

STATE OF NEW HAMPSHIRE
SITE EVALUATION COMMITTEE
INVESTIGATORY SUBCOMMITTEE

Docket No. 2021-02

INVESTIGATION OF COMPLAINTS
REGARDING ANTRIM WIND ENERGY FACILITY

August 23, 2021

**SUBCOMMITTEE'S RECOMMENDATION TO THE SITE EVALUATION
COMMITTEE CONCERNING CHARGE 1**

The Investigatory Subcommittee (the "Subcommittee") makes the following recommendation to the full Site Evaluation Committee (the "Committee"), as required by Charge 1 of the April 2, 2021 Order Appointing the Subcommittee:

I. The Subcommittee's Charge and Work thus Far

1. On April 2, 2021, Chairwoman Martin issued an order constituting this Subcommittee and charging it with three tasks:
 - Charge 1: Review the law, administrative rules, the Facility's Certificate, and all other relevant filings related to noise limits and sound measurement methodology. Forward a written recommendation regarding the appropriate methodologies for measurement and analysis of sound, and procedure for validating noise complaints to the full Committee by April 23, 2021.
 - Charge 2: Review and investigate complaints filed through December 31, 2021, regarding Facility operations to ensure the terms and conditions of the Certificate are being met.
 - Charge 3: Make recommendations to the full Committee regarding the disposition of such complaints.
2. After all members were named, the Subcommittee held its first public meeting on April 20, 2021 and adopted an Investigative Plan.

3. On May 20, 2021 Chairwoman Martin issued an Order Regarding Subcommittee Charge, granting the Subcommittee additional time to complete Charge 1 and instructing the Subcommittee that its charge “is focused on the current requirements pursuant to New Hampshire law, the administrative rules of the Subcommittee, and the existing requirements of the Certificate and Decision related to this facility.”

4. The Subcommittee revised its Investigative Plan and adopted it at a May 21, 2021 public meeting. At that meeting, it also discussed a May 6, 2021 Complaint filed by Rep. Vose regarding the Certificate Holder, Antrim Wind Energy, LLC’s (“Antrim Wind”) aircraft detection lighting system. The Subcommittee decided to recommend to the full Committee that it (1) find no violation of Antrim Wind’s Certificate with regard to the Vose complaint, and (2) undertake no enforcement action on the complaint. That recommendation was forwarded to Chairwoman Martin on May 24, 2021.

5. Pursuant to its Investigative Plan, the Subcommittee held a public meeting on June 17, 2021, to solicit comments from the public concerning Charge 1. It also invited written submissions, which were received from a variety of parties.

6. Before and after the public meeting, the Subcommittee members each independently conducted an exhaustive review of the relevant law, administrative rules, Antrim Wind’s Certificate, and the administrative records in a variety of Committee dockets.

II. Summary of Sound Measurement Terminology

7. The measurement of sound and noise is a highly technical field. To understand the science behind sound measurement and the technical terms employed in the Committee’s rules, the Subcommittee reviewed submissions and comments from interested parties and reviewed outside materials that were mentioned in the rules or previous Committee dockets, such

as publications from the federal government, the World Health Organization (“WHO”) ¹, the American National Standards Institute (“ANSI”), and the International Organization for Standardization (“ISO”).

8. Sound is measured by measuring the air vibrations, or pressure levels, created by a sound source. Sound pressure levels are usually described using the decibel (dB) scale. The decibel scale is logarithmic, so that an increase of 3dB represents a doubling of the sound energy, and a decrease of 3dB represents a halving of the sound energy. Because the scale is logarithmic, pressure levels from two sources cannot be added arithmetically to arrive at a single decibel rating for the combined sources. Generally speaking, two equal pressure levels added together doubles the sound energy, resulting in an increase of 3dB. Relatedly, when the sound from a much louder source is added to quieter source, the quieter source is essentially “masked” such that the combined pressure level in decibels is nearly identical to the louder source. For example, a 100 dB source plus an 80 dB source results in 100.09 dB, which, to the human ear, is an imperceptible difference from the louder source.

9. There are a variety of methods used to measure and quantify sound. One common measure is called “ L_{eq} ” which stands for “equivalent sound pressure” or “equivalent continuous sound pressure.” *See* 1999 WHO Guidelines at 22. L_{eq} “accounts for noise fluctuations from moment to moment by averaging louder and quieter moments, and giving more

¹ The World Health Organization has published three separate guidelines to recommend noise limits protective of public health. In 1999, it promulgated its Guidelines for Community Noise. It published the Night Noise Guidelines for Europe in 2009 and the Environmental Noise Guidelines for the European Region in 2018. As discussed below, these WHO Guidelines have been discussed by various Subcommittees in other dockets, including Docket No. 2014-04, the rulemaking docket which adopted the relevant noise rules, and Docket No. 2012-01, Antrim Wind’s previous application for a Certificate, which was denied.

weight to the louder moments.” See Federal Highway Authority Sound Level Descriptors, Doc. No. FHWA-HEP-17-0053, *available at*

<https://www.fhwa.dot.gov/Environment/noise/resources/fhwahep17053.pdf>. L_{eq} is typically used to measure continuous sounds over a particular time period. See WHO 1999 Guidelines at 23

10. Another measure is called L_{max} . L_{max} is the highest sound level measured during a particular time period. L_{max} is typically used when there are distinct noise events of concern, like aircraft or trains passing. See *id.*

11. Two other relevant terms are L10 and L90. These are statistical descriptors. L10 is the sound level exceeded 10% of the time being measured – e.g., the level exceeded during the loudest 6 minutes (not necessarily consecutive) in an hour. L90 is the sound level exceeded 90% of the time being measured and is generally regarded as a proxy for the background noise levels, i.e., the noise level when there are no intermittent noises. See *id.*

12. Finally, the various sound measures may be weighted by the frequency of the sounds. One of the more common weightings is A-weighting. A-weighting tends to weigh more heavily mid- and high-frequency sounds, which are more easily discernable by the human ear than lower frequencies.² When L_{eq} and L_{max} are computed using an A-weighting they are written as “ LA_{eq} ” and “ LA_{max} .”

