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May 22, 2024

Honorable Debbie Anne Reese, Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Re: Wilder Dam Project No. 1892-030
Bellows Falls Project No. 1855-050
Vernon Dam Project No. 1904-078
**Comments on Great River Hydro accepted Amended Final License Applications in
response to FERC Notice soliciting comments**

Dear Secretary Reese,

The Connecticut River Watershed Council, Inc., doing business as the Connecticut River Conservancy (CRC), is a nonprofit citizen group established in 1952 to advocate for the protection, restoration, and sustainable use of the Connecticut River and its four-state watershed. We have been participating in the relicensing of these three hydropower facilities, along with the relicensing of the Northfield (P-2485) and Turners Falls (P-1889) facilities since the beginning of the process in late 2012.

We have reviewed the Amended Final License Application (hereafter AFLA) dated December 7, 2020, the Offer of Settlement Agreement dated August 2, 2022, the Revised Amended Final License Application dated June 6, 2023 (hereafter RAFLA) and the changes made to both the AFLA and RAFLA as a result of the response of Great River Hydro LLC (hereafter Great River Hydro or GRH) to additional information requests, which were dated March 29, 2021, June 24, 2021, and January 31, 2024. Our comments below encompass the information contained within these various application and information filings, collectively the final application package.

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Additionally, on May 22, 2024, CRC filed a Motion to Intervene in the relicensing proceedings for Great River Hydro Projects.

After reviewing all the materials comprising the accepted applications for the Vernon, Bellows Falls, and Wilder projects, CRC finds the applications to be deficient in addressing environmental and community concerns in multiple areas. Our greatest concerns are inadequate protection, mitigation, and enhancement measures addressing erosion, recreation, cultural and historic preservation, and fish passage. These and other concerns are detailed below along with CRC's recommendations for articles that should be included in the new license to address these concerns.

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I. PROJECT OPERATIONS CAUSE AND EXACERBATE EROSION AND MUST BE MITIGATED

RECOMMENDATION

FERC should require the applicant to develop a multi-decade Erosion Control Plan and Riverbank Monitoring Program as part of the license. These plans should:

- be in place within one year of license issuance,
- comprehensively track changes in riverbank erosion, erosion rates, and changes in sediment transport following the commencement of the desired operational changes under the new license,
- be planned and implemented in partnership with a Vermont or New Hampshire based academic research institution to have independent third-party expertise design the analysis and longitudinal study,
- contain adequate and rigorous data collection to enable determination of significant causes and changes in erosion and sediment transport,
- assess findings regularly within the license period, and contain measures to adjust operations accordingly within the license period to minimize bank erosion and maximize river function by mimicking the Connecticut River's pre-dam natural flow regime,
- contain mitigation measures if the data indicate Project operations are causing or exacerbating erosion, including but not limited to enhancement of bank stability and resilience utilizing best practice nature-based or bioengineering solutions; compensation to landowners for loss of land; and/or operational changes calculated to reduce erosion. If continuing or new adverse project impacts are found as a result of the monitoring program, mitigation must be initiated within a two-year period under the Erosion Control Plan.
- require yearly contributions towards mitigation which are benchmarked to company earnings.

Connecticut River Conservancy (CRC) has commented repeatedly on the inadequacy of the

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erosion studies conducted by the applicant. We strongly encourage the current FERC reviewers of the license application package to consider the comments filed over the course of the past 12 years regarding erosion issues and would draw your attention particularly to the entirety of our comments dated April 23, 2018, regarding the final erosion studies¹.

Based on the peer review and our own analysis, CRC believes that Studies 2-3: (1) were conducted in violation of the Revised Study Report (RSP) dated August 14, 2013, and approved with modifications from FERC on September 13, 2013; (2) did not follow several recommendations from FERC's Determination on Requests for Study Modifications and New Studies dated July 21, 2017; and (3) reached conclusions that the science, data or evidence do not support, most importantly, that project operations do not impact erosion, which is incorrect. FERC needs to address these violations and misinterpretations in ILP process by requiring monitoring and mitigation the new license.

Erosion continues to be widespread in the project area and worsens year by year. These issues were brought to the attention of FERC by a significant number of river citizens over 40 years ago during the last relicensing process and were not addressed at that time or since. The licenses for Wilder, Bellows Falls, and Vernon were issued in 1979, just months prior to the completion of the US Army Corps of Engineers (USACE) "*Connecticut River Streambank Erosion Study: Massachusetts, New Hampshire and Vermont*²". The 1979 FERC license for the Wilder facility stated:

"The New Hampshire Fish and Game Department recommended that NEPCO [New England Power Corporation, the previous owners of these dams] be required to stabilize bank conditions within the impoundment area. The Department contends that fluctuation of the reservoir level has caused serious bank erosion and resultant siltation in the Connecticut River. Intervenors including For Land's Sake, have also raised this issue. Over 100 protests to the issuance of a long-term license to NEPCO, prior to the completion of the US

¹ Accession Number 20180423-5180. Connecticut River Conservancy Comments on Great River Hydro, LLC Study Reports filed by February 9, 2018; Request for Study Modification to Require Compliance with the RSP.

² Simons, Daryl B. (1979) Connecticut River Streambank Erosion Study, Massachusetts, New Hampshire and Vermont. Technical Report: United States. Army. Corps of Engineers. New England Division. Available at <https://hdl.handle.net/11681/44641>

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Army Corps of Engineers Study have been received on the subject of erosion...³”

The 1979 licenses for Vernon⁴ and Bellows Falls⁵ contained similar language. Even though there was significant and widespread public outcry and concern, FERC stated: “In our order we denied For Land Sake’s motion that we not issue a license for the Wilder Project until the erosion study was complete⁶” and FERC chose to issue a license before receiving the final USACE report.

The USACE Erosion study clearly states in its Executive Summary that “[e]valuation of forces causing bank erosion verifies the relative importance of causative factors. In descending order of importance they are: shear stress (velocity), pool fluctuations, boat waves,...⁷” and specifically identified “limiting pool fluctuations associate with hydro development⁸” as one measure to take in controlling erosion. FERC stated in the license that “If the Corps’ report identifies erosion problems... we shall then entertain, on our own motion or the motion of others, the question of what mitigative measures might be appropriate⁹” yet, nothing was done to address the concerns of hundreds of people¹⁰ in the face of evidence that operations were one of the top three causes of erosion as determined at that time. FERC’s lack of action in 1979 must not be compounded during this next licensing period. As evidenced by the multiple

³ Accession Number 19791210-4000. 9 FERC P 61322 (F.E.R.C.), 1979. **1 Commission Opinions, Orders and Notices. New England Power Company. Project No. 1892. Order Issuing New License. December 10, 1979.

⁴ Accession Number 19790625-4000. 7 FERC P 61292 (F.E.R.C.), 1979. **1 Commission Opinions, Orders and Notices. New England Power Company. Project No. 1904. Order Issuing New License. June 25, 1979.

⁵ Accession Number 19790803-4000. 8 FERC P 61122 (F.E.R.C.), 1979 **1 Commission Opinions, Orders and Notices New England Power Company Project No. 1855 Order Issuing New License (Major) August 3, 1979

⁶ Accession Number 19791210-4000. 9 FERC P 61322 (F.E.R.C.), 1979. **1 Commission Opinions, Orders and Notices. New England Power Company. Project No. 1892. Order Issuing New License. December 10, 1979.

⁷ Simons, Daryl B. (1979) Connecticut River Streambank Erosion Study, Massachusetts, New Hampshire and Vermont. Technical Report: United States. Army. Corps of Engineers. New England Division. Page iv.

⁸ Ibid. Page v.

⁹ Accession Number 19791210-4000. 9 FERC P 61322 (F.E.R.C.), 1979. **1 Commission Opinions, Orders and Notices. New England Power Company. Project No. 1892. Order Issuing New License. December 10, 1979.

¹⁰ Simons, Daryl B. (1979) Connecticut River Streambank Erosion Study, Massachusetts, New Hampshire and Vermont. Technical Report: United States. Army. Corps of Engineers. New England Division. Page 2 of cover letter states, “During the entire study, considerable public concern was expressed regarding the erosion that is taking place along the banks of the Connecticut River. This concern resulted in a very active and successful public involvement program. The mailing list of those concerned grew to a total of 150. Eleven separate mailings over the course of the study included status reports, a review draft of the CSU contract, and a review draft of the final consultant report. A formal public hearing and seven public workshop meetings were held.”

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comments submitted over the past twelve years on the applicant's erosion studies¹¹, petitions passed at local town meetings¹², and comments on final application from stakeholders regarding concerns about erosion, it is imperative that FERC address the seriousness of erosion concerns in the project areas and compel the company to take responsibility for mitigating erosion.

Added to this ongoing multi-decade concern about existing operations, the applicant is proposing a major operational change from peaking to inflow equals outflow. While CRC is supportive of the change, it will likely create extensive changes in sediment dynamics over the coming license period. A naturally flowing river trends toward equilibrium between erosion, transport, and deposition, with erosive effects balanced by sediment inputs from upstream¹³. The presence of dams and control of flow interrupts these processes, with dams trapping sediment and starving downstream reaches. The new operational change may further destabilize any equilibrium that was potentially (however unlikely) reached over the last license term. While we are hopeful over time that the river may trend towards a more natural balance between erosion and aggradation, this cannot be a case where we just hope for the best and assume that the changes will be beneficial. Rather, FERC must ensure that license articles address the actual impact of changes to project operations on erosion and transport in real time, and not after the fact.

In the application, Great River Hydro goes to great length to describe the many types of bank instability, but essentially sums up the existing problem when it states that, "Taken together, the three bank stability types representing unstable banks represent 40 percent of the bank length through the three Project areas¹⁴." Almost half of the riverbanks in the project area are unstable and, we are now adding to that a major operational change.

¹¹ See Accession Number 20180322-0011, Accession Number 20180327-0014, Accession Number 20180424-0017, and Accession Number 20180423-0014 as examples.

¹² See Accession Number 20180314-0006 as an example.

¹³ e.g. Hoover Mackin, J. (1948). Concept of the graded river. *Geological Society of America Bulletin*, 59(5), 463-512.

¹⁴ Accession Number 20240131-5575. Revised Amended Final License Application, January 2024, Exhibit E. Page 3-65.

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The applicant goes on to explain that “Banks of the upper Wilder impoundment are composed (almost exclusively) of sand...¹⁵” and “loam and sand banks are also prevalent in the lower impoundment.”¹⁶ Given the nature of bank composition, it is no wonder that erosion rates are higher in that area and will likely be additionally impacted by changes in flows interacting with the already unstable banks. The loss of land due to current operations is significant to landowners who live along these areas. For example, a landowner in Claremont, NH (in the Bellows Falls impoundment) has property along the river which has eroded into a 40-foot-high steep bank and has asked CRC to help identify options for stabilizing the bank to protect their land (See Exhibit A, which is hereby incorporated by reference and appended hereto). Riverbank erosion is a widespread issue throughout the Project Area and appears to be primarily caused and exacerbated by dam operations, resulting in millions of dollars of property loss and restoration efforts.

Additionally, the application stated that, “The lower levels of erosion closer to the [Wilder] dam may be the result of *higher levels of armoring on the riverbanks* in the lower impoundment¹⁷” (emphasis added), indicating that the armored banks (ostensibly so badly impacted by erosion that they previously failed) are not even included as an unstable bank. CRC argues that hard armoring of banks is indicative of extreme erosional issues rather than the lack of them. While armoring has historically been used to stabilize highly eroded banks because it is easy to implement, by decreasing habitat complexity and increasing water velocity, riprap can ultimately transfer increased erosive forces downstream and exacerbate issues¹⁸. Armored banks themselves are not immune to failure and need maintenance. The presence of armoring, rather than demonstrating low erosion, is evidence of widespread and complex erosional issues

¹⁵ Ibid. Page 3-66.

¹⁶ Ibid.

¹⁷ Ibid. Page3-67.

¹⁸ See Reid, D., & Church, M. (2015). Geomorphic and ecological consequences of riprap placement in river systems. *JAWRA Journal of the American Water Resources Association*, 51(4), 1043-1059; Schmetterling, D. A., Clancy, C. G., & Brandt, T. M. (2001). Effects of riprap bank reinforcement on stream salmonids in the Western United States. *Fisheries*, 26(7).; and Fischenich, J. C. (2003). Effects of riprap on riverine and riparian ecosystems. Report, US Army Corps of Engineers.

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that continue to need to be addressed.

GRH states, “While the impoundment upstream of Wilder dam extends upstream to Haverhill, New Hampshire, and Newbury, Vermont, WSE [water surface elevation] fluctuations in the upper impoundment are more significantly impacted by inflows from upstream” and that “an analysis of georeferenced historical aerial photographs indicates that the rate of erosion has increased slightly at some locations in upper Wilder impoundment...¹⁹” To rectify the problem of accelerating erosion, two primary areas must be addressed: flow operations and effective riparian restoration to enhance riverbank resilience and habitat quality. Regarding dam operations, the CRC is in support of GRH’s new operational change to mitigate a number the erosion-causing changes to water surface elevation (i.e. minimizing hydro-peaking operations). However, GRH needs to explicitly address how the success of such operational changes will be impacted by upstream projects, which will continue to hydropeak.

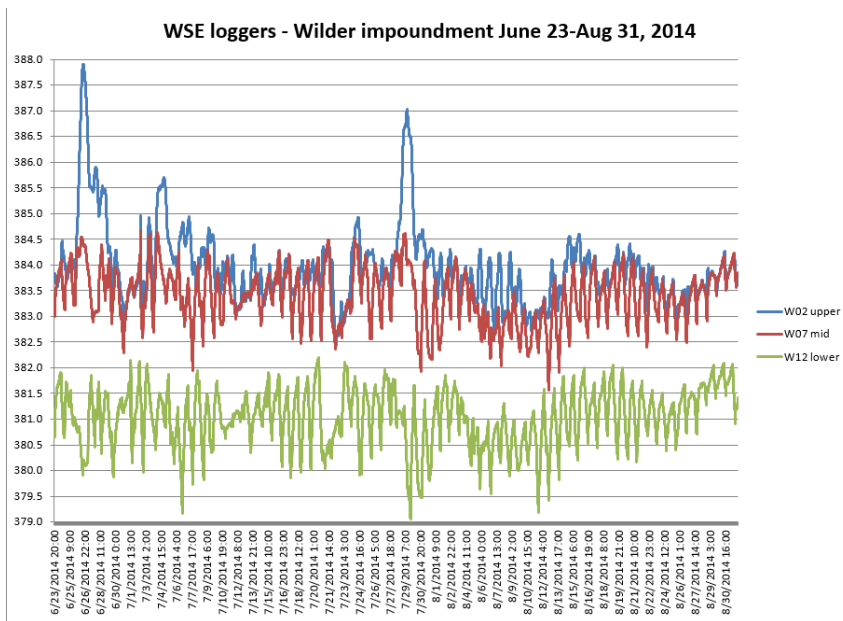


Figure 1: Water Surface Elevation as measured in the lower, middle, and upper Wilder impoundment in 2014, demonstrating peaking frequency as well as the higher water level and greater magnitude of fluctuation in relation to distance upstream from the dam.

¹⁹ Ibid. Page 3-68.

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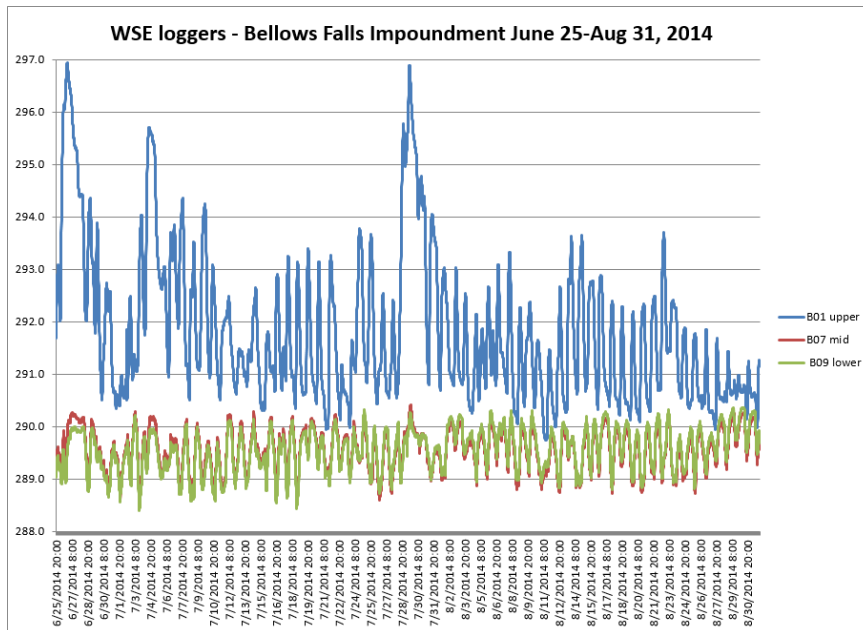


Figure 2: Surface water elevation changes at various distances above the Bellows Falls dam in 2014 showing pronounced differences in the magnitude of WSE caused by peaking between the lower and upper impoundment.

Figures 1 and 2 provide examples illustrating the difference between surface water elevation changes in the Wilder and Bellows Falls impoundment during current operations at different distances upstream of those dams. There are greater magnitude of surface water elevation changes in the upper ends of the impoundments due to a delayed wave flow effect, and not coincidentally, our members who are generally most concerned about loss of land live in these areas. Given that bank erosion is likely to continue, especially in the Wilder impoundment due to upstream operations, and that bank armoring and/or ignoring the issues has proved an ineffective and counterproductive strategy over the last 40-year license period, a new approach needs to be required in the upcoming license period. GRH contends, and CRC agrees, that the operational change should have a positive impact on potentially reducing erosion issues in the Bellows Falls and Vernon impoundments. However, given the specific influence of peaking flows from the Fifteen Miles Falls projects that impact the upper end of Wilder impoundment, GRH should evaluate and take responsibility for ongoing potential impacts of operation on the banks of the upper area of the Wilder impoundment. CRC has significant concerns about

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erosional impacts as a result of continued surface water elevation changes and river flow velocities in that area and asserts that FERC must ensure that license articles address the actual impacts on riverbank erosion and sediment transport as a result of changes to project operations over the next license in real time.

