



WILPINJONG COAL PTY LTD

Environment Protection Licence (EPL) 12425

[Link to Environment Protection Licence EPL12425](#)

LICENCE MONITORING DATA MONTHLY SUMMARY REPORT

for

1 December 2016 to 31 December 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				1.3				28/12/16	11/01/17
4	DG5	Particulates - TSM	grams per square metre per month	Monthly	1				1.2	1.3	4.0	No	28/12/16	11/01/17
6	DG8	Particulates - TSM	grams per square metre per month	Monthly	1				1.2				28/12/16	11/01/17
9	DG11	Particulates - TSM	grams per square metre per month	Monthly	1				4.6				28/12/16	11/01/17
17	DG15	Particulates - TSM	grams per square metre per month	Monthly	1				3.9				28/12/16	11/01/17
13	HV1	PM10	micrograms per cubic metre	Every 6 days	6	1.5	23.0	13.3			50		31/12/16	16/01/17
19	HV4	PM10	micrograms per cubic metre	Every 6 days	6	9.1	23.0	15.0			50		31/12/16	16/01/17
20	HV5	PM10	micrograms per cubic metre	Every 6 days	6	8.4	21.6	15.6			50		31/12/16	16/01/17
22	TEOM3	PM10	micrograms per cubic metre	Continuous (24 Hr Average)	100.0%	2.9	19.9	11.7			50			
23	TEOM4	PM10	micrograms per cubic metre	Continuous (24 Hr Average)	100.0%	4.3	30.5	13.3			50			

