



State of Vermont

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Agency of Natural Resources

April 8, 2014

Kelli M. Dowell
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308 E. Pearl Street, Suite 700
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RE: ANR Response to Entergy March 28, 2014 Letter and Memorandum Relating the Vermont Yankee NPDES Permit

Dear Ms. Dowell:

I am writing in response to your March 28, 2014 letter and accompanying memorandum from Normandeau Associates regarding the Vermont Agency of Natural Resources (ANR) draft NPDES permit language. Attached is a memorandum from ANR staff responding to points made by Normandeau Associates in their memorandum. In addition, you make several statements in your cover letter that ANR would like to address.

In your cover letter, you state that Entergy is “aware of no new information” that would warrant the changes in the limits of thermal pollution and biological monitoring beyond what is currently required in Vermont Yankee’s expired NPDES permit. This is not the standard of review for the renewal permit and a significant amount of new information has been made available since the Entergy Nuclear Vermont Yankee NPDES renewal permit was issued by ANR in 2001.

During the Vermont Public Service Board’s (PSB) review of the application for a Certificate of Public Good (CPG) in Docket Number 7862, the Agency presented testimony that clearly outlines Agency concerns regarding the ENVY thermal discharge. In addition, the parties generated numerous reports and voluminous testimony, exhibits and discovery documents related to the thermal discharge. For example, Dr. Shanahan from HydroAnalysis produced reports addressing the Vermont Yankee thermal discharge and the use of Equation 1.1. Mr. Shanahan further testified about these reports as part of the PSB proceedings. Entergy also submitted reports and testimony regarding the thermal discharge to the PSB from Dr. Barnthouse and Dr. Swanson.

In addition, the Environmental Advisory Committee (EAC) issued a final recommendation to ANR regarding the Vermont Yankee thermal discharge. As you are aware, this recommendation was issued in November 2013.

Based on its review of available information, and Entergy's application, ANR has determined that the changes to the permit communicated to Entergy are necessary to assure compliance with the Vermont Water Quality Standards (VWQS) and the Clean Water Act (CWA) and its implementing regulations.

In your letter, you indicate that the existing permit has been vetted by the Vermont courts and the PSB, and that both entities found that the Vermont Yankee thermal discharge is not causing an "actual impairment to the Connecticut River." It is not clear to ANR what Entergy means by the statement that the Vermont Yankee thermal discharge is not causing an "actual impairment" to the Connecticut River. The Agency is not required to list the Connecticut River as impaired in order to assure compliance with the CWA and the VWQS. The burden of demonstrating that the thermal discharge complies with the CWA and Vermont law lies with Entergy. The standard of review applicable to the renewal of this thermal discharge permit is whether the thermal discharge meets the VWQS and qualifies for a variance under section 316a of the CWA and the applicable CWA regulations.

Entergy has applied for a variance to the VWQS pursuant to section 316a of the CWA. Accordingly, the standard of review is whether Entergy has proven that the thermal discharge limit in the VWQS is more stringent than necessary to assure the protection and propagation of the Connecticut River's balanced, indigenous population (BIP) of shellfish, fish and wildlife. The VWQS allow only a 1 degree Fahrenheit change in the river temperature for a thermal discharge. As you aware, Entergy's application requests authorization to alter the temperature of the river up to 13.4 degrees Fahrenheit.

Contrary to Entergy's assertions, the PSB recently made a number of findings that are consistent with the concerns ANR has expressed about Entergy's proposed variance request. For example, the PSB found that:


- Thermal discharge is a pollutant that "influenc[es] fish performance and survival." Kenneth M. Cox, ANR ("Cox") pf. at 5-6.
- Water temperature significantly affects fish behavior, health, growth, reproduction, and survival. Cox pf. at 5-6; exh. ANR-KC-7.
- The NPDES Permit is based on information, studies and data that are at least thirteen years old, while the amended portions of the Permit are based on studies and data that are at least eight years old. Tr. 2/13/13, Vol. II, at 74-76 (Goodell).
- The location of the discharge of heated effluent into the Vernon Pool upstream and on the same side of the river as the Vernon Dam Fish Ladder and the downstream fish passage facilities, and uncertainty about the full mixing and extent of the thermal plume create the potential for impacts to fish. Cox pf. at 6.
- To date, there have been issues concerning the adequacy of information defining the full extent and characteristics of the thermal plume from the VY Station and the potential impacts of that plume on certain fish species. Cox pf. at 3-4.

