

Monthly Environmental Monitoring Report

August 2017

2017	1	Final	Klay Marchant	Beth Viertel	Klay Marchant
Date	Rev.	Status	Prepared By	Checked By	Approved By

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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**.

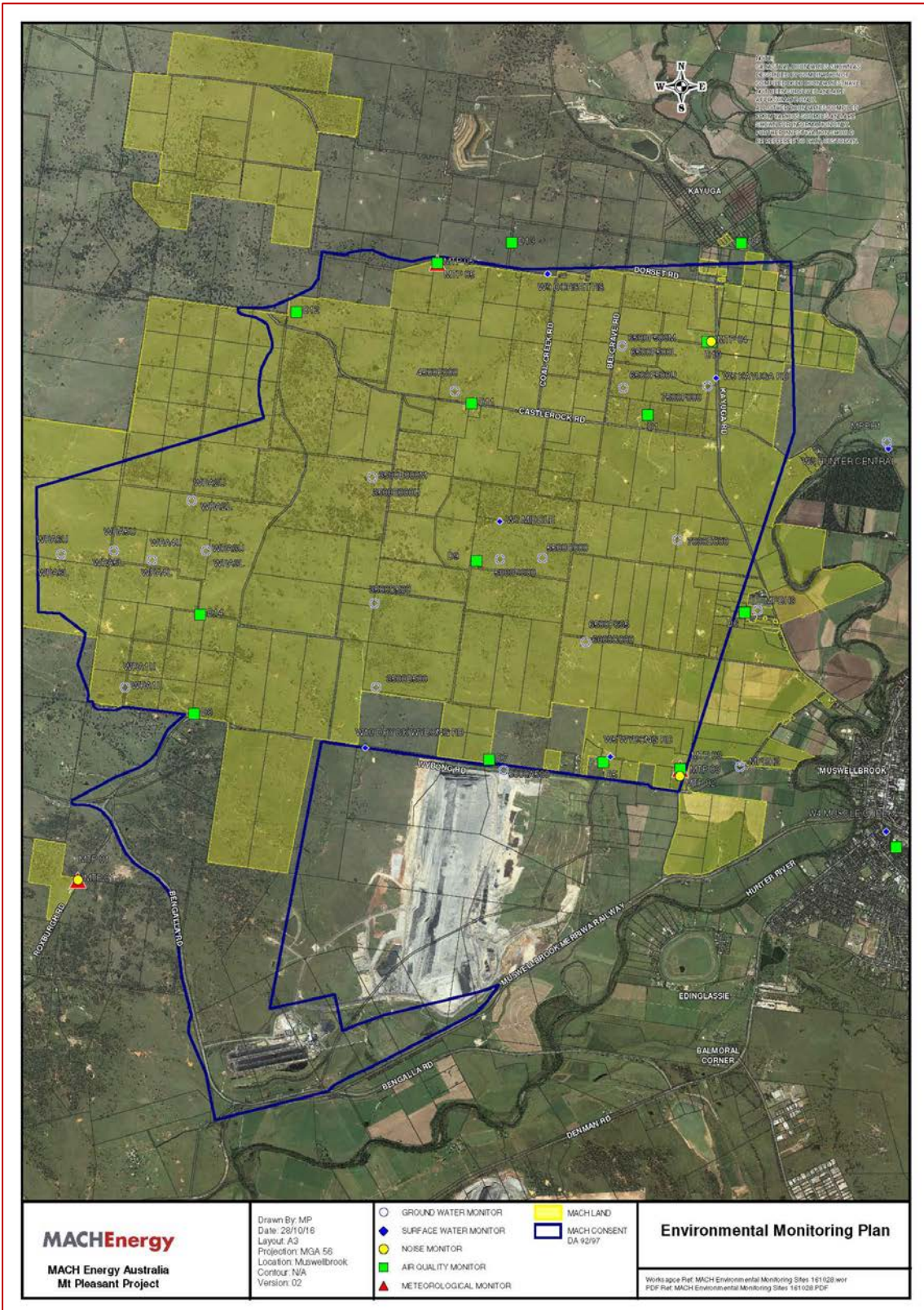


Figure 2-1 – MPO Environmental Monitoring Network

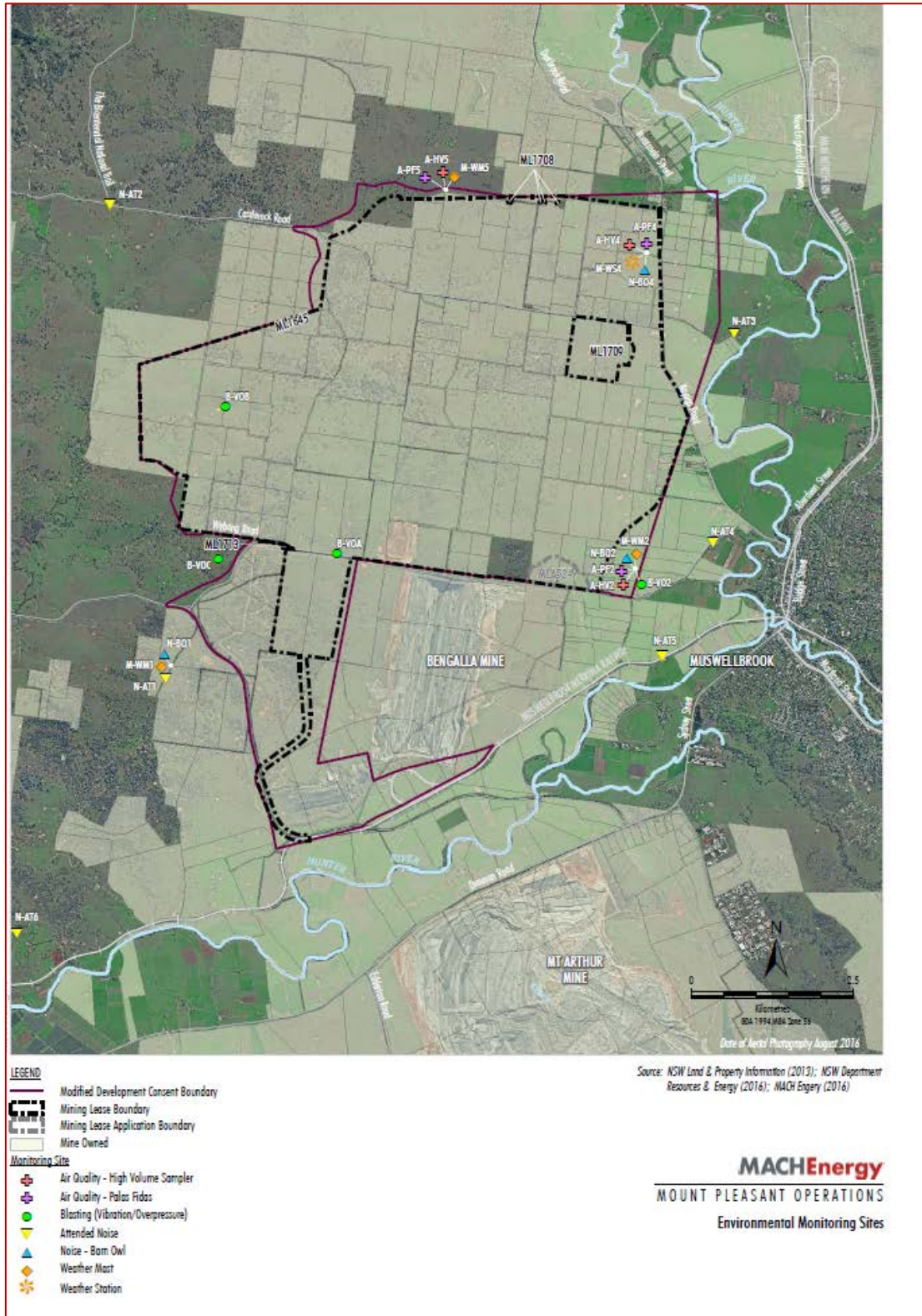


Figure 2-2 – MPO Environmental Monitoring Network/EPL Monitoring Sites

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 August are shown in **Table 3-1**.

