HEGGIES

REPORT 30-1664R2R0

Revision 0

Quarterly Noise Monitoring Report

Austar Coal Mine

Middle Road, Paxton NSW

April 2007

PREPARED FOR

Austar Coal Mine Pty Ltd
P.O Box 806
Cessnock NSW 2325

14 MAY 2007

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PREPARED BY:

Heggies Pty Ltd
ABN 29 001 584 612
Level 1, 14 Watt Street Newcastle NSW 2300 Australia
(PO Box 1768 Newcastle NSW 2300 Australia)
Telephone 61 2 4908 4500 Facsimile 61 2 4908 4501
Email newcastle@heggies.com Web www.heggies.com

DOCUMENT CONTROL

Reference	Status	Date	Prepared	Checked	Authorised
30-1664R2R0	Revision 0	26 February 2007	OM	JC	JC

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1 INTRODUCTION

Heggies Pty Ltd (Heggies) has been commissioned by Austar Coal Mine Pty Ltd to conduct quarterly noise monitoring of its operations at Paxton, NSW.

The purpose of the monitoring was to identify the contribution of noise from mining operations at surrounding residential receivers. The monitoring report has been prepared to address requirements of the Austar Noise Monitoring Program that was prepared to satisfy the requirements of the Notice of Modification issued by the Minister for Planning in September 2006. The assessment also takes into account the noise goals outlined in Environmental Protection Licence Number 416.

Additionally, the monitoring undertaken in this assessment was conducted in accordance with Australian Standard AS 1055-1997 "*Description and Measurement of Environmental Noise*" Part 1, 2 and 3, the New South Wales Industrial Noise Policy (INP) and the NSW Environmental Noise Control Manual (ENCM).

2 DESCRIPTION OF FACILITY, OPERATIONS AND NOISE GOALS

2.1 Project Overview

The mine was originally developed from the old Pelton Colliery, mining coal in the Greta Seam in 1978. Longwall production commenced in 1983 and continued until the mine, known then as Ellalong Colliery, was closed by Oakbridge in May 1998. In July 1998, Southland Coal acquired the assets of Ellalong and Pelton Collieries from Oakbridge and amalgamated with the Bellbird South assets already held by Southland Coal.

Southland Coal developed a longwall operation that mined the substantial Bellbird South coal reserves utilising the existing Ellalong facilities and infrastructure. In December 2003 a fire in the underground workings caused the sealing of the mine to extinguish the fire. Following the fire, the mine was recovered and placed on "care and maintenance" and the company was placed in receivership.

Yanzhou Coal Mining Company Limited purchased the mine in December 2004 and changed the name to Austar Coal Mine (Austar). The acquisition of Southland Coal Mine was completed early in 2005 and a subsidiary company was formed to hold the assets.

Austar recommenced longwall extraction of coal in the Greta seam in late September 2006. This followed modification to the development consent (DA 29/95) to allow the introduction of Longwall Top Coal Caving Method (LTCC). The modification was approved subject to a number of conditions. The principle change allowed for an increase in the thickness of coal extracted from the Greta seam using LTCC technology in addition to modifications to surface infrastructure. This included an upgrade to the mine ventilation system and water treatment systems.

2.2 Plant and Equipment

Acoustically significant plant and equipment utilised on site include the following:

2.2.1 Washery

There are a range of noise sources at the washery that contribute to the overall ambient noise levels at surrounding receptors. These sources include:

- train movements;
- dozer;
- washery;
- trucks;
- waste water treatment plant; and
- conveyors.

2.2.2 Infrastructure Upgrade Area (Kalingo)

Identified noise sources on the Kalingo site that have potential to impact surrounding residential receivers are listed below in order of highest expected noise contribution:

- ventilation fan;
- compressors;
- nitrogen plant;
- Kalingo dam pump; and
- occasional truck movements.

