



December 7, 2020

Submitted via email: [General@Ores.ny.gov](mailto:General@Ores.ny.gov)

Mr. Houtan Moaveni  
Deputy Executive Director  
New York State Office of Renewable Energy Siting  
99 Washington Avenue  
Albany, New York 12231-0001

**Re: AWEA and ACE NY Comments on the Sound Components of the ORES Proposal**

Dear Mr. Moaveni,

The American Wind Energy Association (AWEA) and the Alliance for Clean Energy New York (ACE NY) are submitting these comments on the New York State Office of Renewable Energy Siting's (ORES) proposed draft rules for permitting new wind and solar energy projects, Chapter XVIII, Title 19 of NYCRR Part 900. This set of comments is focused on sound-related requirements.

**AWEA and ACE NY established a working group of acoustical consultants to review and comment on the sound portions of the proposed rule. The individuals in this group collectively have worked on every project permitted through the existing Article 10 process.**

It is our professional opinion that our recommendations included in these comments – and expressed in Appendix 1 as a red-lined version of the applicable portions of the ORES regulatory proposal – will strengthen these regulations with respect to methods to predict and analyze sound impacts from proposed wind and solar projects. These recommendations represent best professional practice and will streamline and simplify the regulations without sacrificing community protection or reducing an operator's obligations to comply with the sound standards established in 900-6, Uniform Standards and Conditions.

We appreciate the opportunity to comment on these portions of the regulations and would welcome the opportunity to review our submittal with you at any time.

Respectfully submitted,

Hilary Clark, AWEA  
Anne Reynolds, ACE NY

# **AWEA and ACE NY Comments on Chapter XVIII, Title 19 of NYCRR Part 900 Wind and Solar Energy Permitting Requirements Regarding Sound**

**900-2.8 Exhibit 7 (Noise and Vibration); Subpart 900-6.1 (Facility Authorization); Subpart 900-6.5 (Facility Operation); Subpart 900-6.4 (Facility Construction and Maintenance)**

**December 7, 2020**

## **I. Introduction**

The American Wind Energy Association (AWEA) and the Alliance for Clean Energy New York (ACE NY) submit these comments and recommendations regarding the New York State Office of Renewable Energy Siting's (ORES) proposed draft rules for permitting new wind and solar energy projects, Chapter XVIII, Title 19 of NYCRR Part 900.

This set of comments is focused on sound-related requirements, specifically Subpart 900-2.8 (Exhibit 7: Noise and Vibration) and Subparts 900-6.1 (Facility Authorization), 900-6.4 (Facility Construction and Maintenance) and 900-6.5 (Facility Operation). Our comments on the remaining portion of the ORES regulatory proposal will be submitted in a separate document.

Overall, there is broad agreement and support among renewable energy companies for establishing uniform standard conditions for sound and modeling methodologies used to assess renewable energy project compliance with such conditions during the permitting phase. Our recommendations are primarily focused on improving clarity and reducing duplication, especially between §900-2.8 and Subpart 900-6.5.

In Part II we identify our priority issues, in Part III we provide a narrative discussion of all recommendations, and in Appendix 1 (below) we have provided a ~~strikeout~~/underline version of the sound portions of the ORES regulatory proposal.

These comments have been developed by the AWEA and ACE NY in consultation with member companies and acoustical consultants familiar with the existing Article 10 process.

## **II. Priority Recommendations**

1. **Clarify Uniform Standards are Project-only.** A cumulative impacts study is required by 900-2.8[c]. While the renewable energy industry does not object to this requirement, the proposed language in Part 900-6 should be modified to clarify that the noise standard applies to all components of the project, not to other facilities outside of the permittee's control. Given the potential site-specific complexities associated with a cumulative assessment, it is expected that potential cumulative conditions would be developed on a project specific basis.
2. **One post-construction sound study should be required.** We support the use of a single operational sound survey rather than the two studies required in §900-6.5 (a)(2) of the proposal. The single study should be performed during the conditions with the best signal to noise ratio (i.e. in leaf-off conditions). This has proven to be best practice. Therefore, we recommend that one study be required and that the timing of the survey be adjusted to allow for testing during

leaf-off conditions. In the unlikely event that this is not sufficient, the change we propose provides for a second survey at the discretion of the ORES.

3. **Modify the proposal to simplify and clarify.** The remainder of our recommended changes to the regulatory proposal are designed to avoid confusion, reference the best standards, and avoid duplication between Part 900-2.8 and 900-6.5. While each of these recommended changes may be minor, taken together we believe they will greatly improve the regulations and avoid future conflicts.
4. **An ambient sound study should not be required.** The renewable energy industry urges ORES to eliminate the requirement to do an ambient sound study, currently required in the proposal at Part 900-2.8(i). Because all permit applicants will be subject to the same sound standard that is established in Part 900-6, the ambient sound study will not be used by ORES in any decision-making. Therefore, it should not be required.

### III. Explanation of All Recommended Changes

Each of the recommended changes outlined in this part are reflected in the redlined version of the ORES regulatory proposal which is included as Appendix 1.

#### *§900-2.8 Exhibit 7: Noise and Vibration*

**§900-2.8 (b).** Modifications to this part are proposed because the concept of a “design goal” appears to be the same as limit, therefore one can consolidate all limits in Subpart 900-6.5 to simplify the regulations.

**§900-2.8 (c).** This part is related to one of our priority requested changes (please refer to our comment on §900-6.5 (a)(1)). The change we recommend to §900-2.8 (c) in Appendix 1 is designed to clarify that the purpose of the cumulative analysis is not to evaluate compliance of facilities outside of the permittee’s control with noise standards in §900-6.5 (a)(1), rather it is to identify if potential cumulative sound levels warrant additional analysis or site-specific permit conditions.

**§900-2.8 (d).** The modeling means and methods required by Exhibit 7 result in predicted sound levels that are independent of duration. That is, the predictions outlined are based on all equipment capable of operating simultaneously being included in the model at its highest sound level, thus the reference to durations may be an inadvertent source of confusion. For clarity, the IEC standard for determining the apparent sound power level is added.

