

## Monthly Environmental Monitoring Report

February 2017

February 2017	1	Final	Klay Marchant	Beth Viertel	Klay Marchant
<b>Date</b>	<b>Rev.</b>	<b>Status</b>	<b>Prepared By</b>	<b>Checked By</b>	<b>Approved By</b>

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## 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 Project boundary, 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 POEO Act and the MPO Project Approval DA 92/97.

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

<http://www.environment.nsw.gov.au>

## 2. Monitoring Requirements

The MPO Environment Protection Licence (EPL) 20850 specifically requires the monitoring of:

- 2 x Palas Fidas PM10 sites;
- Noise 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.

The MPO Environmental Monitoring Network is shown on **Figure 2-1 and Figure 2-2**.

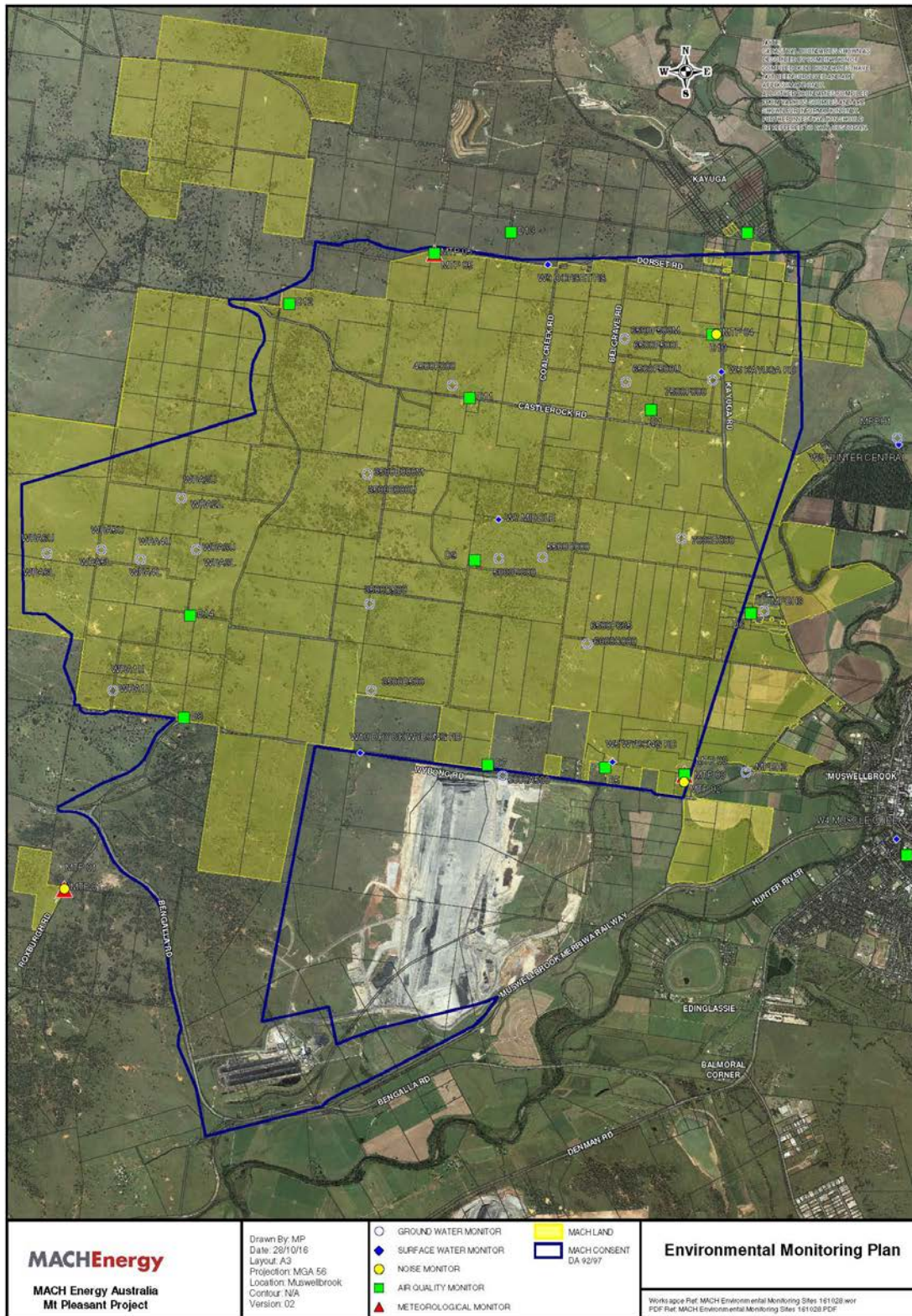
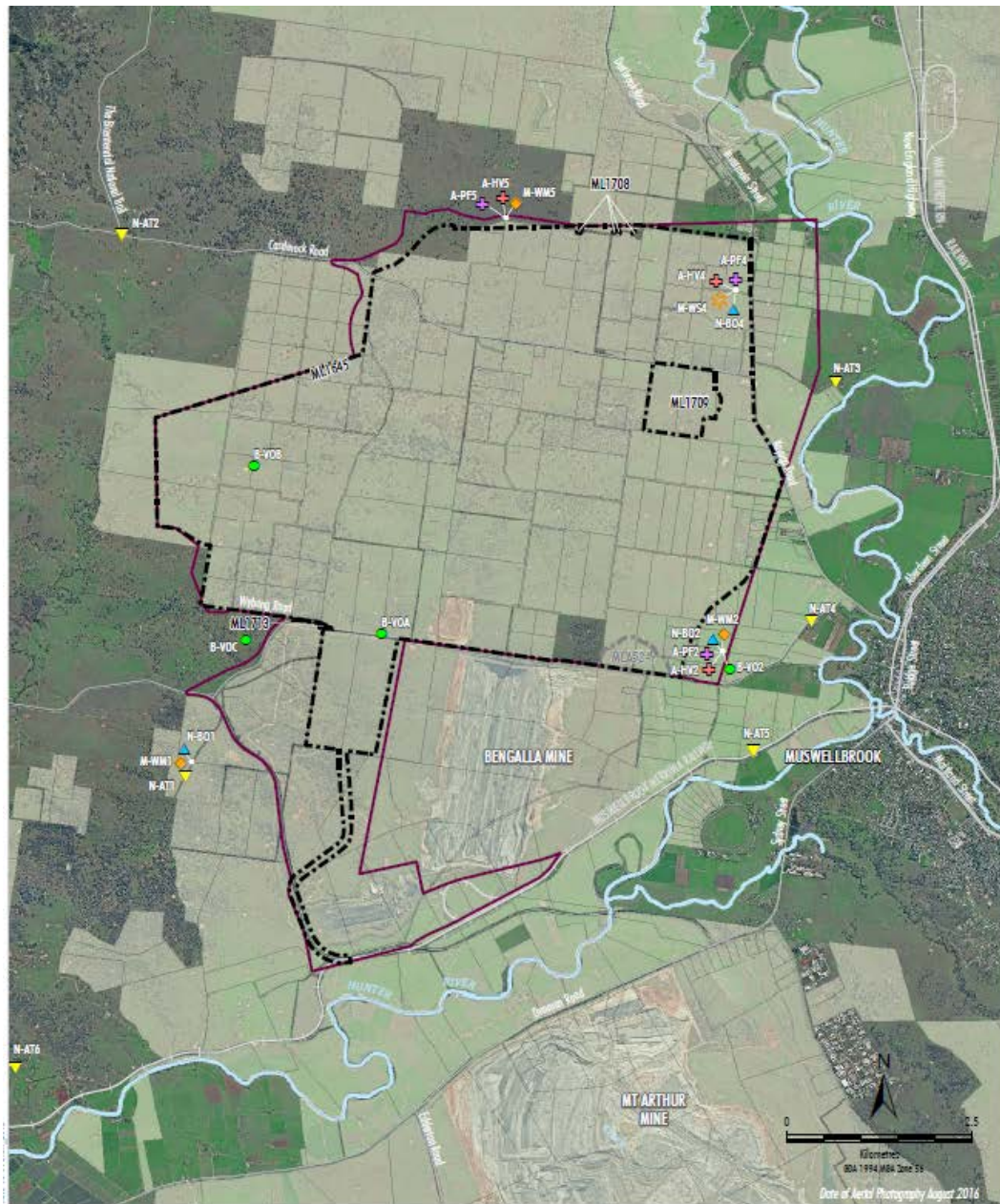


