



Maxwell Infrastructure
Environmental Monitoring Data
Quarter 3 2020

1 INTRODUCTION

Maxwell Infrastructure (formerly Drayton Mine) is owned by Malabar Resources. 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 July to 30 September 2020. Summaries of historic environmental monitoring data (prior to this report) can be found in the Annual Environmental Management Reports located on the Malabar Resources 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 to 4**.

Table 1: Deposited dust monitoring results for Quarter 3.

Gauge	Insoluble Solids Result (g/m ² /month)			Annual Mean Limit (g/m ² /month)	2020 Annual Mean (g/m ² /month)
	July	August	September		
2175	1.5	1.1	2.6	4.0	2.2
2230	1.2	1.3	1.9	4.0	2.0
2235	1.3	1.1	1.9	4.0	1.9
2247	1.2	1.2	1.9	4.0	2.2

Note: Deposited dust results in Q3 were similar to Q2 which were themselves significantly lower than Q1, this reflecting the increased rainfall throughout the region and the end to the bushfire season. The year-to-date mean of results recorded at all gauges remain below the annual mean limit.

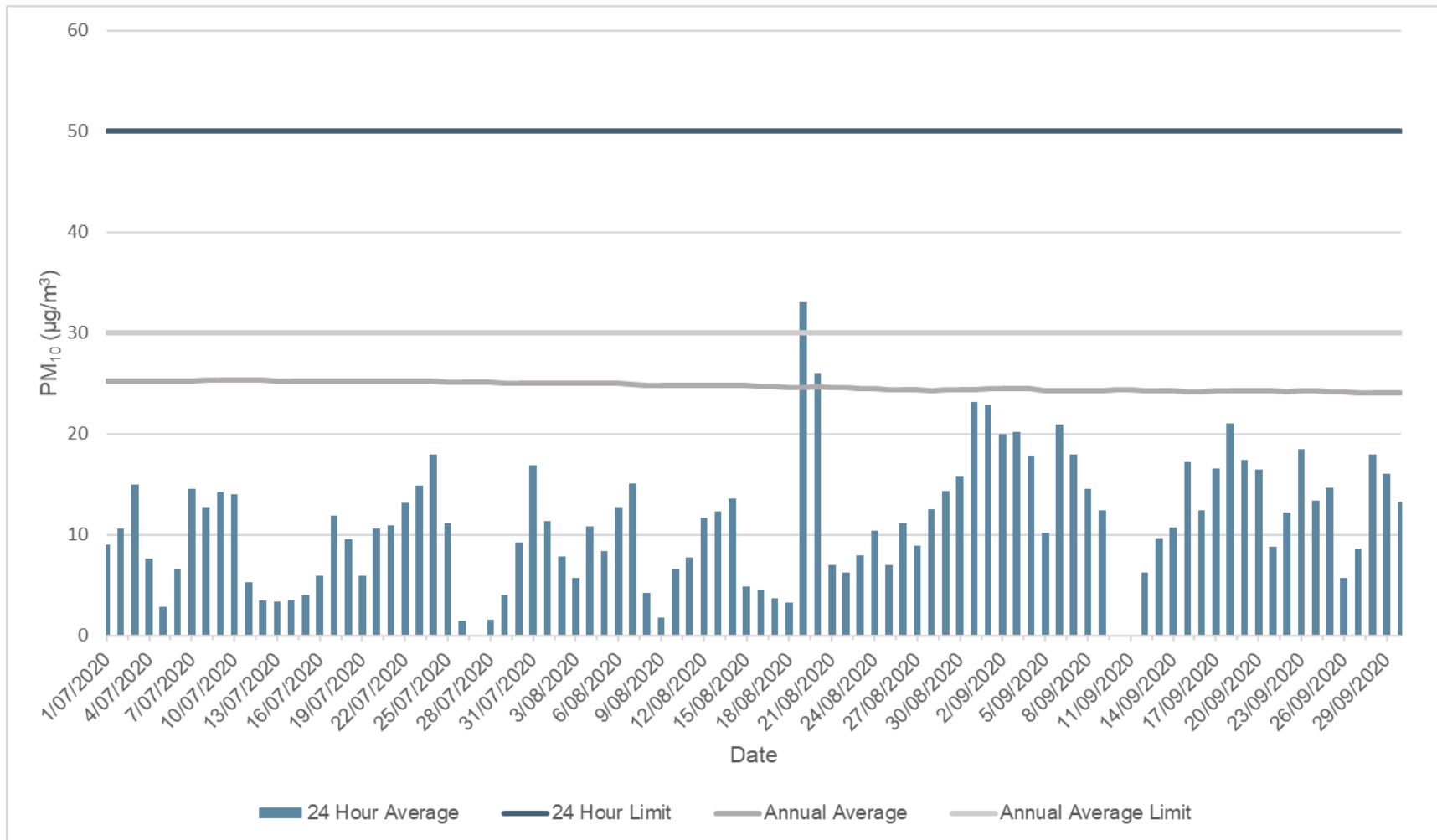


Figure 1: TEOM PM₁₀ monitoring results for Quarter 3.

Notes:

- All 24-hour averages during Quarter 3 were below the 24-Hour Limit. Any future exceedances will be provided in Maxwell Infrastructure's Annual Environmental Management Report.
- An invalid 24-hour PM₁₀ result was recorded on 27 July 2020 due to the scheduled quarterly calibration of the TEOM occurring on that day by monitoring contractors.
- An invalid 24-hour PM₁₀ result was recorded on 10 & 11 September 2020 due to the scheduled annual calibration of the TEOM occurring on those days by monitoring contractors.

Table 2. Surface water quality monitoring results for Quarter 3 (2020 average shown)

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)