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

Figure 1a. DG Results - 12 Month Trend

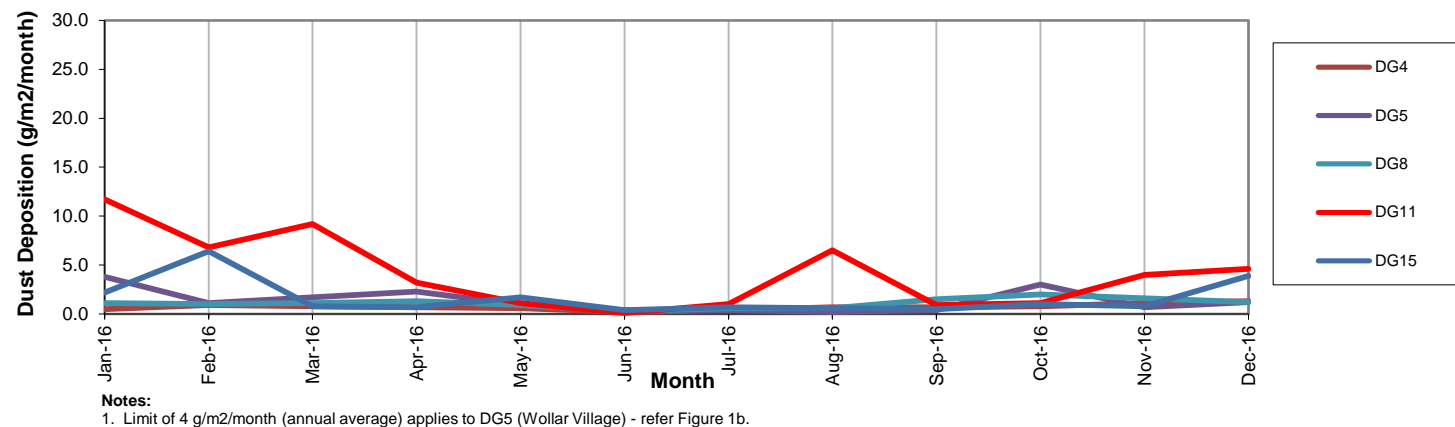


Figure 1b. DG 5 Results - Annual Average

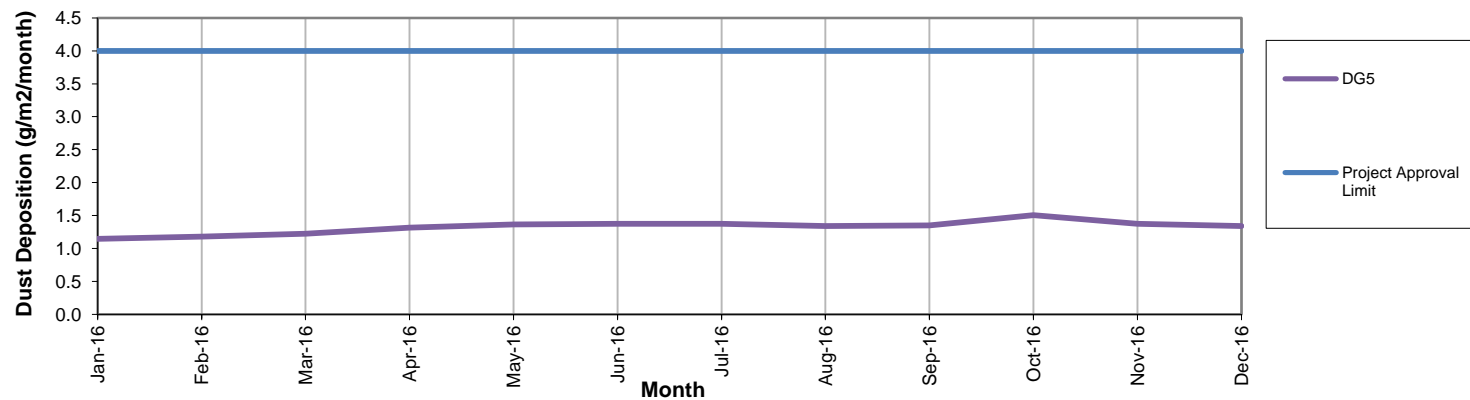
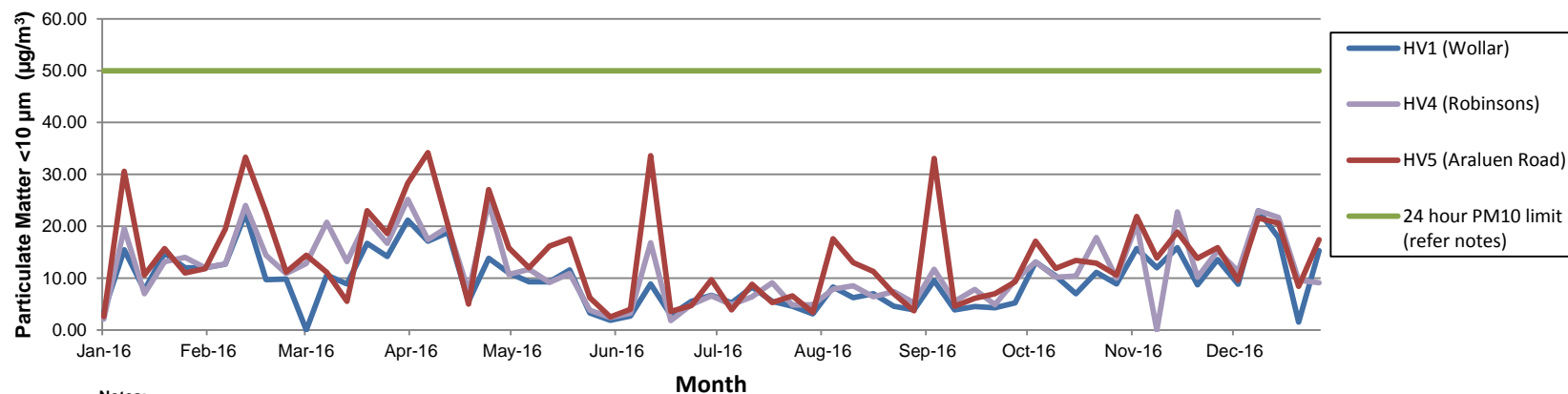


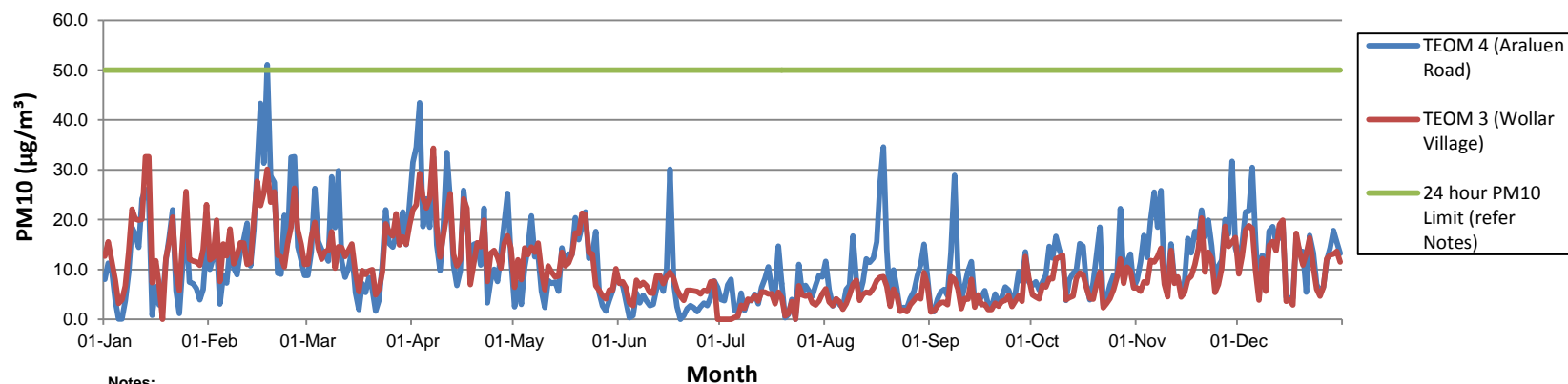
Figure 2. HV (PM10) Results - 12 Month Trend



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 6 March 2016
3. A power outage prevented dust sample being collected from HV4 on 13 November 2016
4. HV5 influenced by dust from Araluen Road generally during stable atmospheric conditions (i.e. dry, temperature inversion and no wind).

