

Linowes

Investigation of Complaints
Regarding Antrim Wind Energy Facility
Docket No. 2021-02

Comment by Lisa Linowes

June 17, 2021

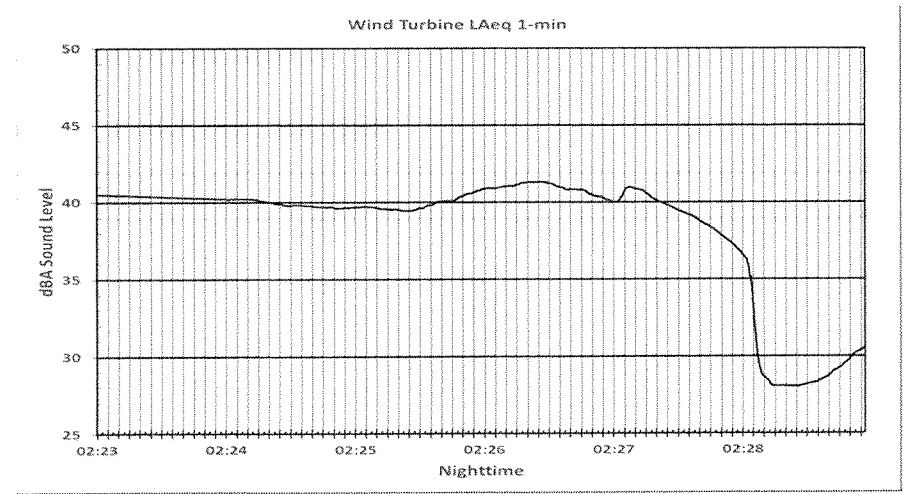
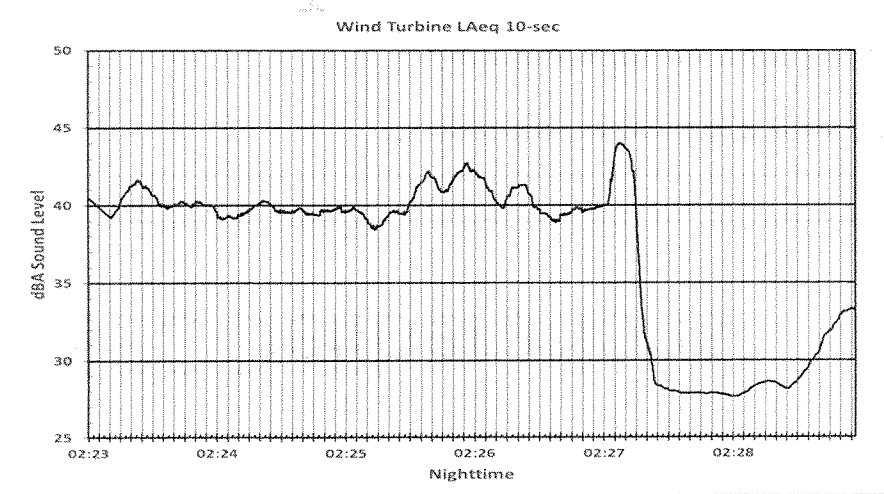
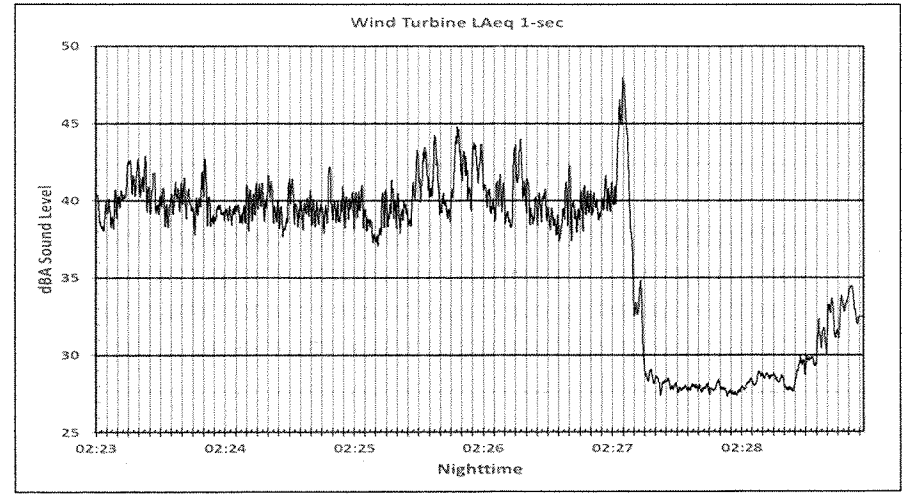
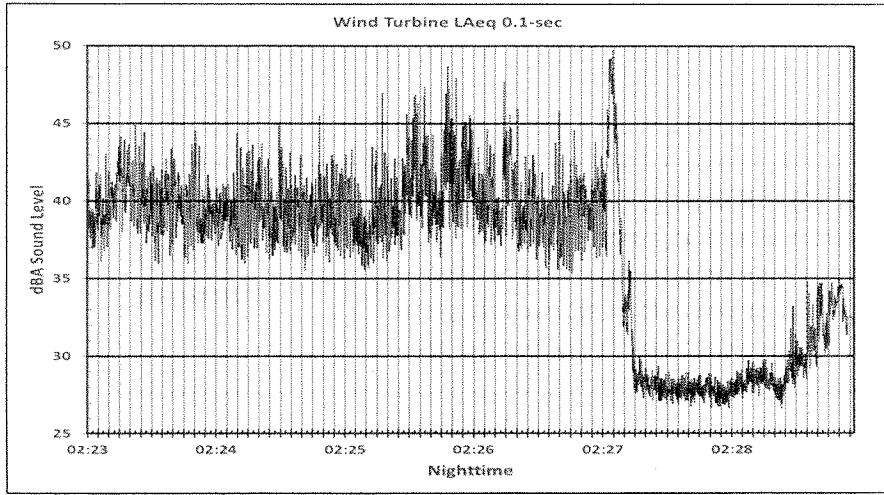
SEC Precedent – Lmax Standard

