STATE OF NEW HAMPSHIRE

SITE EVALUATION COMMITTEE
FEBRUARY 6, 2013 - 1:52 P.M. DAY 2
Concord, New Hampshire AFTERNOON SESSION ONLY

IN RE: SITE EVALUATION COMMITTEE:
DOCKET NO. 2012-01: Application of Antrim Wind, LLC, for a Certificate of Site and Facility for a 30 MW Wind Powered Renewable Energy Facility to be Located in Antrim, Hillsborough County, New Hampshire.

PRESENT:
SITE EVALUATION COMMITTEE:

Amy L. Ignatius, Chrmn.
(Presiding Officer)
Kate Bailey, Engineer Harry T. Stewart, Dir. Johanna Lyons, Designee

Brad Simpkins, Dir.
Ed Robinson, Designee Craig Green, Designee Richard Boisvert, Designee Brook Dupee, Designee

Public Utilities Comm.
Public Utilities Comm. DES - Water Division Dept. of Resources \& Econ. Dev.
DRED-Div. Forests \& Land Fish \& Game Department Dept. of Transportation Div. Historic Resources Dept. Health \& Human Svs.

COUNSEL FOR THE COMMITTEE: Michael Iacopino, Esq.

COURT REPORTER: Susan J. Robidas, N.H. LCR No. 44
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## APPEARANCES (CONT'D)

APPEARANCES: Reptg. Antrim Wind, LLC:
Susan S. Geiger, Esq. (Orr \& Reno)

Counsel for the Public: Peter C. L. Roth, Esq.
Sr. Asst. Atty. General
N.H. Atty. Gen. Office

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AFTERNOON PROCEEDINGS
CHAIRMAN IGNATIUS: I'd like to resume the proceedings after the lunch break. It's ten of two, and we're going to begin again, finishing up the final pieces -- we were so close -- but finish up those final pieces on possible conditions in the Natural Environment category.

When we left off, we were going through the Fish and Game letter that was submitted in this docket and wanting to be clear whether there were items that Fish and Game asked for that we have already addressed, any that we have not addressed.

And Mr. Iacopino, you had read -- the first one had to do with natural revegetation that was called for under the AP -- the ABPP. And the Fish and Game was asking for a copy of the plan to be notified of the steps that were intended, and to receive periodic updates evaluating the degree to which the revegetation plan was successful. And I don't believe anybody had any opposition to the request that had been
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voiced, but some uncertainty about whether it was going beyond the terms of the AP -- ABPP. Do you know, Mr. Iacopino, whether the request made by Fish and Game really does go beyond the terms of the plan itself?

MR. IACOPINO: I think it does, only to the extent that it -- I'm sorry. I think it does, only to the extent that it requires the reports to be made to Fish and Game, in terms of providing them with a copy of the plan and then the periodic updates. I don't recall seeing that in the ABPP.

CHAIRMAN IGNATIUS: And they'd be informational filings. It's not that it would be giving Fish and Game the authority to make changes to the plan, but really just informational copies of the plan, of any steps that are undertaken under it and updates on how it's been going; is that right?

MR. IACOPINO: Yes, that's clearly what Fish and Game is asking for, is nothing but information.

CHAIRMAN IGNATIUS: Is the
Committee comfortable with that? Any reason
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you would not want to grant that request as a condition?

MS. BAILEY: I don't think
that's overly burdensome.
CHAIRMAN IGNATIUS: So it
sounds like there's no concern that it intrudes too much or creates an obligation that isn't appropriate. And certainly, if it had been made a formal permit by an agency, we would honor it automatically. And so I think it seems reasonable to include it, although it came in as a recommendation.

The next item in the letter from Fish and Game, Mr. Iacopino, can you read us that?

MR. IACOPINO: This more a comment, but I'll let you decide if you should make it a condition or not.

It references Page 64 of the
ABPP and says, "This section refers to consultation and evaluation of wind data from other wind projects in the region. However, we would like to emphasize that AWE used data from wind projects established in the
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northeast for more comparative information. Although this may be referred -- inferred in the ABPP, we would like it to be clear that data from the other New England states and local projects should be utilized for comparison purposes to the AWE project." So they're looking for a little more clarity on the wind projects that are going to be used to compare against for the adaptive management plan.

CHAIRMAN IGNATIUS: Mr.
Robinson.
MR. ROBINSON: The Fish and Game having the ability to review and approve all wildlife and avian surveys, my intent was to capture No. 3 through No. 7, all those.

CHAIRMAN IGNATIUS: Questions that could be -- I assume the department could work that out with the Applicant under those conditions, the Items 3 through 7 in the letter?

MR. ROBINSON: Hmm-hmm.
They're all specific comments and requests of certain things. And if they work with the
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CHAIRMAN IGNATIUS: Well, I think it's assumed that anytime a term can't be met and there's a disagreement or need for guidance, it comes back to us, unless we've specifically said that, you know, we're done and it only can be resolved through some other entity. If we're saying that Fish and Game has the ultimate decision-making about that, and Fish and Game says "We're not comfortable with what we've gotten. We want" -- you know, they come to us asking for help and not just simply declaring an answer, then $I$ think it would come to us. We wouldn't have to say that. But if you think there's a need for more clarity on that, on the role we play going forward, we could try. My fear is that you never can anticipate exactly what -- how something is going to play out. So it may not be necessary. I don't know.

Mr. Iacopino, do you have a sense from other condition language that we've used to avoid those problems?

MR. IACOPINO: I was just going to point out that the statute, under R.S.A.
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162-H:4,I(C), as in Charlie, says that, "The Committee shall monitor the construction and operation of any energy facility granted a certificate under this chapter." And subsection (d), as in Delta, says, "The Committee shall enforce the terms and conditions of any certificate issued under its chapter." So, between those two sections, chapters, there's certainly the authority of the Committee to monitor what goes on, and if there are disputes between Fish and Game and the Applicant, to exercise its monitoring power and enforcement powers, if there's something to enforce. So, to the extent you may want to provide a specific condition, that's up to the Committee. I just want to point out that there is this generic authority granted to you under the statute. MS. BAILEY: Madam Chairman? CHAIRMAN IGNATIUS: Yes. MS. BAILEY: If the condition is that the Applicant has to work with Fish and Game on a mitigation plan, I think Fish and Game is raising the question as to what
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happens if they're working together and they can't agree. And if the condition is that they just have to work together, there may not -- I think the point here is that there may not be a condition that they have to resolve and come to a decision. And so -CHAIRMAN IGNATIUS: But weren't we talking about a condition earlier, that Fish and Game would hold the authority for the final decision-making on the plan? So if that were the case, some period of time may go on where they try to work together, and if it doesn't -- if it's not successful, Fish and Game gets to dictate what the right answer is, or if it feels needs more guidance, could, of its own choice, come back to us, I suppose.

MS. BAILEY: Okay.
CHAIRMAN IGNATIUS: But I think
if we're -- if our first condition was that Fish and Game holds that ultimate authority, then if you hit that point of impasse, and cooperation no longer can get you to an agreed-upon resolution, I think we have one or two steps: Fish and Game just says what the
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answer is, or they ask for involvement of the Committee.

MS. BAILEY: Okay. Thank you.
CHAIRMAN IGNATIUS: So, is it acceptable to the Members to treat the remaining requests in the letter from Fish and Game as part of the issues that's to be worked out with Fish and Game and the Applicant and not have need for additional conditions on those matters?
(No verbal response)
CHAIRMAN IGNATIUS: It appears no one's troubled by that. All right. And so perhaps a specific reference in our conditioning language about Fish and Game authority to mention the actual exhibit that we've been talking about, so that everyone knows where to find those additional discussions.

All right. Having been through our list of conditions, and we've set aside the one that relates to land under the protective easement, to be picked up again in the context of aesthetics and whether it
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comes up in any other issue that we have yet to discuss, setting that aside for the moment, is there anything further on issues of natural environment that people want to raise?
(No verbal response)
CHAIRMAN IGNATIUS: I see
nothing. Is there anyone who, having been through those discussions on natural environment issues, now is concerned that there is the potential for an undue adverse impact and wants to revisit that question? Or is the initial discussion that there was no finding of undue adverse effect, but that could be improved with conditions, or in the case of Dr. Boisvert, there is no adverse effect, provided there are conditions that we've now been through -- so with either of those two conditions, is anything anyone wants to revisit on that, or is everyone still comfortable with the way they came out before and comfortable with the list of conditions?
(No verbal response)
CHAIRMAN IGNATIUS: All right.
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Seems like we're -- everyone seems okay on that.

So with that, then, the next
category is another very broad one and will take quite a bit of time to go through as carefully as we can because we don't want to cross up the evidence too much, and we'll take them kind of in separate pieces.

Public Health and Safety. And
Kate Bailey, you're going to manage most of that topic, maybe not all of it. But however best you want to work your way through the various topics under Public Health and Safety, we'd appreciate.

MS. BAILEY: Okay. Thank you.
So, the statute is the same. We have to decide whether the project would not have an unreasonable adverse effect on public health and safety. And there are several topics included in the discussion about public health and safety, but the biggest topic that raised the most noise was about the impact from the noise of the project and whether that was going to have an impact -- or an undue impact,
an unreasonable impact on people's health. So I'm going to go through all the positions and the arguments that were made, and hopefully we can have a discussion about it. It's really complicated, and if you have questions, stop me along the way. I'll try to take this slowly.

I think, in general, as a summary, there were a couple of big issues: One of the first -- well, there's the question of is there an impact from audible sound and is there an impact from inaudible sound. And the issues around the impact from audible sound include whether you should measure the background sound at the absolute quietest it can ever be and compare that to the model that Epsilon produced that showed what the expected sound from the project would be and all the assumptions in that model.

