

GLENCORE

**BAAL BONE COLLIERY**

October to December 2015  
Environmental Monitoring Summary

# 1. Introduction

In accordance with Schedule 5, Condition 9 of Project Approval 09\_0178 this report provides a summary of environmental monitoring results for Baal Bone Colliery, for the period **1 October 2015 to 31 December 2015**. Baal Bone's licensed discharge and monitoring locations are identified in **Drawing 1**.

## 2. Air quality

Monthly dust monitoring is carried out in accordance with Australian Standard AS3580.10.1, EPL requirements and Baal Bone's Air Quality Monitoring Program.

Monitoring is undertaken by the ALS Group Environmental Division, a NATA Accredited laboratory.

Baal Bone maintains a network of dust deposition gauges:

- Sample location DM1 (EPL monitoring point No. 7);
- Sample location DM2 (EPL monitoring point No. 13);
- Sample location DM3 (EPL monitoring point No. 14);
- Sample location DM4 (EPL monitoring point No. 15).

Locations of the dust deposition gauges are shown in **Drawing 1**.

Schedule 3, Condition 10 of Project Approval 09\_0178 includes air quality impact assessment criteria for the project (summarised in Table 1). The pollutants to be monitored include deposited dust, TSP and PM<sup>10</sup>.

In accordance with the DoPI approved Air Quality Monitoring Program, monitoring for TSP and PM<sup>10</sup> was discontinued in June 2012. The monitoring was discontinued following Baal Bone mining operations entering care and maintenance in September 2011, and the completion of coal washing and transporting of coal off-site in December 2011 and April 2012 respectively.

**Table 1:** Baal Bone Air Quality Impact Assessment Criteria

Pollutant	Averaging period	Criterion	
Deposited dust	Annual	Maximum increase	Maximum total
		2 g/m <sup>2</sup> /month	4 g/m <sup>2</sup> /month
TSP	Annual	90 µg/m <sup>3</sup>	
PM <sup>10</sup>	24 hour	50 µg/m <sup>3</sup>	
	Annual	30 µg/m <sup>3</sup>	

The monthly results for each of the monitoring locations are summarised in Table 2. Figures 1 to 4 provide monthly results for each site.

**Table 2:** Deposited dust monitoring results for 2015 (g/m<sup>2</sup>/month)

Month	DM1	DM2	DM3	DM4
January	0.3	0.6	0.5	0.6
February	0.7	0.4	0.7	0.6
March	0.6	0.5	0.5	0.5
April	1.2	0.1	0.3	0.2
May	1.9	0.4	0.5	0.4
June	0.2	1.3	0.2	0.2
July	0.2	0.1	0.1	0.1
August	0.1	0.1	0.1	0.1
September	0.7	0.2	5.0*	0.3
October	0.4	0.5	0.4	0.4
November	0.6	0.2	0.5	12.6**
December	0.6	0.6	3.9	0.8

\* The September dust monitoring result for point 14 (AQ3) recorded an abnormally high result of 5.0 g/m<sup>2</sup>/month. The sample was microscopically analysed to determine the source of particles. The analysis was undertaken by the ALS Group Environmental Division, a NATA Accredited laboratory and results indicated that the insoluble matter was comprised of insects, bird droppings and vegetation. Therefore the high reading is most likely from non-mining related sources.

All dust monitoring results for 2015 to date, are below the maximum allowable annual average dust level of 4 g/m<sup>2</sup>/month, in accordance with Schedule 3, Condition 10 of Project Approval 09\_0178.

\*\* The November dust monitoring result for point 15 (AQ4) recorded an abnormally high result of 12.6 g/m<sup>2</sup>/month. The sample was microscopically analysed to determine the source of particles. The analysis was undertaken by the ALS Group Environmental Division, a NATA Accredited laboratory and results indicated that the insoluble matter was comprised of 60-70% of organic matter, 30-40% of sand/clay and <10% of fine dark particles. Therefore the high reading is most likely from non-mining related sources.

All dust monitoring results for 2015 to date, are below the maximum allowable annual average dust level of 4 g/m<sup>2</sup>/month, in accordance with Schedule 3, Condition 10 of Project Approval 09\_0178.

