VERMONT AGENCY OF NATURAL RESOURCES

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Vernon Hydroelectric Project – Water Quality Certification

Public Comments

The Agency of Natural Resources' Department of Environmental Conservation (Department) placed its tentative decision and draft water quality certification on public notice from February 13th, 2025 - March 17th, 2025, for the purpose of receiving written statements and data bearing on the issuance of a water quality certification to Great River Hydro, LLC (the Applicant) in connection with a license application before the Federal Energy Regulatory Commission for the Vernon Hydroelectric Project, located on the Connecticut River in the town of Vernon, Vermont. The Department also held a public hearing on March 5th, 2025, for the purpose of receiving oral testimony. The public hearing was held in person in Brattleboro, Vermont with an online option.

A total of 20 persons, representing themselves or organizations, presented oral and/or written testimony at the hearing or filed letters with the Department. Written comments were received from the Applicant, Connecticut River Conservancy, Vermont Natural Resources Council, Conservation Law Foundation, American Rivers, American Whitewater, Appalachian Mountain Club, Windham Regional Commission, Town of Brattleboro, Massachusetts Department of Fish and Wildlife, FirstLight Power Resources, Legislators of the Vermont General Assembly, and Tom Clynes.

The following is a summary response to the substantive comments received. Some of the comments have been paraphrased. The full text of these comments is available upon request for review at the Vermont Department of Environmental Conservation – Watershed Management Division. A recording of the hearing is also available upon request.

The Department notes that there may be changes to the certification related to its continuing review and not related to the public comments. Interested persons should carefully review the final decision.

1. Licensing and Certification

a. Process

Comment 1: Comments expressed a range of concerns regarding the studies developed as part of the relicensing, including that they were flawed or inadequate and they are too old to be relied upon.

Response 1: The studies were developed and implemented through a formal process that included extensive stakeholder engagement and resulted in a robust dataset to support relicensing and certification of the Project. To complete a comprehensive assessment of the effects of project operations, the Federal Energy Regulatory Commission (FERC) is required under the National Environmental Protection Act (NEPA) to seek input from the public, nongovernmental organizations, Indian tribes, and state and federal resource agencies. This input helps identify environmental issues regarding proposed or existing project operations and determine studies needed to better understand the issues. The applicant is responsible for working with FERC and other stakeholders to develop scientifically supported study plans to assess the effects and potential effects of project operations on various resources (i.e. water quality, recreation, aquatic habitat).

The FERC relicensing process includes a two-year period for the applicant to conduct the requested studies. During this time, stakeholders have several opportunities to comment on study plans, request additional studies or modifications, and comment on study reports. Under the licensing process, FERC is responsible for resolving disagreements on studies and issuing a formal study plan determination on the studies required and methods to be employed. For this relicensing, stakeholders utilized these opportunities to provide comments, request study modifications, and recommend additional analyses, which were incorporated throughout the process. For example, additional hydraulic modeling, sediment sampling, and sediment characterization were conducted at all sites initially monitored for erosion.

The information gathered through these studies serves as the basis for FERC's licensing decision, as well as for determinations made by state and federal resource agencies with mandatory conditioning authority

under the Federal Power Act (FPA). The study results also support the Applicant's application for water quality certification under Section 401 of the Clean Water Act. As part of its review, the Department may request additional studies, if necessary. On April 19, 2024, the Department determined the applications for the Connecticut River projects to be both administratively and technically complete.

In the case of the Connecticut River projects, this process resulted in 33 studies that were required based on the input of 20 agencies, organizations, or individuals, not including the Applicant and FERC.[1] The studies covered a broad spectrum of resources, including erosion, hydraulic and operations modeling, water quality, aquatic habitat, geomorphology, resident and migratory fish, rare threatened, and endangered (RTE) species, odonates, recreation, whitewater boating, and aesthetics. The geographic scope of the studies included more than 120 miles of river, from the upstream extent of the Wilder impoundment to the riverine reach downstream of Vernon Dam.

In the case of one study, focused on upstream passage of American Eel at Vernon, study efforts continued over the course of five field seasons. While there was a delay in FERC deeming the license applications "ready for environmental analysis" to allow coordination with the environmental reviews of two downstream hydroelectric projects also undergoing relicensing, the results of the studies remain valid. Taken together, these studies form the most comprehensive assessment of project effects in support of a hydroelectric licensing effort in Vermont.

Comment 2: Comments expressed concerns that studies were performed based on the status quo of current operations, cannot be used to assess the proposed operations, and that modelling the change in operation should have been required to review the application.

[1] Comments on the 33 studies were filed by: the U.S. Fish and Wildlife Service; the National Park Service; the New Hampshire Department of Environmental Services; the New Hampshire Fish and Game Department; the Vermont Agency of Natural Resources; the Vermont Division of Historic Preservation; the City of Lebanon, New Hampshire; the Connecticut River Watershed Council; the Connecticut River Joint Commission; the American Whitewater Association; New England FLOW; The Nature Conservancy; the Appalachian Mountain Club; the Vermont River Conservancy; the Friends of the Connecticut River Paddlers' Trails; the Narragansett Indian Tribal Historic Preservation Office; the Nolumbeka Project; Two Rivers-Ottauquechee Regional Commission; and F. William and Jennifer Lipfert.

Response 2: The studies conducted by the Applicant occurred at the appropriate time and serves as the foundation for intensive modelling used to assess the Applicant's proposal. The licensing and certification processes are designed to identify and obtain necessary information before the filing of the respective applications. The information gathered through the studies conducted by the Applicant are intended to support a comprehensive review of project benefits, environmental effects, and to inform the development of conditions by resource agencies and FERC.

In the case of the Connecticut River projects, the relevance of the studies in assessing proposed operational changes was demonstrated through their use in extensive modeling of the Applicant's proposal. This modeling was critical in evaluating the effects of proposed operations on each studied resource. Multiple agencies and non-governmental organizations engaged in discussions that were informed by modeling operational scenarios using the operations and hydraulic studies to model flows and water levels across the entire geographic extent of the Project.

