

Monthly Environmental Monitoring Report

December 2017

January 2018	1	Final	Klay Marchant	Stephen Bragg	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.

Table 1-1 – Mount Pleasant Operations

Name of Operation	Mount Pleasant Operation
Name of Licensee	MACH Energy Australia Pty Ltd
Environmental Protection Licence	20850
Reporting Period Start Date	1 December 2017
Reporting Period End Date	31 December 2017
Date Data Received	19 December 2017

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
- 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.

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

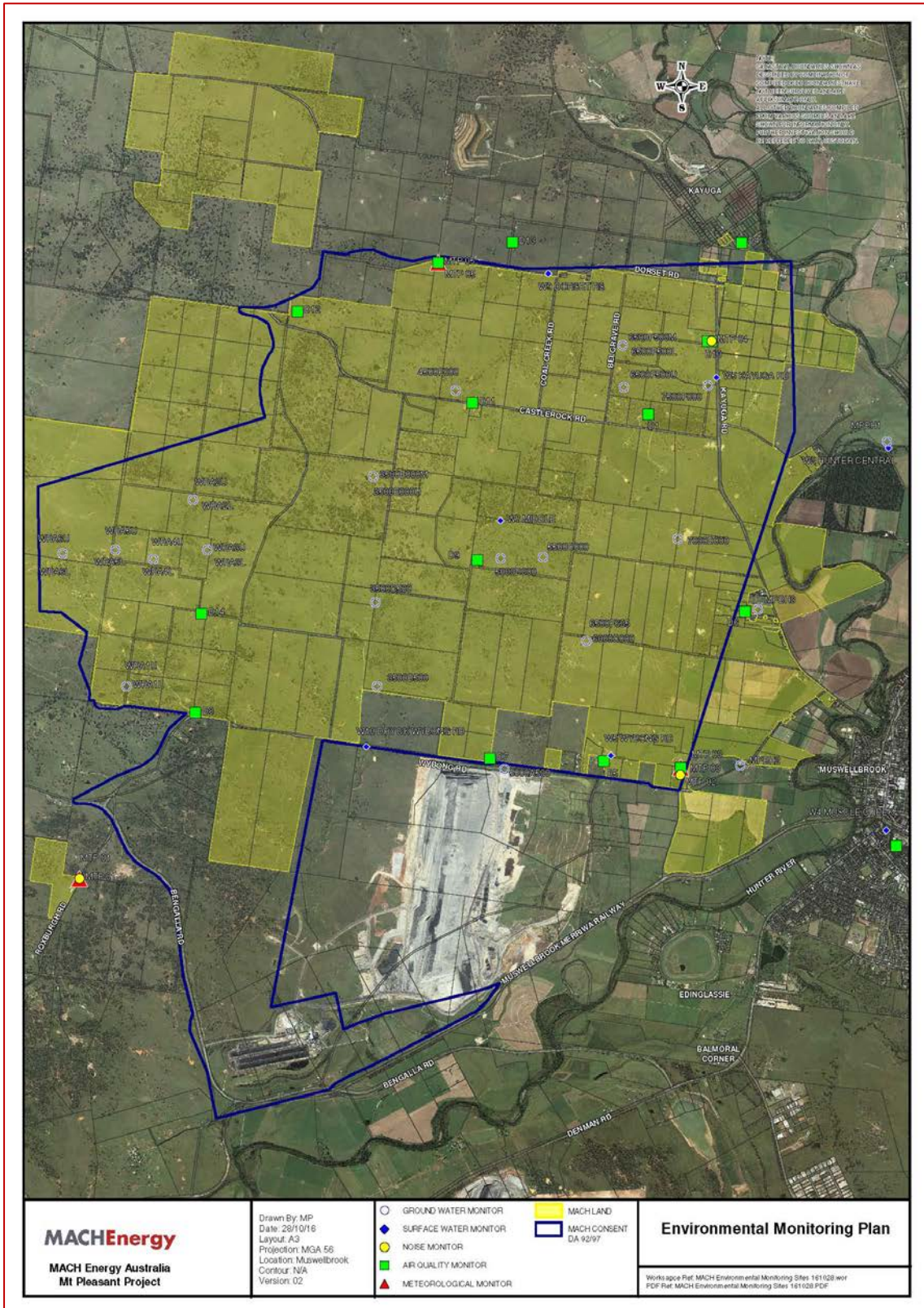


Figure 2-1 – MPO Environmental Monitoring Network

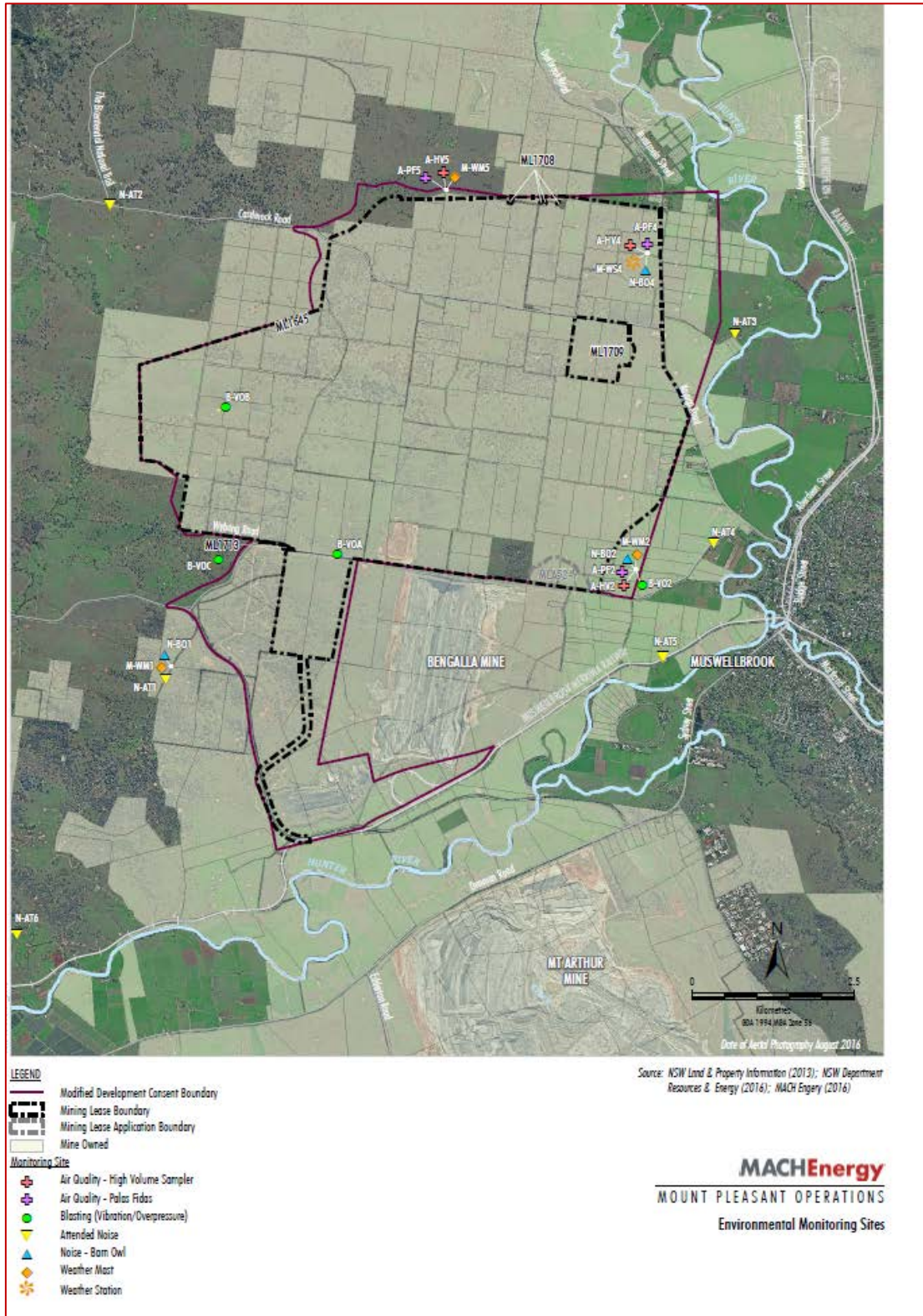


Figure 2-2 – MPO Environmental Monitoring Network/EPL Monitoring Sites

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 dust deposition exposure period for all gauges commenced on 22 November 2017. Sample collection was undertaken on 21 December 2017 by AECOM with sample analysis performed by SRT NATA accredited laboratory. The monitoring network comprises of 13 dust deposition gauges (DDG). Results for December are shown in **Table 3-1**.

