

**Vermont Department of Environmental Conservation**

Watershed Management Division

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July 3, 2019

Low Impact Hydropower Institute Office

329 Massachusetts Ave, Suite 6

Lexington, MA 02420

Re: Vernon Hydroelectric Project (FERC No. 1904)  
Comments on Low Impact Hydropower Certification

Dear LIHI Governing Board,

On May 7, 2019 the Low Impact Hydropower Institute (LIHI) noticed of a complete application for the recertification of the Vernon Hydroelectric Project (Vernon) by Great River Hydro (GRH). The notice asked that comments be submitted by July 6, 2019 and that they specifically address LIHI's new criteria. Based on our review, the Vermont Agency of Natural Resources (Agency) has concerns with the project's ability to meet the LIHI criteria and does not support the recertification of the Vernon Hydroelectric Project, based on a number of significant factors. The Agency provides its comments, herein.

**Background**

The Vernon Hydroelectric Project was originally licensed in 1979 and much of the operations remain governed by this original license. Vernon was first certified by LIHI in 2008 and recertified in 2016, at which time the Agency provided comments expressing concern about the Project's ability to meet LIHI criteria. The Agency still maintains those concerns and reiterates them here. Additionally, Vernon is currently undergoing a FERC relicensing process, as it was in 2016, and as a result several key studies have been completed and shed light on the projects impacts to aquatic biota and habitat. Given this new information and the revised criteria, below the Agency outlines its concerns and position that the Vernon project does not meet LIHI's low impact standard, drawing on specific examples of language from the LIHI handbook (second edition) as well as the GRH Application.

**Zone 1: Tailrace – Criteria A Ecological Flow Regime**Handbook Criteria:

**Goal:** The flow regimes in riverine reaches that are affected by the facility support habitat and other conditions suitable for healthy fish and wildlife resources.

**STANDARD A-2. Agency Recommendation:** The flow regime at the Facility was developed in accord with a site-specific, science-based agency recommendation;

**Agency Recommendation** (see Appendix A for definitions):

- Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally stringent).

- Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is or is not part of a Settlement Agreement.
- Explain how the recommendation relates to agency management goals and objectives for fish and wildlife.
- Explain how the recommendation provides fish and wildlife protection, mitigation and enhancement (including in-stream flows, ramping and peaking rate conditions, and seasonal and episodic instream flow variations)

Application:

GRH provided evidence for the Agency recommended minimum flow requirements from the 1979 FERC license. GRH also provides evidence that they have been in compliance with those recommendations to date.

Agency Comments:

The Agency agrees that Vernon currently operates within the 1979 FERC license that was issued after stakeholder-involved settlement and has not violated the minimum flow requirement prescribed therein. The application package for Vernon includes FERC documents describing which stakeholders agreed to the 0.2 cfs in 1979.

However, GRH's application does not meet three of the four requirements specified in the certification instructions. Specifically, Vernon does not:

- Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is or is not part of a Settlement Agreement.
- Explain how the recommendation relates to agency management goals and objectives for fish and wildlife.
- Explain how the recommendation provides fish and wildlife protection, mitigation and enhancement, including in-stream flows, ramping and peaking rate conditions, and seasonal and episodic instream flow variations

Because the revised criteria emphasizes the importance of science-based recommendations, the Agency concludes that this information is imperative for certifying that the facility is in fact low impact. The Vernon Project does not meet the "Agency Recommendation" Standard because the current flow regime was not developed in accordance with a science-based agency recommendation.

Neither the Agency nor GRH have adequate documentation from the 1970s to respond to the certification instructions, hence the application notes "GRH has no further documentation as to the scientific or technical basis for the agency minimum flow requirement of 0.2 cfs." (application pg. 14). However, both the Agency and GRH now possess extensive scientific data emerging from the current FERC proceedings to conclude that the current minimum flow and overall hydropeaking regime does not provide adequate fish and wildlife protection. For example, based on the applicant's instream flow study (Study 9), the current flow regime exposes numerous gravel bars where Sea Lamprey spawn during low flows (pg 38). Additionally, a relicensing-related review of project-related water level fluctuation suggested that key reproductive habitats for a state-threatened species (Fowler's Toad) may be inundated/washed out on daily cycles due to project generation. Impacts to spawning of various species downstream of the dam were evident during relicensing studies.