In previous license issuances, FERC has included requirements to address erosion concerns. For instance, for the Northfield Mountain Pumped Storage project (P-2485) and Turners Falls dam (P-1889), FERC issued an order requiring the development of an Erosion Control Plan, the final version of which was submitted on June 23, 1999²⁰. In their Plan, then Western MA Electric Company states,

Article 20 of FERC License No. 2485 states that, "The Licensee shall be responsible for and shall minimize soil erosion and siltation on lands adjacent to the stream resulting from construction and operation of the project." Article 19 under FERC License No. 1889 states that, "in the construction, maintenance, or operation of the project, the Licensee shall be responsible, and shall take reasonable measures to prevent soil-erosion on lands adjacent to streams.... Article 20 of License 2485 goes on to say that the Commission (FERC) "may order the licensee to construct and maintain such preventive works to accomplish this purpose and to revegetate exposed soil surface as the Commission may find to be necessary after notice and opportunity for hearing."²¹

This Plan established a process for baseline assessment of stream banks, criteria for prioritizing erosion sites based on risk factors, plans for stabilizing the highest priority erosion sites, monitoring of restoration sites, consultation with a third-party erosion committee to function as an advisory group to plan needed restoration work, and a process for repeating assessment of riverbanks periodically on a 3 to 5 year interval over the course of the license in order to update the prioritized list of sites to be repaired.

Similarly, FERC ordered Puget Sound Energy to develop a Reservoir Shoreline Erosion Control Management Plan, pursuant to Article 409 and the Settlement Agreement Article 110 of the

²⁰ Accession Number 19990623-0251. Erosion Control Plan for the Turners Falls Pool of the Connecticut River. Simon & Associates, Inc. Western Massachusetts Electric

²¹ Ibid. Page 2.

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license for the Baker River Project No. 2150²². At a minimum this type of monitoring and reporting makes data transparent and publicly available for assessment and oversight and gives communities agency to address their concerns regarding erosion. These examples of erosion control plans both within and outside of the Connecticut River watershed provide precedent allowing FERC to compel the applicant to monitor and mitigate erosion issues through a license article. FERC needs to do this in the current proceedings.

It would be irresponsible of FERC to issue a new license without requiring an independent analysis or ground truthing of the actual effects of water surface elevation changes at the upper end of the Wilder impoundment under the new operational scenario. In addition to this specific concern, GRH should be required to develop a multi-decade longitudinal study in all of the impoundments to monitor changes in sediment transport, erosion rates, and erosive forces that will impact the stability of the river and riverbanks due to the new operational change. The magnitude of this change in operation requires an adaptive management process to monitor and respond to potential issues that may arise. This process should include periodic reporting, third-party verification, and, most importantly an action plan to immediately mitigate any impacts to water quality or private property that may result from the operational change. This mitigation for erosion should embrace nature-based bioengineering solutions that mirror natural riparian environments in order to enhance bank resilience and stability (with co-benefits for habitat enhancement) over hard armoring, which will only transfer the issue downstream. Numerous community members have promoted the idea of a fund with yearly contributions from GRH that could be utilized for mitigation efforts. This is only one example of how bank stability in the face of erosion caused by project operations could be enacted. CRC cannot stress enough how important it is for FERC to address the impact of Project operations on erosion issues in this license proceeding, particularly after failing to take action in the past despite direct evidence of operations causing and exacerbating erosion problems.

²² Accession Number 20081017-3024. 125 FERC ¶ 62,064 (F.E.R.C.), 2008. Puget Sound Energy, Inc. Proj. Nos P-2150-033, -27. Order on offer of settlement, Issuing new license, and dismissing amendment application as moot. (October 17, 2008)

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II. RECREATIONAL FEATURES ARE INADEQUATE AND MUST BE IMPROVED WITH PUBLIC INPUT

RECOMMENDATION:

FERC should require the applicant to develop a comprehensive Recreation Plan within 3 years of license issuance that provides enhanced recreation in the entire 126 collective miles of the project areas between Vernon and Wilder dams. This Recreation Plan should be developed with significant public input from all thirty communities along the river between the border of Massachusetts and Newbury, VT/Haverhill, NH. In addition to collaborative stakeholder discussions and public meetings, FERC should require at least one formal public comment period for the public to respond to the draft Recreation Plan.

This Recreation Plan should include:

- substantial capital and annual operating investments in recreation facilities, programs, and public access that are benchmarked to annual revenue and energy generation as well as indexed for inflation,
- establishment and support of a stakeholder's advisory committee to provide regular input and oversight on the implementation of recreation, education, and land management obligations of the project owners,
- significant increases to the percentage of land within each project area that is accessible to the public and land acquisition to expand the recreational offerings,
- increases in the number of boat launch and access facilities as well as river accessible camping sites,
- addition of state-of-the-art ADA accessible facilities,
- significant improvements to all portages, including a walkable portage for the Bellows Falls dam,

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- maintenance of all recreational facilities in optimal condition throughout the license term,
- conservation easements on all project lands not explicitly associated with operation of facilities,
- improvements to fish viewing facilities and programs, and creation of public information notification and education about fish passage counts,
- creation of new educational programs and facilities to interpret the history and archeological resources of the project areas,
- improvements to public notification systems to provide real time river flow and condition information for river users,
- funding to support the operations of the Connecticut River Paddlers' Trail,
- scheduled releases to accommodate whitewater boaters,
- comprehensive management of terrestrial and aquatic invasive species.
- removal of the low head dam in the Bellows Falls bypass reach,
- funding for the development and implementation of a coordinated marketing plan for the recreational opportunities of the Connecticut River,

A. The Application Is Badly Flawed

Great River Hydro's application is deficient based on FERC's faulty Integrated Licensing Process (ILP). Had GRH proposed any real protection, mitigation, and enhancement measures (PMEs) in the Preliminary License Proposal (PLP) there would have been public input and reasonable recommendations for more robust and appropriate PMEs for recreation in the final application. As evidenced by the lack of PMEs proposed in the AFLA, RAFLA, and AIR responses, GRH is still refusing to provide adequate mitigation measures that should have been included in 2017 when they submitted their PLP. In this regard, the application is deficient because GRH is in fact providing the status quo of what they currently provide for recreation. There are in fact no new

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PMEs for recreation to be found in the application, which is unacceptable for a new license.

In addition to this, the applicant is proposing significant operational changes. While we support these operational changes, they were not included in a draft application, which would have enabled time to comprehensively analyze impacts of the changes on boating flows. As a result, the AFLA is lacking in important detailed analysis needed to fully consider impacts to recreation in the NEPA process. This omission violates, compounds prior violations of, and undermines the ILP.

Additionally, GRH's application is in direct conflict with their responses to FERC's January 14, 2021, request for additional information²³. In their application, GRH states,

"3.9.2.2 Great River Hydro Proposal Great River Hydro is not proposing any changes to existing recreation access areas, portage trails or access into the Bellows Falls bypassed reach (portage or whitewater boating) and as such, effects to these resources will be the *same as those described under the no-action alternative [emphasis added]*. Great River Hydro proposes to incorporate into their respective Projects three canoe campsites, currently non-project recreation areas on Great River Hydro fee-land; Lower Meadow Campsite in Charlestown NH (Bellows Falls Project); Wantastiquet-Hinsdale canoe rest area in North Hinsdale, and Stebbins Island in Hinsdale New Hampshire (Vernon Project).²⁴"

Yet, in the excel files provided in their response to AIR requesting revised Exhibit D Tables for the three projects specifying environmental measures, the cost for each, and timing²⁵ they contemplate \$737,000 (Wilder), \$941,000 (Bellows Falls), and \$665,000 (Vernon) in improvements to specific current recreational facilities over the coming 40 years. There is no narrative or explanation to define details of what these improvements will entail – either in the March 29 response to AIR or in the RAFLA. The improvements listed in Tables D-1 are limited to

²³ Accession Number 20210114-3047 Letter informing Great River Hydro, LLC that the license application is deficient and requesting additional information within 60 days for the Wilder Hydroelectric Project et al under P-1892 et al.

²⁴ Accession Number 20240131-5575. Revised Amended Final License Application, January 2024, Exhibit E. Page 3-589.

²⁵ Accession Number 20210330-5038. Great River Hydro, LLC submits revised responses to additional information requests issued 01/14/2021 under P-1855 et al.

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minor enhancements to existing recreational amenities. Moreover, GRH ignores the results of their own studies that clearly indicate the need for additional recreational amenities²⁶ throughout the project area(s).

GRH states that it “will continue to manage its existing Recreation facilities and enhance them as needed to address demands and use²⁷.” This does not mitigate impacts on recreation under this new license and does not provide for any mechanism to understand increases in demand or use. With the absence of the previous required Form 80, there is no mechanism that requires GRH to consider needed upgrades over the course of the license or for the public to understand ongoing support of recreational amenities. GRH cannot rely on the recreation amenities required of them because of the 1979 license to address current impacts to recreation or those that will continue to exist over the next 30 to 50 years.

B. FERC Must Require a Recreation Plan

The applicant has not included a Recreation Plan as part of their license application. Instead, GRH is relying on FERC’s previous careless handling of the ILP process and an inadequate post-license requirement for a Recreation Plan. This again deprives the public of its opportunity to comprehensively participate in the ILP process. FERC’s own guidance suggests that “the best way to fully evaluate a project’s recreation resources is to develop a comprehensive plan²⁸.” With the absence of a proposed recreation plan, it is incumbent upon FERC (even at this late hour) to require that GRH develop a comprehensive Recreation Plan that specifically outlines considerations for anticipating and responding to additional recreational needs in the project areas over the next 30 to 50 years. This plan should be in place within three years of license issuance and should require extensive community engagement and at least one formal comment period to FERC.

²⁶ Accession Number 20160301-5331 TransCanada Hydro Northeast Inc. ILP Study 30 Recreation Facility Inventory. Use and Needs Assessment Study Report. Prepared by Louis Berger and Normandeau Associates, Inc. March 1, 2016. Page 240.

²⁷ Accession Number 20201207-5221. Amended Final License Applications of Great River Hydro, LLC for Bellows Falls Project, et. al. under P-1855 et. al. Exhibit D. Page D-2.

²⁸ Recreation Development at Licensed Hydropower Projects: Division of Project Compliance and Administration, Office of Hydropower Licensing, Federal Energy Regulatory Commission, Washington DC. March 1996. Page 12.

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C. FERC Should Require a Stakeholder Public Advisory & Oversight Committee

As Great River Hydro has ongoing and future recreation and educational obligations to the public, there should be a regular and structured opportunity for the public to gauge implementation of these requirements. Local governments and NGOs can and should be named to a recreational management committee responsible for advising the licensee on how to implement mitigation measures required under the license²⁹.

This is particularly important now that FERC has eliminated the minimal reporting requirements (Form 80) on recreational expenditures and the extent of public access. A public advisory committee would be responsible for engaging with the recreation, education, and land management staff across their holdings within the Connecticut River watershed. For example, CRC was a signatory to the 2003 Settlement Agreement for the Holyoke Dam license. Twenty years into this agreement, Holyoke Gas & Electric has been meeting with recreation stakeholders every other year to evaluate and resolve ongoing issues.

Additionally, GRH should be required to develop a Recreation Report which would inform periodic updates to the Recreation Plan³⁰. This report should include company expenses on recreation programs for each project, user numbers, and the amount of shoreline publicly accessible. We recommend that it be filed every 5 years to inform Vermont and New Hampshire of recreational trends in the project areas.

D. FERC Should Require Improved Marketing of the Connecticut River and its Recreational Amenities

²⁹ See, e.g., Duke Energy Progress, Inc., 151 FERC ¶ 62,004, 64044 (Apr. 1, 2015) (“The Recreation Plan must be developed after consultation with the U.S. Fish and Wildlife Service, North Carolina Wildlife Resources Commission, North Carolina Division of Parks and Recreation, the City of Rockingham, North Carolina, and Anson, Montgomery, and Stanly Counties, North Carolina.”)

³⁰ See 177 FERC ¶ 62,138. Order Modifying and Approving Recreation Management Plan. Village of Lyndonville Electric Department, which states, “The licensee will also update the recreation plan at intervals not exceeding ten years or provide a written statement indicating that there is no need to update the facilities or otherwise modify the recreation plan.”

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CRC's survey results and results from Great River Hydro's Study 30 indicate that many access sites in the project area are under-utilized in general. Most of the sites are used primarily by local citizens. On average, 30% of respondents of CRC's Recreation Survey³¹ indicated that they "didn't know" that many of the recreation sites included in the study even existed.

Additionally, Great River Hydro's Final Report for Study 30³² indicates that for the Wilder Project area:

"Public boat launch facilities at Newbury-Haverhill Bridge, Bedell Bridge State Park, Bugbee Landing, North Thetford Landing, Ompompanoosuc Boat Launch, Norwich Landing, East Wilder Boat Launch, Two Rivers Park and Lebanon Public Boat Launch, and Ottaquechee Boat Launch were well below capacity on average during the peak season."

For the Bellows Falls Project area:

"Public boat launch facilities within these two sites were well below capacity for most of the year while spot counts of the Herrick's Cove Boat Launch and Picnic Area during the peak season weekends counted an average of 15 vehicles, well below the site's capacity."

Many of the recreational access sites are found at the end of rutted dirt roads with little or no signage. Our experience with members of the public who call from out of state indicates that they have difficulty finding information on the internet to help them understand where they can park long-term or leave a canoe or kayak trailer to put in for multi-day river trips.

Additionally, when they come to badly maintained and badly marked access sites, they think they are trespassing. This reality is reflected in the numerous survey responses that indicate that additional signage is needed at specific access sites. We expect this to change as licensees need to comply with the updated regulations for signage promulgated in late 2018³³.

Nonetheless, FERC must explicitly require adequate signage, installed within a reasonable

³¹ Accession Number 20181024-5050. ILP Comments of Connecticut River Watershed Council under P-1892. regarding Study 30 Recreation.

³² Accession Number 20160301-5331. TransCanada Hydro Northeast Inc. ILP Study 30 Recreation Facility Inventory. Use and Needs Assessment Study Report. Prepared by Louis Berger and Normandeau Associates, Inc. March 1, 2016. Page 240.

³³ 18 CFR § 8.2 - Posting of project lands as to recreational use and availability of information.

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amount of time.

GRH should be required to allocate a stable amount of funding each year, beginning in the first year of the new license, increasing with the rate of inflation through the life of the license, to develop and implement targeted marketing to promote recreational opportunities in the Connecticut River valley. The state of Vermont created the Vermont Outdoor Recreation Economic Collaborative (VOREC) with a mandate to increase economic development of recreational assets in the state. To encourage recreational money to come to the watershed and support our rural local economies, these access areas need to be advertised and clearly marked and marketed. Local businesses and communities stand to gain if a more thorough, appropriately scaled, and consistent marketing effort were launched and maintained. This would be an important ancillary opportunity for GRH and local businesses to increase their public exposure.

E. The Public Needs New and Formalized Access Sites

Surveys, interviews, and public meetings held by Great River Hydro as well as CRC and Appalachian Mountain Club (AMC), show that the public is keen to have more locations at which to launch boats and spend time camping. The conclusions to GRH Recreation Study (Study 30) state, that:

“these users continued to make recommendations such as a need for **more boat ramps and launches** river access for shoreline fishing, parks (picnic tables and benches), and walking trails... **more bank angling opportunities** within existing sites, adding walking and hiking trails along the riverbank wherever possible, and adding more motorboat launch facilities. **New motor boat launch facilities were specifically recommended below Wilder dam and Bellows Falls dam** due to the combination of limited number of access sites in these reaches and the demand for fishing. **Additional primitive camping locations for users along the Connecticut River Paddlers’ Trail downstream of Wilder dam were also recommended**³⁴.” [emphases added].

³⁴ Accession Number 20160301-5331. TransCanada Hydro Northeast Inc. ILP Study 30 Recreation Facility Inventory. Use and Needs Assessment Study Report. Prepared by Louis Berger and Normandeau Associates, Inc. March 1, 2016. Page 240.

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Additionally, there were multiple comments from CRC and AMC's survey³⁵ that an additional motorboat access site on the NH side between the Bellows Falls Dam and Westmoreland is needed. Right now, the only motorboat access to the river is at Norm's Marina in Hinsdale, or from the VT side in Putney/ Dummerston. There were multiple requests for additional access sites in the Hanover/ Norwich to White River Junction area as well.

Despite the clear public request for **more** recreational amenities, GRH has not proposed developing any additional recreational amenities in its application. Under section 2.1 of the AFLA, GRH provides the acreage available for outdoor use as well as additional acreage of fee ownership lands. The company owns significant land; as an example, in the Vernon project area, it owns 287 acres of land, 34 of which are for recreational use, and 223 acres of which are forested³⁶. Stakeholders have clearly stated a desire for additional recreational infrastructure. Moreover, by utilizing a Public Trust for profit, GRH has a responsibility to ensure the public can also continue to access and utilize the resource that belongs to all of us but is managed by a private company. GRH must present a plan for how additional recreational assets throughout their landholdings and the towns adjacent to the projects can be developed. New access points and campsites should be added on land already owned by GRH and additional property should be purchased to ensure equitable increased access across the project area(s).

F. FERC Should Expand the Project Area for Mitigation Measures

Because of the number of miles of shoreline and the number of towns in and adjacent to the Project Area, GRH has multiple options to provide for mitigation of the hydro facilities' impacts to recreation. CRC asserts that mitigation of project impacts is not limited by the project boundary. If needed, the project boundary can be adjusted to accommodate mitigation requirements. CRC believes that the scale and scope of project impacts necessitates comprehensive increases in recreation amenities throughout the 126 miles of river affected by

³⁵ Accession Number 20181024-5050. ILP Comments of Connecticut River Watershed Council under P-1892. regarding Study 30 Recreation

³⁶ Accession Number 20240131-5575. Revised Amended Final License Application, January 2024, Exhibit E. Page 2-19.

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project operations. As noted above, GRH should be directed to identify additional properties for purchase to develop additional boat access and other recreational sites³⁷ and the project boundary should be expanded to include those.

GRH indicates in Table 3.9-8. Bellows Falls Project recreation sites and facilities³⁸ that the portage put-in is located below Bellows Falls dam on land owned by the Town of Walpole, NH, outside the Project boundary. GRH should apply to change the project boundary to include this recreation access site. The Division of Hydropower Administration & Compliance Handbook confirms that:

“Occasionally, lands outside a project boundary must be used to serve a particular project need or to satisfy a particular license requirement. In most of these cases, the licensee must apply for a change to the project boundary to add those lands to the project and bring the lands into the project boundary³⁹.”

The definition of the project boundary affects not only recreation considerations, but also erosion, invasive species, cultural and historic resources, and other concerns. See the section below for additional comments for changes to project area boundaries under this licensing application.

G. FERC Must Require Timely Improvements to Portages

It is not clear what PME's are being proposed by GRH for the portage trails. In the application they indicate that they are not making any improvements and that the “effects to these resources will be the same as those described under the no-action alternative⁴⁰,” yet in their response to AIR dated March 29, 2021, they seem to provide estimates for upgrades such as installation of boat slides, and improvements to trails⁴¹.

³⁷ See City of Seattle, Washington, 26 FERC ¶ 61406, 61906 (1984) where FERC required off project site recreation facilities.

³⁸ Accession Number 20240131-5575. Revised Amended Final License Application, January 2024, Exhibit E. Page 3-548.

³⁹ FERC. Division of Hydropower Administration & Compliance. Compliance Handbook. Office of Energy Projects. 2015. Page 19.

