

REVIEW OF APPLICATION FOR RECERTIFICATION BY THE LOW IMPACT HYDROPOWER INSTITUTE OF THE VERGENNES PROJECT, LIHI #134

Prepared by Stephen Byrne
June 8, 2022

I. INTRODUCTION

This report summarizes the review findings of the application submitted by Green Mountain Power Corporation (Applicant or licensee) to the Low Impact Hydropower Institute (LIHI) for recertification of the Vergennes Hydroelectric Project FERC (P-2674), LIHI #134. The Project is a 2.6-MW facility that operates in a run-of-river mode and is located on Otter Creek, a tributary to Lake Champlain, at river mile 7.6, in Addison County Vermont. On April 6, 2022, LIHI received a complete application package for recertification of the Project. This current review was conducted using the new 2nd Edition LIHI Certification Handbook.

II. RECERTIFICATION PROCESS AND MATERIAL CHANGE REVIEW

Under the current LIHI Handbook (Revision 2.05: January 1, 2022), recertification reviews are a two-phase process starting with a limited review of a completed LIHI application, focused on three questions:

- (1) Is there any missing information from the application?
- (2) Has there been a material change in the operation of the certified facility since the previous certificate term?
- (3) Has there been a change in LIHI criteria since the Certificate was issued?

In accordance with the Recertification Standards, all Projects currently applying for renewal must go through a full review unless their most recent certification was completed using the 2016 version of the Handbook. While there were no material changes at the Project, which was originally reviewed under the 1st edition Handbook, the LIHI Handbook was materially changed, thus, this Stage II report was required for the Project.

A review of the initial application, dated February 2022, resulted in a Stage I Report dated March 28, 2022, that indicated minor additional information was needed. The Stage II review resolved these matters.

This Stage II assessment included review of the application package, public records in FERC's eLibrary since the last LIHI certification in 2017, and annual compliance statements received by LIHI during the past term of Certification.

III. PROJECT'S GEOGRAPHIC LOCATION

The Vergennes Project is located in northeastern Vermont in Addison County, at river mile (RM) 7.6, on Otter Creek (Figure 1). Otter Creek is Vermont's longest river and is a tributary to Lake Champlain. Vergennes is the first of seven hydroelectric dams located on Otter Creek. Upstream hydro projects include Weybridge, LIHI #98, the Huntington Falls and Belden developments of the Otter Creek Project, LIHI #126, Middlebury Lower, LIHI #99, and the Proctor development of the Otter Creek Project as well as other dams farther upstream.

IV. PROJECT AND IMMEDIATE SITE CHARACTERISTICS

The Vergennes Project was originally licensed by FERC on June 29, 1979 and relicensed on July 30, 1999. Electric power has been generated from Vergennes Falls since 1896. The current facilities of the Vergennes Project were originally constructed between 1911 and 1943 and underwent a significant number of changes to enhance environmental performance, most notably the conversion from a daily peaking plant to run-of-river operation. Project works consist of the dam which is topped with 1.5-foot-high timber flashboards that are in place year-round. Due to differences in the spillway crest elevations, the side spillway flashboard is set about three inches lower than the center spillway boards. Two powerhouses are located on either side of the river - Plant 9 located on the south bank of Otter Creek and Plant 9B located on the north bank. The powerhouses are separated by three concrete spillway sections that are divided by two instream islands and one 29-foot-long non-overflow dam. Center Island divides the 9B spillway from the center spillway and Grist Mill Island divides the center spillway from the Plant 9 spillway. Each of the spillways are approximately 10 feet high, with a total length of 231 feet. Plant 9 contains two steel penstocks and Plant 9B contains one steel penstock.

Each powerhouse includes a forebay with trashracks and head gates. Plant 9 powerhouse contains two 852-kW double discharge Francis turbines and Plant 9B powerhouse contains a single 1-MW vertical Francis turbine generator (see Figures 2 - 6).

