REVIEW OF APPLICATION FOR LIHI CERTIFICATION
OF THE
MOLLY'S FALLS HYDROELECTRIC PROJECT

Non-FERC regulated

Peacham Pond Brook, Sucker Brook, Molly's Brook, and Winooski River
Vermont

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FINAL REVIEW OF APPLICATION FOR LIHI CERTIFICATION OF THE MOLLY'S FALLS HYDROELECTRIC PROJECT

1. INTRODUCTION

This report provides review findings and recommendations related to the certification application submitted to the Low Impact Hydropower Institute (LIHI) by Green Mountain Power Corp. (GMP or Applicant) for certification of the 5-MW Molly's Falls Hydroelectric Project (Project). The initial certification application was filed on November 30, 2023 and updated on March 28, 2025. It is subject to review under the 2nd edition LIHI Handbook (Revision 2.05) that was in effect at the time of the initial submittal.

2. PROJECT'S GEOGRAPHIC LOCATION

The Molly's Falls Project is located in the towns of Peacham, Cabot, and Marshfield, in Washington and Caledonia counties, Vermont in the northeastern region of Vermont between Montpelier and St. Johnsbury. The Project consists of two dams and one powerhouse. Peacham Pond Dam is located on Peacham Pond Brook. The discharge from Peacham Pond enters Sucker Brook which flows to the Molly's Falls Reservoir, impounded by the Marshfield No. 6 dam. The Marshfield No. 6 powerhouse is located about 1.6 miles downstream from the Marshfield No. 6 dam and discharges into the Winooski River a short distance upstream of the confluence of Molly's Brook and the Winooski River. Molly's Brook constitutes the Marshfield No. 6 bypassed reach and enters the Winooski River about 0.13 miles downstream of the powerhouse (Figure 1).

There are no other dams on the Project's streams. Six hydro dams are located on the Winooski River downstream of the Molly's Brook confluence. These include, among others, the LIHI-certified Winooski No. 8 (LIHI #77), Bolton Falls (LIHI #201), Essex 19 (LIHI #146), and Winooski One/Chace Mill (LIHI #16) projects.

3. PROJECT AND IMMEDIATE SITE CHARACTERISTICS

The current Project was built around 1927 by the Molly's Falls Electric Company (which later became part of Green Mountain Power Corp.) at dams and a former powerhouse originally constructed at the site around 1900.[1] The Project is not FERC-regulated because it was constructed in 1927 prior to the enactment of federal licensing regulations. It is regulated by the Vermont Public Utilities Commission and subject to Vermont Agency of Natural Resources (VANR) regulations and oversight.

[1] http://accdservices.vermont.gov/ORCDocs/Marshfield_TownReport__Miscellaneous_00000020.pdf

Figure 1. Project Location

Peacham Pond Dam

The Peacham Pond development has no hydropower, but a provision was made at the time of construction for the future addition of a power plant. The dam impounds Peacham Pond, a 382-acre spring-fed pond with 2,056 acre-feet of useable storage. The rolled earthfill dam is 710 feet long and 25.6 feet high, with a 90-foot-wide overflow spillway which is maintained in an open state and is not equipped with flashboards, stoplogs or other impounding devices.

The dam has a reinforced concrete intake structure that utilizes a cast iron slide gate with a manually operated screw stem operator. The intake structure also contains a set of stop log slots, a 6-inch bypass pipe around the gate, and a trashrack with 2.5-inch spacing. The intake

opening located at the trashracks is 7.5 feet high and 6.5 feet wide and controls flow to a 4-foot-diameter reinforced concrete outlet pipe that extends from the intake structure, through the embankment, to the downstream toe of the embankment. The discharge pipe is 122 feet long and has a 9-inch-thick cast-in-place reinforced concrete wall. On the left end of the embankment is the 90-foot-wide spillway section with a 12-inch-thick layer of riprap and a concrete core wall (Figure 2).

Figure 2. Peacham Pond Dam and Intake Gatehouse

Marshfield No. 6 Development

The current Marshfield No. 6 dam was built in 1927 (three prior iterations had been built and operated prior to 1914) and impounds the 377-acre Molly's Falls Pond that is also home to Molly's Falls Pond State Park. The impoundment has useable storage of 740 acre-feet. The rolled earthfill dam is 1,100 feet long with a maximum height of 48.5 feet.

The dam is equipped with an intake structure and a 40-foot-wide, 260-foot-long service spillway equipped with a pair of side-by-side slide gates which discharge to a plunge pool (Figure 3). The emergency spillway is 46 feet wide and is a 370-foot-long channel consisting of an upstream concrete structure with gates and a stepped concrete channel with sidewalls leading to the same plunge pool as the service spillway. A gate structure at the upstream part of the emergency spillway retains water in the reservoir and can be opened if needed to release water into the spillway. There are two gates each 23 feet wide that consist of three bays of stoplogs and stanchions (Figure 4).

