information technology industry, including, but not limited to, the federal Department of Commerce's National Institute of Standards and Technology, the North American Electric Reliability Corporation, or the International Organization for Standardization, and providing for periodic validation of compliance with the applicable standard by an independent auditor.

c) A preliminary Emergency Response Plan (ERP) to ensure the safety and security of the local community, including:

1. An identification of contingencies that would constitute a safety or security emergency;

2. Detailed procedures for site personnel, the general public and emergency responders in the event of an emergency response, including plans for regular meetings with local first responders;

3. Evacuation procedures for site personnel, the general public and emergency responders; and

4. Community notification procedures in the event of an emergency response.

5. Proposed joint ERP training with local responders on annual or bi-annual basis.

d) Documentation of submission and review request of the preliminary site security plans and ERP to the New York State Division of Homeland Security and Emergency Services and the New York State Department of State.

e) The Facility will not be located within any part of a city with a population over one million, therefore the requirements of 16 NYCRR § 1001.18(e) do not apply.

f) The ERP will also include a description of all on-site equipment and systems available for responding to fire emergencies and hazardous substance incidents.

g) A description of all contingency plans to be implemented in response to the occurrence of a fire emergency or a hazardous substance incident.

h) Documentation of submission and review request of the preliminary ERP to local emergency first responders serving the area of the facility site, including the County Offices of Emergency Services and County Sheriffs' Offices, and a statement of review of any responses received.

Stipulation 19-1001.19 Exhibit 19: Noise and Vibration

Exhibit 19 shall comply with the requirements of 1001.19 by containing:

A study of the noise impacts of the construction and operation of the facility, related facilities and ancillary equipment, performed by a qualified professional. The qualifications of the individual to perform the study will be included in Exhibit 19. If any noise assessment methodology standards

are applied in the preparation of the study, an identification of such standards[1] will be included. The study in support of Exhibit 19 will include:

a) A map of the Noise Study Area[2] showing the location of sensitive receptors[3] in relation to the turbine locations, the point-of-interconnect substation equipment, and any related facilities.[4] The map will be created using aerial imagery.

b) An evaluation of ambient pre-construction baseline noise conditions, including identification of A-weighted sound levels, prominent discrete (pure) tones, if any, at representative potentially impacted sensitive receptors, using actual measurement data recorded during winter and summer during the day and at night as a function of time and frequency. Ambient sound levels will be measured at six locations utilizing Class-1 sound instrumentation that complies with the following standards:

1. ANSI S1.43-1997 (R March 16, 2007). Specifications for Integrating-Averaging Sound Level Meters.
2. ANSI S1.11-2004 (R June 15, 2009) Specification for Octave-Band and Fractional-Octave-Band Analog and Digital Filters.
3. ANSI S1.40-2006 (R October 27, 2011) (Revision of ANSI 1.40-1984) Specifications and Verification Procedures for Sound Calibrators.

[1] Many of these standards are protected by copyright and cannot be photocopied or reproduced in any way. Therefore, to the extent that copyright protections apply to a given standard or set of standards, the standards will be summarized and discussed in the relevant Application sections, but the documents containing the standards themselves cannot be reproduced in the Application or otherwise directly submitted in a manner which violates their copyright. The Applicant does not own these materials and cannot violate the copyright protections of a third party—in this case, the American National Standards Institute (ANSI), the International Organization for Standardization (ISO), and the International Electrotechnical Commission (IEC). Parties may want to consult the NYS Library in Albany, New York or any other sources for availability.

[2] In this Application, for purposes of audible noise, the Audible Noise Study Area is defined as all parcels of land within one mile from a proposed wind turbine, substation or O&M Building. For purposes of low-frequency noise or "infrasound," the Infrasound Noise Study Area is defined as all parcels of land within 1.25 miles of a proposed wind turbine or substation. If modeled low-frequency noise emissions are greater than any applicable impact thresholds identified in the standards established through Exhibit 15's literature review in less than 1.25 miles, calculations may be concluded. Additional review of low-frequency noise or infrasound beyond 1.25 miles will be discussed.

[3] Sensitive receptors will be defined, for purposes of noise and shadow flicker studies, as residences (participating and nonparticipating), hospitals, care centers, schools, libraries, places of worship, cemeteries, public campsites and summer camps, public parks, and New York State lands. While all of these property types are classed together as "sensitive receptors" for purposes of this Exhibit, some subgroups of receptors will be subject to different noise standards that are reasonably related to the type of usage occurring at that receptor type (e.g., residences versus buildings/properties occupied only during the daytime), and the receptors' status as participating or nonparticipating. A discussion of these nuances, as they pertain to setting appropriate standards, will be included in the Application. Only properties that have a signed contract with the Applicant prior to the date of filing the Application will be identified as "participating." Other properties will be designated either as "non-participating" or "potentially participating." Updates with ID-tax numbers will be filed through Certification.