Therefore, the Agency provides the following documentation that when using a scientific or technical basis for determining if ecological flows provide fish and wildlife protection, the current Vernon operations are not protective, and do not relate to Agency management goals.

- The revised reservoir and minimum flow and monitoring plan (<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=11654799>) supplied by GRH in the application (pg 35) J. Cueto of VT ANR noted in the e-mail chain dated 2008 how low the conservation flows relate to the provided flow duration curves. He indicates that flows are almost never as low as 0.2 cfsm indicating that the minimum flow set in 1979 was likely too low (pg. 6 of Appendix D).
- Fowlers Toad Study 28 (<https://www.greatriverhydro-relicensing.com/download/Documents/Study%20Reports/Study-Reports-1-33/Study-28-Fowlers-Toad/PUBLIC-TC%20Study%2028-Fowlers%20Toad-ReportFiled%202016-06-17.pdf>). Page 18 of the report states “Daily water level fluctuations due to project operation may affect Fowler’s toads breeding habitat because this species is not adapted to relatively rapid, frequent fluctuations in water depth.”
- Study 9 – Instream Flow Final Study Report (<https://www.greatriverhydro-relicensing.com/download/Documents/Study%20Reports/Study-Reports-1-33/Study-09-Instream-Flow/TC-Study%209%20Instream%20Flow%20Report%202017-03-22.pdf>).

## **Zone 2: Impoundment – Criteria A Ecological Flow Regime**

### Handbook Criteria:

**Goal:** The flow regimes in riverine reaches that are affected by the facility support habitat and other conditions suitable for healthy fish and wildlife resources.

**STANDARD A-1. Not Applicable/De Minimis Effect:**

- Confirm the location of the powerhouse relative to other dam/diversion structures to establish that there are no bypassed reaches at the facility.
- If Run-of-River operation, provide details on how flows, water levels, and operation are monitored to ensure such an operational mode is maintained.
- In a conduit project, identify the water source and discharge points for the conduit system within which the hydropower plant is located.
- For impoundment zones only, explain how fish and wildlife habitat within the zone is evaluated and managed – *NOTE:* this is required information, but it will not be used to determine whether the Ecological Flows criterion has been satisfied. All impoundment zones can apply Criterion A-1 to pass this criterion.

### Application:

“Vernon Project consists of a dam and integral powerhouse. There are no bypassed portions of the Connecticut River. There are no penstocks. The trash racks and concrete intakes structures are integral features of the powerhouse located on the upstream face of the powerhouse. Fish and wildlife resources and habitat in and adjacent to the Vernon impoundment are evaluated and managed by the US Fish and Wildlife Service, New Hampshire Fish and Game Department and Vermont Fish and Wildlife Department. Setback areas are important rearing habitat for juvenile American Shad along with numerous other species.”

Agency Comments:

The Agency does not believe that the current license terms, nor operations as implemented, support impoundment conditions consistent with LIHI's criteria, as they specifically relate to the overall goal of this criteria which is healthy fish and wildlife resources. Daily peaking fluctuations during the sensitive spawning period have been shown to impact spawning success of resident and diadromous species (See FERC studies 14 and 15<sup>1</sup>) and potentially other aquatic organisms including the cobblestone tiger beetle (*Cicindela marginipennis*) which is listed as threatened in both New Hampshire and Vermont (see below). While within the terms of its 1979 FERC license, drawdowns to conduct repairs have dewatered substantial portions of the river including ecologically important setback areas (Figure 2). In short, as currently licensed and operated, Vernon can have significant adverse impacts on fish and wildlife in the impoundment and setback ponds.

The Agency is aware that "The Low Impact Hydropower criteria have been established as a relatively simple objective criteria for distinguishing hydropower in the marketplace. These criteria should not, however, be considered a benchmark for exemplary environmental operations at hydropower facilities... The Low Impact Hydropower Certification Project is also intended only to aid in differentiating the environmental performance among hydropower facilities. LIHI certifies facilities whose impacts are low compared to other hydropower facilities based on objective scientific environmental criteria<sup>2</sup>" To date, operations within the terms of its 1979 FERC license, are in direct conflict with the overall goal of "healthy fish and wildlife resources". GRH specifically noted the importance of setback areas as rearing habitat, which were likely the areas most impacted by this past spring by an extensive drawdown, as well as during daily impoundment fluctuation (Figure 2). In addition, the Agency believes that the extent of this dewatering event should not be considered "low compared to other hydropower facilities" particularly for the New England region.