## 2015 Monthly Total Insoluble Matter

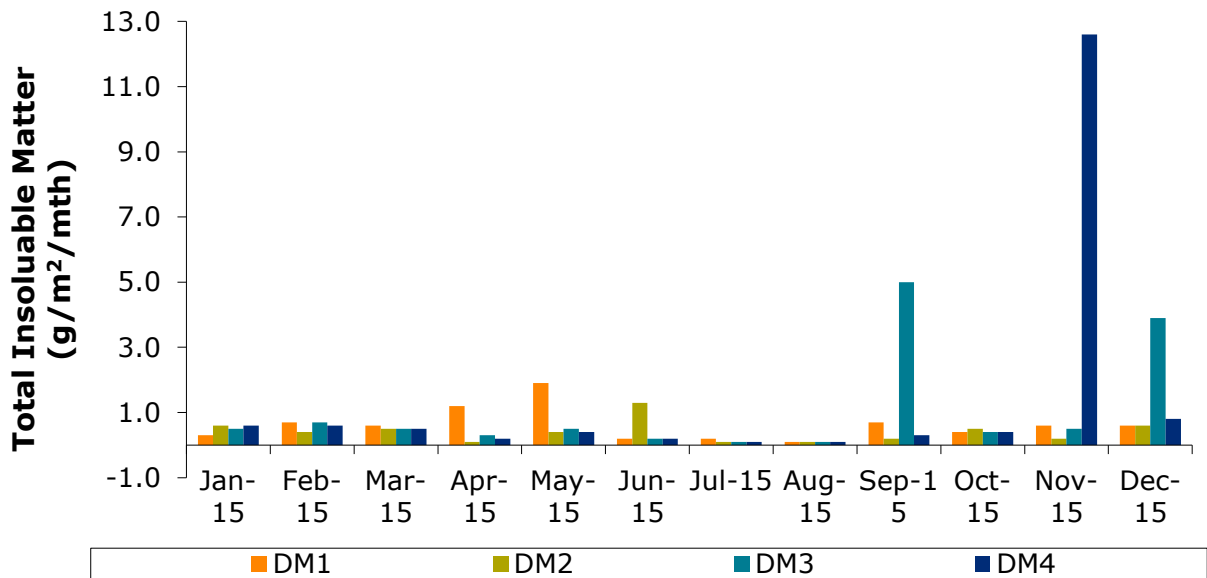


Figure 1: 2015 Monthly Total Insoluble Matter.

## 2015 Annual Average Total Insoluble Matter

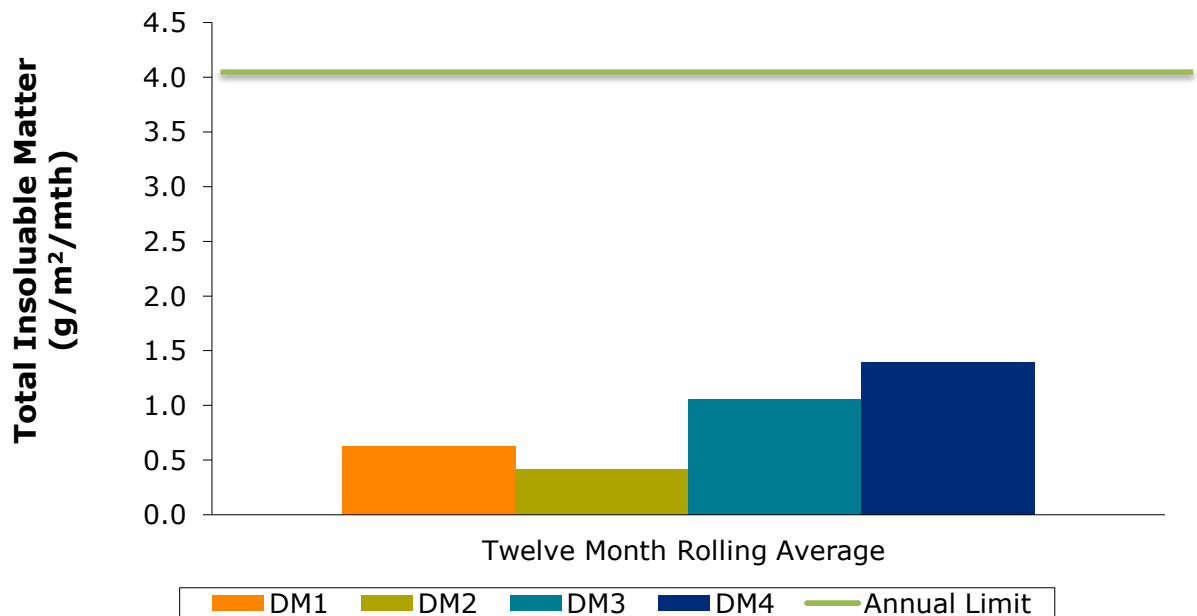


Figure 2: 2015 Annual Average Total Insoluble Matter.