- If the VY Station were going to operate for an additional eighteen years, this evidence might cause us to conclude that Entergy VY had not met its obligation to demonstrate that the discharge would not adversely affect the water quality.

Finally, Entergy's continued reliance on the decision of the Vermont Environmental Court is contrary to established state and federal law regarding the CWA, renewal permit review, and amended permit proceedings. The Environmental Court decision on the 2006 amendment to Entergy's existing permit to increase its thermal discharge 1 degree Fahrenheit did not address the entire thermal discharge or all the discharge permit conditions. As we discussed, the Environmental Court's review was limited to only the 1 degree Fahrenheit increase in the thermal discharge, and did not include a review of the full 13.4 degree thermal discharge, or of the use of Equation 1.1 to calculate the discharge. Accordingly, an ANR decision on the impact of the full extent of the Vermont Yankee thermal discharge, including the use of Equation 1.1, has not been vetted by Vermont courts. Moreover, regardless of any previous reviews of the Vermont Yankee thermal discharge, ANR has the legal obligation to review the proposed discharge for compliance with the applicable law every five years as part of the NPDES renewal process.

As noted above, the attached memorandum sets forth ANR responses to Normandeau's analysis of the ANR draft permit conditions. ANR will continue to work on the draft permit, taking into consideration Entergy's comments. Moreover, Entergy is welcome to provide ANR with additional information based on this reply. ANR will contact Entergy after the draft permit is complete.

Sincerely,



Jon Groveman, Esq.
ANR General Counsel

cc: Alyssa Schuren
Ernie Kelley
Julia Butzler
Ken Cox

**Agency of Natural Resources Response to Normandeau Associates
March 28, 2014 Memorandum**

The following are the Agency of Natural Resources (Agency) responses to the concerns and questions raised by Normandeau Associates for Entergy Nuclear Vermont Yankee (Memorandum, March 28, 2014) regarding the draft thermal conditions prepared by the Agency for the renewal of the National Pollutant Discharge Elimination System (NPDES) permit.

Equation 1.1.

Entergy Nuclear Vermont Yankee (ENVY) questions the biological rationale for the proposed elimination of Equation 1.1. The Agency maintains that ENVY has not addressed questions regarding the efficacy and veracity of Eq. 1.1 to the Agency's satisfaction. Data shows that the calculated temperatures with Eq. 1.1. for Station 3 consistently underestimate actual river temperatures at Station 3; calculated Station 3 temperatures also underestimate the actual river temperature in the Vernon forebay and in the fish ladder. It has been reported in peer reviewed scientific literature that American Shad migrating upriver to spawn, and juveniles during outmigration, can be negatively affected both behaviorally and physiologically by the river temperature. Vernon Dam is a critical point for both upstream and downstream fish passage during periods of fish migration. Therefore it is essential that Vermont Yankee Nuclear Power Station's (VY) thermal discharge above Vernon Dam is regulated by absolute temperature values.

Modified Seasons

ENVY rejects the need for the modification of the seasonal periods, as presented by the Agency. However, there is significant data suggesting that the seasonal periods specified under the current NPDES permit have no relevance to the life stages of the fish of the Connecticut River (including but not limited to American Shad). The Connecticut River Atlantic Salmon Commission (CRASC) annually issues a "fish passage operations schedule" to mainstem Connecticut River hydropower dam operators; this schedule prescribes critical periods of up and downstream fish passage for life stages of migratory fishes (e.g., Atlantic Salmon adults and smolts, American Shad and Blueback Herring adults and juveniles) at each facility. The schedule further specifies dates and daily duration of operation for these passage facilities. The seasonal periods defined for VY have been out of sync with respect to operational passage needs respected by hydropower operators (TransCanada in the case of Vernon Dam).

