40.4883.R6:ZSC

28th February, 2011

Communities NSW
Locked Bag 1422
SILVERWATER NSW 2128

Attention: Mr D. Clout

SOUTHERN HIGHLANDS REGIONAL SHOOTING COMPLEX
WATTLE RIDGE ROAD, HILL TOP

The purpose of this report is to present the results of an acoustic testing carried out in relation to operations at the 800 metre firing position on the existing rifle range at the Southern Highlands Regional Shooting Complex.

The proposed additional ranges (a 500 m rifle range, a 200 m rifle/pistol shooting range, a 50 m pistol range, a shotgun range) would in terms of noise criteria be classified as "future ranges" resulting in a lower noise limit than for an "existing range".

The new ranges have a similar setback from Wattle Ridge Road to that for the 800 metre range.

Concerns have been expressed as to accuracy of predicted noise levels set out in the EIS for the proposed additions, as actual noise level testing from the 800 metre firing position was not conducted for the EIS.

Testing was carried out on Saturday 9th October 2010 of the existing 800 metre firing position at reference locations in Hill Top, to reveal under the existing range classification shooting could occur 7 days a week but under the future range classification there would be an exceedance of the nominated 75 dB peak hold limit.

THE ACOUSTIC GROUP
20-22 FRED STREET, LILYFIELD, 2040, NSW, AUSTRALIA
ph: (612) 9555 4444 fx: (612) 9555 4442 tag1@acoustics.com.au
A.B.N. 73 082 704 701

There was negligible wind at the time of the testing.

A series of test firings were undertaken for the following disciplines with only one shot being fired at a time:

- Shotgun (angles over ±45º)
- Silhouette Centrefire (.308 and 400/450)
- Field Rifle (358 Winchester)
- Service Rifle (8mm x 57mm)
- Black Power (Muzzle Loader 054BD)
- Shotgun (angles over ±45º)

On Saturday 15th January 2011 compliance testing was being conducted for the 100 metre firing position and the 500 metre firing position in the morning and afternoon shooting periods respectively.

As there is normally a break between the morning and afternoon sessions there was an opportunity to conduct additional testing at the 800 metre position so as to provide further data.

Testing carried out using a similar format to the previous testing with attended monitoring in Hill Top (locations A1, A2 and B2) and near the rural residential property to the north west of the range (location A4 and A4a).

Supplementary measurements were conducted for the morning and afternoon firings at a position approximately 50 metres to the east of the firing position to provide an identification of the number of shots occurring at the time of the measurements in the residential area.

For this testing the shooting was conducted on a random basis using the following disciplines:

- Shotgun (angles over ±45º)
- Centrefire (.308 and .303)
- Service Rifle (8mm x 57mm)

There was negligible wind at the time of the testing.

Measurement Techniques

For the purpose of compliance testing, measurements were conducted as unattended and attended measurements.

Attended sound level measurements in the residential area of Hill Top were carried out using three Bruel & Kjaer Modular Sound Level Meters Type 2260 with Sound Enhanced Software Package BZ7206. One meter is NATA Calibrated and the other two meters are calibrated to manufacturer's standards. All meters hold current calibration certificates.

Attended measurements at the rural property north west of the range (locations A4 and A4A) used a Larson Davis LD831 Sound Level Meter. The meter holds current calibration to manufacturer's standards.

Unattended measurements to the side of the firing position were conducted using a SVAN 957 Sound Level Meter with the data being recorded for subsequent analysis. This sound level meter has current calibration to manufacturer's standards.

All sound level meters are classified as Type 1 meters.

The reference calibration level of each meter was checked prior to and after measurements with a NATA Calibrated Bruel & Kjaer Sound Level Calibrators Type 4231.

All attended measurements incorporated time splice recording for subsequent analysis.

Measurement Procedures & Results

Appendix A shows the location of the Southern Highlands Shooting Complex off Wattle Ridge Road. The Google map shows the existing 800 metre range and 7 measurement locations used for the compliance testing.

The nature of the distance from the range to the residential receiver locations A1, A2, A4, and B2 (reference locations identified by GHD) can result in many of the shots being inaudible. Providing a logarithmic average of the measured levels without identifying the number of inaudible (or un-measureable shots that were audible) provides an incorrect average.

Accordingly unattended (logger) measurements were recorded using ½ second sampling at Location L6 being 50 metres to the east of the 800 metre firing position.

As the targets remain in a fixed position, the use of different firing distances involves the firing position moving back from the targets. Therefore for fixed receiver locations there can be a significant difference in noise levels – dependent upon the firing position, which can vary from day to day and even on a single day.

