

Town of Greenwood
Ordinance Review Committee Meeting Minutes
August 31, 2017

Meeting held at the Legion Hall
(A digital recording exists for this meeting)

Item 1: Call the Meeting to Order/Determine quorum

Brad Payne, Secretary
Tyler Bennett
Jim St. Germain
Dennis Doyon
Becky Secrest
Jessie Fredrickson,
Rob Lally
John Maloney, AVCOG
Kim Sparks, recording secretary

Absent
Larry Merlino, Chairman
Paul Marcolini, Vice Chair

The Committee agreed to have Dennis Doyon chair the meeting.
Chair Doyon called the meeting to order at 5:30pm.

Attendance: 98

Item 2: Review Minutes of August 3, 2017

Chair Doyon stated that there was a correction to minutes on Page 14 – Mr. Greenfeld stated he said non lawyers not young lawyers.

Becky Secrest motioned to accept the minutes as amended and Tyler Bennett seconded.
Vote 7-0. Motion passes. Minutes accepted as amended.

Item 3: Review updates on Public Inquiries and Complaints from John Maloney

Town of Greenwood, Maine
Site Plan Review Ordinance
Commercial Wind Energy Facilities
Revised Standards
July 6, 2017
August 3, 2017
August 31, 2017

Public Inquiries and Complaints

7-701.3.R- Public Inquiries and Complaints

[Current Provisions]

R. Public Inquiries and Complaints

1. The Applicant or its designee shall maintain a phone number and identify a responsible person for the public to contact with inquiries and complaints throughout the life of the CWEF.
2. The Applicant or its designee shall provide the Code Enforcement Officer with a written notice that a complaint has been received within 10 days of its receipt.
3. Then within 20 days of the date that the applicant or its designee received the complaint the applicant or its designee shall provide the Code Enforcement Officer with written notice of how the complaint was responded to.

[Proposed Provisions]

1-403.3.D.17. The name, telephone number, and E-mail address of the CWEF owner's/operator's contact person that is responsible to respond to public inquiries and/or complaints.

18. A copy of the owner's/operator's public inquiry/complaint response protocol.

Note: These are new submission requirements.

7-701.3.R- Public Inquiries and Complaints

1. **CWEF public inquiries and/or complaints shall be made as follows.**
 - a. **By completing a public inquiry and complaint form found on the Town of Greenwood, Maine web site (www.greenwoodmaine.org, or**
 - b. **By completing a public inquiry and complaint form at the Town of Greenwood, Maine town office (593 Gore Road) during normal office hours.**

2. **Receipt of CWEF public inquiries and/or complaint**

Upon a receipt of a public inquiry and/or complaint the Town shall.

- a. **Notify the inquiry and/or complainant that a public inquiry and/or complaint have been received.**
- b. **Forward by E-mail and certified US Mail return receipt requested to the CWEF owner/operator's contact person that is responsible to respond to**

public inquiries and/or complaints, the public inquiry and/or complaint form.

- c. **Place in the appropriate file for public inspection the public inquiry and complaint form.**

3. Responsibility of the CWEF owner/operator

- a. **Within seventy-two (72) hours the owner/operator's contact person, that is responsible to respond to public inquiries and/or complaints, shall provide a response to the Town and the person filing public inquiry and/or complaint in accordance with the approved public inquiry/complaint response protocol.**

4. Responsibility of the Town

- a. **The Town shall attach to the appropriate public inquiry and complaint form the response of the owner/operator.**
- b. **Within one (1) week of the receipt by the Town of the response from the owner/operator, the Town shall contact the person that made the inquiry and/or complaint to assess if he/she is satisfied with the response based on the approved public inquiry/complaint response protocol, Town Ordinances and conditions of and CWEF approval.**
- c. **The Town within one (1) week shall forward to the owner/operator's contact person, that is responsible to respond to public inquiries and/or complaints, the results of the assessment as identified in b above.**
- d. **If the Town, within fourteen (14) days, of the actions provided in Sections 3.a and 4.b determines that the complaint is without merit, it will be dismissed, and the Town will inform the complainant and the Owner/Operator.**
- e. **If needed The Town shall may convene a meeting with the Town, the owner/operator, and person filing the inquiry and/or complaint to attempt a-to reach a resolution if such actions as identified in 3.a and 4.a-c above have not resolved the complaint. If such a meeting is convened with forty-five (45) days of the receipt of the original public inquiry or complaint by the Town.**

The Committee reviewed what John Maloney had submitted (see above). Chair Doyon read aloud all of the changes highlighted in gray. Chair Doyon asked everyone to review section 2. B. certified mail return receipt. Chair Doyon stated his concern is that this is going to be a huge hang-up as notification back from certified mailings can take up to 90 days and if that stays in this document he believes it will interfere with the 45 days in section 4. E. Becky Secret asked

if they could just request and signature and then tracks it online. John stated he would research the issue bring this back to the Committee. Becky Secret asked to review 4. E. as it is not a complete sentence. John Maloney that it should read: **If such a meeting is convened it shall held within forty-five (45) days of the receipt of the original public inquiry or complaint by the Town**

Chair Doyon asked if these corrections could be completed by the September 7th meeting. John Maloney said he would have them done and submitted by September 7th.