Table 3-1: Dust Depositional Results – August 2017

Station	Depositional Dust (g/m ² .month)		Ratio of Insoluble Solids to Ash (%)	YTD Insoluble Solids (g/m ² .month)	Insoluble Solids Annual Rolling Average (g/m ² .month)
	Insoluble Solids	Ash			
D1	0.5	0.3	60	1.4	1.5
D3	1.0	0.7	70	1.9	1.8
D4	0.4	0.3	75	1.5	1.5
D5	2.0	1.4	70	3.0	3.0
D6	1.4	0.8	57	2.7	2.6
D7	-	-	-	-	-
D8	1.2	0.7	58	6.6	5.4
D9	0.6	0.4	67	1.7	1.6
D10	0.4	0.3	75	1.3	1.4
D11	4.1c	1.2c	29	1.6	1.5
D12	0.5	0.2	40	0.8	0.7
D13	2.1	1.1	52	3.4	2.9
D14	0.7	0.3	43	2.6	3.0
<i>Criterion</i>	-	-	-	-	4

* The site of D7 is now in the active mine area and will be relocated.

Note: Contaminated results are not included in the 12 month rolling average. Monthly results above 4g/m²/month are not classed as an exceedance of criteria as the criteria is an annual average of 4g/m²/month. **Figure 3-1** compares the monthly insoluble solids results to the annual averages for each dust gauge and the assessment criterion.