**Zone 2: Impoundment – Criteria E Watershed and Shoreline Protection**

Handbook Criteria:

**Goal:** The Facility has demonstrated that sufficient action has been taken to protect, mitigate and enhance the condition of soils, vegetation and ecosystem functions on shoreline and watershed lands associated with the facility.

*STANDARD E-1. Not Applicable/De Minimis Effect:*

- There are no lands associated with the facility under ownership and control of the applicant that have significant ecological value for protecting water quality, aesthetics, or low-impact recreation, and there has been no Shoreline Management Plan (SMP) or similar protection required at the facility;
- or the facility has no direct or indirect project-related land ownership, excluding lands used for power generation and transmission, flowage rights and required developed recreational amenities;

Application:

"The vast majority of the shoreline upstream of Vernon dam is private property owned by others [than GRH] on which GRH exercises flowage rights. A portion of the 287 acres of fee ownership that lies in the

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<sup>1</sup> [https://www.greatriverhydro-relicensing.com/download/Documents/Study%20Reports/Study-Reports-1-33/Study-14-and-15-Resident-Fish-Spawning/TransCanada\\_Study14\\_15\\_Final\\_Report\\_%202016\\_08\\_01.pdf](https://www.greatriverhydro-relicensing.com/download/Documents/Study%20Reports/Study-Reports-1-33/Study-14-and-15-Resident-Fish-Spawning/TransCanada_Study14_15_Final_Report_%202016_08_01.pdf)

<sup>2</sup> <https://lowimpacthydro.org/marketing-guidelines/>

vicinity of the dam within the FERC Project Boundary of the Vernon Project can be considered in ZOE #2 but it is largely necessary for project related uses including the dam, powerhouse, fish ladder, spillway, maintenance garage, switchyard, substation, transmission easements by others (New England Power Company, d.b.a. National Grid), and developed and passive recreation including a small picnic area and canoe portage. Also within the fee ownership is the natural feature known as Vernon Neck, which the eastern end of the dam abuts and is a significant natural feature important to the overall project impoundment. The base of this feature is rip-rapped and routinely inspected for stability.”

Agency Comments:

The Vernon Project does not meet the above criteria because there is fee-owned land on which recreation takes place, there is an erosion management plan for the facility, and GRH owns land that is not used for project related purposes.

GRH states that a portion of their owned land lies within Zone 2, “but is largely necessary for project related uses”. However, while most of the land is largely necessary, it is not wholly necessary for project related uses. Therefore, Vernon does have an impact – albeit a small one compared to the overall impoundment size and owned land, but not negligible compared to other LIHI certified facilities. Please see Figure 1 for an image of GRH owned land near the Vernon Project. This figure was presented in the FERC relicensing process in the pre application document. The map also notes locations where recreation takes place on GRH lands.

GRH also has an erosion monitoring plan, that was submitted as part of the amended 401 water quality certification issued by New Hampshire Department of Environmental Services in 2006. This erosion plan specifically calls out concerns and monitoring requirements on GRH owned lands. As erosion takes place along shorelines within Zone 2, at a minimum the Applicant should have introduced this plan into the application as they have complied with its requirements.

**Zone 2: Impoundment – Criteria F Threatened and Endangered Species Protection**

Handbook Criteria:

*Goal:* The Facility does not negatively impact listed species.

*Introduction to Standards:* To pass the Threatened and Endangered Species criterion for LIHI Certification, the applicant shall demonstrate compliance with at least one of the following standards. Facilities shall not have caused or contributed in a demonstrable way to the extirpation of a listed species. However, a facility that is making significant efforts to reintroduce an extirpated species may pass this criterion.

