

**WAMBO COAL
BLAST MONITORING RESULTS
1 JANUARY 2019 – 31 DECEMBER 2019**

Published 06 August 2020

Environment Protection Licence Number: 529

Licensee: Wambo Coal Pty Limited, PMB 1, Singleton NSW 2330

Premises: Wambo Coal Pty Limited, Jerrys Plains Road, Warkworth NSW 2330

Wambo Coal has approval to blast in accordance with DA 305-7-2003 and EPL 529.

During the 2019 Calendar year Wambo Coal conducted a total of 97 blast events occurred, all of which were monitored at EPL locations 10, 11 and 12.

EPL 529 outlines several specific conditions in relation to blast monitoring. These include;

- L6.2 - The airblast overpressure level from blasting operations in or on the premises must not exceed: 115 dB (Lin Peak) for more than 5% of the total number of blasts during each reporting period; at either monitoring point 10, 11 or 12 in Condition P1.3.
- L6.3 - The airblast overpressure level from blasting operations in or on the premises must not exceed: 120 dB (Lin Peak) at any time; at either monitoring point 10, 11 or 12 in Condition P1.3.
- L6.4 - The ground vibration peak particle velocity from blasting operations carried out in or on the premises must not exceed: 5 mm/second for more than 5% of the total number of blasts during each reporting period; at either monitoring point 10, 11 or 12 in Condition P1.3.
- L6.5 - The ground vibration peak particle velocity from blasting operations carried out in or on the premises must not exceed: 10 mm/second at any time; at either monitoring point 10, 11 or 12 in Condition P1.3

A summary of blast compliance is outlined in Table 1.

Table 1 Summary of Blast Compliance

Parameter	Criteria	Results Exceeding Approval Criteria					
		BM02		BM05		BM07	
		No.	%	No.	%	No.	%
Airblast Overpressure Level (dB Lin Peak [dBL])	115	0	0	1*	1.03	1	1.03
	120	0	0	1*	1.03	0	0
Ground Vibration Peak Particle Velocity (mm/s)	5	0	0	0	0	0	0
	10	0	0	0	0	0	0

Note: dBL = low frequency noise levels.

* Only one event resulted in an airblast overpressure greater than 115 dBL at BM05. This event was also over 120 dBL and has been recorded against both of these criteria.

Less than 5% of all blasts recorded overpressure greater than 115 dBL,

One blast during the reporting period recorded an overpressure over 120 dB (120.6 dB) at BM05 on 21 September 2019. No blasts at BM02 or BM07 recorded overpressure greater than 120 dBL.

No blast recorded a vibration of greater than 5mm/s during the reporting period.

A review of the blast that occurred on 21st September resulted in the following findings;

- At the time of firing nothing perceptibly out of the ordinary was observed (neither loud noise or excessive flyrock)
- There have been no complaints from neighbouring properties
- Review of the blast indicates no fundamental flaws in the design process
- Wave trace of overpressure from blast indicates an immediate spike with no build up
- Review of video footage supports this with no dramatic burden failure or stemming relief
- Possible low frequency mass air movement generated from free face geometry and piston movement
- Dyke through the blast may have led to weaker than normal rock strength parallel to the open face, leading to stemming relief and possible propagation of air-blast.
- After review of post drilling photographs no cutting piles showed an intersection with the dyke but review of muck-pile and video indicate that the dyke structure was larger than anticipated
- The two open faces may have focused the initial pulse of air movement
- Peer and consultant review of design and video supports the above findings.

Table 2 provides the monitoring results for all blast that occurred in the 2019 calendar year.