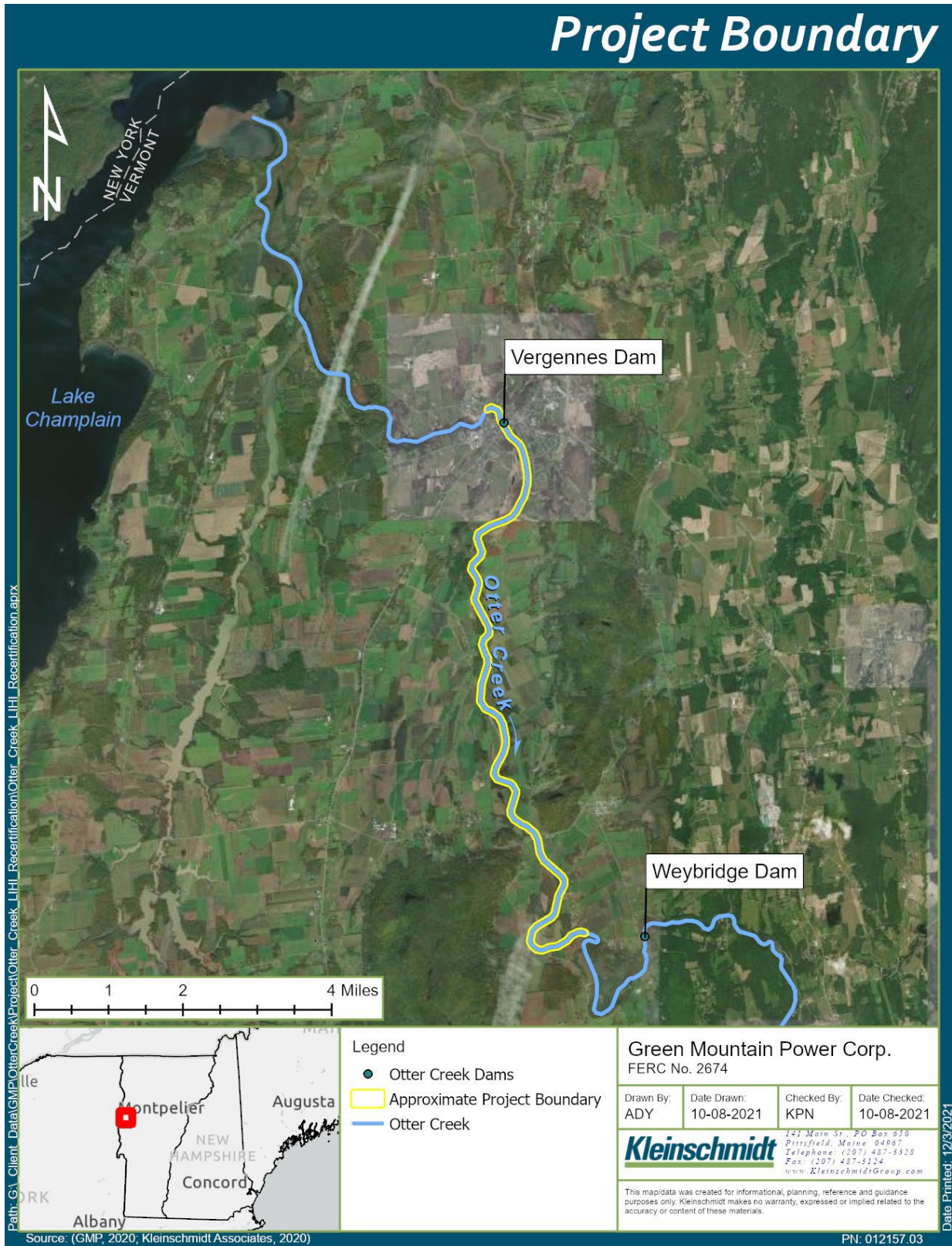


Figure 1 – Vergennes Project Location



Figure 2 – Google Earth street view looking upstream at the Vergennes Impoundment from Route 22A bridge.



Figure 3 – View looking upstream at the Vergennes Project Bypass Reach and Downstream Zones of Effect.



Figure 4 – Plant 9 Intake, Penstocks, and Powerhouse.



