REVIEW OF APPLICATION FOR CERTIFICATION BY THE LOW IMPACT HYDROPOWER INSTITUTE OF THE LOWER GREAT FALLS HYDROELECTRIC FACILITY

APPENDICES

A – Communications with GMP and NHDES

REVIEW OF APPLICATION FOR CERTIFICATION BY THE LOW IMPACT HYDROPOWER INSTITUTE OF THE LOWER GREAT FALLS HYDROELECTRIC FACILITY

Prepared by Patricia McIlvaine
April 24, 2024

I. INTRODUCTION

This report summarizes the review findings of the certification application submitted by Green Mountain Power Corporation (GMP), on behalf of itself and its co-licensee the City of Somersworth, NH for the 1.28-megawatt (MW) Lower Great Falls Hydroelectric Project (the Project) located on the Salmon Falls River in New Hampshire and Maine. The Project is managed and operated by GMP. The Project was issued a 40-year license (P-4451) on January 20, 2023, by the Federal Energy Regulatory Commission (FERC). The Project operates as a run-of-river facility. GMP and the City of Somersworth are frequently referenced as the "Licensees" in this report.

II. PROJECT'S GEOGRAPHIC LOCATION

The Lower Great Falls Project is located on the Salmon Falls River in the states of New Hampshire (NH) and Maine (ME). Most of the infrastructure, including the intake, penstock, and powerhouse, is located within the City of Somersworth, NH. The left abutment of the dam is in the Town of Berwick, ME. Figure 1 shows the location of the Project, as well as upstream and downstream dams on the Salmon Falls River.

The Project dam is located at approximately river mile (RM) 3.1 and is the third dam on the mainstem of the Salmon Falls River. At the Project dam, the total drainage area is approximately 220 square miles (mi^2), which is about 93.2% of the Salmon Falls drainage area (236 mi^2). Table 1 details the name, status, location, FERC license number and existence of downstream fish passage of all dams along the Salmon Falls River from upstream to downstream.

The next downstream dam, the Rollinsford Hydroelectric Project, has upstream eel passage scheduled for construction in 2028. The first dam on the river, the South Berwick Hydroelectric Project, had upstream fish passage facilities (i.e., Denil fish ladder) constructed in 2001. The addition of trap and transport capabilities to the existing Denil fish ladder at the South Berwick Project are scheduled for2025. Both of these dams are owned and operated by GMP and are LIHI certified (South Berwick- LIHI #195 and Rollinsford – LIHI #196. The South Milton Project (LIHI #100), owned by SFR Hydro Company, is also certified.

Figure 1 - Location of the Lower Great Falls and other dams on the Salmon Falls River

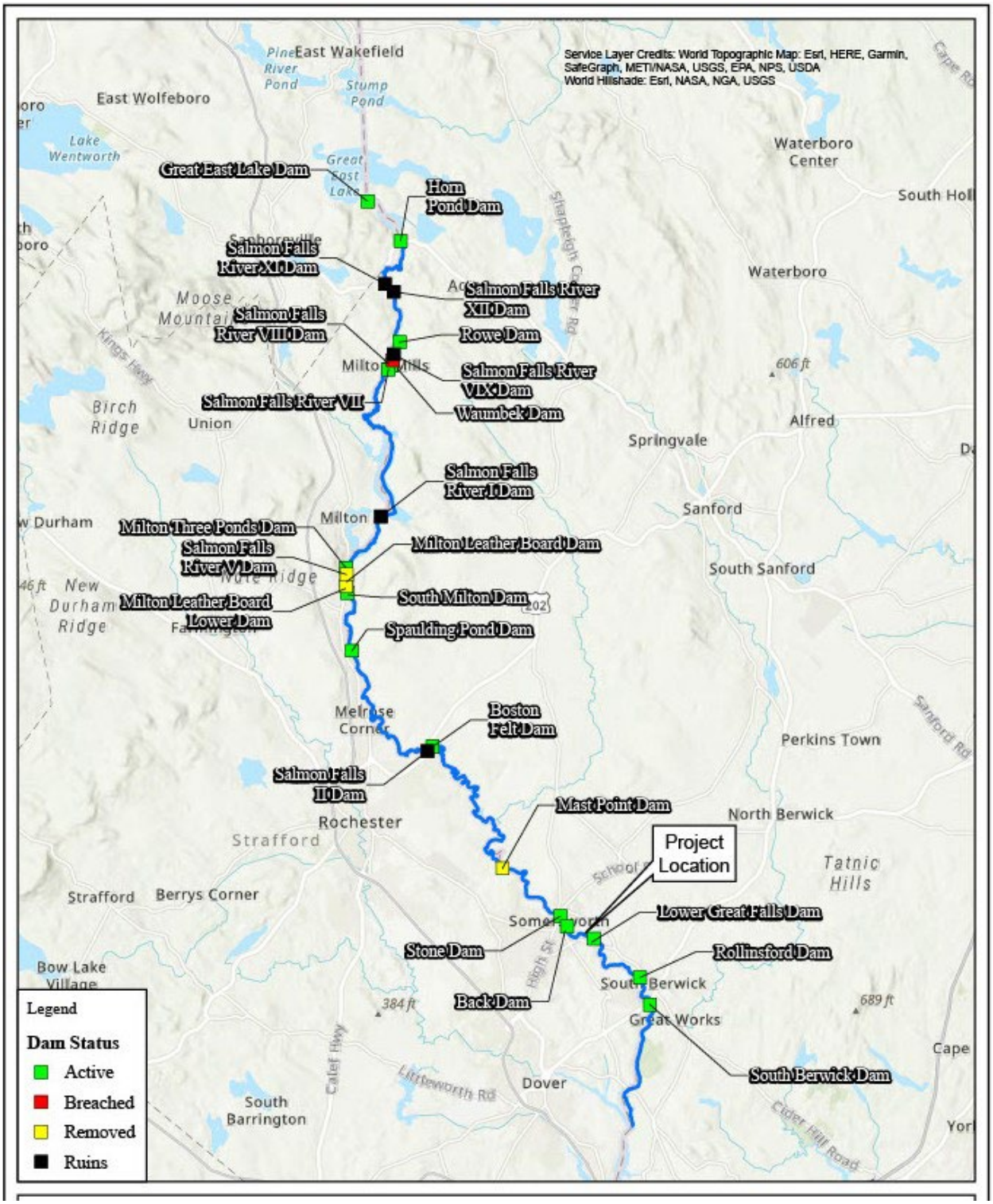

Table 1 – Upstream and Downstream Dam Information

Name	Status	Town	FERC No.	Owner	River Mile	Downstream Fish Passage Facility
Great East Lake Dam	Active	Wakefield	-	NHDES Water Division	35	No
Horn Pond Dam	Active	Wakefield	-	NHDES Water Division	33.5	No
Salmon Falls River XI Dam	Ruins	Milton	-	Mr. Carr Horn	31.6	NA
Salmon Falls River XII Dam	Ruins	Milton	-	Mr. L E Wiggin	31.2	NA
Rowe Dam	Active	Milton	-	NHDES Water Division	29.5	No
Salmon Falls River VIX Dam	Ruins	Milton	-	PSNH	29.2	NA
Salmon Falls River VIII Dam	Breached	Milton	-	PSNH	28.9	NA
Waumbek Dam	Active	Milton	5872	NHDES Water Division	28.8	No
Salmon Falls River VII	Active	Milton	-	Mr. David Aubert	28.6	Yes (eel)
Milton Three Ponds Dam	Active	Milton	-	NHDES Water Division	21.4	No
Salmon Falls River V Dam	Removed	Milton	-	PSNH	21.3	NA
Milton Leather Board Dam	Active	Milton	-	Milton Land Corp	21.1	No
Milton Leather Board Lower Dam	Removed	Milton	-	Mr. John Jamesom	21	NA
South Milton Dam*	Active	Milton	3984	SFR Hydro Co.	20.8	No
Salmon Falls River I Dam	Ruins	Milton	-	Spaulding Fiber Company	20.1	NA
Spaulding Pond Dam	Active	Rochester	3985	Spaulding Ave Industrial Complex, LLC	18.8	No
Salmon Falls II Dam	Ruins	Rochester	-	Cocheco Woolen	13.8	NA
Boston Felt Dam	Active	Rochester	4542	Salmon Falls Power and Light Co	13.7	No
Mast Point Dam	Removed	Somersworth	-	General Electric Co.	7.2	
Stone Dam	Active	Somersworth	3820	Aclara Technologies, Inc.	4.4	No
Back Dam	Active	Somersworth	-	Aclara Technologies, Inc.	4.1	No
Lower Great Falls Dam	Active	Somersworth	4451	City of Somersworth & GMP	3.1	Expected (2026)
Rollinsford Dam*	Active	Rollinsford	3777	Town of Rollinsford (operated by GMP)	0.9	Expected (2025)
South Berwick Dam*	Active	Rollinsford	11163	Salmon Falls Hydro, LLC (GMP)	0	Yes

*LIHI Certified

III. PROJECT AND IMMEDIATE SITE CHARACTERISTICS

The Project dam (Figure 2) is a stone masonry and concrete gravity dam, in place since 1825 with a total length of 297 feet, consisting of a 50-foot-long left abutment, a 176-foot-long spillway section, and a 71-foot-long right abutment. The dam is approximately 32 feet high. The spillway has a crest elevation of 102.4 feet, NGVD 1929. The dam is topped with 4-foot-high flashboards, resulting in a normal pond elevation of 106.4 feet, at the crest of the flashboards. The dam was rehabilitated in 1984 and the spillway was rehabilitated in 1991. The red arrow indicates the location of the trash gate discussed below.

Figure 2 – Project Dam

There is one low level outlet gate located in the left abutment which controls flow into a seven-foot-diameter, 40-foot-long bypass pipe. The gate is 8 feet wide by 8 feet high, with a sill elevation of 84.9 feet, NGVD 1929. A second inoperable outlet pipe that had previously been partially filled with concrete is present. In the Fall of 2022, GMP completed several FERC mandated dam safety repairs that included filling the remaining portion of the inoperable outlet pipe with concrete. The gate that is operable is opened when the impoundment level rises approximately 10 inches above the flashboards to prevent failure of the flashboards during high flow periods. The gate is operated manually by a hydraulic unit mounted to the gate structure that is run by a dedicated portable generator.

There is also a small trash gate located adjacent to the intake structure with a manually operated screw stem operator. The gate is 5.25 feet wide by 4 feet high, with a sill elevation of 102.4 feet,

NGVD 1929. The gate is typically used to sluice debris and is also opened when the impoundment level rises approximately 10 inches above the flashboards during high flow periods.

The Project impoundment (Figure 3) has a gross volume of 584 acre-feet with an approximate surface area of 40 acres at the normal pond elevation of 106.4 feet, NGVD 1929. Since the Project operates as a run-of-river facility, the useable storage volume is negligible.

Figure 3 – Project Impoundment

The 40.5-foot-wide by 20-foot-high intake is a concrete structure with a wooden-deck that includes four steel frame gates with a sloping steel trashrack. Two pairs of gates control flow to each penstock. Each gate is 5-ft-wide by 10.5-ft-high with a sill elevation of 92.0 feet. The gates are hand operated with a chain hoist on a monorail. These gates provide closure to two 8.5-foot penstocks and in turn each penstock bifurcates into two penstocks that convey water to the powerhouse. All the penstocks are buried and extend 200-225 feet from the intake structure.

The left penstock bifurcates approximately 120 feet downstream of the intake structure into a 5.3-foot-diameter penstock (Unit 4) and a 7.6-foot-diameter penstock (Unit 3), both with lengths of 85 feet. The right penstock bifurcates approximately 140 feet downstream of the intake structure into a 7-foot-diameter penstock (Unit 2) and a 7.6-foot-diameter penstock (Unit 1), both with lengths of 85 feet.

The powerhouse is located approximately 250 feet downstream of the Project dam. It is a 30-foot by 46-foot concrete and brick building, and includes the four turbine/generators, controls, and station switchgear with a total installed capacity of 1.28 MW. The Project began initial operation in 1985. The Project tailrace is approximately 55 feet wide and 30 feet long. A 250-foot-long

bypass reach extends between the dam and the tailrace. The bypass varies in width between approximately 90 feet at the downstream end and approximately 160 feet at the upstream end. Figure 4 shows the powerhouse and tailrace (Figure 4).

Figure 4 – Powerhouse and Tailrace

Figure 5 is an aerial showing the locations of the key Project features as well as the Project Boundary. The reservoir covers 41.1 acres of water. There are 0.9 acres of land within the Project Boundary and that all is used for Project facilities and operations. Land occupied by two apartment buildings and an associated parking lot (0.24 acres), and 0.56 acres of land associated with Olde Mill Road were removed from the Project Boundary pursuant to FERC license Article 205.