The dam creates a bypassed reach on Molly's Brook approximately 1.9 miles long. Minimum flows into the bypassed reach are provided either via a bypass pipe, which provides cool water from approximately 28 feet deep in the reservoir, or via the service spillway slide gates. From July through March, a minimum flow of 8.5 cfs is released and from April through June, a minimum flow of 12 cfs is released.

Figure 3. Marshfield Dam and Intake Gatehouse

Figure 4. Marshfield Dam Service Spillway (left) and Emergency Spillway (right)

Water is conveyed from the dam to the powerhouse via a gatehouse and concrete pipe that that converts to a welded steel penstock, continues to a surge tank, and then on to the powerhouse which is located on the Winooski River approximately 700 feet upstream of the Molly's Brook confluence.

The powerhouse intake has steel trashracks that measure 12 feet wide by 14 feet tall. The 3-inch-deep by 3/8-inch-thick bars have 4-inch clear spacing and are supported by concrete at the top and bottom by two horizontal steel I-beams. The powerhouse is equipped with a single Norcan vertical Francis turbine with a capacity of 5 MW although it typically produces less. From 1980 to 2019, annual generation averaged approximately 7,310 MWh. Project operations changed based on the conditions in the August 2019 MOU between GMP and VANR, (see Section 4 below) and GMP expects a decrease in annual generation with the implementation of these conditions. In 2021, the Marshfield Project generated 6,444 MWh. The tailrace (see cover photo) discharges to the Winooski River.

4. REGULATORY AND COMPLIANCE STATUS

The Project is not FERC-regulated since it pre-dates federal licensing regulations. The Project is regulated by the Vermont Public Utilities Commission (PUC) and is subject to Vermont Agency of Natural Resources (VANR) regulations and oversight. No Vermont Water Quality Certification (WQC) applies to this Project, as it predates the implementation of the Vermont Water Quality Standards (VWQS).

In 2012, GMP and VANR entered into a Memorandum of Agreement (MOA) since GMP was contemplating alterations to the spillway at the Marshfield No. 6 dam to improve operations during extreme weather events. This came about in response to safety concerns expressed by the Town of Plainfield, VT in the aftermath of Tropical Storm Irene in 2011. The physical and operational changes required a Certificate of Public Good (CPG) issued by the Vermont Public Service Board. The MOA set forth a set of studies that would be required prior to approval including a study of water quality in the Winooski River below the Project; fishery, instream flow and aquatic habitat assessments in the bypassed reach and in the Winooski River below the Project; assessment of erosion and siltation below the Project; assessment of the recreational uses below the Project; assessment of the winter drawdown of the reservoir; and an assessment of the aesthetics of Molly's Falls. These studies were completed and are discussed in Section 7 below.

In 2019, GMP and VANR entered into a Memorandum of Understanding (MOU) regarding Project operations resulting from the then-proposed spillway and operational changes with terms and conditions to be included in the CPG. On March 27, 2020, the PUC authorized the proposed changes which included replacing the service spillway gates; installing an emergency generator; increasing the height of the service spillway walls; and installing a minimum flow bypass structure and pipe system.

In September of 2020, GMP filed a separate petition at the PUC's direction which sought

approval of the "Emergency Spillway Project", which included construction of a new concrete chute spillway structure with an underdrain system; removal and replacement of the wing walls downstream of the emergency spillway gate; replacement of the temporary extensions to the abutment walls with reinforced concrete wall extensions; installation of a cutoff wall; armoring of the existing plunge pool; and additional security and personnel safety improvements.

A December 2020 MOU with VANR, amended in 2021, dictated the timing of implementation of a Flow and Water Level Management and Monitoring Plan, a Dissolved Oxygen Monitoring Plan, and a Control of Water Plan; as well as interim operations implemented during construction and construction-related restrictions. The final CPG was issued on March 23, 2021.

On February 15, 2021, GMP submitted related permit applications to VANR for the emergency spillway project, including a VT Wetlands Permit, a VT Shoreland Protection Permit, and a VT Construction Stormwater General Permit, and filed an application for a federal Water Quality Act Section 404 general dredge and fill permit. All permits were approved by the spring of 2021 and all improvements have since been completed.

