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NH SUPREME COURT

**STATE OF NEW HAMPSHIRE
SUPREME COURT**

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No. 2017-0313

**MARY ALLEN, BRUCE AND BARBARA BERWICK, RICAHRD AND LORANNE
BLOCK, ROBERT CLELAND, KENNETH HENNINGER, JILL FISH, ANNIE
LAW, JANICE LONGGOOD, MARK AND BRENDA SHAEFER, STODDARD
CONSERVATION COMMISSION AND WINDACTION GROUP, APPELLANTS**

FREDERICK WARD, CO-APPELLANT

V.

NEW HAMPSHIRE SITE EVALUATION COMMITTEE

**ANTRIM WIND ENERGY
INTERVENOR**

CO-APPELLANT'S REPLY BRIEF

**MANDATORY APPEAL PURSUANT TO
SUPREME COURT RULE 7**

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ARGUMENT

I. UNSOUND MODELING

The Brief of Antrim Wind Energy contends that the Co-Appellant claims only one “technical error” in the SEC’s Order, in that the Sound Assessment inappropriately used a G-Factor of 0.5 and failed to adjust for modeling accuracy. Site 301.18(c) “Sound Study Methodology” states:

- (c) The predictive sound modeling study shall:
 - (1) Be conducted in accordance with the standards and specifications of ISO 9613-2 1996-12-15, available as noted in Appendix B;
 - ...
 - (3) Include predictions to be made at all properties within 2 miles from the project wind turbines for the wind speed and operating mode that would result in the worst case wind turbine sound emissions during the hours before 8:00 a.m. and after 8:00 p.m. each day; and
 - (4) Incorporate other corrections for model algorithm error to be disclosed and accounted for in the model.

It is undisputed by all that the O’Neal utilized a ground attenuation factor of 0.5. According to ISO 9613-2 1996-12-15, in Section 7.3.1 “General Method of Calculation”:

Ground Attenuation, A_{gr} , is mainly the result of sound reflected by the ground surface interfering with the sound propagating directly from source to receiver. The downward-curving propagation path (downwind) ensures that this attenuation is determined primarily by the ground surfaces near the source and near the receiver. **This method of calculating the ground effect is applicable only to ground which is approximately flat, either horizontally or with a constant slope.** [Emphasis supplied.] Co-Appellant’s Appendix at 32.

This theoretical limitation is further reiterated in ISO 9613-2:1996(E), Section 9 “Accuracy and Limitations of the Method”:

There are also a substantial number of limitations (non-meteorological) in the use of individual equations. Equation (9) is, for example, limited to approximately flat terrain. Id. at 40.

There is no “battle of the experts” in this regard. It is clear pursuant to the black letter of ISO 9613-2:1996(E) that O’Neal’s Sound Assessment does not accord with the standards and specifications of ISO 9613-2 1996-12-15. The “technical error” here is that the SEC approved a certificate on the basis of a Sound Assessment that did not comply with the SEC’s own minimal regulatory standards, which entailing that “technically” the Applicant failed to meet its burden of proof and that the SEC’s approval was in error.

The error was material as well in as much as O’Neal predicted that the project would be 2 dB below the nighttime noise threshold, and taking out O’Neal’s assumptions about G would result in an increase of 3 dB, rendering the application over the legally permitted limit. Certified Record, Vol. I, Bk. 1 at 590-2; Vol. I, Bk. 2 at 2295; Vol I., Bk. 5 at 4724-4730; Vol. II, Bk. 1 at 579-593.

O’Neal’s Sound Assessment also failed to include “other corrections for model algorithm error to be disclosed and accounted for in the model”. ISO 9613-2 1996-12-15 Section 9 provides a table for estimating the range of uncertainty between the theoretical model and the actual observed sound measurements. While it is true that the estimate range of uncertainty is only given for mean heights of no greater than 30 meters and a distance no greater than 1000 meters, the SEC rules specifically requires inclusion of other corrections for algorithm errors. However, the Applicant fails to note that this also entails that ISO 9613-2 was not scientifically appropriate for assessing the sound effects of the project, given the extreme height of the sound sources, the uneven terrain, and the low frequency/highly penetrative sound waves in the 0-31.5 Hz range, all of which fall outside the theoretical limitations of the model. ISO 9613-2 1996-12-15 at § 9; Certified Record, Vol. II, Bk. 1 at 588-9. It is absurd that a model intended to model a sound source emitting mid-range sound waves at a minimum of 63 Hz and a receiver on a level plane that differ no more than 30 meters in height

and 1000 meters away would not require adjustment when modeling a sound source emitting highly penetrative, low frequency sound between 0-31.5 Hz, hundreds of meters above the receiver and up to two miles away. Adding a provision for uncertainty would result in an additional increase of at least 3 dB, rendering the application over the legally permitted limit.

