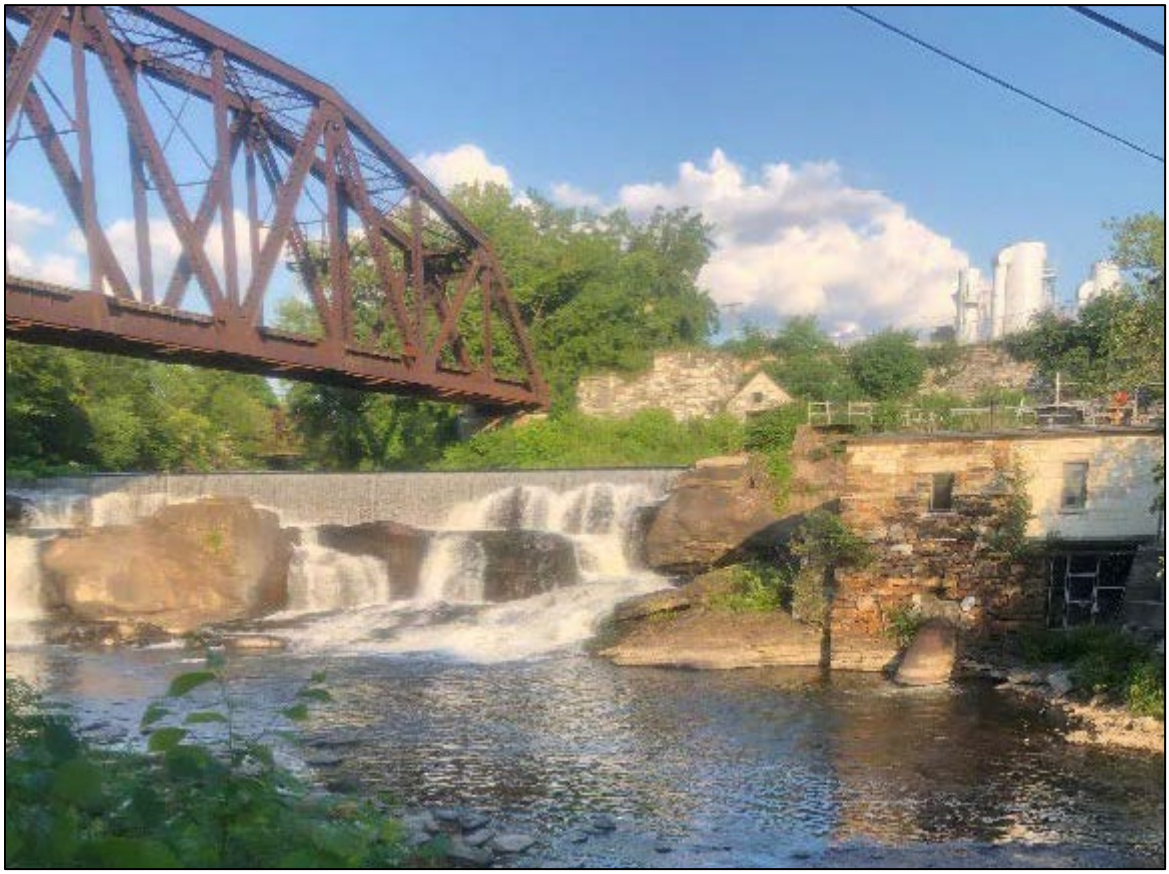
REVIEW OF APPLICATION FOR LIHI CERTIFICATION OF THE CENTER RUTLAND HYDROELECTRIC PROJECT

(FERC PROJECT NO. 2445)



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CENTER RUTLAND HYDROELECTRIC PROJECT
FERC PROJECT NO. 2445

REVIEW OF APPLICATION FOR LIHI CERTIFICATION

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Acronyms and Abbreviations

A	
APE	Area of Potential Effect
ARA	Archaeological Resources Assessment
ASA	Archaeologically Sensitive Area
C	
cfs	cubic feet per second
D	
dbh	diameter at breast height
DLA	draft license application
E	
EA	environmental assessment
el.	elevation
ESA	Endangered Species Act
F	
FERC	Federal Energy Regulatory Commission
FMMP	Flow Management Monitoring Plan
FLA	final license application
G	
GMP	Green Mountain Power Corporation
H	
HPMP	Historic Properties Management Plan
HUC	hydrologic unit code
I	
IPaC	Information for Planning and Consultation
K	
kV	kilovolt
kW	kilowatt
L	
LIHI	Low Impact Hydropower Institute
M	
MW	megawatt
N	
NE ARC	Northeast Archaeology Research Center
NEPA	National Environmental Policy Act
NGVD29	National Geodetic Vertical Datum of 1929
NHPA	National Historic Preservation Act
NTU	Nephelometric Turbidity Unit

O	
OCMP	Operations Compliance Monitoring Plan
P	
Project	Center Rutland Hydroelectric Project
PA	Programmatic Agreement
R	
RM	river mile
S	
SHPO	State Historic Preservation Office
U	
USFWS	United States Fish and Wildlife Service
USGS	U.S. Geological Survey
V	
VANR	Vermont Agency of Natural Resources
VDHP	Vermont Division for Historic Preservation
VTFWD	Vermont Fish and Wildlife Department
W	
WQC	water quality certification
Z	
ZoE	Zone(s) of Effect

1.0 INTRODUCTION

The 0.275-megawatt (MW) Center Rutland Hydroelectric Project (FERC Project No. 2445) is an existing, run-of-river hydroelectric facility located on Otter Creek at river mile (RM) 71 in Rutland County, Vermont. The Project is owned and operated by Green Mountain Power Corporation (GMP) and is one of six GMP-owned hydroelectric developments along Otter Creek. The watershed drains approximately 307 square miles at the Project site, with the U.S. Geological Survey (USGS) Gage No. 04282000 located approximately 350 feet downstream. The Project is situated within the Middle Otter Creek subbasin (HUC 04150402) approximately 65 miles upstream of Lake Champlain and adjacent to the Town of Rutland (Figure 1). Two non-powered dams are located upstream and six hydroelectric projects are located downstream including the Otter Creek Project (LIHI #128), Middlebury Lower (LIHI #99), Weybridge (LIHI #98), and Vergennes (LIHI #134), all also owned by GMP.

As licensed, the Center Rutland Project works consist of the following principal features:

1. A concrete and stone masonry gravity dam totaling approximately 249 feet in length, consisting of a 190-foot-long spillway section that includes a 174-foot-long concrete ogee section with the ability to install flashboards, and a 16-foot-long non-overflow section. The total structural height varies from 12 to 14 feet.

2. An impoundment with a surface area of less than 11 acres and a gross storage capacity of approximately 35 acre-feet at the normal water surface elevation of 507.4 feet mean sea level (msl) (with flashboards installed). With flashboards removed, which they have been since 2012, the normal high-water elevation is 505.05 feet National Geodetic Vertical Datum of 1929 (NGVD 29), corresponding to a reduced surface area of 11.21 acres (of which 10.97 are the impoundment) and negligible active storage.