⁴⁰ Accession Number 20240131-5575. Revised Amended Final License Application, January 2024, Exhibit E. Page 3-589.

⁴¹ Accession Number 20210330-5038. Great River Hydro. Response to License Application Additional Information Requests. Dated March 29, 2021. Table D-1 for each project.

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All three portage trails need significant improvements to make them usable. While GRH's Recreation Study focused on infrastructure issues at the portage trail put-in and take-out locations, it did not ask specific questions to ascertain user perception of portage trail usefulness when considering a through paddle⁴². CRC and AMC surveyed river users and heard consistent responses that indicated that the portages are so bad that most people would not bother attempting a through paddle.⁴³

Under FirstLight's previous license for the Turners Falls dam in MA, that company provided a shuttle service to pick up through paddlers to mitigate the obstacle to navigation. Where direct improvements or shorter portage routes are not possible, GRH should be required to at least implement an alternative such as this for all projects in their next license and ensure that users know that this option is available.

All portages should be as short as possible and should be clearly marked with consistent and clear signs, such as those that have the symbol of the person carrying a canoe, and a Paddlers' Trail medallion, placed at intervals so that signs are always in sight during the portage. The clearest, shortest, and most direct route should be determined for each portage and a maintenance plan developed for each to ensure that it is always safely usable. While we are asking for a comprehensive Recreation Plan to be developed within 3 years of license issuance, upgrades to existing portages should begin immediately.

The Wilder portage needs to be generally improved and maintained. Steps at the take-out need to be repaired, improvements to parking area, additional signage, and safer cleared path to put-in area. The put-in area is not ideal because it forces paddlers to put-into the downstream flow of river coming from the dam.

⁴² Accession Number 20160301-5331. TransCanada Hydro Northeast Inc. ILP Study 30 Recreation Facility Inventory. Use and Needs Assessment Study Report. Prepared by Louis Berger and Normandeau Associates, Inc. March 1, 2016. See Appendices B and D.

⁴³ Accession Number 20181024-5050. ILP Comments of Connecticut River Watershed Council under P-1892. regarding Study 30 Recreation.

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The Bellows Falls portage is a difficult and lengthy portage. Great River Hydro should explore all possible options for improving this portage, including the preferred option of a walkable portage. One alternative that they have dismissed would be for the portage take-out to be relocated just upriver of the Rte 12/Arch Bridge, with the portage trail over the bridge, through town and down Mill Street. This would also enable additional economic support for downtown businesses in Bellows Falls. Another option is an on-call shuttle service, which GRH appears to be considering, based on information provided in their response to AIRs. This shuttle should be implemented immediately.

The area above the Vernon dam needs to be cleared of logs to maintain open access to the take-out on river right. Either the implementation of a trash boom or the relocation of the portage take-out should be utilized to facilitate this.

These are some examples of specific upgrades to the portages that have been identified over the past twelve years and that can be implemented immediately. A comprehensive Recreation Plan should include more involved upgrades to portages to support expanded use of the Connecticut River Paddlers Trail and subsequent increases in the recreation economy of river towns.

H. FERC Should Require the Applicant to Provide Easily Accessible Public Information on River Flow and Conditions

Information on recreational facilities or educational programming run by GRH should be readily available to the public. There is minimal information provided on the Great River Hydro website to help the public be aware of campsites, access points, portage routes, or a contact person for any inquiries or concerns.

Project owners have access to real time information about flows being released from their facilities. There is no reason that the notification system can't make real time information

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available electronically to ensure that river users have realistic expectations and an understanding of current and expected near-future river conditions. Additionally, emergency first responders have indicated that this kind of real time data would benefit them during high flow events. Relatedly, public members have noted “safety concerns at Sumner Falls when water rises quickly due to release for generation and the public is unaware of the threat of danger. Definitely needs a warning device - perhaps activated at Wilder at time of release, especially during periods of highest recreational activities⁴⁴.” The need for release warnings will still be necessary under the anticipated operational change, and information and warnings should be as easily accessible and understandable as possible for public safety.

The current Waterline website that provides information is antiquated and sorely needs to be updated or scrapped for a better tool. With the advent of smartphones and text messaging, we have the technology to provide real-time instantaneous information about flows to the public. This notification system should also include access to historic flow data to understand what may have been happening with flows after the fact. Additionally, to accommodate whitewater boaters who will be planning river trips based on flow information, flow data should also include anticipated changes to discharge rates up to 8 hours in advance.

I. FERC Should Require Facilities that Comply with the Americans with Disabilities Act

Great River Hydro should offer recreational amenities to people of all abilities. GRH proposes limited enhancements to increase accessibility to persons with disabilities in their response to AIRs, mostly focused on parking and picnic areas. CRC and AMC recommended that GRH establish ADA-compliant access for people with disabilities at as many licensee recreation locations as possible. GRH has not addressed this need in their AFLA.

According to FERC’s licensing handbook, “Titles II and III of the ADA apply to licensee’s

⁴⁴ Quote from the Basin 10 survey for the Tactical Basin Planning process, “Q: Please describe the surface waters or areas of specific concern in relation to surface waters in the Basin. A: safety concerns at Sumner Falls when water rises quickly due to release for generation and the public is unaware of the threat of danger. Definitely needs an warning device - perhaps activated at Wilder at time of release, especially during periods of highest recreational activities.” (Marie Caduto via email on 12/14/2022)

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recreation facilities. This law required public and private entities which have public accommodations to be accessible to persons with disabilities... and new recreational facilities and access areas at hydropower projects must comply with the requirements of the ADA⁴⁵.”

Tables D-1 in the March 29, 2021, response to AIRs⁴⁶ show Wilder, Bellows Falls, and Vernon budget allocations to improve ADA compliance and accessibility. However, there needs to be a comprehensive plan for each project that goes beyond the minimum requirements for outdoor environments. While access is mandated, the current guidelines of the ADA are not at the level needed to truly give outdoor freedom to Americans with disabilities. GRH should find a third-party group with the experience and drive to create exceptional recreation opportunities for the disability/adaptive community to provide state of the art access facilities. Because of the expertise required to create inclusive outdoor recreation, GRH should form a committee consisting of either experts or representatives from the disability/adaptive recreation community or allow a third-party to create a detailed ADA plan. The combination of experience and knowledge will make truly accessible and inclusive improvements to the Wilder, Bellows Falls, and Vernon projects possible.

A recent example of ADA-accessible recreational amenity can be found just downstream of the Holyoke Dam, where Holyoke Gas & Electric established a wheelchair-accessible bank fishing location as part of its license requirements (“Slim Shad Point”). Additional good examples of ADA-compliant facility improvements are campgrounds and amenities such as those at John Dillon Park on Tupper Lake in NY⁴⁷. This and more is the level of ADA accessibility that we expect under the next license.

With the creation of ADA accessible outdoor recreation areas often comes an increase in tourism from the disability/adaptive recreation community. There is a lack of available outdoor

⁴⁵ Handbook For Hydroelectric Project Licensing and 5 MW Exemptions from Licensing. Federal Energy Regulatory Commission. Washington DC. April 2004. Page B-3

⁴⁶ Accession Number 20210330-5038. Great River Hydro. Response to License Application Additional Information Requests. Dated March 29, 2021. Table D-1 for each project.

⁴⁷ <https://www.adirondackexperience.com/campgrounds/john-dillon-park>

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recreation that the ADA community can take part in throughout the United States. Accessible trails and accessible spaces become destinations and draw those with mobility differences. If GRH dedicates time and funding to creating accessible recreation destinations, people will travel to these locations to use the recreation facilities and increase tourism to the area. With this relicensing, there is a huge opportunity to create inclusive outdoor recreation opportunities for a group that has been largely ignored.

J. FERC Should Provide for Whitewater Flows

GRH was required to study whitewater flows⁴⁸ at both Sumners Falls and in the Bellows Falls bypassed reach. The minimum acceptable flows for whitewater in Sumners Falls are 3,500 cfs and the best whitewater boating flows occur at between 5,000 to 13,000 cfs. For Bellows Falls, adequate whitewater boating flows occurred at 1,580 cfs, while optimal flows occurred between 2,500 and 5,000 cfs.

Sumners Falls has been an important whitewater destination under the current license. GRH indicates that, “boating opportunities at the preferred levels for the 2 primary play spots at Sumner Falls occur regularly under current Project operations during the summer-fall daylight hours,” and that “the Main Wave (or Summer Wave as it is known locally) is the preferred feature because of its shape and consistency, and its good eddy service (a hydraulic feature boaters can use to easily paddle upstream close to the rapid). Main Wave is so named because this is the primary feature when river flow is approximately 3,800 cfs to 5,000 cfs.... The name also refers to its consistency and the fact that other local rivers or streams in relative proximity to the Connecticut River often do not have enough water for boaters to play during summer in the absence of substantial precipitation⁴⁹.”

While CRC was a participant in negotiations that resulted in the proposed operational change,

⁴⁸ Accession Number 20160301-5331. Transcanada Hydro Northeast, Inc ILP Study 31 Whitewater Boating Flow Assessment – Bellows Falls and Sumner Falls. Study Report. March 1, 2016.

⁴⁹ Accession Number 20240131-5575. Revised Amended Final License Application, January 2024, Exhibit E. Page 3-575.

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and we are supportive of the operational change for the positive effects it will have on aquatic habitat and flows, we have concerns that the proposed changes will reduce boatable flows for whitewater enthusiasts on the river. Given that the proposed changes to operation were proposed so late in the ILP process and were not evaluated for impacts through formal studies, GRH should be required to provide some detailed analysis to illustrate when and how proposed changes to operation may provide appropriate whitewater flows, and to develop a plan to schedule their flexible operations, within the confines of the operational agreement, during the summer and early fall to accommodate whitewater flows. Alternately, GRH can identify a process for timing passage of peaking flows from the Fifteen Mile Falls project through the Wilder project to enable scheduled whitewater flows at Sumners Falls, and subsequently at the Bellows Falls bypass reach.

As mentioned in our comments in response to the Fish Passage Settlement agreement and in these comments on the REA, GRH should be responsible for removing the low-head dam in the Bellows Falls bypass reach that was installed to prevent Atlantic salmon from entering the dewatered river during the previous license. In addition to being important for accessing habitat in the bypass reach, the removal of this dam is important for increased safety for whitewater boaters who may use this reach of river to experience the unique whitewater waves created in larger flows. The barrier dam currently serves no purpose, is a hazard to navigation, and should be required to be removed by the applicant before the installation of the proposed Natel low flow turbine at the dam.

K. FERC Should Require Applicant to Support the Connecticut River Paddlers' Trail

As GRH describes, "The Connecticut River Paddlers' Trail is a regional resource for multi-day canoe/kayak trips along the Connecticut River. It extends along the length of the Connecticut River in Vermont and New Hampshire and offers visitors a series of access points and primitive campsites⁵⁰." GRH also indicates that they will, "[i]ncorporate into their respective Projects

⁵⁰ Accession Number 20240131-5575. Revised Amended Final License Application, January 2024, Exhibit E. page 3-527.

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three canoe campsites, currently non-project recreation areas on Great River Hydro fee-land; Lower Meadow Campsite in Charlestown NH (Bellows Falls Project); Wantastiquet-Hinsdale canoe rest area in North Hinsdale, and Stebbins Island in Hinsdale New Hampshire (Vernon Project)⁵¹.” The applicant has been maintaining these three campsites for several years, and while we are supportive of this addition to the formal in-project recreational assets, this amounts to essentially no additional recreational camping. GRH is offering to maintain the status quo. CRC asserts that GRH must also maintain and improve the campsite currently maintained by the Vermont River Conservancy and other volunteers on Gilman Island, on land owned by GRH⁵².

A goal of the Connecticut River Paddlers’ Trail is to have campsites every 3-5 miles. The applicant provides tables of existing recreation amenities at various river miles in each project area that shows existing Paddlers’ Trail Campsites at specific river miles⁵³. To reach the goal of expanding the Connecticut River Paddlers’ Trail, five additional campsites should be added in the Wilder project area; three additional campsites should be added in the Bellows Falls project area, and four additional campsites should be added to the Vernon project area.

GRH does not address the sections of river between their defined project boundaries even though they are controlling the flow of the river in these areas between projects. When you consider these “non-project” stretches of river, at least one additional campsite could be added between the Vernon and Bellows Falls project areas, and two or three could be added between the Bellows Falls and Wilder project areas. GRH should provide financial assistance to develop additional Paddler’s Trail campsites in high use areas of the river or where there are stretches longer than 5 miles without a site (for example, between the Windyhurst and the Wantastiquet campsites). GRH should be required to identify additional land to purchase or to enter into

⁵¹ Ibid. page 2-33.

⁵² See: Accession Number 20201207-5219. Amended Final Application for New License for Major Water Power Project — Existing Dam. December 2020. Wilder Project (FERC No. 1892). Exhibit G. Sheet 3.

⁵³ Accession Number 20240131-5575. Revised Amended Final License Application, January 2024, Exhibit E. See Table 3.9-1 on page 3-528; Table 3.9-7 on page 3-547; and 3.9-13 on page 3-561 showing Public Recreation Areas at each project.

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cooperative agreements with landowners to develop additional primitive campsites.

Additionally, all campsites currently owned by GRH should allow overnight camping or parking at their facilities to enable use of the Paddler's Trail.

L. FERC Should Require Financial Support for Access if it Allows Limitations to Access for Safety

Reasons

GRH extends its reach to limit access to the river from a safety standpoint, but does not similarly provide consistent support for recreational access or activities in the same areas under non-emergency conditions. A recent example of this is illustrated by the flooding that occurred in July of 2023. GRH (rightly) put signs up at many of the *privately owned* boat ramps to dissuade boaters and others from using the river, essentially controlling access to the river for safety reasons. However, simultaneously Great River Hydro does not support these private landowners with any resources for managing or maintaining those boat ramps when the river is safe to navigate despite the impact of project operations on boat ramp conditions and river useability.

In response to the July 2023 floods, GRH needed to draw down the Bellows Falls impoundment to replace the stanchion gates to return the dam to working order. The dewatering of backwater areas caused additional impacts to recreation and the fishery as illustrated by pictures below, and any future dewatering should be mitigated through additional financial support for enhancement to private access areas that are not owned by GRH. FERC should not countenance the paternalistic control and limitation of access to the whole project area under safety scenarios while not also supporting access throughout the project area during regular river use.

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Photos taken July 2023 during the drawdown at the Bellows Falls Dam. The left photo indicates a large expanse of mud between the riverbank and the water and the right photo is of a dead lamprey found stranded in the mud.

M. FERC Should Require Prevention and Control of Aquatic Invasive Species

Hand in hand with increased recreational access comes the need to manage the negative impacts of increased human use of waterways, a major concern being the introduction of nuisance or invasive aquatic species by boating and/or fishing activities. GRH should be required to install up-to-date signage, educational materials, and CD3 boat cleaning stations (CD3 is Clean, Drain, Dry, Dispose) as well as provide financial support for the expansion of greeter or “river watch” programs at all the boat launches in the project area(s). Aquatic invasive species need to be considered comprehensively throughout the watershed. We address additional recommendations for this below, but would also note that state boat patrols to ensure safety and compliance with regulations as well as to respond to emergency situations are chronically underfunded and typically focused elsewhere in both Vermont and New Hampshire. We encourage FERC to require GRH to identify avenues to enhance oversight for invasive species and safety through recreation PME measures.

N. FERC Should Require Improvements to Fish Viewing Areas

GRH states in its application that the Wilder, Bellows Falls, and Vernon projects include

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“recreation areas and facilities including... fish ladder viewing area[s] ⁵⁴.” For the Wilder project, the fish ladder, inclusive of the viewing area, has not been opened for years due to the cessation of the Atlantic salmon restoration program. While Great River Hydro’s 2015 Form 80 filing noted that there was a visitor center at Wilder Dam, there is no public information indicating that any such facility is currently operational. GRH does not even indicate that it exists on their website of recreational opportunities for the Wilder project⁵⁵. GRH should redevelop an interpretive visitor center at Wilder Dam to educate the public about hydro projects, local history, and natural, cultural, and recreational resources in addition to providing fish passage viewing and information. GRH also does not seem to contemplate any upgrades to this viewing ladder or public access anywhere in their application or in any of the related documents such as the Settlement Agreement for Fish Passage.

The Bellows Falls fish ladder and visitors center is “operated by the Nature Museum at Grafton through an agreement with Great River Hydro⁵⁶.” In their response to AIR, GRH indicates that they will invest \$20,000 in the Bellows Falls “Visitor Center - updating fixtures, systems, parking and landscaping⁵⁷” in year 5 of the new license. There are no upgrades to fish viewing facilities for Bellows Falls agreed to in the Settlement for Fish Passage.

GRH indicates that it will invest \$25,000 for the Vernon Visitor Fish ladder window to “update window, lighting, [and] ADA accessibility⁵⁸” in year 4 of the new license. Conversely, in the Settlement Agreement for Fish Passage they indicate that for the Vernon project they,

“shall design and implement improvements to the public viewing window and counting room. The Licensee shall initiate design consultation with the Agencies during License Year 4, complete final designs by December 31 of License Year 4, initiate the improvements in License Year 5, and complete the improvements

⁵⁴ Accession Number 20240131-5575. Revised Amended Final License Application, January 2024, Exhibit E. page 2-2 for Wilder, 2-10 for Bellows Falls, and 2-16 for Vernon.

⁵⁵ See <https://www.greatriverhydro.com/recreation-location/wilder-project-recreation/>. Accessed on 5/20/24.

⁵⁶ Accession Number 20240131-5575. Revised Amended Final License Application, January 2024, Exhibit E. Page 3-548.

⁵⁷ Accession Number 20210330-5038. Great River Hydro. Response to License Application Additional Information Requests. Dated March 29, 2021. Table D-1 for Bellows Falls.

⁵⁸ Ibid. Table C-1 for Vernon.

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no later than April 1 of License Year 6⁵⁹.”

It is unacceptable that through settlement agreement negotiations the applicant was able to extend the timeline for these improvements to the Vernon Fish Ladder viewing area for another two years beyond what they indicated in their filing in 2021.

As fisheries management improves, we can only assume that migration numbers in the Connecticut River will increase over the coming years. Greater education and engagement with local community members and school groups through interpretation at fishways as well as the availability of additional data to use in classrooms will increase the understanding of and appreciation for the river. For all three fish ladders (Wilder, Bellows Falls, and Vernon) GRH should be required to provide clearly published public information about fish ladder hours; provide ADA access and improve access in general to viewing windows; install a white reflective panel, paint the partition wall, or implement something similar to improve viewing; and partner with a third-party to provide interpretation for both Wilder and Vernon similar to how the Bellows Falls Fish Ladder visitor center is currently managed.

