



Bengalla Mining Company Pty. Limited

Bengalla Road, (Locked Mailbag 5)

Muswellbrook NSW 2333 Australia

A.B.N. 32 053 909 470

Bengalla Mine

Environment Protection Licence 6538 Monthly Monitoring Data Summary

September 2016



Contents

1. INTRODUCTION	1
2. AIR QUALITY	2
2.1. Total Suspended Particulates	2
2.2. Particulate Matter less than 10 Microns	4
2.3. Dust Deposition	6
3. SURFACE WATER	9
3.1 Mine Water	9
3.2 Conductivity	11
3.3 Total suspended solids and pH	13
4. NOISE	15
5. BLASTING	17

Tables

Table 1: Total Suspended Particulates Monitoring Summary	3
Table 2: PM ₁₀ Monitoring Summary	5
Table 3: Dust Deposition Monitoring Summary	7
Table 4. Mine Water Monitoring Summary	10
Table 5. Conductivity Monitoring Summary – Outlet pipe from 280 ML HRSTS storage dam	12
Table 6. Conductivity Monitoring Summary– Tributary monitoring point in Dry Creek downstream of EPA1	12
Table 7. Total suspended solids and pH Monitoring Summary	14
Table 8. Noise - LAeq (15 minute) Monitoring Summary	16
Table 9: Blast Monitoring Summary	18



1. INTRODUCTION

Environmental Protection Licence (EPL) holders are required under the *Protection of the Environment Operations Act 1997* to make publicly available their monitoring results for those parameters specified in the EPL. This document has been prepared to satisfy this requirement.

Bengalla Mining Company Pty Limited's (BMC) operations are conducted in accordance with EPL 6538. The licence details are as follows:

License Holder:	Bengalla Mining Company Pty Limited
Licence Number:	6538
Premises:	Bengalla Mine Bengalla Road via Muswellbrook NSW 2333
Access to Licence:	http://www.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=6538&id=6538&option=licence&searchrange=licence&range=POEOlicence&prp=no&status=Issued
Monitoring Locations:	See main text and Appendix A

This document provides a summary of environmental monitoring data sampled as prescribed by EPL 6538 for September 2016 (reporting period). Monitoring data provided is as follows:

- Air quality, including total suspended particulates (TSP), particulate matter less than 10 microns (PM₁₀) and deposited dust matter;
- Surface water, including discharge mine water, conductivity, total suspended solids and pH;
- Noise - LAeq (15 minute); and
- Blast vibration and overpressure.



2. AIR QUALITY

In accordance with Condition M2.2 of EPL 6538, ~~and to monitor regional air quality,~~ Bengalla Mine operates and maintains a network of five high volume air samplers (HVAS) measuring TSP, three HVAS measuring PM₁₀ and 14 depositional dust gauges on land representative of private receivers surrounding its operations. Additional PM₁₀ data is also sourced from Mt Arthur Coal through an information sharing agreement. The air quality monitoring network, as described, is shown in **Appendix A**.

2.1. Total Suspended Particulates

Pollutant:	TSP
Unit of measure:	Micrograms per cubic metre ($\mu\text{g}/\text{m}^3$)
Monitoring location:	See Table 1 and Appendix A
Monitoring frequency required by licence:	Every 6 days (24 hours)
Sampled:	21/08/2016, 27/08/2016, 02/09/2016, 08/09/2016, 14/09/2016 Results for 21/08/2016 and 27/08/2016 to be presented in this summary due to sample schedule.
Obtained:	11 October 2016
Published:	28 October 2016
Development consent limit:	Annual average 90 $\mu\text{g}/\text{m}^3$



In accordance with Condition M2.2 of EPL 6538, TSP data (EPA Monitoring Point 3) for the reporting period is provided in **Table 1**.

Table 1: Total Suspended Particulates Monitoring Summary

Sampling point		No. of samples required by licence	No. of samples collected and analysed*	Minimum sample value	Maximum sample value	Monthly mean of samples	Annual rolling average *
HV01	Wybong Road (East), Muswellbrook	5	5	10	35	19	53
HV02	Racecourse Road, Muswellbrook	5	5	12	43	23	55
HV03	Logues Lane, Muswellbrook	5	5	10	35	18	40
HV04	St James School, Muswellbrook	5	5	13	29	21	46
HV06	Wybong Road (West), Muswellbrook	5	5	9	82	30	81

* Annual rolling average as at 14/09/16.