The LIHI application does not mention one compliance matter that arose during construction, although supplemental documentation was provided about it. There was a discrepancy between the original plans filed with the PUC and the subsequent plans filed with the other permit applications that included delineation of areas of tree clearing needed for construction staging and laydown areas. In May of 2021 GMP cleared about 2 acres of land partly within a state-identified deer wintering area. The PUC had not originally approved this action since it was not included in the originally filed plan, but VANR had approved it in the additional permits. VANR became aware of the discrepancy and notified GMP which promptly notified the PUC of the discrepancy and of their failure to file revised plans with the PUC to include the tree clearing areas, in violation of conditions of the PUC's approval order.

All parties agreed that the failure to obtain PUC approval was unintentional and GMP implemented remedial actions including additional internal review of plans and PUC orders and additional training of staff related to seeking amendments for material deviations or substantial changes to a project. In addition, GMP agreed to pay a $15,000 penalty. This information is detailed in a July 21, 2021 MOU between GMP and VANR.

5. PUBLIC COMMENTS RECEIVED OR SOLICITED BY LIHI

The application was publicly noticed on April 2, 2025 and notice of the application was forwarded to resource agencies listed in the application (no other stakeholders were listed). No public comments were received by LIHI during the 60-day comment period which ended on June 1, 2025. Due to the availability of current data, no additional outreach was conducted.

6. ZONES OF EFFECT

The Applicant delineated the Project into five Zones of Effect (ZoEs).

- Zone 1: Peacham Pond Impoundment
- Zone 2: Peacham Pond downstream reach to the top of the Marshfield impoundment, approximately 0.6 miles long (Sucker Brook)
- Zone 3: Marshfield No. 6 impoundment (Molly's Falls Pond)
- Zone 4: Marshfield No. 6 bypassed reach (Molly's Falls Brook), approximately 1.6 miles long
- Zone 5: Marshfield No. 6 downstream reach to the confluence with the Winooski River, approximately 1.3 miles long.

The Applicant selected the standards shown in the table below. The reviewer agrees with the selected Standards.

CRITERION		**ZoE 1. Peacham Pond Impoundment**	**ZoE 2. Peacham Pond Downstream Reach**	**ZoE 3. Marshfield Impoundment**	**ZoE 4. Marshfield Bypassed Reach**	**ZoE 5.Marshfield Downstream Reach**
A	**Ecological Flows**	2	2	2	2	2
B	**Water Quality**	2	2	2	2	2
C	**Upstream Fish Passage**	1	1	1	1	1
D	**Downstream Fish Passage**	1	1	1	1	1
E	**Shoreline and Watershed Protection**	1	1	1	1	2
F	**Threatened and Endangered Species**	2	2	2	2	2
G	**Cultural and Historic Resources**	1	1	1	1	1
H	**Recreational Resources**	1	1	1	1	1

7. DETAILED CRITERIA REVIEW

A: Ecological Flow Regimes

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

Assessment of Criterion: The Applicant selected Standard A-2, Agency Recommendation for all ZoEs. Impoundments can typically qualify for A-1 since this criterion is focused primarily on riverine reaches. The reviewer agrees with the selection of Standard A-2 in all ZoEs as discussed below, based on the VANR MOUs and PUC order.

Discussion: The Project is subject to a Flow and Water Level Management Monitoring Plan developed in consultation with VANR in accordance with the August 2019 MOU, and in compliance with the March 2020 PUC Order. The final Flow and Water Level Management and Monitoring Plan was submitted to VANR in February 2024 which provided comments on March 8, 2024. GMP then filed the final report with the PUC on March 28, 2024 which was approved on June 30, 2025. As modified by the December 23, 2020 MOU with VANR, operational changes related to Peacham Pond and Marshfield No. 6 reservoir water levels, Molly's Brook bypassed reach flows, generation rate caps, and generation-ramping have been implemented.

The plan is intended to guide operations related to water levels, flows, and schedules. It contains detailed protocols for normal operations and criteria for exceptions to normal operational restrictions. Operational parameters are monitored via a SCADA system.

The plan requires GMP to provide advance notice of planned drawdown of the Marshfield No. 6 reservoir for inspection, maintenance, or repairs to the Vermont Department of Forest, Parks and Recreation, and the Molly's Falls Pond State Park. An annual summary of planned drawdown events is also provided to VANR.

<u>ZoE 1, Peacham Pond:</u> Water levels in Peacham Pond are maintained at the normal operating level (NOL) of 1,402.39 feet (NGVD 29) from May 1 to November 30, with the allowed fluctuations listed below, and with allowance for exceptions based on snow water content, forecasted precipitation, maintenance and repair activities, or other specific conditions detailed in the Flow and Water Level Management Monitoring Plan.

