Monthly Environmental Monitoring Report

May 2018

May 2018	1	Final
Date	**Rev.**	**Status**

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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 May 2018
Reporting Period End Date	31 May 2018
Date Data Received	20 June 2018

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 PM_{10} 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**.

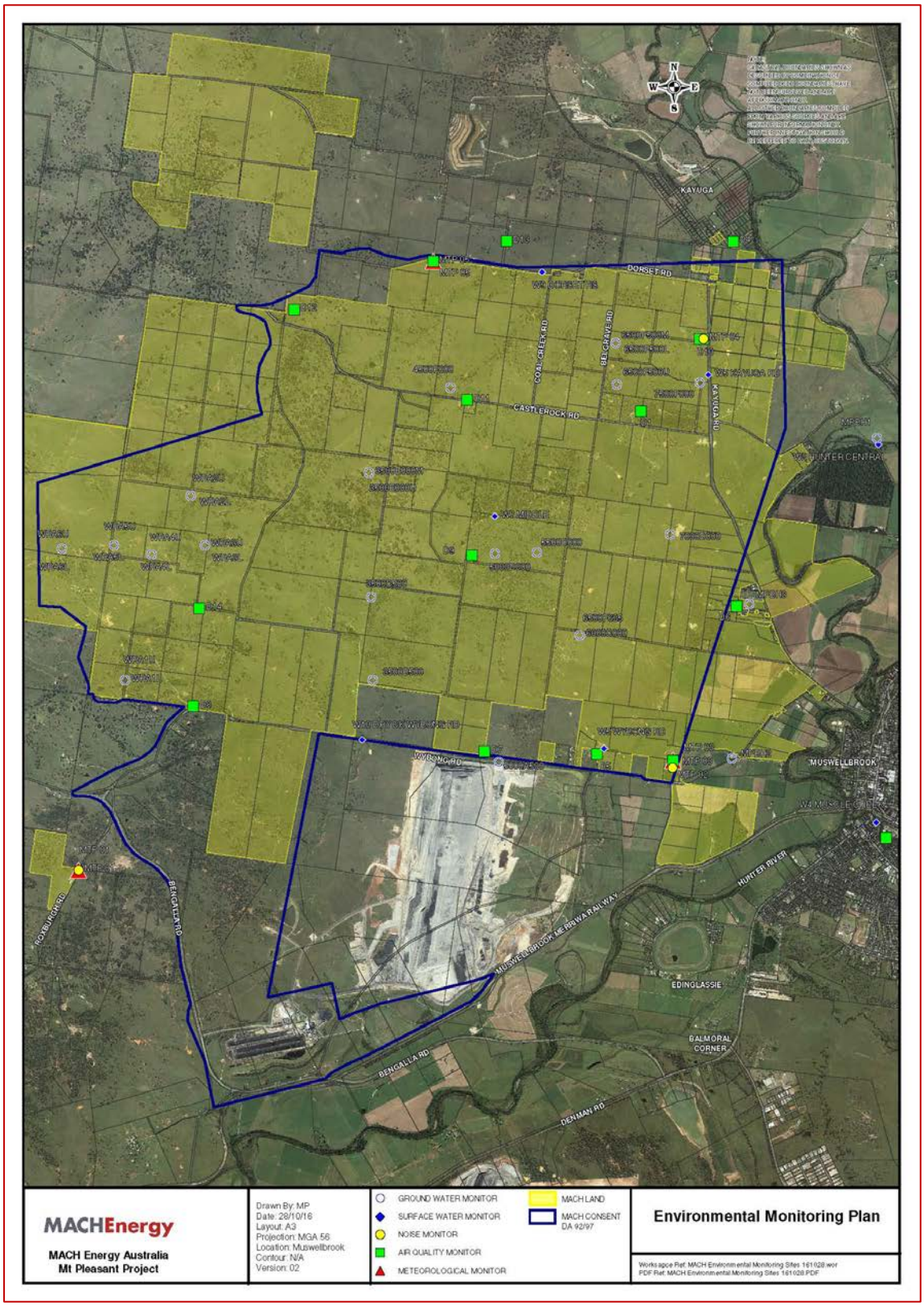

Figure 2-1 – MPO Environmental Monitoring Network

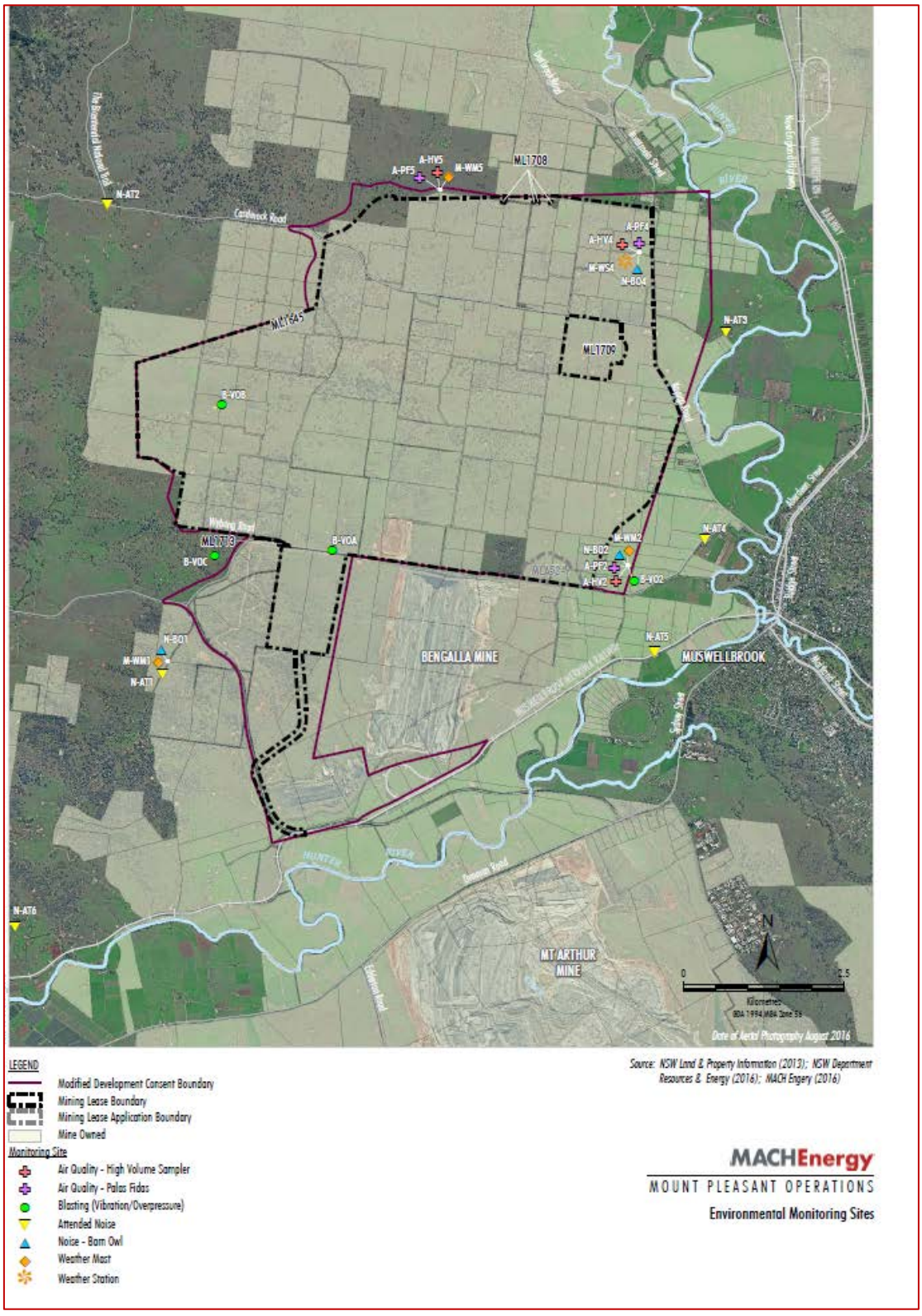

Figure 2-2 – MPO Environmental Monitoring Network/EPL Monitoring Sites

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 20 April 2018. Sample collection was undertaken on 21 May 2018 by AECOM with sample analysis performed by SRT NATA accredited laboratory. The monitoring network comprises of 13 dust deposition gauges (DDG). Results for May 2018 are shown in **Table 3-1**.

Table 3-1: Dust Depositional Results – May 2018

Location	YTD Insoluble Solids (g/m2.month)	Insoluble Solids Annual Rolling Average (g/m2.month)
D1	1.5	1.3
D3	3.1	2.3
D4	1.8	1.4
D5	2.4	1.4*
D6	3.8	3.1
D7	10.2	6.2*
D8	4.0	4.1
D9	1.8	1.7
D10	1.5	1.2
D11	1.7	1.8
D12	1.0	0.9
D13	1.9	2.6
D14	3.3	2.5
Criterion	-	*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.