• *STANDARD F-2. Finding of No Negative Effect:* There are listed species in the area, but the facility has been found by an appropriate resource management agency to have no negative effect on them, either recently or in the past;

Application:

GRH in the application mentions a variety of federally listed species, and one state listed species. However, GRH failed to note the presence of the cobblestone tiger beetle (*C. marginipennis*), located at Walpole Island.

Agency Comments:

The cobblestone tiger beetle is listed as threatened by both the state of New Hampshire and the State of Vermont<sup>3</sup>. Walpole Island is listed within the project boundary as it is downstream of Route 123 Bridge, which is the upstream end of the Project Impoundment, as stated in the application. The Agency has concerns with the fluctuation of the impoundment and its effects on the cobblestone tiger beetle. As part of the FERC relicensing process GRH did a study on this species and on page 19 conclude:

“Project operations have the potential to cause direct adverse effects on cobblestone tiger beetle populations. Adult individuals are winged and therefore generally able to avoid direct mortality from project-related water level fluctuations, but they may suffer energetic costs from temporary loss of foraging habitat during multi-day periods of habitat inundation. Similarly, if daily water level fluctuations or recreational activity (albeit not a direct project effect) cause larval burrows to collapse frequently, there may be an energetic cost of re-excavating burrows, which would divert resources from larval growth and maturation<sup>4</sup>.”

For this reason, GRH does not meet the LIHI criteria for a finding of no effect.

**Recommendation**

Based on its review of the filed application and related pertinent information, the Agency does not believe the Vernon hydroelectric project complies with LIHI’s criteria and goals, as set forth in the 2<sup>nd</sup> edition Handbook. As such the Agency would recommend the Vernon Hydroelectric Project not be certified as “low impact”. If LIHI does certify the project, the Agency would recommend the following conditions be included in certification of the project.

- A. The fishway should be operated at a minimum from early April to late October to allow passage of resident and diadromous species including American eel.
- B. GRH should continue to work to provide safe, timely and effective downstream passage of American eel, American shad, and sea lamprey.
- C. Any repair work that could cause negative impacts to aquatic biota should utilize techniques to minimize or avoid impacts such as time of year constraints, the use of coffer dams etc. Any repair and or maintenance work which may cause negative impacts to aquatic biota should occur in consultation and be approved by the Agency.

Finally, the Agency would like to take this opportunity to raise a more general concern with a facility like Vernon (i.e., one with significant resource impacts) being recertified while it is mid-way through its FERC relicensing. That is, while GRH and stakeholders continue to work towards future operating terms that ensure resource protection—informed in large by a large volume of new information—a third-party

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<sup>3</sup> <https://www.wildlife.state.nh.us/nongame/documents/endangered-threatened-wildlife-nh.pdf>;  
<https://vtfishandwildlife.com/sites/fishandwildlife/files/documents/Learn%20More/Library/REPORTS%20AND%20DOCUMENTS/NONGAME%20AND%20NATURAL%20HERITAGE/ENDANGERED%2C%20THREATENED%20AND%20RARE%20SPECIES%20LISTS/Endangered%20and%20Threatened%20Animals%20of%20Vermont.pdf>

<sup>4</sup> <https://www.greatriverhydro-relicensing.com/download/Documents/Study%20Reports/Study-Reports-1-33/Study-26-Cobblestone-and-Puritan-Tiger-Beetle/PUBLIC-TC%20Study%2026-Tiger%20Beetle%20Report-Filed%202016-06-17.pdf>

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certifier is sanctioning past practices as being 'low impact'. The Agency recognizes that this scenario is by no means unique to the Vernon project, however it nonetheless warrants being noted here.

Thank you for consideration of our comments.

Yours truly,

A handwritten signature in cursive script that reads "Betsy P. Simard".

