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ORIGINAL
N.H.P.U.C. Case No. DE 11-250
Exhibit No. 88
Witness Elizabeth H Stanton
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February 28, 2012

BY CERTIFIED MAIL AND EMAIL

John Paul King
U.S. Environmental Protection Agency
Office of Ecosystem Protection
5 Post Office Square, Suite 100 (OEP06-1)
Boston, MA 02109-3912

Re: Comment on Draft National Pollutant Discharge Elimination System ("NPDES") Permit No. NH0001465 for Public Service Company of New Hampshire's ("PSNH") Merrimack Station

Dear Mr. King:

Conservation Law Foundation ("CLF") appreciates the opportunity to comment on the Draft NPDES Permit to Discharge to Waters of the United States Pursuant to the Clean Water Act ("Draft Permit"), accompanying fact sheet, and associated permitting determinations for PSNH's Merrimack Station, located at 97 River Road in Bow, New Hampshire. As an initial matter, CLF learned on February 23, 2012, that documents responsive to a Freedom of Information Act Request submitted to EPA by PSNH in connection with this permit proceeding were being made available by EPA. In light of the short time period to review those documents in advance of the February 28 close of the comment period, CLF reserves its rights to request a limited reopening of the comment period for purposes of submitting any additional comment on those documents.

Founded in 1966, CLF protects New England's environment for the benefit of all people. We use the law, science and the market to create solutions that preserve our natural resources, build healthy communities and sustain a vibrant economy. CLF operates advocacy centers in Massachusetts, Vermont, New Hampshire, Maine and Rhode Island. In coordination with this geographic structure, CLF's work is organized into four substantive program areas: Ocean Conservation; Clean Energy and Climate Change; Healthy Communities and Environmental Justice; and Clean Water and Healthy Forests. CLF's approach to environmental advocacy is distinguished by our close involvement with local communities; our ability to design and implement effective strategies; and our capacity for developing innovative and economically sound solutions to our region's environmental challenges. CLF is very familiar with PSNH's Merrimack Station facility and operations and has long been engaged in advocacy to ensure that facility fully complies with all applicable environmental laws to protect public health and the environment.

INTRODUCTION

Merrimack Station is one of the New England region's oldest and most polluting coal-fired power plants. Unit 1 began operating over fifty years ago in 1960, and Unit 2 began operating forty-four years ago in 1968. According to EPA's most recent Toxics Release Inventory ("TRI") data, PSNH is the region's top toxic polluter, and Merrimack Station releases more toxic pollution to the environment than any other facility in New England.[1] In 2010, Merrimack Station released 2.8 million pounds of toxic chemicals to the environment—eighty-five percent of the 3.3 million total pounds of toxic pollution released in New Hampshire in 2010. Merrimack Station is also the largest single point source of carbon dioxide (a greenhouse gas) emissions in New Hampshire.

The Merrimack River is an important public resource, prized by communities in New Hampshire and Massachusetts for its wildlife, aesthetic values, prominent role in the history of the region, and for the fishing, boating and other recreational opportunities it affords. Millions of dollars in public resources have been devoted by state (both New Hampshire and Massachusetts) and federal agencies to restoring the ecological health of the Merrimack, and significant progress has been made.[2] The work of restoring the River continues; for example, the Merrimack River Anadromous Fish Restoration Project continues to make strides to restore American shad and herring populations to their historical reaches. A healthy River ecosystem is imperative for these indigenous species to flourish.

Nevertheless, the Merrimack River remains threatened by industrial and other sources of pollution. The River, and all New Hampshire fresh surface waters, are classified by New Hampshire as impaired for fish consumption due to mercury pollution, primarily caused by atmospheric deposition.[3] As a result of the mercury pollution, the River is also subject to Massachusetts and New Hampshire fish consumption advisories warning vulnerable populations

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[1] United States Environmental Protection Agency ("EPA"), EPA Analysis Shows Increase in 2010 Toxic Chemical Releases in New Hampshire (Jan. 5, 2012), http://yosemite.epa.gov/opa/admpress.nsf/0/DB3B894071AC40278525797C007D8564.

[2] *See, e.g.*, Draft Permit Administrative Record ("AR") 96, Technical Committee for Anadromous Fishery Management of the Merrimack River Basin, A Plan for the Restoration of American Shad (2010); Massachusetts Division of Marine Fisheries Strategic Plan,14 (2009), http://www.mass.gov/dfwele/dmf/publications/dmf_strategic_plan.pdf; Merrimack River Anadromous Fish Restoration Program Strategic Plan & Status Review (1997), http://www.fws.gov/northeast/cnefro/pdf/merplan.pdf.

[3] *See* New Hampshire Department of Environmental Services ("NHDES"), Impairments Removed from the 303(d) List of Threatened or Impaired Waters, 2 (2010), http://des.nh.gov/organization/divisions/water/wmb/swqa/2010/documents/2010_final_sub_303d_delist.pdf ("NHDES Impairments Removed"); *see also* U.S. E.P.A, Waterbody Report for Merrimack River (2010), http://iaspub.epa.gov/tmdl_waters10/attains_waterbody.control?p_list_id=NHRIV700060302-24&p_cycle=&p_report_type=.

to avoid consuming fish caught in the River.[4] The Merrimack River is also subject to the EPA-approved Northeast Regional Mercury Total Maximum Daily Load ("Northeast Regional Mercury TMDL").[5]

Despite the fact that the federal government and two states have officially recognized the significant levels of mercury pollution in the Merrimack River, PSNH now proposes to directly discharge *more* mercury to the River in the form of treated blowdown from its new $422 million dollar wet flue gas desulphurization system ("FGD System")—a scrubber that will remove mercury from PSNH's flue gas and transfer it and other pollutants to other media, including water.[6,7] Mercury is a potent neurotoxin that bioaccumulates in the tissues of organisms that ingest it, including humans, birds (such as loons and bald eagles), mammals (including river otters and minks), reptiles (such as snapping turtles) and a number of fish species.[8] Its adverse health effects on humans and animals are well-documented.[9]

As well, for decades, PSNH has drawn about 287 million gallons per day ("mgd") (design flow) of cooling water from the Merrimack River, killing, maiming, or poisoning fish, fish larvae, and other aquatic organisms that become trapped on the plant's intake screens, or are pulled into the existing once-through cooling system.[10] After passing through the plant, the water is discharged back to the Hooksett Pool section of the River—frequently reaching temperatures of 90 to 104 degrees F[11] in summer months at sampling locations near the plant.[12] As a result, Merrimack Station's operations have contributed to a *nearly 95 percent decline* in resident fish species in the

[4] *See* Massachusetts Public Health Fish Consumption Advisory, available at, http://webapps.ehs.state.ma.us/dph_fishadvisory/SearchWaterBody.aspx?WaterBody=Merrimack%20River (last visited Feb. 28, 2012); New Hampshire Fish Consumption Guidelines, available at http://www.wildlife.state.nh.us/Fishing/fish_consumption.htm (last visited Feb. 28, 2012).
[5] *See* Northeast Regional Mercury TMDL, http://www.epa.gov/waters/tmdldocs/Northeast-Regional-Mercury-TMDL.pdf.
[6] This number is based on PSNH's own representation, and will be subject to prudency review and reconciliation before the New Hampshire Public Utilities Commission.
[7] Northeast Utilities, U.S. Securities and Exchange Commission Form 10-Q, 44 (Nov. 7, 2011), http://www.sec.gov/Archives/edgar/data/23426/000007274111000101/september302011edgarform10qf.htm.
[8] *See generally*, *Mercury Matters*, Hubbard Brook Research Foundation (2006), http://hubbardbrookfoundation.org.s113055.gridserver.com/wp-content/uploads/2010/12/mercury-matters1.pdf.
[9] Mercury exposure is known to cause birth defects, including neurologic impairment, in humans and thought to cause cardiovascular disease in adult men. *Id.* at 6. In animals, mercury disrupts reproduction, gross motor function, and can cause acute toxicity. *Id.* at 6–7.
[10] *See* Fact Sheet, Attachment D, Clean Water Act NPDES Permitting Determinations for Thermal Discharge and Cooling Water Intake Structures at Merrimack Station in Bow, New Hampshire ("Attachment D") at 31 ("cooling water discharged into Hooksett Pool more than tripled in 1968 after Unit 2 came on line, increasing from approximately 86.4 mgd to 286.6 mgd (design flow)."
[11] *Id.* at 106.
[12] We note that 104 degrees F is the maximum hot tub temperature for healthy adults recommended by the Consumer Products Safety Commission. *See, e.g.*, CPSC Health Sciences Staff Assessment of the Final Technical Report and Staff Recommendations (2008), available at http://www.cpsc.gov/volstd/hottubspa/HTSpaHyp.pdf.

Hooksett Pool.[13] Under low-flow conditions, Merrimack Station "typically" diverts up to sixty-two percent—well over half of the entire River flow—to cool its coal-fired power generation.[14] Indeed, as early as 1977, incidents in which PSNH drew more than 100 percent of the flow—more than the entire River—were observed by PSNH's consultants, Normandeau Associates, Inc., who reported "the generating station may utilize more than 100 percent of the river volume during coincident periods of low flow and maximum power generation. During these periods, water from the discharge canal *may recirculate and flow upstream* toward the circulating water intakes."[15] In other words, in those extreme events, PSNH has actually drained the River dry, causing the flow to reverse direction, while PSNH's thirsty plant re-consumes its thermal discharge.

The Draft Permit catalogs a number of instances in which PSNH displayed its now familiar disregard for its regulatory obligations by failing to comply with the terms of its prior and existing permits and using its considerable influence to weaken the terms of those permits or delay the introduction of new requirements, despite well-founded and significant concerns voiced repeatedly by regulators. As far back as 1969, PSNH acknowledged that closed circuit cooling would be necessary, as least part of the year—and then immediately proposed less proven and less effective technologies instead.[16] In 1975, the New Hampshire Fish and Game Department ("NHFGD") warned that Merrimack Station was still not meeting its thermal discharge requirements, and bluntly informed PSNH that it was "rather disturbing . . . to see such a wide discrepancy after so many years of operation."[17] Based on 1974 Merrimack River monitoring data, NHFGD predicted that Merrimack Station's massive water withdrawals at lower flow conditions would be "disastrous to the aquatic environment."[18] NHFGD informed PSNH, as well, that PSNH's thermal discharge (i) was causing wildlife to suffer; (ii) would potentially threaten New Hampshire's anadromous fish restoration program; and (iii) was causing more heat tolerant fish species to replace native game species.[19]

Additionally, and as discussed more fully below, PSNH has *never* installed a fish return system that would comply with the terms of its existing permit. Fish handled in PSNH's existing "fish return system" empty into a concrete pit on the riverbank above the normal water elevation. As a result, over the past fifty years, the survival rate for fish trapped (impinged) on Merrimack Station's cooling water intake screen is *"virtually zero."*[20] PSNH's cooling water intake screens are, quite literally, a death trap for Merrimack River fish.

[13] *See* Attachment D at 117.
[14] *Id.* at 38.
[15] *Id.*
[16] *Id.* pp. 8–14.
[17] *Id.* at 12.
[18] *Id.*
[19] *Id.*
[20] *Id.* at 291.

PSNH also misled the New Hampshire Site Evaluation Committee when its counsel represented, in a 2009 hearing on the FGD System installation, that the wastewater treatment facility for the FGD System would not discharge *any* mercury-laden wastewater to the Merrimack River.[21] Further, as EPA has explained, PSNH "designed, financed, and, for the most part, constructed the Merrimack Station FGD wastewater treatment system," for which it now seeks a Clean Water Act ("CWA") NPDES permit, "without first discussing with EPA whether this WWTS would satisfy technology-based and water quality-based standards."[22] PSNH appears to believe that EPA should not now require anything additional of it, since the new system is built. While not required to confer with EPA regarding the new treatment system, it would have been prudent for PSNH to do so.

At bottom, PSNH has known for decades that its activities are harming the River and upsetting the natural balance of its native populations. The Company has been successful in strategically avoiding requirements to install adequate controls, and regulators have been far too willing to accommodate PSNH's inaction. PSNH is still attempting to shield its activities from regulator review. EPA should take into account PSNH's bad faith compliance history, and put in place—finally—technology-based limits that will effectively protect the Merrimack River ecosystem and water quality.

For these and the reasons set forth below, CLF supports EPA's denial of PSNH's request for a renewal of its CWA Section 316(a) variance and EPA's determination that year-round use of wet or wet-dry hybrid mechanical draft cooling towers in closed cycle configuration is the best available technology ("BAT") for controlling thermal discharge at Merrimack Station.[23] In addition, EPA should require the most protective fish screening and return technology available. EPA should not apply an alternative water quality-based limit pursuant to 316(a). With respect to the FGD System wastewater, we agree with EPA's determination that Vapor Compression Evaporation ("VCE") could be BAT, however, EPA erred in not requiring VCE as BAT for that discharge.

REGULATORY FRAMEWORK

Congress passed the CWA in 1972 "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." 33 U.S.C. § 1251(a). The CWA's goal is to eliminate all discharges of pollution into navigable waters. *See id.* § 1251(a)(1). To that end, the CWA prohibits point sources from discharging pollutants into surrounding waters without a

[21] N.H. Site Evaluation Committee Docket # 2009-01, Transcript of Public Hearing page 106, line 14-107, line 16 (May 8, 2009), available at http://www.nhsec.nh.gov/minutes/documents/090508minutes200901.pdf.
[22] *See* Fact Sheet, Attachment E, Determination of Technology-Based Effluent Limits for the Flue Gas Desulfurization Wastewater at Merrimack Station in Bow, New Hampshire ("Attachment E") at 5.
[23] As discussed *infra* at pp. 23–31, the CWA's Best Technology Available Standard, *see* U.S.C. §§ 1326(a),(b), for Merrimack Station's cooling water intake structures also requires application of wet or wet-dry hybrid mechanical draft cooling towers operated in a closed cycle configuration.

NPDES permit. *See* 33 U.S.C. §§ 1311(a), 1342(a). A point source is "any discernible, confined and discrete conveyance" and includes effluent pipes and other channels "from which pollutants are or may be discharged." 33 U.S.C. § 1362(14). A discharge is the "addition of any pollutant to navigable waters from any point source." *Id.* § 1362(12).

Every NPDES permit must contain effluent limits sufficient both to "restore" and "maintain" the receiving waterbody. *Id.* § 1251(a). The CWA requires permitting agencies to set technology-based effluent limits that reflect the ability of available technologies to reduce and ultimately eliminate pollution discharges. *See id.* §§ 1311 (establishing technology-based effluent limits), 1342(a)(1) (requiring that NPDES permits incorporate technology-based effluent limits). All sources and all pollutants must be subject to technology-based effluent limits, *see* 33 U.S.C. § 1311(b)(2)(A), unless more stringent water quality-based effluent limits are required to avoid exceedances of water quality standards. *See id.* § 1312(a).

To implement the CWA's technology-based effluent limit requirements, EPA is required to promulgate national effluent limitations and guidelines ("NELGs") to control discharges of pollutants into the waters of the United States from industrial point sources. 33 U.S.C. §§ 1311(b), 1314(b). These NELGs establish an absolute minimum level of pollution control that must be achieved by industrial point sources. *See Natural Res. Def. Council v. EPA*, 859 F.2d 156, 183 (D.C. Cir. 1988). EPA looks first to the NELGs when setting technology-based effluent limits. *See id.* Where NELGs do not exist for a particular pollutant or class of pollutants to be discharged from a point source, states or EPA are required to exercise their best professional judgment ("BPJ") to set case-by-case technology-based effluent limits for these pollutants in NPDES permits. *Id.*; 33 U.S.C. §§ 1311(b)(2)(A), 1342(a)(1)(A), (B); 40 C.F.R. § 125.3(c)(2); *see also Am. Petroleum Inst. v. EPA*, 787 F.2d 965, 969 (5th Cir. 1986) ("Where EPA has not promulgated applicable technology-based effluent limitations guidelines, the permits must incorporate, on a case-by-case method, 'such conditions as the Administrator determines are necessary to carry out the provisions of the Act.'") (citations omitted).

