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VIA E-MAIL
VIA OVERNIGHT MAIL

Mr. Mark A. Stein, Esq.
Senior Assistant Regional Counsel
U.S. Environmental Protection Agency - Region 1
Office of Regional Counsel, Region 1
5 Post Office Square, Suite 100 (CIP)
Boston, Massachusetts 02109-3912

Re: **Public Service Company of New Hampshire
Merrimack Station, Bow, New Hampshire
Draft NPDES Permit No. NH0001465
Compliance Plan for Bottom Ash Transport Wastewater Pursuant to Effluent
Limitations Guidelines Rule**

Confidential and Proprietary Business Information

Dear Attorney Stein:

Public Service Company of New Hampshire d/b/a Eversource Energy ("PSNH" or "the Company") is providing the following report in response to your request of September 21, 2016, made on behalf of Region 1 of the Environmental Protection Agency ("EPA" or "the agency"), seeking information related to Merrimack Station's plan to comply with the bottom ash transport wastewater ("BATW") effluent limitations set out in the agency's Effluent Limitations Guidelines for the Steam-Electric Power Plant industrial category ("ELGs"), 80 Fed. Reg. 67,838 (Nov. 3, 2015). There are a number of unknowns and challenges in developing this compliance plan, the most significant of which is the planned sale of PSNH's generating assets through an auction process managed by the New Hampshire Public Utilities Commission ("NHPUC"). The timing of this auction is likely this summer with the goal of transitioning ownership of the plants in late 2017-early 2018.

The upcoming sale of Merrimack Station makes it impossible for PSNH to identify at this time a definitive date by which the plant can be brought into compliance with the new BATW effluent limitation. PSNH's best estimate at this time given the current unknowns and challenges associated with divestiture is that Merrimack Station should be able to comply with new BATW effluent limitation in 2022. Since the ELGs were promulgated, PSNH undertook a project effort to understand the regulation and initiate a plan to comply. The Company has worked diligently to identify the most feasible option for the Station and to carry out essential preliminary engineering and design tasks. However, certain work and decisions, both technical and financial, cannot be made until a new owner

has assumed control of the facility. Once a new owner and operator are in place, there will be a transition period of undetermined length while the new owner/operator becomes familiar with plant budgets and capabilities, identifies staffing needs, reviews immediate operational needs and maintenance activities, and develops a timetable for future work. It is impossible for PSNH, as the current owner, to commit an unknown new owner to a time frame for implementing the compliance plan PSNH proposes particularly given the possible variations a new owner may determine appropriate. Thus, while we have diligently explored viable options and developed what we believe to be a well-thought-out compliance plan, it is only reasonable to acknowledge a new owner may see things differently. Accordingly, PSNH believes an applicability date of December 31, 2022, would allow time for potential contingencies and the transition following divestiture. PSNH will update the agency of any developments affecting this compliance date until the sale of Merrimack Station is finalized.

Background

Work Completed to Date

Since EPA promulgated the ELGs, PSNH has been working diligently to evaluate the feasibility of potential retrofit BATW treatment technologies to achieve the new “no discharge” limitation. As a preliminary note, Merrimack Station is fundamentally different from most other power plants in that both units have wet bottom cyclone-fired boilers, which produce slag as an end product. Molten ash, once quenched in a tank, becomes slag (shown below)—a stable, inert, glass-like solid compound, which is very different from typical bottom ash that is targeted in the relevant ELGs.



The slag is beneficially reused, and, as an illustrative fact, our slag is used as sandblasting grit and glass-like aggregate on roof shingles. Our boilers and the slag end product thus differentiate us from the industry as a whole and, insofar as the ELGs go, put Merrimack Station in the position of an outlier

since the ELGs were written for industry-wide applicability. The molten ash produced in Merrimack Station's two boilers is currently quenched and collected in water-filled slag tanks below each boiler. From there, the slag is conveyed through clinker grinders to reduce the size of the glass-like slag material. The resulting material is then transported with water (i.e., sluiced) to a collection area, where it is dewatered and processed by a third-party company for 100 percent beneficial reuse as abrasive blasting material and/or roofing shingle aggregate.