Last, it is clear that O'Neal's Sound Assessment does not provide a "worst case" as required by the rules. According to ISO 9613-2 1996-12-15, in Section 7.3.1 "General Method of Calculation":

- a) **Hard ground**, which includes paving, water, ice, concrete and other ground surfaces, having a low porosity. Tamped ground, for example, as often occurs around industrial sites, can be considered hard. For hard ground $G = 0$.
- b) **Porous ground**, which includes ground covered by grass, trees, or other vegetation, and all other ground surfaces suitable for growth of vegetation, such as farming land. For porous ground, $G = 1$.
- c) **Mixed ground**: if the surface consists of both hard and porous ground, then G takes on values ranging from 0 to 1, the value being the fraction of the region that is porous.

It is clear that during the winter months, the ground will be frozen, entailing a low porosity. O'Neal's assumption of a $G = .5$ is not justified in winter months, and is not a "worst case". In any event, anticipating significant "ground absorption" between a sound source on a high ridge and a residence in direct line of view, without any vegetation or other materials impeding the direct transmission of sound is not justified in any season. Moreover, assuming a $G = 0$ would result in the model predicting noise levels exceeding the nighttime standards.

II. SHADOW FLICKER

The same kind and quality of methodological errors were evident in O'Neal's preconstruction analysis of shadow flicker. O'Neal used the average "percent sunshine" to account for the effects of clouds in reducing the potential, astronomical, hours of shadow flicker to the actual hours. Certified Record, Vol. I, Bk. 5 at 3533; Vol. II, Bk. 2 at 2325-2326; Vol. II, Bk. 3 at 2389-2417. O'Neal's choice

of these data for this purpose is scientifically invalid, as it falsely assumes that the percent of sunshine was directly and inversely related to the degree of cloudiness, when in fact the two measurements have a much different relationship, especially at times when the sun is visible through clouds. Certified Record, Vol. II, Bk. 2 at 2325-6. The error here is analogous to using data for barometric pressure in a model of temperature-based effects. Granted, there is some relationship between barometric pressure and temperature, but a competent meteorologist would not substitute barometric pressure readings in the place of temperature readings¹. Given that empirical measurements of percent cloudiness are available, there is no empirical justification for using an indirect (and inaccurate) measure for percent cloudiness. However, by using percent sunshine, O'Neal did succeed in drastically underestimating the incidence of shadow flicker caused by the Project. Certified Record, Vol. II, Bk. 5 at 3539-3540. O'Neal's analysis also underestimated the incidence of shadow flicker by failing to account for changes in the apparent size of the sun caused by translucent clouds. Shadow flicker is more frequent when the conditions of high, thin clouds enlarge the apparent size of the solar disk, creating more hours of shadow flicker. The methodological flaws were further compounded by using averages for cloud cover, when in fact wind blowing from the east results in much more cloud than westerly winds. Certified Record, Vol. II, Bk. 5 at 575-6. Perhaps not coincidentally, all the above methodological flaws resulted in the underestimation of the shadow flicker resulting from the project.

III. MITIGATION TESTIMONY

The SEC failed to consider the effectiveness of proposed mediation measures. According to Site 301.14 Criteria Relative to Findings of Unreasonable Adverse Effects:

(f) In determining whether a proposed energy facility will have an unreasonable adverse effect on public health and safety, the committee shall:

¹ Given the issues concerning the validity of the Sound Assessment and the Shadow Flicker Assessment, the soundness of O'Neal's representations concerning the ability to mitigate adverse public health effects stemming from the project brought little reassurance to the Co-Appellant.