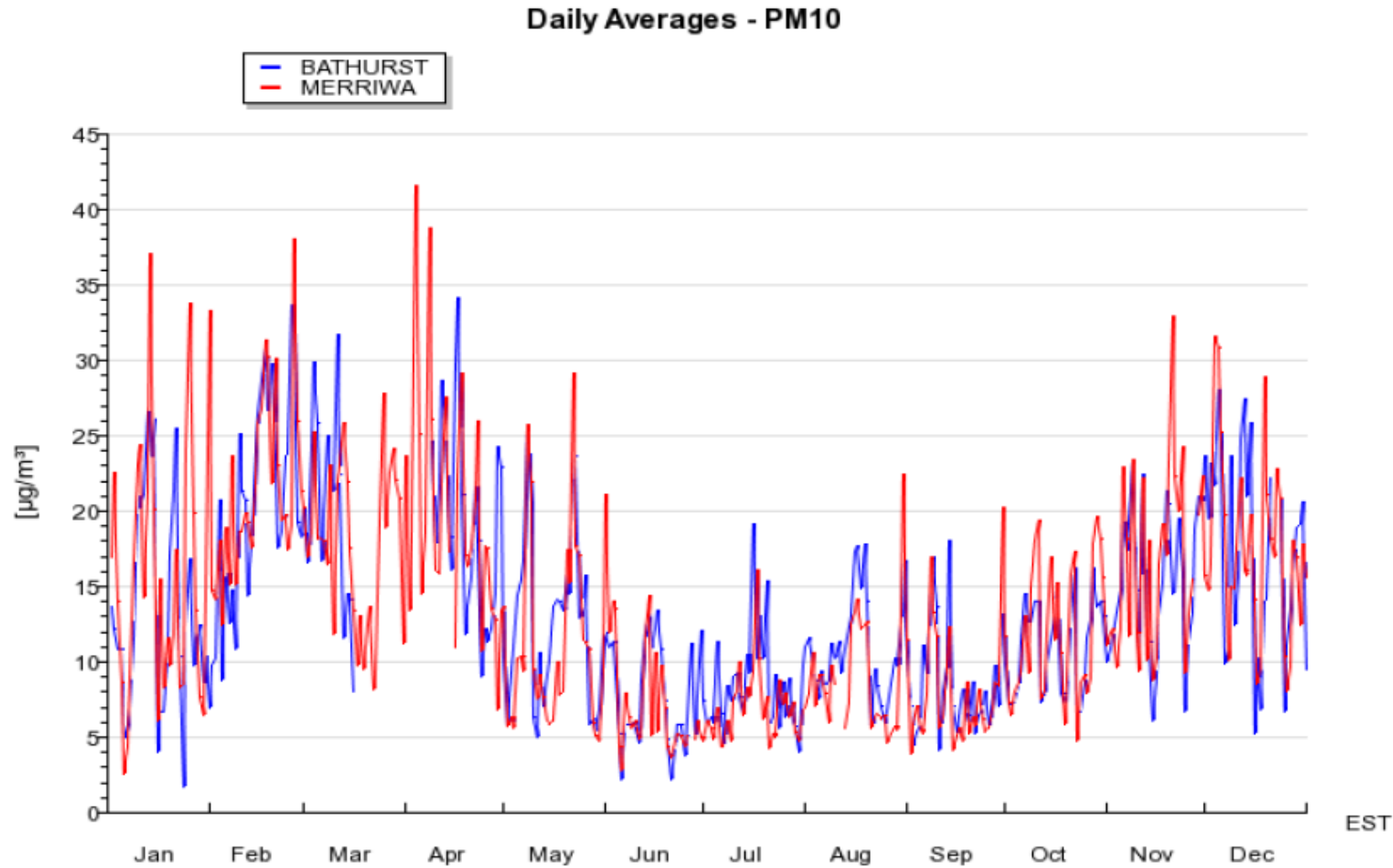
Figure 3. TEOM (PM10) Results - 12 Month Trend



Notes:

1. Limit doesn't apply for extraordinary events such as bushfires, prescribed burning or dust storms
2. Elevated PM10 dust levels recorded mid Feb caused by Totness bushfire and dust from Araluen Road.
3. TEOM 3 (Wollar Village) taken offline for repairs June 31 to July 4.
4. TEOM 4 (Araluen Rd) influenced by dust from Araluen Road generally during stable atmospheric conditions (i.e. temperature inversions)

