COAL & ALLIED

Managed by Rio Tinto Coal Australia

Mount Thorley Warkworth

Monthly Obtained Data Summary

Environment Protection Licence 1376

Environment Protection Licence 1976

Environment Protection Licence 24

July 2017

Date Published: 22nd August 2017

EPA public register: http://www.epa.nsw.gov.au/publicregister/

EPL	Licensee	Premises
1376	**Warkworth Mining Ltd** PO Box 315 Singleton NSW 2330 Australia	**Warkworth Coal Mine** Putty Road, Mount Thorley NSW 2330 Australia
24	**Mount Thorley Coal Loading Ltd** PO Box 315 Singleton NSW 2330 Australia	**Mount Thorley Coal Loading Ltd** Mount Thorley Road, Mount Thorley VIA Singleton NSW 2330 Australia
1976	**Mount Thorley Operations Pty Limited** PO BOX 315 Singleton NSW 2330	**Mount Thorley Operations** Mount Thorley Road, Mount Thorley NSW 2330 Australia

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1.0 INTRODUCTION

This report has been compiled to provide a summary of environmental monitoring results for Mount Thorley Warkworth in accordance with Environment Protection Licences 1376, 1976 and 24. This report includes all monitoring data collected in accordance with the aforementioned licences for the period 1st July – 31st July 2017.

The Environmental Protection Licence 1376 may be found here:

http://www.epa.nsw.gov.au/prpoeoapp/ViewPOEOLicence.aspx?DOCID=85647&SYSUID=1&LICID=1376

The Environmental Protection Licence 1976 may be found here:

http://www.epa.nsw.gov.au/prpoeoapp/ViewPOEOLicence.aspx?DOCID=85860&SYSUID=1&LICID=1976

The Environmental Protection Licence 24 may be found here:

http://www.epa.nsw.gov.au/prpoeoapp/ViewPOEOLicence.aspx?DOCID=32017&SYSUID=1&LICID=24

Monitoring in this report includes:

- Air quality monitoring;
- Surface water monitoring including mine water discharge; and
- Blast monitoring.

2.0 AIR QUALITY

To monitor regional air quality, MTW operates and maintains a network of 5 Particulate Matter <10µm (PM10) Monitors (DustTrak II) on mine owned land surrounding the mining operations. The location of these monitors can be found in Appendix A – MTW Monitoring Location Plan.

2.1 Particulate Matter <10µm (PM10) Monitoring

2.1.1 PM_{10} Results

In accordance with the requirements of Condition M2.2 (WML 1376 and MTO 1976), Mount Thorley Warkworth maintains a network of five PM_{10} monitors. The following monitoring locations (EPA Monitoring Points 9, 10, 11, 12 and 13) are listed on the licences for the purpose of monitoring:

- EPA Identification Number 9 (WML 1376) **– Warkworth North**
- EPA Identification Number 10 (WML 1376 & MTO 1976) – **Dragline Crossing**
- EPA Identification Number 11 (WML 1376 & MTO 1976) – **Heavy Vehicle Bridge**
- EPA Identification Number 12 (WML 1376 & MTO 1976) – **MTIE**
- EPA Identification Number 13 (MTO 1976) – **MTO Boundary**

Results of Particulates (PM_{10}) monitoring (EPA Monitoring Points 9, 10, 11, 12 and 13) are shown in Table 1. Results reported represent the 24hr average PM10, derived from 10 minute PM10 values for the period midnight to midnight, for each calendar date during the reporting period. The last sampling date was 31st July 2017; the data was obtained on the 1st August 2017.

Table 1: Particulate Matter <10µm Monitoring

Date	Unit of Measure	Monitoring Frequency	Monitoring Point				
		Continuous	Warkworth North	MTO Boundary	Dragline Crossing	Heavy Vehicle Bridge	MTIE
1/07/2017	µg/m³		13.7	8.1	21.1	15.3	9.4
2/07/2017	µg/m³		10.7	13.5	22.8	24.3	12.4
3/07/2017	µg/m³		14.8	14.5	35.5	30.8	17.7
4/07/2017	µg/m³		7.0	#	#	17.0	5.6