Betsy Simard

CC. Melisa Grader, USFWS  
Kathy Urffer, CRC  
Lael Will, VTFWD  
Pete McHugh, VTFWD  
Jeff Crocker, VTDEC  
Eric Davis, VTDEC  
Katie Kennedy, TNC  
Andrea Conlon, CRC  
Caleb Slater, MDFW  
Greg Comstock, NHFG

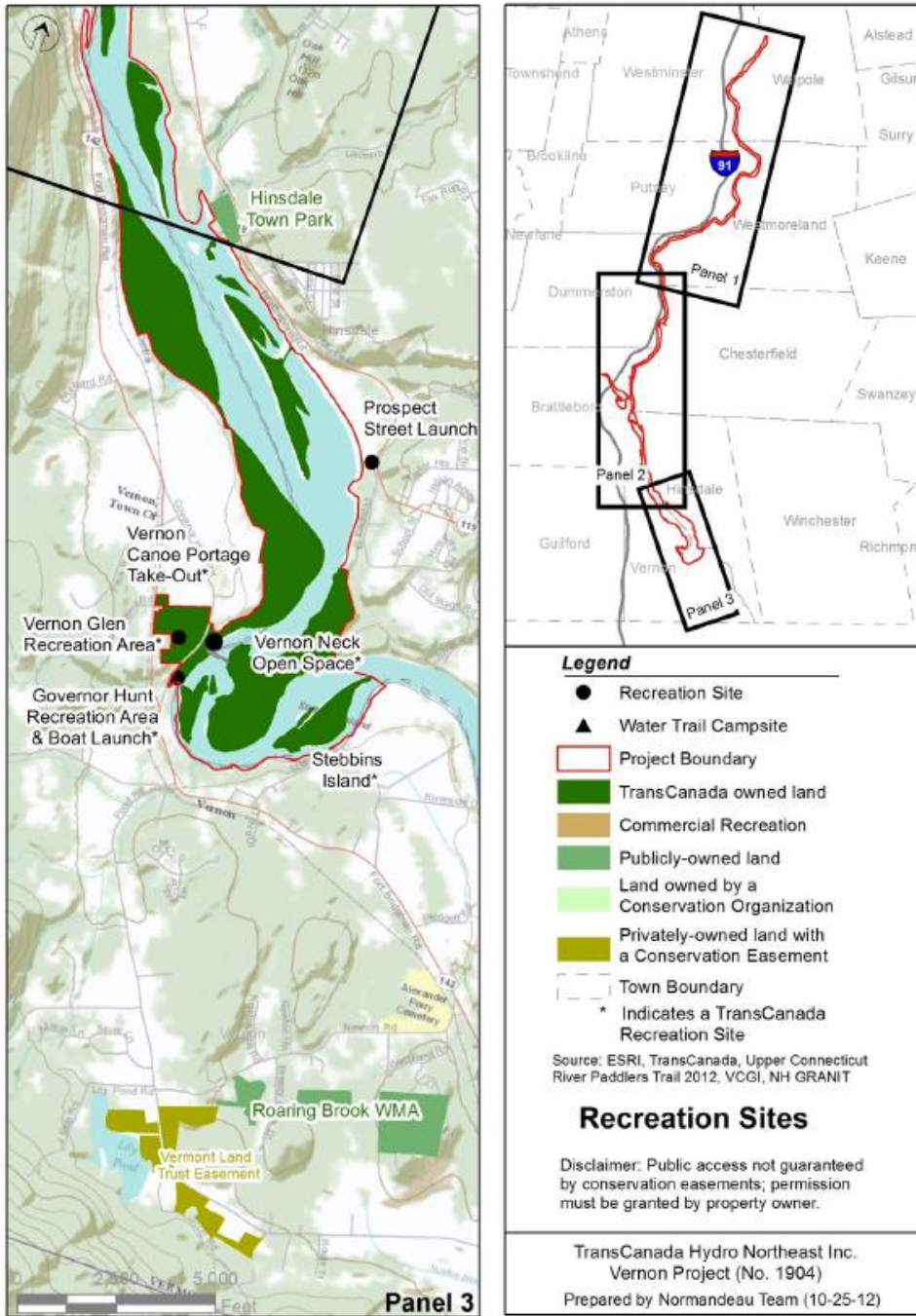


Figure 1. An image from the pre application document submitted to FERC as part of the ongoing relicensing process that depicts Vernon (TransCanada) owned lands. <https://www.greatriverhydro-relicensing.com/download/Documents/NOI%20and%20PAD/Vernon%20Project%20P-1904/10-30-12-Vernon-Project-Pre-Application%20Document.pdf>





Figure 2. Images taken during a maintenance drawdown in zone 2 that occurred May 2019.