O. The Application Does Not Provide Any Reasons for the Failure to Adopt Recreation Recommendations, Contrary to Law

The ILP regulations at 18 CFR §5.18(b)5(ii)C require that if an applicant does not adopt a preliminary environmental measure proposed by a resource agency, Indian tribe, *or member of the public* [emphasis added], it must include its reasons, based on project-specific information. On July 30, 2019, CRC filed with FERC a detailed set of recreation recommendations put together by CRC and AMC⁶⁰. The AFLA and RAFLA do not contain any reasons for not adopting these proposed PMEs. Additionally, 18 CFR 5.18(b)(5)(ii)(E) states that, “the applicant should estimate the cost of each proposed resource protection, mitigation, or enhancement measure

⁵⁹ Accession Number 20220803-5124. Great River Hydro, LLC submits Offer of Settlement between Great River Hydro, LLC and the U.S. Department of Interior et. al, and Revisions to Exhibit D Documents for the Wilder Hydroelectric Project et, al. under P-1855, et. al. “Fish Passage Settlement Agreement.” Page 13.

⁶⁰ Accession Number 20190730-5077. ILP Comments - CRC and AMC recreation recommendations for GRH and FL projects under P-1855.et al.

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and any specific measure filed with the Commission by agencies, Indian tribes, or members of the public when the application is filed⁶¹.” The application similarly did not provide a cost estimate of any of the recommendations filed by CRC and AMC after the Final Application was filed in May of 2017.

By creating a comprehensive, specific, and measurable recreation plan, we can ensure that regardless of future management changes, Great River Hydro will be held accountable to creating a better recreation experience for local communities and travelers who all enjoy river access. FERC needs to facilitate this process through license articles.

III. PROJECT IMPACTS ON CULTURAL RESOURCES HAVE BEEN MINIMIZED AND MUST BE ADDRESSED WITH INPUT

RECOMMENDATION

CRC asks for a license article requiring a Historic Properties Management Plan (HPMP) that:

- is filed and implemented within two years of license issuance,
- is constructed with public and state and federally recognized tribal input and public participation,
- requires tribal representation in producing a more comprehensive Traditional Cultural Property (TCP) evaluation leading to the HPMP,
- is revisited and updated periodically throughout the license term.

CRC additionally recommends that the license article specifically requires that the HPMP addresses:

- disturbance of a culturally sensitive area during the installation of the proposed new turbine at Bellows Falls,
- land access to harvest traditional foods,

⁶¹ 18 CFR 5.18(b)(5)(ii)(E). Accessed at <https://www.law.cornell.edu/cfr/text/18/5.18>.

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- expedited enhancements to migratory fish passage,
- monitoring and mitigation for erosion of riverbank areas with traditional cultural significance under the proposed operational change.

The license application is woefully deficient regarding Cultural and Historic Resources. While studies were conducted and some post-study consultations occurred, the AFLA and RAFLA do not include any meaningful discussion of how this information will be incorporated into an Historic Property Management Plan (HPMP), or the timeline by which this will occur. GRH has had almost a decade since the studies occurred to engage in additional consultation with the VT and NH State Historic Preservation Offices (SHPOs), address study report recommendations, conduct landowner outreach for the remaining phase IB and phase II studies, and draft an HPMP for comment, yet none of this has occurred. The application itself indicates that it only contains a “preliminary assessment of the potential effects of the Projects⁶²” because required consultation with the SHPOs has apparently not occurred since the last communication listed in 2017. FERC’s own guidelines for implementation of HPMPs encourage submission of draft plans with license applications⁶³. Submission of an HPMP did not occur with the initial application in 2017, the AFLA in 2020, or the RAFLA in 2023. The lack of attention and detail in this aspect of the final license application limits both stakeholder and FERC abilities to evaluate whether proposed PMEs regarding historic and cultural resource issues are adequate and impactful.

For example, Table 4.1-8⁶⁴ indicates that GRH expects to spend \$600,000 in HPMP measures at each project, yet section 3.11.2.4⁶⁵ describes only what may be included in an HPMP on a process level (e.g. identify goals for long-term monitoring and preservation of historic properties) with no indication of how this money will be spent. Table D-1 similarly contains only

⁶² Accession Number 20240131-5575. Revised Amended Final License Application, January 2024, Exhibit E, page 3-727.

⁶³ Guidelines for the Development of Historic Properties Management Plans For FERC Hydroelectric Projects, issued May 20, 2002, Page 4. Accessed at <https://www.ferc.gov/sites/default/files/2020-07/hpmp.pdf>

⁶⁴ Accession Number 20240131-5575. Revised Amended Final License Application, January 2024, Exhibit E. Page 4-8.

⁶⁵ Ibid. Page 3-732.

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vague description of how this money will be spent (e.g. “HPMP requirements”)⁶⁶. GRH must explain how they arrived at this estimate when there are currently no proposed monitoring, protection, or management plans. Similarly, page 2-33 indicates that GRH intends to:

“[d]evelop new HPMPs for the Wilder and Bellows Falls Projects and update the current HPMP for Vernon; continue attempts to secure landowner permission to conduct Phase IB on remaining identified locations and if permission allows, conduct Phase II surveys as appropriate; expand and support educational and cultural programs, activities and outreach for Abenaki tribal groups and interests⁶⁷. “

Yet no timeline is given for these poorly defined PMEs. This statement also conflicts with a statement on page 3-727 indicating that “no further [tribal] consultation is being sought” in regard to the traditional cultural property (TCP) study⁶⁸, which seems counter to the desire to include tribal interests in developing management plans for TCP impacted by the Projects as well as educational and outreach materials about these properties.

A complete TCP evaluation requires consultation with the tribes. GRH needs to ask what is important to the Abenaki and it is our understanding that they have not adequately done that. The TCP description was essentially a compendium of texts and a literature survey. It is our understanding, based on personal communication, that there was one meeting in 2016 to address tribal cultural concerns, but GRH has not followed through with additional outreach to complete the recommendations that were outlined in their own study report⁶⁹. Noted in the

⁶⁶ 20230608-5102. Amended Final License Application. Exhibit D: Statement of Project Costs and Financing. June 2023 revision.

⁶⁷ Accession Number 20240131-5575. Revised Amended Final License Application, January 2024, Exhibit E. Page 2-33.

⁶⁸ Ibid. Page 3-279.

⁶⁹ GRH states in their Study 33 Accession Number 20160517-5034 – Traditional and Cultural Properties (TCP), “The following recommendations are provided for consideration:

- ...
- Tribal consultation and participation is also important to determine if additional information through oral histories or other research should be gathered to supplement the research in this study. Research through oral histories from Tribal members may provide more information on ancestral, traditional, and current use of the study area. The memory of these places may live on through oral histories, which we can only know as a result of ethnographic interviews or site visits conducted with Tribal members and traditional practitioners.

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application, GRH intended to initiate a Programmatic Agreement and HPMP shortly after filing applications with the NH and VT for water quality certifications⁷⁰. The Water Quality Certification application was filed on April 19, 2024; CRC does not currently know whether GRH has initiated these other actions as intended as it is unclear what is meant by “shortly after filing.” GRH should explain their proposed timeline for these actions and how they will engage the indigenous community moving forward. This consultation work with the tribes and development of the HPMP should have already begun, and comprehensive information should have been provided as part of the final application. Again, the AFLA is deficient in this regard and compounds prior ILP violations.

GRH also states that “no Project effects on TCPs have been identified at this time⁷¹.” CRC believes strongly that this is misleading, though hopefully not intentionally so. Because an aspect of HPMPs is to “**Identify** types of maintenance, operation, and new construction activities that have the potential to cause effects on historic properties⁷²” (emphasis added) and no HPMP currently exists, the conclusion that the Project does not affect TCPs cannot be drawn because the activities that may affect TCPs have not been defined. In fact, section 3.11.2.4 also indicates that the Section 106 process has not been concluded because there is not even a draft programmatic agreement in place and potential project effects have not been evaluated⁷³. As a result of the lack of communication with tribal representatives and SHPOs over the past years, no traditional cultural properties that are not already in the National

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- If Tribal consultation provides information on ancestral, traditional, and current use of places within the APE that indicates cultural importance and there is a direct impact on such due to project operations then the following actions are recommended:
 - If places are within the APE but privately owned by others, the Licensee should attempt to foster communication between the Tribe and the landowner in order to develop a mutual understanding of the cultural significance of the place and examine opportunities to preserve its heritage.
 - If places are within the APE and on Project land held in fee by the Licensee, the Licensee should, through communication and cooperation by the Tribe, develop an understanding of the cultural significance of the place, examine opportunities to protect its heritage and to the extent possible, implement measure to do so.”

⁷⁰ Accession Number 20240131-5575. Revised Amended Final License Application, January 2024, Exhibit E. Page 2-25

⁷¹ Ibid. Page 3-734.

⁷² Ibid.

⁷³ Ibid. Page 3-732.

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Register of Historic Places have attempted to be identified by GRH beyond the preliminary archeological surveys. Therefore, the TCP study should be considered incomplete and not representative of Project effects.

Despite this, Project effects on TCPs *have* been identified. The archeological surveys indicate that some sites, including those proposed for inclusion on the National Register, are in areas of active erosion. As detailed in our above comments, erosion concerns on riverbank property cannot be separated from Project operations with the existing data. Potential and listed TCPs in active erosion areas have been subject to continued detrimental forces without the benefit of a monitoring program or mitigation plan because GRH has not implemented or even proposed an HPMP for the projects. Consideration of cultural properties, archeological sites, and erosion needs to be included in a comprehensive Erosion Control and/or Shoreline Management Plan for the entire Project Area as well as within the HPMP.

Culturally significant sites and artifacts on Wantastiquet Mountain within the Vernon impoundment have already been lost to erosion of the terrace on which they were located (within the last license term); erosion, which has been alluded to have worsened due to the construction and operation of the hydroelectric facility at Vernon that raised the river level⁷⁴. This was not noted in the application. Nor was the extraordinary PaleoIndian Tenant Swamp site in Keene NH noted, despite being much closer geographically to the Projects than northern Vermont sites⁷⁵. The description of the TCPs surrounding Bellows Falls similarly did not mention that this area contains historically documented ancestral burial sites⁷⁶, including on “The Island” an area created by the canal that carries water to the Bellows Falls Project. And, while the petroglyph site just downstream of the salmon dam was mentioned, it was not mentioned that there is an ongoing National Park Service funded study contextualizing the site in the

⁷⁴ Page 68, Goodby, Robert. (2021) *A Deep Presence: 13,000 Years of Native American History*. United States: Peter E. Randall Publisher.

⁷⁵ Goodby, Robert G., et al. (2014) The Tenant Swamp site and PaleoIndian domestic space in Keene, New Hampshire. *Archaeology of Eastern North America*, vol. 42, pp. 129–64. *JSTOR*, <http://www.jstor.org/stable/43868961>.

⁷⁶ Hayes, Lyman S. (1907) *History of the Town of Rockingham, Vermont: Including the Villages of Bellows Falls, Saxtons River, Rockingham, Cambridgeport and Bartonsville, 1753-1907, with Family Genealogies*. Published by the Town of Bellows Falls VT. Pages 29-30.

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regional landscape, with the goal to “affirm the sacredness of the Bellows Falls Petroglyph Site, address cultural representational inequalities, and prepare an amendment of the documentation for this site in the Bellows Falls Island National Register of Historic Places (NRHP) nomination⁷⁷.” This site, too, has seen alteration, disrespect, and damage over the years. While Great River Hydro was not responsible for this initial construction and despoilment of a sacred indigenous place at the Great Falls, they and FERC should recognize that any action that continues to move the earth within the narrowly defined Project APEs, be it continued riverbank erosion of areas that were not underwater prior to the hydro facilities or blasting for the construction of the proposed Natel turbine installation at Bellows Falls, affects an area that is deeply meaningful to indigenous communities.

CRC decries the lack of care in describing what is currently known regarding historic and traditional cultural properties and in drafting an HPMP to comprehensively identify project effects. Greater efforts need to be made to involve state and federally recognized tribes in determining what TCPs exist and how they will be protected from Project impacts, or otherwise mitigated. Additionally, Abenaki representatives must be notified if any ground disturbance (including erosion due to changes in or higher flows under the proposed operational change) uncovers indigenous sites or materials. The protection of these areas is critically important.

Even though section 106 of the National Historic Preservation Act (NHPA) governs property, the consideration of fee-owned land as the only aspect of Project impacts that may have cultural significance is an ethnocentric view in and of itself, something of which NHPA warns. To that end, we encourage FERC and GRH to recognize the cultural significance of migratory fish populations on equal footing with that of “property” and reduce the collective impact of the Project on preventing fish access to traditional spawning habitat and impeding spawning runs by implementing fish passage upgrades on an expedited time scale from that proposed in the Fish Passage Settlement Agreement. Access to the river around the dams is also culturally

⁷⁷ Kchi Pôntegok – Revisiting the Historic Landscape of the Bellows Falls Petroglyphs. <https://www.rockinghamvt.org/kchi-pontegok> accessed May 21, 2024.

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important and should be improved within the Project Boundary, particularly regarding interacting with traditional food sources. There are multiple examples of “gathering agreements” that have established partnerships between companies and tribal entities to facilitate access to lands for harvesting of food and materials⁷⁸. This is just one aspect that could be explored within an HPMP.

While CRC cannot directly represent indigenous knowledge, viewpoints, and needs, we are here to remind both FERC and GRH that indigenous voices are a critical and needed component in contextualizing Project impacts and mitigation, and to date have not been well represented in the license application.

IV. IMPROPERLY OUTLINED PROJECT BOUNDARIES INHIBIT PROJECT IMPACT MITIGATION

RECOMMENDATION

FERC should update Exhibit G map Project Area Boundaries to:

- reflect a boundary based on an elevation contour that is 200 feet from the river and impoundment edge,
- encompass all land that would potentially be flooded as part of project operations up to and including the above-described elevation,
- be consistent with the definition of project boundary in 18 CFR § 4.41(h)(2)(i)(B).

CRC has concerns about the extent of the formal project area as illustrated on the Exhibit G maps. Our concern is that formally accepting GRH’s antiquated project boundary reduces the possibility that significant land area that might be utilized for project impact mitigation is not formally considered “in project.” The project area as defined in the application maps is an artifact of past licensing and appears to have not been seriously considered or evaluated during

⁷⁸ Such as those found here: <https://abenakitribe.org/partnerships>. Note that the agreement pertaining to these facilities was executed in 2016 by TransCanada and has not been updated by Great River Hydro since then.

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the current relicensing process. There are lands that are necessary for project operation (such as flowage easements and the Bellows Falls portage put-in) that are not formally included in the project area on the Exhibit G maps that should be. For example, maps number 1 and 2 indicate that the project area for the lower extent of the Bellows Falls project ends at the “tie line” in the bypass reach⁷⁹. The map states in Note 3, “[e]xisting Project recreation facilities, including private access roads, are wholly contained within the Project Boundary,” except that in this case the formal portage put-in is accessed from Rte 12 approximately 1,700 feet south of this extent and is not included in the Exhibit G map.

CRC and others negotiated with GRH on a preferred operational change. GRH describes on page 2-27 the target water surface elevation (m.s.l., NGVD29) at each dam with the intention of maintaining that target within 6 inches at the dam. Those targets are 384.5 ft for Wilder, 291.1 ft for Bellows Falls, and 219.63 ft for Vernon⁸⁰. Each of the Exhibit G maps indicates that the project boundary is depicted as an inundation limit elevation above the dams and a separate contour line is used below the dam. For example, for Wilder the 385-foot contour line is utilized for depicting the inundation limit elevation in the impoundment, while below the dam, the project boundary is defined at the 328-foot contour line. CRC is unclear why a static elevation contour would be used to describe the project boundary over 46 miles (for Wilder) or 26 miles (for Bellows and Vernon) of shoreline. The river and land increase in elevation as you move up the watershed, so it is logical to define the project boundary by including a gradual increase in elevation. For example, the FirstLight Exhibit G maps provide an incremental increase in boundary line elevation, which includes a boundary line at the northern end of their project at the Vernon dam at the 211.5 feet elevation⁸¹. The GRH Exhibit G indicates “below the Vernon Dam, the Project Boundary follows the shoreline around the Licensee's fee-owned property

⁷⁹ Accession Number 20201207-5219 Amended Final License Applications of Great River Hydro, LLC for Bellows Falls Project, et. al. under P-1855 et. al. Bellows Falls Amended Final License Application Exhibit G.

⁸⁰ Accession Number 20240131-5575. Revised Amended Final License Application, January 2024, Exhibit E. Page 2-27.

⁸¹ See Accession Number 20201204-5120. Amended Final Application for New License for Major Water Power Project – Existing Dam. December 2020. Exhibit G. Sheet 13.

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(including islands), depicted as the 188-foot contour line⁸². Something is badly amiss when GRH's project boundary is set at an elevation that is 23.5 feet *lower* than FirstLight's upper project boundary.

18 CFR § 4.41(h)(2)(i)(B) states, "[t]he boundary must be located no more than 200 feet (horizontal measurement) from the exterior margin of the reservoir, defined by the normal maximum surface elevation, *except where* deviations may be necessary in describing the boundary according to the above methods or where *additional lands are necessary for project purposes.*"[emphasis added] According to the Exhibit G maps, Great River Hydro has flowage rights on almost all of the adjacent parcels, which are "necessary for project purposes" specifically in case those lands need to be flooded as a result of project operation. So, it follows that land up to 200 feet from the exterior margin of the reservoir should be included in the project boundary. See Exhibit B, attached and hereby incorporated by reference.

The Commission's regulations provide that the boundary of a project "must enclose only those lands necessary for operation and maintenance of the project and for other project purposes, such as recreation, shoreline control, or protection of environmental resources" and that "[e]xisting residential, commercial, or other structures may be included within the boundary only to the extent that underlying lands are needed for project purposes⁸³." But simultaneously, FERC's policy is that its jurisdiction and thus enforcement capability extend only over those lands and waters within the project boundary. Given this, the project boundary should accurately reflect all lands needed for project operation, including flowage rights.

Additionally, CRC argues that the extent of the river and the shoreline from the Wilder Dam to the upper extent of the Bellows Falls impoundment, and the extent of the river from the Bellows Falls dam to the upper end of the Vernon impoundment should be included in the

⁸² Accession Number 20201207-5219. Amended Final Application for New License for Major Water Power Project — Existing Dam. December 2020. Vernon Project (FERC No. 1904). Exhibit G. Sheet 1.

⁸³ 18 C.F.R. § 4.41(h)(2)

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formal project area⁸⁴. The movement of flows between the facilities is coordinated based on water volume and operational need. Those areas left out of the project boundary encompass towns and shorelines of the river that are being acted on and impacted by the operation of the facilities as the river increases or decreases in flow, floods, or recedes because of operations. For example, studies focused on the Dwarf Wedge Mussel⁸⁵ identified populations in various reaches of river between the projects in the southern part of Hartford, VT, but that reach of the Connecticut River is left out of the project boundary. Similarly, a major geographic focus for whitewater recreation and GRH's ILP Whitewater Boating Flow Assessment⁸⁶ is located at Sumners Falls, adjacent to Hartland, VT, yet this stretch of river is not included in the project area⁸⁷. These relatively short stretches of river should be included in the project area as the projects act together to control the entire flow of the Connecticut River for over 120 miles.

