

April 10, 2017

Don Guzzetta  
Designated Representative, Devon Power  
Middleton Power, LLC  
1866 River Road  
Middletown, CT 06457

Re: Petition to Use Alternative Sampling Procedures for Appendix E NO<sub>x</sub> Emission Rate Testing at Eight Units at Devon Station (ORISPL 544) and Middletown Station (ORISPL 562)

Dear Mr. Guzzetta:

The United States Environmental Protection Agency (EPA) has reviewed the May 11, 2016 petition<sup>1</sup> submitted under 40 CFR 75.66 by Devon Power LLC and Middletown Power LLC, affiliates of NRG Energy, Inc. (NRG), requesting permission to use alternative sampling procedures for appendix E NO<sub>x</sub> emission rate testing at Units 15, 16, 17, and 18 at Devon Station (Devon) and Units 12, 13, 14, and 15 at Middletown Station (Middletown). EPA approves the petition in part, with conditions, as discussed below.

#### Background

Devon Power LLC and Middletown Power LLC (collectively, NRG) operate, and other NRG affiliates partially own, Devon Units 15 through 18 in Milford, Connecticut and Middletown Units 12 through 15 in Middletown, Connecticut. These eight units are identical General Electric LM6000PC combustion turbines that can combust either natural gas or ultra-low sulfur distillate oil and have nameplate capacity ratings of approximately 50 MW each. According to NRG, the units are subject to the Acid Rain Program. NRG is therefore required to continuously monitor and report sulfur dioxide (SO<sub>2</sub>) and carbon dioxide (CO<sub>2</sub>) mass emissions, nitrogen oxides (NO<sub>x</sub>) emission rate, and heat input for these units in accordance with 40 CFR part 75. To satisfy the part 75 requirements related to NO<sub>x</sub>, instead of installing and operating continuous emission monitoring systems (CEMS) on the units, NRG has elected to use the optional excepted methodology set forth in appendix E to part 75 for gas- and oil-fired units that meet the definition of “peaking unit” in 40 CFR 72.2.

Under the appendix E methodology, a unit’s owner or operator conducts testing and develops correlation curves representing the relationship of the unit’s NO<sub>x</sub> emission rate (in lb/mmBtu) to its heat input rate (in mmBtu/hr). The correlation curves are then used in

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<sup>1</sup> The May 11, 2016 petition was submitted as a revision of a petition dated October 22, 2015.

conjunction with the unit's reported heat input data to determine the unit's reported data for NO<sub>x</sub> emission rate and/or NO<sub>x</sub> mass emissions.<sup>2</sup> Separate correlation curves must be developed for each non-emergency fuel or consistent combination of fuels combusted by the unit. Each correlation curve must be updated based on new testing at least once every 20 calendar quarters.

To develop each correlation curve, the owner or operator performs simultaneous three-run tests of NO<sub>x</sub> and oxygen (O<sub>2</sub>) concentration at each of four or more load levels representing the unit's full range of operations. Under section 2.1.2.2 of appendix E, for each test run at a combustion turbine, flue gas samples are taken from 12 points that traverse the flue in order to ensure that the NO<sub>x</sub> emission rates computed from the flue gas samples reflect the unit's entire flue gas stream rather than an unrepresentative, stratified portion of the stream. A NO<sub>x</sub> emission rate in lb/mmBtu is computed from each pair of NO<sub>x</sub> and O<sub>2</sub> concentration data, and the NO<sub>x</sub> emission rate for the tested load level is computed as the average of the NO<sub>x</sub> emission rates from all sampling points for all three test runs for the load level. During the emissions tests, the owner or operator must also record fuel flow rate data that are used, in combination with data on the fuel's gross calorific value, to determine a heat input rate in mmBtu/hr for each tested load level. The average NO<sub>x</sub> emission rates are then plotted against the corresponding heat input rates to form a correlation curve with one point for each tested load level.

In the May 11, 2016 petition, NRG requests permission to use an alternative to the appendix E procedures described above. Specifically, NRG requests permission to rely on one-time tests of stratification at the Devon and Middletown units as the basis for reducing the number of traverse points used in all future appendix E test runs at the units. In support of this request, NRG cites other EPA regulations, including a provision of part 75, that allow the number of traverse points to be reduced in some of the test runs of a multi-run set of tests if the first test run in that set of runs indicates sufficiently low stratification.<sup>3</sup> NRG states that granting the request would reduce the time for which the units are operated solely to perform testing, the emissions associated with such operation, and the cost of the testing. NRG also presents results from past emission testing at the Devon units that showed little stratification and proposes that EPA rely on these tests as the one-time stratification tests for the Devon units. If the request is granted, NRG would conduct tests and provide similar one-time stratification test results for the Middletown units.

