



Mount Thorley Warkworth EPL Monitoring Data

Published 25 May 2021 FOR THE MONTH ENDING 30 April 2021

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&S YSUID=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&S YSUID=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 30 April 2021.

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 PM_{10} monitors.

Results of Particulates (PM_{10}) monitoring are shown in **Table 1**. Results reported represent the 24hr average PM_{10} , derived from 10 minute PM_{10} values for the period midnight to midnight, for each calendar date during the reporting period. The last sampling date was 30 April 2021 and the data was obtained on 1 May 2021.

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TABLE 1: PARTICULATE MATTER < 10 µM MONITORING

		Monitoring			Monitoring Point		
Date	Unit of Measure	Frequency & Capture	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)
01/04/2021	μg/m³		7.2	4.6	4.0	7.3	5.5
02/04/2021	μg/m³		12.2	4.0	3.1	7.5	4.4
03/04/2021	μg/m³]	13.1	4.0	2.7	7.3	4.9
04/04/2021	μg/m³]	14.5	7.8	13.0	12.4	9.9
05/04/2021	μg/m³]	18.1	8.3	9.0	15.9	14.7
06/04/2021	μg/m³]	13.8	6.2	4.3	8.7	6.4
07/04/2021	μg/m³]	11.9	4.1	2.9	6.8	4.9
08/04/2021	μg/m³]	12.9	6.8	4.8	9.8	6.5
09/04/2021	μg/m³]	10.6	11.3	16.5	18.6	16.3
10/04/2021	μg/m³		13.9	10.1	16.1	19.1	15.8
11/04/2021	μg/m³		3.9	5.3	12.2	9.3	7.4
12/04/2021	μg/m³	Continuous	5.1	3.6	5.3	9.8	5.9
13/04/2021	μg/m³]	8.4	5.3	6.3	12.3	8.9
14/04/2021	μg/m³]	7.5	13.2	11.4	18.0	11.7
15/04/2021	μg/m³]	17.3	20.4	18.1	24.2	22.5
16/04/2021	μg/m³]	16.8	11.8	9.2	19.8	19.0
17/04/2021	μg/m³		5.5	5.0	1.5	7.7	7.1
18/04/2021	μg/m³]	8.6	7.1	#	13.4	12.5
19/04/2021	μg/m³]	14.3	14.6	#	23.6	22.0
20/04/2021	μg/m³]	13.3	15.0	21.5	23.0	20.1
21/04/2021	μg/m³]	7.9	6.6	10.3	11.8	8.9
22/04/2021	μg/m³		4.7	4.2	11.6	11.5	9.1
23/04/2021	μg/m³]	6.9	6.8	12.4	11.6	#

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		Monitoring	Monitoring Point Monitoring										
Date	Unit of Measure	Frequency & Capture	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)						
24/04/2021	μg/m³		13.5	15.1	17.7	21.0	#						
25/04/2021	μg/m³		19.1	13.2	21.1	27.2	#						
26/04/2021	μg/m³		22.6	12.9	15.9	20.1	#						
27/04/2021	μg/m³		19.6	14.2	14.7	20.2	17.4						
28/04/2021	μg/m³		20.7	15.8	19.0	23.6	22.4						
29/04/2021	μg/m³		17.5	13.1	14.3	21.4	20.0						
30/04/2021	μg/m³		19.8	11.0	13.9	18.1	16.1						
			N	Ionthly Meaningful Data									
April	μg/m³	Minimum*	3.9	3.6	1.5	6.8	4.4						
April	μg/m³	Mean*	12.7	9.4	11.2	15.5	13.2						
April	μg/m³	Maximum*	22.6	20.4	21.5	27.2	24.1						
April	μg/m³	Median*	13.2	8.1	11.9	14.7	12.1						

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

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^{*}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.

During the reporting period, pH exceeded licence limits at EPL Point 4. The EPA was consulted prior to an exceedance being recorded and a licence variation was submitted to increase the pH upper limit. A protocol was established with the EPA to report any exceedance of the pH upper limit, whilst the licenced discharge continued. The pH exceedance results were reported to the EPA each day when discharging, in accordance with the agreed protocol.

Results of water monitoring undertaken in accordance with HRSTS requirements are detailed in **Table 2** and **Table 3**. The last sampling date was 6 April 2021 and the data was obtained on 16 April 2021.