SEC NOISE STANDARDS IMPOSED ON WIND ENERGY FACILITIES (PREDATES 2015 SEC RULES)	
Lempster Wind	<ul style="list-style-type: none"> • Not to exceed 55 dBA or 5dBA above ambient level at property line or 300-feet from homes, whichever is closer. Different standard for Goshen/Lempster school. • Mitigation measures if sound at wall of homes exceeds 45 dBA/5 dBA above ambient (interior bedroom sound levels do not exceed 30 dBA/5dBA above.
Granite Reliable Wind	<ul style="list-style-type: none"> • No noise standard
Groton Wind	<ul style="list-style-type: none"> • Daytime: Not to exceed 55 dBA or 5 dBA above ambient • Nighttime: Not to exceed 45 dBA or 5 dBA above ambient • Campground: Not to exceed 40 dBA or 5 dBA above ambient
Antrim Wind (Dk# 2012-01)	<ul style="list-style-type: none"> • Daytime: Not to exceed 45 dBA or 5 dBA above ambient • Nighttime: Not to exceed 40 dBA or 5 dBA above ambient

SEC Deliberations

Antrim Wind (2012-01)	
Deliberations	<ol style="list-style-type: none">1) Extended Committee debate over Lmax standard vs. long-term averaging.2) Committee ultimately rejected long-term averaging for two reasons:<ol style="list-style-type: none">a) Risk of rendering the standard moot;b) concerns regarding compliance validation.3) Committee opted for nighttime 40 dBA Lmax standard and acknowledged as more restrictive than long-term averaging.
Relevant Quotes	<p><i>MR. BOISVERT: So, we could have, say, a six-week period in the summer, where, hypothetically, it's very noisy, and most reasonable people would agree this is interrupting sleep, and it's an annoyance, and it certainly is quite negative. But, when you pump it through, pump the numbers through on the annual average, it wouldn't make any difference. It wouldn't be in violation of what we have approved. https://www.nhsec.nh.gov/projects/2012-01/documents/130207minutes201201am.pdf</i></p>

PRACTICAL APPLICATION OF AVERAGING TURBINE SOUND DATA (Falmouth, MA)



