



The State of New Hampshire  
**Department of Environmental Services**

**Robert R. Scott, Commissioner**



August 23, 2023

**VIA EMAIL AND STANDARD USPS MAIL**

Elizabeth H. Tillotson, Vice President  
Granite Shore Power, LLC  
431 River Road  
Bow, NH 03304

**NOTICE OF FINDINGS**

**Re: GSP Merrimack LLC – Merrimack Station**

Dear Ms. Tillotson:

The purpose of this Notice of Findings (NOF) is to inform GSP Merrimack, LLC (GSP Merrimack) of the findings of the New Hampshire Department of Environmental Services, Air Resources Division, (NHDES), based on a review of permit deviation reports and stack test reports received by NHDES from GSP Merrimack regarding the operation of the facility located at 431 River Road in Bow, New Hampshire (the Facility). In addition, this NOF provides you with an opportunity to submit additional information regarding possible compliance issues and the corrective measures that GSP Merrimack has taken or plans to implement to minimize future occurrences.

**Facility Background**

On September 7, 2011, NHDES issued Title V Operating Permit, TV-0055 (the Permit) to GSP Merrimack authorizing the operation of two coal fired electric generating units, designated as MK1 and MK2 among, other devices at the Facility. On June 14, 2014, NHDES received from GSP Merrimack a timely and complete application for a Title V Permit. Therefore, GSP Merrimack was granted application shield. The Permit expired on September 30, 2016.

Env-A 1303.06, effective August 15, 2018, limits each wet bottom cyclone-fired boiler equipped with a selective catalytic reduction (SCR) control device to 0.22 pounds (lb) of nitrogen oxides (NO<sub>x</sub>) /million British thermal units (MMBtu) on a calendar day average basis except on days where startup, shutdown or low-load operations occur. Both MK1 and MK2 are wet bottom cyclone-fired boilers and equipped with SCR systems. For days where startup, shutdown or low-load conditions occur, GSP Merrimack is subject to a NO<sub>x</sub> limit based on the capacity of the boiler. MK1 has a maximum nameplate capacity less than 320 megawatts; therefore, the NO<sub>x</sub> limit is 4.0 tons based on a 24-hour calendar day total. Similarly, MK2 has a maximum nameplate capacity equal to or greater than 320 megawatts; therefore, the NO<sub>x</sub> limit is 11.5 tons of NO<sub>x</sub> on a 24-hour calendar day total.

[www.des.nh.gov](http://www.des.nh.gov)

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On July 30, 2020, NHDES reissued the Permit and incorporated the requirements of Env-A 1300 related to MK1 and MK2 into the Permit as specified in Condition VIII.B, Table 5, Item 1. The Permit expires on July 30, 2025.

### **Summary of Findings**

1. GSP Merrimack notified NHDES that MK1 and/or MK2 exceeded the daily permitted NO<sub>x</sub> RACT limits specified in Condition VIII.B, Table 5, Item 1 of the Permit and Env-A 1303.06 on six occasions as summarized below:
  - On December 8, 2021, MK1 exceeded the NO<sub>x</sub> startup limit by 0.2 tons or 5%. GSP Merrimack stated that the programmable logic controller (PLC) failed to initiate ammonia flow to the SCR once the temperature permissive had been met.
  - On December 20, 2021, MK2 exceeded NO<sub>x</sub> startup limit by 3.1 tons or 26.9%. GSP Merrimack stated that the preheated feedwater pump was shut down due to leaking boiler tubes which resulted in an extended startup period. Temperature stratification in the boiler delayed the introduction of ammonia into the SCR.
  - On January 15, 2022, MK2 exceeded the NO<sub>x</sub> startup limit by 2.1 tons or 18.2%. GSP Merrimack stated that a thermocouple failed, and the PLC failed to sense that the temperature permissive had been reached resulting in the delayed activation of ammonia flow to the SCR. In addition, the coal feeder tripped offline interrupting start up resulting in an even longer start up time.
  - On December 15, 2022, MK1 exceeded the NO<sub>x</sub> daily rate limit by 0.15 lb/MMBtu or 68%, during normal operations for this daily period. GSP Merrimack stated that the solenoid valve on the ammonia feed line failed to open restricting the flow of ammonia to the SCR.
  - On February 3, 2023, MK1 exceeded the NO<sub>x</sub> daily rate limit by 0.04 lb/MMBtu or 18.1% during normal operations for this daily period. GSP Merrimack stated that the ammonia vaporizer tripped offline resulting in the interruption of ammonia flow to the SCR for 90 minutes.
  - On July 7, 2023, MK2 exceeded the NO<sub>x</sub> startup limit by 11 tons or 98.2%. GSP Merrimack stated that MK2 experienced a longer than normal startup delaying the unit from reaching the temperature permissive for introducing ammonia to the SCR. The long startup in part was due to an overabundance of water in the coal supply that made the fuel hard to feed.
2. Condition VIII.B, Table 5, Item 8(b) of the Permit and 40 CFR 63 Subpart UUUUU (MATS) require GSP Merrimack to limit filterable particulate matter (PM) from MK1 and MK2 to 0.030 lb/MMBtu at all times that MK1 and/or MK2 are operating. Compliance with

MATS PM limit is demonstrated by conducting a performance test in accordance with Condition VIII.G, Table 7, Item 32 of the Permit and MATS.