Specifically, the hydraulic study allowed modeling at specific 'econodes', or points of interest identified through resource specific studies, to evaluate how the changes in flow and water levels affected resources of interest. This included evaluating these impacts on rare, threatened, and endangered species such as Dwarf Wedgemussel and Cobblestone Tiger Beetle. Modeling was performed across a range of hydrologic conditions, using four representative years that spanned wet to dry conditions, and included different months to assess seasonal considerations like spawning.

These efforts led to a memorandum of understanding (MOU) that was signed by all participating parties, including the Connecticut River Conservancy. The MOU served as a key reference in shaping the Applicant's licensing and certification proposal. This extensive modeling, along with additional analyses, was then incorporated into the Amended Final License Applications (AFLA) for broader stakeholder review. The AFLAs that reflects this analysis were filed on December 7, 2020. As part of the water quality certification process, the Department conducted its own independent analysis of the modeling performed by the Applicant. The studies conducted in support of the relicensing facilitated development of extensive modeling that supported a comprehensive assessment of the activity subject to certification.

b. Decision

Comment 3: Comments expressed concern about the basis of the Certification and the extent to which it addresses resource issues describing it as an "unfettered ecological experiment" and akin to a "shot of penicillin".

Response 3: The Certification is grounded in accepted scientific principles and is consistent with the Department's established approach to addressing flow alteration across Vermont. The importance of flow regimes to a broad range of ecological uses and values is well supported in scientific literature, most notably by the research of Dr. LeRoy Poff et al. and the seminal publication, *The Natural Flow Regime: A paradigm for river conservation and restoration*.[2] This foundational research established flow as the 'master variable' driving a range of ecological considerations including water quality, channel geomorphology, and habitat diversity. Further, the authors underline the importance of the dynamic character of rivers to ecological integrity. The authors highlight specific elements of the dynamic nature of rivers that practitioners should consider: (i) magnitude, or the amount of water, (ii) frequency, or how often a flow occurs, (iii) duration, or the period of time associated with a flow condition, (iv) timing, or the regularity for which flows occur, and (v) rate of change or flashiness, which is how quickly flow changes. This framework has guided both academic research on hydrologic alteration and provided the basis for practitioners to approach river conservation for nearly three decades.

The Certification incorporates each element of the natural flow regime to broadly protect uses and ecological integrity. The framework addresses magnitude of flow by incorporating a maximum generation flow based on inflow, thereby limiting the extent of flow alteration, but does so in a way that considers and restores the dynamic nature of river flows. Frequency is addressed by including a maximum number of hours that the Project may alter incoming flow. Duration is addressed by incorporating a framework for counting hours that works along with the flexible hours allocation to limit the duration of flexible events. Timing is addressed by tailoring the number of allowable hours to vary by season which limits hydrologic alteration based upon when resources are either more or less sensitive to changes in flow. Rate of change or flashiness is addressed by

[2] Poff NL, JD Allan, MB Bain, JR Karr, KL Prestegaard, B Richter, R Sparks, J Stromberg. 1997. The natural flow regime. *BioScience* 47:769-784.

incorporating specific up-ramping and down-ramping conditions for transition operations that govern departures from and returns to inflow equals outflow (IEO) operations. Incorporation of each element of the natural flow regime reduces hydrologic alteration in a manner that reestablishes the dynamic nature of the river system to protect uses and resources in a holistic manner.

Further, the Certification is consistent with longstanding practice to address flow alteration across Vermont. The Department, along with the Vermont Fish and Wildlife Department, has worked to address hydrologic alteration associated with the operations of hydroelectric projects for decades. In 1988, the Department published *Hydropower in Vermont: an assessment of environmental problems and opportunities*. Volume 2 of that report contained project-specific assessments highlighting the effects of hydropeaking on waterbodies. Of the 55 projects identified in the report, the Department has addressed environmental issues caused by hydrologic alteration at 46 projects, or 84 percent, by requiring operational changes to bring facilities closer to a run-of-river or an inflow equals outflow mode when feasible.

In several recent examples, such as the Proctor Hydroelectric Project located on Otter Creek and the Mollys Falls Hydroelectric Project located on the Winooski River, the Department has required conditions that modify peaking operations like those included in the Certification. These conditions have included limitations on maximum generation flow based on inflow, requiring inflow equals outflow operations under specific conditions, among other measures. The actions required by this Certification reflect established practice and do not represent experimental or untested approaches.

The Certification takes an approach to protecting resources and supporting uses by addressing the root cause of the issues by focusing on reducing hydrologic alteration in a comprehensive manner rather than applying isolated or temporary solutions. The Certification shifts Project operations from a daily peaking mode to one that primarily passes inflow and where alteration explicitly considers and incorporates all elements of the natural flow regime. This represents a fundamental shift in the operations of the Project.

Several comments recommended more narrowly tailored measures to address issues associated with current operations for specific issues, such as prescribing an action for a particular location or point in time. However, these approaches can create conflicts among different uses. Rather, the Certification establishes a comprehensive framework to holistically protect resources and support uses over a range of conditions for the more than 120-river miles affected by the projects.

2. Water Quality Standards

a. Legal Obligations

Comment 4: Comments addressed the scope of the Department's review in issuing water quality certifications.

Response 4: The Department clearly defined the appropriate scope of certification and included conditions that reflect that scope. To issue a water quality certification under Section 401 of the federal Clean Water Act, the Department must "evaluate whether the activity will comply with applicable water quality requirements." 40 C.F.R. § 121.3. The scope of certification is explicitly stated as the first finding in the analysis section of the Certification (Finding 451). The Department's review of the activity is further demonstrated by both the analysis and the inclusion of conditions that address the activity as a whole. For example, the Certification includes conditions related to water level management in the impoundment and provisions related to fish passage.

Comment 5: Comments addressed the necessary outcomes of the Certification, including that the proposal needs to support all designated uses.

