

WAMBO COAL PTY LIMITED

**MONTHLY ENVIRONMENTAL MONITORING
REPORT**

January 2014

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1.0 Introduction

This report presents environmental monitoring results for the reporting period **Wednesday 1 to Friday 31 January 2014**. Monitoring during this period includes meteorological measurement, surface and ground water sampling, depositional dust sampling, High Volume Air Sampling, 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 TSS levels EC results for SW06 outside trigger levels.

Table 1: Monthly Surface Water Results – January 2014

Sample Location	pH	EC (μ S/cm)	TSS (mg/L)	TDS (mg/L)	Oil & Grease (mg/L)	Temp ($^{\circ}$ C)	Comments
WOLLOMBI BROOK							
Wollombi Brook							
SW01 - Wollombi Brook Up	7.70	724	6	369	-	-	-
SW03 - Wollombi Brook Pump Out	7.50	1,539	13	815	<5	-	-
SW02 - Wollombi Brook Down	7.70	1,007	1	502	<5	-	-
SW40 - Confluence with SWC	7.80	796	8	437	-	-	-
NORTH WAMBO CREEK							
North Wambo Creek							
SW04 - North Wambo Creek Up	-	-	-	-	-	-	Sample site dry
SW27a - North Wambo Creek Middle Lower	-	-	-	-	-	-	Too shallow
SW32a - North Wambo Creek Pump	-	-	-	-	-	-	Sample site dry
SW05 - North Wambo Creek Down	-	-	-	-	-	-	Sample site dry
SOUTH WAMBO/STONY CREEK							
South Wambo/Stony Creek							
SW06 - South Wambo Creek	7.60	710	14	373	-	-	-
SW07 - South Wambo/Stony Creek	-	-	-	-	-	-	Sample site dry
SW08 - Stony Creek	-	-	-	-	-	-	Sample site dry
LONGFORD/DOCTOR'S CREEKS							
SW43 - Longford Creek Up	7.80	495	30	280	<5	-	-
SW44 - Longford Creek Down	-	-	-	-	-	-	Sample site dry
SW46 - Doctors Creek Up	-	-	-	-	-	-	Sample site dry
SW45 - Doctors Creek Down	-	-	-	-	-	-	Sample site dry
WATERFALL CREEK							
SW39 - Waterfall Creek Midstream	-	-	-	-	-	-	Sample site dry
MINE WATER DAMS							
SW11 - West Cut Dam Pipe	Not Pumping						
SW12 - West Cut Dam	9.10	7,780	-	-	-	-	-
SW14 - Box Cut Dam (Admin)	9.00	1,260	-	-	-	-	-
SW15 - Eagles Nest Dam	9.10	7,680	34.00	5,330	<5	-	-
SW20 - Dam Adjacent to West Cut Dam	-	-	-	-	-	-	Sample site dry
SW29 - SCB Dam	8.80	2,120	-	-	-	-	-
SW30 - Turkeys Nest	9.20	7,280	-	-	-	-	-
SW31 - Gordon Below Franklin	9.20	7,730	-	-	-	-	-
SW37 - Wollemi Sump	8.50	6,460	-	-	-	-	-
SW38 - Homestead Open Cut	8.80	9,450	-	-	-	-	-
SW47 - NWU Pumpout Water	-	-	-	-	-	-	Sample site dry
SW48 - Inpit sample	8.40	7,000	-	-	-	-	-
SW49 - Bates Pit Pumpout	8.10	4,830	-	-	-	-	-
SW51 - South Dam	9.1	8690	-	-	-	-	-
SW50 - Hunter River Water	Not Pumping						-

Note: Figures in bold fall outside trigger levels.

4.0 Groundwater Sampling

Groundwater results collected on a bi-monthly basis.

Table 2: Ground Water Results – January 2014

Sample Location	pH	EC (µS/cm)	Depth to Water (m)	Temp (°C)	Comments
GW02	-	-	-	-	-
GW11	-	-	-	-	-
P106	-	-	-	-	-
P109	-	-	-	-	-
P110	-	-	-	-	-
P111	-	-	-	-	-
P114	-	-	-	-	-
P116	-	-	-	-	-
P202	-	-	-	-	-
P206	-	-	-	-	-
P301	-	-	-	-	-
P311	-	-	-	-	-
P315	-	-	-	-	-
GW12	-	-	-	-	-
GW13	-	-	-	-	-
GW14	-	-	-	-	-
GW15	-	-	-	-	-
GW16	-	-	-	-	-
GW17	-	-	-	-	-
GW18	-	-	-	-	-
GW19	-	-	-	-	-
GW20	GW20 is a vibration wire multi-piezometer installation				
GW21	-	-	-	-	-
GW22	-	-	-	-	-
P1	-	-	-	-	-
P3	-	-	-	-	-
P5	-	-	-	-	-
P6	-	-	-	-	-
P11	-	-	-	-	-
P12	-	-	-	-	-
P13	-	-	-	-	-
P15	-	-	-	-	-
P16	-	-	-	-	-
P17	-	-	-	-	-
P18	-	-	-	-	-
P20	-	-	-	-	-