Figure 5 – Plant 9B Intake, Penstock, and Powerhouse

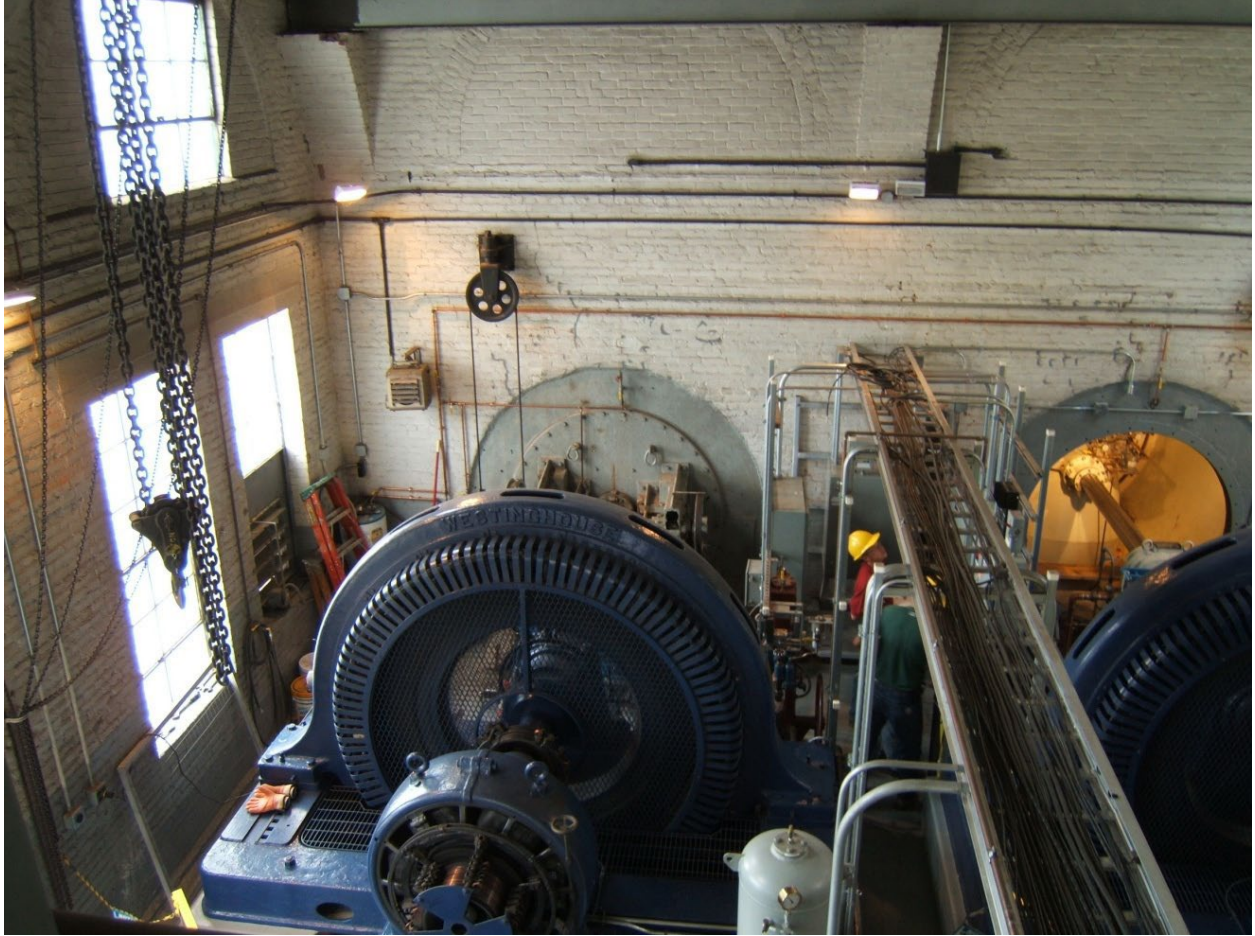


Figure 6 – Plant 9 Powerhouse Turbine.

V. ZONES OF EFFECT AND STANDARDS SELECTED

Three Zones of Effect (ZOE) were designated by the Applicant and were determined to be appropriate. Zone 1 includes the Vergennes impoundment; Zone 2 includes the bypass reach and Zone 3 includes the tailrace and downstream reach. Table 1 shows the Standards selected for each criterion for the three ZOE. Where applicable, reviewer recommendations for alternate standards are show in **red**.

Table 1. Standards Matrix for the Vergennes Project.

Zone:		1: Impoundment Reach	2: Bypass Reach	3: Downstream Reach
River Mile Extent:		RM 16.4 – 7.6	RM 7.6 – 7.58	RM 7.58 – 7.2
Criterion		Standard Selected		
<i>A</i>	<i>Ecological Flows</i>	1	2	1 , 2
<i>B</i>	<i>Water Quality</i>	2	2	2
<i>C</i>	<i>Upstream Fish Passage</i>	1	1 , 4	1 , 4
<i>D</i>	<i>Downstream Fish Passage</i>	1 , 3	1 , 2	1
<i>E</i>	<i>Shoreline and Watershed Protection</i>	1	1	1
<i>F</i>	<i>Threatened and Endangered Species</i>	2	2	2
<i>G</i>	<i>Cultural and Historic Resources</i>	2	2	2
<i>H</i>	<i>Recreational Resources</i>	2	2	2

VI. REGULATORY AND COMPLIANCE STATUS

The Project was issued a license order from the Federal Energy Regulatory Commission (FERC) on July 30, 1999.¹ The Vermont Department of Environmental Conservation (Vermont DEC) issued a Water Quality Certificate (WQC) for the operation of the Project on May 4, 1999.² On February 26, 2008, FERC issued a License Amendment³ to reflect turbine rehabilitation at Plant 9, which resulted in efficiency improvements that increased annual generation by 23%. In 2018 the Applicant completed the replacement of the historic dual penstocks and twin headgates at Plant No. 9B. The purpose of this project was to replace deteriorating infrastructure to maintain the long-term operability of the Project. In addition to headgates and penstocks replacement, minor modifications were made to the powerhouse, an overhead electric transmission line was replaced with a steel galvanized conduit, and minor concrete resurfacing occurred. During

¹ https://elibrary.ferc.gov/eLibrary/filelist?accession_number=19990802-0450&optimized=false

² https://elibrary.ferc.gov/eLibrary/filelist?accession_number=19990511-0310&optimized=false

³ https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20080226-3008&optimized=false

construction activities, ecological flows were maintained over the dam sections that were not impacted by construction. A cofferdam was installed to divert flows away from the construction area. Otherwise, operations at the Project were maintained per the Project License.

The current LIHI certification was issued effective December 30, 2016, expiring on December 30, 2021. It was subsequently extended to May 31, 2022 and again to July 31, 2022. The certification includes the following condition:

- Condition 1. The owner shall consult with the Vermont Department of Environmental Conservation to determine appropriate procedures to verify Run-of-River (RoR) operations at the Vergennes facility. Within 180 days after certification, the owner shall provide LIHI with documentation describing the agreed-upon procedures and then implement those procedures within the first year of LIHI certification. In the first annual compliance report to LIHI, the owner shall summarize the initial results from RoR verification. If RoR verification activities continue beyond the first year of certification, then the owner shall report on the results annually.

Following consultation with the agency, the Applicant provided Vermont DEC with a proposed monitoring protocol for Vergennes operations on May 10, 2018, as well as March 2017 - September 2017 operations data. Vermont DEC approved of the protocol on August 22, 2018. Within the approved protocol, the Applicant committed to submitting operations data to VDEC four times a year for a year starting in May 2018 and ending in May 2019. The Applicant submitted May 2018 - July 2018 operations data on October 3, 2018, August 2018 – October 2018 operations data on January 2, 2019, and November 2018 – January 2019 data and February 2019 – May 2019 data on February 14, 2020. LIHI deemed the condition satisfied in 2020.

