



VIA ELECTRONIC FILING

Kimberly D. Bose, Secretary

Federal Energy Regulatory Commission

888 First Street, N.E. Rom 1-A

Washington, D.C. 20426

**Re:** Comments on TransCanada Hydro Northeast Inc.'s Proposed Study Plans  
Project Nos. 1892-026, 1855-045 and 1904-073

July 15, 2013

Dear Secretary Bose,

The Connecticut River Joint Commissions is writing, pursuant to 18 CFR 5.12, in response to TransCanada's Proposed Study Plans (PSP), filed on April 15, 2013 concerning the hydroelectric projects referenced above. These comments are submitted on behalf of the Connecticut River Joint Commissions, Inc. (CRJC), a public not-for profit organization incorporated in the State of New Hampshire and comprised of two entities, the New Hampshire Connecticut River Valley Resource Commission (CRVRC) and the Vermont Connecticut River Watershed Advisory Commission (CRWAC).

New Hampshire's Connecticut River Valley Resource Commission (CRVRC) was created by the New Hampshire Legislature in 1987. The purpose of the CRVRC is to cooperate with the state of Vermont in protecting and preserving the visual, ecological and agricultural integrity of the Connecticut River Valley while planning for and guiding the development of the recreational, tourist, commercial and residential uses of the Connecticut River Valley. Vermont's Connecticut River Watershed Advisory Commission (CRWAC) was created in 1988. The CRWAC was established to develop ways to cooperate, and to initiate and encourage interstate cooperation and coordination with the state of New Hampshire.

The Connecticut River Joint Commissions has facilitated coordination of plans, programs, and projects on behalf of the two commissions since 1989. The Connecticut River Joint Commissions appreciates the level of effort put forth by the applicant, TransCanada, in collaborating with stakeholders on the Proposed Study Plans.

## **General Comments on the Proposed Study Plans**

The following comments relate to many or all of the plans.

- The role of climate change in influencing the impact of project operations on the ecology of the Connecticut River system should be addressed. While Tropical Storm Irene in 2012 appears to have resulted in one of the worst flooding situations in many years, it may not be the most extreme event that will occur in the future. Due to concerns about climate change, model runs should incorporate scenarios of more frequent and intense storm events as well as future prolonged periods of drought to examine worse case conditions.
- Study results should be compiled as a comprehensive electronic topographic base map that extends laterally to at least the extent of the 500-year flood and include bathymetric mapping of instream features. It should show the locations of inventoried species as well as critical habitats. This base map should (1) show 1-foot contours and the extent of flooding during yearly, 100-year and 500-year storm events, (2) be scalable and (3) be available in the public domain.

## **Request for an Economic Impact Study Plan**

The economic impact of project operations has not been addressed in any of the study plans currently proposed. The economic impact of the projects operations, both positive and negative, affects many interests and relates to many resources. In order to assess the cost-benefit of various operational models, a comprehensive and objective assessment of these impacts, including on the local communities, must be made.

CRJC is entrusted by the two states with planning for and guiding the development of commercial uses of the Connecticut River Valley. Operation of the hydroelectric dams is the paramount commercial use in the bi-state river region, and we believe that all parties affected by the projects will benefit from using a cost-benefits analysis in assessing cumulative impacts.

Economic impact assessments should include both the cost and benefits of project operations to landowners, private businesses, municipalities, states and TransCanada's shareholders, including the following:

1. Outdoor recreation, including fishing, boating and swimming activities. Impoundments create opportunities for recreation. Negative impacts could result from fluctuating water levels, turbidity from erosion and impacts of dam operations on water quality.

2. Positive and negative municipal impacts include payment of property taxes, effects on property valuations including flowage easements, effects on infrastructure such as New Hampshire Route 12, and changes in tax assessments as a result of judicial appeals should be included. Benefits could accrue from a lowering of electric rates in riverfront towns.
3. Environmental impacts include benefits from green energy production and creation of habitat. Costs may be associated with effects of erosion, toxin accumulation in fish and sediments, turbidity and erratic flows.
4. Property and business owner costs include recovering from flood damage, loss of property value and loss of developable land.