Shown below and for comparison with Figures 2 and 3 is the 24Hr Av. PM₁₀ dust levels recorded at Bathurst and Merriwa by NSW EPA from 1 January 2016 to 31 December 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%	208	479	276		500	No		
		Oil and Grease	milligrams per litre (mg/L)	Weekly during any discharge	9	<5	<5	<5		10.0	No	30/12/16	25/01/17
		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	9	<1	3	1.7		50	No	30/12/16	25/01/17
		Volume discharged	megalitres per day	Continuous during discharge	100%	0.26	1.89	1.07		5.0	No		

Figure 4 – Volume discharged per day (ML)

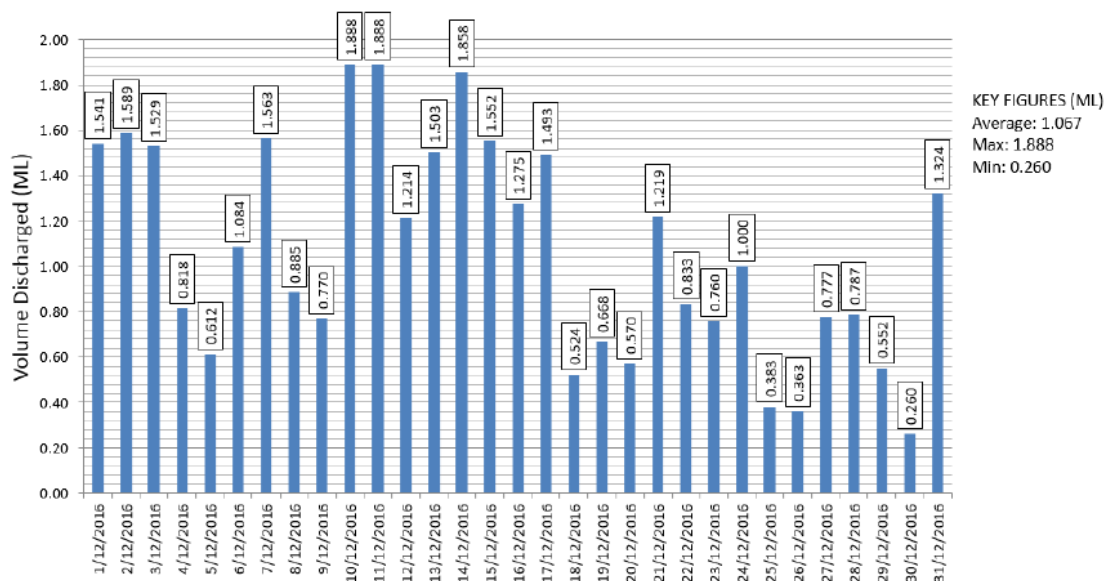


Figure 5 – Conductivity (max, min & average / day)