2.3 Noise Impact Assessment Noise Goals

2.3.1 Washery Noise Goals

The relevant noise criteria and goals for the site outlined in the EPL and are provided in **Table 1.**

Table 1 Relevant Noise Criteria and Goals

Receiver	Location	Criteria/Goal	Source
A	Pelton Village	43 dB(A) $_{L90}$	Environment Protection Licence No 416
B	South of Bimbadeen Road, Mt View (previously referred to as Pyne residence)	40 dB(A) $_{L90}$	Environment Protection Licence No 416
C	Bimbadeen Road, Mt View (previously referred to as O'Hearn residence)	37 dB(A) $_{L90}$	Environment Protection Licence No 416

The location of the receivers are shown in **Appendix A**.

2.3.2 Infrastructure Upgrade Areas (Kalingo) Noise Goals

The relevant noise criteria and goals for the site outlined the Notice of Modification dated 27 September 2006 are reproduced in **Table 2.**

Table 2 Relevant Noise Criteria and Goals

Receiver	Location	Criteria/Goal	Source
D	Nash Lane, Quorrobolong	35 dB(A) $L_{Aeq(15minute)}$	Notice of Modification dated 27 September 2006
E	Glennie St, Ellalong	35 dB(A) $L_{Aeq(15minute)}$	Notice of Modification dated 27 September 2006

Receivers D and E are the nearest residential receptors to Kalingo Infrastructure Area and are shown in **Appendix A**.

Notes accompanying the Notice of Modification are reproduced as follows:

Notes:
a) Noise from the development is to be measured at the most affected point or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary, to determine compliance within the above table. Where it can be demonstrated that the direct measurement of noise from the development is impractical, the Department and DEC may accept alternative means of determining compliance (see chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW INP shall also be applied to the measured noise levels where applicable.
b) The noise emission limits identified in the above table apply under meteorological conditions of:
- Wind speeds of up to 3 m/s at 10 metres above ground level: or
- Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

2.4 Determining Compliance

It should be noted that compliance of license conditions is typically determined by direct measurement or by modelling, the results for either are compared against the relevant consent or license condition. Notwithstanding this, the NSW INP identifies in Section 11.1.3 that noise levels may be up to 2 dB above the statutory noise limits. Section 11.1.3 is reproduced below :

"A development will be deemed to be in non-compliance with a noise consent or license condition if the monitored noise level is more than 2 dB above the statutory noise limit specified in the consent or license condition."

2.5 Noise Monitoring Locations

The nearest potentially affected residential receivers are shown in **Appendix A**. Five (5) monitoring locations representative of the surrounding receivers have been selected as reference locations and form the basis for evaluating and assessing noise emissions from mining operations from the Washery and Kalingo Area.

2.5.1 Washery Monitoring Locations

Table 3 presents the receiver identifier and location for assessed receivers with respect to the Washery and noise goals specified in Environment Protection Licence No 416.

Table 3 Monitoring Receivers (Washery)

Receiver	Receiver Location	Receiver Description
A	Pelton Village	South-east of washery
B	Pyne Residence, South of Bimbadeen Road, Mt View.	West of washery
C	O'Hearn Residence, Bimbadeen Road, Mt View.	North-west of washery

2.5.2 Infrastructure Upgrade Area (Kalingo)

Table 4 presents the receiver identifier and location for assessed receivers with respect to the Kalingo Area and requirements specified in the Notice of Modification dated 27 September 2006.

Table 4 - Kalingo Area

Receiver	Receiver Location	Receiver Description
D	Nash Lane Quorrobolong	East of Kalingo infrastructure site
E	Glennie St Ellalong	West of Kalingo infrastructure site

Monitoring locations within the Austar Kalingo lease have been used as reference positions for comparison with modelled noise levels for surrounding receivers location D (Nash Lane, Quorrobolong) and location E (Glennie Street, Ellalong). Noise levels were modelled to residential receivers using an ENM validation model to incorporate the meteorological conditions stated in *Note B* from the *Notice of Modification*. Direct measurement during these conditions is impractical as they rarely occur during field surveys.