So, I guess I'll start with Mr. O'Neal's testimony. And Mr. O'Neal was the witness for the Company -- or for the Applicant. And he testified about the
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Epsilon sound-level assessment report. And in summary, Epsilon performed a background noise study to determine ambient sound without turbines. And I sort of use "ambient sound" and "background sound" interchangeably. I don't know if that's technically accurate, but that's my understanding. So he conducted the study for 18 days in September and October of 2011. The study was unattended and collected at five locations. And those were listed as locations L1, L2, L3, L4 and L5 that the Applicant thought would represent the community, or to try to establish what the background normal quiet level of sound was without the project. The results shown are in Table 6-2. And the exhibit that we're discussing, the Epsilon sound-level
assessment, is AWE 3, Appendix 13A. The results shown in Table 6-2 indicate the average background at L90 sound. And L90 is where the sound level was exceeded 90 percent of the time during the measurement period; so, most of the time this is what the
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sound level is. They measured 37 to 44 dBA. Now, "dBA" is a way of measuring sound that concentrates the measurement around a thousand hertz. And we'll talk a little bit more about that. But it has to do with what sounds, I think, are most audible to humans. The second part of the analysis was his model of the sound levels that were expected to be produced when all 10 turbines were running at the same time. And he articulated they use very conservative assumptions. They measured -- or they modeled or predicted the sounds at 154 receptor points, using a grid pattern. They used Cadna/A software, which uses an ISO Standard 9613-2, which we heard a lot about. And I don't think there was a whole lot of debate about whether that was the appropriate standard or not. I think people were comfortable that the Cadna/A software was okay to use. He said that the model would be conservative, as it assumes all receptors are always located directly downwind from all the turbines simultaneously, which was a physical
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impossibility -- now, that's required by the ISO standard, that they do the model that way, but he still makes the point that that does produce a conservative result; that all 10 turbines were operating simultaneously, which isn't always going to be the case; that no vegetation was included in the model, which can reduce some of the sound; and that the maximum sound guaranteed by Acciona was used with a 2 dBA uncertainty factor.

So he input into the model the absolute maximum sounds that Acciona guarantees this turbine is going to produce. The results for this part of the study are shown in Table 7-3, which shows the sound expected at the five locations; L1 through L5 showed that the results were expected to be between 33 and 42 dBA. And Table 7-2 shows the predicted sound levels at all 154 points on their grid, and it indicates that the sound would not be any greater than 43 dBA . And I think that was only in one location. So, according to Mr. O'Neal, these predicted levels are worst case and
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will easily meet the acceptable noise levels applied by the SEC to the Groton and Lempster projects. In those cases, according to his testimony, the most restrictive requirement was established for Lempster, where the sound levels at residences could be no greater than 45 dBA or 5 dBA greater than background. The predicted sound would also meet the 1999 World Health Organization's 45 dBA night guideline for residential locations and the United States Environmental Protection Agency guideline of 48.6 dBA . According to this analysis, predicted sound levels are all below 45 dBA, and except for the $L 3$ location on Salmon Brook Road, the average L90 background sound is greater than the predicted sound from the turbines. The difference between the average L90 background sound at Salmon Brook Road and the sound predicted from the turbines would only be 4 dB. So that's less than 5 dB , so it should be okay.

He also said that
interconnection facilities won't add
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appreciable noise. The transformers, at the worst case, would only be expected to produce only 33 dBA of noise at any residence, and that's lower than the background, and when combined with the highest turbine sound, the addition would be less than 1 dBA. So that's almost imperceptible. So the transformers, he said, don't add anything to the sound impacts.

Mr. Tocci, the witness for
Public Counsel, testified that the World
Health Organization updated its guidelines in 2009 and recommended the nighttime noise level be limited to 40 dB , and they used a new term, "L night, outside." I looked at the 2009 World Health Organization guidelines because they were on the Web, easily accessible, and the "L night, outside" is defined as "The A-weighted, long-term average sound level as defined in the ISO 1996-2, 1987, determined over all the night periods of the year" -- "over all the night periods of a year." Mr. Tocci testified this was "considered a health-based limit value of the
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night noise guidelines necessary to protect the public."

So, to contrast, Mr. O'Neal said that the 45 met the World Health Organization standards, and Mr. Tocci pointed out that those standards had been updated since, in 2009, and now the new standard was 40.

Now, here's the big point I think of Mr. Tocci's testimony, is that he measured background sound levels at Gregg Lake and Willard Pond. He did it from August 22nd through 29th, 2012. And there was testimony that says that insect noises occur in late summer until the first frost. And so I think there was probably insect noise when Mr. Tocci did his measurements at Gregg Lake and Willard Pond, and there was probably insect noise when Mr. O'Neal did his study. And the point that they're making is that insect noise is not present at all times of the year, especially in winter. So the difference in the sound level, when you have the quietest time of year and you compare
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that to the project noise, is a lot greater than what Mr. O'Neal was testifying.

So he made his measurements, and he used one-third octave bands, which will allow the identification of insect noise, and it showed that there was a great increase in high-frequency noise during the night when insects would be expected. So he estimated that the background sound at Gregg Lake and Willard Pond, once he subtracted the insect noise that he measured, would be really, really quiet, at 12 to 19 dBA . And he says that that's -- you know, that's scientifically proven because it was a measurement that he took.

Using L90, he concludes the average background level at night in the area, in the general area, is about 15 dBA, which is much quieter than the minimum background sound reported by Epsilon. As a result, he says, "The Epsilon data would understate AWE sound impact when impact is quantified as an amount that the background sound would be raised during AWE operation."
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CHAIRMAN IGNATIUS: Can I ask a question? On the measuring of the background noise that Mr. Tocci did, did you say that he measured it but then removed it because he could see the bands, the sounds bands, and knew what was attributed to insects, so removed it from the numbers to reach that lower level, or that he actually was measuring that lower level?

MS. BAILEY: No, he didn't measure the lower level. He measured the overall sound. But the instrument that he used allowed him to identify certain frequency noises. And so by identifying the impact from the high-frequency insect noise, he subtracted that noise from the overall measurement that he took, and he said if the insects weren't there, then this is what the sound would have been.

CHAIRMAN IGNATIUS: Okay.
Thank you.
MS. BAILEY: TO avoid adverse community response, according to Mr . Tocci, wind turbine sound should be limited to a
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margin above $L 90$ baseline sound without insects. If sound at a residence exceeds background by more than 10 dBA , significant impact is expected. If sound exceeds background by 5 and 10 dBA , then modest noise impact is expected. I think that's where he talked about "annoyed" and "highly annoyed." And his definition of "annoyed" and "highly annoyed" wasn't annoyed, like I'm annoyed by a fly. It's, you know, the impact from the change in sound that I'm used to, to what I hear today, is so annoying that it's raising my stress levels. And when it's "highly annoyed," it's so annoying, that my stress levels are raised and it has an impact on my health and I can't live here anymore.

He also cites a Pedersen study
which indicates there are never any complaints if the sound is less than 30 dBA . So if the overall sound at any time is less than 30 dBA, you don't have to worry about it.

So there's two kinds of
standards that people are talking about:
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What the absolute maximum sound should be allowed, and what the difference between the right background noise, whatever that is, and the new noise from the project. But he says that if it's more than 10 dBA , then it's going to have a significant impact. Therefore, he recommended, on cross from Chairman Ignatius, that sound levels should be limited to the greater of 30 dBA or 10 dBA above background, with insect correction applied. He also pointed out background noise could be reassessed during winter to establish the baseline background rather than subtracting measured insect noise from measured background noise.

So, to answer your question,
Chairman Ignatius, they could go out -according to Mr. Tocci, they could go out right now and actually take a measurement, and that would give them a more accurate measurement of background sounds, and it wouldn't include insect noise. So if people are troubled by the math that he did, then he suggests that we could do another measurement
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right now, well before the insect noise starts again.

According to his analysis, Mr. Tocci found that, in wilderness areas within 4,000 feet of the turbines, the project sound will exceed the background sound by 25 dB , which will dominate the acoustical environment and greatly diminish the wilderness experience.

Mr. James was the witness for the North Branch intervenors, and he critiqued the Epsilon sound-level assessment. According to him, the purpose of background noise tests is to determine quiet periods, and if new noise does not increase that level by more than about 5 dB , the community will have no negative reaction to it. He says the background sound level measured by Epsilon is not accurate because it includes seasonal and transient noise, like insect noise, and maybe rustling leaves because it was the fall, and it uses daytime background noise when it should use the quietest time, which is generally at night. This results in an
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upward biased assessment of background sound levels by 10 to 15 dBA. According to Mr. James, he says that if the background sound levels used to compare to predicted new sound from the project was correct, the results would show an increase in noise from the project of 10 to 20 dBA near residences, and that would be fairly significant. That would be significant. On cross, he said -- on cross from the Committee, he said we could use the minimum L90 measurement for baseline background in Table 6-2 of the Epsilon report, and that would be adequate. So, Table 6-2 in the Epsilon report shows the background sound that they measured, and they showed the minimum and the average and the mean, and I think maybe one other number. He said, you know, rather than deal with the insect noise, another way to deal with it is just to accept the quietest sound that they measured during their measurement period, the minimum sound, would be acceptable to use as a baseline for background.

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According to Mr. James, the computer model used to predict the project sound is not adequate. He made a big point about the maximum sound guaranteed by Acciona, and he said that it's based -- the maximum sound's based on standardized conditions so buyers can compare models and products. So he said it's kind of like the highway mileage ratings on a car when you're buying a car. You can compare what the gas mileage is on this car to the gas mileage on another car, and those levels are all determined the same way, using the same tests. But when you put the turbine out in the field, it's not under the standardized conditions used to figure out what the guaranteed sound is, and it's going to produce higher sounds when there's great wind shear. And wind shear, he said, was the difference between, I think it was the difference of the wind speed at the top of the blade and the bottom of the blade was large, that would produce high wind shear, and that would make more noise than when the
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turbines were tested under the standards, where it was all -- there was no wind shear.

On cross, Mr. Patch implied the noise guaranty was firm. But Mr. James would not agree. Mr. Patch suggested the Committee could impose a condition that would limit the maximum sound to the guaranteed value.

In response to a question from the Committee, Mr. James said he believes the disconnect between what sound engineers predict and what people experience is because background noise is inflated by including things like transient sounds, like leaf rustle in the fall and insect noise, and the emphasis on average background noise rather than the quietest time, and because the predicted sound level is deflated by using the guaranteed sound output as the maximum possible, the modeled project sound represents the average, not the extreme. So the difference between quiet background and actual project sounds are actually greater than predicted when it actually goes out into
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the field.
Mr. James said he believes people can live with absolute sound levels of 35 dBA, compared to Mr. Tocci's minimum of 30 dBA and Mr. O'Neal's minimum of 45 dBA . But he also would add a limit on low-frequency noise, which I'll cover in a little while. Ms. Linowes argues prior noise standards imposed by the Committee are outdated. She points out that all three sound experts agree that the background sound survey is intended to identify the lowest sound level consistently present and available to mask project noise, and that also, in her opinion, should be used to set a floor against which new sounds are judged. She also points out that the $V$-Bar report states the highest wind speeds occur at night, which will produce the loudest sounds at the quietest time.