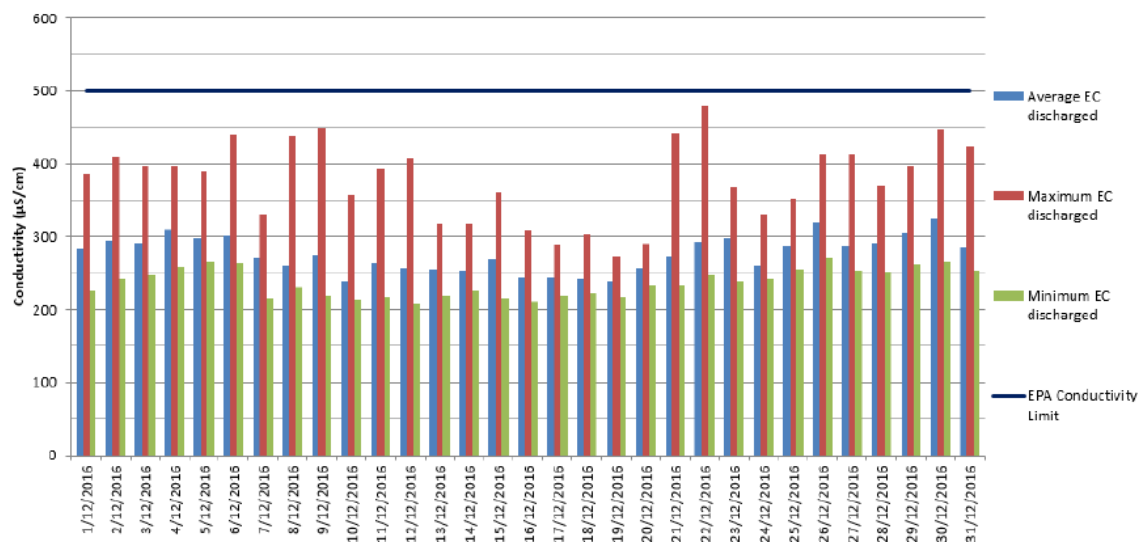
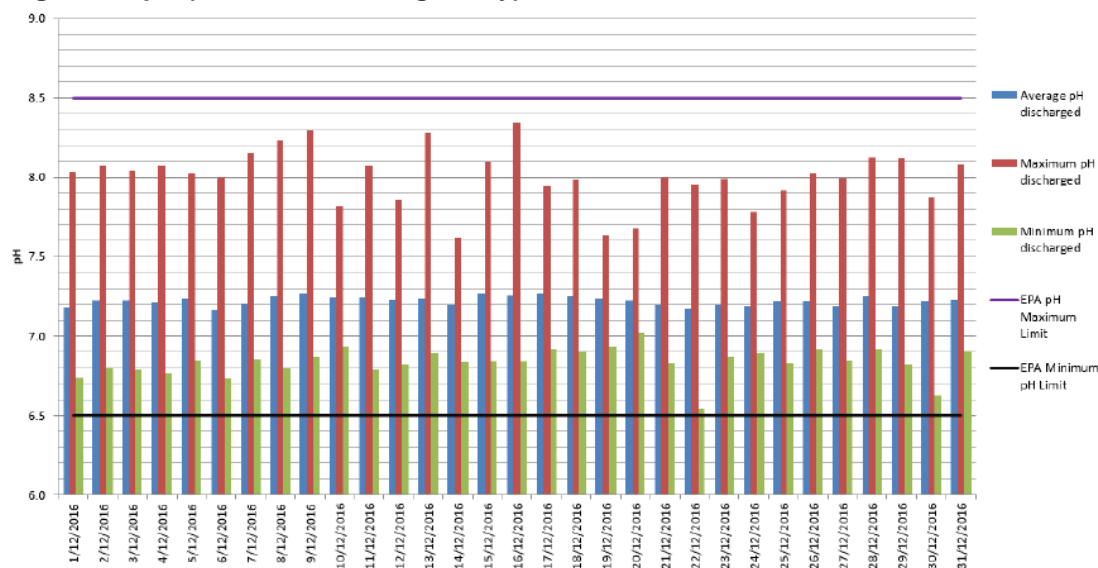


Figure 6 – pH (max, min & average / day)



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 environmental noise monitoring report (**noise monitoring report**).

Table 4.3: $L_{Aeq,15min}$ GENERATED BY WCP AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – DECEMBER 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	19/12/2016 23:23	1.3	-0.4	35	Yes	<20	Nil
N13	20/12/2016 01:25	1.0	-0.2	36	Yes	<25	Nil
N14	19/12/2016 22:56	2.0	-0.8	35	Yes	<25	Nil
N15	19/12/2016 23:42	1.4	-0.4	35	Yes	<20	Nil
N16	20/12/2016 00:44	1.4	-0.4	37	Yes	<20	Nil
N17	20/12/2016 00:14	1.4	-0.4	35	Yes	<20	Nil
N18	19/12/2016 22:25	2.8	-1.0	35	Yes	1A	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: $L_{A1,1min}$ GENERATED BY WCP AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – DECEMBER 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	19/12/2016 23:23	1.3	-0.4	45	Yes	<20	Nil
N13	20/12/2016 01:25	1.0	-0.2	45	Yes	30	Nil
N14	19/12/2016 22:56	2.0	-0.8	45	Yes	28	Nil
N15	19/12/2016 23:42	1.4	-0.4	45	Yes	<20	Nil
N16	20/12/2016 00:44	1.4	-0.4	45	Yes	25	Nil
N17	20/12/2016 00:14	1.4	-0.4	45	Yes	<20	Nil
N18	19/12/2016 22:25	2.8	-1.0	45	Yes	1A	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: $L_{Aeq,15min}$ GENERATED BY WCP AGAINST EPL ASSESSMENT CRITERIA – DECEMBER 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	19/12/2016 23:23	1.3	-0.4	35	Yes	<20	Nil
N13	20/12/2016 01:25	1.0	-0.2	35	Yes	<25	Nil
N14	19/12/2016 22:56	2.0	-0.8	35	Yes	<25	Nil
N15	19/12/2016 23:42	1.4	-0.4	36	Yes	<20	Nil
N16	20/12/2016 00:44	1.4	-0.4	35	Yes	<20	Nil
N17	20/12/2016 00:14	1.4	-0.4	35	Yes	<20	Nil
N18	19/12/2016 22:25	2.8	-1.0	35	Yes	1A	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 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: $L_{A1,1min}$ GENERATED BY WCP AGAINST EPL IMPACT ASSESSMENT CRITERIA – DECEMBER 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	19/12/2016 23:23	1.3	-0.4	45	Yes	<20	Nil
N13	20/12/2016 01:25	1.0	-0.2	45	Yes	30	Nil
N14	19/12/2016 22:56	2.0	-0.8	45	Yes	28	Nil
N15	19/12/2016 23:42	1.4	-0.4	45	Yes	<20	Nil
N16	20/12/2016 00:44	1.4	-0.4	45	Yes	25	Nil
N17	20/12/2016 00:14	1.4	-0.4	45	Yes	<20	Nil
N18	19/12/2016 22:25	2.8	-1.0	45	Yes	1A	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 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 19/20 December 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 December 2016 monitoring period.