- From May 1 (or full refill if later) until loon nesting begins: NOL ± 0.5 feet.
- During loon nesting season: manage pond levels as stable as is feasible and safe. Operators make observations of loon nesting and implement frequent adjustments if needed.
- From August 1 (or end of loon nesting, whichever is earlier) until November 30: NOL ± 1 foot.
- At any time of year, higher fluctuations above the NOL may occur due to storms and heavy snowmelt/rainfall, and GMP manages flow releases as best as possible to

minimize high water levels.
- Winter drawdowns typically start on December 1 and have been limited to 6.6 feet below NOL. Starting in the upcoming 2025-2026 winter, drawdown limits are reduced to 3 feet below NOL.
- Drawdown rate is limited to no more than 6 to 12 inches per week prior to December 15 with full drawdown typically completed by December 31.
- Spring refill is generally completed by May 1.

ZoE 2, Peacham Pond Downstream Reach: Minimum flows to Sucker Brook downstream of Peacham Pond vary throughout the year. The Peacham Pond development operates in run-of-river (ROR) mode from May 1 (or Peacham Pond refill date if later) to November 30. Between December 1 and May 1 (or the date that Peacham Pond is refilled to the normal operating level), minimum flows during Peacham Pond refill are 6.7 cfs at the dam outlet, or net inflow less evaporation if less. There is a maximum peak discharge flow of 25 cfs, or inflow if higher, during normal winter drawdown operations, with higher flows discharged only as needed to keep pond levels steady for dam safety. The up-ramping rate is limited to 5.8 cfs per hour and the down-ramping rate is limited to 3 cfs per hour. When the pond level subsequently drops, outflow is decreased until either 25 cfs is released, or the pond level stabilizes.

ZoE 3, Marshfield No. 6 Impoundment: This ZoE has an NOL of 1,223.7 (NAVD 88) maintained from May 1 to November 30, with the allowed fluctuations listed below, and allowance for exceptions based on snow water content, forecasted precipitation, maintenance and repair activities, or under other specific conditions.

- From May 1 (or full refill if later) until loon nesting begins: NOL ± 0.5 feet.
- During loon nesting season: manage pond levels as stable as is feasible and safe. Operators make observations of loon nesting and implement frequent adjustments if needed.
- From August 1 (or end of loon nesting, whichever is earlier) until November 30: NOL ± 1 foot.
- Winter drawdown typically starts on December 1, limited to 2.0 feet below NOL. Drawdown should be completed usually no later than mid-March.
- Spring refill is generally completed by May 1.

ZoE 4, Marshfield No. 6 Bypassed Reach: Minimum flows vary seasonally as follows:
- From July through March, 8.5 cfs
- From April through June, 12.0 cfs

Minimum flows are provided from either the service spillway slide gates or the bypass pipe which is tapped off of the penstock and is preferred in summer since it releases cooler water from a depth of about 30 feet in the impoundment to support aquatic habitat, and in winter since it avoids potential ice buildup at the slide gates. The bypass pipe contains an adjustable valve to regulate the discharge. If the slide gates are used (e.g., during penstock inspection or

repair) they are operated by electric motors and can be adjusted by 0.1-foot increments.

ZoE 5, Marshfield No. 6 Downstream Reach: Generation flows released from the powerhouse are regulated based on the time of year, natural stream flows, and water levels in the Marshfield No. 6 impoundment. The generating turbine's safe hydraulic capacity ranges from 103 – 173 cfs, and the turbine typically operates to match inflows, or as follows:

- From November 1 through March 31, the normal flow rate is 135 cfs.
- During the rest of the year, the normal flow rate is 103 cfs.
- Up to 212 cfs may be released via the turbine only when required by the Project's Emergency Action Plan in order to manage reservoir water levels safely during high inflow events.

The powerhouse also contains a 16-inch ball valve leading to a 12-inch diameter pipe bypassing the turbine and discharging into the tailrace beneath the building. The pipe is equipped with three baffle plates to dissipate exit velocities. The bypass is used to release flows that are below the turbine's minimum capacity, for up-ramping at the start of generating cycles, and for down-ramping at the end of generating cycles. Ramping rates are limited as follows:

- Up-Ramping:
  - 0 to 103 cfs in 30 minutes
  - April-October: 60 cfs/hour for 103 cfs up to 173 cfs to match inflow
  - Nov-March: 103 cfs to 135 cfs, or to match inflow if higher, in 30 minutes
- Down-Ramping:
  - Generation rate down to 103 cfs in 120 minutes
  - 103 to 0 cfs in 30 minutes

In developing these operational parameters, GMP conducted several field studies as part of the 2012 VANR MOA including an instream flow study, winter drawdown assessment, flood mitigation evaluation, river hydrology analysis[2], and a public benefit/detriment analysis related to operations and minimum flows.[3] The results of these studies led to the 2019 VANR MOU containing the detailed operational parameters described above. The PUC approved the Flow and Water Level Management Monitoring Plan on June 30, 2025.