#### EPA's Determination

EPA approves the petition, in part. EPA agrees with NRG to the extent that the results of a stratification test performed at each load level and for each fuel (as described in appendix A, section 6.5.6.1) could verify that the concentration profile of the flue gases is not stratified, based on the acceptance criteria found in section 6.5.6.3 of appendix A, thereby reducing the number of traverse points necessary in additional test runs conducted for appendix E correlation testing at the same time. However, EPA believes it is necessary to perform the stratification testing just prior to or concurrently with each appendix E correlation test rather than relying on a one-time stratification test performed at some earlier date, as NRG proposed in the May 11, 2016 petition.

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<sup>2</sup> See generally section 2 of appendix E to part 75.

<sup>3</sup> See section 6.5.6 of appendix A to part 75. NRG also cites testing requirements under other EPA regulations, e.g., subpart KKKK of 40 CFR part 60 and method 7E in appendix A-4 to part 60.

EPA notes that none of the other EPA regulations that NRG cites in the petition allows use of a one-time stratification test to serve as the basis for reducing the minimum required number of sampling points in all future tests.

Accordingly, NRG may perform stratification testing just prior to or concurrently with each future appendix E correlation test at Devon Units 15 through 18 and Middletown Units 12 through 15 and may use the stratification testing results, according to the acceptance criteria found in section 6.5.6.3 of appendix A, to reduce the minimum number of traverse points for subsequent appendix E test runs conducted at the units at that time. If the stratification test results meet the acceptance criteria in paragraph (b) of section 6.5.6.3 of appendix A, sampling for the subsequent test runs may be conducted at a single point meeting the requirements of that paragraph (b). If the stratification test results do not meet the acceptance criteria in paragraph (b) but do meet the acceptance criteria in paragraph (a) of section 6.5.6.3, sampling for the subsequent test runs may be conducted at three points meeting the requirements of that paragraph (a). Separate stratification testing must be conducted for each fuel tested and at each tested load level, and all other requirements for appendix E testing continue to apply.

#### Conditions of Approval

1. For the purpose of NO<sub>x</sub> emission rate testing under appendix E to part 75, in order to qualify to sample at fewer than 12 traverse points at a CT that is required to be tested while operating at a particular load level and burning either natural gas or distillate oil:
  - a. NRG must demonstrate immediately prior to or concurrently with the testing that both the NO<sub>x</sub> and O<sub>2</sub> concentrations, determined in accordance with section 6.5.6.1 of appendix A to part 75, meet the acceptance criteria in section 6.5.6.3 of appendix A to part 75 to qualify to use a reduced number of sampling points.
  - b. The stratification testing must be conducted for each load level and each fuel tested.
2. NRG may use the 12-point run used for the stratification testing as the first of the minimum required test runs for each tested load level and fuel.
3. For each test run for which sampling is conducted at fewer than 12 points, NRG must collect data for a minimum of 21 minutes per run for all sampling points in total (dividing the time equally among the sampling points), consistent with the minimum sampling times required under section 6.5.7 of appendix A to part 75. These minimum sampling times do not include the time required to ensure that the system has obtained stable stack gas readings (i.e., two measurement response times whenever the test probe is inserted at a new sampling port and one measurement response time whenever the test probe is moved to a new sampling point using the same sampling port).
4. NRG must record, in a form suitable for inspection, the results of all performance testing including any stratification testing that was conducted, and must maintain those records for a minimum of three years from the date of the test in accordance with § 75.57(a).

EPA's determination relies on the accuracy and completeness of the information provided by NRG in the May 11, 2016 petition and is appealable under 40 CFR part 78. If you have any questions regarding this determination, please contact Jenny Jachim at 202-343-9590 or Charles Frushour at 202-343-9847. Thank you for your continued cooperation.

Sincerely,

/s/

Richard A. Haeuber, Acting Director  
Clean Air Markets Division

cc: Susan Lancey, U.S. EPA, Region 1  
John DeGirolamo, Connecticut DEEP