



Maxwell Infrastructure
Environmental Monitoring Data
Quarter 1 2019

1 INTRODUCTION

Maxwell Infrastructure (formerly Drayton Mine) is owned by Malabar Coal. This report has been compiled to present environmental monitoring data for Maxwell Infrastructure in accordance with Schedule 5, Condition 11 (b) and (c) of Project Approval 06_0202.

This report covers the reporting period 1 January to 31 March 2019. Summaries of historic environmental monitoring data (prior to 2019) can be found in the Annual Environmental Management Reports located on the Malabar Coal website.

2 MONITORING RESULTS

Deposited dust monitoring results are provided in **Table 1**.

Continuous TEOM PM₁₀ monitoring results are provided in **Figure 1**.

Surface water quality monitoring results are provided in **Table 2**.

Groundwater quality results are provided in **Table 3**.

Groundwater level results are provided in **Table 4**.

Noise monitoring results are provided in **Table 5**.

Locations of monitoring sites are shown in **Appendix 1**.

Table 1: Depositional dust monitoring results for Quarter 1.

Gauge	Insoluble Solids Result (g/m ² /month)			Annual Mean (YTD) (g/m ² /month)	Annual Mean Limit (g/m ² /month)
	January	February	March		
2175	2.6	3.2	3.3	3.0	4.0
2230	2.0	4.0	2.9	3.0	4.0
2235	3.2	3.2	3.9	3.4	4.0
2247	2.0	2.3	3.1	2.5	4.0

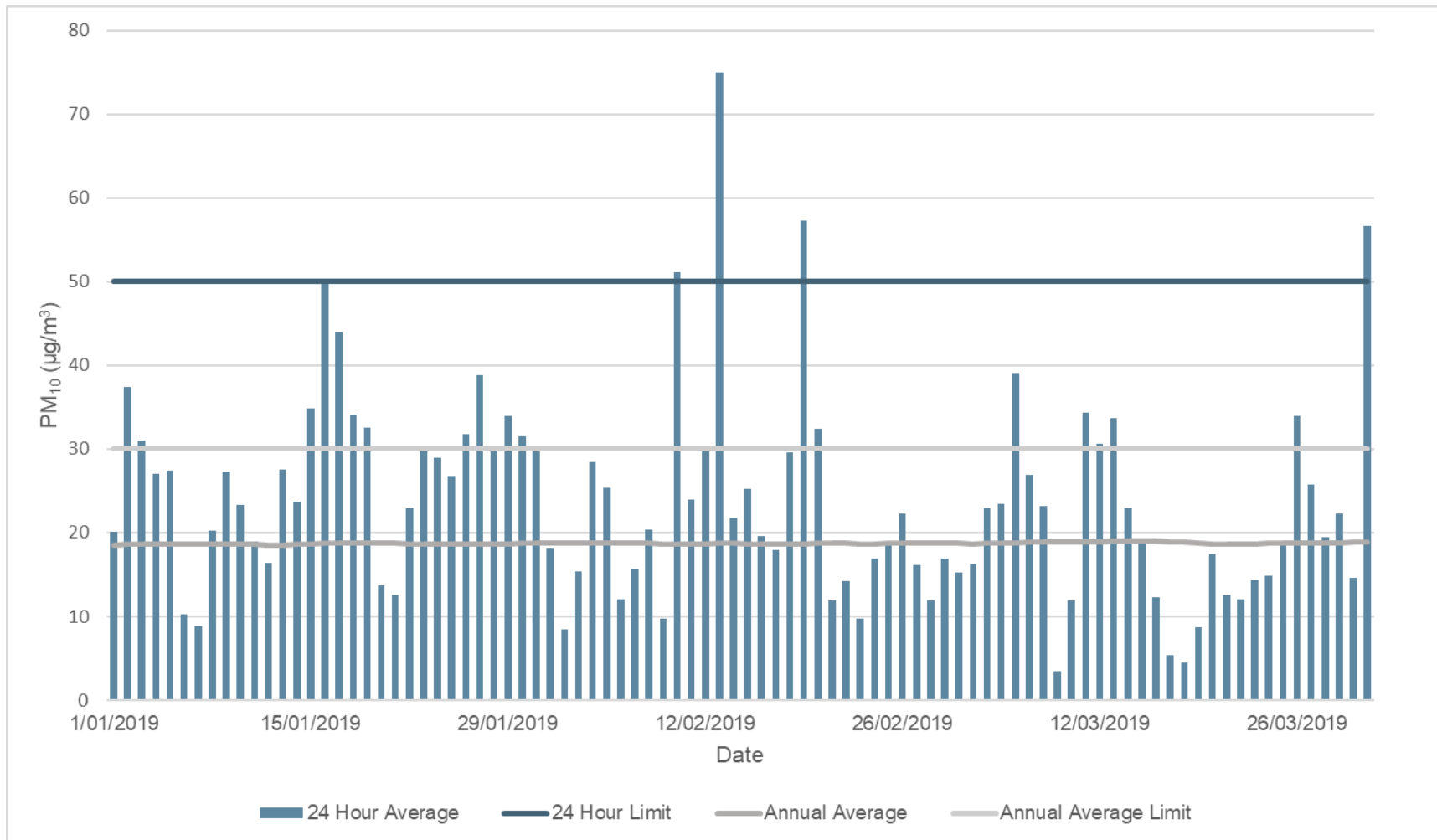


Figure 1: TEOM PM₁₀ monitoring results for Quarter 1.