### 3. Surface Water

Condition L2 of EPL 765 outlines water concentration limits for oil and grease, pH, total suspended solids and total iron. These limits are presented below in Table 3.

**Table 3: EPL 765 concentration limits**

	LD2	LDP1	WMP1
Oil and grease (mg/L)	-	10	-
pH	-	6.5-8.5	-
Total Suspended Solids (mg/L)	-	50	-
Total Iron (mg/L)	-	1.0	-

The monthly results for each of the monitoring locations are summarised in Table 4. Figures 5 to 8 provide monthly results for each pollutant.

**Table 4: EPL Water quality results for the Quarter 3 2015**

EPL Point	Month	EC uS/cm	O&G mg/L	SO <sup>2-4</sup> mg/L	Fe mg/L	TSS mg/L	pH	BOD mg/L	Faecal Coliforms cos/100ml	N mg/L	P mg/L
LD2 <sup>a</sup>	Oct										
	Nov										
	Dec										
LDP1	Oct	1150	<1	290	0.13	2	8.1	-	-	-	-
	Nov	1140	<1	274	0.52	11	8.1	-	-	-	-
	Dec	1120	<1	339	0.18	4	8.1	-	-	-	-
WMP1 <sup>b</sup>	Oct										
	Nov										
	Dec										

**Notes**

- (a) No samples taken at LD2 during period as sample location was dry
- (b) No samples taken at WMP1 during period as sample location was dry

**Legend**

- BOD = Biological oxygen demand
- EC = Electrical conductivity
- Fe = Iron
- N = Nitrogen
- O & G = Oil and Grease
- P = Phosphorus
- SO<sup>2-</sup> = Sulfate<sub>4</sub>
- TSS = Total suspended solids

