



Mount Thorley Warkworth EPL Monitoring Data

Published 24 January 2023
FOR THE MONTH ENDING 31 December 2022

Name of Operation	Mount Thorley Coal Loader
Environment Protection Licence	24
Licensee	Mount Thorley Coal Loading Ltd
Premises	Mount Thorley Coal Loading Ltd Mount Thorley Road, Mount Thorley Via Singleton NSW 2330
EPL Link	http://app.epa.nsw.gov.au/prpoeoapp/ViewPOEOLicence.aspx?DOCID=89660&SYSUID=1&LICID=24
Name of Operation	Mount Thorley Operations
Environment Protection Licence	1976
Licensee	Mount Thorley Operations Pty Limited
Premises	Mount Thorley Operations Mount Thorley Road Mount Thorley NSW 2330
EPL Link	https://apps.epa.nsw.gov.au/prpoeoapp/ViewPOEOLicence.aspx?DOCID=161559&SYSUID=1&LICID=1976
Name of Operation	Warkworth Coal Mine
Environment Protection Licence	1376
Licensee	Warkworth Mining Ltd
Premises	Warkworth Coal Mine Putty Road Mount Thorley NSW 2330
EPL Link	https://apps.epa.nsw.gov.au/prpoeoapp/ViewPOEOLicence.aspx?DOCID=160262&SYSUID=1&LICID=1376

1 INTRODUCTION

This report provides a summary of environmental monitoring results for Mount Thorley Warkworth (MTW) in accordance with the requirements of the following Environment Protection Licences (EPL):

- EPL24 – Mount Thorley Coal Loader (MTCL);
- EPL1376 – Warkworth Mining Limited (WML); and
- EPL1976 – Mount Thorley Operations (MTO).

This report includes all monitoring data collected in accordance with the above licences for the period 1 to 31 December 2022.

Monitoring in this report includes:

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

Monitoring locations are shown in **Figure 1**.

2 AIR QUALITY

In accordance with the requirements of Condition M2.2 of WML EPL 1376 and MTO EPL 1976, MTW maintains a network of five PM₁₀ monitors.

Results of Particulates (PM₁₀) monitoring 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 31 December 2022 and the data was obtained on 1 January 2023.

TABLE 1: PARTICULATE MATTER <10µm MONITORING

Date	Unit of Measure	Monitoring Frequency & Capture	Monitoring Point				
			Warkworth North (EPA ID # 9 - WML EPL 1376)	MTO Boundary (EPA ID # 13 - MTO EPL 1976)	Dragline Crossing (EPA ID # 10 - WML EPL 1376 & MTO EPL 1976)	Heavy Vehicle Bridge (EPA ID # 11 - WML EPL 1376 & MTO EPL 1976)	MTIE (EPA ID # 12 - WML EPL 1376 & EPA ID #19 - MTO EPL 1976)
1/12/2022	µg/m ³	Continuous	9.1	4.3	8.4	8.9	5.5
2/12/2022	µg/m ³		9.5	5.6	9.4	9.4	6.1
3/12/2022	µg/m ³		8.7	4.7	8.7	9.7	5.3
4/12/2022	µg/m ³		7.0	2.1	6.4	7.1	#
5/12/2022	µg/m ³		8.6	6.5	27.9	11.3	#
6/12/2022	µg/m ³		13.1	10.5	14.1	13.8	12.2
7/12/2022	µg/m ³		5.4	6.0	21.6	11.4	7.5
8/12/2022	µg/m ³		4.8	3.3	17.1	4.9	4.1
9/12/2022	µg/m ³		8.9	4.7	9.4	5.3	5.3
10/12/2022	µg/m ³		8.4	4.8	8.2	6.4	5.4
11/12/2022	µg/m ³		9.6	6.1	20.8	8.2	9.8
12/12/2022	µg/m ³		6.2	6.8	23.0	9.8	8.4
13/12/2022	µg/m ³		2.5	4.6	20.4	7.4	4.7
14/12/2022	µg/m ³		#	#	16.9	8.5	6.9
15/12/2022	µg/m ³		#	#	13.0	9.7	6.5
16/12/2022	µg/m ³		6.8	3.3	6.5	9.8	3.6
17/12/2022	µg/m ³		8.2	3.3	5.9	6.4	4.0
18/12/2022	µg/m ³		7.9	1.4	5.3	3.0	2.3
19/12/2022	µg/m ³		12.7	5.6	9.0	7.2	6.3
20/12/2022	µg/m ³		10.5	4.9	8.9	8.7	5.2
21/12/2022	µg/m ³		9.7	3.1	7.6	5.4	#
22/12/2022	µg/m ³		7.8	3.7	8.0	4.0	#