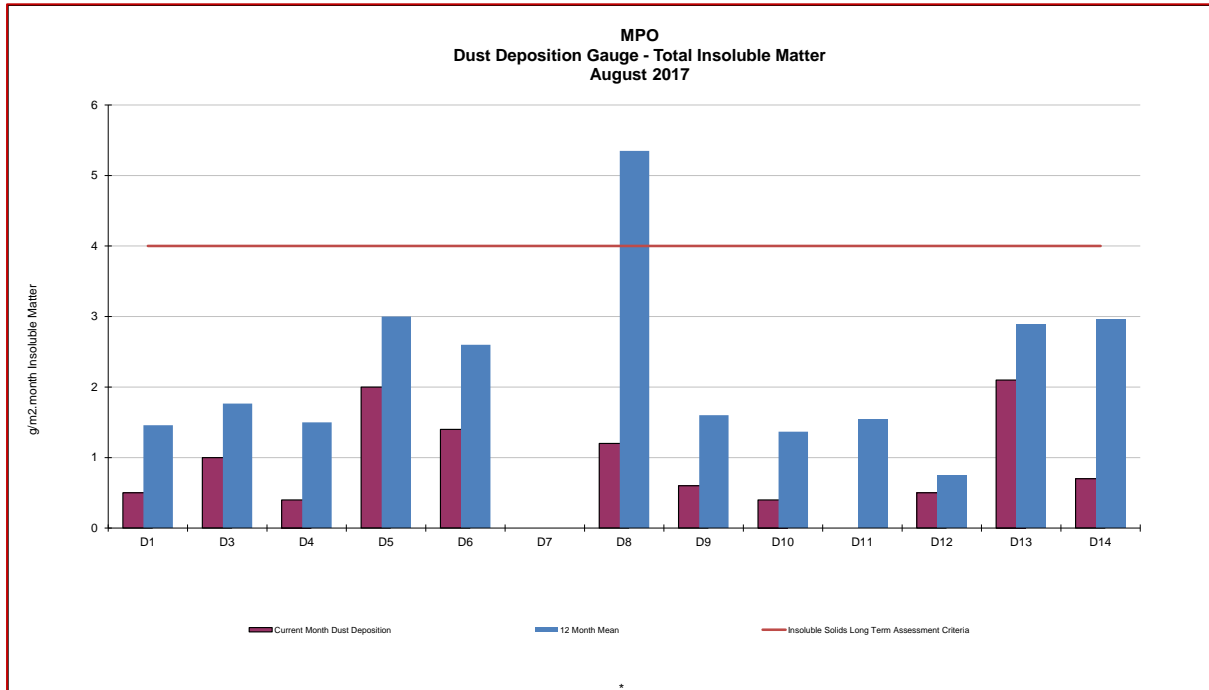


Figure 3-1: MPO DDG Total Insoluble Solids Monitoring Results – August 2017

Exceedance of the EPA annual average criterion for dust deposition (insoluble solids) was recorded at site D8 (5.4g/m².month).

The location of site D7 is now in the active mine area and is waiting on relocation. For this reason there was no result for D7 for August 2017. DDG water for D11 was recorded in field notes as being cloudy and slightly turbid and containing insects, vegetation and bird droppings. The ash to insoluble solids ratio for the gauge was 29% which indicated that the contents were mainly organic material. As such, the sample was considered likely to have been contaminated. Due to the likelihood of contamination the D11 gauge’s analysed result did not contribute to the annual rolling average.

4. Total Suspended Particulates

All 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.

TSP results for the monitoring period are provided in **Table 4-1**.

Table 4-1 Total Suspended Particulate Monitoring Data – August 2017

Run Date	Criterion	A-PF2	M-WS4	A-PF5
	µg/m ³			
4/08/2017	-	14	3	2
10/08/2017	-	43	10	13 [^]
16/08/2017	-	70	19	18
22/08/2017	-	89	47	31
28/08/2017	-	176	51	46
Monthly Mean	-	78.4	26.0	22.0
Annual Rolling Average	90	48.5*	25.8*	21.4*

*Year to date (YTD) average only available.

For the reporting period, the year to date average TSP data for HVAS A-PF2 and HVAS M-WS4 was below the annual average criterion of 90 µg/m³ at all monitoring sites.

5. Real Time PM₁₀ Monitoring

Continuous particulate matter less than 10µm (PM₁₀) monitoring was conducted by three (3) Palas Fidas units at MTP during August 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.

Real time PM₁₀ results for August 2017 are illustrated in **Figure 5-1** and shown in **Table 5- 1**