Table 2 - 2019 Blast Monitoring Results

Blast Description	Date/Time	Kelly (EPA10)		Mueller (EPA 11)		Thelander (EPA12)	
		Max R (mm/s)	Max AB (dBL)	Max R (mm/s)	Max AB (dBL)	Max R (mm/s)	Max AB (dBL)
M_27WRA_341	4/01/2019 12:04	0.06	88.9	0.52	107.6	0.58	98.7
HD_WWA_340	9/01/2019 11:07	0.15	103.8	0.45	105.9	0.3	98.4
M_27WTA_350	18/01/2019 11:55	0.63	103	0.04	92.6	0.04	92.5
M_27WRA_346	18/01/2019 12:07	0.03	90.5	0.5	105	0.59	99.2
ME_WMA_349	23/01/2019 13:54	0.27	100.1	1.88	108.3	1.16	99.8
M_27WRA_351	30/01/2019 14:15	0.09	96.3	0.4	110.7	0.28	99
M_27WRC_347	30/01/2019 14:20	0.06	90.3	0.66	107.6	0.48	99.8
M_27WRA_353	8/02/2019 14:28	0.13	98.1	0.37	99.1	0.24	94.1
M_27WRC_355	8/02/2019 14:34	0.11	101.9	0.43	106.6	0.39	104
HD_WWA_352	8/02/2019 14:43	0.18	104.7	0.37	106	0.19	98.3
M_27WMA_356	18/02/2019 11:00	0.12	108.7	1.96	108.9	2.23	100.7
M_27WRA_348	18/02/2019 11:10	0.06	96	0.31	105.7	0.2	96.2
M_27WRA_357/359	5/03/2019 15:54	0.22	97.9	0.41	100.5	0.3	93.2
M_27WRC_360	5/03/2019 16:11	0.06	94.5	1.05	106.5	1.18	97.2
ME_2WMB_363 & M_27WRC_108_362	5/03/2019 16:15	0.1	94.8	0.93	107.1	0.78	102.3
M_27WMA_358	12/03/2019 12:03	0.09	99.9	1.85	104.5	1.91	97.4
ME_2WTA_354	12/03/2019 12:23	0.07	93.1	1.29	109.3	0.96	103.7
HD_WWA_371	25/03/2019 15:55	0.1	101.7	0.18	110	0.11	103.2
HD_RCA_367/369	25/03/2019 16:01	0.05	101.6	0.1	98.3	0.00	81.1
M_27WRC_365	25/03/2019 16:08	0.09	106.8	1.1	107.3	1.08	105.6
M_27WRC_364	29/03/2019 11:06	0.06	97.2	0.76	110.8	0.82	103.4
M_27MWA_366	8/04/2019 12:06	0.39	103.3	1.68	110.4	1.53	97.6



Blast Description	Date/Time	Kelly (EPA10)		Mueller (EPA 11)		Thelander (EPA12)	
		Max R (mm/s)	Max AB (dBL)	Max R (mm/s)	Max AB (dBL)	Max R (mm/s)	Max AB (dBL)
M_27WRA_375 & M_27WRA_377	8/04/2019 12:17	0.12	102.3	0.56	110.1	0.24	101
M_27WRA_372 & HD_RCA_373	8/04/2019 12:25	0.06	103.8	0.27	108.2	0.16	98
HD_RCA_378 & HD_WWA_380	13/04/2019 10:00	0.01	82.6	0.13	105.8	0.09	101.8
M_27WMA_374	26/04/2019 10:08	0.12	85.7	2.4	107.7	1.84	99.7
HD_RCA_376	26/04/2019 10:20	0.02	83.5	0.09	91.9	0.06	89.4
M_27WMA_379	26/04/2019 10:27	0.3	90.9	1.08	109.6	0.88	99.3
M_27WRA_381	2/05/2019 11:12	0.05	77.5	0.19	101.1	0.14	95.4
M_27WRA_382	2/05/2019 11:22	0.12	98.9	0.26	101.9	0.16	96.5
M_27WMA_385	7/05/2019 14:31	0.1	84.6	0.71	109.6	0.69	101.9
M_27WMA_383	7/05/2019 14:36	0.09	105.5	1.53	108.6	0.79	103.8
M_27WRC_384	7/05/2019 14:41	0.11	83.7	0.34	101.9	0.22	93.7
M_27WRC_386	10/05/2019 12:04	0.06	80.7	0.37	105.6	0.42	96.2
HD_RCA_387	14/05/2019 11:24	0.03	88.1	0.09	95.4	0.05	90.5
M_27WRC_389	14/05/2019 11:30	0.22	101	0.33	101.5	0.23	93.2
HD_RCA_388/391	24/05/2019 11:09	0.06	82.2	0.14	100.5	0.09	94.1
M_WEST_DOZER_390	24/05/2019 11:16	0.1	81.5	0.44	101.6	0.33	92.2
M_27WRC_392	24/05/2019 11:28	0.16	82.4	0.74	106.2	1.64	98
M_27WMA_393	31/05/2019 12:02	0.17	75.2	2.57	100.5	2.59	97
M_27WRC_396 & M_27WMA_399	6/06/2019 11:13	0.21	82.2	0.99	107.2	0.95	99.3
M_27WRC_402	6/06/2019 11:24	0.14	79.5	0.28	99.4	0.21	95.6
M_27WMA_401	12/06/2019 14:21	0.04	78.9	0.41	94.7	0.33	90.7
HD_RCA_395	12/06/2019 14:34	0.05	77	0.1	97.1	0.07	91.3
M_27WMA_397	18/06/2019 14:25	0.21	79.2	2.45	98.9	2.65	96.2
M_27WMA_403	29/06/2019 12:03	0.24	80.7	2.71	104.8	1.87	96.6
W_27WMA_407	29/06/2019 12:13	0.28	89.4	1.04	113.6	1.2	100.8

