

**WAMBO COAL PTY LIMITED**

**MONTHLY ENVIRONMENTAL MONITORING  
REPORT**

**March 2014**

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## 1.0 Introduction

This report presents environmental monitoring results for the reporting period **Saturday 1 to Monday 31 March 2014**. Monitoring during this period includes meteorological measurement, surface and ground water sampling, depositional dust sampling, High Volume Air Sampling, blasting events and PM<sub>10</sub> 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 results for SW05; SW27a; SW32a; SW39; SW45 were outside trigger levels.

**Table 1: Monthly Surface Water Results – March 2014**

Sample Location	pH	EC (µS/cm)	TSS (mg/L)	TDS (mg/L)	Oil & Grease (mg/L)	Temp (°C)	Comments
<b>WOLLOMBI BROOK</b>							
Wollombi Brook							
SW01 - Wollombi Brook Up	7.80	837	4	482	-	29.1	-
SW03 - Wollombi Brook Pump Out	7.70	864	35	516	<2	21.5	-
SW02 - Wollombi Brook Down	7.70	988	2	526	<2	22.2	-
SW40 - Confluence with SWC	7.60	835	3	467	-	21.7	-
<b>NORTH WAMBO CREEK</b>							
North Wambo Creek							
SW04 - North Wambo Creek Up	-	-	-	-	-	-	Sample site dry
SW27a - North Wambo Creek Middle Lower	8.40	453	<b>234</b>	792	-	21.5	-
SW32a - North Wambo Creek Pump	8.40	350	<b>224</b>	676	-	21.1	-
SW05 - North Wambo Creek Down	7.80	343	<b>412</b>	988	-	21.2	-
<b>SOUTH WAMBO/STONY CREEK</b>							
South Wambo/Stony Creek							
SW06 - South Wambo Creek	-	-	-	-	-	-	Sample site dry
SW07 - South Wambo/Stony Creek	7.80	349	70	278	-	21.0	-
SW08 - Stony Creek	-	-	-	-	-	-	No Access
<b>LONGFORD/DOCTOR'S CREEKS</b>							
SW43 - Longford Creek Up	7.70	461	150	730	<2	22.2	-
SW44 - Longford Creek Down	7.80	178	132	450	<2	22.3	-
SW46 - Doctors Creek Up	7.50	623	25	420	<2	22.3	-
SW45 - Doctors Creek Down	7.50	550	<b>36</b>	378	<2	22.2	-
<b>WATERFALL CREEK</b>							
SW39 - Waterfall Creek Midstream	7.90	181	<b>134</b>	958	-	21.5	-
<b>MINE WATER DAMS</b>							
SW11 - West Cut Dam Pipe	Not Pumping						
SW12 - West Cut Dam	8.90	5,980	-	-	-	22.0	-
SW14 - Box Cut Dam (Admin)	8.80	1,075	-	-	-	24.5	-
SW15 - Eagles Nest Dam	9.00	6,160	28.00	3,620	<2	21.9	-
SW20 - Dam Adjacent to West Cut Dam	-	-	-	-	-		Sample site dry
SW29 - SCB Dam	8.60	1,181	-	-	-	19.2	-
SW30 - Turkeys Nest	9.30	7,500	-	-	-	23.7	-
SW31 - Gordon Below Franklin	9.40	4,700	-	-	-	23.7	-
SW37 - Wollemi Sump	-	-	-	-	-		No longer exists
SW38 - Homestead Open Cut	8.80	7,480	-	-	-	26.0	-
SW47 - NWU Pumpout Water	-	-	-	-	-		Sample site dry
SW48 - Inpit sample	8.00	6,720	-	-	-	26.1	-
SW49 - Bates Pit Pumpout	7.90	3,890	-	-	-	26.2	-
SW51 - South Dam	9.00	8390	-	-	-	23.5	-
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 – March 2014**

Sample Location	pH	EC ( $\mu\text{S}/\text{cm}$ )	Depth to Water (m)	Temp ( $^{\circ}\text{C}$ )	Comments
GW02	-	-	-	-	-
GW11	-	-	-	-	-
P106	-	-	-	-	-
P109	-	-	-	-	-
P110	-	-	-	-	-
P111	-	-	-	-	-
P114	-	-	-	-	-
P116	-	-	-	-	-
P202	-	-	-	-	-
P206	-	-	-	-	-
P301	-	-	-	-	-
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

Fifteen depositional dust gauges were collected for the reporting period (Table 3). 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 – March 2014**

