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**Attention:** Nicole Van den Berg

25 November 2013

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

# BAAL BONE COLLIERY NOISE COMPLIANCE AUDIT NOVEMBER 2013

## 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 Thursday 21 November 2013 between 4.15pm and 11.30pm. Inquiries with site operations confirmed that there were no plant or equipment operating on-site, other than mine ventilation 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 instrumentation selected included a SVAN949 Sound and Vibration Analyzer. The meter was programmed to calculate and record statistical levels at 15-minute intervals. 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).*

## 3.0 WEATHER CONDITIONS

Weather conditions during the audit varied from calm to light variable winds from the north-west to the north, clear sky during the day and 85-90% cloud cover during the evening/night . The day temperatures ranged between 26°C and 27°C. Temperatures during the evening/night audits ranged between 14°C and 16°C. A thunderstorm occurred at about 6.00pm. There was no rainfall recorded during the evening/night audits.

## 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<br>dBA LAeq, 15 min | Night<br>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<br>dBA LAeq, 15 min | Night<br>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 RESULT

*Table 3* presents 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***
***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 (1600-1735)** | | | | | | | | | |
| Location R1 (1620 hours) | 38.6 | 35.3 | 37.0 | 40.7 | 45.9 | 51.3 | 46 | <30 | BBC vent fan (<30), breeze, insects; birds. |
| Location R1 (1635 hours) | 40.3 | 34.8 | 38.1 | 41.9 | 48.7 | 59.7 | 46 | <30 | BBC vent fan (<30), rooster, breeze, insects; birds. |
| Location R2/3 (1705 hours) | 41.9 | 34.1 | 38.2 | 43.6 | 53.1 | 61.6 | 41 | <30 | Distant road traffic, Breeze in trees, insects; birds. |
| Location R2/3 (1720 hours) | 40.3 | 33.1 | 36.9 | 43.6 | 48.9 | 54.7 | 41 | <30 | Breeze in trees, insects; birds, plane, highway road traffic . |
| **Evening Audit (1800 to 2140)** | | | | | | | | | |
| Location R1 (1800 hours) | 36.9 | 34.2 | 36.1 | 38.9 | 42.6 | 46.9 | 46 | <30 | Insects. BBC vent fan (<30) |
| Location R1 (2040 hours) | 38.1 | 34.8 | 37.0 | 39.5 | 45.3 | 54.9 | 46 | <30 | Insects. BBC vent fan (<30) |
| Location R2/3 (2110 hours) | 36.9 | 31.1 | 35.1 | 39.8 | 43.7 | 57.1 | 41 | <30 | BBC vent fan (<30), breeze in trees. |
| Location R2/3 (2125 hours) | 35.8 | 32.2 | 34.1 | 37.3 | 44.9 | 45.3 | 41 | <30 | BBC vent fan (<30), breeze in trees. |

### *Table 3. Attended Noise Measurement Results. Cont'd*

***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 2310)** | | | | | | | | | | | |
| Location R1 (2240 hours) | 35.2 | 31.4 | 33.6 | 38.2 | 42.3 | 46.0 | 46 | 47 | <30 | <30 | BBC ventilation fan <30dBA; Intermittent highway traffic; insects. |
| Location R1 (2255 hours) | 39.1 | 31.7 | 35.5 | 43.4 | 46.0 | 48.8 | 46 | 47 | <35 | <30 | BBC ventilation fan <30dBA; Intermittent highway traffic; insects. |
| Location R2/3 (2200 hours) | 33.3 | 30.7 | 32.6 | 33.9 | 40.6 | 48.1 | 41 | 48 | <30 | <30 | BBC ventilation fan <30dBA; Intermittent highway traffic; insects. |
| Location R2/3 (2215 hours) | 33.5 | 31.6 | 32.4 | 34.3 | 39.2 | 49.1 | 41 | 48 | <30 | <30 | BBC ventilation fan <30dBA; ducks; insects. |

*Table 4* presents a summary of the measured $L_{Aeq}$ octave band sound pressure levels with the overall A-weighted and C-weighted levels.

### *Table 4. 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 | 57.6 | 48.8 | 44.6 | 36.8 | 33.4 | 32.4 | 31.8 | 29.4 | 26.7 | 38.6 | 58.3 |
| Location R1 | 62.7 | 55.4 | 45.1 | 38.2 | 34.5 | 34.1 | 33.3 | 31.1 | 27.9 | 40.3 | 62.6 |
| Location R2/3 | 61.2 | 50.7 | 44.0 | 38.0 | 35.7 | 36.5 | 35.7 | 32.7 | 30.2 | 41.9 | 62.6 |
| Location R2/3 | 6704 | 56.9 | 45.0 | 37.6 | 34.6 | 33.0 | 32.1 | 32.0 | 30.8 | 40.3 | 61.2 |
| **Evening** | | | | | | | | | | | |
| Location R1 | 57.2 | 47.5 | 43.8 | 35.6 | 31.7 | 30.5 | 29.6 | 28.4 | 26.3 | 36.9 | 58.2 |
| Location R1 | 48.5 | 44.1 | 44.3 | 36.4 | 32.8 | 32.4 | 31.0 | 29.0 | 26.5 | 38.1 | 51.3 |
| Location R2/3 | 55.1 | 47.0 | 41.3 | 35.6 | 33.3 | 30.5 | 29.5 | 27.8 | 26.3 | 36.9 | 57.1 |
| Location R2/3 | 49.3 | 44.9 | 40.6 | 32.9 | 31.3 | 28.7 | 28.8 | 28.3 | 25.0 | 35.8 | 50.6 |
| **Night** | | | | | | | | | | | |
| Location R1 | 63.9 | 53.6 | 45.5 | 36.7 | 29.7 | 25.3 | 25.2 | 22.2 | 24.7 | 35.2 | 64.5 |
| Location R1 | 67.6 | 58.7 | 50.0 | 41.5 | 34.2 | 29.7 | 26.8 | 21.7 | 23.3 | 39.1 | 68.3 |
| Location R2/3 | 47.8 | 39.2 | 33.6 | 29.9 | 28.2 | 23.8 | 24.4 | 29.0 | 23.8 | 33.3 | 49.7 |
| Location R2/3 | 49.9 | 42.4 | 36.0 | 30.7 | 29.3 | 26.4 | 26.3 | 25.7 | 23.9 | 33.5 | 51.1 |