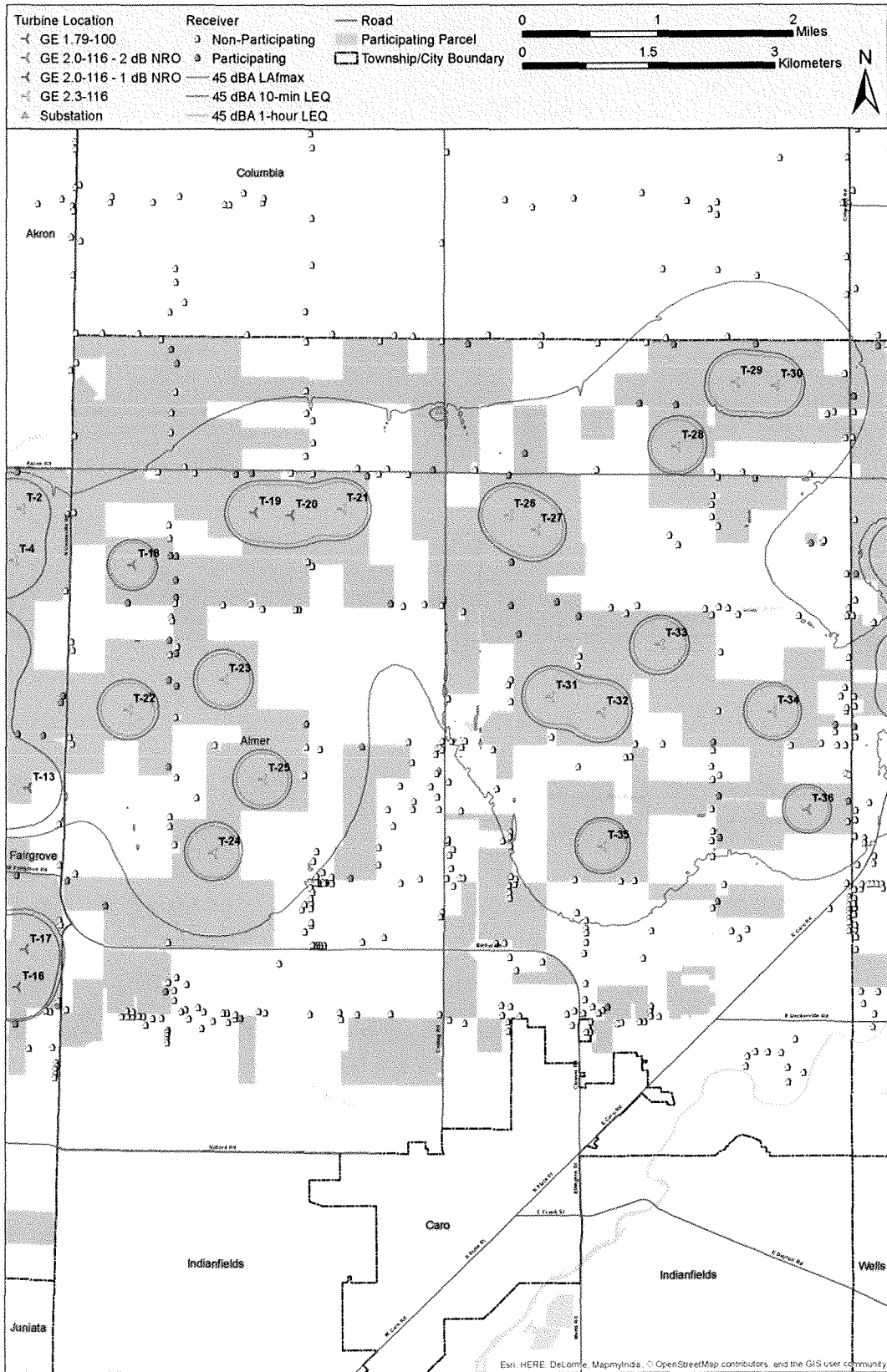


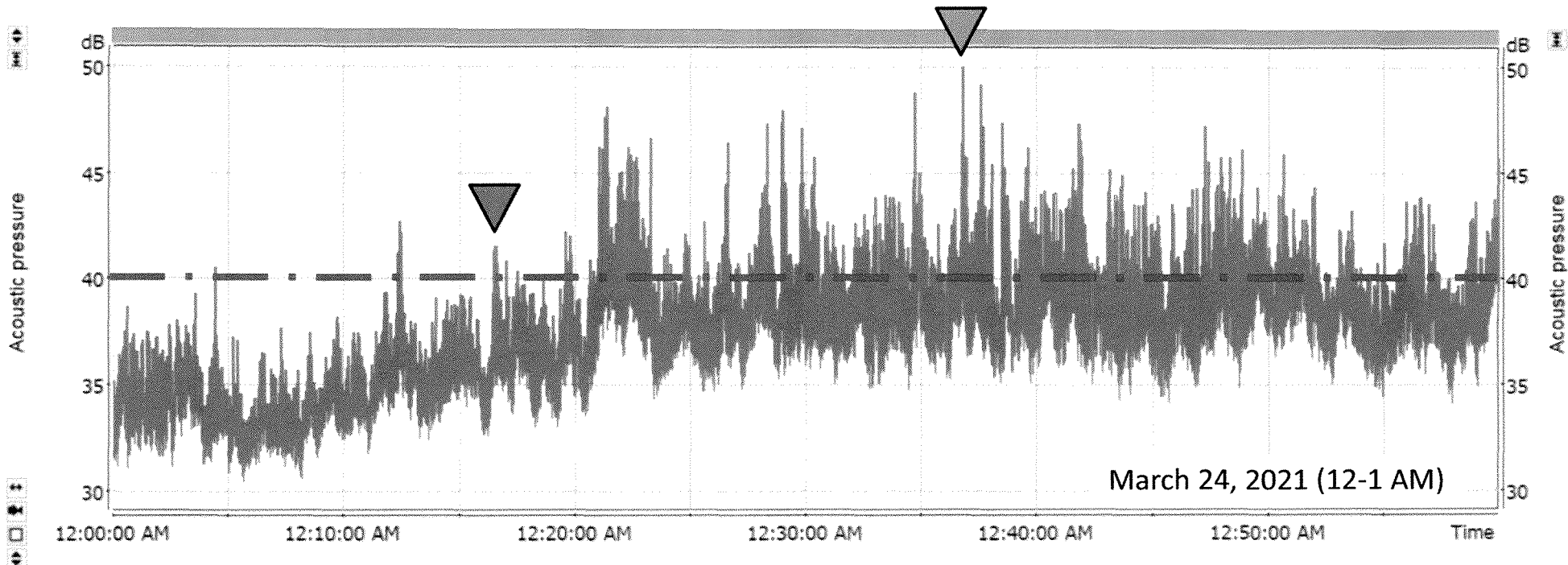
FIGURE 1: 45 dBA ISOLINES FOR MAXIMUM 1-HOUR L_{eq} , 10-MINUTE L_{eq} , AND L_{fmax}



SEC Rulemaking

Factors that led to NH Site 301.18 Language	
Intent of the Stakeholder Group	<ul style="list-style-type: none"> • Identify metric that is consistent with SEC precedent; • Ensure compliance interval appropriate for capturing full range of the modulating fluctuations; • Any longer timeframe starts averaging away highest noise levels that produce complaints; • Define separate rule for compliance interval (NH Site 301.18(e)(6) to avoid confusion over intent; • Site 301.18(e)(6) is the only point in the SEC rules where an interval is ascribed for Leq.
Rulemaking	<ul style="list-style-type: none"> • The Committee adopted language recommended by the Stakeholder group nearly verbatim; • SEC Chair Honigberg noted the purpose of NH Site 301.14(f)(2)(a) and its reliance on NH Site 301.18 (“...this [301.14(f)(2)(a)] is where the standard is set, and [301.]18 is where you explain how and where you test.” See: Docket 2014-04 TR 09-29-2015 at 141)
Other considerations	<ul style="list-style-type: none"> • Wind energy developers in other jurisdictions pushing back on Lmax as a standard (2014-2015); • The switch to Leq (time averaged) with a short interval resolved the issue and permitted a sufficiently short frame for measuring amplitude modulation.

