

WAMBO COAL PTY LIMITED

**MONTHLY ENVIRONMENTAL MONITORING
REPORT**

August 2013

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1.0 Introduction

This report presents environmental monitoring results for the reporting period **Thursday 1 to Saturday 31 August 2013**. Monitoring during this period includes meteorological measurement, surface and ground water sampling, depositional dust sampling, High Volume Air Sampling (HVAS), blasting events and PM10 real time air monitoring results. Real time noise monitoring results are reported in a quarterly format and can be found on the Peabody Wambo website at <http://www.peabodyenergy.com/content/404/Australia-Mining-New/New-South-Wales/Wambo-Mine>

2.0 Meteorological Data

Results for reporting period are available in **Appendix A**.

3.0 Surface Water Sampling

Surface water samples are collected in accordance with **AS/NZS 5667.4:1998 – Guidance on sampling from lakes, natural and man-made** and **AS/NZS 5667.6:1998 – Guidance on sampling of rivers and streams**. All samples collected were analysed in the field for **pH**, electrical conductivity (**EC**) and temperature. Selected sites were analysed in a **NATA*** accredited laboratory for total suspended solids (**TSS**) and total dissolved solids (**TDS**).

*National Association of Testing Authorities - NATA is the authority that provides independent assurance of technical competence.

Surface water reporting for the period recorded that EC levels were outside the criteria limits at SW07 and SW44. Surface water reporting for the period recorded that TSS levels were outside the criteria limits at SW44 and SW55.

Table 1: Monthly Surface Water Results – August 2013

Sample Location	pH	EC (µS/cm)	TSS (mg/L)	TDS (mg/L)	Oil & Grease (mg/L)	Temp (°C)	Comments
WOLLOMBI BROOK							
Wollombi Brook							
SW01 - Wollombi Brook Up	7.70	689	6	320	-	17.5	-
SW03 - Wollombi Brook Pump Out	7.60	702	10	278	<2	15.7	-
SW02 - Wollombi Brook Down	7.60	697	6	333	<2	15.5	-
SW40 - Confluence with SWC	8.00	700	6	387	-	17	-
NORTH WAMBO CREEK							
North Wambo Creek							
SW04 - North Wambo Creek Up	-	-	-	-	-	-	Sample site dry
SW27a - North Wambo Creek Middle Lower	-	-	-	-	-	-	Sample site dry
SW32a - North Wambo Creek Pump	-	-	-	-	-	-	Sample site dry
SW05 - North Wambo Creek Down	7.60	2,060	9	1,150	-	12.5	-
SOUTH WAMBO/STONY CREEKS							
South Wambo/Stony Creek							
SW06 - South Wambo Creek	7.20	516	5	240	-	14.5	-
SW07 - South Wambo/Stony Creek	7.60	800	3	363	-	13.5	-
SW08 - Stony Creek	-	-	-	-	-	-	Sample site dry
LONGFORD/DOCTOR'S CREEKS							
SW43 - Longford Creek Up	7.40	255	23	175	2.0	16.2	-
SW44 - Longford Creek Down	7.40	635	54	686	<2	15.6	-
SW46 - Doctors Creek Up	8.80	9,650	22	5,960	<2	19.3	-
SW45 - Doctors Creek Down	8.80	9,770	29	5,870	2.0	20.2	-
WATERFALL CREEK							
SW39 - Waterfall Creek Midstream	-	-	-	-	-	-	Sample site dry
MINE WATER DAMS							
SW11 - West Cut Dam Pipe	Not Pumping						
SW12 - West Cut Dam	8.8	6100	-	-	-	7.8	-
SW14 - Box Cut Dam (Admin)	8.8	689	-	-	-	12.3	-
SW15 - Eagles Nest Dam	8.8	6800	68	3950	<2	13.1	-
SW20 - Dam Adjacent to West Cut Dam	8.40	5,650	-	-	-	10.2	-
SW29 - SCB Dam	8.20	1,655	-	-	-	11	-
SW30 - Turkeys Nest	9.00	6,890	-	-	-	13	-
SW31 - Gordon Below Franklin	9.20	5,230	-	-	-	13.6	-
SW37 - Wollemi Sump	8.60	2,190	-	-	-	10	-
SW38 - Homestead Open Cut	8.70	7,040	-	-	-	14.5	-
SW47 - NWU Pumpout Water	-	-	-	-	-	-	Sample site dry
SW48 - Inpit sample	8.30	6,280	-	-	-	16.4	-
SW49 - Bates Pit Pumpout	6.30	1,002	-	-	-	15.3	-
SW51 - South Dam	8.8	7100	-	-	-	14.3	-
SW50 - Hunter River Water	Not Pumping						