3 RESULTS

Noise levels were monitored from 19 April 2007 at five locations surrounding the Austar Coal Mine operations. A Brüel and Kjær 2260 sound level meter was used to record statistical noise indices including L_{A1}, L_{A10}, L_{A90}, L_{Aeq} and L_{Amax}. To determine mine noise contribution the amplitude of non-mining and mining noise sources were noise recorded and later analysed by using Brüel and Kjær Type 7820 Evaluator Software. This software package assist in establishing the mining noise contribution by excluding extraneous or unwanted noise sources that typically dominate noise measurements.

3.1 Operator Attended Noise Survey

3.1.1 Washery

Noise levels measured during April 2007 quarterly survey at the monitored locations adjacent to the Washery area for day, evening and night periods are presented in **Table 5** to **Table 7**.

Table 5 Summary of Operator Attended Monitoring Results – Daytime, April 2007

Monitoring Location **Date** **Start** **Wind Speed**	**Criteria/Goal**	**Primary Noise Descriptor (dBA ref 20μPa)**					**Observations, Description of Noise Emission & Typical Maximum Levels (dBA)**
		LAmax	**LA1**	**LA10**	**LAeq**	**LA90**	
A : Pelton Village 19/04/2007 16:48 SE 0.5m/s to 1m/s	43 dB(A) L_{90}	79	76	67	64	46	Traffic 48 - 68 Mining not audible
		Estimated $L_{A90\ Mine}$ Contribution : < 40 dBA					
B: Pyne 19/04/2007 17:12 SE 0.5m/s to 1m/s	40 dB(A) L_{90}	62	48	45	44	42	Washery 40 – 42 Birds 42 – 43
		Estimated $L_{A90\ Mine}$ Contribution: 42 dBA					
C: O'Hearn 19/04/2007 17:35 SE 0.5m/s to 1m/s	37 dB(A) L_{90}	58	54	53	51	42	Insects 58 - 42 Washery just audible 35 - 36
		Estimated $L_{A90\ Mine}$ Contribution : 35 dBA					

Table 6 Summary of Operator Attended Monitoring Results – Evening, April 2007

Monitoring Location Date Start Wind Speed	Criteria/Goal	Primary Noise Descriptor (dBA ref 20μPa)					Observations, Description of Noise Emission & Typical Maximum Levels (dBA)
		LAmax	LA1	LA10	LAeq	LA90	
A : Pelton Village 19/04/2007 20:08 NW 0.5m/s to 1m/s	43 dB(A) L_{90}	77	70	57	57	41	Traffic 45 - 70 Insects 50 - 60 Washery 40 – 43
		Estimated LA90 Mine Contribution: 41 dBA					
B: Pyne 19/04/2007 20:37 NW 0.5m/s to 1m/s	40 dB(A) L_{90}	51	44	41	40	38	Insects 40 Washery 38 Washery Dozer 36 – 40
		Estimated LA90 Mine Contribution: 38 dBA					
C: O'Hearn 19/04/2007 21:07 NW 0.5m/s to 1m/s	37 dB(A) L_{90}	58	52	41	41	36	Insects 38 - 41 Washery 34 - 36
		Estimated LA90 Mine Contribution: 36 dBA					

Table 7 Summary of Operator Attended Monitoring Results – Night, April 2007

Monitoring Location Date Start Wind Speed	Criteria/Goal	Primary Noise Descriptor (dBA ref 20μPa)					Observations, Description of Noise Emission & Typical Maximum Levels (dBA)
		LAmax	LA1	LA10	LAeq	LA90	
A : Pelton Village 19/04/2007 22:45 NW 0.5m/s to 1m/s	43 dBA (LA90)	79	71	55	57	44	Washery 42 – 48 Dozer audible 36 (160Hz) Traffic 50 - 70
		Estimated LA90 Mine Contribution: 44 dBA					
B: Pyne 19/04/2007 23:10 NW 0.5m/s to 1m/s	40 dBA (LA90)	55	48	41	39	34	Insects 42 - 55 Washery 35 - 41 Train horn 45 Dozer 33 (160Hz)
		Estimated LA90 Mine Contribution : 34 dBA					
C: O'Hearn 19/04/2007 23:26 NW 0.5m/s to 1m/s	37 dBA (LA90)	47	44	42	40	37	Washery 36 - 38 Insect 35 – 40
		Estimated LA90 Mine Contribution : 37 dBA					