- On February 27, 2023, GSP Merrimack conducted a timely performance test of MK1 and MK2 at the combined stack designated in the Permit as MK-CS. On April 28, 2023, NHDES received a test report presenting the results of the PM performance test. Results presented in the report showed that GSP Merrimack emitted PM at the rate of 0.052 lb/MMBtu which exceeded the MATS PM limit in the Permit by 73.3%.
  - On April 28, 2023, GSP Merrimack notified NHDES that the Facility emitted excess PM emissions during the period of February 27 through 01:30 on March 1, 2023 when MK1 and MK2 were taken offline. In the report, GSP Merrimack stated that all air pollution control parameters were within normal operating conditions during the test and the cause of the failed stack test could not be determined.
  - On May 23, 2023, NHDES notified GSP Merrimack in an email that any operation of MK1 or MK2 prior to conducting a performance test that demonstrated compliance with the MATS PM limit in the Permit would constitute an excess emission and a deviation from permit conditions.
  - On June 20, 2023, NHDES issued a letter of acceptance stating that the results of the performance test were accepted as valid and that GSP Merrimack emitted PM above the MATS PM limit in the Permit.
  - On July 10, 2023, NHDES received initial notification followed by a written permit deviation report, on July 18, 2023, stating that MK1 and/or MK2 operated during the period of July 4 through July 8, 2023 in order to complete a required ISO New England Summer Claim Audit. In the report, GSP Merrimack stated after-the-fact that the Facility operated out of compliance with the MATS PM limit stated in Condition VIII.B, Table 5, Item 8(b) of the Permit for the period stated.
  - On July 13, 2023, NHDES and GSP Merrimack met virtually to discuss the continuing violation of the MATS PM limit in the Permit and to discuss GSP Merrimack's plans to determine the causes of the failed stack test, the schedule for the retest and GSP Merrimack's plan going forward to mitigate future violations.
  - On August 11, 2023, NHDES determined that GSP Merrimack operated MK1 and/or MK2 out of compliance with the MATS PM emission rate limit since the failed stack test on February 27, 2023 for a total of 114 hours.
3. Condition VIII.B, Table 5, Item 9(a) of the Permit and MATS require GSP Merrimack to limit hydrogen chloride (HCl) emissions from MK1 and MK2 to 0.0020 lb/MMBtu at all times that MK1 and/or MK2 are operating. Compliance with the MATS HCl limit is

demonstrated by conducting a performance test in accordance with Condition VIII.G, Table 7, Item 32 of the Permit and MATS.

Condition VIII.B, Table 5, Items 8(b) and 9(b) of the Permit and MATS allow GSP Merrimack to qualify as a Low Emitting Electric Generating Unit (LEE) for PM and HCl respectively if the performance tests conducted in accordance with §63.10007 demonstrate that the emissions are less than 50 percent of the emission limit specified in Condition VIII.B, Table 5, Items 8(a) and 9(a) of the Permit for PM and HCl respectively for 3 consecutive years. If emissions are greater than 50 percent of the emission limit specified in Condition VIII.B, Table 5, Items 8(a) and 9(a) of the Permit for PM and HCl respectively, GSP Merrimack is required to conduct quarterly testing for PM and / or HCl during quarters where either MK1 and/or MK2 operate 168 hours or more. If the operating times for all quarters in a year are less than 168 hours per quarter, GSP Merrimack is required to test at least once per year.

- On February 28, 2023, GSP Merrimack conducted a timely performance test of MK1 and MK2 at the combined stack designated in the Permit as MK-CS. On April 28, 2023, NHDES received a test report presenting the results of the HCl performance test. Results presented in the report showed that GSP Merrimack emitted HCl at the rate of 0.0013 lb/MMBtu which is greater than 50% of the MATS HCl limit in the Permit. As a result, GSP Merrimack no longer qualifies for LEE status and must conduct performance tests as per the requirements of Condition VIII.G, Table 7, Item 32(b) of the Permit and MATS.
- On June 20, 2023, NHDES issued a letter of acceptance stating that the results of the performance test are accepted as valid and that GSP Merrimack emitted HCl below the MATS HCl limit in the Permit.

