



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I

5 Post Office Square, Suite 100
BOSTON, MASSACHUSETTS 02109-3912

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

FEB 07 2013

William H. Smagula, P.E., Vice President - Generation
Public Service of New Hampshire
P.O. Box 330
Manchester, NH 03305-0330

Devesh Sharma, Executive Vice President
Aquatech International Corporation
One Four Coins Drive
Canonsburg, Pennsylvania 15317

Re: Information Request for NPDES Permit Re-issuance, NPDES Permit No: NH0001465

Dear Messrs. Smagula and Sharma:

The New England Regional office of the United States Environmental Protection Agency (EPA) is continuing work on developing the final National Pollutant Discharge Elimination System (NPDES), Permit No. NH0001465, for Public Service of New Hampshire's (PSNH) Merrimack Station electrical generating facility in Bow, New Hampshire (Merrimack Station). Pursuant to Section 308(a) of the Clean Water Act (CWA), 33 U.S.C. § 1318(a), EPA is sending PSNH and Aquatech International Corporation (Aquatech) this information request letter because EPA requires additional information to support development of appropriate NPDES permit limits for Merrimack Station's pollutant discharges to the Merrimack River.

Specifically, this letter seeks additional information related to PSNH's existing Flue Gas Desulfurization Wastewater Treatment System (FGD WWTS), which includes a vapor compression evaporation system referred to as the Secondary Wastewater Treatment System (SWWTS). In the public comments that EPA received on the draft permit issued in September 2011 for Merrimack Station, a number of parties submitted a variety of conflicting comments related to the FGD WWTS. We feel that it is likely that you have information that would support and improve our analysis given that you have direct experience operating the FGD WWTS at your facility. In past staff-level communications, we indicated that we expected we would send you an information request letter, such as this one, but that we preferred to first conduct a site visit and have a meeting or conference call because it would provide information and likely facilitate the streamlining of any subsequent information request letter. *See* 40 C.F.R. § 124.3(e). For a number of reasons, however, PSNH declined to agree to arrange either a site

visit or conference call. Therefore, we are sending this letter at this time.

CWA § 308(a) authorizes EPA to require the owner or operator of any point source to make reports and provide information as may reasonably be required to:

... carry out the objectives of ... [the CWA], including but not limited to: (1) developing or assisting in the development of any effluent limitation, or other limitation, prohibition ... or effluent standard, ... , or standard of performance under [the CWA] ... ; (2) determining whether any person is in violation of any such effluent limitation, or other limitation, prohibition or effluent standard, pretreatment standard, or standard of performance; (3) any requirement established under this section; or (4) carrying out section ... [402] ... of [the CWA]

EPA's information indicates that Aquatech, under contract with PSNH, installed the SWWTS at Merrimack Station, and that Aquatech has been operating the SWWTS for PSNH since it was installed. Therefore, Aquatech may, in addition to PSNH, have control of and access to certain information regarding the design, operation and maintenance of the SWWTS, as well as information regarding any discharge or disposal of SWWTS distillate and non-contact cooling water at local publicly owned treatment works (POTWs). For some of the items requested, we have specified that only PSNH need reply whereas for other items, we have asked PSNH and Aquatech to reply. For the latter items, both PSNH and Aquatech may submit separate responses or a single joint response may be provided.

To assist in the determination of final effluent limits for wastewater discharges from the FGD WWTS at Merrimack Station, EPA requires PSNH and Aquatech to submit the information specified below **within forty-five (45) business days** of receipt of this letter.

PSNH and Aquatech must also provide an electronic copy of the information submitted in response to the questions and requests specified below.

Compliance with This Request

Compliance with this request is mandatory. Failure to respond fully and truthfully, or to adequately justify any failure to respond, can result in an enforcement action by EPA pursuant to Section 309 of the CWA, 33 U.S.C. § 1319, which provides for administrative, civil, and criminal penalties. In addition, any person who knowingly submits false information may be subject to criminal prosecution under 18 U.S.C. § 1001. If responsive information or documents not known or available to you as of the date of submission of the response to this request should later become known or available, you must supplement your response to EPA. Moreover, should you find at any time after your initial response that any portion of the submitted information is false or misrepresents the truth, you must notify EPA of this fact and provide a corrected response.