Item 4: Introduce guest speaker, Stephen Ambrose, INCE, Bd. Cert

Presentation on audible noise and infra-sound – copies of power point presentation attached.

Mr. Ambrose introduced himself and stated how impressed he was with the large audience. Mr. Ambrose explained he has been studying wind towers since 2009 and he has worked on complaints filed at Mars Hill, Vinalhaven, and Freedom Maine. Mr. Ambrose stated that he understood and would speak about the difference between daytime and night time noise levels. Mr. Ambrose stated that he has experienced folks complain about wind towers when it interferes with their activities such as sleep or simply enjoying the peace and tranquility in Maine. Mr. Ambrose began his presentation on Wind Turbines Being Good Acoustic Neighbors and said that they can be and in some cases they are not good neighbors. Mr. Ambrose stated that he has found that the only effective noise control for wind towers is distance. Mr. Ambrose explained that towers are inherently loud and are design does not permit them to be quiet unless they are slowed down which is not a viable option. Mr. Ambrose stated that Maine has many good wind turbine neighbors but there are some that are not. Mr. Ambrose stated that we complain about noise for two reasons, it is loud or it is ugly. Mr. Ambrose explained that we do not complain about average sound levels and our ears are very good at picking out pure tone. He explained that the human ear is one dramatic transducer and has a dynamic range greater than their instruments. He explained that their instruments pick up 90 dB and our ears pick up 120 dB. He explained that places that don't have noise restrictions a 10dB increase is typical for a noise limit and the State use to have that but they chose to do away with it. He stated that we can hear a change in the low frequencies much quicker than we can in the mid-range frequencies. He stated that most ordinance and regulations they always deal with something centered around 1000 Hz yet we have to be careful when it comes to wind turbines as they are primarily a low frequency noise source and will cause a greater sound response from the community because of their low frequency. He explained that the only thing for wind turbines is separation distance. He reviewed several different noise charts from different groups and both stated that at night in a quiet rural area it is about 25 dBA and he thought it could be lower as this area is so rural but would suggest that 25 dB would work for Maine. He stated that one has a quiet winter night measurement as 20 dB. Mr. Ambrose stated that there are towers that predicted a 38 dBA and neighbors complained about the noise and measurements taken showed 43 to 46 dBA. He stated that rural Maine measures an 18 to 23 dBA without wind yet some of these turbine installations are measuring 43 to 46 dBA and is such a dramatic increase he understands why folks are complaining. Mr. Ambrose stated that he would advise developers that the best place to put a wind turbine is in an urban area because the background noise levels are louder and would need less distance before the sound levels decay into the background, it would be dramatically less. He explained that his chart on page 17 comes from an EPA levels document and normalized that information to a quiet rural area and these are the sound levels that are present and that rural is defined at 15 to 25 dBA. He explained that this chart shows when the trigger points are for complaints starting at 35 dBA to 45 dBA with a community response with strong appeals to stop the noise and vigorous community reaction with widespread complaints and that communities find that sporadic complaints are

