

Comments regarding Oil and Gas Regulation and Permitting, with focus on acoustic impacts and noise mitigation

October 28, 2008

Thank you for the opportunity to share with you some experience and resources regarding the acoustic impacts of oil and gas development.

The Acoustic Ecology Institute offers comprehensive resources on sound-related environmental issues, with an emphasis on making complex issues comprehensible to lay readers. AEI is not an advocacy organization; we try to present balanced information, with links to organizations on all sides of key issues. Our website serves an international audience of, agency staffers, scientists, media, individuals, and environmental advocates, and we regularly submit comments to government agencies worldwide. I was a plenary speaker at the Alberta Energy Utility Board's 2007 noise reduction conference; my presentation focused on the challenges presented by noise issues during expanding energy development.

I refer you as well to more detailed comments that I submitted in December 2007, at which time the draft ordinance had much stronger noise standards; that document included links to outside experts that could be of use should you decide to address noise issues in a more diligent way.

The noise components of the proposed county ordinance have changed significantly in each draft. The late 2007 version included strong protections, which would assure that residents in this rural area would not experience any audible change in the soundscape near their homes (AEI's comments then focused on clarifying how to measure current ambient and new noise, and on potentially loosening the restrictions in some night time atmospheric conditions). The early 2008 draft was a dramatic step backwards, and included no objective noise limits or standards at all, though it did call for the use of acoustic shielding on all installations. The noise section of the current draft county ordinance (Section 11.22) once again shifts gears, this time proposing a "limit" on noise that is remarkably high, while adding even more vagueness to the clause that (perhaps still) still requires acoustic shielding.

Specific comments on the current draft:

Section 11.22.4 sets a noise limit of 75dB(A) at 300 feet from an installation, or 70dB(A) if a house is within 500 feet. I'm not sure I've ever seen an oil and gas noise regulation that set such a high limit. The most protective approach, used in some jurisdictions, is to

limit noise to 1dB or 5dB above current ambient noise levels (which assures that any new noise will be barely audible); a more relaxed standard is commonly 55dB or 45dB, with some places reducing it to 35dB at night.

It is acceptable to use much higher limits during drilling and construction, since these noises are temporary; for these periods, perhaps 75dB makes sense. During ongoing operations at oil and gas installations, however, a much lower limit is clearly necessary in this rural area.

The ordinance, it appears from my reading, is not explicit about hours of operation. Construction, transportation, and drilling are clearly limited to daytime hours, but ongoing operations appear to have no limits on hours of operation. That is no doubt the practical approach, but if pumps or motors will be running at night, it is crucial that noise be kept close to current ambient sound levels. In many rural areas, night time ambient noise is as low as 35dB; a pump or motor at 45dB will sound twice as loud as the background, and is sure to be an annoyance. A night time noise standard of 35dB(A) is common in rural areas.

As currently written, the 300-foot noise monitoring point could create some issue in rolling terrain. If the 300-foot mark is in a hollow or dip in the landscape, it is entirely possible that higher sound levels will persist at farther distances; it could be useful to set a maximum sound level at the nearest residence.

Section 11.22.1 appears to be written as a vague fig-leaf; its purpose and practical effect is not at all clear: “All construction, maintenance and operations of any Oil or Gas Facility shall be conducted in a manner to minimize the noise created to the greatest extent possible.” The requirement to use acoustic shielding, present in the early 2008 draft, is gone, though the language seems to imply that “state of the art” noise abatement is required. If it is the intent of this clause to actually require maximal acoustic shielding, then the 75dB(A) limit is clearly irrelevant (modern acoustic shielding should get nearly any installation down to 45dB). I fear that county staff is juggling with words in these drafts, attempting to write something that will get past all the various constituencies, while neglecting the hard decisions about what the noise sections is really aiming to accomplish.

Additional comments:

Low Frequency Noise: Most industrial noise regulations are now also including special care about low-frequency noise, which travels the farthest, and can propagate through the ground and into walls of houses. Some industrial installations produce low frequency noise at levels that cause disturbance. Simple averaged noise level measurements are not always effective at identifying possible low-frequency impacts. In some jurisdictions (notably Alberta, as regulated by the Alberta Energy Utilities Board), measurements are taken using two different acoustic weighting standards, db(A) and db(C). db(A) is designed to more closely reflect the ways that humans hear sound (i.e., it accentuates the frequencies that we hear most easily and discounts the frequencies we do not perceive as

well; I assume that the ordinance is using this weighting); dB(C) is weighted more toward low-frequency sounds. A common approach is that when dB(C) exceeds dB(A) by 20dB or more, then added attention and mitigation is directed toward low-frequency noise emissions. **The proposed ordinance should be amended to allow for special treatment of low-frequency noise when dB(C) exceeds 60dB or when dB(C) exceeds dB(A) by 20dB or more.** For more details, see footnote 1.¹

Variations

As condition to the granting of any variations, special attention should be given to acoustic impacts. **Any variations granted to allow well placement closer to residences should be contingent on the installations of the most effective noise abatement technologies.** Ideally, variations would be granted only if the installation could be kept to within 1dB of ambient, to assure it not become a dominant feature in the soundscape.

