IN THE STATE OF VERMONT

CONNECTICUT RIVER WATERSHED COUNCIL

PETITION TO THE

VERMONT AGENCY OF NATURAL RESOURCES

SECRETARY DEBORAH L. MARKOWITZ

RE

ENTERGY NUCLEAR VERMONT YANKEE
RENEWAL NPDES PERMIT

Dated: February 17, 2011

VERMONT LAW SCHOOL

Environmental and Natural Resources Law Clinic
Vermont Law School, 164 Chelsea Street
South Royalton, VT 05068-0096
802-831-1630 (phone) • 802-831-1631 (fax)

Dear Secretary Markowitz:

Connecticut River Watershed Council (CRWC) hereby petitions the Vermont Agency of Natural Resources (ANR) to either grant or deny Entergy Nuclear's application for renewal of its National Pollutant Discharge Elimination System (NPDES) permit for the Vermont Yankee facility, which was submitted to ANR over five years ago. In the event of permit issuance, CRWC further petitions ANR to include in the permit: thermal effluent limitations sufficiently stringent to protect the fish populations of the Connecticut River, requirements for the facility to operate its closed-cycle cooling technology, and provisions to reform the Environmental Advisory Committee (EAC) toward improved independence and transparency.

INTRODUCTION

The Connecticut River is one of New England's most valuable natural treasures. It is the region's longest river, spanning more than four hundred miles and flowing through four different states to reach Long Island Sound, where it is a major source of freshwater. It provides important recreational opportunities such as fishing, swimming, and boating for river enthusiasts. It also hosts a variety of fish and wildlife species, including falcons, eagles, sturgeon, mussels, and migratory fish. In particular, it has been valuable spawning ground for the coldwater species Atlantic salmon and the coolwater species American shad.

In this context, the Connecticut played a supporting role in John McPhee's classic book about American shad as the river that was "rich in shad but not in places to cast for them."[1] In turn, the shad were described by one of the book's leading characters – Boyd Kynard, a fisherman and behaviorist with the Conte Research Center in Turners Falls - as "beautiful fish" ("[w]ith their big silvery scales, they're lovely animals") with "emotional problems."[2] That is, "[t]hey're afraid of variation. They're afraid of the unknown. They get used to a particular environment, and if it changes they have problems."[3] They are also devoted to giving their offspring apparent selective advantages by migrating as far upstream as they are able during critical spawning periods:

> In spring, sexually mature shad begin to enter their home rivers when the water temperature rises through six degrees Celsius, and they spawn when the temperature is between sixteen and twenty-two (sixty to seventy Fahrenheit). So, in effect, they have brackets around them. In the Connecticut River, they have, on

[1] John McPhee, *The Founding Fish* 24 (2002).
[2] *Id.* at 28-29.
[3] *Id.* at 30.

average, forty-five days to make their run and complete the ritual sexing of their eggs.

In Kynard's words, "When they enter a river, the clock is ticking. They have varying degrees of energy, varying degrees of swimming ability. They're not feeding, so they have an unrenewable energy reserve that will take them only so far up the river, depending also on delays, water velocity (how hard they have to swim to get there), and water temperature. It is fairly well established that when water temperature gets to twenty-one they slow down, and by twenty-two they stop. They look for a suitable place to spawn. It's a race against time. If you're a shad, you take every opportunity to get as far upstream as you can, past every obstacle, before the water temperature reaches twenty-one degrees. The joker is that you never know what the environment is going to throw at you. You can have the fifty-year flood. You can have low water. Through it all, you have to keep going, and go as fast and as far upstream as you can, because that's the only way your offspring have any chance to have an advantage."[4]

Today, the Connecticut River and the migratory fish populations it supports are at risk. Over the years, the River has been transformed from a habitat supporting healthy populations of American shad and Atlantic salmon into one supporting non-native, pollution or heat-tolerant species such as smallmouth bass, largemouth bass, and walleye.[5] Research has demonstrated that warmer water temperatures can negatively impact many key life stages of coldwater and coolwater fish species, including upmigration, spawning, egg incubation, juvenile development, and both adult and juvenile outmigration.[6] Vermont Yankee's thermal discharge is contributing to the warming of a significant portion of the Connecticut River and so may be exacerbating these impacts.