The information requested must be provided even though you may contend that it includes possible confidential information or trade secrets. You may, however, if you desire, assert a business confidentiality claim with respect to part or all of the information submitted to EPA in the manner described at 40 C.F.R. § 2.203(b). Information covered by such a claim will be disclosed by EPA only to the extent, and by means, of the procedures set forth in 40 C.F.R. Part 2, Subpart B. If no such claim accompanies the information when it is submitted to EPA, it may be made available to the public by EPA without further notice to you. Please note that effluent information may not be regarded as confidential. *See* 40 C.F.R. § 2.302.

Information Requested

Description of the Secondary Wastewater Treatment System and How it Operates

PSNH and Aquatech shall respond to the requests specified in Items 1-16 below.

1. Provide an updated process flow diagram (or diagrams) and, if necessary, a written narrative, detailing the quantity inputs and outputs of effluent fed into and exiting from the SWWTS. Specifically, the flow diagram(s) must:
 - a. Identify each component of the SWWTS (e.g., brine concentrator, crystallizers, filter presses, centrifuge, spray dryer, bag house, energy source, etc.);
 - b. Identify and illustrate all connections between components and the associated design flow rates (gpm) between components;
 - c. Identify all chemical additions that are part of the SWWTS treatment process (i.e., what, where, how much, and at what concentrations chemicals are added to which component(s) of the SWWTS per cycle, day, and week);
 - d. Identify all recycling and disposal streams including distillate, brine and salt cake;
 - e. Indicate whether reverse osmosis is used to reduce the volume of FGD wastewater going into the SWWTS for treatment; and
 - f. Indicate the manufacturer's make and model of each component.
2. Provide an electronic and hard copy of the most current Merrimack Station site plan (MK-S-30-2).
3. Regarding the brine concentrator:
 - a. What type of system is used? (E.g., seeded slurry falling film)
 - b. Does the brine concentrator operate with one or multiple treatment chains?
 - c. Are brine tube distributors a part of the brine concentrator?
 - d. Is a de-aerator utilized?
 - e. Are heat exchanger(s) utilized?
 - i. If so, what type? (E.g., plate and frame)

- ii. If a seeded slurry falling film system is used, is seed crystal added prior to the heat exchangers?
 - iii. Was a redundant heat exchanger installed?
 - f. Is it equipped with an external mist eliminator and/or vapor scrubber?
 - g. Is the vapor stream compressed? If so, is it used for preheating incoming FGD wastewater?
 - h. What is the metallurgy used for the vessel, tubing and heat exchangers? (E.g., titanium tubing, Hastelloy, etc.)
 - i. Is a hydrocyclone used where the overflow goes to the crystallizer?
 - j. Is the concentrated slurry combined with un-concentrated FGD wastewater?
4. Regarding the crystallizer:
- a. Is the crystallizer operated in a forced circulation mode under vacuum?
 - b. What are the different stages/effects of the crystallizer's multi-effects system? (E.g., high temperature and/or low temperature)?
 - c. Are heat exchanger(s) used for incoming wastewater and/or to condense vapor? If so, what type? (E.g., shell, tube, etc.)
 - d. What is the volume of non-contact cooling water blowdown generated and where is it reused or otherwise disposed of?
 - e. What is the metallurgy used for the vessel, tubing, and heat exchanger? (E.g., rubber-coated steel, titanium, etc.)
 - f. Is there a purge stream of higher soluble salts (bromine, iodine) from the crystallizer? If so, is this purge stream spray dried (e.g., using a spray film evaporator) or mixed with ash?
 - g. Is a brine cooler used?
 - h. What types of crystals are formed as a result of the SWWTS process? (E.g., calcium chloride, magnesium chloride hydrate, calcium sulfate, boron, sodium chloride, etc.)
 - i. What type of dewatering device is used for the salt slurry formed in the crystallizer? (E.g., belt pressure filters, centrifuges, drum dryers, etc.)
 - j. How is the dewatering filtrate handled? (E.g., returned to crystallizer, hauled for off-site disposal, recycled or reused elsewhere in plant processes, etc.)