**§900-2.8 (e).** The standard referenced for tones has been revised as the reference in the proposal, ASA S12.9 Part 3, can result in a finding of tonality for a steadily decreasing spectrum where there is no tonal spike.

**§900-2.8 (i).** This is another of our priority recommendations. The sound limits are clearly defined in Uniform Standards and Conditions, Subpart 900-6.5 and do not require the determination of baseline sound levels to enable a finding of compliance. That is, the ambient sound study required in Part 900-2.8(i) [“an evaluation of ambient pre-construction baseline noise conditions”] will not be used in ORES decision-making and should not be required.

**§900-2.8 (j).** As proposed, this section requires an “evaluation of future noise levels during construction...including predicted A-weighted/dBA sound levels using computer noise modelling as follows:...” Yet the equipment used to construct wind and solar facilities is the same or very similar to that used on other common major infrastructure programs. The development of construction noise contours for wind and solar projects is not consistent with construction noise evaluations for other, typically more intensive, infrastructure projects. The United States Department of Transportation has evaluated sound levels from construction equipment and NYSDOT establishes requirements for a construction noise analysis. Alternatively, the General Assessment method outlined in Federal Transit Administrations 2018 *Transit Noise and Vibration Impact Assessment Manual* can be considered. For these reasons, the current proposed requirement in [j] is excessive and we urge ORES to not require the noise contours for the construction phase.

**§900-2.8 (m).** As discussed in the comment on §900-2.8 (j), sound levels associated with construction of wind and solar facilities are not extraordinary and Exhibit 10 addresses potential for damage from blasting or pile driving. Therefore, we suggest that the entirety of (m) be deleted. At the very least, (m)(2) should be deleted because Exhibit 10 already addresses this issue.

**§900-2.8 (o).** Projects should not be artificially restricted in their ability to deploy the best available technology, including noise reduced operation (NRO) strategies. Subpart 900-6.5 establishes the applicable limits which the permittee has an obligation to satisfy.

**§900-2.8 (p).** We believe the level of detail in this part may be overly prescriptive and this information may not always be necessary in all cases. Accordingly, we request that “upon request” be added to the first sentence of this section.

**§900-2.8 (q).** Would the definition/glossary discussed here be appropriate for inclusion in the regulations themselves rather than or in addition to inclusion in the application?

### ***§900-6.1 Facility Authorization***

**§900-6.1 (k).** There is broad agreement for the best practices identified with respect to typical construction noise. Compliance with existing construction noise regulations is expected to be reasonable. In the event unreasonably restrictive local laws are developed, it is expected the Office has the ability to waive them. Alternatively, add “to the extent reasonable and feasible” to the end of (k)(3). [NOTE: This point is also relevant to (k)(3) under §900-6.4 (Facility Construction and Maintenance).]

### ***§900-6.4 Facility Construction and Maintenance***

**§900-6.4 (m)(2).** There is broad agreement with referencing the U.S. Bureau of Mines criteria and that blasting should be addressed separately in Exhibit 10, rather than in Exhibit 7.

### ***§900-6.5 Facility Operation***

**§900-6.5 (a)(1).** In Appendix 1, we propose a reordering of the Uniform Standards and Conditions in §900-6.5 (a)(1). This recommended reordering will improve the clarity and flow by identifying

the criteria in (i) and (ii) and adjustments to that criteria in (iii). We suggest that the presence of tones is clarified to be a five (5) dBA penalty rather than a prohibition. (While it would be preferred to have uniform criteria, it is understood that Article VII proceedings utilize criteria similar to (ii) and (iii) for substations.) We suggest the deletion of 16 Hz in (iv) because the concerns regarding airborne induced vibration are addressed in (v). In fact, there is lack of evidence supporting these concerns, nonetheless, it is agreed that (v) is expected to yield reasonable resolution in the event of such complaint. It is also anticipated that similar to the existing Article 10 process, project modifications that do not result in material different effects can be addressed in supplemental analysis. For example, projects can implement the latest turbine technology prior to construction by providing the Office with enough evidence that it is similarly predicted to comply with the applicable criteria.

We also note that (a)(1) as currently proposed says “Noise levels by all noise sources from wind facilities” which to be abundantly clear should state, “Noise levels by all noise sources from the permittee’s wind facilities shall:”. This is one of our priority changes, because wind facilities permitted outside of Article 10/94-c have different noise standards. It is recognized that potential cumulative concerns would be addressed in site specific, rather than uniform, permit conditions.

**§900-6.5 (a)(2).** This is the third of our priority issues. This Part, as proposed, requires “at least two sound compliance tests” but we support the use of a single operational sound survey during the conditions with the best signal to noise ratio (leaf-off conditions). This has proven to be best practice. We recommend that the timing of the survey be adjusted to allow for testing during leaf-off conditions. In the unlikely event that this is not sufficient, the changes we proposed provide for a second survey at the discretion of the Office.

**§900-6.5 (a)(3).** In the unlikely event of an exceedance, we recommend that the resolution is developed based on the facts of the individual case. We consider the current level of detail unnecessary and speculative. A competent acoustical professional will be able to tailor a minimization plan to address the site-specific concerns and work with the ORES on developing a reasonable and feasible implementation plan.

**§900-6.5 (a)(4).** We recommend that Items (iii) and (v) be consolidated – this will help to simplify and clarify the requirement. Evidence documenting substantial amplitude modulation identified in (iv) at operating wind projects in New York or elsewhere in the nation is lacking thus the potential implementation challenges including false positives and false negatives is unknown. A more thorough discussion of this would be prudent and subsection (iv) has been deleted until such a discussion occurs.