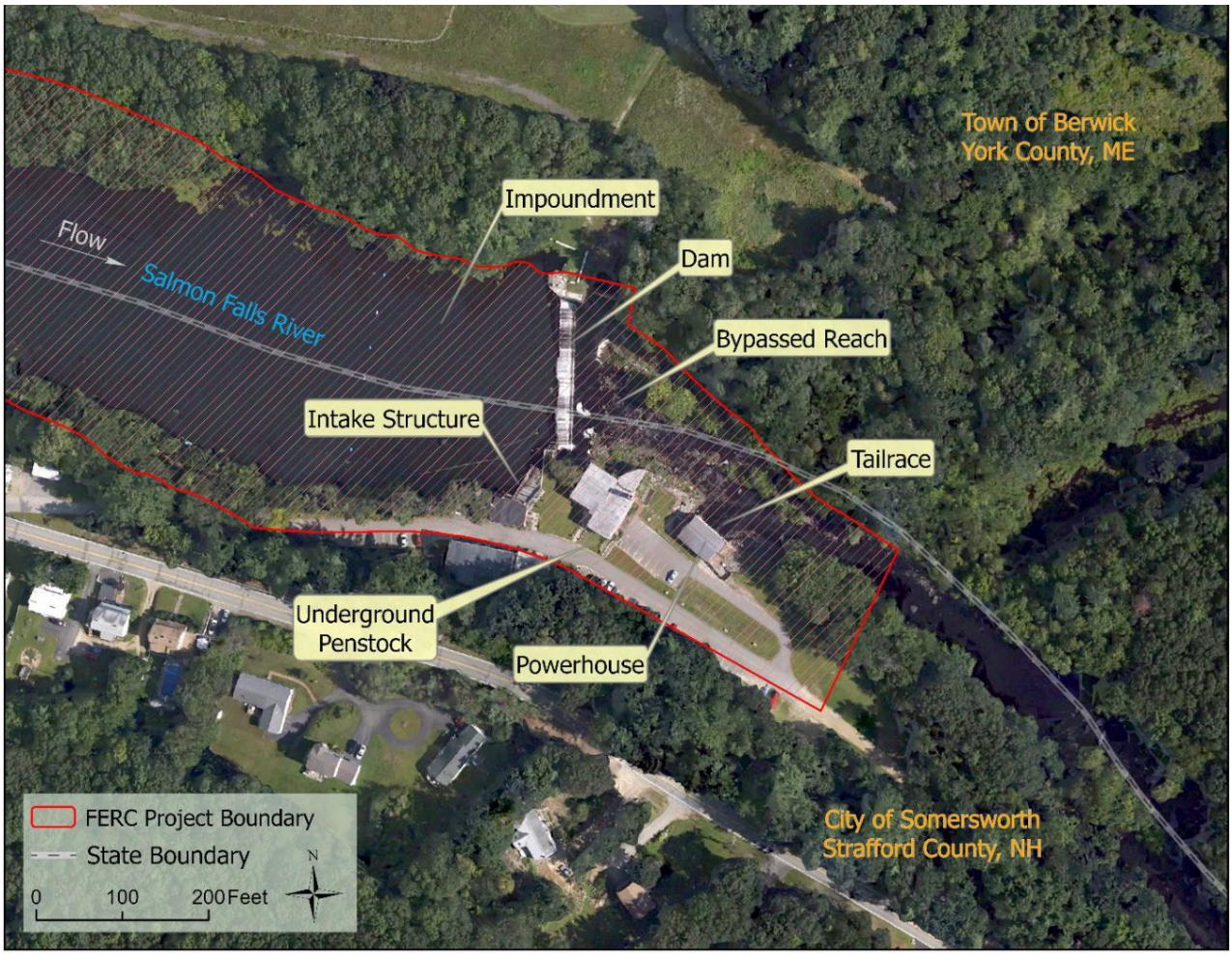

Figure 5 – Aerial of Key Project Features

IV. REGULATORY AND COMPLIANCE STATUS

FERC license

The Federal Energy Regulatory Commission (FERC or Commission) issued the original license for the Project on April 22, 1982 (P-4451), with an expiration date of April 30, 2022, under which the Project operated until a new 40-year license was issued on January 20, 2023, with an expiration date of December 31, 2062.[1] On October 28, 2020, the Commission issued a public notice accepting the application for filing. The Maine Department of Inland Fisheries and Wildlife (MDIFW) and the US Fish and Wildlife Service (USFWS) of the U.S. Department of the Interior

[1] The original license was issued to Somersworth Hydropower Associates, transferred to Somersworth Hydropower Company (a subsidiary of Enel Green Power North America) and the City of Somersworth, New Hampshire, on September 1, 1987, and then transferred to Green Mountain Power and the City of Somersworth, New Hampshire, on May 24, 2017.

(Interior) filed timely notices of intervention on December 7, 2020, and December 15, 2020, respectively. Neither opposed the Project's relicensing. On February 10, 2021, FERC issued a public notice indicating the application was ready for environmental analysis. USFWS filed comments and recommendations on April 14, 2021, and a preliminary Federal Power Act (FPA) Section 18 fishway prescription on April 16, 2021. No comments were received from any Tribal interests during any stage of relicensing. On April 6, 2021, GMP, on behalf of itself and the City of Somersworth, New Hampshire, filed an Offer of Settlement which consists of the Settlement Agreement for Prescription for Fishways. (LGF Settlement Agreement) executed by and between the Co-Licensees and USFWS. It only addresses upstream passage for American Shad and river herring. On October 7, 2021, GMP filed a letter stating that the terms of the Settlement Agreement was their relicensing proposal for providing upstream fish passage. FERC issued an Environmental Assessment (EA) on July 7, 2022, USFWS filed comments on August 18, 2022, and GMP filed comments on August 22, 2022.

Both Water Quality Certifications (WQCs) (issued by New Hampshire Department of Environmental Services (NHDES) on April 4, 2022, and the Maine Department of Environmental Protection (MDEP) on April 6, 2022) were incorporated into the FERC license, and the Settlement Agreement's terms were reflected in the DOI prescriptions and the FERC license. Copies of all of these documents are contained in the LIHI application appendices.

The FERC license also includes Articles that address the following. The details of these are incorporated into the specific criteria discussions below.

- Downstream fish passage as well as reserved Federal Power Act (FPA) Section 18 authorization for additional future needs;
- Reporting of run-of-river (ROR) deviations and a schedule for filing WQC and FERC license required plans, reports, schedules, and amendments for Commission approval; a consolidated list of these is contained in Table 2;
- Replacement of existing trashrack screens with smaller spaced ones;
- Requirements to protect endangered species;
- Requirements to implement an adopted Programmatic Agreement to protect cultural features; and
- Required notification regarding changes to existing recreational facilities.

Water Quality Certification

On April 6, 2021, GMP and the City applied to MDEP for a WQC, which was issued on April 6, 2022. It contained five conditions, three of which were general or administrative. The remaining conditions require GMP and the City to (1) implement the proposed water quality plan (Condition A); and (2) review the effectiveness of the proposed water quality plan within five years after implementation (Condition B).

On April 6, 2021, GMP and the City applied to the NHDES for a WQC which was issued on April 4, 2022. It includes 16 conditions, nine of which are general or administrative. Seven Project-specific conditions address flow related items such as run-of-river operation, bypass minimum flows, reporting of deviations, and development of an Operations Compliance Monitoring Plan.

Two conditions are specific to water quality, including development of a Water Quality Improvement Plan and Dissolved Oxygen and temperature monitoring in the riverine reach upstream of the impoundment, and in the impoundment, tailrace, and bypassed reach every five years. The final condition required actions to be taken to control invasive species should the Licensees be notified of such a need by NHDES. Actions could include temporary modification of Project operations as necessary.

Both WQCs conditions were incorporated into the License, with one modification, as discussed under **Criterion A - Ecological Flow Regimes**, and both are contained in the LIHI application appendices. Details are identified under the applicable criteria. Table 2 shows the due dates of WQC and FERC license required studies, schedules and management plans.

Table 2 - Due Dates of WQC and FERC license Required Studies, Schedules and Management Plans

New Hampshire DES Certification Condition No.	Interior Section 18 Prescription Condition No.	License Article	Plan/Report Name	Commission Due Date	Licensee Submittal Date	Commission Approval Date
E-14			Water Quality Improvement Plan	July 18, 2023	May 24, 2023	October 23, 2023
E-12			Operation Compliance Monitoring Plan	July 18, 2023	July 17, 2023	
		403	Downstream Fish Passage Plan and Schedule	January 20, 2024	December 22, 2023	
		406	Historic Properties Management Plan	January 20, 2024	February 16, 2024	
	11.4		Fishway Operation and Maintenance Plan	April 18, 2024	April 5, 2024	
E-11c			Flow and Impoundment Management Report	June 1 each year of license term		
	11.9.2		Upstream Eel Siting Survey Results	November 30, 2024		
E-15			Long Term Water Quality Monitoring Plan	November 17, 2027, and every five years thereafter		
	11.7.1		Interim Upstream Eel Passageway Effectiveness Monitoring Report	April 15, 2028		
	11.7.1		Interim Downstream Eel Passageway Effectiveness Monitoring Report	April 15, 2028		
	11.7.1		Interim Downstream Anadromous Fishway Effectiveness Monitoring Report	April 15, 2028		

New Hampshire DES Certification Condition No.	Interior Section 18 Prescription Condition No.	License Article	Plan/Report Name	Commission Due Date	Licensee Submittal Date	Commission Approval Date
	11.7.1		Final Downstream Eel Passageway Effectiveness Monitoring Report	July 15, 2028		
E-15			Long Term Water Quality Monitoring Report	February 28, 2029, and every five years thereafter		
	11.7.1		Final Upstream Eel Passageway Effectiveness Monitoring Report	June 30, 2029		
	11.7.1		Final Downstream Anadromous Fishway Effectiveness Monitoring Report	July 15, 2029		
	11.7.1		Fish Passage Effectiveness Testing Plans	September 15, 2029		
	11.7.1		Interim Upstream Anadromous Fishway Effectiveness Monitoring Reports	April 15, 2032		
	11.7.1		Final Upstream Anadromous Fishway Effectiveness Monitoring Reports	March 15, 2033		

Compliance Summary

A FERC records review was conducted for the period from January 1, 2015 to April 7, 2024. Significant material was available as the Project was undergoing relicensing during that time. It did not appear that non-regulatory stakeholders raised any concerns. In general, Project compliance has been good. Three unplanned and two planned deviations from FERC license requirements associated with flows or stage limits were identified from January 2015 through December 31, 2023, based on review of the LIHI application and FERC's eLibrary. All were reported and all were due to factors beyond operator control. None were considered a license violation. No other compliance issues were identified.

V. PUBLIC COMMENTS RECEIVED OR SOLICITED

The deadline for submission of comments on the LIHI application was April 12, 2024. No comments were received.

Outreach was made to Judith Houston of NHDES to confirm the Department's approval of the Water Quality Mitigation and Enhancement Plan. She responded via email on April 5, 2024, confirming it was approved. That email is contained in Appendix A.

I also made an inquiry of GMP on several issues as noted in the criteria discussions below. See Appendix A for a copy of these communications.

VI. ZONES OF EFFECT

Three Zones of Effect (ZOEs) were designated as noted in Table 3 below. This table also shows the standards selected, which I believe are appropriate. Figure 7 illustrates the listed ZOEs.

Table 3 – Selected Standards

Zone:		1: Impoundment	2: Bypassed Reach (if applicable)	3. Downstream Reach
River Mile at upper and lower extent of Zone:		4.2-3.1	3.1-3.05	3.05-2.8
Criterion		**Standard Selected**		
A	Ecological Flows	2	2	2
B	Water Quality	2	2	2
C	Upstream Fish Passage	1	2	2
D	Downstream Fish Passage	2	2	1
E	Shoreline and Watershed Protection	1	1	1
F	Threatened and Endangered Species	2	2	2
G	Cultural and Historic Resources	2	2	2
H	Recreational Resources	1	1	1

VII. 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 Passage

The Applicant appropriately selected **A-2 – Agency Recommendation** for all ZOEs. While impoundments can use Standard A-1 - **Not Applicable/De Minimis Effect,** I believe **Standard A-2** is suitable since there are specific Agency requirements in the WQCs and FERC license for impoundment management.

Impoundment and Downstream Reach Requirements

Under the prior license, the Project was voluntarily operated as run-of-river (ROR). The following summarizes the current Project flow-related requirements applicable to the Impoundment and Downstream Reach. Those driven by a WQC are so noted. All but one are incorporated directly into the FERC license as discussed below.