III. Principles of Administrative Rule Interpretation.

13. Administrative rules are interpreted like statutes. *Vector Mktg. v. Dept. of Revenue Admin.*, 156 N.H. 781, 783 (2008). The appropriate place to start is the plain language

² A commonly used alternative, C-weighting, does not discount lower frequency sounds as much as an A-weighting.

of the rule. *See Bovaird v. N.H. Dept. of Admin. Servs.*, 166 N.H. 755, 758 (2014). The plain and ordinary meaning of the words used controls, unless the rule specifies an alternative meaning. *See id.* Furthermore, rules have to be read in the context of the overall regulatory scheme, not in isolation. *See id.* at 759. If the regulatory language is ambiguous, it is appropriate to review regulatory history to determine administrative intent. *See Vector Mktg.*, 156 N.H. at 784.

IV. Summary of the Relevant Law and Administrative Rules.

14. Because the starting point is the plain language of the relevant law and administrative rules, the Subcommittee has closely examined the relevant statute and rules.

15. The relevant statute is RSA 162-H and specifically RSA 162-H:10-a for wind energy systems. The statute offers no guidance on Charge 1, requiring only that the Committee adopt rules concerning “project-related sound impact assessment prepared in accordance with professional standards by an expert in the field,” rules considering impacts to the environment and “natural communities,” and rules concerning “[b]est practical measures to avoid, minimize, or mitigate adverse effects.” RSA 162-H:10-a, II.

16. The relevant rules are Site 301.14(f)(2)(a) and 301.18.

17. The rules impose four distinct categories of requirements on wind facilities with regard to sound and noise: (1) a Noise Limit, (2) requirements for pre-construction background sound and predictive modeling studies, (3) requirements for post-construction compliance monitoring, and (4) requirements for validating noise complaints.

The Noise Limit

18. Section 301.14(f)(2)(a) contains the Noise Limit. It provides in relevant part:

With respect to sound standards, the A-weighted equivalent sound levels produced by the applicant’s energy facility during operations shall not exceed the

greater of 45 dBA or 5 dBA above background levels, measured at the L-90 sound level, between the hours of 8:00 a.m. and 8:00 p.m. each day, and the greater of 40 dBA or 5 dBA above background levels, measured at the L-90 sound level, at all other times during each day, as measured using microphone placement at least 7.5 meters from any surface where reflections may influence measured sound pressure levels, on property that is used in whole or in part for permanent or temporary residential purposes, at a location between the nearest building on the property used for such purposes and the closest wind turbine;

If an applicant's facility would exceed those limits, then the facility would have an unreasonable adverse effect on health and safety, and the application for a Certificate must be denied under RSA 162-H:16, IV(c).

19. As more fully discussed below, the principal area of disagreement between Antrim Wind and other interested parties is the meaning of the Noise Limit.

Pre-Construction Sound Studies and Predictive Modeling

20. Site 301.08(a)(1) requires a pre-construction sound background study and a sound modeling study. Site 301.18(a) and (b) contain detailed requirements on the required sound background study, which must comply with ANSI standards regarding short-term and long-term monitoring, *see* Site 301.18(a)(1)-(2), and must provide "A-weighted and C-weighted sound levels for L-10, Leq, and L-90", *see* Site 301.18(b)(8).

21. Site 301.18(c) and (d) describe the necessary predictive sound modeling. Site 301.18(c)(1) requires the modeling comply with ISO 9613-2 1996-12-15 ("ISO Standard:"). The ISO standard is used to predict the "equivalent continuous A-weighted sound pressure level" (i.e. LA_{eq}) from a source given attenuation of the sound due to various factors, like atmospheric absorption, ground effects, reflection from surfaces, and screening by obstacles. *See* ISO Standard § 1.

Post-Construction Sound Monitoring

22. Section 301.18(e)-(h) contains detailed provisions about a Certificate Holder's required post-construction sound monitoring. Among other provisions, it requires seasonal post-construction monitoring surveys for at least the first year following commissioning, *see* Site 301.18(e)(7), adherence to ANSI standards for short-term attended monitoring, *see* Site 301.18(e)(1), that "[a]ll sound measurements during post-construction monitoring shall be taken at 0.125-second intervals measuring both fast response and Leq metrics," *see* Site 301.18(e)(6), and that post-construction monitoring reports shall include LAeq, LA-10, LA-90, LCeq, LC-10, and LC-90, *see* Site 301.18(g).

Validation of Complaints

23. Finally, Section 301.18(i) requires that noise complaints be validated by "field sound surveys, except as determined by the administrator to be unwarranted." The field studies "shall be conducted under the same meteorological conditions as occurred at the time of the alleged exceedance that is the subject of the complaint."