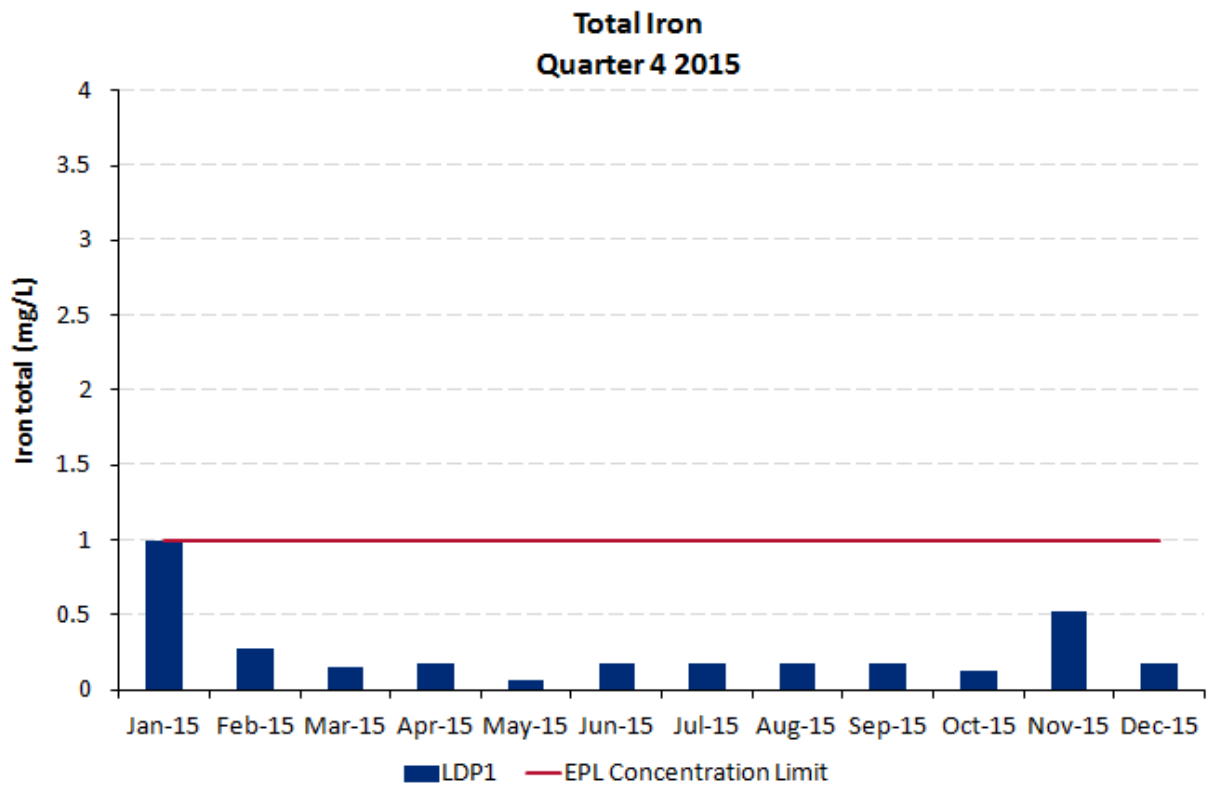


Figure 5: Total iron levels

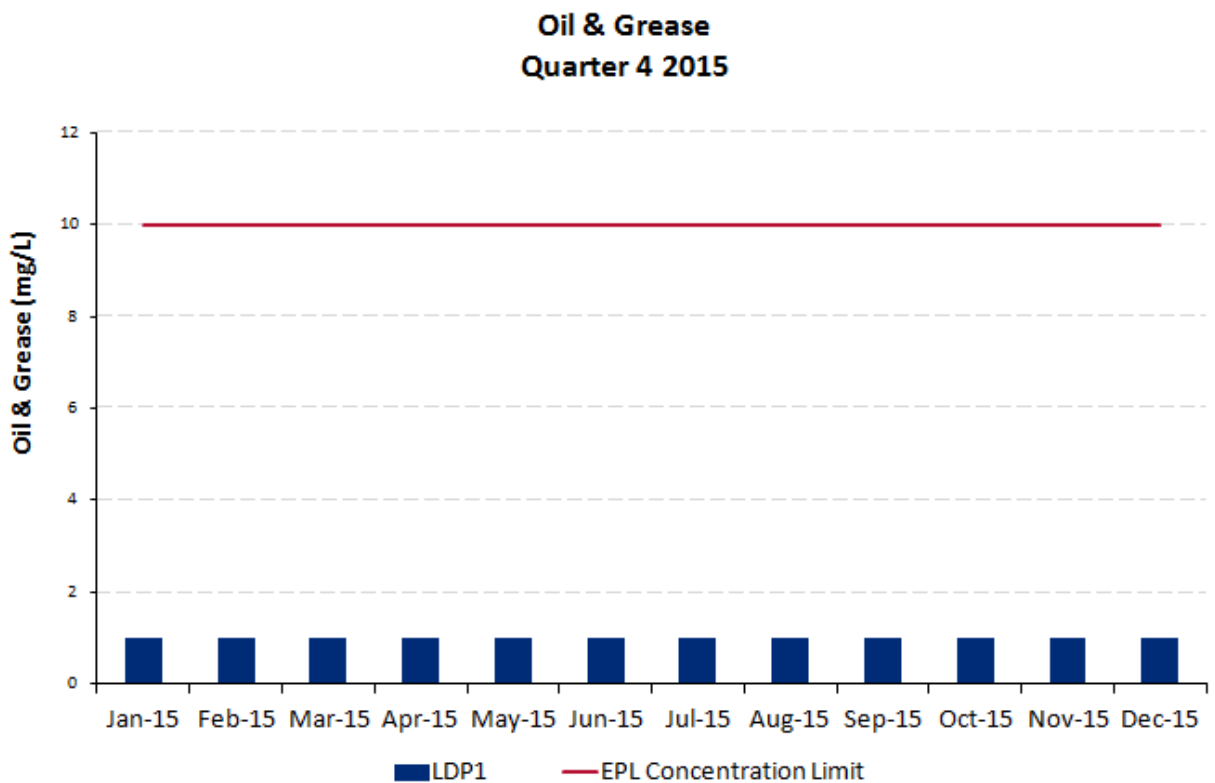


Figure 6: Oil and grease levels

Note: all values shown as 1 were reported as <1 (refer to Table 4).

