WILPINJONG COAL PTY LTD

Environment Protection Licence (EPL) 12425

Link to Environment Protection Licence EPL12425

LICENCE MONITORING DATA
MONTHLY SUMMARY REPORT

for

1 June 2016 to 30 June 2016

Air Monitoring

Air quality surrounding the Wilpinjong Coal Mine is monitored using:

1. tapered element oscillating microbalances (TEOM);
2. high volume air samplers (HV); and
3. dust deposition gauges (DG).

In terms of the above equipment:

1. the TEOM and HVAS measure fine dust particles up to 10 microns in diameter (i.e. PM10); and
2. the DG measure the total dust deposited in the gauge during the sample period.

All are influenced by mining as well as non mining activities in the local area.

The location of the above monitoring equipment in relation to Wilpinjong Coal Mine is shown in Figure 8.

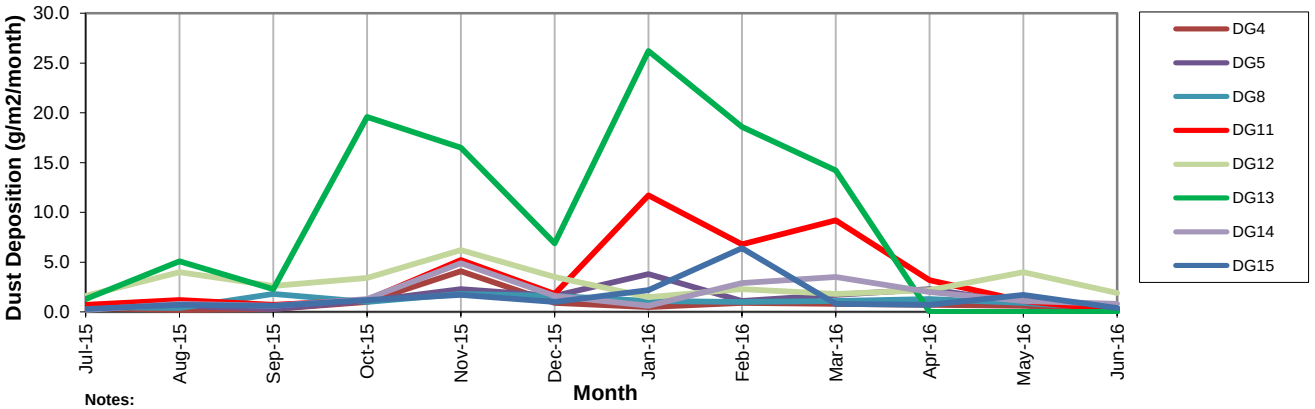
A summary of the monitoring results for the month is provided in Table 1 and the yearly trends are also shown in Figures 1 to 3.

Table 1

EPL ID No.	Monitoring Point ID.	Pollutant	Unit of Measure	Monitoring Frequency required by EPL	No. of times measured during month	Min. Value	Max. Value	Mean Value	Measurement	Annual Average	Limit	Exceed[n] (yes/no)	Date Last Sampled	Date Reported
3	DG4	Particulates - TSM	grams per square metre per month	Monthly	1				0.2				29/06/16	06/07/16
4	DG5	Particulates - TSM	grams per square metre per month	Monthly	1				0.4	1.4	4.0	No	29/06/16	06/07/16
6	DG8	Particulates - TSM	grams per square metre per month	Monthly	1				0.3				29/06/16	06/07/16
9	DG11	Particulates - TSM	grams per square metre per month	Monthly	1				0.1				29/06/16	06/07/16
10	DG12	Particulates - TSM	grams per square metre per month	Special Frequency 1	1				1.9				29/06/16	06/07/16
11	DG13	Particulates - TSM	grams per square metre per month	Special Frequency 1	1									
12	DG14	Particulates - TSM	grams per square metre per month	Special Frequency 1	1				0.8				29/06/16	06/07/16
17	DG15	Particulates - TSM	grams per square metre per month	Monthly	1				0.4				29/06/16	06/07/16
13	HV1	PM10	micrograms per cubic metre	Every 6 days	5	1.9	8.9	4.4			50		28/06/16	13/07/16
19	HV4	PM10	micrograms per cubic metre	Every 6 days	5	1.8	16.8	5.8			50		28/06/16	13/07/16
20	HV5	PM10	micrograms per cubic metre	Every 6 days	5	2.5	33.6	9.7			50		28/06/16	13/07/16
22	TEOM3	PM10	micrograms per cubic metre	Continuous (24 Hr Average)	96.7%	2.8	9.5	6.4			50			
23	TEOM4	PM10	micrograms per cubic metre	Continuous (24 Hr Average)	100.0%	0.0	30.1	4.9			50			

Note: Limits specified in the above table are from Project Approval 05-0021.

Figure 1a. DG Results - 12 Month Trend



Notes:
1. Limit of 4 g/m2/month (annual average) applies to DG5 (Wollar Village) - refer Figure 1b.
2. DG13 no longer compliant with AS/NZS 3580.1.1:2007 as DG13 is within 5m of mine operations. DG13 to be removed from EPL