MTW EPL Monitoring Data
FOR THE MONTH ENDING 31 December 2022

Date	Unit of Measure	Monitoring Frequency & Capture	Monitoring Point				
			Warkworth North (EPA ID # 9 - WML EPL 1376)	MTO Boundary (EPA ID # 13 - MTO EPL 1976)	Dragline Crossing (EPA ID # 10 - WML EPL 1376 & MTO EPL 1976)	Heavy Vehicle Bridge (EPA ID # 11 - WML EPL 1376 & MTO EPL 1976)	MTIE (EPA ID # 12 - WML EPL 1376 & EPA ID #19 - MTO EPL 1976)
23/12/2022	µg/m ³		10.7	9.5	20.2	9.7	9.9
24/12/2022	µg/m ³		9.5	8.8	16.5	9.8	9.6
25/12/2022	µg/m ³		16.4	16.0	17.4	14.9	16.1
26/12/2022	µg/m ³		11.2	8.3	11.9	9.6	#
27/12/2022	µg/m ³		13.1	4.8	9.2	6.9	4.1
28/12/2022	µg/m ³		14.0	7.6	16.9	10.8	#
29/12/2022	µg/m ³		19.2	12.4	16.3	12.6	13.5
30/12/2022	µg/m ³		13.0	8.3	11.0	10.2	8.9
31/12/2022	µg/m ³		9.6	6.3	9.1	7.5	6.7
Monthly Meaningful Data							
December	µg/m³	Minimum*	2.6	1.4	5.3	3.0	2.3
December	µg/m³	Mean*	9.3	6.0	13.1	8.7	7.0
December	µg/m³	Maximum*	19.2	16.0	27.9	14.9	16.1
December	µg/m³	Median*	9.1	5.3	11.0	8.9	6.3

24 hour data unavailable due to equipment or communications issue causing one or more missing 10 minute values

*Data calculated with missing 10 minute value(s) due to equipment or communication issue

MTIE denotes Mount Thorley Industrial Estate

3 SURFACE WATER

3.1 Mine Water Discharge Monitoring

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

Results of water monitoring undertaken in accordance with HRSTS requirements are detailed in **Table 2** and **Table 3**. The last sampling date was 2 December 2022 and the data was obtained on 5 December 2022.

TABLE 2: MINE WATER DISCHARGE MONITORING - VOLUME AND MASS LIMITS

Monitoring Location	Unit of measure	Volume/mass Limit	No. of samples required by licence	No. of samples you collected and analysed	Lowest Sample Value	Mean of sample	Highest sample value	Median
Dam 1N Discharge / Point 1 (WML EPL 1376) Dam 1N Discharge Point	Megalitres per day	100	0	0	-	-	-	-
Dam 9S Discharge / EPL Point 4 (MTO EPL 1976) Discharge pipe from Dam 9S	Megalitres per day	100	2	2	3.9	4.9	5.8	4.9