Related studies on the economic impact of outdoor recreation in the two states (cited in *CRJC, 2009:6-8*) and the economic impact of water quality (*Nordstrom, 2007*) have been conducted. But a comprehensive cost-benefit analysis such as we recommend, has not been done. Using available data, we believe it can be undertaken by an economic consultant for a relatively moderate cost. We recommend that the applicant work with the states, regional planning commissions, affected businesses and other interests to conduct an evaluation of the economic impact of project operations.

### **Comments on Specific Study Plans**

For ease of reference, we follow the same study plan number and title as used by the applicant.

1. **Study Plan #4, Hydraulic Modeling Study:** This study plan, as currently proposed, does not assess the effect of climate change. The applicant's study approach entirely relies on historical stream gage data to extrapolate future flows.

#### **Discussion:**

It is well documented that in the decades since the construction of the project dams there have been significant changes in the frequency and intensity of precipitation events. Specifically, between 1958 and 2010 the Northeast saw a 74% increase in the amount of precipitation falling in very heavy events (*NCADAC, 2013*). The applicant should develop an analytical tool that has the ability to evaluate the potential effects of more severe storm events and prolonged periods of drought. The goal for doing so is to provide more realistic and accurate projections of future flow conditions. These projections are not possible if only historic gage data are used.

To date, the applicant does not propose to address climate change as it relates to project operations because it claims "such a study would not necessarily inform potential mitigation measures (FERC study criteria 4) and would be cost prohibitive (FERC study criteria 7)." (*TransCanada, 2013b:7*).

It is unclear if the applicant's proposed hydraulic model can determine the effect of anticipated future meteorological trends. This approach is insufficient to inform potential mitigation measures for project effects related to climate conditions over the next forty years. Practicable operational alternatives can be explored and evaluated only if there is a hydrologic model that can be used throughout a full range of flows, including extreme high and low flows due to climate change, in order to avoid and reduce projected adverse effects.

Moreover, the cost to develop a hydraulic model that incorporates projections of future stormwater flows can be significantly reduced if the applicant cooperates with regional partners in its development. The reliability of flow projections over the term of the requested licenses has an unequivocal nexus to assessing the effect of the projects operations.

**Comprehensive River Plan:**

The *Connecticut River Water Management Plan Riverwide Overview*, developed and published by the Connecticut River Joint Commissions in 2008 includes several pages on the subject of "climate change." In it are examples of recent intense rain episodes with resulting erosion and sedimentation, and a discussion of droughts and how they increase demands for river water (CRJC, 2008:29-30).

**Recommendation:**

As an alternative to a study of climate change per se and since the proposed hydraulic model will be an important element used in fully evaluating many of the other environmental, historic and habitat impact studies, the model should be robust enough to evaluate the effects of variable flows including higher and or lower flows anticipated due to generally accepted precipitation forecasts associated with climate change. The model should have the capacity to incorporate and predict impact on river resources at the flood flow levels already part of the FERC required safety review of the dams.

**2. Study Plan #4, Hydraulic Modeling Study and Study Plan #5, Operations Modeling**

**Study:** The proposed studies, as currently presented, will not be capable of assessing the effect of the existing dams and their operations on a variety of floodplain resources.

**Discussion:**

Do the dams contribute to seasonal flooding or increase the elevation of the 100-year and 500-year storms on adjacent lands? Do project operations contribute to reaches of the river incising, cutting them off from their floodplains? How do project operations affect flooding of low-lying properties during flood events?

In response to a request from the Vermont Agency of Natural Resources that the applicant identify the extent of development within the floodplain of the lower Connecticut River, the

applicant stated that the request was aimed at mitigation and lacks a nexus to the three projects and thus would not meet FERC's study criteria 5. Further, the applicant stated that this study request would not inform measures that could be considered for a new license, and thus does not meet FERC study criteria 6. (*TransCanada, 2013b:52*)

In the applicant's denial of a request from The Nature Conservancy (TNC) to survey habitats within the 100-year floodplain, the applicant states that such a survey "could result in extensive mapping of terrestrial habitats far from the river. This will not contribute significantly to the information needed to assess the areas influenced by project activities, and hence is not included in this study." (*TransCanada, 2013c:5*).