EPA CORRECTLY DENIED PSNH'S REQUEST TO RENEW 316(a) THERMAL DISCHARGE VARIANCE

Section 316(a) of the CWA provides that if the owner or operator of a source "can demonstrate to the satisfaction of the Administrator . . . that any effluent limitation proposed for the control of the thermal component of any discharge from such source will require effluent limitations more stringent than necessary to assure the projection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the body of water into which the discharge is to be made," EPA may impose a thermal effluent limit that will assure the protection and propagation of a balanced, indigenous population ("BIP") of shellfish, fish, and wildlife. 33 U.S.C. § 1326(a); 40 C.F.R. 125.73(a). That demonstration must also show that "the cumulative impact of [the] thermal discharge together with all other significant impacts on the species affected, will assure the protection and propagation of a balanced indigenous community of shellfish, fish and wildlife in and on the body of water into which the discharge is to be made." 40 C.F.R. §125.73(a). The standard for granting a § 316(a) variance is stringent; Congress intended that such variances be granted only rarely.[24]

PSNH currently operates Merrimack Station under the terms of a 1992 NPDES permit ("1992 Permit") that expired nearly fifteen years ago but has been administratively continued.[25] The 1992 Permit includes thermal discharge limits based on a CWA 316(a) variance. It is PSNH's burden of proof, in seeking to renew its existing variance-based limits, to demonstrate that Merrimack Station's operations have not caused "appreciable harm" to the BIP.[26] PSNH has failed to satisfy its burden of proof; indeed, as the record amply demonstrates, the long term, cumulative impact of PSNH's thermal discharge has had an extremely harmful impact on the Hooksett Pool BIP. As the Environmental Appeals Board ("EAB") has held, "if prior appreciable harm has occurred in the past, it may be reasonably assumed that it will continue in the future and that a balanced aquatic community will not be maintained." *In the Matter of: Pub. Serv. Co. of Indiana, Inc., Wabash River Generating Station*, 1 E.A.D. 590 (1979 EPA App. LEXIS 4, *14) (1979).

Based on data supplied by PSNH and its own independent evaluation of existing and new information,[27] EPA cites thirteen specific facts evidencing the substantial harm PSNH's inadequately controlled thermal discharge has had on the Hooksett Pool BIP.[28] Among the most concerning impacts are:

- In summer low-flow conditions, Merrimack Station's thermal plume of pollution can extend nearly three miles down the River, covering about fifty percent of the surface area of Hooksett Pool.[29]

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[24] The legislative history of the 1977 CWA Amendments shows that Congress intended that 316(a) variances be granted only in very limited circumstances. In the Senate Report on the 1977 CWA Amendments, Congress expressed its concern that § 316(a) was too often being employed in inappropriate circumstances, resulting in heat effectively becoming an unregulated pollutant. *See* S. Rep. No. 95-370 (1977), reprinted in 1977 U.S.C.C.A.N. 4326, 4334. That report shows that Congress intended that 316(a) serve as a "very limited waiver" provision to be employed only in instances where it could be established "beyond any question" that the BIP could be protected by the modified federal effluent limitations. *Id.* Section 316(a), the Report warned, was not intended to become a "gaping loophole," allowing indiscriminate waivers of federal thermal effluent discharge controls. *Id.*

[25] AR 236, Permit No. NH0001465, Authorization to Discharge Under the National Pollutant Discharge Elimination System (1992).

[26] 40 C.F.R § 125.73(c) ("Existing dischargers may base their demonstration upon the absence of prior appreciable harm. . . ."); *Entergy Nuclear Vermont Yankee Discharge Permit 3-1199*, 187 Vt. 142, 166 (2009) ("The burden of making the necessary showing under § 316(a) is necessarily on the applicant."); *Dominion Energy Brayton Point, LLC*, 2006 WL 3361084 at *45–46 (E.P.A. 2006) (existing discharger's burden of proof to show no appreciable harm resulting from discharge).

[27] Attachment D at 118–120.

[28] *Id.*

[29] *Id.* at 118.

- Based on twenty-one years of data provided by PSNH, the average daily maximum water temperature reached or exceeded 100 degrees F at Station S-0 on thirty days in July and August, with the highest temperature reaching 104 degrees F.[30]

- During periods of extreme low-flow conditions, Merrimack Station withdraws up to 83% of the River flow for cooling its coal fired power plant operations.[31]

- Once abundant cool water fish species (yellow perch, white sucker) have significantly declined, and heat tolerant species (bluegill, largemouth and smallmouth bass)[32] now dominate.[33]

- Documented attraction of yellow perch to the thermal plume in colder months could impair that species ability successfully to reproduce.[34]

The fact that PSNH's decades of thermal pollution combined with its massive daily water intake has wrought substantial harm to Hooksett Pool's BIP is no surprise. It is well understood that thermal discharges can drastically alter aquatic communities. As EPA recently noted, a large body of research demonstrates that critical habitat factors, including levels of dissolved oxygen, growth rates in aquatic organisms, and life cycle behaviors in fish, can be damaged by thermal pollution.[35] As documented by two research professors at the University of Maryland Center for Environmental Science, "temperature has long been recognized as a major environmental factor at the molecular, cellular, tissue, organism and ecosystem levels of biological hierarchy."[36]

Elevated temperature induces behavioral changes that have been documented in important managed species. Some of these behavioral changes include:

- Avoidance of parts or all of a waterbody by certain species during summer and early fall;[37]

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[30] *Id.* at 119.
[31] *Id.*
[32] As discussed further below, some of the most heat tolerant species, like smallmouth bass, are species that accumulate the highest amount of mercury.
[33] Attachment D at 120. This amounts to an ongoing violation of PSNH's current NPDES permit which states: "The combined thermal plumes for the station shall: (a) not block zone of fish passage, (b) not change the balanced indigenous population of the receiving water . . ." AR 236 at I.A.1.g.
[34] Attachment D at 120.
[35] *See* EPA Environmental and Economic Benefits Analysis of the Proposed Section 316(b) Existing Facilities Regulation, 2-12 (March 28, 2011) ("2011 EEBA"), http://water.epa.gov/lawsregs/lawsguidance/cwa/316b/upload/environbenefits.pdf.
[36] *See*, University of Maryland Center for Environmental Science, The Effects of Temperature on Invertebrates and Fish: A Selected Bibliography, http://www.mdsg.umd.edu/issues/chesapeake/habitat/fishtemp/ (last visited Feb. 28, 2012).
[37] Attachment D at 89.

- Metabolic rate of organisms increases with increased temperatures resulting in decreased growth and survival,[38] especially during summer months when ambient water temperatures are at their peak;

- Lessens species' abilities to compete for forage and habitat and avoid predation.[39]

Thermal loading directly interferes with physiological processes of biota, such as feeding, reproduction, egg maturation, and maintaining energy reserves.[40] Less conspicuous, indirect effects, which are difficult to quantify, include greater vulnerability to disease, parasites, and to chemical toxicants associated with thermal enrichment.[41]

EPA has correctly identified significant deficiencies with the information provided by PSNH in support of its 316(a) variance renewal request, including PSNH's failure to apply basic scientific principles and PSNH's "inaccurate and misleading" characterization of relevant data.[42] EPA ultimately concluded "Merrimack Station's assessment of thermally influenced habitat is based on very limited data, and these data are neither conservative nor even representative of actual conditions in Hooksett Pool when the plant is under full operation, particularly during the summer months when thermal effects are most significant."[43]

For example, PSNH excluded critical data throughout its analysis, including fish data from the 1960s;[44] trapnetting data;[45] and thermal data.[46] EPA identified PSNH's failure to include fish data from the 1960s as the demonstration's "greatest deficiency."[47] The effect PSNH was trying to achieve by excluding fish data from the 1960s is obvious: the 1960s fish data best represents the pre-impact balanced, indigenous population in the Hooksett Pool, and without it, the decline in fish species does not appear as dramatic as it truly is.[48] EPA easily saw through this improper manipulation of the data by PSNH and correctly included the 1960s data in its analysis.

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[38] *Id.* at 29, 80, 178.
[39] *Id.* at 80, 194.
[40] *Id.* at 204 (feeding); 100 (reproduction); 29 (egg maturation and maintaining energy reserves).
[41] *Id.* at 29
[42] *Id.* at 87.
[43] *Id.* at 81.
[44] *Id.* at 43, 78.
[45] *Id.* at 47.
[46] *Id.* at 83–85.
[47] *Id.* at 78.
[48] *See* P.A. Henderson, Aquatic Ecology Issues Relating to the Merrimack Generating Station National Pollutant Discharge Elimination System Permit Renewal (2012) ("Henderson Report"), attached hereto as Exhibit 01, at 11 ("It is notable that the analysis presented by the power plant did not consider data from the 1960s. The result was that they did not use an appropriate BIP against which to assess the effects of the thermal discharge.") & 16.

PSNH's approach is inconsistent with the requirements of the CWA's implementing regulations, which provide that:

> Normally, however, [the BIP] will not include species whose presence or abundance is attributable to the introduction of pollutants that will be eliminated by compliance by all sources with section 301(b)(2) of the Act; and *may not* include species whose presence or abundance is attributable to alternative effluent limitations imposed pursuant to section 316(a).

40 C.F.R. 125.71(c) (emphasis supplied). Accordingly, the BIP "explicitly excludes certain currently present species whose presence or abundance is attributable to avoidable pollution or previously-granted section 316(a) variances." *Dominion Energy Brayton Point* at *48. Further, "[b]y requiring a showing that the BIP has not been harmed by the existing discharger's prior discharges, [C.F.R. 125.73(c)(1)] implicitly suggests that the population under consideration is not necessarily just the population currently inhabiting the water body but a population that may have been present but for the appreciable harm." *Id.* (*citing* Wabash, 1 E.A.D. at 592-95). Section 316(a), therefore, "cannot be read to mean that a [BIP] is maintained where the species composition, for example shifts from . . . thermally sensitive to thermally tolerant species." *Id.* at *49.

In addition to the exclusion of critical data, EPA identified several flaws in PSNH's analysis. For example, PSNH inappropriately assumed the portion of the Hooksett Pool upstream from the facility's discharge was representative of ambient water quality conditions in the Pool. Given that the Pool is a 5.8 mile long segment of the River and that fish populations are highly mobile, EPA easily and correctly concluded that each resident fish species in the Hooksett Pool should be treated as comprised of a single population.[49] Other significant analytical deficiencies identified by EPA are as follows:

- PSNH's Catch Per Unit Effort (CPUE) data are artificially inflated by the inclusion of large numbers of spottail shiners and bluegill that were not present in the BIP in the 1960s.[50] The effect of including these data masked the decline of resident indigenous species, such as yellow perch, white sucker, and pumpkin seed.[51]

- PSNH's analysis of thermal effects on fish was too limited because it focused only on avoidance of the thermal plume but ignored other important factors such as potential thermal impacts on the microscopic forage base for the early life stages of many fish species; heat's effect on a species' ability to compete with others for available forage

[49] *See* Henderson Report at 16 (concurring with EPA's conclusion that fish populations in the upstream portion of the Hooksett Pool were not an appropriate "control" groups).
[50] Attachment D at 44.
[51] *Id.*

and habitat, utilize dissolved oxygen, and avoid predation; and heat's powerful influence on fish as an attractive force.[52]

- When evaluating species' temperature tolerance, PSNH inappropriately lumped together many species with widely disparate tolerances and did not use the most thermally-sensitive lifestage of the most thermally-sensitive species to represent the larger group.[53]

In addition to noting the many deficiencies of PSNH's thermal variance demonstration, EPA also ruled out causes for the drastic decline of fish species in the Hooksett Pool not related to Merrimack Station's discharge. For example, EPA correctly eliminated large scale climate change as the cause of the fish abundance decline in the Hooksett Pool based on evidence that yellow perch populations in other portions of the Merrimack River and in New Hampshire sections of the Connecticut River are thriving, which "clearly indicate[s] that the poor status of the yellow perch population in the Hooksett Pool does not merely reflect a state- or region-wide phenomenon."[54]

For these reasons, PSNH has failed to satisfy its burden of proof, and EPA correctly denied PSNH's request for a renewal of its thermal discharge variance pursuant to 33 U.S.C. § 1326(a).

EPA CORRECTLY DETERMINED THAT CLOSED CYCLE COOLING USING WET OR WET-DRY HYBRID MECHANICAL DRAFT COOLING TOWERS ("CCC"), OPERATING ON A YEAR-ROUND BASIS, IS THE BAT TO CONTROL MERRIMACK STATION'S THERMAL DISCHARGE.

BAT for Thermal Discharge

CWA § 301 requires that thermal discharges be limited consistent with levels achievable using the "best available technology economically achievable . . .which will result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants." 33 U.S.C. §§ 1311(b)(2)(A) & (F). As set forth *supra* at 6, in the absence of a NELG governing the discharge of heat from steam-electric power plants, EPA correctly set technology-based permit limits based on a BPJ, facility-specific application of the BAT standard. *See* 33 U.S.C. § 1342(a)(1)(B); 40 C.F.R.§ 125.3(c)(2).

Applying the BAT standard, EPA must take into account (i) the age of the equipment and facilities involved; (ii) the process employed; (iii) the engineering aspects of the application of various types of control techniques; (iv) process changes; (v) the cost of achieving such effluent

[52] *Id.* at 80.
[53] *Id.* at 86.
[54] *Id.* at 110. *See also* Henderson Report at 16 (concurring with EPA that the observed decline of yellow perch in the Hooksett Pool is not caused by large-scale factors but rather traceable to Merrimack Station's thermal discharge).

reduction; (vi) non-water quality environmental impact (including energy requirements); and (vii) such other factors as EPA deems appropriate. *See* 33 U.S.C. § 1314(b)(2)(B); 40 C.F.R. 125.3(d). EPA must also consider "(i) the appropriate technology for the category or class of point sources of which the applicant is a member, based upon all available information; and (ii) any unique factors relating to the applicant." 40 C.F.R. 125.3(c)(2).

EPA has broad discretion to determine which control technology is "the best available technology economically achievable." "To be technologically available, it is sufficient that the *best operating facilities* can achieve the limitation. . . . To demonstrate economic achievability, no formal balancing of costs and benefits is required; . . . BAT should represent a commitment of the maximum resources economically possible to the ultimate goal of eliminating all polluting discharges." *Natural Res. Def. Council, Inc. v. U.S. E.P.A.*, 863 F.2d 1420, 1426 (9th Cir. 1988) (internal quotations and citations omitted) (emphasis supplied).

A technology is "available" where there is evidence that its use is practicable within the relevant industry, even if such technology is not yet in use in the relevant industry. *Hooker Chems. & Plastics Corp. v. Train*, 537 F.2d 620, 636 (2d Cir. 1976) ("That no plant in a given industry has adopted a pollution control device which could be installed does not mean that the device is not 'available.'"). The use of technology is "economically achievable" if it is affordable by other plants in the industry. *BP Exploration & Oil, Inc. v. EPA*, 66 F.3d 784, 790 (6th Cir. 1995); *NRDC v. EPA*, 863 F.2d 1420, 1426 (9th Cir. 1990).

To determine economic achievability under the BAT test, EPA must take into account a number of factors, one of which is "the cost of achieving such effluent reduction." 33 U.S.C. § 1314(b)(2)(B). For EPA to find that a particular technology is "economically achievable," it need only "consider" the potential costs involved. *Id.* EPA is not required to compare costs to benefits of the chosen BAT. *See, e.g., E.P.A. v. Nat'l Crushed Stone Ass'n*, 449 U.S. 64, 71 (1980); *Texas Oil & Gas Ass'n v. U.S. E.P.A.*, 161 F.3d 923, 936 n.9 (5th Cir. 1998). EPA's consideration of costs is adequate so long as the determination based on that consideration is rational in light of the economic evidence in the administrative record. *Dominion Energy Brayton Point* at *17 (E.P.A. 2006); *Gov't of D.C. Mun. Separate Sewer Sys.*, 10 E.A.D. 323, 348 (E.P.A. 2002).

In addition to the BAT standard, to the extent more stringent requirements must be implemented in order to satisfy state water quality standards ("WQS"), such limits must be included in the NPDES permit. 33 U.S.C. § 1311(b)(1)(C).

With respect to EPA's application of the specific BAT factors, we provide the following.

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Cost

EPA concluded that installing CCC technology at Merrimack Station is economically feasible and that PSNH has not demonstrated otherwise.[55] In examining the costs of installing CCC technology, EPA correctly questioned PSNH's estimate of lost profits associated with construction outage periods during the conversion to CCC. PSNH estimated such lost profits to total $9.1 million.[56] The lost profits were entirely associated with three weeks of operation that PSNH estimated the construction would take on top of the plant's regular four-week outage for regularly scheduled maintenance.[57] EPA correctly noted that PSNH's estimate of lost profits may err on the high side because:

> [F]irst, PSNH has used the units' nameplate ratings rather than the lower production capability ratings that PSNH currently claims in its reports to the regional system operator; and second, PSNH has assumed that the units would have been operating at 100 percent capacity rather than a lower figure reflecting the facility's recent actual capacity factors.[58]

PSNH's estimate of its annual operating costs is also biased high. PSNH again calculated its estimate of annual recurring costs based on the assumption that equipment, such as the new booster pumps and tower fans, would be operating and consume electricity in all hours of each year.[59] EPA correctly noted that such constant operation is unlikely, calculated that the annual costs would decrease by approximately $850,000 if PSNH had used Merrimack Station's actual capacity factor over the last eight years, and would come down even further if adjustment for fan usage during the cooler months were included.[60] As with many of the assumptions in its analysis, however, EPA gave PSNH the benefit of the doubt and used the company's estimates.[61] In spite of PSNH's artificially inflated cost estimates for annual operations costs, EPA still correctly concluded that installing CCC at Merrimack Station was economically achievable.