For the reporting period, annual rolling average TSP data were below the annual average Development Consent limit of 90 µg/m³.



2.2. Particulate Matter less than 10 Microns

Pollutant:	PM ₁₀
Unit of measure:	Micrograms per cubic metre (µg/m ³)
Monitoring location:	See Table 2 and Appendix A
Monitoring frequency required by licence:	Every 6 days (24 hours)
Sampled:	21/08/2016, 27/08/2016, 02/09/2016, 08/09/2016, 14/09/2016 Results for 21/08/2016 and 27/08/2016 to be presented in this summary due to sample schedule.
Obtained:	11 October 2016
Published:	28 October 2016
Development consent limit:	Annual average 30 µg/m ³ 24-hour average 50 µg/m ³



In accordance with Condition M2.2 of EPL 6538, PM10 data (EPA Monitoring Point 4) for the reporting period is provided in **Table 2**.

Table 2: PM₁₀ Monitoring Summary

Sampling point		No. of samples required by licence	No. of samples collected and analysed*	Minimum sample value	Maximum sample value	Monthly mean of sample	Annual rolling average *
PM ₁₀ - 1	Racecourse Road, Muswellbrook	5	5	4	19	9	20
PM ₁₀ - 2	St James School, Muswellbrook	5	5	6	15	9	19
PM ₁₀ - 3	Mt Arthur Coal Residence, Muswellbrook †	5	5	2	30	9	21
PM ₁₀ - 4	Wybong Road (West), Muswellbrook	5	5	3	27	10	25

* Annual rolling average as at 14/09/16.

† Data sourced from Mt Arthur Coal

For the reporting period, annual rolling average PM₁₀ data were below the annual average Development Consent limit of 30 µg/m³.

For the reporting period, 24-hour average PM₁₀ data were below the 24-hour average Development Consent limit of 50 µg/m³.



2.3. Dust Deposition

Pollutant:	Particulates – deposited matter
Unit of measure:	Grams per square metre per month (g/m ² /month)
Monitoring location:	See Table 3 and Appendix A
Monitoring frequency required by licence:	Once a month (minimum of 4 weeks)
Sampling period:	22 August 2016 – 22 September 2016
Obtained:	11 October 2016
Published:	28 October 2016
Development consent limit:	Annual average 4 g/m ² /month



In accordance with Condition M2.2 of EPL 6538, dust deposition data (EPA Monitoring Point 5) is provided in **Table 3**.

Table 3: Dust Deposition Monitoring Summary

	Sampling point	No. of samples required by licence	No. of samples collected and analysed	Measured value	Observations	Annual rolling average
D01	Queen Street, Muswellbrook	1	1	0.5	Insects	0.9
D02	King Street, Muswellbrook	1	1	1.0	Insects	1.1
D04A	Industrial Estate, Muswellbrook	1	1	1.9	Insects	1.9
D05	Intersection Kayuga and Wybong Road, Muswellbrook	1	1	1.0	Insects	1.0
D06	Logues Lane, Muswellbrook	1	1	0.8	Insects	1.8
D07A	St James School, Muswellbrook	1	1	1.3	Insects	1.4
D08	Denman Road, Muswellbrook	1	1	1.6	Insects	1.4
D09	Wybong Road, Muswellbrook	1	1	1.8	Insects	1.4
D10	Racecourse Road, Muswellbrook	1	1	1.7	Insects	1.7
D20	Wyndams Arms R.O.W., Muswellbrook	1	1	1.9	Insects	3.3
D23B	Logues Lane, Muswellbrook	1	1	2.6c	Insects, seeds	3.4
D25	Roxburgh Road, Muswellbrook	1	1	1.7	Insects	2.6
D26	Wybong Road, Muswellbrook	1	1	2.5	Insects	2.4
DA	Roxburgh Road, Muswellbrook	1	1	1.5	Insects, vegetation	3.1

(c) Sample contaminated. Results for contaminated gauges are not included in the calculation of the annual averages.



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8

Dust deposition samples can be contaminated by a variety of means, notably by the presence of insects and bird droppings. Results for contaminated gauges are not included in the calculation of the annual averages for the reporting period.