[4] The structure shapefile developed for use by the Applicant in Project support studies includes any residences, hospitals, schools, libraries, places of worship, commercial buildings, barns, or public buildings located within one mile of a turbine or substation for audible noise, and 1.25 miles for low-frequency noise. Street Address Maintenance (SAM) Program structure shapefiles used to support New York State's Next Generation 9-1-1 program were obtained and further classified and supplemented using 2015 ESRI aerial imagery and Pictometry oblique imagery. These points were further verified by the Applicant, as possible, during site visits on December 8, 2015 and April 13, 2016.

Measurements will be recorded for 24 hours per day for a minimum of seven consecutive days. The sound level meters will measure various broadband A-weighted (dBA), and one-third octave band (Z or linear) sound levels including the Leq, L10, and L90 noise descriptors. Final brand and model number of the sound level meters and calibrators used will be reported along with specifications from the manufacturers, (such as sound floor, temperature, and relative humidity ranges of operation), and certificates of calibration; locations, dates, and times of testing; weather conditions[5](wind speed, wind direction, temperature, relative humidity and precipitation); frequency range of measurement, meter settings, and general methodology and procedures will be specified, described and reported. The associated spatial accuracy will be estimated by following the procedures included in ANSI S12.9-1992 (R2013)/Part 2 or any other applicable statistical procedure (e.g., Student-T, Chi-Square, etc.), as appropriate. In brief, as reported by the Applicant, summer measurements were conducted from September 17-29, 2015, and winter measurements were conducted from March 9-22, 2016.

One-third-octave band ambient measurements (Z or linear) to cover the infrasound range (from 0.5 Hz to 20 Hz) will be included at two of the six measurement locations using specialized equipment. These two infrasound locations will also include broad-band and one-third-octave band ambient data from 20 Hz to 20 kHz. Noise descriptors including Leq and L90 will be calculated and reported as specified in ANSI/ASA S3/SC1.100-2014 and included as part of the tabular results to be provided in section f) below. Temporal accuracy (for the number of days tested) will be calculated and reported for the Leq and the L90 noise descriptors based on a 95% confidence interval following the procedures included in ANSI Standard S12.9-1992 (R2013)/Part 2 or any other applicable statistical procedures as appropriate.

Ground level on-site wind speed/wind direction data will be used as specified in this protocol. This weather information can be supplemented with data from the most representative and proximal National Weather Service (NWS) weather station.

The ambient preconstruction baseline sound level will be filtered to exclude seasonal and intermittent noise, periods of rain, thunderstorms and excessive wind and gusts, as

[5] Cloud cover and ceiling height for calculation of CONCAWE meteorological corrections will be obtained from the National Weather Service (NWS) weather station at Niagara Falls International Airport (NWS ID # 04724). The NWS precipitation and relative humidity data may also be used to supplement missing/uncollected precipitation and relative humidity on-site data unless the weather conditions at the site are not similar to those at the NWS station. For example, if precipitation data is not available for the site and data from the NWS station suggests periods of rain and/or thunderstorms, sound data at the on-site measurement locations will be reviewed and excluded after corroboration. On the other hand, if precipitation data is not available at the site, but sound data results show abnormalities suggesting periods of rain or thunderstorms at the site, but not at the NWS station, weather information may be supplemented with precipitation data from an airport's weather advisory service or another weather station closer to the site and excluded after corroboration. Snow data from the NWS station at Niagara Falls International Airport, an airport's weather advisory service or another weather station close to the site may also be used when such information is not available at the site.

appropriate.[6] The A-Weighted, noise-compensated (ANS-weighted metric) metric as defined in ANSI/ASA S3/SC1.100-2014 will be used to calculate the Leq (ANS) and L90 (ANS) at each location.

Technical specifications of the windscreens used for the noise surveys, including type, make, model, attenuation effects and wind induced noise levels, will be documented with information from the manufacturer or from laboratory tests. The existing condition pre-construction broadband background/ambient sound levels (broadband only) will be categorized by wind speed and illustrated with graphs showing sound levels with wind speed at 10 meters as extrapolated from the meteorological tower. Additional graphs for low frequency (including infrasound) and "audible" noise levels (Leq and L90) as a function of frequency will be included with consideration of wind speed.