Figure 1b. DG 5 Results - Annual Average

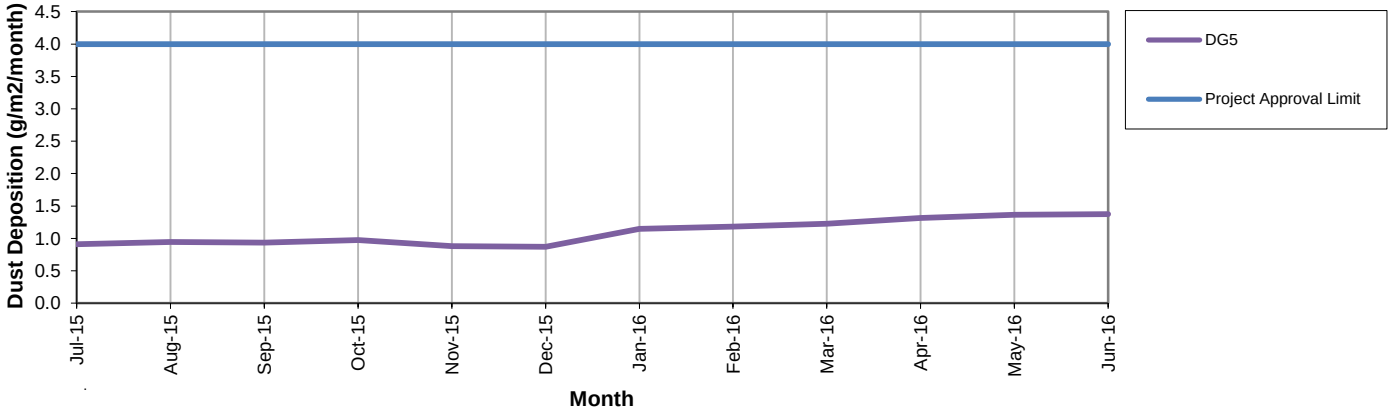
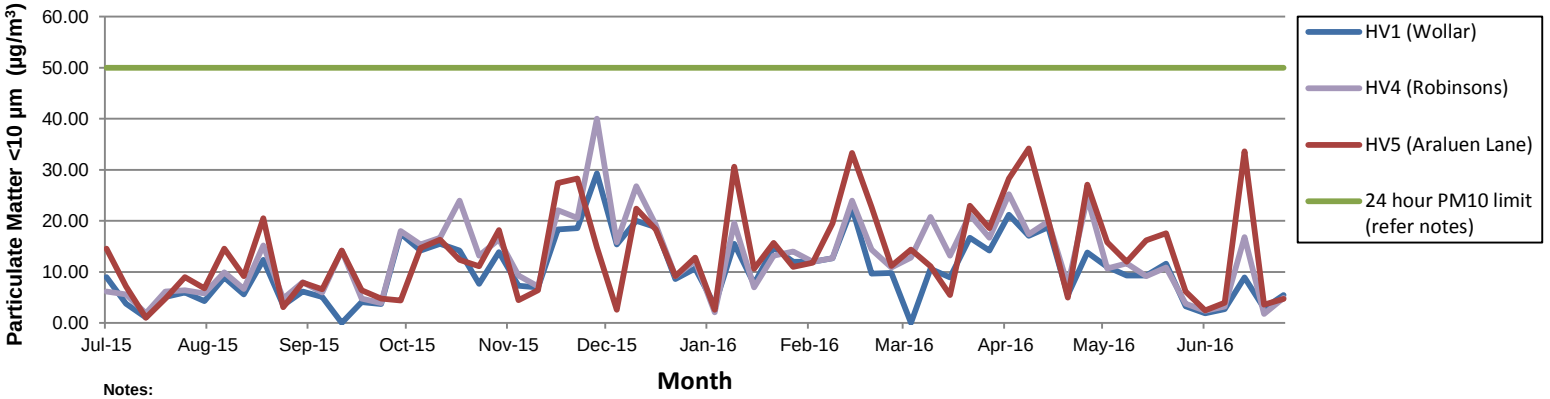
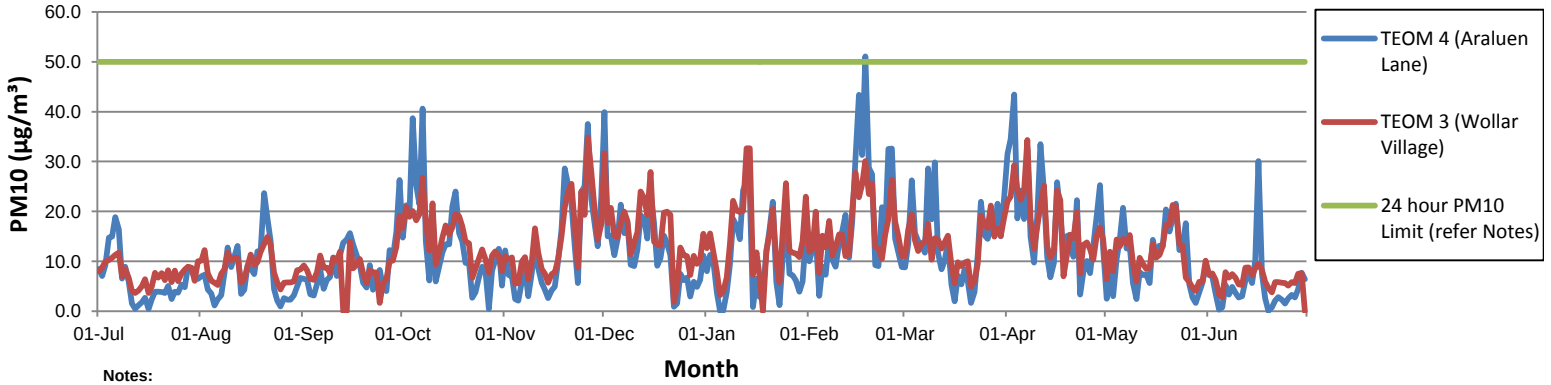


Figure 2. HV (PM10) Results - 12 Month Trend



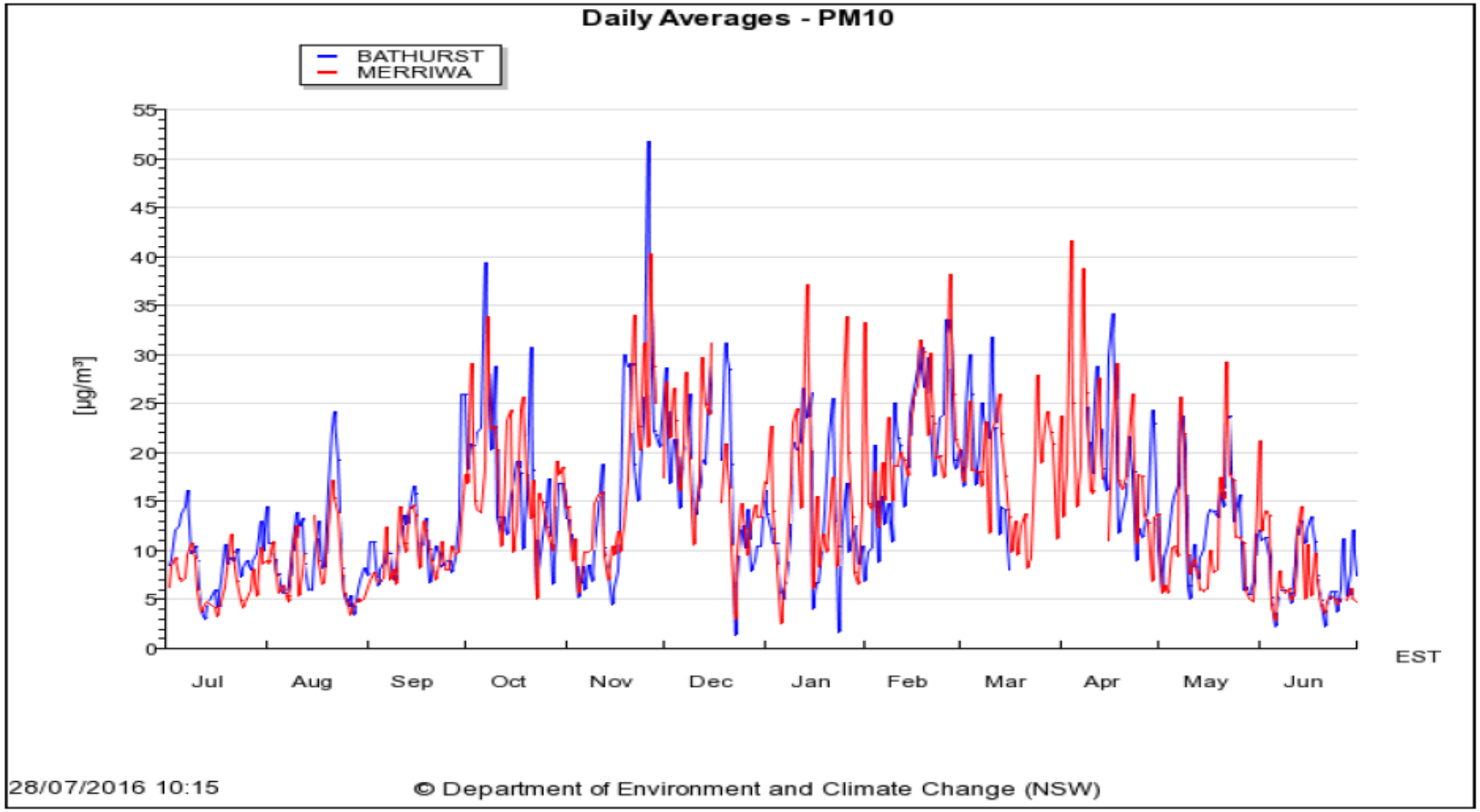
Notes:
1. Limit doesn't apply for extraordinary events such as bushfires, prescribed burning, or dust storms.
2. A power outage prevented dust sample being collected from HV1 on 14 September 2015 and 6 March 2016
3. HV5 influenced by dust from Araluen Road generally during stable atmospheric conditions (i.e. dry, temperature inversion and no wind).