The Australian Standard does not provide criteria for the determination of contamination of a dust deposition sample. In this regard, a dust deposition sample is determined to be contaminated if it meets at least three of the following criteria:

1. Contents – gauge contains organic matter or bird droppings;
2. Water colour/turbidity – gauge water is coloured and turbid;
3. Ash to insoluble ratio – <50% or <70% for gauges within close proximity to mining operations; or
4. ARA comparison – insoluble result is higher than the annual rolling average.

For the reporting period, annual rolling average dust deposition data were below the annual average Development Consent limit of 4 g/m²/month.

Operator, for and on behalf of Bengalla Joint Venture, an unincorporated joint venture between:
Harcove Pty Ltd, Wesfarmers Bengalla Limited, Taipower Bengalla Pty Limited & Mitsui Bengalla Investment Pty Limited.

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3. SURFACE WATER

Bengalla Mine participates in the Hunter River Salinity Trading Scheme (HRSTS). In accordance with Condition P1.3, M2.3 and M7 of EPL6538, Bengalla Mine maintains two monitoring locations to measure concentration, volume and mass of mine water discharges.

The location of these monitoring points is provided in **Appendix A**.

3.1 Mine Water

Pollutant:	Mine water
Unit of measure:	Megalitres per day (ML/day)
Monitoring location:	EPA Monitoring Identification Point 1 (EPA01) – Outlet pipe from 280 ML HRSTS storage dam See Appendix A
Monitoring frequency required by licence:	Continuous during all discharge events
Sampled:	16/17 September 2016, 20/21 September 2016
Obtained:	26 October 2016
Published:	28 October 2016
Volume/mass limit: (EPL6538 Condition L3)	200 ML/day



Table 4. Mine Water Monitoring Summary

Sampling point	River Register Block ID	Discharge Start		Discharge Finish		Volume Discharged (ML)
		Date	Time	Date	Time	
EPA1/ SW01	2016-262(2)	16/09/16	15:20	17/09/16	03:35	19
EPA1/ SW01	2016-266(1)	20/09/16	15:15	21/09/16	03:30	14

For the reporting period, the volume of water release during discharge events was less than the EPL6538 limit of 200ML/day.



3.2 Conductivity

Pollutant:	Conductivity
Unit of measure:	Microsiemens per centimetre ($\mu\text{S}/\text{cm}$)
Monitoring location:	EPA Monitoring Point 1 (EPA1) – Outlet pipe from 280 ML HRSTS storage dam EPA Monitoring Point 2 (EPA2) – Tributary monitoring point in Dry Creek downstream of EPA1 See Appendix A
Sampled:	16/17 September 2016, 20/21 September 2016
Obtained:	26 October 2016
Published:	28 October 2016



Table 5. Conductivity Monitoring Summary – Outlet pipe from 280 ML HRSTS storage dam

Sampling point	Frequency required by licence	River Register Block ID	Discharge Start		Discharge Finish		Minimum sample value	Maximum sample value	Mean of sample
			Date	Time	Date	Time			
EPA1/ SW01	Continuous	2016-262(2)	16/09/16	15:20	17/09/16	03:35	2885	2988	2942
		2016-266(1)	20/09/16	15:15	21/09/16	03:30	2945	2972	2961

Table 6. Conductivity Monitoring Summary– Tributary monitoring point in Dry Creek downstream of EPA1

Sampling point	Frequency required by licence	River Register Block ID	Discharge Start		Discharge Finish		No. of samples collected and analysed	Measured value	Observations
			Date	Time	Date	Time			
EPA2/ SW02	Twice daily	2016-262(2)	16/09/16	15:20	17/09/16	03:35	-	-	Discharge did not reach tributary monitoring point.
		2016-266(1)	20/09/16	15:15	21/09/16	03:30	-	-	Discharge did not reach tributary monitoring point.

For the reporting period, the conductivity of the water released during discharge events was monitored in accordance with EPL6538.



