
Sound Monitoring Plan

1320 South Street, Andover

Applicant: South Street Energy Storage, LLC

For Activities At:
1320 South Street
Andover, MA 01810

Prepared by:



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1.0 Introduction

New Leaf Energy's mission is to help solve the world's energy needs by responsibly developing clean, renewable energy facilities. Part of that mission means ensuring that the projects do not adversely impact the local community. One aspect of this is to ensure that noise created by the system does not result in a nuisance to neighboring properties. Several measures are taken to provide these assurances. This document provides information on the sources of noise from Battery Energy Storage Systems (BESS), predictive noise modeling, pre and post noise measurements, and complaint resolution procedures.

2.0 Sources of Noise

Noise sources from the proposed project are from the HVAC units the battery segment containers, as well as the HVAC system of the Inverters. No other significant noise producing equipment is proposed. Transformers, meters, DAS equipment, and pole mounted safety equipment do not produce appreciable levels of noise. Therefore, the type of noise being produced and mitigated from the system is typical of that seen in other types of industrial or commercial developments that require HVAC.

A total of 94 battery containers and 4 inverters are proposed as part of the project, each with their own HVAC system. These HVAC systems will primarily be operating only during charging or discharging of the system, when heat is produced as a byproduct of operation. Charging and discharging have a 4-hour duration, for a total of 8 hours of operation time per day.

3.0 Noise Modeling and Compliance

New Leaf Energy partners with Epsilon Associates to provide acoustic modeling reports for all our proposed BESS projects. Epsilon Associates is a recognized national leader in sound level studies. Epsilon Associates follow International Organization for Standardization (ISO) standards in their sound level modeling reports, which are used to ensure that BESS projects are responsibly located and mitigated to minimize sound impacts to the community and ensure compliance with local and state requirements.

A Sound Level Modeling Report produced by Epsilon Associates has been provided (under separate cover) for this project. The Sound Level Modeling Report was created specifically for this project, and includes site specific layout of equipment, topography, vegetation, and proximity to property lines and residential receptors.

The purpose of the Sound Level Modeling Report is to understand the noise impacts, if any, to neighboring residences, and ensure compliance with MassDEP Noise Policy. Applicable MassDEP noise guidance states, in part:



“A new noise source will be required to mitigate its sound emissions if they are projected to cause the broadband sound level at a residence or building housing sensitive receptors to exceed ambient background by more than 10 dB(A).”

The modeling presented in the Sound Level Modeling Report shows that if unmitigated, the project would result in a sound level of 49 dB at the nearest sensitive receptor (5 Sunset Circle). This would correspond to an ambient noise level of 39 dB, which is higher than expected for a suburban area. Therefore, it was determined that noise mitigation in the form of sound barrier walls would be appropriate to ensure compliance with MassDEP Noise Policy. An 18-foot-tall sound barrier wall was modeled, which reduced the expected sound level at the closest sensitive receptor to 41dB, which corresponds to an ambient level of 31 dB, well within the typical background noise levels for this area, thereby meeting MassDEP guidance.

4.0 Sound Monitoring

A sound monitoring protocol will be put in place to a) confirm assumptions included in the sound modeling report and b) confirm adherence to the MassDEP Noise Policy.

Pre-Construction Monitoring

Sound monitoring will be performed prior to construction commencing. This monitoring program will allow for a baseline to be established. The baseline measurements will be used to compare noise levels upon completion of the project, as well as data in the case of a noise complaint. The following procedures will be followed for pre-construction noise monitoring:

The applicant will conduct sound level measurements for a minimum of 7 days at one (1) location on the site to determine the background (ambient) sound levels in the vicinity of the Project. New Leaf will be responsible for obtaining any necessary permission from the landowners and/or homeowners.

In addition to the 7 day “long term” monitoring locations, Epsilon will conduct short term sound level measurements at up to three (3) additional locations. Each short-term measurement will be 20-minutes in duration. These measurements will be conducted during both a daytime and nighttime period.

The equipment at the long-term location will not be staffed continuously but will be checked at the beginning, during a nighttime period, and at the conclusion of the program. The sound levels at the long-term location will be measured continuously (24 hours/day) using Larson Davis (LD) model 831 ANSI S1.4-1983 Type 1 Sound Level Analyzers (or equivalent). The sound level meters will measure various broadband A-weighted (dBA) and one-third octave band sound levels including the L_{eq} , L_{max} , L_{10} , L_{50} , and L_{90} . Data will be logged every hour with a one-second time



history. The Analyzers will be calibrated before and after the measurement program using the appropriate manufacturer's sound calibrator.

