February 8, 2018

Ms. Elizabeth H. Tillotson
Executive Director of Administration and Regulatory Affairs
Granite Shore Power LLC
431 River Road
Bow, NH 03304

Re: Request for Alternative Stratification Test Procedure for Units 1 and 2 at Merrimack Station (ORIS 2364)

Dear Ms. Tillotson:

The United States Environmental Protection Agency (EPA) has reviewed the January 25, 2017 petition submitted under 40 CFR 75.66 by Public Service Company of New Hampshire d/b/a/ Eversource Energy (Eversource) for units 1 and 2 at Merrimack Station, ORIS 2364 (Merrimack), requesting authorization to perform the stratification test set forth in 40 CFR part 75, appendix A, section 6.5.6.1[1] with a modification to address temporal variations in the gas concentrations. Specifically, Eversource requested authorization to modify the stratification test using the normalization procedure for temporal variations set forth in EPA Method 30A, section 8.1.3.3 (see 40 CFR part 60, appendix A-8). Granite Shore Power LLC, through its subsidiary GSP Merrimack LLC (Granite Shore), purchased Merrimack from Eversource earlier this year and has indicated continuing interest in a response to the petition. EPA approves the petition, with conditions, as discussed below.

Background

Granite Shore owns and operates Merrimack units 1 and 2, located in Bow, New Hampshire. According to Granite Shore, these units are subject to the Acid Rain Program. Granite Shore is therefore required to continuously monitor and report sulfur dioxide (SO_2) and carbon dioxide (CO_2) mass emissions, nitrogen oxides (NO_X) emission rate, and heat input for these units in accordance with 40 CFR part 75. To meet these monitoring requirements, Granite Shore operates continuous emission monitoring systems (CEMS) for gas concentrations and stack gas flow rate. SO_2 and CO_2 mass emissions and heat input are monitored jointly for units 1 and 2 at the common stack after the flue gas has passed through the common SO_2 scrubber serving both units. However, in order to comply with

[1] In the January 25, 2017 petition, Eversource requested permission "to modify the stratification test required by 75.59(a)(7)(vi)". EPA interprets the petition as a request to modify the stratification test procedures set forth in sections 6.5.6.1 through 6.5.6.3 of appendix A to part 75 for which recordkeeping requirements are specified in § 75.59(a)(7)(vi).

unit-specific NO_X-related requirements, Granite Shore monitors the units' NO_X emission rates individually at the inlet ducts from each unit to the common scrubber.[2]

Part 75 requires periodic (semiannual or annual) relative accuracy test audits (RATAs) of the gas and flow rate monitoring systems for quality-assurance purposes. Part 75 provides several options for determining the location and number of traverse points from which sample measurements should be taken when performing a gas monitoring system RATA. One of those options allows for a single reference method measurement point (see 40 CFR part 75, appendix A, section 6.5.6(b)(4)). In order to qualify for the single reference method measurement point methodology, part 75 requires the performance and passage of a 12-point stratification test (according to the acceptance criteria of 40 CFR part 75, appendix A, section 6.5.6.3(b)) prior to each RATA.

As an attachment to the January 25, 2017 petition, Eversource provided a letter from its stack test contractor, Montrose Air Quality Services (Montrose). In the letter, Montrose describes the challenges of fully traversing the inlet ducts at Merrimack units 1 and 2 when performing gas RATAs. Montrose's letter also describes the difficulty of performing accurate 12-point stratification tests at the unit 1 and 2 inlet ducts using the standard test methodology due to variability in process conditions and gas concentrations over the time required to complete the stratification test. Montrose's letter echoes Eversource's request for the approval of a modified stratification test procedure that considers temporal variation in the gas concentration measurements, asserting that a modified stratification test accounting for the temporal variation in the measurements due to varying process conditions would more accurately demonstrate whether or not stratification is present at the time of the test.

The requested test modification would be to apply a procedure allowed in another EPA test – Method 30A, which is a reference test method for mercury emissions – to the 12-point stratification test set forth in section 6.5.6.1 of appendix A to part 75. Method 30A includes a procedure to normalize gas concentration measurements taken during a stratification test in order to account for temporal variations in gas concentrations that "may complicate the determination of stratification." (See section 8.1.3.3 of Method 30A, appendix A-1 to 40 CFR part 60.) Under the procedure in Method 30A, while conducting gas concentration measurements at multiple traverse points in order to check for stratification, the tester simultaneously conducts gas concentration measurements at a fixed point. Once the two sets of measurements have been obtained, the tester accounts for temporal variation by normalizing the traverse point measurements to account for changes in gas concentration over the time required to complete the stratification test. Specifically, the tester multiplies the measurement at each traverse point by the ratio of (i) the average of all the values measured at the fixed point over the duration of the entire stratification test to (ii) the value measured at the fixed point simultaneously with that particular traverse point measurement. In order to apply this procedure to stratification testing at Merrimack, Eversource and Montrose proposed to use CEMS measurements as the fixed point measurements that would be taken simultaneously with the traverse point measurements.