VII. PUBLIC COMMENT RECEIVED OR SOLICITED BY LIHI

The application was posted for public comment on April 6, 2022, and the notice was forwarded to agencies and stakeholders listed in the application. The deadline for submission of comments was June 5, 2022. No formal comments were submitted. Based on the completeness of the application and documents available on the FERC elibrary, I did not need to contact resource agencies.

VIII. 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 correctly selected Standard A-1, Not Applicable/ De Minimis Effect for the Impoundment Zone and Standard A-2, Agency Recommendation for the Bypass Reach Zone. For reasons discussed below, this review disagrees with the selected standard of A-1, Not Applicable/ De Minimis Effect for the Downstream Zone and finds Standard A-2, Agency Recommendation to be more appropriate.

Otter Creek originates in East Dorset, Vermont, extends approximately 100 miles to Lake Champlain, and its basin has a total drainage area of about 936 miles. At the Vergennes Dam the river drains approximately 873 square miles. The normal impoundment elevation is maintained within 0.5 feet of 134.28 feet NGVD.

The Project operates in a run-of-river mode in accordance with FERC License Article 401 and Condition A of the Vermont DEC WQC and releases seasonal minimum flows over the spillway into the bypass flows in accordance with License Article 403 and WQC Condition B. The License allows for temporary deviations from run-of-river operations and minimum flows due to operating emergencies or with prior approval of resource agencies for planned temporary modifications. FERC must be notified within 10 days of these events.

Impoundment water surface elevation is measured continuously with a pressure sensor deployed in the impoundment that transmits data to the automated control system in Plant 9. When the impoundment needs to be refilled following flashboard installation or other agency-approved construction events, up to 10% of project inflow can be placed in storage. To ensure adequate flow below the project during refill, the refill is limited to 1 inch per hour, unless a slower refill is required to allow the Project to pass 90% of inflow. These refill procedures were developed in the Applicant's Monitoring and Operations Plan required by Article 404 which was filed with FERC on March 1, 2000 and approved by FERC on August 9, 2000.

License Article 403 requires the Applicant to release the following seasonal minimum flows shown in Table 1 below for the protection and enhancement of aesthetic and recreational resources. The minimum flows are passed through orifices at the bottom of the flashboards. The application notes that these flows were determined by a demonstration study with a team composed of representatives from the Vermont Agency of Natural Resource (Vermont ANR), Vermont DEC, the City of Vergennes, and the Applicant. The study team evaluated the effect of various flows over Vergennes Falls based on the dimensions of sound, exposed rockface, and

veil effect. The study team was divided in its opinion of the higher target flows of 200 and 300 cfs; some members found that these flows were considerably better than lower flows while others did not see much difference or thought that lower flows were preferable. The study team generally agreed that the 150 cfs target flow was better for aesthetic flows than the 100 cfs target flow, though not substantially. All members thought that the target flow of 100 cfs was substantially better than the 50 cfs target flow.

Table 1. Seasonal minimum flows released over the Vergennes Spillway.

Period	Minimum Flow
April 1 through October 31	150 cfs daytime ^a and 75 cfs nighttime ^b
November 1 through December 15	100 cfs daytime and 50 cfs nighttime

a – Daytime is defined as one-half hour before sunrise to one-half hour after sunset.

b – Nighttime is defined as one-half hour after sunset to one-half hour before sunrise.

Lake Champlain backwaters to the tailrace (base of Vergennes Falls). Further studies at the time of relicensing showed that even under the lowest lake levels there were no dewatered sections of the tailrace.

Vermont DEC noted in the WQC that bypass flows provide localized habitat improvement as highly oxygenated water will exist prior to mixing with the water in the downstream channel. The entrained bubbles in that zone will also provide cover for fish. Run-of-river operations also protect mussel species and habitats downstream as demonstrated in relicensing studies.

The two powerhouses at the Project release instantaneous flows equal to inflow into the impoundment. FERC Article 402 required that the Project be managed in such a way that one generating unit of Plant 9 shall be given first priority for use of water diverted from Otter Creek during the period of April 1 through June 15 and from September 15 through November 15. This is done in order to protect preferential walleye and lake sturgeon spawning habitat in the Plant 9 side of the tailrace in the spring/summer period and landlocked Atlantic salmon spawning habitat in the fall. Because of this requirement, Standard A-2, Agency Recommendation is more appropriate for the Downstream Zone than Standard A-1, Not Applicable/ De Minimis Effect.

During the previous LIHI certification process, Vermont DEC reviewed the Project’s operations data to verify compliance with the flow requirements but due to a lack of available flashboard data, the agency could not conclude that the facility was in compliance with operational requirements. As such, the Project was certified by LIHI with the condition to consult with the Vermont DEC to determine appropriate procedures to verify run-of-river operations. On August 28, 2017, the Applicant sent Vermont DEC a draft concept on operations monitoring and on September 18, 2017, Vermont DEC provided comments and further input to enhance the monitoring procedure. The Applicant and Vermont DEC additionally followed up with a conference call on October 16, 2017, to clarify procedure needs and expectations. On May 10,

2018, the Applicant provided Vermont DEC with a proposed monitoring protocol for operations as well as March 2017 - September 2017 operations data. Vermont DEC approved of the protocol on August 22, 2018. Within the approved protocol, the Applicant committed to submitting operations data to VDEC four times a year for a year starting in May 2018 and ending in May 2019. The Applicant submitted May 2018 - July 2018 operations data on October 3, 2018, August 2018 – October 2018 operations data on January 2, 2019, and November 2018 – January 2019 data and February 2019 – May 2019 data on February 14, 2020. LIHI deemed the condition satisfied in 2020.