Response 5: The Vermont Water Quality Standards (VWQS) require the Department to manage waters to support designated uses through the achievement of management objectives, the attainment of water quality criteria, and by preventing the degradation of waters. The federal Clean Water Act requires states to adopt water quality standards consistent with federal requirements, and the Vermont Secretary of the Agency of Natural Resources adopts the VWQS pursuant to 10 V.S.A. Chapter 47. The VWQS set forth designated uses that waters must be managed to support, specific water quality criteria that must be met based on the classification of the water, and general water quality criteria to be achieved in all waters

regardless of classification.[3] This is consistent with the federal regulations that require states to include "use designations consistent with the provisions of section 101(a)(2) and 303(c)(2) of the Act" and "water quality criteria sufficient to protect the designated uses."[4] Further, the Clean Water Act and the VWQS require protecting the water quality necessary to support the most sensitive use, and do not allow for protecting a use that would degrade water quality.

Comment 6: American Whitewater and Appalachian Mountain Club (AW/AMC) contend that designated uses are protected in the same manner as existing uses.

Response 6: Designated uses and existing uses are distinct concepts under the VWQS and are supported and protected by different mechanisms within the standards. A designated use is defined as "any value or use, whether presently occurring or not, for which a water has been designated as Class A(1), A(2), B(1), or B(2)." VWQS, § 29A-102(10). Designated uses are supported by attaining the management objectives and criteria defined in the VWQS for a specific class of water. An existing use is defined as "a use that has actually occurred on or after November 28, 1975, in or on waters, regardless of whether or not the use is presently occurring or included in these rules." VWQS, § 29A-102(15). Existing uses are protected by the VWQS through the application of the Antidegradation policy. Whether designated or existing, as defined above, the Clean Water Act and the VWQS require protecting the water quality necessary to support the most sensitive use, and do not allow for protecting a use that would degrade water quality. VWQS, § 29A-105.

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[3] Agency of Natural Resources. Vermont Water Quality Standards. 2022.

[4] 40 C.F.R. § 131.6. The complete list of elements required under 40 C.F.R. § 131.6 include the following:

(a) Use designations consistent with the provisions of section 101(a)(2) and 303(c)(2) of the Act.
(b) Methods used and analyses conducted to support water quality standards revisions.
(c) Water quality criteria sufficient to protect the designated uses.
(d) An anti-degradation policy consistent with 40 CFR § 131.12.
(e) Certification by the State Attorney General or other appropriate legal authority within the State that the water quality standards were duly adopted pursuant to State law.
(f) General information which will aid the Agency in determining the adequacy of the scientific basis of the standards which do not include the uses specified in section 101(a)(2) of the Act as well as information on general policies applicable to State standards which may affect their application and implementation.

Comment 7: Several comments state that comparing the proposed operations to inflow equals outflow is inappropriate and state that “natural condition” is the appropriate baseline.

Response 7: For some designated uses, the VWQS establish an acceptable degree of departure from natural condition as an element of the applicable criteria. The comparison to inflow equals outflow operations is not intended to be a reference point for natural condition. This is explicitly stated in the Certification. (Finding 74). Rather, it is used to isolate and quantify the hydrologic effects of the activity proposed by the Applicant. To assess departures from natural condition, the Department relied on additional analyses beyond inflow equals outflow modeling. For example, the Department reviewed the unregulated gage data that is included in the hydrology section of the Certification along with additional analyses of streamflow records from these unregulated gages. Additionally, during the development of the MOU, stakeholders incorporated data from the Connecticut River Unimpaired Streamflow Estimate, a model that produced a record of unaltered flows for the Connecticut River.

Comment 8: Some comments recommended measures beyond the scope of Certification as being necessary for compliance with the VWQS. For example, comments request certain terrestrial improvements for the stated purpose of supporting recreation.

Response 8: The Clean Water Act and VWQS are designed to protect the level of water quality necessary to support designated and existing uses. The three designated uses related to recreation are boating, fishing, and swimming. For boating, the management objective is achieved by maintaining a level of water quality appropriate for the classification through criteria associated with hydrology. For fishing, the management objective is achieved by maintaining a level of water quality appropriate for the classification through criteria associated with fish population metrics and temperature. For swimming, the management objective is achieved by maintaining a level of water quality appropriate for the classification through implementing criteria focused on limiting E. coli concentrations and discharges. However, FERC has a broader purview to consider such measures as recreation interests must receive equal consideration to power interests under the FPA. Beyond the scope of the Certification,

additional detail on the specific recommendations are addressed in Comment 17.

Comment 9: Some comments recommended measures inconsistent with the classification of the affected waters. For example, that the Certification should require flows in the Bellows Falls bypass reach that provide excellent aesthetic value.

Response 9: For the protection of designated uses, the Department evaluated the application in the context of the use classifications applicable to the affected waters and included conditions to ensure the support of those uses. All designated uses of the Connecticut River are classified as B(2). Therefore, the management objectives and criteria associated with the B(2) use classification are those that are applicable to review of the certification applications for the Connecticut River projects. Specific to the aesthetics designated use, the Class B(2) management objective is to achieve and maintain good aesthetic quality through the attainment of the associated criteria, which are "[w]ater character, flows, water level, bed and channel characteristics, and flowing and falling water of good aesthetic value." VWQS, § 29A-306(c)(3)(B). The flows required by the Certification conditions are consistent with achieving and maintaining good aesthetic value consistent with the classification of the use.

3. Flow and Water Level Management

a. Operational Conditions

Comment 10: Several comments stated that operational changes at the dam should minimize both upstream and downstream surface water fluctuations and protect aquatic habitat of the river.

Response 10: The conditions of the Department's water quality certification will create a more stable impoundment, reduce the magnitude and frequency of sub-daily changes in discharge, and increase the amount of time that the Project is operating in an inflow equals outflow mode. The Department's analysis, documented in the Certification, demonstrates that these conditions will reduce the mean daily amplitude and the flashiness resulting from current Project operations. The analysis

also considered attenuation from upstream projects. Additionally, the Certification conditions will increase the downstream minimum flows over the current minimum flow. The Department's analysis also demonstrates that these conditions will reduce daily changes of the water surface elevation of the impoundment and increase the percentage of time that impoundment will be at the target elevation.