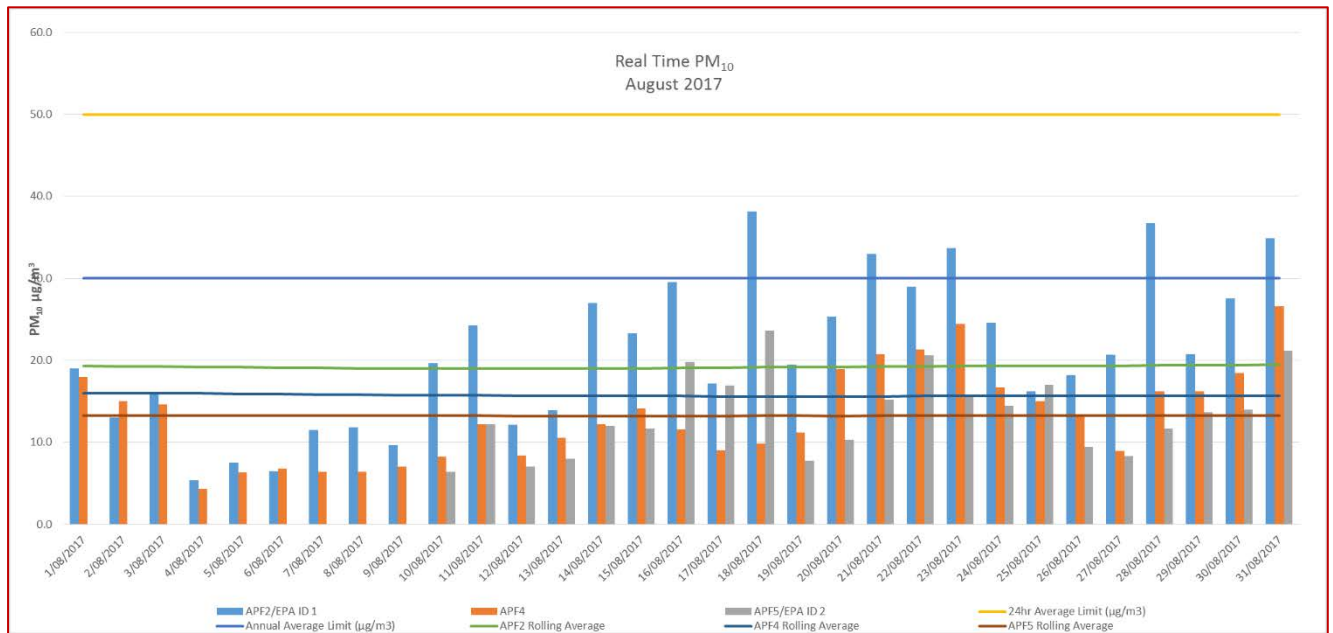


Figure 5-1 : MPO Daily Results from Palas Fidas

Table 5-1: MPO Palas Fidas Data – August 2017

Date	APF2/EPA ID 1	APF4	APF5/EPA ID 2	24hr Average Limit (µg/m3)
	Daily Result	Daily Result	Daily Result	
1/08/2017	19.0	18.0	Instrument fault	50
2/08/2017	13.1	15.0		50
3/08/2017	16.0	14.6		50
4/08/2017	5.4	4.4		50
5/08/2017	7.5	6.3		50
6/08/2017	6.5	6.8		50
7/08/2017	11.5	6.4		50
8/08/2017	11.8	6.4		50
9/08/2017	9.7	7.0		50
10/08/2017	19.7	8.3	6.4	50
11/08/2017	24.3	12.2	12.2	50
12/08/2017	12.2	8.4	7.0	50
13/08/2017	13.9	10.5	8.0	50
14/08/2017	27.0	12.2	12.0	50
15/08/2017	23.3	14.1	11.6	50
16/08/2017	29.5	11.5	19.8	50
17/08/2017	17.2	9.1	16.9	50
18/08/2017	38.2	9.8	23.6	50
19/08/2017	19.5	11.2	7.7	50
20/08/2017	25.3	18.9	10.3	50
21/08/2017	33.0	20.7	15.2	50
22/08/2017	29.0	21.3	20.6	50

23/07/2017	33.7	24.5	15.7	50
24/07/2017	24.6	16.7	14.5	50
25/07/2017	16.2	15.0	17.1	50
26/07/2017	18.2	13.1	9.4	50
27/07/2017	20.7	9.0	8.3	50
28/07/2017	36.8	16.2	11.7	50
29/07/2017	20.7	16.2	13.7	50
30/07/2017	27.6	18.4	14.0	50
31/07/2017	34.9	26.6	21.2	50

6. Surface Water Monitoring

Surface water quality is monitored on a monthly basis at nine (9) sites. **Table 6-1** shows the total suspended solids, electrical conductivity and pH for the routine monthly monitoring.

Table 6-1 – MPO Surface Water Monitoring Results – August 2017

Sampling Point	pH	Electrical Conductivity (µs/cm)	Total Suspended Solids (mg/L)
W1 - Hunter Upstream	8.1	440	4
W2 - Hunter Central Site	7.9	440	1
W4 - Muscle Creek	7.6	2750	3
W5 – Kayuga Road	*	*	*
W6 - Hunter Downstream	^	^	^
W7 – Middle MTP near DDG9	*	*	*
W8 – Wybong Rd near DDG5	*	*	*
W9 – Dorset Rd – 2 nd culvert	*	*	*
W10 – Dry Creek Wybong Rd	*	*	*
<i>Criteria</i>	6.5 – 8.5	125 - 2200	<50
* 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. W6 was not sampled as no suitable access point was identified. W4 exceeded the assessment criterion for EC. All of the other sites sampled met the adopted criteria during August 2017.