### **Request for Information**

Based upon the foregoing, NHDES requests that GSP Merrimack submit the following:

1. For each of the dates in Item 1 above relating to exceedances of the daily NO<sub>x</sub> limit, provide the following information:
  - The time that fires were introduced in MK1 or MK2 and the time that the temperature permissive was met and startup ended;
  - The boiler load as indicated by steam rate, heat input rate or equivalent megawatts of electricity at the end of each startup period;
  - The hourly inlet temperature to the SCR during each startup day;

- The hourly NO<sub>x</sub> emissions in units of lb/hour and lb/MMBtu at the outlet of each SCR for each of the violation days; and
  - A compliance plan that describes measures that GSP Merrimack will take to minimize exceedances of the daily NO<sub>x</sub> RACT rate or mass limits during future operations.
2. For Item 2 above relating to exceedances of the MATS PM limit, submit the following information:
- On February 27, 2023, the time that fires were first introduced in MK1 and MK2, the time when startup was completed and confirmation that the time that the PM stack test commenced was considered normal operations;
  - Electrostatic precipitator (ESP) data for each PM test run conducted on February 27, 2023, that includes the number of fields in service for each ESP, the number of fields out of service for each ESP, hourly data showing secondary power (secondary voltage and amperage) and the outlet flue gas temperature for each ESP and information showing that MK1 and MK2 precipitators were at normal operating conditions at the time of the failed particulate test;
  - A description of the activities conducted as of the date of your response to this letter to isolate the cause(s) of the elevated particulate loadings resulting in the failed stack test. Provide information on all issues identified during recent maintenance activities, as well as preventive measures put in place to ensure that a retest will demonstrate compliance with the MATS PM limit; and
  - A schedule including the anticipated date for a PM retest; submittal of a revision to the protocol to include process data described in the first bullet of item 3 below and a pretest meeting.
  - ESP data collected during each PM retest run that includes number of fields in service for each ESP, number of fields out of service for each ESP, hourly data showing secondary power (secondary voltage and amperage) for each ESP and information showing that MK1 and MK2 precipitators are operating in the normal range during the time of the particulate retest.
3. For Item 3 above related to the HCl performance test reports, provide the following:
- Process information on the wet limestone-based flue gas desulfurization (FGD) system showing that the system had reached equilibrium and was operating within the control parameters during the HCl performance test; and

- An explanation of why the results of recent stack tests are approximately 50% higher than past tests.
4. For the period of time from February 27, 2023, when the initial fires were introduced in MK1 and MK2 for the failed stack test to March 1, 2023 when MK1 and MK2 were taken offline, provide the following data on an hourly basis:
- Coal feed, heat input rate and equivalent megawatts of power generation for MK1 and MK2;
  - ESP inlet and exit gas temperatures, secondary voltage and amperage (power) for each ESP in service;
  - MK1 and MK2 SCR inlet temperatures and ammonia flowrate for each SCR;
  - Scrubber pH; makeup water flowrate; recirculation flowrate; and FGD inlet and exit gas temperature;
  - Sulfur dioxide (SO<sub>2</sub>) loading from MK1 and MK2 entering the FGD in units of lb/hour and lb/MMBtu; SO<sub>2</sub> emissions at the common stack in units of lb/hour and lb/MMBtu; and the removal efficiency of SO<sub>2</sub> at the common stack in terms of percent; and
  - Opacity readings in percent from the common stack.
5. Since GSP Merrimack no longer qualifies for LEE status relative to PM and HCl, provide a written plan describing how GSP Merrimack intends to track and address the requirement to conduct quarterly testing for PM and HCl during quarters where either MK1 and/or MK2 operate 168 hours or more.

In addition to the information requested above, NHDES requests that GSP Merrimack submit any other information that NHDES should consider in evaluating the aforementioned violations. Please provide a written response to each of the items listed above, except for ESP data to be collected during the PM retest, in this NOF **within fifteen (15) days of issuance**. For the ESP data, submit that data within 15 days of the date of the retest. Please address all information to Edward Peduto, Enforcement Section Supervisor, at the following address:

NHDES Air Resources Division  
Enforcement Section  
29 Hazen Drive, P.O. Box 95  
Concord, NH 03302-0095

Please be aware that these violations have been evaluated against the United States Environmental Protection Agency's *Guidance on Federally Reportable Violations for Clean Air*

*Act Stationary Sources*, and it has been determined by NHDES that one or more of the violations meet the criteria of a Federally Reportable Violation due to being violations of a federal requirement that has been incorporated into New Hampshire's State Implementation Plan.

Please be advised that NHDES has not completed its review and, therefore, this letter does not guarantee compliance with items not otherwise noted or preclude enforcement action(s) to address any matters noted herein or to be determined.

If you have any questions regarding these findings, please contact Edward Peduto, Enforcement Section Supervisor, at (603) 271-1374 or by email at [Edward.F.PedutoJr@des.nh.gov](mailto:Edward.F.PedutoJr@des.nh.gov). A current copy of the Air Resources Division Rules can be obtained from the NHDES website at <http://www.des.nh.gov/rules-and-regulatory/administrative-rules>, or by contacting the NHDES Public Information Center at (603) 271-2975.

Sincerely,



Sheri Eldridge  
Compliance Bureau Administrator  
Air Resources Division

SRE/efp

ec: NHDES Legal Unit  
EPA Region 1  
Town Official, Town of Bow

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(Stationary Source)