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ATKINS ACOUSTICS

Postal Address
P.O. Box 432
Gladesville
N.S.W. 1675
AUSTRALIA
A.C.N. 068 727 195
A.B.N. 19 068 727 195
Telephone: 02 9879 4544
Fax: 02 9879 4810
Email: AtkinsAcoustics@bigpond.com.au

The Wallerawang Collieries Ltd
Baal Bone Colliery
Castlereagh Highway
CULLEN BULLEN NSW 2790

Attention: Elizabeth Wood

25 July 2014

Atkins Acoustics and Associates Pty Ltd.
Consulting Acoustical & Vibration Engineers

BAAL BONE COLLIERY
NOISE COMPLIANCE AUDIT
JULY 2014

1.0 Introduction

Atkins Acoustics was engaged by The Wallerawang Collieries Ltd to conduct an environmental compliance noise audit for Baal Bone Colliery *(BBC)*. The results and findings presented in this report are based on-site attended noise monitoring conducted on Wednesday 23 July 2014 between 2.00pm and 11.30pm. The audit was conducted by Graham Atkins, Grahams qualifications and membership include BE; MAAS, MIEAust, CPEng and MINCE. Graham is employed by Atkins Acoustics and Associates Pty Ltd a Member Firm of the AAAC.

Inquiries with site operations confirmed that mobile plant including a dozer and trucks were operational in the reject emplacement area during daytime hours. Other site plant indentified included the mine ventilation fan and water recirculation pumps. The reference measurement locations *(Attachment 1)* selected for noise monitoring are summarised in *Table 1.*

Table 1. Noise Monitoring Locations

Measurement Location	Description
R1	'Muldon' Residence
R2/R3	'Speirs/Desch' Residence

2.0 Measurement Instrumentation

The noise measurement instrumentation selected comprised a SVAN949 Sound and Vibration Analyzer. The meter was programmed to calculate and record 15 minute statistical levels. The reference calibration level of the meter was checked prior to and after the measurements with a Bruel & Kjaer Sound Level Calibrator Type 4230 and remained within ± 0.5dBA. The meter carried appropriate and current NATA calibration *(Attachment 2)*.

The noise audit and measurements were undertaken in accordance with procedures documented in Australian Standard AS1055-1997 ' Acoustics - Description and Measurement of Environmental Noise' and the NSW Environmental Protection Authority Industrial Noise Policy *(INP)*.

3.0 Weather Conditions

Weather conditions during the audit varied from calm to light variable winds from the north-north-west to east-north-east, 80-90% cloud cover during the day/evening/night. The day temperatures ranged between 7°C and 13°C. Evening/night temperatures ranged between 2°C and 6°C. An analysis of the evening and night sigma-theta and wind speed data confirmed that positive temperature inversion conditions were not a feature of the results. No rainfall was recorded during the audit.

4.0 Project Consent Noise Limits

The Licence noise limits for *BBC* are documented in Schedule 3 'Specific Environmental Conditions' of the *DoPI* Conditional Approval (Project Approval 09_0178) dated 14 January 2011.

4.1 Noise Assessment Limits ROM Surface Infrastructure (09_0178)

Condition 4.

By 31 December 2011, the Proponent will ensure that noise generated by the project does not exceed the long-term noise assessment criteria in *Table 1* at any residence on privately owned land or on more than 25 percent of any privately-owned land.

Table 1: Long Term Noise Assessment Criteria

Assessment Location	All periods dBA LAeq, 15 min	Night dBA LA1, 1 min
Location R1	46	47
Location R2	41	48
Location R3	41	48
All other privately-owned land	35	45

Condition 5.

Until 31 December 2011, the Proponent will ensure that noise generated by the project does not exceed the interim noise assessment criteria in *Table 2* at any residence on privately owned land or on more than 25 per cent of any privately-owned land.