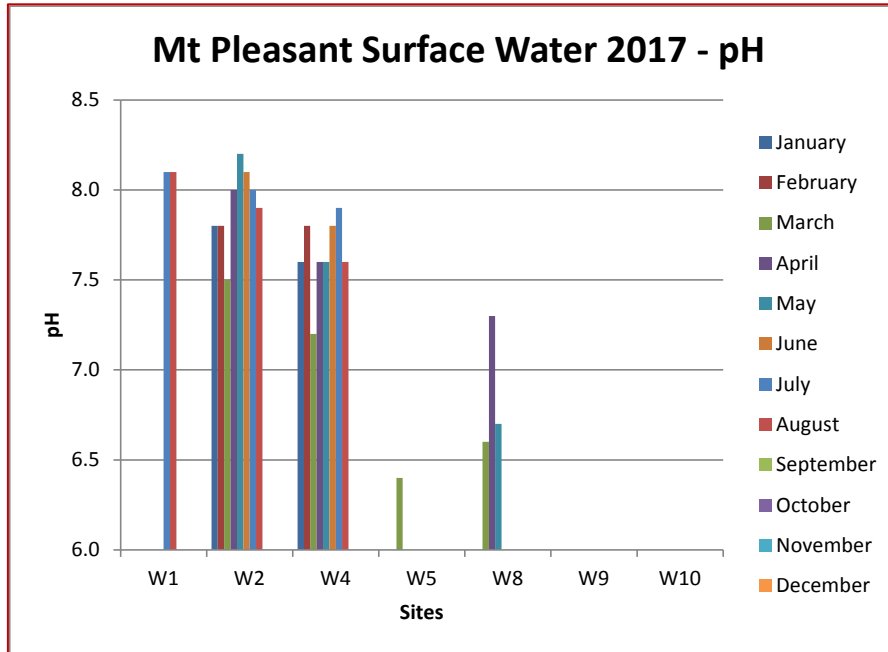


Figure 6-1 – MPO Surface Water pH

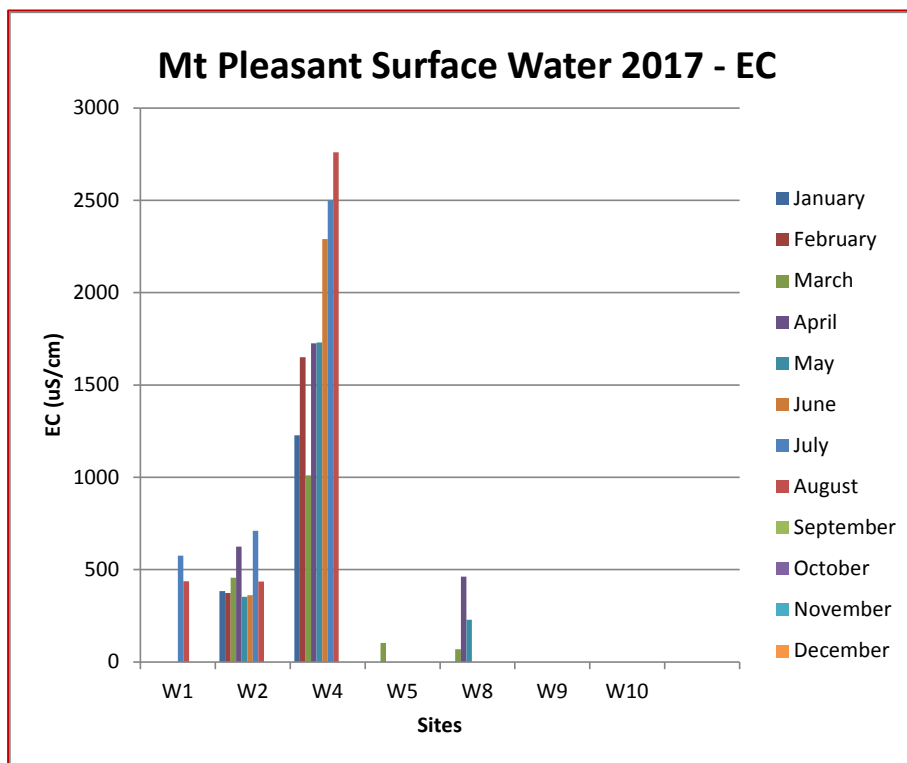


Figure 6-2 – MPO Surface Water EC