- NHDES WQC requires that the Project be operated in "*an instantaneous run-of-river mode, such that outflow from the Project equals inflow at all times and water levels above the dam are not drawn down for the purpose of generating power*". However, as noted in the FERC license, "*The project is not capable of operating in an instantaneous run-of-river mode, with total outflow from the project equaling inflow on an instantaneous basis*". Instead, the Project is operated using a Programmable Logic Controller (PLC) to automatically control headpond water level as river flows vary by modulating the turbine gate setting such that the total outflow from the Project approximates, rather than equals, inflow at any point in time. This system measures changes to the surface elevation of the impoundment, thus providing an indirect measure of changes to inflow. As inflow increases or decreases, a certain amount of time elapses before the impoundment elevation changes, depending on the rate and magnitude of the change in inflow. Once the change in inflow affects the impoundment elevation, the pond level control system automatically adjusts turbine flow. FERC concluded "*Therefore, operating the project as run-of-river – defined as the sum of all outflows approximating the sum of all inflows at any given point in time – would provide the same level of benefits to aquatic resources upstream and downstream of the project as NHDES's certification condition E-10a, and is operationally feasible.*
- NHDES WQC requires that the target impoundment water elevation under normal operating conditions shall be the top of the flashboards (elevation 106.4 feet NGVD 1929) plus any additional elevation required to pass the bypass reach conservation flow. The Licensee shall minimize the magnitude and frequency of fluctuations in the impoundment to the maximum extent practicable and shall not draw the water level in the impoundment down for the purpose of generating power.

- NHDES WQC requires that after drawdown of the Project impoundment for maintenance or emergencies, the Licensee release 90 percent of the inflow downstream to the Salmon Falls River and utilize the remaining 10% of inflow to refill the impoundment.
- NHDES WQC requires that when drawing the water level in the impoundment down for scheduled maintenance, the Licensee lower the impoundment water level no more than six (6) inches per day.
- NHDES WQC requires the development of a Flow/Impoundment Compliance Monitoring Plan and Operation Monitoring Plan, respectively to ensure compliance with impoundment level and bypass flow requirements, as well as reporting of Project operational parameters (i.e., generation, turbine flow, etc.). The Operations Compliance Monitoring Plan (OCMP) was filed for Commission review on July 17, 2023, but has not yet been approved.
- NHDES WQC requires that the Licensee file an annual summary report by April 1 of each year (beginning the first April after the date the FERC license is reissued) to NHDES, New Hampshire Fish and Game Department (NHFGD), USFWS, MDEP, Maine Department of Marine Resources (MDMR) and MDIFW a summary report for the previous calendar year with appropriate tables, graphs, text and supporting documentation that demonstrates compliance with the flow/impoundment management requirements. Where deviations occurred, the report is to indicate when the event occurred, the duration of the deviation, and a description of corrective actions taken to prevent such excursions from reoccurring.
- FERC license Article 401 details the requirements, including notification requirements, for planned and unplanned deviations from run-of-river operation. For planned deviations, run-of-river operation may be temporarily modified for short periods, of up to three weeks, after mutual agreement among GMP and NHDES, NHFGD, MDEP, MDMR, MDIFW, USFWS, and National Marine Fisheries Service (collectively, resource agencies). After concurrence from the resource agencies, the Licensee is required to file a report with the Commission as soon as possible, but no later than 14 calendar days after the onset of the planned deviation. For planned deviations exceeding three weeks, the Licensee is to file an application for a temporary amendment of the operational requirements of the license and receive Commission approval prior to implementation.

While the system used to manage/monitor run-of-river operations does not provide instantaneously equal inflow and outflow, the July 2023 Operations Compliance Monitoring Plan (OCMP) clearly describes the system used. While NHDES did make a number of suggestions, which were all adopted in the final OCMP, they did not express a concern with what could have been considered a deviation from the NHDES WQC condition.

There are no formal agreements with upstream facilities to regulate inflow or outflow at the Project. However, GMP operate the downstream Rollinsford Dam Hydroelectric Project, FERC No. 3777 and South Berwick Hydroelectric Project, FERC No. 11163, which provides some level of coordination, if necessary, even though each of the three facilities operate in a run-of-river mode. There are no active USGS stream gages in the Project vicinity.

Bypass Reach Requirements

Under the prior license, GMP and the City were required to release a minimum flow of 6.05 cubic feet per second (cfs) or inflow to the impoundment, whichever is less, from the dam to the bypassed

reach. However, it appears that 10.3 cfs was traditionally released.

The following apply to the Bypass Reach:

- NHDES WQC requires that the Licensee provide a minimum continuous conservation flow in the bypass reach of 37 cfs, or inflow, whichever is less. This flow was recommended by USFWS in addition to being required by NHDES.
- Currently, during normal operations, the Project passes a portion (10 cfs) of the minimum flow via the two (12-inch and 4-inch diameter) pipes located at the base of the dam, while the remaining portion (27 cfs) is passed via a cut-out in the flashboards on the right side of the spillway. It is anticipated that the entire minimum flow (37 cfs) will be passed via the downstream fish passage facility when constructed (2026). In addition, during flashboard repair and impoundment refill, the Project passes the minimum flow through a combination of the two pipes at the base of the dam (10 cfs) and the low-level gate (27 cfs).

Minimum bypass flows are based upon a 2020 Instream Flow Incremental Methodology (IFIM) study conducted by the Licensees to evaluate the relationship between aquatic habitat and flow within the 250-foot-long bypass reach. Based on the FERC EA, dated July 2022, the study was conducted at flow releases of 22, 37, 69, and 79 cfs. The study used a Physical Habitat Simulation (PHABSIM) methodology that incorporated existing biological information, including Habitat Suitability Index model data, to determine riverbed elevation, wetted widths, water surface elevation, and river width along five transects. GMP and the City used the hydraulic data to calculate habitat availability for adult brown trout; spawning and incubating fry, juvenile, and adult American shad and river herring; spawning and incubating sea lamprey; juvenile and adult longnose dace; and macroinvertebrates. **A**quatic habitat availability in the bypassed reach was expressed in terms of the percentage of the maximum weighted usable area (WUA), for flow releases of 6, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, and 75 cfs.

Habitat versus flow relationships from the study indicated that a minimum bypass flow of 37 cfs maximized habitat for migratory and resident fish species. Relative to the 10.3-cfs minimum flow previously provided, the newly proposed minimum flow of 30 cfs would provide an approximately 71, 24, and 61% increase in suitable habitat for adult shad and river herring; brown trout; and longnose dace in the bypassed reach, respectively. In comparison, 37 cfs would provide an approximately 80, 33, and 80% increase compared to 10.3 cfs.

While FERC did not believe that a minimum of 37 cfs was warranted, it has been adopted as it is included in the NHDES WQC and is therefore mandatory under Section 401 of the Clean Water Act (CWA).

Compliance

The LIHI application reported (and my FERC records review supported) there have been three unplanned and two planned run-of-river and impoundment water level deviations following the issuance of the new FERC license:

- An unplanned deviation from run-of-river operations occurred at the Project on May 3 through 9, 2023. Due to high river flows of approximately 3,000 cfs and a partial failure of the flashboards that occurred on May 3, 2023, the impoundment water level dropped approximately two feet lower than the normal pond elevation

of 106.4 feet. On May 7, 2023, inflow to the impoundment began to fall to approximately 1,080 cfs. As part of the normal operating procedure, the Project operator began the process of closing the low-level outlet gate. However, one of the hydraulic lines in the gate operating mechanism failed, so that the gate could not be fully closed. This caused the impoundment level to slowly drop an additional two feet to the permanent spillway crest (102.4 feet, NGVD 1929) over the next two days. On May 9, 2023, at approximately 0715 hours with inflow at approximately 600 cfs, the operator was able to take measures to manually close the gate further to reduce flow through it, allowing the impoundment level to return to its original elevation (approximately 104.2 feet, NGVD 1929). In a letter dated August 23, 2023, FERC determined that the unplanned deviation did not constitute a violation of Article 401.

- A planned short-term deviation from run-of-river operations occurred at the Project on June 1 through 5, 2023. The drawdown of the impoundment was necessary to complete flashboard repairs that were necessitated by high water that occurred May 2-3, 2023. The drawdown began on June 1, 2023, and returned the Project to normal operations on June 5, 2023. The impoundment reached its lowest level at approximately 4.0 feet below the top of the flashboards, or 102.40 feet NGVD 1929 on June 2-3, 2023. The minimum bypass flow of 37 cfs was maintained by opening the low-level gate. Resource agencies were also notified in advance of the filing as required by the FERC license. In a letter dated August 23, 2023, FERC determined that the unplanned deviation did not constitute a violation of Article 401.
- An unplanned deviation from run-of-river operations occurred on July 21, 2023 when the flow release from Milton Three Ponds dam, located approximately 18 miles upstream of the Project and operated by NHDES, was reduced from approximately 422 cfs to 211 cfs. Due to a miscommunication, GMP's operator was not aware of the flow release change. The reservoir elevation deviation began on July 21, 2023, at approximately 0330 hours when the reservoir elevation dropped to106.15 feet due to the decreasing river flow. As a result of a malfunction of the Project alarm system, the reservoir did not recover to its normal elevation of 106.4 feet until 0845 hours. In a letter dated September 20, 2023, FERC determined that the unplanned deviation did not constitute a violation of Article 401.
- On October 16, 2023, GMP filed a report of a planned deviation from run-of-river operations that occurred from September 27, 2023, through October 2, 2023, resource agencies were also notified in advance of the filing as required by the FERC license. During that time, the Project impoundment was drawn down (and subsequently refilled) to facilitate removal of a large log that had become lodged in the sluice gate located on the right (looking downstream) side of the spillway. This maintenance activity resulted in a modification in impoundment level and run-of-river operations. This deviation was not considered a violation of the license by FERC.
- On October 23, 2023, GMP filed a report of unplanned operations deviations that occurred from August 19, 2023, through September 13, 2023, due to a malfunctioning rain gauge. As a result, deviations from the required nighttime shutdowns for the protection of downstream migrating American eel occurred on three occasions. Corrective measures were taken, and no other deviations related to

the nighttime shutdown requirement occurred subsequently. This deviation was not considered a violation of the license by FERC.

Assessment and Conclusion

My review of the LIHI application and FERC records suggests that the Project currently satisfies this criterion. While there were some deviations in 2023 since the new license was issued, none were found to be license violations.

The Project Passes Criterion A – Ecological Flow Regimes

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 Passage

The Applicant appropriately selected **Standard B-2 Agency Recommendation** for all ZOEs.

Background

The Salmon Falls River at the Project is classified as Class B in New Hampshire and Class C in Maine. In New Hampshire, Class B water bodies are considered acceptable for fishing, swimming, and other recreational purposes, and after treatment, as potential water supplies. In Maine, Class C water must ensure suitability for the designated uses of drinking water, fishing, agriculture, recreation, industrial processes, cooling water, hydroelectric power generation, navigation, and habitat for fish and other aquatic life.

In New Hampshire, the Project impoundment is listed on the Clean Water Act section 303(d) list of impaired waters for pH. In Maine, the section of river in which the Project is located is listed on the 303(d) list for the following impairments: Escherichia coli, ammonia, eutrophication, dissolved oxygen, phosphorus, and biochemical oxygen demand.

During relicensing, the Applicant conducted water quality monitoring for dissolved oxygen and temperature within the Project impoundment, bypass reach, and tailwater, as well as analysis of existing water quality data for the Salmon Falls River. Available data indicate that water quality conditions upstream and downstream of the Project generally meet both NH and ME state standards. However, state standards are not always met in the Project impoundment. Water quality sampling done as part of relicensing indicated that the Project discharges to the bypass reach and to the tailrace met both ME and NH water quality standards under a variety of operational and hydrologic conditions. However, the impoundment does not achieve NH and ME state standards for dissolved oxygen at times primarily due to upstream non-point and point source pollutants (per Salmon Falls River Total Maximum Daily Loads (TMDLs) results from the 1990's to 2018). This condition presents itself particularly during the low flow, warm summer months while the Project is often shut down due to inflows being below the minimum hydraulic capacity of 60 cfs. In these cases, all inflow is passed via the two (12-inch and 4-inch diameter) pipes located at the base of

the dam, and via spillage over the dam crest. Thus, the Applicant suggests that Project operations do not appear to contribute to these periods of poor water quality.

Requirements

The following summarizes the current Project water quality requirements applicable to all ZOEs. The FERC license did not include any additional water quality requirements beyond these.