The Certification conditions directly address the hydrological alteration that occurs in the Connecticut River from current operations of the Project. The Connecticut River Joint Commission commented "operational changes will likely benefit the river's biological community as these changes will provide a hydrological regime that more closely resembles natural pre-impoundment conditions."[5] The Department concurs. The conditions will benefit the aquatic habitat and biota within the impoundment and downstream. Additionally, the operations create more predicable flow conditions for recreational users above and below the Project. The operational conditions of the Certification will result in Project-affected waters meeting the VWQS.

Comment 11: Several comments stated that while they support proposed changes in flow management conditioned by the Certification, they believe they only address one aspect of the issue, and that mitigation should be required.

Response 11: The operational changes required by the Certification are a fundamental shift from the Project's current mode of operation as a daily hydropeaking facility to one that primarily operates in an inflow equals outflow mode. Operational changes are not solely aimed at specific impacts associated with current operations in certain reaches of the Connecticut River. But rather, they address the underlying cause of those impacts, which is hydrologic alteration in a holistic manner to protect resources across the geographic extent of the Project and throughout the duration of the License. By addressing the flow regime, the Certification will positively affect water quality, hydraulic influences on erosion, and habitat quality. Addressing operations of the Project is essential for supporting a multitude of uses and provides reasonable assurance that

[5] Connecticut River Joint Commission letter to Jeff Crocker, Vermont Department of Environmental Conservation. RE: Bellows Falls (FERC No. 1855) – Comments on the Draft Water Quality Certification. February 26, 2025

the waters will comply with VWQS. The Department's analysis found that Project operations will meet the applicable criteria of the VWQS.

b. Climate Change

Comment 12: Several comments stated that the water quality certification does not address how Project operations will affect water quality, aquatic habitat and erosion under changing climatic conditions, which has the potential to increase flooding or drought conditions in Vermont.

Response 12: Climate change is a phenomenon affecting Vermont and the region which can potentially lead to an increase of both flooding and drought conditions. The Projects' operations affect flow in the Connecticut River up to 15,400 cubic feet per second (cfs). The Certification conditions require the Project to operate primarily in an inflow equals outflow mode with restricted discretionary flexible operations that are limited by a specified number of hours per month. This mode of operation addresses the hydrologic alteration that currently results from the daily hydropeaking operations of the Project.

Additionally, the Applicant used its hydraulic model to simulate the Project operations across a spectrum of different hydrologic conditions. This included modeling simulated operations for four months that were representative of different seasons and biological importance for four different years that ranged from dry to wet. These simulations generally provide insight into how the Project will be operated under varying hydrologic conditions with increased time in inflow equals outflow mode during wet periods when flow tends to be over the hydraulic capacity of the Project.

Given the hydraulic capacity limit of the Project, the Project does not have the capacity to control or alter flows of the Connecticut River during flood events. During these flood events, the Project passes all flow downstream, through both the powerhouse and spilling at the dam. Given that during high flow and flood events the Project cannot alter flow in the Connecticut River, the effect that these flood events may have on the water quality, aquatic habitat and erosion under climate change lack a clear nexus to the Project operations.

Alternatively, during periods of drought when flows in the Connecticut River are low, the Project will effectively operate in an inflow equals outflow mode, as required by the Certification conditions that establish a minimum base flow below the Project and refill requirements.

Comment 13: The Connecticut River Joint Commission commented that state-of-the-art climate models should be used to model climate scenarios and asked the question of how the release of water from the hydroelectric project and the flood control dams will be coordinated to minimize flooding and other adverse impacts.

Response 13: The Certification includes the Applicant's proposal to continue flood profile operations at the Project during flood events. The operations of the other flood control dams operated by the US Army Corps of Engineers are outside the scope of the Certification. However, ongoing coordination during flood events between the Army Corps of Engineers and the Applicant will continue, as is current practice, to minimize, to the extent possible, damage from flood events.

c. Water Quality Monitoring

Comment 14: Several comments stated that the Certification should include a condition requiring water quality monitoring, including water temperature, dissolved oxygen, pH, nutrients and bacteria, throughout the license period.

Response 14: Water chemistry parameters currently meet the criteria established in the VWQS, and the Certification conditions are expected to improve water chemistry criteria. As part of the FERC relicensing process, the Applicant conducted a water quality monitoring study throughout the Project affected area. Review of the water quality data collected indicated that water chemistry criteria of the VWQS are being attained under current Project operations, including under existing daily peaking operation. This information is included in the findings of the Certification (See Findings 156-168 and 454-459). The conditions of the Certification require a fundamental change in Project operations, shifting to an inflow equals outflow mode with limited discretionary flexible operations. The change in operations addresses the hydrologic alteration caused by current operations in a manner that is expected to benefit water chemistry related criteria. As a result, the Department has reasonable assurance that the water chemistry criteria referenced by the comments received will continue to meet the VWQS.

4. Recreation

Comment 15: Several comments addressed access to outflow information from the Project. Some comments indicated interest in real time flows and/or anticipated flows the following day. Some comments noted that the Applicant's current website can be confusing for users and occasionally inaccurate. Others noted that the current methodology for communicating flows is helpful but recognized that there could be changes. Additional comments requested day-ahead flow information by a specific time each day.

Response 15: The Certification addresses the availability of flow information and includes measures to provide flow information to stakeholders. The Certification incorporates findings that require real time flow information and day-ahead reporting of flows using a website and call in number, consistent with the Applicant's proposal (Finding 140). The condition has been modified to, in part, read:

Additionally, the Applicant shall maintain the call in flow number for boating conditions and the availability of <u>real time</u> flow information and day ahead forecasting online.

Additionally, the Projects operations conditions result in more predictable flow estimates for users because the Projects will primarily operate in an inflow equals outflow mode. Therefore, other water gauges, such as those operated by U.S. Geological Survey, will become more reliable sources of information for river users.

Comment 16: A number of respondents noted concerns with the recreation management plan condition within the draft Certification. Concerns include that the water quality certification application is incomplete without the detailed information, there is no authority over recreation if the plan is not developed before issuance of a certification, the development of the plan lacks any specificity, and that the development of the recreational management plan will occur in a secretive process without stakeholder input.

