

BEFORE THE  
NEW YORK STATE BOARD ON ELECTRIC GENERATION  
SITING AND THE ENVIRONMENT

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In the Matter of

APPLICATION OF CASSADAGA WIND LLC FOR A  
CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND  
PUBLIC NEED TO CONSTRUCT A MAJOR ELECTRIC  
GENERATING FACILITY IN THE TOWNS OF CHARLOTTE, CHERRY CREEK,  
STOCKTON, AND ARKWRIGHT, NEW YORK.

CASE NO. 14-F-0490

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**NYS Department of Health Staff Initial Post-Hearing Brief**

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NEW YORK STATE BOARD ON ELECTRIC  
GENERATION SITING AND THE ENVIRONMENT

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IN THE MATTER OF:

Case No. 14-F-0490

Application of Cassadaga Wind LLC for a Certificate  
Of Environmental Compatibility and Public Need to  
Construct a Major Electric Generating Facility in the  
Towns of Charlotte, Cherry Creek, Stockton and  
Arkwright, New York

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**NEW YORK STATE DEPARTMENT OF HEALTH STAFF  
INITIAL POST-HEARING BRIEF**

**I. INTRODUCTION**

This brief is submitted on behalf of New York State Department of Health Staff (“DOH Staff”) regarding the application of Cassadaga Wind LLC (“Applicant”) for a Certificate of Environmental Compatibility and Public Need (“Certificate”) to construct and operate a commercial scale 126 megawatt (MW) wind energy project, following the evidentiary hearings held on July 17, 2017 through July 24, 2017. The project is proposed to be located within the towns of Charlotte, Cherry Creek, Arkwright, and Stockton in Chautauqua County.

DOH Staff are participating as a statutory party in this Public Service Law (“PSL”) Article 10 proceeding and offer this brief in support of the New York State Board on Electric Generation Siting and the Environment (“Siting Board”) granting an Article 10 Certificate pursuant to PSL § 168(3), provided that the health-based design goals and regulatory limits for noise proposed by DOH Staff in testimony and incorporated into the Applicant’s revised proposed certificate conditions for the Cassadaga Wind Project (Ex. 97) be included in the final

certificate conditions. As set forth in greater detail below, DOH Staff believe that the weight of evidence presented in pre-filed testimony and at evidentiary hearings supports a finding that the adoption of these design goals and regulatory limits is a necessary condition for determinations to be made by the Siting Board in favor of granting an Article 10 Certificate.

Pursuant to the directive of the presiding examiners in this case, this brief adheres to a common Table of Contents that all parties are to follow, to the extent possible. However, many of the subjects included in the Table of Contents fall outside the jurisdiction or expertise of the Department of Health, or are not otherwise disputed by DOH Staff. As such, DOH Staff did not offer any testimony on the issues contained in these sections. To conform to the common Table of Contents, these sections will be intentionally left blank.

## **II. THE LEGAL BACKGROUND**

Article 10 of the PSL provides for a comprehensive review of environmental and public health impacts and the issuance of a Certificate as a precondition to the siting of a major electric generating facility, *i.e.*, a facility with a generating capacity of twenty-five thousand kilowatts or more (PSL § 160(2)). Authority for the prescribed review and issuance of a Certificate is invested in the Siting Board which, *inter alia*, must make “explicit findings regarding the nature of the probable environmental impacts of the construction and operation,” prior to issuing a Certificate (PSL § 168(2)). More specifically, the Siting Board must determine that any “adverse environmental effects of the construction and operation of the facility will be minimized or avoided to the maximum extent practicable” (PSL § 168(3)).

As it relates to environmental impacts, Article 10 supersedes and replaces the requirements of the State Environmental Quality Review Act (“SEQRA”). However, the

language of Article 10 closely mirrors that of SEQRA, which requires that Agencies act or choose alternatives that “to the maximum extent practicable, minimize or avoid adverse environmental effects” (Environmental Conservation Law § 8-0109(1)). As such, case law interpreting SEQRA provides a guide to the relevant standards of review that should be applicable to environmental impacts under Article 10.

In particular, under SEQRA, having identified a project’s potential environmental impact, an agency must take a "hard look" at the proposal before making its final determination and must set forth a reasoned elaboration for its determination (*see, e.g., Merson v. McNally*, 90 N.Y.2d 742, 752-753 (1997)). Further, the agency must examine the ways in which adverse effects might be minimized, but SEQRA (and by extension, Article 10), does not require the imposition of “every conceivable mitigation measure, or any particular one” (*see, e.g., Jackson v. N.Y. State Urban Dev. Corp.*, 67 N.Y.2d 400, 421-22 (1986)). Rather, mitigation is required only to the “maximum extent practicable,” consistent with other statutory and policy goals (*Id.*).