3. A small forebay structure at the head of the penstock providing flow regulation and debris control.

4. A concrete and marble masonry intake structure measuring approximately 17 feet long by 39 feet wide by 18 feet high, fitted with steel trashracks with 9/16-inch clear spacing. Water is conveyed through a 6-foot-diameter, 75-foot-long steel penstock to the powerhouse.

5. A stone and marble masonry powerhouse, measuring approximately 32 by 37 feet, containing a single horizontal-shaft turbine driving a 275-kilowatt (kW) generator. The unit operates between 60 and 190 cubic feet per second (cfs) and has a rated hydraulic head of approximately 13 feet.

6. A small substation, an 80-foot-long, 12.47-kilovolt (kV) transmission line interconnecting to GMP's distribution system, and a 0.35-mile-long fiber-optic cable providing smart-grid communications and remote operational control.

7. Appurtenant equipment and facilities including spillway stoplogs, tailrace retaining walls, and site access infrastructure.

The Project boundary encompasses approximately 11.2 acres, extending about 4,000 feet upstream of the dam to include the impoundment and about 100 feet downstream of the tailrace to the Route 4 bridge. The surrounding land is primarily urban-residential and transportation corridor, with vegetated riparian buffers along portions of the shoreline. There are no federal lands within the Project boundary.

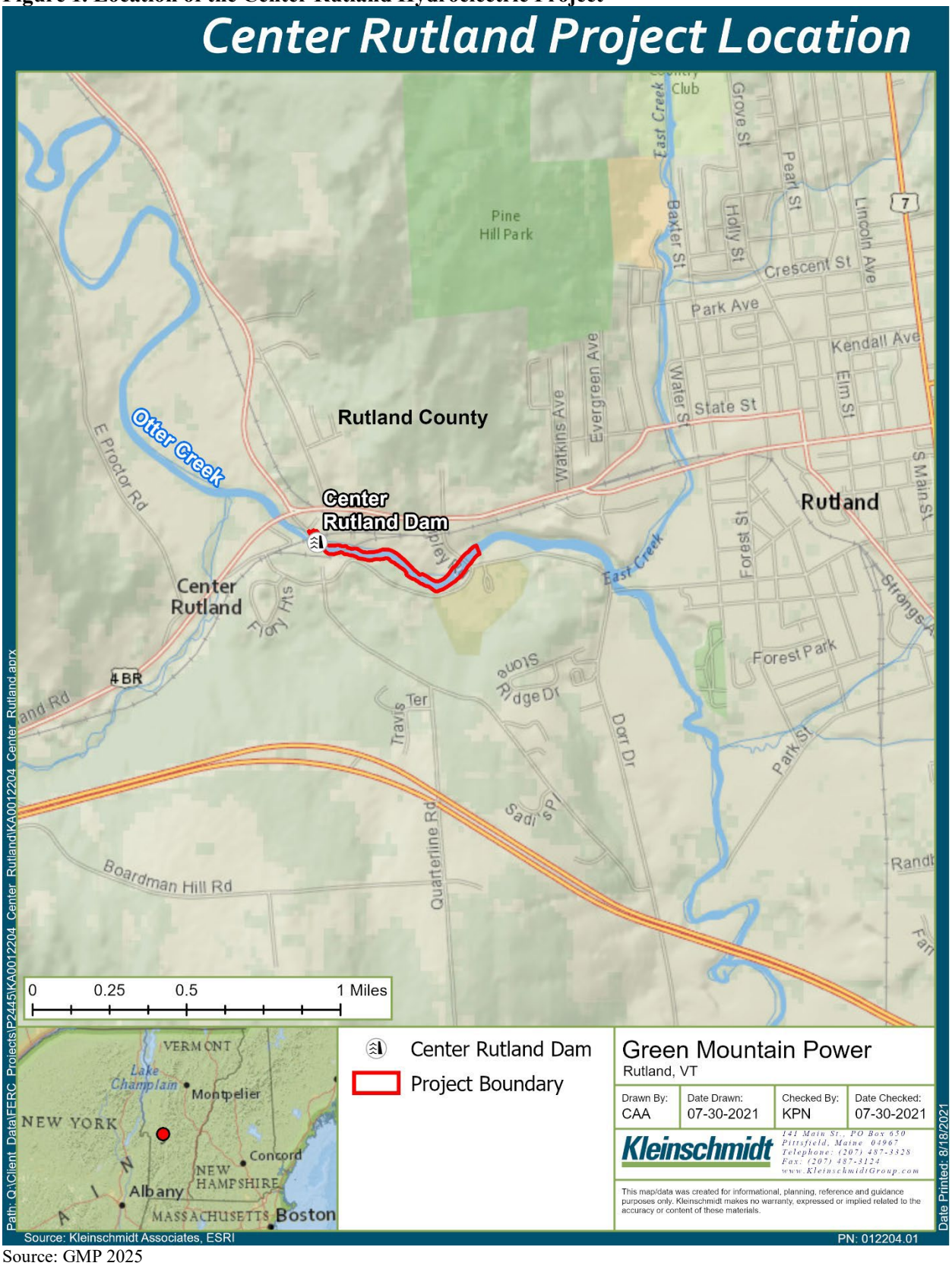
The Project operates under a minor license issued by the Federal Energy Regulatory Commission (FERC) on December 26, 2024, for a 40-year term expiring November 30, 2064 (FERC 2024). The license incorporates the conditions of the Vermont Agency of Natural Resources (VANR) Water Quality Certification (WQC) issued March 29, 2024 (VANR 2024).

The Project operates in instantaneous run-of-river mode, with inflow approximately equaling outflow. No peaking or storage operations occur. The Project maintains the impoundment at a normal high-water mark of elevation 505.05 feet NGVD29, approximately 0.25 feet above the spillway crest (elevation 504.8 feet). The reservoir extends about 3,000 feet upstream and covers roughly 11 acres. A minimum flow of 80 cubic feet per second (cfs) or inflow, whichever is less, is released into the 250-foot-long bypassed reach[1] from June 1 through October 15, and 60 cfs or inflow, whichever is less, from October 16 through May 31, consistent with the FERC license and WQC. The Project's average annual generation between 2014 and 2020 was approximately 541 megawatt-hours (MWh), providing local renewable energy to GMP's distribution network.

The Low Impact Hydropower Institute (LIHI) full application package for certification was submitted by GMP in September 2025, under the LIHI Handbook 2nd Edition, Revision 2.06 (March 2025). This report presents independent review findings and recommendations for certification. For a comprehensive description of the facility, refer to Table 1 in GMP's LIHI application.