c) An evaluation of future audible noise levels during construction of the proposed Facility, related facilities and ancillary equipment, including predicted A-weighted sound levels at various distances and at proximate potentially impacted and representative sensitive receptors using the FHWA Roadway Construction Noise Model (RCNM), predicted construction traffic levels, construction equipment and construction activities sound emissions. Sound levels from construction noise will be calculated using reference sound emission data from a FHWA source such as the RCNM or equivalent source. Information will include predicted sound levels at the nearest sensitive receptor(s) around the most critical location, the substation and at any proposed batch plant/laydown area including all construction related noise and the loudest pieces of equipment for the different phases of construction (e.g., excavation, foundation, erection of turbines). By its very nature, construction equipment typically moves around the site. If construction will take place simultaneously at several turbine locations in close proximity to a particular receptor or group of receptors, that location will be selected as the most critical location. For construction sound level impacts, tables of "sound levels vs. distances" will be presented. The construction analysis will create these tables, and include actual distances from expected construction activity to sensitive receptors within the Audible Noise Study Area. This will provide construction sound levels at residences, and will compare them to existing measured ambient sound levels. Audible noise levels will be estimated for the main phases of construction. This section will include a discussion of timeframes for construction activities indicating seasons of the year, days of the week, hours of the day, and whether construction activities will be performed during evening time (6:00 p.m. to 10 p.m.), nighttime (after 10:00 p.m. or before 7:00 a.m.), weekends or national holidays.

d) An estimate of the audible noise level to be produced by operation of the proposed Facility, related facilities and ancillary equipment using the Cadna/A noise calculation software

[6] Weather conditions are used to evaluate validity of the ambient measurement. Relevant conditions include wind speed, temperature and relative humidity (check if within equipment tolerances) and precipitation (rainfall and thunderstorms invalidate the data). Data collected out of the range of operation of the sound instrumentation will be excluded. Sound data collected at wind speed exceeding 5 meters per second (11 miles-per-hour) at the sound microphone or portable weather station heights will also be excluded. Pre-construction sound level data collected during periods of rain, thunderstorms and snowstorms will also not be used in the calculation of background sound levels.

program or similar which incorporates the ISO 9613-2 and CONCAWE[7] propagation standards under the following conditions:

1. ISO 9613-2: Originally developed to predict outdoor sound propagation for well-developed moderate ground-based temperature inversions or, equivalently, downwind propagation which commonly occurs at night. This model will be used by using the least attenuation due to temperature and humidity (10 degrees Celsius and 70% relative humidity). Additional noise contours may be presented by the Applicant in the application for other ground absorptions or assumptions if needed, along with a justification for inclusion. A ground absorption factor value of zero (G=0) will be used to represent water bodies. The Application will include a discussion of ground absorption values used in this modeling, and a justification for why the ground absorption values chosen are considered appropriate.

2. Noise modeling and calculation of the Conservation of Clean Air and Water Europe (CONCAWE) meteorological adjustments (K4) will include a sufficient variety of different meteorological conditions and one year of turbine sound levels at each receptor by the use of computer noise model with estimates of hourly turbine power and one year of met tower data.[8] These will be used to provide worst case (L10) and typical (L50) sound levels at all sensitive receptors, as required by Section (f) below. The reasoning behind the variety and amount of selected meteorological conditions will be discussed and justified.

3. ISO-9613 and CONCAWE modeling results will be discussed independently without applying any corrections to match both results. If any corrections are applied to the results of the ISO 9613-2 or CONCAWE models to match the results of the other propagation model, they will be explained and justified, and the full results of both models (with and without corrections) will be included.

4. In addition to the wind turbines, the noise models will also include relevant noise sources from substations and ancillary equipment within the Audible Noise Study Area, if any.

5. The Application will include a brief discussion about the accuracy of selected outdoor propagation models (ISO 9613-2 and CONCAWE), methodologies, ground absorption values, meteorological corrections, atmospheric stability and meteorological category (For the CONCAWE model), other assumptions, and the correlation between

[7] For the purposes of this stipulation, the term "ISO -9613-2" will refer to the ISO 9613-2:1996 Standard or equivalently the ANSI/ASA S12.62- 2012/ISO 9613-2:1996 (Modified) Standard with no meteorological correction (Cmet) or equivalently with the meteorological correction Cmet equaled to a value of zero. For the purposes of this stipulation the term "CONCAWE" will refer to the ISO 9612- 2:1996 Standard or equivalently the ANSI/ASA S12.62-2012/ISO 9613-2:1996 (Modified) Standard with the CONCAWE meteorological correction (denoted K4 in the CONCAWE standard) instead of the ISO 9613-2 meteorological correction Cmet or equivalently with the ISO 9613-2 meteorological Cmet equaled to the value of the CONCAWE meteorological correction K4.