Additionally, there are several parcels adjacent to the river within the current project areas that may be impacted by changes in operation where GRH does not own flowage easements or own the land outright. Under the Federal Power Act, FERC must require GRH to acquire flowage rights or outright ownership of these potentially impacted private properties⁸⁸.

In summary, the entire project boundary area needs to be updated to better reflect all lands necessary for project operations including PME and flooding, as per the boundary definition.

⁸⁴ Accession Number 20240131-5575. Revised Amended Final License Application, January 2024, Exhibit E. Page 1-3.

⁸⁵ See Accession Number 20140915-5144 ILP Initial Study Report for TransCanada's Wilder, Bellows Falls and Vernon Projects or Accession Number 20150302-5375 ILP Initial or Updated Study Report of TransCanada Hydro Northeast Inc. under P-1855, et. al..ILP Study 24 Dwarf Wedgemussel and Co-Occurring Mussel Study, Phase 2 Geodatabase, March 2, 2015

⁸⁶ Accession Number 20160301-5331. Transcanada Hydro Northeast, Inc ILP Study 31 Whitewater Boating Flow Assessment – Bellows Falls and Sumner Falls. Study Report. March 1, 2016. Figure 3-1 on page 11 showing Sumners Falls in relation to the Wilder Dam.

⁸⁷ Accession Number 20201207-5219. Amended Final Application for New License for Major Water Power Project — Existing Dam. December 2020. Bellows Falls Project (FERC No. 1855). Exhibit G. Sheet 18 with northern extent of project area ending at Windsor, VT AND Wilder Project (FERC No. 1892). Exhibit G. Sheet 2 with southern extent of project area ending in the middle of Hartford, VT.

⁸⁸ See uncontrolled parcels in the following Exhibit G maps: Newbury (Wilder Map 23); Haverhill (Wilder Map 21); Bradford (Wilder Map 20); Lyme Road in Hanover (Wilder Map 6); Connecticut River Road in Springfield (Bellows Falls Map 10); and Vernon (Vernon Map 2)

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V. SAFE, TIMELY, AND EFFECTIVE FISH PASSAGE CANNOT BE DELAYED ANY LONGER

RECOMMENDATION

FERC should implement license articles for safe, timely, and effective up- and downstream fish passage, which minimize continuing negative impact on migratory fish populations by:

- requiring preliminary consultations and studies, designs, and construction be completed so that all facilities are operational within 10 years of license issuance,
- requiring GRH to remove the salmon dam in the Bellows Falls bypass reach during or before installation of the new low flow turbine in the Bellows Falls dam.
- requiring that any ongoing evaluation of improvements to passage facilities should include financial support of long-term monitoring of fish passage at the counting windows.

Additionally, CRC recommends that the impact of the Fish Settlement Agreement proposed schedule and the expedited schedule proposed above for fish passage improvements be included in the environmental impact statement under the NEPA process.

We are heartened to see the planned improvements to fish passage facilities at all three projects outlined in the Fish Passage Settlement Agreement⁸⁹ as they are desperately needed. As acknowledged in the study reports and Final License Applications, the ladders were designed to provide upstream passage for Atlantic Salmon only at Wilder and Bellows Falls, and salmon and American Shad at Vernon. As a result, other diadromous species that are fortunate enough to pass Turner's Falls project's egregiously ineffective facilities, as well as migratory resident

⁸⁹ Accession Number 20220803-5124. Great River Hydro, LLC submits Offer of Settlement between Great River Hydro, LLC and the U.S. Department of Interior et. al, and Revisions to Exhibit D Documents for the Wilder Hydroelectric Project et, al. under P-1855, et. al. "Fish Passage Settlement Agreement"

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species, have been denied access to habitat due to a lack of safe, timely, and efficient passage since the fish passage facilities were constructed in the 1980s (Vernon – 1981, Bellows Falls – 1982, Wilder - 1987). The improvements to accommodate both upstream and downstream passage of species other than salmon are critical and should have been implemented years ago, when it was clear that salmon restoration was not working but other fish were attempting to pass through outdated facilities not designed for them. We are pleased that these improvements will happen but are concerned about the protracted timeline under which they will occur. The necessity for shakedown years and studies to determine effectiveness and needed alterations is not disputed; yet we maintain that it is imperative to undertake improvements at all facilities concurrently or compress the timeline from the currently projected 17 years to complete. It took only 7 years to construct the current passage facilities at all three projects. And yet, it will be over 50 years from that initial construction until these projects provide safe, timely, and effective passage for diadromous fish under the currently proposed license application and settlement agreement. This is unacceptable for New England's longest river and the fish that depend on it.

In its response⁹⁰ to CRC's previous comments⁹¹ detailing concerns about the timing of implementation of fish passage improvements and enhancements, GRH indicated that the timeline is in part dictated by the prioritization of downstream facilities before those upstream. Even with that being the case, the timeline is still too long. For example, upstream eel passage at Wilder will not be implemented until 10 years after interim upstream eel passage is installed at Bellows Falls despite knowing that the current upstream ladders are ineffective at passing eel and having well defined design criteria for upstream eel passage⁹². As noted in the Fish Passage Settlement agreement, the proposed schedules "do not preclude the Licensee from proactively

⁹⁰ Accession Number 20220919-5149. Reply Comments of Great River Hydro, LLC in response to comments re Offer of Settlement for the Wilder Hydroelectric Project et al. under P-1855, et. al.

⁹¹ Accession Number 20220901-5247. CRC, AMC, AW comments on Great River Hydro Fish Passage Settlement Agreement.

⁹² USFWS (U.S. Fish and Wildlife Service). (2019) Fish Passage Engineering Design Criteria. USFWS, Northeast Region R5, Hadley, Massachusetts.

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addressing any element on an expedited timeframe⁹³ and we contend that it is possible to expedite this timeframe without sacrificing effective design and evaluation, and more importantly, that it is critically important to do so. GRH did not provide any justification for the long gaps between consultation and studies occurring at the different facilities. If consultation and studies for an upstream facility were to occur immediately following that of the downstream project, this would not sacrifice the consultation or evaluation and would shorten the timeline by at least three years. Similarly, conducting necessary hydraulic studies concurrently at all three facilities would also allow for compression of the timeline and would likely allow GRH more flexibility to respond to adverse conditions or repeat studies if needed, rather than those issues inherently extending the time until the improvements are operational.

Additionally, there are currently discrepancies within the text of the Fish Passage Settlement Agreement (stated to be the definitive answer if there were differences between the text and the appended schedules) regarding timing of study implementation. Section 3.5.1 states that downstream hydraulic studies will take place in years 3 and 4 yet consultation for these studies will happen in year 6 and reporting of results in year 7⁹⁴. Similarly, section 3.4.2.1 refers to a hydraulic study being the same as one described in section 3.2.3⁹⁵, yet this earlier section does not exist. We recommend that when these discrepancies are rectified, that the activities occur at the earliest timeline possible. We also do not see any evidence of ecological, environmental, or data driven benefits to waiting in between eel monitoring and Passive Integrated Transponder (PIT) studies, particularly the extended 5-year gap between the two studies as currently proposed at Wilder. It is more efficient to conduct ladder monitoring and PIT studies simultaneously. Similarly, it is more efficient to simultaneously conduct the ladder hydraulic study, the ladder engineering assessment, and the study to assess the potential for shad to get trapped in the collection gallery at Vernon. Not only would this provide more opportunity to conduct additional studies or respond to adverse study conditions without delay to the

⁹³ Accession Number 20220803-5124. Great River Hydro, LLC submits Offer of Settlement between Great River Hydro, LLC and the U.S. Department of Interior et. al, and Revisions to Exhibit D Documents for the Wilder Hydroelectric Project et, al. under P-1855, et. al. "Fish Passage Settlement Agreement" Section 3.1, Page 8.

⁹⁴ Ibid. Section 3.5.1, Page 14.

⁹⁵ Ibid. Section 3.4.2.1, Page 11.

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timeline, but it would also allow for the company to have data regarding all aspects of ladder function prior to designing improvements. GRH has provided no evidence as to why it is beneficial to conduct the studies separately. While we respect the need for data gathering, informed design, and performance evaluation post-construction, we continue to maintain that the proposed timing of installation of improved fish passage facilities is actively harmful to migratory fish populations due to its extended length and can be shortened without sacrificing proper design methodology.

The agreement outlines two years of quantitative effectiveness studies proposed for post-construction evaluation of upgraded passage facilities⁹⁶, yet we cannot find any proposed provisions to support longer term monitoring of fish counts at the improved video observation windows. As fish passage counts are critical to evaluating both passage facility effectiveness and fish population recovery in light of obstructions imposed by hydro operations, GRH should fund these monitoring efforts.

It is unclear from the Fish Passage Settlement Agreement whether interim and permanent upstream eel ramps will be operated simultaneously with ladders during the April to July time period. We request that they are concurrently open, given the generally poor passage rates for eel in the ladders. Please ensure that this is clarified in the fishway prescription license articles. We would also note that all references to the Connecticut River Atlantic Salmon Commission (CRASC) need to be updated to reflect that CRASC has evolved into the Connecticut River Migratory Fish Restoration Cooperative as of October 2023. Please ensure that all appropriate prescriptions, recommendations, and duties attributed to CRASC in the new license reflect that this organization no longer exists under that name. We expect that US Fish and Wildlife Service will have comments indicating the preferred name and contact information for the "Cooperative" in their comments and will defer to them on the issue of the nomenclature of who is issuing fish passage opening and closing schedules.

⁹⁶ Ibid. Section 3.1, Page 8. And Section 3.8, Page 21.

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We know from studies conducted during this relicensing period (Study 11⁹⁷) as well as state survey data, and fish ladder observations that American Eel exist upstream of the Bellows Falls and Wilder dams. Study 19 indicated that over 80% of migrating silver eels pass through the turbines on their way downstream to breed in the Sargasso Sea⁹⁸. This license application states that a majority of adult eels will choose to pass “where the greatest proportion of flow was allocated”. This currently is, and will continue to be, through the turbines. The proposed fish passage improvement schedule does not indicate functional downstream eel passage until years 12 (Bellows Falls) and 16 (Wilder) post license issuance, despite interim upstream eel passage being implemented at year 4 in Bellows Falls. This leaves an 8–12-year long period in which the mostly likely route of seaward migration for eel that have accessed the impoundments through enhanced upstream passage, as well as those currently inhabiting these areas, is through the turbines, which under the proposed operational changes will be generating constantly and thus continue to be the most attractive route. Study 23 modeled a predicted survival rate for eel as low 17% for American Eel passing through some of the turbines under certain conditions⁹⁹. This can and should be rectified by improving downstream passage sooner than the proposed timeline.

GRH, in its response¹⁰⁰ to our previous comments¹⁰¹ urging performance standards for safe, timely, and effective fish passage for eel and lamprey, indicated that it would only adopt passage performance standards if they were included in a management plan. There now exists an eel management plan¹⁰² with the following goals related to passage performance:

“1.2.1 Achieve upstream passage performance of 95% (internal structure

⁹⁷ Accession Number 20160301-5231 March 1, 2016 ILP Study Reports of TransCanada Hydro Northeast Inc. under P-1855, et. al.. Study 10 Fish Assemblage Report and Appendices; Study 11 American Eel Survey Report and Appendices; Study 12 Tesselated Darter Survey Report and Appendices

⁹⁸ Accession Number 20170228-5202 ILP Study 19: American Eel downstream passage assessment – Final study report. Table 5.1.1-1, Page 34; Table 5.1.2-1, Page 46; Table 5.1.3-1, Page 63.

⁹⁹ Accession Number 20161130-5265 ILP Study 23: Fish Impingement, Entrainment, and Survival Study – Final Report. Section 6.1, Pages 48-55.

¹⁰⁰ Accession Number 20220919-5149. Reply Comments of Great River Hydro, LLC in response to comments re Offer of Settlement for the Wilder Hydroelectric Project et al. under P-1855, et. al.

¹⁰¹ Accession Number 20220901-5247. CRC, AMC, AW comments on Great River Hydro Fish Passage Settlement Agreement.

¹⁰² Accession number 20230630-5046. Connecticut River Eel Management Plan. Approved by CRASC on June 8, 2023.

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passage) based upon fish present at the entrance of the fishway (or dedicated eelway) for all size classes present. 1.2.2 Achieve downstream passage performance of no more than 5% through project mortality and debilitating injury that needs to be assessed on project level basis, and a time to pass of 24 hours or less for fish actively migrating within 1 km of a project facility. 1.2.3 Address project-specific fishway attraction, entry, internal passage efficiency, and delay as suitable information is available. 1.2.4 Address project specific downstream bypass route attraction, entry, passage efficiency, and delay, as suitable information is available.”

The study results demonstrate that these goals are not currently being met; CRC contends that they should be achieved as soon as possible. This management plan and performance standards should be applied to all eel passage facilities to be constructed.

In VT, eel are a species of greatest conservation need. Delaying safe downstream passage for nearly half of the anticipated license term is counter to conservation needs and detrimental to restoring populations throughout their historic range. The proposed timeline subsequently delays implementation of fish passage and PME measures at all upstream tributary dams where implementation of passage measures is triggered by observations of fish downstream. This further delays conservation and restoration plans for multiple species, as we noted in our comments on the fish passage settlement agreement. For instance, the License Issuance for the North Hartland project¹⁰³ states, “To determine if permanent upstream eel passage facilities are needed at the project, North Hartland proposes to develop an eel trapping program plan in consultation with the Vermont DEC and the U.S. Fish and Wildlife Service (FWS), and implement the plan within one year of the installation of upstream eel passage facilities at the downstream Bellows Falls Project No. 1855.” This license was issued in 2023 and it will likely be 2036 before this plan is enacted due to the lengthy delays during the current relicensing proceedings as well as the extended timeline for completing passage upgrades. While Great River Hydro may wish to defer responsibility for that upstream project’s impact on accessibility of migratory fish habitat, FERC should not.

¹⁰³ Accession number 20230216-3079. Order issuing new license to North Hartland LLC. Project number 2816-050. Clauses 29 and 39.

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We are pleased to see that GRH is willing to implement an evaluation of turbine survival and injury following the installation of the Natel low head turbine in the Bellows Falls Dam and will implement mitigation measures should the turbine not meet standards predicted by the laboratory studies. We found that the post-turbine passage evaluations conducted in ILP study 19 were more rigorous than those reported by Natel in Watson et al., which did not categorize injuries as major or minor. For example, the extent of observed bruising or abrasion is unknown and the concerning observation of bleeding from the gills resulting from blades strikes¹⁰⁴, which would have been counted as a major injury in Study 19, was dismissed as relatively inconsequential by Watson et al. This makes it more difficult to compare results between the studies. While we are heartened by the lower mortality rate and seemingly reduced injury rate and severity from the Natel turbine, we welcome the additional in field performance evaluation proposed by GRH with eels that are size representative of those found in the Connecticut River.

We do however continue to have concerns about the presence of the “Salmon Dam” just downstream from the Bellows Falls dam, GRH’s insistence on abdicating financial responsibility for its removal, and the effect of the salmon dam on fish that may now be more inclined to enter the bypassed reach through the proposed low flow turbine, including outward migrating adult eel, juvenile shad, and juvenile lamprey. In the fish passage settlement agreement GRH agreed to support the removal of the salmon dam but would not pay for it¹⁰⁵. Subsequently, in their response to CRC’s comments on the settlement agreement they indicated that they believe “there is a benefit to support fish ladder passage by retaining the barrier dam¹⁰⁶.” CRC disagrees. Given the proposed change in operations, resulting in more consistent and greater flow through the turbines and a general change in the river from a lentic to a lotic system, GRH

¹⁰⁴ Watson, S., Schneider, A., Santen, L., Deters, K. A., Mueller, R., Pflugrath, B., ... & Deng, Z. D. (2022). Safe passage of American Eels through a novel hydropower turbine. *Transactions of the American Fisheries Society*, 151(6), 711-724.

¹⁰⁵ Accession Number 20220803-5124. Great River Hydro, LLC submits Offer of Settlement between Great River Hydro, LLC and the U.S. Department of Interior et. al, and Revisions to Exhibit D Documents for the Wilder Hydroelectric Project et. al. under P-1855, et. al. “Fish Passage Settlement Agreement” Section 2.5, Page 8.

¹⁰⁶ Accession Number 20220919-5149. Reply Comments of Great River Hydro, LLC in response to comments re Offer of Settlement for the Wilder Hydroelectric Project et al. under P-1855, et. al. Page 3.

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should, as part of the hydraulic studies, be assessing potential changes in attraction flows to be more appropriate for target species. These assessments should take place after the removal of the salmon dam, which GRH has agreed can happen, to provide the best possible design to ensure passage through the intended ladder route.

Given the potential for greater and more consistent flows through the bypassed reach as well, the Salmon Dam will now become a barrier for resident fish who may be able to utilize habitat that was formerly unsuitable. And, given the greater likelihood of passage into the bypassed reach through the new turbine, the dam should be removed as soon as possible to provide the least impediment to downstream migrants. Under low flow conditions, water does not pass over the salmon dam, but rather through small tubes at the bottom of it (see photo below). The license application does not address whether the proposed minimum flow (300cfs) in the bypass reach is enough to continually overtop the dam, or whether eels and other fish would at times be restricted to passing “under” the dam to access downstream portions of the river. Importantly, the inclusion of the low flow turbine in the application occurred after the Fish Passage Settlement Agreement, so we assume that none of these considerations were addressed as part of those settlement discussions. Removal of the salmon dam is a mitigation and enhancement measure for fish habitat and passage considerations, recreational access, and traditional cultural property considerations discussed previously in this document. As such, GRH should be responsible for the removal of the “salmon dam” prior to installing the new turbine.

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Photo of water passing “under” the salmon dam during low flow conditions. Photo take July 7, 2022 by Annette Spaulding.

Additionally, passage for shad should be specifically included in the upgrades of fish passage facilities at the Bellows Falls dam. While it is often cited that Bellows Falls was the northern extent of shad range in the Connecticut River, there are also historic anecdotes indicating that shad migrated as far as the Mascoma River¹⁰⁷ and some shad currently pass through the Bellows Falls facility¹⁰⁸. The prior license issued in 1979 specifically refers to the desired passage of shad at Bellows Falls¹⁰⁹, not just Vernon. The license application states that the Bellows Falls ladder in its current configuration should be adequate for continued shad passage, yet this is patently untrue. Current passage for shad is not safe, timely, or effective. The Connecticut River

¹⁰⁷ “When the country was new and the Connecticut poured its floods into Long Island Sound unrestrained by dams, its waters were the resort of a multitude of salmon and shad. They came up as far as Lebanon, the salmon turning up White River and the shad up the Mascoma to deposit their spawn.” Downs, Charles Algernon. (1908) History of Lebanon, N.H., 1761-1887. Rumford Press. Page 189.