(1) For all energy facilities, consider the information submitted pursuant to Site 301.08 and other relevant evidence submitted pursuant to Site 202.24, the potential adverse effects of construction and operation of the proposed facility on public health and safety, the effectiveness of measures undertaken or planned to avoid, minimize, or mitigate such potential adverse effects, and the extent to which such measures represent best practical measures;

Given that the actual specifics on shadow flicker mitigation measures were filed at the end on the last day of the public hearings on November 7, 2016, and never the subject of discussion by the SEC Subcommittee, the Subcommittee failed to deliberate the “effectiveness of measures undertaken or planned to avoid, minimize or mitigate” measures or whether “such measures represent best practical measures” contrary to their own administrative rules. Antrim Wind Energy Brief at 41. Antrim Wind Energy in its Brief does point to several places in the record where typical hand-waving concerning Siemen’s shadow control technology occurred, although these events took place prior to AWE actually submitting any specifics to the Subcommittee. *Id.* A review of the transcript of deliberations cited by Antrim Wind Energy yields no mention of “best practical measures” or “effectiveness of measures”. Antrim Wind Energy Brief at 42; AWE Appendix at 1196-1234. Given that concerns relating to shadow flicker triggering epileptic seizures are in part responsible for shadow flicker restrictions, a review of the transcripts of deliberations fails to reveal mention of the word “epilepsy”, nor discussion of the effectiveness of mitigation to address this adverse effect.

It is true that the Subcommittee put in place conditions to monitor postconstruction shadow flicker and noise, and efforts to mitigate those effects, but the Subcommittee failed to consider whether those methods would be effective or whether they represent the best practical measures (in contrast to significantly reducing the scope of the project), or the public health impacts in relation to epilepsy or other health conditions.

“Evidence” of noise mitigation consisted of testimony from O’Neal that amounted to hand waving. No discussion of the economic impact of the mitigation measures on the fiscal feasibility of the project was considered. There is no evidence in the record that the Subcommittee did its job with

respect to mitigation measures, which given the fundamental flaws in the sound assessment and the finding of significant preconstruction shadow flicker in excess of allowable thresholds, calls the soundness of the SEC Subcommittee's decision into question.

IV. VISUAL IMPACT

The problem with Raphael's Visual Assessment was self-evident in his exchange with Dr. Fred Ward, contained in the Certified Record, Vol. II, Bk. 3 at 2704-43. On cross examination by Ward, Raphael was shown a number of cards of different sizes, which were held at different heights above the heads in the room, and which were held static and moving. Raphael disingenuously refused to acknowledge that the size, height, or the fact that the object was moving enhanced the visual impact of the cards. For Raphael, the character "A" does not have more visual impact than the character "a". This was not a "battle of the experts", any more than a "battle" between an "expert" who denies the existence of the law of gravity and a competent physicist. Nowhere in AWE's Brief is an argument advanced that size, height, and motion do not increase visual impact, the point is simply ignored, as it was by the SEC Subcommittee.

The daytime visual impact of this facility cannot be judged without considering its huge size, extreme isolation and height above an exposed ridge, which the SEC Subcommittee refused to acknowledge in their deliberations. The facility will also have significant visual impact at night, with or without flashing lights, being brightly lit on the 15-hour-long moonlit nights of winter, with bright reflections off the winter snow and ice cover. The fact that the proposed energy system seeks a night lighting system that will only turn on when a plane approaches does not solve the problem of night-time visual impact without additional information regarding how many planes on a given evening may trigger the lighting system, and how sensitive the system is to approaching planes and other possible atmospheric triggers. SEC Subcommittee failed to deliberate over the night time visual impact of the

facility, and failed to make an inquiry as to how often and for how long the night time lighting system will engage.