For the distances to residential receivers used in this compliance test the influence of ambient noise and wind can result in peak hold linear levels greater than that of shooting.

It is noted that there is some confusion in the GHD reports as to identification of the location in Starlight Place (location B2). For some reports Location B2 appears to be the nearest residential boundary location to the existing (and future) range, and is considered by some residents to be the most critical/nearest residential receiver location.

The B2 location was identified by GHD as a test site for military weapons and became a request for monitoring from residents. In one GHD report location B2 is identified as A2 with a description of Rocky Waterholes Road. On this basis the compliance monitoring for this test program utilised GHD locations A1, B2 and A2. We see that on some occasions GHD had location A2 on private property off the western end of Rocky Waterholes Road whereas we were located at the western end of the bitumen road.

With respect to the property to the NW location A4 (used by GHD) is removed from the residence on that property. For the purpose of the compliance test we utilised location A4A being on the site boundary of the property adjacent to the bushwalkers car park at the end of the road and the same distance as the dwelling from the range.
Whereas instrumentation used in the 1980s and 1990s had dedicated peak hold detectors with a manual push button release, modern instrumentation no longer has such facilities. Testing that I have conducted at a number of rifle ranges to compare different digital instrumentation has found the display of peak hold values on some instruments to be inconsistent – hence in my opinion requiring the need for attended measurements at residential locations and time splice recordings as a backup.

In view of the need to obtain Linear Peak Hold measurements each B & K 2260 meter was set to measure and display the Linear Peak Hold value with the observer at each location manually writing down the results (level and time) when a shot was audible. At times a shot may be audible but show no measureable increase on the meter.

The B & K 2260 meter display provides the maximum value in each second and permits identification of the noise level, whereas other digital displays have different updates and may not actually show the maximum level. Furthermore it is essential to utilise attended measurements at critical residential locations in view of the ambient noise and wind in the area that can give rise to levels higher than shooting.

Use of the unattended meter time splice recordings necessitates manual processing of the data.

Appendix B sets out the results of the Saturday 15th January 2011 attended monitoring in relation to the 4 residential assessment locations. The results for the operator observed levels correlated with the audible shot.

The bottom line in each table provides the logarithmic average of the recorded levels.

The following table provides a summary of the range of noise levels identified in Appendix B.

TABLE 1: Linear Peak Hold Levels

Location	Measured Shooting Levels			
	Min	Max	Log Ave	No of shots
L6	100	132	127	67
A1	<60	82	71	43
A2	60	73	66	53
B2	61	82	69	44
A4A	na	na	na	0

From the SPCC Guideline under no wind conditions the 800 metre firing position could be used 7 days per week under the existing range classification and 4 days a week under the future range classification.

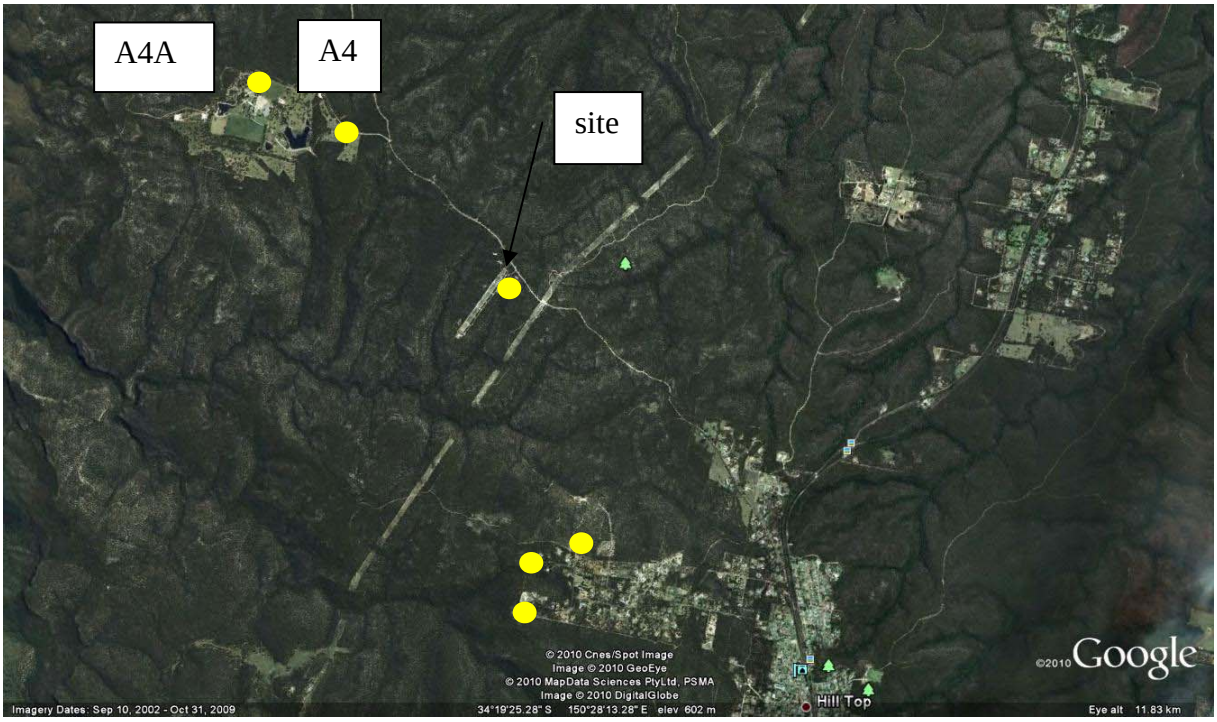
We trust the above satisfies your immediate requirements.