- Condition E-14 of the NHDES WQC requires development, implementation, and NHDES approval of a Water Quality Improvement Plan (WQIP) that includes measures to (1) ensure that water in the impoundment, bypassed reach, and tailrace either: (a) meets New Hampshire water quality standards or (b) is not "any worse than in the upstream riverine segment," to the extent that the riverine segment immediately upstream of the Project is not meeting water quality standards; (2) monitor the effectiveness of the measures; (3) schedule the implementation of the measures; and (4) report on monitoring results.
- Condition A of the MDEP WQC requires the Water Quality Mitigation and Enhancement Plan (WQMEP) be implemented upon approval from MDEP and FERC.
- Condition E-15 of the NHDES WQC requires long term water quality monitoring and reporting every five years beginning the fifth year after license issuance and ending five years prior to expiration of the license. The purpose of the monitoring is to (1) determine the future effects of Project operation during the duration of the license, (2) to compare results to New Hampshire surface water quality standards; and (3) to determine if additional changes in Project operation are necessary to comply with surface water quality standards. Should monitoring indicate that water quality standard excursions persist, the Licensee will consult with NHDES and, if requested by NHDES in writing, submit a new or updated WQMEP.
- Condition B of the MDEP WQC requires that five years after implementation of the WQMEP, the Licensee is to consult with MDEP and review the effectiveness of the Plan. If implementation of the WQMEP has not resulted in compliance with the State's water quality standards for dissolved oxygen, the Licensee is then required to submit a revised WQMEP to the MDEP for review and approval, and then implement the revised WQMEP to bring operation of the Project into compliance with these water quality standards.
- Conditions E-10a and 10b of the NHDES WQC require that the Project be operated in a run-of-river mode and release a minimum flow of 37 cfs or inflow, whichever is less, as discussed earlier.
- Condition E-10b of the NHDES WQC requires that flow in the bypass reach comply with New Hampshire surface water quality criteria, including, but not limited to, dissolved oxygen.
- Condition E-16 of the NHDES WQC requires that if the Licensee is notified in writing by NHDES that invasive species control efforts are needed in the river segments impacted by Project operation, the Licensee shall assist by seeking funding for implementation of control efforts and by temporarily modifying Project operation as necessary to facilitate those control efforts.

Table 2 above identifies the due dates for the initial Long Term Water Quality Monitoring Plan (2027) and Report (2029).

By issuance of the two WQCs, NHDES and MDEP assume that compliance with them will allow state standards for water quality to be met, forming the technical basis of the conditions.

Assessment and Conclusion

A draft of the Water Quality Mitigation and Enhancement Plan (WQMEP) Plan was reviewed by NHDES, MDEP, and other resource agencies required by the NHDES WQC, as shown by email correspondence incorporated into the May 2023 WQMEP. In an email dated March 22, 2023, Kyle Olcott of MDEP stated that the WQMEP satisfied the requirements of the MDEP WQC indicating their approval of it. Email correspondence between James Tilley of NHDES and GMP between March 22 to May 19, 2023, suggests the NHDES is satisfied with the approach used in this plan, suggesting to me that they believe it addresses the NHDES WQC requirements for a WQIP. In a May 17, 2023, email James Tilley of NHDES stated he had no further comments on the WQMEP. I contacted NHDES regarding whether the May 19 email constituted their plan approval, which is required. Judith Houston of NHDES responded on April 5, 2024, stating that it does. The WQMEP was then submitted to FERC on May 24, 2023, and was approved on October 23, 2023.

Based on my review of the LIHI application, FERC eLibrary review, supporting documents and outreach to NHDES, I believe the Project conditionally satisfies the requirements of this criterion with a recommendation to address future monitoring required by the two WQCs.

The Project Conditionally Passes Criterion B – Water Quality

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 populations in areas affected by the facility.

Assessment of Criterion Passage

The Applicant appropriately selected **C-1 - Not Applicable/De Minimis Effect** for the impoundment and **C-2-Agency Recommendation** for the bypass and downstream reach.

Background

The LIHI application lists the following fish species found in Project waters. American eel are present in the Lower Great Falls Project impoundment and the bypassed reach, and have been documented at the South Milton Project located approximately 20 miles upstream.

Table 4 – Fish Species Found in Project Waters

Common Name	Scientific Name	Notes
American Eel	*Anguilla rostrata*	Diadromous
Black Crappie	*Pomoxis nigromaculatus*	Unauthorized Introduction
Bluegill	*Lepomis macrochirus*	Unauthorized Introduction
Bridle Shiner	*Notropis bifenatus*	
Brook Trout	*Salvelinus fontinalis*	
Brown Bullhead	*Ameiurus nebulosus*	
Brown Trout	*Salmo trutta*	Stocked for sport
Common Shiner	*Luxilus cornutus*	
Eastern Silvery Minnow	*Hybognathus regius*	
Fallfish	*Semotilus corporalis*	
Golden Shiner	*Notemigonus crysoleucas*	
Largemouth Bass	*Micropterus salmoides*	Stocked for sport
Longnose Dace	*Rhinichthys cataractae*	
Rainbow Trout	*Oncorhynchus mykiss*	Stocked for sport
Rainbow Smelt	*Osmerus mordax*	Diadromous
Redfin Pickerel	*Esox americanus americanus*	
Smallmouth Bass	*Micropterus dolomieu*	
White Perch	*Morone americana*	
Yellow Perch	*Perca flavescens*	
White Sucker	*Catostomus commersoni*	

According to the FERC EA, anadromous fish, including American shad, alewife, and blueback herring historically occurred in the Salmon Falls River and may have migrated at least as far upstream as Somersworth, New Hampshire (Old Berwick Historical Society, 2020), which is approximately 1 mile upstream of the Lower Great Falls Project, until 1847 when dams prevented anadromous fish from migrating upstream. GMP reported in the LIHI application that the Lower Great Falls Dam was originally constructed in 1825, while the downstream Rollinsford Dam was constructed in 1910; however, other dams were previously in place at Rollinsford that date back to 1822. The South Berwick Dam was constructed in 1831, both dams thus predating the Project dam.

Currently, shad, alewife, and blueback herring have access to the Salmon Falls River downstream of the Rollinsford Project (located about 2.4 miles downstream), through upstream fish passage facilities at the South Berwick Project No. 11163 (located about 3.5 miles downstream of the Lower Great Falls Project). There are no upstream fish passage facilities at the Lower Great Falls Project or the Rollinsford Project, although the Rollinsford Project will provide upstream passage as part of its new FERC license. Therefore, anadromous fish do not have access to the Salmon Falls River in the immediate Project vicinity. The timing of upstream passage installation at Rollinsford, which is also operated by GMP, is discussed below.

Upstream Passage Requirements

USFWS issued a Preliminary and Modified Section 18 prescription for upstream and downstream fish and eel passage in April 2021, which mandatorily are incorporated into the FERC license. The Lower Great Falls (LGF) Settlement Agreement executed between the Licensees and USFWS address upstream passage for American Shad and river herring. Neither NH or Maine WQCs specified any additional requirements. The following summarizes the upstream passage requirements:

From the LGF Settlement Agreement:

- The Licensees shall construct and operate upstream fish passage for American shad and river herring at the Lower Great Falls Project, to be constructed and operational by March 15 of the fourth calendar year after entry into operation of permanent volitional upstream fishways for American shad and river herring at the downstream Rollinsford Hydroelectric Project (FERC No. 3777).
- The size of the fishway(s) shall accommodate the anticipated production potential of the Lower Great Falls impoundment: 12,425 river herring, 1,595 shad, and approximately 500 resident or other target species. A standard 4-foot-wide Denil fish ladder is estimated to have an annual biological capacity of 25,000 adult American shad, 12,000 Atlantic salmon, or 200,000 adult river herring (USFWS 2019). Given these capacities, a single 4-foot Denil ladder (or equivalent), installed at a slope of 1:8 (vertical: horizontal) or milder slope, should be sufficient to pass the design populations of the target species.
- The design elements (e.g., slope, pool/slot size, attraction water) of the fishway(s) shall ensure successful passage of river herring and American shad. The fishway shall operate for the full range of design flows based on the migratory season for each species. The fishway, including the design, shall be established in consultation with and approved by USFWS. The design, operation, and maintenance of the fishways shall be consistent with the USFWS 2019 Fish Passage Engineering Design Criteria Manual (USFWS 2019).

Additional requirements are specified in the FERC license based on the Section 18 prescription:

- operate and maintain the upstream fish passage facilities annually from April 15 through July 15;
- conduct a two-season upstream eel passage facility siting survey beginning the first full passage season after license issuance, and consult with the USFWS and other resource agencies to determine the optimal location for siting permanent upstream eel passage facilities;
- install an upstream eel passage facility no later than May 1 of the fourth year after license issuance or the second calendar year after completing the siting survey, and operate and maintain the facility from May 1 through October 31 annually;
- design upstream and downstream eel and anadromous fish passage facilities in a manner consistent with the USFWS's Design Criteria Manual;
- develop a Fishway Operation and Maintenance Plan (FOMP) for USFWS approval by April 18, 2024 that includes provisions for: (1) operating and maintaining upstream and downstream fish passage facilities at the Project; and (2) monitoring and reporting on the operation and maintenance of the facilities that are in place at that time. It must be updated

as new passage facilities are installed;
- develop plans for testing the effectiveness of upstream and downstream fish passage facilities for a minimum of two years after the facilities are operational. These plans must be approved by USFWS; and
- FERC reserves authority to require fishways at the Project that are prescribed by DOI or the Department of Commerce (DOC) pursuant to FPA Section 18.

GMP reported that there are currently no performance standards established for the Project.

Assessment and Conclusion

The following activities have been performed to date:

- On May 24, 2023, the Licensee filed with the Commission its Upstream Eel Ramp Siting Survey Study Plan for the Project. On October 5, 2023, FERC issued a letter acknowledging receipt of the submittal.
- 2023 was the first year of the two-year siting survey. Two temporary eel ramps were installed and began operating on May 26, 2023, after spillage flows subsided, and were operated until October 31, 2023. Required observation studies and supplemental electrofishing surveys were performed.
- The Fishway Operation and Maintenance Plan was submitted to FERC on April 5, 2024. Details of many plan sections are limited as the operational aspects cannot be developed until the final feature designs are approved. However, where possible, schedules of deliverables were included.

Table 2 above identifies the due dates for upstream eel passage plans and reports. Table 5, taken from the Fishway Operation and Maintenance Plan, shows the schedule for upstream eel passage facility design/construction. It does not show anadromous upstream passage design or construction schedules presumably because those are governed by passage at the downstream Rollinsford Project.

Table 5 – Upstream Eel Passage Schedule

Task	Milestone Date
Conduct upstream American eel siting study	May 1 to October 31, 2023 (year 1) May 1 to October 31, 2024 (year 2)
Operate temporary upstream eel ladder at location identified as part of the eel siting study	May 1 to October 31, 2025 May 1 to October 31, 2026
Submit 30% design for permanent upstream eel ladder to USFWS for review	May 2026
Submit 90% design for permanent upstream eel ladder to USFWS for review	August 2026
Submit final design for permanent upstream eel ladder for FERC approval	October 2026
Start construction of permanent upstream eel ladder	January 2027
Start operation of permanent upstream eel ladder	May 1, 2027

The timing of any future anadromous fishway is contingent on the Rollinsford Project passage installation, based on a Settlement Agreement established for that Project's upstream passage that is summarized below:

- Beginning in 2025 the Town of Rollinsford (the Licensee of the Rollinsford Project) and GMP will implement an interim trap and transport program for river herring and American shad in the lower Salmon Falls River. This program will include the transport and stocking of these fish species upstream of the Rollinsford and Lower Great Falls Hydroelectric Projects. Permanent upstream anadromous fish passage facilities at the Rollinsford and Lower Great Falls Hydroelectric Projects will not be required while the interim trap and transport program is in place.
- In 2032, the Town of Rollinsford and GMP will consult with USFWS to determine whether continued trap and truck operations are appropriate considering factors relevant at that time, including data on resulting population growth of American shad and river herring in the Salmon Falls River over the period of the trap and truck program.
- The Town of Rollinsford, GMP, and USFWS will meet for further discussion every two years thereafter, and trap and truck operations may continue as long as at each successive two-year meeting, the Parties agree that trap and truck continues to be appropriate in light of the data and factors relevant at that time. If USFWS determines at a two-year meeting that the trap and truck operations no longer provide for American shad and/or river herring population growth at expected levels, then the Town of Rollinsford would construct permanent volitional upstream fishways at the Rollinsford Project for anadromous fish.

GMP stated that as a result of the interim trap and transport program, it is likely that anadromous fish will be present upstream and downstream of the Lower Great Falls Project beginning in 2025.

Based on my review of the application and FERC eLibrary review, I believe that the Project conditionally satisfies this criterion. Current deadlines have been met. However, as many elements of the upstream fish passage have yet to be developed and implemented by GMP, I am recommending a condition to address these outstanding requirements.

The Project Conditionally Passes Criterion C – Upstream Fish Passage

D. DOWNSTREAM FISH PASSAGE AND PROTECTION

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. Migratory species are able to successfully complete their life cycles and maintain healthy populations in the areas affected by the Facility.

Assessment of Criterion Passage

The Applicant appropriately selected **D-1 Not Applicable / De Minimis Effect** for the downstream reach and **D-2–Agency Recommendation** for the bypass and impoundment.