V. Summary of the Certificate and Order Granting the Certificate.

24. Antrim Wind received its Certificate on March 17, 2017. The Certificate imposed a number of conditions on the facility. Relevant here are the following requirements:

- Retain a third-party expert, as approved by the Administrator of the Committee, to assist the Town of Antrim and the Administrator in taking field measurements in order to evaluate and validate noise complaints. *See* Certificate at 9.
- Provide post-construction sound monitoring reports as required by N.H. Admin. R. Site 301.18(e) and (f), that includes a map or diagram showing certain locational and distance data. *See id.* at 10.

- Comply with the Agreement between the Town of Antrim and Antrim Wind. *See id.* at 5.³

25. In addition, the Subcommittee’s March 17, 2017 Decision and Order Granting Application for Certificate of Site and Facility ruled that (1) Antrim Wind’s pre-construction sound study and modeling “was prepared in accordance with professional standards and our administrative rules,” and (2) Antrim Wind “guaranteed that the noise levels associated with the project will not exceed the requirements set forth in N.H. Code Admin. Rules Site 301.14(f)(2)(a).” *See* Decision at 153.

VI. The Meaning of the Noise Limit.

A. Points of Agreement Among Interested Parties

26. There are several points on which all the interested parties seem to agree.

27. First, there does not appear to be any dispute that Site 301.14(f)(2)(a) creates a “not-to-exceed” standard, i.e., that the noise emitted from the Antrim Wind facility shall not exceed the greater of 40 dBA or 5dBA above background in the night and shall not exceed the greater of 45 dBA or 5 dBA above background during the day. Additionally, the background level is to be measured at the L-90 level. *See, e.g.*, Antrim Wind July 1, 2021 Technical & Regulatory Review Submission (“Antrim Wind Memo.”) at 32; Lisa Linowes July 1, 2021 Comment (“Linowes Memo.”) at 2.

28. Based on the plain language of the rule, the Subcommittee believes this standard means that Antrim Wind is permitted to emit noise from its facility that is 45 dBA or less during

³ The Agreement with the Town, as amended in 2018, requires among other things retention of a third-party expert and compliance with noise limits that are functionally the same as Site 301.14(f)(2)(a). *See* Amended Agreement Between Town of Antrim and Antrim Wind §§11.1, 11.3.

the day and 40dBA or less during the night. However, Antrim Wind is permitted to exceed those limits if the background noise, measured using the L90 statistic, is sufficiently loud. For example, if the background sound level at an appropriate monitoring point (or the location of a complaint) as measured by the L90 statistic is 44 dBA during the day, the noise emitted from Antrim Wind’s facility may reach 49 dBA.

29. Second, Site 301.14(f)(2)(a) specifies that the noise emitted from the facility shall be measured as “A-weighted equivalent sound levels.” All parties seem to agree that “A-weighted equivalent sound levels” means LA_{eq} . See Antrim Wind Memo.; Linowes Memo. at 2; July 1, 2021 Comment of Robert W. Rand (“Rand Submission”) at 4 (“The NH SEC rule is based on the Leq metric for compliance assessment.”).

30. Based on the plain language of the regulations, the Subcommittee agrees. “Equivalent” is used in all the literature reviewed by the Subcommittee to signify Leq . For instance, LA_{eq} is defined by the World Health Organization as “A-weighted equivalent sound pressure level,” which is nearly identical to the regulatory language. See 2009 WHO Night Noise Guidelines at XI. The language used in ANSI S12.9-2013 Part 3 (the “ANSI Standard”), which is referred to specifically in the rules, also uses similar terminology: “equivalent-continuous sound pressure level.” See ANSI Standard §§5.3, 6.5-6.7.

31. Because the regulatory scheme as a whole should be considered, see *Bovaird*, 166 N.H. at 759, it is also appropriate to consider other provisions of the regulations when interpreting the Noise Limit. The A-weighted Leq (i.e. LA_{eq}) is required to be measured in pre-construction sound surveys. See Site 301.18(b)(8). In addition, ISO 9613-2 1996-12-15, which is the standard an applicant is required to use for its predictive sound modeling, see Site 301.18(c)(1), is a prediction of LA_{eq} after considering geography, obstacles, and other possible

sources of sound attenuation. Finally, post-construction compliance monitoring reports also require a Certificate Holder to report LA_{eq} . *See* Site 301.18(g). It would make no sense for the rules to (a) require an applicant to show predicted LA_{eq} to be below the Noise Limit, and (b) after issuance of the certificate, prove compliance with the Noise Limit through measured LA_{eq} , and yet find a violation of the Noise Standard by using some value other than LA_{eq} .

32. Thus, the plain and ordinary meaning of “A-weighted equivalent sound levels” in Site 301.14(f)(2)(a) is LA_{eq} , as supported by the structure of the overall regulatory scheme.

B. The Parties’ Disagreement Over the Time Period.

33. However, the parties disagree over what time period LA_{eq} should be determined. As stated above, LA_{eq} is, roughly, an average of the sound emitted by a source over some time period, with a weighting toward the louder sounds. Site 301.14(f)(2)(a) does not, however, state over what time period LA_{eq} should be measured.