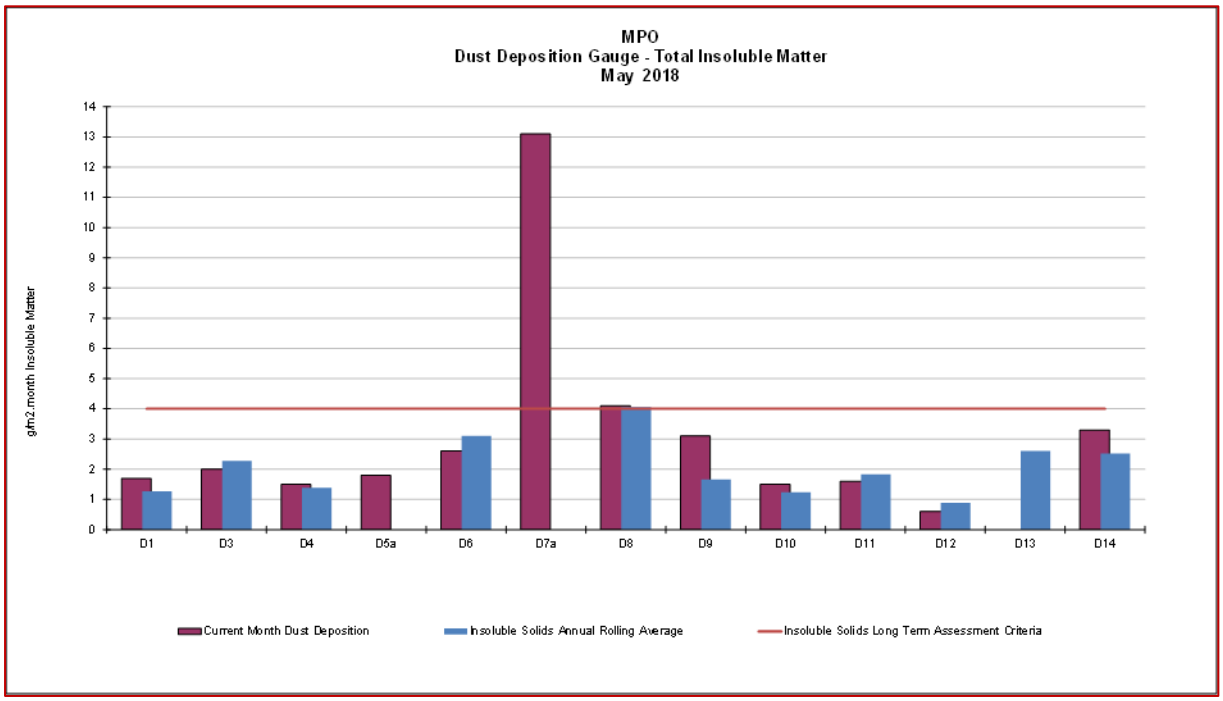

Figure 3-1: MPO DDG Total Insoluble Solids Monitoring Results – May 2018

Exceedance of the EPA annual average criterion for dust deposition (insoluble solids) was recorded at site D8 (4.1 g/m^2.month). DDG water for D13 was recorded in field notes as being brown and turbid. The gauge contained insects and had a low ash to insoluble solids ratio (44%). The monthly dust deposition result of 3.4 g/m^2.month exceeded the annual average result at this site (1.9 g/m^2.month) and as such the sample was considered likely to have been contaminated. Due to the likelihood of contamination the D13 gauge 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 – May 2018

Run Date	Criterion	A-PF2	M-WS4	A-PF5
	µg/m³			
1/05/2018	-	45	35	35
7/05/2018	-	107	42	24
13/05/2018	-	113	50	63
19/05/2018	-	99	12	48
25/05/2018	-	75	50	44
30/05/2018	-	70	30	14
Monthly Mean	-	85	36	38
Annual Rolling Average	**90**	73	42	37

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 PM_{10} Monitoring

Continuous particulate matter less than 10µm (PM10) monitoring was conducted by three (3) Palas Fidas units at MPO during May 2018.