5/07/2017	µg/m³		2.8	8.9	23.7	12.5	2.7
6/07/2017	µg/m³		4.2	13.2	27.3	16.9	5.2
7/07/2017	µg/m³		5.7	18.5	31.6	27.2	16.7
8/07/2017	µg/m³		#	#	#	#	#
9/07/2017	µg/m³		#	#	#	#	#
10/07/2017	µg/m³		5.6	13.7	24.2	14.1	7.2
11/07/2017	µg/m³		7.9	11.6	21.0	17.5	11.3
12/07/2017	µg/m³		#	#	#	#	#
13/07/2017	µg/m³		#	#	#	#	#
14/07/2017	µg/m³		#	#	#	#	#
15/07/2017	µg/m³		8.0	24.2	27.8	17.7	9.3
16/07/2017	µg/m³		#	#	#	#	#
17/07/2017	µg/m³		#	#	#	#	#
18/07/2017	µg/m³		8.5	19.6	36.4	24.1	14.6
19/07/2017	µg/m³		3.0	20.7	28.3	9.7	2.8
20/07/2017	µg/m³		3.8	8.2	33.5	12.0	3.5
21/07/2017	µg/m³		8.0	7.5	23.3	18.0	9.9
22/07/2017	µg/m³		7.8	10.9	30.5	25.4	10.9
23/07/2017	µg/m³		5.0	12.0	41.0	10.9	4.2
24/07/2017	µg/m³		4.7	15.5	32.4	13.3	6.7
25/07/2017	µg/m³		#	#	#	#	#
26/07/2017	µg/m³		5.8	13.5	33.4	13.5	6.6
27/07/2017	µg/m³		8.1	9.6	28.7	15.7	14.6
28/07/2017	µg/m³		6.3	20.9	32.2	17.7	10.4
29/07/2017	µg/m³		4.9	16.2	49.6	20.5	12.1
30/07/2017	µg/m³		5.7	-139.9	51.8	18.5	7.0
31/07/2017	µg/m³		17.7	13.6	38.0	24.8	17.7

Data unavailable due to equipment or communications issue

3.0 SURFACE WATER

Mine Water Discharge Monitoring

MTW participates in the Hunter River Salinity Trading Scheme (HRSTS), and maintains two monitoring locations associated with this scheme as follows:

- EPA Monitoring Point 1 (WML EPL 1376) – **Dam 1N Discharge Point**
- EPA Monitoring Point 4 (MTO EPL 1976) – **The end of the discharge pipe from Dam 9**

Mount Thorley Warkworth did not receive any discharge opportunities in the reporting period and no water was discharged. As such, no samples were collected at Monitoring Points 1 and 4 during the reporting period (shown in Table 2 below).

Table 2: Mine Water Discharge Monitoring

Discharge Point	Date	Pollutant	unit of measure	Licence Limits	No. of samples required by licence	No. of samples you collected and analysed
Dam 1N Discharge / EPL Point 1	N/A	Electrical Conductivity	microsiemens per centimetre	-	0	0
		pH	pH	6.5 - 9.0	0	0
		Total Suspended Solids	milligrams per litre	120	0	0
Dam 9S Discharge / EPL Point 4	N/A	Electrical Conductivity	microsiemens per centimetre	-	0	0
		pH	pH	6.5 - 9.0	0	0
		Total Suspended Solids	milligrams per litre	120	0	0

Hunter River Tributaries Monitoring

MTW undertakes routine monitoring in Loders Creek, in accordance with Condition M2.3, at the following location:

- EPA Monitoring Point 3 (MTO EPL 1976) – **In Loders Creek, at the coal preparation plant access road bridge**

The location of these sampling points can be found in Appendix A – MTW Monitoring Locations Plan

Result of monitoring undertaken from W5 – Loders Creek is detailed in Table 3. Monthly sampling occurred on 10th July 2017, the data was obtained on 10th August 2017.

Table 3: Hunter Water Tributaries Monitoring

	Pollutant	unit of measure	Monitoring frequency required by licence	No. of samples you collected and analysed	Value
Loders Creek / EPL Point 3	Electrical Conductivity	microsiemens per centimetre	Once a month (min. of 4 weeks)	1	11320
	pH	pH units	Once a month (min. of 4 weeks)	1	7.7
	Total Suspended Solids	milligrams per litre	Once a month (min. of 4 weeks)	1	18