3.3 Total suspended solids and pH

Pollutants:	pH and Total suspended solids (TSS)
Monitoring location:	EPA Monitoring Point 1 (EPA1) – Outlet pipe from 280 ML HRSTS storage dam See Appendix A
Monitoring frequency required by licence:	Daily during all discharge events
Sampled:	16/17 September 2016, 20/21 September 2016
Obtained:	26 October 2016
Published:	28 October 2016
pH limit: (EPL6538 Condition L2.4)	6.5 – 9.5 (100 th percentile)
TSS limit: (EPL6538 Condition L2.4)	120 Milligrams per litre (mg/L) (100 th percentile)



Table 7. Total suspended solids and pH Monitoring Summary

Sampling point	River Register Block ID	Discharge Start		Discharge Finish		Sample Date	Sample Time	Measured value	
		Date	Time	Date	Time			pH	TSS (mg/L)
EPA1/ SW01	2016-262(2)	16/09/16	15:20	17/09/16	03:35	16/09/16	17:20	8.7	20
						17/09/16	12:40	8.7	36
	2016-266(1)	20/09/16	15:15	21/09/16	03:30	20/09/16	09:30	8.8	28
						20/09/16	17:20	9.0	57
						20/09/16	23:30	9.0	45

For the reporting period, the pH of the water released during discharge events was in the range of the EPL6538 100 percentile concentration limit of 6.5 to 9.5.

For the reporting period, the TSS of the water released during discharge events was below the EPL6538 100 percentile concentration limit of 120mg/L.



4. NOISE

In accordance with Condition P1.4, L4 and M10 of EPL 6538, Bengalla Mine undertakes compliance attended noise monitoring for 15minutes once per calendar month during the night period (10 pm to 7 am) at three locations representative of the nearest private receivers. The noise monitoring locations, as described, are shown in **Appendix A**.

Pollutant:	Noise – Bengalla Only LAeq (15 minute)
Monitoring location:	EPA Monitoring Point 7 (EPA7) AN01 – Wybong Road, Castle Rock EPA Monitoring Point 8 (EPA8) AN03 – Denman Road, Muswellbrook EPA Monitoring Point 9 (EPA9) AN04 – Racecourse Road, Muswellbrook See Appendix A
Monitoring frequency required by licence:	Monthly
Sampled:	8/9 September 2016
Obtained:	27 October 2016
Published:	28 October 2016
EPA7/AN01 and EPA9/AN04 limit: (EPL6538 Condition L4.1)	35 dB(A)
EPA8/AN03 limit: (EPL6538 Condition L4.1)	40 dB(A)



Table 8. Noise – Bengalla Only¹ LAeq (15 minute) Monitoring Summary

Sampling point	No. of samples required by licence	No. of samples taken and analysed	Sample Date	Sample Time	Measured value
EPA7/AN01	1	1	08/09/2016	22:33	27
EPA8/AN03	1	1	08/09/2016	22:57	32
EPA9/AN04	1	1	08/09/2016	23:06	NM ³

For the reporting period, EPA7/AN01 and EPA9/AN04 data were below the EPL 6538 limit of 35 dB(A).

For the reporting period, EPA8/AN03 data was below the EPL 6538 limit of 40 dB(A).

Note:

1. These are LAeq, 15minute operational noise levels for Bengalla in the absence of all other noise sources;
2. Inaudible (IA) - No noise from the source of interest audible at the monitoring location.
3. Not Measurable (NM) - Some noise from the source of interest was audible at low-levels, but could not be quantified.



5. BLASTING

In accordance with Condition P1.4, L5 and M8 of EPL 6538, Bengalla Mine maintains a network of three blast monitors on private (non-mine owned) land to measure air-blast overpressure and ground vibration for all blasts events undertaken by the operation. The location of these monitors is provided in **Appendix A**.

Monitoring locations:	EPA Monitoring Point 12 (EPA12) MRE EPA Monitoring Point 19 (EPA19) SCH EPA Monitoring Point 20 (EPA20) BLK See Appendix A
Monitoring frequency required by licence:	All blasts
Sampled:	1 – 30 September 2016
Obtained:	1 – 30 September 2016
Published:	28 October 2016
Overpressure limits: (Condition L5)	a) 115 linear decibels (dB(L)) for more than 5% of the total number of blasts carried out on the premises within the 12 months annual reporting period; and b) 120 dB(L) at any time
Ground vibration limits: (Condition L5)	a) exceed 5 millimetres/second (mm/s) for more than 5% of the total number of blasts carried out on the premises within the 12 months annual reporting period; and b) 10mm/s at any time



In accordance with Condition M8 of EPL 6538, overpressure and ground vibration data is provided in **Table 9**.