Requirements

Requirements specified in USFWS's preliminary and modified Section 18 prescription for downstream fish and eel passage are incorporated into the FERC license. The details are noted below. The LGF Settlement Agreement did not address downstream passage. Requirements included in the prescription and supplemented by FERC include:

- Develop a plan to provide permanent downstream alosine passage and protection, including the design of permanent downstream passage facilities, developed in consultation with, and approved by, the USFWS.
- Within 3 years of license issuance, construct, operate, and maintain a downstream passage and protection system that provides safe, timely, and effective downstream passage for both spent adult and juvenile anadromous fish. The downstream fish passage facilities must consist of a two-foot-high flume fixed to the crest of the spillway that would convey 35 cfs over the dam and drop fish approximately 19 feet to a 5.25-foot-deep plunge pool downstream of the dam. The downstream fish passage facilities must be operational by May 15 of the third year after license issuance (2026).
- Develop a plan to provide permanent downstream eel passage and protection including the design of permanent eel passage facilities and/or operational measures, to be developed in consultation with, and approved by the USFWS.
- Within three years of license issuance, construct, operate, and maintain a downstream eel passage and protection system that provides safe, timely, and effective downstream passage
- Upon license issuance, implement, as an interim measure, targeted nighttime turbine shutdowns to protect emigrating eels during the first year of license issuance. Turbine shutdowns will occur from dusk to dawn for three consecutive nights following rain accumulations of 0.50 inch or more over a 24-hour period. Turbine shutdowns will occur during the duration of the downstream eel passage season (August 15-November 15).
- License Article 404 also requires that by May 15, 2025, the Licensee must replace the current trashrack having 2.0-inch clear bar spacing with a trashrack that has 0.75-inch clear bar spacing, to protect downstream migrating fish from turbine entrainment and mortality.
- Development of a FOMP within one year of license issuance to cover operations and maintenance of the downstream fish passage facilities at the Project. FERC specified a due date of April 18, 2024 for facilities in place at that time.
- Development of a Fishway Effectiveness Monitoring Plan (FEMP) in conjunction with and approved by USFWS. The FEMP will contain plans for ensuring (1) the effectiveness of the downstream anadromous and downstream eel passage measures required by the prescription; and (2) that the minimum bypass flow provide safe, timely, and effective downstream passage to emigrating diadromous species (i.e., does not strand fish). Effectiveness testing measures will commence the first migratory season after the downstream fishway(s) is operational and continue for a minimum of two passage seasons.

Tables 6 and 7, taken from Fishway Operation and Maintenance Plan, show the schedules for design and installation of the traskracks and downstream eel passage, respectively. Table 8, excerpted from GMP's Downstream Fish Passage Plan and Schedule dated December 22, 2023, shows due dates for downstream anadromous fish passage activities.

Table 6 – Downstream Fish Protection Schedule

Task	Milestone Date
Submit 30% design of trashracks to USFWS for review	June 2024
Submit 90% design of trashracks to USFWS for review	October 2024
Submit final design of trashracks to FERC for approval	December 2024
Start construction of trashracks	February 2025
Start operation of trashracks	May 15, 2025

Table 7 - Downstream Eel Passage

Task	Milestone Date
Conduct upstream American eel siting study	May 1 to October 31, 2023 (year 1) May 1 to October 31, 2024 (year 2)
Operate temporary upstream eel ladder at location identified as part of the eel siting study	May 1 to October 31, 2025 May 1 to October 31, 2026
Submit 30% design for permanent upstream eel ladder to USFWS for review	May 2026
Submit 90% design for permanent upstream eel ladder to USFWS for review	August 2026
Submit final design for permanent upstream eel ladder for FERC approval	October 2026
Start construction of permanent upstream eel ladder	January 2027
Start operation of permanent upstream eel ladder	May 1, 2027

Table 8 – Downstream Fish Passage Activity Proposed Schedule

Activity	Timeline
Implement targeted nighttime shutdowns	August 15 to November 15, 2023 August 15 to November 15, 2024
Final Design and Construction of Downstream Fish Bypass	
Submit draft downstream fish passage plan to USFWS (and other agencies)	November 20, 2023
Submit for FERC approval the downstream fish passage plan that provides for the installation of downstream fish bypass	January 20, 2024
Submit Conceptual Design to USFWS	April 2024
Submit 30% design to USFWS	July 2024
Submit 90% design and Basis of Design Report to USFWS	February 2025
Submit final design plans for FERC approval	May 2025
Construction Period	July-October, 2025
Begin operation of downstream fish bypass	May 15 to November 15. 2026 (and every year thereafter)
File final as-built drawings with USFWS and FERC	January 31, 2026
Submit Draft Fishway Effectiveness Monitoring Plan (FEMP) to USFWS	September 15, 2025
Submit Final FEMP for FERC approval	November 14, 2025

Activity	Timeline
Conduct fishway effectiveness monitoring of downstream fish bypass for American eel and anadromous fish (Year 1)	May 15 – November 15, 2026
Interim (Year 1) downstream effectiveness monitoring report for American eel and anadromous fish	February 15, 2027 (Draft to USFWS) July 15, 2027 (Final to FERC)
Conduct fishway effectiveness monitoring of downstream fish bypass for American eel and anadromous fish (Year 2)	May 15 – November 15, 2027
Interim (Year 2) downstream effectiveness monitoring report for American eel and anadromous fish	February 15, 2028 (Draft to USFWS) July 15, 2028 (Final to FERC)

According to GMP, there are currently no passage performance standards required at the Project.

Assessment and Conclusion

The following downstream passage activities have been implemented to date:

- The turbine shutdowns for eel passage were implemented beginning in the 2023 downstream eel passage season.
- The Downstream Fish Passage Plan and Schedule was reviewed by required agencies and submitted to FERC on December 22, 2023.
- The Fishway Operation and Maintenance Plan was submitted to FERC on April 5, 2024.

Based on my review of the application, and FERC eLibrary review, I believe that the Project conditionally satisfies this criterion. Current deadlines have been met. However, as many elements of the downstream fish passage standard have yet to be developed and implemented by GMP, I am recommending a condition to address these outstanding requirements.

The Project Conditionally Passes Criterion D – Downstream Fish Passage and Protection

E. SHORELINE AND WATERSHED PROTECTION

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

Assessment of Criterion Passage

The Applicant appropriately selected **Standard E-1 - Not Applicable / De Minimis Effect** for all ZOEs.

The area within the FERC Project boundary is very limited - 0.9 acres of land and 41.1 acres of water. Based on FERC's EA, lands on the northern shoreline of the impoundment consist of forested uplands and a few areas of palustrine wetlands, while the southern shoreline is surrounded

by developed land and some narrow strips of forested uplands. (See Figure 6). Less than 0.25 acre of grass is mowed on a routine basis around the powerhouse. Adjacent lands are primarily developed (residential, commercial, and industrial), forested, or farmland. The Project's run-of-river operation and stable pond elevations provide protection for the Project's shoreline areas. The FERC license does not require a shoreline management plan nor does the Licensee maintain a buffer zone around the Project impoundment. No defined critical habitats for protected species were identified within the Project boundary.

Assessment and Conclusion

Based on my review, ROR operations, and the small Project footprint, I believe the Project satisfies the requirements of this criterion.

The Project Passes Criterion E – Shoreline and Watershed Protection

F. THREATENED AND ENDANGERED SPECIES PROTECTION

Goal: The Facility does not negatively impact federal or state-listed species.

Assessment of Criterion Passage

Standard F-2 – Finding of No Negative Effect was appropriately selected for all ZOEs.

Federally Protected Species

USFWS's Information for Planning and Consultation (IPaC) tool was used to identify species listed as threatened or endangered under the federal Endangered Species Act (ESA) within a one-mile buffer of the Project boundary. The northern long-eared bat (*Myotis septentrionalis*) (NLEB), listed as endangered, and the monarch butterfly (*Danaus plexippus*), listed as a candidate species, were the only species identified within one mile of the Project boundary. In its April 14, 2021, filing (linked in the LIHI application) responding to FERC's Notice of Application Ready for Environmental Analysis, the USFWS stated that the small whorled pogonia may occur in the vicinity of the Project.

No critical habitat for any species was documented within the search area. No known northern long-eared bat hibernacula sites occur within 0.25 mile of the Project, although upland and wetland forest in the Project vicinity may provide suitable habitat for northern long-eared bat summer roosting and foraging activities. In the EA, FERC staff determined that the northern long-eared bat could be affected by construction of the new upstream and downstream fish and eel passage facilities at the Project.

The FERC license noted that on September 14, 2022, USFWS proposed to list the tricolored bat (*Perimyotis subflavus*) as endangered based upon the range-wide impacts of white-nose syndrome that have caused declines in affected colonies. It is found in Maine and New Hampshire. Its active season is similar to the northern long-eared bat. Its listing has not been finalized at this time.

State Protected Species

The LIHI application provided a list of 36 state (Maine and New Hampshire) listed species noting they may be present within the Project vicinity. Follow-up consultation with GMP (see Appendix A) clarified that this list was initially developed as part of the Pre-Application Document (PAD) for the FERC relicensing process using Maine, New Hampshire, and federal data sources. This list was developed using regional scale information, rather than a Project-specific basis. As explained in their March 21, 2024, clarification, for New Hampshire, GMP was able to identify a subset of the species that had historical records of occurrence in the City of Somersworth, which included greater fringed-gentian, lopsided rush, northern beggar-ticks, northern blazing star, unpretentious yellow-seeded false pimpernel, and Blanding's turtle. For Maine, a subset of species based on those occurring in the immediate vicinity of the City of Berwick, included small whorled pogonia, Georgia bulrush, spotted turtle, black racer, and Blanding's turtle.

NHFGD required a mussel survey be done during re-licensing to look for the brook floater, a NH listed species. The 2018 mussel survey only found three mussel species, including: eastern elliptio, eastern floater, and triangle floater, but not brook floater. All three species were found in the impoundment, and only eastern elliptio was found in the bypassed reach.

Table 9 provides a more specific list of protected species that may be found onsite. In their March 21, 2024, response, GMP also prepared Table 10, which assesses the habitat requirements of the species listed in Table 9, and occurrence of that habitat with the Project ZOEs. It also identifies any measures employed with current operation protocols or that would be utilized when necessary for other onsite activities.

Table 9 – Rare or Threatened Species Potentially Found in the Project Area

Common Name	Scientific Name	Type	State Protection Status	Federal Protection Status
Redfin Pickerel	*Esox americanus americanus*	Fish	Endangered (ME), Special Concern (NH)	
Bridle Shiner	*Notropis bifrenatus*	Fish	Special Concern (ME)	
Longnose Dace	*Rhinichthys cataractae*	Fish	Special Concern (ME)	
Monarch Butterfly	*Danaus plexippus*	Insect		Candidate Species
Northern Long-eared Bat	*Myotis septentrionalis*	Mammal	Endangered (ME), Special Concern (NH)	Endangered
Spotted Turtle	*Clemmys guttata*	Reptile	Threatened (NH, ME)	
Black Racer	*Coluber constrictor*	Reptile	Endangered (ME), Threatened (NH)	
Blanding's Turtle	*Emydoidea blandingii*	Reptile	Endangered (NH, ME)	
Northern Beggar-tick	*Bidens hyperborea*	Plant	Special Concern (ME), Endangered (NH)	
Greater Fringed-gentian	*Gentianopsis crinita*	Plant	Threatened (NH)	
Small Whorled Pogonia	*Isotria medeoloides*	Plant	Endangered (ME, NH)	Threatened
Lopsided rush	*Juncus secundus*	Plant	Endangered (NH)	
Northern blazing star	*Liatris novae-angliae*	Plant	Endangered (NH)	
Unpretentious yellow-seeded false pimpernel	*Linderni dubia var. anagallidea*	Plant	Threatened (NH)	
Georgia Bulrush	*Scirpus georgianus*	Plant	Endangered (NH)	

Table 10 - Summary of Rare, Threatened, or Endangered Species Habitat Identified in the Project Zones of Effect and Measures to Avoid Potential Impacts

Common Name	Habitat Requirements	Habitat Identified in Project ZOEs	Measures to Avoid Potential Impacts
Redfin Pickerel	Prefers shallow weedy backwaters in stands of aquatic vegetation or thick overhanging grasses and shrubs. It is often found in smaller watersheds than the chain pickerel. In New Hampshire it is frequently found in streams flowing through abandoned beaver ponds in very small watersheds that may dry up in some years.	None identified.	N/A
Bridle Shiner	Dependent on dense communities of submerged aquatic vegetation for survival. Found along the shorelines and coves of lakes and ponds, the backwaters of larger rivers, and in slow flowing streams.	Potential habitat in the Project impoundment.	The FERC and 401 WQCs require that the Project operate in run-of-river mode and require drawdown and refill rates during maintenance drawdowns to avoid impacts to aquatic biota.
Longnose Dace	Swift flowing riffle sections of rivers and streams with boulder, cobble, and gravel substrate.	Potential habitat in the Project bypass.	The FERC and 401 WQCs require that the Project operate in run-of-river mode and release a minimum bypass flow of 37 cfs. The minimum bypass flow was set based on an IFIM study of the bypass reach. Longnose dace were one of the target species analyzed as part of that study. Its habitat requirements were taken into consideration when determining an appropriate minimum bypass flow.
Northern Long-eared Bat	Winter: Caves and mines. Spring, Summer and Fall: Forests. Roosts singly or in colonies underneath bark, in tree cavities of both live trees and snag, or dead trees. Less commonly in structures such as barns and sheds.	Potential habitat identified in certain upland areas within the Project boundary.	To protect the northern long-eared bat during its active season (April 1 to October 31), GMP limits non-hazardous tree removal to the period of November 1 through March 31.
Spotted Turtle	Small, acidic wetlands and vernal pools located in large, intact forests. They also use small streams, shrub swamps, wet meadows, bogs, and forested swamps.	None identified.	N/A

