3200	No
WRA1U	^	^	*	*	*	
WRA3L	16710	22000	16600	16200	15000	No
WRA3U	9032	22000	4700	10000	8850	No
WRA6L	5950	7800	5700	5500	5400	No
WRA6U	11140	22000	10900	10500	10200	No
MPBH1	590	800	460	460	470	No
MPBH2	930	930	810	850	840	No
MPBH3b	4544	7800	3750	2500	3750	No
MPBH4***	^	^	5150	-	-	
MPBH5***	^	^	*	-	-	
3500C500 (L)	4478	7800	4100	4000	4050	No
3500C500 (S)	^	^	4500	4250	4050	No
4500F000	3646	7800	<b>8800</b>	<b>9000</b>	<b>9000</b>	Yes
5000D000	710	800	760	760	760	No
5500D000	1099	2350	<b>4000</b>	<b>4350</b>	<b>3200</b>	Yes
6500F500L	1406	2350	<b>3650</b>	<b>3500</b>	<b>3400</b>	Yes
6500F500M	1918	2350	<b>2950</b>	<b>3000</b>	<b>2900</b>	Yes
6500F500U	5814	7800	*	5100	5200	No
6500F625	^	^	3950	3800	-	No
Melody	^	^	2600	2500	-	No
7000D000L	1146	2350	1550	1500	1500	No
7000D000U	6688	7800	6150	6350	6400	No
7500F000	3908	7800	6300	6300	6250	No

\* Dry/insufficient water to sample

\*\* Bore appeared to be blocked

\*\*\* New site

^ 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).

Several groundwater monitoring sites were outside of the EC and/or pH triggers, and as such an investigation has been commenced for these sites. All other sites complied with trigger levels.



The next quarterly monitoring event is scheduled for May 2019.

## 8. Noise Monitoring

Attended noise monitoring was undertaken during the night period of February 2019 at seven monitoring locations in accordance with the EPL and MPO Noise Management Plan.

### 8.1 Results

The results for day time and night time attended noise monitoring for noise generated by MPO in February against noise criteria is shown in **Table 8-1** and **Table 8-2** respectively.

**Table 8-1 –  $L_{Aeq,15min}$  Generated by MPO Night-Time Monitoring - February 2019**

Location	Start Date and Time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies <sup>1</sup>	MPO Only $L_{Aeq}$ dB <sup>2,4,5</sup>	Exceedance dB <sup>3,4</sup>
N-AT1	26/02/19 23:16	3.3	D	40	No	Not Measurable	NA
N-AT2	26/02/19 22:00	3.0	D	36	Yes	Inaudible	Nil
N-AT3	26/02/19 22:55	2.9	D	35	Yes	Inaudible	Nil
N-AT4	26/02/19 23:47	3.1	D	42	No	<30	NA
N-AT5	26/02/19 23:23	2.7	D	40	Yes	Inaudible	N/A
N-AT6	26/02/19 23:37	3.6	D	35	No	Inaudible	N/A
N-AT7	26/02/19 22:31	3.4	D	40	No	Inaudible	N/A

Notes:

- 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 atmospheric conditions outside those specified in the project approval and so criterion is not applicable; and
- Bold results in red indicate exceedance of criteria.

Noise monitoring as described in this report was undertaken during the night period of 26 February 2019 at seven monitoring locations.

The survey purpose is to quantify and describe the existing acoustic environment around the mine project and compare results with relevant limits.

Noise levels from MTP complied with noise limits at all monitoring locations during the February 2019 monitoring period.

## 9. Blast Monitoring

Results for February 2019 are presented in **Table 9-1**.

**Table 9-1 – MPO Blast Monitoring Results – February 2019**

Date Fired	Time Fired	Vibration BVOA	Overpressure BVOA	Vibration BVOC	Overpressure BVOC	Vibration BVO2	Overpressure BV02
01/02/19	13:14	1.350 mm/s	106 DBL	0.970 mm/s	114.9 DBL	1.190 mm/s	105.1 DBL
07/02/19	13:00	0.600 mm/s	97.4 DBL	0.320 mm/s	87.5 DBL	0.630 mm/s	105 DBL
13/02/19	13:01	1.590 mm/s	100.5 DBL	0.550 mm/s	90.9 DBL	1.910 mm/s	103.5 DBL
21/02/19	15:01	0.390 mm/s	105.2 DBL	0.440 mm/s	96.9 DBL	1.020 mm/s	105.8 DBL
28/02/19	15:21	1.270 mm/s	98.1 DBL	0.800 mm/s	97.6 DBL	2.050 mm/s	104.0 DBL

Blast results complied with all criteria at each monitoring site in February 2019.

## 10. Meteorological Monitoring

Weather data is measured continuously at the Kayuga Road meteorological station (M-WS4). In addition to air quality parameters, the weather station also measures wind speed and direction, temperature (at 2 m and 10 m), solar radiation, relative humidity, rainfall, atmospheric pressure, and sigma theta. All data was captured during February 2019.