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	5	5	6.7	14.5	33.1	10.1

Note: Reported discharge volume data is based on HRSTS 24-hour discharge block totals, at the relevant discharge point.

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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
	Electrical Conductivity	microsiemens per centimetre	-	0	0	-	-	-	-
Dam 1N Discharge / Point 1 (WML EPL 1376)	рН	рН	6.5 - 9.0	0	0	-	-	-	-
Dam 1N Discharge Point	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	-	-	-	-
D 05 D: 1 /5D: D :	Electrical Conductivity	microsiemens per centimetre	-	Continuous	Continuous	5401	5486	5569	5496
Dam 9S Discharge / EPL Point 4	pН	рН	6.5 - 9.0	5	5	9.1*	9.2*	9.3*	9.2*
(MTO EPL 1976) Discharge pipe from Dam 9	Total Suspended Solids	milligrams per litre	120	5	5	7.0	14.8	28.0	14.0

^{*}Note: pH exceedance results were reported to the EPA each day when discharging in accordance with a protocol agreed with the EPA.

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 13 April 2021 and the data was obtained 11 May 2021. Sampling is undertaken on a quarterly basis at WML (typically in March, June, September and December) and as such no sampling was required in April 2021.

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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
W5 – Loders Creek / EPL Point 3	Electrical Conductivity	microsiemens per centimetre	Once a month (min. of 4 weeks)	1	1	6380
(MTO EPL 1976) Coal preparation plant access road bridge	рН	pH units	Once a month (min. of 4 weeks)	1	1	7.8
	Total Suspended Solids	milligrams per litre	Once a month (min. of 4 weeks)	1	1	<5
W1 – Hunter River / EPL Point 26	Electrical Conductivity	microsiemens per centimetre	Once a quarter	0	0	-
(WML EPL 1376)	рН	pH units	Once a quarter	0	0	-
	Total Suspended Solids	milligrams per litre	Once a quarter	0	0	-
W2 – Hunter River / EPL Point 27	Electrical Conductivity	microsiemens per centimetre	Once a quarter	0	0	-
(WML EPL 1376)	рН	pH units	Once a quarter	0	0	-
	Total Suspended Solids	milligrams per litre	Once a quarter	0	0	-
W3 – Hunter River / EPL Point 28	Electrical Conductivity	microsiemens per centimetre	Once a quarter	0	0	-
(WML EPL 1376)	рН	pH units	Once a quarter	0	0	-
	Total Suspended Solids	milligrams per litre	Once a quarter	0	0	-
W5 – Loders Creek / EPL Point 29	Electrical Conductivity	microsiemens per centimetre	Once a quarter	0	0	-
(WML EPL 1376)	рН	pH units	Once a quarter	0	0	-
	Total Suspended Solids	milligrams per litre	Once a quarter	0	0	-
WW5 – Dights Creek / EPL Point 30 (WML EPL 1376)	Electrical Conductivity	microsiemens per centimetre	Once a quarter	0	0	-

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

^{# -} Sample unable to be collected due to insufficient water or unsafe access

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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**. Sampling is undertaken on a quarterly basis and as such no sampling was conducted in April 2021.

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	Faecal Coliforms	Colony forming units per 100 millilitres	Once a quarter	0	0	-
(WML EPL 1376)	рН	pH units	Once a quarter	0	0	-
Main Warkworth Staging Pond / EPL Point 15	Faecal Coliforms	Colony forming units per 100 millilitres	Once a quarter	0	0	-
(WML EPL 1376)	рН	pH units	Once a quarter	0	0	-
Warkworth Admin Envirocycle / EPL Point 16	Faecal Coliforms	Colony forming units per 100 millilitres	Once a quarter	0	0	-
(WML EPL 1376)	рН	pH units	Once a quarter	0	0	-
West Pit South Crib Hut Envirocycle / EPL Point 17	Faecal Coliforms	Colony forming units per 100 millilitres	Once a quarter	0	0	-
(WML EPL 1376)	рН	pH units	Once a quarter	0	0	-
Warkworth Medical Centre Envirocycle / EPL Point 18	Faecal Coliforms	Colony forming units per 100 millilitres	Once a quarter	0	0	-
(WML EPL 1376)	рН	pH units	Once a quarter	0	0	-
Dam 1S / EPL Point 18	Faecal Coliforms	Colony forming units per 100 millilitres	Once a quarter	0	0	-
(MTO EPL 1976)	рН	pH units	Once a quarter	0	0	-

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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 30 April 2021. The data was obtained on 1 May 2021.