TABLE 3: MINE WATER DISCHARGE MONITORING- CONCENTRATION LIMITS

Discharge Point	Pollutant	Unit of measure	Licence limits	No. of samples required by licence	No. of samples you collected and analysed	Lowest Sample Value	Mean of sample	Highest sample value	Median
Dam 1N Discharge / Point 1 (WML EPL 1376) Dam 1N Discharge Point	Electrical Conductivity	microsiemens per centimetre	-	0	0	-	-	-	-
	pH	pH	6.5 - 9.5	0	0	-	-	-	-
	Total Suspended Solids	milligrams per litre	120	0	0	-	-	-	-
Dam 1N Discharge Turbidity Monitoring / Point 25 (WML EPL 1376) Continuous turbidity monitor	Turbidity	nephelometric turbidity units	-	0	0	-	-	-	-
Dam 9S Discharge / EPL Point 4 (MTO EPL 1976) Discharge pipe from Dam 9	Electrical Conductivity	microsiemens per centimetre	-	Continuous	Continuous*	4876	4886	4895	4886
	pH	pH	6.5 - 9.5	2	2	9.0	9.1	9.1	9.1
	Total Suspended Solids	milligrams per litre	120	2	2	16.0	16.5	17.0	16.5

*1 missing 5-minute values over 2 discharge blocks due to equipment issue. Data calculated with missing 5-minute value.

3.2 Water Quality Monitoring

MTW undertakes monitoring in accordance with Condition M2.3 of WML EPL 1376 and MTO EPL 1976 as detailed in **Table 4**. Monthly sampling occurred on 9 December 2022 and the data was obtained 10 January 2023. Next quarterly sampling will occur in March 2023.

TABLE 4: WATER QUALITY MONITORING

Monitoring Location	Pollutant	unit of measure	Monitoring frequency required by licence	No. of samples required by licence	No. of samples collected and analysed	Value(s)
W5 – Loders Creek / EPL Point 3 (MTO EPL 1976) Coal preparation plant access road bridge	Electrical Conductivity	microsiemens per centimetre	Once a month (min. of 4 weeks)	1	1	8430
	pH	pH units	Once a month (min. of 4 weeks)	1	1	7.9
	Total Suspended Solids	milligrams per litre	Once a month (min. of 4 weeks)	1	1	6
W1 – Hunter River / EPL Point 26 (WML EPL 1376)	Electrical Conductivity	microsiemens per centimetre	Once a quarter	1	1	741
	pH	pH units	Once a quarter	1	1	8.3
	Total Suspended Solids	milligrams per litre	Once a quarter	1	1	24
W2 – Hunter River / EPL Point 27 (WML EPL 1376)	Electrical Conductivity	microsiemens per centimetre	Once a quarter	1	1	1103
	pH	pH units	Once a quarter	1	1	8.3
	Total Suspended Solids	milligrams per litre	Once a quarter	1	1	26
W3 – Hunter River / EPL Point 28 (WML EPL 1376)	Electrical Conductivity	microsiemens per centimetre	Once a quarter	1	0	#
	pH	pH units	Once a quarter	1	0	#
	Total Suspended Solids	milligrams per litre	Once a quarter	1	0	#
W5 – Loders Creek / EPL Point 29 (WML EPL 1376)	Electrical Conductivity	microsiemens per centimetre	Once a quarter	1	1	8430
	pH	pH units	Once a quarter	1	1	7.9
	Total Suspended Solids	milligrams per litre	Once a quarter	1	1	6
WW5 – Dights Creek / EPL Point 30 (WML EPL 1376)	Electrical Conductivity	microsiemens per centimetre	Once a quarter	1	0	#

Monitoring Location	Pollutant	unit of measure	Monitoring frequency required by licence	No. of samples required by licence	No. of samples collected and analysed	Value(s)
	pH	pH units	Once a quarter	1	0	#
	Total Suspended Solids	milligrams per litre	Once a quarter	1	0	#
SW40 – Wollombi Brook Downstream / EPL Point 31 (WML EPL 1376)	Electrical Conductivity	microsiemens per centimetre	Once a quarter	1	1	699
	pH	pH units	Once a quarter	1	1	7.6
	Total Suspended Solids	milligrams per litre	Once a quarter	1	1	14
Wollombi Brook / EPL Point 32 (WML EPL 1376)	Electrical Conductivity	microsiemens per centimetre	Once a quarter	1	1	688
	pH	pH units	Once a quarter	1	1	7.6
	Total Suspended Solids	milligrams per litre	Once a quarter	1	1	16
Wollombi Brook Upstream / EPL Point 33 (WML EPL 1376)	Electrical Conductivity	microsiemens per centimetre	Once a quarter	1	1	665
	pH	pH units	Once a quarter	1	1	7.6
	Total Suspended Solids	milligrams per litre	Once a quarter	1	1	23