Figure 3. TEOM (PM10) Results - 12 Month Trend



Notes:
1. Limit dosen't apply for extraordinary events such as bushfires, prescribed burning or dust storms
2. Regional dust storm occurred 6 May also elevated regional dust levels December 17.
3. Elevated PM10 dust levels recorded mid Feb caused by Totness bushfire and dust from Araluen Lane

Shown below and for comparison with Figures 2 and 3 is the 24Hr Av. PM_{10} dust levels recorded at Bathurst and Merriwa by NSW EPA from 1 July 2015 to 30 June 2016.



Surface Water Monitoring

Surface water runoff is isolated and diverted around disturbed areas through the construction of water diversion bunds. Runoff from disturbed areas is diverted into on-site water retention dams.

A Reverse Osmosis (RO) Plant treats all water from the retention dams before it is discharged to Wilpinjong Creek. The EPL specifies limits for the quantity and quality of water that may be discharged from the site.

A summary of the monitoring results for the month is provided in Table 2. The continuous monitoring results for pH, conductivity and volume are also shown in Figures 4 to 6.

Table 2

EPL ID No.	Monitoring Point ID.	Pollutant	Unit of Measure	Monitoring Frequency required by EPL	No. of times measured during month	Min. Value	Max. Value	Mean Value	Measurement	Limit	Exceed[n] (yes/no)	Date Last Sampled	Date Last Reported
24	RO Plant Discharge	Conductivity	microSiemens per centimetre (uS/cm)	Continuous during discharge	100%	132.1	350.3	176.8		500	No		
		Oil and Grease	milligrams per litre (mg/L)	Weekly during any discharge	7	<5	<5	<5		10.0	No	27/06/16	06/07/16
		pH	pH Unit	Continuous during discharge	100%	6.5	8.4	7.2		≥6.5≤8.5	No		
		Total Suspended Solids	milligrams per litre (mg/L)	Weekly during any discharge	7	<1	6	1.7		50	No	27/06/16	06/07/16
		Volume discharged	megalitres per day	Continuous during discharge	100%	0.00	1.66	0.51		5.0	No		

Figure 4 – Volume discharged per day (ML)

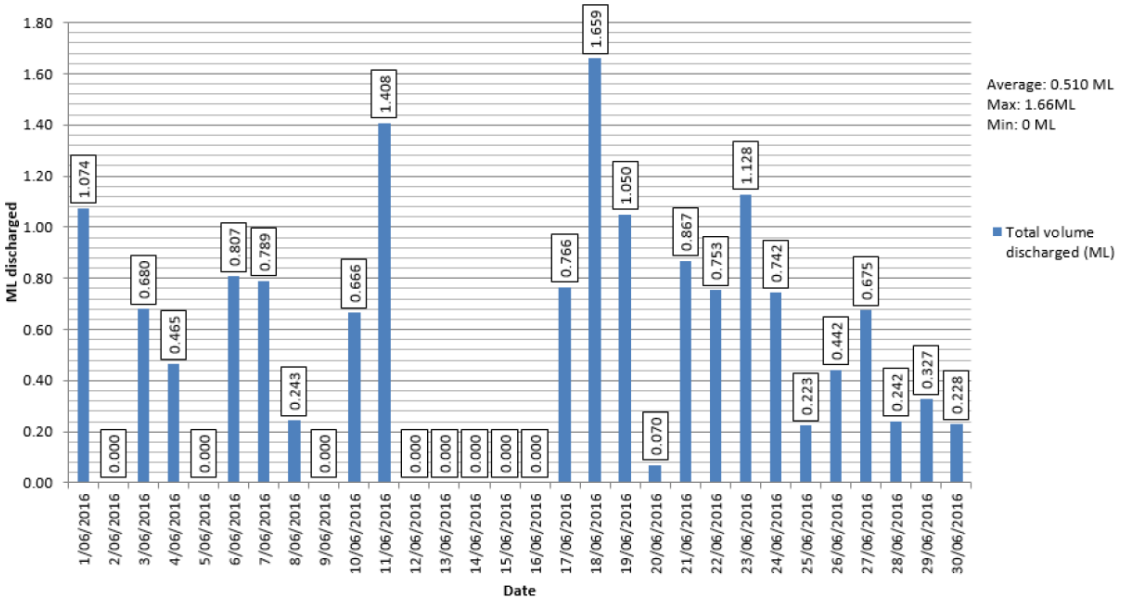


Figure 5 – Conductivity (max, min & average / day)