[8] Wind magnitude and wind direction will be obtained from one year of meteorological data collected at the on-site meteorological tower. Cloud cover and ceiling height for the calculation of CONCAWE meteorological corrections, as well as any missing wind data from the on-site meteorological data, will be obtained from the National Weather Service (NWS) weather station at Niagara Falls International Airport (NWS ID # 04724).

measurements and predictions for documented cases as compared to other alternatives, as available. References to published papers comparing modeled vs. measured sound levels at wind turbine projects will be included in the Application. These will discuss the settings used in the modeling and the level of accuracy expected from predictive modeling as related to the specific noise descriptors and time frames of evaluation of the Article 10 regulations, local laws, standards, guidelines, thresholds or goals to be evaluated. To the extent that published literature contains measured sound level data from Wind Turbine Projects compared to modeling results, these studies will be discussed. The Application will also include a description and discussion of the site topography between turbines and receptor locations as applicable to the site, and its effects on accuracy of results. (e.g. Flat, steady or concave slopes) and other factors such as sound power level uncertainties and height of sound receptors above the ground.

6. Noise modeling will be performed using the turbine model with the highest sound power levels, and contextualized with reference to other models under consideration. Sound modeling will be done using the wind speed which generates the maximum broad band overall sound power level from the turbines. If other turbines have lower broadband A-weighted sound power levels but greater maximum un-weighted sound power levels at the 31.5 Hz or 63 Hz full-octave bands, the discussion of low frequency noise impacts for those bands will be based on the use of the highest sound power levels at those bands, on additional modeling scenarios that use the maximum sound power levels at those low frequency bands, or by applying corrections to the low-frequency band results of the computer noise modeling, provided the sound power levels for all the turbines at the 31.5 and 63 Hertz are equal. If Noise Operation Reductions (NRO's) are simulated, the Application will document the sound power levels for the NRO's for the turbine used in the application with information from the manufacturers or provide justification for any noise reduction assumption at low, mid, and high full-octave frequency bands. The final turbine model selected will not generate sound power levels in excess of those presented in the Application.

e) The Noise Study will also include:

1. An evaluation of future audible noise levels during operation of the proposed Facility, related facilities and ancillary equipment including predicting A-weighted sound levels, C-weighted sound levels, and un-weighted full octave band levels at all sensitive receptors and participating residences within the Audible Noise Study Area;

2. A tonal evaluation based on the reported one-third octave band sound power of each wind turbine model and substation transformers under consideration will be performed. This will be done as part of the pre-construction evaluation. The "prominent discrete tone" constant level differences (Kt) described in ANSI S12.9-2013/Part 3 Annex B, section B1 will be used to evaluate tones at the ten most potentially impacted noise receptors using spreadsheet calculations. If available, information from the IEC 61400-11 documentation on tonality will be provided for the wind turbine model(s) under consideration. In addition, the Applicant will report and discuss post-construction operational noise measurements of one-third octave bands taken on the most comparable wind turbines

from other existing wind turbine projects indicating whether a "prominent discrete tone" was found;

3. Sound power levels and related information available from the manufacturer will be provided for all wind turbine models under consideration for use in the Project. In addition, any apparent and declared sound power level, tonality values, and uncertainty values, as specified in IEC-61400-11 and IEC TS-61400-14 from the wind turbine manufacturer will be provided, if available. The Application will state the basis for sound power levels used.

4. An analysis of whether the facility will produce significant levels of low-frequency noise or infrasound. Lighthouse Wind will provide available low frequency and infrasound data from the manufacturers of the turbines identified in the Application. These data will be used to calculate low frequency and infrasound levels at the most impacted sensitive receptors.

Since the CadnaA computer model uses algorithms for nominal mid band frequencies starting at 31.5 Hz, the analysis will be as follows:

i. a spreadsheet approach will be used for both one-third octave bands and full octave bands from 0.5 Hz to 200 Hz with consideration of decay rate for infrasound (divergence), distances and atmospheric absorption in the appropriate octave frequency bands (including one-third octave bands if available) and other relevant factors. However, because infrasound data (below 20 Hz) is not required as part of the wind turbine acoustic standards (IEC 61400- 11 or IEC TS-61400-14), these data may not be available from all manufacturers. If that is the case, the Application will include estimates and a discussion of infrasound impacts based on extrapolated data from manufacturers down to the infrasound region for a few representative sound receptors giving consideration to the decay rate as a function of frequency for fractional band data (full or one-third octave band data, as appropriate)
ii. Sound pressure levels will also be estimated based upon computer noise modeling results extrapolated down to the full octave band of 16 hertz and upon relevant criteria of decay rate per full octave band (e.g.,Tachibana, 2014) for all sensitive receptors within the infrasound Project area. This will also be done for frequencies lower than 16 Hz. for the same representative and critical receptors where the extrapolated power data from the manufacturer and manual spreadsheet calculations were used.
iii. Results from approaches (e)(4)(i) and (e)(4)(ii) will be discussed independently including appropriateness of each method to estimate infrasound levels at frequencies lower than or equal to 20 Hertz
iv. Discussion of data from other wind turbine projects with similar wind turbines where actual post-construction sound data is publicly available, and/or the literature, adapted and inter/extrapolated at similar distances, as appropriate, may be included.
v. Un-weighted (Z or linear) low frequency and infrasound data will also be used to

provide an indication of potential for annoyance, airborne induced vibrations and rattles in residential structures and sensitive buildings as discussed in section k.5.iii. of this stipulation.