Ms. Linowes recommends increases over 490 minimum background noise from the project should be limited to 5 dBA in order to avoid an unreasonable adverse
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impact to those living near the project. If the Committee prefers to adopt an absolute number, she recommends 35 dBA , so residents who live nearby can still enjoy their property, and that noise limits be set at the property lines.

Public Counsel emphasizes the findings of Mr. Tocci, that background sound is the area in -- that background sound in this area is much more quiet than measured by Epsilon -- "in this area," I mean in the Antrim area is much more quiet than measured by Epsilon. As a result, changes in sound level resulting from the project will have a significant impact and create a substantial risk to people living with those sound levels being annoyed or very annoyed.

He argues Ms. Longgood's property is expected to receive an increased noise impact of 26 dBA when comparing background sounds without insect noise to the predicted sound from the project. This, he argues, will likely lead to abandonment of her house.
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A similar analysis of the Blocks' property indicates the sound will increase by 16 dBA, and at the Voelcker property by 15 , which, again, would be significant. He therefore concludes the weight of the evidence shows the project's predicted noise levels are at best unknown, and at worst will have a significant and unreasonable adverse effect on the health and safety of residents. At a minimum, the Applicant has not shown that very large turbines will not have an unreasonable adverse effect on the people of Antrim.

Now I'm going to switch to the low-frequency discussion. So do you have any questions about this part? Do you want to talk about this part, or shall I just keep going?

CHAIRMAN IGNATIUS: I think probably keep on going and get through all the noise issues together.

MS. BAILEY: Okay. A large
part of Mr . James's testimony focused on "low-frequency" and "infrasound." He said
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everyone agrees that infrasound is 10 hertz and below, and low frequency is defined as "200 hertz and below." There's general agreement that the problem with low-frequency audible sound, the "whoosh" sound that was evolving to a loud "thump" sound as the tower heights increase, has been addressed by the modern turbine design where the rotors are located on the upwind side of the tower. The record, to me, seemed to get a little muddled between the discussion about "low frequency" and "very low frequency." And Mr. James's testimony was primarily focused on "very low-frequency" or "infrasound." He said some people called the region between 10 and 20 hertz "very low-frequency" sound, and others call it "infrasound." According to Mr. James, that's the region where most of the acoustic energy from wind turbines is concentrated. So he refers to this range as "infra" and "low-frequency" sound.

I think that sort of helps muddle the record, because when he's talking
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about "low-frequency" sound, he's not talking about the low-frequency sound that's above 20 hertz. And when other people are talking about low-frequency sounds, they're saying, "Well, low frequency got fixed by putting the blades on the other side of the tower." So it is confusing. The "low-frequency" and "infrasound," as Mr. James defined it, for the vast majority of people, is inaudible. According to Mr. James, A-weighted measurements, or dBA, do not include low frequencies. This is corroborated in the Epsilon report which says, "A-weighted sound levels emphasize the middle frequency, around 1,000 hertz, and de-emphasize lower and higher frequency sounds. Absolute standards, like 35 dBA , protect people from health effects of audible sounds." According to Mr. James, there's a growing body of evidence that health can be affected by inaudible sounds from wind turbines.

To demonstrate health effects of infrasound, he cites research by Dr. Salt
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from August 2011, which claims, "Inaudible low-frequency sounds interfere with the sense of balance; cause sensations like stuffiness in the ears, headache and general malaise. This is 'believed' to be the result of in-flow turbulence of the air stream entering the path of the blades. The turbulence results in dynamically modulated infra and low-frequency sound emitted in short-duration bursts of acoustic energy, with peak sound pressure levels of 30 to 40 dB higher than the sound pressure in the valleys between them." He says these frequencies can be measured by C-weighting, or "dBC." He recommends a limit of 50 dBC . He said Germany imposed a limit of 35 dBC in quiet, rural areas, but the standard in the U.S. has been mostly limited to dBA. The World Health Organization has broad guidelines, not specific to wind turbine noise, that say something like, "If dBC level is more than 10 $d B$ higher than the dBA level, then there's reason for concern about low frequency and noise and health impacts."
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 When asked about infrasound and low-frequency sound mediated by the cochlear vestibular organs, Mr. Tocci said he was "aware of other experts making the claim," but he was not an expert and could not say that was, in fact, the case. He was reminded of his testimony in Groton, where he said, "Modern upwind-styled wind turbines avoid the propensity to generate the significant levels of low-frequency sound common in older turbines," and his testimony that "designing wind turbines so that the blades are upstream of the tower support has mostly eliminated low-frequency excitation in newer wind turbines." Mr. Patch had him read into the record a statement from his Groton testimony which said, "There is no evidence to indicate that low-frequency sound or infrasound from current models of wind turbine generators should cause concern." Mr. Patch didn't ask him if he still agreed with that.Mr. O'Neal strongly disagrees with Mr. James about the potential health
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risks associated with low-frequency and infrasound and argues that James's conclusions are based on conjecture and not based on evidence. Mr. O'Neal cited a study released by the American Wind Energy Association and Canadian Wind Energy Association entitled, "Wind Turbine Sound and Health Effects - An Expert Panel Review," from December 2009. The conclusions drawn were that "vibroacoustic disease," "Wind Turbine Syndrome" and "visceral vibratory vestibular disturbance" are unproven hypotheses that have not been confirmed by appropriate research studies.

Mr. O'Neal cited another study released in January of 2012, commissioned by the Massachusetts Department of Environmental Protection and Department of Health, which found, first, "There is insufficient evidence that the noise from wind turbines is directly -- i.e., independent from an effect on annoyance or sleep -- causing health problems or disease; 2) whether annoyance from wind turbines leads to sleep issues or
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stress has not been sufficiently quantified; 3) claims that infrasound from wind turbines directly impacts the vestibular system have not been demonstrated scientifically; available evidence shows that the infrasound levels near wind turbines cannot impact the vestibular system; and 4) there is no evidence for a set of health effects from exposure to wind turbines that can be charactered as a wind turbine syndrome." On cross-examination about this study, Mr. James said the study was only based on a literature review, but that he does not dispute the conclusions of the literature review, based on the literature that existed at that time.

Public Counsel argues there is evidence that low-frequency noise, inaudible to the human ear, may still be problematic.

He points out that the scientific understanding of the effects of low-frequency noise is not yet well established, but there's growing acceptance that it can cause problems with some people, and criticizes the
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Applicant for its lack of modeling for low-frequency noise effects, because it dismissed the issue. Public Counsel cited a recent Wisconsin Public Service Commission conclusion that low-frequency noise from operating turbines could be detected in residences within 3500 feet of the nearest turbine and that such could lead to an adverse response, such as motion sickness. He quotes Mr. Tocci's answer in response to a Committee question as, "There's enough of an issue there to call into question that low-frequency sound could be an issue and that the usual ways of evaluating noise, using A-weighted sound levels and so forth, may fall short of trying to identify those issues."

The North Branch intervenors conclude, based on the testimony of Mr. James, that noise will unquestionably result in serious noise disturbance and health risks and therefore will have an unreasonable adverse effect on public health and safety.
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|  |  |
| :---: | :---: |
| 1 | For all of the reasons |
| 2 | discussed, the Audubon Society argues the |
| 3 | Applicant has not demonstrated that noise |
| 4 | will not have an unreasonable impact. |
| 5 | And that is the summary of the |
| 6 | record that we have so far on noise. |
| 7 | CHAIRMAN IGNATIUS: See, that's |
| 8 | why we gave this issue to the engineer. |
| 9 | Thanks. That's extremely thorough. Thank |
| 0 | you. |
| 11 | Are there other facts that |
| 12 | people recall from the testimony that Kate |
| 13 | didn't highlight and that you want to bring |
| 4 | out, or conflicting arguments that you heard |
| 15 | on some of those issues that haven't been |
| 16 | brought out? Mr. Simpkins. |
| 17 | MR. SIMPKINS: I just had a |
| 18 | question. Mr. Tocci measured at Willard Pond, |
| 19 | but Mr. O'Neal didn't; is that correct? |
| 20 | MS. BAILEY: That's correct. |
| 21 | MR. SIMPKINS: And you |
| 22 | mentioned Mr. O'Neal used 45 decibels as the |
| 23 | World Health Organization, and Mr. Tocci said |
| 24 | that was updated in 2009 to 40. You did find |

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that that was correct, 40?
MS. BAILEY: I did.
MR. SIMPKINS: Okay.
MS. BAILEY: I didn't look at the 1999 standard to see what scale that was, if it was 45 dBA. The 2009 report says 40 dB night... night outside, which was based on some A-weighted rating. But they didn't call it "40 dBA." But I assumed that the -- I assumed, and I didn't check -- and I can go back and check this -- that they didn't change the way the units were.

CHAIRMAN IGNATIUS: Unless
there's other questions or sort of clarifying factual things to talk about, $I$ think the next thing to tackle here is what to make of all that. And this is the one that had probably the most split of opinion and dueling expertise and conflicting studies and literature over the years thrown back and forth. So this is probably the most challenging issue, because none of us are sound engineers, to make sense of the different studies and claims that were given
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to us. Does anyone want to lead off on how you interpreted all of that, what conclusion you drew?

MS. BAILEY: Can I make a suggestion?

CHAIRMAN IGNATIUS: Yeah. MS. BAILEY: Maybe if we break it all up in small bits --

CHAIRMAN IGNATIUS: Sure.
MS. BAILEY: -- it might be
easier. I think the main issues are how should we measure the background sound and what level of background sound should we use, whether the model that Epsilon -- whether the assumptions that Epsilon used and the models to predict the sound that would be generated by the project was reasonable; and then, when you're trying to figure out whether there's a health impact, whether you should use an absolute value or whether you should use a comparison between background and the modeled sound, and if so, what those levels -- what those levels should be. And then there's a whole discussion about the infra, very
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low-frequency sound.
CHAIRMAN IGNATIUS: All right.
So, having given us that good series of questions, you want to start tackling them? MS. BAILEY: Okay. I'll start off. I was convinced that it's appropriate to look at how much noise the project is going to increase the norm. And I think it's going to be most irritating or most -- it's going to have the most impact on people probably at night when it's usually more quiet and when it's the most quiet time of the year. So I think that, for background purposes, we should be trying to figure out what the quietest time is, if we're going to use that to compare to -- if we're going to use that to figure out what the difference is with the projected sound.