Common Name	Habitat Requirements	Habitat Identified in Project ZOEs	Measures to Avoid Potential Impacts
Black Racer	Varied moist and dry habitats. Preferred habitat in southern Maine includes open grasslands, power line rights-of-way, orchards, rocky ridges, and the edges between forests and fields.	None identified.	N/A
Blanding's Turtle	Small, acidic wetlands and vernal pools in large blocks (over 500 acres) of forested habitat. Occasionally found in large marshes, forests and shrub swamps, and slow-moving rivers and streams. Wetland indicator code: OBL.	None identified.	N/A
Northern Beggar-tick	Localized in fresh to brackish estuaries. [Tidal wetland (non-forested, wetland)]. Wetland indicator code: OBL.	None identified.	N/A
Greater Fringed-gentian	Disturbed habitats, meadows and fields. Wetland indicator code: FACW.	None identified.	N/A
Small Whorled Pogonia	Mid-succession mixed forests. [Hardwood to mixed forest (forest, upland)]. Wetland indicator code: FACU.	Potential habitat identified in certain upland areas within the Project boundary.	The FERC license requires that prior to any ground disturbing activities at the Project, GMP will employ a qualified botanist to conduct surveys for small whorled pogonia. If the species is not present, GMP will file the results of the survey with FWS and FERC and proceed with the ground- disturbing activities. If the species is present, GMP will consult with the FWS to determine the need for any measures to protect the species.
Lopsided rush	Dry, open, sterile soil and clearings [Rocky summits and outcrops (non-forested upland)]. Usually occurs in non-wetlands, but occasionally in wetlands. Wetland indicator code: FACU.	None identified.	N/A
Northern blazing star	Dry grasslands, barrens, and woods openings. [Dry barrens (partly forested, upland)]. Wetland indicator code: FACU.	None identified.	N/A

Common Name	Habitat Requirements	Habitat Identified in Project ZOEs	Measures to Avoid Potential Impacts
Unpretentious yellow-seeded false pimpernel	Open wet areas. [Open wetland, not coastal nor river shore (non-forested, wetland); Old field / roadside (non-forested, wetland or upland)]. Wetland indicator code: OBL.	None identified.	N/A
Georgia Bulrush	Wet fields, graminoid marshes, ditches, open seasonally wet areas. Wetland indicator code: OBL.	None identified.	N/A

By letter dated July 7, 2022, FERC staff requested USFWS's concurrence that relicensing the Project with the staff-recommended measures is not likely to adversely affect the northern long-eared bat. They also requested concurrence that an incidental take of the northern long-eared bat, should that occur from required onsite actions, would not be prohibited under section 4(d) of the ESA. On August 18, 2022, USFWS concurred with FERC's staff's conclusions.

Requirements

The FERC license has the following requirements:

- Article 405 requires a seasonal restriction on tree removal to protect the federally listed northern long- eared bat during its active season (April 1 to October 1). The Licensee must limit non-hazardous tree removal to the period of October 2 through March 31. Tree removal is defined as cutting down, harvesting, destroying, trimming, or manipulating in any other way the non-hazardous trees, saplings, snags, or any other form of woody vegetation likely to be used by northern long-eared bats (i.e., woody vegetation greater than or equal to 3 inches diameter at breast height.
- Article 406 requires that a qualified botanist conduct surveys for the small whorled pogonia prior to any ground-disturbing activities. If the species is not present, the results of the survey shall be filed with the USFWS and FERC, and work can proceed in a manner consistent with other terms and conditions of the license. If the species is present, the Licensees must consult with the USFWS to determine the need for any measures to protect the species. The Licensees must file with FERC documentation of their consultation with the USFWS, including any measures proposed by the Licensees and/or recommended by the USFWS. The Licensees must not conduct ground-disturbing activities until informed by the Commission that the requirements of this article have been fulfilled.

GMP reported that state resource agencies did not request any studies specific to these endangered and threatened species, nor did they request any protection, mitigation, or enhancement measures specific to state listed species beyond those contained in the new FERC license. As noted in Table 10, some Project requirements associated with downstream flows and impoundment management do serve to minimize impacts to state species that may occur.

Assessment and Conclusion

Given my review of the application, various re-licensing documents and follow-up information provided by GMP, I believe that adherence to required minimum flows, impoundment management protocols and FERC Article 405 and 406 license requirements would eliminate or minimize impacts to listed species. However, given FERC's comment in the EA about the potential for impacts for northern long-eared bat from fish and eel passage installation, and required surveys for small whorled pogonia prior to any ground-disturbing activities, I am recommending a condition to address these items.

The Project Conditionally Passes Criterion F – Threatened and Endangered Species Protection

G. CULTURAL AND HISTORIC RESOURCE PROTECTION

Goal: The Facility does not inappropriately 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 Passage

The Applicant appropriately selected **Standard G-2 – Approved Plan** for all ZOEs.

Archaeological

Archaeological evaluations were not done in the New Hampshire portion of the Project as none were requested by the New Hampshire Division of Historical Resources (NHDHR), according to GMP and as noted in FERC's EA. However, those conducted in consultation with the Maine Historic Preservation Commission (MHPC) concluded that three archaeological sites in the Maine Area of Potential Affect (APE) are eligible for listing on the National Register of Historic Places (NRHP), including the remnants of a mid to late 19th century stone water tower, the remnants of a 19th century sawmill complex, and a Middle to Late Ceramic period site. In their November 7, 2019, letter, MHPC noted that prehistoric site 3.16 is being affected by erosion that will require a data recovery plan as part of the Project's Historic Properties Management Plan. The APE extended approximately one mile upstream from the powerhouse in both Maine and New Hampshire according to an October 2, 2018 letter from GMP's consultant, Gray and Pape Heritage Management to the Maine Historic Preservation Commission (contained in LIHI application).

Historical

An architectural survey within the Project APE was conducted in 2018 to identify historic resources currently listed or determined eligible for listing in the NHRP. No historic buildings more than fifty years of age were identified within the Maine portions of the APE. MHPC, in their April 1, 2019 letter, stated that "*based on the information submitted, I have concluded that there are no architectural resources eligible for listing in the National Register of Historic Places within the Area of Potential Effect (APE).*"

FERC noted in the EA, that the north abutment of the Project dam and the area surrounding the low-level outlet gates (Maine side of river) consist of stone masonry and structural remains that were originally constructed in 1825. Based on follow-up information provided by GMP. The Lower Great Falls dam includes foundations and industrial remains of a nineteenth-century sawmill complex that was converted into an early hydroelectric plant in 1888. Structural remnants closest to the river are the most intact including the wheelhouse and southernmost stone wall foundation along the south side of the riverbank. The powerhouse foundation is perched on a ridge above the river with a steep slope down to the water and portions of the site are inaccessible due to safety concerns. The Maine SHPO is currently developing a "Mill Context" to include National Register eligibility standards; while unavailable at this time, this context could be considered for these two sites when it becomes available.

Within the NH portion of the APE, the survey denoted the presence of the Great Falls Woolen Company Complex. This Complex (also known as the Baxter Mill) consists of four buildings and the Lower Great Falls Dam. The Great Falls Woolen Company was likely associated with the Great Falls Manufacturing Company, which operated a large complex of textile mills on the Salmon Falls River in Somersworth north of the Project. The buildings consist of a three-story brick factory located southeast of the dam, two brick buildings along the south side of Olde Mill Road, and a wood-frame office building. All of the buildings have been converted into residential apartments. The office building is within the Project APE but is not a Project facility.

FERC staff concluded that adverse effects on historic properties could occur if repairs are needed to maintain the structure and function of the north abutment of the dam or the low-level outlet gates, or to fix structural damage to the north abutment of the dam or the low-level outlet gates that may occur over the course of Project operation. Adverse effects could also occur if the fish and eel passage facilities prescribed by USFWS are installed on the historic properties.

Requirements

Because FERC concluded adverse effects to cultural features could occur if repairs are needed at the north abutment of the dam, low-level outlet gates, and construction of eel and fish passage facilities, the FERC license includes:

- Article 407 which requires implementation of the "Programmatic Agreement Among the Federal Energy Regulatory Commission, the New Hampshire State Historic Preservation Office, and the Maine State Historic Preservation Office for Managing Historic Properties that May be Affected by Issuing a Subsequent License to Green Mountain Power Corporation and the City of Somersworth, New Hampshire for the Continued Operation of the Lower Great Falls Hydroelectric Project in Strafford County, New Hampshire and York County, Maine (FERC No. 4551-024)," executed on October 28, 2022, and including but not limited to the Historic Properties Management Plan (HPMP) for the Project. As part of the Programmatic Agreement, the Licensee must file, for Commission approval, a HPMP within one year of license issuance. If the Programmatic Agreement is terminated prior to Commission approval of the HPMP, the Licensee must obtain approval from the Commission and the New Hampshire and Maine State Historic Preservation Officers (SHPOs), before engaging in any ground- disturbing activities or taking any other action that may affect any historic properties within the Project's areas of potential effects.

The HPMP was submitted to FERC on February 16, 2024. An extension to the January 2024 deadline had been obtained from FERC. On March 29, 2024, FERC submitted a list of questions about the HPMP and asked for an update to the plan by May 29, 2024.

The HPMP specifies how historic properties will be managed in the Project's APE during the term of the FERC license and includes provisions for the following based on the signed Programmatic Agreement:

1. identification of the APE for the Project and inclusion of a map or maps that clearly show the APE in relation to the Project boundary;
2. completion, if necessary, of identification of historic properties within the Project's APE;
3. continued use and maintenance of historic properties;
4. treatment of historic properties threatened by Project-induced shoreline erosion, other Project-related ground-disturbing activities, and vandalism;
5. consideration and implementation of appropriate treatment that would minimize or mitigate unavoidable adverse effects on historic properties;
6. treatment and disposition of human remains that may be discovered, consistent with applicable State laws and taking into account the Advisory Council's "Policy Statement Regarding Treatment of Burial Sites, Human Remains, and Funerary Objects," February 23, 2007;
7. discovery of previously unidentified properties during Project operations;
8. public interpretation of the historic and archeological properties at the Project;
9. a list of activities (i.e., routine repair, maintenance, and replacement in kind at the Project) not requiring consultation with the New Hampshire SHPO and the Maine SHPO because these activities would have little or no potential effect on historic properties;
10. a procedure to address effects on historic properties in the event of a Project emergency; and
11. a review of the HPMP by the Licensee, the New Hampshire SHPO, Maine SHPO, and Tribes to ensure that the information continues to assist the Licensee in managing historic properties and updating the HPMP based on agency and tribal consultations.

The Programmatic Agreement also requires that after a license for the Project has been issued, but before the HPMP has been approved by the Commission (hereinafter, "the Interim"), the Licensee will consult with the New Hampshire SHPO, Maine SHPO, and the Tribes regarding the effects of the following actions that may be implemented in the Interim, including:

1. all Project-related activities, including recreational developments, that require ground-disturbance;
2. non-routine maintenance, new construction, demolition, or rehabilitation of National Register-eligible structures within the Project APE; and
3. Project-induced shoreline erosion of archeological sites not attributable to flood flows or phenomena, such as wind-driven wave action, erodible soils, and loss of vegetation due to natural causes.

During relicensing, NHDHR concluded that the FERC relicensing of the Project will not have any impacts on properties or districts that are listed or may be eligible for the NRHP. However, the New Hampshire SHPO stated in its review finding that consultation would be required for any activity that involves ground disturbance or alteration to historic properties within the Project APE. Such investigation will require archaeological investigation to determine whether the affected area has the potential to contain significant cultural deposits. Furthermore, any proposed activity, that has the potential to cause effects to the Lower Great Falls Dam or other property within the potential Great Falls Woolen Company Complex will require an evaluation of the complex to determine whether it meets the criteria for inclusion in the National Register.

Assessment and Conclusion

Based on my review of the LIHI application and FERC eLibrary data, I believe the Project conditionally satisfies this criterion. A condition has been recommended to require notification to LIHI when the HPMP has been updated and fully approved.

The Project Conditionally Passes Criterion G – Cultural and Historic Resource Protection

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 appropriately selected **Standard H-1 - Not Applicable / De Minimis Effect** for all ZOEs.