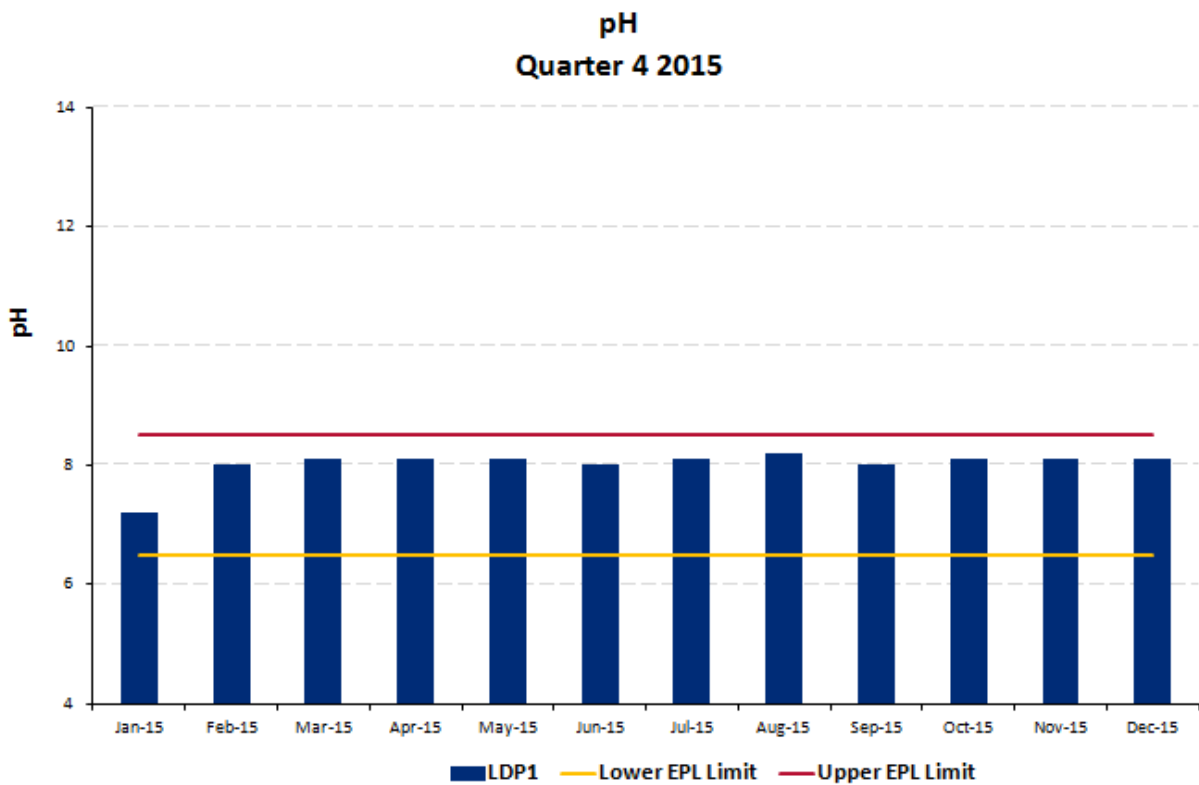


Figure 7: pH levels

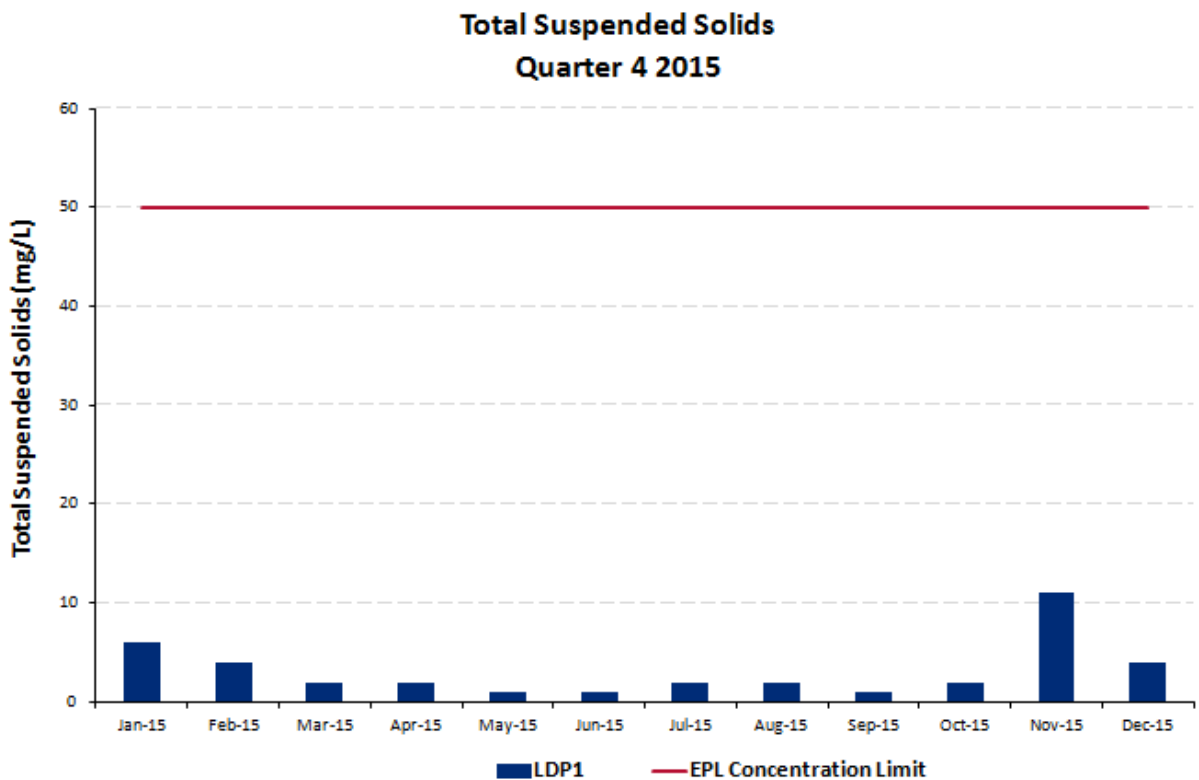


Figure 8: Total suspended solids levels

Note: some values shown as 1 were reported as <1 (refer to Table 4).

Monthly EPL reporting can be accessed at:

<http://www.glencore.com.au/webauth/EN/who-we-are/baal-bone/Pages/epl-reporting.aspx>

## 4. Noise

### Noise Impact Assessment Criteria

Schedule 3, Condition 4 of Project Approval 09\_0178 includes long term noise impact assessment criteria. Table 5 outlines the assessment criteria.

**Table 5:** Long term noise impact assessment criteria

Location	All periods dB(a) $L_{Aeq}(15 \text{ min})$	Night dB(a) $L_{A1}(1 \text{ min})$
R1	46	47
R2	41	48
R3	41	48
All other privately-owned land	35	45

From 2013 onwards attended monitoring is undertaken on an annual basis at receptors R1 and R2/R3 (refer to **Drawing 2**).

### Noise Audit Results

Atkins Acoustics carried out an environmental compliance noise audit at Baal Bone Colliery on Tuesday 11 August 2015 between 3.00pm and 11.45pm.

Table 6 summarises the results from the audit.

**Table 6: Noise Audit Summary**

Location (Start time)	Measured Predicted Colliery Noise	Limit	Unit	Comments
	$L_{Aeq}$			
Daytime Audit (1350-1505) – Tuesday 11 August 2015				
Location R1 (1600 hours)	<30	46	dBA	Mine ventilation fan <30dBA; Dist road traffic 35/48dBA; Birds 35/40dBA