Conclusion

There were six issues raised by the Co-Appellant throughout the course of the hearings in connection with this application: i.) daytime visual impact; ii.) nighttime visual impact; iii.) the faulty preconstruction sound assessment, iv.) preconstruction shadow flicker assessment employing the wrong meteorological data, v.) a lack of deliberations concerning the effectiveness and appropriateness of proposed noise mitigation, vi.) a lack of deliberations concerning the effectiveness and appropriateness of propose shadow flicker mitigation. The SEC Subcommittee failed to deliberate over the impact of size, height, and motion on visual impact, and AWE's Brief fails to argue or address the impact of size, height, and motion on visual impact. The SEC Subcommittee failed to deliberate over the night time visual impact, and AWE's Brief does not deny or refute the nighttime impacts of the project, or the SEC Subcommittee's failure to require any kind of estimate as to the frequency of night lighting due to airplanes or rates of false positives as a result of atmospheric interference. The SEC Subcommittee failed to deliberate over the clear empirical flaws in the Sound Assessment and the Shadow Flicker analysis, and the AWE Brief simply posits an argument counseling deference to the authority of O'Neal as an expert, and not a justification of his deviation from the clear letter of ISO 9613-2 1996-12-15.. The SEC Subcommittee failed to deliberate over the use of the wrong empirical data in the model of Shadow Flicker, and the AWE Brief counsels deference to authority rather than a meteorological justification for using the wrong empirical data in O'Neal's work product. The SEC Subcommittee failed to deliberate over the effectiveness of mitigation technologies or whether those measures constituted the best measures. The AWE Brief notes brief discussions over mitigation technologies, but cannot cite a single instance where there was deliberation over the effectiveness of the mitigation or whether mitigation represented the "best practice measures", despite

administrative rules requiring such determination. These omissions suggest the AWE did not have any substantive basis to contest the Co-Appellant's assertions of error.

The Applicant failed to meet its burden of demonstrating the public health impacts of noise and shadow flicker due to the flawed and faulty studies it produced. The SEC Subcommittee failed to deliberate over these issues, and failed the public in approving the project without sufficient evidence that the project would not have adverse aesthetic and public health impacts, as well as failed to insure that mitigation methods would prove both appropriate and effective.² The result of this proceeding calls into question the function of the SEC in approving applications. If Applicants can present flawed and erroneous assessments that are accepted at face value by the SEC, without any discussion or deliberations over the gross methodological problems raised in public hearings, and the Applicant promises to mitigate any adverse public health resulting from the project, also accepted at face value by the SEC without consideration of the effectiveness or appropriateness of mitigation, then the SEC would appear to add nothing of value to the regulatory approval process, and is entitled to no deference from this Court.

WHEREFORE, for all the reasons set forth above, Appellant respectfully requests that this Honorable Court:

- A. Declare the Action of the SEC Subcommittee void ab initio; in the alternative;
- B. Revoke the Certificate of Site and Facility;
- C. Remand for Reconsideration of the Application Consistent with the Court's Decision;
- D. For such other and further relief as may be equitable and just.

² The Applicant notes significant supporters from the community in its footnote 1, but fails to note that the day after the last day of the hearing, its supporters from the legislature were removed from office and replaced by legislators with a more critical and informed views on the project. The Applicant fails to note that the Town of Stoddard opposed the project, and the center of Stoddard is closer to the project than the center of Antrim.

Respectfully submitted,

by his attorneys
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Dated: December 15, 2017

By: 

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CERTIFICATE OF SERVICE AND REQUEST FOR ORAL ARGUMENT

I hereby certify that copies of the foregoing Brief was mailed first class on this ____ day of November, 2017 to Counsel for the Site Evaluation Committee, Michael J. Iacopino, Esq. of Brennan, Caron, Lenehan & Iacopino, 85 Brook St., Manchester, NH 03104, and Counsel to Antrim Wind Energy, Barry Needleman, Esq., Rebecca S. Walkley, Esq., and Wilbur A. Glahn, III, Esq. of McLane, Graf, Raulerson & Middleton, 11 South Main St., Suite 500, Concord, NH 03301, and Counsel to the Appellants, Eric A. Maher, Esq. of Donahue, Tucker & Ciandella, PLLC, 225 Water Street, Exeter, NH 03833 and and Counsel for the Public, Mary Maloney, Esq., of New Hampshire Attorney General, 33 Capitol St., Concord NH 03301-6397, and Justin C. Richardson, Esq. of Upton and Hatfield, LLP, 10 Centre Street, PO Box 1090, Concord NH 03302-1090.

The Co-Appellant respectfully requests oral argument before the full Court, and time to address the Court, not to exceed 15 minutes.



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