Based on the application and supporting documentation, this review finds that the Project operates in a manner that supports healthy fish and wildlife habitat and thus conditionally satisfies the ecological flows criterion. Since the Flow and Water Level Management Monitoring Plan is not yet fully implemented, a condition is recommended (See Section 8 below).

[2] Stream gages near the Project are upstream: USGS 01135150 Pope Brook (Site W-3) Near North Danville, VT. Downstream: USGS 04285500 North Branch Winooski River at Wrightsville, VT and USGS 04286000 Winooski River.

[3] Required under VANR's Streamflow Procedures.

B: Water Quality

Goal: *Water Quality is protected in waterbodies directly affected by the facility, including downstream reaches, bypassed reaches, and impoundments above dams and diversions*.

Assessment of Criterion: The Applicant selected Standard B-2, Agency Recommendation for all ZoEs based on the VANR MOUs and PUC order. The reviewer agrees with this selection.

Discussion: The Project is not subject to water quality certification since it predates those regulations. Molly's Brook, Sucker Brook and Peacham Pond Brook are not listed as impaired in the state's 2024 Section 303(d) list of impaired waters; but the Winooski River upstream and downstream of the Molly's Brook confluence is listed as impaired for e coli.[4]

The Winooski River and Molly's Brook are categorized by the State of Vermont as Class B2 for all designated uses and as cold-water fish habitat. The state water quality standards establish dissolved oxygen (DO) criteria for salmonid spawning or nursery areas of not less than 7 mg/L and 75% saturation at all times, and not less than 95% saturation during late egg maturation and larval development of salmonids. For all other waters, DO must meet instantaneous minimum values of not less than 6 mg/L and 70% saturation at all times.

GMP conducted a water quality study in 2015. Results showed that DO standards were generally met except for a few brief deviations at all monitoring stations, except for at the Project tailrace where brief but frequent low DO was measured. The cause was attributed to the introduction of low DO water to the Winooski River from the penstock at the beginning of power generation cycles.

As part of the Project upgrades, a new bypass pipe was constructed to release additional water into Molly's Brook from the reservoir to meet increased minimum conservation flow requirements discussed in Section 7.A above. The bypass pipe draws water from about 30 feet below the surface, leading to the potential of low DO discharges. To alleviate that issue, the discharge is aerated by turbulent flow over rip-rap before reaching the brook.

A second aeration system was installed to alleviate low DO in tailrace discharges. It consists of a penstock valve that enables flows to be ramped up and down at the beginning and end of generation cycles. The valve entrains air in the water which is then released from the penstock into the Winooski River. Operation of the valve occurs automatically any time a generation cycle change takes place. Additionally, GMP changed its generation operations pursuant to the MOU, so that the frequency and magnitude of generation cycles have been reduced, timing of generation has changed to align more with natural higher-flow events, and generation flows are now gradually ramped-up and down.

GMP is implementing the final Dissolved Oxygen Monitoring Plan filed with the PUC in

[4] https://dec.vermont.gov/watershed/tasc/assessment-and-listing

March 2024 and approved on June 30, 2025. If monitoring indicates that DO levels do not comply with state standards, adjustments will be made including increasing the aeration system capacity, and/or reducing the magnitude of generation flows and continuing to monitor DO until the results confirm the criteria are met. Monitoring is expected to be conducted during the first summer following PUC approval of the DO Monitoring Plan, so it is scheduled for 2025. No further monitoring is proposed unless the monitoring results show that water quality does not meet the VWQS due to facility operations. If that is the case, additional improvements would be made and monitoring would continue at the locations that did not meet the standards, during the following summer(s) until the standards are met.

GMP will also implement a riparian restoration plan outside of the Project area to alleviate water temperature fluctuations in the Winooski River upstream of the tailrace discharge. This is discussed in Section 7.E below.

Based on the application and supporting documentation, this review finds that the Project has or is taking steps to minimize its operational impacts on water quality and conditionally satisfies the water quality criterion pending results from the DO study and VANR concurrence that the Project is meeting state standards. Therefore, a condition is recommended (see Section 8 below).

C: Upstream Fish Passage

Goal: *The facility allows for the safe, timely, and effective upstream passage of migratory fish. This criterion is intended to ensure that migratory species can successfully complete their life cycles and maintain healthy, sustainable fish and wildlife resources in areas affected by the facility.*

Assessment of Criterion: The Applicant selected Standard C-1, Not Applicable/De Minimis Effect in all ZoEs to pass the upstream fish passage criterion. The reviewer agrees with this selection.

Discussion: There are no recommendations or requirements in the VANR MOUs or the PUC order related to providing upstream fish passage.