Finally, in rendering a decision granting a Certificate, the Siting Board may, in its discretion, grant the application upon such terms and conditions for the construction or operation of a facility as the Siting Board may deem appropriate. Such terms and conditions are to be monitored, administered and enforced by the Department of Public Service (PSL § 168(4)).

### **III. PUBLIC INVOLVEMENT**

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### **IV. PROCEDURAL ISSUES**

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**V. BENJAMIN R. BRAZELL SUR-REBUTTAL**

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**VI. EVIDENTIARY HEARING ISSUES**

Subsections A through I are intentionally left blank.

**J. EXHIBITS 15 – PUBLIC HEALTH AND SAFETY AND  
EXHIBIT 19 – NOISE AND VIBRATION**

Project Design Goals and Regulatory Limits for Noise

The Cassadaga Application and testimony provided at the evidentiary hearing discussed a number of potentially significant environmental impacts. As the Article 10 statutory party charged with protecting and promoting public health, DOH Staff focused testimony on one principal environmental impact with consequences for public health; specifically, noise.

Modern wind turbines typically emit audible noise at power levels of over 100 “A-weighted” decibels (dBA), with the loudest turbines considered for the Cassadaga Wind Project reaching 108.7 dBA (Ex. 22 at pp. 13-14). Noise pressure levels diminish with distance from the noise source, although turbine noise can be perceptible at nearby residences and other receptors. Health effects related to noise, recognized by authoritative bodies, such as the World Health Organization (WHO), include “any temporary or long-term impairment of physical, psychological or social functioning” (Ex. 62 at p.428) such as “annoyance, sleep disturbance, cognitive performance reduction, effects on social behavior, cardiovascular effects and psychophysiological effects (*e.g.*, noise induced stress reaction)” (Tr. 1478-1479, *see also* Ex. 62 at pp.

458-463). Some health effects such as cardiovascular effects are associated with higher levels of noise, while others such as annoyance and sleep disturbance are associated with lower levels (*Id.*).

In direct testimony, Henry M. Spliethoff, a member of DOH Staff, provided recommendations for the most appropriate noise level guidelines, for this and other wind projects. Those recommendations were to limit outdoor nighttime noise levels at permanent and seasonal non-participating residences and other sensitive sound receptors to a nighttime annual average (“ $L_{\text{night, outside}}$ ”) of 40 dBA, and a maximum eight-hour night average (“ $L_{\text{Aeq}}$ ” or “maximum L(8)”) of 45 dBA (Tr. 1480). Mr. Spliethoff further testified that potential benefits to individuals could, in some circumstances, offset the risk of higher noise levels; as such, “participating residences”<sup>1</sup> could be subject to a higher annual average nighttime noise design goal such as 50 dBA ( $L_{\text{night, outside}}$ ), and its one night equivalent (i.e., as a regulatory limit) of 55 dBA ( $L_{\text{Aeq}}$ ) (Tr. 1487).

These recommended design goals and regulatory limits are based upon guidelines published by the World Health Organization (“WHO”): *Guidelines for Community Noise* (1999) (“WHO 1999”) and *Night Noise Guidelines for Europe* (2009) (“WHO 2009”) (Tr. 1478). The WHO is an established public health organization and authoritative body, routinely relied upon by state and federal public health agencies as a reliable source of guidance (Tr. 1485). WHO 1999 and WHO 2009 were the products of international working groups of public health experts with backgrounds in the evaluation of noise, who conducted reviews of scientific studies and literature to produce health-based audible noise guidelines to protect the public. WHO 2009

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<sup>1</sup> “Participating residences” are those residences where the property owner has signed a contractual agreement with the Applicant, and receives a financial benefit in the form of lease or other payments.



stated that there is sufficient evidence for biological effects of noise during sleep, including increases in heart rate, arousals, sleep state changes and awakening, and specifically addressed the most vulnerable groups such as children, the chronically ill and the elderly. WHO's work represents a consensus among experts and stakeholders from government, industry and non-governmental organizations (Tr. 1481).