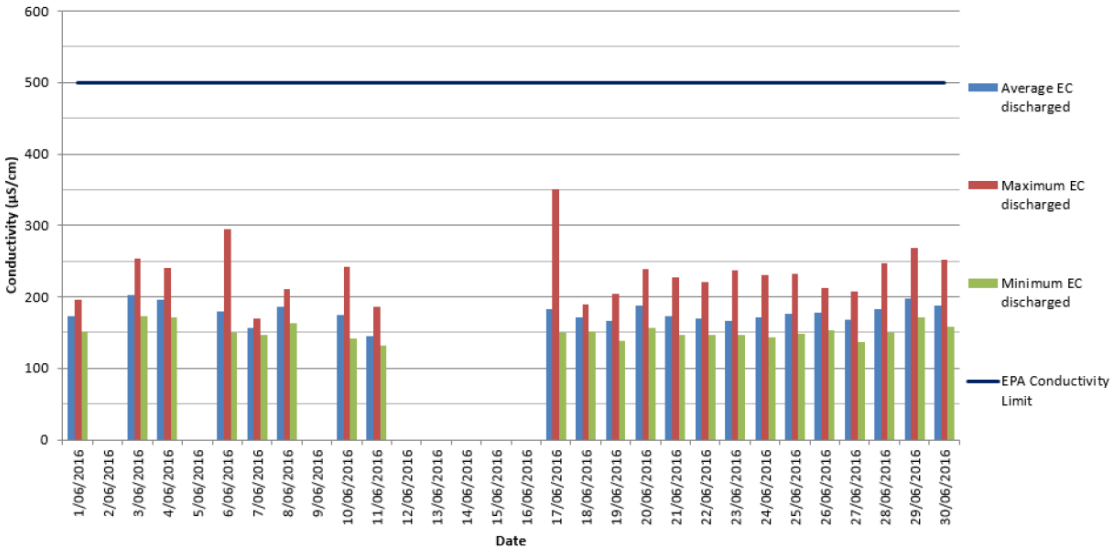
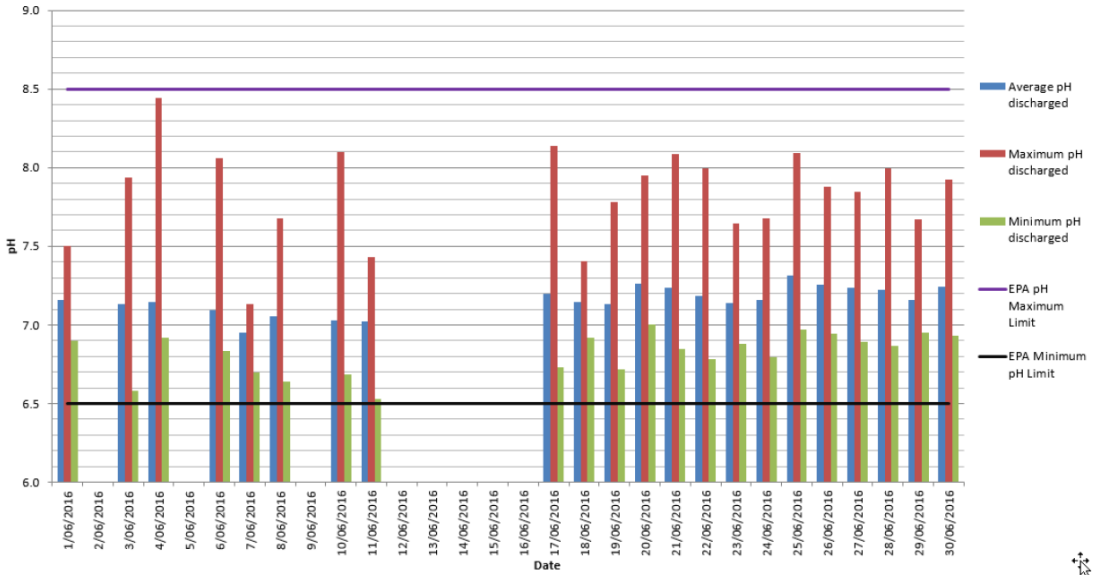


Figure 6 – pH (max, min & average / day)



Noise Monitoring

Environmental noise monitoring ("monitoring") is carried out on a monthly basis.

The purpose of the monitoring is to assess whether mining operations are consistent with the objectives of the EPL and the development consent conditions.

In terms of this monitoring, it is undertaken:
1. by an independent noise consultant;
2. during the night-time; and
3. at the sites shown in Figure 9.

On pages 10 and 11 of this report are the noise levels and findings from the consultant's report.

Table 4.3: $L_{Aeq,15minute}$ GENERATED BY WCP AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – JUNE 2016

Location	Start Date and Time	Wind Speed m/s [1,2]	VTG °C per 100m [1,2]	Criterion dB	Criterion Applies? [2,3]	WCP $L_{Aeq,15min}$ dB [4,5]	Exceedance [6]
N6	22/06/2016 23:50	0.6	0.8	35	Yes	21	Nil
N13	23/06/2016 00:34	0.0	0.2	36	Yes	IA	Nil
N14	23/06/2016 00:21	0.0	0.2	35	Yes	22	Nil
N15	22/06/2016 23:21	0.0	1.0	35	Yes	28	Nil
N16	22/06/2016 22:53	0.7	1.2	37	Yes	27	Nil
N17	22/06/2016 22:20	0.0	0.0	35	Yes	28	Nil
N18	23/06/2016 01:00	0.9	0.4	35	Yes	NM	Nil

Notes:

1. *Wind speed is sourced from WCP weather station, Vertical Temperature Gradient (VTG) is sourced from the WCP inversion tower;*
2. *Criterion may or may not apply due to rounding of meteorological data values;*
3. *Noise emission limits apply for winds up to and including 3 metres per second at a height of 10 metres, temperature inversion conditions between 1.5°C and 3°C/100m with winds up to and including 2 m/s, or temperature inversion conditions up to and including 3°C/100m;*
4. *These are results for WCP in the absence of all other noise sources;*
5. *Bolded results in red are those greater than the relevant criterion (if applicable); and*
6. *NA in exceedance column means atmospheric conditions outside conditions specified in development consent and so criterion is not applicable or criterion not specified.*

Table 4.4: $L_{A1,1minute}$ GENERATED BY WCP AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – JUNE 2016

Location	Start Date and Time	Wind Speed m/s [1,2]	VTG °C per 100m [1,2]	Criterion dB	Criterion Applies? [2,3]	WCP $L_{A1,1min}$ dB [4,5]	Exceedance [6]
N6	22/06/2016 23:50	0.6	0.8	45	Yes	26	Nil
N13	23/06/2016 00:34	0.0	0.2	45	Yes	IA	Nil
N14	23/06/2016 00:21	0.0	0.2	45	Yes	25	Nil
N15	22/06/2016 23:21	0.0	1.0	45	Yes	34	Nil
N16	22/06/2016 22:53	0.7	1.2	45	Yes	33	Nil
N17	22/06/2016 22:20	0.0	0.0	45	Yes	32	Nil
N18	23/06/2016 01:00	0.9	0.4	45	Yes	NM	Nil

Notes:

1. *Wind speed is sourced from WCP weather station, Vertical Temperature Gradient (VTG) is sourced from the WCP inversion tower;*
2. *Criterion may or may not apply due to rounding of meteorological data values;*
3. *Noise emission limits apply for winds up to and including 3 metres per second at a height of 10 metres, temperature inversion conditions between 1.5°C and 3°C/100m with winds up to and including 2 m/s, or temperature inversion conditions up to and including 3°C/100m;*
4. *These are results for WCP in the absence of all other noise sources;*
5. *Bolded results in red are those greater than the relevant criterion (if applicable); and*
6. *NA in exceedance column means atmospheric conditions outside conditions specified in development consent and so criterion is not applicable or criterion not specified.*