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 May 2018 are illustrated in **Figure 5-1** and shown in **Table 5- 1**

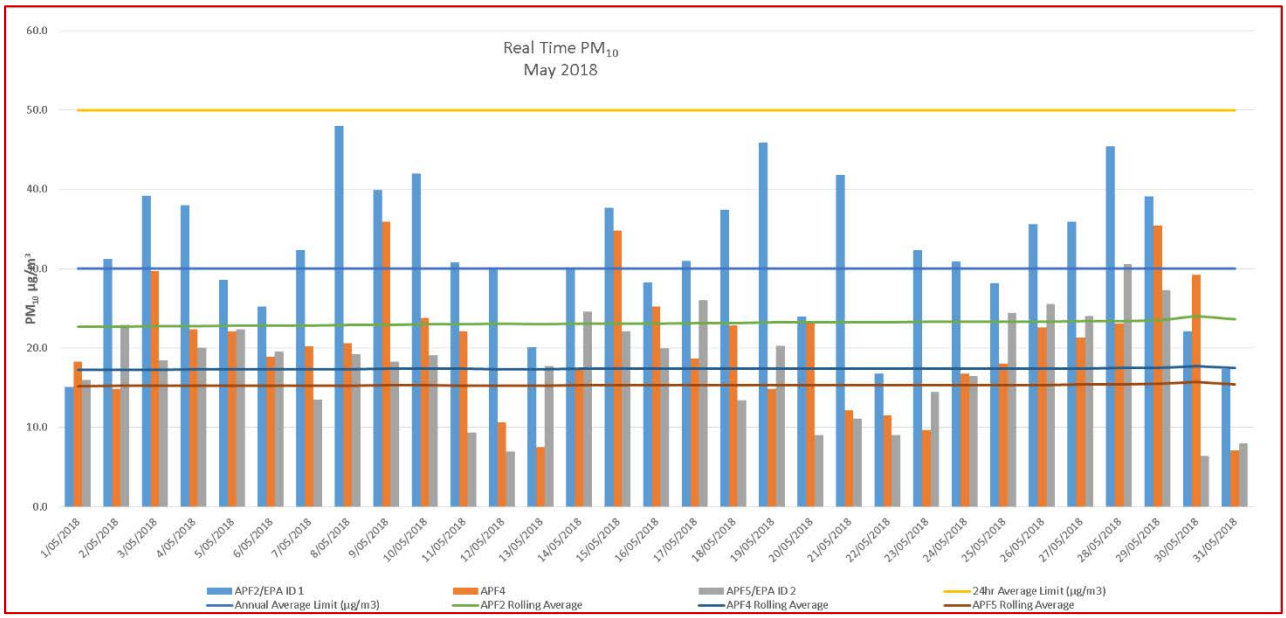

Figure 5-1 : MPO Daily Results from Palas Fidas – May 2018

Table 5-1: MPO Palas Fidas Data – May 2018

Date	APF2/EPA ID 1	APF4	APF5/EPA ID 2	24hr Average Limit (µg/m^3)
	Daily Result			
1/05/2018	15.1	14.9	16.0	50
2/05/2018	31.2	29.7	22.9	50
3/05/2018	39.2	22.4	18.4	50
4/05/2018	38.0	22.1	20.1	50
5/05/2018	28.6	18.9	22.3	50
6/05/2018	25.3	20.2	19.5	50
7/05/2018	32.3	20.6	13.5	50
8/05/2018	48.0	35.9	19.2	50
9/05/2018	39.9	23.8	18.3	50
10/05/2018	42.0	22.2	19.0	50
11/05/2018	30.8	10.7	9.3	50
12/05/2018	29.9	7.5	6.9	50
13/05/2018	20.1	17.2	17.8	50
14/05/2018	30.1	34.8	24.6	50
15/05/2018	37.7	25.2	22.1	50
16/05/2018	28.2	18.7	20.0	50
17/05/2018	31.0	22.9	26.0	50
18/05/2018	37.4	14.9	13.4	50
19/05/2018	45.9	23.3	20.2	50
20/05/2018	24.0	12.1	9.0	50
21/05/2018	41.8	11.5	11.1	50
22/05/2018	16.8	9.7	9.1	50
23/05/2018	32.3	16.8	14.5	50
24/05/2018	30.9	18.1	16.5	50
25/05/2018	28.1	22.6	24.5	50
26/05/2018	35.6	21.3	25.6	50
27/05/2018	35.9	23.0	24.0	50
28/05/2018	45.4	35.5	30.6	50
29/05/2018	39.1	29.2	27.3	50
30/05/2018	22.1	7.1	6.4	50

6. Surface Water Monitoring

Monthly surface water quality sampling and field analysis was conducted on 27 May 2018 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 – May 2018

Sampling Point	pH	Electrical Conductivity (µs/cm)	Total Suspended Solids (mg/L)	Total Dissolved Solids (TDS) (mg/L)
W1	8.2	330	2	166
W2	8.2	330	3	161
W3	8.0	340	7	163
W4	7.9	1600	5	917
W5	*	*	*	*
W6A	8.1	330	3	163
W7	*	*	*	*
W8	*	*	*	*
W9	7.9	6750	8	3640
W11	8.0	4900	8	2720
W12	*	*	*	*
W13	*	*	*	*
W14	8.0	350	15	189
W15	8.2	330	2	166
** dry or insufficient water* *x no suitable access point*				

Five of the thirteen monitoring locations were found to be dry on the sampling day. All of the remaining sites sampled were below or inside the trigger level values during May 2018.