WHO 1999 established a nighttime noise guideline for outside noise averaged over a single night of 45 dBA ( $L_{Aeq}$ ), based upon the level above which the adverse health effect of sleep interruption begins to occur (*Id.*, *see also* Ex. 62 at p.479). This guideline was recommended in DOH testimony for a one night (i.e., regulatory) limit for all permanent and seasonal non-participating residences and other sensitive receptors. WHO 2009 established a nighttime guideline for outdoor noise of 40 dBA ( $L_{night, outside}$ ) averaged over a year, based on their review of dose response relationships and identified effects thresholds (Tr. 1481, *see also* Ex. 62 at p.691).<sup>2</sup> WHO 2009 established the 40 dBA ( $L_{night, outside}$ ) guideline at the level it identified as the lowest-observed-adverse-effect level ("LOAEL") for harmful health effects related to sleep disturbance; below 40 dBA, WHO concluded that there was not sufficient evidence of effects harmful to health (Tr. 1482). This guideline was recommended in DOH testimony as a design goal for all permanent and seasonal non-participating residences and other sensitive receptors. In addition to this guideline, WHO 2009 identified other thresholds including 50 dBA ( $L_{night, outside}$ ), the LOAEL for the more serious noise-related health effects of hypertension and myocardial infarction (*Id.*). This threshold was recommended in DOH testimony as a design goal for participating residences. In order to have regulatory limits that are

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<sup>2</sup> Note that WHO 2009 was intended to supplement, but not replace, WHO 1999.

enforceable through post construction monitoring, the one night equivalent of 50 dBA ( $L_{\text{night, outside}}$ ), or 55 dBA ( $L_{\text{Aeq}}(8)$ ), was proposed as a regulatory limit for participating residences in DOH testimony.

DOH Staff reviewed numerous other peer reviewed research articles and reports, and did not discover any other transparently derived and sufficiently supported health-based guidance values or thresholds for environmental noise that were based on objective review of data (Tr. 1485).

The WHO 1999 and 2009 nighttime noise guidelines of 45 dBA  $L_{\text{Aeq}}(8)$  and 40 dBA ( $L_{\text{night, outside}}$ ), respectively, were supported as appropriate regulatory limits and design goals for all non-participating residences by the Department of Public Service (See Tr. 2219 and Ex. 52 at p.154) and by the Applicant (Tr. 1932-1934). Furthermore, in response to DOH testimony, the Applicant agreed to revise proposed regulatory limits in Certificate Conditions to “[c]omply with a maximum noise limit of 45 (dBA) Leq (8-hour) nighttime” at all seasonal and permanent non-participating residences, and “55 (dBA) Leq (8-hour) nighttime for any participating residence” (Ex. 97 at para. 68(a)). The Applicant has further committed to non-regulatory design goals of 40 dBA ( $L_{\text{night, outside}}$ ) for all permanent and seasonal non-participating residences, and 50 dBA ( $L_{\text{night, outside}}$ ) for participating residences (Ex. 97 at para 69(b)).<sup>3</sup> These regulatory limits and non-regulatory design goals are directly equivalent to those based on the WHO 1999 and 2009 guidelines proposed in DOH testimony.

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<sup>3</sup> DOH Staff understands that the annual average guidelines established by WHO 2009 are appropriate as design goals but may not be appropriate regulatory limits because the year-long noise monitoring would present a practical obstacle to effective compliance monitoring.

The appropriateness of the WHO 1999 and WHO 2009 guidelines proposed in DOH testimony for noise limits for wind turbines was questioned only in rebuttal testimony by Dr. Jerry L. Punch, submitted on behalf of Concerned Citizens of the Cassadaga Wind Project. Dr. Punch recommended a single nighttime noise limit of 40 dBA over one night ( $L_{Aeq}(8)$ ) for non-participating residences, whereas DOH recommended a limit of 45 dBA over one night ( $L_{Aeq}(8)$ ) and design goal of 40 dBA over one year ( $L_{night,outside}$ ) for these residences. Although DOH has no objection to a noise limit lower than its recommendation, it is unclear whether there would be any additional public health benefit at this lower level. Furthermore, DOH disagrees with certain assertions made by Dr. Punch in support of this lower limit.

Dr. Punch asserts that “[t]he more recent WHO guidelines state that good-quality evidence is available to show that noise consisting of a large proportion of low-frequency components should be limited to below 40 dBA outdoors at night to minimize self-reported sleep disturbance and the considerable burden of disease that can stem from chronic sleep disturbance. This is a reaffirmation of the warnings issued by the WHO in earlier guidelines...” (Tr. 1649). DOH disagrees with this characterization of the WHO Guidelines. In particular, the more recent WHO 2009 Guidelines do not discuss the proportion of low frequency noise or its potential impact on any noise limit. In fact, little mention of low frequency noise is made other than in summaries of some animal studies. WHO 2009 does recommend that audible noise be limited to 40 dBA on an annual basis, which is the same as DOH Staff’s recommendation and which the applicant has adopted as a design goal.