Table 4.5: $L_{Aeq,15minute}$ GENERATED BY WCP AGAINST EPL ASSESSMENT CRITERIA – JUNE 2016

Location	Start Date and Time	Wind Speed m/s [1,2]	VTG °C per 100m [1,2]	Criterion dB	Criterion Applies? [2,3]	WCP $L_{Aeq,15min}$ dB [4,5]	Exceedance [6]
N6	22/06/2016 23:50	0.6	0.8	35	Yes	21	Nil
N13	23/06/2016 00:34	0.0	0.2	35	Yes	IA	Nil
N14	23/06/2016 00:21	0.0	0.2	35	Yes	22	Nil
N15	22/06/2016 23:21	0.0	1.0	35	Yes	28	Nil
N16	22/06/2016 22:53	0.7	1.2	35	Yes	27	Nil
N17	22/06/2016 22:20	0.0	0.0	35	Yes	28	Nil
N18	23/06/2016 01:00	0.9	0.4	35	Yes	NM	Nil

Notes:

1. *Wind speed is sourced from WCP weather station, Vertical Temperature Gradient (VTG) is sourced from the WCP inversion tower;*
2. *Criterion may or may not apply due to rounding of meteorological data values;*
3. *Noise emission limits apply for winds up to and including 3 metres per second (at a height of 10 metres), temperature inversion conditions of up to and including 3°C/100m with winds up to and including 2 m/s, or temperature inversion conditions up to and including 3°C/100m;*
4. *These are results for WCP in the absence of all other noise sources;*
5. *Bolded results in red are those greater than the relevant criterion (if applicable); and*
6. *NA in exceedance column means atmospheric conditions outside conditions specified in development consent and so criterion is not applicable or criterion not specified.*

Table 4.6: $L_{A1,1minute}$ GENERATED BY WCP AGAINST EPL IMPACT ASSESSMENT CRITERIA – JUNE 2016

Location	Start Date and Time	Wind Speed m/s [1,2]	VTG °C per 100m [1,2]	Criterion dB	Criterion Applies? [2,3]	WCP $L_{A1,1min}$ dB [4,5]	Exceedance [6]
N6	22/06/2016 23:50	0.6	0.8	45	Yes	26	Nil
N13	23/06/2016 00:34	0.0	0.2	45	Yes	IA	Nil
N14	23/06/2016 00:21	0.0	0.2	45	Yes	25	Nil
N15	22/06/2016 23:21	0.0	1.0	45	Yes	34	Nil
N16	22/06/2016 22:53	0.7	1.2	45	Yes	33	Nil
N17	22/06/2016 22:20	0.0	0.0	45	Yes	32	Nil
N18	23/06/2016 01:00	0.9	0.4	45	Yes	NM	Nil

Notes:

1. *Wind speed is sourced from WCP weather station, Vertical Temperature Gradient (VTG) is sourced from the WCP inversion tower;*
2. *Criterion may or may not apply due to rounding of meteorological data values;*
3. *Noise emission limits apply for winds up to and including 3 metres per second (at a height of 10 metres), temperature inversion conditions of up to and including 3°C/100m with winds up to and including 2 m/s, or temperature inversion conditions up to and including 3°C/100m;*
4. *These are results for WCP in the absence of all other noise sources;*
5. *Bolded results in red are those greater than the relevant criterion (if applicable); and*
6. *NA in exceedance column means atmospheric conditions outside conditions specified in development consent and so criterion is not applicable or criterion not specified.*

6 SUMMARY OF COMPLIANCE

Environmental noise monitoring described in this report was undertaken during the night period of 22/23 June 2016. Attended noise monitoring was conducted at seven sites. The duration of all measurements was 15 minutes.

6.1 Operational Noise Assessment

Wilpinjong Coal Project (WCP) complied with noise limits at the monitoring locations during the June 2016 monitoring period.

6.2 Low Frequency Assessment

During the June 2016 survey, WCP did not trigger modifying factor penalties for low frequency noise. None of the measurements occurred during which WCP was measurable (not "inaudible", "not measurable" or less than a maximum cut-off value of 30 dB), was within 5 dB of the relevant criterion and where meteorological conditions resulted in criteria applying (in accordance with the EPL and project approval). No further assessment of low frequency noise was undertaken.

Wilpinjong Coal received report from Global Acoustics Pty Ltd on 30 June 2016.

Blasting

Monitoring is carried out near sensitive locations during blasting activities to determine the vibration in the air (overpressure) and earth (ground vibration). A summary of the results of this monitoring, and the limits specified in the EPL, are shown in Tables 3 and 4. Figure 7 shows the actual overpressure and vibration levels recorded during the month.

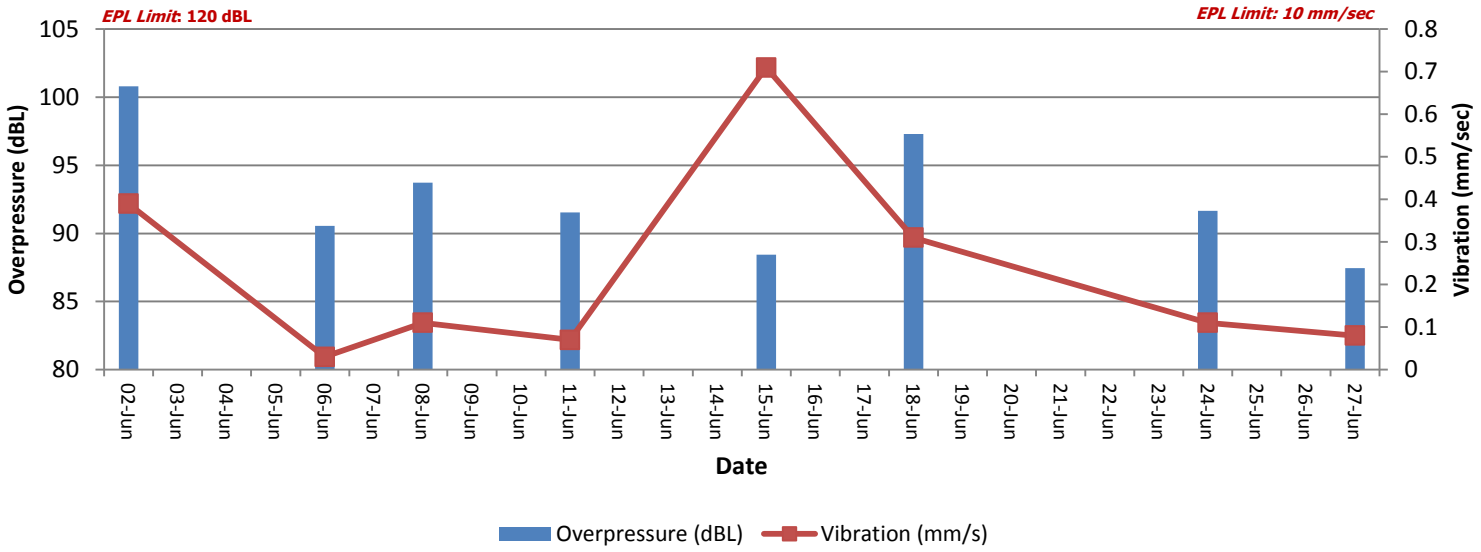
Table 3 – Overpressure Monitoring Results

Location	Month	Number of Blasts	Minimum overpressure (dB(L))	Maximum overpressure (dB(L))	Mean overpressure (dB(L))	EPL overpressure Limits (dB(L))	Exceedance (yes/no)
Approx. 50m west of the Wollar Public School	June	8	87.5	100.8	92.7	115dB (95% blasts) 120 dB (100% blasts)	no

Table 4 – Vibration Monitoring Results

Location	Month	Number of Blasts	Minimum vibration (mm/sec)	Maximum vibration (mm/sec)	Mean vibration (mm/sec)	EPL vibration Limits (mm/sec)	Exceedance (yes/no)
Approx. 50m west of the Wollar Public School	June	8	0.03	0.71	0.23	5 mm/s (95% blasts) 10 mm/s (100% blasts)	no

Figure 7. Overpressure (dBL) and Vibration (mm/sec) recorded during Month



Weather Monitoring

Continuous weather monitoring occurs onsite at the location shown on Figures 8 and 9 (**Meteorological Station**). The Meteorological Station continuously monitors for: rainfall; relative humidity; temperature (i.e. at 2m, 10m & 60m), barometric pressure, wind speed, wind direction and temperature lapse rate.