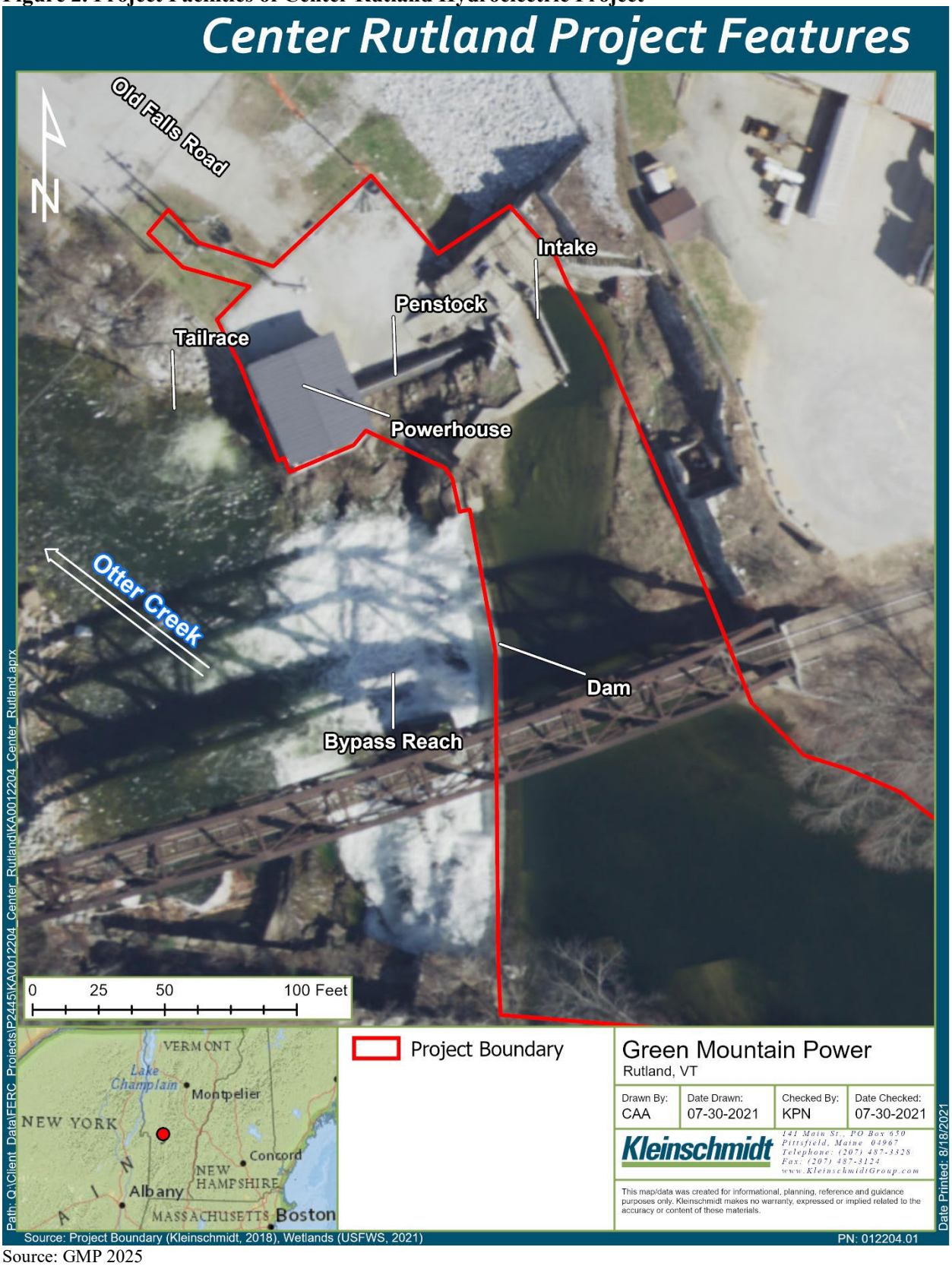
[1] The FERC License reports the bypassed reach as being 100 feet long. The LIHI application states 250 feet long.

Figure 1. Location of the Center Rutland Hydroelectric Project



Source: GMP 2025

Figure 2. Project Facilities of Center Rutland Hydroelectric Project



Source: GMP 2025

2.0 REGULATORY AND COMPLIANCE STATUS

The dam was originally constructed in 1850, and the facility was first developed in the late 1800s, with hydromechanical power installed in 1878 and hydroelectric conversion completed in 1914, with substantial reconstruction in 1928. The current generating equipment dates to 1940 but retains original casings (GMP 2021). GMP acquired the Project in 2012 and has since implemented operational, structural, and safety upgrades, including generator rehabilitation (2005) and intake repairs (wall and penstock in 2018, and headwall in 2019).

The prior license for the Center Rutland Project was issued by the FERC on March 31, 1993 to OMYA, Inc. for a term of 30 years and went into effect on January 1, 1994. The license was transferred from Vermont Marble Power, division of OMYA, Inc. to Central Vermont Public Service Corporation on November 23, 2010 (133 FERC ¶ 62,171). The license was again transferred from Central Vermont Public Service Corporation to Green Mountain Power Corporation per FERC Order Approving Transfer of Licenses and Substitution of Applicant issued September 13, 2012 (140 FERC ¶ 62,191). The license for the Center Rutland Project expired on December 31, 2023. Pursuant to FERC's requirements, GMP filed their final license application (FLA) in December 2021. FERC issued the current 40-year license in December 2024 following completion of the Environmental Assessment (EA) and public notice process (FERC 2024). The license incorporates the conditions of the March 29, 2024 VANR WQC, which specifies operational, monitoring, and reporting requirements. Key conditions include:

- License Article 401 and WQC Condition C – Flow Management and Monitoring Plan (FMMP): Requires continuous flow monitoring and reporting of conservation flows, turbine discharge, and impoundment levels. The FMMP was due by June 30, 2025 (filed July 1, 2025), and its requirements were integrated into the Project's Operation Compliance Monitoring Plan (OCMP).

- License Article 401 and WQC Condition D – American Eel Passage: Requires development of a passage plan within one year after eel passage is installed at the downstream Otter Creek Hydroelectric Project (FERC No. 2558, LIHI #128).

- License Article 402 and WQC Condition B – Project Operation: Requires run-of-river operation with an impoundment target elevation of 505.05 feet during normal operating conditions, provision of bypassed reach minimum flow from June 1 through October 15, of 80 cubic feet per second (cfs) or inflow to the Project's impoundment, whichever is less, and 60 cfs, or inflow if less, from October 16 through May 3, along with reporting of planned and unplanned operational deviations.

- License Article 403 and WQC Condition B – OCMP: Establishes procedures for verifying run-of-river operation.

- License Article 405 – Protection of Northern Long-eared and Tricolored Bats: Restricts tree clearing on Project lands between April 1 and October 31.

- License Articles 406 and 409 – Cultural Heritage Kiosk Construction and Historic Properties Management Plan (HPMP) Implementation.
- License Article 407 and 408 – Recreation Monitoring Plan Implementation.

No consultation under the Endangered Species Act (ESA) or National Historic Preservation Act (NHPA) was pending at the time of review. FERC's 2024 EA found no significant environmental impacts, and no contested issues remain.