Figure 2-1 – MPO Environmental Monitoring Network



- LEGEND**
- Modified Development Consent Boundary
  - Mining Lease Boundary
  - Mining Lease Application Boundary
  - Mine Owned
- Monitoring Site**
- Air Quality - High Volume Sampler
  - Air Quality - Palas Fidas
  - Blasting (Vibration/Overpressure)
  - Attended Noise
  - Noise - Barn Owl
  - Weather Mast
  - Weather Station

Source: NSW Land & Property Information (2013); NSW Department Resources & Energy (2016); MACH Energy (2016)

**MACHEnergy**  
 MOUNT PLEASANT OPERATIONS  
 Environmental Monitoring Sites

**Figure 2-2 – MPO Environmental Monitoring Network/EPL Monitoring Sites**

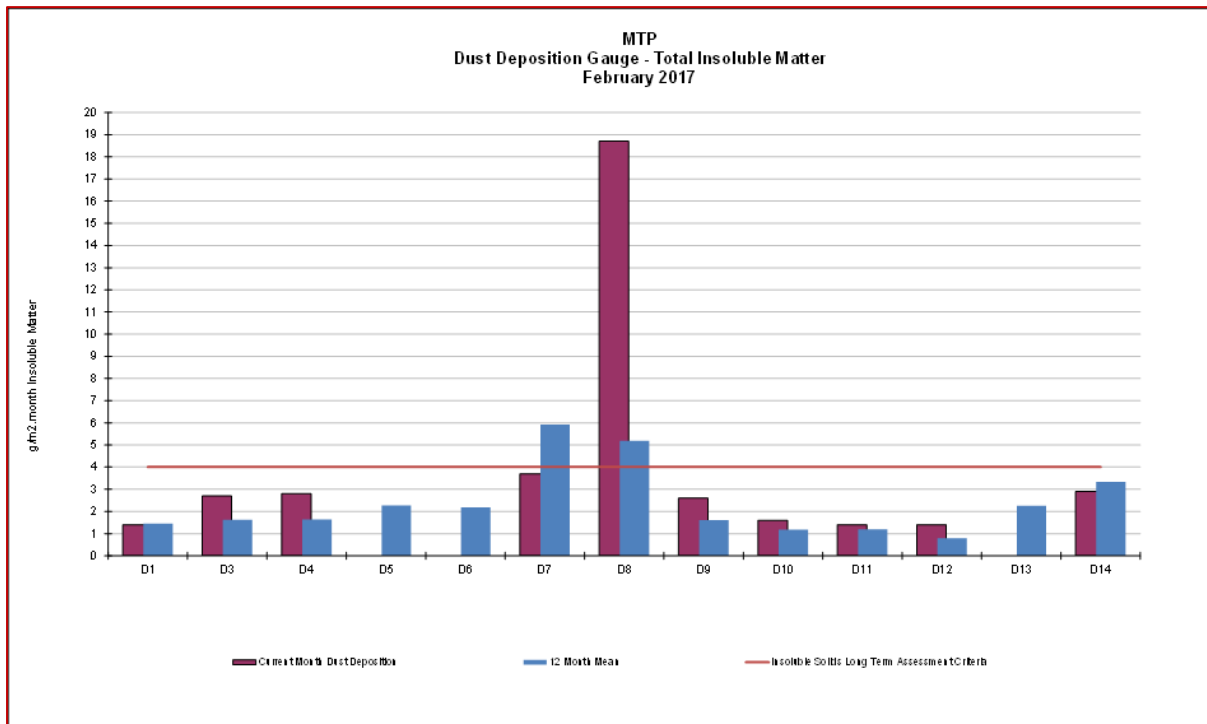
## 3. Dust Depositional Monitoring

Dust deposition was monitored according to the OEH's Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (DEC 2007), which references AS/NZS 3580.10.1:2003 (R2014) Determination of particulate matter – Deposited matter – Gravimetric Method. The monitoring network comprises of 13 dust deposition gauges (DDG). Results for February 2017 are shown in **Table 3-1**.