Spring Period

The spring period, as defined in the current NPDES permit, begins May 16 and ends June 15. However, Atlantic Salmon smolts stocked into tributaries of the upper Connecticut River basin are expected to be in the vicinity of Vernon Dam as early as April 1 as they outmigrate to sea. Although 2013 was the last year of Atlantic Salmon stocking in the Connecticut River basin, it is predicted that salmon smolts produced from stocking in the upper basin in 2011-2013 will be outmigrating through at least 2015 or 2016. Furthermore, it is not known at this time how many years adult salmon will continue to run in the absence of a stocking component; Atlantic Salmon adults potentially numbering upwards to 100% of the adult fish passed above Holyoke Dam will have access to the river above Turners Falls Gatehouse and Vernon dams beginning in 2014. The possibility of natural reproduction occurring from these adults cannot be dismissed at this time.

The earliest date adult shad have been observed passing into Turners Falls Pool is April 20 of the 2012 spawning migration, which was 26 days earlier than when VY's current spring thermal limits go into effect. Furthermore, anticipated changes in climate are predicted to cause increased water temperatures which may, in turn, result in shifts to earlier spring and later running fall migrations.

The Agency's draft thermal conditions retain the current thermal limits for the spring period, however, applying them to the expanded spring period (April 1 – June 30) and with the following additional changes: (1) should actual, not calculated, hourly river temperature at Station 3 equal or exceed 70°F over 8 consecutive hours then VY shall reduce the thermal output of the discharge and until such time that river temperatures at Station 3 have fallen

below 70°F following 8 consecutive hours. After 8 continuous hours of river temperatures below 70°F the plant may resume discharging heated water to the river in compliance with permitted temperature compliance limits.

New Late Summer/Fall Period

ENVY states “there is no demonstrated biological basis for creating a new “late summer/fall” compliance period.” However, the thermal effects on the timing of outmigration, and the physiological condition that effect juvenile shad survival during fall outmigration, has not been adequately investigated by ENVY. ENVY has the burden of establishing that the thermal discharge assures a balanced indigenous population of fish and wildlife, including shad. The currently permitted temperature standards cannot be supported in the absence of site specific studies assessing the effects of these temperature criteria on juvenile shad behavior and physiology. Marcy (2004) reported that in the lower Connecticut River juvenile shad were observed moving downstream and leaving the river by mid-August at temperatures between 78.8 and 73.4°F. The majority of the fish emigrated in early-September to early-October when river temperatures were in the range of 73.4 and 64.0°F, and that a smaller proportion of the juvenile shad population left the river between mid-October and early-November when temperatures were between 64.0 and 51.6°F. VY’s own data has shown that emigrating juvenile shad have been in the vicinity of the facility and entrained into the river water of intake structure as late as mid-November. Additionally hydropower operators provide downstream passage for juvenile shad at their projects on the river from August 1 – November 15. They are notified annually of the requirement by the CRASC. The proposed seasonal period of August 1 through November 15 encompasses the outmigration period, and establishes a provisional temperature regime that is protective in the absence of site specific studies which would clearly define the optimal thermal limits for outmigrating shad.

Other Permit Conditions

1. The Agency proposes that Station 7 remain the measure of ambient temperature, and measured water temperature at Station 3 become the demonstration of compliance.