Note: Figures in bold fall outside trigger levels.

4.0 Groundwater Sampling

Table 2: Ground Water Results – August 2013

Sample Location	pH	EC (µS/cm)	Depth to Water (m)	Temp (°C)	Comments
GW02	-	-	-	-	-
GW11	6.90	621	4.06	17.1	-
P106	7.00	520	7.81	20.5	-
P109	6.80	979	4.62	18.3	-
P110	6.50	713	4.6	18.20	-
P111	6.50	689	5.90	19.2	-
P114	6.50	5,840	5.46	18.7	-
P116	6.80	794	5.11	18.9	-
P202	7.50	5,550	8.28	19.1	-
P206	7.40	2,280	15.11	19.8	-
P301	6.60	5,810	15.29	18.8	-
P311	-	-	-	-	Collapsed
P315	6.00	445	7.32	18.0	-
GW12	6.8	21800	11.00	21.6	-
GW13	6.9	3780	5.19	19.8	-
GW14	-	-	-	-	Bore dry
GW15	6.8	879	10.50	20.1	-
GW16	7.7	831	7.14	18.4	-
GW17	7.1	4640	10.15	19.0	-
GW18	-	-	-	-	Bore dry
GW19	-	-	-	-	Bore dry
GW20	GW20 is a vibration wire multi-piezometer installation				
GW21	-	-	-	-	Bore dry
GW22	8.4	6930	35.81	22.2	-
P1	6.91	7,800	26.23	-	*
P3	-	-	-	-	Removed
P5	7.68	718	10.42	-	*
P6	7.53	839	7.96	-	*
P11	-	-	32.32	-	*
P12	7.47	625	6.93	-	*
P13	6.59	1,063	7.11	-	*
P15	7.66	6,940	6.14	-	*
P16	7.32	7,910	7.33	-	*
P17	7.56	10,240	6.17	-	*
P18	7.45	7,820	7.59	-	*
P20	7.31	9,630	7.91	-	*

Note: All depths measured to top of casing, except United bores which are to ground. Figures in bold are outside trigger levels listed in Table 5 of the Ground Water Monitoring Programme (GWMP), which is part of the Site Water Management Plan.

* Represents data that is provided on a quarterly basis. The results are to be updated once available.

5.0 Depositional Dust Sampling

Fifteen (Table 3) depositional dust gauges were collected for the reporting period. Sampling and analysis is conducted in accordance with AS 3580.10.1 – 1991 – *Determination of particulates – Deposited matter – Gravimetric method*. All gauges were analysed for insoluble solids (IS) and ash residue (AS). Field observations include water quantity and quality, and any visible contaminants in the sample.

Table 3: Dust Deposition Results – August 2013

Site	Insoluble Solids (IS) (g/m ² .month)	Ash Residue (AR) (g/m ² .month)	IS:AR Ratio	IS YTD Average (g/m ² .month)	AR YTD Average (g/m ² .month)
D01	4.6	15.4	335	7.8	5.8
D03	1.8	2.6	144	2.9	2.3
D07	2.5	4.0	160	4.6	3.3
D09	2.6	4.6	177	4.3	2.9
# D11	0.6	0.7	117	2.7	1.9
# D12	1.6	2.3	144	2.7	2.2
# D17	0.4	1.0	250	3.3	1.7
D19	1.3	2.3	177	2.8	2.1
D20	1.1	1.6	145	1.7	1.2
# D21	0.50	0.80	160	2.0	1.7
# D22	1.5	2.7	180	2.0	1.7
D23	1.0	1.2	120	1.6	1.1
# D24	Access to gauge suspended until further notice.				
# D25	0.6	0.9	150	2.5	1.8
D26	0.3	0.3	100	1.2	0.9

Note:

Results in **bold** are YTD average above 4g/m²/month (YTD are calculated on a calendar year)

Results # are dust gauges not on WCPL owned land. DD gauges on Wambo Coal land and above criteria level are not considered non-compliance.