vi. Infrasound and low frequency calculations will be made out to 1.25 miles or until calculated levels are below the stipulated criteria, whichever comes first.

vii. The un-weighted infrasound and low frequency data discussed above will be used for evaluation of potential low frequency and/or infrasound impacts. This discussion would also include information on the uncertainties inherent in extrapolation of sound below 20 Hz, if any.

5. Amplitude modulation:

i. The Application will include a literature review of amplitude modulation from wind turbines. The review will include an analysis of the effects of amplitude modulation and its potential to contribute to community annoyance and complaints, measurement methodologies for assessing amplitude modulation, whether amplitude modulation can be predicted, a description of post-construction operational mitigation options, if any, and a process for investigation of complaints. Applicant will include in this literature review, at least the following resource, as well as site specific evaluation:

Review of the evidence on the response to amplitude modulation from wind turbines. Phase 2 Report. Department for Business, Energy and Industrial Strategy. U.K. Commissioned by the Department of Energy & Climate Change (DECC). United Kingdom. August 2016.

ii. Estimates of existing wind shear and turbulence conditions will be based on the information collected from the on-site meteorological tower(s) and will reference the formulae and procedures outlined in IEC 61400- 11 Annexes B and D as applicable and appropriate. A brief summary of formulae and procedures will be included in this section of the Application.

iii. One year of meteorological data will be evaluated to determine the existing magnitude and frequency of wind shear and turbulence conditions at the project site.

iv. The discussion of potential for amplitude modulation will include the review of existing wind shear and turbulence conditions at the Facility site.

v. Site-specific wind shear and turbulence data from the on-site meteorological tower will be provided in the Application.

vi. Since wind shear and turbulence are not inputs to the ISO 9613-2 sound standard, it will not be used directly in the sound propagation modeling. However, if sound power level data are available from the wind turbine manufacturers for high wind shear or turbulent conditions, that data will also be used and results will be discussed.

6. A consistent receptor labelling system will be used to identify common receptors in the noise and shadow flicker studies in Exhibits 15, 19 and 24. A discussion of which sensitive receptors, if any, will experience noise and shadow flicker impacts above identified thresholds will be provided in Exhibit 24.

f) A summary, in:

1. Graphical format of A-weighted sound levels within the Audible Noise Study Area as specified in section (d) of this stipulation or within the 35 dBA noise contours or the Study Area, whichever is greater, using a resolution of 1-dB to include all sound sensitive receptors and participating residences with labels, identified turbine locations, and property lines.

2. Since forecasted sound levels at property lines may vary substantially, tabular modeling results for all property lines may not be practical. In lieu of this, sound contour plots (isopleths) in 1-dB increments overlaid on property lines will provide sound information for any property line within the Audible Noise Study Area. Noise Contours representing sound levels in multiples of 5 dB will be differentiated from other noise contours. Figures will be provided in electronically and in scaled drawings or a series of inset maps, which will differentiate between participant, non-participant and vacant (non-participant and undeveloped) lot property lines, and include locations of sensitive receptors and aboveground project components. One set of full size, legible color drawings of contours will be provided to DPS and DOH, and available at document repositories and project office. Below a sound level of 30 dBA (if applicable), a 1 dBA contour resolution is not necessary, and thus a 5 dBA contour interval may be used.

3. Weather data will be reported in graphical format indicating weather parameters as a function of time, indicating periods of and reasons for exclusions.

4. Tabular format of A-weighted, C-weighted, and octave bands from 31.5 to 8000 Hz sound levels indicated by computer noise modeling at all sensitive receptors and participating residences including a label identifying each receptor. Tables will also include the ANS-weighted estimated pre-construction ambient noise levels (L90 and Leq) for each sound receptor based upon measured pre-construction ambient noise levels within the Audible Noise Study Area (as selected by giving consideration to similarities on the use and soundscapes of the locations being evaluated) expressed with the upper and lower limits and the mean levels for a 95% confidence interval. Preconstruction ambient noise measurement locations will include GPS coordinates of the sound microphones and AADT information of the nearest road, to the extent the data is available from the County and/or NYSDOT.