4.0 BLAST MONITORING

Blast Monitoring

In accordance with the requirements of Conditions M7.1 (WML 1376) and M8.1 (MTO 1976), Mount Thorley Warkworth maintains a network of blast monitors to measure airblast overpressure and ground vibration for all blasts carried out at MTW. The following monitoring locations (EPA Monitoring Points 4/5, 5/6, 6/7, 7/8 and 8/9) are listed on the licences for the purpose of assessing compliance with the airblast overpressure and ground vibration criteria:

- EPA Identification Number 4 (WML 1376) and Number 5 (MTO 1976) respectively **– Warkworth**
- EPA Identification Number 5 (WML 1376) and Number 6 (MTO 1976) respectively – **Wambo Road**
- EPA Identification Number 6 (WML 1376) and Number 7 (MTO 1976) respectively – **Bulga Village**
- EPA Identification Number 7 (WML 1376) and Number 8 (MTO 1976) respectively – **Wollemi Peak Road**
- EPA Identification Number 8 (WML 1376) and Number 9 (MTO 1976) respectively – **Putty Road MTIE**

The location of these monitors can be found in Appendix A – Mount Thorley Warkworth Environmental Monitoring Locations.

The last date sampled was on 29th July 2017. The data was obtained on the 7th August.

During the reporting period no blasts exceeded the 115 dB(L) or the 5mm/s threshold for airblast overpressure and ground vibration respectively.

Blast monitoring results are detailed in Tables 4 (Airblast Overpressure) and 5 (Ground Vibration).

Table 4: Blast Monitoring (Airblast Overpressure)

Blast ID	Date and Time		Monitoring Frequency	EPL Limits		Monitoring Point				
		Unit of Measure	All blasts carried out in or on premises	Only 5% of blasts can exceed 115dB(L) during the reporting period	Blasts cannot exceed 120 dB(L)	Bulga Village	Wambo Road	Putty Rd MTIE	Warkworth	Wollemi Peak Road
n43-rcc-ptg1	3/07/2017 13:01	dB(L)		115	120	106.5	109.3	114.8	90.3	107.9
l47-gma-ps4 and l50-wnb-ptg2	5/07/2017 12:11	dB(L)		115	120	107.1	105.9	115.0	94.0	99.1
l47-gma-ps5 and l47-gma-md1	6/07/2017 13:00	dB(L)		115	120	95.8	93.1	106.5	104.2	103.5
w36-wyc-pr1	7/07/2017 11:31	dB(L)		115	120	102.7	98.5	105.3	104.8	102.5
l50-wnb-pr1	7/07/2017 12:25	dB(L)		115	120	100.0	96.7	110.7	98.8	104.9
n37-ble-ptg3	8/07/2017 11:16	dB(L)		115	120	91.4	94.4	114.6	97.4	94.6
w27-bfa-ps1	10/07/2017 12:28	dB(L)		115	120	95.4	93.7	102.3	97.7	94.1
w36-wyc-pr2	11/07/2017 12:15	dB(L)		115	120	98.8	98.4	98.5	94.8	100.0
l50-wnb-pr2	11/07/2017 14:58	dB(L)		115	120	94.7	93.6	91.2	96.7	102.0
s22-wwek-co2	12/07/2017 12:27	dB(L)		115	120	88.7	91.5	100.7	96.3	97.0
l47-gma-md2	13/07/2017 13:48	dB(L)		115	120	98.3	94.4	97.6	87.2	97.2
s22-wwek-co3	13/07/2017 15:51	dB(L)		115	120	90.1	87.1	98.3	83.3	96.6

w36-wyc-pr3	14/07/2017 10:56	dB(L)		115	120	108.6	96.0	108.4	97.4	110.0
n37-ble-ptg4	15/07/2017 12:29	dB(L)		115	120	91.9	93.4	95.6	91.7	88.8
w28-bfa-ps1	17/07/2017 12:19	dB(L)		115	120	95.9	95.6	95.6	99.9	101.1
n31-bfa-ps4 and w28-bfa-ps2 and n37-ble-ptg5	19/07/2017 12:27	dB(L)		115	120	103.3	103.9	113.2	102.8	111.3
w26-wwe-md6	20/07/2017 11:27	dB(L)		115	120	95.0	101.8	102.6	97.3	101.1
l52-wnb-pr3	20/07/2017 12:33	dB(L)		115	120	106.7	98.5	109.4	112.5	114.0
n39-wna-pr4 and n41-wba-ps5	21/07/2017 11:42	dB(L)		115	120	91.3	97.3	96.655	105.1	87.6
n43-rcc-ptg2	21/07/2017 12:19	dB(L)		115	120	88.4	95.9	87.4	94.9	96.7
l50-wnb-ptg3	26/07/2017 9:27	dB(L)		115	120	89.7	90.1	108.6	94.9	97.6
n41-wba-ps6 and n39-wna-pr5	27/07/2017 12:24	dB(L)		115	120	90.8	78.9	89.3	95.6	92.3
n37-ble-ptg6	28/07/2017 11:51	dB(L)		115	120	101.4	106.4	110.9	90.0	114.6
l50-bla-pr1	28/07/2017 13:34	dB(L)		115	120	83.6	100.7	107.3	99.8	94.5
n30-bfa-ptg1	29/07/2017 11:49	dB(L)		115	120	104.7	107.1	90.9	106.1	105.0