3.0 PUBLIC COMMENTS RECEIVED OR SOLICITED BY LIHI

The LIHI application was publicly noticed on September 29, 2025, and notice of the application was forwarded to resource agencies, Tribal entities, and other interested party representatives listed in the application. On September 30, 2025, Chief Don Stevens of the Nulhegan Band of the Coosuk - Abenaki Nation request further involvement should any archaeological investigations surface any artifacts which should be repatriated to the Abenaki Nation. Additionally, Chief Don Stevens recommended outreach to the Elnu Abenaki and Nulhegan tribes. On October 2, 2025, Rich Holschuh responded to the outreach with questions and requests for data related to the Project's HPMP. LIHI staff referred him to the Vermont Division for Historic Preservation since LIHI does not have access to privileged information. As these items are not required by the license to be completed until December 26, 2025, no further responses were warranted. Additionally, during relicensing, GMP consulted with Chief Don Stevens regarding access and gathering rights on GMP property surrounding the Center Rutland Project. At the time, GMP owned the land where the Pocket Park was going to be located. Through relicensing with FERC, it was determined this land was not within the Project Boundary and therefore GMP sold the land directly to the town. There is now very little land within the Project Boundary that is publicly accessible (i.e. outside of the safety fences). As such, the agreement with the Nulhegan was never finalized for the Center Rutland Project. However, GMP does have agreements with the Nulhegan at other Projects (Bolton Hydro) where there are publicly accessible lands.

The reviewer did not solicit additional comments from the resource agencies or Tribal governments listed in the application. Because the Center Rutland Project received a new FERC license in December 2024, all relevant agencies and interested parties, including the VANR, the Vermont Fish and Wildlife Department (VTFWD), and the U.S. Fish and Wildlife Service (USFWS), recently completed formal consultation, review, and comment-response processes as part of the FERC licensing and NEPA proceedings. Those regulatory consultations included circulation of the draft and final license applications, issuance of the EA, and public notice of the Section 401 WQC. The resulting license and WQC conditions fully reflect the outcomes of those reviews. Given that the Project is still within its first year of operation and compliance under the new license, no additional agency or Tribal review is considered necessary at this time. The LIHI comment period closed on November 28, 2025.

4.0 ZONES OF EFFECT

Three Zones of Effect (ZoE) were designated by the GMP. Aerial photographs illustrating these ZoE can be found in Figure 2-1 of the LIHI application and shown below (Figure 3). The three ZoE are listed here organized from upstream to downstream.

- ZoE 1 (Impoundment; RM 70.88 to 71.47) extends from the dam upstream 3,000 feet and encompasses the upstream portion of the Project Boundary which follows the contour line at El. 505.05 feet NGVD29.;
- ZoE 2 (Bypassed Reach; RM 70.86 to 70.88) extends immediately downstream of the toe of the dam, for approximately 250 feet.; and
- ZoE 3 (Tailrace; RM 70.75 to 70.86) extends from approximately 550 feet downstream of the powerhouse to the Route 4 bridge.

Figure 3. Center Rutland Project's Zones of Effect

4.1 STANDARDS MATRIX

The table below shows the Applicant-selected standards for each criterion in each ZoE. If any, changes shown in red font are those where the reviewer disagrees with the Applicant selection.

Table 1. Zones of Effect Criterion and Standard Selected

Criterion and Standard Selected								
Zone Number and Zone Name	***A***	***B***	***C***	***D***	***E***	***F***	***G***	***H***
	Ecological Flows	**Water Quality**	**Upstream Fish Passage**	**Downstream Fish Passage**	**Shoreline and Watershed Protection**	**Threatened and Endangered Species**	**Cultural and Historic Resources**	**Recreational Resources**
ZoE 1 – Impoundment	1	2	1	1	1	2	2	1
ZoE 2 – Bypassed Reach	2	2	1	1	1	2	2	2
ZoE 3 – Tailrace	1	2	1	1	1	2	2	2

5.0 DETAILED CRITERIA REVIEW

ZoE are analyzed separately under each criterion topic and are grouped together by classifying standard.

5.1 FLOW REGIMES OVERVIEW

The Center Rutland Project operates in instantaneous run-of-river mode, maintaining inflow equal to outflow at all times. The Project's flow regime and associated minimum flow requirements were developed and approved through formal consultation with the VANR as part of the 2024 FERC licensing and Section 401 WQC process. This flow regime was derived using a science-based resource agency approach, incorporating site-specific hydrologic and biological information from the Otter Creek watershed, with the objective of maintaining aquatic habitat connectivity, aesthetic flows, and cold-water fish protection throughout seasonal and inter-annual hydrologic variability. Continuous compliance with these flow prescriptions is verified through real-time monitoring using the USGS Gage No. 04282000 located 350 feet downstream of the dam, as well as through the required FMMP (WQC Condition C).

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.

5.1.1 ZOE 1 (IMPOUNDMENT)

***STANDARD A-1**. **Not Applicable/De Minimis Effect:** The facility operates in a true run-of-river operational mode and there are no bypassed reaches or water diversions associated with the applicable Zone of Effect, or the facility is located within an existing water conduit that does not discharge into natural waterways.*

The Project maintains a stable water surface elevation at approximately elevation 505.05 feet NGVD29. The impoundment provides only about 35 acre-feet of gross storage and does not support any active peaking or storage operations. Flows are passed instantaneously to the downstream reach, and the Project is prohibited from any diurnal fluctuation in water levels. When occasional drawdowns are necessary for maintenance, GMP coordinates with VANR to minimize potential disturbance to aquatic habitats. Because the impoundment lacks any measurable capacity for flow alteration or ramping, it does not modify natural inflow patterns or affect downstream hydrology. For these reasons, the impoundment has a negligible effect on riverine flow conditions and qualifies under Standard A-1, Not Applicable or De Minimis Effect.

5.1.2 ZOE 2 (BYPASSED REACH)

STANDARD A-2. Agency Recommendation: *The flow regime was developed and is being implemented in accordance with science-based resource agency and, if applicable, science-based or indigenous knowledge-based tribal government recommendations.*

In the bypassed reach, the Project provides continuous minimum flow releases that were developed based on science-based recommendations from VANR and VTFWD. The bypassed reach is short, only 250 feet in length, extending from the dam to where it joins the tailrace, and includes a natural bedrock drop and a hydraulically connected pool that remains wetted under nearly all flow conditions. The flow regime prescribed by VANR during the 2024 relicensing includes a minimum release of 60 cfs year-round while the FERC license specifies 80 cubic feet per second (cfs), or inflow if less, from June 1 through October 15, and 60 cfs, or inflow if less, from October 16 through May 31. These flow levels were established through agency consultation to support aquatic habitat connectivity, maintain aesthetic and recreational values, and provide seasonal variability consistent with Otter Creek's natural hydrology. FERC's EA confirmed that this regime balances habitat protection with generation efficiency and that the resulting flows maintain adequate depth and velocity for resident fish populations. The flow regime, combined with real-time monitoring requirements and adaptive management provisions under the FMMP, reflects a science-based resource agency approach and meets Standard A-2, Resource Agency and Tribal Government Recommendations.