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

Fourteen (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 – January 2014

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	1.4	1.0	71	1.4	1.0
D03	1.3	1.0	77	1.3	1.0
D07	2.7	1.9	70	2.7	1.9
D09	2.0	1.6	80	2.0	1.6
# D11	0.5	0.4	80	0.5	0.4
# D12	1.8	1.5	83	1.8	1.5
# D17	1.2	0.9	75	1.2	0.9
D19	2.1	1.5	71	2.1	1.5
D20	1.1	0.9	82	1.1	0.9
# D21	2.30	1.80	78	2.3	1.8
# D22	1.5	0.9	60	1.5	0.9
D23	1.2	0.6	50	1.2	0.6
# D24	-	-	-	-	-
# D25	3.70	2.60	70	3.7	2.6
D26	2.3	1.5	65	2.3	1.5

Note:

Results in **bold** are YTD average above 4g/m²/month

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 – January 2014

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 ($\mu\text{g}/\text{m}^3$)
4/01/2014	140.0	136.0	111.0	104.0
10/01/2014	117.0	85.5	108.0	140.0
16/01/2014	173.0	139.0	140.0	122.0
22/01/2014	88.1	51.9	48.2	81.4
28/01/2014	117.0	87.6	78.6	134.0
Monthly Mean	127	100	97.2	116.3
Yearly Mean	127	100	97.2	116.3

All reported yearly means are above the reporting criteria of $90\mu\text{g}/\text{m}^3$.

7.0 Blast Events

Four 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 four sites is conducted under the blast monitoring requirements set out in the **Wambo EPA licence (EPL 529) and DA 305-7-2003**.

All measured blast events for January 2014 were within the prescribed criteria limits. The blast occurring on 2/01/2014 was not recorded due to equipment malfunction.

Table 5: Blast Results – January 2014

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
2/01/2014	11:07:00	M13WTA2	*	*	*	*	*	*	*	*	*	*	*	*
8/01/2014	11:09:00	BS2RCA1	98.7	0.31	YES	106	1.72	YES	105.6	0.6	YES	103.7	0.14	YES
10/01/2014	15:33:16	M13WTA3	92	0.22	YES	97.3	0.19	YES	96.4	0.17	YES	100.9	0.33	YES
15/01/2014	15:31:23	BS1WWD1	101	0.22	YES	109.3	1.1	YES	106.2	0.21	YES	98.7	0.12	YES
15/01/2014	14:40:21	M16WRA3	90.3	0.08	YES	92.1	0.13	YES	97.9	0.07	YES	99.3	0.45	YES
24/01/2014	13:09:00	M12WMA4	100	0.19	YES	99.5	0.3	YES	99.3	0.33	YES	105.3	0.68	YES
31/01/2014	11:07:00	M18WRA5	92	0.1	YES	*	*	*	95.4	0.09	YES	98.7	0.38	YES

*Equipment Failure – No result.

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 **$30\mu\text{g}/\text{m}^3$** , although were outside of 24hr average criteria of **$50\mu\text{g}/\text{m}^3$** for a single day during this reporting period.