Operating Parameters

- 5. What is the manufacturer-specified and/or actual range of pH at which the brine concentrator can be operated?
- 6. What is the manufacturer-specified and/or actual range of pH at which the crystallizer can be operated?
- 7. What is the manufacturer-specified and/or actual range of pressure (in atm) at which the brine concentrator can be operated?

8. What is the manufacturer-specified and/or actual range of pressure (in atm) at which the crystallizer can be operated?
9. What has been the maximum chloride concentration in the FGD scrubber since it began operating?

Pretreatment

10. Is FGD wastewater (after physical and chemical treatment) softened or partially softened prior to entering the brine concentrator or the crystallizer or both?
 - a. If the response is yes, indicate clearly on the updated process flow chart provided in response to Item 1 all points at which softening occurs and answer the following:
 - i. What chemicals are added (e.g., lime, soda ash, coagulant, polymer, etc.) during this step?
 - ii. What is done with the purge stream? (E.g., spray dryer, mixed with ash, high pressure recess chamber to dewater sludge, etc.)
 - iii. Is there or would there be any reclamation of calcium carbonate back to the FGD scrubber?
 - b. If the response is no, are any chemicals added to the FGD wastewater just prior to the brine concentrator or the crystallizer?

Date and Frequency of SWWTS Operation

11. Provide the date that each major component of the SWWTS began operating at Merrimack Station.
12. Provide the date that the SWWTS as a whole began operating at Merrimack Station.
13. Provide the frequency and duration of operation for each major component of the SWWTS; specifically, provide the average hours of operation per day, week and month since operation began.
14. Provide the average hours of operation of the SWWTS compared to the average hours of operation of the FGD scrubber system as a whole.
15. Provide the total volume of FGD wastewater (gallons) that has been subject to treatment by the physical/chemical system, the polishing step (also referred to as the Enhanced Mercury Arsenic Removal System or EMARS) and the SWWTS since operation of the SWWTS began.
16. Provide the total volume of FGD wastewater (gallons) that has been subject to treatment by the physical/chemical system and the SWWTS, but not the polishing

step, since operation of the SWWTS began.

Coal

PSNH shall respond to the questions and requests specified in Items 17 and 18 below:

17. Identify all coal types (e.g., Eastern Bituminous, Powder River Basin, etc.) and regional subtypes (e.g., Central v. Northern Appalachian Eastern Bituminous) delivered to and used as a fuel source at Merrimack Station since July 1, 2012. Also, PSNH shall provide the fly ash content of each type of coal identified.
18. Is the delivered coal at Merrimack Station blended from different coal types?
 - a. If yes, what are the criteria for blending?
 - b. If no, how is the coal inventory drawn on? (E.g., FIFO, LIFO, random, etc.)
 - c. Provide the average weight of fly ash collected at Merrimack Station per month since January 2011.
 - d. Provide the remaining capacity of the on-site ash landfill and explain whether PSNH has any plan for adding additional on-site landfill capacity at Merrimack Station in the future.

Energy Demand

19. PSNH and Aquatech shall identify and explain:
 - a. The energy source(s) that were considered for the brine concentrator and crystallizer at Merrimack Station (e.g., vapor compressors, turbo fans, thermo compressors, direct steam, indirect steam heat exchange, etc.);
 - b. The various energy conservation considerations that contributed to the choice of crystallizer design (e.g. single- versus multiple-effect crystallizers);
 - c. The energy source(s) ultimately chosen for the brine concentrator and crystallizer and the reason(s) why it was chosen; and
 - d. If direct steam was selected, was a boiler installed with this system? If yes, indicate clearly on the updated process flow chart provided in response to Item 1 all associated waste streams, if any (e.g., boiler blow down).
20. In response to EPA's request for information regarding the energy demand of the SWWTS, PSNH stated in a December 20, 2012, email to EPA that the contractually guaranteed value is 1.4 MW, and that PSNH will provide a more complete response once the SWWTS optimization phase and adjustment process is completed. PSNH shall provide the amount of energy required for operating the SWWTS system (i.e., the total electrical load of the SWWTS) if it is different than the contractually guaranteed value mentioned above.