¹⁰⁸ 2022 – 896 shad passed Bellows Falls, 2021 – 356 shad passed Bellows Falls. Connecticut River Basin Fishway Passage Counts available at <https://www.fws.gov/office/connecticut-river-fish-and-wildlife-conservation/connecticut-river-migratory-fish-counts>

¹⁰⁹ “The Department of the Interior (Interior) and the New Hampshire Fish and Games Department (NHFG) recommended that fish passage facilities, needed for the restoration of Atlantic salmon and American Shad to upstream reaches of the Connecticut River, should be constructed as soon as possible at the Bellows Falls Project. The New Hampshire Office of State Planning, the New England River Basins Commission, and the intervenors in this proceeding expressed similar views.” Accession Number 19790803-4000. 8 FERC P 61122 (F.E.R.C.), 1979 **1 Commission Opinions, Orders and Notices New England Power Company Project No. 1855 Order Issuing New License (Major) August 3, 1979

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Shad Management Plan¹¹⁰ has a goal of 1.7 million shad entering the mouth of the Connecticut River. In 2023 there were not even 300,000 counted at the first barrier on the mainstem. Improving access to all potential spawning habitat and reducing delays in both upstream and downstream passage should help reach management goals by supporting spawner abundance and repeat spawning activity. These improvements should be implemented at all passage facilities that shad are currently utilizing.

Related, it is known that the endangered Shortnose sturgeon has been anecdotally observed upstream of the Turners Falls dam, with at least one of those sightings verified in 2017¹¹¹. This was not noted in the application. While it is unknown whether there is a remnant resident population or whether individuals have sporadically accessed this area during high flow events, the anticipated fish lift at the Turners Falls project may facilitate future upstream movement of this endangered species. It is nonsensical to wait until there is a problem with passage for these fish at Vernon to alter the ladder yet again. We would like to see provisions to encourage a designed opportunity to facilitate access to additional upstream habitat (that may have been historically utilized) for both shad and sturgeon in fish passage improvements. It is in the best interests of the river and the fish population to consider a holistic, full-assemblage, community approach rather than focus on one species at a time.

Section 18 of the Federal Power Act grants authority to the Department of the Interior or the Department of Commerce, through the US Fish and Wildlife Service, to submit fishway prescriptions during a license issuance and the Commission will need to include articles requiring appropriate design plans, installation schedules, and effectiveness studies. While the Fish Passage Settlement Agreement precludes the resource agencies from dramatically modifying their prescriptions from what was in the settlement, FERC can and should consider the continued delay of adequate passage when conducting the Environmental Impact

¹¹⁰ Accession Number 20220729-5377. US Fish and Wildlife – Connecticut River Fish and Wildlife Conservation Office submits Updated Version to the Addendum on Fish Passage Performance to the Connecticut River American Shad Management Plan under ZZ09-5. Updated and accepted in 2022.

¹¹¹ <https://www.fisheries.noaa.gov/feature-story/surprise-catch-first-shortnose-sturgeon-documented-above-dam-connecticut-river>

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Statement. Given the extensive length of time to which resident and migratory species have been subject by these projects to non-existent or unsafe, insufficient passage to critical habitat, and the added stressors of climate change on population recovery, we are asking FERC to recommend that expedited construction of improved passage facilities to ensure safe, timely, and efficient passage of all diadromous species.

VI. THE LICENSE SHOULD BE THE SHORTEST POSSIBLE TERM

RECOMMENDATION

If FERC chooses to issue a license for the Wilder, Bellows Falls, and Vernon projects, the term should not exceed 30 years.

Great River Hydro does not explicitly request a specific length of license term in their application. FERC Policy Statement on Establishing Licensing Terms indicates that, “For projects located at non-federal dams, the Commission sets a 30-year term where there is little or no authorized redevelopment, new construction, or environmental mitigation and enhancement¹¹².” FERC’s Policy goes on to say that “[i]n establishing the appropriate license term, staff initially examines the nature and extent of the required measures in the context of the project at issue, and then uses the cost of measures as a check on a qualitative conclusion that the measures required under the license are minimal, moderate, or extensive¹¹³.” The applicant’s proposal provides very little in the way of mitigation and enhancement. We would classify the measures included in the application as moderate at best due to the enhancement of fish passage facilities, but the lack of PME in other areas in our opinion pushes the measures into minimal territory.

In the 2017 policy statement¹¹⁴, FERC established three criteria to help guide determination of

¹¹² Policy Statement on Establishing License Terms for Hydroelectric Projects, 82 Fed. Reg. 49502 (Oct. 26, 2017). Page 49501.

¹¹³ Ibid. Page 49502.

¹¹⁴ Policy Statement on Establishing License Terms for Hydroelectric Projects, 82 Fed. Reg. 49502 (Oct. 26, 2017).

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the length of license terms: (1) coordination with other projects in the same basin; (2) agreed upon timeframes included in a comprehensive settlement agreement; and (3) “significant measures” expected in the new license. This final consideration is contingent upon the first, meaning that the license term must still be coordinated with other projects in the basin.

The applicant has been operating on a series of annual licenses since the prior license expired in 2018 – six years ago. Given the need to acquire 401 Water Quality Certifications and the development of a comprehensive Environmental Impact Statement, which will take at least one additional year, if not more, FERC has already provided almost a decade of a renewed license and allowed the applicant to further delay overdue environmental benefits. This default extension of their previous license should be counted against the next licensing term. All the above supports a 30-year license term.

VII. OTHER IMPACTS ON ENVIRONMENTAL QUALITY HAVE NOT BEEN SUFFICIENTLY CONSIDERED

RECOMMENDATION

FERC should address issues related to water quality, invasive species, and endangered and threatened species by issuing license articles requiring GRH to:

- monitor and mitigate changes in water quality due to the operational change,
- within six months of license issuance develop and implement an invasive species monitoring and management plan including both terrestrial species discussed in the application sections 3.7 of Exhibit E and aquatic species such as water chestnut, hydrilla, and other species about which VT and NH are concerned. This should be consistent with invasive species plans implemented at downstream facilities so that collected data is comparable across the watershed. This plan

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should be developed in consultation with members of the USFWS and the Northeast Aquatic Nuisance Species Panel at a minimum.

- encourage the adoption of an Early Detection and Rapid Response Protocol with baseline and rotating surveys for aggressive aquatic invasive species (AIS) and treatment approaches coordinated with resource agencies if found,
- provide invasive species educational materials and signage at all GRH facilities and access points,
- manage all appropriate GRH owned lands for grassland bird nesting,
- encourage protection through conservation easements of GRH fee-owned lands utilized by grassland birds, northern long eared bats, tiger beetles, Fowler's Toad, and other terrestrial species of concern,
- include a clause implementing shortnose sturgeon protection and management plans triggered by the passage of sturgeon at Turner's Falls or the confirmation of existing sturgeon in the Project area.

A. Water Quality Impacts

As previously stated, we are grateful for GRH's engagement in lengthy discussions and subsequent agreement to the proposed operational changes. The anticipated increase and stabilization of water surface elevation, discharge, and flow should be beneficial to the river ecosystem. However, there are unknowns that come along with the anticipated benefits of this operational change, and CRC maintains that FERC should require real-time comprehensive data collection in the license to monitor these changes. In particular, the increased flow may have both positive and negative consequences for sediment transport. Increased sediment transport may rejuvenate downstream habitats that have been sediment starved for decades, yet E. coli and nutrients bound to sediments that are "liberated" by changing flows may decrease water quality, both in the impoundments and downstream, in addition to the erosion issues CRC has previously discussed. Both short- and long-term changes to water quality because of operation changes need to be assessed and mitigated before the end of the license term. We would encourage along with this real-time data collection, the utilization of best available models to

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address future hydrologic changes, and how these will impact operations, water quality, and quantity in the environmental impact statement.

The state 303d and 305b lists, which respectively indicate a state's threatened or impaired waters and a quality report for all state surface waters, have been updated since the application was initially written in 2017. Any changes to the waters included within the project boundary in the latest listing update (2022) should be considered for the environmental impact statement.

Similarly, the application states that National Pollutant Discharge Elimination System (NPDES) permit renewals were pending¹¹⁵ (presumably in 2017) but subsequent application modifications did not indicate whether these permits were received or whether the permits contained any changes from the prior ones. We can only assume that NPDES permit renewals are happening once again (or have already happened) given the passage of time and the 5-year intervals for NPDES renewals. GRH should provide information on any changes to these renewals and whether the proposed operation changes, and installation of a new turbine will necessitate any modifications to these permits.

Given the changing nature of water flows in New England, in addition to the proposed operational changes, there is the possibility that water quantity and quality as currently described in the application will be markedly different by the end of the license period. FERC needs to include measures to address reasonably foreseeable changes in hydrological patterns, water temperatures, and water resources utilizing the best available models.

B. Aquatic Invasive Species

The presence of aquatic invasive species (AIS) impact on water resources of these invasives, and the interaction with project operations were not adequately addressed in the license

¹¹⁵ Accession number 20240131-5575. Revised Amended Final License Application, January 2024, Exhibit E. Page 3-140 – 3-141.

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application. Invasives were mentioned under terrestrial resources but no plan for management or detection of aquatic invasive species was listed under the GRH proposal, despite a brief mention indicating that AIS might expand ranges under the new operation¹¹⁶. FERC has previously established invasive species monitoring and removal as a requirement of hydropower licensing on the Connecticut River. Under Article 417(d) of the Holyoke Gas and Electric (HG&E) Settlement Agreement (FERC Project 2004), FERC approved requirements for HG&E to conduct invasive species monitoring annually each summer for invasive flora and fauna. Additionally, FERC required HG&E to contribute to the cost of water chestnut control in the project area in cooperation with state and federal agencies. Monitoring requirements under the license include, “(1) data from the previous two years of monitoring for invasive species; (2) invasive species maps that shall identify found populations of invasive species in relation to the project features as well as all the bordering wetlands and banks within the project boundary; (3) the total quantity of each invasive species found within the surveyed areas each year; (4) any control measures implemented; (5) the total quantity of each invasive species controlled or removed each year; (6) documentation of the annual meeting that occurred with the resource agencies; and (7) agency comments and recommendations on the monitoring results.¹¹⁷” Similar monitoring and the collection of comparable data needs to be implemented in the upper watershed as well.

Additionally, an annual survey by GRH for highly aggressive AIS will prevent the rapid spread of these species by coordinating monitoring and control. As we have recommended for downstream facilities, this work should be done in collaboration with resource agencies and the Northeast Aquatic Nuisance Species Panel to ensure best practices and a coordinated regional approach to AIS. Furthermore, a rotating monitoring approach of segments throughout the Projects’ waters coupled with regular baseline surveys of the entire affected stretch will result in comprehensive survey data to address AIS. All GRH-owned access points and facilities should display signage educating visitors about AIS prevention and particular species of concern. In

¹¹⁶ Ibid., Page 3-503 – 3-504.

¹¹⁷ Accession Number 20010822-0499. Order modifying & approving invasive species monitoring plan pursuant to License Article 417 re Holyoke Water Power Co under P-2004.

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tandem with recreation improvements, GRH should consider the installation and support of boat cleaning units like the CD3 at boat access areas that they manage. Increasing vigilance and education around transport and spread of aquatic invasive species is critical, particularly given concerns about the Connecticut River strain of hydrilla in the lower watershed¹¹⁸. GRH, through its management of water resources and recreational access has a critical role to play in preventing the spread of AIS and supporting awareness campaigns and a consistent message throughout the watershed.

C. Terrestrial Resources

Great River Hydro indicates that it will be “continuing to manage undeveloped land through cooperative agreements with farmers to maintain prime agricultural lands productive but also managed for critical wildlife habitat such as grassland bird nesting¹¹⁹.” While we are supportive of GRH’s indication that they are willing to do this, we would prefer that FERC codify this through a formal license article.

D. Threatened and Endangered Species

During the course of these extended proceedings, the northern long eared bat has now been listed as federally endangered¹²⁰. While project operations are not predicted to directly impact this species, CRC encourages GRH to take note of potential bat habitat on its fee-owned land and implement protective measures. As noted above, we also recommend instituting management policies and conservation easements for the long-term protection of grassland bird nesting habitats within the Project Boundary. The Eastern Meadowlark, a bird that is known to exist on Project lands, is listed as Threatened in both NH and VT. Similar long-term protective measures can and should be instituted for fee-owned lands that host other terrestrial species of concern, including the Fowler’s Toad and Tiger Beetles.

¹¹⁸ See: <https://www.nae.usace.army.mil/Missions/Projects-Topics/Connecticut-River-Hydrilla/> for more information.

¹¹⁹ Accession Number 20240131-5575. Revised Amended Final License Application, January 2024, Exhibit E, page 2-32.

¹²⁰ <https://www.regulations.gov/docket/FWS-R3-ES-2021-0140>).

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For fully aquatic species of concern, we are grateful for GRH's operational measures to ensure protection of dwarf wedge mussels during their overwintering and to decrease lateral movement and potential for dewatering of mussel beds during growing seasons. We did note that there was no mention of the federally endangered shortnose sturgeon in the license application. As detailed above, expected upgrades to fish passage facilities at Turner's Falls will ideally enable the movement of shortnose sturgeon past this obstacle. Provisions to address the presence of sturgeon in waters impacted by Project operations (i.e. the whole river) should be included in the license when they are known to occur in the Project Area.

VIII. A SHORELINE MANAGEMENT PLAN WOULD COORDINATE PME EFFORTS

RECOMMENDATION:

CRC recommends that FERC require the development of an adaptive shoreline management plan focused on efforts to:

- Minimize and mitigate the impacts of the operation/management of the three hydro projects as one part of a holistic plan,
- Restore, enhance, and protect riverine functions to provide in-river and riparian habitat, protect riparian land and cultural/historic artifacts and recreation areas,
- Monitor the impacts of project operations, and bank management techniques over the term of the license,
- Identify and set an end goal for the term of the license and have checks every five years on progress toward those goals.

We have made several specific recommendations throughout our comments that include monitoring and responding to erosion, developing additional recreational amenities, and enhancing existing access areas, concerns about the appropriateness of the project boundary, addressing the ongoing threat of both aquatic and terrestrial invasive species, protection of habitat for terrestrial species, and preservation of important cultural properties. All these

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recommendations are centered at the interface between land use and the water's edge. Upon review of other FERC licenses, it seems apparent that the most comprehensive way to integrate a holistic approach to the development of these plans would be to include them in a Shoreline Management Plan. There are multiple examples of similar situations where a Shoreline Management Plan was implemented such as on the Merrimack River¹²¹ in New Hampshire and on the Osage River¹²² in Missouri.

18 CFR 4.51(f)(6)(iv) requires that applicants for existing hydropower projects must include "[a] statement including an analysis of costs and other constraints, of the applicant's ability to provide a buffer zone around all or any part of the impoundment, for the purpose of ensuring public access to project lands and waters and protecting the recreational and aesthetic values of the impoundment and its shoreline." CRC did not find any information related to this in the application.

IX. FINANCIAL ASSURANCES FOR DECOMMISSIONING AND DAM REMOVAL ARE NEEDED

RECOMMENDATION

FERC should require the applicant to develop a decommissioning and dam removal plan and provide financial assurances to ensure the ability of the applicant to complete this work if and when it is necessary.

Under 2.3.3 of Exhibit E, the applicant discusses Retiring of the Projects¹²³. GRH quotes FERC's response to this inquiry in Scoping Document 2 in relation to comments received on Scoping Document 1. FERC states, "[t]here would be significant costs involved with decommissioning

¹²¹ Accession Number 20100816-3020. Order Modifying and Approving Shoreline Management Plan Pursuant to Article 407. August 16, 2010.

¹²² Accession Number 20110726-3006. Order Modifying and Approving Shoreline Management Plan. July 26, 2011.

¹²³ Accession Number 20240131-5575. Revised Amended Final License Application, January 2024, Exhibit E. Page 2-35.

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the projects and/or removing project facilities...¹²⁴” and “we do not consider decommissioning to be a reasonable alternative for the Connecticut River projects, at this time¹²⁵.” While we are not proposing decommissioning of any of the Great River Hydro projects at this time, the complete absence of any financial assurances for future decommissioning is unacceptable. The license should include provisions regarding the removal of the Projects if deemed necessary either before, or during the next relicensing process. Given current shifting developments in renewable energy, and ongoing and expected profound changes in precipitation and storms, it is distinctly possible that one or more of these facilities will either become unsafe, obsolete, or will reach the end of their useful lives before the expiration of the next license.

The presence of these facilities has and will continue to adversely impact the health of the Connecticut River and causes impairments in the project areas. The presence of dams is arguably the greatest long-term influence on river health and ecological function in the watershed. At the end of their operational life, they must be removed to fully restore the Connecticut River and support all the designated uses as outlined by the VT and NH Water Quality Standards and the Clean Water Act. Almost 30 years ago, in 1995, FERC stated¹²⁶ that it had the ability to require financial assurances and stated that, “[t]he Commission has concluded that it has the power to take steps necessary to assure that the public interest is suitably protected, including, in the rare case, requiring removal of the project dam¹²⁷” and further states that, “the Commission may impose license conditions to assure that funds are available to do the job when the time for decommissioning arrives¹²⁸.” CRC argues that it should not be a surprise when that time arrives, and funds should be available well in advance as they would be to rectify any other maintenance or safety issue.

¹²⁴ FERC Accession No. 20130415-3041. Scoping Document 2 for the Wilder (FERC No. 1892-026), Bellows Falls (FERC No. 1855-045), Vernon (FERC No. 1904-073), and Turners Falls (FERC No. 1889-081) hydroelectric projects, and the Northfield Mountain Pumped Storage Project (FERC No. 2485-063). April 15, 2013. Page 7.

¹²⁵ Ibid.

¹²⁶ Project Decommissioning at Relicensing; Policy Statement, Federal Energy Regulatory Commission, 60 Fed. Reg. 339 (Jan. 4, 1995).

¹²⁷ Ibid. Page 340.

¹²⁸ Ibid.

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In 2021, FERC issued a Notice of Inquiry regarding Financial Assurance Measures for Hydroelectric Projects and solicited comments¹²⁹. FERC received several comments from federal resource agencies, including USFWS and NMFS that support the idea of FERC requiring financial assurances to address decommissioning costs and removal of hydroelectric projects. It is the responsibility of the applicant, rather than taxpayers, to pay for and decommission these facilities when they reach the end of life. Given that, the license should require the applicant to develop a decommissioning plan inclusive of dam removal and provide financial assurances to ensure the ability of the applicant to complete this work if and when it is necessary.

X. THE APPLICANT SHOULD BE REQUIRED TO PRESENT ACCURATE PME COST INFORMATION

RECOMMENDATION

FERC should require the applicant to update PME costs to reflect actual protection, mitigation, and enhancement activities, and not operating costs.