6.2 Low Frequency Assessment

During the December 2016 survey, 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 project approval and EPL). No further assessment of low frequency noise was undertaken.

Wilpinjong Coal received the noise monitoring report from Global Acoustics Pty Ltd on 24 January 2017.

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.

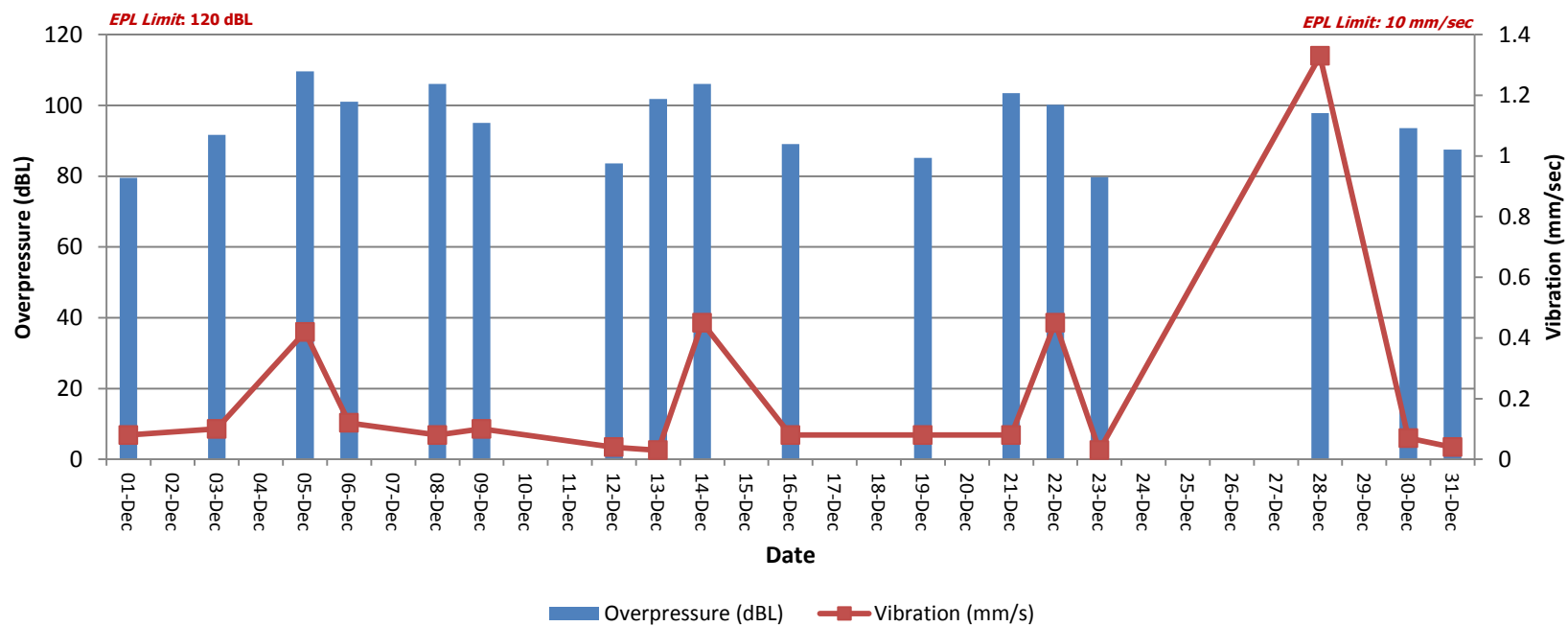
Table 3 – Overpressure Monitoring Results

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	December	17	79.5	109.6	94.8	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	December	17	0.03	1.33	0.21	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 °C/100m.

Table 5 shows the meteorological data recorded during the month.