Table 6
PM₁₀ Results – January 2014

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
1/01/2014	29.2	29.2	25.9	25.9	24.9	24.9	28.6	28.6
2/01/2014	28.2	28.7	32.2	29.1	24.4	24.7	21.3	25.0
3/01/2014	43.0	33.5	37.6	31.9	37.7	29.0	31.5	27.1
4/01/2014	42.7	35.8	42.3	34.5	36.4	30.9	33.6	28.8
5/01/2014	27.8	34.2	32.1	34.0	27.4	30.2	28.8	28.8
6/01/2014	35.0	34.3	33.3	33.9	29.4	30.0	26.5	28.4
7/01/2014	31.5	33.9	26.9	32.9	31.6	30.3	26.0	28.0
8/01/2014	19.0	32.1	17.4	31.0	20.5	29.0	12.2	26.1
9/01/2014	16.6	30.3	19.6	29.7	17.7	27.8	18.5	25.2
10/01/2014	20.1	29.3	17.7	28.5	21.3	27.1	25.5	25.3
11/01/2014	28.9	29.3	27.4	28.4	43.4	28.6	43.4	26.9
12/01/2014	28.7	29.2	29.1	28.5	35.3	29.2	31.0	27.2
13/01/2014	27.2	29.1	24.5	28.2	26.4	29.0	22.4	26.9
14/01/2014	24.7	28.8	32.8	28.5	25.5	28.7	31.0	27.2
15/01/2014	38.5	29.4	47.5	29.8	34.1	29.1	41.3	28.1
16/01/2014	55.2	31.0	50.9	31.1	50.5	30.4	55.5	29.8
17/01/2014	31.8	31.1	26.3	30.8	32.3	30.5	41.1	30.5
18/01/2014	30.3	31.0	29.2	30.7	32.1	30.6	44.3	31.3
19/01/2014	35.1	31.2	26.8	30.5	39.7	31.1	38.5	31.6
20/01/2014	24.6	30.9	22.2	30.1	25.2	30.8	25.0	31.3
21/01/2014	15.7	30.2	16.3	29.4	12.2	29.9	18.3	30.7
22/01/2014	17.7	29.6	13.7	28.7	13.1	29.1	16.2	30.0
23/01/2014	24.9	29.4	16.6	28.2	18.7	28.7	22.7	29.7
24/01/2014	19.6	29.0	17.3	27.7	13.2	28.0	15.1	29.1
25/01/2014	20.9	28.7	15.2	27.2	18.7	27.7	15.7	28.6
26/01/2014	20.6	28.4	19.9	27.0	21.0	27.4	19.7	28.2
27/01/2014	18.5	28.0	16.3	26.6	18.8	27.1	25.6	28.1
28/01/2014	22.9	27.8	22.5	26.4	18.8	26.8	24.9	28.0
29/01/2014	30.3	27.9	24.6	26.3	22.0	26.6	32.2	28.2
30/01/2014	23.8	27.8	18.9	26.1	24.7	26.6	26.4	28.1
31/01/2014	23.3	27.6	25.3	26.1	30.2	26.7	36.3	28.4

Note:
Results in **red** are greater than the 24hr period guidelines of 50ug/m³
Results in **bold** are between 30ug/m³ and 50ug/m³