Insoluble solid results are reported on the **annual average** of **4g/m²/month** of all **uncontaminated results** which are not located on Wambo Coal owned land. All depositional dust gauges located outside of Wambo owned land were within prescribed criteria level for the reporting period.

6.0 High Volume Air Sampling

Four high volume air sampler (HVAS) operated at locations surrounding Wambo during the reporting period (Table 4). All units sampled Total Suspended Particulates (TSP) over a 24-hour period on a six day cycle, in accordance with AS 2724.3 – 1984 – *Determination of total suspended particulates (TSP) – High volume sampler gravimetric method*.

Table 4: HVAS Results – August 2013

Date of Run	HV01 - Coralie TSP ($\mu\text{g}/\text{m}^3$)	HV02 - Caban TSP ($\mu\text{g}/\text{m}^3$)	HV03 - Thelander TSP ($\mu\text{g}/\text{m}^3$)	HV04 - Muller TSP ($\mu\text{g}/\text{m}^3$)
01/08/13	29.1	37.6	29.2	39
07/08/13	47.6	61.5	13.8	12
13/08/13	27.9	59	10.4	9.2
19/08/13	103	72.6	20.3	18
25/08/13	40.2	73.5	17.1	12.1
31/08/13	63.3	78.7	39.1	34.8
Monthly Mean	52	64	22	21
Yearly Mean	56	57	39	47

(YTD are calculated on calendar year)

Reported yearly means are below the yearly mean reporting criteria of $90\mu\text{g}/\text{m}^3$.

7.0 Blast Events

Five monitoring sites measure ground vibration and air blast overpressure for blasts conducted at Wambo. Seven blasts were conducted during the reporting period. Monitoring at all five sites is conducted under the blast monitoring requirements set out in the **Wambo EPA licence (EPL 529) and DA 305-7-2003**.

Wambo continues to comply with the EPL condition that 95 per cent of all blasts (in a reporting year) shall have overpressure results less than 115dB (linear peak) and ground vibration results less than 5 mm/s.

Table 5: Blast Results – August 2013

Date	Time	Location	Kelly Residence – A0728			Wambo Homestead – A0722			Harris Site – A6006			Muller Residence – A6005		
			Over Pressure (dB(L))	Vibration (mm/s)	Wave-form	Over Pressure (dB(L))	Vibration (mm/s)	Wave-form	Over Pressure (dB(L))	Vibration (mm/s)	Wave-form	Over Pressure (dB(L))	Vibration (mm/s)	Wave-form
01/08/13	15:39	M15WRC1	94.2	0.10	Yes	88.7	0.13	Yes	94.4	0.11	Yes	110.9	0.55	Yes
07/08/13	11:13	M12WMA2	*	*	*	95.5	0.44	Yes	98.6	0.33	Yes	109.4	0.83	Yes
12/08/13	09:19	M16RCA2	102.3	0.05	Yes	102.3	0.05	Yes	105.9	0.05	Yes	107.6	0.33	Yes
14/08/13	15:36	M17RCA2	96.3	0.05	Yes	101.3	0.04	Yes	97.2	0.05	Yes	107.2	0.22	Yes
21/08/13	11:11	M12WMA3	95.7	0.27	Yes	105.2	0.42	Yes	99.3	0.46	Yes	106.2	0.88	Yes
27/08/13	14:08	M14WRC2	92.5	0.09	Yes	94.0	0.10	Yes	97.9	0.11	yes	93.9	0.27	Yes
30/08/13	15:17	M5WRC1	105.1	0.08	Yes	*	*	No	110.7	0.05	Yes	106.4	0.09	Yes

*No SMS received for monitor, network issue.