Therefore, it is extremely important that ANR either deny Entergy's authorization to discharge, or issue a renewal permit with adequate thermal limitations, cooling technology, and research and oversight provisions as soon as possible. Entergy submitted its renewal application more than five years ago. It should not be allowed to continue to discharge under an outdated permit and thereby avoid the public scrutiny afforded under the NPDES permitting process. Instead, we urge ANR to take a fresh look at Entergy's application, evaluate it under the applicable standards, and allow the public its right to participate in NPDES permitting decisions under the Clean Water Act.[7]

---

[4] *Id.* at 37-38.

[5] *See, e.g., In re Entergy Nuclear/Vermont Yankee Thermal Discharge Permit Amendment*, No. 89-4-06, at 24-25 (Vt. Env. Ct. 2008); U.S. Fish & Wildlife Serv., Conn. River Coordinator's Office, Restoring Migratory Fish to the Conn. River Basin, http://www.fws.gov/r5crc/index.html; Normandeau Assoc., Inc., *316(a) Demonstration in Support of a Request for Increased Discharge Temperature Limits at Vermont Yankee Nuclear Power Station during May through October* 177, 193, 202 (Apr. 2004).

[6] *See, e.g.,* Dale McCullough et al., *Issue Paper 5: Summary of Technical Literature Examining the Physiological Effects of Temperature on Salmonids*, EPA-910-D-01-005 (May 2001); S.D. Leach & E.D. Houde, *Effects of Environmental Factors on Survival, Growth, and Production of American Shad Larvae*, 54 J. Fish Biology 767 (1999); J.B.K. Leonard et al., *Metabolic Rates in an Anadromous Clupeid, the American Shad (Alosa Sapidissima)*, 169 J. Comp. Physiol. B 287 (1999).

[7] *See* 33 U.S.C. § 1342(b)(1)(B) (permit terms of five years); 40 C.F.R. §§ 124.1-124.21, 124.51-124.66 (procedures for NPDES permitting decisions, including public notice, comment, and appeals); Vermont Water Pollution Control

PERMIT RECOMMENDATIONS

I. If issued, Entergy's NPDES permit should include water quality-based effluent limitations (WQBELs) limiting its thermal discharge during migratory periods to the Vermont Water Quality Standard for cold water fish habitat: a 1°F increase from ambient temperature.

Federal law requires NPDES permits to contain effluent limitations sufficient to ensure compliance with water quality standards.[8] The Connecticut River near the Vermont Yankee facility is designated as "cold water fish habitat" under the Vermont Water Quality Standards (VWQS).[9] This means that the "total increase from the ambient temperature due to all discharges and activities shall not exceed 1.0°F," unless a discharger qualifies for a variance.[10] In order to qualify for a variance, a permit applicant must demonstrate, among other things, that a proposed effluent limitation will be more stringent than necessary to assure the protection and propagation of a balanced and indigenous fish population and that an alternative, less stringent limitation will nevertheless assure such protection and propagation.[11]

This "316(a)" demonstration, so named after the Clean Water Act section from which it derives, is a threshold federal requirement that a permit applicant must meet in order to be considered for a variance. It does not ensure that the applicant will receive a variance, but rather gives a permitting agency discretion to consider a variance if the specified minimum requirement is satisfied.[12] There may also be additional, more stringent state requirements that a thermal discharge must meet, including state water quality standards.[13]

In this case, under the threshold standard in Section 316(a), Entergy has not demonstrated that it is currently eligible for a variance during the times that migratory species utilize the River. Federal regulations require a permitting agency to conduct an analysis for each draft permit that it issues—even a renewal permit—and to explain how any proposed terms will comply with Clean Water Act requirements.[14] Vermont law echoes these requirements, providing that a "renewal permit shall be issued following all determinations and procedures required for initial

---

Permit Regulations (Permit Regulations) 13.3-.3i (state permitting procedures), *available at* http://www.anr.state.vt.us/dec/ww/Rules/WPC/1974WPCregs.pdf.

[8] 33 U.S.C. § 1311(b)(1)(C) (2006); 40 C.F.R. §§ 122.4, 122.44(d) (2010).

[9] Vermont Natural Resources Board/Water Resources Panel, Vermont Water Quality Standards (VWQS), App. A (eff. Jan. 1, 2008), *available at* http://www.nrb.state.vt.us/wrp/publications/wqs.pdf.