**§900-6.5 (b)(1).** For enhanced clarity and consistency, we recommend that the standards for solar (which are expected to also apply to energy storage) be addressed here rather than Section 900-2.8. Moreover, we suggest that additional flexibility regarding daytime sound level limits may be prudent. A 45 dBA requirement for facilities that are expected to emit their highest sound levels during the daytime hours has the potential to limit the viability of some projects.

Further, in consideration that solar projects are operational generally only during the day, we propose introducing the concept of daytime and nighttime periods for the noise limits. This concept is included in the noise guidelines for other jurisdictions and has been considered in most of the noise impact assessments for solar projects in New York under the Article 10 process. Therefore, a 5 dBA adjustment for daytime is proposed, for a noise limit of 50 dBA for non-participating residences during the daytime, with ‘daytime’ defined as the start of twilight to the end of twilight. This limit is

used for other proposed solar projects in New York (e.g.: Morris Ridge Solar – Pre-Construction Noise Impact Assessment, page 6). We believe that, by recognizing the operational realities of solar projects (that the inverters and substation are running during the daytime), this amendment to the regulations will provide flexibility for solar development while continuing to be consistent with precedent, and accounting for the greater sensitivity to nighttime noise.

#### IV. Conclusion

We appreciate the opportunity to offer these recommendations. Further, it is appropriate that the detailed methodology for the post-construction monitoring is not fully incorporated into this regulatory proposal, and our organizations would welcome the opportunity to join an advisory work group to help inform ORES’s development of guidance on appropriate compliance monitoring for sound compliance.

Appendix 1 to Follow

# APPENDIX 1: Recommended Changes to ORES Sound Proposal

## §900-2.8 Exhibit 7: Noise and Vibration

Exhibit 7 shall contain:

(a) A study of the noise impacts of the construction and operation of the facility. The name(s) of the preparer(s) of the study and qualifications to perform such analyses shall be stated. If the study is prepared by certified member(s) of a relevant professional society or state, the details of such certification(s) shall be stated.

~~(b) Design Goals: The study shall demonstrate document predicted noise levels from the facility as specified in this section and compare the predicted sound levels to the Subpart 900-6.5 (a) and/or (b) Uniform Standards and Conditions, Facility Operations, Noise Limits for Wind Facilities, Noise Standards for Solar Facilities. that noise levels from noise sources at the facility will comply with the following:~~

~~(1) For wind facilities:~~

~~(i) A maximum noise limit of forty-five (45) dBA Leq (8-hour), at the outside of any existing non-participating residence, and fifty-five (55) dBA Leq (8-hour) at the outside of any existing participating residence;~~

~~(ii) A prohibition on producing any audible prominent tones, as defined by using the constant level differences listed under ANSI S12.9-2005/Part 4 Annex C (sounds with tonal content) (see section 900-15.1(a)(1)(iii) of this Part), at the outside of any existing non-participating residence. Should a prominent tone occur, the broadband overall (dBA) noise level at the evaluated non-participating position shall be increased by 5 dBA for evaluation of compliance with subparagraph (i) and (v) of this paragraph;~~

~~(iii) A maximum noise limit of sixty-five (65) dB Leq (1-hour) at the full octave frequency bands of sixteen (16), thirty-one and a half (31.5), and sixty-three (63) Hertz (Hz) outside of any existing non-participating residence in accordance with Annex D of ANSI standard~~

~~S12.9-2005/Part 4 Section D.2.(1) (Analysis of sounds with strong low-frequency content) (see section 900-15.1(a)(1)(iii) of this Part);~~

~~(iv) Not producing human perceptible vibrations inside any existing non-participating residence that exceed the limits for residential use recommended in ANSI/ASA Standard S2.71-1983 (R August 6, 2012) "Guide to the evaluation of human exposure to vibration in buildings" (see section 900-15.1(a)(1)(i) of this Part);~~

~~(v) A maximum noise limit of forty (40) dBA Leq (1-hour) at the outside of any existing non-participating residence from the collector substation equipment; and~~

~~(vi) A maximum noise limit of fifty-five (55) dBA Leq (8-hour), short-term equivalent continuous average nighttime sound level from the facility across any portion of a non-participating property except for portions delineated as NYS-regulated wetlands pursuant to section 900-1.3(e) of this Part and utility ROW. The applicant shall demonstrate compliance with this design goal through the filing of noise contour drawings and sound levels evaluated at the worst-case discrete locations. No penalties for prominent tones will be added in this assessment.~~

~~(2) For solar facilities:~~

~~(i) A maximum noise limit of forty-five (45) dBA Leq (8-hour), at the outside of any existing non-participating residence, and fifty-five (55) dBA Leq (8-hour) at the outside of any existing participating residence;~~

~~(ii) A maximum noise limit of forty (40) dBA Leq (1-hour) at the outside of any existing non-participating residence from the collector substation equipment;~~

~~(iii) A prohibition on producing any audible prominent tones, as defined by using the constant level differences listed under ANSI S12.9-2005/Part 4 Annex C (sounds with tonal content) (see section 900-15.1(a)(1)(iii) of this Part), at the outside of any existing non-participating residence. Should a prominent tone occur, the broadband overall (dBA) noise level at the evaluated non-participating position shall be increased by 5 dBA for evaluation of compliance with subparagraph (i) and (ii) of this paragraph; and~~



~~(iv) A maximum noise limit of fifty-five (55) dBA Leq (8-hour), short-term equivalent continuous average sound level from the facility across any portion of a non-participating property except for portions delineated as NYS-regulated wetlands pursuant to section 900-1.3(c) of this Part and utility ROW to be demonstrated with modeled sound contours drawings and discrete sound levels at worst-case locations. No penalties for prominent tones will be added in this assessment.~~

(c) Radius of Evaluation: Evaluation of the ~~maximum~~ predicted noise levels to be produced during operation of the facility shall be conducted for all sensitive receptors within the sound study area, defined as follows:

1) For wind facilities, the evaluation shall include, at a minimum, all sensitive receptors in a one (1)-mile radius from any wind turbine or substation proposed for the facility. For the cumulative noise analysis, the modeling shall include noise from any wind turbine and substation existing and proposed by the time of filing the application and any existing sensitive receptor within a two (2)-mile radius from any wind turbine or substation proposed for the facility. The purpose of the cumulative analysis is to provide a complete environmental review record and not to evaluate compliance of facilities outside of the permittee's control with noise standards in §900-6.5 (a) (1).