Date	Time	Location	Thelander Residence – A0728		
			Over Pressure (dB(L))	Vibration (mm/s)	Wave-form
01/08/13	15:39	M15WRC1	102.9	0.7	Yes
07/08/13	11:13	M12WMA2	104	1.08	Yes
12/08/13	09:19	M16RCA2	95.9	0.35	Yes
14/08/13	15:36	M17RCA2	98.4	0.3	Yes
21/08/13	11:11	M12WMA3	102	0.99	Yes
27/08/13	14:08	M14WRC2	97.7	0.23	Yes

8.0 Real-Time Air Quality Monitoring

Four real time Tapered Element Oscillating Microbalance (**TEOM**) units were in operation during the reporting period. The sites are located at Coralie (**PM01**), the Caban residence (**PM02**), Thelander residence (**PM03**) and the Muller residence (**PM04**). These units measure particulate matter less than 10 microns in diameter (PM_{10}) on a continuous basis and provide a 24 hour average result. These units operated and sampled in accordance with **AS 3580.9.8 - 2002, *Method for Sampling and Analysis of Ambient Air - Determination of Suspended Particulate Matter - PM_{10} Continuous Direct Mass Method using a Tapered Element Oscillating Microbalance Analyser.***

All **PM10** sites were within the yearly average criteria limits of **30ug/m³** for this reporting period.

Table 6: PM10 Results – August 2013

Date of Run	AQ01 (Coralie)		AQ02 (Wambo Road)		AQ03 (Thelander)		AQ04 (Muller)	
	PM10 24 Hour Result (ug/m ³)	YTD Average	PM10 24 Hour Result (ug/m ³)	YTD Average	PM10 24 Hour Result (ug/m ³)	YTD Average	PM10 24 Hour Result (ug/m ³)	YTD Average
01/08/13	11.8	17.95	11.6	19.58	12.5	15.97	12.9	15.73
02/08/13	12.1	17.92	22.5	19.59	8.0	15.93	7.4	15.69
03/08/13	9.5	17.88	12.6	19.56	7.7	15.89	5.9	15.64
04/08/13	10.4	17.85	16.4	19.54	8.4	15.85	6.8	15.60
05/08/13	16.6	17.84	27.3	19.58	13.3	15.84	12.0	15.58
06/08/13	16.2	17.84	22.9	19.59	10.5	15.81	8.8	15.55
07/08/13	16.2	17.83	22.3	19.61	8.8	15.78	7.4	15.52
08/08/13	6.7	17.78	5.2	19.54	4.5	15.73	3.2	15.46
09/08/13	7.6	17.73	13.8	19.52	5.0	15.68	3.9	15.41
10/08/13	10.3	17.70	17.3	19.51	6.3	15.63	5.4	15.36
11/08/13	12.3	17.67	12.0	19.47	6.4	15.59	5.5	15.32
12/08/13	19.1	17.68	13.1	19.44	6.7	15.55	6.2	15.28
13/08/13	9.9	17.65	18.6	19.44	8.1	15.52	6.1	15.24
14/08/13	9.8	17.61	22.0	19.45	8.2	15.48	6.7	15.20
15/08/13	11.5	17.58	16.1	19.44	10.3	15.46	10.8	15.18
16/08/13	18.1	17.59	43.6	19.54	15.3	15.46	15.7	15.18
17/08/13	27.1	17.63	29.1	19.58	16.0	15.46	15.7	15.18
18/08/13	10.2	17.60	20.0	19.59	7.4	15.43	5.9	15.14
19/08/13	24.9	17.63	27.2	19.62	9.7	15.40	7.7	15.11
20/08/13	12.8	17.61	20.3	19.62	6.8	15.36	4.6	15.07
21/08/13	9.8	17.57	31.3	19.67	7.9	15.33	6.3	15.03
22/08/13	9.5	17.54	20.4	19.67	8.1	15.30	6.8	14.99
23/08/13	28.2	17.58	28.2	19.71	9.5	15.27	7.8	14.96
24/08/13	12.4	17.56	46.2	19.82	10.6	15.25	11.4	14.95
25/08/13	12.3	17.54	25.8	19.85	9.5	15.23	6.9	14.91
26/08/13	16.3	17.53	43.8	19.95	10.2	15.20	13.0	14.91
27/08/13	17.8	17.54	42.1	20.04	13.5	15.20	16.2	14.91
28/08/13	25.5	17.57	34.4	20.10	19.1	15.21	20.4	14.93
29/08/13	46.0	17.69	43.0	20.20	41.9	15.33	42.8	15.05
30/08/13	37.0	17.77	52.0	20.33	24.6	15.37	23.0	15.08
31/08/13	21.4	17.78	54.7	20.47	15.9	15.37	14.2	15.08