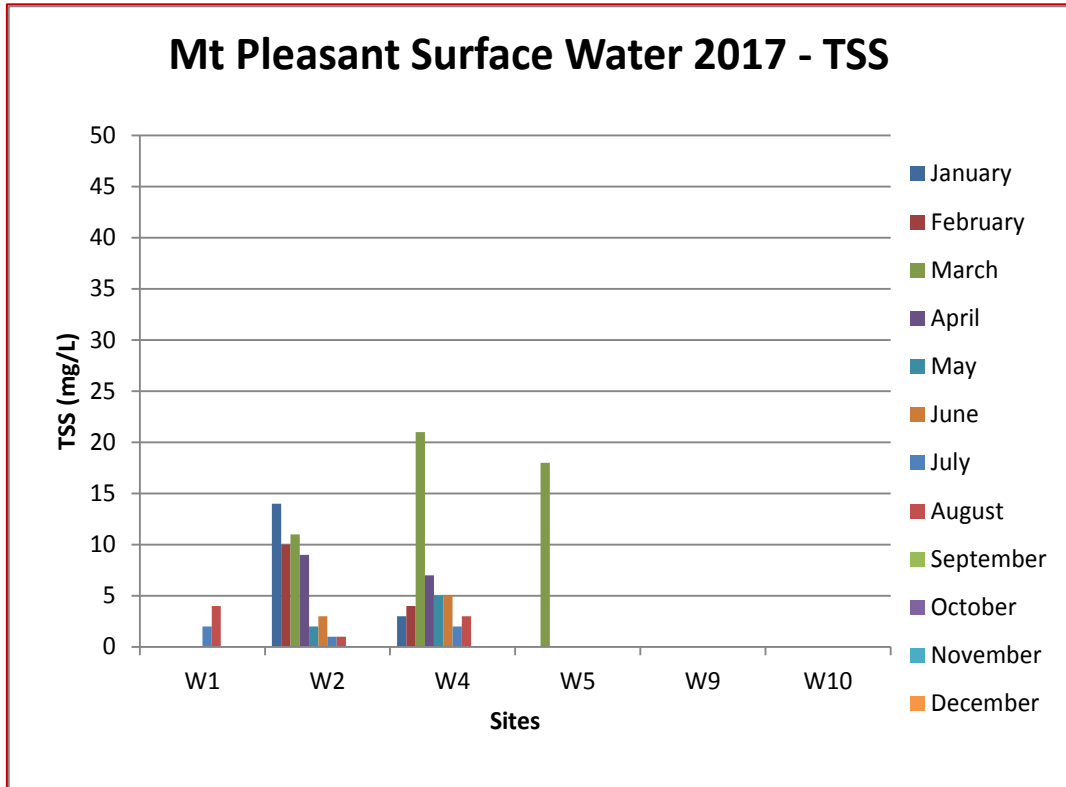


Figure 6-3 – MPO Surface Water TSS

7. Groundwater Monitoring

Sampling was conducted during August 2017; results are provided in **Table 7-1** below.