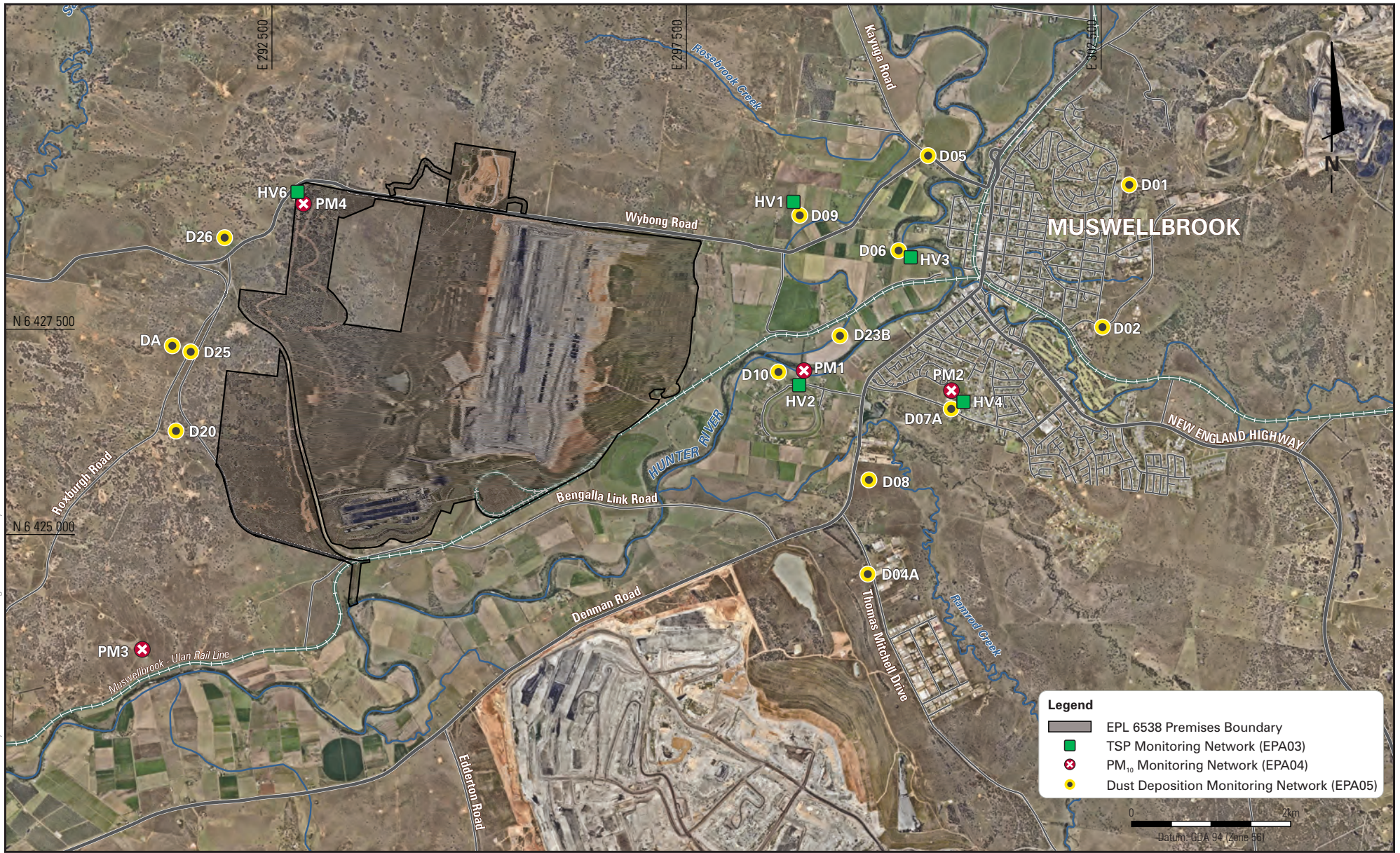
Table 9: Blast Monitoring Summary

Sampling point	Pollutant	Unit of measure	No. of samples required by licence	No. of samples collected and analysed	Minimum value	Maximum value	Mean of samples
Blake (BLM)	Overpressure	dB(L)	All blast events	17	84.20	106.10	93.29
	Ground vibration	mm/s	All blast events	17	0.02	0.55	0.22
St James School (SCH)	Overpressure	dB(L)	All blast events	17	84.20	101.70	91.46
	Ground vibration	mm/s	All blast events	17	0.01	0.21	0.09
Moore (MRE)	Overpressure	dB(L)	All blast events	17	86.60	104.90	97.25
	Ground vibration	mm/s	All blast events	17	0.08	2.70	1.04

For the reporting period, overpressure and ground vibration data were below the maximum limit and within the 5% allowance limit specified in Condition L5 of EPL 6538.