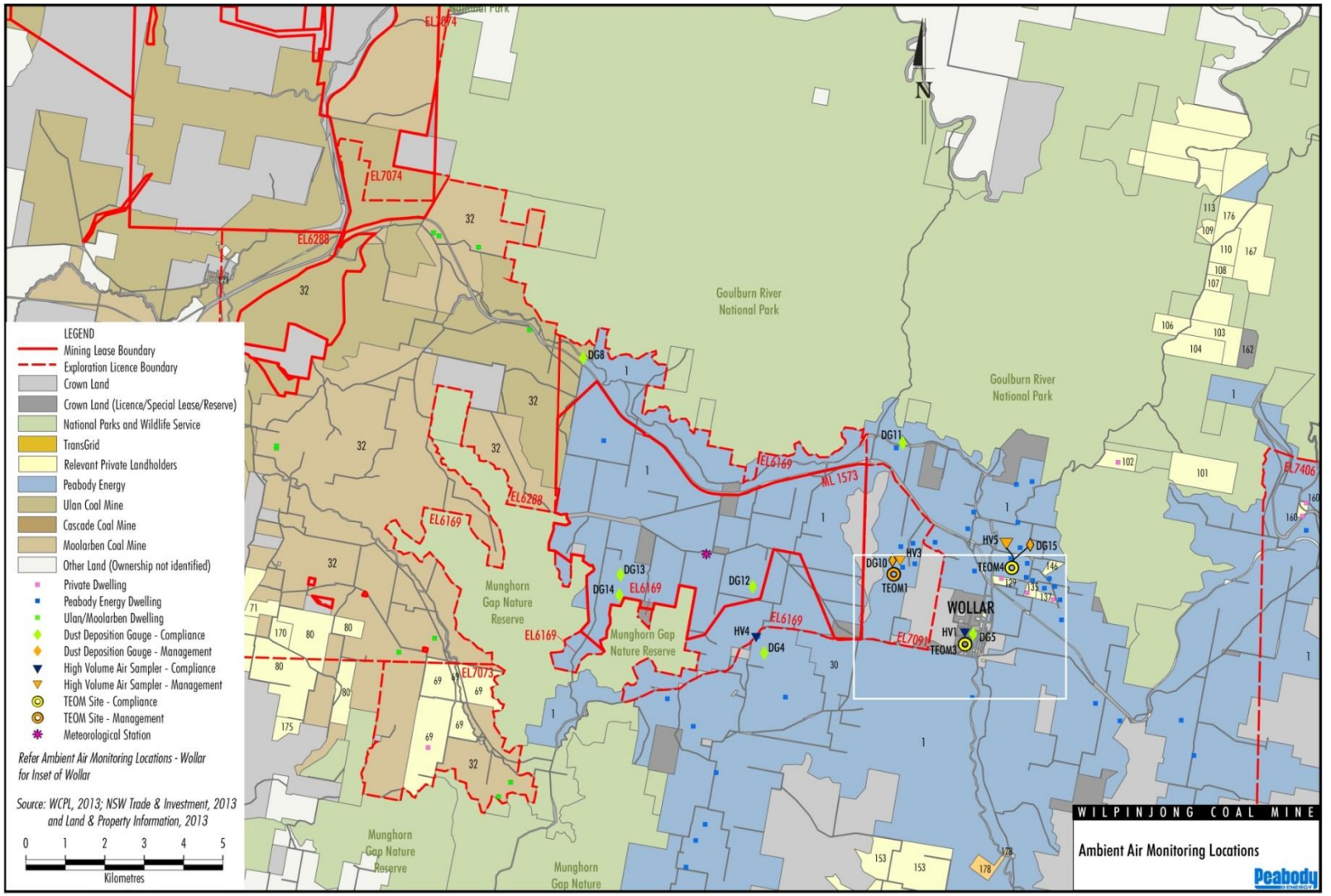
The temperature lapse rate is a measure of stable atmospheric conditions and is determined by measuring air temperature at two elevations 58m apart (i.e. 2m and 60m from ground level) and extrapolating the temperature difference over 58m to determine the lapse rate per ^{o}C/100m.

Table 5 shows the meteorological data recorded during the month.

