

Memorandum

To: Blair Debban, Senior Project Manager

From: R. Stevens

Company: Tenaska

Date: February 9, 2026

cc: Timberly Ross, Tenaska

cc: Jarrod Pitts, Tenaska

cc: Lori Schweller, Williams Mullen

Expedition Project, Fluvanna County, VA

Re: Special Use Permit – Acoustical Considerations

HGC Project #: 02500480

Tenaska has forwarded comments and questions from Fluvanna County and its consultants regarding the acoustical aspects in the Special Use Permit (“SUP”) for the project, and asked HGC to respond via this memorandum.

In total, there were between fifteen and twenty compiled comments and questions on various aspects of acoustics, measurement of sound, and the types of noise limits typically used in various jurisdictions. In many cases, there are commonalities and overlap among the comments and questions, so we have collated the content of those questions into six overall themes in order to streamline our comments and responses below.

1 Use a better time-based metric than L_{90} for the limit in the SUP, such as a one-hour LEQ or L_{MAX} , in order not to miss shorter-term or transient activities such as startups, shutdowns, steam venting, diesel operation.

For the Expedition project, it would be appropriate to adopt a one-hour LEQ sound level limit of 60 dBA at the project property boundaries and 50 dBA at the residences, applicable during a “realistic worst case hour” – i.e., an hour of maximum sound output from normal, planned and predictable activities (startups, shutdowns, steam venting), but excluding unplanned emergency events.

LEQ is the “energy-equivalent sound exposure level” and is technically defined as the hypothetical steady sound that contains the same acoustic energy as an actual time-varying sound over a defined time period. In that sense, LEQ is like a “noise dose” reading. There is a wealth of published information showing a strong correlation of LEQ sound levels and community response to noise. Accordingly, LEQ is almost universally used as the basis for environmental noise limits in most jurisdictions in the US and worldwide, particularly for industrial facilities. Choosing an appropriate time period of

the L_{EQ} – such as one-hour – can ensure that short duration or transient events are captured in a way that represents overall impact in the community. In that respect, the most common time period among sound limits for industrial facilities is a one-hour L_{EQ} .

The L_{90} is the sound level that is exceeded 90% of the time during a defined period. As a measurement tool, it can be useful in rejecting transient background sounds such as wind noise, birds, car passes, etc., in order to capture the steady sound from an industry, like the base load operation of a power plant. However, it can miss shorter-duration events attributable to the industry, such as steam venting from a power plant.

The L_{MAX} is the maximum instantaneous sound level occurring during a defined period. While it is used in special cases of short-duration, highly-intrusive sounds – such as aircraft flyovers or blasting, where sleep interruption can occur – the one-hour L_{EQ} is more-commonly used to capture both the steady sounds, and the shorter-term sounds with durations of less than one-hour.

Key Takeaway: Based on the above considerations, a sound level limit in the SUP stipulating a one-hour L_{EQ} attributable to the Expedition project of 60 dBA at the property boundary lines and 50 dBA at the residences, during a realistic worst-case hour, would be appropriate.

2 In addition to A-weighted sound levels (“dBA”) consider also the use of dBC sound levels.

Whereas L_{EQ} (along with L_{90} and L_{MAX}) are descriptors of sound that define what is being measured, dBA and dBC are the units of those measurements. “dB” is an abbreviation for *decibels*, and the most commonly used units are “dBA”, where the “A” indicates A-scale frequency weighting, which approximates the human perception of loudness. Two different sounds with the same dBA sound level have approximately the same perceived loudness. For this reason, units of dBA are used in the vast majority of environmental noise limits.

C-weighted sound levels, measured in units of “dBC”, are a somewhat outdated method of investigating the low frequency content of a sound, and its potential to cause a rumbling effect. Whereas A-weighting de-emphasizes low frequencies – because the human ear is less sensitive to low frequencies – C-weighting does not, and is therefore similar to an unweighted sound level. In the era of analog electronics, before the advent of digital sound level meters, the arithmetic difference between dBC and dBA measurements was a simple, arguably crude, way to determine the amount of low frequency, potentially “rumbling” content in a complex sound. In the current era of digital sound level meters, measuring specific, unweighted frequency ranges in real time – e.g., full octave or 1/3-octave frequency bands – is straightforward, and is considered a more accurate way of assessing the low frequency content of sound. Moreover, there is no strong correlation of dBC levels to community impact or risk of rumbling.