Appendix A

EPL 6538 Monitoring Locations



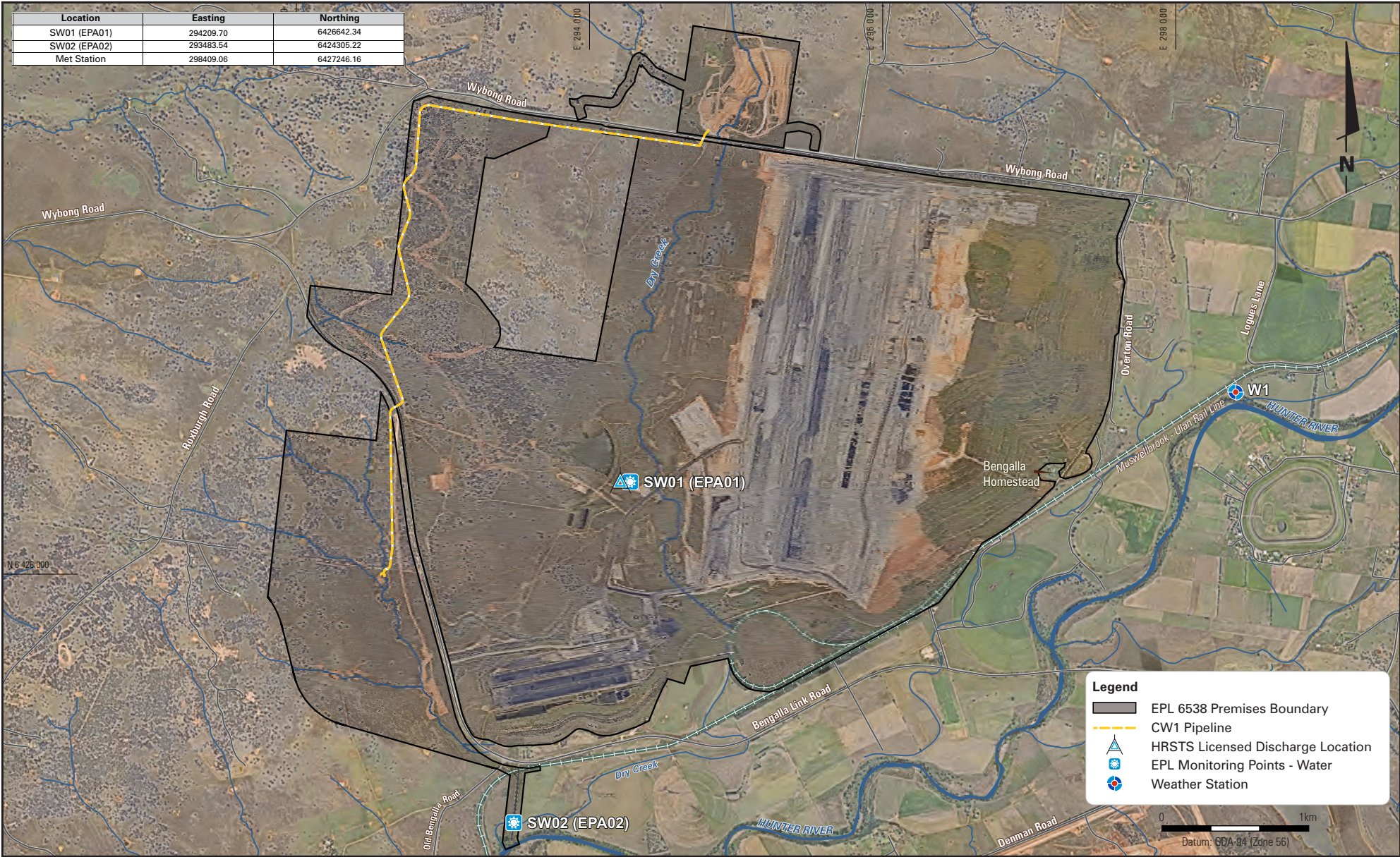
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EPL Monitoring Points - Air Quality

FIGURE 2



Location	Easting	Northing
SW01 (EPA01)	294209.70	6426642.34
SW02 (EPA02)	293483.54	6424305.22
Met Station	298409.06	6427246.16