[10] *Id.* at § 3-01 B.1.b, d.

[11] *Id.*; 33 U.S.C. § 1326(a) (2006); *In re Entergy Nuclear Vermont Yankee Discharge Permit 3-1199*, 989 A.2d 563, 583 ¶ 50 (Vt. 2009).

[12] 33 U.S.C. § 1326(a) (2006) ("the Administrator *may* impose") (emphasis added).

[13] *See* 33 U.S.C. § 1370 (2006) ("Except as expressly provided in this chapter, nothing in this chapter shall . . . preclude or deny the right of any State or political subdivision thereof or interstate agency to adopt or enforce . . . any standard or limitation regarding discharges of pollutants . . . except that . . . such State or political subdivision or interstate agency may not adopt or enforce any effluent limitation, or other limitation, effluent standard, prohibition, pretreatment standard, or standard of performance which is less stringent than . . . this chapter.") For more detailed analysis on this point, see CRWC's recent filing before the Natural Resources Board. Letter from David Deen, River Steward, Connecticut River Watershed Council, to Peter Young, Chair, Vermont Natural Resources Board (Dec. 22, 2010).

[14] *See. e.g.*, 40 C.F.R. §§ 122.44, 124.7, 124.8 (2010).

permit application."[15] As stated by the Environmental Court, "[I]n each successive five-year renewal permit proceeding, the burden is on the applicant to show that the operation of the facility qualifies for the requested discharge, including, if applicable, the special analysis under § 316(a) to allow thermal discharges."[16]

In other words, if Entergy wishes to continue to discharge in excess of the VWQS for cold water fish habitat, then it must continue to show that it satisfies the threshold requirement for receiving a thermal discharge variance. Entergy has not done so. The 316(a) demonstration report that Entergy relied upon to justify its 2006 thermal variance amendment is more than six years old. It does not reflect current science, data, and monitoring on the health of American shad and Atlantic salmon populations in the Connecticut River. In fact, since Entergy's last demonstration report, several important pieces of information – many highlighting the need for more information – have issued.

- In a July 2007 letter, Drs. Theodore Castro-Santos and Alexander Haro of the United States Geological Survey (USGS) concluded that there was a "need for further studies to determine whether or not Vermont Yankee's thermal discharge [wa]s having an effect on shad passage at Turner's Falls Dam."[17] The letter had explained that there was a decline in shad passage at Turners Falls Dam between 1990 and 2006 which was not likely attributable to either decreased passage at a downstream dam or striped bass predation.[18] The authors referred to data suggesting that shad "may abandon their migration without spawning" if appropriate temperature conditions were not present, and stated that they "kn[e]w of no data that could support or refute" whether Vermont Yankee's thermal discharge was a possible factor in the Turners Falls decline.[19] They made specific recommendations on studies that would help determine how Vermont Yankee's discharge actually effects shad passage at Turner's:

> The most important information with which to address thermal effects on any of the Connecticut River flora or fauna is the extent of the thermal influence of the plant. The further downstream this influence extends, the more opportunities to affect the river's ecology. For example, the energetic requirements of migratory fish could be affected, even if the river is warmed even slightly. The magnitude of this effect depends on exposure, duration, timing, and swim speed. To reasonably assess whether there is any influence, therefore, it would be necessary to collect data on swim speeds, location, migratory timing, and delays to upstream and downstream migration under both elevated and unaltered river temperature conditions. No such studies have been performed. More information is also needed to better characterize the relationship between temperature and swimming energetics over a range of swim speeds.

---

[15] 10 V.S.A. § 1263(e) (2007). *See also* Permit Regulations, *supra* note 7, at 13.5(b)(2)(c) (requiring the "scope and manner of any review of an application for reissuance of a permit [to] insure at least" that the discharge is "consistent with applicable effluent standards and limitations" and "water quality standards").

[16] *In re Entergy Nuclear/Vermont Yankee Thermal Discharge Permit Amendment,* No. 89-4-06, at 4 (Vt. Env. Ct. 2008).

[17] Letter from Stephen P. Garabedian, United States Geological Survey, to David L. Deen, Connecticut River Watershed Council, at Q. 11 (July 2, 2007), included as Attachment A.