Response 16: The development of a recreational management plan following issuance of a FERC license is common practice for Vermont-issued water quality certifications for hydroelectric projects. The conditions

within previously issued certifications typically include the Applicants proposal, consultation with stakeholders, and approval by the Department. In response to public comments, the Certification has been modified to include (i) specific recreational improvements to be implemented, (ii) the development of a recreational management plan to ensure those measures remain available for use by the public, (iii) consultation with relevant stakeholders, and (iv) Department review and approval. The Certification as modified includes enforceable obligations to develop and implement the approved plan according to its terms.

Consistent with the above response, the Certification (Condition G) contains language that states:

In accordance with the Applicant's proposal, the Applicant shall improve the upstream portage to include a dock, pathway, and boat slide; the downstream portage improvements to include trail improvements, new stairs, and a boat slide; the Governor Hunt/Vernon Glen recreation area to include accessibility improvements to the parking and picnic sites; the Stebbins Island canoe camp site; and update the fish ladder window to include lighting and accessibility improvements. Additionally, the Applicant shall include the Wantastiquet-Hinsdale and Stebbins Island canoe rest areas as formal Project recreation facilities. The Applicant shall maintain a call in flow number for boating conditions and the availability of real time flow information and day ahead forecasting online.

Within one year of the effective date of the FERC license, the licensee shall develop a recreation management plan providing additional details on the schedule for implementing the Applicant's recreation proposal summarized above and in Findings 140-142. The plan shall include the frequency at which recreational sites that the Applicant has agreed to maintain will be checked for maintenance needs, how maintenance needs will be addressed to ensure continued public use, and how future enhancements will be considered.

The plan shall be developed in consultation with the Department and include consultation with relevant stakeholders who have a direct interest in the facilities at the Project. The plan shall be subject to review and approval by the Department.

Comment 17: Several comments expressed concerns regarding public access and the need for greater public access.

Response 17: The Department acknowledges the public concerns regarding the need for greater access. However, under the federal Clean Water Act and the VWQS, the Department's authority is limited to evaluating whether a federally licensed activity will comply with applicable water quality standards and ensuring the level of water quality necessary to protect designated and existing uses. The Department does not have independent authority to require the development of additional terrestrial recreational infrastructure, such as trails and parking areas, unless those improvements are necessary to protect designated or existing uses. Instead, the VWQS are focused on protecting the level of *water quality* necessary to support designated and existing uses.

In contrast, FERC has the authority to require recreational measures at hydropower projects that require a license. For example, under the Federal Power Act, FERC can mandate that project owners provide public access to their reservoirs and surrounding lands for activities like fishing, boating, and hiking, as long as it does not significantly interfere with the primary purpose of power generation.

Comment 18: Comments expressed concerns regarding the amount of public access and whether the scarcity and condition of the facilities limits public uses.

Response 18: As part of the Recreation Facility Assessment conducted during the licensing process, individuals were asked about their level of satisfaction with the number of public recreational areas, the types of public recreation areas and the location of public recreation areas in the Vernon impoundment and downstream of the facility. Survey results indicated that:

For the number of recreation areas, 43 percent (impoundment) and 46 percent (downstream) of respondents were extremely to moderately satisfied, while 46 percent and 43 percent were neutral, and 12 percent and 13 percent were slightly to not satisfied, respectively.

For the type of recreation areas, 44 percent (impoundment) and 48 percent (downstream) were extremely to moderately satisfied, 49 percent and 43 percent were neutral, and 4 percent and 9 percent slightly to not satisfied, respectively.

For the location of recreation areas, 42 percent (impoundment) and 38 percent (downstream) of respondents were extremely to moderately satisfied, 54 percent and 51 percent were neutral, and 6 percent and 9 percent were slightly to not satisfied, respectively.

Based on the record before the Department, including stakeholder input, survey results, and the Applicant's recreation proposals, the Department concludes that the current project-related recreational facilities are adequate to protect designated and existing uses under the VWQS. Some stakeholders have expressed interest the Applicant providing greater public access, please see response above.

Comment 19: Comments stated that currently the recreation facilities supporting public uses are minimally adequate – if not inadequate – or non-existent. In addition, that draft Certification does not assess the adequacy of the facilities and whether the condition of the facilities limits public uses.

Response 19: The record before the Department does not support the comments that recreational facilities are inadequate. As part of the FERC relicensing process, the Applicant in consultation with the resource agencies and stakeholders conducted a Recreational Facility Inventory, Use and Needs Assessment. As part of this assessment, 73 percent of individuals indicated being extremely to moderately satisfied with the condition of the Vernon Project recreation sites (Finding 429). While 81.4 percent indicated overall being extremely to moderately satisfied with condition of recreational sites in the Vernon Project study area with 12.3 percent indicating being not too or slightly satisfied.

The comments received provided no additional data or examples to demonstrate that the recreational facilities are inadequate.

Comment 20: Comments received contend that the recreation study did not consider future use of recreational sites and that the study results are no longer relevant given the age of the study.

Response 20: Please refer to the Department's Response 1 above. The Department has no reason to conclude the data provided in the Applicant's recreation study or other studies conducted as part of the licensing process are no longer relevant. The Recreational Facility Inventory, Use and Needs Assessment did consider the future of recreational use. (Finding 434). To summarize, future use was evaluated by taking the estimated current use and applying population growth projections according to the methodology of Bowker et al. and assessed the recreational facilities' adequacy for accommodating additional expected population growth. The comments received did not provide specific evidence indicating that the referenced study's findings are invalid or the methods used are no longer applicable. The comments received provided no additional data or examples to demonstrate that the recreational facilities are inadequate.

Comment 21: Comments noted that the draft Certification is "woefully inadequate" for the protection of swimming, boating, and fishing recreational uses and is "short in demonstrating compliance" with the recreation criteria in the VQWS. Additionally, comments state that the Certification is silent on the swimming designated use.