HB BENGALLA EPL Boundary Revisions 1649 F1 EPL Boundary 02 08 2016 Rev D

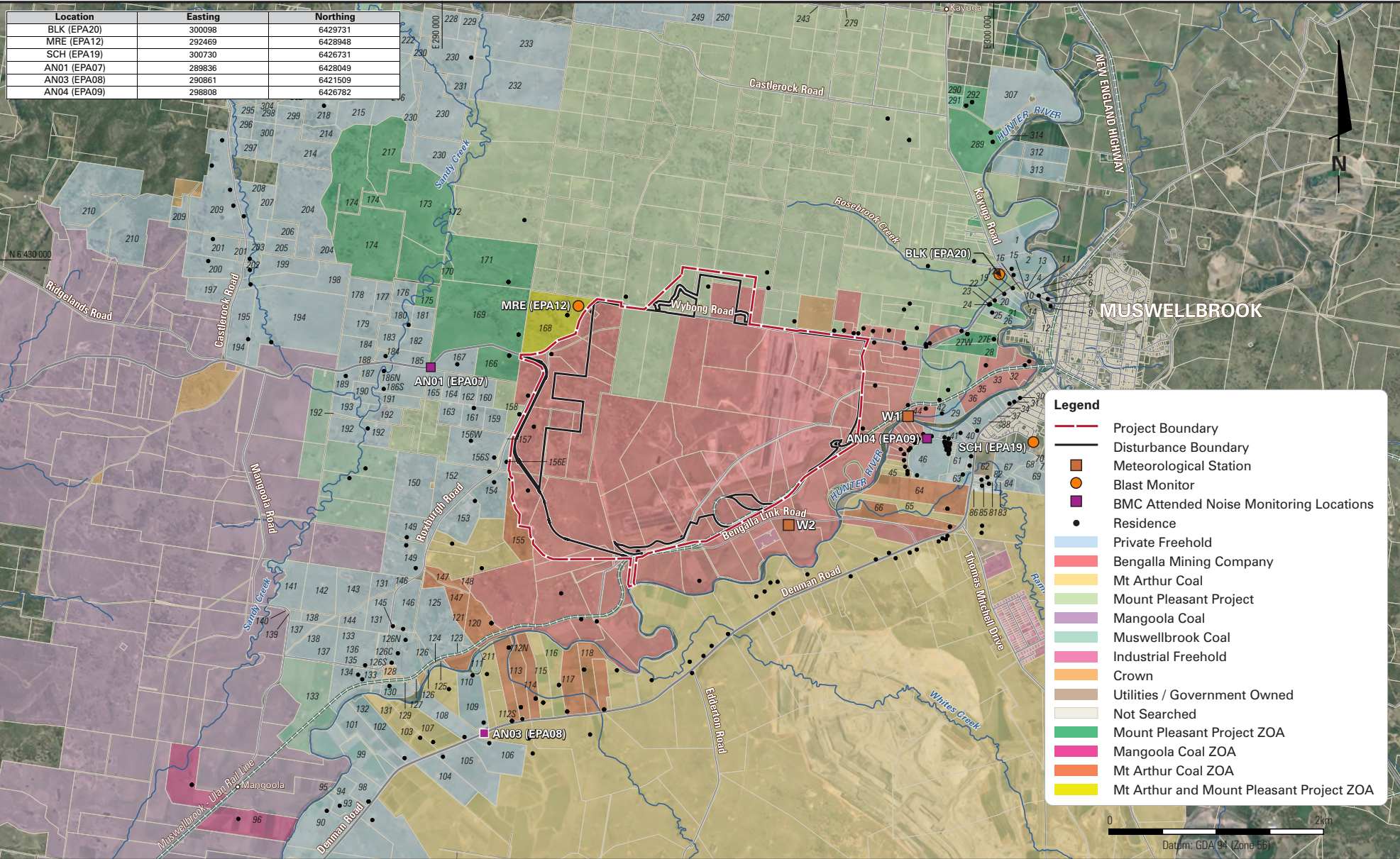


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EPL Monitoring Points - Water

FIGURE 1



HB BENGALLA EPL 1428 F1 Bengalla Compliance Acoustic Monitoring Network - Aerial Version 09 09 2016



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Bengalla Compliance Acoustic Monitoring Network

FIGURE 1