(2) For solar facilities, the evaluation shall include, at a minimum, all sensitive receptors within a one thousand five hundred (1,500) foot radius from any noise source (e.g., substation transformer(s), medium to low voltage transformers, inverters) proposed for the facility ~~or within the thirty (30) dBA noise contour, whichever is greater.~~ For the cumulative noise analysis, the modeling shall include noise from any solar facility and substation existing and proposed by the time of filing the application and any existing sensitive receptors within a three thousand (3,000)- foot radius from any noise source proposed for the facility ~~or within the thirty (30) dBA noise contour, whichever is greater.~~ The purpose of the cumulative analysis is to provide a complete environmental review record and not to evaluate compliance of facilities outside of the permittee's control with noise standards in §900-6.5 (a) (1).

(d) Modeling standards, input parameters, and assumptions:

(1) For both wind and solar facilities, the evaluation shall use computer noise modeling software that follows the ANSI/ASA S12.62-2012/ISO 9613-2:1996 (MOD) (see section 900-15.1(a)(1)(v) of this Part) or the ISO-9613-2:1996 propagation standards (see section 900-15.1(g)(1)(i) of this Part) with no meteorological correction (Cmet) added. The model shall:

(i) Set all noise sources which can operate~~ing~~ simultaneously at maximum sound power levels;

(ii) Use a ground absorption factor of no more than  $G=0.5$  for lands and  $G=0$  for water bodies;

(iii) Use a temperature of ten (10) degrees Celsius and seventy (70) percent relative humidity;

(iv) Report, at a minimum, the ~~maximum~~ predicted: A-weighted dBA Leq ~~(1-hour or 8-hour)~~ sound pressure levels ~~in a year~~, and the ~~maximum~~ linear/unweighted/Z dB ~~(Leq 1-hour)~~ sound pressure levels ~~in a year from~~ in the thirty-one and a half (31.5) Hz and sixty-three (63) up to the eight thousand ~~(8,000)~~ Hz full-octave band, at all sensitive sound receptors within the radius of evaluation;

(v) Report the ~~maximum-predicted~~ A-weighted dBA Leq sound pressure levels ~~in a year (Leq 8-hour)~~ at the most critically impacted external property boundary lines of the facility site (e.g., non-participating boundary lines);

(vi) Report the information in tabular and spreadsheet compatible format as specified herein and in subdivisions (f)(3) and (q)(2) of this section. A summary of the number of receptors exposed to sound levels greater than thirty-five (35) dBA will also be reported in tabular format grouped in one (1)-dB bins; and

(vii) Report ~~noise impacts with~~ sound level contours (specified in subdivision (k) of this section) on the map described in subdivision (h) of this section.

(2) For wind facilities, the model shall:

(i) Be performed at a minimum for the turbine model with the highest apparent broadband A-weighted sound power level per IEC 61400-11 at any wind speed condition;

(ii) Use a one and a half (1.5) meter assessment point above the ground and the addition of a minimum ~~uncertainty~~ adjustment factor of two (2) dBA, or a four (4) meter assessment point above the ground and the addition of an ~~uncertainty~~ minimum adjustment factor of zero (0) dBA ~~or greater.~~

(3) For solar facilities, the model shall use a one and a half (1.5) meter assessment point above the ground and the addition of an uncertainty factor of zero (0) dBA or greater.

(e) Evaluation of prominent tones for the design:

(1) For wind and solar facility noise sources: The evaluation shall be conducted by using manufacturer sound information, the ANSI/ASA S12.62-2012/ ISO 9613-2:1996 (MOD) (see section 900-15.1(a)(1)(v) of this Part) or the ISO 9613-2:1996 propagation standard (see section 900-15.1(g)(1)(i) of this Part) attenuations (Adiv, Aatm, Agr, and Abar), and the "prominent discrete tone" constant level differences (Kt) specified in ANSI /ASA S12.9-2013 ~~Part 3 Annex B-2005 Part 4 Annex C, Section B.1~~ (see section 900-15.1(a)(1)(ii) of this Part), as follows: fifteen (15) dB in low-frequency one-third-octave bands (from twenty-five (25) up to one hundred twenty-five (125) Hz); eight (8) dB in middle-frequency one-third-octave bands (from one hundred sixty (160) up to four hundred (400) Hz); and five (5) dB in high-frequency one-third-octave bands (from five hundred (500) up to ten thousand (10,000) Hz).

(2) For substation transformers ~~and other solar facility noise sources (such as inverters/medium to low voltage transformers)~~ where no manufacturer's information or pre-construction field tests are available, the sound ~~s~~ emissions will be assumed to be tonal ~~and prominent~~.

(f) Evaluation of low frequency noise for wind facilities: If other wind turbines considered for the facility have lower (or equal) broadband A-weighted sound power levels than the turbine modeled in the application, but greater maximum un-weighted sound power levels at the thirty-one and a half (31.5) Hz, or sixty-three (63) Hz full-octave bands, the estimate of low frequency noise levels at the thirty-one and a half (31.5) Hz, or sixty-three (63) Hz bands shall be based on:

(1) Computer noise modeling that uses the maximum sound power levels at the thirty-one and a half (31.5) and sixty-three (63) Hz frequency bands at any wind speed among all turbines considered for each turbine location.