Site	Insoluble Solids (IS) (g/m <sup>2</sup> .month)	Ash Residue (AR) (g/m <sup>2</sup> .month)	IS:AR Ratio	IS YTD Average (g/m <sup>2</sup> .month)	AR YTD Average (g/m <sup>2</sup> .month)
D01*	11.2	4.3	38	2.9	2.0
D03	2.4	2.0	83	3.5	2.6
D07*	15.2	9.5	63	<b>6.0</b>	3.4
D09*	7.4	3.8	51	2.0	1.6
# D11	2.4	1.8	75	2.1	1.5
# D12	3.9	3.0	77	3.5	2.6
# D17	1.5	1.0	67	1.8	1.3
D19	3.2	2.1	66	3.7	2.6
D20	1.1	0.8	73	1.4	1.0
# D21	2.10	1.40	67	2.5	1.9
# D22	2.4	1.7	71	2.6	1.9
D23	1.5	1.1	73	1.7	1.2
# D24*	18.4	16.5	90	-	-
# D25	2.60	2.00	77	3.9	2.9
D26	2.1	1.5	71	2.3	1.8

**Note:**

Results in **bold** are YTD average above 4g/m<sup>2</sup>/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.

\* Contaminated sample

Insoluble solid results are reported on the **annual average** of 4g/m<sup>2</sup>/month of all **uncontaminated results** which are not located on Wambo Coal owned land. No depositional dust gauge locations were outside the 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 – March 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 ( $\mu\text{g}/\text{m}^3$ )
5/03/2014	30.8	27.9	30.8	27.7
11/03/2014	58.1	35.3	37.1	67.4
17/03/2014	62.9	41.5	25.1	37.2
23/03/2014	66.5	60.9	68.9	67.3
29/03/2013	29.8	29.4	40	29.8
<b>Monthly Mean</b>	49.6	39.0	40.4	45.9
<b>Yearly Mean</b>	87.4	71.4	71.0	88.4

Reported yearly means for locations are within 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. Six 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 March 2014 were within the prescribed criteria limits.

**Table 5: Blast Results – March 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
5/03/2014	15:34:00	M16WRC1	97.2	0.13	YES	<115.0	<0.16	No	105	0.17	YES	100.4	0.91	YES
7/03/2014	14:33:00	M16WRC1b	92.9	0.08	YES	<115.0	<0.16	No	98.6	0.04	YES	97.4	0.22	YES
12/03/2014	15:39:45	BS5WWD4	105.3	0.31	YES	107.4	1.73	Yes	108.6	0.63	YES	98.7	0.21	YES
12/03/2014	15:51:44	M14WTA1	89.6	0.06	YES	<115.0	<0.16	No	97.9	0.06	YES	96.6	0.29	YES
20/03/2014	14:08:22	M13WTA4	92.9	0.18	YES	93.9	0.32	YES	99.3	0.16	YES	104.1	0.53	YES
25/03/2014	15:37:42	M19RCA1	97.2	0.05	YES	<115.0	<0.16	No	99.3	0.16	YES	103.4	0.26	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  **$30\mu\text{g}/\text{m}^3$** , no sites were outside of 24hr average criteria of  **$50\mu\text{g}/\text{m}^3$**  for a single day during this reporting period.