Location R1 (1615 hours)	<30	46	dBA	Mine ventilation fan <30dBA; Birds 55/58dBA; Dist road traffic 35/8dBA
Location R2/3 (1648 hours)	<30	41	dBA	Breeze in trees, Dist road traffic 40/45dBA, Birds 38/45dBA
Location R2/3 (1648 hours)	<30	41	dBA	Breeze in trees, Dist road traffic 38/45dBA, Birds 35/48dBA

Location (Start time)	Measured Predicted Colliery Noise	Limit	Unit	Comments
	$L_{Aeq}$			
Evening Audit (2000 to 2130) - Tuesday 11 August 2015				



Location R1 (1840 hours)	<30	46	dBA	Mine ventilation fan <30dBA; Dist road traffic 46/54dBA; Insects
Location R1 (1855 hours)	<30	46	dBA	Mine ventilation fan <30dBA; Dist road traffic 46/54dBA; Insects
Location R2/3 (1805 hours)	<30	41	dBA	Dist road traffic 45/54dBA; Birds; Domestic; Dogs
Location R2/3 (1820 hours)	<30	41	dBA	Dist road traffic 48-55dBA; Birds; Domestic; Dogs

Location (Start time)	Measured Predicted Colliery Noise	Limit	Unit	Comments
	L <sub>Aeq</sub>			
Night Audit (2200 to 2330) - Tuesday 11 August 2015				
Location R1 (2205 hours)	<30	46	dBA	Ventilation fan <30dBA; Road traffic 46/8dBA; Insects
Location R1 (2220 hours)	<35	46	dBA	Ventilation fan <30dBA; Road traffic 46/8dBA; Insects
Location R2/3 (2250 hours)	<30	41	dBA	Ventilation fan <30dBA; Road traffic 46/8dBA; Insects
Location R2/3 (2303 hours)	<30	41	dBA	Ventilation fan <30dBA; Cows; Insects