(2) Alternatively, if the noise modeling uses only one (1) wind turbine model across the site and if noise reduction operations are not used in the design, the noise levels at the thirty-one and a half (31.5) and sixty-three (63) Hz full octave bands can be estimated by applying corrections to the low-frequency band sound pressure results from the computer noise modeling for the turbine with the maximum overall broadband sound power level. These corrections will be equivalent to the differences between the maximum sound power levels at the thirty-one and a half (31.5) and sixty-three (63) Hz bands at any wind speed for all turbines considered for the facility and the sound power levels for the turbine used for computer noise modeling at the thirty-one and a half (31.5) and sixty-three (63) Hz full-octave bands respectively.

(3) The maximum linear/unweighted/Z Leq (1-hour) sound pressure levels (dB) ~~in a year~~ at the sixteen (16), thirty-one and a half (31.5) and sixty-three (63) Hz full octave bands for all receptors within the radius of evaluation shall be reported in tabular and spreadsheet compatible format. A list of all sound sensitive receptors with sound pressure levels (SPLs) equal to or greater than sixty-five (65) dB at sixteen (16), thirty-one and a half (31.5) or sixty-three (63) Hz, shall be provided along with their SPLs. The number of receptors exceeding sixty (60) dB at sixteen (16), thirty-one and a half (31.5) or sixty-three (63) Hz shall also be reported, grouped in one (1)-dB bins.

(g) Evaluation of infrasound for wind facilities: Infrasound levels at the sixteen (16) Hz full-octave band can be based on computer noise modeling software with such capabilities or, by using extrapolated SPL data down to sixteen (16) Hz. The extrapolation estimates can be based on corrections applied to the sound pressure results at thirty-one and a half (31.5) Hz to obtain the sound pressure results at sixteen (16) Hz at each receptor as follows:

(1) If no information from the manufacturer is available for the sixteen (16) Hz full-octave frequency band for any turbine models considered for the facility, at a minimum four (4) dB shall be added to the SPLs at thirty-one and a half (31.5) Hz, to obtain SPLs at sixteen (16) Hz.

(2) If computer noise modeling uses only one (1) wind turbine model across the site, noise reduction operations are not used in the design, and the sound power levels at sixteen (16) Hz are available for all turbine models considered for the facility, the correction shall be equivalent to the difference between the highest manufacturer's sound power level at sixteen (16) Hz at

any wind speed and the sound power level at thirty-one and a half (31.5) Hz used for computer noise modeling, and it shall be applied to the sound pressure results at thirty-one and a half (31.5) Hz to obtain the sound pressure results at sixteen (16) Hz.

(3) If computer noise modeling uses only one (1) wind turbine model across the site, noise reduction operations are not used in the design, and the sound power level information at sixteen (16) Hz is available for some but not all turbines considered for the facility, at a minimum four (4) dB, or the difference between the maximum sound power level at sixteen (16) Hz at any wind speed known for any turbines considered for the facility and the sound power level for the thirty-one and a half (31.5) Hz full-octave frequency band used for computer modeling, whichever is greater, shall be applied to the sound pressure results at thirty-one and a half (31.5) Hz to obtain the sound pressure results at sixteen (16) Hz.

(4) The procedures indicated above, do not restrict the applicant from using additional corrections that provide more conservative (i.e., higher) SPLs at the receptors than as obtained as indicated above.

(h) A map of the study area showing the location of sensitive sound receptors in relation to the facility (including any related substations), as follows.

(1) The sensitive sound receptors shown shall include all residences, outdoor public facilities and public areas, hospitals, schools, libraries, parks, camps, summer camps, places of worship, cemeteries, any historic resources listed or eligible for listing on the State or National Register of Historic Places, any public (federal, state and local) lands, cabins and hunting camps identified by property tax codes, and any other seasonal residences with septic systems/running water within the Sound Study Area.

(2) All residences shall be included as sensitive sound receptors regardless of participation in the facility (e.g., participating, potentially participating, and non-participating residences) or occupancy (e.g., year-round, seasonal use).

(3) Only properties that have a signed contract with the applicant prior to the date of filing the application shall be identified as "participating." Other properties may be designated either as "non-participating" or "potentially participating." Updates with ID-tax numbers may be filed after the application is filed.

(i) An evaluation of ambient pre-construction baseline noise conditions by using the L90 statistical and the Leq energy based noise descriptors, and by following the recommendations for ANS-weighting included in ANSI/ASA S3/SC 1.100 -2014-ANSI/ASA S12.100-2014 American National Standard entitled Methods to Define and Measure the Residual Sound in Protected Natural and Quiet Residential Areas (see section 900-15.1(a)(1)(iv) of this Part) is optional. If conducted, the sound surveys shall be conducted for, at a minimum, a seven (7) day-long period for wind facilities and a four (4) day-long period for solar facilities.

(j) An evaluation of future noise levels during construction of the facility consistent with "Construction Noise Analysis" requirements of New York State Department of Transportation (Section 4.4.18.5.5 of NYSDOT's "The Environmental Manual") ~~including predicted A-weighted/dBA sound levels using computer noise modeling as follows:~~

~~(1) The model shall use the ANSI/ASA S12.62-2012/ISO9613-2:1996 (MOD) (see section 900-~~

~~15.1(a)(1)(v) of this Part) or the ISO-9613-2:1996 propagation standard (see section 900-~~

~~15.1(g)(1)(i) of this Part) for the main phases of construction, and from activities at any proposed batch plant area/laydown area;~~

~~(2) The model shall include, at a minimum, all noise sources and construction sites that may operate simultaneously to meet the proposed construction schedule for the most critical timeframes of each phase;~~

~~(3) For wind and solar facilities, the operational modeling requirements included in subdivisions~~

~~(d)(1)(i) through (d)(1)(iii), and (d)(3) of this section shall be used for modeling of construction noise; and~~

~~(4) Sound impacts shall be reported with sound level contours (specified in subdivision (k) of this section) on the map described in subdivision (h) of this section and sound levels at the most critically impacted receptors in tabular format (as specified in subdivision (q)(2) of this section).~~

(k) Sound Levels in Graphical Format:

(1) The application shall include legible sound contours rendered above the map specified in subdivision (h) of this section.