The current NPDES permit relies on a calculated temperature at Station 3 that parses out the sources of the thermal changes in the Connecticut River from upstream Station 7 to downstream Station 3. However, migratory fishes are affected by temperature regardless of the source of heat (e.g., insolation, VY’s wastewater discharge, etc.), thus the Agency proposes to replace the calculated temperature of Station 3 with the absolute temperature of Station 3 as the measure of compliance

The origin of sources of heat to the river system is irrelevant to the welfare of migrating fishes; of importance to them are real time cumulative temperature conditions of the river to which they are exposed. As stated by ENVY “[t]hese influences [i.e., air temperature, flow regulation, impoundment ponding during times of minimum generation, etc.] are highly complex and cannot be forecast by VY operators with sufficient accuracy to meet permit compliance demonstration requirements” and “[in] practical terms, these hydrodynamic and atmospheric complexities often result in temperatures at Station 3 that are 3, 4, or even more °F higher than at Station 7, much of which cannot be explained by the VY discharge.” The Agency considers it imperative that the human-mediated affects in the Connecticut River be managed to assure the protection and propagation of the Connecticut River’s balanced, indigenous population (BIP) of shellfish, fish and wildlife.

2. ENVY raises concerns about the lag time of “2 to 6 or even more hours” before the temperature is reflected at Station 3. Modern thermal measurement technology is inexpensive and easily communicated in real time to facility operators, allowing virtually instantaneous tracking of thermal conditions in the receiving waters. Thus, it would be quite feasible to install and maintain sequential telemetered thermal probes that allow VY operators to make decisions as to thermal characteristics of the discharge well within the 2-6 hour window.

3. ENVY concludes “VY would have little choice but to operate conservatively under this proposed [Station 3 compliance point] permit revision, which would likely mean closed cycle operation [during the proposed spring period of April 1 – June 30].” Based on a review of hourly temperature data supplied by VY to the Agency, for the years 2005 – 2010 river temperatures at Station 3 were consistently $\geq 70^{\circ}\text{F}$ during the following periods (Table 1).

Table 1.

Year	No. of consecutive hours (days) at Station 3 $\geq 70^{\circ}\text{F}$	Dates when Station 7 water temperature was $\geq 70^{\circ}\text{F}$	Percent of time (hours) during the extended spring period that VY would have operated in closed-cycle mode ¹
2005	295 (37)	6/9 – 6/16, 6/25 – 6/30	13.5
2006	177 (22)	6/20 – 6/28	8.1
2007	322 (40)	6/17 – 6/30	14.7
2008	364 (46)	6/10 – 6/23, 6/28 – 6/30	16.7
2009	109 (14)	6/26 – 6/30	5.0
2010	609 (76)	5/23 – 5/25, 5/27 – 6/9, 6/19 – 6/30	27.9

¹ Total number of days in spring period (April 1 – June 30) is 9 or 2,184 hours.

Ultimately, however, the Agency recognizes the potential for substantial curtailment of open-cycle heat discharge to the river during the modified spring period, but is convinced that the proposed permit changes are needed to provide migratory fishes necessary protections.

4. ENVY argues that “the proposed 70°F maximum temperature criterion for the Vernon Fish Ladder [during the period April 1 through June 30] is not grounded in biology.” ENVY cites the following literature references taken from the 2004 316(a) Demonstration of temperature criteria for American Shad to support its position:
- ENVY states the “thermal tolerance of adult American Shad is reported in peer reviewed literature as optimum for growth between 50°F and 88°F .” Correction: the reported values apply to juvenile shad and not adults. Furthermore, adults lose weight while in freshwater. There is “no demonstrated biological basis” for applying these juvenile temperature values to adult shad.
 - ENVY reports the upper avoidance temperature for adult shad to be 86°F . Correction: the reported value applies to juvenile shad and not adults (see Marcy et al. 1976). Again, there is “no demonstrated biological basis” for applying juvenile temperature values to adult shad.
 - ENVY goes on to report the upper incipient lethal temperature is 90.5°F . Correction: the reported value again applies to juvenile shad and not adults (see Moss 1970). And again, there is “no demonstrated biological basis” for ENVY to apply juvenile temperature values to adult shad.