Table 5

Date	Temperature (°C)									Humidity (%)			Prevailing Wind				Rain	Bar	Lapse Rate
	2m			10m			60m						Speed			Dir	(mm)	(hPa)	(°C/100m)
	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	(Deg)			Max
1/12/2016	23.5	14.7	32.8	23.7	15.3	32.3	23.8	15.4	31.2	42	13.2	77.4	0.8	0	5.8	246	0	1006.1	8.1
2/12/2016	24.5	12.5	34	24.8	13.3	33.4	25	14.9	32.1	37.9	14.9	71.7	1.5	0	6.3	220	0	1008.9	6.4
3/12/2016	25.3	15	35.7	25.3	16	35.2	25	17.2	34.2	46.8	17.2	71.6	1	0	5.4	92	0	1011.2	5.5
4/12/2016	25.6	16.7	35.8	25.6	17.1	35.3	25	16.6	34.6	54.4	20.9	84.8	1.3	0	3.3	89	0	1012	4.8
5/12/2016	30	22.6	36.8	30	22.9	36.3	29.5	23.7	35.1	43.2	21.8	71.1	1.1	0	5.2	227	0	1007.6	3.3
6/12/2016	25.2	19.8	30.5	25.2	20.2	29.9	24.6	19.8	29	60.1	38.5	80.6	1.2	0	6.5	235	0.2	1010	2.4
7/12/2016	22.6	18.2	29.2	22.4	18.3	28.4	21.6	18	27.1	60.4	35.5	82.5	1.4	0	3.3	86	0.6	1012.4	0.0
8/12/2016	25.5	16.2	35	25.3	16.6	34.3	24.5	16.3	33.1	53.6	21.5	88.3	2.6	0.8	10.6	271	0	1003.8	0.9
9/12/2016	18.5	13.6	23	18.2	13.8	22.4	17.4	13.2	21.2	40.1	22.5	69.4	3.9	0.4	6.9	231	0	1011.2	4.3
10/12/2016	19.9	8.6	29.7	19.8	9.5	29.1	19.8	10.3	28	44.3	16.1	73.5	1.1	0	4.9	88	0	1018	6.4
11/12/2016	22.7	13.8	31.8	22.6	14.3	30.9	22	14.6	29.8	52.2	23.3	79.9	1.1	0	4.5	88	0	1018	2.6
12/12/2016	25	17.7	32.9	24.9	18.2	32.3	24.5	17.9	31	51.1	20.3	85	0.5	0	4.6	319	1.4	1018.2	7.4
13/12/2016	25.5	15	34.4	25.8	15.9	33.5	26.1	17.4	32.5	41.5	17.8	76.2	2	0	5.8	287	0	1014.5	8.6
14/12/2016	26.6	15.6	35	26.8	16.7	34.2	27.2	19.2	33.1	38.2	16.3	69.2	1.9	0	7.5	270	0	1009.7	11.7
15/12/2016	20.1	16	24.8	20.1	16	25.1	19.5	15.5	24.5	74.1	49.3	93.2	3.3	0.7	5.5	86	8.4	1013.6	1.0
16/12/2016	18.7	16.1	22	18.6	16	21.7	18	15.4	21	92	78	97.2	1.7	0	4.6	85	19	1010.9	0.3
17/12/2016	24.3	18.7	30.1	24.2	18.8	29.8	23.7	18.8	28.9	59.3	25.7	97.8	2.7	0	5.8	256	0.8	1007.9	5.3
18/12/2016	20.3	14.1	26.8	20.3	14.6	25.9	20.1	16	24.8	56.3	36	77.5	2.8	0	6.6	78	0	1014.8	7.9
19/12/2016	21	15.3	27.8	20.7	15.3	26.9	19.9	14.7	25.8	53.8	34.3	71.9	3.3	0.7	6	83	0	1015.4	0.0
20/12/2016	24.4	14.3	33.1	24.4	15.1	32.6	24.1	15.1	31.6	50.4	22.6	84	1.3	0	6	282	0	1008.3	8.1
21/12/2016	25.5	18.3	32.4	25.5	19	31.7	25.5	19.8	30.5	40.2	11.4	70.1	1.7	0	6.7	251	0	1009.8	8.4
22/12/2016	22	18.4	27.6	21.7	18.4	27	20.9	17.9	26.1	58.3	37.5	70.7	4.2	2.7	6.1	86	0	1014.9	-0.7
23/12/2016	24	16.4	32.8	23.7	16.6	32.1	22.9	16.3	31.1	54.4	27.1	77.7	2.3	0.3	4.9	81	0	1014.2	0.0
24/12/2016	23.6	18.1	30.3	23.4	18.3	29.5	22.7	18	28.7	54.5	26.3	83.6	0.8	0	7.8	188	0.8	1013.7	1.0
25/12/2016	22.4	15.8	30.3	22.2	16.3	29.6	21.7	16.2	28.1	64.2	31.6	94.7	1.2	0	4.8	80	0.2	1013.5	1.9
26/12/2016	24.9	17.2	32.5	24.9	17.6	31.1	24.8	19	29.5	57.4	31.1	89.9	0.8	0	3.8	321	0	1012	5.7
27/12/2016	26.6	17.8	35.3	26.5	18.4	34.6	26.1	18.9	33	50.7	22.4	82.4	0.4	0	6.3	58	0	1010.9	3.8
28/12/2016	28	18.6	35.2	28.1	19.3	34.4	27.7	20.5	33.1	44.2	21.6	81.2	0.9	0	3.8	304	0	1009.1	6.2
29/12/2016	28.3	17.3	37.4	28.5	18.2	36.7	29.1	20	35.7	38.3	15.9	73.8	1.5	0	4.7	282	0	1005.9	9.5
30/12/2016	29.5	19.1	37.2	29.7	20	36.2	29.6	21	34.9	36.4	18.4	64.9	1.6	0	6.1	291	0	1002.2	5.5
31/12/2016	31.6	25.4	37.9	31.3	25.6	36.7	30.5	25.3	35.4	43.7	28.6	65.9	2	0.4	8	251	0	1001	0.7