Dr. Punch also refers to statements in WHO 1999 recommending a one night indoor noise guideline lower than 30 dBA — which WHO 1999 and WHO 2009 consider the indoor equivalent of an outdoor noise level of 45 dBA ( $L_{Aeq}(8)$ ) — if noise consists of a “large

proportion of low frequency sounds” (Tr. 1649-1650). However, a definition of “large proportion” is not provided in WHO 1999, or in any other source that have been identified. Further, wind turbines produce relatively low levels of low frequency noise compared to other sources (Exhibit 62, pp. 40-43). For the Cassadaga facility, modeled sound levels at low frequency bands (16 Hz, 31.5 Hz, and 63 Hz) are well below the 65 dB maximum level recommended by ANSI S12.9 Part 4 (Ex. 99, Table 19-7), suggesting that low frequency noise is not prominent.

Dr. Punch rejects DOH’s recommendation to apply the WHO 2009 annual average guideline of 40 dBA ( $L_{\text{night, outside}}$ ), but offers no suggestion for a substitute annual guideline (Tr. 1652-1654). Dr. Punch argues that noise exposure over a shorter time frame represented by an  $L_{\text{Amax}}$  (the maximum level for a single event inside a bedroom) is a better metric for avoiding health effects. He mentions that WHO 2009 recommends an  $L_{\text{Amax}}$  of 42 dBA for indoor noise, but he does not propose an outdoor noise guideline for this shorter timeframe. In fact, WHO 2009 considered studies that used  $L_{\text{Amax}}$  in the derivation of its annual guideline and states that “a choice for an  $L_{\text{night}}$  level ties the  $L_{\text{Amax}}$  related effects to a maximum and therefore allows for a protective /conservative approach” (Ex. 62 at p.601). If, as Dr. Punch suggests, no annual design goal or guideline should be applied to limit noise produced by this facility, then the additional constraint on noise modeling and protection against long-term noise exposure an annual design goal provides is eliminated.

For these reasons, DOH maintains its original recommendation of a limit of 45 dBA over one night ( $L_{\text{Aeq}}(8)$ ) and design goal of 40 dBA over one year ( $L_{\text{night, outside}}$ ) for all non-participating residences and other sensitive sound receptors.

## Preconstruction Noise Impact Assessment

The Applicant's Supplemental Sound Modeling Report (Ex. 22) updates the Application's pre-construction noise impact assessment based upon the above referenced design goals and regulatory limits, and a reduced proposed array of 48 turbines for this project. The modelling results presented in Exhibit 22 show that both the proposed regulatory limits and design goals discussed above have been met for all non-participating (including seasonal) and participating residences (Ex. 22 at p.7). Based on these results, the Applicant's compliance with the health-based WHO 1999 and 2009 guidelines, and the revised proposed certificate conditions, the Siting Board could reasonably conclude that the Applicant has minimized or avoided adverse environmental effects on public health. As such, the record supports a finding that the requirements of PSL § 168 have been met with regard to the environmental impacts of noise, provided that Certificate Conditions are adopted requiring compliance with the design goals and regulatory limits discussed above.

### **VII. ISSUES NOT ADDRESSED AT EVIDENTIARY HEARING**

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### **VIII. OTHER ISSUES**

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### **IX. CONCLUSION**

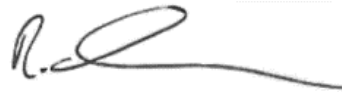
Overall, the weight of evidence presented in this case supports a finding that the appropriate long-term regulatory limits and design goals for this project, and other wind projects,

should be based on the recommended WHO 1999 and WHO 2009 guidelines. Therefore, DOH Staff respectfully recommends that the record forms a sufficient basis for a determination that the adverse environmental effects of the operation of the facility, as they relate solely to noise, will be minimized or avoided to the maximum extent practicable, provided that the proposed certificate conditions related to noise are adopted (Ex. 97 at paras. 68(a) and 69(b)). Specifically, the project's certificate conditions should require that the facility shall:

- 1) Comply with a maximum noise limit of 45 dBA Leq (8-hour) nighttime at any non-participating permanent or seasonal residence, and 55 dBA Leq (8-hour) nighttime at any participating residence; and
- 2) Show conformance with a 40 dBA ( $L_{\text{night, outside}}$ ) annual average nighttime noise level for non-participating permanent and seasonal residences, and 50 dBA ( $L_{\text{night, outside}}$ ) annual average nighttime sound level for participating residences.

**Dated:** September 8, 2017

Respectfully submitted,



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