Table 3-1: Dust Depositional Results – December 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	2.1	1.1	52	1.3	1.3
D3	2.0	0.9	45	1.9	1.9
D4	0.9	0.4	44	1.4	1.4
D5	1.9	1.2	63	1.3	N/A
D6	4.4c	1.7c	39	2.6	2.6
D7	2.9	2.0	69	5.1	N/A
D8	5.0	3.5	70	5.9	5.9
D9	2.5	1.3	52	1.7	1.7
D10	1.5	1.0	67	1.3	1.3
D11	1.7	0.9	53	1.7	1.7
D12	1.1	0.7	64	0.9	0.9
D13	4.2	1.1	26	3.3	3.3
D14	7.2c	3.5c	49	2.5	2.5
<i>Criterion</i>	-	-	-	-	4

* Sites D5a and D7a were installed in September 2017. Insoluble solids annual rolling average data is not available.

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.

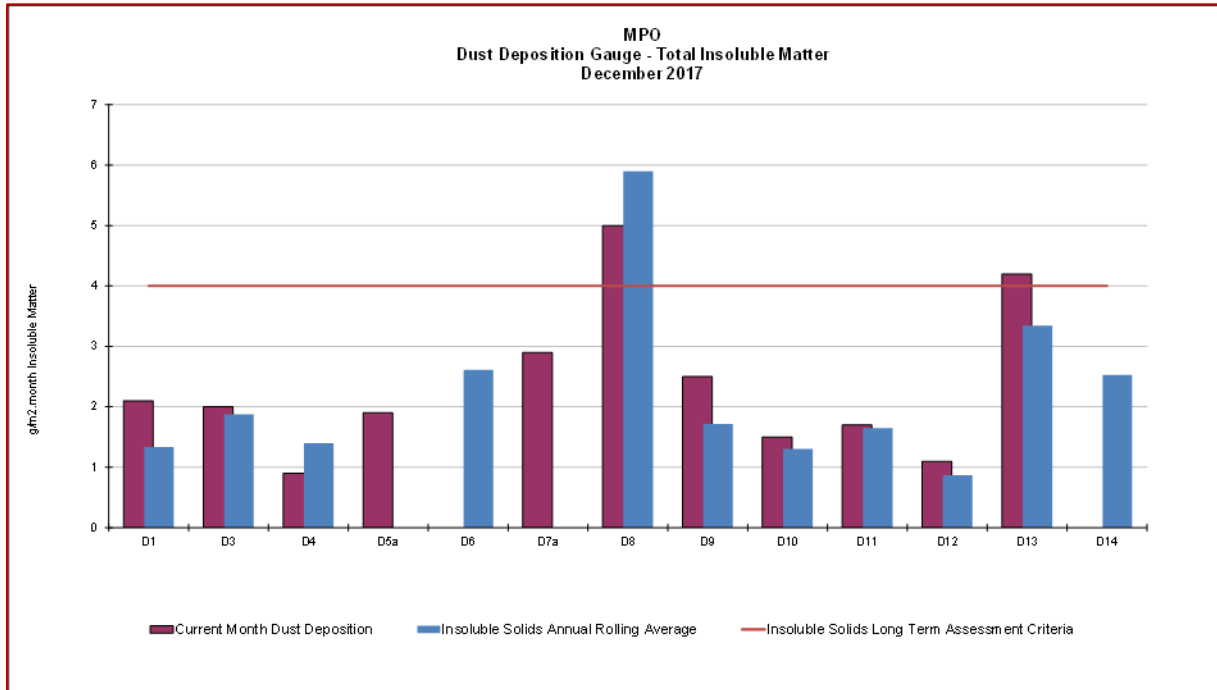


Figure 3-1: MPO DDG Total Insoluble Solids Monitoring Results – December 2017

Exceedance of the EPA annual average criterion for dust deposition (insoluble solids) was recorded at site D8 (5.9g/m².month). This gauge was immediately adjacent road works. DDG water for D6 was recorded in field notes as being brown and turbid. The DDG water for D14 was recorded as cloudy and slightly turbid. These gauges both contained insects. D6 also contained bird droppings, and D14 also contained vegetation. The ash to insoluble solids ratio for both D6 and D14 was less than 50%. This indicates that the contents of these DDG were mainly of organic material. As such, these samples were considered likely to have been contaminated. Due to the likelihood of contamination of gauges D6 and D14, the analysed results did not contribute to their respective annual rolling averages