(2) Sound contours shall include all sensitive sound receptors and boundary lines (differentiating participating and non-participating) and all noise sources (e.g., wind turbines for wind facilities, substation(s), transformers, HVAC equipment, energy storage systems and emergency generators for wind and solar facilities; and inverters and medium to low voltage transformers for solar).

(3) Sound contours shall be rendered at a minimum, until the thirty (30) dBA noise contour is reached, in one (1)-dBA steps, with sound contours multiples of five (5) dBA differentiated.

(4) Full-size hard copy maps (22" x 34") in 1:~~12,000~~  
24,000 scale shall be submitted, upon request.

(1) A tabular comparison between maximum sound impacts predicted sound levels and any design goals, noise limits-subpart 900-6.5 (a) and/or (b) Uniform Standards and Conditions, Facility Operations, Noise Limits for Wind Facilities, Noise Standards for Solar Facilities, and local requirements for the facility, and the degree of compliance at all sensitive sound receptors and at the most impacted non-participating boundary lines within the facility site.

~~(m) An evaluation as to whether any of the following potential community noise impacts will occur:~~

~~(1) Hearing loss for the public, as addressed by the World Health Organization (WHO) Guidelines for community noise published in 1999 (see section 900-15.1(d)(1)(i) of this Part). The requirements for the public are not to exceed an average sound level of seventy (70) dBA from operation of the facility and one hundred twenty (120) dB-peak for children and one hundred forty (140) dB-peak for adults for impulsive sound levels (e.g., construction blasting).~~

~~(2) The potential for structural damage from some construction activities (e.g., blasting, pile driving, excavation, horizontal directional drilling or rock hammering, if any) to produce any cracks, settlements, or structural damage on any existing proximal buildings, including any residences, historical buildings, and public or private infrastructure.~~

(n) An identification and evaluation of reasonable noise abatement measures for construction activities.

(o) An identification and evaluation of noise abatement measures for the design and operation of the facility to comply with the design limits set forth in subdivision (b) of this section.

(1) For wind facilities:

~~(i) If noise reduction operations (NROs) are used to demonstrate conformance with any limit, or local law on noise in computer noise modeling or any filing, the design shall use less than half of the maximum NRO available for each turbine model. In this case, the application shall report both "unmitigated" and "mitigated" results.~~

(ii) If noise reduced operations (NROs) are necessary for the design, those NROs shall be implemented at the start date of operations.

(2) For solar facilities: If noise mitigation measures are necessary for the design, those mitigation measures shall be implemented no later than the start date of operations.

(p) The software input parameters, assumptions, and associated data used for the computer modeling shall be provided upon request as follows:

(1) GIS files used for the computer noise modeling, including noise source and receptor locations and heights, topography, final grading, boundary lines, and participating status shall be delivered by digital means upon request;

(2) Computer noise modeling files shall be submitted by digital/electronic means;

(3) Site plan and elevation details of substations, as related to the location of all relevant noise sources (e.g., transformers, emergency generator, HVAC equipment, and energy storage systems, if any); specifications, any identified mitigations, and appropriate clearances for sound walls, barriers, mufflers, silencers, and enclosures, if any.

(4) In addition, for wind facilities, the application shall contain sound information from the manufacturers for all wind turbines, transformers and any other relevant noise sources. Sound power levels from the turbines shall follow these provisions:

(i) Sound power levels from the turbines selected for the facility shall be documented with information from the manufacturer(s) following the International Electrotechnical Commission (IEC) 61400-11 standard (see section 900-15.1(b)(1)(ii) of this Part) and IEC TS 61400-



14 Technical Specification (see section 900-15.1(b)(1)(iii) of this Part) to the extent this information is available.

(ii) Sound power level information shall be reported associated with wind speed magnitudes, and with angular speed of the rotor, and rated power to the extent this information is available. Turbine dimensions to include hub height and diameter of the rotor shall be reported.

(iii) The sound power level information shall include specifications for normal operation, noise reduced operations and low-noise or serrated trailing edges, or any other noise reduction measures, if these are available or required to meet the noise limits indicated in subdivision (b)(1) of this section.

(5) For energy storage or solar facilities, the application shall contain:

(i) The locations of all noise sources (e.g., substation transformer(s), medium to low voltage transformers, inverters, storage system, HVAC equipment, emergency generators, if any) identified with GIS coordinates and upon request, GIS files.

(ii) Sound information from the manufacturers for all noise sources as listed above, and any other relevant noise sources.

(q) Miscellaneous:

(1) The application shall include a glossary of terminology, definitions, and abbreviations used throughout this section 900-2.8 and references mentioned in the application.

(2) Information shall be reported in tabular, spreadsheet compatible or graphical format as follows:

(i) Data reported in tabular format shall be clearly identified to include headers and summary footer rows. Headers shall include identification of the information contained on each column, such as noise descriptors (e.g., Leq, L90, etc.); weighting (dBA, linear, dB, dBZ) duration of evaluation (e.g., 1-hour, 8-hour), time of the day (day time, nighttime); whether the value is a maximum or average value and the corresponding time frame of evaluation (e.g., maximum 8-h-Leq-nighttime in a year, etc.);

(ii) Titles shall identify whether the tabular or graphical information correspond to the "unmitigated" or "mitigated" results, if any mitigation measures are evaluated, and "cumulative" or "non-cumulative" for cumulative noise assessments;

(iii) Columns or rows with results related to a specific design goal, noise limit or local requirement, shall identify the requirement to which the information relates;

(iv) Tables shall include rows at the bottom summarizing the results to report maximum and minimum values of the information contained in the columns. For this purpose, sound receptors shall be separated in different tables according to their use (e.g., participating residences, non-participating residences, non-participating boundary lines, schools, parks, cemeteries, historic places, etc.); and

(v) The application shall report estimates of the absolute number of sensitive sound receptors that will be exposed to noise levels that exceed any ~~design goal or~~ noise limit (in total as well as grouped in one (1)-dB bins).