34. Several commenters urge the Subcommittee to adopt a compliance standard of LA_{eq} measured over a 0.125 second (or 1/8 second) interval. They point to the following language in Site 301.18(e)(6): “[a]ll sound measurements during post-construction monitoring shall be taken at 0.125-second intervals measuring both fast response and Leq metrics.” They contend that language requires LA_{eq} to be computed over every 1/8 second interval and that if any computed LA_{eq} value is over the noise limit there is a violation. *See* Linowes Memo. at 2-3.

35. Antrim Wind takes the position that a 1/8 second compliance interval is inconsistent with the Committee’s rules. Specifically, it points out that Site 301.18(g) requires the certificate holder to report L10, L90, and LA_{eq} in its post-construction compliance reports. It contends that to measure the L10 and L90 statistics would require at least 10 measurements for the chosen compliance interval. If the compliance interval is 1/8 of a second (0.125 seconds),

then the certificate holder would need to take measurements every 1/80 (0.0125 seconds) of a second to compute the necessary statistics. Antrim Wind says that is not possible. *See* Antrim Wind Memo. at 23 (“Since the data recorded cannot be subdivided any further from 1/8 second in any meaningful way, the LA-10, the LA-90, LC-10, and LC-90 would all yield identical – and nonsensical – values.”).

36. However, Mr. Rand’s July 1 submission demonstrates that at least some modern sound meters can measure L_{eq} over periods as short as 2 ms (0.002 seconds) by continuously converting the meter’s microphone voltage to digital values. According to Mr. Rand, even if the compliance interval is as short as 0.1 seconds, L_{eq} can be computed with 4,800 digital values from the meter. *See* Rand Submission at 2.

37. The Subcommittee did not have to resolve this factual dispute, because it ultimately agrees with Antrim Wind that an L_{eq} of 0.125 seconds is not supported by the language of the rules. First, as public commenters have suggested, an L_{eq} of 0.125 seconds is essentially the same as an L_{max} , i.e., the maximum recorded sound level during measurement. *See* Linowes Letter at 1; July 1, 2021 Comment from Lori Lerner at 1. There is no textual support in the rules for L_{max} as a compliance measure. The term is entirely absent from the rules. Instead, the noise standard is based on “equivalent” sound levels, which all parties agree means LA_{eq} .

38. Second, using a 0.125 second compliance interval is inconsistent with the ANSI S12.9-2013 standard, but Site 301.18(e)(1) requires that post-construction monitoring compliance adhere to that Standard.

39. The Standard’s stated purpose “is to provide the method(s) to measure the sound of a specific source at a specified location, such as the noise from a specific power plant in some

specified person's backyard." ANSI Standard at vii. The general method it prescribes "is to measure the total sound and then to subtract the background, which is all sound at the location in question except for the sound from the specific source in question." *Id.*

40. The Standard's conceptual approach is outlined in Section 5.3 – "General data collection methods for measurement of the LEQ of a source corrected for the continuous LEQ of the background and for transient background sound." *See id.* at 6. The steps are: (1) measurement of the source sound for some "basic measurement period," (2) removing from the source measurement "transient background sounds" such as a dog barking, an airplane, gun shots, and then (3) correcting the source measurement for the contribution of "continuous background sound"⁴ if the source sound is not dominant. The basic measurement period is not prescribed, but one hour is the common example used in the Standard.

41. The Standard provides three different approaches to measuring sound. The first two approaches are procedures for "accelerated measurement" that seek to "reduce on-site measurement time." *See id.* §§6.5-6.6. They can be used when the source sound is steady, a standard frequency weighting like A-weighting is used, and when the source can be turned on and off. In one of the accelerated measurement procedures, an LA_{eq} is calculated over a five-minute monitoring period with the source on, and a five-minute period with the source off. *See id.* §6.5. In the other accelerated procedure, $L90$ is calculated over five-minute periods with the source on and off. *See id.* §6.6.

⁴ The ANSI Standard defines "continuous background sound" as the sound in an environment without contribution from the source sound and excluding the contribution of transient background sounds.

42. The Standard's third approach is called the "basic procedure." *See id.* § 6.7. It requires "measurement of the continuous background sound for 10 minutes or more and measurement of the sound with the source(s) in operation for the basic measurement period (e.g. 1 hour)." *Id.*

43. The basic procedure also requires removing transient background sounds from both the continuous background sound and the source sound. The Standard provides two different methods to remove transient background sounds. The first method divides the measurement period into "many small blocks of time." *See id.* § 6.7.2. Each block of time "shall be neither less than 1 s nor greater than 60 s." *See id.* § 6.7.2(a). L_{eq} for each block of time is then computed and blocks corrupted by transient noises are thrown out. *See id.* § 6.7.2(c). An average L_{eq} for all of the remaining blocks of time is then computed using a mathematical formula. *See id.* § 6.7.2(e).

44. The basic procedure's second method for removing transient background noise requires measuring L_{eq} for "large, continuous blocks of time" and using technological means to stop measurements when a transient background noise occurs. *See id.* § 6.7.3. Again, the Standard gives an hour-long measurement as an example.

45. The Subcommittee agrees with Antrim Wind that an L_{eq} computed over 0.125 seconds is inconsistent with the ANSI Standard. The "accelerated" methods require a five-minute L_{eq} or L_{90} be computed. The "basic procedure" prescribes measurement of background L_{eq} that is at least 10 minutes long. *See id.* While the basic procedure doesn't prescribe a basic measurement period, it is plainly meant to be longer than the period used in the "accelerated" methods. The Standard commonly refers to a basic measurement period for the source sound as

one hour, even though it is not prescribed. By contrast, a time period as short as 0.125 seconds for measuring L_{eq} is not mentioned anywhere in the Standard.