Operation and Maintenance

PSNH and Aquatech shall answer the questions specified in Items 21-22 below:

21. Have the brine concentrator and/or crystallizer been cleaned since operation of the SWWTS began?
22. Describe in detail the daily, weekly, monthly and yearly maintenance procedures and practices for SWWTS equipment at Merrimack Station.

PSNH shall respond to the questions and requests specified in Items 23-30 below:

23. What was the total operating and maintenance (O&M) cost associated with the SWWTS that PSNH incurred from September 28, 2011 through the end of 2012? PSNH's response must include all supporting assumptions and must itemize all cost components making up this total.
24. Has PSNH sought, or is PSNH currently seeking, recovery of SWWTS O&M costs that it incurred from September 28, 2011 through the end of 2012 as part of its Energy Service rate approval application with the New Hampshire Public Utilities Commission (NHPUC)?
 - a. If yes:
 - i. What was the total amount sought?
 - ii. Does the Energy Service rate that was approved by the NHPUC for PSNH for 2012 account for SWWTS operation and maintenance costs?
 - b. If no, does PSNH plan to recover such costs in the future?

Sampling Data

25. Has PSNH conducted sampling analysis of constituents in effluent from the FGD physical/chemical treatment system prior to SWWTS treatment (i.e., SWWTS feedwater) since operation of the SWWTS began?
 - a. If yes, what were the constituents sampled? Provide all such sampling data. Please provide this data electronically on an excel spreadsheet or other format that allows for data analysis. In addition, include the test method(s) used for each analysis and all corresponding QA/QC information.
 - b. Enclosed with a letter dated February 9, 2012, from GZA GeoEnvironmental, Inc. (GZA), on behalf of PSNH to the Allenstown Wastewater Treatment Facility is a table labeled "Table 1" that provides sampling data referred to as "Calculated Stream B Concentrations". Footnote 1 of Table 1 indicates that these concentrations were calculated

based on “recent analytical results”. Please provide these “recent analytical results” and confirm whether samples collected for this analysis were representative of Stream A on the line diagram provided by PSNH on December 20, 2012. Please provide this data electronically on an excel spreadsheet or other format that allows for data analysis.

26. According to a document titled “Waste Disposal Agreement No. WDA-001” issued on October 1, 2012, one of the permitted flows from PSNH to the Hooksett Wastewater Treatment Plant is referred to as “softened Stream A”. Does “softened Stream A” refer to FGD wastewater that has undergone treatment by the EMARS plus a pretreatment softening step, but has not received treatment by the brine concentrator or crystallizer? Please identify all treatment steps that “softened Stream A” received.
27. The Self Monitoring Report, SMR Summary Sheet and Analytical Data Reports that GZA submitted on behalf of PSNH to the Lowell Regional Wastewater Utility (under a cover letter dated August 24, 2012) for the July 1 – July 31, 2012 monitoring period provided sampling data for a wastewater stream labeled “softened Stream B”. Does “softened Stream B” refer to FGD wastewater that has undergone treatment by the EMARS plus the brine concentrator plus a pretreatment softening step? If not, identify all treatment steps that “softened Stream B” received.
28. The Waste Water Discharge Monitoring Report and Analytical Data Report that GZA submitted on behalf of PSNH to the Winnepesaukee River Basin Program Wastewater Treatment Plant for the January 27 – February 3, 2012 monitoring period refers to the wastewater stream being sampled as “treated FGD wastewater” and “treatment tank effluent”. Identify the precise sampling location(s) of this waste stream on the updated process flow diagram provided in PSNH’s response to Item 1.
29. The Waste Water Discharge Monitoring Report and Analytical Data Report, dated October 11, 2012, that GZA submitted on behalf of PSNH to the Hooksett Sewer Commission referred to the waste stream discharged to Hooksett Wastewater Treatment Facility from September 1, 2012 to September 30, 2012, as a “distillate.” Identify the precise sampling location(s) for this distillate (e.g., brine concentrator, crystallizer) on the updated process flow diagram provided in PSNH’s response to Item 1.
30. Has any cooling water blow down associated with the SWWTS been discharged and/or sent to local POTWs for disposal since operation of the SWWTS began? If yes, provide the total amount discharged and disposed of and all sampling data for such effluent. Please provide this data electronically on an excel spreadsheet or other format that allows for data analysis. In addition, include the test methods used for each analysis and all corresponding QA/QC information.