Access Rd Dam (2081)	Sep	98	543	1070	9400	678	8.8	81	856	4200	5.0	8600
	Average	84	630	1198	10043	805	8.7	98	981	4913	8.8	9995
DC2 Dam (2109)	Sep	72	122	926	5690	210	6.8	7.0	806	1710	106	4120
	Average	91	116	1147	6335	248	7.2	10	999	1804	73	4840
Rail Loop Dam (2114)	Sep	116	110	201	2040	89	8.0	7.0	180	664	20	1380
	Average	128	125	305	2680	130	8.0	13	286	999	15	1969
Industrial Dam (1969)	Sep	106	297	669	5640	356	8.4	43	498	2470	10	4640
	Average	80	360	778	6548	463	8.7	55	622	3110	12	5900
OPC Dam	Sep	84	72	60	1090	49	8.6	6.0	70	366	5.0	735
	Average	103	126	223	2183	120	8.5	16	180	864	18	1684
V Notch	Sep	325	356	1150	8840	319	7.9	12	1280	3180	5.0	6680
	Average	290	508	2448	14830	686	7.9	24	2643	6280	6.3	13975
ES Void	Sep	251	531	824	7640	531	7.9	68	598	3480	21	6630
	Average	228	554	855	7643	588	7.9	76	635	3858	27	7260

Notes:

As was reported for Q2, the February 2020 revision of the Water Management Plan (approved 19 February 2020) included a reduction in the frequency of surface water monitoring from monthly to quarterly to align with the post-closure monitoring program summary in the 2016 Mining Operations Plan (incorporating the Mine Closure and Final Void Management Plans).

The averages presented are for 2020 (January–September 2020), consisting of samples taken in January, February, June and September. Samples in March were not taken due to COVID-19 restrictions; the sampling frequency then reverted to quarterly as per the revised Water Management Plan. The exception is for the V Notch dam, where samples are taken monthly as is required by the EPL.

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

Table 3: Groundwater quality monitoring results for Quarter 3 (samples taken September) compared to the 2020 average. See notes for further details.