The ambient data collected will be analyzed and summarized in a report to determine the background (ambient) sound levels in the Project area. The report will describe the monitoring methodologies and present the monitoring results.

The results of these ambient noise measurements will be provided to the Town of Andover prior to commencement of construction.

Post-Construction Monitoring

Upon completion of construction, post-construction noise monitoring will be performed in order to evaluate the resulting noise levels and compare to the predicted noise levels. The results of this monitoring will be provided to the Town of Andover within 6 months of the facility being operational, unless otherwise approved by the Andover Board of Health. The post-construction monitoring procedure will entail:

A post-construction sound survey will be performed in accordance with MassDEP guidelines. Epsilon will conduct an operational sound level measurement program. Short-term broadband (A-weighted) and octave band measurements will be made at up to 4 locations around the site. These levels will be measured for approximately 20 minutes per location during one weeknight under two different scenarios 1) with the facility operating at full load, and 2) with the facility shut down. No daytime compliance measurements are proposed. The nighttime levels will be measured during the hours that may have the greatest impact from the facility on nearby residents (i.e. the quietest overnight period from 12 a.m. to 4 a.m. or determined based on typical operating hours). The specific operational conditions during this program will be outlined prior to commencing the measurements.

Monitoring cannot take place under high winds (over 12-15 mph) or during periods with precipitation. The short-term sound level measurements at all locations will be made using Larson Davis Type 1 sound level meters or equivalent that will produce values of various noise measurement parameters including the Leq, Lmax, L10, L50, and L90. This meter meets Type 1 S1.4-1983 standards for sound level meters. The sound level meters will be calibrated before and after the measurement program using the manufacturer's sound calibrator or equivalent.

5.0 Complaint Investigation

In order to ensure the proposed BESS will not negatively impact neighboring residences, the following noise complaint procedure will be included in the operational procedures of the facility. The contact information for the facility operator will be posted on a sign readily visible from Moonlight Drive.

- If the complaint represents a residence within one mile of any project



component

The proponent will:

- Investigate whether equipment near the complainant was operating on the date, and at the time and location identified.
- Determine if the sound is related to Project maintenance or abnormal operational conditions.
- Determine if there is a reasonable possibility that the sound level induced by the Project is likely to be within 5 dBA of any applicable sound limit:
and
- Review pre-construction sound modeling and any available post-construction sound data to determine whether the sound level at the complaint location is within 5 dBA of a sound level limit

The results and findings will be promptly communicated to the complainant in writing, with a copy sent to the Andover Board of Health.

- The proponent will conduct additional sound monitoring using an independent acoustical or noise consultant if:
 - The complaint location is closer than 0.5 miles; and
 - The complaint location is closer than any previously tested monitoring location; or
 - The modeled sound levels are higher than the position(s) previously evaluated, or if the complaint location is not representative of the same conditions as the positions previously evaluated (e.g. vegetation, geography, other ambient sound); or
 - If there is a reasonable possibility that conditions have changed that affect Project sound levels; or
 - The last sound monitoring was conducted more than three years ago.
 - The proponent will inform a resident when it intends to conduct any exterior sound monitoring and cooperate with the resident to determine an appropriate location for the monitoring equipment.

- The proponent will not conduct sound monitoring if:
 - The modeled sound level, or any post construction sound levels, if such data is available, is more than 5 dBA lower than any applicable sound limit or
 - The complaint has occurred because of Project maintenance or abnormal operational conditions. In this case, the Proponent will complete necessary repairs. This finding will be promptly communicated to the complainant in writing, with a copy sent to the Andover Board of Health.



The Proponent may request that a complainant or the Andover Board of Health maintain a written log of potentially offending sound events over some reasonable period to assist in identifying influences that may affect the sound from the facility. If an independent acoustical or noise consultant determines that the identified factors demonstrate that follow-up sound monitoring is warranted, the Proponent will coordinate with the Andover Board of Health and make reasonable efforts to conduct such monitoring under conditions like those existing at the time the complaint arose.