46. Furthermore, removal of transient background noises would be impossible under the ANSI Standard using a basic measurement period of 0.125 seconds. The Standard mandates one second as the smallest block of time for removal of transient background noises, and even then, the Standard envisions that many one-second blocks not corrupted by transient noises will be averaged into a longer timeframe L_{eq} .

47. At the same time, the Subcommittee does not agree with Antrim Wind that the rules *require* a 1-hour L_{eq} be used to measure compliance. The Committee's rules do not mention a 1-hour L_{eq} . Antrim Wind's expert Robert O'Neal confirmed that at the June 17, 2021 public meeting. He also testified that a 10-minute L_{eq} could be a reasonable period for compliance monitoring.

48. The Subcommittee's interpretation of the plain language of the rules is that they only require compliance monitoring to adhere to the ANSI Standard; they do not prescribe any particular time period to measure LA_{eq} . Therefore, to comply with the ANSI Standard, if sound is measured using an accelerated method, a five-minute or longer LA_{eq} is required. If ANSI's basic procedure is used, some period of time longer than five minutes is used to compute the LA_{eq} , though there is no requirement for a 1-hour LA_{eq} .

C. Regulatory History and Administrative Intent

49. Public commenters and interested parties have also discussed the intent behind the rules. Because the plain language of the rules is clear that compliance is measured using an LA_{eq} of whatever time period is consistent with the ANSI Standard, there is no need to consult the administrative history. *See Vector Mktg.*, 156 N.H. at 784 (approving review of regulatory

history to interpret an ambiguous rule). Still, to completely investigate the appropriate recommendation to make to the full Committee, the Subcommittee completed an in-depth review of the rulemaking docket, Docket No. 2014-04, the original Antrim Wind docket, No. 2012-01, and Docket No. 2015-02. The Subcommittee believes the administrative history is contradictory and unclear. It is not a useful indicator of the Committee's intent when it adopted the Noise Standard in Site 301.14(f)(2)(a), except in one facet: the administrative history confirms that the Rulemaking Subcommittee in Docket No. 2014-04 intended that noise monitoring be conducted in accordance with ANSI standards.

50. The Noise Limit, Site 301.14(f)(2)(a), was adopted in late 2015, as required by 2013's SB99. *See* Laws 2013, ch. 134. SB99 also created a "public stakeholder process" to recommend rules on energy facility siting. That process included numerous workgroups, including a "Health and Safety Work Group" which examined noise emissions from energy facilities. In areas where the Work Group agreed, the Rulemaking Subcommittee in Docket No. 2014-04 adopted the Work Group's recommendations almost verbatim. The Work Group recommended, among other things, a pre-construction sound survey, predictive modeling, and post-construction compliance monitoring, all of which were eventually adopted as Site 301.18. The Work Group also recommended the requirement to measure L_{eq} during post-construction monitoring, and to include in such reports L_{eq} , L10, and L90.

51. But the Work Group couldn't agree on noise limits. One participant, Ken Kaliski (now an Antrim Wind consultant) suggested "an absolute sound limit (for example an overall turbine cap of 40 dB(A) or 45 dB(A) L_{eq} 1-hour)." Another participant suggested a "relative noise limit of 10 decibels above the background level with a noise cap not to exceed 45dB(a)." Other participants advocated that a "not to exceed" limit be established and measured at the

property lines.” Because there was no consensus on the critical issue of noise limits, the SB99 Work Group’s report sheds little light on the intent behind the rules that were ultimately adopted.

52. The Rulemaking Subcommittee in Docket No. 2014-04 ultimately adopted the Noise Limit with very little discussion. The initial version of the draft rules used the following language:

A-weighted equivalent sound levels produced by the applicant’s energy facility during operations shall not exceed the greater of 45 dBA or 5 dBA above ambient levels between the hours of 8:00 a.m. and 8:00 p.m. each day, and the greater of 40 dBA or 5 dBA above ambient levels at all other times during each day, as measured at the exterior wall of any existing permanently occupied building on a non-participating landowner’s property, or at the non-participating landowner’s property line if it is less than 300 feet from an existing occupied building, and **these sound levels shall not be exceeded for more than 3 minutes within any 60 minute period** (emphasis added)

53. The highlighted portion of the initial draft rule was removed after a June 29, 2015 technical session for unexplained reasons. Because the Rulemaking Subcommittee did not explain its removal of this language, this Subcommittee does not believe the change provides any meaningful insight into administrative intent about the length of the compliance period (i.e., over what time period to compute LA_{eq}).

54. One commenter pointed out that the highlighted language was included in the Certificates issued to Groton Wind, LLC and Lemptster Wind, LLC. *See* Linowes Memo. at 4. She urges the Subcommittee to interpret the Committee’s current rules to include a similar restriction. The Subcommittee declines. There is no such restriction in the current rules and the removal of such language in the draft rules is very strong evidence there was no administrative intent to create such a restriction.

55. There are several other stray comments from the Rulemaking Subcommittee in Docket No. 2014-04 about the Noise Limit, but the Subcommittee does not believe they provide any definitive guidance as to administrative intent.