Blast Description	Date/Time	Kelly (EPA10)		Mueller (EPA 11)		Thelander (EPA12)	
		Max R (mm/s)	Max AB (dBL)	Max R (mm/s)	Max AB (dBL)	Max R (mm/s)	Max AB (dBL)
M_WRA_404	29/06/2019 12:24	0.08	79.5	0.34	98.7	0.19	93.8
M_27WMA_405	17/07/2019 15:46	0.14	79.5	2.17	100.6	1.88	93.2
M_27WRA_408 & 409	17/07/2019 15:58	0.1	95	0.42	107.6	0.31	101.6
M_27WTA_414	19/07/2019 12:01	0.04	102.4	0.48	104.8	0.68	98.2
M_27WRA_410/411	19/07/2019 12:08	0.18	92.5	0.73	103.4	0.36	96.5
M_27WRA_413 & 416	26/07/2019 11:32	0.2	81.2	0.52	104.7	0.28	96.2
HS_WRA_406	31/07/2019 12:03	0.54	102.1	0.04	103	0.03	85.5
M_27WTA_420	7/08/2019 14:34	0.05	79.2	0.52	96.9	0.33	92.5
M_27WRC_417	7/08/2019 14:38	0.07	94.6	0.29	97.7	0.21	95
M_WMA_412	7/08/2019 14:48	0.09	80.2	1.12	104.2	1.45	98.8
M_27WRA_418	15/08/2019 15:16	0.15	100.7	0.48	105.7	0.19	97.8
M_27WMA_421	16/08/2019 12:29	0.31	103	1.2	107.8	0.81	101
M_27WMA_419	28/08/2019 14:44	0.14	83.3	1.07	104.3	1.1	101
M_27WRA_423	28/08/2019 14:50	0.14	101.9	0.36	110.5	0.23	100.9
M27WRC_422	28/08/2019 14:58	0.12	82.4	0.52	102.9	0.37	95.8
M_27WMA_426	6/09/2019 12:00	0.04	79.9	0.47	107.3	0.41	106
MW_WWA_427	12/09/2019 15:50	0.15	76.2	0.82	108.5	1.35	104.4
HS_WMA_430	13/09/2019 11:59	0.78	98.1	0.05	96.9	0.06	83.4
M_WTA_431	21/09/2019 11:59	0.11	85.9	1.52	105.7	1.67	95.7
M_WMA_433	21/09/2019 12:09	0.21	80.2	1.17	120.6	0.89	115.9
M_27WMA_432	27/09/2019 12:08	0.1	95.1	0.81	103.2	0.84	92.7
M_27WMA_435	27/09/2019 12:15	0.15	105.5	0.81	104.6	0.58	91.3
M_WTA_436	4/10/2019 12:03	0.06	88.1	0.3	98	0.26	90
M_WMA_424	4/10/2019 12:17	0.1	90.9	1.61	107.6	1.83	103.1
M_WMA_438	16/10/2019 14:42	0.12	97	0.32	108.4	0.22	103.5