Despite the applicant's assertion that natural and human resources in the floodplain are not germane to project operations and therefore should not be inventoried, the applicant has agreed to assess current project effects on floodplain forests (*Study Plan #27*). The selection of only one resource ignores the fact that other floodplain land uses and resources have compelling community, ecological, and economic values that warrant at least as much consideration as floodplain forests.

Additionally, the applicant has primarily limited the project study area to project lands and 200 feet of upland buffer, but this determination ignores significant resources on private lands and the full lateral extent of potential impacts from project operations. For example, the Town of Westminster, Vermont attributes annual spring flooding "in the low lying areas adjacent to the Connecticut River, particularly on Route 5 where the businesses Allen Brothers and Patriot Motors are located" to the operations of the Bellows Falls dam (*Town of Westminster, VT, 2013:11*). This issue has not been addressed in any of the study plans.

The Connecticut River Valley has experienced several 500-year storms in recent history, and more can be expected during the term of the proposed license application (*e.g., see CRJ C, 2008:29*). The lateral extent of studies that the applicant proposes is too limited in geographic scope to enable an adequate assessment of project impacts. The goal of expanding the study area is to overcome limitations inherent in (1) defining the study area to an arbitrary 200 feet from the river's edge and project lands and (2) selecting only one resource, among many, for specific study. The study objective instead should be to document significant resources, including roads, buildings, farmland and important habitats in the floodplain that may be affected by dam operations over the term of the proposed licenses.

**Recommendation:**

The proposed hydraulic and operations modeling studies should be capable of assessing the effect of project operations on a greater variety of significant public interests in the geographic

area that would be affected by a 500-year storm. This requires delineating the lateral extent of the 500-year floodplain so that resources in this area can be inventoried.

We encourage the applicant to partner with other entities to (1) develop a more robust hydraulic model (2) clearly define the elevations of the annual, 100-year and 500-year flood events, and (3) share the cost in modifying the study plan.

### **3. Study Plan #5 Operations Modeling Study and Study Plan #6, Water Quality**

**Monitoring:** The studies do not address the accumulation of toxins in the river and their effects on fisheries and public health.

#### **Discussion:**

No study of the effect of project operations on toxins was requested by FERC or the public, and the applicant does not propose to do one. Consequently, the effect of project operations on the distribution and biological concentration of toxins, such as mercury and dioxin, is not proposed to be assessed. Mercury is a neurotoxin that threatens public and environmental health. It has been shown that in fluctuating impoundments, such as those behind the dams, mercury moves up through the food chain in the more dangerous methylated form (*Evers, 2007*). As a result, dam operations may have exacerbated the concentration of mercury in fish in the impoundments.

A study conducted by the United States Environmental Protection Agency and the four Connecticut River states, at the request of CRJC, found that Connecticut River fish tissue showed bioaccumulation of mercury and dioxins, sometimes to high levels, in the aquatic food chain (*U.S. EPA, 2006*). The CRJC recognizes that the applicant may not want the acceptance of this study plan modification to imply responsibility for existing mercury in the river as it is widely acknowledged that the majority of the mercury in the project watershed is the result of airborne emissions. Nevertheless, the projects' fluctuating reservoirs may continue to contribute to enhanced bioaccumulation of mercury in fish in the river. Therefore, more study is needed in the specific reaches of the river that are subject to the pending FERC license application to assess the impact of the reservoirs on this process as it is a threat to human health. Currently, the NH Department of Environmental Services has a fish consumption advisory in effect for the Connecticut River because of documented high mercury levels.

#### **Comprehensive River Plan**

*The Connecticut River Recreation Management Plan* prepared and published by the Connecticut River Joint Commissions in 2009 includes top recommendations from each of the five local river subcommittees. The Upper Valley, Mount Ascutney, and Wantastiquet subcommittees, which

cover the river reaches affected by relicensing, each had a strong recommendation to “reduce mercury contamination in the Connecticut River system” (*CRJ C, 2009:68*).