56. For instance, the Rulemaking Subcommittee referred to the noise limits several times as a “maximum” or “not-to-exceed” standard. *See, e.g.*, Statement of Chairman Honigberg, April 15, 2015 Trans. at 26-27; Statements of Commissioner Scott and Attorney Weisner, Aug. 18, 2015 Trans. at 45-46; Statement of Attorney Weisner, Sept. 29, 2015 Trans. at 144-45 (“[T]his is setting an absolute standard not to be exceeded.”).

57. The Subcommittee does not consider these statements important indicators of administrative intent. All current interested parties agree that the current rules impose a not-to-exceed standard, but these statements do not provide evidence on the critical question: what time period did the Rulemaking Subcommittee intend for LA_{eq} .

58. Also, in its discussion of the final draft rules, the rulemaking Subcommittee discussed how the proposed noise standard related to the standards imposed on other facilities. The Rulemaking Subcommittee’s attorney stated the proposed “limits are those that were adopted by the Subcommittee in the Antrim Wind [2012] case.” Sept. 29, 2015 Trans. at 142-43. Thereafter, the Rulemaking Subcommittee adopted the current version of the rule.

59. This is some indication that the current Noise Standard was intended to mimic the standard adopted in the final decision in Docket No. 2012-01.

60. In that matter, a Subcommittee denied a Certificate because it found the proposed project would have had an unreasonable adverse effect on aesthetics. *See* Apr. 25., 2013 Decision at 48. But it also considered possible adverse effects on public health and safety and noise emissions in particular. That Subcommittee adopted a limit similar, but not identical, to the

Noise Limit in Site 301.14(f)(2)(a): the greater of 40dBA night / 45dbA day, or 5 dB above ambient. In doing so, that Subcommittee stated it had relied on the WHO's 2009 guidelines. *See id.* at 68. The 2009 WHO Guidelines established a benchmark of 40 dB for nighttime noise, measured at “L_{night, outside},” meaning “1 year LA_{eq} (exposure to noise) over 8 hours outside at the most exposed façade.”

61. But the 2012 Antrim Subcommittee specifically discussed the year-long average in the WHO standard and decided against it, because it would be too difficult to measure for compliance, and because it could lead to long periods of excessive noise. *See* Docket 2012-01, Day 3 Deliberations, Morning Session, Feb. 7, 2013 Trans. at 11-26. Instead, they adopted “a daytime and nighttime limit, not get into the average over time, not get into lesser versus greater. Keep it pretty straightforward, but have it step down. So, that 45 in a day, or 5 over; and the nighttime 40, or 5 over.” *See id.* at 16, 25.

62. The Subcommittee does not find this discussion informative on administrative intent. The discussion in the 2012 Antrim docket is unclear as to whether that Subcommittee rejected the WHO's year-long averaging, rejected night-time averaging, or ruled out any possible averaging of sound levels (i.e., adopted an L_{max} standard). It is also unclear whether the 2014 Rulemaking Subcommittee even considered this discussion and intended to follow the 2012 Subcommittee's reasoning, or whether, instead, it was simply referring to the similar numeric limits imposed by the 2012 Subcommittee.

63. The Subcommittee believes the only persuasive indicator of administrative intent in the regulatory history is the Rulemaking Subcommittee's constant desire to craft the rules to comply with ANSI standards. *See* July 7, 2015 Memo to Subcommittee (noting that technical session recommended changing “ambient” to “background,” with reference to the L-90

measured sound level, consistent with applicable ANSI standards”); Aug. 27, 2015 Transcript at 96-97, 111; Sept. 29, 2015 Trans. at 151-52 (“Then, if it’s covered in the ANSI and the ISO numbers and all that, I’m good.” (statement by Member Oldenburg concerning where to take measurements to measure compliance with sound limits)). That regulatory intent confirms the Subcommittee’s reading of the plain language of the Noise Limit.

D. Counsel for the Public Comments

64. The Subcommittee reviewed June 24 comments from Counsel for the Public. Counsel for the Public framed his discussion around the L₉₀ standard in Site 301.14(f)(2)(a), but he also focused on the time-period disagreement that is the principal focus of the interested parties. Counsel disagreed with the 1/8 second interval advocated by several members of the public. Counsel stated his belief that the 1/8 second interval mentioned in Site 301.18(e)(6) “is meant to describe the minimum interval for data collection” and that “it would be meaningless to have the time interval for data collection and the time interval for averaging be the same.” But Counsel also offered that he was not convinced there was a firm basis in the rules or other background information that would require the adoption of the 1-hour L_{Aeq} standard advocated by Antrim Wind.

65. For the reasons stated above, the Subcommittee generally agrees with Counsel for the Public that the plain language of the rules do not dictate a 1-hour L_{Aeq} as the compliance period, but that they do rule out a 0.125 second L_{Aeq} (or L_{max}) standard.