[18] *Id.* at Qs 3, 4.

[19] *Id.* at Qs 7, 10.

Similarly, studies on the effects of thermal alterations on juvenile development would help determine whether any influence exists. Again, this would require controlled studies over a range of flow conditions (and presumably years) with and without thermal alteration. Influences on juvenile development are important because any reduced viability among the offspring of shad spawning upstream of the dam would probably cause a reduction in the proportion passing Turners Falls.

Finally effects of thermal alterations on passage at Vernon Dam, both for adult upstream migrants, and for both adult and juvenile downstream migrants would provide valuable information. Differential survival between the Turners-Vernon reach and the river upstream of Vernon could affect passage behavior of subsequent generations.[20]

- Another USGS paper, also co-authored by Castro-Santos, presented a simulation model to assess the effects of migratory distance and dams on the spawning success and survival of American shad in the Connecticut.[21] It found that the "thermal environment" was "one habitat characteristic that affected all three performance variables [migratory distance, fecundity, survival]."[22] Specifically, the model suggested a "potential mismatch between arrival timing and riverine environment" because fish that arrived earlier (when water temperatures were cooler) tended to perform better.[23] The paper concluded, among other things, that "[t]hermal influences on energetics . . . need further study."[24]

- Additionally, a recent article by fisheries scientist Dale McCullough pinpointed multiple technical problems with temperature standards and 316(a) demonstrations as they are currently performed under the United States Environmental Protection Agency's (EPA's) 1977 guidance—both generally and in relation to Vermont Yankee specifically.[25] He found that, "[a]t a minimum," Vermont Yankee's variances "do not fully protect seasonal uses of salmonids in the river [Atlantic salmon, rainbow trout, brown trout, or brook trout], and they also do not fully protect adult migration or kelt downstream migration or lead to restoration."[26] One of the primary issues he identified was the difficulty in setting accurate baselines against which to measure thermal effects.[27]

  He explained that the "challenge in aquatic resource management today is in setting a baseline against which to establish limits to allowable change. Until there is significant monitoring or survey work done, baselines can constantly shift."[28] Specifically, the "[l]ack

---

[20] *Id.* at Q. 12.
[21] Theodore Castro-Santos & Benjamin H. Letcher, *Modeling Migratory Energetics of Connecticut River American shad (Alosa sapidissima): Implications for the Conservation of an Iteroparous Anadromous Fish,* 67 Can. J. Fish. Aquat. Sci. 806 (2010), included as Attachment B.
[22] *Id.* at 824.
[23] *Id.*
[24] *Id.* at 826.
[25] Dale A. McCullough, *Are Coldwater Fish Populations of the United States Actually Being Protected by Temperature Standards?,* 3 Freshwater Revs. 147 (2010), included as Attachment C.
[26] *Id.* at 156–57.
[27] *Id.* at 160–61.
[28] *Id.* at 154 (citation omitted).

of a minimally perturbed fish community reference point for a large river such as the Connecticut River facilitates acceptance of a shifting baseline as the standard against which to measure impacts of new thermal discharges."[29] In Vermont Yankee's case, this means that "the continual shifts in [Representative Important Species] composition seem to allow the causation of declines in species abundance to be obscured."[30] McCullough also noted that shifting sampling protocols were a complicating factor in population assessments, particularly at Vermont Yankee.[31]

The article emphasized the importance of establishing temperature standards and controls that protect all life stages and account for sublethal thermal impacts as well as optimum growth conditions.[32] It offered several recommendations for improved practices, including those from a 2003 EPA Region 10 temperature guidance.[33]

- In addition to these articles and reports, the life of the River has not remained static. For instance, United States Fish and Wildlife Service data indicate that 16,768 shad passed Turners Falls Dam in 2010, a seven-and-a-half fold increase from 2007, which saw 2,248 pass, and an eleven-fold increase from 2006, which saw 1,500 passing.[34] However, the returns passing Vernon did not increase by equivalent numbers.[35] This is but one piece of monitoring data relevant to the development of Vermont Yankee's NPDES permit.