I appreciate the opportunity to make these comments and suggestions, and wish all county staff involved good luck in completing this ordinance without going crazy! It's a challenging task, and I wish you well.

Sincerely,

Jim Cummings
Executive Director, Acoustic Ecology Institute

¹ Excerpted from Oil And Gas Accountability Project's And San Juan Citizens Alliance's Recommended Changes To Cogcc's Proposed Noise Rule (Rule 802). August 9, 2005:

RECOMMENDATION 3. Revise the low frequency noise trigger and add a low frequency noise standard to the proposed noise rule.

As written, Section d. of the proposed rule does not provide a low frequency noise standard to meet, only a trigger for a low frequency noise study. Without an actual low frequency noise standard, there is no way to judge whether or not an oil and gas operator is in compliance with the noise rule.

Proposed new language for the noise rule:

802. NOISE ABATEMENT

d. In situations where the complaint or commission onsite inspection indicates that low frequency noise is a component of the problem, the commission shall obtain a sound level measurement twenty-five (25) feet from the exterior wall of the residence or occupied structure nearest to the noise source, using a noise meter calibrated to the dB(C) scale. If this reading exceeds 60 dB(C) the commission shall require the operator to obtain a low frequency noise impact analysis by a qualified sound expert, including identification of any reasonable control measures that shall be employed to mitigate such low frequency noise impact to achieve a level of 60 dB(C) or to remove offending low frequency tones to the satisfaction of the complainant. Such study shall be provided to the Commission for consideration and possible action.

This proposed new language is based on information obtained while attending an environmental noise conference hosted by the Alberta Energy Utilities Board. Several of the presentations focused on low frequency noise from industrial sources, including oil and gas facilities.

Two papers presented at the conference specifically addressed the need to develop low frequency

noise criteria for noise emissions from industrial sources. These papers can be obtained from the Alberta Energy and Utilities Board.¹⁷

One presenter, Jim Farquharson, provided data from noise surveys showing that in 6 out of 8 cases there were complaints of low frequency noise when dBC levels were above 54 dB.¹⁸ In two instances, however, dBC > 62 but there were no complaints. This highlights the fact that not all people respond negatively to low frequency noise.

Farquharson also noted that when the difference between dBC and dBA exceeds 20, the potential for a complaint increases.

A second presenter, George Hessler, recommended that a dBC level of 60 dB not be exceeded in quiet, rural areas (i.e., below 40 dBA), if the industrial operation runs 24- hours-a-day, 7-days-a-week. These conditions will definitely apply in parts of rural Colorado that are undergoing oil and gas development. For residential areas that have ambient noise levels above 40 dBA, Hessler recommended that a dBC value of 65 should not be exceeded.¹⁹ In his paper, Hessler explains that these proposed criteria were derived from investigating a valid but relatively small sampling of problem sites, and cautions that the criteria may need to be lower to account for the variable nature of human response to low frequency sound. Based on Hessler's recommendations, as well as Farquharson's data, we believe that a low frequency noise standard of 60 dBC should be protective of the majority of low frequency noise sufferers.

Hessler also mentioned that if the dBC minus dBA level exceeds 20 dB, that the low frequency content of the noise is excessive. This is another method of determining if there is a low frequency noise problem. COGCC staff and industry may want to employ this method as a means of double-checking the simple dBC measurement.

17 Contact Anita Lewis, AEUB. (403) 297-3793. Anita.Lewis@gov.ab.ca

18 Farquharson, J. 2005. "C-A weighting sound monitoring survey case studies." Paper presented at the 2005 Spring Conference on Environmental and Occupational Noise For whom the decibel tolls: reducing the impact of noise. Banff, Alberta. May23-26, 2005.

19 Hessler, G. Jr. 2004. "Proposed criteria in residential communities for low-frequency noise emissions from industrial sources," Noise Control Engineering. July/August, 2004. 52(4):179- 185.