66. Counsel for the Public outlined several options available to the Subcommittee.

67. First, he suggests a short compliance interval, like 0.125 seconds, could make compliance impossible. This Subcommittee shares that concern. Antrim Wind has submitted materials showing that jurisdictions adopting a 45 dB L_{max} standard have permitted no wind

energy facilities. *See* Antrim Wind Memo. Exh. G. The Subcommittee has limited its investigation and analysis to New Hampshire laws, rules, and administrative materials, so has not vetted these assertions.⁵ If true, the Subcommittee agrees with Counsel for the Public that likely was not the administrative or legislative intent. *See* RSA 162-H:1 (stating legislative declaration “that it is in the public interest to maintain a balance among those potential significant impacts and benefits in decisions about the siting, construction, and operation of energy facilities in New Hampshire”).⁶

68. Second, Counsel suggests the Subcommittee could interpret the rule and Certificate to imply a “reasonable” time interval. The Subcommittee agrees with Counsel’s statement, however, that such a standard “leaves the Subcommittee with too much discretion to determine, post-certificate what the compliance standard will now be.” Instead, the Subcommittee believes the plain language of the rules require use of a time period for calculating LA_{eq} that is consistent with ANSI standards.

69. Finally, Counsel suggests that “it seems appropriate for the Subcommittee to use the same methodology in determining post-certificate compliance that the Committee used in the application phase.” As Antrim Wind notes, pre-construction background sound studies and sound modeling focused on LA_{eq} measured over 1-hour. *See* Antrim Wind Memo. at 10.

⁵ For the same reason, the Subcommittee has not reviewed the regulations and standards used in other jurisdictions. *See* Antrim Wind Memo. at 25-30 (summarizing noise restrictions from other jurisdictions); Linowes Memo. at 2-3 (discussing Michigan federal court case).

⁶ Counsel for the Public suggests the Subcommittee might want to investigate the impacts an L_{max} standard would have on wind energy facility siting decisions in New Hampshire. The Subcommittee welcomes any factual submissions from any party on this important point.

70. The Subcommittee generally agrees with Counsel for the Public that an application should not be granted under one standard and then certificate compliance measured under a different standard, unless the rules are changed. However, the plain language of the rules remains the most important consideration.

71. Antrim Wind's Certificate was granted on the basis of background sound studies and predictive modeling that the Subcommittee in Docket 2015-02 determined "was prepared in accordance with professional standards and our administrative rules." *See* Mar. 17, 2017 Decision in Docket No. 2015-02 at 153. The Committee has thus determined a one-hour $L_{A_{eq}}$ can therefore demonstrate compliance. The ANSI Standard makes that clear. But the decision granting the Certificate did not purport to *require* use of a 1-hour $L_{A_{eq}}$ to demonstrate compliance or noncompliance. Nor could it if inconsistent with the plain language of the rules. *See Appeal of Silva*, 172 N.H. 183, 187 (2019). The Subcommittee believes the rule's plain language is a better guide than the decision on Antrim Wind's application for a certificate.

E. Other Comments and the Tocci Report

72. The Subcommittee considered the public comments made at the June 17, 2021 public meeting and the written comments submitted by interested parties.

73. Several commenters expressed a belief that the Committee's rules preclude averaging of sound levels for compliance purposes because averaging would allow the facility to operate above the noise limits for long periods of time so long as there were other periods of relative quiet. *See, e.g.*, Comment by Dr. Fred Ward at 3. The Subcommittee disagrees. The L_{eq} standard is an average of sound pressure levels over some time period, but not the arithmetic average commonly used in everyday life. Because the decibel scale is logarithmic, L_{eq} is heavily influenced by the louder sounds in those time periods. The Subcommittee has no evidence or

materials before it that LA_{eq} is used to shield excessive source noise. Instead, the ISO Standard, the ANSI Standard, and WHO publications all endorse using LA_{eq} (of various time periods) to accurately measure environmental noise. In any event, the plain language of the rule requires averaging by mandating the use of LA_{eq} .

74. Several commenters have expressed concerns about continued loud noise and that their complaints are not being handled. *See, e.g.*, July 1, 2021 Comment of Barbara Berwick. Pursuant to the April 2, 2021 Order constituting this Subcommittee, the Subcommittee is first deciding its recommendation to the full Committee “regarding the appropriate methodologies for measurement and analysis of sound, and procedure for validating noise complaints to the full Committee.” Following that recommendation, the Subcommittee will begin investigation of individual complaints as outlined in the Subcommittee’s Investigative Plan.

75. Finally, the Subcommittee reviewed Gregory Tocci’s September 4, 2020 Peer Review of Antrim Wind’s Winter 2020 post-construction sound monitoring report. Mr. Tocci was retained by the Committee’s administrator to review Antrim Wind’s report. Antrim Wind’s contractor Acentech conducted measurements of 1-hour LA_{eq} at five different locations in March 2020, all of which were below the limits in Site 301.14(f)(2)(a). Mr. Tocci opined that “[t]he methods employed by Acentech are generally consistent with those of ANSI S12.9 Part 3 and meet the requirements of the NH Code Admin. R. Site 301.18 for testing.” He also agreed with Acentech that the noise emissions from the facility were below limits.

76. The Subcommittee believes the opinion of Mr. Tocci, the third-party expert hired to assist the Committee, supports its interpretation of the Noise Limit. Mr. Tocci did not fault Acentech’s analysis for failure to compute LA_{eq} on a 0.125 second time interval, but found use of the 1-hour LA_{eq} complied with the rules and ANSI Standard. This comports with the

Subcommittee's interpretation of the plain language of the rule that a 1-hour LA_{eq} for compliance purposes is acceptable under ANSI, though not required.