In sum, Vermont Yankee's previous demonstration reports are insufficient to continue to support a variance under either the VWQS or Section 316(a), which requires, among other things, consideration of the "cumulative impact of [the] thermal discharge" in question.[36] We therefore encourage ANR to issue any renewal permit in accordance with state and federal law requiring WQBELs sufficient to ensure compliance with water quality standards.[37]

II. If issued, Entergy's NPDES permit should require closed-cycle cooling technology to minimize the adverse impingement and entrainment impacts of its cooling water intake, which will also reduce the levels of its thermal discharges.

Section 316(b) of the Clean Water Act requires that permits issued to facilities with cooling water intake structures (CWIS)—such as Vermont Yankee—reflect the "best technology

---

[29] *Id.* at 153 (citation omitted).
[30] *Id.* at 160.
[31] *Id.* at 157, 160 ("[G]iven the lack of comparison of pre- versus post-operational conditions with a consistent sampling protocol, it is inconceivable that a claim of 'no prior appreciable harm' could be established. . . . Over the period of operation of the VY plant, there were numerous changes in fish sampling gear, making long-term trends in fish abundance impossible to track.").
[32] *Id.* at 183–86.
[33] *Id.* at 183-84.
[34] U.S. Fish & Wildlife Serv., Conn. River Coordinator's Office, Data/Fish Counts, http://www.fws.gov/r5crc/Stuff/stuff.html (last visited Feb. 8, 2011). Online data are not currently available for 2008 and 2009.
[35] *Id.* Only 290 shad passed Vernon in 2010, a four-and-a-half fold increase from 2007 (which saw 65), and a two-fold increase from 2006 (which saw 133).
[36] 40 C.F.R. § 125.73(a).
[37] *See* 33 U.S.C. § 1311(b)(1)(C) (2006); 40 C.F.R. §§ 122.4, 122.44(d) (2010); VWQS, *supra* 9, at § 3-01 B.1.b, d.

available [BTA] for minimizing adverse environmental impact."[38] The primary "adverse environmental impact[s]" associated with CWIS are mortalities and injuries of fish and other aquatic organisms caused by impingement and entrainment.[39] As explained by EPA:

> Impingement takes place when organisms are trapped against intake screens by the force of the water being drawn through the cooling water intake structure. The velocity of the water withdrawal by the cooling water intake structure may prevent proper gill movement, remove fish scales, and cause other physical harm or death of affected organisms through exhaustion, starvation, asphyxiation, and descaling. . . .
>
> Entrainment occurs when organisms are drawn through the cooling water intake structure into the cooling system. Organisms that become entrained are typically relatively small, aquatic organisms, including early life stages of fish and shellfish. Many of these small, fragile organisms serve as prey for larger organisms higher on the food chain which are commercially and recreationally desirable species. As entrained organisms pass through a facility's cooling system they may be subject to mechanical, thermal, and at times, chemical stress. Sources of such stress include 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, sheer stress, thermal shock in the condenser and discharge tunnel, and chemical toxic effects from antifouling agents such as chlorine.[40]

Death from either impingement or entrainment can occur immediately or subsequently as the individual succumbs to the damages of stress.[41] While EPA estimates that over 3.4 billion fish and shellfish are killed from impingement and entrainment at Phase II facilities annually, closed-cycle cooling systems can reduce mortality by up to 98 percent as compared to conventional once-through systems.[42]

In 2004, EPA adopted BTA regulations setting national performance standards for "Phase II" CWIS facilities such as Vermont Yankee (existing facilities with water intake flow reaching a certain level).[43] Until that time, permit writers made BTA determinations on a case-by-case basis.[44] Under the new standards, a permit could satisfy the BTA requirement by requiring reductions in impingement and entrainment consistent with one of five alternative technologies.[45] These technologies were meant to "approach [the benefits] estimated" for closed-cycle cooling systems, but less expensively.[46] However, if the costs of complying with the national

---

[38] 33 U.S.C. § 1326(b) (2006).
[39] Final Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities (Phase II Rule), 69 Fed. Reg. 41,576, 41,586 (July 9, 2004).
[40] *Id.* at 41,586.
[41] *Id.*
[42] *Id.* at 41,586, 41,601.
[43] *Id.* at 41,576, codified at 40 C.F.R. § 125.94 (2010).
[44] *See Entergy v. Riverkeeper,* 129 S. Ct. 1498, 1503 (2009).
[45] Phase II Rule, 69 Fed. Reg. at 41,591.
[46] *Id.* at 41,606.