**Recommendation:**

We recommend that Water Quality Study Plan #6 be amended to sample sediments and fish tissue for mercury and dioxin within the project area. The goal of this sampling will be to identify mercury levels in the three reservoirs, and inform possible mitigation measures.

The cost for this study modification is modest in relation to the impact mercury has on human health.

- 4. Study Plan #6, Water Quality Monitoring and Study Plan #27, Terrestrial Studies:** The updated studies do not specify parameters or methodologies that can be used to determine if wetlands are being degraded by project operations.

**Discussion:**

Wetlands as well as surface waters are “waters of the United States” and both are subject to provisions of Section 401 of the Clean Water Act (see *Kusler, 2012*). The applicant proposes to collect data to determine if the projects are meeting state water quality standards; however, it does not offer a plan to establish baseline wetland conditions in order to critically assess project effects on wetlands.

Study Plan #6 is designed to determine the operational effects of the projects on surface water quality parameters (e. g., dissolved oxygen and temperature). However, these parameters are not as useful in assessing the quality of many wetlands, which only need to be saturated near the surface for short periods during the growing season. Thus, we suggest that the applicant collect data on species-richness (species diversity and abundance) at permanent wetland reference sites to determine if project operations affect wetland health. Changes in species-richness are known to track changes in water quality.

The applicant’s July 3<sup>rd</sup> updated Terrestrial Study Plan #27 proposes to provide detailed mapping and characterization of wetlands; however, we suggest that reference wetland sites outside of the zone of influence of the project be established and delineated according to the methodologies currently required by the United States Army Corps of Engineers. This will enable changes in species-richness in wetlands affected by dam operations to be compared with changes in species-richness at reference sites that are not affected by project operations. In essence, the sites outside of the influence of the dams act as control sites.

A crucial component of a biological assessment program is the careful selection of reference sites. Reference sites are wetlands of the same class that define the best possible condition for that class. (*U.S. EPA, 2002*). The applicant states that “data for reference wetlands will not be

collected, as proposed in an agency study request. On a large system such as the Connecticut River it is unrealistic for several reasons: few if any reaches of the river are not affected by water management; the river changes character rapidly north and south of the project areas; and lastly, the natural variability of any potential reference habitats would require a very large data set for effective comparisons to project habitats, of limited value and at significant expense." (*TransCanada, 2013c:4*).

Nevertheless, we believe the use of reference sections is a cost effective way to ensure wetlands are not degraded by project operation and suggest the applicant consider amending the Terrestrial Study #27 to: (1) establish permanent reference sites (within and outside the zone of influence of the project) in various wetland classes (e.g., palustrine forested, scrub-shrub and emergent), (2) inventory species-richness at each of the sites and (3) monitor changes in species-richness over time at each of the sites to assess the effect of project operations.

**Statutory Authority:**

Section 401 of the Clean Water Act. "A State's authority under Section 401 includes consideration of a broad range of chemical, physical, and biological impacts. The State's responsibility includes acting upon the recognition that wetlands are critical components of healthy, functioning aquatic systems." (*U.S. EPA, 1989:6*).

**Recommendation:**

Amend the Water Quality Study Plan #6 to acknowledge that wetlands need to be monitored to ensure they are not degraded. Amend Terrestrial Study Plan #27 to identify the locations of reference sites in high quality wetlands, within and outside of the zone of influence of the project, which can be delineated and monitored for changes in species richness to assess whether wetlands are being degraded by project operations.

The cost to include this recommendation in the study plan should be minimal.

- 5. Study Plan #9, Instream Flow:** This study plan should be modified to include a determination of the flow requirements of all significant uses for which the river was designated into the New Hampshire Rivers Management and Protection Program, rather than just aquatic life.

**Discussion:**

The Connecticut River has been incorporated by the legislature into the New Hampshire Rivers Management and Protection Program (NH RSA: 483) and the statute stipulates that instream

flows be protected on every statutorily designated river. The Souhegan and Lamprey Rivers have had necessary flows established through a Pilot Study that would inform models for the Connecticut and other rivers.