Note:

Results in **red** are greater than the 24hr period guidelines of 50ug/m³

Results in **bold** are between 30ug/m³ and 50ug/m³

* Represents a value where the data could not be retrieved due to an operational error with the monitor.

YTD are calculated on calendar year

Appendix A
Wambo Weather Station
Meteorological Data

Meteorological Data August 2013

Date	Temp (2m) °C			Temp (10m) °C			Temp Inversion °C/100m			Relative Humidity %			Solar Radiation W/m ²			Rain mm	Wind Speed (m/s)		
	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	mm	Min	Avg	Max
01/08/13	2.6	10.2	18.7	4.1	11.3	18.8	-3.0	13.6	36.3	42.0	79.2	98.0	0.2	304.6	424.6	0.0	0.4	1.2	1.9
02/08/13	2.5	10.7	20.5	3.5	11.8	20.7	-11.2	14.2	65.5	33.3	72.9	98.0	39.8	317.4	466.4	0.0	0.5	1.8	3.3
03/08/13	10.0	13.8	18.7	10.8	14.3	18.8	-2.9	5.9	16.0	35.3	50.4	67.3	106.5	335.3	461.0	0.0	1.2	2.8	3.8
04/08/13	7.3	13.0	18.5	9.3	13.6	18.5	-4.2	8.0	43.2	35.4	54.1	71.9	68.1	328.4	449.7	0.0	0.7	2.8	3.9
05/08/13	5.7	12.7	18.9	8.7	13.4	19.0	-4.2	9.3	38.0	33.9	54.6	82.8	43.0	304.2	440.4	0.0	1.2	2.6	3.7
06/08/13	4.3	15.1	23.2	6.2	16.1	23.4	-2.1	12.9	38.4	24.7	50.1	83.5	-0.8	249.4	422.7	0.0	0.3	2.6	3.7
07/08/13	8.0	14.2	22.6	9.6	15.0	22.3	-3.2	10.0	34.4	34.4	68.9	96.5	-1.0	170.1	433.7	6.9	0.2	1.6	3.4
08/08/13	6.4	11.9	15.3	8.9	12.9	15.5	-2.0	12.0	52.4	46.1	66.6	96.8	17.2	282.6	431.2	0.2	0.4	2.3	3.4
09/08/13	3.2	12.1	19.4	5.3	13.0	19.4	-4.6	10.7	40.1	36.4	62.6	96.0	-0.8	243.9	415.1	0.0	0.7	2.2	3.2
10/08/13	5.7	14.8	22.7	9.1	15.9	23.0	-2.3	14.5	63.1	30.8	54.0	92.8	-0.8	237.1	430.1	0.0	0.8	2.2	3.8
11/08/13	0.9	12.1	23.1	2.7	13.5	23.2	-3.6	17.6	57.2	36.2	70.4	97.4	-1.1	229.6	479.4	0.0	0.2	1.7	3.6
12/08/13	3.4	13.9	25.1	5.4	14.9	25.3	-2.8	13.1	31.7	26.9	65.8	97.3	-2.1	207.4	584.8	0.0	0.3	2.3	3.9
13/08/13	5.2	13.4	21.3	6.9	14.3	21.2	-3.1	11.3	52.6	24.1	51.1	85.5	-2.3	182.5	665.9	0.0	0.8	2.7	3.9