Since the last certification, the Applicant completed the replacement of the historic dual penstocks and twin headgates at Plant No. 9B. The purpose of this project was to replace deteriorating infrastructure to maintain the long-term operability of the Project. In addition to headgates and penstocks replacement, minor modifications were made to the powerhouse, an overhead electric transmission line was replaced with a steel galvanized conduit, and minor concrete resurfacing occurred. During construction activities, ecological flows were maintained over the dam sections that were not impacted by construction. A cofferdam was installed to divert flows away from the construction area. Otherwise, operations at the Project were maintained per the Project License. Outside of lowering and raising the headpond for the installation and removal of the cofferdam, run-of-river operations were maintained. This helped protect surrounding resources and maintain water quality at the Project.

A review of the FERC eLibrary and the Applicant’s annual compliance letters to LIHI indicated that no issues related to run-of-river operations or minimum flow releases have occurred during the previous certification period.

Based on my review of the application, supporting documentation, and publicly available information, the Project is operated in a manner such that it does not adversely affect fish and wildlife resources under its limited flow regime. As such, the Project continues to satisfy the Ecological Flow Regimes criterion.

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 Zones.

In 1999 Vermont DEC issued a Section 401 Water Quality Certificate with a finding that the Vergennes project as proposed by the Applicant and with Vermont DEC’s WQC Conditions would not cause a violation of the Vermont Water Quality Standards.

Otter Creek in the Project-affected reach is designated by the Vermont Water Resources Board as Class B waters. Class B stream reaches are managed to achieve and maintain a high level of quality compatible with certain beneficial values and uses. Values are high quality habitat for aquatic biota, fish and wildlife and water quality that consistently exhibits good aesthetic value. Class B water uses include public water supply with filtration and disinfection, irrigation and other agricultural uses, swimming, and recreation. The run-of-river operations, seasonal bypass flows over the spillway, and seasonal priority flow releases from Plant 9, required by License Articles 401, 402, 403 and WQC Condition B, all collectively support maintaining high quality habitat for aquatic biota, fish and wildlife and a water quality that consistently exhibits good aesthetic value.

Otter Creek downstream of the dam to Lake Champlain is listed in Vermont DEC’s 2020 303(d) list of impaired waters as being in need of a Total Maximum Daily Load (TMDL).⁴ The impairment is due to *E. coli* from periodic and recurring overflows at pump stations within the wastewater collection system. The Applicant generated an EPA Water Body Report for the downstream reach and included it in its LIHI application. The report lists aquatic biota, habitat, and plant life as good, but notes the reach being impaired for fish consumption due to mercury in fish tissue in addition to the *E.coli* impairment. The report lists atmospheric deposition – acidity as the unconfirmed probable source contributing to the mercury impairment and combined sewer outflows as the confirmed probable source contributing to the *E.coli* impairment.

As stated above in section A – Ecological Flow Regimes, since the last certification, the Applicant completed the replacement of the historic dual penstocks and twin headgates at Plant No. 9B. Outside of lowering and raising the headpond for the installation and removal of the cofferdam, run-of-river operations were maintained. This helped protect surrounding resources and maintain water quality at the Project.

The consistent impoundment levels, minimum bypass flows, and run-of-river operations minimize Project impacts on water quality. A review of the FERC eLibrary and the Applicant’s annual compliance letters to LIHI, indicated that no issues related to water quality have occurred at the Project during the previous LIHI certification period. However, the LIHI application included communications from Vermont DEC with a request to submit operations data for the most recent water year ending September 2021 to confirm compliance with the WQC. The Applicant indicated that they are developing the data to submit. I recommend a condition to confirm data submittal and Vermont DEC’s concurrence that requirements are being met.

Based on my review of the application, supporting documentation, and publicly available information, the Project does not appear to adversely impact water quality in the river and

⁴ https://dec.vermont.gov/sites/dec/files/documents/mp_PriorityWatersList_PartA_303d_2020.pdf

therefore continues to satisfy the Water Quality criterion with the condition recommended in Section IX.

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 Standard C-1, Not Applicable/De Minimis Effect for the Impoundment Zone. For reasons discussed below, this review finds that Standard C-4, Acceptable Mitigation is more appropriate for both the Bypass Reach and Downstream Zones than the selected Standard C-1, Not Applicable/De Minimis Effect.

The Project waters support a mix of coldwater and warmwater fish species. Lake sturgeon and landlocked Atlantic salmon migrate up to the Vergennes Dam during their spawning seasons while largemouth bass, smallmouth bass, northern pike, walleye, chain pickerel, yellow perch, brown and rainbow trout, sunfish species, and a variety of minnows reside in the Project area year-round.

There are no Project-related barriers to upstream fish passage in the impoundment zone. As such, this review finds that Standard C-1, Not Applicable/De Minimis Effect is appropriate for this zone of effect. There is no agency recommendation to support upstream fish passage at the Project. No fishway prescriptions or reservations of authority were filed under Section 18 of the FPA in the 1999 License.