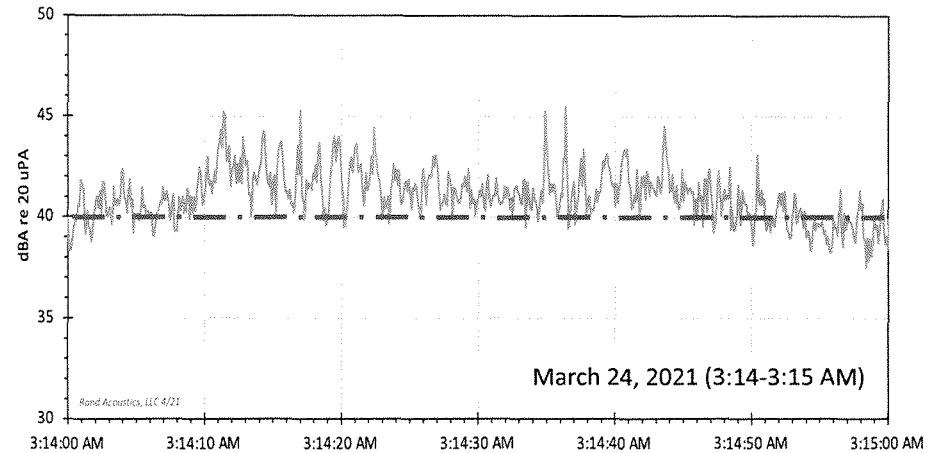
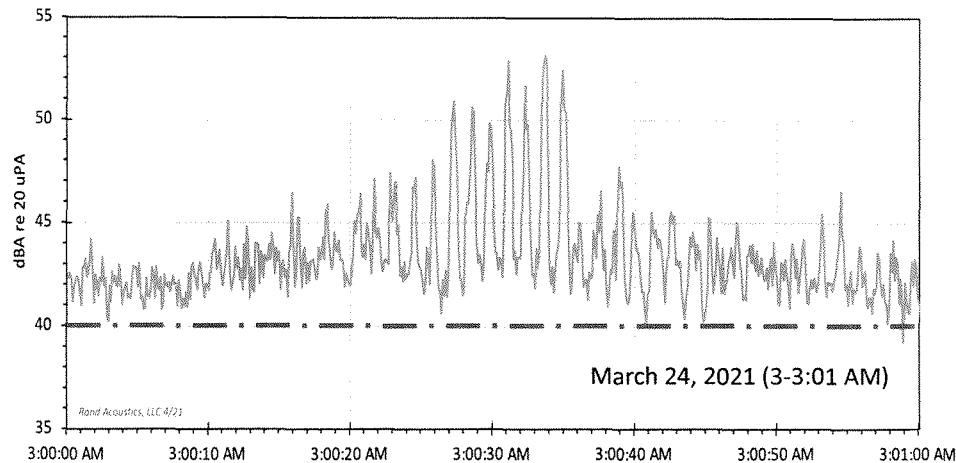
Antrim Wind Noise



Source: Rand Report - https://www.nhsec.nh.gov/projects/2021-02/public_comments/2021-02_2021-05-11_comment_rand.pdf

- Leq-0.1 second measurements at Location 4 (Berwick property);
- Turbines dominating acoustical environment confirmed via high-quality digital audio recordings (.wav);
- The NH shall-not-exceed 40-dBA night noise limit is shown in red, reaching up to 50 dBA (blue marker).

Antrim Wind Noise



Source: Rand Report - https://www.nhsec.nh.gov/projects/2021-02/public_comments/2021-02_2021-05-11_comment_rand.pdf

Antrim Wind noise levels:

- a) reached 45 to 53 dBA (6 to 13 dB over the SEC 40-dBA nighttime noise limit;
- b) dominated the acoustic environment with repetitive 1/10th-second LAeq fluctuations exceeding 40 dBA numerous times;
- c) confirmed as not "steady" with fluctuations of 4 to 11 dB breaching 3-dB limit for steady sound specified in ANSI S12.9 Part 3;
- d) exceeded Epsilon Associates "Predicted Worst Case Sound Level" at the Berwick home (35.7 dBA) by 17 dBA.