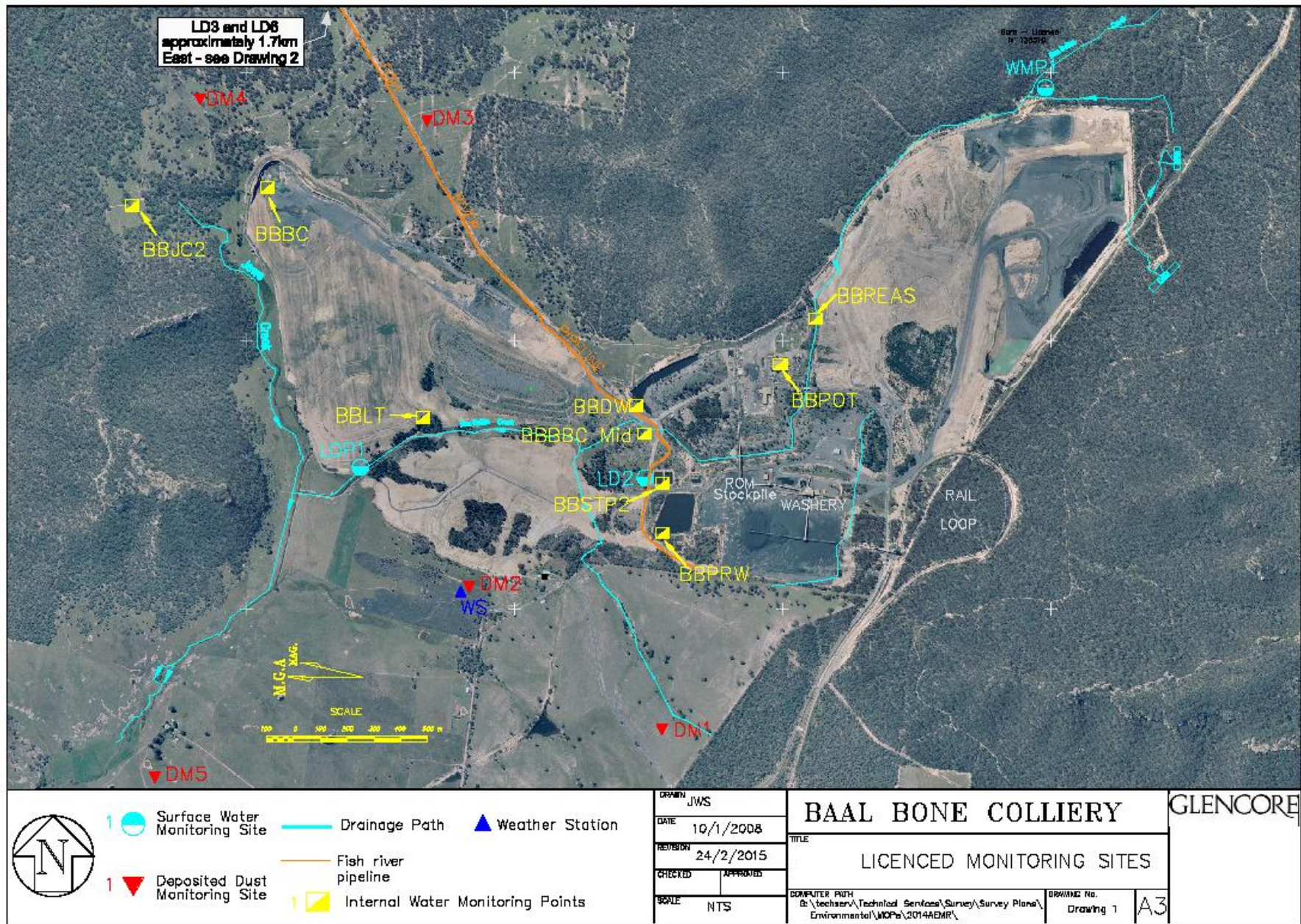
The audit report concluded that:

*“During the site-attended audits noise from the ventilation fan would not be described as tonal, impulsive, irregularity or with low frequency content. Accordingly no ‘modifying factor’ corrections are required to satisfy EPL 765 (L4.7). From the audit measurements and assessment, the L<sub>Aeq</sub>, 15 min noise contributions from BBC during the day, evening and night assessment periods satisfied the long-term licence noise limits.*