5. Tabular format of the infrasound and low frequency sound levels from 0.5 Hz to 200 Hz will be presented in both one-third octave bands and full octave bands. These results will be done for the most potentially impacted and representative receptors within the 1.25 mile Infrasound Study Area. These receptors will include the closest receptors among a variety of wind turbine alignments. Receptors will be analyzed out to 1.25 miles or until the 16 Hz, 31.5 Hz, and 63 Hz octave band levels are below the criteria in Section 19.k.5, whichever comes first.

6. The Application will include a clear description about the information contained in graphical and tabular formats including but not limited to the noise descriptors, weightings,

duration of evaluation, time frames of evaluation, seasons and whether the information corresponds to a maximum, minimum, arithmetic or logarithmic (energy-based) average value, etc.

7. The information presented in tabular formats will be split in different groups to differentiate participant residences, non-participant residences and other sensitive receptors.

8. Maximum, minimum and arithmetic values for all receptors for each column and each group of receptors (e.g., schools, residences, churches, etc.) will be calculated and reported in a summary table.

9. Each specific receptor (residence, noise-sensitive receptor and participating receptor) will be identified by Tax ID # or some other unique label along with a cross-reference table to include Parcel/Tax ID numbers for each unique label. Receptor locations signifiers for noise and shadow flicker will be correlated. All parcels will be labeled with Tax ID numbers in noise contour drawings.

10. These analyses will be done for the following scenarios:

    i. Daytime ambient noise level - a single value of sound level equivalent to the level of sound exceeded for 90 percent of the time during the daytime hours (7 am -10 pm) of a year (L90). The ANS-frequency-weighting network will be used.

    ii. Summer nighttime ambient noise level - a single value of sound level equivalent to the level of sound exceeded for 90 percent of the time during the nighttime hours (10 pm - 7 am) during the summer (L90). The ANS-frequency-weighting network will be used.

    iii. Winter nighttime ambient noise level - a single value of sound level equivalent to the level of sound exceeded for 90 percent of the time during the nighttime hours (10 pm - 7 am) during the winter (L90). The ANS-frequency-weighting network will be used.

    iv. Worst case future noise level during the daytime period - the daytime ambient noise level (L90) as indicated in (f) (1) above, plus the modeled upper tenth percentile sound level (L10) of the Facility. Long-term (one year) statistical sound level (L10) will be determined for scenarios that exclude periods when turbines will not be in operation (not rotating). Long-term (one year) statistical sound levels (L10) will also be determined for all hours in a year, including those hours when the turbines will not be in operation (not rotating).

    v. Worst case future noise level during the summer nighttime period - the summer nighttime ambient noise level (L90), as indicated in (f) (2) above, plus the modeled upper tenth percentile sound level (L10) of the Facility. Long-term (one year) statistical sound level (L10) will be determined for scenarios that exclude periods when turbines will not be in operation. Long-term (one year) statistical sound levels (L10) will also

be determined for all hours in a year, including those hours when the turbines will not be in operation.

vi. Worst case future noise level during the winter nighttime period - the winter nighttime ambient noise level (L90), as indicated in (f) (3) above, plus the modeled upper tenth percentile sound level (L10) of the Facility. Long-term (one year) statistical sound level (L10) will be determined for scenarios that exclude periods when turbines will not be in operation. Long-term (one year) statistical sound levels (L10) will also be determined for all hours in a year, including those hours when the turbines will not be in operation.

vii. Daytime ambient average noise level - a single value of sound level equivalent to the long-term energy average ambient sound levels (Leq, one year: summer and winter, after exclusions noted in footnotes above) during daytime hours (7 am -10 pm). The ANS frequency-weighting network will be used.

viii. Nighttime ambient average noise level - a single value of sound level equivalent to the long-term energy-average ambient sound levels (Leq, one year: summer and winter, after exclusions noted in footnotes above) during nighttime hours (10 pm - 7 am). The ANS frequency-weighting network will be used.

ix. Typical facility noise levels - the noise level from the proposed new sources modeled as a single value of sound level equivalent to the level of the sound exceeded 50 percent of the time by such sources under normal operating conditions by such sources in a year (L50). Long-term (one year) statistical sound level (L50) will be determined for scenarios that exclude periods when turbines will not be in operation. Long-term (one year) statistical sound levels (L50) will also be determined for all hours in a year, including those hours when the turbines will not be in operation.

x. Typical facility future noise levels during the daytime period -the energy-average ambient sound level during the daytime hours (Leq), as indicated above in (f) (7), plus the sound level equivalent to the level of the sound exceeded 50 percent of the time by such sources under normal operating conditions by such sources in a year (L50), as indicated above in (f) (9). Long-term statistical sound level L50 will be determined for scenarios that exclude periods when turbines will not be in operation. Long-term (one year) statistical sound levels (L50) will also be determined for all hours in a year, including those hours when the turbines will not be in operation.

g) The noise design goal(s) for boundary lines and sensitive receptors will take into consideration, at a minimum, local standards, NYSDEC guidelines for lands under the jurisdiction of NYSDEC, and other guidelines and studies, including WHO Guidelines for Community Noise (1999) and WHO Night Noise Guidelines for Europe (2009),[9] the 2012

[9] For the purposes of evaluation of WHO-2009 yearly thresholds, calculations will be determined for scenarios that exclude periods when turbines will not be in operation. It will also be determined for all hours in a year, including those hours when the turbines will not be in operation.