Response 21: The Department disagrees. The Certification includes conditions necessary to attain the management objectives and the applicable water quality criteria for the recreation designated uses. The management objectives and criteria for each of the designated recreation uses for Class B(2) waters are as follows:

Swimming and other primary contact recreation
The management objective for waters classified as B(2) for swimming and other primary contact recreation are "Where sustained direct contact with the water occurs, waters shall be managed to achieve and maintain a level of water quality compatible with good quality swimming and other primary contact recreation with negligible risk of illness or injury from conditions that are a result of human activities. (VWQS, § 29A-306(f)(4)(A)). The Class B(2) criteria for swimming and other primary contact recreation are "[c]riteria. Escherichia coli – Not to exceed a geometric mean of 126 organisms/100ml obtained over a representative period of 60 days, and no more than 10% of samples above 235 organisms/100 ml. In waters receiving combined sewer overflows, the representative period shall be 30 days. The Secretary may, by permit

condition, waive compliance with this criterion during all or any portion of the period between October 31 and April 1, provided that a health hazard is not created. The Secretary shall provide written notice to the Vermont Department of Health prior to issuing a permit waiving compliance with this criterion" (VWQS, § 29A-306(f)(4)(B)).

Fishing
The management objective for waters classified as Class B(2) for fishing is "[w]aters shall be managed to achieve and maintain a level of water quality compatible with good quality fishing." (VWQS, Section 29A-306(e)(3)(A)). The criteria for fishing are "measures of wild salmonid densities, biomass, and age composition indicative of good population levels" and compliance with the temperature criteria in § 29A-302(B) of the VWQS. ((VWQS, § 29A-306(e)(3)(B)(i)) and § 29A-306(e)(3)(B)(ii)).

Boating
The management objective for waters classified as Class B(2) for boating is "[w]aters shall be managed to achieve and maintain a level of water quality compatible with good quality boating." (VWQS, § 29A-306(d)(3)(A)). The Class B(2) criteria for boating use is "waters shall comply with the Hydrology Criteria in Section 29A-304 of these rules." (VWQS, § 29A-306(d)(3)(B)).

Hydrology criteria
"Class A(2) and B(2) Waters for Aquatic Habitat or Recreation – Boating. Any change from the natural flow regime shall provide for maintenance of flow characteristics that ensure the full support of uses and comply with the applicable water quality criteria. The preferred method for ensuring compliance with this subsection is a site specific flow study or studies. In the absence of site-specific studies, the Secretary may establish hydrologic standards and impose additional hydrologic constraints, consistent with any applicable Agency of Natural Resources rule or procedure, to ensure compliance with the requirements of this subsection." (VWQS, § 29A-304 (b)(3)).

The Certification includes conditions that are protective of the applicable criteria for all recreational designated uses under the Vermont Water Quality Standards. Additionally, the Project does not affect the Escherichia-coli within the Connecticut River, which is associated with discharges from wastewater and runoff, and thus is not discussed in detail.

Comment 22: Comments noted the Certification should include improvements to the fish passage viewing area.

Response 22: The Applicant is proposing enhancements at the fish ladder window to include lighting and accessibility improvements. (Finding 139). This recreation enhancement is included in the list of items to be implemented in the recreation condition of the Certification.

5. Boating

a. Boating Designated Use and Subcategories of Boating

Comment 23: AW/AMC contend that whitewater and flatwater boating are both designated and existing uses and that the Department holding that boating is the designated use is inconsistent with the MWL decision. Additionally, AW/AMC state that whitewater and flatwater boating should be included as part of the Tier 1 review.

Response 23: The Certification is wholly consistent with the Vermont Supreme Court's decision in *In re Morrisville Hydroelectric Project Water Quality*, 2019 VT 84. As described in Response 6 above, a designated use under the VWQS is defined as "any value or use, whether presently occurring or not, for which a water has been designated as Class A(1), A(2), B(1), or B(2)." While "boating" is explicitly identified as a designated use under the VWQS, "whitewater boating" and "flatwater boating" are not separate and distinctly designated as Class A(1), A(2), B(1), or B(2) uses. Rather, they are subcategories of the broader boating designated use, along with other subcategories of boating such as motorboating and sculling. Therefore, whitewater and flatwater boating are not designated uses. However, support of the boating designated use must consider all applicable subcategories of the use. The consideration of whitewater and flatwater boating as subcategories of the broader boating designated use is consistent with the Court's finding that "whitewater boating fits into the definition of a designated use." *In re Morrisville*, ¶ 67.

Whitewater boating and flatwater boating are existing uses. Accordingly, these uses have been included in the Tier 1 review of existing uses, along with the other subcategories of boating that are identified in Table 25 of

the Certification as presently occurring on the Connecticut River in the Project affected area.

6. Fish Passage

Comment 24: Comments expressed concern over the Department's non-party status to the Settlement Agreement for Fish Passage (Settlement Agreement) and the enforceability of the conditions related to fish passage.

Response 24: The Department relied on subject matter experts to lead the technical discussion of the specific steps and timeline necessary to assure safe, timely, and effective fish passage, while requiring adherence to the Settlement Agreement as a condition and included the Settlement Agreement as an appendix to fulfill its obligation to protect the life-cycle functions and reproductive requirements of migratory species. The resource agencies party to the Settlement Agreement were the United States Fish and Wildlife Service, the Vermont Fish and Wildlife Department, and the New Hampshire Department of Fish and Game. These parties have extensive expertise and experience in fish passage hydraulics, fish passage design and construction, and assessment of fish passage performance grounded in a deep background of fisheries biology. These were the appropriate parties to determine what is necessary and feasible to achieve safe, timely, and effective fish passage at a technical level. In order to fulfill its obligations, the Department required adherence to the Settlement Agreement as a condition of its Certification. To avoid ambiguity regarding compliance, the Department appended the Settlement Agreement in full to the Certification. The condition requiring adherence to the Settlement Agreement will carry the full force and same weight as any certification condition. The Department finds no basis for the assertion that this condition would be unenforceable.

Comment 25: Comments expressed concern about what is perceived to be excessive delay in implementation of fish passage requirements.