5.1.3 ZOE 3 (TAILRACE)

***STANDARD A-1. Not Applicable/De Minimis Effect*:** The facility operates in a true run-of-river operational mode and there are no bypassed reaches or water diversions associated with the applicable Zone of Effect, or the facility is located within an existing water conduit that does not discharge into natural waterways.

In the tailrace, flows are determined entirely by turbine discharge, which varies directly with inflow to the impoundment. The tailrace extends approximately 550 feet downstream of the powerhouse to the Route 4 bridge, where it rejoins the mainstem of Otter Creek. Because the Project operates in instantaneous run-of-river mode, there are no operational fluctuations beyond those caused by natural inflow variation. The tailrace provides immediate hydraulic continuity with Otter Creek and does not create any backwater or impoundment effect. Flow in this reach is therefore fully representative of the natural hydrology of the river, and the Project does not alter flow timing, magnitude, or duration downstream. This zone, like the impoundment, meets Standard A-1, Not Applicable or De Minimis Effect.

Based on the application, supporting documentation, and FERC eLibrary documents, this review finds that the Project is in compliance with flow requirements and operates to protect aquatic habitat, and therefore satisfies the flow regimes criterion.

5.2 WATER QUALITY OVERVIEW

Water quality within and downstream of the Center Rutland Project is governed by the conditions established in the VANR Section 401 WQC issued on March 29, 2024, in conjunction with the new FERC license issued on December 26, 2024. The WQC provides reasonable assurance that operation of the Project will comply with Vermont's water quality standards for Class B(2) cold-water fish habitat in Otter Creek. The certification incorporates both narrative and numeric standards necessary to protect aquatic life, habitat, recreation, and aesthetics, and it prescribes flow and monitoring conditions designed to maintain the biological, chemical, and physical integrity of the affected waters. The Project directly affects three distinct waterbodies: the impoundment above the dam (ZoE 1), the short, bypassed reach below the dam (ZoE 2), and the tailrace downstream of the powerhouse (ZoE 3). Each of these reaches was evaluated for potential impacts on 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.

5.2.1 ALL ZOES

STANDARD B-2. Resource Agency and Tribal Government Recommendations*: The facility is in compliance with all water quality conditions contained in a recent Water Quality Certification or in compliance with facility-specific science-based resource agency and, if applicable, science-based or indigenous knowledge-based tribal government recommendations, that provide reasonable assurance that water quality standards will be met for all waterbodies that are directly affected by the facility. Such recommendations, whether based on a generally applicable water quality standard or one that was developed on a site-specific basis, must include consideration of all water quality components necessary to preserve healthy fish and wildlife populations, human uses, and recreation.*

The impoundment extends about 3,000 feet upstream, with limited depth and a total storage capacity of 35 acre-feet. The WQC provides reasonable assurance that Project operation will comply with Vermont's 2022 Water Quality Standards (Environmental Protection Rule Chapter 29A) for Class B(2) cold-water fisheries habitat in Otter Creek. These standards require dissolved-oxygen levels of at least 6 mg/L and 70 percent saturation, temperature increases not exceeding 1°F above ambient, and turbidity averaging less than 10 NTU under base-flow conditions (VANR 2024). The WQC conditions establish specific flow,

monitoring, and reporting measures to ensure the biological, chemical, and physical integrity of Otter Creek downstream, within the impoundment, and through the short bypassed reach.

In the impoundment zone, which covers approximately 11 acres at elevation 504.8 feet NGVD29 and has only about 35 acre-feet of storage, the facility's instantaneous run-of-river operation prevents prolonged retention and thermal stratification. Both FERC and VANR found that inflows and outflows are nearly identical at all times, resulting in stable temperatures, high dissolved-oxygen concentrations, and no measurable alteration of chemical or biological conditions (FERC 2024). Macroinvertebrate community surveys conducted by VANR upstream and downstream of the dam in 2006, 2016, and 2020 indicated "good to very good" species richness for mayflies, stoneflies, and caddisflies, which are biological indicators consistent with high water-quality integrity (GMP 2025 Table 3-1; FERC 2024). Dissolved-oxygen concentrations recorded at those monitoring sites ranged between 7.7 mg/L and 10.6 mg/L, meeting or exceeding Class B(2) criteria. The EA concluded that the Project does not measurably influence downstream temperature, pH, or nutrient concentrations, and that the aquatic community structure remains consistent with Vermont's cold-water fish-habitat objectives (FERC 2024).

Within the bypassed reach, continuous flow is provided via uniform spill over the dam, maintaining high turbulence and oxygenation. Under the 2024 license and WQC Condition B, GMP must release 80 cubic feet per second (cfs), or inflow if less, from June 1 through October 15, and 60 cfs, or inflow if less, from October 16 through May 31 to the bypassed channel (FERC 2024). This flow regime was developed through hydrologic modeling and habitat analysis conducted jointly by VANR and VTFWD to ensure compliance with the hydrology and aquatic-habitat criteria in Sections 29A-304 and 29A-306 of the Vermont Wqter Quality Standards. FERC confirmed in its EA that this minimum-flow requirement will enhance aquatic habitat connectivity, maintain adequate dissolved-oxygen levels, and sustain aesthetic values in the bypassed channel (FERC 2024). Because the reach is short and hydraulically connected to the tailrace pool, monitoring during the relicensing study period indicated that water temperatures remain equivalent to those of the mainstem, with no observable nutrient accumulation or algal growth (VANR 2024).

The tailrace zone, which conveys turbine discharge directly to Otter Creek, maintains water quality comparable to natural conditions. No water withdrawals or industrial discharges occur within the Project boundary, and the nearest permitted discharge, the Rutland City Wastewater Treatment Facility, is located nearly one mile upstream and is the identified source of localized E. coli impairment unrelated to Project operations (VANR 2024). VANR determined that the Center Rutland facility neither contributes to nor exacerbates those upstream impairments.

5.3 UPSTREAM FISH PASSAGE

FERC's EA documents that no diadromous species, including American eel, currently occur in the Center Rutland Project area. The local fish assemblage is comprised of resident trout and warm-water species supported by natural habitat and supplemental stocking; no upstream migratory run is present at the dam site (FERC EA, Aquatic Resources). Likewise, VANR's WQC establishes flow and monitoring requirements but does not prescribe immediate upstream fish passage at Center Rutland; instead, it provides a contingent eel-passage obligation keyed to downstream actions on Otter Creek (WQC Condition D). During licensing, the USFWS requested reservation of authority under FPA §18 to prescribe fishways in any license issued; FERC noted this in the EA's licensing/consultation summary (Section 1.4; fishway reservation) and included it in License Article 404. The WQC Condition D (American Eel Passage) requires GMP to develop an eel-passage plan within one year after upstream eel passage is installed at the downstream Otter Creek Hydroelectric Project (FERC No. 2558, LIHI #128, located between river mile 21 and 64.2), i.e., Center Rutland's upstream passage obligation is contingent on if/when basin connectivity for eel advances upstream toward the Project.