- Sample unable to be collected due to insufficient water or unsafe access

3.3 Effluent Quality Monitoring

Monitoring is undertaken in accordance with Condition M2.3 of WML EPL 1376 and MTO EPL 1976 as detailed in **Table 5**. Next quarterly sampling will occur in March 2023.

TABLE 5: EFFLUENT QUALITY MONITORING

Monitoring Location	Pollutant	unit of measure	Monitoring frequency required by licence	No. of samples required by licence	No. of samples collected and analysed	Value
North Pit North Crib Hut Envirocycle / EPL Point 14 (WML EPL 1376)	Faecal Coliforms	Colony forming units per 100 millilitres	Once a quarter	1	1	<910
	pH	pH units	Once a quarter	1	1	7.02
Main Warkworth Staging Pond / EPL Point 15 (WML EPL 1376)	Faecal Coliforms	Colony forming units per 100 millilitres	Once a quarter	1	1	~1000
	pH	pH units	Once a quarter	1	1	9.31
Warkworth Admin Envirocycle / EPL Point 16 (WML EPL 1376)	Faecal Coliforms	Colony forming units per 100 millilitres	Once a quarter	1	1	120000
	pH	pH units	Once a quarter	1	1	7.12
West Pit South Crib Hut Envirocycle / EPL Point 17 (WML EPL 1376)	Faecal Coliforms	Colony forming units per 100 millilitres	Once a quarter	1	1	<91
	pH	pH units	Once a quarter	1	1	7.64
Warkworth Medical Centre Envirocycle / EPL Point 18 (WML EPL 1376)	Faecal Coliforms	Colony forming units per 100 millilitres	Once a quarter	1	1	1000
	pH	pH units	Once a quarter	1	1	7.10
Dam 1S / EPL Point 18 (MTO EPL 1976)	Faecal Coliforms	Colony forming units per 100 millilitres	Once a quarter	1	1	28000
	pH	pH units	Once a quarter	1	1	9.07

4 BLAST MONITORING

In accordance with the requirements of Conditions M7.1 (WML EPL 1376) and M8.1 (MTO EPL 1976), MTW maintains a network of blast monitors to measure airblast overpressure and ground vibration for all blasts carried out at MTW. Blast monitoring results are detailed in **Table 6** (Airblast Overpressure) and **Table 7** (Ground Vibration). The last date sampled was on 31 December 2022. The data was obtained on 1 January 2023.

TABLE 6: BLAST MONITORING (AIRBLAST OVERPRESSURE)