CHAIRMAN IGNATIUS: I can tell
you that one of my reactions to the whole background sound that $I$ find a little bit confusing about this is that, because it's a natural environment, and a relatively undeveloped natural environment, there are
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noises that just are sort of occurring as part of wind rustling, insects, just sort of the sound of being out in the open that are part of, I would say part of the reasons people value being out in the open space and miss that when they're in a more sterile, built environment. So I've always been surprised when people say it's important to strip those noises out, when I always thought that was one of the charms of being in a rural area, was that kind of noise that you would hear, that you may not get in a more developed area. And so I always find it confusing to say that we want to take this -- in order to preserve this rural character, we have to take out the sounds of life in a rural place.

MS. BAILEY: I don't think that's what they're saying. I don't think anybody disagrees that there's insect sounds some of the months of the year. I think when you're trying to figure out whether there's going to be a health impact, you have to look at when it's the most quiet time and what the difference is -- this is the argument -- and
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what the difference is when sound from the project is present. And when that is a big difference, then the study suggests that that could have a health impact -- or the evidence suggests that that could have a health impact, when the difference is larger than 10 dB .

So I think that nobody's
saying that you should eliminate insect noise -- or nobody's saying that insect noise won't help maybe mask the project sound in the summer, so people might be less annoyed in the summer because there's a little bit more background noise. But in winter, when it's a lot quieter, then it's really going to -- people are going to hear the noise more, the project noise. And so when you're setting up a standard, the standard should be based on the -- I don't want to say -- yeah, I guess it would be the worst-case scenario, you know, where you're going to experience the greatest difference in the sound. And by using -- by taking the measurement during a period of time when there's noise that isn't there all year-round, it sort of overstates
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what the general sound level in the area is for a lot of the time.

CHAIRMAN IGNATIUS: That's a good explanation. Mr. Simpkins.

MR. SIMPKINS: This is another question. When they're looking at the quietest times of the day, the nighttime noises, was it the averages over all the hours that they monitored, or was it the absolute quietest point in time that they monitored over the entire time?

MS. BAILEY: Let me look that up. So I'm going to go to AWE 3, 13A.

MR. SIMPKINS: Because I know there was discussion about that using averages. And I don't remember who it was, but one of the people testified that you're going to notice it most at those times when it's the most quiet. So if you just go by average, that's not going to --

MS. BAILEY: Oh, I think I know what that discussion was about. In the Epsilon report -- let me get to the table. They gave us results for different --
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MR. IACOPINO: Table 6.2.
MS. BAILEY: Table 6.2. on
page, I think, Page 6-3. And it says for the measurements, they measured the minimum sound that was present 90 percent of the time, the maximum sound that was present 90 percent of the time, the median and the average. And your question is what does the "average" mean?

MR. SIMPKINS: Well, I think that answers it. So it's 90 percent of the time.

MS. BAILEY: Right.
MR. SIMPKINS: So it's
90 percent of the time, that was the minimum. There may be 10 percent or some-odd thing that went lower than that, but...

MS. BAILEY: Right. And it had to do with 10-minute, I think, sampling increments, and -- you know, there was a lot more math to it. But as a shorthand, that's my understanding.

And so that's the column that Mr. James said would be acceptable to him to use as a minimum -- as a background to which
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you compare the predicted noise. And Mr. Tocci and Mr. -- Mr. Tocci said even that's too high because it includes some insect noise which isn't there all the time.

CHAIRMAN IGNATIUS: So your thought that it makes sense to develop a quiet winter baseline to compare against rather than using the noisier summer/fall period makes sense.

MS. BAILEY: I think if we're trying to evaluate whether there's going to be a health impact. And the evidence suggested that a health impact is likely if the difference between the sound level, the ambient sound level, and the project sound level is more than 10 dB , then it makes sense to compare the quietest sound to the sound that's made by the project, because that's when you're going to have the health impact. CHAIRMAN IGNATIUS: And the measurement Mr. Tocci made that took the insect noise out of the results -- was that him who did that?

MS. BAILEY: Yes. Did it for
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Willard Pond and Gregg Lake only.
CHAIRMAN IGNATIUS: And his results were coming in the 15 to 19 dBA level. MS. BAILEY: Yeah. He concluded that the background sound in the area, in the Antrim -- I mean in the Willard Pond and Gregg Lake area, was between -- he measured between -- he said he measured, after he corrected for insect noise, between 12 and 19 dBA. And actually, I think Mr. O'Neal was asked on cross-examination if he agreed with how Mr. Tocci did that, and he said yes. And then Mr. Tocci sort of made, well, the leap, but interpolated that to mean that the ambient sound near the residences that we were talking about would be around the same level. And he surmised that if he took the insect noise that he measured at Willard Pond and Gregg Lake and subtracted that from the measurements that O'Neal did, it verified that it came out around 15 dB .

CHAIRMAN IGNATIUS: And I know you said this today. But once again, what is the source and the theory that more than a 10
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dB difference between baseline and the sound when you add the project will cause health effects? It will cause more sound. But how do we get to "will cause more health effects"? MS. BAILEY: Right. I think I found that in a couple different places. And I think the thing to give you a really sound answer, $I$ should take that over a break and try to find out where that came from, because I think it came -- I mean, I think it -- I think Linowes cited something that said it was 5 dB and somebody else said something like the difference should be 5 dB . And I think it was the -- no. Let me think.

CHAIRMAN IGNATIUS: We have used a "level over background" sound level that wasn't the "stripped-out" baseline. But we've used a "no greater than $x$ dB over the baseline" as one of the tests in both, I think in both Groton and Lempster. I don't know about Granite Reliable. But I don't recall that being because there was a defined showing that an increase in $d B$ over baseline leads to health effects, it was just another way of
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measuring impacts, overall impacts of sound -the overall sound impact at different times, so that during quiet nighttimes it was a different way of measuring it than the way you might measure it in the middle of a noisier afternoon.

MS. BAILEY: I think it came from Mr. Tocci's testimony.

CHAIRMAN IGNATIUS: We can come back to that.

What are other people's
impressions of that issue, about how to measure a baseline and what sort of baseline is important to do? You know, there's sort of the O'Neal approach and the Tocci approach on that. Anyone have any comments? Mr. Simpkins.

MR. SIMPKINS: Well, I guess I
would -- I kind of feel on the side that Ms. Bailey was mentioning, that you would think as a baseline you would want to use the quietest time because that's when you're going to notice it the most. That typically occurs at nighttime, and that's when people are going to
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be most quiet. They're going to be sleeping. During the day they may be doing other things. There's going to be noises in the house and outside from all the other things going on. But typically, you consider nighttime to be a quiet time. And so it seems to me that you would use the quiet time as the baseline because that's going to impact people or affect people the most. I mean, at least in my mind, that makes sense. You know, I think that nighttime you are going to have different noises at nighttime, the environmental noises. But I also agree that insects are not year-round. So I think it does make sense to take out the insects. And so whatever that number is after you take out the insects, of the quietest time of day, I think would make sense to be the baseline.

MS. BAILEY: And if people aren't comfortable using that mathematical measurement, we can ask the Applicant to go out and do a sound test before the insects get here. And I think in the brief they said they would do some more sound testing, but that was
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probably after the project's built. CHAIRMAN IGNATIUS: Other comments on the background testing methodology or levels?

Mr. Iacopino, do you recall, in other cases, the levels that were -- I think Kate Bailey mentioned a couple of them -- the levels that were established, rather than absolute levels, the ways in which some of them were established to be an amount over baseline at different times of day?

MR. IACOPINO: Yes. Originally
in Lempster, we had areas where the existing ambient sound pressure levels exceeded 55 dBA. "The standard shall be ambient plus 5 dBA." We also had a requirement that, "Sound from the project immediately outside the residence of a non- participating homeowner shall be limited to the greater of 45 dBA or 5 dBA above the ambient sound level," for non-participating landowners, and eventually we changed that to just the 45 dBA . In Groton --
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CHAIRMAN IGNATIUS: I'm sorry.
"Changed that," meaning?
MR. IACOPINO: I'll have to double-check the exact wording in the orders. But I think we actually changed it. We originally had it as an "either/or." It was the greater of 45 dBA or 5 dBA above the ambient level. I think that was subsequently changed to just 45 dBA , though, because of the -- we had the other requirement in areas where it's 55, so it took care of itself.

CHAIRMAN IGNATIUS: The first part didn't change. It was only the second --

MR. IACOPINO: Right. And then in Groton, it was daytime, 55 dBA or 5 dBA greater than ambient, whichever is greater. And at night, it was 45 dBA or 5 dBA greater than ambient, whichever is greater, with the exception of Baker River Campground, where it was 40 dBA or 5 dBA above ambient, whichever is greater. And that was to be measured within the boundaries of the campground itself.

CHAIRMAN IGNATIUS: I'm sorry.
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Can you do that again, on the 45 and the 55, before you get to the campground?

MR. IACOPINO: Sure.
MS. BAILEY: I think in some prior cases they allowed the noise generated to be higher during the day than at night. And there was some testimony about it was fairer to use an "either/or" standard, because you could have a day when there's other noise in the background, that when added to the project noise would exceed the absolute standard. So if the background noise -- you know, who knows what the background noise in Lempster and Groton were. I don't know. But if there was a time when the background noise was -- or there was noise from other sources, not the project, then the project shouldn't have to take the hit for those other noises. So they had the other standard where it was background plus 5 dBA.

MR. IACOPINO: Did you want me to repeat the Groton ones again?

CHAIRMAN IGNATIUS: Sure, why don't you.
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MR. IACOPINO: In Groton, at the outside facade of homes, as the point of measurement, okay, should not exceed in the daytime 55 dBA or 5 dBA greater than ambient, whichever is greater; then at nighttime, again at the outside facade of the home, 45 dBA or 5 dBA greater than ambient, whichever is greater. Do you want the campground, too?

CHAIRMAN IGNATIUS: No, that's okay. Well, actually, maybe that -- sure, why not.

MR. IACOPINO: The campground was limited to -- doesn't say day or night -40 dBA or 5 dBA over ambient, whichever is greater, as measured within the current boundaries of the Baker River Campground. I have to double-check on the Lempster thing.

CHAIRMAN IGNATIUS: Thank you. And Ms. Bailey, the levels that Mr. O'Neal predicted for the project were -- what were the maximum levels that he modeled could be the result of the project?

MS. BAILEY: Well, he said that everything he measured was lower than the 45
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dBA that was imposed on by the last certificate. So I think he was thinking 45 dBA was really acceptable, and his results showed that everything would be lower than that.

CHAIRMAN IGNATIUS: Did he show
what the actual figures would be, to see how much lower than 45? I mean, I guess that was all the turbines running at all times -MS. BAILEY: Right.

CHAIRMAN IGNATIUS: -- and all downwind immediately of them. So that's a slightly artificial way of calculating it. But in that case, do you recall what the actual sound levels were?