more reasonable. Mr. Ambrose stated if they could design the turbines with this in mind everyone would be much better off and said they could design for that by limiting the size of the turbine. He explained that these turbines are getting so big that they are getting louder and louder but eventually they get so big that they flatten out. He explained that smaller turbines have a smaller footprint and go out less distance. He stated that he has done presentations showing that several smaller towers could give you about 80% of the output that one large tower will give you. He explained that the next chart was on a test of towers in Falmouth Massachusetts where the Courts determined that any tower about 40 dBA was deemed a nuisance. Mr. Ambrose explained that he got a lot of his information from the US EPA- Appendix D, who is the world health organization and their 2009 study for non-wind turbine noise sources 40dBA outdoors, however to prevent sleep interference we are dealing with 30 dBA Lmax indoors. He explained that the EPA and other studies have shown that the envelope of a house there can be a reduction of 10 dBA however there are studies that show that wind turbines and low frequency noise there is much more penetration to get into a structure. He stated that being inside a house does not always provide adequate protection from low frequency noise. He explained that in 1989 the State of Maine changed the nighttime dBA levels to 45dBA adopted for noise in urban areas but Maine is mostly a rural State and this is not sufficient. He explained that because there have been so many complaints from Mars Hill, Freedom, and Vinalhaven they were going to lower it to 40 dBA but compromised and settled for 42 dBA. He explained that he goes out to measure what the community is experiencing. He stated that he went to Falmouth Massachusetts to do some measurements and within 5 minutes of meeting a neighbor of the wind towers there they were invited in to their home to complete some testing. He explained that the family invited them to do their survey in their house, the family packed up their belongings and left them (complete strangers) to have access to their house and this was very strange to have total strangers in someone else's house with all their possessions and they just abandoned it to us. He stated that within 30 minutes of being inside that house he started to feel like he was coming down with the flu or a cold with nausea and a headache. He explained they took their measurements and left the house the next morning to go get some breakfast and he apologized to his friend that he just didn't feel well yesterday and his friend said he felt the same way. He explained that they went back to the house to complete more testing and within 5 minutes they both felt ill again and it persisted until they left. He stated that after staying three days and two nights there, his wife said she noticed it took him about two weeks to return to normal. Mr. Ambrose said that page 23 shows why they felt so ill at their visit. He explained that when the wind speeds went up they felt ill and when the speeds came down they felt better. He explained that it is not the wind speed but the electrical power output that turned out to be the key factor. He stated that the electrical power output tells him how hard the turbine is working, how strong the blades are getting a bite out of the air and they could reduce this by feathering the blades and when they do a compliance test the blades are not being feathered. He explained that we do not hear IS (infrasound) and we sense it and the frequencies for infrasound are from .1 to 20 Hz yet the ones that make him miserable are the ones from the .2 to .8 Hz. He explained if any of us are prone to motion sickness beware. He explained that sleep interruptions, headaches, nausea, stress, heart palpitations, vertigo are all some of the symptoms that people feel while near towers. He explained that page 26 shows the measurement of pascals – unit of pressure – infrasound measurements outdoors and indoor. He explained that these are the perils we have with wind towers getting larger and larger and the blade pass frequency gets lower and lower and you have to be careful as they measure infrasound in the nauseogenic range. (page 27). He explained that he can't investigate wind turbine noise unless there are complaints and many sites there aren't complaints due to contracts. He explained that we have to be very careful when we review wind turbine predictions in applications as they may site proper industry standards but these standards are based on turbines that are tested and measured over flat ground and they only measure average sound power levels with low turbulence and low shear and Maine does not match that as we have hills, mountains and higher terrain with moderate to high turbulence and moderate to high wind shear and wind veer. He explained that wind shear is when the wind speed is greater aloft than it is on the ground and wind veer is when the wind is going at a different direction at a higher elevation. He stated that noise prediction limitations - these are ground based- that the estimated accuracy is +/- 3dB to 1000 meters and no accuracy above 30 meters. He explained that

weather conditions can also impact noise and that there are a lot of factors that can happen that haven't been considered when they calculated the industry standards. He explained that wind speed and wind veer all change with height and you can have a turbine that is above and is going to be at a much higher velocity than at the ground level. He stated that one of the things we need to know is what is the wind speed at the hub height and that the manufacturers do put sensors up there to measure the wind speed.

He explained that wind turbines are high and the sound does not travel across the ground, it comes down from above so it doesn't meet the definition of ground attenuation (page 34) He explained that it disqualifies itself for anything on a mountain, a ridgeline, or a hill so they can't predict or calculate using "G" and they can use an alternate method using A-weighted sound pressure levels over porous or mostly porous ground. He explained that the models end up showing "G" and they should not. He explained that when you get about the 30 meter height (page 36) you are out of bounds and ISO 9613-2 doesn't work and should not be used yet it is consistently used. He stated that lawyers have always told him that they get caught in the details. He explained the red lines on page 37 are showing what the models missed based on measurements and that the industry noise predictions were actually off by 3 to 12 dBA. He stated that there is no such thing as wind masking and that wind is a contaminant and that it is an error that is being introduced and that a wind turbine has a very unique acoustic signature and that we can pick out frequencies easier than loudness. Mr. Ambrose thanked everyone for attending and stated it had been a wonderful opportunity for him to speak to so many people.