To support this proposed normalization procedure, Montrose provided the results of a series of stratification tests that were performed at Merrimack units 1 and 2 during a 2016 RATA. These test results demonstrate that even though there was variation in measured gas concentrations across the traverse points, the gas concentration measurements taken at the various traverse points using the

[2] A brief description of the test locations was included with the petition, and a supplemental email (dated November 16, 2017) from Eversource included a schematic of the layout of the CEMS noting the test locations.

reference method closely track the simultaneous CEMS measurements taken at a fixed point throughout the duration of the traverse.

EPA's Determination

EPA agrees that the stratification test procedure in part 75, appendix A, section 6.5.6.1 does not take into account temporal variations in pollutant concentrations that may occur as a result of process changes during the test. EPA also agrees that modifying the stratification test procedure by normalizing stratification test results using the EPA-developed and approved procedure found in section 8.1.3.3 of Method 30A will help to address such temporal variations.

EPA approves the request for a modification to the 12-point stratification test procedure in section 6.5.6.1 of appendix A to part 75 to correct for temporal variation in gas concentrations at Merrimack. Depending on the test results, the modified test may be used to qualify to perform a gas monitoring system RATA at a test location using either a single reference method measurement point as described in section 6.5.6(b)(4) of appendix A or using a short reference method measurement line as described in section 6.5.6(b)(3) of appendix A, as discussed below. In order to qualify to perform a gas monitoring system RATA at a test location using either a single reference method measurement point or a short reference method measurement line, Granite Shore must conduct the modified 12-point stratification test at the test location immediately prior to that RATA. The modified stratification test must be performed for every gas measured at that test location[3] and the results of the modified test for each gas must meet the relevant acceptance criteria.

To correct for temporal variations, Granite Shore (or its contractor) must proceed as follows. In addition to collecting gas concentration measurements at 12 traverse points according to the procedures for a 12-point stratification test (see 40 CFR part 75, appendix A, section 6.5.6.), Granite Shore must collect gas concentration measurements for each gas measured at the test location at a fixed measurement point at least one meter from the stack or duct wall throughout the entire stratification traverse. To provide the fixed point data, Granite Shore may use either a second reference method sampling system or quality-assured data from an installed CEMS. Granite Shore must collect the fixed point data concurrently with the measurements collected at the 12 traverse points. To normalize the data collected at each traverse point, Granite Shore must multiply the measured concentration at each traverse point by the ratio of $C_{F,\,avg}$ to $C_{F,}$ where C_F is the simultaneous fixed-point concentration measurement and $C_{F,\,avg}$ is the average of all the fixed-point measurements over the duration of the stratification test.

To determine whether or not the results of the normalized 12-point stratification test for a particular gas meet the acceptance criteria in section 6.5.6.3(a) or (b) of appendix A, Granite Shore must calculate the arithmetic average of the normalized concentrations for that gas across all traverse points and determine the percent deviation of the normalized concentration at each traverse point from the arithmetic average of the normalized concentrations across all traverse points. This procedure should be performed for each of the gases being measured at the test location. If the calculated percent deviations for all gases measured at the test location meet the acceptance criteria in section 6.5.6.3(b) of appendix A, the single reference method measurement point may be used when performing the RATA for the

[3] For example, at the Merrimack inlet duct test locations, the modified 12-point stratification test must be performed for NO_X and CO_2, and at the Merrimack common stack test location, the modified 12-point stratification test must be performed for SO_2 and CO_2.

gases at that test location. If the calculated percent deviations for one or more gases do not meet the acceptance criteria in section 6.5.6.3(b) but the calculated percent deviations for all gases meet the acceptance criteria in section 6.5.6.3(a), the short reference method measurement line described in section 6.5.6(b)(3) may be used when performing the RATA for the gases at that test location.

Granite Shore must keep records of the raw data and calculated test results of the modified stratification tests (see § 75.59(a)(7)(vi)).

EPA's determination relies on the accuracy and completeness of information provided by Eversource in the January 25, 2017 petition and the supplementary data provided to EPA via email on November 16, 2017 and January 5, 2018 and is appealable under 40 CFR part 78. If you have any questions regarding this determination, please contact Jenny Jachim at (202 343-9590). Thank you for your continued cooperation.

Sincerely,

/s/

Reid P. Harvey, Director
Clean Air Markets Division

cc: Susan Lancey, U.S. EPA, Region 1
Mike O'Brien, New Hampshire Department of Environmental Services
Melissa Cole, Granite Shore Power LLC