Appendix A
Wambo Weather Station
Meteorological Data

Meteorological Data January 2014

Date	Temp (2m)			Temp (10m)			Temp Inversion			Humidity			Solar Radiation			Rain	Wind Speed		
	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	mm	Min	Avg	Max
01/01/14	17.8	25.6	34.7	19.4	26.0	34.3	-15.9	4.4	23.3	26.2	61.1	91.9	-1.5	265.5	992.8	0.0	0.4	1.9	3.5
02/01/14	21.7	29.4	37.6	22.5	30.2	37.7	-8.8	9.8	45.2	16.6	47.9	82.5	-1.5	187.7	1056.1	0.0	0.0	1.8	3.8
03/01/14	21.5	26.1	32.1	22.0	26.3	32.0	-9.4	3.0	11.2	43.8	68.7	86.1	-1.5	248.5	979.5	0.0	0.8	2.3	3.4
04/01/14	19.9	25.9	37.4	21.1	26.2	36.1	-16.2	4.0	24.4	9.9	66.4	94.7	-1.5	329.5	1042.6	0.0	0.2	2.1	3.7
05/01/14	20.4	26.8	36.9	21.0	27.0	36.4	-13.1	3.0	24.7	20.5	57.6	81.9	-1.5	301.8	1018.3	0.0	0.2	1.9	3.2
06/01/14	15.1	25.0	35.6	17.3	25.6	35.0	-13.7	8.4	32.9	5.1	52.9	93.4	-1.6	330.0	996.8	0.0	0.3	2.2	3.9
07/01/14	18.9	20.9	24.1	19.6	21.1	23.8	-10.4	2.6	10.4	52.3	66.3	82.4	-1.6	174.0	1167.8	0.0	1.1	2.7	4.0
08/01/14	18.3	20.7	24.1	18.8	20.9	23.8	-7.4	2.9	8.5	48.1	61.0	75.8	-1.6	140.6	847.8	0.0	1.2	2.6	3.8
09/01/14	17.2	21.2	26.2	18.1	21.4	25.5	-10.9	3.3	10.9	38.9	58.0	72.8	-1.6	166.9	1113.9	0.0	1.2	2.3	3.5
10/01/14	17.8	23.8	31.9	18.6	24.0	31.1	-13.1	2.9	13.2	32.5	60.7	82.5	-1.6	261.3	1216.0	0.0	0.5	1.8	3.4
11/01/14	19.6	27.1	35.8	20.9	27.5	35.4	-13.8	4.8	23.8	24.1	53.3	82.9	-1.5	298.4	941.8	0.0	0.2	1.7	3.5
12/01/14	17.9	26.1	34.5	18.9	26.5	33.8	-9.5	5.7	25.8	24.7	55.2	87.0	-1.6	317.4	929.8	0.0	0.0	2.2	3.8
13/01/14	19.8	24.0	30.4	20.4	24.2	29.9	-13.0	2.1	11.8	39.1	62.2	83.4	-1.6	309.1	1095.7	0.0	0.9	2.3	3.8
14/01/14	16.4	24.7	33.9	17.5	25.1	33.8	-9.3	4.4	15.9	20.4	61.0	90.8	-1.6	318.6	950.1	0.0	0.6	1.9	3.6
15/01/14	16.0	27.0	37.4	17.6	27.5	37.1	-12.7	5.9	27.7	16.5	57.4	93.9	-1.6	312.1	915.2	0.0	0.4	1.9	3.6
16/01/14	17.6	27.7	37.7	19.0	28.3	37.5	-11.4	6.7	27.3	21.8	56.4	93.0	-1.6	305.5	955.2	0.0	0.1	1.9	3.7
17/01/14	17.7	26.7	37.1	19.2	27.1	36.7	-9.7	4.7	21.4	13.3	56.5	91.1	-1.6	316.3	950.1	0.0	0.2	2.0	3.6
18/01/14	15.0	27.8	39.2	16.3	28.4	38.8	-12.6	7.2	32.0	8.8	49.0	93.8	-1.6	329.2	952.2	0.0	0.1	1.9	3.6
19/01/14	17.9	26.1	36.9	19.8	26.7	36.4	-9.7	7.7	38.6	21.7	57.5	84.4	-1.6	302.3	910.3	0.0	0.3	2.1	4.1
20/01/14	20.9	26.0	33.6	21.6	26.2	33.1	-9.4	2.2	11.8	38.0	63.9	85.6	-1.6	250.7	1004.9	0.0	1.2	2.4	3.9
21/01/14	21.9	25.6	32.2	22.5	25.7	31.7	-16.0	1.2	8.1	44.2	69.2	86.2	-1.6	232.7	1010.5	0.0	1.0	2.3	3.6
22/01/14	19.6	22.0	24.5	20.1	22.4	24.8	2.0	5.3	8.5	64.7	76.8	91.0	-1.6	32.3	150.9	0.4	1.5	2.2	3.2
23/01/14	19.3	21.8	25.2	19.8	22.1	24.7	-11.2	3.5	8.1	62.5	75.4	86.4	-1.6	96.5	948.5	0.0	1.3	2.3	3.5
24/01/14	20.0	24.8	33.0	20.6	25.0	32.7	-11.1	3.2	16.7	31.3	68.4	93.6	-1.6	156.2	684.3	7.2	0.1	1.9	4.1
25/01/14	18.4	22.6	30.0	19.6	22.9	29.5	-10.4	3.6	15.6	33.7	65.8	94.7	-1.6	266.6	1099.9	0.0	0.2	2.3	4.1
26/01/14	17.5	20.6	25.1	18.3	20.9	24.4	-9.9	3.2	12.3	42.1	59.1	76.8	-1.6	159.9	775.0	0.0	1.1	2.4	3.8
27/01/14	14.4	22.2	30.0	15.4	22.5	29.5	-10.5	4.8	24.3	31.7	58.9	84.3	-1.6	298.1	1161.2	0.0	0.4	2.1	3.7
28/01/14	15.6	23.8	32.7	16.8	24.2	32.2	-9.7	5.3	26.7	28.5	56.8	85.4	-1.6	334.7	975.6	0.0	1.0	1.9	3.4
29/01/14	14.4	25.9	36.7	16.0	26.4	36.2	-9.9	6.4	33.8	17.3	53.5	93.2	-1.6	328.8	960.0	0.0	0.2	2.0	3.7
30/01/14	17.8	25.1	33.7	18.9	25.5	33.3	-11.5	4.4	17.3	26.9	54.1	87.1	-1.6	333.3	979.6	0.0	1.1	2.3	3.4
31/01/14	12.2	25.1	36.4	13.9	25.8	36.2	-11.3	8.6	35.8	19.0	52.3	92.2	-1.6	329.8	964.8	0.0	0.2	1.8	3.2
MONTH	12.2	24.8	39.2	13.9	25.2	38.8	-16.2	4.7	45.2	5.1	60.1	94.7	-1.6	259.2	1,216.0	7.6	0.0	2.1	4.1