Blast Description	Date/Time	Kelly (EPA10)		Mueller (EPA 11)		Thelander (EPA12)	
		Max R (mm/s)	Max AB (dBL)	Max R (mm/s)	Max AB (dBL)	Max R (mm/s)	Max AB (dBL)
M_WTA_441	16/10/2019 14:52	0.04	78.2	0.24	89.1	0.22	85.2
M_WMA_429	16/10/2019 14:56	0.12	80.2	1.05	109.2	0.65	101.9
M_WMA_437	18/10/2019 12:01	0.22	87.6	0.82	100.4	0.65	99.4
M_27WMA_434	18/10/2019 12:06	0.02	92.5	0.3	95	0.24	93
M_WMA_442	25/10/2019 12:04	0.21	94.8	0.66	95.7	0.37	100.2
M_WRC_440	25/10/2019 12:12	0.12	99.6	0.34	103.3	0.25	96.2
M_West Dozer_448	6/11/2019 14:30	0.05	87.4	0.24	98	0.24	98.1
M_WMA_444	6/11/2019 14:39	0.17	85.3	0.82	100.3	0.57	96.3
M_WRC_443	6/11/2019 14:48	0.13	110.1	0.26	100.4	0.17	93.6
M_27WMA_450/452	8/11/2019 12:10	0.05	107.4	0.21	99.6	0.12	95.2
M_WMA_445	14/11/2019 15:49	0.1	90	0.39	91.2	0.33	92.7
M_MWA_449	14/11/2019 15:58	0.27	88.3	1.02	101.2	0.6	95.7
M_WTA_454	14/11/2019 16:04	0.06	84.8	0.78	107.5	0.6	99.5
ME_WTA_455	21/11/2019 15:35	0.2	96.5	0.23	98.4	0.11	93.6
M_WRA_453	21/11/2019 15:51	0.08	94.6	0.17	99	0.16	92.1
M_WMA_451	21/11/2019 15:57	0.17	80.2	1.01	98	0.45	90.3
M_WRC_457	3/12/2019 15:39	0.09	95.3	0.46	108.4	0.19	94.9
M_WMA_458	3/12/2019 15:46	0.04	102.5	0.72	101.7	0.55	101.1
M_27WTA_462 & M_27WMA_460	6/12/2019 12:24	0.03	101.8	0.27	100.2	0.23	91.9
M_27WMA_461	10/12/2019 15:34	0.02	82.9	0.26	96.8	0.18	88.5
M_27WMA_465	10/12/2019 15:37	0.17	89.8	0.47	101	0.3	93.1
ME_WTA_463	19/12/2019 15:37	0.06	92.1	0.09	96.3	0.05	90.5
M_27WRC_456	19/12/2019 15:46	0.1	78.9	0.35	97	0.31	92.4
M_27WMA_464	19/12/2019 15:53	0.08	77.8	0.52	103	0.45	98.2
HS_WRA_466	20/12/2019 11:59	0.44	103.2	0.02	109	0.03	82.8

Blast Description	Date/Time	Kelly (EPA10)		Mueller (EPA 11)		Thelander (EPA12)	
		Max R (mm/s)	Max AB (dBL)	Max R (mm/s)	Max AB (dBL)	Max R (mm/s)	Max AB (dBL)
No. Blast <5mm/s		0		0		0	
No. Blast <10mm/s		0		0		0	
% Blast <5mm/s		0		0		0	
No. Blast < 115db		0		1		1	
% Blast < 115db		0		1.03		1.03	
No. Blast < 120db		0		1		0	