The Agency is no longer proposing monitoring river temperatures in the fish ladder. However, stipulating 70°F at Station 3, during the period April 1 through June 30, as the trigger for VY to go to closed-cycle mode is a reasonable number supported by the peer-reviewed literature (Table 2). Leggett and Whitney (1972) report peak spawning movements into rivers occurs at 65.3°F . Walburg and Nichols (1967) report the spawning run peaks at 65°F with a range of 56 to 68°F . Shad spawning runs for populations on both Atlantic and Pacific coasts peak at water temperatures in the range of 60.8 to 67.1°F (Leggett and Whitney 1972). The water temperature associated with the end of spawning migration is 71.6°F (Leggett and Whitney 1972). In the Connecticut River, shad normally discontinue spawning when water temperatures exceed 68°F (Kuzmeskus 1977). Based upon these publications, a case could be made that a 70°F temperature cap may not be protective enough of shad migration and spawning.

Table 2.

Water Temperature Requirements for Specific Life History Activity Periods of Adult and Juvenile American Shad		Reported temperatures
Life stage	Life stage activity	
Adult	Upstream spawning migration.	<ul style="list-style-type: none"> On the West Coast migration reported to begin between March and May, when water temperatures exceed 57°F, and extends into July. Sacramento River (CA) population, shad do not spawn until water temperatures reach 62.6-75.2°F (Moyle 2002 in Bratovich et al. 2004). Connecticut River, migration begins between 62 and 71°F (Kuzmeskus in Weiss-Glanz et al. 1986).
	Peak upstream migration.	<ul style="list-style-type: none"> Peak spawning movements into rivers occur at temperatures near 65.3°F (Leggett and Whitney 1972 in Stier and Crance 1985). Spawning run peaks at 65°F with a range of 56-68°F (Walburg and Nichols 1967 in Weiss-Glanz et al. 1986). Peak migration in CA rivers occurs when water temperatures are in the range of 59-68°F (USFWS 1995 in Bratovich et al. 2004). Sacramento River population, peak migration occurs when water temperatures are in the range of 62.6-75.2°F (Moyle 1972 in Bratovich et al. 2004).
	Upstream migration water temperature tolerance.	<ul style="list-style-type: none"> Shad normally discontinue spawning migrations in the Connecticut River at water temperatures above 68°F (Watson 1968, 1970; Katz 1972, 1976; Marcy 1972; and Kuzmeskus 1977 in Stier and Crance 1985). Tend to discontinue migration when temperatures exceed 68°F (Kuzmeskus in Weiss-Glanz et al. 1986). Water temperature associated with the end of spawning migration reported to be 71.6°F (Leggett and Whitney 1972 in Leonard et al. 1999). Peak migration generally occurs when river temperatures have declined to between 48.2 and 60.8°F (Leggett and Whitney 1972, O'Leary and Kynard 1986, RMC Environmental Services, personal communication in Zydlewski et al. 2003). <p>The range of temperatures that allow survival but may be stressful or lethal.</p>
Upstream migration water temperature preference.	<ul style="list-style-type: none"> Columbia River (WA) population, 90% of the run reportedly takes place when water temperatures are in the range of 60.8-67.1°F (Leggett and Whitney 1972 in Bratovich et al. 2004). Preferred temperature range reported to be 55.4-60.8°F (Leggett and Whitney 1972 in Leonard et al. 1999). Spawning runs at various latitudes on both Atlantic and Pacific coasts peak at water temperatures of 59.9-68.0°F (Leggett and Whitney 1972 in MacKenzie and Moring 1985). <p>The range of temperatures that is suitable, preferred or optimal.</p>	

Table 2.