Non-Water Quality Environmental Impacts

As required by the CWA, EPA considered non-water quality environmental impacts in assessing BAT for Merrimack Station.[62] EPA examined air pollutant emissions (including those resulting from additional energy requirements associated with conversion to CCC), sound emissions, and

[55] Attachment D at 148.
[56] PSNH's estimate of $8.8 million was in 2007 dollars. EPA brought that value forward to 2010 dollars, which resulted in a figure of $9.1 million. *Id.* at 150.
[57] *Id.*
[58] *Id.*
[59] *Id.* at 152.
[60] *Id.*
[61] *Id.* at 153.
[62] *See* 33 U.S.C. § 1314(b)(2)(B); *see also* Attachment D at 156–62.

visual/aesthetic effects. In all three cases, EPA concluded that the non-water quality impacts would not disqualify CCC from being the BAT for Merrimack Station. In light of EPA's broad discretion and PSNH's lack of evidence to the contrary, EPA's decisions with respect to non-water quality environmental impacts were reasonable.

Other Factors EPA Deemed Appropriate

The CWA also directs EPA to take into account "such other factors as [the agency] deems appropriate. 33 U.S.C. § 1314(b)(2)(B). In this case, EPA considered three factors that were specifically identified by PSNH as concerns: (1) water loss from the Merrimack River due to the use of CCC technology; (2) the possible effect of requiring the installation of CCC on the reliability of the regional electric system; and (3) potential adverse effects due to fogging or icing. EPA also considered the beneficial effect requiring CCC would have in terms of reduced impingement and entrainment.

Any argument that water loss from evaporation due to the use of CCC should be grounds not to require that technology is meritless, especially in light of the overall environmental benefits provided by CCC.[63] EPA recognized that changing to CCC may not result in any appreciable increase in evaporative water loss over current once-through cooling technology due to the evaporation that occurs once Merrimack Station's heated effluent is discharged into the cooling canal and the River.[64] PSNH has not accounted for all of the evaporative water loss that occurs due to its current operations, and therefore can make no informed conclusions as to whether evaporative loss will increase under a CCC regime.

As the Henderson Report demonstrates, on a 77 degree summer day evaporative loss in the cooling canal alone can be as high as 67,000 gallons per day.[65] This is likely an underestimate of the actual evaporative loss because it does not take into account the evaporation that occurs as a result of the operation of the power spray modules. Further, water loss from evaporation occurs as the thermal plume discharges into the main stem of the river where there is a greater surface area to facilitate evaporation.[66] Finally, the percentage of River water loss due to evaporation from CCC is small: 1.3% during extreme low flow conditions based on EPA's calculations.[67] That percentage is likely biased high, since EPA accepts PSNH's estimate of water loss of 4.79 million gallons per day and uses the most extreme low flow conditions.[68]

[63] *See* Henderson Report at 24–25.
[64] Attachment D at 163.
[65] *See* Henderson Report at 22.
[66] *See* Attachment D at 39 ("the [thermal] plume typically flows across the river under low-flow conditions, reaching the east bank between S-1 and S-3, and disperses throughout the river width as it approaches S-4 . . . the plume often extends downstream to a point immediately upstream of Hooksett Dam.").
[67] Attachment D at 163.
[68] *Id.*

When the average water loss from the Electric Power Research Institute's ("EPRI") 2002 Water and Sustainability Report is used (4 million gallons per day), the percentage of water loss declines to 1.05% using the same extreme low flow.[69] When a more typical low flow rate is used (1000 ft3/s), the percentage of water loss attributed evaporation from the use of CCC drops further to 0.619%, as compared to 0.387% evaporative water loss caused by current once-through cooling operations.[70] Nevertheless, EPA again in this instance accepted PSNH's estimates, yet correctly concluded that "it is unclear which cooling system would ultimately result in greater overall evaporative losses" and the possible loss of River water due to evaporation should not disqualify CCC as BAT for Merrimack Station, "given the very substantial reductions in thermal discharge available."[71]

EPA also more than adequately addressed PSNH's two other concerns, reliability of the regional electric system and potential fogging and icing. EPA examined the two possible ways the CCC requirement could affect the regional electric supply – the incremental additional electrical demand needed to power the CCC configuration and possible outages needed to implement the conversion to CCC – and found both would have little effect, if any, on the regional electrical supply.[72] The estimated incremental *peak* demand for electricity to power the CCC configuration is 22 MW, which can be easily absorbed in the projected excess capacity in the region over the next six years of 3700 MW.[73] As discussed above, PSNH projects that only three weeks of additional outage at Merrimack Station (in addition to scheduled maintenance outages) would be required to convert to CCC. As demonstrated by the fact that PSNH's extensive 2009 outage to repair Merrimack Unit 2's new HP/IP turbine after catastrophic failure had no adverse effect on regional electrical supply, none would reasonably be anticipated as a result of this more limited outage duration.

Although PSNH raised fogging and icing of nearby roadways as a concern, the Company failed to provide EPA with any modeling data for such weather-related effects, nor did PSNH give EPA estimates of the likely timing, frequency, location, or geographic extent of such roadway effects.[74] Even if PSNH had provided data to support its speculative concern, EPA notes that this issue would be easily managed through weather monitoring and notification to the Bow Highway Department in the event that fogging and icing appears possible so icing controls could be initiated.[75] Accordingly, EPA correctly concluded that none of PSNH's concerns, either independently or in combination, are enough to disqualify CCC as BAT for Merrimack Station, especially in light of the expected 95% reduction in entrainment and impingement and 99.5% reduction in temperature of the thermal discharge.

[69] *See* Henderson Report at 24.
[70] *Id.*
[71] *See* Attachment D at 162.
[72] *Id.* at 164.
[73] *Id.*
[74] *Id.* at 165.
[75] *Id.* at 167.

Appropriateness of Technology for Point Source Category

In addition to the statutory BAT factors, EPA must consider "the appropriate technology for the category or class of point sources of which the applicant is a member, based upon all available information . . ." 40 C.F.R. § 125.3(C)(2)(i). EPA has assembled ample evidence that CCC is an appropriately and widely used technology in the steam electricity generating sector.[76]

Merrimack Station applied to the New Hampshire Water Supply and Pollution Control Commission (WSPCC) for its first thermal permit in 1969.[77] That same year, before the first permit issued, PSNH conceded that "closed circuit" operation would be necessary during some seasons to ensure compliance with New Hampshire law.[78] Yet PSNH sought and obtained instead permission from WSPCC to rely on a system of spray modules and an elongated discharge canal.[79] After installation in 1972, NHFGD and the WSPCC warned several times that the spray and canal technology was inadequate.[80] During EPA's 1992 consideration of the most recent NPDES permit the agency had "significant concerns" about violations of thermal limitations.[81]

PSNH has evaded for far too long the requirement to install CCC as BAT with which many of its industry peers have already complied. In December 2009, EPA compiled a list of fifty-three coal-fired power plants that have already retrofitted with CCC.[82] A 2011 Electric Power Research Institute ("EPRI") study identified eighty-two such retrofits.[83] As EPA noted, only twenty-five percent of steam electric generating plants used CCC in 1955, but that number grew to seventy-five percent by 1997.[84] CCC is an appropriate, and highly successful, technology for reducing thermal pollution from coal-fired power plants.

Unique Factors Relating to PSNH

As set forth above, New Hampshire has been discussing the prospect of installing CCC with PSNH since 1969. In a February 18, 1975, memorandum, for example, New Hampshire's Inland and Marine Fisheries Division advised:

[76] *Id.* at 134–137.
[77] *Id.* at 9.
[78] *Id.*
[79] *Id.*
[80] *Id.* at 10–12.
[81] *Id.*
[82] AR 596, EPA, *Power Plant Units with Closed-Cycle Cooling Retrofits* (Dec. 8, 2009) (using 2005 data).
[83] *See* EPRI, National Cost Estimate for Retrofit of U.S. Power Plants with Closed-Cycle Cooling, Technical Brief, 1 (2011), http://my.epri.com/portal/server.pt?Abstract_id=000000000001022212.
[84] Attachment D at 136 n. 26.

> In summary, negotiations in an effort to assist Public Service Company with their problems and, at the same time, assure that fish and wildlife habitat is protected and preserved, we have consumed to date, nine years and have a minimum of another two to look forward to. If further biological studies fail to prove that this utility can safely operate without meeting established water quality standards, as the staff believes will happen, it will take an additional year or two to complete construction necessary to enable the company to operate *on a closed cycle basis*. Completion of engineering design will require even more time, thus utilizing a total of at least thirteen or fourteen years for one utility to meet water quality standards.
>
> In addition to the proposed permit which the staff recommends be approved, we believe the company *should be required to complete engineering design for closed cycle operation coincident with their biological survey*. This procedure would, in all probability, save one entire year and yet not place an undue financial burden upon the utility.[85]

As decades have passed, during which time ecological conditions in the River predictably deteriorated, EPA Region 1 has required, or effectively required, power plants to install CCC. For example, in a negotiated agreement with EPA Region 1 announced December 17, 2007, Dominion Energy's Brayton Point Station in Somerset, Massachusetts agreed to replace its existing open-cycle cooling system with CCC.[86] PSNH is well aware of these developments. Moreover, in 2007, EPA specifically put PSNH on notice that CCC would be considered as part of its NPDES permit renewal when it issued a CWA 308 letter requesting that the Company describe the engineering aspects or considerations pertinent to installing CCC technology at Merrimack Station.[87]

Others, including CLF, have repeatedly raised the issue in public proceedings.[88] During a March 31, 2010, information session before the New Hampshire Public Utilities Commission ("PUC"), PSNH was asked whether it had considered the potential ratepayer impact of installation of CCC at Merrimack Station.[89] PSNH flatly refused to answer the question.[90] During a November 18, 2010, prehearing conference before the PUC, EPA's draft permit and its potential inclusion of a requirement for the Company to install cooling towers was raised numerous times.[91]

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[85] AR 396, NH Inland and Marine Fisheries Division, Memo: Bow Permit, Summary and Recommendations.
[86] EPA, Agreement Reached for NPDES Permit at Brayton Point Station Power Plant (2007), http://www.epa.gov/region1/braytonpoint/index.html.
[87] AR 237, EPA Letter to PSNH regarding Information Request for NPDES Permit Reissuance, 3 (July 3, 2007).
[88] *See, e.g.*, AR 791, Kenneth A. Colburn, Symbiotic Strategies, Compendium of Concerns Regarding the Proposed Installation of a Scrubber at PSNH's Merrimack Station in Bow, NH, for Commercial Ratepayers' Group (Rev. Jan. 5, 2009), prepared in connection with N.H. Public Utilities Commission DE 08-103.
[89] AR 351 & 486, CLF letter to N.H. Public Utilities Commission, 5 (May 13, 2010).
[90] *Id.*
[91] *See* AR 632, CLF Email to EPA regarding PSNH 2010 Least Cost Integrated Resource Plan and NPDES Permit.

To say PSNH has had ample notice that the Draft Permit likely would require conversion to CCC technology is an understatement. It is PSNH's legal obligation to plan prudently for such investments. EPA should consider the long term economic benefit the Company and its shareholders have accrued through externalizing the costs of Merrimack Station operations at great price to the Merrimack River, the people who value it, and the wildlife that depend on it. The Company should be required to come into compliance with the new permit term on an expedited basis, and under no circumstance should compliance be delayed.

New Hampshire Water Quality Standards As Applied to Thermal Discharge

New Hampshire's surface water quality regulations have as their purpose the protection of public health and welfare, enhancement of water quality, protection of fish, shellfish, and wildlife, and preservation of public uses, including drinking water, agriculture, recreation, and industry. *See* N.H. Code Admin. R. ("Env-Wq") 1701.01. The regulations apply to all point source dischargers, *see* Env-Wq 1701.02, and require that thermal discharges to Class B waters be regulated in accordance with RSA § 485-A:8. *See* Env-Wq 1703.13. RSA 485-A:8, II provides that "[a]ny stream temperature increase associated with the discharge of treated sewage, *waste or cooling water*, water diversions, or releases shall not be such *as to appreciably interfere with the uses assigned* to this class." RSA 485-A:8, II (emphasis supplied). The statute also provides that, "[i]n prescribing minimum treatment provisions for thermal wastes discharged to interstate waters, the department shall adhere to the water quality requirements and recommendations of the New Hampshire fish and game department, the New England Interstate Water Pollution Control Commission, or the United States Environmental Protection Agency, *whichever requirements and recommendations provide the most effective level of thermal pollution control.*" *Id.* at VIII (emphasis supplied). The New Hampshire regulations, therefore, require the "most effective" control of thermal pollution. Section 1703.19(a) also requires that "surface waters shall support and maintain a balanced, integrated, and adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of similar natural habitats of a region." Taken together, these narrative water quality standards require the most effective control of thermal pollution sufficient to ensure that the receiving water will have a balanced, integrated community of organisms, comparable to that of similar habitats in the region—i.e., those not subject to thermal pollution discharges.

In order to ensure that the technology-based thermal discharge limits would also result in compliance with New Hampshire's Water Quality Standards, EPA developed water quality-based thermal discharge limits for comparison.[92] The water quality-based limits were based on temperatures necessary to protect fish species in the Hooksett Pool at various stages of their lifecycle.[93] EPA analyzed resident and diadromous fish species separately.[94] EPA chose the

[92] Attachment D at 174.
[93] *Id.* at 178–79.

most temperature sensitive species from each category as a way to ensure protection of the entire fish community. Put another way, if the temperature limits are sufficient to protect the most thermally sensitive species, at the most thermally-sensitive stage of its lifecycle, then the limits also will ensure protection of less sensitive fish species. EPA chose yellow perch as the most thermally sensitive resident fish species, and American shad, Atlantic salmon, and Alewife at various life stages as the most thermally sensitive diadromous species.[95]

For the most part, EPA's analysis and conclusions with respect to protective fish temperatures were reasonable and supportable. Normandeau reported that the salmon smolts were not inhibited in their downstream migration by Merrimack Station's thermal discharge. However, as the Henderson Report notes, EPA's decision to use the most temperature sensitive resident (yellow perch) and diadromous (American shad, Atlantic salmon, and alewife) species as a proxy for protectiveness of other less heat tolerant species was appropriate.[96] However, EPA's analysis is too limited to assure that its water quality-based temperature limits will assure the protection and propagation of the BIP in the Hooksett Pool. Specifically, EPA's analysis, while focusing on the physiological requirements of single fish species at their various life stages, did not adequately consider competitive interactions between species.[97] For example, EPA based its water quality-based temperature limit between October 1st and November 4th on the protective temperature for yellow perch juveniles set at 28.4 C (83.1 F). This temperature limit is above the upper bound of physiological optimum temperatures for maximum growth rates identified by EPA for yellow perch juveniles of 28 C (82.4 F).[98] A temperature above the physiological optimum for growth has the potential to alter the competitive outcomes between coolwater and warmwater species, such as yellow perch and bluegill.[99] Accordingly, EPA has not demonstrated that the water quality-based temperature limits it chose would be sufficiently protective of coolwater species that are in competition with increasing populations of more thermally tolerant species in the Hooksett Pool.[100]

Additionally, PSNH's attempt to demonstrate Merrimack Station's thermal plume would not inhibit the migration of anadromous species like Atlantic salmon should be given no weight. In 2006, Normandeau conducted a salmon tagging study that involved radio-tagging salmon smolts released above the Merrimack Station and tracing their movement past the plant's discharge point. As the Henderson Report notes, the smolts "passage downstream and past the thermal discharge could have simply been the response of a disoriented and scared fish" as a result of their being anesthetized and having a radio tag inserted into their stomachs for the purposes of

[94] *Id.* at 179.
[95] *Id.* at 180, 198.
[96] Henderson Report at 10.
[97] *Id.*
[98] Attachment D at 192.
[99] Henderson Report at 11.
[100] *Id.*

the study.[101] Such a study is far from the rigorous scientific study needed to show that migratory fish are not inhibited by Merrimack Station's thermal discharge, especially when the evidence is that in-River temperatures in the summer regularly reach levels that cold-water migratory fish are known to avoid.[102]

EPA Should Give Special Consideration To Merrimack River Anadromous Fish Restoration Efforts

EPA deserves commendation for recognizing the interwoven objectives of thermal discharge permits and the long-running efforts to restore indigenous anadromous fish populations in the Merrimack River.[103] The free-flowing Merrimack River historically supported Atlantic salmon, American shad, and alewives in abundance.[104] Those once abundant populations have experienced a precipitous decline.