MS. BAILEY: I think they were all lower than 43. And I have that. Hang on a second.

MR. IACOPINO: I believe that's Table 7-3.

MS. BAILEY: Yeah.
CHAIRMAN IGNATIUS: And he did not do the amount over ambient modeling that Mr. Tocci recommended.
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MS. BAILEY: He didn't. But he gave us data on what he thought the ambient was. So if the standard were to be -- I mean, maybe that's because that's what every other Applicant had to produce. But if the standard were going to be an absolute sound, and he knew it was going to be 45, then the predicted modeling that he did, which shows I think at 154 receptor points, he thinks that the sound levels on the project are going to be somewhere between, I think, 33 and 43 dBA , and 32 at the low end.

CHAIRMAN IGNATIUS: Well, was it -- did you say that his receptor tests, the five that he used, that Mr. O'Neal used, was somewhere in the range of 34 dBA -- or maybe $a$ range leading up to 34 dBA is what he found from those five receptors as his way of measuring the ambient sound that still included the insect noises?

MS. BAILEY: Correct.
CHAIRMAN IGNATIUS: And so if he were to look at that as a baseline, plus if you had, you know, five over ambient sound,

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that would be his baseline. You'd be taking five above, somewhere in the --

MS. BAILEY: But it didn't matter because the actual noise was lower than the baseline in most cases. That was his point.

CHAIRMAN IGNATIUS: And he was not suggesting that 5 dBA over the Tocci version of baseline would be met because that's a whole different --

MS. BAILEY: Right.
CHAIRMAN IGNATIUS: -- much
lower number.
MS. BAILEY: Correct.
CHAIRMAN IGNATIUS: And when --
in those other cases, Mr. Iacopino, that you read off, in Lempster and Groton, when there was an over-baseline -- over-ambient sound level, that was the all-in measurement that included whatever noises happened to be in the baseline, whether insect noise and all that. It was not stripped out.

MR. IACOPINO: Well, it was the greater of either a limit, which was 45 dBA ,
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or 5 dBA above the ambient. And the condition itself did not mention whether -- how "ambient" was to be measured. MS. BAILEY: And I think when that standard comes into play, you go out at that time when the complaint is registered, and you measure what the ambient is then. So, you know, some other project may have been developed in the meantime, and there could be a lot of ambient noise from that other project. So I think that's kind of fair. But I doubt that they took any -- I don't -- I'm not going to say what I think about that. I don't know what they did. I don't think it mattered.

MS. LYONS: Well, I think, I
mean, if you know what the --
MR. IACOPINO: I'm just not
sure that insect noise was ever a consideration at all in the Lempster docket. I'm not sure they used the same criteria that had been presented to you in this case in that particular docket.

CHAIRMAN IGNATIUS: I would
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agree with that. I think how to measure ambient was not an issue that $I$ recall in Lempster. And I didn't participate in Groton. But when we compare one to another, I think we're using very different starting points in what the comparisons are. And it may be that there's evolution that makes sense in how we evaluate these, but it is somewhat different.

MS. BAILEY: It is a big difference.

CHAIRMAN IGNATIUS: So, do people want to discuss more the question of the background sound, how to measure it, or move into the modeling that was done?

Are you ready to move into a question of how the modeling was done --

MS. BAILEY: Oh, I'm sorry.
Yes.
CHAIRMAN IGNATIUS: -- and what assumptions are reasonable?

MS. BAILEY: Yeah. The biggest
issue that was raised about the modeling was the fact that the Applicant used the greatest -- the guaranteed sound level from
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Acciona, which was like 109 dB when you add plus or minus 2 dB . I don't know what else they could have used. And I think if the Applicant is willing to limit the noise level to that produced when you assume in the model the greatest sound -- I think I was convinced by the testimony that the actual sound could be higher than the guaranteed sound, because the guaranteed sound is just sort of a standard that you compare other models against. But on cross-examination, Mr. Patch was really adamant that there was a firm guaranty, and it would never exceed 109 dBA. And I also don't know, if the actual sound was 110, how that would have changed the predicted sound values. But somebody suggested that -I think it was Mr. James -- that he thinks that the predicted sound levels are about 5 dB too low for the actual maximum sound that could possibly come from these turbines.

I think it doesn't really
matter, because if you set an absolute sound level, and the turbine exceeds the maximum guaranteed sound level, then they're probably
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going to exceed the absolute standard level. And that could be, you know, you set the standard at 45 dBA like you did in Lempster, or you set it at 40. So I don't really think that's a big thing we need to get hung up on. And nobody really criticized the rest of the model. That was the only assumption that was criticized.

CHAIRMAN IGNATIUS: Whatever
the maximum sound level is coming at the source, the important part is what the level is at the reception point of the exterior of the residence.

MS. BAILEY: Well, that's what
they were trying to model, is what the sound would be at the residence. But they had to assume what the sound was starting at. But it doesn't really matter, because if we set a standard and we have a complaint and we go out and we measure it and it's higher than the standard, who cares what the sound was where it started; it's what we're measuring at the location. So, to the extent that these sound levels are under-predicted, that's a risk on
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the Applicant.
CHAIRMAN IGNATIUS: Anyone?
Any comments on that? Looks like people are nodding in agreement.

All right. So you were, Ms.
Bailey, I think, sort of giving us ways to break out the discussion. What was your third question?

MS. BAILEY: The "weirdness
factor."
CHAIRMAN IGNATIUS: The
"weirdness factor"?
MS. BAILEY: Infrasound.
CHAIRMAN IGNATIUS: Oh, well,
the health impact and ambient versus
background value. I've written down that maybe we've talked about that. I guess we've done it in a combination of both ways in prior cases. And in this case, the recommendation from Mr. Tocci was to do a combination of both an absolute and a background of... what did he have? A 30 dBA or 10 above the background?

MS. BAILEY: Right.
CHAIRMAN IGNATIUS: And he was
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in other cases, was to reflect that there might be other things going on? You might be near a highway, or you might be near a processing station that has some high industrial sounds periodically that have nothing to do with the wind facility, and that setting those levels over ambient was to reflect sometimes it would be reflecting a quieter time, and other times it would be reflecting a noisier time?

MS. BAILEY: Right. I think he said that if the new noise is between 5 and 10 dBA greater than the old noise, it's going to be pretty annoying. If it's more than 10 dBA greater than the old noise, it's going to be really annoying, and really annoying is going to cause health impacts.

CHAIRMAN IGNATIUS: I guess what I'm struggling with is that in the desire to be able to measure the impact the wind facility adds to the ambient noise, we can't also be intentionally stripping down to the quietest possible ambient level. There's some times when that may be appropriate. But how
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background sound would mask it, and it would still meet the standard compared to the ambient. Does that make sense or just confuse things?

CHAIRMAN IGNATIUS: No, it makes sense. I'm not sure I've got clarity yet, but it makes sense.

MS. BAILEY: I think the
question you asked me to find out about -where did the idea that if the change in sound between ambient and the project is more than 10 dBA, that's going to create a health impact -- I think I need to find the answer to that question.

CHAIRMAN IGNATIUS: Okay.
Should we then talk some more about the infrasound?

MS . BAILEY: Sure. So, anybody want to start with this or -- you want me to start again.

CHAIRMAN IGNATIUS: I think it's fair -- and Mr. Iacopino, correct me if I'm wrong -- that this is an area that we have not addressed in prior certificates. We've
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been dealing only with the audible sound levels and have not set any kind of standards or really tried to delve into the meaning of "infrasound issues" in prior wind cases. Am I right about that?

MR. IACOPINO: I believe that it's been mentioned in some prior wind cases. The Committee in those cases did not find it to be an issue, based upon what the evidence presented in those dockets was.

MS. BAILEY: I think they even made a finding that there's no scientific proof that it exists, or something like that.

MR. IACOPINO: They didn't say that infrasound doesn't exist, but that there was no proof of ill-health effects.

MS. BAILEY: Ill-health
effects. Right.
MR. IACOPINO: Correct.
CHAIRMAN IGNATIUS: That was in the Groton case?

MR. IACOPINO: I'm checking. I think it was Groton.

CHAIRMAN IGNATIUS: And just
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for the record, the reason that $I$ keep checking back to where we've been is not because $I$ want to follow exactly what was done in another case, but $I$ want to be certain that if we want to follow what was done before, we have a sound basis to do so, and if we want to deviate from what was done before, we have a sound basis to do so. I mean, I think in the notion of predictability and fairness to applicants and parties in the future on any other cases, there has to be a sense that we have a reasoned approach to what we're doing and that we are not locked into the decisions made by people in the past, but we have reason why we head off in different directions and that it isn't just the whims of whoever happened to be sitting on any particular case that the answers are bouncing all over the place. So, all of these issues evolve. The facts change from case to case. The scientific literature changes. And so I would expect there to be change over time, but it has to be -- I want to be sure that we are being as analytical as we can about it and
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understand what we've done in the past as a way to help think through should we do something different now.

But I interrupted you there.
If you want to go back to the infrasound issues --

MR. IACOPINO: Do you want me to read the finding in Groton?

In Groton, on Page 81 to 82 of the decision, the Committee made a couple of findings. They said they were "not persuaded by the intervenors' evidence that Wind Turbine Syndrome will be a public health result from the construction of the facility; the existence of Wind Turbine Syndrome has not been scientifically established, and the intervenors have not pointed us to any specific characteristics of this project that are likely to cause the constellation of symptoms which the intervenors alleged establishes the syndrome." The Committee went on to find, "We also find the assertion that the project may affect human health by causing vibroacoustic disease to be
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unpersuasive. It is undisputed that only significant high sound-wave levels can affect the connective tissue. In fact, vibroacoustic disease is generally connected to sound levels caused by close proximity to jet engines. The project will not generate such sound levels; therefore, we find the project will not have an adverse effect on human health by causing vibroacoustic disease." So those were the two findings which would pertain to some of what was discussed here. There was more discussion regarding low-frequency and infrasound, per se, in this docket, $I$ believe.

CHAIRMAN IGNATIUS: Thank you.
MS. BAILEY: So I think that
there's some evidence that this could be a concern. I don't think there's any proof that there's an impact on public health as a result of this very low-frequency and infrasound.

But I think there is a body of evidence sort of growing or increasing that suggests that, well, maybe there might be something to this, especially after turbines get bigger, and we
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just don't have the data to know whether it's going to cause an impact on public health. But the World Health Organization did include -- did choose to keep in the 2009 guidelines, although not specific to wind turbine noise, that if the dBC level is more than 10 dB higher than the dBA level, then there's reason for concern about low frequency and noise health impacts.