Table 5: Blast Monitoring (Ground Vibration)

Blast ID	Date and Time		Monitoring Frequency	EPL Limits		Monitoring Point				
		Unit of Measure	All blasts carried out in or on premises	Only 5% of blasts can exceed 115dB(L) during the reporting period	Blasts cannot exceed 120 dB(L)	Bulga Village	Wambo Road	Putty Rd MTIE	Warkworth	Wollemi Peak Road
n43-rcc-ptg1	**3/07/2017 13:01**	mm/s		5	10	0.21	0.26	0.05	0.42	0.18
l47-gma-ps4 and l50-wnb-ptg2	5/07/2017 12:11	mm/s		5	10	0.63	0.56	0.11	0.31	0.58
l47-gma-ps5 and l47-gma-md1	6/07/2017 13:00	mm/s		5	10	1.92	0.90	0.24	0.29	2.11
w36-wyc-pr1	7/07/2017 11:31			5	10	1.15	0.66	0.12	0.39	0.67
l50-wnb-pr1	7/07/2017 12:25	mm/s		5	10	1.31	0.37	0.07	0.64	1.04
n37-ble-ptg3	8/07/2017 11:16	mm/s		5	10	0.09	0.18	0.05	0.24	0.08
w27-bfa-ps1	10/07/2017 12:28	mm/s		5	10	0.60	0.42	0.16	0.52	0.76
w36-wyc-pr2	11/07/2017 12:15	mm/s		5	10	1.04	0.71	0.10	0.33	0.71
l50-wnb-pr2	11/07/2017 14:58	mm/s		5	10	2.41	0.60	0.09	0.43	2.54
s22-wwek-co2	12/07/2017 12:27	mm/s		5	10	0.03	0.09	0.06	0.08	0.04
l47-gma-md2	13/07/2017 13:48	mm/s		5	10	1.00	0.70	0.10	0.18	1.76

s22-wwek-co3	13/07/2017 15:51	mm/s		5	10	0.04	0.03	0.05	0.06	0.05
w36-wyc-pr3	14/07/2017 10:56	mm/s		5	10	1.25	1.40	0.12	0.51	1.22
n37-ble-ptg4	15/07/2017 12:29	mm/s		5	10	0.05	0.07	0.02	0.07	0.05
w28-bfa-ps1	17/07/2017 12:19	mm/s		5	10	0.45	0.65	0.23	0.48	0.64
n31-bfa-ps4 and w28-bfa-ps2 and n37-ble-ptg5	19/07/2017 12:27	mm/s		5	10	0.85	0.61	0.24	0.47	1.56
w26-wwe-md6	20/07/2017 11:27	mm/s		5	10	0.29	1.05	0.35	2.26	1.65
l52-wnb-pr3	20/07/2017 12:33	mm/s		5	10	0.69	0.25	0.05	0.22	0.62
n39-wna-pr4 and n41-wba-ps5	21/07/2017 11:42	mm/s		5	10	1.12	0.82	0.16	1.55	0.53
n43-rcc-ptg2	21/07/2017 12:19	mm/s		5	10	0.04	0.13	0.03	0.10	0.12
l50-wnb-ptg3	26/07/2017 9:27	mm/s		5	10	0.03	0.07	0.03	0.57	0.14
n41-wba-ps6 and n39-wna-pr5	27/07/2017 12:24	mm/s		5	10	0.04	0.06	0.03	0.06	0.26
n37-ble-ptg6	28/07/2017 11:51	mm/s		5	10	0.04	0.11	0.03	0.08	0.08
l50-bla-pr1	28/07/2017 13:34	mm/s		5	10	0.04	0.96	0.22	0.51	1.35
n30-bfa-ptg1	29/07/2017 11:49	mm/s		5	10	0.04	0.04	0.03	0.09	0.05

