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June 7, 2021

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**Subject: Rand Complaint Response Noise Survey – 3/18/21 to 4/9/21  
Antrim Wind Energy, Antrim, NH**

Dear Mr. Mollasalehi:

Epsilon Associates, Inc. (Epsilon) is in receipt of the "Complaint Response Noise Survey" letter written by Mr. Robert Rand dated May 11, 2021 ("Rand letter"). The Rand letter summarizes a sound level measurement program conducted from March 18 to April 9, 2021 at the Berwick home on Reed Carr Road in Antrim, NH. My thoughts and observations relative to the Rand letter are provided below.

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As a threshold matter, the Rand letter does not establish a valid noise complaint because it fails in many material respects to comply with the SEC rules for post-construction sound monitoring (see Site 301.18.e; Site 301.18.f; Site 301.18.g). Furthermore, it is inconsistent with the methodologies previously used and accepted by the SEC for sound level compliance testing on other NH wind energy projects.

NH SEC Rule Site 301.18.e requires that monitoring include periods with the wind turbines in both operating and non-operating ("background") mode. This was not done during the Rand testing period. Non-operational ("background") sound measurements are an important tool to determine how much of the total measured sound is due to the wind turbines and how much is due to other, non-wind turbine sources (wind itself; vehicular traffic; rustling trees; etc.). Mr. Rand's failure to comply with this basic SEC requirement renders his conclusions meaningless since there is no basis for differentiating turbine noise from other noise.

Specifically, if one examines Figures 5, 6, 7, and 8 in the Rand letter, these are instantaneous plots of "total" sound—some portion of the total is likely from the wind

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turbines but some portion is certainly from other sources. This is especially important in the case of the “spikes” which are one-eighth (0.125) of a second in duration and could easily be due to a gust of wind or some other, non-turbine related source. The ground-level anemometer located nearby collected wind speed in 10-second averages. In other words, one wind speed is supposed to be representative of 80 different sound levels (10 seconds x 8 sound measurements/second). This is not accurate and not a proper representation of pairing sound data with wind data.

NH Site 301.18.g requires each period of time during a post-construction monitoring program to include the following measurements:

- LAeq; LA-10; LA-90
- LCeq; LC-10; LC-90

The Rand letter did not provide this required information. The SEC rules require these measurements because they provide a clearer picture of how much the sound source of interest is the primary contributor to the total sound at the measurement location(s) of interest. Statistical metrics like the LA-90 and LC-90 minimize the influence of background sound level fluctuations due to other non-wind turbine sources. In addition, the SEC obviously felt these sound level descriptors were important since the same six parameters are required to be measured during the pre-construction baseline sound survey under SEC rules (see Site 301.18(b)(8)). Without them, one has an incomplete picture of sound levels due to just the wind turbines.

Not only did the Rand letter not supply the required information, but it is both improper and impossible to use a one-eighth second compliance period<sup>1</sup> AND also comply with Site 301.18.g. According to ANSI S12.9-2013 Part 3 (the national standards upon which the SEC rules are based), compliance with Site 301.18.g requires the use of a basic measurement period. This basic measurement period is recommended to be one hour for total sound and 10 minutes (or more) for background. Without going into the engineering detail here, suffice it to say for purposes of this letter that it is not possible to calculate LA-10, LA-90, LC-10, and LC-90 from one-eighth of a second measurements.

In sum, the Rand letter fails to validate the noise complaint. The flaw in the Rand approach goes back to the basic point that it is wrong to use one-eighth of a second sound measurement data alone to try and determine compliance with the SEC’s sound standard.

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<sup>1</sup> As explained previously, the correct compliance period under the SEC rules is not one-eighth of a second. See Letter to Mr. Jean-Francois Latour, TransAlta Corporation, from Epsilon Associates, Inc. dated March 22, 2021.

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The one-eighth of a second sound measurement data simply provides the starting point for a multi-step analysis to determine compliance with the sound standard; the one-eighth second sound measurement data is not an end in itself for determining compliance with the standard.

If you have any questions on this letter, please feel free to call me at (978) 461-6236, or e-mail me at [roneal@epsilonassociates.com](mailto:roneal@epsilonassociates.com).

Sincerely,

EPSILON ASSOCIATES, INC.

A handwritten signature in black ink that reads "Robert D. O'Neal". The signature is written in a cursive style with a large, stylized 'R' and 'O'.

Robert D. O'Neal, CCM, INCE Bd. Cert.  
Managing Principal