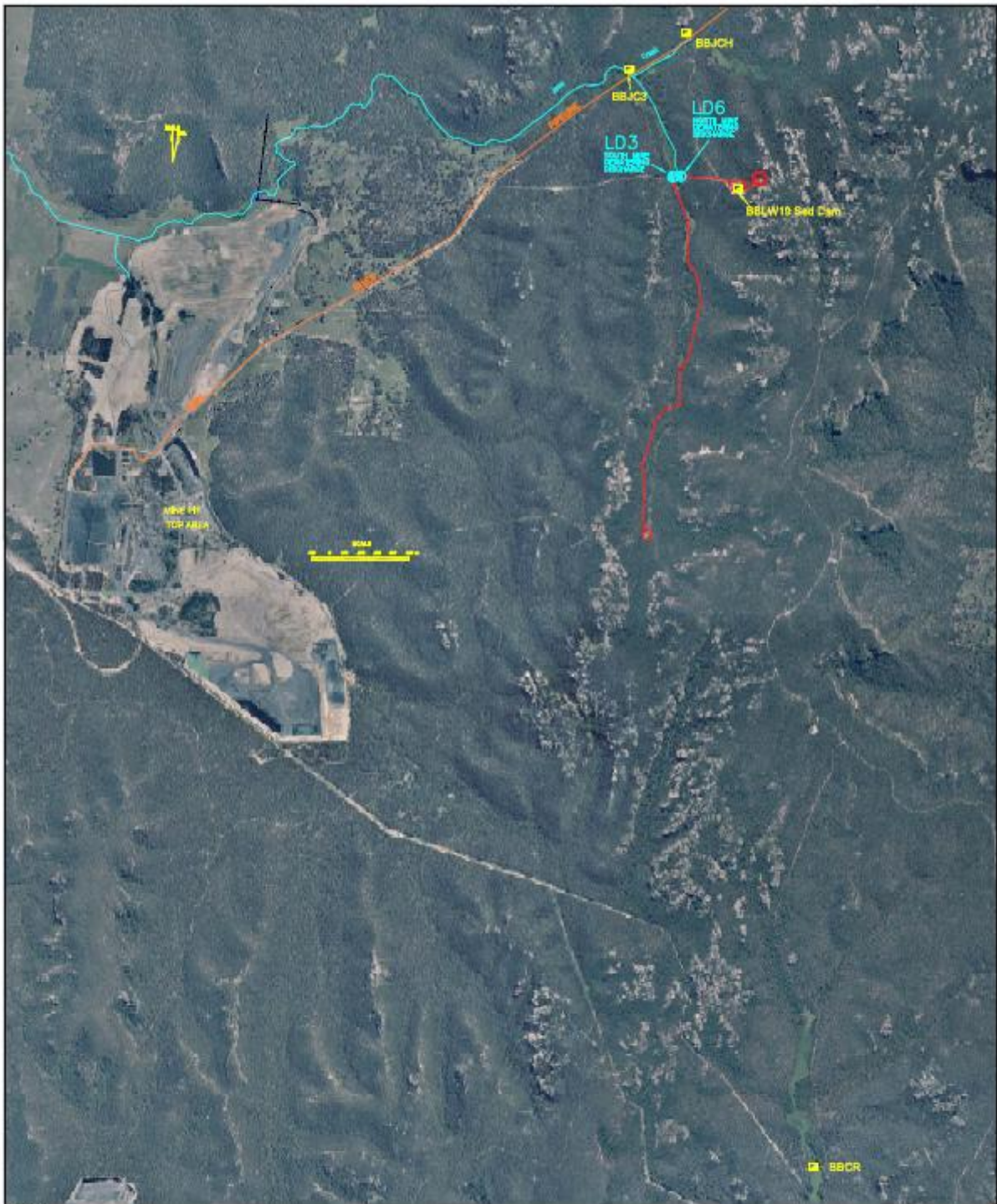
*BBC related L<sub>Amax</sub> noise levels were not observed to cause exceedances of the licence noise limits at measurement locations for the duration of the audit.”*


The full August 2015 audit report and previous noise audit reports can be accessed from the Baal Bone publications page at:

<http://www.glencore.com.au.webauth/EN/who-we-are/baal-bone/Pages/epl-archives.aspx>



Drawing 1. Baal Bone Monitoring Points



DRAWN JWS		<b>BAAL BONE COLLIERY</b>		OAKBRIDGE	
DATE 24/2/2014					
CHECKED		TITLE <b>2013 LICENCED MONITORING SITES</b>			
APPROVED					
SCALE NTS	REVISION 24/2/2014	COMPUTER PATH G:\techserv\Technical Services\Survey\Survey Plans\ Environmental\MOPs\2013ABMR\	DRAWING No. - Drawing 2	A3	PTY LIMITED

Drawing 2. Baal Bone Monitoring Points