Table 2: Interim Noise Impact Assessment Criteria

Assessment Location	All periods dBA LAeq, 15 min	Night dBA LA1, 1 min
Location R1	48	47
Location R2	43	48
Location R3	43	48
All other privately-owned land	35	45

Notes to Tables 1 and 2:

- *Noise generated to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy; and*
- *These noise assessment criteria do not apply if the Proponent has an agreement with the relevant owner/s to generate higher noise levels, and the Proponent has advised the DoPI in writing of the terms of this agreement.*

4.2 Comments

Referenced to the *BBC* Noise Management Plan *(NMP)* and the *EPA, Industrial Noise Policy* environmental noise *(INP Section 2.2.1)* is measured or assessed at the most affected point on or within the residential property boundary or, if this is more than 30m from the residence, at the most affected point within 30m of the residence. In accordance with *INP* procedures, the noise levels summarised in this report were measured within approximately 30m of the residences.

5.0 Measurement Results

Tables 3 and 4 present a summary of the measured ambient sound pressure levels, calculated *BBC* noise contributions and observations noted during the audit.

Table 3. Attended Noise Measurement Results (Day/Evening)

dBA re: 20 x 10^{-6} Pa

Measurement Location	Measured Ambient Sound Pressure Levels						License Noise Limits	Measured Predicted Colliery Noise	Comments
	L_{Aeq}	L_{A90}	L_{A50}	L_{A10}	L_{A1}	L_{Amax}	L_{Aeq^*}	L_{Aeq}	
Daytime Audit (1350-1505)									
Location R1 (1430 hours)	39.0	25.7	29.5	34.4	51.8	56.5	46	<30	Dozer reversing alarm<30dBA; Mine ventilation fan <25dBA; Domestic activities 34/5dBA; Dist road traffic 29/30dBA
Location R1 (1445 hours)	32.5	25.8	28.8	34.9	43.3	52.6	46	<30	Mine ventilation fan <25dBA; Dogs 34/6dBA; Plane 41/5dBA; Domestic activities 34/7dBA; Dist road traffic 35/8dBA
Location R2/3 (1350 hours)	40.4	30.6	37.0	41.6	44.7	46.5	41	<30	Breeze in trees, Dist road traffic, ducks
Location R2/3 (1406 hours)	41.4	30.0	35.5	40.5	48.6	52.8	41	<30	Breeze in trees, Dist road traffic, insects, birds
Evening Audit (2000 to 2130)									
Location R1 (2000 hours)	44.1	31.3	33.5	36.7	50.2	55.0	46	<30	Mine ventilation fan <25dBA; Domestic activities 34/5dBA; Dist road traffic 29/30dBA
Location R1 (2016 hours)	37.7	31.3	32.9	36.0	51.7	58.5	46	<30	Mine ventilation fan <25dBA; Dist road traffic 36/8dBA
Location R2/3 (2046 hours)	35.5	28.1	32.1	38.6	45.3	52.2	41	<30	Mine ventilation fan <25dBA; Dist road traffic 32/5dBA
Location R2/3 (2106 hours)	36.6	28.7	32.2	39.4	47.3	51.8	41	<30	Mine ventilation fan <25dBA; Dist road traffic 30/4dBA

Table 4. Attended Noise Measurement Results. (Night)

dBA re: 20 x 10^{-6} Pa

Measurement Location	Measured Ambient Sound Pressure Levels						License Noise Limits		Measured Predicted Colliery Noise		Comments
	L_{Aeq}	L_{A90}	L_{A50}	L_{A10}	L_{A1}	L_{Amax}	L_{Aeq}	L_{Amax}	L_{Aeq}	L_{Amax}	
Night Audit (2200 to 2330)											
Location R1 (2210 hours)	32.2	29.2	31.0	33.3	38.2	41.4	46	47	<30	<30	Mine ventilation fan <30dBA; Intermittent highway traffic; insects.
Location R1 (2225 hours)	32.2	30.0	31.3	33.0	38.3	40.8	46	47	<30	<30	Mine ventilation fan <30dBA; Intermittent highway traffic; insects.
Location R2/3 (2248 hours)	34.6	29.4	31.9	37.2	43.9	45.8	41	48	<30	<30	Mine veentilation fan <30dBA; Intermittent highway traffic; insects.
Location R2/3 (2303 hours)	36.6	30.0	32.2	39.8	46.9	47.5	41	48	<30	<30	Mine veentilation fan <30dBA; Intermittent highway traffic; insects.

Table 5 presents a summary of the measured L_{Aeq} octave band sound pressure levels with the overall A-weighted and C-weighted levels.