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 – December 2017

Run Date	Criterion	A-PF2	M-WS4	A-PF5
	µg/m ³			
2/12/2017	-	48	21	16
8/12/2017	-	93	54	53
14/12/2017	-	82	36	31
20/12/2017	-	105	51	45
26/12/2017	-	34	19	20
Monthly Mean	-	72.4	36.2	33.0
Annual Rolling Average	90	52.9*	30.5*	25.4*

*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 MPO during December 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 December 2017 are illustrated in **Figure 5-1** and shown in **Table 5- 1**

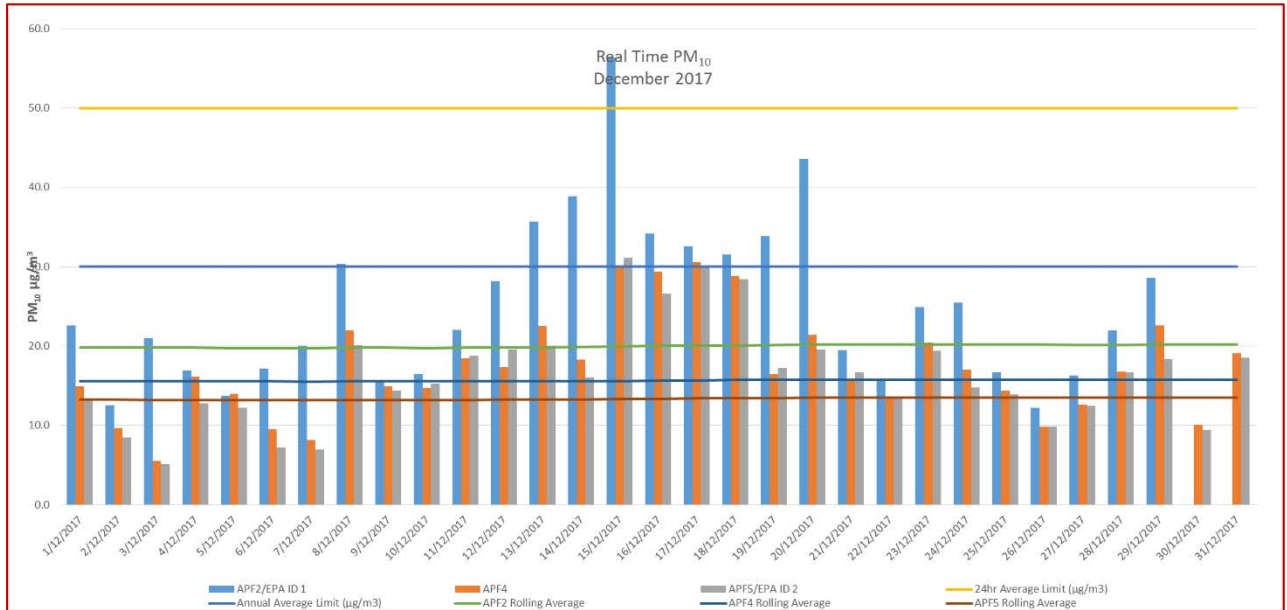


Figure 5-1 : MPO Daily Results from Palas Fidas – December 2017

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

Date	APF2/EPA ID 1	APF4	APF5/EPA ID 2	24hr Average Limit (µg/m ³)
	Daily Result	Daily Result	Daily Result	
1/12/2017	22.6	15.0	13.3	50
2/12/2017	12.5	9.7	8.4	50
3/12/2017	21.0	5.5	5.1	50
4/12/2017	16.9	16.1	12.8	50
5/12/2017	13.7	13.9	12.3	50
6/12/2017	17.1	9.5	7.2	50
7/12/2017	20.1	8.2	6.9	50
8/12/2017	30.3	22.0	20.1	50
9/12/2017	15.4	14.9	14.4	50
10/12/2017	16.5	14.7	15.2	50
11/12/2017	22.0	18.5	18.8	50
12/12/2017	28.2	17.3	19.6	50
13/12/2017	35.7	22.5	20.0	50
14/12/2017	38.9	18.3	16.0	50
15/12/2017	56.3	30.0	31.1	50
16/12/2017	34.1	29.4	26.6	50
17/12/2017	32.6	30.6	29.8	50
18/12/2017	31.6	28.9	28.4	50
19/12/2017	33.8	16.5	17.2	50
20/12/2017	43.6	21.4	19.6	50
21/12/2017	19.5	15.9	16.7	50
22/12/2017	15.9	13.5	13.5	50