NARUC Wind Energy and Wind Siting Reports, 2011 NARUC Best Practices Guidelines for Assessing Sound Emissions from Proposed Wind Farms and Measuring the Performance of Completed Projects, ANSI/ASA S2.71-1983 (R August 6, 2012), and ANSI standard S12.9 - 2005/Part 4 Annex D. For sound sensitive receptors which fall within the Audible and Infrasound Noise Study Area distances, the evaluation will include the A and C weighted sound levels.

The review of the Facility's degree of compliance with goals and guidelines will also include, but will not limited to, determining whether future noise levels from the facility will comply with the recommendations and thresholds of the references listed in this subsection. Comparisons between future noise levels, or the change in noise levels, at noise sensitive receptors and participating receptors, and any identified goals or thresholds, will be done using the specific noise descriptors and specific requirements of local laws, and the guidelines listed in this subsection.

h) A tabular comparison of the noise standards applicable to the Facility, including any local regulations (such as Section 205-43.2 of the Town of Somerset Municipal Code and Section 591.13 of the Town of Yates Zoning Regulations), and noise design goals for the facility, and the degree of compliance indicated by computer noise modeling at all sensitive receptors, and at representative external property boundary lines of the facility and related facilities and ancillary equipment sites.

i) A noise complaint resolution plan covering the construction period, including identification, evaluation and implementation of reasonable noise abatement measures for construction activities along with procedures for handling complaints.

j) An identification and evaluation of reasonable noise abatement measures for the final design and operation of the Facility including the use of alternative technologies, alternative designs, and alternative Facility arrangements. There will be discussion of the Applicant's measures for avoidance and minimization of sound impacts presented in the Application;

k) An evaluation of the following potential community noise impacts:

1. The potential for the Facility to result in hearing damage based on Occupational Safety and Health Administration (OSHA) standards, the recommendations of the United States Environmental Protection Agency (USEPA) and the guidelines of the World Health Organization (WHO), such as the WHO Community Noise Guidelines (1999) and the WHO Night Noise Guidelines (2009);

2. A discussion of the potential for indoor and outdoor speech interference based on guidelines from the United States Environmental Protection Agency (USEPA) and the World Health Organization (WHO), including discussion of sound spectra at the appropriate frequency bands;

3. A discussion of the potential for interference in the use of outdoor public facilities and areas;

4. A literature review of studies, peer reviewed publications, government, scientific and professional publications, specific to the relationship between wind turbine noise and annoyance/complaints will be included. The review will include but will not be limited to the following references: NARUC 2011; Pedersen. Community complaint potential will be evaluated based upon identified factors, thresholds and guidelines. Additional detail regarding annoyance/complaint thresholds and/or guidelines will be included in this section; and

5. A discussion of the potential for structural damage and for interference with technological, industrial or medical activities or uses that are sensitive to vibration or infrasound.

    i. Structural damage from construction: An evaluation of the potential for some construction activities (such as blasting, pile driving, excavation, horizontal directional drilling (HDD) or rock hammering, if any) to produce cracks, settlements or structural damage on existing proximal buildings, (such as residential, commercial and historical buildings), and the effects on existing infrastructure.

    ii. An evaluation of the potential for interference with technological, industrial, or medical activities that are sensitive to vibration or infrasound, including but not limited to the following:

        - An inventory of facilities in the Project Area, if any, that are usually sensitive to vibration or infrasound.
        - A discussion of potential interference with and a map of the seismological and infrasound stations within 100 miles of the project site including USGS, Canadian National Seismic Network, and Comprehensive Nuclear Test Ban Treaty Organization (CTBTO) International Monitoring System infrasound and seismological stations. A discussion will be substituted for a map for those stations located more than 100 miles distant from the Project site.

    iii. Airborne induced vibrations from Operation of the Facility: At a minimum, the potential for sound-induced vibration and annoyance at the low frequency bands of 16, 31.5 and 63 Hz will be assessed using outdoor criteria established in Annex D of ANSI standard S12.9 -2005/Part 4. Applicable portions of ANSI 12.2 (2008) may be used for the frequency bands where ANSI 12.2 (2008) may be a more restricting criteria or if it is expected that ANSI S12.9-2005/Part 4- Annex D guidelines would be met but still represent a potential for perceptible vibrations at indoor locations of sensitive receptors.

    iv. Ground borne vibrations: Discussion of the potential for ground borne vibrations from Facility operation to cause perceptible vibrations on floors, windows, ceilings and walls of participating residences and sensitive receptors within the Project area that exceed the recommendations of ANSI/ASA S2.71-1983 (R August 6, 2012).