And so, reasons for concern:
Don't know what the extent is. We don't even know for sure what the sound power level is that these turbines would generate at these frequencies. And, you know, even if it does generate some level, is it enough to cause a health impact? We don't know. I've thought about this a lot. And it struck me this morning, you know, we don't know if the turbines are going to help kill off the bat population, so we're going to do a study. Do you think we might should do a study on this, just to see what the levels are and if the turbines produce this kind of low-frequency sound and at what level? It's just a thought
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that I had. I'm not convinced. I don't really know what my position is on this one yet, and I'm really hoping you guys will help me out.

CHAIRMAN IGNATIUS: Mr. Dupee.
MR. DUPEE: Thank you, Madam
Chairman. Are you suggesting that we would do a study to demonstrate that the infrasound existed or that there was a health effect derived therefrom?

MS. BAILEY: I think we need to know both.

MR. DUPEE: The second thing would be a much harder question to ask if you really want to do that adequately in an experimental situation. Some people get exposed, some not. A lot of control goes into that. It would be a very difficult study to do in the concert of this particular effort. I think that's good scientific endeavor, but not one that $I$ think would fall under the purview of this Committee.

MS. BAILEY: Okay. So what do we do about the possibility that this might
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cause a health impact? We don't know.
CHAIRMAN IGNATIUS: Please.
MR. DUPEE: I would say what Attorney Iacopino read earlier from the record in previous cases is pretty much indicative of where the science is today. I don't think it's changed particularly since we've had that conclusion. Very low-frequency noise, looks like it doesn't really affect many people, but potentially may affect some. But then you try to weed out, okay, this person's exposed, the person next to them is exposed; one says yes, one says no. It becomes very difficult to develop a methodology that would account for that in a disease way.

CHAIRMAN IGNATIUS: Ms. Bailey, do we have any evidence in the record of what the dBC levels are? You probably just went through this, and I'm sorry. I'm losing it here.

MS. BAILEY: We don't have any evidence of what the predicted $d B C$ levels are because the Applicant didn't touch this subject.
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| 1 | CHAIRMAN IGNATIUS: And none of |
| 2 | the other -- |
| 3 | MS. BAILEY: And reasonably so, |
| 4 | because the Committee dismissed it the last |
| 5 | time. |
| 6 | What Mr. James said was that, in |
| 7 | Germany, they established a level at 35 dBC , |
| 8 | and he recommended that we establish a level |
| 9 | of 50 dBC . And I think that's because he |
| 0 | recommends... does he recommend -- he |
| 11 | recommends 35 dBA. And so 10 above that |
| 12 | would be 45 dBA. So $I$ don't really know why |
| 13 | he said 50. I can't remember. |
| 14 | CHAIRMAN IGNATIUS: And nobody |
| 15 | measured or modeled what they thought the dBC |
| 6 | level would be at various receptor points. We |
| 17 | know Mr. O'Neal did not. But Mr. Tocci did |
| 8 | not either? |
| 19 | MS. BAILEY: No. Mr. Tocci |
| 20 | kind of -- he didn't really have any testimony |
| 21 | on this, except for on cross-examination where |
| 22 | he said, you know, it could be. I don't know. |
| 33 | CHAIRMAN IGNATIUS: And do you |
| 24 | recall if anyone had data from other wind |

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facilities in the region, $I$ guess, or elsewhere, on what kind of dBC levels had been recorded?

MS. BAILEY: No, I didn't see any data on what had been recorded.

CHAIRMAN IGNATIUS: People's comments on this issue? Mr. Simpkins.

MR. SIMPKINS: Well, just some thoughts. I don't think it will help us really get to a conclusion. But this is what I've given a lot of thought to also, because it's -- well, one, out of the topics, it's probably the one I'm least familiar with, not being an acoustician, however you say that. But it also probably bothers me the most because, you know, when it comes to natural environment and things, you know, we can do easements, we can do studies of birds and bats, you know, we can deal with aesthetics, those types of things. But, you know, when it's impacting someone's health, I mean, to me, that's a big deal. And, you know, this -we didn't hear a lot of scientific evidence that these types of things actually exist or
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| :---: | :---: |
| 1 | that there's -- the science seems very cloudy |
| 2 | on it certainly, at best. However, I can't |
| 3 | say I'm convinced that nothing exists. You |
| 4 | know, I kind of think in my line of work, lyme |
| 5 | disease is a big deal. And, you know, for a |
| 6 | while, lyme disease was kind of dismissed. |
| 7 | You know, it's other things and it's kind |
| 8 | Of -- and, you know, now, all of a sudden, |
| 9 | it's starting to -- lyme disease is getting |
| 10 | more attention and those types of things. |
| 11 | But, you know, it took a long time. And so, |
| 12 | you know, this project is not going to be a |
| 13 | six-month or a one-year project. It's going |
| 14 | to go out decades. |
| 15 | So while we may not know |
| 16 | what's going on, sitting here today, I guess |
| 17 | my question is: What do we do about it 10 |
| 18 | years from now when they say, "Yeah, this is |
| 19 | a real deal." Do we just say, "Well, we |
| 20 | didn't know about it then, so nothing we can |
| 21 | do about it now?" You know, as far as |
| 22 | setting certain limits, $I$ don't really see |
| 23 | how that's going to help us much, because |
| 24 | there's no scientific basis to set a limit. |

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Is it 35? Is it 50? Is it 100? So I don't know that setting a limit is going to help. So what I'm looking at is, if a local resident all of a sudden comes up with some type of symptoms that they did not have prior, is that something that, you know, we need to deal with? You know, granted, that would -- you know, none of us are medical doctors. But I guess that's the question in my mind. If we're wrong, what do we do about it then, if someone gets ill from it? And how -- I guess it would be up to a medical doctor to make the connection that if someone did get ill, it was a result of infrasound. But that's kind of what I'm wrestling with.

CHAIRMAN IGNATIUS: Others? I
mean, we're getting close to taking a decision, sort of a straw vote, on a finding of whether there would be health and safety issues as a result of noise. And so I'm wondering, are there other issues people want to discuss before they can reach that sort of a conclusion in their own minds, or is it
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something that you're not ready yet to answer, because we need to check other things in the record, as Ms. Bailey offered, to check back on that 10 dB increment issue? Dr. Boisvert.

MR. BOISVERT: I just was
thinking that, as I recall the testimony from various people who objected to the noise from the wind towers, as much as anything that came through to me, it was the annoyance factor, and it's almost at an aesthetic level, not a health level. And now I fully recognize that a certain degree of stress to somebody has health impacts, physiological health impacts. I'm not disputing that. But it seemed to be more an issue that, "It was quiet, and I appreciated the quiet. This is why I moved here, to be away from the noise." But it was the quiet. And without explicitly saying so, with one exception, it was a matter of, I would say, aesthetics and not health. We're talking about health here. The exception was the individuals who had the recording studio, and that sound issue played out there. No pun intended.
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But in terms of the health aspect, I did not hear a strong thread of argument that the sound was causing enough annoyance to be stressful, to be unhealthy. It was more the sound was causing a lot of annoyance because you lost the appreciation for the quiet solitude, et cetera, of the rural character of the area.

That said, the issue of the inaudible, low-frequency sound causing physiological problems, the best comparison was that it made you feel like you had motion sickness. That was something that I thought that appears to me to have some validity. But the problem is how is this -- as Mr. Dupee said, how do you factor that out? How do you recognize -- you know, what test case can you have? Do you expose some people to sound, some people not? Do you look at meta-studies of lots of people in lots of areas and so forth, proximity to wind towers and so forth? We've heard a lot of argument in the Groton Wind case about Wind Tower Syndrome. That came from a totally different
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people. The argument on Wind Tower Syndrome was really not raised as an issue here. It was people drawing upon a totally different set of data.

I would be concerned that there are health impacts. But like Mr. Dupee, I despair that we're going to be able to come up with a condition on the permit that would allow us to discover it and treat it. But as I said, the discussions of the ambient sound, whether or not to include insects and so forth, to me was setting a baseline of: Are you going to compare it against "sort of quiet" or "really quiet"? What is more fair to compare against? If you use the baseline plus so many decibels, if you start with a higher ambient, then it makes it a harder threshold to achieve that it be will be a problem. And that's how I read the testimony on sound. And it was almost a mental health -- in other words, being upset that you've lost the quiet of your home as opposed to physiological health. And believe me, I recognize that mental
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health and physiological health are both health issues and that you don't only pay attention to just the physiological as opposed to the mental health issues. I think they're both equally important.

But that's what I heard before, and $I$ was struggling to find a way to process and take into account what Ms. Bailey was saying and realized it was almost aesthetic versus health issue.

CHAIRMAN IGNATIUS: I remember one of the things we were told that seemed consistent with what you're saying, and that was someone stating that -- I think Mr. O'Neal stating that, for those who can see the turbines, the aggravation of the noise is perceived to be greater than for those who can't see the turbines. And so it was, again, in that sort of annoyed, aggravated way more than a change in someone's health.

Mr. Dupee, comment?
MR. DUPEE: Yes. Thank you,
Madam Chair. Once again, pointing out the microphone to me.
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Couple thoughts here to Mr. Simpkins' point about what happens if this Committee were to make a decision to the effect that it wasn't going to be a health problem, and then it turned out at some point in the future there was a recognized etiology of people getting sick, and there was a clear and demonstrable reason for why that was happening, that in the world of public health, statutory authority in cases like that, where all of a sudden you find out that things that were considered fine before are no longer fine, there are steps you can take, under law to try to address that.

Getting back to your point. I think another way to frame that up is somewhere between a health effect -- a public health effect called a "nuisance," things that maybe some would object to and some would not. But it's -- somebody objecting to something smells awful would be considered a nuisance. And is that a health effect or, you know, is it something less than that? But clearly, it's something that affects
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individuals. It might affect their health ultimately if, as you mentioned, it's a strong enough mental stimulus. But it's a hard thing to write into a permit because we can't say with certainty who was affected and who was not affected by those kinds of things. And is there a way we can measure it and say, "Yes, this is the sort of effect we can count on, understand and manage" versus an individual idiosyncrasy, which may be real, but that person probably has to work with a healthcare provider to understand what their particular unique circumstance is and then work with their provider to reach their own remedy?