Building on efforts that began in the mid-1800s, New Hampshire and Massachusetts along with USFWS and National Marine Fisheries Service commenced the Anadromous Fish Restoration Program in 1969.[105] Within the first decade, the inter-agency cooperative surveyed and tested the quality of potential habitat, developed a broodstock program to supply salmon fry, continuously stocked shad, and looked again at fish passage needs.[106] New Hampshire also acquired and manages Atlantic salmon habitat as part of the restoration program.[107] Between these efforts and the development of strategic plans, the agencies spent an estimated $18.3 million by 1996 in hopes of restoring unquantifiable lost natural resources.[108] As of 2010, the inter-agency cooperative is focusing on restoring shad but intends to develop restoration plans for the Atlantic salmon, alewife, American eel, and sea lamprey.[109]

As EPA has noted, tension between Merrimack Station's thermal discharge and the restoration program became apparent immediately. Regarding the first thermal permit, issued in 1969, NHFGD emphasized that the addition of thermal pollution would thwart the program's goals.[110] Similarly, in late 1975, NHFGD pointed to studies indicating that the discharge was potentially threatening the restoration program, in particular that heat tolerant species were replacing game

[101] *Id.* at 13.
[102] Henderson Report at 14 (concluding that Normandeau's salmon tagging study "is an unsuitable basis on which to support a claim that the thermal discharge will not interfere with salmon smolt migrations").
[103] *See generally* Attachment D at 8, 9, 12, 33, 95.
[104] Technical Committee for Anadromous Fishery Management of the Merrimack River Basin, Strategic Plan & Status Review, Anadromous Fish Restoration Program, 15–17 (Oct. 16, 1977), http://www.fws.gov/northeast/cnefro/pdf/merplan.pdf ("Strategic Plan").
[105] *Id.* at 24.
[106] *Id.* at 26.
[107] *Id.* at 27.
[108] *Id.*
[109] Attachment D at 199.
[110] *Id.* at 9.

species.[111] Also, because the construction of a fish passage structure at Hooksett Falls is conditioned on the number of returning shad at dams downstream, adverse effects from Merrimack Station's thermal discharge and cooling water intake structures on passing juveniles may have delayed and may continue to delay major improvements in the watershed.[112] Merrimack Station's thermal discharge and cooling water intake have undermined these fish restoration efforts that began long before the plant began operating. EPA's requirement of closed-cycle cooling will begin to reverse the decline in fish populations caused by impingement and entrainment, and lower the temperatures sufficiently so that efforts in re-establishing populations of cold-water migratory fish like shad and salmon, have a greater chance for success.

EPA SHOULD NOT APPLY AN ALTERNATIVE LIMIT PURSUANT TO 316(A)

EPA specifically has requested comment on the question whether it should waive the inclusion of technology based thermal discharge limits in the final permit and instead establish water quality-based limits, approved via a 316(a) variance. EPA suggests that it may independently determine that the water quality-based limits satisfy the variance criteria of § 316(a), even though PSNH did not request a variance on such grounds. EPA does not interpret the law as requiring EPA to do so, however.

EPA lacks authority to establish such a variance in these circumstances, where PSNH has failed to satisfy its burden of proof that the proposed technology based thermal discharge limits are more stringent than necessary to assure the protection and propagation of the BIP. Consistent with CWA § 316(a), the EAB in *Dominion Energy Brayton Point* defined the predicate for EPA to, *sua sponte*, fashion and impose its own variance:

> (1) the Agency must determine what the applicable technology and WQS-based limitations should be for a given permit;
> (2) the *applicant* must demonstrate that these otherwise applicable effluent limitations are more stringent than necessary to assure the protection and propagation of the BIP;
> (3) the *applicant* must demonstrate that its proposed variance will assure the protection and propagation of the BIP; and
> (4) in those cases where the applicant *meets step 2 but not step 3*, the Agency may impose a variance it concludes does assure the protection and propagation of the BIP.

Dominion at 500 (emphasis supplied). Any EPA discretion independently to impose such a variance is plainly *contingent on the applicant's satisfaction of the burden of proof for the second step.* That makes sense, since the rationale here is to provide EPA with some discretion

[111] *Id.* at 12.
[112] Strategic Plan at 28; Attachment D at 199.

where an applicant successfully shows that proposed limits are too stringent, yet fails to demonstrate that its own proposed variance is adequately protective.

Finding that PSNH failed to meet its burden of proving that its thermal discharge has not caused prior appreciable harm to the BIP, EPA has properly rejected PSNH's request for a renewal of its existing 316(a) variance.[113] PSNH has therefore not satisfied Dominion's third step.

EPA has also determined that "PSNH has not demonstrated that thermal discharge limits based on applicable technology-based *and* water quality-based requirements (*see* Sections 7, 8 and 9, *supra*) would be more stringent than necessary to assure the protection and propagation of the balanced, indigenous population of shellfish, fish and wildlife in and on Hooksett Pool."[114] Indeed, PSNH appears to have made no showing whatsoever that the proposed technology-based limits would be overly stringent; therefore, *Dominion*'s second step is not satisfied, and EPA may not independently establish a variance.

Further, the Fourth Circuit Court of Appeals has rejected the argument that compliance with water quality standards is *prima facie* evidence of compliance with section 316(a). *Appalachian Power Co. v. Train*, 545 F.2d 1351, 1372 (1976). As well, EPA's first guidance document for 316(a) demonstrations explained that the 316(a) test "is distinct from the multiple statutory objectives of water quality standards . . . [t]herefore, compliance or noncompliance with standards alone is not a sufficient demonstration." EPA, *Draft 316(a) Technical Guidance Thermal Discharges* 9 (Sep. 30, 1974).

In any event, the issue is academic here where the technology-based BAT limits EPA has proposed are, in fact, not more stringent than necessary to assure the protection and propagation of the BIP, and limits based solely on the applicable New Hampshire WQS would not be sufficient to assure the protection and propagation of the BIP.

EPA has established technology-based water temperature limits based on BAT and water quality-based protective fish temperatures.[115] In all but two instances where the temperature limits are the same, (American Shad Larva (acute) June 16-July 31 and Yellow Perch Adult Reproduction November 5-December 31), the technology-based standards are more stringent.[116] In three instances, the maximum mean temperature for *current* operations is *lower* than what would be permitted under the water quality-based limits:[117]

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[113] *See* Attachment D at 121.
[114] *Id.* (emphasis added).
[115] *Compare* Attachment D, p. 215, Table 9-3 (technology-based temperature limits) *with* p. 213, Table 9-2 (NH water quality-based temperature limits).
[116] *Id.* at Table 9-3.
[117] *Id.* at Table 9-3.

Time Period	Relevant Species and Lifestage	Water Quality-Based Max. Mean Protective Temp. Degrees F	Current Operations Max. Mean Temp. Degrees F	No. of Degrees F Water Quality-Based Standard Is Warmer than Current Operations
May 9-May 27	Yellow Perch Egg	64.4	62.8	**1.6**
May 28-June 15	Yellow Perch Larva	70.3	70.2	**.1**
Oct.1-Nov.4	Yellow Perch Juvenile	83.1	65.8	**17.3**

Since the current water temperatures have been far too warm to assure the protection and propagation of the BIP, these facts strongly suggest that the water quality-based protective fish temperatures are not sufficiently protective. As the Henderson Report concludes, the fact that EPA's water quality-based temperature limits are set at levels above temperatures caused by current operations when there is strong evidence that the thermal plume caused by current operations has appreciably harmed the BIP in the Hooksett Pool demonstrates either that EPA's water quality-based temperatures are not sufficiently protective or that those limits, while they may satisfy New Hampshire's water quality standards, do not satisfy § 316(a).[118] Either explanation is grounds for rejecting them as an alternative basis for a § 316(a) variance. The Henderson Report gives one reason why EPA's water quality-based temperatures are not sufficiently protective: EPA's analysis did not adequately consider the temperature effects on competitive outcomes between coolwater and warmwater species.[119] Because there is direct field evidence that the current temperature regime is not sufficiently protective of the BIP, and EPA's water quality-based temperature limits in some cases are higher than the current regime, water quality-based limits cannot serve as an alternative basis for granting a § 316(a) variance.

BEST TECHNOLOGY AVAILABLE ("BTA") FOR COOLING WATER INTAKE STRUCTURE IS CCC AND TYPE-2 FISH RETURN OPERATED YEAR ROUND

EPA correctly applied its BPJ in determining the § 316(b) BTA for Merrimack's cooling water intake structures. CWA § 316(b) states that "[a]ny standard established pursuant to section 1311 of this title or section 1316 of this title and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact." 33 USC § 1326(b). EPA may exercise broad discretion in determining BTA. *See Entergy Corp. v. Riverkeeper, Inc.*, 556 U.S. 208, 221 (2009). EPA may compare the costs and benefits of a proposed technology, as

[118] Henderson Report at 10–11.
[119] *Id.* at 11.

well as considering factors listed in the BAT and Best Available Demonstrated Technology ("BADT") standards. *Id.* at 222–23.

We agree with EPA's determination that the most effective way to reduce cooling water intake structure ("CWIS") impact is to require CCC.[120] EPA has selected as BTA "Option 5," which requires CCC operated on a seasonal basis (Units 1 and 2, April 1 through August 31), and a Type 2 fish return system, which consists of low and high pressure wash, continuous screen operation, and a new fish return system.[121] Option 5 is estimated to reduce annual impingement rates by sixty-five percent, and would save 3.6 million fish eggs and larva.[122] CLF supports EPA's CWIS BTA because we understand that, despite the manner in which the BTA is defined (seasonal CCC operation), EPA has "recognized that the permit's thermal discharge conditions are based on using closed-cycle cooling on a ***year-round basis***." Because the thermal discharge limit effectively requires year-round CCC, that limit will, as EPA states, "provid[e] even greater reductions in impingement mortality" than would be realized with the screening system improvements originally included in Option 5.

Entrainment occurs when fish, shellfish, fish eggs and larvae, and other aquatic organisms pass through screening devices and are drawn into a cooling water intake structure into a plant's cooling system. As small, fragile entrained organisms pass through the cooling system, they are subject to mechanical, thermal, and toxic stressors, including physical impacts in the pumps and condenser tubing; pressure changes caused by diversion of the cooling water into the plant or by the hydraulic effects of the condensers; thermal shock in the condenser and discharge tunnel; and chemical toxemia induced by antifouling agents such as chlorine. Few, if any, entrained organisms survive.[123]

PSNH's consultant, Normandeau Associates, Inc., collected fisheries data between 2005 and 2007 to estimate the number of fish (eggs, larvae, juvenile, adults) subjected to entrainment as a result of Merrimack Station's water withdrawals.[124] Normandeau found that, from the period of May 21, 2006, through September 10, 2006, an estimated 2.8 *million* fish larvae, representing at least seven fish species, were entrained through Merrimack Station's Units 1 and 2.[125] In 2007, over a shorter sampling time period, an estimated 2.4 million fish larvae were entrained.[126] Based on the fisheries sampling data and the design intake flows of both units, Normandeau

[120] *See* Attachment D at 312, 346.
[121] *Id.* at 346 (noting Draft Permit does not require installation of the new traveling screens that were originally part of the Option 5 package).
[122] *See id.* at 322, Table 12-1.
[123] *See* 66 Fed. Reg. 65,256 at 65,263; *see also* 65 Fed. Reg. 49,060 at 49,072.
[124] *See generally* AR 2, Normandeau Associates, Entrainment and Impingement Studies Performed at Merrimack Generating Station from June 2005 through June 2007 (2007) ("Normandeau E & I Studies").
[125] *Id.* at 52 (Table 3-6).
[126] *Id.*

calculated that Merrimack Station would entrain an estimated 3.5 million fish at all life stages.[127] Again based on design intake flows, Normandeau estimated that the expected adult equivalent loss based on the estimated entrainment to be nearly 17,000 fish in an average year.[128]

EPA concluded that Normandeau's analysis likely *underestimated* the actual annual entrainment and commensurate adult equivalent loss.[129] For example, EPA noted that Normandeau recorded zero entrainment at Unit 1 in May 2006, when 175 feet downstream at Unit 2, sampling on the same date recorded an estimated entrainment of 742,481 larvae and sampling in May 2007 at Unit 1 recorded an estimated entrainment of 556,360 larvae.[130] Rather than question an obviously erroneous data point, Normandeau used it in its analysis resulting in a 50% lower average annual entrainment rate for Unit 1 in May. When Normandeau's analysis is corrected, the estimated entrainment rate at Merrimack Station rises to 3.8 million fish larvae.[131]

Not surprisingly, when PSNH's consultant looked for entrainment survivors, they found none. Normandeau conducted entrainment survival tests between May 25 and June 18, 2007, when larval abundances in Hooksett Pool were expected to be highest. However, Normandeau reported that no larvae were collected at either Unit 1 or 2 and no eggs or larvae were observed in the samples collected in the control tank either.[132] Amazingly, PSNH's consultant blamed "overall low densities of larvae in the Hooksett Pool"[133] rather than the well-known fact that mortality from entrainment under normal conditions is substantial.[134] EPA correctly and easily concluded that, absent affirmative site-specific evidence to the contrary, 100 percent of fish eggs and larvae entrained at Merrimack Station are killed.[135]

The adult equivalent loss due to entrainment at Merrimack Station must be viewed in relation to the already depleted fish populations. Thus, as EPA correctly noted, "the loss of 195 adult equivalents [of yellow perch] takes on greater significance" given the overall decline in yellow perch abundance that has occurred since the 1960s.[136] In addition to the direct mortality (or adult equivalent loss) of fish species caused by entrainment, there are indirect effects as well. EPA

[127] *See* AR 6, PSNH, Response to United States EPA CWA § 308 Letter, Attachment 6, Table 2-1 (December 10, 2007).
[128] *Id.*
[129] Normandeau initially underestimated the average annual entrainment at Merrimack Station by using actual flow withdrawal data rather than design intake flows. *See* Attachment D at 252 ("While [actual flow data] may be a fair representation of entrainment rates for the river flow rates and plant operations during the monitoring period, it does not necessarily reflect entrainment rates under other flow conditions and plant operation scenarios."). When entrainment rates were adjusted based on design flow data, those rates rose considerably.
[130] Attachment D at 252.
[131] *Id.*
[132] *See* AR 2, Normandeau E & I Studies, at 43.
[133] *Id.*
[134] *See* 65 F.R. at 49,072.
[135] *See* Henderson Report at 7 (concurring with EPA's assumption of 100 percent mortality of organisms entrained at Merrimack Station).
[136] Attachment D at 251.

correctly noted the "ripple effects" that entrainment loss of large numbers of fish eggs and larvae may have, including loss of forage for other species and increased competition among species for other sources of food. It is no wonder given these documented direct and indirect effects that EPA concluded, "entrainment at Merrimack Station represents a significant adverse environmental impact."[137]

Likewise with regard to impingement at Merrimack Station, EPA correctly concluded that "[t]he loss of thousands of juvenile fish per year [due to impingement] from an ecosystem already stressed by the plant's thermal effects and entrainment constitutes an adverse environmental impact."[138] Impingement occurs when larger fish and other aquatic life become trapped on screening devices or other barriers installed at the entrance of the intake structure. Impingement is caused by the force of water passing through the intake structure and can result in starvation and exhaustion (when organisms are trapped against an intake screen), asphyxiation (when organisms are forced against a intake barrier by velocity forces that prevent proper gill movement or when organisms are removed from the water for prolonged periods of time), descaling (when organisms are removed from an intake screen by a wash system), and other physical harms.[139] As the Henderson Report notes, "[a]quatic life is poorly adapted to withstand impingement, and contact with the metal screens frequently results in injury or death."[140] Under normal conditions, a substantial number of the aquatic organisms impinged are killed or subjected to significant harm.[141] Because PSNH has not employed a fish return system to deliver impinged fish back to the river, impingement at Merrimack Station has resulted in 100% mortality.

