



Rifle Rod and Gun Club

Reverse Sensitivity Noise Assessment

for

Palmerston North City Council

File No. N2594 Version Draft D1

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ACOUSAPE CONSULTING & ENGINEERING LTD

A handwritten signature in blue ink that reads "Nigel Lloyd". The signature is written in a cursive, flowing style.

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1. Introduction

Acousafe has been asked to undertake an assessment of the reverse sensitivity impacts of a proposed residential subdivision of the Waters Block on the Manawatu Rifle Rod and Gun Club (RRGC) activities at 428 Pahiatua-Aokautere Road.

Nigel Lloyd visited the site on Wednesday 30th October 2019 and subsequently on 27th November 2019 when informal noise monitoring of rifle noise was undertaken both at the RRGC and on the Waters Block.

2. Brief

Council is currently in the process of preparing a draft structure plan for Aokautere, to rezone much of the land from rural to residential and to enable co-ordinated development, creating over 950 new lots in total. This includes looking at the option of planning structured development of what is known as the Waters' Block (291-301 TURITEA ROAD). Next to the lot is a rifle range (428 PAHIATUA AOKAUTERE ROAD),

Undertake an acoustic assessment, in terms of the effects from reverse sensitivity between the rifle range and rural residential development of the Waters Block (1ha or 0.5ha lots). If 1ha lots were to be developed, it would create approximately 36 lots.

3. The Proposed Subdivision

The proposed sub division is shown in Figure 1 with the RRGC visible in the south east corner.



Figure 1. Proposed Waters Block Subdivision

4. RRG Activity

The RRG was the subject of a resource consent by the Kairanga County Council dated 1 March 1967 and was also the subject of a Declaration to the Environment Court in 1997¹. Acousafe has not seen the original consent and we are unaware of any noise constraints on the RRG.

The RRG activities are set out on their website² and include pistol shooting, black powder shooting, rifle sighting, shotgun and small-bore rifle shooting although we understand that shotgun activity in the form of clay shooting is currently in abeyance while safety facilities at the club are upgraded. Police firearm and dog training also takes place at the RRG.

Archery also takes place at the RRG.

5. Noise Monitoring

Noise monitoring was undertaken of three different rifles at the rifle sighting range on 27th November 2019. Measurements were taken near to the rifle sighting location within the enclosure. Measurements were taken of 308 rifles with the moderator in place (which was what was observed to be the normal mode of operation) and then with the moderator removed to represent an absolute worst-case scenario. Measurements were also made of an unmoderated 270 rifle.

Measurements were then taken on the Waters Block of the rifle shooting.

Measurements were made with a Bruel and Kjaer 2250 sound level meter which was field calibrated prior to and subsequent to the measurements. All equipment carried current laboratory calibration certification.

6. Noise Modelling

Noise modelling was then performed of the unmoderated 308 rifle noise levels using CadnaA noise prediction software.

The assumed sound power level for the unmoderated 308 was 137 dB L_{AFmax} and the resultant prediction was within about two decibels of the measured sound level on the Waters Block. The measurement location is shown in Appendix A along with the predicted contours.

7. Assessment

There are a variety of activities that take place at the RRG ranging from those that generate very little noise (archery) to those with potentially high levels of noise generation such as rifle sighting and black powder shooting. There are no New Zealand Standards for Gun Club noise and there are various assessment metrics that have been used over the years in different cases. Noise from gun clubs can be difficult to assess. It is generally not only the noise of each firearm that causes annoyance but also the number of shots that are fired. This assessment is based on informal measurements that predict the

¹ W120/97 and W35/98

² <https://www.rrgc.org.nz/>

worst-case scenarios and assumes that many thousand shots could be fired at the RRGC and that the busy times could occur at weekends and during public holidays when noise impacts could be greatest on future possible residential neighbours. One of the issues with gun club noise is that the noise can potentially occur on a regular basis and can be incessant. Different people will react differently to the noise but the prolonged and repetitive nature of gunfire can cause people to be annoyed, even at relatively low sound levels.

An appropriate noise criterion was discussed at length in 2011 in a case before the environment court³. The court decided that 50 dB L_{AFmax} was a reasonable noise limit where shooting is frequent and high numbers of gunfire events occur. The District plan noise limits are not appropriate for rifle range noise assessment.

The RRGC is not exempt from the section 16 noise provisions of the RMA which require that the gun club shall adopt the best practicable option to ensure that the emission of noise from their land does not exceed a reasonable level. There are currently dwellings situated closer to the club than those proposed and my understanding is that the RRGC has reached some understanding with existing residents.

The issue is with new subdivision allowing a significantly greater density of population to be exposed to the RRGC noise which, is likely to elicit a greater likelihood of adverse reaction to club activities. The imposition of partial or total restrictions on RRGC activities by new developments is classified as “reverse sensitivity effects” which need to be assessed by the RMA.

Observation of the noise contours predicted in Appendix A show that the highest noise levels generated at the RRGC will be significantly audible to dwellings constructed on the ridgeline and southern hillside of the Waters Block to the east of the access road, namely sections 28, 29, 30 and 31 as shown in Figure 1. The ridgeline forms a significant barrier to noise propagating in a northerly direction.

The modelling prediction in Appendix A shows that land on the southern side of the ridgeline to the west of the access road is also directly exposed to RRGC noise. While the sighting range is screened by the clubrooms building to a degree, other firing locations at the club will not be screened by this building. As such proposed sections 34, 36, 37 and 38 will also be significantly impacted at the baseline firearm noise levels assumed.

Different firearms will generate different levels of noise which will impact in various ways. The modelling has been undertaken with a noisier rifle (308) with the moderator removed and most of the firearms will be quieter than this (with the possible exception of black powder). The police issue Glock pistol reportedly generates similar noise levels to the 308 rifle. It could be reasonably argued that the modelling is overly cautious and that the baseline noise level should be less. Taking that approach however will make the assessment unnecessarily complicated given that the modelling (and common sense) indicates that there is a clear demarcation point at the top of the ridgeline which

³ 2010 NZEnv 48 Nelson City Council/ Delaware Bay residents Assoc In v S Harvey and B R Harvey.

provides significant noise buffering to any residential development further to the north. Any land or any dwellings constructed on the ridgeline or south of it will experience RRGC activity noise in an unimpeded way with only distance providing any respite.

Potential dwelling sites to the west of the access road will also be directly exposed to RRGC noise except they will be further away.

8. Conclusions

An assessment has been undertaken of reverse sensitivity impacts on the Manawatu Rifle Road and Gun Club that will result from the establishment of neighbouring rural residential development.

Informal monitoring of the highest firearm noise levels likely to be generated at the RRGC were undertaken which included firing of an unmoderated 308 rifle. It is expected that all firearms used at the club will be quieter than this.

The modelling demonstrates that a reasonable set back from the firing ranges is approximately 400 metres unless the ridgeline intercedes. It is recommended that no residential dwelling sites be located south of the ridgeline on the Waters Block.

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APPENDIX A