In the ELGs, EPA identified dry handling or "closed-loop" recycling systems as the best available technology ("BAT") for treating constituents commonly found in BATW. Certain dry handling systems collect bottom ash in a water quench bath and typically a drag chain conveyor (mechanical drag system) extracts the bottom ash from the water bath on an incline to dewater it. Closed-loop recycling treatment systems transport bottom ash using the same processes as the current "wet-sluicing" system at Merrimack Station but, instead of going to an open collection area for dewatering and discharging of the decanted wastewater, the bottom ash is sluiced to a remote mechanical drag system. Once there, a drag chain conveyor extracts the bottom ash from the water on an incline to dewater the bottom ash, and the sluice water is continuously recycled using a closed loop system back to the bottom ash collection system.

The changes needed to convert to a dry handling or closed-loop recycling system present significant engineering challenges. As a result, and in anticipation of the retrofitting challenges, PSNH originally contacted a number of top engineering firms and equipment manufacturers; however, because of the preliminary and proprietary nature of this effort, PSNH is not providing the names of the two vendors it is working with at this time. PSNH initiated independent, parallel studies with both vendors to secure best options, costs, and schedules. Both visited Merrimack Station on multiple occasions in 2015 and 2016 to review existing equipment, layout, and plant operations, and to gather required data, drawings, and measurements. Due to intermittent plant operations in 2015 and 2016, there could only be limited actual onsite observations of the existing equipment and plant operations for both firms. Nevertheless, samples from the existing slag transport system were collected using a temporary slip-stream arrangement and analyzed for particle size distribution and settling characteristics.

Both companies considered several options for modifying the existing systems for compliance. Two major equipment manufacturers also were engaged to analyze and develop potential equipment arrangements, cost estimates, and project schedules. In the end, both companies recommended modification to a closed-loop system utilizing a remotely located submerged scraper, or drag conveyor. This was due in large part to the existing boiler and plant physical design and the current slag sluice system configuration. Use of an existing steel building to house the wet drag chain system design is currently planned. The installation of dewatering conveyors under the boiler (i.e., a dry system) is significantly more complex and expensive and the manual transporting of the dry slag or ash to the processing party much more difficult.

Other remote location equipment arrangements were considered by each vendor (e.g., settling bins), but were eliminated because of cold weather concerns and the complexities associated with intermittent operation of the plant.

Proposed BATW Treatment System for Merrimack Station

**REDACTED - Confidential Business Information;
40 C.F.R. Part 2**



REDACTED - Confidential Business Information; 40 C.F.R. Part 2

Ongoing Work and Analyses Planned for 2017

Because all of the Station's systems are engineered to operate as an integrated whole, it is necessary before implementing any significant operational change to conduct a water balance study. In this particular case, the existing slag sluice system water is part of broader service water and wastewater treatment systems used in other Station processes. Thus, a water balance study is required to determine the extent of impacts on the operation of those systems and to identify and possibly redesign and reconfigure alternate water supplies after the elimination of the sluice water flow. This study is underway and will take approximately six months to complete. It will include vendor site visits, flow testing and measurements, records and drawing review, and engineering analyses. Once completed, to confirm the remote conveyor arrangement described above is still feasible, a further, more extensive engineering design of the remote system will be undertaken. Consulting companies will complete a more thorough engineering design including more specific component sizing and placement, electrical load determination and supply requirements, foundation loading requirements, operation and control requirements, and more accurate estimates of project costs and schedule. This activity is expected to span another six months, but it may be delayed if further testing, sampling, or collection of operating information is prolonged due to Merrimack Station's limited dispatch.

The detailed engineering evaluation could be completed by late 2017 or early 2018, but may be delayed by the above-referenced NHPUC auction process and transition to a new owner. Once completed, the water balance study and detailed engineering evaluation will be used to develop a procurement bid specification or specifications for equipment supply and for the overall project. Furthermore, procurement and construction of the chosen BATW treatment technology cannot occur until after the divestiture process is complete and a new owner affirms this compliance method.

Factors Impacting PSNH's Ability to Comply with the ELGs for BATW

The ELGs provide permittees are to comply with the new effluent limitations "as soon as possible" and delineate four factors to consider when establishing a compliance deadline. See 40 C.F.R. § 423.11(t). Relevant here is the factor that allows permittees additional "[t]ime to expeditiously plan (including to raise capital), design, procure, and install equipment to comply," as well as the open-ended factor that allows permittees to assert "other factors" or circumstances unique to them that will or have the potential to delay compliance with the new ELGs. See 40 C.F.R. § 423.11(t)(1) & (4). Specifically, PSNH estimates, absent unforeseen delays in the divestiture process, it will take until early- to mid-2022 to complete the project. Conservatively, PSNH believes a compliance date of December 31, 2022, will allow sufficient time to achieve full compliance with the ELG limit of "no discharge" for BATW due in large part to the following factors: the sale of the plant in accordance with a frequently shifting timeframe, coupled with the transition time needed by a new

owner to become familiar with plant operations; competition within the industry for limited materials and available vendors for these retrofit projects; the at-this-time-unknown requirements, limitations, and implications of the final NPDES permit for the Station and potential ensuing litigation; intermittent plant operations; and ISO-NE limitations and outage scheduling. These uncertainties, including a discussion of their potential to impede the Company's ability to install the BATW treatment technology pursuant to a more predictable construction timeline, are described in greater detail below.