Lake sturgeon, landlocked Atlantic salmon, and steelhead trout are naturally occurring potamodromous species within the Lake Champlain Basin. Historically, migratory fish from Lake Champlain ascended many of its tributaries to access spawning waters. However, downstream of the Project, there is a dam in Plainfield, VT near the confluence of the Winooski River with Great Brook. This dam, along with other Winooski River dams farther downstream, blocks upstream passage of migratory fish. While the first dam on the river, Winooski One/Chace Mill has an upstream trap and truck facility, captured fish are relocated only to above the third dam, Essex 19 so these fish are not present in the Project area.

The Project is located high in the watershed, there are downstream barriers to upstream fish passage on the Winooski River mainstem going back to 1786[5], and the Project dams post-date that time. The current project was constructed in 1927, and three different facilities had been operated prior to 1914 but were unlikely to exist as early as 1786 since the first European settlements in Marshfield occurred in 1794.[6] Therefore, the Project was not likely to have created the original migratory fish barrier in the Winooski River. Based on the application and supporting documentation, this review finds that the Project does not impact upstream migrating fish and therefore satisfies the upstream passage criterion.

D: Downstream Fish Passage

Goal: *The facility allows for the safe, timely, and effective downstream passage of migratory fish. For riverine (resident) fish, the facility minimizes loss of fish from reservoirs and upstream river reaches affected by Facility operations. All migratory species can successfully complete their life cycles and to maintain healthy, sustainable fish and wildlife resources in the areas affected by the Facility.*

Assessment of Criterion: The Applicant selected Standard D-1, Not Applicable/De Minimis Effect in all ZoEs to pass the downstream fish passage and protection criterion. The reviewer agrees with this selection.

Discussion: There are no recommendations or requirements in the VANR MOUs or the PUC order related to providing downstream fish passage or protection measures.

The two Project impoundments are typical warm-water fisheries with largemouth bass, smallmouth bass, northern pike, chain pickerel, and yellow perch. Trout species are stocked to provide angling opportunities in the Marshfield No. 6 impoundment which is part of the state park. These species are not migratory and do not require downstream fish passage facilities. At Peacham Pond dam, the trashrack has 2.5-inch clear spacing and at Marshfield No. 6 dam, the trashrack has 3-inch clear spacing. Intake approach velocities are unknown, but it is unlikely that a sizable number of fish would become impinged on the racks if they approached the intake. It is possible that smaller fish could pass through the racks and become entrained in the powerhouse turbine.

In 2015 GMP and the Vermont Department of Fish and Wildlife (VDFW) collaboratively conducted fish population monitoring at ten stations in the vicinity of the Molly's Falls Project. Resident species in the upper Winooski River included brook trout, brown trout, rainbow trout, blacknose dace, common shiner, creek chub, longnose dace, longnose sucker, slimy sculpin, and white sucker. Common resident species in Molly's Brook below the Marshfield No. 6 reservoir included brook trout, blacknose dace, creek chub, longnose sucker, longnose dace, and northern redbelly dace. Monitoring was not completed in Sucker Brook, but based on surveys

[5] http://winooskinrcd.org/wp-content/uploads/winooski_damming.pdf

[6] http://accdservices.vermont.gov/ORCDocs/Marshfield_TownReport__Miscellaneous_00000020.pdf

conducted by VDFW in 1993, 2004, and 2014, no wild trout were observed in Sucker Brook. Blacknose dace was the only resident fish species that was captured.

An instream flow study was conducted in 2015 to evaluate bypass flows in Molly's Brook and Sucker Brook and to look at Project release flows into the Winooski River. The results of the study found that a 5-cfs minimum flow to Molly's Brook would result in a significant improvement in the amount of baseflow habitat available for most target life stages. The results also found that a minimum conservation flow of 4.2 cfs in Sucker Brook would show a substantial improvement in the habitat available for all the target species/life stages for the spring period. As discussed in Section 7.A above, the minimum flow in Sucker Brook is based on run-of-river operations except during winter drawdown and spring refill when the minimum flow is 6.7 cfs or inflow less evaporation. At Molly's Brook, minimum flows vary from 8.5 to 12 cfs. In both cases, these flows are higher than the instream flow study would dictate.

Based on the application and supporting documentation, this review finds that the Project is unlikely to affect the resident fish species in a way that could adversely impact the fish population and therefore satisfies the downstream passage and protection criterion.

E: Shoreline and Watershed Protection

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

Assessment of Criterion: The Applicant selected Standard E-1, Not Applicable/De Minimis Effect in all ZoEs to pass the shoreline and watershed protection criterion. The reviewer agrees with this selection.