CHAIRMAN IGNATIUS: Mr. Stewart. DIRECTOR STEWART: Yeah, just to reaffirm what $M r$. Dupee has just stated. In my world, which is the regulatory world, and has been forever, standard-setting and then implementation of standards change all the time. You know, for drinking water, standards change all the time. Arsenic standard was 50 parts per billion, now it's
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10. Twenty years ago it was 50 , now it's 10. We adjust. The facilities adjust, in terms of what they have to do to perform -- to attain a standard. So I think we have to recognize that we're dealing with a dynamic environment, and we have to make a reasonable decision based on what we really know and not the hypothetical. And so I think we move -- my suggestion is we move forward with what we have, and ultimately that leads to a standard in the conditions similar to the Groton, although I have a question about the actual numbers in there because of something Mr. Tocci said.

And I actually went on the World Health Organization and found that in the Groton there was a 45 dBA nighttime standard. Mr. Tocci, in his testimony, suggested 40 based on a newer guidance document from WHO. And I think that's actually correct. I think I found it in the document, if I'm reading the right place.

But at the end of the day, $I$ think we move forward with what we have and
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not the hypotheticals and build in the ability to adapt as knowledge about health effects may change in the future.

MS. BAILEY: So are you
suggesting that we should make the absolute level 40 dBA to go along with the World Health Organization guidelines --

DIRECTOR STEWART: Well, I
think --
MS. BAILEY: -- for the nighttime?

DIRECTOR STEWART: Yeah. Well, I think what changes -- now I'm looking at the Groton conditions that the Applicant has provided, and which was consistent with what Mr. Iacopino -- the nighttime 45 dBA , if I'm interpreting this right, may need to be 40 to be consistent with the World Health

Organization. I think that's what Mr. Tocci said, too.

MS. BAILEY: Yes.
DIRECTOR STEWART: And again, that's an adjustment, because it seems like that value shifted. You know, if the reliance
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just went on and found the document. And his testimony is consistent with what I saw upon a quick review of the wHO guidelines.

MS. BAILEY: Also the same thing I did.

CHAIRMAN IGNATIUS: SO, does somebody want to make a proposal of what an appropriate level would be for a daytime absolute limit, and if it's going to be a two-stage, the greater of, an absolute or some amount of over ambient, lay out what you think would be an appropriate standard to set?

DIRECTOR STEWART: Should I go ahead?

CHAIRMAN IGNATIUS: Sure, if
you'd like.
DIRECTOR STEWART: Based on
what we've found, again, unless Kate has something different, the Groton condition was sound levels generated by the project at the outside facades of home should not exceed 55 dBA or 5 dBA greater than ambient, whichever is greater, in daytime. And I think that would hold. I haven't seen anything to change
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that. And the nighttime, what Groton says, 45 dBA or 5 dBA greater than ambient. I think that probably should be 40 dBA or 5 dBA greater than ambient, whichever is greater at night.

MS. BAILEY: I think that that might have a health impact, based on the testimony that $I$ reviewed for the daytime.

DIRECTOR STEWART: So the 55, I'm okay with that, too.

MS. BAILEY: Yeah, and I think it's because we have no idea what the recorded background noise in Lempster was when they set that standard, and we know that in this area it's really quiet most of the time -- a lot of the time -- and when it's not really quiet, it's insect noise. So I think 55 dBA is way too high, especially because the Applicant themselves said they're never going to be more than 43 dBA. So I think it should be much lower than that.

CHAIRMAN IGNATIUS: Would you propose a different absolute level for daytime?
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DIRECTOR STEWART: Would it be $40 ?$

MS. BAILEY: I would be comfortable with 40 dBA absolute level all the time, but $I$ don't know if that's too stringent. And, you know, if ambient is really 15 at the most quiet time, and there is a possibility that there's health impacts when that noise level's increased by 10, that's 25. So even if you double that, if you assume, well, the health impacts are -- that's too conservative or that's too low a number, if you said ambient plus 20 , that would give you 35 dBA, which is a big change in sound for people who are used to living with 15 , and it could have health impacts. I don't know. But 40 dBA seems about at the absolute maximum for me.

CHAIRMAN IGNATIUS: Mr.
Simpkins.
MR. SIMPKINS: Well, a couple things. I'm looking at Table 6-2 in Mr. O'Neal's study, Appendix 13A, and he has maximum numbers. The lowest is 45 and the
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highest is 51 , and then he has averages. This is from the minimum, which I assume is at night, and the maximum during the day. And those averages range from a low of 37 to a high of 44. So I guess my concern with going with 40 during the daytime is you're saying it's already louder than that now without the turbines at least in two of the locations that he measured, and it's within three points. So this is the average. So this isn't even the maximum. If you go with the maximum, there's areas out there -- the lowest maximum he has was at Gregg Lake Road, and that was 45. So there's already noises out there that are well above 40 without the turbines, according to Table 6-2, if I'm reading that correctly. So --

MS. BAILEY: That's a good point.

MR. SIMPKINS: I'm thinking 40 during the daytime may almost be impossible to achieve because of all the other noise. So that's one comment.

Another comment is, and not to
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be the skunk at the lawn party, but I just want to bring this up one more time. We talked about, you know, right now we need to go with what the science is, and into the future standards will change. Mr. Stewart talked about arsenic in water. But we just talked now about the World Health Organization has changed their standards down to 40. I don't think we're advocating that we're to go open up all the other prior approved certificates and drop them from 45 to 40. So $I$ guess that's my question again. So if we approve this certificate and then find out five years from now that there is an issue, is it only for new certificates that are issued?

And then the last thing $I$
have -- and I just have it in my notes because it hasn't come up yet. But during this whole noise discussion, there was, I believe, software with the Acciona 3000 series where there was a one-to-four-decibel noise reduction. I know that was discussed. That hasn't come up yet, but I know there was
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a way to reduce the noise a few decibels. What the power penalty for that is, I don't know. I think we asked that, but I don't think they knew either. But --

MS. BAILEY: That's right.
There is a software package that comes with the turbines, that if they need to reduce the sound output, they can adjust the pitch of the blades, I think, and that gives you a decrease in power output but also will decrease the noise.

CHAIRMAN IGNATIUS: Do other people have a recommendation of what they think an appropriate absolute level might be? I think this ambient sound level makes it a more complicated question than it would be otherwise. If some of the ambient testing was already showing high levels without a turbine, then that's not an effective test to apply. Mr. Stewart.

DIRECTOR STEWART: The language
I'm reading is "generated by the project." So I'm not sure what that means in terms of -you know, in other words, if the ambient level
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is 70 decibels, then I'm not sure it's relevant what the project -- in other words, if the project can attain its 55, and the ambient is 70 absent the project, then it really doesn't matter, $I$ don't think. MS. BAILEY: I think I agree with that. But in the Epsilon report, there's something that shows you what 70 dB sounds -yeah, Page 2-3, Figure 2-1. And 70 dB is a gas lawnmower at 100 feet; it's a vacuum cleaner at 10 feet. That's loud.

DIRECTOR STEWART: Yes.
MS. BAILEY: So I don't think ambient's going to be at 70.

DIRECTOR STEWART: Right. That was just an arbitrary number.

MS. BAILEY: I mean, this --
DIRECTOR STEWART: I didn't
know it was a gasoline mower.
MS. BAILEY: Quiet, urban nighttime is 40 dB , okay. And quiet suburban looks like it's about 37.

CHAIRMAN IGNATIUS: Well,
that's where your two-step approach comes in,
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that you have both an absolute and an over-ambient test, so that if it were five over ambient, whether it's a quiet time or a noisy time, the wind facility can't add more than 5 dBA over that.

DIRECTOR STEWART: That's right.

## CHAIRMAN IGNATIUS: And I

guess, Ms. Bailey, as you were saying, ambient could be measured however it's decided to be measured.

MS. BAILEY: Well, I think it would be measured at the time of the complaint. And then there might be some disagreement. You know, somebody becomes sick, and they think it's because of stress from the increased noise, and the increased noise is $25 d B$ over what they used to have and so that's why they're sick. If that's the point they're making, and they've been experiencing this over the course of a year, then it may not be appropriate just to measure it once, the ambient sound once. You may want to figure out what the ambient sound is the
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| :---: | :---: |
| 1 | majority of the time over the year to really |
| 2 | see what the difference is. |
| 3 | CHAIRMAN IGNATIUS: So it |
| 4 | sounds like there are two possible standards |
| 5 | thrown out, and people may have others yet to |
| 6 | introduce. One would be Mr. Stewart's, to |
| 7 | take 55 dBA or 5 dBA over ambient levels |
| 8 | during the daytime, and a 40 dBA or 5 over |
| 9 | ambient at nighttime. That would be one way |
| 10 | to structure it. Another would be, as Ms. |
| 11 | Bailey was saying, what if you had just one |
| 12 | simple standard, not day or night, that would |
| 13 | be 40 dBA, or 1 assume also a 5 over ambient |
| 14 | level. |
| 15 | MS. BAILEY: Sure. And the |
| 16 | other -- $I$ have a question for Mr. Iacopino. |
| 17 | The last project that was |
| 18 | approved, that didn't have 55 dBA during the |
| 19 | daytime, did it? |
| 20 | MR. IACOPINO: Yeah. |
| 21 | MS. BAILEY: I thought it went |
| 22 | to a standard 45 dBA . |
| 23 | MR. IACOPINO: Last one was |
| 24 | Groton, and that was 55 dBA or 5 dBA greater |

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than ambient in the daytime, and 45 dBA or 5 dBA greater than ambient at night, whichever is greater, and then 40 at the campground. The 40 at the campground was day or night.

CHAIRMAN IGNATIUS: Are there other proposals of standards that anyone else thinks would be appropriate?

MS. BAILEY: How about 45 dBA during the day, and 40 at night or 5 over ambient? I mean, the Applicant has said 43 is the max at these close residences. So why you would set a standard at 55, especially if you have an ambient plus five?

CHAIRMAN IGNATIUS: All right.
So, 45 or 5 over by day, and 40 or 5 over by night, whichever is greater.

MS. BAILEY: Yes.
MR. IACOPINO: What do you say,
Harry, 47/5?
DIRECTOR STEWART: That's what
I just said.
CHAIRMAN IGNATIUS: Any
reactions to that?
MR. SIMPKINS: Just to confirm.
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For the daytime, that would be 5 above the ambient daytime?

MS. BAILEY: Yes.
MR. IACOPINO: Is the proposal
"whichever is greater"?
MS. BAILEY: Yes.
CHAIRMAN IGNATIUS: Can I ask anyone who's thought about this more than I have, if you always have a -- or test above ambient level, why do you need an absolute? What does the absolute play? How does that either protect the public or offer certainty to the Applicant? I'm sure there's a really good answer to this and I'm just getting muddled.