Table 5

Date	Temperature (^{o}C)									Humidity (%)			Prevailing Wind				Rain	Bar	Lapse Rate
	2m			10m			60m						Speed			Dir	(mm)	(hPa)	(oC/100m)
	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	(Deg)			Max
1/06/2016	11.8	5.3	16.8	12.1	6.2	16.6	12.3	10	15.6	73.9	51.8	93.7	2	0	4.5	95	0	1026.9	9.0
2/06/2016	12	7.3	15.6	12.3	7.9	15.4	12.2	8.7	14.6	76.8	62.2	94.6	1.4	0	3.7	98	0	1025	3.4
3/06/2016	12.9	10	15.1	13.1	11	15.2	12.9	11.5	14.8	81.8	72.3	90.7	1.9	0	4.6	94	3.8	1021.8	3.1
4/06/2016	14	12.7	15.9	14.1	12.9	15.9	13.7	12.6	15.4	91.3	83.4	95.1	2.6	0	6.4	92	33.2	1010.2	0.3
5/06/2016	13.1	11.6	14.3	13.1	11.7	14.1	12.6	11.1	13.5	80.1	70	95	3	0.8	6.4	268	0.6	1002.6	0.2
6/06/2016	10.8	8.2	12	10.8	8.5	11.9	10.2	8.4	11.3	69.8	56.6	84	4.7	2.5	7.6	275	0.6	1005.1	0.5
7/06/2016	10.9	8.8	13.4	10.9	8.9	13.1	10.4	8.9	12.2	78.9	62.2	91.4	5	2	20.7	275	1.4	1062.5	0.0
8/06/2016	12.2	9.3	16.2	12.3	9.7	15.8	12.2	9.9	15	73.6	52.6	92.9	2.6	0	5.3	277	0.2	1013.6	6.0
9/06/2016	13.1	10.8	15.9	13.3	11.3	15.7	13.2	11.1	15	77.6	59.8	94.4	3.6	0	6.9	287	10	1012.3	4.0
10/06/2016	12.4	10.1	14.4	12.4	10.2	13.9	11.8	10.1	13	75	62.1	91.2	3.6	1.9	6.3	277	0	1020.3	0.0
11/06/2016	10.7	6.4	13.2	10.9	7.3	13.1	10.6	8.3	12.4	61	54.2	78.2	2.2	0	5.2	236	0	1026.3	4.8
12/06/2016	7.8	0.7	14.5	8.2	1.4	14.2	9	2.1	13.4	70.9	43.4	96.3	1.3	0	4.9	88	0	1034.8	9.7
13/06/2016	8	1.2	16.5	8.4	1.6	16.2	9.4	3.3	15.3	80.5	45.6	97.6	0.7	0	3.9	79	0	1037.2	9.8
14/06/2016	8.6	1.9	18.8	8.9	2.2	18.1	9.8	3.5	17.2	81.8	41.2	98.3	0.4	0	2.8	260	0	1035.2	6.6
15/06/2016	7.8	1.3	16.8	8.2	1.4	16.5	9.2	1.6	15.6	82.4	47	98.2	0.7	0	3.4	62	0	1031.7	8.8
16/06/2016	10.5	3.8	18.4	10.7	4.4	17.7	11.1	5.7	17	79.2	43.6	97	0.7	0	3.7	297	0	1024	5.2
17/06/2016	11.1	5.7	15.7	11.4	6.2	15.6	12	7	15.2	91.3	71.5	96.6	0.5	0	3.6	314	4.2	1018.3	9.1
18/06/2016	13.3	10.2	16.9	13.5	10.2	16.8	13.5	10.9	16	90.8	69	97.3	0.7	0	3.3	258	6.2	1017.5	3.3
19/06/2016	13.1	10.2	14.8	13.3	10.5	14.9	13.2	10.3	14.4	93.5	84.9	97.2	1.9	0	6.1	85	20.2	1010.7	3.8
20/06/2016	11	9.6	12.9	11	9.6	13.2	10.6	9.1	13.3	89.9	83.6	95.3	5.3	0	8.7	284	12.8	1002.8	1.4
21/06/2016	10.2	8.6	11.7	10.2	8.6	11.5	9.7	8.3	10.8	76.7	61	91.5	6	2.4	8.1	279	2.8	1008.7	-0.5
22/06/2016	10.8	7	14.2	10.8	7.4	13.9	10.5	7.9	13.1	78.8	56.1	94.3	3.4	0	7	278	12.2	1010.6	1.9
23/06/2016	9.3	4.3	14.1	9.4	4.4	13.7	9.3	4.9	12.9	86	59	98	1.6	0	4.8	297	1.8	1012.2	3.4
24/06/2016	9.2	5	12.2	9.3	5.1	12.4	8.8	4.6	12	73.1	49.9	91.7	4.6	2	10.4	264	5.8	1010.2	0.0
25/06/2016	5.4	0.3	9.6	5.5	1	9.3	5.2	2	8.5	66.8	47.8	93.3	2.4	0.2	4.5	253	0.2	1020.6	3.6
26/06/2016	4.3	-1.9	10	4.4	-1.5	9.6	4.3	-1.6	8.9	76.8	45.7	97.6	0.1	0	2.7	357	0	1019.7	3.3
27/06/2016	6	4.7	7.7	6	4.8	7.5	5.6	4.3	6.8	74.5	60	91.3	2.2	0.3	5	271	0.6	1017.8	0.7
28/06/2016	6.5	0.5	12.1	6.9	1.5	11.6	7.3	3.3	10.5	71.3	49.3	96.3	1.2	0	4.5	244	0	1025.4	7.4
29/06/2016	4.5	-2.1	15.2	4.8	-1.8	14.8	5.6	-1.2	13.7	79.3	30.5	98.4	0.2	0	1.6	43	0	1027.7	5.3
30/06/2016	4.3	-2.4	12.5	4.7	-2.2	12.2	5.8	-1.4	11.7	80.8	45.5	98.9	1.3	0	6.1	292	0	1021.5	9.5