Notes:

On 11 January 2019 an invalid 24-hour average PM₁₀ result was recorded due to an instrument malfunction. Valid 1-hour average results were recorded for 88 percent of this day. These were utilised to calculate a valid 24-hour average PM₁₀ result.

On 16 January 2019 an elevated 24-hour average PM₁₀ result of 50.16 µg/m³ was recorded. This monitor is located to the north east of the operation. Wind direction during the 24-hour period was predominantly from the south east. This monitor was located downwind of Maxwell Infrastructure's operations for 9 percent of the day. The Upper Hunter Air Quality Monitoring Network's Muswellbrook unit also recorded elevated readings. The 24-hour average PM₁₀ result recorded at the Muswellbrook unit on 16 January 2019 was 63.6 µg/m³, indicating elevated PM₁₀ levels in the region.

On 10 February 2019 an elevated 24-hour average PM₁₀ result of 51.19 µg/m³ was recorded. This monitor is located to the north east of the operation. Wind direction during the 24-hour period was predominantly from the south east. This monitor was located downwind of Maxwell Infrastructure's operations for 25 percent of the day. No operations were undertaken at Maxwell Infrastructure on 10 February. The Upper Hunter Air Quality Monitoring Network's Muswellbrook unit also recorded elevated readings. The 24-hour average PM₁₀ result recorded at the Muswellbrook unit on 10 February 2019 was 59 µg/m³, indicating elevated PM₁₀ levels in the region.

On 13 February an elevated 24-hour average PM₁₀ result of 74.92 µg/m³ was recorded. This monitor is located to the north east of the operation. Wind direction during the 24-hour period was predominantly from the south east. This monitor was located downwind of Maxwell Infrastructure's operations for 8 percent of the day. The Upper Hunter Air Quality Monitoring Network's Muswellbrook unit also recorded elevated readings. The 24-hour average PM₁₀ result recorded at the Muswellbrook unit on 13 February 2019 was 101.5 µg/m³, indicating elevated PM₁₀ levels in the region.

On 19 February an elevated 24-hour average PM₁₀ result of 57.35 µg/m³ was recorded. This monitor is located to the north east of the operation. Wind direction during the 24-hour period was predominantly from either the south east or from the west to north west. This monitor was located downwind of Maxwell Infrastructure's operations for 12 percent of the day. The Upper Hunter Air Quality Monitoring Network's Muswellbrook unit also recorded elevated readings. The 24-hour average PM₁₀ result recorded at the Muswellbrook unit on 13 February 2019 was 141 µg/m³, indicating elevated PM₁₀ levels in the region.

On 31 March 2019 an elevated 24-hour average PM₁₀ result of 56.69 µg/m³ was recorded. This monitor is located to the north east of the operation. Wind direction during the 24-hour period was predominantly from the north west. This monitor was located downwind of Maxwell Infrastructure's operations for 5 percent of the day. No operations were undertaken at Maxwell Infrastructure on 31 March. The Upper Hunter Air Quality Monitoring Network's Muswellbrook unit also recorded elevated readings. The 24-hour average PM₁₀ result recorded at the Muswellbrook unit on 31 March 2019 was 64.9 µg/m³, indicating elevated PM₁₀ levels in the region.

Table 2: Surface water quality monitoring results for Quarter 1.