We believe it is the responsibility of applicants seeking new permits or renewal of licenses on the Connecticut River to respect New Hampshire statute in the course of their relicensing applications. They should document the effect of their proposed operations on protected uses for the Connecticut River (see RSA: 483:15 VIII and NH RSA 483:7a), and especially on those uses that qualified the river for designation into the Rivers Management and Protection Program (RSA 483:6).

While the current dam licenses require a continuous minimum flow from the powerhouses of 675, 1,083, and 1,250 cfs, for the Wilder, Bellows Falls, and Vernon Projects, respectively, under the applicant's Study Plan #9 only the extent to which these flows protect aquatic life will be addressed. However, New Hampshire law requires the New Hampshire Connecticut River Valley Resource Commission, as the local river management advisory committee (NH RSA 483:8a IV), to "consider and comment on any federal, state, or local governmental plans to approve, license, fund or construct facilities that would alter the resource values and characteristics for which the river or segment is designated." (483:8-a III (b)). Under RSA 483:9-c, these resource values and characteristics include "water for instream public uses and .... recreational, fisheries, wildlife, environmental, hydropower, cultural, historical, archaeological, scientific, ecological, aesthetic, community significance, agricultural, public water supply, and the resources for which the river or segment is designated...." The list of protected instream public uses also include "navigation; storage; conservation; the protection of water quality and public health; pollution abatement; and hydroelectric energy production." (RSA 483:4 XI). These, then, are the resources which should be initially addressed in Study Plan # 9.

Not all will undergo full study. Every State Protected River has a unique set of uses that are determined to be significantly affected by flows. For example, on the Lamprey, wastewater dilution was not found to be "flow dependent" because of the nature of its only wastewater disposal system. While on the Connecticut, the ability of the river to dilute effluent and other sources of pollution may be of concern. Only those uses found, in consultation with all of the stakeholders, to be significant and flow dependent would be subject to further analysis of their flow requirements.

The assessment of adequate minimum and maximum flows should include flows under varying operational and climactic conditions, including volume, duration, predictability and timing of flows. In Study Plan # 9, as proposed, only current and historic flows from dam operations are to be considered when evaluating the adequacy of flows. CRJC believes that in order for

operational models to assure adequate instream flows, this study must also include projected future flows.

### **Comprehensive River Plan:**

The *Connecticut River Water Resources Management Plan Riverwide Overview* prepared and published by CRJC in 2008 states “CRJC should identify Instream Protected Uses, Outstanding Characteristics and Resources listed in RSA 483 – for the Connecticut River, based on consultations with organizations, agencies, and communities, as well as discussions in the local river subcommittees.” (CRJC, 2008:20).

### **Recommendation:**

CRJC recommends that the applicant initially consult with organizations, natural resource agencies, communities and CRJC’s local river subcommittees to consider all of the Instream Protected Uses, Outstanding Characteristics and Resources (IPUOCRs) listed in New Hampshire RSA 483 for which the Connecticut River was designated, in order to determine which are significant and flow dependent. This could be done using the protocols established in the Lamprey Pilot program (NHDES, 2006). Then, a determination should be made of which of these IPUOCRs have not been addressed by the applicant in other studies and warrant a full analysis of their flow requirements. These flow requirements should then be incorporated into the operations model.

Costs of this expanded study will be reduced considerably because much of the necessary data either will be generated in the course of other studies by the applicant, or are available from existing sources, most notably the Lamprey River and Souhegan River Pilot studies.

- 6. Study Plans #'s 1, 2 and 3, Riverbank Erosion Studies:** These studies, as proposed, will describe erosion at diverse locations above and below the three dams but they may be insufficient to determine what proportion of that erosion is directly attributable to dam operations.

### **Discussion:**

Studies to determine how the applicant’s operations affect the rate of erosion should be based on an analysis of: (1) existing field conditions to identify all areas of erosion within the relicensing limits to interpret their causes, (2) historical surveys that show the locations of the banks prior to and after installation of the dams and (3) detailed geotechnical analyses to determine the affect of water level fluctuations on slope stability.