## 5.1 Review of Site Investigations

Inquires with the *BBC Environmental Officer* confirmed that no noise incidents were reported between 12 November 2012 and 20 November 2013.

## 6.0 DISCUSSION

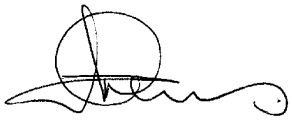
For the purpose of assessing the compliance status of *BBC* with licence noise limits a site-attended audit and noise measurements were conducted on Thursday 21 November 2013.

Inquiries with site operations confirmed that site activities during the audit included mine ventilation and water recirculation pumps. The ventilation fan was audible during the audit. Other noise sources identified included local domestic activities, wind in trees, insects and road traffic.

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.

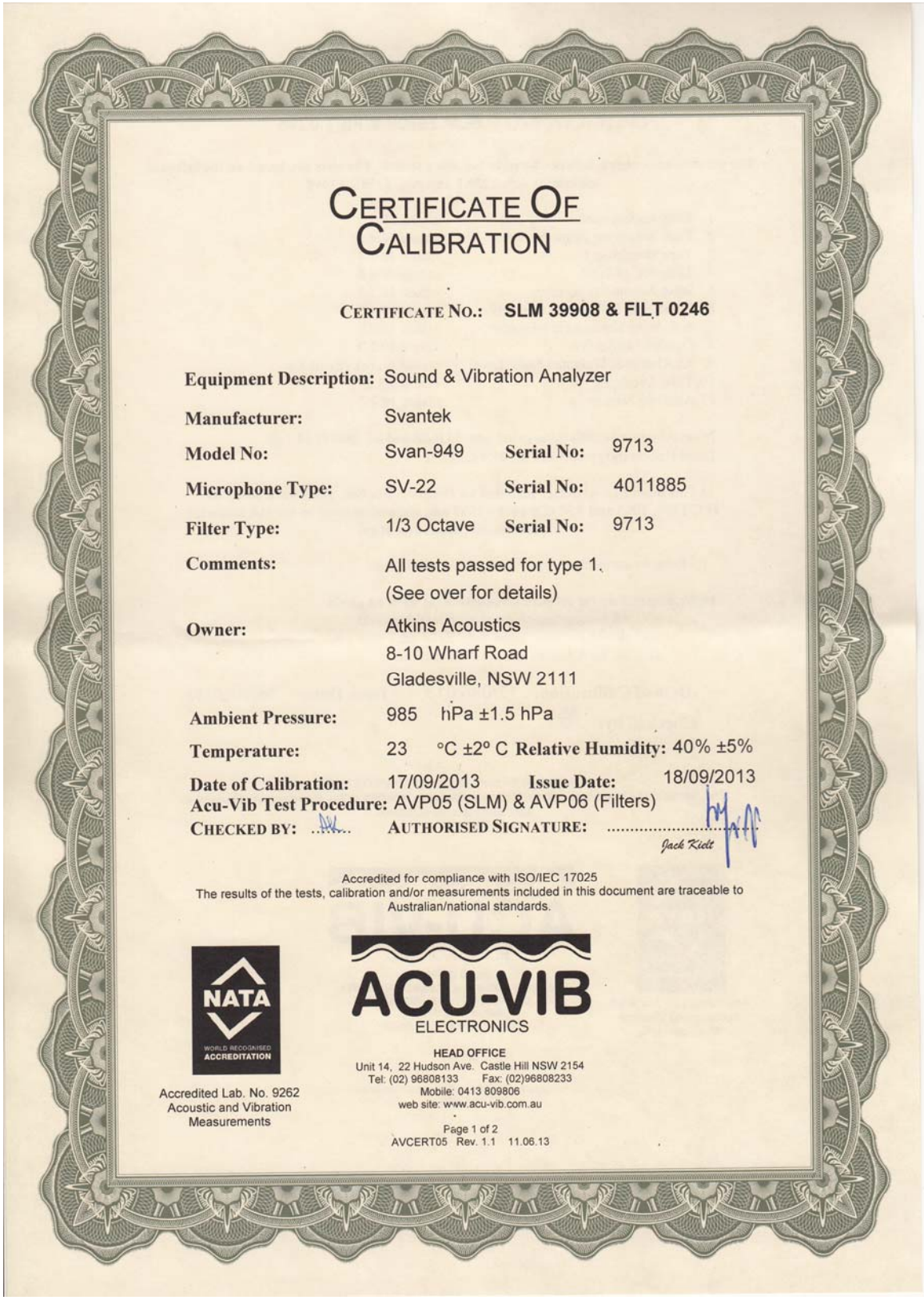
**ATKINS ACOUSTICS & ASSOCIATES PTY LTD.**



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.<br>(See over for details) | | |
| **Owner:** | Atkins Acoustics<br>8-10 Wharf Road<br>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

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