7. Groundwater Monitoring

Quarterly monitoring of groundwater is undertaken for depth to water (DTW), pH and electrical conductivity. Sampling was conducted in accordance with the Department of Planning and Environment document *Groundwater Monitoring Guidelines for Mine Sites within the Hunter Region*, as adapted from AS 5667.11 (1998) *Guidance on sampling of ground waters* and AS/NZS 5667.1 (1998) *Water Quality – Sampling – Guidance on the Design of Sampling Programs, Sampling Techniques and the Preservation and Handling of Samples*. Where monitoring bores could not be practically purged due to depth, large well volumes or slow recharge rates, water was extracted to achieve stability in field measurements before samples were extracted.

Annual sampling was conducted during May 2018; results are provided in **Table 7-1**.

Table 7-1 – MPO Annual Groundwater Sampling Results

Monitoring Location/ ID	pH	Electrical Conductivity (µs/cm)1	Depth to Standpipe May 2018 (m)	Depth to Standpipe February 2018 (m)
WRA1L	7.1	3650	4.67	4.22
WRA1U*	Dry			
WRA2L	7.3	5500	18.03	18.08
WRA2U*	Dry			
WRA3L	6.8	15350	17.87	17.87
WRA3U	7.2	8600	6.06	6.02
WRA5L	Mined Through			
WRA5U	Mined Through			
WRA6L	7.0	5900	3.58	3.38
WRA6U	6.9	10600	4.23	4.13
MPBH1 (Bore3)	7.0	470	9.64	9.90
MPBH2	6.8	810	12.58	12.65
MPBH3 (Bore 2)	7.6	3500	12.36	12.39
3500C500 (L)	7.3	4150	56.32	56.02
3500C500 (S)	7.0	3900	25.61	25.35
4500F000	6.8	8800	22.23	23.60
5000D000	6.9	730	82.76	82.56
5500D000	7.1	3200	65.33	65.13
6000C000(L)	Mined Through			
6000C000(S)	Mined Through			
6500F500L	7.3	3150	52.77	52.78
6500F500M	7.4	2950	54.28	54.29
6500F500U	6.9	5350	31.48	30.94
7000D000U	6.6	6350	6.70	6.00
7000D000L	6.8	1400	18.70	18.64
7500F000	7.9	6200	35.76	35.67

Criteria	-	-	>20 %	-
Results in **bold** indicate exceedences of adopted assessment criteria * Dry/ insufficient water to sample				

WRA1U and WRA2U were found to be dry at the time of sampling. WRA5L, WRA5U, 6000C000(L) and 6000C000(S) sites have been destroyed due to mining advances. All sites met the adopted >20% change in depth criterion. The next quarterly monitoring event is scheduled for August 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. Monitoring was undertaken in May 2018. Results will be made available during the next monthly report.

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9. Blast Monitoring

Results for May 2018 are presented in **Table 9-1**.

Table 9-1 – MPO Blast Monitoring Results – May 2018

Date Fired	Time Fired	Vibration BVOA	Overpressure BVOA	Vibration BVOC	Overpressure BVOC	Vibration BVO2	Overpressure BV02
1/05/18	13:00	0.120 mm/s	89.7 DBL	0.040 mm/s	92 DBL	0.190 mm/s	96 DBL
2/05/18	14:00	0.920 mm/s	94.3 DBL	0.590 mm/s	89.7 DBL	1.440 mm/s	107.7 DBL
5/05/18	14:00	0.130 mm/s	90.5 DBL	0.080 mm/s	84.9 DBL	0.470 mm/s	97.6 DBL
8/05/18	15:00	0.570 mm/s	89 DBL	0.220 mm/s	88.2 DBL	0.790 mm/s	102.9 DBL
14/05/18	13:16	0.270 mm/s	103.3 DBL	0.170 mm/s	99.9 DBL	0.680 mm/s	101.8 DBL
16/05/18	15:35	0.600 mm/s	97.5 DBL	0.180 mm/s	96 DBL	0.510 mm/s	98.8 DBL
22/05/18	9:40	0.660 mm/s	103.2 DBL	0.270 mm/s	96.9 DBL	1.000 mm/s	106.7 DBL
28/05/18	12:10	0.600 mm/s	92 DBL	0.270 mm/s	89.9 DBL	1.170 mm/s	105.1 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 May 2018.