In the updated Study Plans the applicant has agreed to conduct a more intensive search for historical surveys but has not offered to conduct any geotechnical analyses to determine slope

stability. Moreover, the number of erosion study sites proposed in the study plan and the short time frame over which these sites will be observed are unlikely to prove, with any degree of certainty, how the applicant's operations affect slope stability.

Bank erosion has significant impacts on many of the factors related to the relicensing of the Vernon, Bellows Falls and Wilder dams which include but not limited to: loss of agricultural land, water quality, aquatic habitat, endangered species, fish spawning, aesthetics, cultural and historic resources, possible impacts to brown field sites, etc. It is also accepted that vegetative riparian buffers are extremely important in maintaining water quality. Embankment erosion caused by project operations threatens these buffers.

There are substantial areas of significant erosion within the impoundments of the Vernon, Bellows Falls and Wilder dams as well as in the 'free flowing' reaches below the dams. With the extensive bank erosion in the Bellows Falls impoundment, on both the New Hampshire and Vermont sides of the river, the two proposed erosion study sites are simply inadequate to determine the impact of project operations on embankment erosion in this reach. This is a reach with a number of important resources that are being affected by erosion. As an example, in the reach from Charlestown to Walpole alone, erosion has necessitated the relocation of Route 12 and the railway at a cost of 20 million dollars.

**Comprehensive River Plan:**

The *Connecticut River Water Resources Management Plan Riverwide Overview*, developed and published by CRJC in 2008 identifies erosion as a significant issue, it states "[r]iverbank erosion is one of the most prevalent and misunderstood problems on the Connecticut River...." (*CRJC, 2008:11*).

**Recommendation:**

Expand the number of erosion study sites, particularly, in the Bellows Falls and Vernon impoundments to ensure a more complete range of erosion conditions are evaluated. Include at least five additional study sites in the Bellows Falls and Vernon impoundments. These studies should also be undertaken during high, low and transitioning water levels in order to more effectively evaluate the contribution of fluctuating water levels on erosion. Finally, in order to better assess the effect of project operations, we recommend a geotechnical slope stability analysis be conducted at each of the proposed study sites.

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### **Closing Remarks**

The Connecticut River is a public resource. Federal and state laws have changed significantly since 1950 when the Wilder Dam received its federal license to generate power (Bellows Falls and Vernon Dams were licensed much earlier). More is known in 2013 about recreational, municipal, and other users of the river and about various species dependent upon river water and flows. CRJC believes that these recommendations are essential in order to bring the most robust science, analysis, and public participation to the challenge of a long-term license renewal for dams on the Connecticut River. CRJC strongly encourages FERC to require that the applicant incorporate the recommended changes outlined herein to the Proposed Study Plans. Once issued, the FERC license will remain in effect for a period of 30 to 50 years. Therefore, decisions regarding relicensing must be based upon an objective evaluation of past impacts caused by the projects and a thorough analysis of impacts expected to occur long into the future. The CRJC appreciates the thorough approach of FERC in assessing the many potential impacts to the environment from the applicant's license renewal application for these projects. We hope the magnitude of these impacts and the complex ecological interactions that will occur during the decades of project life will be appropriately investigated for the continued functioning of our shared public resource, the Connecticut River Watershed.

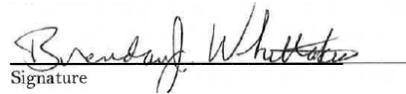
If you have any questions regarding the contents of this PSP comment letter, please feel free to contact either of us at via e-mail at Rebecca Brown [2sugarhillmutts@gmail.com](mailto:2sugarhillmutts@gmail.com) and Brendan Whittaker [gferbwick@gmail.com](mailto:gferbwick@gmail.com).

Sincerely,

A handwritten signature in black ink, appearing to read "Rebecca Brown", written over a horizontal line.

Rebecca Brown

Chair, New Hampshire Connecticut River Valley Resource Commission

A handwritten signature in black ink, appearing to read "Brendan Whittaker", written over a horizontal line. The word "Signature" is printed below the line.

Brendan Whittaker

Chair, Vermont Connecticut River Watershed Advisory Commission