Table 7-1 – MPO Groundwater Monitoring Results – August 2017

Monitoring Location/ ID	pH	Electrical Conductivity (µs/cm)	Depth to Standpipe August 2017 (m)	Depth to Standpipe May 2017 (m)
WRA1L	7.2	3180	3.18	3.33
WRA1U*	Dry			
WRA2L	7.2	5480	18.88	17.40
WRA2U*	Dry			
WRA3L	6.8	15130	17.39	17.41
WRA3U	7.2	6790	5.63	5.05
WRA5L	7.0	4230	1.69	1.69
WRA5U	7.4	2420	2.28	2.28
WRA6L	7.0	5330	2.37	2.51
WRA6U	6.9	10520	3.56	3.38
MPBH1 (Bore3)	6.9	496	10.10	9.75
MPBH2	7.1	814	12.49	12.47
MPBH3 (Bore 2)	7.7	2650	12.31	12.27
3500C500 (L)	7.2	4310	55.31	54.90
3500C500 (S)	7.2	2870	25.18	25.31
4500F000	6.8	8650	20.07	22.49
5000D000	6.9	672	82.71	82.69
5500D000	7.0	2320	65.25	62.59
6000C000(L)	7.0	5110	20.96	20.97
6000C000(S)	7.1	4940	39.50	39.36
6500F500L	7.0	2020	52.76	52.79
6500F500M	7.3	2860	54.22	54.23
6500F500U	6.8	5150	29.87	29.95
7000D000U	6.7	6280	5.81	5.75
7000D000L	6.8	1340	18.84	18.88
7500F000	7.8	6080	35.91	36.14
<i>Criteria</i>	-	-	>20 %	-
* Dry/ insufficient water to sample ^ Unable to sample due to blockage.				

The next quarterly monitoring event is scheduled for November 2018 and the next annual monitoring event is scheduled for May 2018. All sites met adopted criteria.

8. Noise Monitoring

In accordance with the MPO Noise Management Plan attended noise compliance monitoring is undertaken quarterly by a suitably qualified and experienced person. The next round of quarterly monitoring is due in September 2017. All monitoring measurements are undertaken during day, evening and night periods. Construction was limited to day time hours only during August. Additional Out of Hours Construction Monitoring was undertaken in August 2017. Noise levels from MPO complied with all criteria at each monitoring location during all monitoring periods.

Table 3.2: $L_{Aeq,15minute}$ GENERATED BY MTP AGAINST CONSTRUCTION NOISE CRITERIA – JULY/AUGUST 2017

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies ¹	MTP L_{Aeq} dB ^{2,4}	Exceedance dB ^{3,4}
N-AT1	22/07/2017 11:41	4.2	0.0	40	Yes	IA	Nil
N-AT2	22/07/2017 13:24	6.7	0.0	40	No	IA	NA
N-AT3	22/07/2017 12:56	5.8	0.0	40	No	IA	NA
N-AT4	22/07/2017 12:32	2.9	0.0	42	Yes	IA	Nil
N-AT5	22/07/2017 12:09	2.9	0.0	44	Yes	NM	Nil
N-AT6	22/07/2017 11:17	3.2	0.0	40	Yes	IA	Nil
N-AT1	13/08/2017 11:26	1.4	0.0	40	Yes	IA	Nil
N-AT2	13/08/2017 13:08	1.0	0.0	40	Yes	IA	Nil
N-AT3	13/08/2017 12:41	1.7	0.0	44	Yes	IA	Nil
N-AT4	13/08/2017 12:16	0.6	0.0	42	Yes	IA	Nil
N-AT5	13/08/2017 11:53	1.7	0.0	44	Yes	IA	Nil
N-AT6	13/08/2017 11:00	1.5	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 $L_{Aeq,15minute}$ 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. Bold results in red indicate exceedance of criteria.

Figure 8-1 – Attended Noise Monitoring August 2017

9. 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 August 2017.