Discussion: Since the Project is not FERC-regulated, it does not have and is not required to have a shoreline management or similar plan under the terms of the VANR MOUs and PUC order. There are no lands of ecological significance under the Project's control. In addition to the two impoundments, there are 23 acres of land at the Marshfield No. 6 development that includes the dam, buildings for the hydropower facility, and the spillways. At the Peacham Pond development, there are 24.7 acres of land under GMP's control. Landcover around the impoundments consists of deciduous forest, evergreen forest, woody wetlands, and emergent herbaceous wetlands. Most of the development around the impoundments consists of residential homes, roads, and parking.

More than half of the Peacham Pond development impoundment is surrounded by Groton State Forest. Most of the Marshfield impoundment is surrounded by Mollys Falls Pond State Park. Portions of both impoundments are also abutted by Vermont State Land Trust conservation easements, all of which serve to protect the shorelines and watershed around the Project. In 2012 the Vermont Land Trust purchased what is now the state park property from GMP and later sold it to the state.

Impoundment water levels are limited to 0.5 to 1-foot fluctuation except during winter drawdown and spring refill which limits erosion and littoral impacts.

The Sucker Brook area and the Marshfield No. 6 bypassed reach are primarily made up of evergreen forest, mixed forest, and woody wetlands, with smaller amounts of deciduous forest and open space development. The Winooski River downstream area is primarily made up of hay/pasture, mixed forest, and shrub/scrub, with a small amount of evergreen forest and development.

As part of the Project's recent construction and improvements, GMP developed a Riparian Zone Restoration Plan intended to reduce the temperature differences between cooler generation flows released from the Project's powerhouse into the Winooski River and the natural water temperatures that fluctuate in the river. Studies found that generation flows released from the powerhouse during the warmer months have historically been at a consistent, low temperature whereas the receiving portion of the Winooski River has historically had significant daily temperature fluctuations. The variability in temperature seen in the Winooski River is due to degraded riparian habitat along the Winooski River upstream of the powerhouse, outside of the Project's influence. Although GMP's facilities and operations do not cause or contribute to the temperature fluctuations, riverbank erosion, and lack of shade in the Winooski River upstream of the powerhouse discharge, GMP agreed to develop and implement the plan in this area to help improve water quality.

The target restoration areas will be planted with native plant species observed during the field study as well as suitable shade-providing plants. Following completion of planting, monitoring will occur annually during the growing season for up to three years from late spring to early summer to record growing season conditions and allow for implementing corrective measures if needed.

Based on the application, supporting documentation, and publicly available documents, this review finds that the Project has a de minimis effect on its shorelines and watershed, and therefore conditionally satisfies the shoreland and watershed protection criterion. Since the Riparian Zone Restoration Plan was only recently approved by the PUC on June 30, 2025 and has not yet been implemented, a condition is recommended (see Section 8 below).

F: Threatened and Endangered Species

Goal: *The facility does not negatively impact federal or state listed species.*

Assessment of Criterion Passage: The Applicant selected Standard F-1, Not Applicable/De Minimis Effect in all ZoEs to pass the threatened and endangered species criterion. The reviewer agrees with this selection.

Discussion: GMP provided a USFWS IPaC species report which lists the federally threatened

Northern long-eared bat and the proposed monarch butterfly as potentially occurring within the Project vicinity. Birds protected under the federal Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act identified within the USFWS report as species that may have presence within the Project area during parts of the year include bald eagle, black-billed cuckoo, bobolink, Canada warbler, Cape May warbler, Eastern whip-poor-will, evening grosbeak, lesser yellowlegs, olive-sided flycatcher, and wood thrush. Eastern whip-poor-will is a state threatened species.

GMP indicated that they will consult with resource agencies if any tree cutting must occur at the Project to minimize potential impacts on bats or birds.

A freshwater mussel study was conducted in 2015 to determine if the state-threatened Eastern pearlshell was present in the Winooski River upstream or downstream of the Project. Upstream of the Project, only two live individuals and downstream of the Project only two live individuals and three shells were observed in the 1.9-mile study area. The study concluded that Eastern pearlshell exist at very low densities in this area, and while hydropeaking (that has since been reduced in accordance with the VANR MOUs and PUC order), may have contributed to a lack of species presence, mussel habitat may be most limited by natural factors given the low observations upstream of the Project.

GMP also conducted a data check with VDFW which, in addition to Eastern pearlshell, reported several rare plant species and one reptile. Only the bronze sedge plant is listed as endangered in Vermont. Vegetation management at the Project occurs on previously developed lands and is unlikely to adversely affect these species.

As discussed in Section 7.A, operators make observations of common loon nesting and implement frequent adjustments to impoundment levels if needed. Loons are subject to a statewide recovery plan that includes, among other management measures, limiting impoundment fluctuations during nesting season. That plan was developed in 1998 after the species was state-listed as endangered, but the species has since been delisted because recovery has exceeded the target numbers of nesting pairs set at that time.