PSNH's consultant also collected fisheries data between June 2005 and June 2007 to estimate the number of fish subjected to impingement as a result of Merrimack Station's water withdrawals.[142] When adjusted for collection efficiencies, Normandeau estimated the total impingement from July 2005 through June 2006 to be 6,736 fish, and from July 2006 through June 2007 to be 1,271 fish, for a total of 8,007 fish impinged over two years.[143] Again, EPA appropriately put these numbers into context explaining that fish abundance is at a four-decade low in Hooksett Pool and that "while impingement losses result in fewer adult equivalents than losses from entrainment, the numbers are not insignificant based on all the available information on the status of the fish community in Hooksett Pool."[144] Moreover, although PSNH has been

[137] *Id.* at 254; *see also* Henderson Report at 5–7 (concurring with EPA's conclusion that entrainment at Merrimack Station represents a significant adverse environmental impact).
[138] Attachment D at 261; *see also* Henderson Report at 3 ("The impingement losses observed due to Merrimack's current intake structures are significant and have affected the abundance of the local fish populations, both resident and migratory.").
[139] 66 Fed. Reg. at 65,263.
[140] Henderson Report at 3.
[141] *Id.*
[142] *See* AR 2, Normandeau E & I Studies, at 54–82.
[143] *Id.* at 74 (Table 4-5).
[144] Attachment D at 260.

required by its current permit to monitor for impingement during low-flow conditions, it is likely that significant impingement events have gone undetected. The sampling data collected by Normandeau demonstrated that the greatest impingement occurred during the month of June (4,300 fish in 2006, or 72% of all fish impinged in 2006), when PSNH is not required to monitor for impingement.[145]

Perhaps more shocking than the number of fish impinged, is what happens to them after impingement. The 1992 Permit requires that "[a]ll live fish, shellfish, and other aquatic organisms collected or trapped in the intake screens *shall be returned to their natural habitat.*"[146] PSNH's own consultant, however, has described Merrimack Station's current fish return system as "more of a debris return system."[147] EPA correctly concludes, "Merrimack Station's present fish returns are unacceptable. The returns from both units empty into a concrete pit on the riverbank above the normal water elevation. *Therefore, fish survival for impinged fish over the past 50 years of plant operation has been virtually zero.*"[148] That fact amounts to a gross and continuing violation of the 1992 Permit.

PSNH's blatant non-compliance with this permit condition—and EPA's failure to enforce it—raise substantial concerns. This example of longstanding PSNH disregard for a key requirement of its federal NPDES permit is a red flag signaling to EPA that it should closely scrutinize PSNH's compliance with all of the terms of its new NPDES permit going forward.

Cumulative Effects

In assessing the magnitude of adverse environmental impacts from CWIS operation, EPA must consider not only the direct impact of the CWIS, but also those impacts in conjunction with other environmental stressors.[149] In addition to the effects of the thermal discharge previously discussed, there are several additional stressors with which Hooksett Pool fish species must contend, as set forth below that EPA should consider.

Bioaccumulation of Mercury

Methylmercury is the chemical species that bioaccumulates in fish. The bioaccumulation effect is generally compounded the longer an organism lives, so that larger predatory game fish that tend to have a longer lifespan likely will have the highest fish tissue mercury levels.

In Hooksett Pool, temperature-mediated competition has favored fish species such as bluegill, largemouth bass, smallmouth bass, and redbreast sunfish resulting in numerical dominance of these species. Upon review of the available data, EPA concluded "that the most heat tolerant

[145] *Id.* at 261.
[146] *See* AR 236, 1992 Permit, at I.A.1.c. (emphasis added).
[147] Attachment D at 270 (citing Normandeau 2007d).
[148] *Id.* at 291.
[149] *See id.* at 241.

species are likely to remain numerically dominant in the thermally-influenced zone, and generally to fare better throughout Hooksett Pool than less heat-tolerant species."[150] Black bass [small and largemouth bass] are aggressive gamefish whose diets are highly varied, however, they increasingly forage on other fish as they increase in size (Hartel et al. 2002)."[151] Due to the numerical dominance of small and largemouth bass and foraging behavior consisting of other fish as they increase in size, the population of bass inhabiting Hooksett Pool will likely live longer and therefore likely have the highest mercury levels.

Smallmouth bass are the species that the New England Interstate Water Pollution Control Commission (NEIWPCC) identified as the target species for measuring mercury contamination in fish because smallmouth bass are "quite high in fillet mercury" and were "the highest-mercury fish for which data [were] available from most states subject to this TMDL." Northeast Regional Mercury TMDL, at 13–14. In other words, the very species that has been thriving in the Hooksett Pool due to warmer water temperatures is the same species that accumulates the most mercury. The additional stress the aquatic community faces from mercury exposure primarily from atmospheric deposition should inform EPA's decision on setting strict emission limits.

Low Dissolved Oxygen Levels in Hooksett Pool

The level of dissolved oxygen in a water body is an important measurement of that water body's health. If levels of dissolved oxygen decline, sensitive aquatic animals may move away from that area, weaken or die. The Hooksett Pool is already at a disadvantage for levels of dissolved oxygen because it is an impoundment. Slower-moving or impounded water dissolves less oxygen than running water. PSNH's consultant monitored dissolved oxygen levels in the Hooksett Pool, as well as the impoundments immediately above and below Hooksett.[152] The report attributed the low levels of dissolved oxygen to the thermal discharge from Merrimack Station, as well as the cumulative effects of wastewater treatment discharges into the River above the Hooksett Dam.[153] The report further notes that the low levels of dissolved oxygen at lower depth levels is particularly unusual since temperatures at depth are colder, and, as such, can hold more dissolved oxygen.[154] Accordingly, the low levels of dissolved oxygen in the Hooksett Pool constitute an additional adverse effect on the environment (which PSNH's own consultant speculates may be caused, in part, by Merrimack Station's thermal discharge) that weighs in favor of strict thermal discharge standards for Merrimack Station.

Impediments to Fish Migration

Dams located throughout the Merrimack River impede fish migration, especially anadromous

[150] *Id.* at 73–74.
[151] *Id.* at 96.
[152] *Id.* at 6 (citing AR 168, Gomez and Sullivan 2003) and concluded that the Hooksett Pool had lower levels of dissolved oxygen than the other two impoundments. *Id.* at 7 ("At Hooksett, thermal stratification was shown to occur, and dissolved oxygen levels fell below 75% in the bottom portions of the water column.").
[153] *Id.*
[154] *Id.*

species (Atlantic salmon, American shad, alewife) and catadromous species (American eel). These impediments act as an additional stressor on these migratory species, both during upstream and downstream migration.

Dams serve as ongoing barriers to fish passage unless fishways are installed or dams are removed. Absent removal, dams without adequate upstream fish passage facilities prevent, or significantly reduce, the numbers of migratory fish that return to available habitat.[155] Those fish migrating upstream that manage to make it through the multiple fishways and reach the Hooksett Pool, may experience stress from their passage through fishways, and their migration may be delayed. Further, dams impact fish out-migration by causing injury and mortality to young fish that pass over sluices and spillways: "Potential effects to fish passing through spillways or sluices may include injury from turbulence, rapid deceleration, terminal velocity, impact against the base of the spillway, scraping against the rough concrete face of the spillbay [sic], and rapid pressure changes."[156]

EPA noted "[t]he presence of hydroelectric dams downstream from Merrimack Station prevents most anadromous fish from reaching Hooksett Pool, or their natal spawning grounds farther upstream."[157] There are five additional dams/falls upstream of Hooksett Pool that impede fish travel: Ayers Island Dam, Franklin Falls Dam, Eastman Falls Dam, Sewall Falls Breach, and Garvins Falls Dam. EPA found that upstream anadromous fish migration is currently restricted by the lack of suitable fish passage at Hooksett Dam under most flow conditions.[158] As previously discussed, anadromous fish restoration in the Merrimack River is ongoing and fish passage structures at the Hooksett Dam are planned for the future. While these plans may reduce some of the restrictions to fish passage, they will not alleviate entirely the adverse effects to fish migration caused by dams.

Climate Warming Impacts

Several studies have been done on the potential effects of climate warming on fish thermal habitat in streams, and they have recognized the potential for global warming to change the streams' thermal regimes.[159] For cold and cool water species, like many of the indigenous species in the Hooksett Pool, rising temperatures due to global warming will have the effect of reducing available habitat. One study, conducted by researchers from the University of Minnesota, predicted an eleven to twenty-two percent decrease in streams thermally suitable for cool water fishes.[160] Not only will suitable habitat decrease for cool water fishes, rising stream

[155] ASMFC, Atlantic Coast Diadromous Fish Habitat, 328 (2009), http://www.asmfc.org/diadromousSpeciesDocument.htm.
[156] *Id.* at 330.
[157] Attachment D at 88.
[158] *Id.*
[159] *See, e.g.*, AR 735, Omid Mohseni, et al., Global Warming and Potential Changes in Fish Habitat in U.S. Streams, 59 Climatic Change 389–409 (2003).
[160] *Id.* at 398.

temperatures will make the habitat more suitable for warm water fishes such as large mouth bass, which then compete with cool water fish such as yellow perch for available forage.

Rising temperatures, winter snowpack declines, increased frequency of spring/summer droughts, and changes in stream flow patterns could lead to decreases in water supply during the summer and fall.[161] Decreases in water supply would further exacerbate the present thermal impact that Merrimack Station's discharge has on Hooksett Pool that includes:

- Significant fraction of shallow water habitat in the lower pool affected by the [thermal] plume during summer months;
- High and persistent temperatures above ambient associated with the [thermal] plume under typical summer conditions;
- [Thermal] plume's tendency to extend across the entire width of the river;
- [Thermal] plume's demonstrated capacity to cause water column stratification, which can contribute to low dissolved oxygen events above Hooksett Dam; and,
- Low flows in Hooksett Pool typical during summer months (*i.e.*, July, August, September).[162]

Further, Merrimack Station's large volumes of water withdrawal would likely exacerbate the problems associated with more frequent spring and summer droughts causing lower water levels. EPA found that "water withdrawal at a rate significant enough to cause water from the discharge canal to flow upstream clearly has the potential to affect the Hooksett Pool environment. . . . Merrimack Station's current operations typically redirect up to 62 percent of the available flow under low-flow conditions. EPA regards this to be a large fraction of the available river flow."[163] If ambient river temperatures rise as a result of climate warming, Merrimack Station's thermal discharge limits will need to be adjusted downward to assure the protection and propagation of the BIP, especially cool water fish. EPA should take this into consideration in determining if its current protective fish temperatures will be protective enough under shifting thermal regimes.

In summary, we strongly agree with EPA's conclusion that "allowing Merrimack Station to continue, unchecked, to entrain and kill an appreciable number of fish larvae, including those of species exhibiting population declines in the pool, would be inconsistent with the requirements

[161] Confronting Climate Change in the U.S. Northeast Science, Impacts, and Solutions report by Northeast Climate Impacts Assessment Synthesis Team, 63 (2007), http://www.climatechoices.org/assets/documents/climatechoices/confronting-climate-change-in-the-u-s-northeast.pdf.
[162] Attachment D at 39.
[163] *Id.* at 38.

of the Clean Water Act and New Hampshire water quality standards, and, as such, would be contrary to the public interest."[164]

EPA SHOULD REQUIRE VCE, IN ADDITION TO PSNH'S PHYSICAL / CHEMICAL TREATMENT SYSTEM, AS BAT

BAT Determination for FGD System Wastewater

Technical Availability

As set forth *supra* at 6, EPA correctly determined that, in the absence of NELG for FGD wastewater BAT limits, it must apply its BPJ to develop BAT on a case-by-case basis. Applying the BAT factors, EPA determined that PSNH's current physical / chemical treatment system, plus the addition of a polishing step to remove additional mercury and a biological treatment component for removal of selenium are "components of BAT for the control of FGD wastewater at Merrimack Station."[165] As set forth in the *Expert Report of John H. Koon in the Matter of Comments on the NPDES Permit for PSNH's Merrimack Station* ("Koon Report"), attached hereto as Exhibit 02, the law and the facts here, however, dictate a different result:[166] EPA should require VCE, in addition to PSNH's already installed and operating physical chemical treatment system.[167]

PSNH contracted with Burns & McDonald in *late 2010* to study installation of a "supplemental wastewater treatment system," and concluded that installing VCE was possible at Merrimack Station, and would reduce the discharge to zero:

> PSNH decided to pursue the supplemental WWTS option and hired Burns & McDonald (B&M) on November 17, 2010, to provide technical assistance based on their unique knowledge and expertise. Burns & McDonald was engaged to provide engineering and construction oversight under the pre-existing contract arrangement with NU/PSNH due to their experience with the only other similar system in the United States. ***Burns & McDonald's analysis of the Clean Air Project WWTS and effluent concluded the installation of a brine concentrator, crystallizer would reduce the liquid waste stream to between zero to five gpm, which may allow for re-use and an additional crystallizer, and dewatering device will be installed to insure zero discharge.***[168]

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[164] *Id.* at 336.
[165] Attachment E at 38.
[166] *See* Koon Report at 2.
[167] With VCE there is no need for a biological polishing step.
[168] *See* Jacobs Consultancy, Redacted New Hampshire Clean Air Project Due Diligence on Completed Portion, 67 (2011) ("Jacobs Report"), attached hereto as Exhibit 03.

PSNH then revised the budget for the so-called "Clean Air Project" (the name of its overall renovation program including the scrubber installation) to include $20.2 million dollars to install the supplemental VCE elements. Importantly, that expense did nothing to increase the overall scrubber project budget:

> On January 12, 2011, the RMC reviewed the procurement strategy and the plans for the release of RFPs for equipment and construction for the Supplemental WWTS. The RMC approved immediate release of the equipment RFP and the release of the construction RFP later in the spring 2011. **In January 2011, Clean Air Project management revised the project budget to include $20.2M for the supplemental WWTS. The overall project budget did not increase since Clean Air Project management utilized funds from reserve and contingency accounts.** PSNH elected to manage the Supplemental WWTS work directly under a separate PSNH Work Order.[169]

Early last year, PSNH released construction and equipment RFPs for installing the supplemental VCE system, entered into contract negotiations, and apparently opened a purchase order with Aquatech:

> On January 20, 2011, the RMC reviewed evaluations of the equipment supply bids received from Aquatech and BEGIN CONFIDENTIAL [ ] END CONFIDENTIAL under RFP-00014- 02011. Discussions were held with both bidders to further clarify scope of work, schedule and guarantees; both bidders provided best and final offers. Due to long delivery and the equipment being of foreign manufacture PSNH eliminated BEGIN CONFIDENTIAL [ ] END CONFIDENTIAL and continued negotiations with Aquatech. On February 3, 2011, a PO in the NTX amount of BEGIN CONFIDENTIAL [ ] END CONFIDENTIAL was opened with Aquatech. This included a provision for potential future options, design development and shipping as well as a contingency provision allowance.[170]

The administrative record in this case confirms that, at least as of May 2011, EPA was aware of PSNH's contract with Burns & McDonald to design the system, and that Aquatech would build it:

> Allan Palmer also informs me that PSNH has contracted with Burns & McDonnell to design a zero-discharge system for Merrimack Station's FGD

[169] *Id.*

[170] *Id.* Consistent with its pattern and practice of shielding its activities from regulators, just weeks after PSNH hired B&M to study the feasibility of VCE for Merrimack Station, PSNH continued to represent to EPA that VCE should *not* be BAT for the FGD wastewater. *See* AR 402, EPA, Telephone Notes from call with Linda Landis and William Smagula (Jan. 3, 2011).

> WWTS. The equipment will be similar to what is installed at the Iatan Electrical Generating plant in Iatan, MO operated by Kansas City Power & Light. The manufacturer of the zero-discharge is Aquatech. Palmer also stated PSNH still wants [sic] a effluent limits for the FGD WWTS.[171]

The Iatan facility operates a VCE system installed by Aquatech.[172]

BAT-based numeric effluent limits *"**shall** require the elimination of discharges of all pollutants if the Administrator finds, on the basis of information available to him . . . that such elimination is technologically and economically achievable.*" 33 U.S.C. § 1311(b)(2)(A) (emphasis added). Here, there can be no question that EPA was aware that VCE for zero liquid discharge was both an available and economically achievable technology for Merrimack Station, since PSNH told EPA as much, months before the Draft Permit issued. The Jacobs Report confirms independently that PSNH has included the cost of a VCE system in the FGD System project budget and that it is proceeding with the design and construction of a VCE system.

PSNH apparently never submitted an updated permit application proposing to use VCE or "providing information concerning the suitability of the technology for use at Merrimack Station."[173] At the same time, PSNH pushed EPA to reach a decision on the new discharge so that PSNH could begin operating the FGD System as soon as possible (presumably so that PSNH could more quickly begin to seek cost recovery for the Scrubber Project before the New Hampshire Public Utilities Commission).[174] Indeed, so eager was PSNH to begin operating the FGD System that it did so—in September 2011—without an NPDES permit in place, instead opting to ship its wastewater offsite for disposal.[175] Many questions remain about exactly where the wastewater is being shipped; predictably, PSNH has been less than forthcoming, both in proceedings before the New Hampshire Public Utilities Commission, and apparently also with environmental regulators. On February 3, 2012, CLF issued formal requests for information under the New Hampshire public records law to obtain more information regarding where PSNH's FGD System wastewater is being shipped for discharge; on February 25, 2012, CLF issued a Act Request to EPA seeking related information. *See* Exhibits 04 and 05.