MS. BAILEY: I'm sure, too.
DIRECTOR STEWART: My
interpretation is that, if the background were 20, then the project could add 5, you know, for a total of 25 , more or less. I think that's --

MR. BOISVERT: Would it not
then have to read --
(Court Reporter interjects.)
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MR. BOISVERT: It was a comparison of 40 or ambient plus 5. Wouldn't it make more sense to make it whichever is less? In other words, if it's very, very quiet, then you do 5 plus or 10 plus, whatever is decided. That's what you want to shoot for, as opposed to 40, which may be another 10 or 15 decibels above that. I'm kind of muddled, too. I'm trying to struggle with why you would have -- why you would want -- why you sort of give them the -- allow a higher level, 40 decibels in the evening, why you'd say that's fine if the ambient is, say 20 , and plus 5 be 25.

CHAIRMAN IGNATIUS: Well, I
guess I'm answering my own question. I think the purpose of the absolute number is to account for times that it's quiet, and yet the facility is going to make noise and shouldn't have to shut down every time we enter a quiet spell.

DIRECTOR STEWART: Yeah, I got
it wrong.
CHAIRMAN IGNATIUS: Maybe it's
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feathering it back, dialing it back a bit at night so that the noise it imposes into the night air isn't as great as it could be during the day. But if the thought is that a certain level of sound imposed on the community is acceptable, but no greater than, you know, 40, 45, 55 dBA, then I think you do want the maximum, the greater of those, rather than the lesser of those, because otherwise you will always go to the quietest time, which may be good for enjoying the quiet, but does nothing for the notion of operating an industrial wind facility. So I think if we're willing to accept that these things do make noise, we want to make sure that there's a maximum they can't exceed and find that right level of what's loud enough to be realistic to operate, but not so loud as to be so annoying or actually cause physiological effects.

So if we have a recommendation of -- sounds like on nighttime, everybody is coming down to 40 or 5 greater than ambient, whichever is greater, as a maximum standard. It's the daytime level as low as 40, 45 or
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55 -- I'm sure we can put in some 50 s in there as well -- or 5 over ambient, whichever is greater, I think that sounds like the last question to decide, what level to set here. Anybody want to make a pitch for one or another? Anywhere between 40 and 55 sounds like what we're debating. Mr. Robinson.

MR. ROBINSON: I just have a question about the 55 daytime in the past projects. What was the -- does anyone know what the rationale was for setting that? Because it seems like we're just kind of picking numbers out of the air here for the daytime. I haven't heard a whole lot that would convince me that the 55 needs to be changed. Do we have a real good rationale on why it was set that way from the past two projects, and have we had any complaints that we know of from the public?

MS. BAILEY: Well, the
testimony was that there's only been two complaints in Lempster, and one was from somebody who was having a problem with his hearing aid. Groton hasn't been built yet;
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right?
MR. IACOPINO: Groton just recently went on to -- just recently opened the commercial operation.

Just for the Committee's edification, there is a post-construction sound study that is supposed to be conducted by Iberdrola on the Groton project once they're all fired up, but obviously you don't have that for this docket. There was a post-construction noise study done on Lempster as well. That's on our web site, I believe.

MR. ROBINSON: I guess my thought process is that we have a piece of data that tells us that 40 perhaps should be the nighttime from the World Health Organization. But for daytime, I just haven't heard anything that makes me want or need to change my mind on the standards set in the past. I hate to pull things out of the air without some good background.

CHAIRMAN IGNATIUS: And my best
recollection -- and Mr. Iacopino, please
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| 1 | somewhat subject to, anyway. |
| 2 | MS. BAILEY: Can I make a |
| 3 | point? |
| 4 | CHAIRMAN IGNATIUS: Please. |
| 5 | MS. BAILEY: The reason I think |
| 6 | 45 is reasonable is because the Applicant's |
| 7 | testimony, Mr. O'Neal -- this is AWE 2, and |
| 8 | it's in the O'Neal testimony -- says, "Because |
| 9 | the predicted worst-case sound levels from the |
| 10 | Antrim Wind project will be below 45 dBA at |
| 11 | all occupied buildings, the project will |
| 12 | easily meet the acceptable noise level applied |
| 13 | by the SEC to the Lempster and Groton Wind |
| 14 | projects. It will also meet the World Health |
| 15 | Organization's 45 dBA nighttime guidelines for |
| 16 | residential locations and the U.S. EPA |
| 17 | guideline of 48.6 dBA." And they didn't make |
| 18 | a distinction between day and night there, so |
| 19 | that's kind of why I was recommending 45. |
| 20 | CHAIRMAN IGNATIUS: Mr. |
| 21 | Simpkins. |
| 22 | MR. SIMPKINS: So this is a |
| 23 | question. So I mentioned about Table 6-2. It |
| 24 | already had maximums in the upper 40 s and as |

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high as 51 and had averages between 37 and 44. That's now. So if the turbines never created noise above 45, something out there already is creating something above 45. So if the modeling of the turbines said the turbines will never make it go above 45, that's not to say there's not going to be traffic or construction nearby that's going to make it go over 45. If there's a complaint, how do we tease out what was caused by the turbine versus these other things that caused spikes?

MS. BAILEY: I think that's why
you have the standard that says "or 5 dBA above ambient, whichever is greater." And when you have that complaint, you go out and you put the sound-measuring devices on and listen to it with the project turned on, and then you turn the towers off and measure ambient, and you see if there's more than a 5-dB difference.

MR. SIMPKINS: But to get to that ambient, it wouldn't be like a one-day thing. It would be because -- it wouldn't be a point in time. It would have to be an
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average, I would assume.
MS. BAILEY: I would assume
that it would have to be some kind of scientifically proven test procedure. And there's probably guidelines. I don't know that. I'm not a sound engineer.

CHAIRMAN IGNATIUS: SO I guess if we're looking at -- I think we've agreed on 40 or 5 over ambient as a nighttime standard? Yes. So it's the daytime standard, and the 45 or 5 over ambient, as Ms. Bailey recommends, or 55 or 5 over ambient as has been done in other recent cases in New Hampshire.

Any more discussion? You want to just sort of take a vote and see where people want to come out? Or does anybody want to recommend 50 , in between the two or anything before we take a vote?
(No verbal response)
CHAIRMAN IGNATIUS: All right.
You're good with 45 or 55 as a test? All right.

So, for those who would favor the 45 or 5 over ambient daytime as their
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preferred approach, please raise your hands. (Subcommittee members indicating by show of hands.)

CHAIRMAN IGNATIUS: All right.
And those who would favor the 55 or 5 over ambient as the approach.
(Subcommittee members indicating by show of hands.)

CHAIRMAN IGNATIUS: All right.
So it's five more for the lower standard than for the higher standard.

MS. BAILEY: But it's pretty close.

CHAIRMAN IGNATIUS: Yeah.
Well, does anybody want to look at a different way of doing it or -- I'm happy if that's the result and we close this one out. But I'm happy to keep --

MR. SIMPKINS: Well, I was just going to say, I mean, you kind of said it jokingly before, but maybe 50 would be -- I mean, we're split almost half and half. So maybe 50 would be the --

CHAIRMAN IGNATIUS: All right.
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Show of hands for people who would support 50 as a daytime, 50 or 5 over -- maybe this is no longer what your preferred is. But is this something that you would support? Maybe do it that way. So, 50... I think I'm muddling my choices here. Between 50 and 45 is your preferred -- 50 versus 45. Let's do it that way and see how that one comes out. Is there going to be a difference? Not going to be a difference.

MS. BAILEY: Yeah, there could be.

CHAIRMAN IGNATIUS: Okay. So
50 or 5 over --
MS. BAILEY: I think it's more
based on horse trading than science or evidence, but...

CHAIRMAN IGNATIUS: All right.
So, 50 or 5 over, let's see a show of hands.
(Subcommittee members indicating by show of hands.)

CHAIRMAN IGNATIUS: We have
one, two, three, four, five, six. Who knew.
And versus 45?
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| :---: | :---: |
| 1 | (Subcommittee members indicating by |
| 2 | show of hands.) |
| 3 | CHAIRMAN IGNATIUS: Would be |
| 4 | one, two, three. Okay. |
| 5 | Is there anyone who feels -- |
| 6 | well, I won't ask that. Never mind. |
| 7 | Okay. So are we settled, |
| 8 | then, that it be a 50 or 5 over daytime and a |
| 9 | 40 or 5 over nighttime standard? Is that the |
| 10 | end of the discussion on that? |
| 11 | (No verbal response) |
| 12 | CHAIRMAN IGNATIUS: Okay. |
| 13 | Well, that's issue No. 1. |
| 14 | MS. BAILEY: Time for the court |
| 15 | reporter to have a break. |
| 16 | CHAIRMAN IGNATIUS: Yeah, I |
| 17 | think so. That is the hardest of all of them. |
| 18 | I don't think anything on the rest of the |
| 19 | Public Health and Safety will be remotely as |
| 20 | difficult as that. |
| 21 | What I would recommend is we |
| 22 | call it quits for today, unless you want to |
| 23 | take on one more issue. Otherwise, we would |
| 24 | just begin tomorrow morning at 9:00 and |

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continue through that list of health and safety, decommissioning issues, and then circle back again to the aesthetic issues, which is a big one. And the question is: Is there anything that's a mitigation that would be appropriate? Any kind of condition we could set or mitigation action? And, oh, I guess on the financial issue as well, are there mitigation standards required? So we will have to go back into that again tomorrow.

So, unless there's anything else we should talk about right now, I think we're all a little fried. It's probably a good idea to call it quits for now and begin again tomorrow morning at 9:00. Thank you, everyone, for all of your work in slugging through this. We're adjourned until tomorrow morning.
(Whereupon the Deliberations Day 2
Afternoon Session adjourned at 4:12 p.m.)
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C ERTIFICATE
I, Susan J. Robidas, a Licensed Shorthand Court Reporter and Notary Public of the State of New Hampshire, do hereby certify that the foregoing is a true and accurate transcript of my stenographic notes of these proceedings taken at the place and on the date hereinbefore set forth, to the best of my skill and ability under the conditions present at the time.

I further certify that I am neither attorney or counsel for, nor related to or employed by any of the parties to the action; and further, that $I$ am not a relative or employee of any attorney or counsel employed in this case, nor am I financially interested in this action.

Susan J. Robidas, LCR/RPR Licensed Shorthand Court Reporter Registered Professional Reporter N.H. LCR No. 44 (RSA 310-A:173)
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