The Application will also include an illustration and estimates of the range of rotational speeds (RPM) and frequency of rotation (Hz) of the turbines between cut-in and cut-out speeds. If data from other Wind Facilities will be discussed, the discussion will include technical considerations such as similarities between distances of evaluation, oscillating masses, frequencies of rotation, vibration isolation, foundation and soil type, if available.

6. Discussion and literature review regarding potential effects from noise and vibration on human health will be included in Exhibit 15.

l) A proposed post-construction noise evaluation protocol and studies that will be performed to establish conformance with operational noise design goals, local regulations or identified thresholds.

m) An identification of practicable post-construction operational controls and other mitigation measures that will be available to address reasonable complaints, including a description of a complaint-handling and resolution procedure that shall be applied during periods of operation.

n) Noise Modeling information:

1. The computer noise modeling values used for the major noise-producing components of the Facility shall fairly match the unique operational noise characteristics of the particular equipment models and configurations proposed for the Facility.

2. The software input parameters, assumptions, settings, and associated data used for the computer modeling will be provided as an appendix.

3. Raw Cadna/A files will be provided in electronic format or in a format consistent with the Cadna/A exportable formats to the NYSDPS by electronic means and to other parties upon request.

4. GIS files that contain modeled topography (Topographical contour lines and elevations), proposed turbine and substation noise source locations, sensitive receptor locations, and all boundary lines (differentiating participating, non-participating, and non-participating undeveloped lot boundary lines), identified by Parcel ID number will be provided to NYSDPS in electronic format, subject to any applicable confidential protections and to other parties upon request.

o) A glossary of terminology, definitions, and abbreviations used throughout Exhibit 19 and citations with a list of references mentioned in the Application.

p) Histograms or tables with estimates of the number of participating and non-participating residences that are expected to have broadband sound levels above 40 dBA in 1 dBA step intervals as well as the number of residences with sound levels lower than (or equal to) 40 dBA in 5 dBA step intervals within the 35 dBA noise contour as obtained with the ISO 9613-

2 noise model and the CONCAWE meteorological corrections as specified in section (d) of this Stipulation. For the purposes of this section, sound levels will be rounded to the nearest integer.

q) To the extent possible, the findings and results of Exhibit 19 will be reported and presented in the Application in the same order as listed in this stipulation. Some contents can be presented as Appendices (e.g., Pre-construction Ambient Sound Level survey data).

Stipulation 20-1001.20 Exhibit 20: Cultural Resources

Exhibit 20 shall contain:

a) A summary of potential impacts resulting from the construction and operation of the Facility, interconnections and related Facility components on archeological resources including:

1. Potential impacts on archeological resources identified and avoidance and minimization measures considered;

2. A Phase IA Cultural Resources Study conducted and prepared per the New York State Historic Preservation Office *Guidelines for Wind Farm Development Cultural Resources Survey Work* (NYSHPO Guidelines) as developed by the New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP 2006). The Area of Potential Effect (APE) for the Facility site investigation will be developed according to NYSHPO Guidelines and consultation with NYSOPRHP;

3. A Phase IB Archaeological Study conducted and prepared per the NYSHPO Guidelines. The evaluation of the APE for the archaeological survey and work plan will be developed according to the NYSHPO Guidelines and consultation with NYSOPRHP. The Phase IB Archaeological Study APE will be developed using a layout with the largest number turbines considered for this Project, and will likely include the following:

   i. Three (3) acres at each turbine pad site;
   ii. 35 ft. wide corridor centered on proposed access roads, except that, to the extent that a wider corridor is determined to be necessary to accommodate topsoil conservation and drainage features, such as in agricultural lands, a wider corridor will be established on a site-specific basis;
   iii. 15 ft. wide corridor centered on proposed buried electrical or fiber optic interconnection routes, except that, to the extent that a wider corridor is determined to be necessary to accommodate multiple circuit installations, forest clearing, topsoil conservation and drainage features, a wider corridor will be established on a site-specific basis;
   iv. One (1) 10 acre staging area;
   v. One (1) 5 acre substation.
   vi. Two (2) times the height of any above ground transmission or collection