3.1.2 Infrastructure Upgrade Area (Kalingo)

Noise levels measured during April 2007 quarterly survey at the monitored locations adjacent to the Kalingo area for day, evening and night periods are presented in **Table 8**.

Table 8 Summary of Operator Attended Monitoring Results – April 2007

Monitoring Location Date Start Wind Speed	Primary Noise Descriptor (dBA ref 20μPa)					Observations, Description of Noise Emission & Typical Maximum Levels (dBA)
	LAmax	LAeq	LA1	LA10	LA90	
Day						
Kalingo East 19/04/2007 16:10 SE 0.5m/s to 1m/s	56	51	46	45	43	Nitrogen + comp 40 - 41 Ventilation fan 40
	Estimated LAeq(15minute) Mine Contribution : 43 dBA					
Kalingo SW 19/04/2007 16:28 SE 0.5m/s to 1m/s	53	51	38	37	27	Water pump – not audible Motor bikes 45 - 52 Birds 28 - 35
	Estimated LAeq(15minute) Mine Contribution: <30 dBA					
Evening						
Kalingo East 19/04/2007 19:20 NW 0.5m/s to 1m/s	60	52	48	48	47	Nitrogen + compressor <44 Ventilation fan 45 Aircraft 40 - 60
	Estimated LAeq(15minute) Mine Contribution : 47 dBA					
Kalingo SW 19/04/2007 19:20 NW 0.5m/s to 1m/s	41	33	30	30	27	Water pump not audible Insects 28 - 41
	Estimated LAeq(15minute) Mine Contribution: <30 dBA					
Night						
Kalingo East 30/01/2007 22:05 NW 0.5m/s	49	48	47	47	47	Ventilation fan 43 dBA Nitrogen + compressor 45
	Estimated LAeq(15minute) Mine Contribution : 47 dBA					
Kalingo SW 19/04/2007 19:35 NW 0.5m/s to 1m/s	41	34	29	28	27	Water pump not audible Insects 27 - 41
	Estimated LAeq(15minute) Mine Contribution: < 30 dBA					

Note : Noise measurements for the Kalingo infrastructure area were conducted within the boundary of the south west and east perimeter of the site. ENM was used to model and verify noise levels to location D (Nash Lane, Quorrobolong) and location E (Glennie St, Ellalong) to incorporate meteorological conditions as per conditions identified in of Modification dated 27 September 2006.

3.2 DISCUSSION

3.2.1 Receiver A : Pelton Village

Wollombi Road traffic dominates measured noise levels at this receiver during the April 2007 survey. Traffic noise generated sound pressure levels of between 42 dBA to 70 dBA throughout the monitoring session.

Mining noise sources audible throughout the measurements included the washery and the washery dozer. Night-time mine noise contribution from the washery was established as 44 dBA when winds were from the north west direction (from the washery to this receiver). The continual nature of the washery allows for comparison of the contribution with the 43 dBA (L_{A90}) noise criterion. In accordance with Section 11.1.3 of the INP, this level is compliant with the Licence as it is less than 2 dBA above the condition (refer to Section2.4 of this report).

3.2.2 Receiver B: Pyne Residence

Noise sources not associated with mining dominated measured noise levels throughout measurements at this location and included insect and birds generating sound pressure levels of between 40 dBA to 55 dBA.