## **§900-6.5 Facility Operation**

### *(a) Noise Limits for Wind Facilities*

(1) Noise levels by all noise sources from the permittee's wind facility shall:

(i) Comply with a ~~maximum~~ regulatory noise limit of forty-five (45) dBA Leq (8-hour) at the outside of any non-participating residence, and fifty-five (55) dBA Leq (8-hour) at the outside of any participating residence existing as of the issuance date of the siting permit;

(ii) Comply with a noise limit of forty (40) dBA Leq (1-hour) at the outside of any non-participating residence existing as of the issuance date of the siting permit from the collector substation equipment;

(iii) Should a prominent tone occur, the broadband overall (dBA) noise level at the evaluated non-participating position shall be increased by five (5) dBA for evaluation of compliance with subparagraphs (i) and (ii) of this

~~paragraph. Not produce any audible p~~Prominent tones, as are defined by using the constant level differences listed under ANSI S12.9 2005/Part 4 Annex C (sounds with tonal content) (see section 900-15.1(a)(1)(iii) of this Part) at the outside of any non-participating residence existing as of the issuance date of the siting permit. ~~Should a prominent tone occur, the broadband overall (dBA) noise level at the evaluated non-participating position shall be increased by five (5) dBA for evaluation of compliance with subparagraphs (i) and (v) of this paragraph.~~

~~(iii)~~(iv) Comply with a maximum noise limit of sixty-five (65) dB Leq (1-hour) at the full octave frequency bands of ~~sixteen (16)~~, thirty-one and a half (31.5), and sixty-three (63) Hertz outside of any non-participating residence existing as of the issuance date of the siting permit, in accordance with Annex D of ANSI standard S12.9-2005/Part 4 Section D.2.(1) (Analysis of sounds with strong low-frequency content) (see section 900-15.1(a)(1)(iii) of this Part);

~~(iv)~~ Not produce human perceptible vibrations inside any non-participating residence existing as of the issuance date of the siting permit that exceed the limits for residential use recommended in ANSI/ASA Standard S2.71-1983 (R August 6, 2012) "Guide to the evaluation of human exposure to vibration in buildings" (see section 900-15.1(a)(1)(i) of this Part); and

~~(iv) Comply with a noise limit of forty (40) dBA Leq (1-hour) at the outside of any non-participating residence existing as of the issuance date of the siting permit from the collector substation equipment; and~~

(vi) Emergency situations are exempt from the limits specified in this subdivision.

(2) *Post-Construction Noise Compliance and Monitoring for Wind Facilities.* To evaluate compliance with noise-related conditions, the permittee shall comply with the following requirements:

(i) Compliance with subparagraphs (1)(i)-(iv) of this section for the facility shall be evaluated by the permittee by implementing a sound testing compliance protocol that shall follow the provisions and procedures for post-construction noise performance evaluations approved by the Office and stated in the siting permit;

(ii) ~~At least two~~ A sound compliance tests conforming to the sound testing compliance protocol shall be performed by the permittee after the commercial operation date of the facility: ~~one during the "leaf-off" season and one during the "leaf-on" season;~~

(iii) Within ~~seven (7)~~ thirteen (13) months after the commercial operation date of the facility, the permittee shall perform and complete the first sound compliance test and the results shall be submitted by filing a report from an independent acoustical or noise consultant, no later than ~~eight (8)~~ fourteen (14) months after the commercial operation date, specifying whether or not the facility is found in compliance with subparagraphs (1) (i)-(iv) of this section ~~all siting permit conditions on noise during the "leaf on" or "leaf off" season as applicable;~~ and

(iv) ~~The~~ A second sound compliance test shall be performed if requested by the Office.  ~~and results shall be submitted subject to the same provisions contained in subparagraph (iii) of this paragraph, but no later than thirteen (13) months after the commencement of commercial operation of the facility.~~

(3) *Noise Exceedances from Wind Facilities.* If the results of the ~~first or second post-construction sound compliance testing, or any subsequent test, or any compliance or violation test, indicate~~ determine that the facility does not comply with subparagraphs (1) (i)-(iv) of this section ~~siting permit conditions on noise and vibration,~~ the permittee shall:

(i) Present minimization options to the NYSDPS, with a copy to the Office, within sixty (60) days after the filing of a non-compliance test result or the finding of a noncompliance or a violation of siting permit conditions on noise, ~~as follows:~~ This plan shall outline a timeline for implementation which is subject to the approval of the Office.

~~(a) Operational minimization options related to noise or vibrations caused by the wind turbines that shall be considered, including, at a minimum, modifying or reducing times or duration of turbine operation, incorporating noise reduced operations, shutting down relevant turbines, and modifying operational conditions of the turbines;~~

~~(b) Physical minimization options related to noise or vibration caused by the wind turbines that shall be~~

~~considered, including installation of serrated edge trails on the turbine blades, replacement or maintenance of noisy components of the equipment, and any other measures as feasible and appropriate; and~~

~~(c) If applicable, any minimization measures related to noise from transformers (such as walls or barriers), emergency generators (such as installation of noise walls or barriers, adding or replacing enclosures or silencers to the emergency generator), or any other noise sources (such as HVAC equipment or energy storage systems), shall be considered, as well as any other mitigation measures as feasible and appropriate.~~

~~(ii) Upon approval from the NYSDPS and the Office, the permittee shall implement any operational noise or vibration mitigation measures within ninety (90) days after the finding of a non-compliance or siting permit violation, as necessary to achieve compliance.~~

~~(iii) Upon approval from the NYSDPS and the Office, the permittee shall implement any physical noise or vibration mitigation measures within one hundred fifty (150) days after the finding of a non-compliance or siting permit violation, as necessary to achieve compliance.~~