Response 25: The timeline is necessary to assure safe, timely, and effective fish passage and takes a consistent approach to other projects in Vermont. Assuring safe, timely, and effective passage is a complicated process that involves several phases, specifically studying alternatives, design of a preferred alternative, construction of the preferred alternative,

operation and testing, and monitoring to ensure performance. Further, each step is diligently completed in consultation with the fishery resource agencies that are parties the Agreement. The Certification requires changes to fish passage operation upon license issuance. By the second year after license issuance, the Certification requires the Applicant to initiate both study and design phases at the Vernon project and continue in subsequent years to address multiple phases simultaneously. The Certification requires the Applicant to begin addressing the study and design phases at the Bellows Falls Project in the third year after license issuance, while phases continue to proceed at Vernon. Similarly, the Certification requires the Applicant to begin the study and design phases at the Wilder Project while the work at both Bellows Falls and Vernon is ongoing. At which point, the Applicant will be working through multiple phases at each project, all simultaneously. Implementing measures first at Vernon, the most downstream project, is consistent with how fish passage has been approached in Vermont to facilitate access to upstream habitat for the largest population of fish first. The timeline for fish passage implementation is driven by what is necessary to assure safe, timely, and effective passage is achieved and structured in a manner to provide the greatest benefit to migratory species as feasible.

7. Erosion

Comment 26: Comments state the draft Certification does not appropriately consider the effects of erosion. Comments state there is the potential for streambank erosion from higher velocities at or below the water surface and the draft Certification considers the incorrect studies for analysis. Additionally, comments state there are no available studies to provide information on the potential for erosion under the proposed operations within the draft Certification, and that it is unknown if the new regime will fix one problem while creating another.

Response 26: The Department's analysis demonstrates that the change in operations conditioned by the Certification will reduce the frequency and magnitude of Project operations that may contribute to erosion. The Department's review of the supplemental study related to erosion and HEC-RAS modeling, as noted by the comments, provides further support for this finding. The following findings have been added to the Certification for further clarification.

Factual Findings

In addition to the transect monitoring that took place, the Applicant also conducted HEC-RAS modeling to assess the velocity needed to move bank particles at the erosion study sites within the Project area. This study used ADCP data, a constant water surface elevation, and known particle sizes to calculate shear stress and determine what conditions substrates would be moved into the water column.

The Applicant used the D_{50} particles collected at the site to determine which size to consider when determining shear stress. This is a standard practice when considering the shear stress on substrates. Although it does not encompass all available substrate sizes at each sample sites, substrate size results indicate that the next dominant size class was only slightly larger or smaller than the substrate size used in the analysis.

The HEC- RAS model simulated a consistent surface water elevation and then modeled low (2,000 cfs), medium (6,000 cfs), and high (15,000 cfs) flows. The near bank velocity was estimated and compared to the results of the shear stress estimates. When the near bank velocity is greater than the estimated shear stress then there is the possibility of erosion occurring near the bank and under the water surface.

Five sites were evaluated within the Vernon project area for project effects. Four did not show potential for project effects. One riverine site, VR02, showed that under some conditions near bank velocity was greater than the critical shear stress. While sediment from the depositional beach areas could be mobilized at operational flows, the potential for entrainment of bank sediment required a velocity associated with a flow of 15,000 cfs, or above the maximum hydraulic capacity of the Project.

Analysis

A supplemental analysis of erosion utilized sediment sampling and HEC-RAS modeling and allowed for a more direct assessment of project effects. For the Vernon Project area, at high flows, generally higher than the hydraulic capacity of the Project, there are occasions when those flows entrain sediment from the bank. Areas that are potentially affected by operational flows are limited (Finding 315) and the Certification (condition B) will reduce the magnitude and frequency at which high flows associated with Project operations occur within riverine reach downstream of the Project.

As noted in the additional findings, there is limited potential for flows associated with proposed operations to alter stream processes. Where such potential exists, the Certification as conditioned will reduce the frequency of high flow events caused by Project operations and further reduce the potential for the Project to alter stream processes. Therefore, the Department finds there is reasonable assurance that the Certification, as conditioned, will provide physical habitat structure and stream processes consistent with high quality aquatic habitat.

Comment 27: Respondents provided comments that the draft Certification does not appropriately consider the sediment within the system, including potential effects from legacy sediment to increase nutrient loading, the movement of sediment, and its effects on habitat, or the potential for harmful algal blooms.

Response 27: Riverine erosion is a natural process that occurs as a river meanders in the valley over time under a full range of expected flows. The proposed operational changes are not likely to increase sediment mobilization and nutrient loading because the changes reduce the hydrological alteration from the Project operations, move stream process toward equilibrium condition, and do not create a flow regime that would exacerbate the river adjustment processes in a manner that would be inconsistent with high quality aquatic habitat. Any excessive nutrients in the watershed exist regardless of the presence and operation of the dam, and improving flow conditions to support aquatic habitat will not increase the mobilization and transport of nutrient-laden sediments. Additionally, because the Certification is conditioned to move operations toward a more dynamic and less altered flow regime, this reduces the likelihood of algal blooms due to the consistent water movements provided by the inflow equal outflow operations, particularly in the summer and early fall months when waters are warmest and the number of hours for flexible operations are limited to the greatest extent.

Comment 28: Comments assert that the Certification does not identify the Project as contributing to erosion, and the conditions should require erosion monitoring and mitigation due to the new flow regimes.

Response 28: The Department and commenters are in agreement on many issues related to erosion. Parties agree that erosion is a naturally

occurring process; that there are many processes that can contribute to erosion; erosion occurs when forces are stronger than the force of the bank material; that channels move to maintain an equilibrium condition; and that some erosion can be exacerbated by anthropogenic causes. However, the Department does not find a need for additional modeling and monitoring of the Connecticut River. Comments assert that there is insufficient evidence to demonstrate the operations as conditioned within the Certification will meet water quality standards. The Department's analysis found that the limited potential for erosion at flows associated with project operation, the reduction in hydrologic alteration, and the associated influence on stream processes provides reasonable assurance that high quality aquatic habitat will be achieved and maintained.