There are no license-required recreational facilities at the Project because there are no Project lands to accommodate such facilities. However, there are several facilities owned by and located on other's properties that are adjacent to the Project Boundary:

- Riverwalk Park, owned and maintained by the City of Somersworth, located along the shoreline of the Project impoundment on the New Hampshire side of the river. The 10-acre area includes a parking area, a river overlook, a trail that winds along the impoundment and several shoreline locations providing access to the water for canoeists and kayakers.
- A private picnic area and car-top launch located just upstream of the Project dam is owned and maintained by the owner of the adjacent apartment complex (Great Baxter Mills, LLC). The site is for exclusive use by apartment complex residents.
- An informal trail and small informal parking area on land owned by the City of Somersworth downstream of the tailrace providing access along the NH side of the river reach below the Project.
- An informal trail providing access to the Project tailwater on the NH side, just downstream of the tailrace Project security fencing.

Requirements

The new license does not require Project recreational facilities. However, Article 409 requires the Licensee to notify FERC if the City's Riverwalk Park or Greater Baxter Mills, LLC's private picnic area and car-top boat launch cease operation.

Assessment and Conclusion

Based on my review of the LIHI application and FERC records, I believe that the Project satisfies this criterion.

The Project Passes Criterion H – Recreational Resources

VIII. GENERAL CONCLUSIONS AND REVIEWER RECOMMENDATION

Based on my review, I believe that the Lower Great Falls Project conditionally meets the requirements of LIHI Certification, for a ten-year term, with the following conditions.

Condition 1 – In the annual compliance submittals to LIHI, the facility Owner shall provide a copy of the future water quality monitoring required by the NHDES WQC and effectiveness review of the Water Quality Mitigation and Enhancement Plan required by the MDEP WQC. Agency comments on these filings and resolution of the comments shall also be provided.

Condition 2 – In annual compliance submittals to LIHI, the facility Owner shall provide updates on the status of upstream and downstream fish passage activities including results of studies, plans, passage designs, construction of fishways, and effectiveness plans and monitoring studies. Agency comments on these filings and resolution of the comments shall also be provided, until all passage measures are implemented and deemed sufficient by the resource agencies. This annual reporting shall also identify the status of the upstream fishway installation at the downstream Rollinsford Project, as it affects the schedule for upstream passage at this Project.

Condition 3 - In annual compliance submittals to LIHI, the facility Owner shall summarize activities taken to protect impacts to the northern long-eared bat during eel and fish upstream and downstream passage construction. The facility Owner shall also report on any ground-disturbing activity requiring surveys for the small whorled pogonia including results of such surveys as well as any additional requirements imposed by the USFWS if small whorled pogonia is found.

Condition 4 – The facility owner shall notify LIHI within 60 days of submission of the updated Historic Properties Management Plan (HPMP) addressing previously identified deficiencies, and confirmation of final approval of HPMP. Until then, the annual compliance submittals to LIHI shall identify any activities that triggered the interim requirements to protect cultural resources and demonstrate satisfaction of these requirements.

Appendix A

GMP and Agency Communications

Lower Great Falls Hydroelectric Project (P-4451)
Low Impact Hydropower Institute Certification
GMP Response to LIHI's March 8 and 11, 2024 Reviewer Questions

March 21, 2024

1. **LIHI Review Comment:** Have you received actual approval of the WQMEP from the NHDES? All I have found was Mr. James Tilley's email response to GMP on May 19, 2023 (contained in the WQMEP) in which he reviewed the draft and said he had no comments. Not sure that is a formal approval.

   GMP Response: GMP did not receive a formal approval letter from NHDES. However, GMP coordinated closely with NHDES on the development of the WQMEP for the Lower Great Falls Project, as well as a similar plan for the downstream Rollinsford Project, to satisfy the requirements contained in the Water Quality Certification. GMP's interpretation of the NHDES May 19, 2023, email that stated they had no comments on the WQMEP is indicative that they were satisfied and approved of the plan.

2. **LIHI Review Comment:** The FERC EA says within the Project Boundary there are "0.24 acre of land that is occupied by two apartment buildings and an associated parking lot and 0.56 acre of land associated with Olde Mill Road." Your application states there are only 0.9 acres of land within the Project Boundary and that all is used for Project facilities or operation. Can you help me with this conflict?

   GMP Response: License Article 205 required GMP to revise the Exhibit G drawing depicting the Project boundary. Specifically, License Article 205 stated the following.

   > *Within 90 days of the issuance date of the license, the licensees must file, for Commission approval, a revised Exhibit G drawing enclosing within the project boundary all principal project works necessary for operation and maintenance of the project. The Exhibit G drawing should not include the previously licensed project boundary. The Exhibit G drawing should only include the project boundary described in the project description and the project boundary discussion of this order. The Exhibit G drawing should also include: (1) 0.2 acre of land associated with the access road to the powerhouse; and (2) 0.1 acre of land associated with a portion of the parking lot and land south of the apartment building located on the shoreline immediately downstream of the dam. The Exhibit G drawing should not include the 0.1 acre of land occupied by the apartment building located on the shoreline immediately downstream of the dam. The Exhibit G drawing must comply with sections 4.39 and 4.41(h) of the Commission's regulations.*

   On April 19, 2023, GMP filed the revised Exhibit G drawing with the Commission.[1] The Commission approved the revised Exhibit G drawing on August 30, 2023.[2] The revised Exhibit G drawing excluded the apartment complex as required by License Article 205; thus, all land remaining

[1] FERC Accession No. 20230419-5062: https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20230419-5062.
[2] FERC Accession No. 20230830-3044: https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20230830-3044.

contained within the Project boundary is necessary for Project facilities and their operation. The land that the Commission required to be in the Project boundary totals 0.9 acres.

3. **LIHI Review Comment:** Can you send me a pdf of Figure 1.1-2 (map showing dams on the river) that I can cut and paste into my report that keeps the dam locations in place? For some reason when I tried to copy it, many of the features are lost.

   GMP Response: A pdf of Figure 1.1-2 is attached to response.

4. **LIHI Review Comment:** Endangered and Threatened Species

Your application provides Table 3.6-1, a list of 36 species that are listed as endangered or threatened under either NH or ME rules that may be within the Project area and does not say anything else about these species. Thus, my questions are:

a) What is the source(s) used that suggests all of these species may be with the Project Area and what do you mean by "Project Area"? The Project Boundary? Project ZOEs? Some other geographical area?

GMP Response: Table 3.6-1 was initially developed as part of the Pre-Application Document (PAD) for the FERC relicensing process using Maine, New Hampshire, and federal data sources.[3,4,5] As it relates to many state listed species, these sources provided occurrence information on a regional scale rather than a project-specific basis. As described in the LIHI Application, during the PAD comment and study request period, Maine Department of Inland Fisheries and Wildlife (MDIFW) requested that Redfin Pickeral, Longnose Dace, and Bridle Shiner be added to Table 3.6-1.[6] Similarly, New Hampshire Fish and Game Department (NHFGD) requested that Blanding's turtle be added to Table 3.6.1 in their PAD comments.[7] Within the narrative description in the LIHI Application, GMP attempted to refine the list of species described in Table 3.6-1 to the proximity of the Project by using online sources for endangered and threatened species.[8] As described in the LIHI Application, for New Hampshire, GMP was able to identify a subset of the species contained in Table 3.6-1 that had historical records of occurrence in the City of Somersworth. These species included greater fringed-gentian, lopsided rush, northern beggar-ticks, northern blazing star, unpretentious yellow-seeded false pimpernel, and Blanding's turtle.

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[3] Maine Department of Inland Fisheries and Wildlife (MDIFW). (2015). State List of Endangered & Threatened Species. Retrieved from: https://www.maine.gov/ifw/fish-wildlife/wildlife/endangered-threatened-species/listed-species.html.

[4] New Hampshire Fish and Game Department (NHFGD). (2015). Endangered and Threatened Wildlife of New Hampshire. Concord, NH: Nongame and Endangered Wildlife Program. 2pp.

[5] U.S. Fish and Wildlife Service (USFWS). (2019). Environmental Conservation Online System. Information for Planning and Consultation. Retrieved from: https://ecos.fws.gov/ipac/.

[6] FERC Accession No.: 20170609-5036: https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20170609-5036.

[7] FERC Accession No. 20170609-5090: https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20170609-5090.

[8] Rare Plants, Rare Animals, and Exemplary Natural Communities in New Hampshire Towns. New Hampshire Natural Heritage Bureau, Available online: https://www.nh.gov/nhdfl/documents/town-lists.pdf. Date Accessed 12/27/2023.

Similarly, for this response GMP identified several species that have been identified as occurring in the immediate vicinity of the City of Berwick, Maine, including small whorled pogonia, Georgia bulrush, spotted turtle, black racer, and Blanding's turtle. Special status species in Maine were identified using MDIFW's interactive Beginning with Habitat tool, which provides geographic extent of rare, threatened, or endangered wildlife as well as rare or exemplary plants and natural communities.[9] Additional data was obtained from the Maine Natural Areas Program for special status plant species and from the MDIFW for threatened and endangered wildlife species. [10,11]

A revised version of Table 3.6-1 is provided below:

[9]Maine Department of Inland Fisheries and Wildlife (MDIFW). (2024). Beginning with Habitat Map Viewer. Retrieved from https://webapps2.cgis-solutions.com/beginningwithhabitat/mapviewer/.

[10] Maine Natural Areas Program. (2021). Maine Rare Plant List and Rare Plant Fact Sheets. Retrieved from: https://www.maine.gov/dacf/mnap/features/rare_plants/plantlist.htm.

[11] Maine Department of Inland Fisheries and Wildlife (MDIFW). (2023). State List of Endangered & Threatened Species. Retrieved from: https://www.maine.gov/ifw/fish-wildlife/wildlife/endangered-threatened-species/listed-species.html.

Table 3.6-1: Rare, Threatened, or Endangered Species that May be Found in the Immediate Vicinity of the Project

Common Name	Scientific Name	Type	State Protection Status	Federal Protection Status
Redfin Pickerel	*Esox americanus americanus*	Fish	Endangered (ME), Special Concern (NH)	
Bridle Shiner	*Notropis bifrenatus*	Fish	Special Concern (ME)	
Longnose Dace	*Rhinichthys cataractae*	Fish	Special Concern (ME)	
Monarch Butterfly	*Danaus plexippus*	Insect		Candidate Species
Northern Long-eared Bat	*Myotis septentrionalis*	Mammal	Endangered (ME), Special Concern (NH)	Endangered
Spotted Turtle	*Clemmys guttata*	Reptile	Threatened (NH, ME)	
Black Racer	*Coluber constrictor*	Reptile	Endangered (ME), Threatened (NH)	
Blanding's Turtle	*Emydoidea blandingii*	Reptile	Endangered (NH, ME)	
Northern Beggar-tick	*Bidens hyperborea*	Plant	Special Concern (ME), Endangered (NH)	
Greater Fringed-gentian	*Gentianopsis crinita*	Plant	Threatened (NH)	
Small Whorled Pogonia	*Isotria medeoloides*	Plant	Endangered (ME, NH)	Threatened
Lopsided rush	*Juncus secundus*	Plant	Endangered (NH)	
Northern blazing star	*Liatris novae-angliae*	Plant	Endangered (NH)	
Unpretentious yellow-seeded false pimpernel	*Linderni dubia var. anagallidea*	Plant	Threatened (NH)	
Georgia Bulrush	*Scirpus georgianus*	Plant	Endangered (NH)	

b) The Handbook requires the application to "*Provide documentation that there is no demonstrable negative effect of the facility on any listed species in the area from an appropriate natural resource management agency or provide documentation that habitat for the species does not exist within the ZoE or is not impacted by facility operations*." The application does not provide this information, either as agency documentation nor an assessment of available habitat at the Project ZOEs nor an assessment of project impact. This is needed for my assessment of satisfaction of this criterion.

GMP Response: During the recent FERC relicensing process (2016-2023), GMP consulted with various resource agencies from New Hampshire and Maine on a variety of environmental issues, including state listed endangered and threatened species. As described above, these resource agencies identified several species that have the potential to occur in the Project area. However, the resource agencies did not request any studies related to these endangered and threatened species, nor did they request any protection, mitigation, or enhancement measures specific to state listed species beyond those contained in the new FERC license. From GMP's perspective the FERC relicensing record is indicative that resource agencies were satisfied that the conditions in the new FERC license adequately protect endangered and threatened species.

For this response, GMP developed the following summary (Table 1) of each state listed species, its habitat requirements, and an assessment of Project impacts.