Site	Month	Bicarbonate (CaCO ₃) (mg/L)	Calcium (mg/L)	Chloride (mg/L)	EC (µS/cm)	Magnesium (mg/L)	pH	Potassium (mg/L)	Sodium (mg/L)	Sulphate (SO ₄) (mg/L)	TSS (mg/L)	TDS (mg/L)
Antiene Dam (2221)	Jan	-	-	-	-	-	-	-	-	-	-	-
	Feb	-	-	-	-	-	-	-	-	-	-	-
	Mar	-	-	-	-	-	-	-	-	-	-	-
	Average	-	-	-	-	-	-	-	-	-	-	-
Access Rd Dam* (2081)	Jan	95	621	993	9440	768	8.2	97	924	4970	6	9490
	Feb	112	558	1040	9590	685	7.8	91	863	4670	<5	9270
	Mar	111	589	1060	9600	673	8.0	90	834	4950	<5	8930
	Average	106	589	1031	9543	709	8.0	93	874	4863	5	9230
DC2 Dam* (2109)	Jan	225	196	1100	7030	303	7.6	15	1100	1990	9	5170
	Feb	342	224	1680	10700	393	7.9	12	1670	2820	<5	7110
	Mar	121	133	1050	6420	209	7.4	13	891	1580	32	4500
	Average	229	184	1277	8050	302	7.6	13	1220	2130	15	5593
Rail Loop Dam* (2114)	Jan	131	120	184	2010	103	8.1	11	211	689	16	1720
	Feb	142	127	267	2650	121	8.1	12	245	854	14	1850
	Mar	92	142	284	2690	117	7.9	15	233	918	10	1960
	Average	122	130	245	2450	114	8.0	13	230	820	13	1843
Far East Tip* (1895)	Jan	-	-	-	-	-	-	-	-	-	-	-
	Feb	-	-	-	-	-	-	-	-	-	-	-
	Mar	-	-	-	-	-	-	-	-	-	-	-
	Average	-	-	-	-	-	-	-	-	-	-	-

Site	Month	Bicarbonate (CaCO ₃) (mg/L)	Calcium (mg/L)	Chloride (mg/L)	EC (µS/cm)	Magnesium (mg/L)	pH	Potassium (mg/L)	Sodium (mg/L)	Sulphate (SO ₄) (mg/L)	TSS (mg/L)	TDS (mg/L)
Savoy Dam* (1609)	Jan	50	889	1730	14800	1430	8.5	175	1430	8440	<5	16100
	Feb	-	-	-	-	-	-	-	-	-	-	-
	Mar	55	692	2650	16800	1670	8.5	226	1780	9200	28	17100
	Average	53	791	2190	15800	1550	8.5	201	1605	8820	17	16600
SW 13	Jan	197	510	635	7320	502	7.9	57	599	3000	<5	5970
	Feb	211	522	710	7670	530	8.0	61	634	4160	10	7340
	Mar	252	550	724	7520	567	8.0	68	702	3600	13	6120
	Average	220	527	690	7503	533	7.9	62	645	3587	9	6477
Industrial Dam* (1969)	Jan	100	404	746	6940	492	8.2	54	705	3250	9	6360
	Feb	79	368	772	7060	463	8.4	55	654	2850	5	5390
	Mar	75	406	724	7260	462	7.3	59	632	3870	57	6460
	Average	85	393	747	7087	472	8.0	56	664	3323	24	6070
OPC Dam*	Jan	153	572	982	9090	709	8.7	88	894	3890	47	9180
	Feb	154	561	1030	9560	689	8.4	87	878	3620	5	8560
	Mar	119	376	622	6440	411	8.1	54	524	3410	14	5700
	Average	142	503	878	8363	603	8.4	76	765	3640	22	7813
V Notch*	Jan	406	451	3070	16500	764	8.0	27	2990	6000	8	14400
	Feb	322	374	3810	19700	849	8.3	25	3580	6720	5	15200
	Mar	281	496	3440	18900	795	8.1	36	3350	7780	10	14200
	Average	336	440	3440	18367	803	8.1	29	3307	6833	8	14600

Notes:

Site 2221 (Antiene Dam) was too low to sample in the reporting period

Site 1895 (Far East Tip) was not accessible in the reporting period.

Site 1609 Savoy Dam was not accessible in February 2019

Average is the year-to-date mean for 2019 (January – March 2019).

Maxwell Infrastructure is a closed water management system with all water maintained on-site for use in operational activities.

* Indicates mine water storage.

Table 3: Groundwater quality monitoring results for Quarter 1.

Site	Month	Bicarbonate (CaCO ₃) (mg/L)	Calcium (mg/L)	Chloride (mg/L)	EC (µS/cm)	Magnesium (mg/L)	pH	Potassium (mg/L)	Sodium (mg/L)	Sulphate (SO ₄) (mg/L)	TSS (mg/L)	TDS (mg/L)
DS1	Jan	245	496	795	7860	6.65	21	1020	2920	1310	6000	245
	Feb	277	501	759	8010	6.93	21	971	3630	441	6640	277
	Mar	295	515	816	7900	6.64	22	1050	3320	283	5800	295
	Average	272	504	790	7923	6.7	21	1014	3290	678	6147	272
DS2	Mar	1040	499	4240	21200	7.2	37	3770	7580	19	19100	1040
DS3	Mar	1000	499	1230	14000	7.2	37	2160	6850	695	13900	1000
R4241	Mar	630	233	1050	6040	7.2	14	589	1110	61	3940	630
F1162	Mar	-	-	-	-	-	-	-	-	-	-	-
F1167	Mar	-	-	-	-	-	-	-	-	-	-	-
F1024	Mar	-	-	-	-	-	-	-	-	-	-	-
F1164	Mar	-	-	-	-	-	-	-	-	-	-	-
F1163	Mar	-	-	-	-	-	-	-	-	-	-	-
F1168	Mar	-	-	-	-	-	-	-	-	-	-	-
W1102	Mar	-	-	-	-	-	-	-	-	-	-	-