Goal: The facility allows for the safe, timely, and effective upstream passage of migratory fish to ensure that migratory species can successfully complete their life cycles and maintain healthy populations in areas affected by the facility.

5.3.1 ALL ZOES

STANDARD C-1. Not Applicable/De Minimis Effect: *The applicable Zone of Effect does not create a barrier to upstream passage, or there are no migratory fish in the vicinity of the facility. If such species were present historically, the facility did not contribute to the extirpation of such species.*

No upstream-migrating diadromous species currently occur in the Project area, and therefore no upstream passage is warranted. As documented in the FERC EA, the fish community in the impoundment, bypassed reach, and tailrace consists solely of resident species with no anadromous or catadromous runs reaching this portion of Otter Creek. The natural falls in Vergennes at river mile 7.6 preclude upstream passage for migratory species other than possibly American eel which are present in Lake Champlain. The license and WQC Condition D provide an agency-directed, enforceable trigger to implement upstream eel passage in coordination with wider basin actions, ensuring that if future conditions warrant, the Project will transition to agency-compliant passage consistent with LIHI's Standard C-2 standard.

Based on the application, WQC, and FERC eLibrary documents, this review finds that the Project is in compliance with the upstream fish passage requirements and the Project does not adversely effect on upstream migrating fish and therefore satisfies the LIHI upstream fish passage criterion.

5.4 DOWNSTREAM FISH PASSAGE

FERC's EA concludes that no diadromous species such as American eel currently occur in the Center Rutland Project area, and that the fish assemblage consists solely of resident cold- and warm-water species that exhibit limited downstream movement behaviors (FERC EA, Aquatic Resources). Because no diadromous or riverine species requiring protection of downstream life-stage passage (e.g., silver-stage eel, out-migrating smolts, or juveniles) are present at the Project, the EA did not identify any need for downstream passage measures. Likewise, VANR's WQC does not prescribe any downstream passage structures or operational measures, focusing instead on protecting aquatic habitat through run-of-river operations and continuous minimum flow releases. During relicensing, the USFWS reserved authority under FPA §18 to prescribe fishways, which includes downstream measures, but no resource agency indicated that downstream passage was biologically warranted under current species conditions (FERC 2024). This regulatory context reflects the fact that downstream passage needs currently do not exist, but agency authority exists to require measures in the future should American eel or another migratory species recolonize upstream reaches of Otter Creek.

Goal: The facility allows for the safe, timely, and effective downstream passage of migratory fish. For riverine (resident) fish, including resident potamodromous fish, the facility minimizes loss of fish from impoundments and upstream river reaches affected by facility operations. Migratory species can successfully complete their life cycles and maintain healthy populations in the areas affected by the facility

5.4.1 ALL ZOES

STANDARD D-1: *The applicable Zone of Effect does not create a barrier to downstream passage, or there are no fish present at the facility that require downstream passage to complete their life cycle. If such species were present historically, the facility did not contribute to the extirpation of them and the facility does not contribute adversely to riverine fish populations or to their access to habitat necessary for the completion of their life cycles.*

There are no downstream-migrating diadromous or anadromous species present at the Center Rutland Project, and therefore no downstream passage or entrainment-protection measures are presently needed. As documented in the FERC EA, the resident fish community upstream and downstream of the dam

consists entirely of non-migratory species that do not require downstream bypass structures to maintain population viability, and no evidence links the Project to historical extirpation of American eel or any other migratory species in this portion of the watershed.

Resident species include Bluegill (Lepomis macrochirus), Bluntnose Minnow (Pimephales notatus), Brown Trout (Salmo trutta), Brown Bullhead (Ameiurus spp.), Burbot (Lota lota), Common Shiner (Luxilus cornutus), Creek Chub (Semotilus atromaculatus), Cutlips Minnow (Exoglossum maxillingua), Fallfish (Semotilus corporalis), Largemouth Bass (Micropterus salmoides), Longnose Dace (Rhinichthys cataractae), Northern Pike (Exos lucius), Pumpkinseed (Lepomis gibbosus), Rainbow Trout (Oncorhynchus mykiss), Rock Bass (Ambloplites rupestris), Smallmouth Bass (Micropterus dolomieu), Tessellated Darter (Etheostoma olmstedi), Yellow Perch (Perca flavescens), and White Sucker (Catostomus commersoni). Vermont Fish and Wildlife Department (VTFWD) also stocks Brook, Brown, and Rainbow trout annually in Otter Creek (GMP 2025).

The Project's intake is fitted with 9/16-inch trashrack spacing, and hydraulic analyses found approach velocities sufficiently low (< 1 foot per second) to minimize entrainment risk for resident species. Additionally, the short tailrace rapidly rejoins the natural channel, maintaining hydraulic continuity and eliminating delay or disorientation concerns for downstream-moving organisms.

As noted above, federal and state agencies have retained the authority to require downstream eel-passage measures in the future should eel restoration actions proceed farther up Otter Creek. Both the WQC and license acknowledge this through reserved authority under FPA §18 and through the parallel upstream eel-passage trigger contained in WQC Condition D, which may lead to corresponding downstream measures if American eel return to this reach.

Based on the application, WQC, and FERC eLibrary documents, this review finds that the Project is in compliance with the downstream fish passage requirements and the Project does not adversely affect downstream passing fish and therefore satisfies the LIHI downstream fish passage criterion.

5.5 SHORELINES AND WATERSHED

The Center Rutland Hydroelectric Project occupies a small footprint along Otter Creek, with the majority of shoreline, riparian buffer, and upland areas remaining undeveloped, forested, and functioning in a natural condition. The impoundment shoreline is steep and has a narrow forested over- and understory of deciduous trees (GMP 2021). The Project is largely bordered by Route 4 and several railroads which run parallel to Otter Creek. These transportation routes and numerous manufacturing plants characterize the

area. Soils within the Project boundary are dominated by Windsor loamy sand, with some Paxon soils (GMP 2021).

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

5.5.1 ALL ZOES

STANDARD E-1: *There are no lands associated with the facility in the applicable Zone of Effect that are under the direct or indirect ownership or control of the facility owner and have been identified as having significant ecological value for protecting water quality, sensitive species or habitats, aesthetics, or low-impact recreation, and the facility is not subject to any Shoreline Management Plan or similar protection plan.*

The Project does not include any formal shoreline management plan for any zones because federal and state agencies determined during relicensing that such a plan was unnecessary given the limited land disturbance, the absence of development pressure within the Project boundary, and the natural character of the riparian corridor. FERC typically requires shoreline management plans only where hydropower operations influence shoreline stability, recreational development, or land-use patterns. According to FERC (2024), operating the Project in a run-of-river mode results in a stable impoundment elevation that protects sensitive species and habitat such as fish spawning habitat and mussel beds from becoming dewatered, as well as limiting Project-related erosion along the impoundment (FERC 2024). Additionally, in FERC's license order (2024), FERC identified that the existing measures help preserve natural resources and environmental justice communities that may rely on those natural resources for recreational or subsistence fishing.