**Table 6**  
**PM<sub>10</sub> Results – March 2014**

Date of Run	AQ01 (Coralie)		AQ02 (Wambo Road)		AQ03 (Thelander)		AQ04 (Muller)	
	PM10 24 Hour Result (ug/m <sup>3</sup> )	YTD Average	PM10 24 Hour Result (ug/m <sup>3</sup> )	YTD Average	PM10 24 Hour Result (ug/m <sup>3</sup> )	YTD Average	PM10 24 Hour Result (ug/m <sup>3</sup> )	YTD Average
1/03/2014	10.6	24.9	10.1	23.7	10.0	24.0	10.2	26.0
2/03/2014	9.8	24.7	7.7	23.4	8.1	23.7	8.1	25.8
3/03/2014	9.0	24.4	7.1	23.1	8.1	23.4	9.8	25.5
4/03/2014	11.3	24.2	8.5	22.9	10.7	23.2	11.9	25.3
5/03/2014	13.4	24.0	11.7	22.7	8.6	23.0	10.0	25.0
6/03/2014	19.1	23.9	17.3	22.6	17.7	22.9	17.7	24.9
7/03/2014	20.5	23.9	18.0	22.6	*	-	29.5	25.0
8/03/2014	15.2	23.7	10.1	22.4	*	-	16.9	24.9
9/03/2014	16.9	23.6	11.4	22.2	*	-	17.3	24.8
10/03/2014	14.7	23.5	12.2	22.1	13.1	22.8	14.6	24.6
11/03/2014	15.9	23.4	11.4	21.9	13.5	22.6	17.0	24.5
12/03/2014	18.7	23.3	18.7	21.9	15.5	22.5	16.9	24.4
13/03/2014	19.6	23.2	20.0	21.8	17.5	22.5	20.3	24.3
14/03/2014	19.0	23.2	16.2	21.8	13.5	22.3	24.0	24.3
15/03/2014	10.0	23.0	11.3	21.6	9.6	22.2	8.7	24.1
16/03/2014	16.9	22.9	14.1	21.5	10.3	22.0	12.2	24.0
17/03/2014	13.2	22.8	11.0	21.4	8.6	21.8	8.8	23.8
18/03/2014	21.4	22.7	23.2	21.4	20.4	21.8	25.1	23.8
19/03/2014	<b>31.9</b>	22.9	23.3	21.4	25.1	21.8	24.8	23.8
20/03/2014	18.1	22.8	23.6	21.5	17.0	21.8	18.6	23.7
21/03/2014	15.3	22.7	14.4	21.4	18.3	21.7	17.4	23.7
22/03/2014	16.4	22.6	12.3	21.3	7.8	21.5	9.6	23.5
23/03/2014	21.6	22.6	18.5	21.2	19.5	21.5	21.7	23.5
24/03/2014	12.6	22.5	12.7	21.1	10.5	21.4	13.6	23.3
25/03/2014	14.7	22.4	12.0	21.0	14.4	21.3	16.7	23.3
26/03/2014	11.5	22.3	9.4	20.9	11.2	21.2	13.4	23.1
27/03/2014	7.3	22.1	6.6	20.7	6.8	21.0	7.5	23.0
28/03/2014	9.7	21.9	7.0	20.6	7.6	20.8	8.1	22.8
29/03/2014	11.6	21.8	11.7	20.5	9.7	20.7	9.6	22.6
30/03/2014	14.8	21.7	12.4	20.4	15.8	20.7	17.0	22.6
31/03/2014	14.4	21.6	12.3	20.3	16.1	20.6	16.4	22.5

**Note:**

Results in **red** are greater than the 24hr period guidelines of 50ug/m<sup>3</sup>