**Table 3-1: Dust Depositional Results – February 2017**

Station	Depositional Dust (g/m <sup>2</sup> .month)		Ratio of Insoluble Solids to Ash (%)	YTD Insoluble Solids (g/m <sup>2</sup> .month)	Insoluble Solids Annual Rolling Average (g/m <sup>2</sup> .month)
	Insoluble Solids	Ash			
D1	1.4	0.8	57	2.2	1.5
D3	2.7	1.9	70	2.4	1.6
D4	2.8	1.6	57	2.4	1.6
D5	6.3c	3.0c	48	3.3	2.3
D6	4.2c	2.0c	48	2.3	2.2
D7	3.7	2.6	70	4.0	5.9
D8	18.7	15.9	85	12.4	5.2
D9	2.6	1.7	65	2.2	1.6
D10	1.6	1.2	75	1.6	1.2
D11	1.4	1.0	71	1.5	1.2
D12	1.4	0.7	50	1.3	0.8
D13	4.5c	1.1c	24	2.3	2.3
D14	2.9	2.0	69	3.2	3.3
<i>Criterion</i>	1.4	0.8	57	2.2	1.5
Results in <b>bold</b> indicate exceedances' of adopted assessment criteria					

**Note:** Contaminated results are not included in the 12 month rolling average. Monthly results above 4g/m<sup>2</sup>/month are not classed as an exceedance of criteria as the criteria is an annual average of 4g/m<sup>2</sup>/month. **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 DDG Total Insoluble Solids Monitoring Results – February 2017**

Exceedance of the EPA annual average criterion for dust deposition (insoluble solids) was recorded at sites D7 (5.9g/m<sup>2</sup>. month) and D8 (5.2g/m<sup>2</sup>. month). Field notes indicated that the February 2017 sample for D7 was brown and turbid containing insects and a spider. The gauge returned an ash to insoluble solids ratio of 70% which indicates that the contents were mainly inorganic material. The close proximity to the neighbouring mine may explain the elevated results. Field notes for the D8 sample state that it was Brown, very turbid and contained insects. The ash to insoluble solids ratio for the gauge was 85% which indicates that the contents were mainly inorganic material. This site was likely influenced by road construction activities in the local area.

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

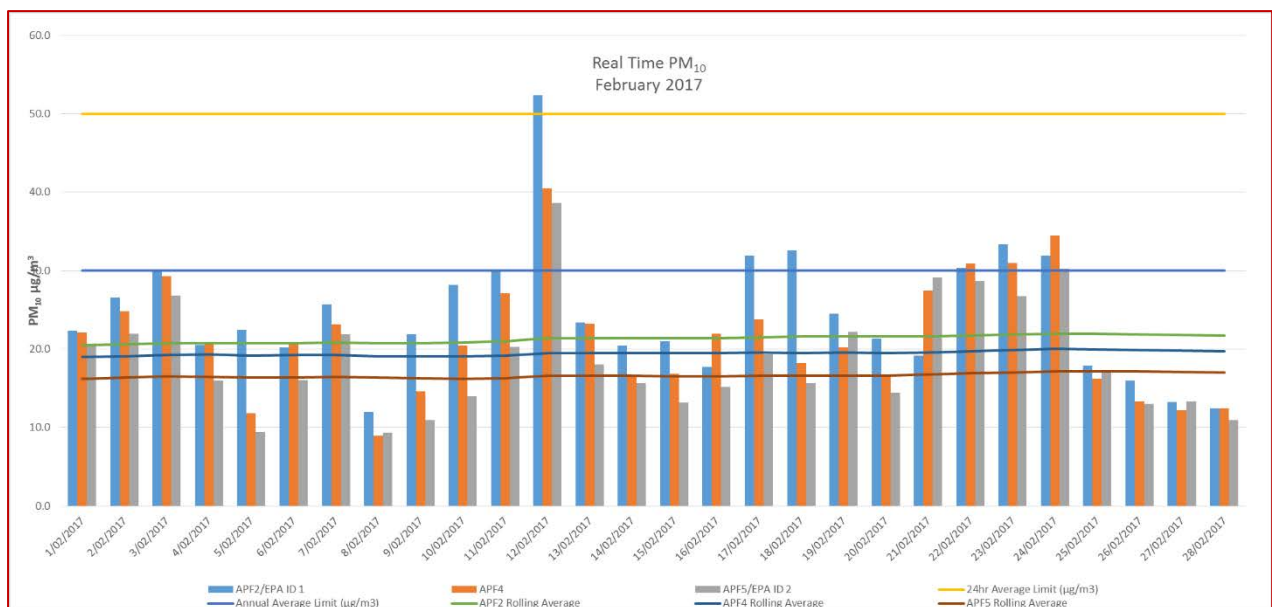
Continuous particulate matter less than 10µm (PM<sub>10</sub>) monitoring was conducted by three (3) Palas Fidas units at MTP during February 2017.