performance standards would be "significantly greater" than the benefit of compliance, a facility could obtain site-specific alternative standards.[47] These regulations were challenged in 2004, suspended, and ultimately remanded by the Supreme Court, which held that EPA could conduct cost-benefit analysis in setting the BTA standards.[48] EPA may issue the new rule at any time. In the meantime, permitting agencies must continue to draft NPDES permits to include "such conditions as [they] determine are necessary" to carry out CWA requirements, using their best professional judgment.[49]

ANR should use its best professional judgment to require closed-cycle cooling technology in any renewal permit issued to Vermont Yankee. ANR need not wait for re-issuance of the Phase II rule because, even if the rule does not set closed-cycle cooling equivalent as the best technology available, ANR has independent authority to require closed-cycle cooling in Vermont Yankee's permit. First, as noted above, states may have more stringent requirements than those mandated by the CWA.[50] Thus, like the CWA itself, any standards developed by EPA pursuant to Section 316(b)'s "best technology available" requirement will function as a floor, not a ceiling, for minimizing the harmful environmental effects of CWIS.[51] Similarly, neither EPA nor ANR is *required* to consider costs in determining CWIS technology requirements.[52] As a result, ANR is not obligated to defer to a less expensive option when the consideration of costs would suggest a weakened BTA standard.[53] Second, closed-cycle cooling makes sense. Not only would closed-cycle cooling reduce the impingement and entrainment caused by Vermont Yankee, it would also reduce the levels of the facility's thermal discharges and associated deleterious impacts.[54]

We urge ANR to consider these points when making the BTA determination it is required to make for any renewal permit issued to Vermont Yankee.[55] We also encourage ANR to review any other information necessary to conduct a complete BTA analysis, including but not limited

---

[47] *Id.* at 41,597.

[48] *Riverkeeper,* 129 S. Ct. at 1510.

[49] *See* 33 U.S.C. § 1342(a)(1) (2006); 40 C.F.R. §§ 125.3, 125.90(b) (2010); Suspension of Regulations Establishing Requirements for Cooling Water Intake Structures at Phase II Existing Facilities (Suspension of Regulations), 72 Fed. Reg. 37,107, 37,108 (July 9, 2007) (directing permitting agencies to establish CWIS requirements for Phase II facilities on a "case-by-case best professional judgment (BPJ) basis" while Phase II rules are suspended).

[50] 33 U.S.C. §§ 1311(b)(1)(C) ("any more stringent limitation"), 1370 (2006). See also *supra* note 13.

[51] *See, e.g., U.S. Steel Corp. v. Train,* 556 F.2d 822, 838-39 (7th Cir. 1977), *abandoned on other grounds by City of West Chicago, Ill. v. U.S. Nuclear Regulatory Comm'n,* 701 F.2d 632, 644 (7th Cir. 1983).

[52] *See Riverkeeper,* 129 S. Ct. at 1509–10 (holding only that EPA "permissibly relied on cost-benefit analysis" in developing § 316(b) rule; also noting EPA's "discretion to weigh benefits against costs" and EPA's historical position that § 316(b) does not "*require* cost-benefit analysis").

[53] Even if costs were considered, the situation here differs from the scenario contemplated by the Phase II rule. In deciding not to base its performance standards upon levels commensurate with those achieved by closed-cycle cooling, EPA was concerned with the high cost of retrofitting facilities for closed-cycle cooling systems. *Id.* at 1504; Phase II Rule, 69 Fed. Reg. at 41,605. In contrast, Vermont Yankee already has a closed-cycle cooling system and has been required to operate under it in the past. *In re Entergy Nuclear,* 989 A.2d at 568 ¶ 6.

[54] *See, e.g.,* Tetra Tech, *California's Coastal Power Plants: Alternative Cooling System Analysis,* Ch. 4 Closed-Cycle Cooling Systems 3.6.2, *available at* http://www.opc.ca.gov/2009/05/california%E2%80%99s-coastal-power-plants-alternative-cooling-system-analysis/ (last visited Feb. 8, 2011).