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[171] AR No. 693, E-mail from John King to David Webster, Mark Stein, and Sharon DeMeo regarding PSNH Supplied Information Concerning the FGD (May 27, 2011). *See also* Attachment E at 21 ("EPA has recently received information that PSNH is currently evaluating the potential use of [VCE] technology for Merrimack Station."); AR 638, EPA E-mails regarding Legal Question Concerning FGD Zero-Discharge Equipment vs FGD WWTS Technology Limits (June 1, 2011).

[172] *See genrerally* AR 150, Project Profile Series #66 Aquatech Supplies Zero Liquid Discharge Treatment for FGD System at the Iatan Generating System (2011) (describing vapor compression, brine concentration, evaporation and other components).

[173] *See* Attachment E at 21.

[174] *See* AR 647, PSNH e-mail to EPA regarding the NPDES permit process and seeking to expedite FGD system permitting (Jan. 2, 2011); AR 402 (Jan 3, 2011 Region 1 notes from call with PSNH relating, in part, to same).

[175] *See* AR 516, New Scrubbers Set for Testing at PSNH Plant in Bow, Manchester Union Leader (Sept. 29, 2011).

That PSNH refuses or fails to provide necessary information to EPA should not result in it obtaining what is effectively a less stringent BAT determination. The BAT standard is intended to be technology-forcing. BAT represents the technology in place in the "single best performing plant in an industrial field" to reduce discharges of pollutants. *Chem. Mfrs. Ass'n v. U.S. E.P.A.*, 870 F.2d 177, 239 ("[W]e reject the petitioners' premise that the limitations are unachievable unless all plants in the data base have met the limitations. . . . [A]n exceedance by one of the data-base plants is irrelevant so long as another data-base plant demonstrates that the limitations are achievable."); *American Iron and Steel Institute v. U.S. E.P.A*, 526 F.2d 1027, 1064 (3d Cir. 1975) (BAT limits for suspended solids in the continuous casting subcategory upheld where "an examination of the record shows that one plant . . . clearly achieved the limitations."). BAT can be based on statistics from a single plant. *See Association of Pacific Fisheries v. U.S. E.P.A*, 615 F.2d 794, 816–17 (9th Cir. 1980) (citing legislative history). All that is required is that at least one discharger in the point source category demonstrate that the BAT limits are achievable. This is consistent with Congress's intent that EPA will "use the latest scientific research and technology in setting effluent limits, pushing industries toward the goal of zero discharge as quickly as possible." *Kennecott v. U.S. E.P.A*, 780 F.2d 445, 448 (4th Cir. 1984); *Natural Res.' Def. Council*, 863 F.2d at 1431 ("The BAT standard must establish effluent limitations that utilize the latest technology"). Further, "[i]n setting BAT, EPA uses not the average plant, but the optimally operating plant, the pilot plant which acts as a beacon to show what is possible." *Kennecott*, 780 F.2d at 448.

Plainly, EPA is aware that coal-fired power plants currently are operating VCE systems to treat FGD wastewater in the United States and Italy.[176] We are aware, as well, of VCE systems in use to treat FGD wastewater at one plant in China and one plant in Japan.[177] Additionally, we understand that there are several other plants in the U.S. in the engineering / feasibility stage of implementing VCE.[178] Placed in operation in 2006–2008, the Italian plants continue to operate well and without any significant problems.[179] As well, "VCE has been used for a number of years in other industries including the treatment of cooling tower blowdown and the treatment of coal gasification wastewaters. While FGD wastewaters have different characteristics compared to these wastewaters, the technology has been in use for at least thirty years."[180]

EPA found "that use of vapor compression evaporation would not interfere with, or require changes to, the facility's other pollution control processes or its primary process for generating

[176] Attachment E at 21 ("one U.S. coal-fired plant and six coal-fired power plants in Italy are treating FGD wastewater with vapor-compression evaporation systems."). *See also* AR 406, EPA Memorandum, Attachment A - Technology-based Effluent Limits, Flue Gas Desulfurization (FGD) Wastewater at Steam Electric Facilities, 4–5 (June 7, 2010).
[177] *See* Koon Report at 2.
[178] *Id.* at 8.
[179] We have learned as of December 2011 that one of the Italian VCE systems is no longer in operation. We understand there were no operational issues with the VCE system; rather another less costly method of treating the wastewater was identified. Koon Repot at 8.
[180] Koon Report at 8–9.

electricity."[181] Specifically, EPA determined that VCE could be installed and used in conjunction with PSNH's already installed physical/chemical treatment system.[182] EPA also determined that the facility's age "would neither preclude nor create special problems with using vapor compression evaporation technology."[183]

Indeed, VCE is a superior technology that will, by far, exceed the removal efficiencies afforded by chemical precipitation with biological treatment, the elements defined as BAT by EPA. As set forth in the Koon Report, Merrimack Station's FGD purge is estimated to contain 7,952 toxic-weighted pound equivalents ("TWPE") of pollutants per year.[184] The following table presents the estimated fraction of TWPE removed for both chemical precipitation plus biological treatment and chemical precipitation plus VCE, based on flow-adjusted model plant data derived from Eastern Research Group's evaluation of FGD wastewaters for EPA in 2009[185]

Waste Loads Associated with Untreated FGD Wastewater and Following Treatment

Wastestream/ Treatment System	Waste Load (lb-eq TWPE/yr)	Fraction TWPE Removed (%)
FGD Scrubber Purge / Blowdown (prior to treatment)	7952	--
Chemical Precipitation + Biological Treatment Effluent	742	90.7
Chemical Precipitation + VCE Effluent	0	100

Additionally, analysis of a January 5, 2012, sample of Merrimack Station treated FGD System effluent shows that it would, if also treated for selenium removal, contain 5,280 lb-eq TWPE per year. [186] Contrasted with the 742 lb-eq TWPE per year estimated for the model plant, PSNH's current treated effluent appears to contain "considerably greater amounts of pollutants compared to the ERG model plant wastewaters."[187] As a result, VCE treatment of Merrimack Station's FGD System wastewater would result in "the removal of a significantly greater amount of TWPE" than would be obtained by chemical precipitation with biological treatment.[188] EPA

[181] Attachment E at 22.
[182] *Id.*
[183] *Id.*
[184] Koon Report at 7-8.
[185] *Id.* at 7-8 & Table 2.
[186] Koon Report at 8 and Appendix 2 (GZA sampling data).
[187] Koon Report at 8.
[188] *Id.*

must take this into account when making its final BAT determination.

As demonstrated above and in the Koon Report, VCE is available technology that could be applied to the treatment of FGD wastewater at Merrimack Station.[189]

Economic Achievability

As set forth *supra* at p. 36, to demonstrate economic achievability, no formal balancing of costs and benefits is required; . . . BAT should represent a commitment of the maximum resources economically possible to the ultimate goal of eliminating all polluting discharges." *Natural Res. Def. Council, Inc. v. U.S. E.P.A.*, 863 F.2d 1420, 1426 (9th Cir. 1988) (internal quotations and citations omitted) (emphasis supplied). BAT represents "best economically achievable performance in the industrial category or subcategory."[190]

The cost of VCE for Merrimack Station plainly is economically achievable, evidenced primarily by the fact that, based on its representations to the NH PUC's expert consultant, PSNH has already budgeted for and is building the VCE system.[191] *See* Jacobs Report at 67 (PSNH has budgeted a capital cost of $20.2 million to construct VCE system).[192]

EPA determined that using physical/chemical treatment together with VCE would cost PSNH approximately $4,162,000 per year.[193] By comparison, EPA estimated the cost of the BAT it chose – physical/chemical plus biological treatment – to be approximately $1,654,000.[194] In considering the cost of the physical/chemical plus biological treatment it chose as BAT, EPA considered the cost of the treatment in relation to the total cost of the FGD project, which PSNH has reported to be approximately $422 million. EPA correctly concluded that "[t]he additional cost for adding biological treatment would represent a small fraction of this total."[195] The same rationale applies to the additional cost of vapor compression evaporation.

As well, the capital cost of VCE is a very small fraction of the overall value of Merrimack Station, ranging from 1.4 to to 4.7 percent, depending on the method applied to calculate Station value.[196] By comparison, the capital cost of chemical precipitation plus biological treatment represents 0.6 to 1.8 percent of Station value.[197] The annual cost of VCE as a fraction of Merrimack Station's operating revenue is 1.5 percent, as compared to 0.7 percent for chemical

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[189] *Id.*
[190] Attachment E at 12 (citing *BP Exploration & Oil, Inc. v. EPA*, 66 F.3d 784, 790 (6th Cir. 1995)).
[191] As well, as illustrated by the growth in planned adoption of VCE by U.S. facilities, VCE is economically achievable for the steam electric generating sector overall. *See* Koon Report at 8.
[192] *See also* Koon Report at 9.
[193] Attachment E at 22.
[194] *Id.* at 28–29.
[195] *Id.* at 29.
[196] *See* Koon Report at 11, Table 4.
[197] *Id.*

precipitation plus biological treatment.[198] As concluded in the Koon Report, "[t]he cost of constructing and operating VCE is a very small fraction of comparable costs that the station has already and is continuing to incur."[199] Importantly, the capital cost of VCE "would *increase* the value of the site facilities by 1.4 to 4.7%."[200]

The Koon Report confirms that VCE impacts related to energy used, air emissions, and solid waste generation are insignificant.[201] Specifically, VCE operations would consume only 0.8 percent of the total energy generated by Merrimack Station, and may increase solids generated by 1.8 percent.[202]

EPA has a legal duty to put in place a BAT standard and establish effluent limitations that utilize the latest technology with the goal of reducing and *eliminating* the FGD System wastewater discharge. Appropriately, EPA is continuing to review information regarding the installation of VCE technology at Merrimack Station and determined that it "could potentially find [VCE] to be part of the BAT for Merrimack Station for the final NPDES permit."[203] EPA must require PSNH to provide whatever additional information is necessary to enable a final determination that BAT for treating Merrimack Station's FGD System wastewater is a VCE system in addition to the existing physical and chemical treatment system. Accordingly, the technology-based permit limits for Outfall 003C should be zero for all pollutants.[204] As well, EPA should include in the permit the recommended sampling and monitoring requirements set forth in the Koon Report at pages 15-16 and Table 6.

BECAUSE THE HOOKSETT POOL IS IMPAIRED FOR FISH CONSUMPTION DUE TO MERCURY CONTAMINATION, THE PERMIT MUST SET A WATER QUALITY-BASED DISCHARGE LIMIT OF ZERO FOR MERCURY TO AVOID CAUSING OR CONTRIBUTING TO A VIOLATION OF NEW HAMPSHIRE'S WQS

Status of the Hooksett Pool Segment of the Merrimack River

New Hampshire classifies the Merrimack River as a Class B water pursuant to R.S.A. § 485-A:8, II.[205] Class B waters are considered ". . . as being acceptable for fishing, swimming and other recreational purposes and, after adequate treatment, for use as water supplies." Despite its designation as a Class B water, since 1967,[206] the NHDES Water Division has classified the

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198 *Id.*
199 *Id.* at 11.
200 *Id.*
201 *Id.* at 12–13.
202 *Id.* .
203 Attachment E at 22.
204 *See* Koon Report at 13–15 (the permit should "contain limits of zero discharge of pollutants (*i.e.*, the concentration of all pollutants in the discharge should be less than the detection limit).").
205 AR 608, Draft Permit Fact Sheet at 7.
206 1967 NH Chapter Law 311:1, LXII.

Hooksett Pool of the Merrimack River as impaired since 1996,[207] because of the health risk associated with fish consumption due to elevated mercury levels.[208]

Waters identified by a state or EPA as failing to meet the water quality standards necessary to protect the designated uses for that particular water body are commonly referred to as "impaired waters."[209] Water quality standards are a combination of designated uses for a water body, the narrative or numerical limitations necessary to protect those uses, and the state's anti-degradation policy. *See* 33 U.S.C. §§ 1313(c)(2), 1313(d)(4)(B); 40 C.F.R. Part 131, Subpart B. Water quality standards therefore "serve both as a description of the desired water quality for particular waterbodies and as a means of ensuring that such quality is attained and maintained." 64 Fed. Reg. 37,073, 37, 074 (July 9, 1999); 40 C.F.R. § 131.2. They are the benchmarks by which the quality of waterbodies is measured: waterbodies that do not meet these benchmarks are deemed "water quality limited" and placed on the CWA 303(d) list. States must develop TMDLs for all such 303(d)-listed waters to establish a scientific basis to clean the waters and bring them back into compliance. 33 U.S.C. § 1313(d)(1)(C).

One such designated use for the Merrimack River is fishing. To support the use of fish consumption, New Hampshire water quality standards dictate that:

> (a) Unless naturally occurring or allowed [for mixing zones], all surface waters shall be free from toxic substances or chemical constituents in concentrations or combinations that:
>
> ...
>
> (2) Persist in the environment or accumulate in aquatic organisms to levels that result in harmful concentrations in edible portions of fish, shellfish, other aquatic life, or wildlife which might consume aquatic life.

Env-Wq 1703.21(a) (2011). To implement this standard, New Hampshire has established numeric limits for mercury in waters. The state relied on EPA's Methylmercury Fish Tissue Criterion, 0.30 parts per million,[210] to establish numeric water quality criteria for mercury set at 0.05 μg/L (Water & Fish Ingestion) and 0.051 μg/L (Fish Consumption Only). *See* Env-Wq 1703.21(b) (reproducing Table 1703.1). Until 2007, the Hooksett Pool, like every fresh surface water in New Hampshire, was listed on New Hampshire's 303(d) list as impaired for fish consumption due to elevated mercury levels.

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[207] 1996 was the first year for which a fish consumption advisory for mercury was incorporated into the state water quality assessments. See N.H. Section 305(b) Water Quality Report III-3-3 (1994); N.H. Section 305(b) Water Quality Report III-3-2 (1996).
[208] *See* Fish consumption advisories, *supra* n.4.
[209] 33 U.S.C. § 1313(d)(1)(A); 40 CFR § 130.7(b), (d).
[210] Northeast Mercury TMDL, *supra* n.5, at 8.

In 2007, NEIWPCC, in conjunction with a technical committee that included representatives of each of the Northeast states, developed the Northeast Regional Mercury TMDL, which was approved by EPA on December 20, 2007. [211] In its approval transmittal letter, EPA stated "[t]he TMDL addresses 5,124 water segments in the State of New Hampshire that are listed as impaired for mercury on the New Hampshire 2006 303(d) list."[212] At the time, the 303(d) list included the Hooksett Pool segment of the Merrimack River.[213] EPA issued a press release announcing EPA's approval of the Northeast Regional Mercury TMDL,[214] and EPA's website currently includes a webpage listing "examples of approved mercury TMDLs," that includes the Northeast Regional Mercury TMDL.[215] Copies of the TMDL and related EPA approval are also available on EPA's website.[216] Each of the seven states that worked with NEIWPCC to develop the TMDL include information about it on their websites,[217] and NEIWPCC also makes available currently on its website a brief history of the TMDL, including its 2007 approval by EPA, and the key documents related to its development and approval.[218]

Indeed, in a September 11, 2009, email, DES Water Division staff reviewing PSNH's proposal to discharge mercury-containing FGD System wastewater to the Merrimack River concluded that:

> In order for the [Northeast Regional Mercury] TMDL to have any credibility at all, ***PSNH cannot be permitted to create a new or increased load of Hg [mercury] to the Merrimack.***[219]

EPA states in the Fact Sheet, however, that "No TMDLs have been developed for this segment of the Merrimack River."[220] Yet, the Northeast Regional Mercury TMDL applies to thousands of

[211] *See* AR 604, Letter from EPA to NHDES regarding Notification of Approval of Northeast Mercury TMDL (December 20, 2007) ("Perkins Letter").
[212] *Id.*
[213] *See* NHDES, Final 303(d) List, Appendix A, 81 (2006) http://des.nh.gov/organization/divisions/water/wmb/swqa/2006/documents/appendixa.pdf ("2006 303(d) List Appendix A").
[214] EPA, EPA Approves Plan by Northeast States to Lower Mercury Levels in Fish (Dec. 27, 2007), http://yosemite.epa.gov/opa/admpress.nsf/3881d73f4d4aaa0b85257359003f5348/9bcf9b1fdbf43d1d852573be00694f27!OpenDocument&Highlight=2,northeast,regional,mercury,TMDL.
[215] EPA Examples of Approved Mercury TMDLs, available at http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/mercury.cfm (last visited Feb. 28, 2012).
[216] Northeast Regional Mercury TMDL, *supra* n.5; EPA TMDL Decision Document, http://www.epa.gov/region1/eco/tmdl/pdfs/ne/NH-Mercury-TMDL-Approval.pdf.
[217] Connecticut, http://www.ct.gov/dep/cwp/view.asp?a=2719&q=325604#mercury (last visited Feb. 28, 2012); Maine, http://www.maine.gov/dep/water/monitoring/tmdl/2007/Hg.htm (last visited Feb. 28, 2012); Massachusetts, http://www.mass.gov/dep/water/resources/tmdlfac.htm (last visited Feb. 28, 2012); New Hampshire, http://des.nh.gov/organization/divisions/water/wmb/tmdl/index.htm (last visited Feb. 28, 2012); New York, http://www.dec.ny.gov/chemical/31304.html (last visited Feb. 28, 2012); Rhode Island, http://www.dem.ri.gov/programs/benviron/water/quality/rest/reports.htm (last visited Feb. 28, 2012); Vermont, http://www.anr.state.vt.us/dec//waterq/cfm/ref/ref_tmdl.cfm (last visited Feb. 28, 2012).
[218] http://www.neiwpcc.org/mercury/MercuryTMDL.asp (last visited Feb. 28, 2012).
[219] *See* AR 351 & 486, CLF Letter, at 9.