Blast ID	Date and Time	Unit of Measure	Monitoring Frequency & Capture	EPL Limits		Monitoring Point				
				95% of Blasts	100% of Blasts	Bulga Village EPA ID # 6 (EPL 1376) & EPA ID # 7 (EPL 1976)	Wambo Road EPA ID # 5 (EPL 1376) & EPA ID # 6 (EPL 1976)	Putty Rd MTIE EPA ID # 8 (EPL 1376) & EPA ID # 9 (EPL 1976)	Warkworth EPA ID # 4 (EPL 1376) & EPA ID # 5 (EPL 1976)	Wollemi Peak Road EPA ID # 7 (EPL 1376) & EPA ID # 8 (EPL 1976)
n49-wyf-pr1	1/12/2022 12:17	dB(L)	All Blasts 100%	115	120	102.4	103.2	97.1	98.8	98.0
n39-wwg-ptg2	2/12/2022 12:12	dB(L)		115	120	103.4	96.1	104.5	111.8	102.4
n49-rca-pr1	2/12/2022 12:13	dB(L)		115	120	105.7	104.1	107.2	100.2	99.3
w39-wnd-ps1a	6/12/2022 12:04	dB(L)		115	120	99.9	98.1	96.5	100.3	98.8
n49-wyf-pr2a	7/12/2022 12:13	dB(L)		115	120	105.0	95.5	94.6	96.3	99.4
w34-bff-ptg1 & w34-bfe-wwc-co1	8/12/2022 12:45	dB(L)		115	120	92.3	92.6	97.0	91.2	106.5
n39-bfb-wwa-co1	9/12/2022 14:56	dB(L)		115	120	98.2	101.7	95.3	104.3	89.7
n47-wyf-pr2b	9/12/2022 14:57	dB(L)		115	120	98.2	101.7	99.0	99.9	92.2
w34-bff-ptg2	14/12/2022 12:35	dB(L)		115	120	87.6	98.7	101.3	88.6	80.0
n40-bfb-ps1d	15/12/2022 12:16	dB(L)		115	120	89.0	101.9	92.5	89.4	85.2
w34-bfe-wwc-co2	15/12/2022 13:02	dB(L)		115	120	100.3	97.0	91.7	98.3	97.3
w37-wnd-pr2 & w39-wnd-ps1b	16/12/2022 12:12	dB(L)		115	120	99.1	98.5	95.5	100.3	101.6
n40-bfb-ps1e	20/12/2022 12:06	dB(L)		115	120	102.0	93.5	100.9	91.1	104.8

Blast ID	Date and Time	Unit of Measure	Monitoring Frequency & Capture	EPL Limits		Monitoring Point				
				95% of Blasts	100% of Blasts	Bulga Village EPA ID # 6 (EPL 1376) & EPA ID # 7 (EPL 1976)	Wambo Road EPA ID # 5 (EPL 1376) & EPA ID # 6 (EPL 1976)	Putty Rd MTIE EPA ID # 8 (EPL 1376) & EPA ID # 9 (EPL 1976)	Warkworth EPA ID # 4 (EPL 1376) & EPA ID # 5 (EPL 1976)	Wollemi Peak Road EPA ID # 7 (EPL 1376) & EPA ID # 8 (EPL 1976)
n47-wnd-pr1 & n47-wnd-ps1h	21/12/2022 12:18	dB(L)		115	120	96.8	98.7	92.1	101.8	96.6
w34-bff-wwc-co1	23/12/2022 11:48	dB(L)		115	120	100.4	96.4	104.6	101.3	96.8
w37-wnd-pr3	23/12/2022 11:49	dB(L)		115	120	100.4	96.4	104.6	101.3	96.8
n47-wnd-ps1i	28/12/2022 12:06	dB(L)		115	120	99.5	90.4	96.5	96.4	94.3
w37-wnd-ptg1	30/12/2022 10:44	dB(L)		115	120	102.2	100.9	101.4	95.6	102.4
w42-wba-pr3	30/12/2022 10:49	dB(L)		115	120	104.0	101.8	98.6	101.1	103.2
w34-bff-wwc-co2	31/12/2022 11:16	dB(L)		115	120	98.9	97.8	105.9	101.7	96.1
Monthly Meaningful Data										
Minimum	December	dB(L)		115	120	87.6	90.4	91.7	88.6	80.0
Mean	December	dB(L)		115	120	99.3	98.2	98.8	98.5	97.1
Maximum	December	dB(L)		115	120	105.7	104.1	107.2	111.8	106.5
Median	December	dB(L)		115	120	100.1	98.3	97.8	100.0	97.7

TABLE 7: BLAST MONITORING (GROUND VIBRATION)