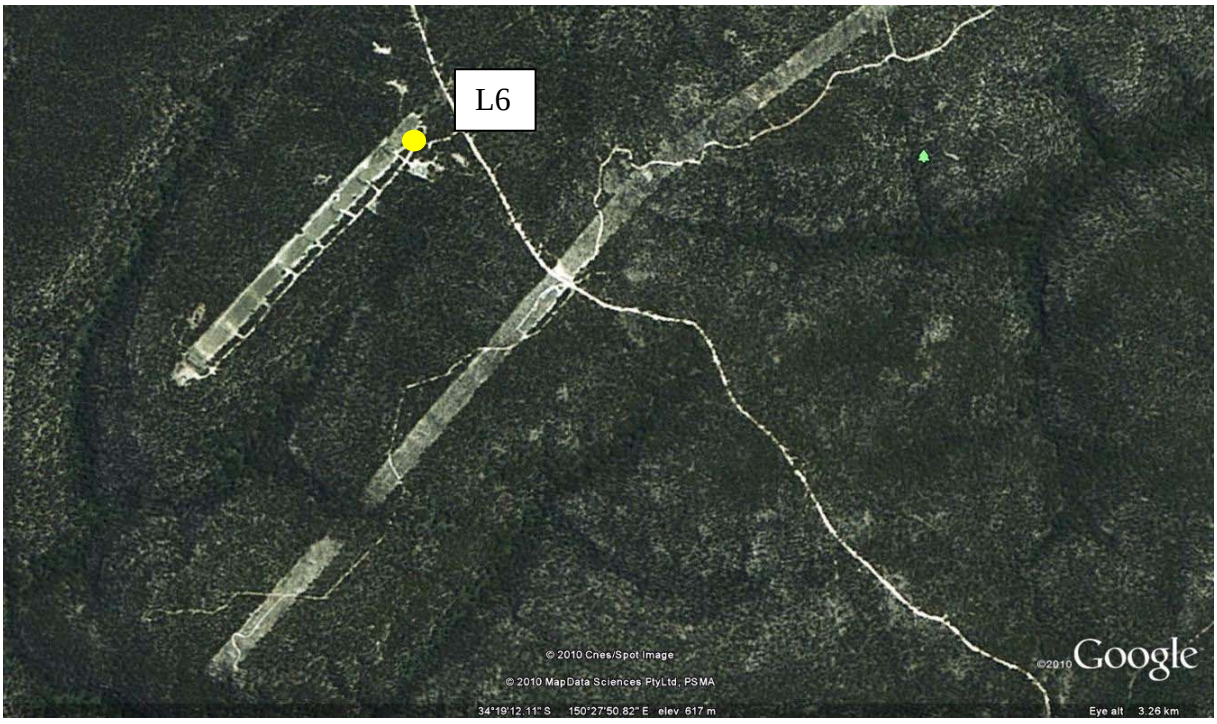
Yours faithfully,

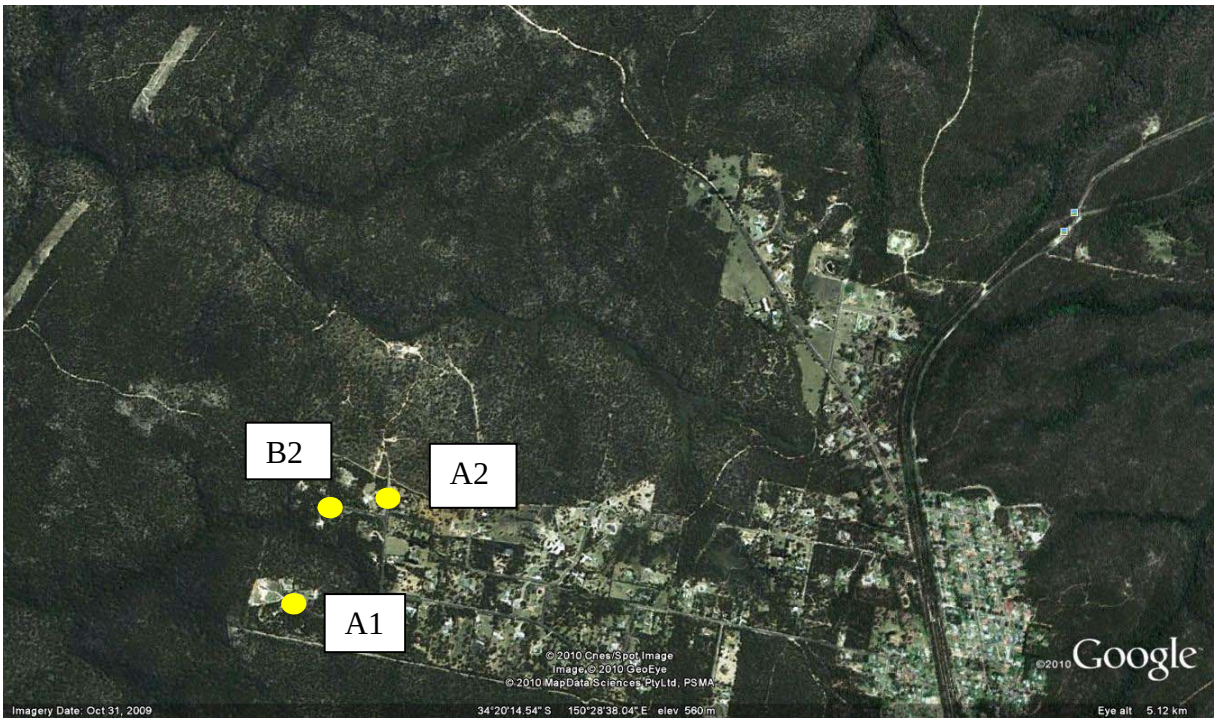
THE ACOUSTIC GROUP PTY LTD

STEVEN E. COOPER

APPENDIX A: Measurement Locations






B2
A2
A1
© 2010 Cnes/Spot Image
Image © 2010 GeoEye
© 2010 MapData Sciences Pty Ltd, PSMA
©2010 Google
Imagery Date: Oct 31, 2009
34°20'14.54" S 150°28'38.04" E elev 560 m
Eye alt 5.12 km

APPENDIX B: Measurement Results – Saturday 15th January 2011

A1 800m. 11:46am-12:35pm

<60	<60	65	<65	<65	<65	<60	62	64	64
<60	67	67	69	69	82	82	72	<65	68
<65	<65	60	68	73	69	63	65	65	62
70	<65	61	65	<60	66	68	71	63	70
<70	66	<60							

Log average 71 over 43 shots (monitoring results for 50 minutes)

B2 800m. 11:55am-12:35pm

71	67	66	68	70	66	75	69	68	63
67	65	65	69	63	62	62	82	63	73
68	67	66	68	68	68	69	68	64	65
66	62	68	63	59	67	62	60	64	64
63	63	61	63						

Log average 69 over 44 shots (monitoring results for 40 minutes)

A2 - 800m. 11:55am-12:36pm

65	65	63	64	66	64	63	65	68	62
60	58	64	63	62	61	60	68	67	66
64	64	62	60	63	61	59	67	63	70
62	66	64	67	65	68	65	63	62	68
73	69	64	63	72	70	67	62	65	61
60	60	64							

Log average 66 over 53 shots (monitoring results for 40 minutes)

L6 - 800m. 11:45am-12:36pm

106	129	129	122	129	130	123	130	124	123
123	122	123	122	120	121	119	124	130	123
130	123	129	122	130	124	130	121	130	123
123	132	122	130	123	122	122	123	122	132
122	130	120	124	124	130	130	130	130	129
132	130	132	131	130	130	131	100	128	127
128	123	122	122	122	124	125			

Log average 127 over 67 shots (monitoring results for 50 minutes)