

Carl Mun P.E.
111 Nottingham Road
Raymond, NH 03077

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Town of Nottingham Planning Board
Attn: JoAnna Arendarczyk – plan.zone@nottingham-NH.gov
139 Stage Road
Nottingham, NH 03290

Cc: Raymond Planning Board – sgardner@raymondnh.gov

Re: Case #21-003-SIT

Dear Board Members,

I would like to formally object to Case #21-003-SIT – Application for approval of a Watercross event to be held three (3) times a year starting in 2021.

These events result in excessive and dangerous noise levels which exceed OSHA and NIOSH standards. Last year during one of these events, we were having a family gathering outside and were forced to retreat indoors from the noise level being so extreme. As shown in the charts below, noise levels above 90 dBA are harmful. These events far exceed that level and are compounded by the fact it is not just one noise source, but multiple noise sources during a race which both carry the noise level further and intensify the noise level exponentially as noise is measured by sound pressure levels expressed in decibels, which is a logarithmic scale. Our house is located approximately only 800 feet from the lake. These events absolutely affect our family life and are detrimental to our health and safety and we are asking this application not be approved.

A graduate paper by Kiera Lynn Moore – University of Northern Colorado stated the problem of noise exposures of recreational snowmobiles very well. Please note racing snowmobile produce exponentially higher noise levels.

STATEMENT OF THE PROBLEM

Noise induced hearing loss (NIHL) is a preventable health risk that affects many individuals on a daily basis. Of the 28 million Americans who have some degree of hearing loss, as many as 10 million individuals in America suffer from hearing loss caused from hazardous noise exposure in the workplace or recreational activities (Rabinowitz, 2000). Hazardous sound levels damage fragile structures of the inner ear and can cause permanent hearing loss over time. Temporary auditory damage can occur but repeated exposure to dangerous levels of sound can cause cell death which leads to irreversible permanent hearing threshold shifts, also known as noise induced permanent threshold shifts.

Below is the Abstract from an article on racing snowmobiles and hearing loss by Authors Fred H. Bess of Vanderbilt University and Robert E. Poynor. They measured racing snowmobiles as high as 137 dBA which far exceeds the standards set by OSHA and NIOSH. This level is even higher than a race car track noise level. At these levels OSHA's standard is less than one minute of exposure, NIOSH is less than one second exposure. Any longer exposure may result in hearing loss.

Snowmobile Engine Noise Level and hearing

Temporary threshold shifts (TTSs) were measured in 17 subjects (12 drivers and five riders) following 120 minutes of snowmobile noise exposure. All subjects were found to exhibit marked TTS at frequencies above 1,000 hertz. Predictably, the greatest amount of TTS occurred at 4,000 Hz. An acoustic analysis of the snowmobiles represented in this study revealed that the noise levels exceeded damage risk criteria for two hours exposure. One snowmobile was found to produce as much as 136 dBA at full throttle.

On November 13th of 2020, Governor Andy Cuomo signed a bill limiting snowmobile noise levels, joining Michigan, Wisconsin and Colorado to 78 decibels at full throttle measured from 50 feet away.

Any type of racing activity, car, motorcycle or snowmobile should not be allowed in a residential area and provide adequate distance to any home. This location does not have adequate distance from residential homes and again, the application should not be approved.

Sincerely,

Carl Mun P.E.

From an article by Sengpiel Audio providing comparable government standards:

Exchange Rates of NIOSH and OSHA Standards - National Institute for Occupational Safety and Health 1998; Occupational Safety and Health Administration 2009. According to each governing body, a person can safely be exposed to each decibel level for its corresponding time without risk of NIHL. For example, according to the OSHA standard, a person can withstand an environment with sound levels at 95 dBA for four hours. After four hours they are at risk for NIHL. NIOSH maintains that a person is safe in a 95 dBA environment for less than one hour.