TABLE 6: BLAST MONITORING (AIRBLAST OVERPRESSURE)

				EPL L	imits			Monitoring Poin	t	
Blast ID	Date and Time	Unit of Measure	Monitoring Frequency & Capture	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)
n41-gmb-pr3	1/04/2021 11:30	dB(L)		115	120	93.6	84.4	82.6	93.0	96.5
w42-bla-ptg2	1/04/2021 13:47	dB(L)		115	120	98.4	104.5	98.1	104.2	93.1
n47-rca-pr7 & n47-rcd- ps3	8/04/2021 11:52	dB(L)		115	120	99.4	102.8	91.7	104.9	92.5
n45-ble-pr2	9/04/2021 13:24	dB(L)		115	120	101.1	101.0	102.6	101.9	98.6
w30-mac-j-co2	10/04/2021 11:52	dB(L)	All Blasts 100%	115	120	88.2	85.5	101.6	96.3	94.1
n47-rca-pr6	14/04/2021 10:17	dB(L)		115	120	108.8	107.9	111.1	98.6	105.1
n45-ble-pr1	16/04/2021 11:31	dB(L)		115	120	99.7	100.4	97.8	109.9	95.2
w35-ski-jump	16/04/2021 12:19	dB(L)		115	120	96.5	97.4	92.2	102.3	93.0
w30-wwe-md5	21/04/2021 11:14	dB(L)		115	120	103.1	96.8	98.1	96.9	104.8

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				EPL Li	mits			Monitoring Poin	ıt	
Blast ID	Date and Time	Unit of Measure	Monitoring Frequency & Capture	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)
n39-gmd-ptg5	22/04/2021 11:31	dB(L)		115	120	99.2	93.3	110.0	102.8	87.8
n47-rca-pr8	23/04/2021 11:55	dB(L)		115	120	103.4	97.9	99.2	92.9	99.0
n37-bfb-h-co	23/04/2021 12:48	dB(L)		115	120	100.0	94.8	99.9	111.2	96.2
w34-bfa-ps1	24/04/2021 11:55	dB(L)		115	120	96.9	87.9	98.7	90.8	93.1
w34-bfa-ps2	26/04/2021 12:05	dB(L)		115	120	94.1	93.9	87.7	94.2	88.2
w31-wwe-ps1	27/04/2021 12:18	dB(L)		115	120	92.6	89.1	93.2	91.0	87.3
w42-bla-ptg3	28/04/2021 12:14	dB(L)		115	120	97.1	94.5	92.9	97.2	93.7
w41-rcd-ps1	29/04/2021 12:04	dB(L)		115	120	94.4	93.4	84.9	96.4	75.6
w31-wwe-ps1b	30/04/2021 12:56	dB(L)		115	120	99.6	87.6	103.5	85.3	93.4
				Monthly	Meaningful I	Data				
Minimum	April	dB(L)		115	120	88.2	84.4	82.6	85.3	75.6
Mean	April	dB(L)		115	120	98.1	95.2	97.0	98.3	93.7
Maximum	April	dB(L)		115	120	108.8	107.9	111.1	111.2	105.1
Median	April	dB(L)		115	120	98.8	94.7	98.1	97.1	93.6

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TABLE 7: BLAST MONITORING (GROUND VIBRATION)