CRC is very concerned about the justification for many of the specific estimated costs that GRH has included as PMEs for the Wilder, Bellows Falls and Vernon Projects as noted in Table 4.1-8¹³⁰.

The \$6,500,000 cost of the minimum flow unit to be installed at the Bellows Falls dam is not a PME and should not be included in Table 4.1-8. That unit is not passing an enhanced minimum flow to protect species or increase habitat, it is passing the amount of leakage that is coming out of the face of the dam. The low flow turbine was not brought forth until after the operational change and minimum flow were agreed upon, thus it is clearly not necessary for the maintenance of flows in the bypassed reach at Bellows Falls. Furthermore, there is the

¹²⁹ Financial Assurance Measures for Hydroelectric Projects, Federal Energy Regulatory Commission, 86 Fed. Reg. 7,081 (Jan. 26, 2021).

¹³⁰ Accession Number 20240131-5575. Revised Amended Final License Application, January 2024, Exhibit E. Page 4-8.

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potential for migratory fish to now pass through that turbine with unexplored potential adverse impacts. If anything, the addition of the minimum flow turbine should require *additional* PMEs to mitigate potential impacts of injuries to migratory fish and stranding of migratory fish in the bypass reach if the salmon dam is not removed. CRC contends that the \$6.5 million dollars currently allocated towards PME in Table 4.1-8 are more rightly considered to be project construction and operation costs as they cannot in good faith be interpreted as protecting, mitigating, or enhancing any project impacts.

GRH allocates \$1,800,000 for “Cultural Resource Surveys, HPMP measures” as a cost of PMEs. This cost should have been included as a cost of relicensing with surveys done and a final HPMP filed well before the filing of the AFLA.

CRC contends that “Recreation O&M,” “Impoundment WSE monitoring/Inflow forecasting enhancements and O&M,” and “Expanded Fish Passage O&M,” are costs of doing business and should not be considered as protection, mitigation, and enhancement measure costs. CRC requests that GRH clarify the difference between what is needed for “Impoundment WSE monitoring/ Inflow forecasting enhancements and O&M” (estimated to cost \$3,600,000 across all three facilities) and “WSE monitoring Inflow forecasting equipment and installation” (estimated to cost \$1,950,000 across all three facilities). We assume these are enhancements due to the proposed change in operation. Again, CRC does not consider this a PME cost. It is the cost of operating the facilities and generating electricity. The change in operational flows may serve to mitigate some impacts of the project, but the facilities are still generating electricity and making money on that electricity. The cost of that change is the cost of doing business.

GRH indicates a total of \$678,000 for recreation area improvements across all three facilities’ project areas. While the only recreation PME they have indicated in the application is ostensibly adding three primitive campsites that they already maintain to their project portfolio, this total reflects the amount that GRH indicates will be invested only at existing project recreational

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facilities for upgrades based on the excel documents provided in their March 29, 2021, response to AIRs¹³¹.

Based on information provided in Exhibit D for each facility, it seems that the Wilder facility had revenue of \$10,323,459; Bellows Falls \$13,982,143; and Vernon \$9,240,984 for a total revenue of \$33,546,586 in 2019. Yet, Exhibit E indicates an intended investment for recreation of only \$678,000 for all three projects that is supposed to serve as a PME for the next 30 to 50 years. That amounts to between \$13,560 and \$22,600 annually. This would be a mere .04% to .07% of revenue (based on 2019) dedicated to recreation enhancements. This minuscule investment in recreation at each facility over the course of the license is completely unacceptable.

In our estimation of Table 4.1-8, at most, PMEs costs over the course of the license provided by the applicant would total \$5,352,000 for Wilder, \$4,781,000 for Bellows Falls, and \$6,390,000 for Vernon. This is significantly less than what they are presenting and a mere \$413,075 per year over forty years, or approximately 1.2% of the reported 2019 revenue.

XI. THE APPLICANT'S DEFICIENT AFLA COMPOUNDS THE PLP'S IMPORTANT DEFECTS

There were deficiencies in the Integrated Licensing Process timeline which diminished the public's opportunity to comment on a comprehensive draft application. As a result of that, the AFLA is deficient and should have been rejected. 18 C.F.R. § 5.20. Further detailed information and public input should have been required prior to the issuance of a Ready for Environmental Analysis. C.F.R. § 5.21 and ILP generally.

CRC previously stated in our comments in both our March 1, 2017¹³² and our March 10, 2017¹³³

¹³¹ Accession Number 20210330-5038. Great River Hydro. Response to License Application Additional Information Requests. Dated March 29, 2021. Table D-1 for each project.

¹³² Accession Number 20170301-5153 Comments by the Connecticut River Watershed Council on TransCanada's Preliminary License Proposal (PLP) dated December 1, 2016

¹³³ Accession Number 20170310-5125 Connecticut River Watershed Council's Objection to: Revised Process Plan and Schedule

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filings our concern that the Preliminary License Proposal (PLP) was deficient in information and the Integrated Licensing Process (ILP) was being undermined¹³⁴. Great River Hydro (at that time TransCanada) filed an admittedly deficient, incomplete, and premature PLP that lacked core components including Protection, Mitigation, and Enhancement Measures (PME), proposed operating conditions, and alternatives. Stakeholders commented on that inadequate PLP, with a lack of substantive information, which precluded any constructive, meaningful comment that the company could respond to. This undermined the ILP.

Similarly, with the AFLA (inclusive of the addition of the Fish Passage Settlement Agreement and the Revised Amended Application materials), the public has not been provided a comprehensive license application to comment on. It is materially lacking in detailed PME proposals. In 2017 FERC allowed a Final Licensing Application to be filed without a reasonable, meaningful 18 C.F.R. § 5.16 process.

Importantly, many of the AFLA's deficiencies, see 18 C.F.R. § 5.18, result from the PLP's deficiencies. As explained in our March 1, 2017, comments, specific measures should have been provided long ago. The result is that CRC's (and the public's) ability to comment and have meaningful input into the ILP has been undermined. To be clear, the ILP violations identified in CRC's March 1, 2017, comments persist and are now compounded.

The public deserves more comprehensive and detailed information and commitments regarding enhancements for recreational and cultural considerations in the license application, timely safe and effective fish passage, as well as monitoring and anticipated mitigation measures to fully understand the effect that operational changes will have on erosion issues and sediment transport in project areas. The license application provides little detailed information on protection, mitigation and enhancement measures for erosion concerns, cultural resources, and recreation besides how these might be enhanced by the operational change.

¹³⁴ CRC reasserts these comments and incorporates these comments by reference as part of these comments.

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At several points in its AFLA, Great River Hydro indicates that details will be worked out at a future date, undermining the public's right to be informed and opportunity to respond to issues of specific or local concern. For instance, GRH indicates that they will, "develop and sign a Programmatic Agreement for Managing Historic Resources with State Historic Preservation Officers in consultation with Abenaki tribal Leaders," and that, "Specific measures for the completion of the outstanding consultation and survey and site evaluation and mitigation tasks will be outlined in the HPMPs." These detailed efforts, along with others such as a comprehensive Recreation Plan, analysis of impacts of proposed operational changes, and others, should have been completed and filed as part of PLP, 18 C.F.R. § 5.16, or if not then filed as part of the draft license application, or if not then filed as part of the final license application. The details required to fully evaluate the application and cumulative impacts have still not been put in front of FERC or the public. The ILP demands that such measures reflecting public input be detailed by the time that this Revised Amended Application was filed. The failures further violate 18 C.F.R. § 5.18 and undermine the ILP process.

In section 3.3, GRH¹³⁵ describes the process by which environmental effects were considered under the proposed operational scenario. While FERC indicated the following resources be considered for cumulative impact, "water quality and quantity (including power generation), fishery resources (including anadromous and catadromous fish and fish passage), floodplain communities, freshwater mussels, sediment movement, recreational uses, and rare, threatened, and endangered species¹³⁶ (FERC, 2013)," it is CRC's perspective that during discussions, stakeholders and GRH analyzed this operational change from the perspective of aquatic resources only and there was little consideration of cumulative impacts to water quality, recreation, fish passage, floodplain communities or particularly sediment movement, as we have detailed in these comments. While CRC agrees that this operational change will be positive for the river, since GRH was not required to provide information as to specifics of how

¹³⁵ Accession Number 20240131-5575. Revised Amended Final License Application, January 2024, Exhibit E.

¹³⁶ Ibid. Page 3-13.

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the proposed operational change will affect these resources, FERC should require this analysis as part of the new license.

At multiple spots in the application, GRH indicates that they are not proposing an operational change, and they have not considered the impacts (possibly positive) under this new scenario. This oversight indicates a material lack of comprehensive analysis of cumulative impacts under this new scenario. A specific example is found in section 3.5.3.2 Water Quality, where GRH states, “Moreover, the existing thermal regime is not expected to change from existing conditions because Great River Hydro is not proposing any change in Project operations”¹³⁷ and “because Great River Hydro is not proposing any change in Project operations, existing DO levels throughout the entire Project area are not expected to change.”¹³⁸ GRH has failed to adequately consider changes to water quality and other resource concerns not specific to aquatic habitat under the new operating scenario.

Great River Hydro’s cover letter to its FLA submitted on May 1, 2017, stated the following:

“In its March 1, 2017 comment letter on the Preliminary Licensing Proposal (PLP), the Connecticut River Watershed Council (CRWC) stated a number of concerns about the ability of the ILP process to address stakeholder interests and provide for meaningful PLP content for comment. As described above, for various reasons outside of TransCanada’s and Great River Hydro’s control, the status of the relicensing studies and subsequent consultation and alternatives evaluation remain on-going. The delay in producing what CRWC and others consider to be a “complete” PLP or FLA will not diminish Great River Hydro’s intent to evaluate project effects on resources, and to engage and consult with resource agencies and other stakeholders. This consultation will include Great River Hydro, LLC discussion of study results, consideration of and responses to study report comments, consideration of additional studies, and evaluation of PM&E recommendations that may lead to a more thoughtful, evidence-based licensing proposal. This iterative study process is a hallmark of the ILP, which requires studies to be satisfactorily completed prior to developing meaningful recommendations or licensing proposals. As a part of this process, Great River Hydro recognizes the need for continued stakeholder participation, consultation,

¹³⁷ Ibid. Page 3-262.

¹³⁸ Ibid. Page 3-263.

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and adequate opportunity to comment on additional study results and/or licensing proposals. Nothing in the ILP process or these FLAs diminishes the opportunity for stakeholder engagement.”

CRC reflects on this statement and reiterates that the public has not had the opportunity to comment on a complete PLP and have those comments considered by GRH. These important deficiencies compound prior deficiencies and short-circuit the public input required by the ILP. FERC should have acted to fully preserve public rights to participate in the ILP process. The applicant’s deficient filing should not have been allowed at the expense of meaningful, substantive stakeholder input. The AFLA should have been rejected as deficient. Stakeholders should have been allowed a formal public comment period on an actual complete application proposal to allow for the continued development of comprehensive PM&Es before the Final Application was deemed complete. This did not happen and because of that, the ILP process has been consistently and profoundly undermined in this proceeding. 18 C.F.R. § 5.16

CRC continues to have concerns regarding deficiencies in the application filings which limit the ability of the public, CRC, and FERC to adequately assess what will be occurring under the proposed license and what the effects will be. These concerns include the complete lack of comprehensive PME measures regarding erosion, traditional cultural properties, recreation access and maintenance, implementation of fish passage improvements, and impacts of the proposed operational change, as well as additional concerns regarding the property boundary, financial assurances, etc., as we have detailed. We respectfully request that FERC directly address these issues through rigorous assessment during the NEPA process and license articles requiring rapid implementation of plans to monitor, manage, and mitigate the many resources and issues affected by the hydro operations.

We acknowledge the numerous comments from community members, organizations, and municipalities who have unequivocally shown that they care for the Connecticut River. We all have a vested interest in ensuring that our public trust is appropriately cared for, now and in the future.

Connecticut River Conservancy comments on Great River Hydro Amended Final License Application dated December 7, 2020 (inclusive of application revisions and changes through January 31, 2024)

Connecticut River Conservancy appreciates the opportunity to comment on the application package for the Great River Hydro facilities. We can be reached at the contact information provided below should you have any questions.

Sincerely,



Kathy Urffer
River Steward, VT
kurffer@ctriver.org
(802) 258-0412



Kate Buckman
River Steward, NH
kbuckman@ctriver.org
(603) 931-2448



Rebecca E. Todd
Executive Director
rtodd@ctriver.org

ATTACHMENTS:

Exhibit A: estimate of cost to stabilize property in Claremont NH

Exhibit B: example of alternative project boundary based on elevation

Connecticut River Conservancy comments on Great River Hydro Amended Final License Application dated December 7, 2020 (inclusive of application revisions and changes through January 31, 2024)

Exhibit A

Cost Estimate for Property Stabilization

May 31, 2020

Via Electronic Mail

Kathy Urffer
Connecticut River Conservancy
PO Box 6219
Brattleboro, VT 05302

Re: Feasibility assessment of bank stabilization and habitat enhancement on Connecticut River at Lipfert property in Cornish, NH

Dear Ms. Urffer:

This letter shall serve as a memorandum discussing the feasibility of completing bank stabilization and habitat enhancement along a high eroding bank on the Connecticut River at the Lipfert property in Cornish, NH (see Appendix 1). The 800-foot long eroding bank is 40 ft high and largely composed of unconsolidated glacial outwash sands (Figure 1). The top of the bank is a narrow relatively flat surface extending back from the bank for a distance of 35 to 90 ft (depending on the position along the bank) before a forested slope is encountered that descends down to a lower surface further from the river. As discussed below, the feasibility of completing bank stabilization and habitat enhancement at the site was determined by: 1) conducting a site visit with a contractor to discuss machine access and constructability, 2) reviewing previously completed topographic surveys, and 3) completing a preliminary conceptual design with rough cost estimate.



Figure 1. The 40-foot high bank at the Lipfert site is composed of glacial outwash sediments.

Typically, bank stabilization and habitat enhancement projects of this type involve installing logs in the form of either multiple marginal log jams deflecting flow away from the bank or a continuous log crib wall along the bank to prevent the strong forces from eroding the soil behind.

The use of log jams is the preferred approach at the Lipfert site given that the strong forces of the Connecticut River could undermine the crib wall and continue to destabilize the bank. Construction of log jams (and crib walls) is typically completed from the top of the bank where machines can more easily access stockpiled logs and pull logs into the bank to provide additional stability to the structures. (Excavators have much less power to push logs into a bank.)

The high bank at the Lipfert site poses several impediments to construction. Excavators will not be able to reach the toe of the bank and perform the necessary functions if situated at the top of the 40-foot high bank. At a site on the Connecticut River in Columbia, NH where the bank was approximately 20 ft high, the bank was lowered (and soil temporarily stockpiled) such that excavators could reach the toe of the bank to install the log jams. (The upper bank was reconstructed and stabilized at the completion of the project.) However, at the Lipfert site where the bank is twice as high, removal of the upper bank sediment would result in a prohibitive increase in project cost and, practically, may not be possible given the limited space available at the top of the bank to temporarily stockpile the sediment (before reaching the forested slope). While working from a barge in the river could be technically feasible, costs would be high in terms of both the specialized equipment needed and the increased duration of construction since the logs could not be readily stockpiled within easy reach of the excavator on the barge. (This approach would also depend on permission from local landowners to launch a barge and supply it with materials as this would likely not be possible from the Lipfert property itself.) Furthermore, working from the base of the bank will require use of the less effective approach of trying to push, rather than pull, logs into the bank.

A topographic cross section of the riverbank at the Lipfert site indicates no deep pools are present along the bank (Figure 2). While this would minimize the difficulties of underwater construction, shallow water depths might make construction untenable if a barge cannot approach close enough to the bank before grounding on the river bottom. Another topographic cross section across the entire river shows the height of the wide floodplain across from the Lipfert site on the Vermont side to be 19 ft above the base of the bank (Figure 3). To minimize the risk of overtopping and outflanking, the marginal log jams along the bank at the Lipfert site should be built at least a few feet higher than the floodplain on the opposite side of the river, so flows are able to spread out and slow the rate of rise in river stage with increases in discharge.

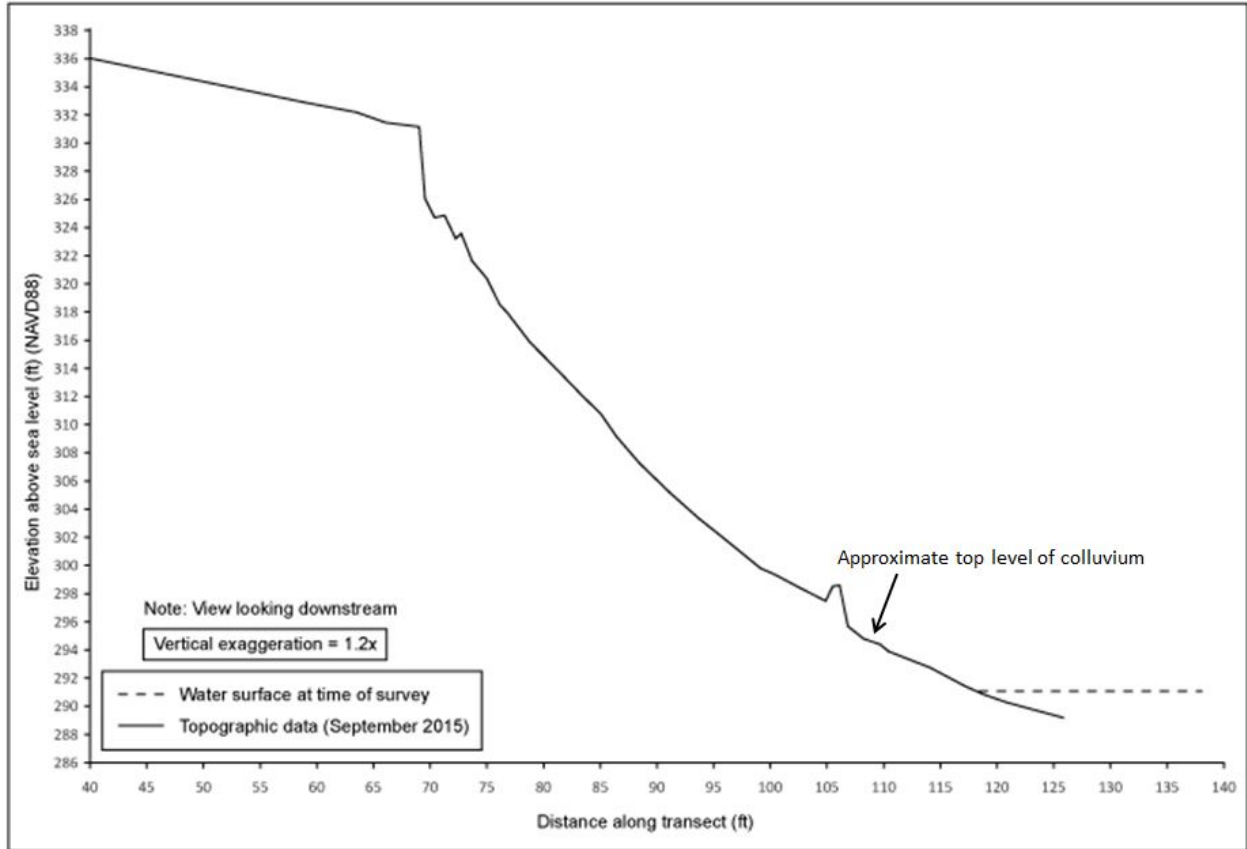


Figure 2. Topographic cross section of 40-foot high Lipfert bank showing approximate top elevation of colluvium.