New Hampshire water segments that were identified as mercury impaired on New Hampshire's 2006 303(d) list, including the Hooksett Pool.[221] Just weeks before the Draft Permit was issued, EPA issued its approval of New Hampshire's new 303(d) list, expressly stating that all freshwater assessment units in New Hampshire are covered by the 2007 Mercury TMDL.[222] EPA should correct this factual error in the final permit and supporting documents, and should take into account the existence of the Northeast Regional Mercury TMDL for permitting purposes.

In any event, to the extent EPA takes the position that the Northeast Regional Mercury TMDL either does not apply to the Hooksett Pool or is otherwise not applicable, the plain language of the CWA implementing regulations clearly provide that no permit may be issued to a new source or discharger "if the discharge from its construction or operation will cause or contribute to the violation of water quality standards." 40 C.F.R. § 122.4 (i) (1) & (2). As discussed more fully below, the FGD System is a "new discharger," pursuant to 40 C.F.R. § 122.2, and EPA may not issue a permit to PSNH when its new discharge will contribute to a WQS violation by adding mercury pollution to a waterbody already impaired for mercury pollution.

Under New Hampshire Law, Impaired Waters, By Definition, Have No Assimilative Capacity

In 2010, New Hampshire developed a specific methodology for assessing and listing (or de-listing) waters on the 303(d) list called the "Section 305(b) and 303(d) Consolidated Assessment and Listing Methodology" ("CALM" or "Methodology").[223] Among other things, the Methodology evaluates as assessment unit's ("AU") assimilative capacity for certain pollutants. Assimilative capacity is defined as "the amount of a pollutant or pollutants that safely can be released to a waterbody without causing violations of applicable water quality criteria or negatively impacting uses." Env.-Wq 1702.03. CALM unambiguously provides that: *"[w]here a given parameter is impaired there is no remaining assimilative capacity,* the antidegradation tier [code] will be impaired (Imp)."[224]

Because the Merrimack River currently is impaired for mercury, there is no assimilative capacity for mercury, and any additional mercury loading would violate state water quality standards pursuant to New Hampshire's approved Methodology.

In 2010, New Hampshire DES began to categorize waters into tiers based on measured parameters.[225] Each tier is defined by its existing water quality and remaining assimilative capacity. Tier 1 water quality is within ten percent of the water quality standard and the reserve

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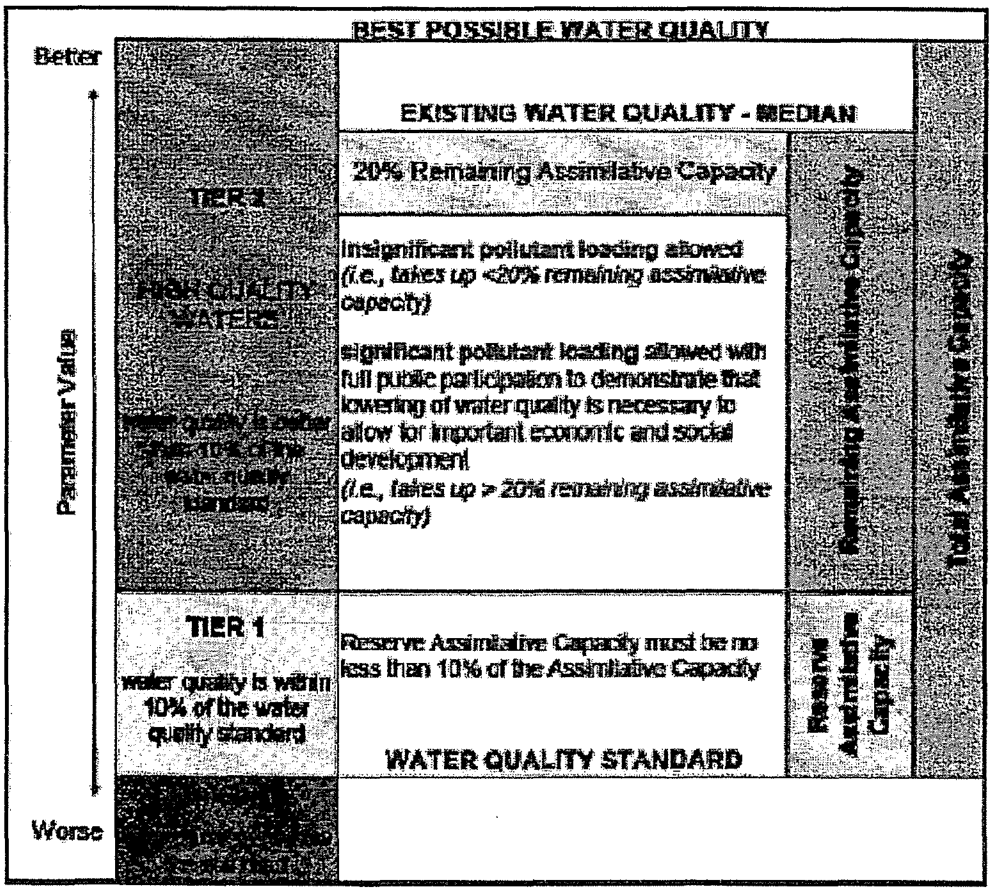
[220] AR 608, Draft Permit Fact Sheet at 7.
[221] *See* 2006 303(d) List Appendix A, *supra* note 215.
[222] AR 604, Perkins Letter, at 9.
[223] http://des.nh.gov/organization/divisions/water/wmb/swqa/documents/2010calm.pdf.
[224] CALM at 33 (emphasis supplied).
[225] *Id.* at 29.

assimilative capacity for Tier 1 must be no less than ten percent of assimilative capacity. Tier 2 water quality is better than ten percent of the water quality standard, and has twenty percent remaining assimilative capacity. Impaired water quality is below the water quality standard, and has no assimilative capacity. The Methodology notes that only parameters that are not impaired will be designated as Tier 1 or Tier 2; accordingly, impaired waters categorically fall below applicable water quality standards and lack assimilative capacity to meet the standards for either tier.[226] DES's conceptual diagram For Tier 1 and 2 water quality estimation confirms that impaired waters *by definition* fail to satisfy water quality standards and retain no assimilative capacity:[227]

Figure 3-1: Conceptual diagram for Tier 1 and Tier 2 waters estimation (not to scale).



[226] *Id.* at 32.
[227] *Id.* at 30, Figure 3-1 (2010).

In addition to categorizing waters as Tier 2, Tier 1 or Impaired, CALM also groups waters into one, and only one, of seven assessment categories. Those categories are as follows:

> *AU Category 1*: Attaining the [sic] all designated uses and no use is threatened.
> *AU Category 2*: Attaining some designated uses; no use is threatened; and insufficient or no data and information is available to determine if the remaining uses are attained or threatened (i.e., more data is needed to assess some of the uses).
> *AU Category 3*: Insufficient or no data and information is available to determine if any designated use is attained, impaired, or threatened (i.e., more monitoring is needed to assess any use).
> *AU Category 4A*: Impaired or threatened for one or more designated uses but does not require the development of a TMDL because a TMDL has been completed.
> *AU Category 4B*: Impaired or threatened for one or more designated uses but does not require the development of a TMDL because other pollution control requirements are reasonably expected to result in attainment of the water quality standard in the near future.
> *AU Category 4C*: Impaired or threatened for one or more designated uses but does not require the development of a TMDL because the impairment is not caused by a pollutant, and
> *AU Category 5*: Impaired or threatened for one or more designated uses by an pollutant(s), and requires a TMDL (this is the 303(d) List).[228]

The Methodology explains that a final assessment of category 4 or 5 "means the waterbody is impaired and there is no remaining assimilative capacity regardless of the calculated existing WQ."[229]

As set forth above, as of 2006, the Hooksett Pool was designated impaired and categorized as AU Category 5.[230] In 2008, that designation changed to AU Category 4A:

> In 2007, EPA approved the Northeast Regional Mercury TMDL prepared by the Northeast States and the New England Interstate Water Pollution Control Commission (see [sic] (http://des.nh.gov/wmb/tmdl/documents/NortheastRegional/FINAL_Northeast_Regional_Mercury_TMDL.pdf). This TMDL addresses all fresh surface waters in NH that are impaired for the fish consumption use primarily due to atmospheric deposition of mercury. Consequently all surface waters on the 2006 303(d) list

[228] *Id.* at 6.
[229] *Id.* at 32.
[230] *See* NHDES 303(d) List, Appendix 19, 1207 (2006), http://des.nh.gov/organization/divisions/water/wmb/swqa/2006/documents/appendix19.pdf.

> that are listed as impaired for fish consumption due to mercury where atmospheric deposition is the primary source of mercury were delisted and moved to Category 4A for in [sic] 2008.[231]

Of course, to the extent EPA takes the position that there is no TMDL, this delisting was inappropriate.

With respect to any new freshwater AUs, NHDES conveyed its intent to:

> [I]nclude all new freshwater assessment units in Category 4A due to impairment of the fish consumption use caused primarily by atmospheric deposition of mercury. *This is because NH considers all surface waters in the state to be impaired for the fish consumption use due to mercury and intent of the TMDL was to address all such impairments in freshwaters.* Consequently, all fresh surface waters in NH, regardless of whether or not they have yet been assigned an assessment unit number, are impaired for this use and are covered by the Northeast Regional Mercury TMDL. Therefore since a TMDL has been approved by EPA, DES proposes to place all new freshwater assessment units where atmospheric deposition is the primary source of mercury in impairment Category 4A instead of on the 303(d) list (Category 5) for fish consumption due to mercury.[232]

Under New Hampshire law, therefore, Hooksett Pool is a Category 4A AU, impaired and governed by a TMDL, and the impairment status denotes the facts that (i) the water quality is below applicable standards for mercury, a bioaccumulative toxin; and (ii) there is no remaining assimilative capacity for mercury in the Hooksett Pool.

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[231] *See* NHDES Impairments Removed, *supra* n.3, at Group 1; *see also* EPA Approval of NH's 2010 303(d) list, 3 (Sept. 7, 2011), available at http://des.nh.gov/organization/divisions/water/wmb/swqa/2010/documents/2010-303d-approval.pdf ("Category 4A contains waters for which a TMDL has already been established and approved by EPA."). Once a waterbody is in a particular AU Category for one or more reporting cycles, its status may only be changed in three limited circumstances:

> (1) If new data or information (including more sophisticated modeling) indicates that the category previously assigned to the AU should be changed based on the most current assessment methodology.
> (2) If flaws are found in the original analysis which indicates that the AU was improperly assessed and that the AU should be placed in another category.
> (3) If there are changes in the assessment methodology and reassessment indicates that the AU should be placed in another category. This includes changes in water quality standards and/or changes in surrogate water quality criteria used to make use support decisions.

CALM, at 26.

[232] NHDES Impairments Removed, *supra* n.3 at Group 1 (emphasis added).

Prohibitions on New Dischargers

Merrimack Station's FGD System wastewater treatment facility ("FGD System WWTF") satisfies the regulatory definition of a "new discharger" at 40 C.F.R. § 122.2:

> [A]ny building, structure, facility, or installation:
> (a) From which there is or may be a "discharge of pollutants;"
> (b) That did not commence the "discharge of pollutants" at a particular "site" prior to August 13, 1979;
> (c) Which is not a "new source;" and
> (d) Which has never received a finally effective NPDES permit for discharges at the "site."

40 C.F.R. § 122.2. The FGD System WWTF is a building, structure, facility, or installation from which there is a discharge of pollutants that began after August 13, 1979. Since there is no new source performance standard ("NSPS") applicable to FGD systems, PSNH's FGD System WWTF is not a "new source."[233] The FGD System WWTF never received a prior NPDES permit for discharges at the Merrimack Station site (or any other site). As EPA has confirmed, "the fact that there may have been discharges from another facility at that same site is irrelevant." 49 Fed. Reg. 37,998, 38,044 (Sept. 26, 1984).[234] The FGD System WWTF is, therefore, a "new discharger" pursuant to 40 C.F. R. 122.2.

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[233] The major difference between a "new source" and a "new discharger" is that a "new source" is one constructed after EPA has promulgated an applicable NSPS. 33 U.S.C. § 1316(a)(2). A "new discharger," by contrast, is a source for which EPA has not yet promulgated a NSPS:

> *New source* means any building, structure, facility, or installation from which there is or may be a "discharge of pollutants," the construction of which commenced:
>
> (a) After promulgation of standards of performance under section 306 of CWA which are applicable to such source, or
>
> (b) After proposal of standards of performance in accordance with section 306 of CWA which are applicable to such source, but only if the standards are promulgated in accordance with section 306 within 120 days of their proposal.

40 C.F.R. § 122.2. Further criteria for the classification of "new sources" are set forth at 40 C.F.R. § 122.29. "A source meeting [these specified criteria] is a new source only if a new source performance standard is independently applicable to it. *If there is no such independently applicable standard, the source is a new discharger.*" *Id.* at §122.29(b)(2) (emphasis added).

[234] *See also* 49 Fed. Reg. 37,998, 38,044 (Sept. 26, 1984) (In response to a comment in connection with the rulemaking process for 40 C.F.R. § 122.29 relating to "[n]ew sources and new dischargers," EPA noted, "A new discharger includes a new facility at any site at which 'it,' the new facility, had not discharged pollutants before October 18, 1972; the fact that there may have been discharges from another facility at that same site is irrelevant." The commenter in that instance was referencing a prior definition of "new discharger," that differed from the current definition only as to the October 18, 1972 cutoff date. 48 Fed. Reg. 39,611, 39, 616 (Sept. 1, 1983)).

The Commonwealth of Pennsylvania's Environmental Hearing Board recently addressed this specific issue in *Environmental Integrity Project v. Commonwealth of Pennsylvania*, EHB Docket No. 2009-039-R (March 21, 2011).[235] There, Allegheny Energy Supply Company ("Allegheny"), contended that its new fluidized gas desulphurization system and associated wastewater treatment plant was not a "new discharger," but rather an existing source of water pollution that should not be required to meet certain water quality criteria. *Id.* at 2. The EHB rejected Allegheny's argument, relying on the plain language of 40 C.F.R. § 122.2 and reasoning that Allegheny's interpretation would allow a NPDES permittee to "convert any number of new facilities into 'existing sources' simply by diverting their discharges into an existing outfall," a result that would "substantially gut the Congressional goal to eliminate pollutant discharges to the waters of the United States as quickly as possible." *Id.* at 6.

40 C.F.R. § 122.4 provides that:

> No permit may be issued:
>
> . . .
>
> (i) To a new source or a new discharger, if the discharge from its construction or operation will cause or contribute to the violation of water quality standards. The owner or operator of a new source or new discharger proposing to discharge into a water segment which does not meet applicable water quality standards or is not expected to meet those standards even after the application of the effluent limitations required by sections 301(b)(1)(A) and 301(b)(1)(B) of CWA, and for which the State or interstate agency has performed a pollutants load allocation for the pollutant to be discharged, must demonstrate, before the close of the public comment period, that:
> (1) There are sufficient remaining pollutant load allocations to allow for the discharge; and
> (2) The existing dischargers into that segment are subject to compliance schedules designed to bring the segment into compliance with applicable water quality standards.

40 C.F.R. § 122.4(i); *see also Friends of Pinto Creek v. USEPA*, 504 F.3d 1007 (9th Cir. 2007), *cert. denied sub nom. Carlota Copper Co. v. Friends of Pinto Creek*, 129 S.Ct. 896 (2009); *San Francisco Baykeeper, Inc.* 147 F. Supp.2d at 995–96 ("Under the regulations to the CWA, there can be no "new source" or "new discharger," if the discharge will contribute to a violation of water quality standards. 40 C.F.R. § 122.4(i)."); *Friends of Wild Swan v. U.S. Environmental Protection Agency*, No. 00-36001, 00-36004 and 00-36013, 2003 WL 21751849, at *4 (9th Cir. July 25, 2003) (affirming district court order restricting issuance of new permits or increased discharges for water quality limited segments that are already in violation of state water quality standard[s]).