As stated above in section A – Ecological Flow Regimes, the Project provides seasonal flows over the dam for aesthetics purposes in accordance with Article 403 and provides priority flows to Plant 9 in accordance with Article 402, from April 1 to June 15 to maintain preferential habitat in the tailrace for lake sturgeon and walleye and from September 15 to November 15 for Atlantic salmon. Because of these planned flow releases, this review finds that Standard C-4, Acceptable Mitigation is more appropriate for both the Bypass Reach and Downstream Zones than the selected Standard C-1, Not Applicable/De Minimis Effect.

Based on my review of the application, supporting documentation, and publicly available information, the Project continues to satisfy the Upstream Fish Passage criterion.

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 selected Standard D-1, Not Applicable/De Minimis Effect for all zones. This review finds that Standard D-3, Best Practice/Best Available Technology is more appropriate for the Impoundment Zone and Standard D-2, Agency Recommendation is more appropriate for the Bypass Reach Zone.

None of the six dams upstream of the Project have downstream fish passage facilities. There are no dams downstream of the Project on Otter Creek. There are no passage facilities at the Project or specific agency recommendations for fish passage. Downstream fish passage can occur at the Project when the flashboards are removed. There is also the potential for downstream fish passage to occur when flashboards are in place, depending on the size of the fish and the size of the gaps between the boards installed. Standard D-2 is more appropriate for the Bypass Reach Zone than Standard D-1 because the seasonal minimal flows over the spillway, determined by agency recommendations allow for downstream passage.

Downstream passage is also possible through the Project turbines however fish are at risk of impingement and injury via turbine strike when passing via this route. The potential for entrainment of residential species that wander near the intakes is minimized by the trashracks. The Plant 9 intake is equipped with trashracks with 1-inch clear spacing while Plant 9B intake is equipped with 2-inch clear spacing between bars. With 1-inch spacing the risk of impingement is higher compared to larger spacing as only minnows and juveniles of other species would likely fit through while entrainment could be higher for the larger 2-inch spacing. However, impingement and entrainment can also be avoided if a fish can swim faster than the intake approach velocity. FERC noted in its 1998 Environmental Assessment for the relicensing of the Project that water velocity upstream of the Plant 9 intake is about 1.8 feet per second and velocity upstream of the Plant 9B intake is about 2.6 feet per second. FERC concluded in its Environmental Assessment that due to the trashrack spacing and approach velocity, catchable fish in the vicinity of the Plant 9 intake would be able to avoid impingement and entrainment, but that some would be entrained at Plant 9B. FERC also concluded that any entrainment at the Project is not adversely affecting the fisheries resources in Otter Creek. Standard D-3 is more appropriate for the Impoundment Zone than Standard D-1 because the trashracks minimize the loss of riverine species.

Standard D-1 is appropriate for the Downstream Reach Zones because once in this zone there are

no Project-related barriers to further downstream movement.

Based on my review of the application, supporting documentation, and publicly available information, the Project continues to satisfy the Downstream Fish Passage and Protection criterion.

E. SHORELINE AND WATERSHED PROTECTION

Goal: The Facility has demonstrated that enough 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 zones.

The FERC Project boundary covers approximately 7 acres of land and approximately 133 acres of water. The Project has a gross reservoir volume of 200 acre-feet. The Project sits on natural falls approximately 7.6 miles upstream of Lake Champlain. There are no lands of ecological significance. The areas surrounding the Impoundment, Bypass Reach, and Downstream Zones consists of areas of low, medium, and high intensity development, developed open space, deciduous forest, evergreen forest, mixed forest, woody wetlands, and open water. Mixed industrial, and commercial buildings, and housing are spaced on both sides of the river within the City of Vergennes.

The Project is not required to have, nor does it have a shoreline management or similar plan. The run-of-river operations and consistent impoundment water surface elevations minimize the potential for the Project to negatively affect the shoreline.

A review of the FERC's eLibrary and the Project's annual compliance letters to LIHI since 2017 indicated that no violations related to the shoreline and watershed protection criterion have occurred. Some shoreline erosion has and continues to occur as documented in the annual Cultural Resources Management Plan (CRMP) reports, however these sites are managed under the FERC-approved CRMP.

Based on my review of the application, supporting documentation, and publicly available information, the Project's operations sufficiently protect shoreline and watershed lands. Therefore, the Project continues to satisfy the Shoreline and Watershed Protection criterion.

F. THREATENED AND ENDANGERED SPECIES PROTECTION

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

Assessment of Criterion Passage: The Applicant appropriately selected Standard F-2, Finding of No Negative Effect, for all Zones.

A USFWS IPaC report generated by the Applicant on October 13, 2021, included the federally-endangered Indiana bat and the federally-threatened Northern long-eared bat. No critical habitat is present for either species in the Project area.

State-listed species that may occur at the Project include the following state endangered species: Indiana bat, Northern long-eared bat, lake sturgeon, black sandshell, fragile papershell, pink heelsplitter, pocketbook mussel, giant floater, creeping love-grass, green dragon, mudpuppy, silvery lamprey, eastern sand darter, channel darter, fluted-shell, silver redhorse, three-parted beggar's ticks, and red-root flat-sedge.