Impact of PSNH's Divestiture of Generation Assets

As mentioned, the ongoing divestiture activities related to PSNH's generation assets are expected to occur throughout 2017, with the sale likely taking place in late 2017 and the transfer of ownership completed in 2018. This timing is critical to the completion of this BATW project in that approval of the funding and any release for such a significant capital expenditure will require consultation with, and approval of, the new owner of Merrimack Station. Ongoing legal proceedings in the divestiture may result in delays to the sale activities and ultimately to the determination of a new owner of the facility. A four-month delay already has occurred since the decision by the NHPUC in July 2016 to proceed with the auction. However, it would be foolhardy for PSNH to move forward with this project prior to the final sale not only because the new owner may choose a different approach based on personal power plant experience but also because a project of this magnitude would require PUC approval prior to PSNH, as a regulated utility, being able to proceed. Such approval by the NHPUC would be a time-consuming and costly process, and in reality, approval would be unlikely to occur before divestiture.

Once a new owner is in place, time will be required for its review, financial analysis, and approval of the compliance plan. The duration of this review and approval process cannot be predicted until after the auction process is completed. Review by a new owner may result in a change in desired technology or design based on that entity's own experience or business model for the facility. In the meantime, however, PSNH is continuing to proceed with the needed field studies and early design data development in a good faith attempt to fulfill its regulatory obligations.

Competition within the Industry for Limited Materials and Available Vendors

It has been widely discussed within the industry that lead times for the detailed design, materials supply, and fabrication of individual system components will be impacted by the backlog of similar project efforts throughout the country. Most notably, inclined drag conveyor vendors have indicated that because of limited man-power and shop space resources, their normal twelve-month lead time is already extended to fifteen to eighteen months and likely will worsen as the number of facilities entering this phase of compliance with the ELGs continues to grow both currently and in the coming years. Similar supply schedule impacts can be expected for other system components, specialty piping and pumps, electrical components, etc., for the same reason. Accordingly, known delays and some contingency in the overall compliance timeline must be included for this phase of the project to allow for delays in engineering due to these companies' limited resources and the likely inability to proceed immediately from study and conceptual design finalization to detailed engineering, design, procurement, and installation. PSNH or the new owner of Merrimack Station will know more

about the full extent of these delays when the time comes to procure and install the BATW treatment system at the facility.

Outcome of Other Aspects of the Final Permit for Merrimack Station

The timing and content of the pending renewal NPDES permit for Merrimack Station also has the potential to significantly impact the technical aspects of this BATW project because other requirements of the permit may alter the Station's overall water balance or individual constituent flows or treatment. The requirements of the final permit could also have the potential to impact project financial analyses and approval schedules by PSNH or the new owner of the Station.

Currently, an overwhelming majority of process wastewater effluent generated at the facility is BATW (excluding cooling water). This is so despite the fact that a considerable volume of BATW is currently recycled elsewhere in the plant. Removing this wastewater stream from Merrimack Station therefore will significantly disrupt current operations. One or more sources of makeup water may need to be utilized to replace the BATW currently recycled elsewhere in the plant. Furthermore, the removal of such a significant overall volume of BATW from the existing wastewater treatment system train may result in the need for new and/or altered treatment systems to adequately treat the remaining wastewater effluent generated at the facility.

The water balance study already underway at the facility will better enable PSNH to understand the scope of changes to the wastewater treatment processes that will be necessary at the facility following the elimination of BATW from the overall wastewater treatment scheme. However, the full extent of these changes cannot be realized by PSNH or the new owner of Merrimack Station until a new final NPDES permit is issued for the facility. Only then will it be known to what extent wastewater streams other than BATW must be treated by the Station and the timeframes within which PSNH or the new owner will have to comply with the new treatment standards for these wastewater streams. The fact that one or more aspects of the final NPDES permit for Merrimack Station is likely to be administratively appealed by certain special interest groups, such as Sierra Club, or the owner of the Station will only further complicate all of these matters, given the requirements of the new permit will likely be stayed or held in abeyance pending resolution of this anticipated appeal.