GMP owns or controls all lands necessary for Project operations which are limited to approximately ¼ acre, and the surrounding municipal lands are protected under local zoning that restricts development in the river corridor (FERC 2024). Run-of-river operations, required under both the license and WQC Condition C, maintain the impoundment at a stable elevation with minimal fluctuation. GMP's FMMP ensures continuous documentation of water levels, inflow, and discharge, allowing agencies to identify and correct any operational conditions that could affect shoreline stability. GMP conducts limited vegetation management and VANR also noted that there are no concerns with plant species at the Project as long as no changes are proposed to run-of-river operations (GMP 2025).

Based on the application, WQC, and FERC eLibrary documents, this review finds that the Project is in compliance with the shorelines and watershed requirements and GMP operates the Project to protect water quality, sensitive species or habitats, aesthetics and low-impact recreation, and therefore satisfies the LIHI shorelines and watershed criterion.

5.6 THREATENED AND ENDANGERED SPECIES

FERC's EA and the VANR 2024 WQC document that several federal and state-listed species may occur within or near the ZoE for the Center Rutland Hydroelectric Project. Under Section 7 of the ESA, FERC consulted with the USFWS to ensure that relicensing the Project would not jeopardize the continued existence of any federally listed species or adversely modify designated critical habitat. According to USFWS's Information for Planning and Consultation (IPaC) database, the northern long-eared bat (*Myotis septentrionalis*, federally endangered) and the tricolored bat (*Perimyotis subflavus*, proposed endangered) have potential to occur within the Project area, though no critical habitat is designated for either species.

Goal: The facility does not negatively impact federal or state listed species, or Tribal trust species.

5.6.1 ALL ZOES

STANDARD F-2: *Listed or tribal trust species are or may be present in the applicable Zone of Effect, but the facility has been found by the appropriate resource agencies and Tribal Nations to have no negative effect on them; or habitat for the species does not exist within the facility's affected area or is not impacted by facility operations.*

FERC found that Project-related tree clearing, primarily periodic vegetation management along the dam, access roads, and generator lead, could affect roosting habitat if conducted during the bats' active season (April through October). Although GMP originally proposed to avoid removal of trees ≥4 inches diameter at breast height (dbh) between April 15 and October 31, FERC staff determined this measure was insufficient to cover the full active period for northern long-eared bats and recommended restricting removal of non-hazardous trees ≥3 inches dbh from April 1 through October 31 (FERC 2024).

Additionally, Article 405 requires GMP to avoid removing or thinning any non-hazardous trees and woody vegetation from April 1 through October 31, unless necessary for public or Project safety. This expanded measure is also necessary to protect the tricolored bat (FERC 2024). VANR's WQC Condition E similarly requires GMP to avoid tree trimming and removal during the same April 1 through October

31 window for all trees ≥3 inches dbh, consistent with its own review of bat habitat usage within Otter Creek's riparian corridor.

In addition to the ESA-listed bats, the USFWS IPaC system identified the monarch butterfly (*Danaus plexippus*, proposed threatened) as potentially occurring within the ZOEs. This species relies on common milkweed and other nectar-bearing plants for reproduction and foraging. The EA found that run-of-river operations and typical hydropower maintenance actions are not expected to affect monarchs, but small-scale vegetation clearing associated with construction of the pocket park could temporarily disturb milkweed or nectar sources (FERC 2024).

Two state-listed rare mussel species, the creek heelsplitter (*Lasmigona compressa*, S2) and the creeper (*Strophitus undulatus*, S3), are known to occur in the Center Rutland impoundment. S2 species are considered rare and at high risk of extinction or extirpation, while S3 species are uncommon and face moderate risk (VTFWD 2025). Because the Project operates in run-of-river mode with very limited ability to draw down the impoundment, normal operations are not expected to affect these mussels. If a drawdown is ever required, GMP must consult with VANR beforehand. Neither the WQC nor the FERC license includes species-specific measures for the mussels, but their presence was acknowledged. American eel, a Vermont Species of Greatest Conservation Need, is not currently present at the Project but could return in the future; GMP will provide upstream eel passage if passage is implemented at downstream Otter Creek projects. No incidental take of any federal or state-listed species has occurred under past or current operations, and continued Project operations are not expected to negatively impact any listed species.

Based on the application, WQC, and FERC eLibrary documents, this review finds that the Project is in compliance with the threatened and endangered species requirements and GMP operates the Project to protect federal, state or Tribal trust species, and therefore satisfies the LIHI threatened and endangered species criterion.

5.7 CULTURAL AND HISTORIC RESOURCES

During relicensing, the Center Rutland Hydroelectric Project underwent a comprehensive evaluation of cultural and historic resources in consultation with the Vermont Division for Historic Preservation (VDHP) and interested Tribal Nations. Through that process, GMP developed a formally defined Area of Potential Effect (APE) that includes lands within the Project boundary as well as surrounding areas where Project activities could cause direct or indirect effects on archaeological or historic properties. This expanded APE encompasses shoreline areas up to elevation 507.4 feet, archaeological site VT-RU-266,

informal tailwater access trails, and the site of a planned cultural heritage kiosk. The Project area is historically significant and includes resources associated with the early 20th-century marble industry in Rutland, including the Center Rutland Hydroelectric Station Historic District (documented but not formally listed on the National Register), remnants of the Vermont Marble Company's mill complex, a large marble retaining wall, and a 1928 camelback steel railroad bridge (GMP 2025).

Goal: The facility does not adversely impact cultural or historic resources associated with the facility's lands and waters, including archaeological sites, historic era sites, traditional cultural landscapes, traditional cultural properties, and other tribal trust resources.

5.7.1 ALL ZOES

STANDARD G-2: *The facility is in compliance with approved local, state, federal, and recognized tribal historic preservation mandates as well as recognized tribal plans for protection, enhancement, or mitigation of impacts to tribal, cultural or historic resources affected by the facility.*

During relicensing, GMP retained the Northeast Archaeology Research Center (NE ARC) to update the Archaeological Resources Assessment (ARA) for the revised APE. Field inspection in June 2020 identified six Archaeologically Sensitive Areas (ASAs), including previously documented archaeological sites like the Clement Mills, Ripley Mill, Revolutionary War-era Fort Granger, and the Native American lithic quarry site, as well as two previously undocumented sensitive areas. NE ARC recommended Phase I archaeological surveys for ASAs sensitive for Native American resources along riverside terraces and a Phase II evaluation at the lithic quarry site. The Project also engaged Vermont's four state-recognized Abenaki tribes and invited participation from the Saint Regis Mohawk Tribe; consultation input was received from Chief Don Stevens of the Nulhegan Band of the Coosuk, who expressed interest in formalizing access and gathering rights on GMP lands, specifically at the proposed pocket park which has since been sold to the town.