Based on the application, supporting documentation, and publicly available documents, this review finds that the Project has a de minimis effect on listed species and therefore satisfies the threatened and endangered species protection criterion.

G: Cultural and Historic Resources Protection

Goal: *The Facility does not unnecessarily impact cultural or historic resources that are associated with the facility's lands and waters, including resources important to local indigenous populations, such as Native Americans.*

Assessment of Criterion: The Applicant selected Standard G-1, Not Applicable/De Minimis Effect in all ZoEs. The reviewer agrees with this selection.

Discussion: Since the Project is not FERC-regulated, it does not have and is not required to have a cultural or historic management plan or similar plan, nor is it generally subject to Section 106 consultation under the National Historic Preservation Act. The Project facilities are old enough that they could be potentially eligible for listing on the National Register, but none are listed on the National Register or the Vermont State Register.

As discussed in Section 7.E above, the impoundments are mostly protected by state park and state forest lands. The state park website provides a brief history of the park noting that, like most river-based development in New England, there was prior Native American presence in the area. Molly's Falls itself is reported in several sources to be named after a Native American woman who lived in the area, along with her husband Joseph Susapp, known as "Indian Joe", who was a scout and guide for American revolutionary war forces. Molly was well known for her herbal remedies, and for hunting and foraging in the area.[7]

It was determined during the recent Project improvements that there was little chance of encountering archaeological sites. The only federal actions potentially triggering Section 106 consultation were the Army Corps permits for portions of the recent improvement project, and those were limited in scope and not found to have an effect on any historic or archaeological resources by the Army Corps.

GMP also consulted with the State Historic Preservation Office (SHPO), including an on-site visit during the Army Corps and VT PUC permitting process for the recent dam improvements project. The SHPO also reviewed the Emergency Spillway Project in October 2020 when it was noticed through the PUC filing and did not have any comments or concerns regarding above-ground and/or below-ground archaeologic or historic resources.

Currently, impoundment fluctuations are limited, which limits erosion and potential exposure of any cultural or historic resources that might exist along the shorelines. The recent construction was conducted in previously disturbed areas and determined to not have an impact by the SHPO and the Army Corps.

Based on the application, supporting documentation, and publicly available documents, this review finds that the Project has a de minimis effect on cultural and historic resources and therefore satisfies this criterion.

[7] See https://sites.google.com/site/histsocorg1/cabot-historical-society/timeline, and http://accdservices.vermont.gov/ORCDocs/Marshfield_TownReport__Miscellaneous_00000020.pdf, and https://www.vtstateparks.com/sites/stateparks/files/documents/mollysfalls.pdf

H: Recreational Resources

Goal: *The facility accommodates recreation activities on lands and waters controlled by the facility and provides recreational access to its associated lands and waters without fee or charge.*

Assessment of Criterion Passage: The Applicant selected Standard H-1, Not Applicable/De Minimis Effect in all ZoEs. The reviewer agrees with this selection.

Discussion: There are no formal or informal recreational amenities or access under GMP's control at the Project. The 1,064-acre Molly's Falls Pond State Park land on the shore of the Marshfield No. 6 reservoir is accessible for boating, fishing, swimming hiking, shoreline picnicking, and water-accessible camping and picnicking sites. Groton State Forest encompasses lands adjacent to the Project and includes a boat launch on Peacham Pond. The forest encompasses a much larger 26,000 acres in the Project vicinity with hiking trails, and picnic areas. Summer homes and camps are also located on Peacham Pond, and residents have access to the Project's waters. The Sucker Brook reach (ZoE 2), the Molly's Brook reach (ZoE 4) and the Project's downstream reach in the Winooski River are open to public access.

Based on the application and supporting documentation, this review finds that the Project has minimal ability to provide recreational access, but access is widely available on public lands and in the Project vicinity, therefore the Project therefore satisfies the recreational resources criterion.

8. CERTIFICATION RECOMMENDATION

This review included an evaluation of the application and additional information provided by the Applicant, a review of the Vermont PUC dockets for the Project improvements, and a review of other publicly available information. Based on this evaluation, I recommend that the Project be certified for a ten-year term with the following condition intended to ensure that the three management and compliance plans that were recently approved by the PUC are implemented and results are subsequently approved by VANR:

Condition 1: In annual compliance submittals to LIHI, the Facility owner will provide updates on the status of implementation of the Flow and Water Level Management Monitoring Plan, the Dissolved Oxygen Monitoring Plan, and the Riparian Zone Restoration Plan until all have been implemented, related studies have been completed, and VANR has concurred that no additional improvements are needed.