The Project adheres to the US Fish and Wildlife Service 4(d) rule and would consult with resource agencies if any tree cutting must occur at the Project so that impacts are minimized. According to Vermont ANR's Natural Resource Atlas, there are no known Indiana bat hibernacula within the project boundary and the nearest hibernacula are upstream in Brandon, VT.

The Project operates in a run-of-river mode and provides flows for the protection of lake sturgeon from April 1 to June 15, therefore operations are not anticipated to negatively affect lake sturgeon. Regarding the state listed mussel species, Vermont ANR commented during the FERC relicensing process that the conversion of operations from peaking to run-of-river would adequately address concerns related to mussels downstream. FERC staff arrived at the same conclusion in the 1998 Environmental Assessment.

A review of the FERC eLibrary and the annual compliance filing to LIHI indicated that no issues related threatened and endangered species have occurred during the previous certification period.

Based on my review of the application, supporting documentation, and publicly available information, the Project continues to satisfy the Threatened and Endangered Species criterion.

G. CULTURAL AND HISTORIC RESOURCE PROTECTION

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

populations, such as Native Americans.

Assessment of Criterion Passage: The Applicant appropriately selected Standard G-2, Approved Plan, for all Zones.

The project is located within the Vergennes Historic District, which was listed in the National Register of Historic Places on September 3, 1976. The boundary of the historic district encompasses the entire complex of buildings and structures of the Vergennes Project. The penstocks and headworks structure are historically significant as contributing components of the Vergennes Project. The licensee monitors and manages the Project and any archaeological and historic structures within the Project's area of potential effect in a responsible manner and in accordance with the CRMP.

Article 405 of the FERC license required the Applicant to implement the Programmatic Agreement between FERC, the Advisory Consul on Historic Preservation, and the Vermont State Historic Preservation Office (SHPO) which included development of a CRMP for the Project. The CRMP was submitted to FERC on August 2, 2000, and approved by FERC on January 8, 2001, with the additional requirement to file annual reports on activities conducted under the plan with FERC and the SHPO. A summary of the major findings of these annual monitoring reports is provided in the LIHI application. The archaeologist found the riverbanks in the lower half of the Project continue to be healthy and stable because they support well developed riparian buffer zones. The 2021 annual report identified the VT-AD-496 area in Weybridge as a location of moderate to severe erosion, with approximately 400 meters of the western left bank of Otter Creek being impacted. To preserve archaeological information threatened by erosion documented at this site, a Phase IB study was conducted on behalf of the Applicant. Additionally, the historic Brittal Azra Stow Cemetery, European American site VT-AD-1121 in Weybridge suffered slope failure roughly 50 meters to the northwest of the shoreline on May 14, 2018. Riparian growth still protects this shoreline, but evidence of the bank failure is visible from the river. Minor erosion related to livestock access, cropland, and water level fluctuations was observed downstream of the Weybridge and New Haven town boundaries in the lower section of the Vergennes impoundment, but the clay soils that form the Otter Creek shorelines and the healthy riparian buffers that they support have protected the known and potential archaeological information that they contain. No exposed soils were observed in the vicinity of previously identified archaeological sites along the lower section of the Vergennes Project during the 2021 inspection. For the locations with noted erosion, the Proposed Management Actions to be undertaken include monitoring the Project shoreline, with specific attention given to locations near known archaeological sites. Future monitoring actions will evaluate and compare conditions at locations where erosion was observed in the past.

Since the last certification, the Applicant completed the replacement of the historic dual penstocks and twin headgates at Plant No. 9B. To ensure that cultural and historic resources

were preserved with this project, the Applicant consulted with the SHPO before and throughout the replacement process. On July 27, 2018, a third-party consultant provided a Memorandum of Agreement (MOA) between the SHPO and the Applicant, executed on June 29, 2018. Pursuant to the MOA, the required photo documentation and video documentation were completed and accepted by the SHPO, prior to the removal of the penstocks, headgates, and their associated features. On April 16, 2018, and June 5, 2018, the Applicant submitted plans and specifications, a quality control and inspection program, and a temporary construction emergency action plan for the Vergennes 9B penstock replacement and intake modernization project. FERC replied with approval to proceed with the project work on July 3, 2018.

Based on a review of the application, supporting documentation, and publicly available information, the Project continues to satisfy the Cultural and Historic Resource Protection criterion.

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-2, Agency Recommendations for all zones.

No fee is charged for public access to recreational facilities at the Project. Recreational resources include boat access, portage routes, picnic areas, and interpretative signage (Figure 7). The Project’s Recreation Plan was developed to provide improved boat access, parking, portage routes, picnic tables, and landscaping improvements. The primary recreational uses in the Project area include shoreline and boat fishing, motor boating, canoeing, picnicking, hiking, and sightseeing.

Article 406 required the Applicant to develop and file a Recreation Plan for the enhancement of recreational facilities at the Project. The Recreation Plan was approved on August 24, 2000 and provided for improvements including: (1) directional and interpretive signs for recreation in the Project area; (2) improved access for small boats and parking at Settler’s Park; (3) improved trail, shoreline fishing access, vegetative plantings, and picnic area along the western bank near Plant 9; (4) construction of a disabled-accessible fishing platform on the western bank near Plant 9; (5) installation of portable toilet facilities, including accessible facilities; and (6) installation of signs interpreting the history of Vergennes Falls and the surrounding historic structures.