Results in **bold** are between 30ug/m<sup>3</sup> and 50ug/m<sup>3</sup>

\* Equipment failure

**Appendix A**  
**Wambo Weather Station**  
**Meteorological Data**

## Meteorological Data March 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
01/03/14	17.4	19.3	22.5	18.0	19.8	22.7	1.0	6.7	12.1	67.7	85.9	95.0	-1.6	48.5	315.5	2.5	0.5	1.9	3.3
02/03/14	17.1	19.4	23.4	17.6	19.8	23.3	-1.4	5.8	10.5	71.1	87.3	94.4	-1.6	69.9	596.3	1.4	0.4	1.6	2.8
03/03/14	18.7	20.9	26.2	19.4	21.3	26.0	-6.6	4.8	9.9	61.8	84.7	93.6	-1.6	148.9	914.2	1.2	0.7	1.8	3.0
04/03/14	18.2	22.4	27.8	19.5	22.9	27.7	-4.4	5.9	16.8	45.5	71.2	89.3	-1.6	218.0	1150.5	0.0	0.7	2.0	3.1
05/03/14	14.6	21.5	31.5	15.9	22.0	31.2	-13.4	6.4	22.4	36.3	78.0	96.5	-1.7	253.6	878.7	6.9	0.0	1.9	3.3
06/03/14	17.1	21.8	27.8	18.0	22.3	27.6	-5.9	5.5	14.5	59.0	83.3	97.0	-1.6	171.0	957.6	0.0	0.2	1.7	2.8
07/03/14	19.2	22.5	28.6	20.0	23.1	28.4	-5.8	6.7	18.4	52.2	79.3	94.9	-1.6	169.1	973.9	0.0	0.0	1.3	3.3
08/03/14	17.4	22.3	28.5	18.5	22.9	28.4	-3.5	7.9	16.7	40.7	71.5	94.6	-1.6	203.3	1035.6	0.0	0.3	1.8	3.3
09/03/14	15.4	22.1	28.3	17.5	22.9	28.5	-4.8	9.3	30.6	38.0	68.3	94.2	-1.7	253.7	1038.5	0.0	0.3	1.8	3.3
10/03/14	16.6	22.4	29.3	18.0	23.2	29.4	-3.8	9.1	24.7	40.9	69.9	93.0	-1.6	253.4	871.4	0.0	1.0	1.9	3.4
11/03/14	16.3	22.3	28.3	17.5	22.9	28.2	-4.0	8.3	21.2	39.8	69.1	94.5	-1.7	258.2	969.2	0.0	0.1	1.9	3.1
12/03/14	13.6	22.6	31.0	15.0	23.3	30.9	-12.9	8.8	28.1	38.6	68.9	96.2	-1.7	200.5	925.1	0.0	0.2	1.5	2.6
13/03/14	20.1	23.2	28.2	21.1	23.7	28.3	-5.4	6.5	20.0	52.4	72.6	86.8	-1.6	187.2	997.9	0.0	0.6	2.1	3.2
14/03/14	15.7	21.2	30.2	17.3	21.8	30.1	-9.4	7.8	23.1	43.3	78.0	94.6	-1.7	193.7	889.6	1.6	0.2	1.5	3.9
15/03/14	15.9	22.2	30.0	16.5	22.6	30.1	-9.2	5.9	22.4	40.5	75.1	97.5	-1.7	192.1	976.5	0.2	0.0	1.7	3.5
16/03/14	16.0	22.0	29.8	17.0	22.9	29.9	-2.1	10.3	29.5	38.4	68.7	96.2	-1.7	142.9	897.9	1.1	0.1	2.3	4.8
17/03/14	9.5	18.6	27.4	11.0	19.7	27.0	-14.3	13.1	44.2	30.6	60.9	93.6	-1.7	270.3	888.0	0.0	0.2	1.8	3.4
18/03/14	9.3	19.8	30.7	11.0	20.7	30.5	-7.1	11.9	35.9	28.6	63.2	95.8	-1.7	251.9	859.1	0.0	0.1	1.6	2.6
19/03/14	12.1	21.5	29.9	13.7	22.2	29.7	-5.3	9.9	29.2	36.3	70.0	95.2	-1.7	217.6	855.3	0.0	0.1	1.8	3.4
20/03/14	17.5	22.4	28.1	18.6	23.0	28.0	-5.1	6.6	14.9	46.7	74.1	94.9	-1.6	150.0	1025.5	0.0	0.3	1.9	3.7
21/03/14	18.3	21.7	27.3	19.4	22.4	27.0	-4.1	8.1	16.1	53.4	77.9	93.8	-1.6	118.7	720.8	0.2	0.3	1.4	3.4
22/03/14	13.9	21.9	31.6	14.6	22.6	31.4	-9.4	8.3	26.4	29.5	70.8	97.3	-1.7	219.9	805.5	0.0	0.2	1.4	2.7
23/03/14	18.6	23.7	32.1	19.8	24.2	31.8	-9.9	5.7	18.4	32.8	65.4	89.6	-1.6	198.8	824.5	0.0	0.2	1.8	3.7
24/03/14	17.4	20.1	23.5	18.6	20.7	23.5	-4.4	7.6	24.3	62.6	78.1	93.0	-1.7	88.8	732.1	8.1	0.2	1.8	3.3
25/03/14	14.5	19.3	24.4	15.6	20.1	24.3	-5.9	9.5	25.7	63.2	84.0	96.0	-1.7	109.3	726.6	0.5	0.1	1.3	2.6
26/03/14	19.3	21.1	24.7	20.0	21.7	24.9	-2.5	6.7	11.1	72.9	91.2	96.7	-1.6	58.0	381.5	6.4	0.0	1.5	2.8
27/03/14	17.5	19.4	20.7	18.0	19.9	21.2	4.3	7.0	9.3	94.7	96.0	96.9	-1.7	23.5	148.8	33.4	0.1	1.5	2.4
28/03/14	17.6	19.6	25.2	18.3	20.1	25.1	-4.9	7.2	11.3	65.7	90.9	96.5	-1.7	93.4	913.4	6.9	0.1	1.4	3.4
29/03/14	17.1	21.1	26.7	18.0	21.6	26.9	-6.2	6.8	19.1	56.6	81.8	95.2	-1.7	140.8	797.1	0.2	0.3	1.4	2.6
30/03/14	16.9	21.3	26.7	17.7	21.9	26.9	-9.5	6.9	16.9	57.0	81.2	97.2	-1.7	182.7	898.0	3.2	0.1	1.5	2.9
31/03/14	17.8	21.8	27.2	18.7	22.0	27.1	-61.3	2.3	16.3	48.6	78.2	93.8	-1.7	156.2	836.0	0.0	0.3	1.4	3.1
<b>MONTH</b>	<b>9.3</b>	<b>21.3</b>	<b>32.1</b>	<b>11.0</b>	<b>21.9</b>	<b>31.8</b>	<b>-61.3</b>	<b>7.5</b>	<b>44.2</b>	<b>28.6</b>	<b>76.6</b>	<b>97.5</b>	<b>-1.7</b>	<b>169.2</b>	<b>1,150.5</b>	<b>73.6</b>	<b>0.0</b>	<b>1.7</b>	<b>4.8</b>