Figure 8 – Air (Dust) Monitoring Locations

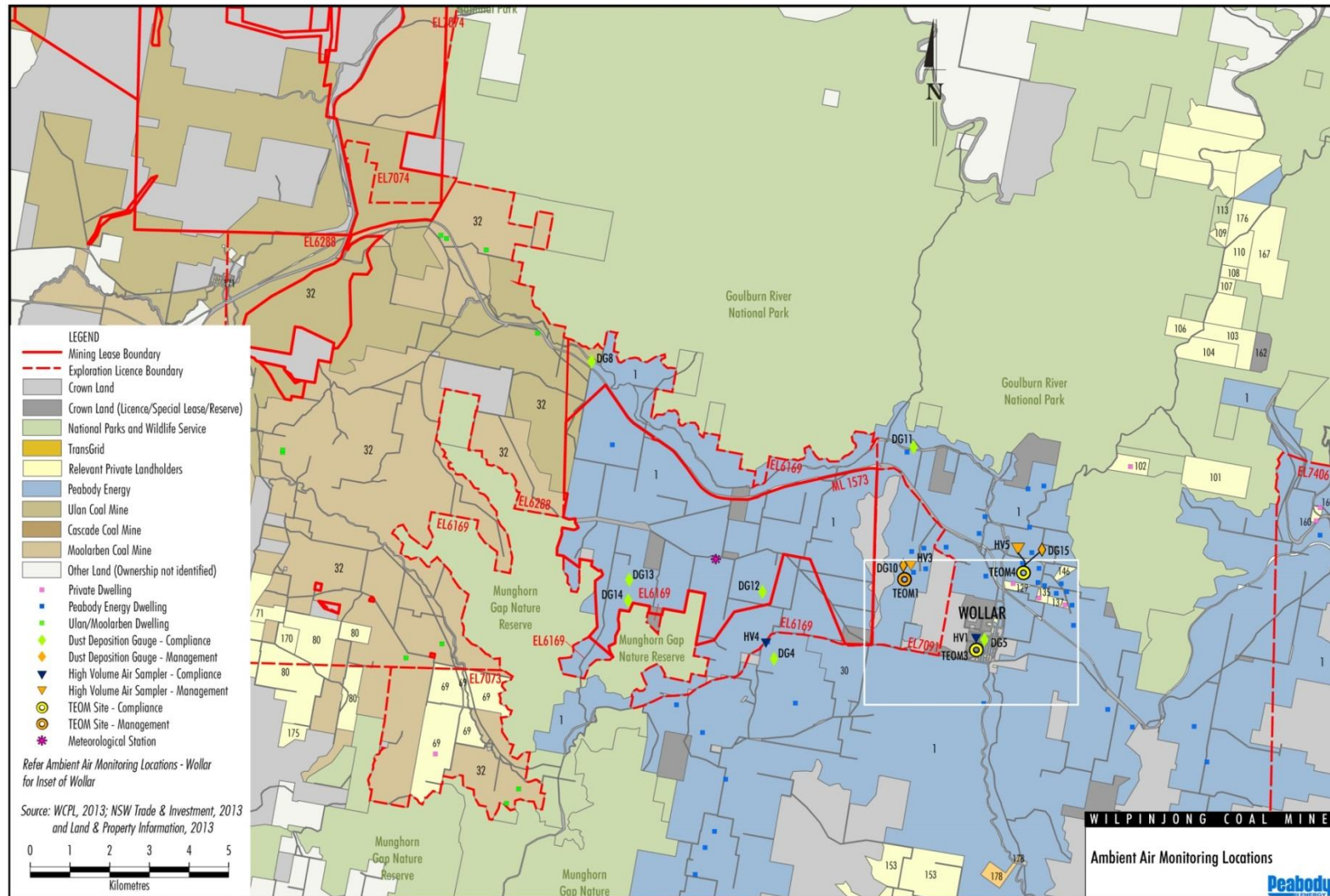




Figure 9 – Attended Noise Monitoring Locations