~~(iiiv) If the permittee cannot meet the timelines agreed to by the Office for implementation of mitigation measures set forth in subparagraphs (ii) and (iii) of this paragraph, the permittee shall cease operation of the turbines of the facility that caused the non-compliance or siting permit violation exceedance until the operational or physical agreed to minimization measures that are presented and approved by the NYSDPS and the Office have been implemented. Once implemented, the permittee shall not operate the facility without the mitigation measures presented and approved by the NYSDPS and the Office.~~

~~(iiiv) Test, document and present results of any minimization measures and compliance with all siting permit conditions on noise, Conduct additional post-construction sound compliance testing to document that the exceedance has been resolved no later than ninety (90) days after the minimization measures are implemented.~~

(4) *Noise and Vibration Complaints from Wind Facilities.* The permittee shall adhere to the following conditions regarding noise complaints:

(i) The permittee is required to maintain a log of complaints received relating to noise and vibrations caused by the operation of the facility. The log shall include name and contact information of the person that lodges the complaint, name of the property owner(s), address of the residence where the complaint was originated, the date and time of the day underlying the event complained of, and a summary of the complaint.

(ii) The permittee shall provide the host municipalities with a phone number, email address, and mailing address where complaints can be notified.

(iii) All complaints received shall be reported to the NYSDPS staff, with a copy to the Office, monthly during the first year of commercial operations and quarterly thereafter, by filing during the first ten (10) days of each month (or the first ten (10) days of each quarter after the first year). Reports shall include copies of the complaints ~~and, if available, a description of the probable cause (e.g., outdoor or indoor noise, tones, low frequency noise, amplitude modulation, vibrations, rumbles, rattles, etc., if known); the status of the investigation, summary of findings and whether the facility has been tested and found in compliance with applicable siting permit conditions on noise or minimization measures have been implemented. If no noise or vibration complaints are received, the permittee shall submit a letter indicating that no complaints were received during the reporting period. The permittee shall investigate all noise and vibration complaints by following the complaint resolution protocol approved by the Office, and consistent with the limits imposed by the siting permit.~~

~~(iv) Should complaints related to excessive and persistent amplitude modulation occur at any non-participating residence existing as of the issuance date of the siting permit, with measured or modeled sound levels exceeding forty (40) dBA Leq (1-hour), the permittee shall investigate and measure amplitude modulation at the affected receptors during the time frame when the worst conditions are known, or, if not known, expected to occur. If the L90-10-minute noise levels (dBA), including any amplitude modulation and prominent tone penalties exceed a noise level of forty-five (45) dBA and amplitude modulation is in excess of a five (5) dB modulation depth at the evaluated~~

~~receptor(s) for more than five (5) percent of the time during the identified time frame of evaluation (which shall not exceed eight consecutive hours), the permittee shall continue with the investigation, identify frequency of occurrence and the conditions that may be favorable for its occurrence, and propose minimization measures to avoid or minimize the impacts. Minimization measures that avoid, minimize, resolve, or mitigate the amplitude modulation impacts shall be identified and reported by filing the identified minimization measures and implementing such measures after, and consistent with, review and approval. Compliance with this requirement shall be finally demonstrated by conducting a test that shows that the L90-10-minute sound levels (dBA), including a five (5) dBA penalty for amplitude modulation (if amplitude modulation depth is in excess of five (5) dB for more than five (5) percent of the time in any eight (8) consecutive hours) at that particular location and any additional prominent tone penalties, are lower than or equal to forty-five (45) dBA. For any complaints that do not exceed the limits established in the foregoing, the permittee shall handle those complaints under the complaint resolution protocol approved by the Office. Amplitude Modulation depth will be evaluated as indicated in the document entitled "A method for Rating Amplitude Modulation in Wind Turbine Noise", 09 August 2016, Version 1 (see section 900-15.1(e)(1)(i) of this Part).~~

~~(v) The permittee shall investigate all other noise and vibration complaints by following the complaint resolution protocol approved by the Office, and consistent with the limits imposed by the siting permit.~~

(5) *Facility Logs for Wind Facilities.* The permittee is required to maintain a log of operational conditions of all the turbines with a ten (10)-minute time interval to include, at a minimum, wind velocity and wind direction at the hub heights, angular speed of the rotors, generated power, and notes indicating operational conditions that could affect the noise levels (e.g., maintenance, shutdown, etc.). A schedule and log of noise-reduced operations for individual turbines shall also be kept and updated as necessary. These records shall be maintained by the permittee for five (5) years from occurrence.

~~(b) *Noise Standards for Solar Facilities.* The permittee shall implement the approved design as required by section 900-2.8 of this Part.~~

(1) Noise levels from solar or energy storage facilities shall comply with the following:

(i) A maximum noise limit of fifty (50) dBA Leq (8-hour) during the daytime and forty-five (45) dBA Leq (8-hour) during the nighttime, at the outside of any existing non-participating residence, where daytime is defined as the start of twilight to the end of twilight, and fifty-five (55) dBA Leq (8-hour) at the outside of any existing participating residence;

(ii) A maximum noise limit of forty (40) dBA Leq (1-hour) at the outside of any existing non-participating residence from the collector substation equipment;

(iii) Should a prominent tone occur, the broadband overall (dBA) noise level at the evaluated non-participating position shall be increased by five (5) dBA for evaluation of compliance with subparagraphs (i) and (ii) of this paragraph. Prominent tones, as are defined by using the constant level differences listed under ANSI S12.9 2005/Part 4 Annex C (sounds with tonal content) (see section 900-15.1(a)(1)(iii) of this Part) at the outside of any non-participating residence existing as of the issuance date of the siting permit.;

(iv) A maximum noise limit of fifty-five (55) dBA Leq (8-hour), short-term equivalent continuous average nighttime sound level from the facility across any portion of a non-participating property except for portions delineated as NYS-regulated wetlands pursuant to section 900-1.3(e) of this Part and utility ROW. No penalties for prominent tones will be added in this assessment.

(v) The permittee shall demonstrate compliance prior to construction with an updated filing consistent with Exhibit 7 requirements.