Table 1: Summary of Rare, Threatened, or Endangered Species Habitat Identified in the Project Zones of Effect and Measures to Avoid Potential Impacts

Common Name	Habitat Requirements	Habitat Identified in Project ZOEs	Measures to Avoid Potential Impacts
Redfin Pickerel	Prefers shallow weedy backwaters in stands of aquatic vegetation or thick overhanging grasses and shrubs. It is often found in smaller watersheds than the chain pickerel. In New Hampshire it is frequently found in streams flowing through abandoned beaver ponds in very small watersheds that may dry up in some years.	None identified.	N/A
Bridle Shiner	Dependent on dense communities of submerged aquatic vegetation for survival. Found along the shorelines and coves of lakes and ponds, the backwaters of larger rivers, and in slow flowing streams.	Potential habitat in the Project impoundment.	The FERC and 401 WQCs require that the Project operate in run-of-river mode and require drawdown and refill rates during maintenance drawdowns to avoid impacts to aquatic biota.
Longnose Dace	Swift flowing riffle sections of rivers and streams with boulder, cobble, and gravel substrate.	Potential habitat in the Project bypass.	The FERC and 401 WQCs require that the Project operate in run-of-river mode and release a minimum bypass flow of 37 cfs. The minimum bypass flow was set based on an IFIM study of the bypass reach. Longnose dace were one of the target species analyzed as part of that study. Its habitat requirements were taken into consideration when determining an appropriate minimum bypass flow.
Northern Long-eared Bat	Winter: Caves and mines. Spring, Summer and Fall: Forests. Roosts singly or in colonies underneath bark, in tree cavities of both live trees and snag, or dead trees. Less commonly in structures such as barns and sheds.	Potential habitat identified in certain upland areas within the Project boundary.	To protect the northern long-eared bat during its active season (April 1 to October 31), GMP limits non-hazardous tree removal to the period of November 1 through March 31.
Spotted Turtle	Small, acidic wetlands and vernal pools located in large, intact forests. They also use small streams, shrub swamps, wet meadows, bogs, and forested swamps.	None identified.	N/A

Common Name	Habitat Requirements	Habitat Identified in Project ZOEs	Measures to Avoid Potential Impacts
Black Racer	Varied moist and dry habitats. Preferred habitat in southern Maine includes open grasslands, power line rights-of-way, orchards, rocky ridges, and the edges between forests and fields.	None identified.	N/A
Blanding's Turtle	Small, acidic wetlands and vernal pools in large blocks (over 500 acres) of forested habitat. Occasionally found in large marshes, forests and shrub swamps, and slow-moving rivers and streams. Wetland indicator code: OBL.	None identified.	N/A
Northern Beggar-tick	Localized in fresh to brackish estuaries. [Tidal wetland (non-forested, wetland)]. Wetland indicator code: OBL.	None identified.	N/A
Greater Fringed-gentian	Disturbed habitats, meadows and fields. Wetland indicator code: FACW.	None identified.	N/A
Small Whorled Pogonia	Mid-succession mixed forests. [Hardwood to mixed forest (forest, upland)]. Wetland indicator code: FACU.	Potential habitat identified in certain upland areas within the Project boundary.	The FERC license requires that prior to any ground disturbing activities at the Project, GMP will employ a qualified botanist to conduct surveys for small whorled pogonia. If the species is not present, GMP will file the results of the survey with FWS and FERC and proceed with the ground-disturbing activities. If the species is present, GMP will consult with the FWS to determine the need for any measures to protect the species.
Lopsided rush	Dry, open, sterile soil and clearings [Rocky summits and outcrops (non-forested upland)]. Usually occurs in non-wetlands, but occasionally in wetlands. Wetland indicator code: FACU.	None identified.	N/A
Northern blazing star	Dry grasslands, barrens, and woods openings. [Dry barrens (partly forested, upland)]. Wetland indicator code: FACU.	None identified.	N/A

Common Name	Habitat Requirements	Habitat Identified in Project ZOEs	Measures to Avoid Potential Impacts
Unpretentious yellow-seeded false pimpernel	Open wet areas. [Open wetland, not coastal nor rivershore (non-forested, wetland); Old field / roadside (non-forested, wetland or upland)]. Wetland indicator code: OBL.	None identified.	N/A
Georgia Bulrush	Wet fields, graminoid marshes, ditches, open seasonally wet areas. Wetland indicator code: OBL.	None identified.	N/A

5. **LIHI Review Comment:** Cultural and Historic Resources

a) Please identify the historical resources known to be within the New Hampshire section of the APE investigated. The Application states none were found in Maine but is silent on what was found in New Hampshire. But the attached October 8, 2018, filing to NHDHR clearly identifies that some were found in NH.

GMP Response: Historical resources within the New Hampshire section of the APE consist of the Great Falls Woolen Company Complex. As described in Section 2.4.4 of the HPMP, the Great Falls Woolen Company Mill Complex (also known as the Baxter Mill) consists of four buildings (former Woolen Mill, Wool Sorting Building, Storehouse, and Office) on the New Hampshire side of the river and the Lower Great Falls Dam (see Figure 4 in the HPMP). The Great Falls Woolen Company was likely associated with the Great Falls Manufacturing Company, which operated a large complex of textile mills on the Salmon Falls River in Somersworth north of the Project. The buildings consist of a three-story brick factory located southeast of the dam, two brick buildings along the south side of Olde Mill Road, and a wood-frame office building. All of the buildings have been converted into residential apartments. The office building is within the Project APE, but is not a Project facility.

b) FERC noted in their EA, that the north abutment of the project dam and the area surrounding the low-level outlet gates consist of stone masonry and structural remains that were originally constructed in 1825. FERC concluded that these features could be eligible for listing on the National Register. Are these in Maine or NH? If in Maine, were these identified in your investigations submitted to ME SHPO? Can you explain what seems to be a conflict?

GMP Response: These features were inventoried in the Archaeological Phase I and II Evaluations conducted in 2019-2020. As described in Section 2.4.4 of the HPMP, the features are on the Maine side of the river where the Lower Great Falls dam is located and includes the foundations and industrial remains of a nineteenth-century sawmill complex that was converted into an early hydroelectric plant in 1888. The site extends approximately 120 meters north of the dam along the river's bank. The structural remains are mostly foundational and comprised of lime mortared field stone and brick. Structural remnants closest to the river are the most intact including the wheelhouse and southernmost stone wall foundation along the south side of the riverbank. The powerhouse foundation is perched on a ridge above the river with a steep slope down to the water and portions of the site are inaccessible due to safety concerns. The Maine SHPO is currently developing a "Mill Context" to include National Register eligibility standards; while unavailable at this time, this context could be considered for these two sites when it becomes available.

c) The Application states "Within the NH portion of the APE, the NHDHR concluded that the FERC relicensing of the Project will not have any impacts on properties or districts that are listed or may be eligible for the NRHP ". Please provide the documentation from NHDHR that states this. The documentation included in Appendix H seems to conclude with the statement that "should ground disturbance or alterations to historic features be proposed, consultation with NHDHR is necessary." Perhaps you have additional documentation not included in the application.

GMP Response: The NHDHR Project Review Form in Appendix H of the LIHI application provides the available documentation. In the Comment/Finding Recommendation section, NHHDR states

"*For purposes of re-licensing studies are not required. However, should ground disturbance or alteration to historic properties be proposed, consultation with DHR is necessary.*"

Section 4.5 of the HPMP addresses this topic more specifically and states the following "*As noted above in Section 2.4, no archaeological or historic architectural investigations were carried out in New Hampshire because the New Hampshire SHPO found that the relicensing of the Project would not affect historic properties. However, the New Hampshire SHPO stated in its finding that consultation would be required for any activity that involves ground disturbance or alteration to historic properties (see Appendix B:10). Therefore, any future Project-related ground-disturbing activity within the Project APE in New Hampshire, as described in Section 4.4.2 above, will require archaeological investigation to determine whether the affected area has the potential to contain significant cultural deposits. Furthermore, any proposed activity, including those described in Section 4.4.3 above, that has the potential to cause effects to the Lower Great Falls Dam or other property within the potential Great Falls Woolen Company Complex will require an evaluation of the complex to determine whether it meets the criteria for inclusion in the National Register*."

d) Please provide a copy of the HPMP that was submitted to FERC on Fen 16, 2024? Given its locational sensitivity, that document is not on FERC's eLibrary public records. To ensure its material is kept confidential it should be forwarded directly to Maryalice Fischer noted clearly as CONFIDENTIAL. As such, it will be protected from public access. I have copied Maryalice on this email so she is aware it is coming.

GMP Response: A copy of the Project's HPMP was emailed to Maryalice Fischer on March 21, 2024.

From: "Houston, Judith" <judith.e.houston@des.nh.gov>
To: "PBMwork@maine.rr.com" <PBMwork@maine.rr.com>
Cc:
Bcc:
Priority: Normal
Date: Thursday April 4 2024 9:57:06AM
RE: Questions on the Lower Great Falls Application to LIHI

Hello Pat!

My apologies for delay in providing you a response to your question. I did find James' 5/2023 email you referenced. Relative to review of WQC compliance reports, etc., the 'no comments' response may be considered as an 'approval' from NHDES.

Thank you for your due diligence on this project.

Judy

Judith E. Sears Houston, P.E., Supervisor

Water Quality Planning Section

Watershed Management Bureau

NH Department of Environmental Services

29 Hazen Drive, P.O. Box 95

Concord, NH 03302-0095

Tel: (603) 271-2983

E-mail: judith.e.houston@des.nh.gov

From: PBMwork@maine.rr.com <PBMwork@maine.rr.com>
Sent: Wednesday, April 3, 2024 3:04 PM
To: Houston, Judith <judith.e.houston@des.nh.gov>
Subject: RE: Questions on the Lower Great Falls Application to LIHI

Hi Judy

I was wondering if you think you will be able to respond to my question by April 15. Green Mountain Power's position on this same question is that since they worked with NHDES extensively in ensuring your Department would be satisfied with the Plan approach, and that James Tilley had no comments on the latest version they had him review, (which is their final version) that in essence, that constituted NHDES approval.

Hope you get through the storm with no problem. Good luck!

Pat McIlvaine

From: PBMwork@maine.rr.com
To: Judith"
Cc:
Sent: Monday March 11 2024 4:17:44PM
Subject: RE: Questions on the Lower Great Falls Application to LIHI

Hi Judy

Thank you so much for getting back to me. I can appreciate how busy you must be. When I was working (I am basically retired now...just doing LIHI reviews) and had a staff member leave, I remember the extra workload that comes along with that.

I attached a copy of the document I have that includes the May 19, 2023 email from James Tilly. The email is the first one contained in Appendix B of this document. Hope this helps.

I am suppose to complete my review by April 15. However, if that will cause you a problem, just let me know that and I can add a condition into my review that says this information is outstanding. Such conditions often come with a 3 month timetable. That may be a lot more doable for you and would not cause a problem for me.

Thanks again.

Pat

From: "Houston, Judith"
To: "PBMwork@maine.rr.com"
Cc:
Sent: Monday March 11 2024 12:42:08PM
Subject: RE: Questions on the Lower Great Falls Application to LIHI

Good afternoon, Ms. McIlvaine!

Thank you for your inquiry. James Tilley is no longer the Water Quality Certification Program Supervisor, as he has moved to a different position with NHDES. Until we have filled the vacant spot, I am covering the program.

As you may have read in the attached email to Ms. Fischer, we no longer have the available time or staff to review and comment on LIHI applications. However, for any WQC questions, I can certainly look into his for you. I may have to contact James if I do not find the referenced documents.

As I'm covering a lot right now, until the WQC position is filled, my schedule is quite full. What is your timeline that you need this information?

Judy

Judith E. Sears Houston, P.E., Supervisor

Water Quality Planning Section

Watershed Management Bureau

NH Department of Environmental Services

29 Hazen Drive, P.O. Box 95

Concord, NH 03302-0095

Tel: (603) 271-2983

E-mail: judith.e.houston@des.nh.gov

From: PBMwork@maine.rr.com <PBMwork@maine.rr.com>
Sent: Friday, March 8, 2024 9:02 AM
To: Houston, Judith <judith.e.houston@des.nh.gov>
Subject: Questions on the Lower Great Falls Application to LIHI

Hi Ms. Houston

You were listed as the contact for the NHDES on Green Mountain Power's (GMP) application to the Low Impact Hydropower Institute (LIHI) for possible certification as a low-impact facility. I am the reviewer assigned to review the application for LIHI. I have a question that I am hoping you can help me with. I noticed that Mr. James Tilley was the

individual involved in many of the NHDES documents on the Project, so he may have specific knowledge needed to answer my questions.

You are welcome to forward me the answer to my question by responding to this email. Alternatively, if the NHDES is sending in comments directly to LIHI on this application, these questions and your answers can be incorporated into those comments ....whichever is easier for you. Also, if you have any other insight you would like to share with me regarding this Project, please feel free to include it in your response.

Thank you in advance for your help. Please feel free to contact me if you have any questions. If you prefer we talk on the phone, please tell me when it would be best for me to reach you.

My question is:

The NHDES WQC requires a Water Quality Improvement Plan (WQIP) to be developed, reviewed by a number of state agencies and approved by NHDES. GMP has instead developed a Water Quality Mitigation and Enhancement Plan (WQMEP) which was submitted to the required state agencies for review. Email correspondence from James Tilley suggests the WQMEP addresses the issues required by a WQIP. My question however is does Mr. James Tilley's email response to GMP on May 19, 2023 in which he stated he had "no comments" on the WQMEP satisfy the need for NHDES approval of the document?

Thanks again.

Pat McIlvaine