Mercury and Bromide Emission

PSNH and Aquatech shall respond to the questions and requests specified in Items 31-34 below.

31. Have mercury air emissions from any component of the SWWTS been monitored (e.g., any mercury emissions from the brine concentrator de-aerator or from the vacuuming process that is part of the crystallizer's operation)? If yes, provide all such mercury emission monitoring data, including the monitoring method used. Please provide this data electronically on an excel spreadsheet or other format that allows for data analysis.
32. Is bromide added to coal at Merrimack Station to enhance mercury removal from flue gas?
33. Have bromide air emissions from any component of the SWWTS been monitored? If yes, provide all such bromide emission monitoring data, including the monitoring method used.
34. Attached to the Self Monitoring Report that GZA submitted on behalf of PSNH to the Lowell Regional Wastewater Utility (under a cover letter dated August 24, 2012) for the July 1 – July 31, 2012 monitoring period is Table 1, which provides the concentration of bromide in effluent referred to as “softened Stream B.” Has any other sampling been conducted for bromide in distillate coming from the brine concentrator or crystallizer since SWWTS operation began? If yes, provide all such sampling data, including the sampling method used. Please provide this data electronically on an excel spreadsheet or other format that allows for data analysis.

Solid Waste from the SWWTS

PSNH shall respond to the questions and requests specified in Item 35 below.

35. In its comments submitted on the draft NPDES permit, PSNH stated that it “does not have on-site landfill capability to dispose of the ash based solid wastes generated by SWWTS.” PSNH has also stated before the NHPUC that “[t]he SWWTS will take the treated effluent from the SWWTS and produce a clean water stream which is recycled into the station for reuse, with any remaining dry solids collected for disposal at a permitted landfill.” Please respond to the following:
 - a. How does PSNH dispose of the SWWTS solid waste?
 - b. What is the quantity of SWWTS solid waste generated per average day, week, and month?
 - c. Can SWWTS residual salt cakes be used beneficially? Could the SWWTS waste (e.g., distillate, concentrated brine, reduced liquid, dewatered solids,

- etc.) be mixed with the fly ash and be disposed of in Merrimack Station's on-site landfill? If not, why?
- d. Please provide copies of the manifests showing SWWTS solids removed for off-site disposal. If these solids are combined with other plant waste for shipment and disposal, please provide the quantity of solids associated with the SWWTS.
 - e. What was the total SWWTS solid waste disposal cost that PSNH incurred in 2011 and 2012? PSNH's response to this question must include all supporting assumptions. PSNH's response shall itemize all cost components making up this total.
 - f. Has PSNH sought or is PSNH currently seeking to recover any SWWTS solid waste disposal costs that it incurred from September 28, 2011, through the end of 2012 as part of its Energy Service rate application with the NHPUC?
 - a. If yes:
 - i. What was the amount sought? Please provide supporting documentation.
 - ii. Did the Energy Service rate approved by the NHPUC for PSNH for 2012 account for SWWTS solid waste disposal costs?
 - b. If no, does PSNH plan to recover such costs in the future?

Information submitted pursuant to this request shall be sent by certified mail and shall be addressed as follows:

Sharon DeMeo, Environmental Engineer
U.S. Environmental Protection Agency
Office of Ecosystem Protection
Industrial Permits Branch (OEP 6-1)
5 Post Office Square - Suite 100 (CIP)
Boston, Massachusetts 02109-3912

If you have any technical questions regarding this information request, please contact Sharon DeMeo at (617) 918-1995. If you have any legal questions, please direct them to Mark Stein at (617) 918-1077.

Sincerely,


Stephen S. Perkins, Director
Office of Ecosystem Protection

cc: Permit File
Linda Landis, PSNH
Stergios Spanos, NHDES