POINT – COUNTERPOINT (LINOWES)

ANTRIM WIND ARGUMENT AGAINST 1/8TH SECOND COMPLIANCE INTERVAL	RESPONSE
<p>The SEC rule does not address a compliance interval. NH Site 301.18(e)(6) only defines meter response time.</p>	<p>FALSE. The SB99 Health and Safety stakeholder group fully understood the difference between meter response and compliance interval and deliberately selected the “fast” response (1/8th second or better) as the time period for the Leq standard in order to most closely approximate human hearing. The intent was to ensure that reported measurements mirrored turbine sound levels as neighbors would hear them. If we were to accept Antrim Wind’s argument that the sole purpose of NH Site 301.18(e)(6) was to inform the technical expert to set the meter a faster setting (1/8th second) and then permitted hourly averaging</p>
<p>NH Site 301.18(e)(6) merely informed a technical expert what setting to use on the sound meter.</p>	<p>FALSE. If the SEC’s intent were to permit 1-hour averaging of data, there would be no need to collect sound data in 1/8th second increments since most of the data collected would be averaged out. The plain language of the rule cannot be ignored.</p>
<p>Measuring compliance in 1/8th second intervals would be a pointless exercise because every extraneous sound (cracking branches, wind gusts, truck brakes, etc.) that would otherwise be averaged out over a normal compliance interval would be interpreted as a non-compliance event.</p>	<p>FALSE. Sound monitoring under the NH SEC Rules mandates that high-quality audio recordings be used for the purpose of identifying and removing intrusive non-turbine sound from the data. Proper sound compliance tests should be taken at a time when the wind turbines are producing the worst case sound emissions at full power levels where the noise emitted is dominating the acoustic environment. This is exactly what the Rand Acoustics report shows.</p>

<p>There are no SEC projects in New Hampshire that have ever used a compliance interval of 1/8 second. No single jurisdiction has adopted a regulation with such a short compliance interval.</p>	<p>FALSE and FALSE. All operating wind projects where a sound standard was a condition of the certificate are required to meet the Lmax standard which is functionally equivalent to Leq 1/8th second (within 1 db).</p> <p>Numerous jurisdictions nationally have adopted an Lmax standard including Dallas County IA, Gratiot County MI, Beaver and Denmark Townships in MI, Sweetwater and Albany Counties in WY, Jasper and Newton Counties in IN, Mason County KY, and Penn Forest Township PA. Also see Tennessee Code Ann. § 65-17-105 and Wisconsin Admin. Code § PSC 128.14(3).</p>
<p>Compliance interval is defined by ANSI 512.9-2013 part 3, which refers to a “basic measurement period” of 1-hour.</p>	<p>FALSE. The basic measurement period is defined under ANSI 512.9-2013 Part 3 as the “planned duration and time of occurrence in a day, day of week, or time of year for measurements of the sound from a source. ... For example, an air-conditioning system is best measured when the ambient temperature is warm and it is in normal use.”</p> <p>In other words, the basic measurement period is merely the time when an attended measurement is planned. Part 3 is the standard governing sound measurements when an observer is present.</p>
<p>The compliance interval must also be compatible with the prescriptions imposed for the pre-project sound modeling study.</p>	<p>FALSE. Modeling is a tool to demonstrate, before a permit is issued, that a facility will operate in compliance with the noise standard. The Committee’s “shall not exceed” standard is “the law.” The burden is on the modeler to ensure the model correctly conforms to that law.</p> <p>Antrim Wind is aware that prediction modeling based on the ISO 9613-2 standard produces long-term average noise levels (Leq 1-hour or more). NH Site 301.18(c)(3) & (4) require modelers apply necessary adjustments to ensure the resulting prediction conforms to the Committee’s sound standard. Predictions based on long-term averages show quieter operating noise levels than those based on Lmax or 1/8-second Leq.</p>

Reference to “one nighttime hour” in NH Site 301.18(e)(1) indicates the Committee intended one-hour averaging.

FALSE. The purpose for stating that measurements “shall include at least one nighttime hour” has nothing to do with the compliance interval metric. Note the SEC rule makes no reference to averaging. Rather, the reference to 1-hour is meant to ensure observers take at least one hour period of observation for some measurements at the facility at a time of day (nighttime) and during an operating condition when we could reasonably expect worst-case noise emissions to occur. The purpose for citing a one-hour timeframe was only to ensure observers spent at least some time at the site at night and did not dominate their on-site measurements during daytime hours.