Blast ID	Date and Time	Unit of Measure	Monitoring Frequency & Capture	EPL Limits		Monitoring Point				
				95% of Blasts	100% of Blasts	Bulga Village EPA ID # 6 (EPL 1376) & EPA ID # 7 (EPL 1976)	Wambo Road EPA ID # 5 (EPL 1376) & EPA ID # 6 (EPL 1976)	Putty Rd MTIE EPA ID # 8 (EPL 1376) & EPA ID # 9 (EPL 1976)	Warkworth EPA ID # 4 (EPL 1376) & EPA ID # 5 (EPL 1976)	Wollemi Peak Road EPA ID # 7 (EPL 1376) & EPA ID # 8 (EPL 1976)
n49-wyf-pr1	1/12/2022 12:17	mm/s	All Blasts 100%	5	10	0.22	0.26	0.04	0.47	0.15
n39-wwg-ptg2	2/12/2022 12:12	mm/s		5	10	0.44	0.15	0.03	0.68	0.16
n49-rca-pr1	2/12/2022 12:13	mm/s		5	10	0.63	0.85	0.05	0.97	0.25
w39-wnd-ps1a	6/12/2022 12:04	mm/s		5	10	0.33	0.62	0.08	1.27	0.25
n49-wyf-pr2a	7/12/2022 12:13	mm/s		5	10	1.25	0.77	0.11	0.65	0.38
w34-bff-ptg1 & w34-bfe-wwc-co1	8/12/2022 12:45	mm/s		5	10	0.29	0.29	0.06	0.52	0.58
n39-bfb-wwa-co1	9/12/2022 14:56	mm/s		5	10	0.78	1.11	0.07	0.58	0.30
n47-wyf-pr2b	9/12/2022 14:57	mm/s		5	10	0.78	1.11	0.07	0.58	0.30
w34-bff-ptg2	14/12/2022 12:35	mm/s		5	10	0.16	0.13	0.04	0.91	0.23
n40-bfb-ps1d	15/12/2022 12:16	mm/s		5	10	0.58	1.05	0.15	2.58	0.71
w34-bfe-wwc-co2	15/12/2022 13:02	mm/s		5	10	0.06	0.07	0.03	0.72	0.05
w37-wnd-pr2 & w39-wnd-ps1b	16/12/2022 12:12	mm/s		5	10	0.89	0.79	0.12	0.77	1.01

Blast ID	Date and Time	Unit of Measure	Monitoring Frequency & Capture	EPL Limits		Monitoring Point				
				95% of Blasts	100% of Blasts	Bulga Village EPA ID # 6 (EPL 1376) & EPA ID # 7 (EPL 1976)	Wambo Road EPA ID # 5 (EPL 1376) & EPA ID # 6 (EPL 1976)	Putty Rd MTIE EPA ID # 8 (EPL 1376) & EPA ID # 9 (EPL 1976)	Warkworth EPA ID # 4 (EPL 1376) & EPA ID # 5 (EPL 1976)	Wollemi Peak Road EPA ID # 7 (EPL 1376) & EPA ID # 8 (EPL 1976)
n40-bfb-ps1e	20/12/2022 12:06	mm/s		5	10	0.45	0.90	0.11	0.97	0.38
n47-wnd-pr1 & n47-wnd-ps1h	21/12/2022 12:18	mm/s		5	10	1.19	1.15	0.15	0.63	0.76
w34-bff-wwc-co1	23/12/2022 11:48	mm/s		5	10	0.70	0.29	0.07	0.27	0.69
w37-wnd-pr3	23/12/2022 11:49	mm/s		5	10	0.70	0.29	0.07	0.27	0.69
n47-wnd-ps1i	28/12/2022 12:06	mm/s		5	10	0.38	0.86	0.10	1.16	0.43
w37-wnd-ptg1	30/12/2022 10:44	mm/s		5	10	0.23	0.19	0.03	0.16	0.26
w42-wba-pr3	30/12/2022 10:49	mm/s		5	10	1.88	1.17	0.10	0.86	1.66
w34-bff-wwc-co2	31/12/2022 11:16	mm/s		5	10	0.09	0.05	0.02	0.15	0.06
Monthly Meaningful Data										
Minimum	December	mm/s		5	10	0.06	0.05	0.02	0.15	0.05
Mean	December	mm/s		5	10	0.60	0.61	0.08	0.76	0.47
Maximum	December	mm/s		5	10	1.88	1.17	0.15	2.58	1.66
Median	December	mm/s		5	10	0.52	0.70	0.07	0.67	0.34