Appendix A: Mount Thorley Warkworth Monitoring Location Plans

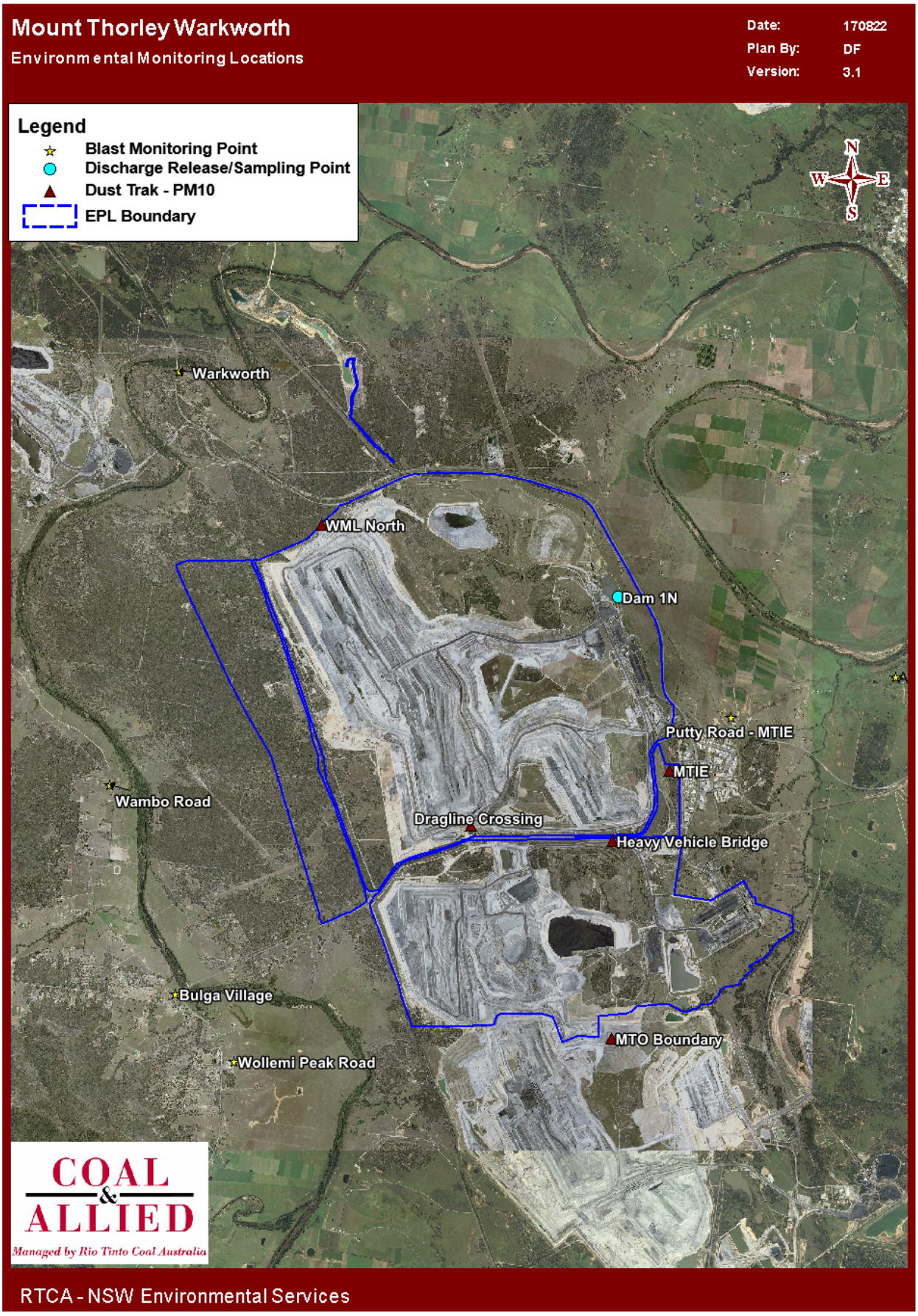

Figure 1 : Mount Thorley Warkworth Environmental Monitoring Locations