The EPA identification numbers 1 and 2 refer to Palas Fidas Units installed on Wybong Road (APF2) and Castlerock Road (APF5) respectively. In addition, a third unit (APF4) is installed on Kayuga Road with data used for management purposes only.

One result was above the daily or annual limit (**Table 4-1**). Real time PM<sub>10</sub> results for February 2017 are illustrated in **Figure 4-1**.

**Table 4-1 Explanation of TEOM results above criteria**

Site	Date	Result (µg/m <sup>3</sup> )	Weather	Comments
APF2 – EPA ID1	12/02/17	52.4	High temperatures (Max 45.1C) and SW-WSW winds (2.1 – 6.1 m/s)	Hot dry weather previous 24 hours and on the 12 February. MPO were not operating on 12 February (Sunday). Regional bushfires contributed to elevated readings. Equipment (scrapers) suspended over the hot dry period.
There were no average results above the annual limit				



**Figure 4-1 : MPO Daily Results from Palas Fidas**



**Table 4-2: MPO Palas Fidas Data – February 2017**

Date	APF2/EPA ID 1	APF4	APF5/EPA ID 2	24hr Average Limit (µg/m <sup>3</sup> )
	Daily Result	Daily Result	Daily Result	
1/02/2017	22.3	22.1	20.4	50
2/02/2017	26.6	24.8	22.0	50
3/02/2017	30.1	29.3	26.8	50
4/02/2017	20.5	20.8	15.9	50
5/02/2017	22.5	11.8	9.4	50
6/02/2017	20.2	20.8	16.0	50
7/02/2017	25.7	23.2	21.8	50
8/02/2017	12.0	9.0	9.3	50
9/02/2017	21.9	14.6	11.0	50
10/02/2017	28.2	20.4	14.0	50
11/02/2017	30.2	27.1	20.3	50
12/02/2017	52.4	40.4	38.6	50
13/02/2017	23.4	23.3	18.1	50
14/02/2017	20.4	16.7	15.6	50
15/02/2017	21.0	16.8	13.2	50
16/02/2017	17.7	22.0	15.2	50
17/02/2017	31.9	23.8	19.3	50
18/02/2017	32.6	18.2	15.7	50
19/02/2017	24.5	20.2	22.2	50
20/02/2017	21.3	16.6	14.5	50
21/02/2017	19.2	27.5	29.1	50
22/02/2017	30.3	30.9	28.7	50
23/02/2017	33.4	31.0	26.7	50
24/02/2017	31.9	34.5	30.2	50
25/02/2017	17.9	16.2	17.3	50
26/02/2017	16.0	13.4	13.0	50
27/02/2017	13.2	12.2	13.4	50
28/02/2017	12.5	12.5	11.0	50

## 5. Surface Water Monitoring

Surface water quality is monitored on a monthly basis at nine (9) sites. **Table 5-1** shows the total suspended solids, electrical conductivity and pH for the routine monthly monitoring.

**Table 5-1 – MPO Surface Water Monitoring Results – February 2017**

Sampling Point	pH	Electrical Conductivity (µs/cm)	Total Suspended Solids (mg/L)
W1 - Hunter Upstream	^	^	^
W2 - Hunter Central Site	7.8	373	10
W4 - Muscle Creek	7.8	1650	4
W5 – Kayuga Road	*	*	*
W6 - Hunter Downstream	^	^	^
W7 – Middle MTP near DDG9	*	*	*
W8 – Wybong Rd near DDG5	*	*	*
W9 – Dorset Rd – 2 <sup>nd</sup> culvert	*	*	*
W10 – Dry Creek Wybong Rd	*	*	*
<b>Criteria</b>	<b>6.5 – 8.5</b>	<b>125 - 2200</b>	<b>&lt;50</b>
Results in <b>bold</b> indicate exceedances of adopted assessment criteria * dry or insufficient water ^ no suitable access point			

Five of the nine monitoring locations were found to be dry or had insufficient water on the sampling day. W1 and W6 were not sampled as no suitable access point was identified. All sites sampled met the adopted criteria during February 2017.