It is the policy of the Department to manage rivers towards equilibrium condition. The Department has included findings based on HEC-RAS modeling that conclude the flows likely to contribute to bank erosion are near or greater than the capacity of the Project. Additional modeling concluded that to the degree that operational flows contribute to substrate movement, these also occur at higher flows which will occur less frequently as conditioned by this Certification. Finding 505 of the Certification recognizes that the current Project operations are a contributing factor to the erosion occurring on the Connecticut River. "These factors include the type of soil, the shape of the channel, natural seeps, and Project operations, which are the subject of this certification. However, it is impossible to determine which of those is the primary cause of a particular erosion event."

The conditions of the Certification address the hydrological alteration that currently results from Project operations. The Department has reasonable assurance that as conditioned stream processes will be consistent with the achievement of high quality aquatic habitat.

8. Rare, Threatened and Endangered Species

a. Shortnose Sturgeon

Comment 29: The Connecticut River Conservancy commented that the water quality Certification states "researchers believe that the population is likely at

lower numbers than the population downstream in the Connecticut River due to the strength of the detection compared with the control." The comment goes on to state, "The current eDNA sampling results prove presence and cannot estimate population numbers or age."

Response 29: The Department does not extrapolate the data to make an estimate of the population levels. The referenced language in the Certification comes directly from the Connecticut River Conservancy's August 29, 2024 press release titled "*eDNA Confirms Shortnose Sturgeon in the Connecticut River Between Turners Falls MA and Bellows Falls VT*".[6] In the press release, the researcher is quoted as saying, "[t]he strength of the hits relative to our positive controls signals to me that these endangered fish are present throughout these upstream reaches, but likely at lower numbers than where they exist farther south." While the Department understands that the eDNA method cannot provide a population estimate, the quote in the press release, that is paraphrased in the Certification, simply makes an observation based on the researchers knowledge of the methodology and the strength of the hits compared to the control (Findings 410-544).

Comment 30: The Connecticut River Conservancy commented that the Department, regardless of whether the National Marine Fisheries Service is the federal agency responsible, must take a conservative approach and assume there is breeding population and the change in operations "may affect" shortnose sturgeon.

Response 30: The Connecticut River Conservancy in their comments does not provide any specific information of how the operations as conditioned may affect Shortnose Sturgeon. As Connecticut River Conservancy is aware, being a signatory to the memorandum of understanding on operations, the change in Project operations conditioned by the Certification is designed to limit flow and water level fluctuations during the biologically sensitive time of year which is primarily in the spring and early summer. This time period when hydrologic alteration is reduced

[6] Connecticut River Conservancy Press Release. eDNA Confirms Shortnose Sturgeon in the Connecticut River Between Turners Falls MA and Bellows Falls VT. August 29, 2024. https://www.ctriver.org/post/edna-shortnose-sturgeon-connecticut-river

to the greatest extent also aligns with the Shortnose Sturgeon spawning and incubation period.

Comment 31: The Connecticut River Conservancy commented "at a minimum, DEC has the authority to condition the §401 on completion of an ESA Section 7 consultation, development of a program to assess sturgeon interactions with project components, and a handling and recovery plan should sturgeon be problematically impacted at the facility."

Response 31: Under the *Modification of Certification* condition, the Department maintains the necessary authority to modify the conditions of the Certification should it be determined through the Section 7 consultation under the Federal Endangered Species Act that the conditions of the Certification need to be modified. For clarity, we have edited the condition as follows.

"Modification of Certification. The conditions of this Certification may be altered or amended by the Department to assure compliance with the Vermont Water Quality Standards and to respond to any changes in classification of management objectives for the waters affected by the Project or if necessary after completion of a Federal Endangered Species Act Section 7 Consultation, when authorized by law, and, if necessary, after notice and opportunity for hearing."

b. Fowler's Toad

Comment 32: Numerous comments were received that the changes in Project operations that are conditioned by the water quality Certification fail to protect Fowler's Toad.

Response 32: The Certification includes an analysis of the effects of proposed operations on Fowler's Toad and requires operational changes that support the species' reproduction (Findings 398-405 and 541-542). As part of the FERC relicensing process, the Applicant conducted a study to determine if Fowler's Toad was present at locations within the Project-affected areas. The study detected the species presence only at a known location below the Vernon Project on Stebbins Island. The Department's review determined the change in Project operations provides stable water levels during the Fowler's Toad breeding season to support reproduction.

The comments received did not include specific information detailing how the conditions of the Certification are insufficient to protect the species.

9. Other

a. Decommissioning

Comment 33: Several comments stated that the Applicant's proposal does not assure the eventual decommissioning of the dam will be adequately funded.

Response 33: The Applicant has requested a water quality certification for continued operation of the Project primarily in an inflow equals outflow mode with restricted discretionary flexible operations. Accordingly, the Department's Certification includes conditions that regulate operations to ensure compliance with the VWQS. At this time, the Applicant has taken no action to surrender its license or decommission the Project, and the Department does not require the Applicant to provide information related to financial assurances for decommissioning. If the applicant were to pursue decommissioning in the future, such a proposal would be subject to review under the FERC decommissioning process and likely require a new state water quality certification.

b. Historical cultural and archaeological resources

Comment 34: Several comments stated the Certification does not address historical, cultural and archaeological resources and require monitoring and protection in the proposed project area.

Response 34: In the FERC relicensing process, the conditions needed to protect cultural, historical, and archeological resources are required under Section 106 of the Historic Preservation Act, which the Vermont State Historic Preservation Office implements. Compliance with this section for a FERC relicense typically requires an agreement between the Applicant and the State Historic Preservation Office on the protection of these resource as well as the development of a plan of how these resources will be managed which is done in consultation with the State Historic Preservation Office.

c. Invasive Species Management

Comment 35: Several comments state that Certification does not detail or contain conditions requiring the management of aquatic invasive species in order to lessen negative impacts on water quality and aquatic habitat.

Response 35: Aquatic invasive species are unfortunately found in many Vermont waterbodies. The comments do not provide information on how the operations of the hydroelectric project will affect aquatic invasive species that would necessitate the Applicant to manage invasives species. At this time, the Department's Aquatic Invasive Species Program, in partnership with New Hampshire, continues to monitor the aquatic invasives on the Connecticut River to determine management needs and provide outreach and education to recreational users of the river to prevent the further spread of these species.