Dozer and washery noise from Austar were audible during all three time periods of the noise survey with the dozer generating sound pressure levels of up to 40 dBA on occasions at this location. The continual nature of the washery dominated the L_{A90} mine noise contribution during each period. The highest contribution was measured during the day period where the L_{A90} noise level was 42 dBA. In accordance with Section 11.1.3 of the INP, this level is deemed compliant with the Licence as it is less than 2 dBA above the condition (refer to Section2.4 of this report).

3.2.3 Receiver C: O'Hearn Residence

Insect noise generating sound pressure levels of up to 58 dBA dominated measured level at this location. Audible mine sources included washery noise from the Austar pit-top operations that generated sound pressure levels of between 35 dBA to 38 dBA, the continual nature of the washery is representative of the washery noise contribution that did not exceed the LA90 noise goal of 37 dBA. The washery dozer was not audible during any attended surveys at this location.

3.2.4 Kalingo East and Kalingo South West

Monitoring locations situated within the Kalingo Area are considered the worst case positions for monitoring noise emissions from surface operations from Austar Mine. Monitored locations are situated within the Austar Kalingo lease and while they are not residential receivers they have been used as reference positions for comparison with modelled noise levels for surrounding receivers location E (Glennie St, Ellalong) and location D (Nash Lane, Quorrobolong).

Noise monitoring adjacent of the east boundary of the Kalingo area was undertaken to determine the noise contribution of the nearby ventilation fan, nitrogen plant and compressors. For the Kalingo west monitoring location the dominant mining noise source is the dam pump that emits higher frequency noise levels. This noise source was recently partially enclosed using a Hebel block wall to provide additional noise attenuation for nearby receivers. The ventilation fan at the Kalingo East reference position generated noise levels between 43 dBA to 47 dBA, while the compressor and nitrogen plant combined to generate sound pressure levels of up to 45 dBA.

During measurement at the Kalingo south west site it was evident that non-mining noise sources dominated measurements at this location. The dam pump was running during monitoring although was not audible on any occasion throughout the survey as a result of the noise attenuation provided by the recently constructed Hebel block wall on the south west side of the unit. Noise modelling conducted at these two monitoring positions (as discussed in the next section of this report) addresses potential issues when source to receiver winds may occur as per requirements of the Notice of Modification dated 27 September 2006.

3.3 Validation Noise Model

To identify mine noise contribution during meteorological conditions specified in the consent a validation model was developed for neighbouring receivers. This model was and calibrated using the reference location at the eastern boundary of the Kalingo area. Meteorological conditions that occurred during the night survey were adopted in the noise model and then compared meteorological conditions identified in the Notice of Modification dated 27 September 2006 and described in Heggies Report 30-1629 'Austar Coal Mine – Noise Monitoring Program', 15 December 2007. Results of this model are presented in **Table 9.**

Table 9 Modelled Noise Emissions - Validation of Existing Operations

Location	Measured Mine LAeq(15minute) Contribution WNW Wind Drift (0.5m/s)	Predicted LAeq WNW Wind Drift (0.5m/s)	Predicted LAeq Source to Receiver 3m/s Wind	Predicted LAeq 3°/100m Inversion
Kalingo East (reference point)	47 dBA	47.1 dBA	47.3 dBA	47.8 dBA
D. Nash Lane, Quorrobolong	N/A	<30 dBA	34 dBA	31 dBA
E. Glennie St, Ellalong	N/A	<30 dBA	33 dBA	29 dBA