Figure 8 – Air (Dust) Monitoring Locations



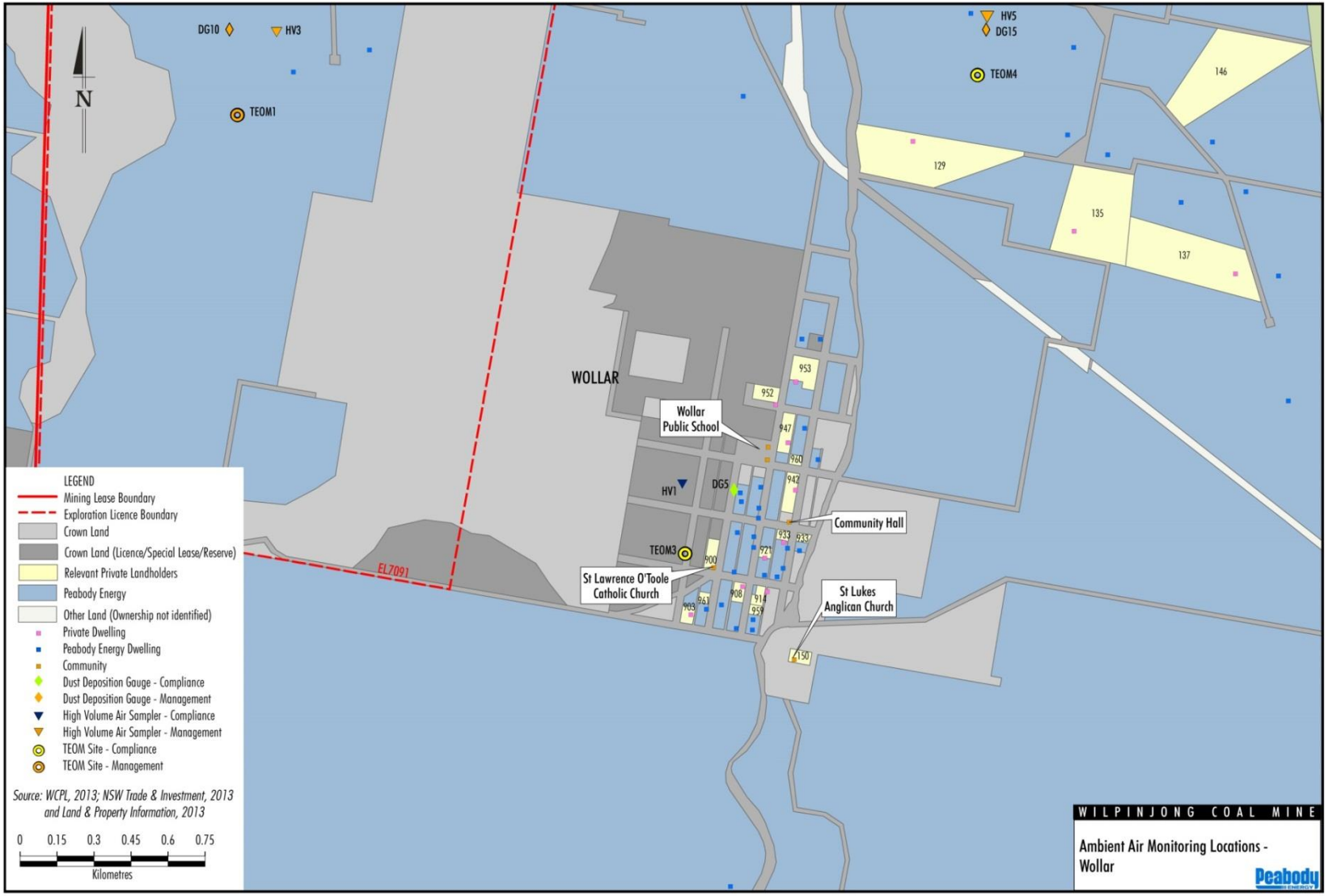
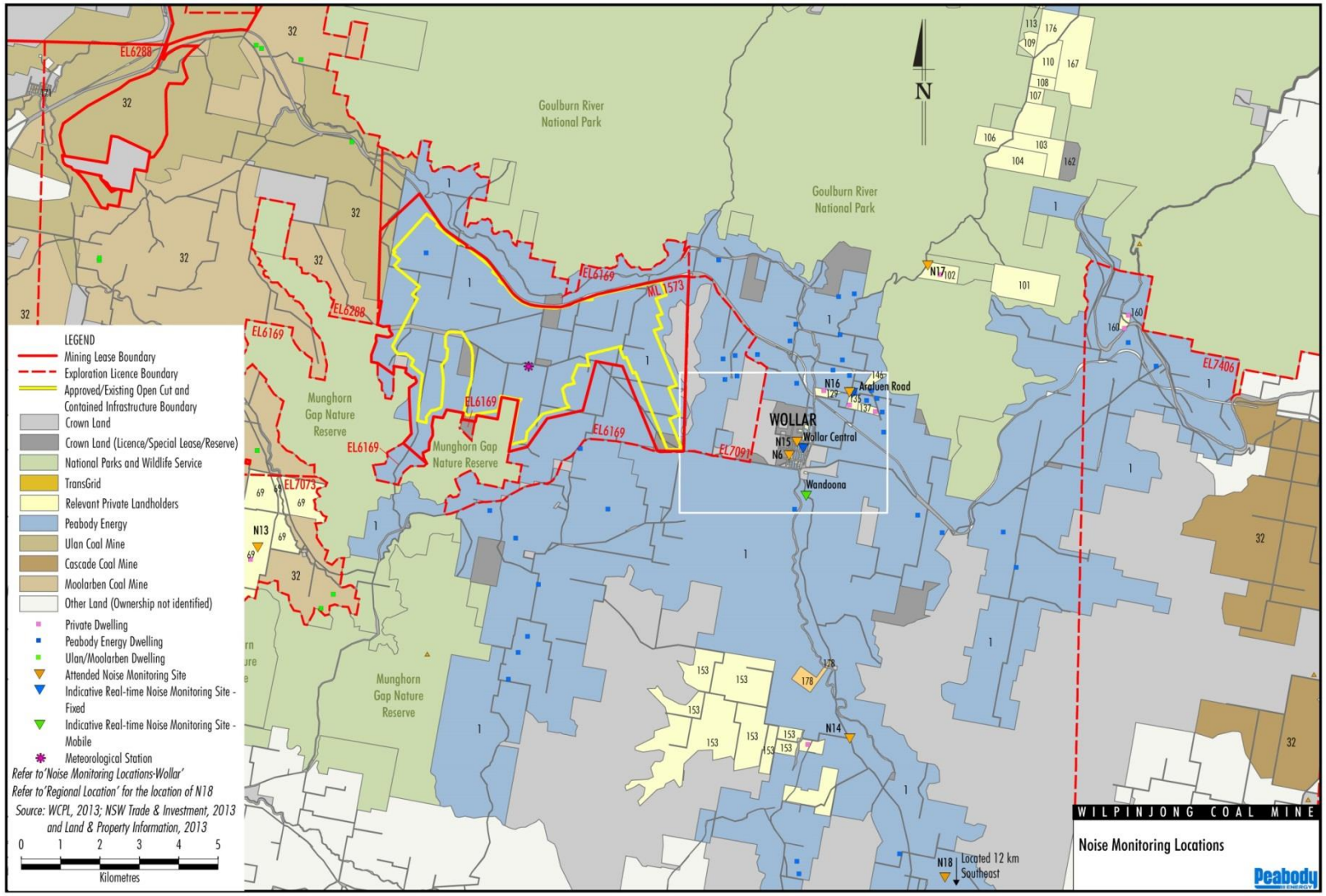

DG10
HV3
TEOM1
HV5
DG15
TEOM4
146
129
135
137
WOLLAR
Wollar Public School
953
952
947
960
942
HV1
DG5
Community Hall
933
937
921
TEOM3
900
St Lawrence O'Toole Catholic Church
908
914
959
903
961
St Lukes Anglican Church
950
EL7091
N
LEGEND
Mining Lease Boundary
Exploration Licence Boundary
Crown Land
Crown Land (Licence/Special Lease/Reserve)
Relevant Private Landholders
Peabody Energy
Other Land (Ownership not identified)
Private Dwelling
Peabody Energy Dwelling
Community
Dust Deposition Gauge - Compliance
Dust Deposition Gauge - Management
High Volume Air Sampler - Compliance
High Volume Air Sampler - Management
TEOM Site - Compliance
TEOM Site - Management
Source: WCPL, 2013; NSW Trade & Investment, 2013 and Land & Property Information, 2013
0 0.15 0.3 0.45 0.6 0.75
Kilometres
WILPINJONG COAL MINE
Ambient Air Monitoring Locations - Wollar
Peabody

Figure 9 – Attended Noise Monitoring Locations




N
WOLLAR
Wollar Public School
N15
Wollar Central
Community Hall
N6
St Lawrence O'Toole Catholic Church
St Lukes Anglican Church
N16
Araluen Road
Wandoona
EL7091
146
129
135
137
953
952
947
960
942
933
937
921
900
903
961
908
914
959
150
LEGEND
Mining Lease Boundary
Exploration Licence Boundary
Crown Land
Crown Land (Licence/Special Lease/Reserve)
Relevant Private Landholders
Peabody Energy
Other Land (Ownership not identified)
Private Dwelling
Peabody Energy Dwelling
Community
Attended Noise Monitoring Site
Indicative Real-time Noise Monitoring Site - Fixed
Indicative Real-time Noise Monitoring Site - Mobile
Source: WCPL, 2013; NSW Trade & Investment, 2013 and Land & Property Information, 2013
0 0.15 0.3 0.45 0.6 0.75
Kilometres
WILPINJONG COAL MINE
Noise Monitoring Locations - Wollar
Peabody