Site	Arsenic	Barium	Beryllium	Bicarbonate Alkalinity as CaCO3	Boron	Cadmium	Calcium	Chloride	Chromium	Cobalt	Copper	Electrical conductivity	Lead	Magnesium	Manganese	Nickel	pH value
DS1	0.0010	0.024	0.0010	301	0.060	0.00020	488	883	0.0010	0.0090	0.0020	7730	0.001	292	1.89	0.025	6.7
DS1 2020 avg	0.0010	0.017	0.0010	294	0.060	0.00020	506	854	0.0015	0.0080	0.0015	7443	0.0010	309	1.9	0.023	6.5
R4241	0.0020	0.066	0.0010	687	0.14	0.00010	183	887	0.0040	0.0040	0.013	4920	0.025	263	0.17	0.016	7.1
R4241 2020 avg	0.0020	0.056	0.0010	720	0.13	0.00010	179	839	0.0045	0.0050	0.0085	4570	0.017	257	0.16	0.021	7.0
F1162	Too low to sample																
F1164	Too low to sample																
GW01D	0.0020	0.093	0.0010	596	0.29	0.00010	392	1320	0.0030	0.0090	0.007	5680	0.002	155	0.31	0.022	6.9
GW01D 2020 avg	0.0015	0.080	0.0010	585	0.310	0.00010	402	1290	0.0020	0.0080	0.0040	5265	0.0015	161	0.3	0.020	6.9
GW01S	Too low to sample																
GW02D	0.035	0.56	0.0020	901	0.22	0.00040	344	1040	0.032	0.021	0.060	8520	0.044	436	0.63	0.068	6.8
GW02 D 2020 avg	0.021	0.35	0.0015	1216	0.23	0.00025	194	892	0.020	0.013	0.035	8030	0.026	224	0.44	0.043	7.1
GW02S	0.0040	0.042	0.0010	1840	0.19	0.00010	41	903	0.0020	0.0060	0.0030	9480	0.0020	11	0.70	0.014	7.4
GW02 S 2020 avg	0.0025	0.04	0.0010	1369	0.17	0.00010	233	972	0.0020	0.0060	0.0020	8570	0.0015	263	0.64	0.016	7.1

Table 3 continued

Site	Potassium	Selenium	Sodium	Sulfate as SO4 - Turbidimetric	Suspended Solids (SS)	Total Dissolved Solids @180°C	Vanadium	Zinc	Nitrite as N	Nitrate as N	Mercury	Ammonia as N	Total Kjeldahl Nitrogen as N	Total Nitrogen as N	Total Phosphorus as P	Reactive Phosphorus as P
DS1	22	0.01	980	3330	160	6420	0.01	0.026	0.01	0.01	0.0001	0.12	0.2	0.2	0.07	0.02
DS1 2020 average	22	0.010	1000	3410	202	6261	0.010	0.028	0.010	0.010	0.00010	0.065	0.15	0.15	0.050	0.015
R4241	14	0.01	469	930	41	3050	0.01	0.122	0.01	0.83	0.0001	0.76	1.20	2.00	0.22	0.01
R4241 2020 avg	14	0.010	478	942	93	3295	0.010	0.12	0.010	0.56	0.00010	0.79	1.5	2.1	0.23	0.010
F1162	Too low to sample															
F1164	Too low to sample															
GW01D	20	0.010	525	634	135	3900	0.010	0.17	0.010	0.15	0.00010	0.55	1.2	1.4	0.13	0.010
GW01D 2020 avg	20	0.010	536	622	94	3845	0.010	0.119	0.010	0.180	0.00010	0.585	0.90	1.10	0.070	0.010
GW01S	Too low to sample															
GW02D	25	0.010	1060	3120	445	6920	0.050	0.21	0.010	0.010	0.00010	0.16	0.40	0.4	0.060	0.010
GW02D 2020 avg	21	0.010	1595	2695	943	6365	0.030	0.13	0.055	0.065	0.00010	2.3	4.6	4.7	1.6	0.010
GW02S	17	0.010	2190	2440	2300	6720	0.010	0.011	0.010	0.13	0.00010	3.1	4.6	4.7	1.1	0.010
GW02S 2020 avg	27	0.010	1675	2975	1598	7170	0.010	0.015	0.010	0.075	0.00015	1.6	2.4	2.4	0.57	0.010

Notes:

- Sites GW01D, GW01S, GW02D and GW02S were added in February 2020 to provide further data to monitor groundwater surrounding the pit, further details are provided in the Water Management Plan (revised in February 2020).
- In addition, nutrients and total and dissolved metals were added to the suite of parameters analysed for all sites to provide further data on groundwater quality. These included:
 - Total and dissolved metals (Arsenic, Boron, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Manganese, Nickel, Lead, Selenium, Vanadium, Zinc, Mercury); and
 - Total nitrogen, nitrate, nitrite, ammonia, total Kjeldahl nitrogen, reactive phosphorus and total phosphorus).

Total metals and nutrients were not monitored during March 2020 due to accessibility issues attributed to restrictions associated with COVID-19.

Averages shown are for 2020 (January–September 2020), however given that monitoring only commenced in June, this is an average of the June and September results. The exception is for DS1 for which monthly samples are taken for specified analytes, and hence the average presented is the average of all samples taken during 2020.