Questions from the Committee

Jim St. Germain: You said size is a contributing factor – that the size of the turbine to the hub is a contributing factor. Mr. Ambrose stated it's like the horsepower on an engine..the more horsepower the louder it is. Jim asked what the formula was for sound/distance. Mr. Ambrose stated 60 dB and double it for distance so take a sound level at 50 feet and then give it a number say 70 and at 100 feet it would be 64 and 200 feet would be 58 and 400 feet would be 52 and what you will find with each doubling is a much bigger distance and eventually you'll get to the point that you will be going 2000 to 4000 feet and only get a 6 dB but he would only go out to about 3000 feet as that is the limit to most of the prediction models for accuracy. Mr. Ambrose stated that he is making one assumption dealing with low frequency sound because the attenuation of sound follows the inverse square law except for frequencies above 1000 Hz and we have an added attenuation with distance and it is the interaction of the sound waves with the oxygen molecule. Mr. Ambrose recommended setback distance for audible sound; 10 times the blade diameter minimum and recommended setback distance for infra-sound; 40 times blade diameter minimum.

Becky Secrest: What prompted the State of Maine to do away with the 10 dBA. Mr. Ambrose stated that he has been trying to research what happened and he actually knew someone who was working with the State on this noise regulation who would not give him an answer as to why the State changed this. Mr. Ambrose stated that he has seen drafts of what the ordinance was going to be and it went from 35 dBA to 45 dBA overnight and he feels if they had stayed with the 35 dBA they would have been consistent and why they adopted urban area for the entire State has perplexed him. He stated that rural areas cherish their tranquility, peace and quiet and recommends that regulations go quieter to preserve the quiet in our rural areas.

Jessie Fredrickson: The taller windmills with larger turbines have greater low frequencies and sounds. Mr. Ambrose – yes those big blade generate huge winds and if you go to the website called www.savoysong.com . Mr. Ambrose stated that a lot of times when the wind tower neighbors go quiet they are forbidden from speaking which makes his work really hard. Jessie asked what that means to be forbidden from speaking. Mr. Ambrose stated that they signed good neighbor agreements or what some call gag order with the wind companies and usually there is financial compensation. Jessie stated that they

can then not file any complaints per the contract. Mr. Ambrose stated that they have come to an agreement with the wind company and he can't challenge those agreements, he doesn't care to and respects them but he found that most of the complaints filed in Mars Hill, they no longer talk to him like they used to. Jessie asked if they no longer talk to him because they now have signed agreements. Mr. Ambrose stated that is correct. He stated that he is mostly concerned about those who are prone to motion sickness and as a rule of thumb for audible sound 10 times the blade diameter and for infrasound 40 times the blade diameter just as a starting point.

Dennis Doyon: you were invited to the home in Falmouth Mass., how far was the home from the turbine. Mr. Ambrose stated that it was 1625 feet and said that all of those calculations are in the Bruce McPherson study and it is online for anyone to review and was written as a white paper for the public and is a technical paper and written into it is their narrative of what they were thinking, feeling and what was going on. Mr. Ambrose explained that it was published as a peer review paper. Dennis stated that on a couple of slides the dBA level was 25 to 26 with no wind and asked if there was a dBA factor added when wind was present. Mr. Ambrose stated that wind was false noise and is a contaminant and ruins the measurement.

Jessie Fredrickson: When you had the graph up from Falmouth Mass, (page 20) and you were talking about the limit being 35 but it dBA swinging up to 55 when the turbines were shut off so there is a 20 dBA swing. Mr. Ambrose stated that it is basically 45. Jessie stated that the graph notes almost 55. Mr. Ambrose explained that is when the brakes went on to shut it down so they need to exclude that. Jessie asked if they were supposed to be operating at 35. Mr. Ambrose stated they were not supposed to be operating louder than 37 – the red line on the graph. Jessie asked if that happens frequently in the industry. Mr. Ambrose stated that this is one wind turbine this is one Vesta model. Jessie asked if this is common and that the prediction models are significantly lower than what is actually being measured and heard. Mr. Ambrose explained this is when the complaints start unless there are signed agreements.

Chair Doyon asked if there were any more questions from the Committee. There were none. Someone from the audience asked if they could ask a question and Chair Doyon stated that the Committee was not taking any questions. This is a public meeting not a public hearing. Mr. Ambrose stated that he would make his presentation PDF file available to the Town Manager and folks can contact her for a copy. Mr. Ambrose stated that he would be willing to stay a bit longer to answer questions for folks after the meeting.

Item 5: Set next meeting date - September 7, 2017 - 5:30pm at the Greenwood Town Office

Item 6: Adjourn - Becky Secret motioned to adjourn the meeting at 7:05pm. Seconded by Tyler Bennett. Vote: 7-0. Meeting adjourned.