As part of the acoustical analysis of both the existing plant and proposed Expedition project commissioned by Tenaska, the low frequency content of the sound is already



being assessed in terms of full-Octave frequency bands, and controlled to meet industry standard limits for avoiding risk of rumbling, rattling, and perceptible vibration.

Key Takeaway: An appropriate consideration of low frequency sound has already been included in the acoustical design and modelling of the Expedition project. The use of a dBC sound level is not recommended given this is a somewhat outdated method with no strong correlation to community impact or risk of rumbling.

3 The sound level limit for residences should apply at the property-lines rather than at the dwelling.

Extending sound level limits for industrial facilities to the property lines of large rural properties is not a typical regulatory approach because it is generally over-restrictive. That is, the limits that are typically applied to residential lands (e.g., 50 dBA) are intended to avoid impact in areas that are used for occupancy and passive recreation. Such limits are not applicable in the same way to areas of the property remote from the dwelling. A common approach is to define a reasonably sized zone around the dwelling within which passive recreation is likely to occur, and inside which the limit would apply, e.g., at any point within 100 feet of the dwelling.

Key Takeaway: Based on the above considerations, it would be appropriate in the SUP to stipulate that the residential sound level limit of 50 dBA, one-hour L_{EQ} , apply at any point within 100 feet of the dwelling.

4 Pre/post sound surveys should be conducted by a qualified acoustician, repeated in the case of substantiated complaints or material change to equipment/operations, and possibly ongoing 24/7 automated monitoring.

Pre- and post-construction sound surveys are a common and effective way of verifying compliance with the applicable sound level limits.

All methods of environmental noise measurement and monitoring face the challenge of isolating the sound attributable to the subject facility from the “background” sound present in the environment, but unrelated to the facility. In virtually all situations, meticulous post-processing of the measured data is required to remove the contribution of these interfering background sounds, to the extent possible. In the case of attended measurements (by a qualified practitioner) anecdotal information gathered during the measurements is used to assist in that post processing. There is currently no automated technology that can reliably isolate the sound of a facility from the interfering background sound in real-time.

Like most gas-turbine power plants, the operations at the Expedition project are essentially steady and unvarying in nature, with the exception of periodic startups and shut-downs. Attended measurements during those steady and short-term periods is the most accurate approach to verifying the sound levels of the facility, potentially



supplemented with a limited period of automated monitoring with concurrent audio recording to investigate the effects of varying meteorological conditions.

Because the isolation of the plant sound from the background sound can be challenging, the sound surveys should be conducted by a qualified practitioner, Board Certified by the Institute of Noise Control Engineers.

Key Takeaway: Sound surveys should be conducted and processed by a qualified acoustician to provide accurate and reliable results; therefore, continuous public-facing monitoring is not recommended. Based on the above considerations, it would be appropriate in the SUP to stipulate that pre- and post-construction sound surveys be required, and that they should be conducted by a qualified practitioner, Board Certified by the Institute of Noise Control Engineers.

5 One shared limit for the two plants.

As discussed in Section 1, above, a more restrictive sound level limit is being proposed for the Expedition project alone (a one-hour L_{EQ} rather than an L_{90} sound level). This more restrictive limit is achievable for the Expedition project because of the newer technology associated relative to the older plant – both the efficiency of the power generating equipment and the effectiveness of newer noise control strategies.

Key Takeaway: The measurement-based modelling of the existing and proposed plants by HGC confirms that the combined sound of the two plants will meet the limits set out in the SUP for the existing plant.

6 Vegetation provides visual screening only but not noise mitigation.

A mature, dense grove of trees, with a depth of 300 feet, tall enough to block the straight line between the source and the receiver, is a moderately effective noise control method, affording about 5 dBA of sound attenuation.

We trust the above is sufficient for your current purposes. If we can be of further assistance, please call.

Yours truly,
HGC Noise Vibration Acoustics, Inc.



Robert Stevens, MASc, P.Eng. (ON, AB, MB)
Principal



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