

**NVDA Wind Study Committee Meeting – November 6, 2013 – 6:30pm Barton Town Office, VT**

In attendance: Jim Greenwood, Robert Croteau, Mark Whitworth, Farley Brown, and David Snedeker (Study Committee and Staff); Dr. David Grass from the VT Dept. of Health (Guest Speaker); and Jennifer Cleveland (Reporter, Orleans County Record).

J. Greenwood opened the meeting, introductions were made, and background and purpose of the study committee was presented.

D. Grass shared that comments for the committee will primarily follow those that he made at the VT State House over February – March 2013. Copies of information he would be speaking on with the committee were distributed. He then spoke of his professional experience with environmental public health, the climate change adaptation program, and school environmental health, and air quality. Related to the study of wind effects on public health, Dr. Grass reviewed peer reviewed public literature that assessed health risks from wind turbines. Dr. Laurie Cregan is Dr. Grass immediate supervisor.

Importantly, Dr. Grass noted that the only complaints that VDOH was investigating were those were the department had been contacted by physicians. Direct complaints to the department from the individuals complaining of health effects from industrial wind turbines have not been investigated. Doctors have visited existing wind turbine project sites, but not the homes of any complainants.

Dr. Grass noted that the noise standards/thresholds utilized in the PSB's CPG process were set by the PSB.

*See #7 and 8 of handouts.*

When asked if noise from wind turbines can cause or lead to health effects, Dr. Grass indicated yes, but the negative health effects are because of the annoyance that is caused. Annoyance levels are higher and happen sooner at the low decibel levels for wind turbines than for other noises at similar levels. The pulsation or modulation of amplitude is higher for a larger percentage of people. Also, low frequency noise penetrates through the atmosphere and buildings better than does high frequency noise.

Dr. Grass noted that epidemiology studies can establish correlations and not causation. Peer-reviewed studies/processes are important because they are reviewed by expert editors. In his review, Dr. Grass noted that most of the peer-reviewed information on wind comes from Europe (5 studies).

*Robt. Dostis (KCW) peer-review literature handout emailed to Dr. Grass on Nov. 26, 2013. In an email reply of 12/13/13, Dr. Grass responded “Yes, this was one of the literature reviews that I read, and the some of the studies referenced were studies I included in my review of the epidemiological literature.”*

Background noise is a determinant as to whether something is annoyance and because the NEK region is one where many people have moved for peace and quiet, the sound of wind turbines may constitute and annoyance.

In response to questioning, Dr. Grass indicated that setback distances are probably not used because the output of the turbines may change over time. There may be more comfort in regulating decibel levels.

The noise findings from the KCW project are going to the VDOH. It was requested that Dr. Grass provide these to the committee, if possible. *Dr. Grass provided sound monitoring information from the Fall and Winter of 2012 (Winter incorrectly listed as 2013).*

For the studies that he reviewed, Dr. Grass noted that noise exposures were estimated through modeling (difficult to obtain actual exposure). The health effects in the studies are also self-reported, which is problematic. The studies did not include objective, individual health measures for those who self-reported. The generation capacity of the turbines in the reviewed studies was not available.

The 2013 Canadian health study will be the largest and most objective study of the effects of wind turbines on health when it is completed. Although the study may be completed by the end of 2014, the information will not have been peer-reviewed until sometime in 2015 at the earliest.

Meeting ended at 8:40pm

Next meeting scheduled for December 4, 2013 at 6:30pm.

*D. Snedeker notes.*

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When a new health issue arises, the DoH tries to figure out what's known about it. That generally involves a literature search.

In the case of turbine-related illnesses, the literature search turned up only five relevant studies and each of them is flawed. The flaws that David noted were:

1. Five is an insufficient number of studies.
2. Noise exposure is estimated (rather than measured).
3. Health effects are self-reported by study participants.
4. No physiological measurements were taken.
5. The studies did not report the sizes of the turbines whose effects were being investigated.

David has no first-hand experience of the conditions that turbine neighbors complain of. He is not sure that others from DoH have visited the families that are reporting illness. He thinks it would be a good idea for DoH to do so because it would contribute to the Department's body of knowledge.

David would be willing to spend a week, with his family, living in a home whose residents had reported negative health effects.

DoH wants to hear from the physicians who attend sick neighbors, not from the sick neighbors. He believes that only two physicians have reported ill health effects. There are currently no health alerts in place that would encourage doctors to report illness that might be related to turbine operations.

David believes that DoH is very responsive to reports of health issues, but he is unsure of what response the Department has made to reports of turbine-related illnesses.

It was noted that the state's summary opinion on health impacts is limited to audible noise (the document is entitled, "Potential Impact on the Public's Health from Sound Associated with Wind Turbine Facilities.")

The state did not consider other turbine effects that might impact health. David suggested that shadow flicker might be such an effect.

David said that there was a qualitative difference between turbine noise and other types of noise (e.g., waves, traffic, etc.). He noted that the low frequency noise produced by turbine operations has different effects on people and has different characteristics (e.g., attenuation, the wave effects within a room, etc.).

We discussed the relationships among noise, sleep disturbance, annoyance, and negative health impacts. The Department holds these positions:

- There is no direct link between turbine noise and ill health.
- There is a direct link from turbine noise to sleep disturbance and annoyance.
- There is a direct link from sleep disturbance and annoyance to ill health.
- Therefore the link between turbine noise and ill health is indirect.

The indirect nature of the link between turbine noise and ill health is important to DoH because the Department contends that the sleep disturbing effects can be mitigated somehow. It was not clear how the effects could be mitigated or if attempts were being made in Vermont to mitigate them. This does not appear to be an interest of the Department.

The Department contends that the state's noise standards are protective of sleep, health, and quality of life. The standards apply to noise inside and outside and make use of hourly averages. David acknowledged that a deafening noise followed by 59 minutes of silence would comply with standards.

It was not clear how the standards were derived or how they were demonstrated to be protective. It was also unclear how useful the standards could be, in the absence of continuous sound monitoring.

David said that some researchers claimed to be able to "control for annoyance" and that by doing so, they could apportion health effects between sleep disturbance and annoyance. This apportionment seems highly speculative. In fact, the model developed by another set of researchers showed sleep disturbance and annoyance operating in a feedback loop.

We discussed the potential for infrasound to produce negative health effects. It is the position of the Department that inaudible infrasound produces no effects and that audible infrasound produces effects through the same indirect means as other audible noise. David contends that this has been demonstrated by laboratory tests.

We recalled that Steve Therrien reported that it was only months after the Sheffield turbines began operating that he began to suffer ill effects. If infrasound were the cause of Steve's illness and if it took months of exposure to produce the illness, some of us doubted that these effects could be produced in a laboratory test. This led us to question the applicability of the research. David agreed to send us a report of the research. *On 11/12/13, Dr. Grass sent a copy of a report on infrasound.*

David also agreed to tell us how many individuals and how many doctors had reported turbine-related illness to the Department. In an email from 11/13/13, Dr. Grass replied

*“The total number of health care providers who have contacted us regarding patients who were concerned about the effects of wind turbines on their health is three. The total number of patients concerned is six.”*

*M. Whitworth notes.*