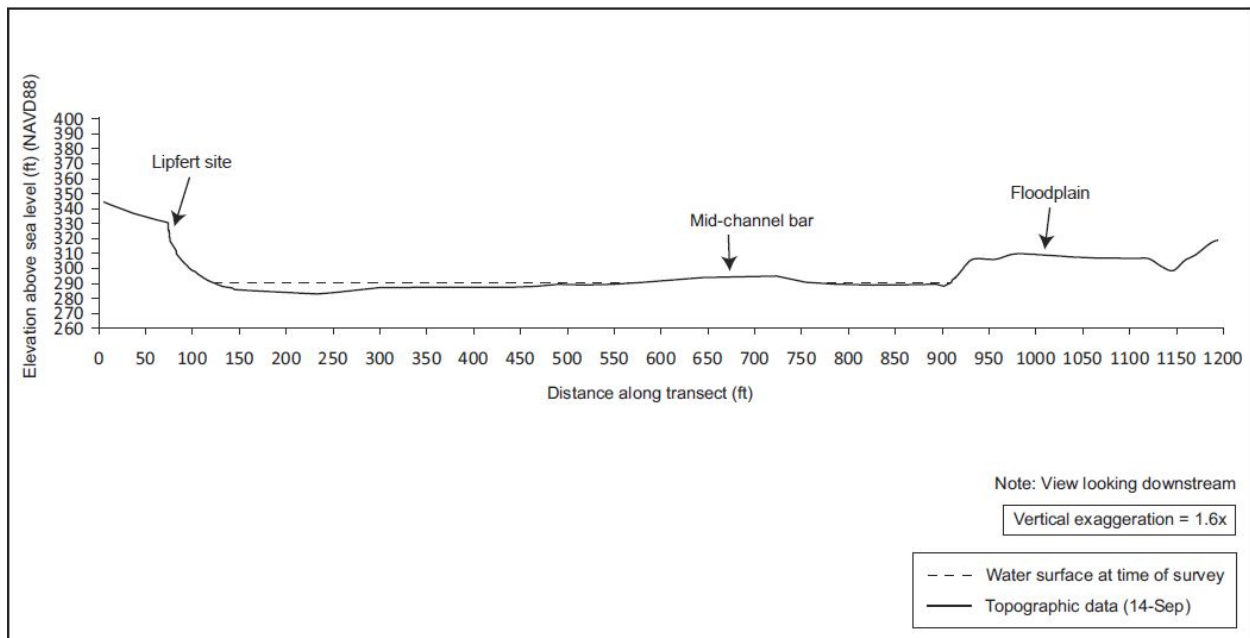


Figure 3. Full river cross section at Lipfert site showing floodplain height of 19 ft above base of bank.

Marginal log jams built to a height of 22 ft (i.e., 3 ft higher than the height of the opposite bank) could be unstable (as the anchoring vertical log piles would be difficult to install to the necessary 22+ ft into the channel bed) and cost prohibitive to construct. In addition, marginal log jams

need to be constructed against and into solid undisturbed native soil. Ground photographs (Figure 1) and the more detailed topographic cross section (Figure 2) suggest colluvium (i.e., loose sediment accumulating at the base of the slope from upslope erosion) is present at the bank toe. The colluvium would need to be removed to construct the log jams into the native soil behind. Depending on the amount that is removed, the upper slope could be destabilized by oversteepening at the base of the slope – potentially threatening workers and equipment during construction and even jeopardizing the log jams themselves following project completion.

A preliminary conceptual design and cost estimate for bank stabilization and habitat enhancement at the Lipfert Site using a series of 14 marginal log jams is appended to the end of this memo (Appendix 1). Each log jam will extend into the river 15 ft and along the river for 20 ft with the spacing between each log jam equaling 60 ft from the center of each structure. The design assumes that the technical difficulties associated with construction discussed above can be satisfactorily addressed at minimal additional cost, so the estimated total of more than \$1.3 million is likely to become much higher if project design were to move forward.

Given the high cost and uncertainties associated with construction and long-term stability of marginal log jams at the Lipfert site, I would recommend not moving forward with final project design and permitting. Other less expensive design options may be available for bank stabilization and habitat enhancement such as the use of boulder deflectors, but many of the same construction constraints associated with the high bank would likely hinder project implementation and increase project cost. Along the Connecticut River many previously high eroding banks have stabilized and revegetated over time with no intervention (Figure 4), so simply planting appropriate tree species on the Lipfert bank might represent a low-cost bank stabilization approach worth consideration with the understanding that the likelihood of project success would be low (but with minimal financial loss if unsuccessful).



Figure 4. Eroding bank on Connecticut River in Bellows Falls Pool in 1964 was stable by 2015.

Please let me know if you have further questions regarding the feasibility assessment described above or if you would like us to further explore other methods for bank stabilization and habitat enhancement at the site. I can be contacted at any time at 207-491-9541 or jfield@field-geology.com.

Sincerely,

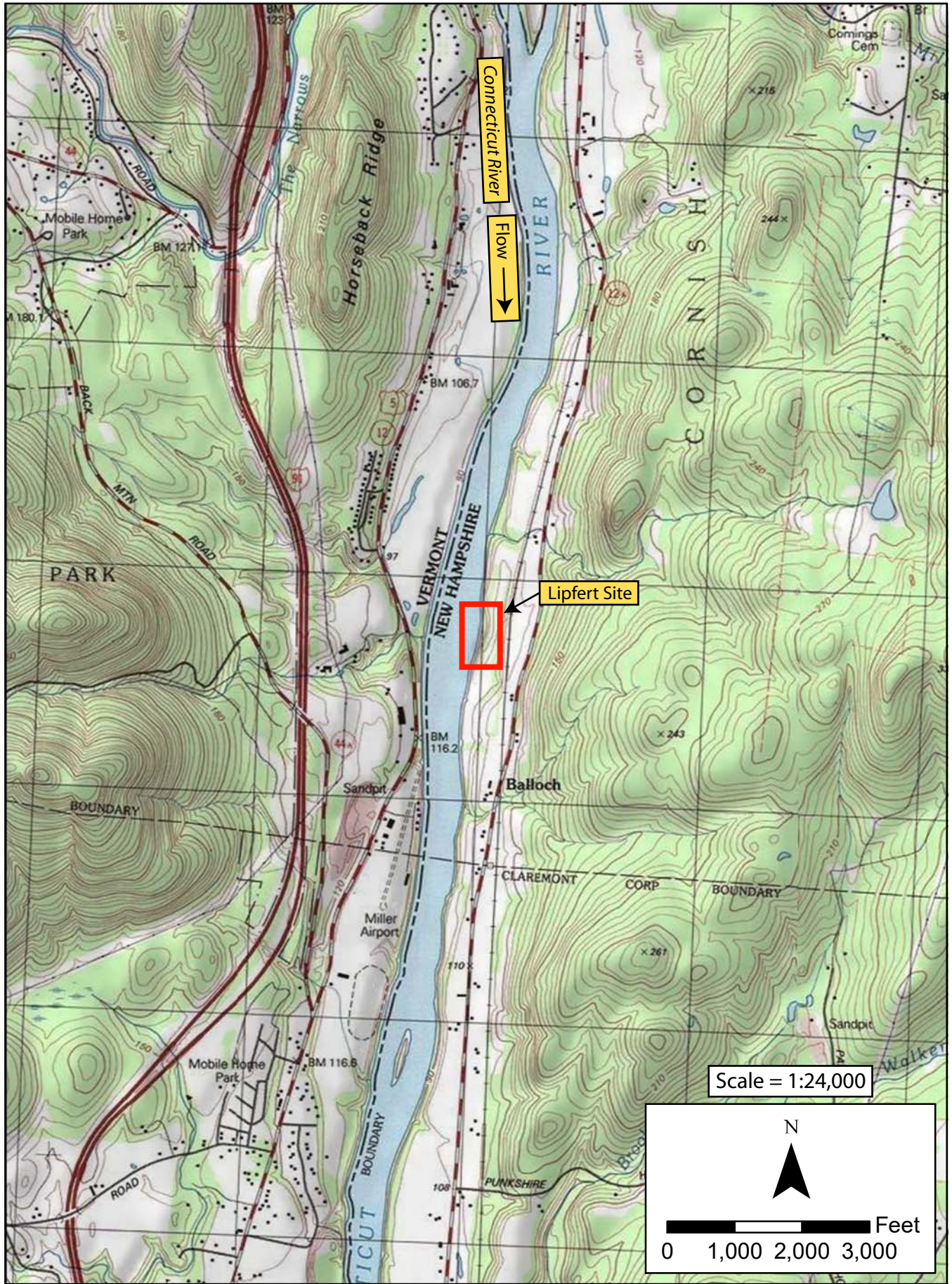
A handwritten signature in black ink, appearing to read "John Field". The signature is fluid and cursive, with the first name "John" and the last name "Field" clearly distinguishable.

John Field, PhD

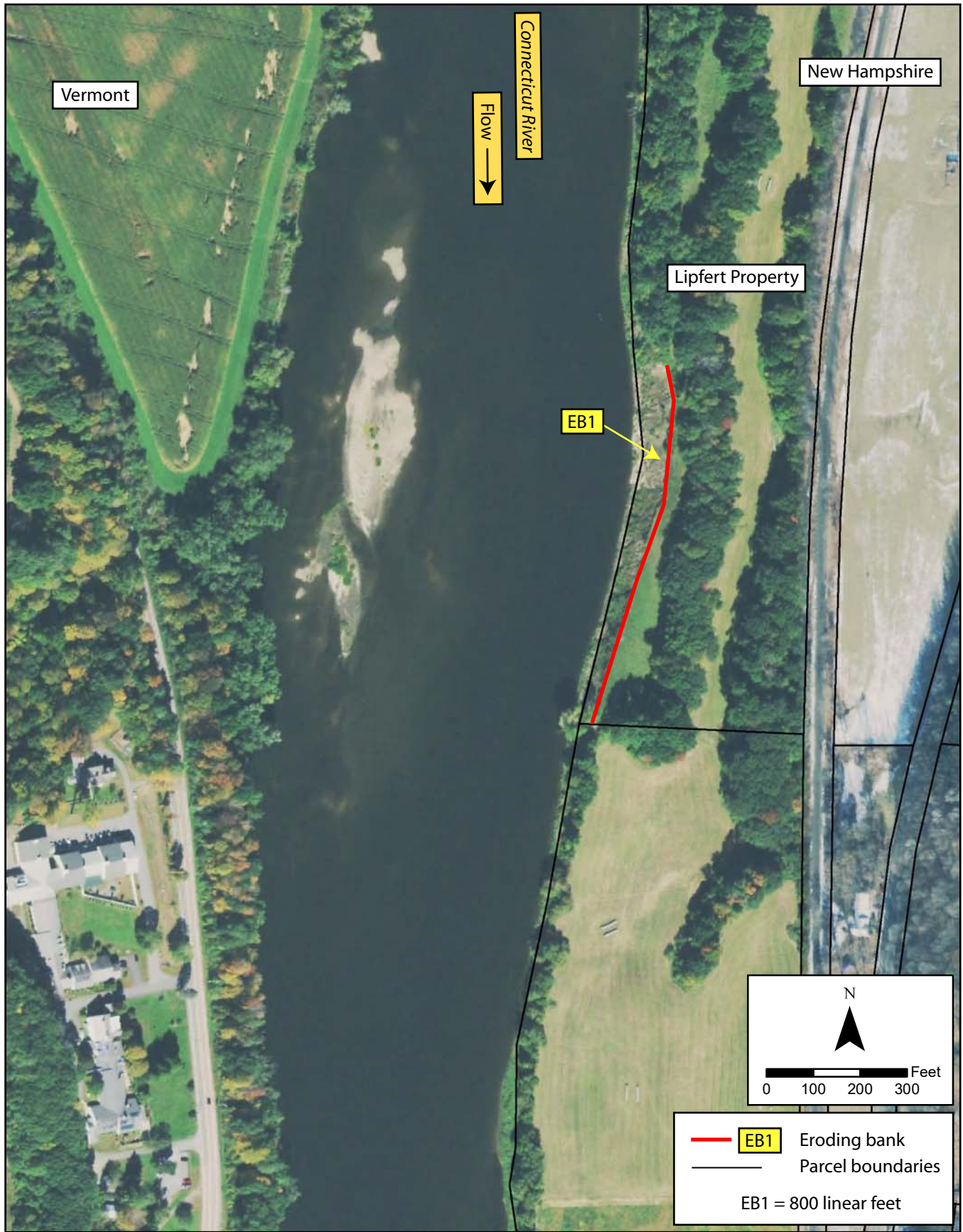
Enclosure

APPENDIX 1

(Conceptual design and cost estimate for bank stabilization and habitat enhancement at Lipfert site)



Connecticut River - Lipfert Site. Topographic map.



Connecticut River - Lipfert Site. Overview map.

Lipfert Site - Connecticut River
 Estimated Materials List

Structure Type	Number of structures	Quantity per structure	Material (description)	Diameter (dimensions)	Length (feet)	Total Count
Log jam - 22 feet high 800 linear feet	14	48	Rootwads	15+	45	672
		5	Logs (extra long vertical piles)	15+	45	70
		16	Logs (toe wood)	15+	45	-
		8 loads	Brush / slash / tops			112
		120 cu.yd.	Boulders	1.5 to 2.0 ft	1.5 to 2.0 ft	1680
Subtotal						
Whole trees (rootwads, piles, toe wood)						742
Brush / slash / tops						112
Boulders						1680
Add 10 percent contingency						
Whole trees (rootwads, piles, toe wood)						74
Brush / slash / tops						11
Boulders						168
Total						
Whole trees (rootwads, piles, toe wood)						816
Brush / slash / tops						123
Boulders						1848

Material	Subtotal	add 10%	Total with contingency	Unit cost	Unit	Material cost
Trees (45 ft long)	742	74	816	\$ 350.00	tree	\$ 285,600.00
Brush / slash / tops	112	11	123	\$ 1,200.00	truck load	\$ 147,600.00
Boulders	1680	168	1848	\$ 120.00	cu.yd.	\$ 221,760.00
						\$ 654,960.00

Note: assumes that toe wood is cut out of same trees as rootwads.
 All materials delivered to site as whole trees minimum diameter 15 inches and minimum length 45 feet.

Lipfert Site - Connecticut River

Estimated Costs

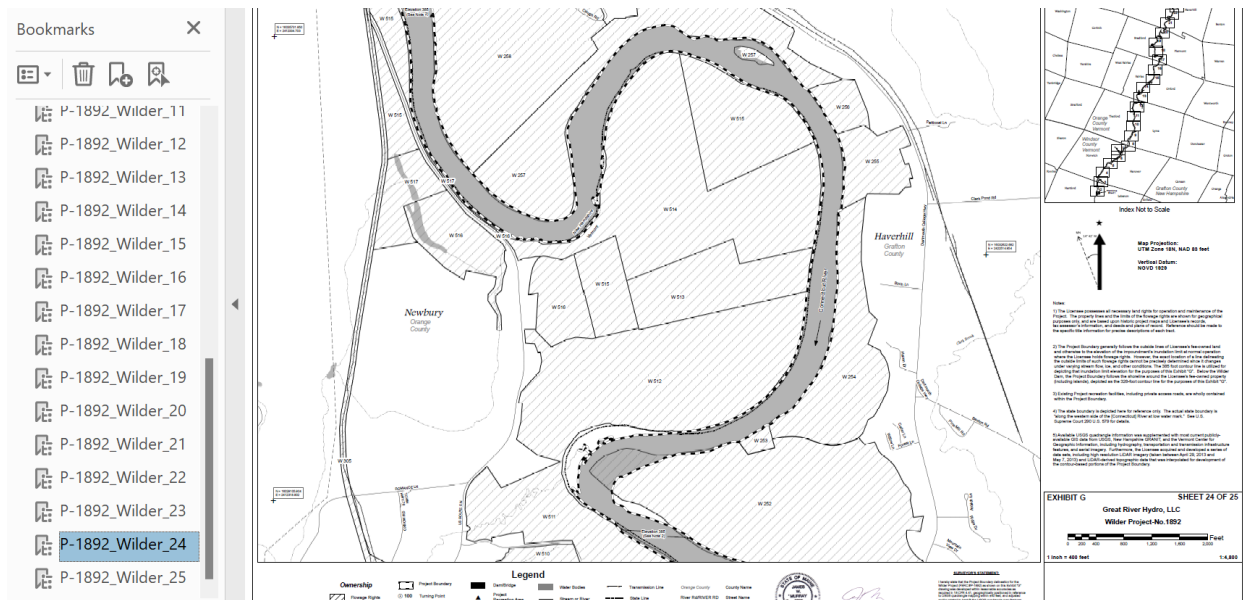
Task / Material / Description	Cost
Trees (45 ft long)	\$285,600.00
Brush / slash / tops	\$147,600.00
Boulders	\$221,760.00
Materials subtotal	\$654,960.00
Heavy equipment - Excavation, pile driving, etc. Includes all equipment and operators, vibrating head rental, crane rental, mobilization and demobilization, final site preparation.	\$370,000.00
General contracting labor and supplies - all installation labor including sawyers, cabling, fuel, mulch and seed mixes	\$290,000.00
Construction oversight - Field Geology Services	\$37,500.00
Total	\$1,352,460.00

Exhibit B

Project Boundary Delineation Problem

As stated in our comments Project boundaries are problematic. Below is an example of one site to illustrate this concern.

If you consider Map 24 of the Exhibit G for Wilder you identify a curve in the river in Newbury, VT surrounded by flowage easements owned by GRH:



If you pick a spot 200 feet from the reservoir edge in Newbury, VT where GRH owns flowage rights, you'll see that this intersects with the 400-foot contour line.



This includes significantly more land that might necessarily be flooded under project

operations, that should be included in the project area.



This is one example of how choosing a contour line and applying it as the project boundary throughout the entire reach is nonsensical. Rather, the elevation 200 feet above the surface water should be the project boundary, which can intersect with many different contour lines. The project boundary should increase in elevation as you move upriver, just as the edge of the river does.

Document Content(s)

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