Table 5. Attended Ambient LAeq Octave Band Noise Measurements

$L_{Aeq\ ,\ 15\ min}$ dB re: 20 x 10^{-6} Pa

Measurement Location	Sound Pressure Level										
	31	62	125	250	500	1K	2K	4K	8K	dBA	dBC
Day											
Location R1	55.0	51.2	43.5	36.5	35.9	33.5	31.0	28.6	24.1	39.0	55.3
Location R10	55.8	47.6	46.0	30.5	24.7	24.0	24.2	21.6	18.6	32.5	50.7
Location R2/3	58.5	49.6	43.8	37.4	35.2	33.4	33.2	33.4	29.0	40.4	59.1
Location R2/3	57.5	49.4	45.2	37.2	33.2	32.0	36.5	34.6	26.3	41.4	58.5
Evening											
Location R1	47.9	48.7	46.5	42.5	41.2	40.5	35.6	30.2	26.4	44.1	52.6
Location R1	42.1	44.2	43.6	35.2	28.9	35.6	30.5	24.6	24.1	37.7	47.8
Location R2/3	38.2	41.7	39.2	35.2	27.8	33.1	28.4	21.4	21.2	35.5	44.9
Location R2/3	46.4	44.9	43.0	37.8	29.2	33.8	29.0	21.3	21.2	36.6	49.2
Night											
Location R1	38.9	39.4	38.1	32.1	28.5	26.3	25.6	20.5	18.2	32.2	43.2
Location R1	38.8	38.0	38.0	31.8	27.5	26.8	25.1	21.4	20.3	32.6	42.6
Location R2/3	36.5	34.7	36.8	28.0	31.8	27.7	28.7	24.3	22.4	34.6	41.2
Location R2/3	43.1	43.7	40.4	33.5	32.1	31.2	300	26.2	25.2	36.6	46.9

5.1 Review of Site Investigations

Inquires with the *BBC Environmental Officer* confirmed that no environmental noise incidents have been reported for the period from 21 November 2013 to 22 July 2014.

6.0 Discussion

For the purpose of assessing the compliance status of *BBC* with licence noise limits a site-attended audit and noise measurements were conducted on Wednesday 23 July 2014.

Inquiries with site operations confirmed that during daytime hours mobile plant including a dozer and trucks were operational in the reject emplacement area. Other site plant identified included the mine ventilation fan and possible noise from water recirculation pumps. During the daytime audit noise from the dozer operating in the reject emplacement area was audible at the Maldon Residence (R1). The mine ventilation fan was audible at both monitoring locations during the audit. Other noise sources identified included local domestic activities, wind in trees, insects, aircraft and distant road traffic.

During the site-attended audits noise from activities associated with *BBC* 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 $L_{Aeq,\ 15\ min}$ noise contributions from *BBC* during the day, evening and night assessment periods satisfied the long-term licence noise limits.

BBC related L_{Amax} noise levels were not observed to cause exceedances of the licence noise limits at measurement locations for the duration of the audit.