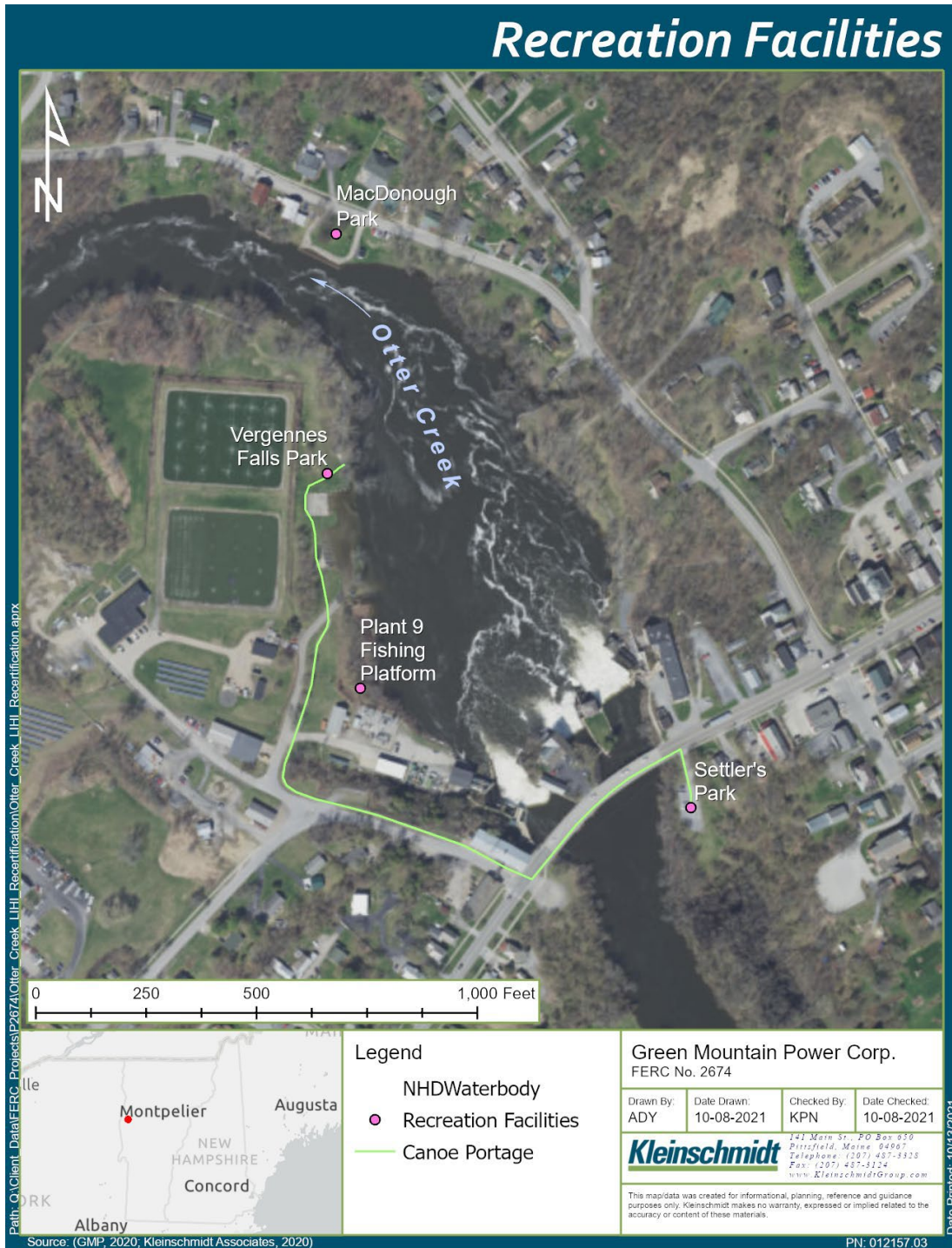


Figure 7 – Recreation Facility at the Vergennes Project.

FERC notes in its 2015 Environmental Use and Public Inspection Report⁵ that considerable progress had been made over the prior decade in the implementation of the Recreation Plan and all recreational facilities were complete. FERC staff also noted during the inspection that the boat ramp needed repair and that a missing interpretative sign needed replacement. Repairs to the boat ramp were completed in December 2015. On June 6, 2016, the Applicant filed a letter and photo evidence to show that the missing interpretative had been re-installed. The Applicant filed its revised Public Safety Plan with FERC on August 27, 2019, that includes all safety signage, warning sirens, safety fencing, and life rings to ensure public safety for recreational users at the Project.

A review of the FERC eLibrary indicated that no issues related to recreation have occurred during the FERC licensing period.

Based on my review of the application, supporting documentation, and publicly available information, the Project continues to satisfy the Recreational Resources criterion.

IX. GENERAL CONCLUSIONS AND REVIEWER RECOMMENDATION

Based on my review, I believe that the Project continues to meet the requirements of Low Impact Certification and recommend it be recertified for a ten-year period with the following condition:

- **Condition 1:** The facility Owner shall confirm submittal of operations data as requested by Vermont DEC within 60 days of the submittal. In annual compliance statements to LIHI, until the agency has concurred that facility operations continue to meet WQC requirements, the Owner shall provide an update on the status of this review and copies of all operations data related agency correspondence.

⁵ [20150818-3054](#)