All results are in mg/L except Conductivity ($\mu\text{S}/\text{cm}$) and pH (in pH units).

Table 4. Reduced standing groundwater levels (mAHD) for Quarter 3 compared to the 2020 average

Site	September 2020	2020 Average
DS1	223.23	223.36
R4241	174.94	174.70
F1162	Too low to sample	121.26
F1164	Too low to sample	119.29
GW01D	198.55	198.53
GW01S	196.95 (mud)	197.21
GW02D	136.90	139.55
GW02S	189.11	188.26

Table 5. Noise monitoring results for Quarter 3

Sampling point	Day (LA eq (15 minute))		Evening (LA eq (15 minute))		Night (LA eq (15 minute))		Night (LA1 (1 minute))		Exceedance (yes/no)	Observations
	Criteria	Noise Level	Criteria	Noise Level	Criteria	Noise Level	Criteria	Noise Level		
R12	35	<20	35	<20	39	<20	47	<20	No	
R13	35	<20	35	<20	36	<20	45	<20	No	
R14	35	<20	35	<20	37	<20	47	<20	No	
R16*	35	<20	35	<20	38	<20	47	<20	No	
R17	35	<20	35	<20	38	<20	47	<20	No	
R18	35	<20	35	<20	40	<20	47	<20	No	
R19	35	<20	35	<20	41	<20	47	<20	No	
R20	35	<20	35	<20	41	<20	45	<20	No	
R21	35	<20	36	<20	41	<20	45	<20	No	
R22	35	<20	36	<20	42	<20	45	<20	No	
R23	35	<20	37	<20	40	<20	47	<20	No	
R25	35	<20	37	<20	41	<20	47	<20	No	
R26	36	<20	36	<20	35	<20	47	<20	No	
R27	36	<20	36	<20	36	<20	47	<20	No	
R28	36	<20	37	<20	37	<20	47	<20	No	
R29	36	<20	37	<20	38	<20	47	<20	No	
R31	36	<20	37	<20	39	<20	47	<20	No	
R32	36	<20	37	<20	42	<20	47	<20	No	
R33	37	<20	38	<20	36	<20	45	<20	No	
R34	38	<20	38	<20	38	<20	45	<20	No	
R35	38	<20	38	<20	38	<20	45	<20	No	

R37	38	<20	39	<20	38	<20	45	<20	No	
R42	39	<20	40	<20	39	<20	45	<20	No	
R61*	39	<20	40	<20	39	<20	45	<20	No	
R69	40	<20	39	<20	39	<20	47	<20	No	
R70	40	<20	40	<20	39	<20	47	<20	No	
R71	41	<20	41	<20	39	<20	47	<20	No	
R72*	35	<20	35	<20	35	<20	47	<20	No	
R75*	35	<20	35	<20	35	<20	47	<20	No	
R76*	35	<20	35	<20	35	<20	47	<20	No	
R86	35	<20	35	<20	35	<20	45	<20	No	
All Other Privately-Owned Land	35	<20	35	<20	35	<20	45	<20	No	
Additional Information										
Date of Final Report	22 October 2020									
Date Sampled	22 September 2020 by Matthew Pennington of Spectrum Acoustics									
Weather Conditions	Wind speed 1.8–7.0 m/s. There was 0.6mm of rain between 0215 and 0310 hrs (however monitoring did not commence until 1650 hrs).									
Notes	<p>Attended noise monitoring is conducted 6-monthly in March and September.</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>									

APPENDIX 1 – AIR QUALITY MONITORING LOCATIONS



Source: Esri, DigitalGlobe, GeoEye, IGN, GeoEye, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

<p>MALABAR COAL</p> <p>0 0.38 0.75 1.5 Kilometers</p>	<p>Legend</p> <ul style="list-style-type: none"> ● Depositional Dust Gauge ● TEOM ● Meteorological Station ● E Sampler 	<p>Figure 1: Maxwell Infrastructure Air Quality Monitoring Locations</p> <p>Drawn by: DM Checked by: GC Date: 15/5/18</p>
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APPENDIX 2 – BLAST MONITORING LOCATIONS



APPENDIX 3 – SURFACE & GROUNDWATER MONITORING LOCATIONS



APPENDIX 4 – NOISE MONITORING LOCATIONS