NIOSH Standard	
Sound level (dBA)	Duration (Hours: Minutes: Seconds)
82	16:00:00
85	8:00:00
88	4:00:00
91	2:00:00
94	1:00:00
97	0:30:00
100	0:15:00
103	0:07:30
106	0:03:45
109	0:01:53
112	0:00:56
115	0:00:28
118	0:00:14
121	0:00:07
124	0:00:03
127	0:00:01

OSHA Standard	
Sound level (dBA)	Duration (Hours: Minutes: Seconds)
85	16:00:00
90	8:00:00
95	4:00:00
100	2:00:00
105	1:00:00
110	0:30:00
115	0:15:00
120	0:07:30
125	0:03:45
130	0:01:53
135	0:00:56
140	0:00:28
145	0:00:14
150	0:00:07
155	0:00:03
160	0:00:01

Abbreviations

dB – Decibel

dBA – Decibel A – Weighted

OSHA – Occupational Safety and Health Administration

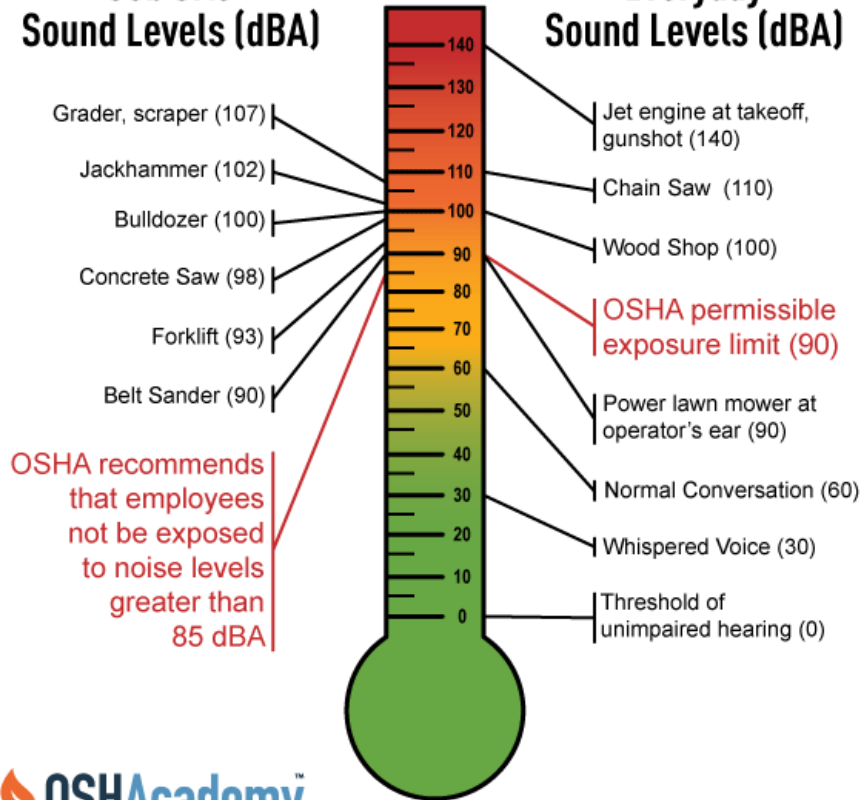
NIOSH – National Institute for Occupational Safety and Health

NIHL – Noise Induced Hearing Loss

TTS – Temporary Threshold Shift

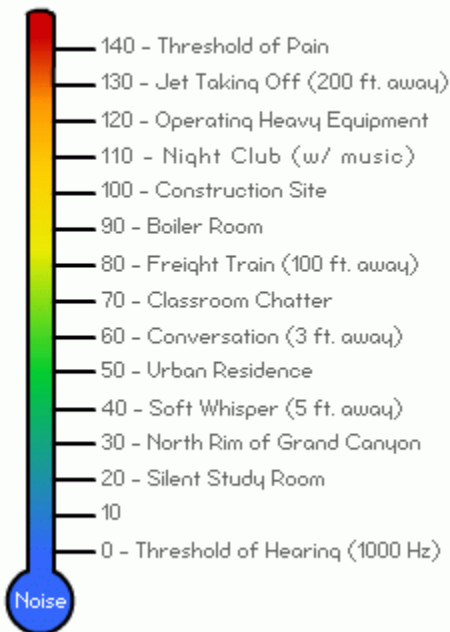
Job Site Sound Levels (dBA)

Everyday Sound Levels (dBA)



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Typical Sound Levels (dBA)



From Nex Flow