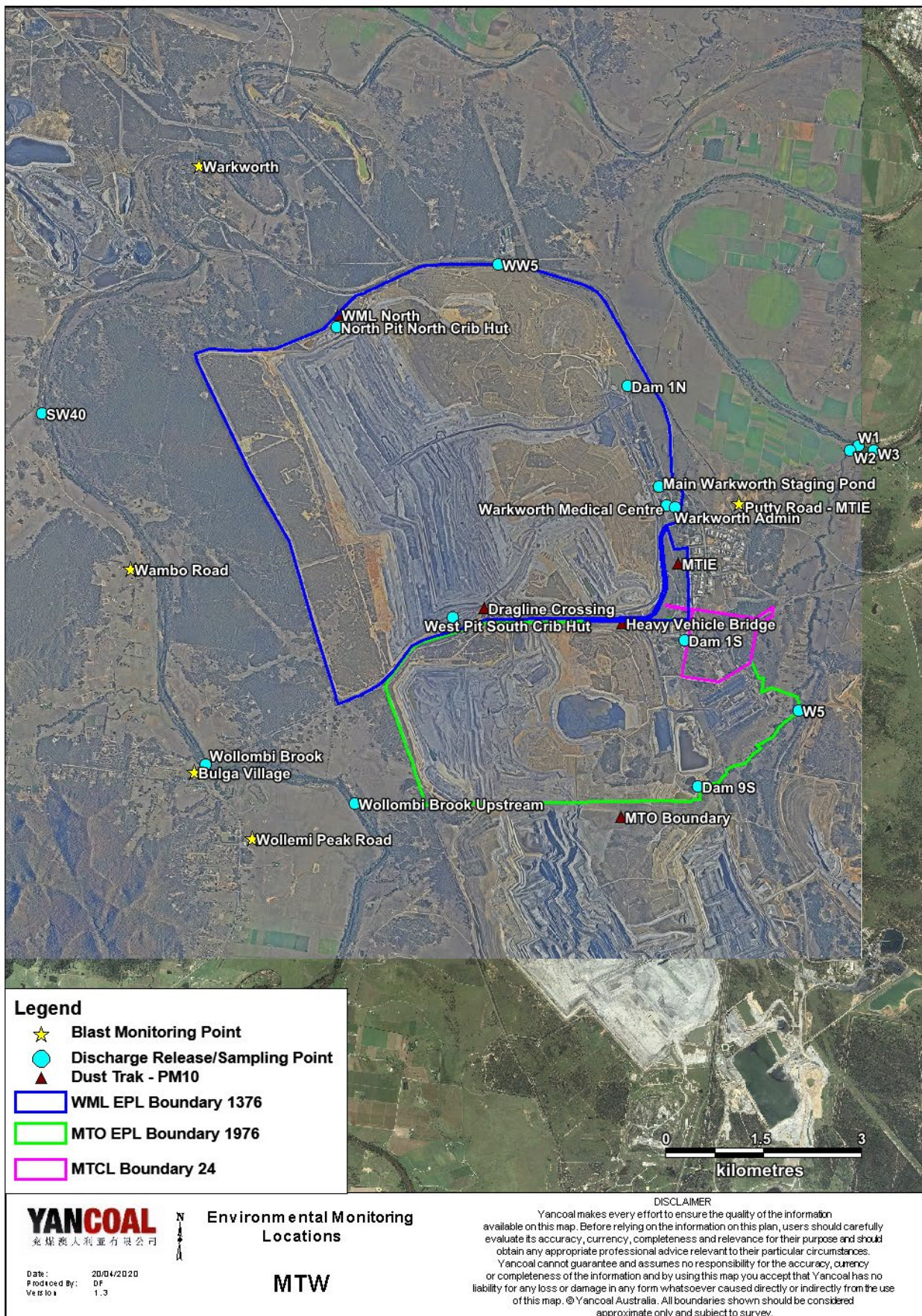


Figure 1 : Mount Thorley Warkworth Environmental Monitoring Locations