The new FERC license includes two license articles related to this criterion: Article 406, requiring design and installation of a cultural heritage information kiosk for the Town of Rutland, and Article 409, requiring GMP to implement a Programmatic Agreement (PA) and develop a Historic Properties Management Plan (HPMP) within one year of license issuance (or by December 26, 2025). The PA was executed on in September 2024. The HPMP, now under development in consultation with VDHP, will govern ongoing protection, monitoring, and treatment of cultural resources for the duration of the license. Routine run-of-river operations are not expected to adversely affect cultural resources, and infrequent

maintenance activities and ground disturbing activities will be coordinated with VDHP and Tribal representatives to avoid or minimize adverse effects.

Based on the application, WQC, and FERC eLibrary documents, this review finds that the Project is in compliance with the cultural and historic protection requirements and GMP operates the Project to protect cultural and historic resources and therefore satisfies the LIHI cultural and historic resource protection criterion with the proposed condition.

5.8 RECREATIONAL, PUBLIC, AND TRADITIONAL CULTURAL ACCESS

Recreational use in the vicinity of the Center Rutland Hydroelectric Project is shaped by its urban setting, limited Project Boundary, and long-standing informal public access patterns along Otter Creek. The Project's impoundment is bordered largely by commercial and industrial development, and no FERC-required recreation facilities are located within the impoundment or immediate shoreline areas. However, downstream of the dam, GMP has historically provided and maintained informal public access to Otter Creek that supports angling, boating carry-in, and general river access. During relicensing, FERC reviewed existing recreation use, the Town of Rutland's proposal for a small pocket park adjacent to the tailwater, and GMP's commitments under the new license to support public recreation through monitoring, coordination, and interpretive enhancements.

Goal: The facility accommodates recreational activities on lands and waters controlled by the facility; and provides recreational, public, and traditional cultural access to its associated lands and waters without fee or charge.

5.8.1 ZOE 1 (IMPOUNDMENT)

STANDARD H-1: *The facility in the applicable Zone of Effect does not occupy lands or waters to which the public or tribal members can be granted safe access and does not otherwise impact recreational opportunities in the vicinity.*

The Project does not have any formal recreation sites located within the impoundment. The Project does not restrict the public access to the impoundment; however, the area surrounding the impoundment is dominated by commercially developed land. Since the Project boundary only occupies up to the normal water surface elevation, no land is available within the Project boundary for recreational development. More suitable recreation areas are located downstream of the Project dam, which GMP provides access to and is discussed below. No formal recreation areas are required for the impoundment based on the new 2024 FERC license.

5.8.2 ZOE 2 AND 3 (BYPASSED REACH AND TAILRACE)

STANDARD H-2: *The facility demonstrates compliance with resource agency and, if applicable, tribal government recommendations for recreational, public, and traditional cultural access or accommodation (including recreational flow releases), or any enforceable recreation, public and traditional cultural access plans or agreements in place for the facility in the applicable Zone of Effect.*

GMP currently provides informal public access to Otter Creek just below the tailwater via a dirt footpath suitable for canoe carry-in, with informal parking adjacent to the trail. This area is regularly used by anglers accessing both the north and south banks of the river. For several years, the Town of Rutland and GMP explored establishing a small pocket park at this long-used access area; however, FERC determined that the land lies outside the Project Boundary and APE, meaning the park would not be part of the licensed Project. GMP then sold the necessary parcel to the Town, which will manage any future park development. Although the park is not a Project requirement, Article 406 obligates GMP to design and install a cultural heritage information kiosk at the Town's non-project park site if the park is constructed, and to coordinate annually with the Town, VDHP, and Tribal representatives. Article 407 requires a Recreational Monitoring Plan within one year of license issuance, and Article 408 provides that if the park is not built or ceases operation, FERC may require GMP to implement additional recreational measures. Together, these commitments demonstrate compliance with Standard H-2, as the Project provides agency-approved free public access where safe to do so, and adheres to all recreation conditions in the 2024 FERC license.

Based on the application, WQC, and FERC eLibrary documents, this review finds that the Project complies with all recreation-related requirements and provides public access consistent with the limited Project footprint and agency expectations. GMP operates the Project in accordance with Articles 406 through 408, supports existing informal access, and is developing required recreation monitoring and interpretive measures. Accordingly, the Project satisfies the recreational, public, and traditional cultural access criterion with the proposed condition.

6.0 CERTIFICATION RECOMMENDATIONS

This review included an evaluation of the LIHI application, the 2024 WQC, the 2024 EA, the 2025 license, and all relevant publicly available information in the FERC eLibrary. Based on this assessment, the reviewer finds that GMP operates the Project in full compliance with LIHI standards. All ZoEs meet the applicable numbered criteria. The reviewer concludes that the Project is operating consistent with state and federal environmental mandates, is implementing all license-required protection and enhancement measures and has demonstrated robust agency and Tribal consultation throughout the licensing process.

Based on continued compliance with all applicable LIHI criteria and long-term commitments under the 2024 FERC license, including implementation of the HPMP, Recreation Monitoring Plan, and cultural heritage kiosk, the reviewer recommends that the Center Rutland Hydroelectric Project be certified for a full LIHI term of ten (10) years.

Condition 1 – Upon FERC approval of the HPMP required under Article 409, the Facility Owner shall provide LIHI with a copy of the approved HPMP, documentation of consultation with VDHP and affected Tribal Nations, and a brief summary of its implementation status. Updates on HPMP implementation and any consultation with VDHP and Tribal Nations during ground-disturbing work shall also be provided in annual compliance submittals to LIHI.

Condition 2 – Following FERC approval of the Recreation Monitoring Plan required under Article 407, the Facility Owner shall file the approved plan with LIHI. Annual compliance submittals to LIHI shall summarize recreational use, kiosk development coordination with the Town of Rutland, and any changes in public access conditions.

7.0 REFERENCES

Federal Energy Regulatory Commission (FERC). 2024. Environmental Assessment for Hydropower License. Center Rutland Hydroelectric Project P-2445. April 2024.

FERC. 2024. Federal Energy Regulatory Commission. 2024. Order Issuing License for the Center Rutland Hydroelectric Project (P-2445) (189 FERC ¶ 62140) issued December 26, 2024.

Green Mountain Power (GMP). 2021. Final License Application for the Center Rutland Hydroelectric Project. FERC No. 2445. Submitted by Green Mountain Power Corporation. Prepared by Kleinschmidt. Pittsfield, Maine. December 2021.

GMP. 2025. Application for Low Impact Hydropower Institute Certification.

Low Impact Hydropower Institute. 2025. Certification Handbook, 2nd Edition, Revision 2.06.

Vermont Fish and Wildlife Department (VTFWD). 2025. Rare and Uncommon Animals of Vermont. Vermont Natural Heritage Inventory. September 17, 2025.