



15 March, 2006

Concerned Citizens for Regional Impact
PO Box 105
Groton, NH 03266

To the members of CCFRI,

At your request, I have reviewed the noise portions of the slide presentations that were given to the Towns of Farmingham and Groton by the North American Training Lodge (NATL). In those slides the NATL purports to estimate the sound pressure levels of gunshots at up to 5,100 feet from the shooting range. The presentation concludes that sound levels at 2,500 feet will be below the threshold of human hearing. Their analysis assumes:

- 1) A single shot is fired at one time,
- 2) A reduction in sound levels of 6 dB for every doubling of distance, and
- 3) An additional reduction of 18 dB for every 300 feet between the source and receiver due to forest cover.

These NATL presentations are extremely misleading and come to the wrong conclusion. Given the significant and obvious mistakes made, it is apparent that the noise portions of the presentation were not prepared by an expert in acoustics. My conclusion is based on the following:

- 1) Sound reductions due to foliage are limited to 10 dB at midrange frequencies and lower limits at lower frequencies. There is a limit imposed because much of the sound travels over the treetops, and therefore additional foliage beyond about 200 meters has no impact. The amount of attenuation provided by foliage is determined by the International Standards Organization standard, ISO 9613-2, and is the result of scientific research and peer review among the international community of acousticians. The NATL's use of 18 dB per 300 feet with no limit to foliage attenuation is clearly in error.
- 2) Sound propagation is a function of many other things beside the inverse square law (6 dB for every doubling of distance) and foliage. For example, sound is significantly impacted by meteorological conditions and terrain, none of which are considered as part of the NATL presentation.
- 3) NATL only considers a single gunshot from a rifle. I understand that there are to be as many as 35 trainees, shooting upwards of 1,000 rounds per day from all types of

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weapons, including automatic weapons. As a result, there is a significant potential for gunshots going off at the same time, and thus adding to the sound emissions from the ranges. Sound levels increase by 3 dB for every doubling of the number of simultaneous shots.

- 4) There is no detail from NATL on measures that can reduce noise. As should be clear from this letter, the noise from the range will be significantly more than NATL is presenting and thus a detailed mitigation plan should be prepared.

I should note that we have investigated noise from a number of shooting ranges in the past, and thus my critique above is not only based on the science of acoustics but also from my experience as a noise control engineer. In addition, I am a licensed professional engineer, one of three Board Certified noise control engineers in Vermont and New Hampshire, and a member of the Institute for Noise Control Engineering and Acoustical Society of America. RSG is a member firm of the National Council of Acoustical Consultants.

In conclusion, I want to reiterate that the NATL presentation with regards to noise is erroneous and should not be used to evaluate the impacts of the proposed training facility. Given the magnitude of the potential noise impacts from this facility, a study should be prepared by the NATL using a qualified individual or firm, taking into account the proposed site plan, sound emissions from various weapons, the simultaneous firing of weapons, the vegetation, terrain, and meteorological conditions consistent with the proposal, and using sound propagation algorithms that are commonly accepted (like ISO 9613-2).

Of course, we are available to CCFRI to conduct further analyses and review of the NATL proposal.

Sincerely,

Resource Systems Group, Inc.



Kenneth Kaliski, P.E., INCE Brd. Cert.

Director of Environmental Services