14/08/13	4.8	15.0	23.4	7.4	15.9	23.6	-4.6	10.6	48.3	18.2	41.1	86.6	-2.1	152.0	679.9	0.0	0.4	2.3	3.6
15/08/13	1.4	12.2	19.2	4.2	13.1	19.0	-3.5	11.3	38.0	18.6	45.1	87.7	-3.4	235.4	685.3	0.0	0.7	2.0	3.3
16/08/13	-2.0	8.7	20.7	-0.8	9.9	20.5	-6.7	14.2	40.0	24.4	64.8	96.2	111.6	339.5	476.6	0.0	0.1	1.3	2.2
17/08/13	2.6	13.2	21.6	3.9	14.1	21.6	-1.6	11.4	33.9	32.6	64.7	96.4	-1.1	262.3	440.5	0.0	0.5	2.5	4.1
18/08/13	5.9	15.1	22.3	7.4	15.8	22.3	-4.7	9.7	30.5	22.4	44.3	75.0	61.3	327.8	436.4	0.0	0.7	2.4	3.7
19/08/13	10.0	15.0	21.5	11.0	15.6	21.5	-0.9	8.0	20.4	29.7	38.9	49.0	159.9	342.6	455.0	0.0	1.5	2.8	4.1
20/08/13	5.4	10.4	16.3	6.9	11.0	16.1	-6.2	7.3	35.4	23.5	44.5	65.3	149.1	344.2	465.2	0.0	1.3	2.4	3.2
21/08/13	3.6	10.3	17.5	4.6	10.9	16.8	-12.4	8.4	57.6	29.5	50.7	73.2	139.1	370.6	489.9	0.0	0.6	2.3	3.4
22/08/13	7.1	12.2	18.3	7.9	12.6	18.3	-4.9	5.3	11.4	30.1	50.5	65.7	126.3	352.9	488.1	0.0	1.9	2.6	3.6
23/08/13	10.4	14.8	19.0	10.9	15.3	19.1	-1.6	5.9	10.8	36.9	49.1	62.4	104.7	359.4	478.0	0.0	2.0	3.0	3.6
24/08/13	6.4	15.0	23.4	8.4	15.6	22.9	-8.6	7.7	31.2	34.3	63.1	93.4	126.4	343.7	481.8	0.0	0.2	2.1	3.1
25/08/13	2.6	12.8	24.9	3.4	14.2	24.9	-6.9	17.5	64.1	23.1	65.3	97.5	9.9	334.2	495.0	0.0	0.5	1.9	3.4
26/08/13	1.0	12.2	23.3	2.9	13.4	23.5	-8.1	15.6	53.7	24.8	62.6	95.6	34.7	336.6	501.4	0.0	0.4	1.6	3.1
27/08/13	4.3	12.7	23.9	5.7	13.9	23.9	-5.7	14.7	48.9	22.8	65.8	95.4	11.2	344.5	455.8	0.0	0.3	1.4	2.3
28/08/13	2.7	13.5	24.3	3.7	14.5	24.3	-6.4	12.9	34.2	27.3	65.2	97.4	146.7	351.6	458.1	0.0	0.3	1.7	2.7
29/08/13	4.8	14.2	23.3	6.3	15.2	23.5	-3.4	12.2	34.2	36.0	70.6	96.3	133.8	340.8	459.9	0.0	0.2	1.5	2.4
30/08/13	9.6	18.5	28.4	11.1	20.0	28.5	-5.2	18.1	82.9	23.6	59.2	96.5	11.3	310.6	429.1	0.0	0.4	2.1	3.7
31/08/13	8.0	16.5	26.2	9.5	17.7	26.2	-7.1	14.6	50.8	25.1	56.2	87.1	0.0	291.5	439.8	0.0	0.3	1.5	3.2
MONTH	-2.0	13.2	28.4	-0.8	14.2	28.5	-12.4	11.6	82.9	18.2	58.1	98.0	-3.4	294.6	685.3	7.1	0.1	2.1	4.1