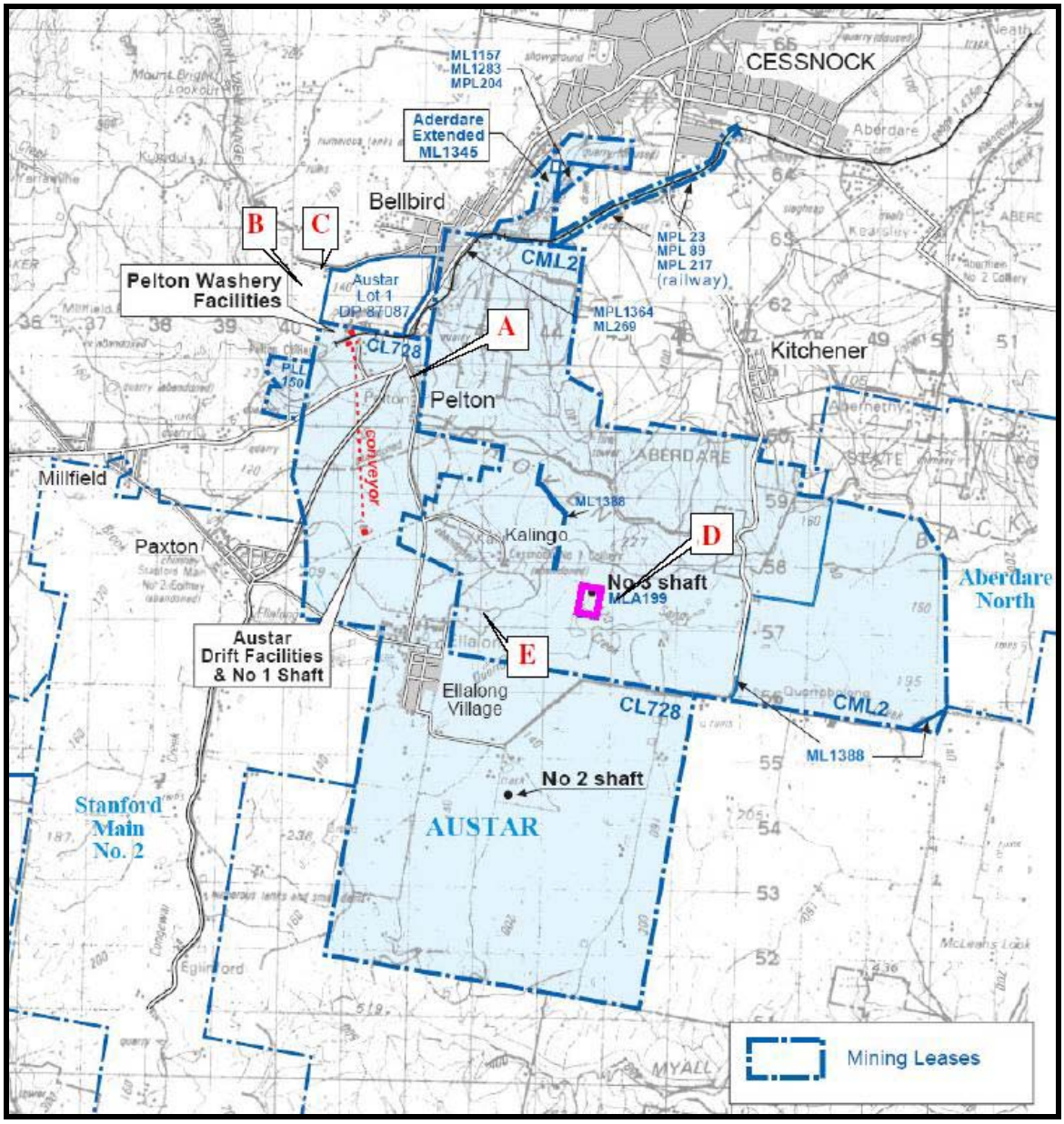
Noise modeling identifies that during noise enhancing meteorological conditions, noise emissions from the Kalingo surface operations comply with the 35 dB(A) LAeq(15minute) noise criteria at location D (Nash Lane, Quorrobolong) and location E (Glennie St, Ellalong).

4 CONCLUSION

Heggies have completed a noise monitoring assessment for Austar Coal Mine situated at Paxton, NSW. The objective of the monitoring assessment was to determine compliance with relevant noise goals, in particular during noise enhancing meteorological conditions.

The combination of monitoring and validation modelling has identified that noise emissions generated by the Austar surface operations generally comply with respect to the relevant statutory noise limit specified in consent or licence conditions.

Appendix A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North
Austar
Drift Facilities
& No 1 Shaft
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