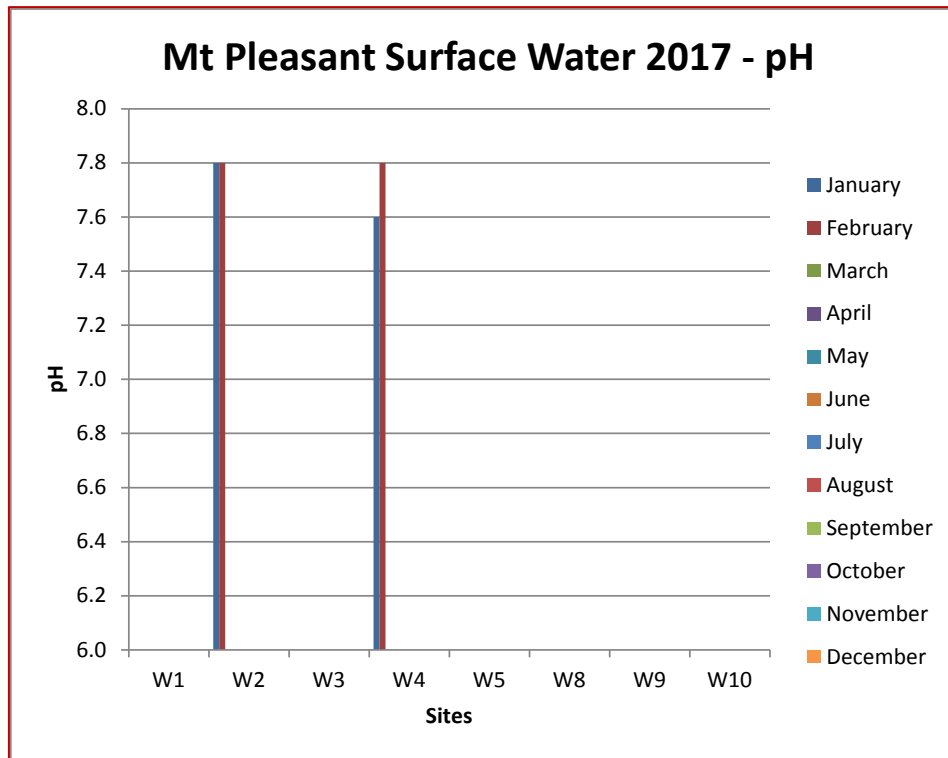


Figure 5-1 – MPO Surface Water pH

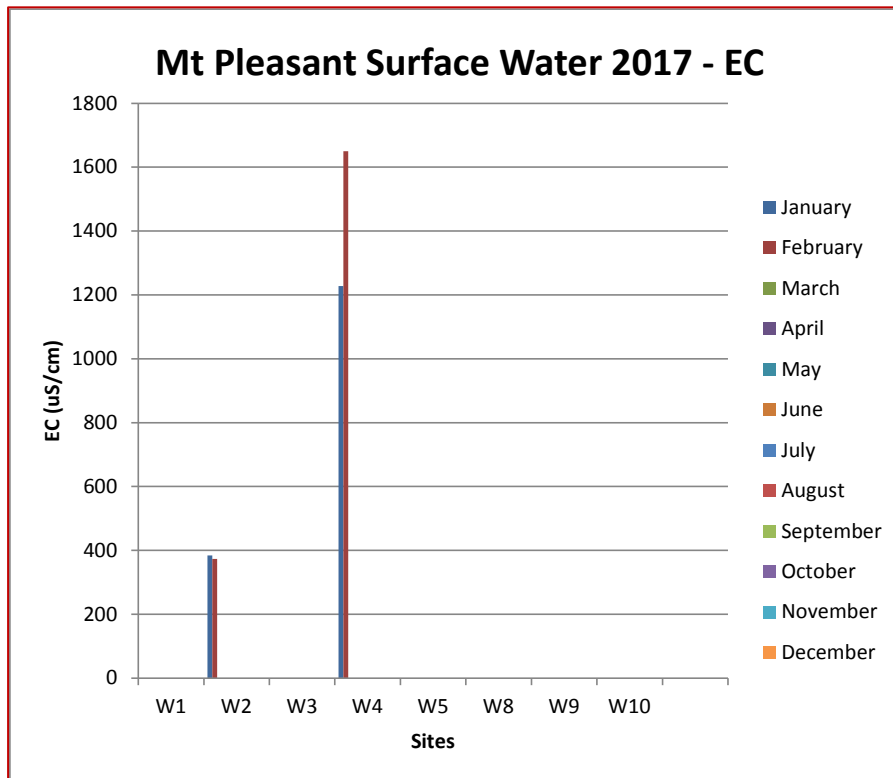


Figure 5-2 – MPO Surface Water EC

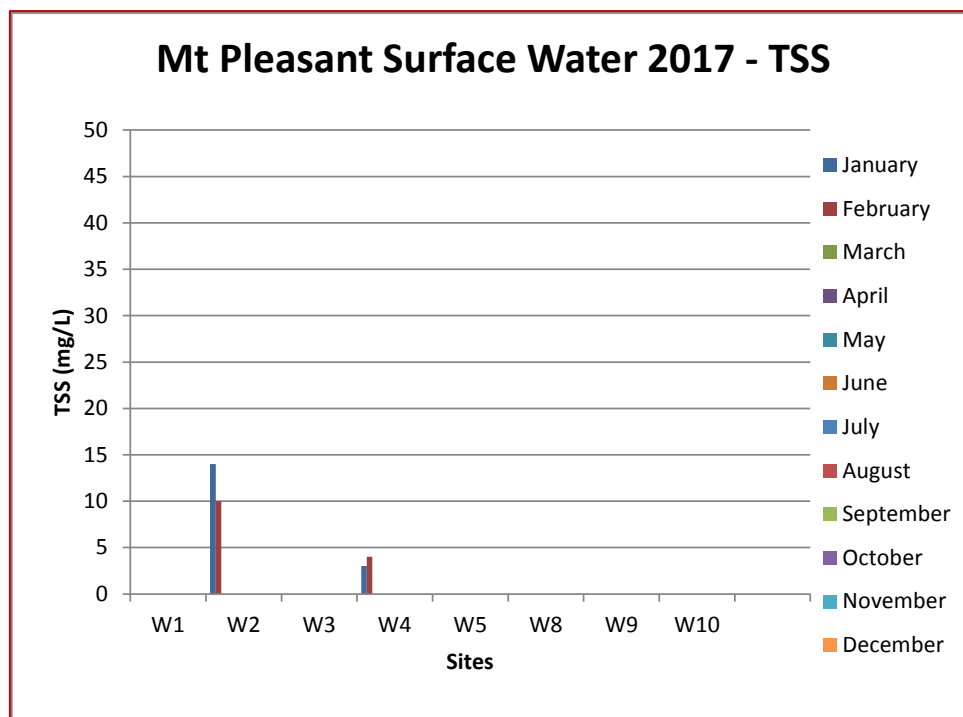


Figure 5-3 – MPO Surface Water TSS

## 6. Groundwater Monitoring

Quarterly sampling of groundwater is undertaken for pH and electrical conductivity. Sampling was conducted during February 2017; results are provided in **Table 6-1**.

Table 6-1 – MPO Quarterly Groundwater Monitoring Results – February 2017

Monitoring Location/ ID	pH	Electrical Conductivity (µs/cm)	Depth to Standpipe February 2017 (m)	Depth to Standpipe November 2016 (m)
WRA1L	7.6	3320	3.36	2.89
WRA1U*	Dry			
WRA2L	7.2	5870	17.59	17.79
WRA2U	Dry			
WRA3L	6.8	15460	17.67	17.38
WRA3U	7.5	3010	5.01	4.62
WRA5L	7.3	2670	2.98	2.18
WRA5U	7.8	3550	3.49	2.73
WRA6L	7.3	5860	2.94	2.34
WRA6U	6.8	11240	3.77	3.32
MPBH1 (Bore3)	6.9	510	10.00	9.95
MPBH2	6.6	847	12.50	12.40