				EPL L	imits			Monitoring Poin	t	
Blast ID	Date and Time	Unit of Measure	Monitoring Frequency & Capture	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)
n41-gmb-pr3	1/04/2021 11:30	mm/s		5	10	0.01	0.02	0.03	1.00	0.02
w42-bla-ptg2	1/04/2021 13:47	mm/s		5	10	0.13	0.14	0.03	0.65	0.11
n47-rca-pr7 & n47-rcd- ps3	8/04/2021 11:52	mm/s		5	10	0.66	0.74	0.11	1.12	0.36
n45-ble-pr2	9/04/2021 13:24	mm/s		5	10	0.35	0.9	0.13	0.97	0.32
w30-mac-j-co2	10/04/2021 11:52	mm/s		5	10	0.05	0.05	0.03	0.18	0.04
n47-rca-pr6	14/04/2021 10:17	mm/s		5	10	0.55	0.73	0.09	0.72	0.37
n45-ble-pr1	16/04/2021 11:31	mm/s	All Blasts 100%	5	10	0.63	1.01	0.17	3.50	0.38
w35-ski-jump	16/04/2021 12:19	mm/s		5	10	0.24	0.11	0.03	0.23	0.14
w30-wwe-md5	21/04/2021 11:14	mm/s		5	10	1.04	0.87	0.37	1.2	0.83
n39-gmd-ptg5	22/04/2021 11:31	mm/s		5	10	0.21	0.21	0.03	0.29	0.14
n47-rca-pr8	23/04/2021 11:55	mm/s		5	10	0.72	1.07	0.1	0.66	0.32
n37-bfb-h-co	23/04/2021 12:48	mm/s		5	10	0.07	0.1	0.02	0.26	0.06
w34-bfa-ps1	24/04/2021 11:55	mm/s		5	10	1.01	0.46	0.33	0.62	1.38

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				EPL Li	imits	Monitoring Point					
Blast ID	Date and Time	Unit of Measure	Monitoring Frequency & Capture	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)	
w34-bfa-ps2	26/04/2021 12:05	mm/s		5	10	0.75	0.96	0.26	1.89	0.87	
w31-wwe-ps1	27/04/2021 12:18	mm/s		5	10	1.25	0.83	0.19	1.91	1.02	
w42-bla-ptg3	28/04/2021 12:14	mm/s		5	10	0.08	0.06	0.03	0.62	0.07	
w41-rcd-ps1	29/04/2021 12:04	mm/s		5	10	0.02	0.03	0.02	0.69	0.02	
w31-wwe-ps1b	30/04/2021 12:56	mm/s		5	10	1.19	0.41	0.16	0.31	0.57	
				Monthly	/ Meaningful I	Data					
Minimum	April	mm/s		5	10	0.01	0.02	0.02	0.18	0.02	
Mean	April	mm/s		5	10	0.50	0.48	0.12	0.93	0.39	
Maximum	April	mm/s		5	10	1.25	1.07	0.37	3.50	1.38	
Median	April	mm/s		5	10	0.45	0.44	0.10	0.68	0.32	

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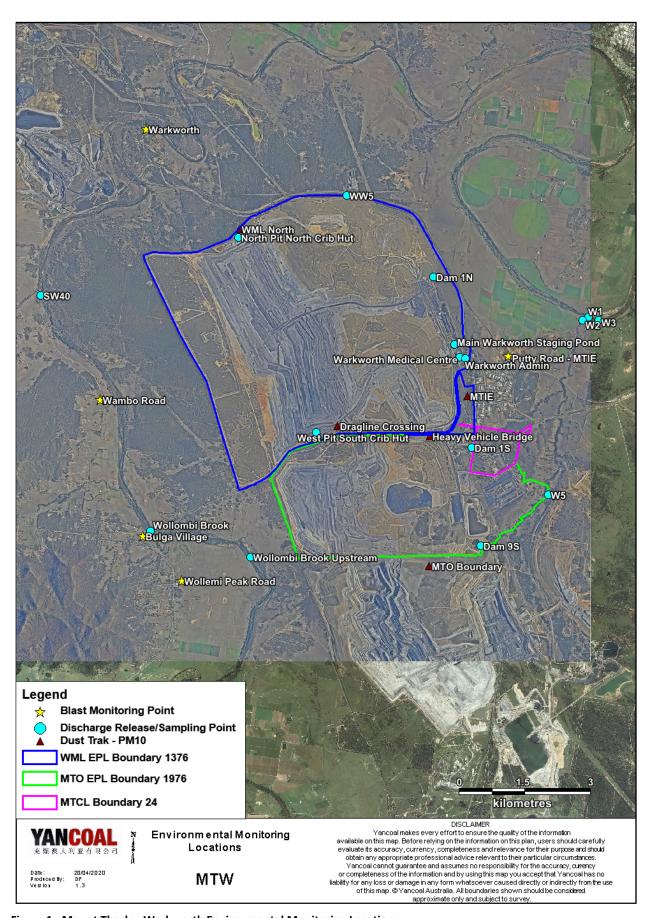


Figure 1: Mount Thorley Warkworth Environmental Monitoring Locations

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