[55] *See* 33 U.S.C. § 1326(b) (2006) (CWIS standards must reflect BTA); 33 U.S.C. § 1342(a)(1) (2006); 40 C.F.R. §§ 125.3, 125.90(b) (2010) (permit writers must use best professional judgment on a case-by-case basis when national standards have not been established); Permit Regulations, *supra* note 7, at § 13.4b.(1)(f) (absent EPA standards, Secretary of ANR to establish permit conditions as necessary to carry out CWA).

to the impingement monitoring data required under Vermont Yankee's existing permit.[56] ANR should consult technical experts as necessary and/or require Entergy to fund and produce an independent, third-party study on the full impingement and entrainment impacts of its Vermont Yankee facility.[57] ANR may also find it useful to consult with its counterparts at New York's Department of Environmental Conservation (NYDEC) and New Jersey's Department of Environmental Protection (NJDEP), who have recently conducted BTA analyses for several nuclear units following EPA's guidance to establish technology-based requirements using best professional judgment until the final Phase II Rule is issued.[58] These agencies settled upon closed-cycle cooling as the best technology available despite its associated costs. For Entergy's Indian Point units, NYDEC concluded that "conversion from a once-through cooling system to a closed-cycle cooling system, while expensive and involving a potentially lengthy construction process, is nevertheless an available and technically feasible technology."[59] In New Jersey, NJDEP established a five-year schedule for the Oyster Creek Generating Station to construct a closed-cycle cooling system, stating that it was "particularly noteworthy that closed-cycle cooling is one of the few technologies available to target entrainment effects."[60] (This draft permit was not finalized after a deal was reportedly struck between the state and the facility whereby cooling towers would not be required if the plant retired early.[61])

Unless and until ANR is able to determine that technology other than closed-cycle cooling is the best available for minimizing adverse environmental impact, ANR should require closed-cycle cooling. Not only does ANR have the authority to do so as described above, but closed-cycle cooling has already been approved by EPA as BTA for Phase I (new) CWIS facilities, by at least two neighboring agencies as BTA for several existing nuclear facilities, and by at least one state as BTA statewide;[62] it would therefore satisfy the BTA test. Closed-cycle cooling is even more

---

[56] Vt. Agency of Natural Res., Entergy Nuclear Vermont Yankee Final Amended Discharge Permit #3-1199, at 21–24 (Mar. 30, 2006).

[57] *See, e.g.* 40 C.F.R. § 122.41(h) (2010) ("The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit.").

[58] *See* Suspension of Regulations, 72 Fed. Reg. at 37,108; N.Y. State Dep't of Envtl. Conservation, *Notice of Denial: Joint Application for CWA § 401 Water Quality Certification NRC License Renewal – Entergy Nuclear Indian Point Units 2 and 3 (Notice of Denial)* (Apr. 2, 2010), *available at* http://www.dec.ny.gov/docs/permits_ej_operations_pdf/ipdenial4210.pdf; N.J. Dep't of Envtl. Protection, *Draft Surface Water Renewal Permit Action, NJPDES Permit No. NJ000555 (Draft NJPDES Permit)* § 7 (Jan. 7, 2010) ("Specifically, the Department has determined that closed-cycle cooling (i.e. cooling towers) constitutes best technology available . . . in accordance with best professional judgment."), *available at* http://www.nj.gov/dep/dwq/pdf/draft_permit100107.pdf.

[59] *Notice of Denial, supra* note 58, at 17.

[60] *Draft NJPDES Permit, supra* note 58, at 25.

[61] Matthew L. Wald, *Oyster Creek Reactor to Close by 2019,* N.Y. Times (Dec. 8, 2010) (the facility stated that "installing cooling towers 'would cost . . . significantly more than the current value of the plant'"), *available at* http://www.nytimes.com/2010/12/09/nyregion/09nuke.html.

[62] National Pollutant Discharge Elimination System: Regulations Addressing Cooling Water Intake Structures for New Facilities, 66 Fed. Reg. 65,256 (Dec. 18, 2001); *Riverkeeper,* 129 S. Ct. at 1503; *Notice of Denial* and *Draft NJPDES Permit, supra* note 58; N.Y. Dep't of Envtl. Conservation, Best Technology Available (BTA) for Cooling Water Intake Structures, (Draft Mar. 4, 2010), *available at* http://www.dec.ny.gov/docs/fish_marine_pdf/drbtapolicy1.pdf ("[T]he Department establishes closed-cycle cooling or its equivalent as the performance goal for the best technology available (BTA) to minimize adverse environmental impact. . . .").

appropriate where, as here, cooling towers have already been constructed and operated.[63] Thus, even if ANR were to consider costs in making its BTA determination – which it need not – closed-cycle cooling would surely qualify as BTA for the Vermont Yankee facility (which has existing cooling towers) as it has for other facilities (which require new construction).