Water Temperature Requirements for Specific Life History Activity Periods of Adult and Juvenile American Shad		
Life stage	Life stage activity	Reported temperatures
	Spawning	<ul style="list-style-type: none"> Connecticut River, spawning occurs in May-June at water temperatures between 50.0-71.6°F (Leonard and McCormick 1999). Spawning begins when the water temperature reaches 54°F and continues as long as the temperature does not drop much below 54°F or exceed 68°F (Leggett and Whitney 1972 <i>in</i> Weiss-Glanz et al. 1986). Reported spawning temperature range is 46.4-78.8°F, although peak spawning generally occurs from 57.2-69.8°F (Walburg and Nichols 1967 <i>in</i> Stier and Crance 1985). Sacramento River population, shad do not spawn until water temperatures are in the range of 62.6-75.2°F (Moyle 1972 <i>in</i> Bratovich et al. 2004). Reported to be in the range of 46.4-78.8°F (Painter and Wixom 1979 and Wang 1986 <i>in</i> Bratovich et al. 2004). Upper Joaquin River (CA) population, spawning water temperature range is reported to be 53.6-62.6°F (Wang 1986 <i>in</i> Bratovich et al. 2004).
Adult	Spawning water temperature tolerance.	<ul style="list-style-type: none"> The range of temperatures that allow survival but may be stressful or lethal.
	Spawning water temperature preference.	<ul style="list-style-type: none"> In both Atlantic and Pacific coast populations, the preferred spawning temperature is 65.3°F (Leggett and Whitney 1972 <i>in</i> Bratovich et al. 2004). Delaware River, maximum suitability for spawning is reported to be 57.2-76.1°F (Ross et al. 1993). Preferred temperature range is reported to be 62-68°F (USFWS 1995 <i>in</i> Bratovich et al. 2004).
Juvenile	Emigration	<ul style="list-style-type: none"> Begin emigrating from streams when water temperatures drop below 59.9°F (Leggett and Whitney 1972 <i>in</i> Stier and Crance 1985). In the lower Connecticut River, juveniles began moving downstream and leaving the river by mid-August at temperatures between 78.8 and 73.4°F with the majority of the fish emigrating in early September-early October within the temperature range of 73.4-64.0°F. A smaller proportion of the population left the river between mid-October and early November when temperatures were between 64.0 and 51.6°F. No juveniles were captured by the end of November at temperatures below 43.9°F (Marcy 2004). In the Delaware River it was reported that juveniles only move downstream when the temperature falls below 69.8°F (Sykes and Lehman 1957 <i>in</i> Marcy 2004). Delaware River, downstream migration begins at 69°F; movement peaks at 60°F (Sykes and Lehman 1957 <i>in</i> Weiss-Glanz et al. 1986).

Table 2.

Water Temperature Requirements for Specific Life History Activity Periods of Adult and Juvenile American Shad		
Life stage	Life stage activity	Reported temperatures
Juvenile		<ul style="list-style-type: none"> • Peak periods of outmigration in the Connecticut River 55.4-50.0°F in 1981 and 57.2-50.0°F in 1982 (O'Leary and Kynard 1986). • Generally peak migration occurs when temperature drops to between 60.8 and 48.2°F (Leggett and Whitney 1972 and O'Leary and Kynard 1986 in Shrimpton et al. 2001). • Lower limit reported to be about 36.0°F; sublethal effects suggest that prolonged exposure to 39.2-42.8°F cannot be tolerated (Chittenden 1972). • Lower thermal tolerance limit is about 35.6°F but prolonged exposure to 39.2-42.8°F may cause high mortality or stress. If given a choice juveniles generally avoid temperatures below 46.4°F and strongly avoid temperatures below 41.0°F (Chittenden 1972 in MacKenzie and Moring 1985). • Juveniles have been found in water temperatures ranging from 50.0-87.8°F, however only one fish was found at the higher temperature. Upper natural limit may be about 86.0°F; young shad avoid potentially lethal temperatures above 86.0°F (Marcy et al. 1972).
	Temperature tolerance.	The range of temperatures that allow survival but may be stressful or lethal.