Table 4. Reduced standing groundwater levels (mAHD)

Site	Jan	Feb	Mar	Average (YTD)
DS1	223.53	223.25	223.4	223.39
DS2	238.47	238.46	238.46	238.46
DS3	235.67	236.19	235.84	235.90
R4241	174.68	174.61	174.58	174.62
F1162	121.29	121.30	121.30	121.30
F1167	-	-	-	-
F1024	-	-	-	-
F1164	119.27	119.28	119.28	119.28
F1163	-	-	-	-
F1168	-	-	-	-
W1102	-	-	-	-

Notes:

Water quality is analysed monthly at DS1 and twice annually at other monitoring sites.

Sites W1102 and F1163 were not accessible in the reporting period.

Site F1168 was unable to be sampled in the reporting period as it was blocked.

Sites F1167 and F1024 were dry in the reporting period.

Sites F1162 and F1164 had insufficient water to collect a sample for water quality analysis in March 2019.

Table 5. Noise monitoring results for March 2019.

Sampling point	Period	L _{Aeq} (15 min)				L _{A1} (1 min)		Exceedance (yes/no)	Observations
		Evening Criteria	Noise Level	Night Criteria	Noise Level	Night Criteria	Noise Level#		
R12	15 mins	35	IA	39	IA	47	IA	No	
R13	15 mins	35	IA	36	IA	45	IA	No	
R14	15 mins	35	IA	37	IA	47	IA	No	
R16*	15 mins	35	IA	38	IA	47	IA	No	
R17	15 mins	35	IA	38	IA	47	IA	No	
R18	15 mins	35	IA	40	IA	47	IA	No	
R19	15 mins	35	IA	41	IA	47	IA	No	
R20	15 mins	35	IA	41	IA	45	IA	No	
R21	15 mins	36	IA	41	IA	45	IA	No	
R22	15 mins	36	IA	42	IA	45	IA	No	
R23	15 mins	37	IA	40	IA	47	IA	No	
R25	15 mins	37	IA	41	IA	47	IA	No	
R26	15 mins	36	IA	35	IA	47	IA	No	
R27	15 mins	36	IA	36	IA	47	IA	No	
R28	15 mins	37	IA	37	IA	47	IA	No	
R29	15 mins	37	IA	38	IA	47	IA	No	
R31	15 mins	37	IA	39	IA	47	IA	No	
R32	15 mins	37	IA	42	IA	47	IA	No	
R33	15 mins	38	IA	36	IA	45	IA	No	
R34	15 mins	38	IA	38	IA	45	IA	No	

R35	15 mins	38	IA	38	IA	45	IA	No	
R37	15 mins	39	IA	38	IA	45	IA	No	
R42	15 mins	40	IA	39	IA	45	IA	No	
R61*	15 mins	40	IA	39	IA	45	IA	No	
R69	15 mins	39	IA	39	IA	47	IA	No	
R70	15 mins	40	IA	39	IA	47	IA	No	
R71	15 mins	41	IA	39	IA	47	IA	No	
R72*	15 mins	35	IA	35	IA	47	IA	No	
R75*	15 mins	35	IA	35	IA	47	IA	No	
R76*	15 mins	35	IA	35	IA	47	IA	No	
R86	15 mins	35	IA	35	IA	45	IA	No	
All Other Privately-Owned Land	15 mins	35	IA	35	IA	45	IA	No	
Additional Information									
Date of Final Report	18 April 2019								
Date Sampled	29 March 2019								
Weather Conditions	Calm								
Notes	<p>IA – Inaudible</p> <p>* Measured: R16 (Doherty), R35 (Wilson), R61 (Skinner), R72 (Robertson), R75 (Shaman), and R76 (Holder). The noise levels at all other locations are determined by noise modelling or extrapolation.</p> <p># L_{A1} (1 min) is approximated as measured L_{max}</p>								

APPENDIX 1 – MONITORING LOCATIONS



<p>MALABAR  COAL</p> <p>0 0.5 1 1.5 km</p> 	<p>Legend</p> <ul style="list-style-type: none"> ● TEOM Monitoring ● Deposited Dust Monitoring ● Surface Water Monitoring ● Groundwater Monitoring ● Attended Noise Monitoring — Project Approval Boundary 	 <p>N</p>	<p style="text-align: center;">Monitoring Sites</p> <hr/> <p>Drawn by: RH Checked by: DM Date: [29/04/2019]</p>
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