23/12/2017	24.9	20.4	19.4	50
24/12/2017	25.5	17.0	14.8	50
25/12/2017	16.7	14.4	13.9	50
26/12/2017	12.2	9.8	9.9	50
27/12/2017	16.3	12.6	12.5	50
28/12/2017	22.0	16.8	16.7	50
29/12/2017	28.6	22.6	18.4	50
30/12/2017	Power outage	10.0	9.4	50
31/12/2017		19.1	18.5	50

6. Surface Water Monitoring

Monthly surface water quality sampling and field analysis was conducted on 22 December 2017 by AECOM. Laboratory analysis was performed by SRT NATA accredited laboratory. **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 – December 2017

Sampling Point	pH	Electrical Conductivity (µs/cm)	Total Suspended Solids (mg/L)
W1	8.2	360	7
W2	8.1	360	7
W3	8.0	350	8
W4	7.6	1350	3
W5	*	*	*
W6A	8.1	350	13
W7	*	*	*
W8	*	*	*
W9	*	*	*
W11	7.8	5850	8
W12	8.0	4800	9
W13	*	*	*
W14	*	*	*
W15	8.0	350	16
* dry or insufficient water ^ no suitable access point			

Six of the fourteen monitoring locations were found to be dry on the sampling day. All of the sites sampled were below or inside the trigger level values during December 2017.

7. Groundwater Monitoring

Monitoring did not occur during December 2017. The next quarterly sampling event is scheduled for February 2018 and the next annual monitoring event is scheduled for May 2018.

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. All monitoring measurements are undertaken during day, evening and night periods. Noise monitoring was undertaken during the day, evening and night periods between 31 October and 2 December 2017, at six monitoring locations in accordance with the MPO Environmental Protection Licence (EPL). Noise levels from MPO complied with all criteria at each monitoring location during all monitoring periods.

Results for Quarter 4 are presented in full in the October 2017 Monthly Environmental Monitoring Report. The next round of Quarterly monitoring is scheduled between February and March 2018.

9. Blast Monitoring

Blasting commenced at MPO in December 2017. Results for December are presented in **Table 9-1**.

Table 9-1 – MPO Blast Monitoring Results – December 2017

Date	Time	Vibration Wybong Road	Overpressure Wybong Road	Vibration MWD	Overpressure MWD	Vibration HV Road	Overpressure HV Road	Vibration EDMIA	Overpressure EDMIA	Vibration BVOC-ED3 (Wybong Dam)	Overpressure BVOC-ED3	Vibration BVOC Moore Mach	Overpressure BVOC Moore Mach	Vibration BVO2 Site 2	Overpressure BVO2 Site 2
01/12/17	12:10	0.300 mm/s	100 DBL	0.870 mm/s	113.2 DBL	0.130 mm/s	98.8 DBL	0.770 mm/s	108.5 DBL	0.530 mm/s	102.9 DBL	0.170 mm/s	108.4 DBL	0.100 mm/s	101.1 DBL
07/12/17	13:55	0.240 mm/s	111.3 DBL	0.360 mm/s	109.7 DBL	0.080 mm/s	109 DBL	0.280 mm/s	106.9 DBL	0.260 mm/s	105.5 DBL	0.190 mm/s	99.8 DBL	0.130 mm/s	101.2 DBL
13/12/17	10:00	0.300 mm/s	102.8 DBL	0.230 mm/s	99.5 DBL	0.130 mm/s	101.7 DBL	0.120 mm/s	98.2 DBL	0.170 mm/s	97 DBL	0.140 mm/s	91.2 DBL	0.070 mm/s	96.9 DBL
29/12/17	11:41	0.690 mm/s	110.6 DBL	0.250 mm/s	98.1 DBL	0.140 mm/s	100.8 DBL	0.090 mm/s	94.6 DBL	0.180 mm/s	99.6 DBL	0.090 mm/s	94.3 DBL	0.180 mm/s	99.6 DBL

Blast results complied with all criteria at each monitoring site.

10. 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 December 2017.