5. ENVY requested clarification for the “maximum daily temperature when used in an hourly context.” During the period April 1 through June 30, hourly river temperatures measuring $\geq 70^{\circ}\text{F}$ at Station 3 over 8 consecutive hours shall trigger VY to go to closed-cycle generation.
6. ENVY requested clarification regarding “the permit condition refer[ring] to “shad passage observed through Turners Falls Gatehouse Ladder” .” After further consideration the Agency proposes that in addition to the $\geq 70^{\circ}\text{F}$ trigger measured at Station 3, confirmation of shad in Turners Falls Pool during the period of April 1 through June 30 shall be based on the observation of adult shad in the Vernon Fish Ladder or Vernon Dam Tailwater. VY shall immediately comply with the permit condition upon notification from Vermont Fish and Wildlife Department personnel.
7. ENVY requested guidance “for determining when the plant could come out of closed cycle” during the period April 1 through June 30. Hourly river temperatures measuring $< 70^{\circ}\text{F}$ at Station 3 over 8 consecutive hours shall trigger VY to come out of closed-cycle generation mode.
8. During the summer period (July 1 – July 31), ENVY again states that “it would be impossible for VY to maintain permit compliance without operating in closed cycle during this time period.” However, the Agency counters that the thermal limits for the summer period are unchanged from the current NPDES permit with exception of eliminating Equation 1.1. Further, the 70°F temperature cap measured at Station 3 does not apply to the summer period; the 85°F cap remains in place but shall be based on actual and not calculated temperatures at Station 3. The Agency proposes that should the hourly (not average hourly) temperature at Station 3 equal or exceed the 85°F cap VY shall, as soon as possible, reduce the thermal output of the discharge to the extent that the hourly temperature at Station 3 does not exceed 85°F . The Agency notes that at no time did the actual hourly river water temperatures measured at Station 3 reported for the years 2005 – 2010 exceed 83.5°F . . In the view of the Agency, these changes should have minimal impact on VY’s generation output.
9. ENVY argues that “there is no demonstrated biological basis . . . for imposing the more restrictive “spring’ delta T requirements during the [August 1 – November 15] time period.” In addition to the observations of Marcy (2004) above, juvenile shad downstream movement (emigration from freshwater to seawater) is influenced by river temperature and in particular cooling river conditions. Application of spring temperature limits (not including the 70°F cap) from August 1 through November 15 is more protective of shad than application of summer limits.
10. The requested excel data files in Part IV. Environmental Monitoring Studies, Connecticut River for the previous year should be provided at the same time as the annual report by May 31 of the year. The Agency does not consider this an unreasonable request given that it is the data used to prepare the report.
11. In Part IV. Environmental Monitoring Studies, Connecticut River: Fish: the Agency allows that length alone will distinguish the young of year from the adults, and scale samples are only required from adult American Shad.
12. In Part IV. Environmental Monitoring Studies, Connecticut River: Fish & Fish Impingement: ENVY requested justification for changes to the sampling regime. Prior to ENVY’s decision to cease power generation at VY Station by the end of the year, 2014, the Agency and other EAC representatives had been discussing the need to increase fish population sampling effort, both at river locations, and impingement samples when in operation. Under the current and preceding

NPDES permits sampling by boat electrofishing is done monthly for May, June, September and October leaving out important months of July and August. It is from fish collections and sampling effort that population abundance by individual fish species or genera are grossly estimated; these estimates do not provide insight into the age/size class composition or structure of the populations as may be affected by VY's thermal discharge. The Agency has concerns that this approach is insufficient to understand the dynamics of fish populations in the river. We believe this minimal sampling effort in the river should be increased to include the two summer months currently not being sampled, and that impingement sampling at the intake structure should be increased to occur whenever the plant is operating in open/hybrid cycle. Although the Agency still supports presentation of Mann-Kendall trend analyses for species, this in itself is not adequate to evaluate populations.

13. The draft document handed out during the March 18, 2014 meeting between ENVY and the Agency representatives outlined the proposed changes to the thermal limits for the NPDES permit renewal. However, it was not a comprehensive draft of the permit; several sections were left out in an effort to focus on the proposed changes only. The absence of the Trend Analysis of Macroinvertebrates was not intended to indicate deletion. The Agency will continue to require trend analysis for macroinvertebrates.

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