F. Summary of Recommendation Concerning Noise Standard

77. To summarize, the Subcommittee makes the following recommendation to the Committee regarding "the appropriate methodologies for measurement and analysis of sound":

- The Noise Limit in Site 301.14(f)(2)(a) limits Antrim Wind's sound emissions to the greater of (i) 40 dBA at night/45 dBA during the day, or (ii) 5 dBA above background levels (measured using the L90 statistic). Thus, Antrim Wind's sound emissions may go above 40 dBA night/45 dBA day if the background sound levels are sufficiently loud (i.e., greater than 35 dBA at night, or 40 dBA during the day).
- Measurements of Antrim Wind's sound emissions and background sound shall be conducted according to the ANSI Standard.
- Antrim Wind's sound emissions shall be measured using LA_{eq} over the time period required by the relevant ANSI Standard. That is at least five minutes for accelerated measurements and a longer period if ANSI's basic procedure is utilized, as reasonably determined by the professional conducting the study.

78. The Subcommittee received comments from numerous Antrim residents indicating that they consider the noise emitted by Antrim Wind disturbing, even if the noise levels are below the limits in Site 301.14(f)(2)(a) as interpreted by the Subcommittee. The Subcommittee therefore also recommends that the Committee consider initiating a rulemaking proceeding to consider amending Site 301.14(f)(2)(a) to establish a definitive time limit over which LA_{eq} is to be measured and whether the numerical limits set in 301.14(f)(2)(a) are appropriately protective of public health and safety.

VII. Recommendation Concerning Procedure for Validating Noise Complaints

79. The Subcommittee is also charged with recommending a procedure for validating noise complaints. *See* Apr. 2, 2021 Order at 2.

80. Site 301.18(i) provides that “[v]alidation of noise complaints submitted to the committee shall require field sound surveys, except as determined by the administrator to be unwarranted, which field studies shall be conducted under the same meteorological conditions as occurred at the time of the alleged exceedance that is the subject of the complaint.”

81. There are two possible readings of this regulation. One reasonable interpretation is that a complainant must back up a complaint with field sound surveys. The other reasonable interpretation is that once the Committee receives a complaint, it conducts the field sound survey to validate the complaint, unless it decides a study is unwarranted. Because both of these interpretations are reasonable, the requirement is ambiguous, and it is appropriate to consider administrative intent. *See Vector Mktg.*, 156 N.H. at 784.

82. The Rulemaking Subcommittee in Docket No. 2014-04 specifically discussed this requirement in its September 29, 2015 public meeting. It discussed a comment that requiring field sound survey studies would “be subject to abuse without bounds or limitations on expenses that could be imposed on the applicant.” *See* Sept. 29, 2015 Public Meeting Trans. at 202-03. The Rulemaking Subcommittee indicated they agreed with the commenter that the requirement would be at the applicant’s expense because they debated on how to limit the number of field surveys. *See id.* at 203-04. After deciding against a numeric limit of field surveys, that Subcommittee decided to add language giving the administrator discretion on whether to require a field survey. *See id.*

83. Thus, the Rulemaking Subcommittee always understood that field surveys would be ordered by the administrator at the Certificate Holder’s expense, not that a complainant was required to provide a field survey to have the complaint adjudicated. *See also* Post-Certificate Matters in Docket No. 2015-02, June 15, 2020 Letter from Chairwoman Martin (“As a result, the

field sound surveys to evaluate noise complaints are required to be done by the Administrator (assisted by an expert), who will report the results to the Committee for a determination as to whether there is a violation.”).

84. The Certificate is consistent with this interpretation of the regulation. On page 9 of its Certificate, Antrim Wind is required to “retain a third-party expert, as approved by the Administrator of the Committee, to assist the Town of Antrim and the Administrator in taking field measurements in order to evaluate and validate noise complaints.” *See also* Amended 2018 Agreement Between Town of Antrim and Antrim Wind Energy LLC § 11.3 (requiring the same).


85. Therefore, the Subcommittee recommends the following as the appropriate procedure for validating noise complaints:

- Upon receipt of a complaint, the matter will be delegated to the Subcommittee.
- The Subcommittee will decide whether a field survey by the third-party retained sound expert is required.
- The purpose of the discretion afforded to the Committee was to limit overburdening the Certificate Holder with repeated field surveys. Thus, multiple surveys may not be required for repetitive or duplicative complaints.
- If a field survey is performed, the Subcommittee will publish the field survey and accept comments on the survey and conduct any additional investigation it deems appropriate. If a field survey is not required, the Subcommittee will conduct further investigation as it deems appropriate and make an appropriate recommendation to the Committee on disposition of the complaint.
- If the Subcommittee accepts the findings of any field survey, it shall recommend to the full Committee denial of a complaint if the field survey does not validate the complaint. If the field survey does validate the complaint, the Subcommittee will recommend the Committee find a violation and take the appropriate enforcement actions.

86. Because of the repeated and numerous noise complaints in this matter, the Subcommittee believes it may be appropriate to hold complaints for some time period, until one or just a few field surveys are able to validate multiple complaints. The Subcommittee

recommends investigatory proceedings every three to six months to investigate complaints, if any, filed in the preceding time period. At the same time, the Subcommittee also recognizes the need for field surveys to take place under the same meteorological conditions as were present at the time of the Complaint. *See* Site 301.18(i). Therefore, upon referral of a Complaint, the Subcommittee may request a field survey to be conducted before the scheduled time for adjudication of complaints if warranted by meteorological conditions.

FOR THE INVESTIGATIVE SUBCOMMITTEE IN DOCKET 2021-02



Jonathan Evans, Presiding Officer