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[235] *Available at* http://ehb.courtapps.com/efile/documentViewer.php?documentID=8962.

The prohibition on permitting new discharges that will cause or contribute to water quality standards violations may be overcome where a pollutants load allocation for the pollutant to be discharged has been completed *and* the new discharger can demonstrate that: (1) there are sufficient remaining pollutant load allocations to allow for the discharge, and (2) the existing dischargers into that segment are subject to compliance schedules designed to bring the segment into compliance with applicable water quality standards. 40 C.F.R. § 122.4(i)(1)&(2).

The Northeast Regional Mercury TMDL includes a wasteload allocation ("WLA") that represents 2.1 percent of the TMDL,[236] and is "regional and is not specific to each particular state or source."[237] Rather than allocating the WLA among sources, the Northeast Regional Mercury TMDL provides that "mercury reduction will be accomplished through mercury minimization plans ("MMPs") and the continuation of region-wide mercury reduction efforts."[238]

Because PSNH is a new discharger proposing to discharge mercury containing wastewater to the Hooksett Pool, which is impaired for mercury, it is PSNH's burden under federal law to demonstrate—before the close of the comment period and before EPA may issue a permit—that there are sufficient remaining pollutant load allocations to allow for the discharge, and that existing dischargers into that segment are subject to compliance schedules designed to bring the segment into compliance with applicable water quality standards.[239] PSNH has failed to satisfy its burden of proof, and indeed, cannot since neither New Hampshire nor NEIWPCC has performed a pollutants load allocation for mercury, and no discharger currently is subject to a compliance schedule. Until such time as PSNH can satisfy its burden, EPA may not permit the discharge of any mercury, and the mercury limit for the FGD system NPDES permit must be zero.

The Anti-Degradation Study Is Flawed and The Recommended Limits Do Not Appear Sufficient to Protect Water Quality

A primary purpose of New Hampshire's antidegradation regulations is to ensure that "[e]xisting uses and the level of water quality necessary to protect the existing uses shall be maintained and

[236] Because the TMDL has identified anthropogenic atmospheric deposition as by far the largest source of mercury pollution in the Northeast, the Load Allocation represents 98 percent of the TMDL; as a result, the TMDL recommends a 98 percent reduction in atmospheric deposition to achieve the target fish mercury concentration of 0.3 ppm. See generally, Northeast Regional Mercury TMDL, *supra* n.5, at § 7.6.
[237] *Id.* § 7.5 at 30.
[238] *Id.*
[239] EPA "may waive the submission of information by the new source or new discharger required by [40 C.F.R. § 122.4(i)] if [EPA] determines that [it] already has adequate information to evaluate the request." 40 C.F.R. § 122.4(i)(2). The fact sheet accompanying the Draft Permit must, in that circumstance, include "an explanation of the development of limitations to meet the criteria of this paragraph (i)(2)." *Id.* Here, the Fact Sheet provided no such explanation, nor could it, since there are no compliance plans in place for existing dischargers.

protected." Env-Wq 1708.01(a). An applicant such as PSNH is required to submit data describing a number of conditions when proposing a "new or increased activity, including point source and nonpoint source discharges of pollutants, that would lower water quality or affect the existing or designated uses." Env-Wq 1708.02 (a); 1708.03. Correctly concerned about the impact of the new FGD System wastewater discharge on the quality of the Merrimack River, NHDES conducted an antidegradation review, and requested that PSNH make the required data submission. PSNH engaged URS Corporation ("URS") to undertake analysis and prepare a report. URS produced in May, 2010 the Antidegradation Study Prepared in Support of Station NPDES Permit Renewal NH0001465 ("Study").

In the first instance, a full copy of the Study has not been made publicly available and is not part of the Administrative Record in this matter; only a copy of the Study's executive summary has been provided. Further, certain spreadsheets[240] and draft proposed sections of the Draft Permit Fact Sheet[241] summarizing the Study are part of the record, but it is not possible to discern whether the data in them are complete. As well, it is not possible to determine whether the Study included all of the elements enumerated in New Hampshire's antidegradation regulations. *See* Env-Wq 1708.03 (defining data that must be supplied by applicant). Particularly because of the potential for the FGD System WWTF discharge to cause or contribute to water quality standards violations, it is imperative that the final, complete Study be made available and part of the Administrative Record, and CLF hereby requests that EPA do so.

The goal of the Study as defined by URS was to:

> [D]emonstrate that the following criteria are satisfied for each regulated chemical species, (in the order shown):
> 1) The Merrimack River has sufficient remaining assimilative capacity so that there is not a "reasonable potential" (per EPA procedure) for the metals in the future effluent to exceed the New Hampshire Water Quality Standards. In this case, the impact of the future treated FGD wastewater stream would be deemed to be insignificant.
> 2) If the river is impaired or does not have sufficient assimilative capacity, there must be a demonstration of no net mass increase between present and future discharges.[242]

Among other chemical species, mercury was evaluated. Inexplicably, URS ignored the existing mercury impaired status of the Hooksett Pool, and proceeded to evaluate whether the Merrimack River had sufficient assimilative capacity for mercury. This is a significant error in URS's

[240] *See e.g.*, AR 233 Spreadsheet, Maximum Daily Limits at Outfall 003 to Protect Acute Criteria (2010); AR 234, Spreadsheet, Antidegradation Permit Calculator (2011).
[241] *See e.g.*, AR 209, NHDES, Antidegradation Study Fact Sheet (2010) ("Study Fact Sheet"); AR 668, EPA Emails regarding NHDES Anti-Degradation Analysis Released to PSNH (June 18, 2010).
[242] AR 50, URS, Antidegradation Study Executive Summary, 1 (2010) ("URS Study ES").

underlying assumptions, in light of the fact that, as set forth *supra* at pages 38-44, the Merrimack River currently is impaired for mercury and is subject to the Northeast Regional Mercury TMDL.

It is unclear how many River samples were taken.[243] It is also unclear during which months the sampling was performed.[244] These inconsistencies regarding the underlying data should be clarified, and raise questions concerning the reliability of the conclusions set forth by URS.

In any event, on the basis of a very limited number of samples obtained over about three months, URS determined, contrary to NHDES's categorization of the River as a Category 4A AU, impaired, with no remaining assimilative capacity, that the Merrimack River does indeed have remaining assimilative capacity for mercury.[245] To the extent that EPA relied on PSNH's anti-degradation study to conclude that the Hooksett Pool is *not* impaired for mercury, that reliance was misplaced. The duration of the sampling program was too short and the number of samples taken too small to be representative for any purpose, and the data certainly do not provide sufficient evidence to negate multiple years of impairment determinations for the Hooksett Pool.[246]

For example, in connection with a proposed upgrade to the Hooksett Wastewater Treatment Facility ("Hooksett WWTF"), an antidegradation study was performed by NHDES in or around 2008.[247] For that study, four metals samples were collected from the River. NHDES noted that, based on the limited number of samples obtained, the conclusion regarding necessary limits may not be accurate, and could change if more samples were collected.[248] While in that case, NHDES conjectured that the determination of reasonable potential to exceed the maximum allowable permit concentration may have erred on the conservative side, NHDES correctly observed that such a small sample size produced questionable results.[249] We assume that, for that same reason, URS opted to use two years' (2008 and 2009) of compliance monitoring results to

[243] *Compare id.* at 3, § 2.2 (four samples) *with* AR 209, Study Fact Sheet, at 35 (five samples).
[244] *Compare* AR 50, URS Study ES at 2, § 2.0 ("PSNH obtained new water samples from the Merrimack River during the months from June 2009 through September 2009.") *with* AR 209, Study Fact Sheet, at 3 § 2.2 (chart depicting 2009 sample dates as July 16, August 17, September 17 and September 25 and showing none in June).
[245] AR 50, URS Study ES at 10, § 5.1; 11, § 5.2.1. To the extent PSNH is, through the Study, attempting to challenge the existing impairment classification or the TMDL, the time for that is long passed.
[246] As well, the NH procedural requirements for formally changing the status of any assessment unit was not followed in this instance. *See* CALM at 26.
[247] *See* AR 515, EPA Letter to Town of Hooksett, NH regarding Antidegradation Water Quality Study (Feb. 4, 2008).
[248] *Id.* at 3.
[249] *See also* Attachment D at 81 (EPA's criticism of PSNH thermal analysis as "based on very limited data," which "are neither conservative nor even representative of actual conditions in the Hooksett Pool").

determine the baseline iron and copper concentrations at the slag settling pond[250] and fifteen months' worth of nitrate sampling data.[251]

The Henderson Report and a recent study of atmospheric mercury deposition in New Hampshire illustrate the vulnerability of relying on the limited data set in the URS Study. As the Henderson Report outlines, there are several reasons why mercury levels in the Hooksett Pool may vary from year-to-year, season-to-season, and even day-to-day, including: periods of drought and low flow, changes in bacterial activity in the sediments, natural seasonal cycles of growth and death of organisms.[252] A study based on sampling taken during one season of one year is not representative of conditions in the Hooksett Pool because it does not account for these temporal variations. For example, in a recent study done on mercury deposition in Southern New Hampshire, the annual variation in mercury deposition and concentration is clear.[253] The study took samples of mercury deposition during the same time period as the URS Study (June 21, 2009 through August 2009), which showed that the amount and concentration of mercury deposited during that time was significantly lower than in the summers of 2007 and 2008.[254] This not only demonstrates the year-to-year variation in mercury levels that can occur,[255] but also suggests that URS's 2009 sampling occurred in a year in which mercury deposition in southern New Hampshire was lower than normal. Accordingly, URS's samples are not representative and EPA should not have relied on them as a basis for concluding that the Hooksett Pool had remaining assimilative capacity for mercury.

Despite these flaws in assumptions and protocols, and the erroneous conclusion that there is assimilative capacity for mercury, the Study nevertheless represents that "PSNH plans to add additional treatment to the physical-chemical system, to further decrease the mercury concentration in the WWTS effluent, in order to achieve no net mass increase in mercury discharge. This goal has been established because of impairment with regard to reported concentrations of mercury in fish tissue."[256] The Study, therefore, proposes a limit that purportedly would be effective to ensure no net mass increase of mercury, consistent with the approach that would be required had a determination been made that no assimilative capacity remained for mercury.[257] At no time is the precise additional technology proposed to be installed by PSNH identified.

[250] *See* AR 50, URS Study ES, at 2, § 2.1.
[251] *Id.*
[252] Henderson Report at 26-27.
[253] *See* M.A.S. Lombard, et al., Mercury Deposition in Southern New Hampshire, 2006-2009, 11 Atmospheric Chemistry and Physics 7657 (2011) (attached hereto as Exhibit 06). The data underlying this study were collected at a farm in Durham, NH, which is only about 30 miles east of the Hooksett Pool.
[254] *Id.* at 7660, Table 1.
[255] Henderson Report at 27.
[256] AR 50, URS Study ES, at 11.
[257] *See* AR 209, Study Fact Sheet (describing three possible outcomes of antidegradation analysis and explaining that where there is no available remaining assimilative capacity for a certain pollutant, loading must be "held," *i.e.*, not increased).

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The Study concludes that calculations show that a value *less than* 0.13 μg/l for the FGD System WWTF effluent (prior to dilution in the slag settling pond) would meet the requirement of no net mass increase.[258] NHDES, however, proposed a limit of exactly 0.13 μg/l of mercury for Outfall 003C (not *less than* 0.13).[259] EPA has proposed a limit of 0.014 μg/l at outfall 003C, which is consistent with the URS recommendation, and more protective in light of the existing impairment.[260]

For the slag settling pond outfall, 003A, which discharges directly to the River, NHDES suggested a limit of 0.0072 μg/l.[261] EPA has essentially adopted that value, proposing a limit of 0.0000071 mg/l at outfall 003A (0.0070 μg / l). That number is higher, however, than the existing mercury concentration of 0.006 μg/l at outfall 003A, derived from URS's six sampling rounds at the slag settling pond. If the limit is actually set higher than the existing baseline, it will not assure no net mass increase in mercury loading. To ensure that there will be no net mass increase of mercury discharged to the River—in other words, that there will be no increased mercury discharge—it is critically important to have a clear understanding of the current baseline loading from the slag settling pond.

Most significantly, it is not clear at this time how permitting *any* additional mercury discharge from the FGD System WWTF will enable PSNH to "hold" constant mercury loading to the River in light of the fact that nothing has been proposed to reduce existing mercury loading to the slag settling pond. An existing baseline of mercury plus more mercury from the FGD WWTF equals higher net mass mercury loading to the River than currently is occurring. Moreover, it is impossible at this time to understand whether PSNH can achieve these limits, since the Company has still not formally disclosed to EPA the type of additional technology it is installing. To ensure that New Hampshire water quality standards are met, therefore, the 003C mercury limit should be set at zero. To ensure compliance with that limit, EPA should specify the use of EPA-approved Method 1631E.[262]

EPA MUST CONDUCT A BPJ ANALYSIS AND SET TECHNOLOGY-BASED EFFLUENT LIMITS FOR DISCHARGES OF COAL ASH WASTEWATER FROM OUTFALL 003A.

EPA failed to conduct a BPJ analysis and set technology-based effluent limits for toxic pollutants in ash landfill leachate and ash wash (*i.e.* coal ash wastewater) even though EPA has advised

[258] *See* AR 50, URS Study ES, at 11.
[259] *See* AR 209, Study Fact Sheet (discussion of mercury).
[260] *See* EPA Letter to William H. Smagula, PSNH (Dec. 17, 2011) (correcting transcription errors in Draft Permit), attached hereto as Exhibit 07.
[261] Based on an undisclosed calculation of the limit required to hold the existing load, reportedly 0.000315 lbs/day.
[262] *See* AR 53, U.S.EPA Memo regarding Determination of Effluent Limits for FGD Wastewater at PSNH Merrimack Station (Aug. 11, 2011) at 10.

state permit writers that this is required under the CWA.[263] The slag settling pond that discharges to the River from Outfall 003A receives a number of waste streams, including coal ash landfill leachate and slag (bottom ash) transport wastewater.[264]

Based on an extensive multi-year review of power plant discharges, EPA found that power plants discharge toxic pollutants at high levels, and that "most of the toxic pollutant loadings for this category are associated with metals and certain other elements present in wastewater discharges . . . associated with ash handling and wet flue gas desulfurization (FGD) systems."[265] According to EPA, the discharge of coal ash wastewater poses a risk to public health and the environment.[266]

EPA has stated that:

> [m]any of the common pollutants found in coal combustion wastewater (*e.g.*, selenium, mercury, and arsenic) are known to cause environmental harm and can potentially represent a human health risk. Pollutants in coal combustion wastewater are of particular concern because they can occur in large quantities (*i.e.*, total pounds) and at high concentrations (*i.e.*, exceeding Maximum Contaminant Levels (MCLs)) in discharges and leachate to groundwater and surface waters.[267]

Even relatively small amounts of coal ash pollutants can pose a threat to aquatic ecosystems and human health due to the persistent and bioaccumulative nature of these pollutants.[268] EPA notes that

> [n]umerous studies have shown that the pollutants found in wastewater associated with coal combustion wastes can impact aquatic organisms and wildlife, and can result in lasting environmental impacts on local habitats and ecosystems. Many of these impacts may not be realized for years due to the persistent and bioaccumulative nature of the pollutants released.[269]

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263 EPA Letter to Tennessee Dep't of Env't & Conservation regarding TVA Kingston Fossil Plant (Aug. 8, 2011) *and* EPA Letter to Tennessee Dep't of Env't & Conservation regarding TVA Gallatin Fossil Plant (Aug. 8, 2011) [hereinafter TVA Letters], attached hereto as Exhibits 08 and 09.
264 AR 608, Draft Permit Fact Sheet at 14–15, 26.
265 74 Fed. Reg. 68,599, 68,606 (Dec. 28, 2009).
266 U.S. Envtl. Prot. Agency, Steam Electric Power Generating Point Source Category: Final Detailed Study Report (821-R-09-008) 6-1–6-2 (Oct. 2009), http://water.epa.gov/lawsregs/guidance/cwa/304m/archive/upload/2009_10_26_guide_steam_finalreport.pdf.
267 *Id.* at 6-2.
268 *Id.* at 6-1.
269 *Id.*

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EPA recently has confirmed that the existing NELGs do not address discharges of coal ash wastewater.[270] EPA must conduct the BPJ analysis and set technology-based limits for discharges of toxic pollutants in coal ash wastewater discharged from Outfalls 003A.

CLF appreciates the opportunity to provide these comments. Please do not hesitate to contact me at 617.850.1710 should you have any questions.

Sincerely,

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[270] *See* Exhibits 10 and 11.