Monitoring Location/ ID	pH	Electrical Conductivity (µs/cm)	Depth to Standpipe February 2017 (m)	Depth to Standpipe November 2016 (m)
MPBH3 (Bore 2)	7.1	3430	12.30	12.20
3500B500 (L)	7.2	5770	68.37	68.18
3500B500 (S)^	Unable to sample - Blocked			
3500C500 (L)	7.2	4670	54.70	54.61
3500C500 (S)	7.2	4990	25.34	25.41
4500F000	6.8	9100	21.05	19.49
5000D000	6.8	650	82.59	82.70
5500D000	6.9	2630	65.04	65.21
6000C000(L)*	Dry			
6000C000(S)	6.8	5040	39.42	39.36
6500F500L	6.5	1372	53.01	52.93
6500F500M	7.2	3040	54.66	54.64
6500F500U	6.7	5620	31.10	33.04
7000D000U	6.6	6640	5.82	6.00
7000D000L	6.6	1312	19.00	6.00
7500F000	7.6	6390	36.17	36.13
<i>Criteria</i>	-	-	>20 %	-
Results in <b>bold</b> indicate exceedences of adopted assessment criteria				
* Dry/ insufficient water to sample				
^ Unable to sample due to blockage.				

An exceedence of the adopted >20% change in depth criterion was noted at sites WRA5L, WRA5U, WRA6L and 7000D000L. The depth at site 7000D000L returned to levels recorded prior to September 2016. All other sites met the adopted criteria.

## 7. Noise Monitoring

In accordance with the MPO Construction Noise Management Plan attended noise compliance monitoring is undertaken monthly by a suitably qualified and experienced person. Monthly monitoring was conducted in February 2017 with results obtained on 13 March 2017. All monitoring measurements were undertaken during day time construction hours.

Full attended noise monitoring results for February 2017 are shown in **Table 7-1**.

**Table 7-1 – Attended Noise Monitoring Results – February 2017**

*Table 4.3: L<sub>Aeq,15minute</sub> GENERATED BY MTP AGAINST CONSTRUCTION NOISE CRITERIA – FEBRUARY 2017*

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies <sup>1</sup>	MTP L <sub>Aeq</sub> dB <sup>2,4</sup>	Exceedance dB <sup>3,4</sup>
N-AT1	13/02/2017 11:32	2.2	0.0	40	Yes	IA	Nil
N-AT1	13/02/2017 11:47	1.3	0.0	40	Yes	IA	Nil
N-AT2	13/02/2017 14:45	3.4	0.0	40	Yes	IA	Nil
N-AT2	13/02/2017 15:01	4.7	0.0	40	Yes	IA	Nil
N-AT3	13/02/2017 13:57	3.6	0.0	40	Yes	IA	Nil
N-AT3	13/02/2017 14:12	4.1	0.0	40	Yes	IA	Nil
N-AT4	13/02/2017 13:01	2.4	0.0	42	Yes	IA	Nil
N-AT4	13/02/2017 13:17	4.0	0.0	42	Yes	IA	Nil
N-AT5	13/02/2017 12:18	3.2	0.0	44	Yes	IA	Nil
N-AT5	13/02/2017 12:36	2.3	0.0	44	Yes	IA	Nil
N-AT6	13/02/2017 15:45	3.5	0.0	40	Yes	IA	Nil
N-AT6	13/02/2017 16:03	3.4	0.0	40	Yes	IA	Nil

**Notes:**

1. Noise emission limits do not apply during periods of rainfall or winds greater than 5 metres per second (at a height of 10 metres);
2. Estimated or measured L<sub>Aeq,15minute</sub> attributed to MTP;
3. NA in exceedance column means atmospheric conditions outside those specified in project approval and so criterion is not applicable; and
4. Bolded results in red indicate exceedance of criteria.

Construction noise levels from MPO complied with LAeq, 15 minute criteria at all monitoring locations during February 2017 monitoring.

## 8. Meteorological Monitoring

Weather data is measured continuously at the Kayuga Road (M-WS4). Temperature (2m) and rainfall data are presented below. In addition to these parameters the weather station also measures wind, temperature (10m), solar radiation, humidity, atmospheric pressure, and sigma theta. All data was captured during February 2017.