III. If issued, Entergy's NPDES permit should substantially reform the Environmental Advisory Committee (EAC) in order to increase its effectiveness and to ensure independence and transparency.

Currently, the Environmental Advisory Committee (EAC) established under Vermont Yankee's NPDES permit is neither independent nor transparent. There is limited membership on the EAC and little public scrutiny of the EAC's process and information. As a matter of public policy, a committee established by an agency for the purposes of giving advice about the scientific basis for appropriate standards governing a permitted facility should be open to public scrutiny to avoid either the appearance or the reality of undue influence by the permittee, which has vested interests in minimizing costs of compliance.[64] Accordingly, we urge ANR to reform the EAC consistent with the following recommendations. If implemented, these recommendations will greatly improve the quality of and process for agency decisions regarding Vermont Yankee's thermal discharges.[65]

1) Provide public notice of EAC meetings, allow the public to attend meetings, and publish publicly-available minutes of the meetings. Allow time on the agenda for members of the public to provide input.

2) Expand EAC membership to include some or all of the following: specifically interested non-governmental organizations such as CRWC, Connecticut River Joint Commissions, Windham Regional Commission in Brattleboro, Southwest Regional Planning Commission in Keene, Franklin Regional Council of Governments in Greenfield, the United States Geological Survey Conte Lab in Turner Falls, and university scientists with expertise relevant to American shad and riverine ecosystems.

3) Solicit discussion and suggestions from interested or knowledgeable parties who could inform the EAC and lead to studies the EAC would request Entergy to conduct.

4) Circulate all study outlines or proposals to interested parties for comment and possible modification prior to implementation.

---

[63] *See In re Entergy Nuclear*, 989 A.2d at 568 ¶ 6 (noting past permit requiring facility to operate in closed cycle mode during summer period).

[64] *See, e.g.*, Vermont Open Meeting Law, 1 V.S.A. §§ 310-314 (guaranteeing various public rights to information, access, and input in meetings of public bodies, which include "any board, council or commission of any agency, authority or instrumentality of the state . . . or any committee of any of the foregoing boards, councils or commissions"); *Animal Legal Def. Fund v. Institutional Animal Care & Use Comm. of the Univ. of Vt.*, 616 A.2d 224, 226-27 (Vt. 1992) (holding that University of Vermont committee to oversee animal use and care was "public body" subject to Open Meeting Law because, among other things, it was appointed by the University (an instrumentality of the State), answerable to the University, and had policy-making authority in that its "reports . . . ha[d] a direct impact on the types and methods of animal research pursued at the institution").

[65] These recommendations largely echo CRWC's recommendations in its July 23, 2010 letter to Secretary Wood.

5) Convene stakeholder meetings (see suggested names for expanded membership) outside regularly scheduled meetings for input on studies, study parameters, and discussion of study results.

6) Establish a fund, managed and overseen by ANR, to provide funding for neutral, third-party consultations or scientific studies for review by the EAC. Because Entergy benefits from the privilege of operating under an ANR permit, the cost of this work should be reimbursed by Entergy rather than being borne by taxpayers.

CONCLUSION

For the foregoing reasons, we respectfully request that ANR either grant or deny Entergy Nuclear's application for renewal of its Vermont Yankee NPDES permit as soon as possible. In the event ANR issues the permit, we request that the permit contain, as described above: protective thermal limitations, closed-cycle cooling requirements, and provisions for reforming the EAC.

Respectfully submitted,

Laura Murphy
Staff Attorney & Assistant Professor
Environmental & Natural Resources Law Clinic
Vermont Law School
For Connecticut River Watershed Council

David Deen, River Steward
Connecticut River Watershed Council

Student Clinicians
Tara Franey
Matthew Marks

Cc: Catherine Gjessing
Associate General Counsel, VT Department of Environmental Conservation

Dated: February 17, 2011
Via Electronic Mail and United States Postal Service