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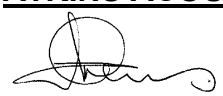
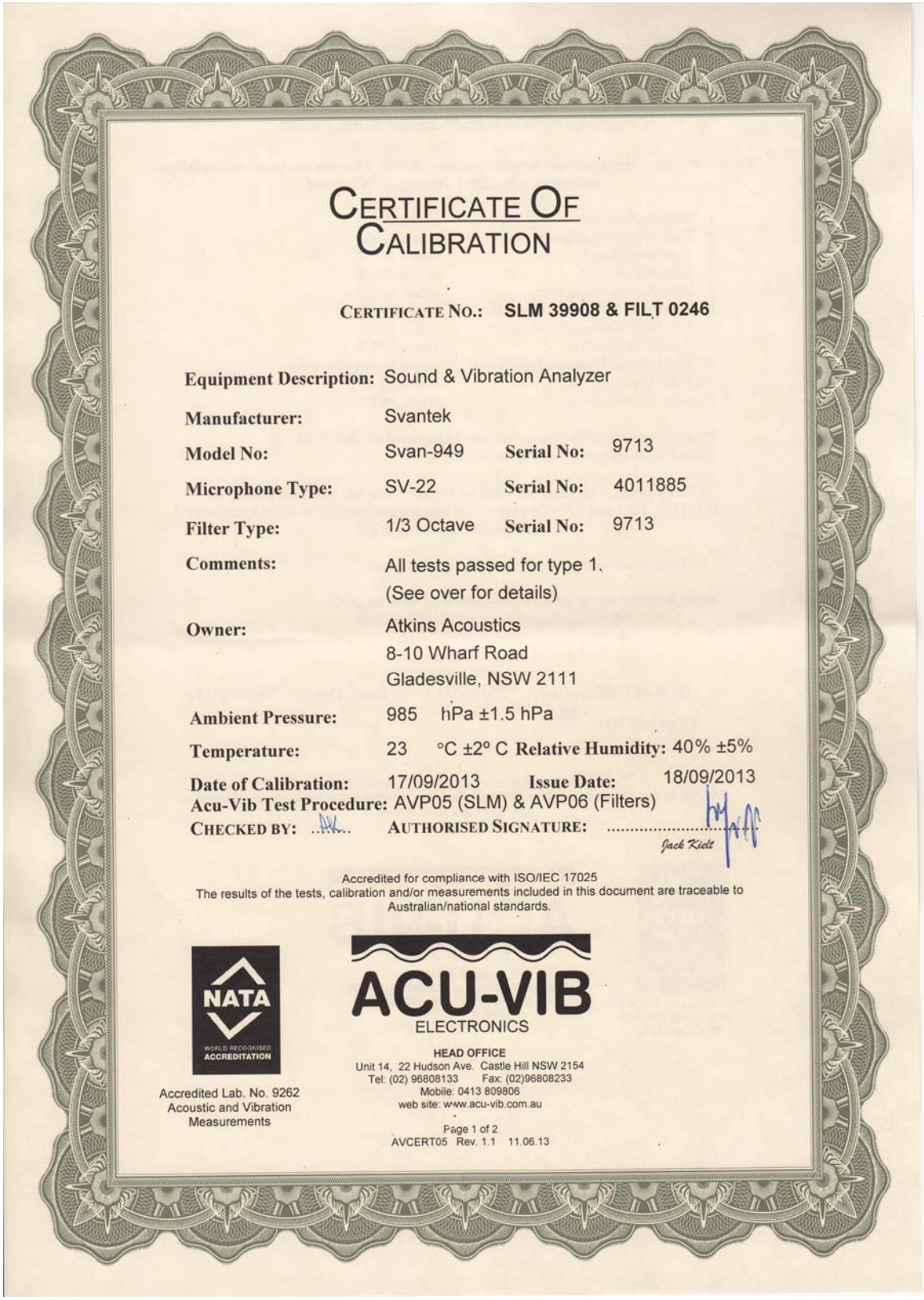


Graham Atkins

ATTACHMENT 1. REFERENCE MEASUREMENT LOCATIONS

ATTACHMENT 2: SVAN Certificate of Calibration.



CERTIFICATE OF CALIBRATION

CERTIFICATE NO.: SLM 39908 & FILT 0246

Equipment Description:	Sound & Vibration Analyzer		
Manufacturer:	Svantek		
Model No:	Svan-949	**Serial No:**	9713
Microphone Type:	SV-22	**Serial No:**	4011885
Filter Type:	1/3 Octave	**Serial No:**	9713
Comments:	All tests passed for type 1. (See over for details)		
Owner:	Atkins Acoustics 8-10 Wharf Road Gladesville, NSW 2111		
Ambient Pressure:	985 hPa ±1.5 hPa		
Temperature:	23 °C ±2° C	**Relative Humidity:**	40% ±5%
Date of Calibration:	17/09/2013	**Issue Date:**	18/09/2013
Acu-Vib Test Procedure:	AVP05 (SLM) & AVP06 (Filters)		

CHECKED BY: ..... **AUTHORISED SIGNATURE:** .....
Jack Kiett

Accredited for compliance with ISO/IEC 17025
The results of the tests, calibration and/or measurements included in this document are traceable to Australian/national standards.

NATA
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Acoustic and Vibration Measurements

ACU-VIB
ELECTRONICS

HEAD OFFICE
Unit 14, 22 Hudson Ave. Castle Hill NSW 2154
Tel: (02) 96808133 Fax: (02)96808233
Mobile: 0413 809806
web site: www.acu-vib.com.au

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