Intermittent Operation of the Plant

Merrimack Station likely will be dispatched intermittently for the foreseeable future. This fact will continue to impact the abilities of consultants and vendors to conduct the engineering analyses that must be completed to ultimately procure and install the BATW technology. Moreover, the inability to observe and document plant operations at full dispatch for a significant period of time may complicate the abilities of these professionals to design the treatment system for this maximum capacity and extend the overall time it takes to develop a concrete set of installation plans. Even once this new treatment system is installed, sporadic plant operations will extend the time it takes to ensure the system will function properly and allow the facility to consistently comply with the ELG's "no discharge" effluent limitation.

ISO-New England – Scheduling Outages

In setting applicability dates for BAT limits under the ELG Rule, EPA advises the permitting authority to consider grid reliability: “EPA’s decision is also designed to allow, more broadly, for the coordination of generating unit outages in order to maintain grid reliability and prevent any potential impacts on electricity availability, something that public commenters urged EPA to consider.” 80 Fed. Reg. at 67,854. See *also* Response to Comments, p. 8-138.

Also, EPA clearly anticipated that much of the new technology required for retrofits would be constructed and equipment installed in a manner that would attempt to minimize interruption of routine facility operations, and then be tied in during regularly scheduled plant or unit outages. According to the preamble, the timing of the final rule “enables facilities to take advantage of planned shutdown or maintenance periods to install new pollution control technologies.” 80 Fed. Reg. at 67,854. In addition, in its Regulatory Impact Analysis, EPA explained the implementation period was designed to avoid impacts to energy reliability:

EPA would generally expect that plants would meet the new effluent limitations and standards in a somewhat staggered fashion throughout this period, which would reflect the fact that (1) some plants may be able to meet the limitations and standards sooner than others, (2) all permits are not re-issued at the same time due to their 5-year permit term, and (3) *the implementation window is in part intended to ensure no adverse effects on electricity availability.*

Regulatory Impact Analysis, EPA-HQ-OW-2009-0819-5849, at 3-4 (emphasis added). Moreover, EPA recognized tie-ins of new equipment may need to occur across more than one outage: “the need to span installation of equipment over separate unit outages [is a] consideration[] that can be incorporated into the permit writer’s determination of the ‘as soon as possible’ date, assuming the plant provides documentation demonstrating such a need.” Response to Comments, p. 8-54.

The modification of the existing systems and installation of the new equipment at Merrimack Station will require both units to be off-line and unavailable for some periods. Even though the units at Merrimack Station are at times off-line in reserve status, these planned outage periods of unavailability for the system installation must be coordinated through ISO-New England, through an application and approval process that ensures reliability of the New England power system. Gaining approval for planned outages from ISO-New England has become increasingly difficult, with requests at times denied due to electric system constraints. These constraints are largely the result of the continued and significant reduction of baseload generation in the New England area causing reduction in reserve capacity needed to meet regional load demands. In the recent past, ISO-New England has been increasingly reluctant to approve in advance any planned outages for large blocks of time that coincide with seasonal peak demand periods (e.g., June through August due to peak summer demand). Therefore, even more advance planning of outages will be necessary.

Conclusion

The issues discussed herein dictate that PSNH cannot commit to Merrimack Station complying with the ELG's "no discharge" effluent limitations for BATW earlier than December 31, 2022. EPA provided in the ELGs that if a plant's final NPDES permit will be issued after January 4, 2016, but before November 1, 2018, permit writers are to "apply limitations based on the previously promulgated BPT limitations or the plant's other applicable permit limitations until *at least* November 1, 2018." 80 Fed. Reg. at 67,883 (emphasis added). PSNH respectfully requests that the BATW effluent limitations from its existing permit be carried forward into the new permit for the facility until the Station can comply with the ELG's "no discharge" limitation for BATW.

Completing this work prior to December 31, 2022, may become possible as existing uncertainties are resolved. We will keep EPA informed of any significant developments in the divestiture proceedings that may impact this schedule or plan. We look forward to an ongoing dialogue with EPA. Finally, by submitting this plan in response to EPA's September 21, 2016 request, PSNH is not waiving and hereby reserves all its rights and arguments, including those concerning the applicability of the BATW limitations, to PSNH's fundamentally different slag operations.

Very truly yours,



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Senior Counsel

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Attachment A

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