APPLICATION OF BARTON VILLAGE HYDRO TO THE LOW IMPACT HYDROPOWER INSTITUTE

FERC PROJECT NO. 7725

FEBRUARY 2019



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I. INTRODUCTION

OVERVIEW OF BARTON VILLAGE HYDRO

The Barton Village Hydroelectric Project (Project) is located on the Clyde River in the Northeast Kingdom of Vermont. Originally constructed in the 1890's, it has a nameplate generation capacity of 1.4 MW, and generates approximately 4.2 million kWh per year. As shown in Figure 1, the Project is in the Town of Charleston, which is approximately ten miles south of the United States-Canada border and fifteen miles northeast from Barton Village. From Barton Village, it can be reached by following Routh 16 east to US 5A north to where it intersects with US 105.

The Clyde River is a tributary to Lake Memphremagog, and lies within the St. Lawrence River watershed. (See Figure 2) It originates in Warrens Gore (elevation 1,350 feet mean sea level (MSL)) as the Pherrins River, and becomes known as the Clyde River at the convergence of the Pherrins with Oswegatchie Brook in the Town of Brighton. The Project is located at River Mile (RM) 11.3, between Pensioner Pond and Charleston Pond (also known as Lubber Lake).

The Clyde River basin at the project site has a watershed area of approximately 108 square miles, and the river flows northwesterly for approximately twenty more miles to Lake Memphremagog in Newport, Vermont. It includes two headwater impoundments, Seymour Lake and Echo Pond, which are located on an unnamed tributary. This tributary drains from the north and joins the Clyde River approximately six miles upstream from the Town of West Charleston. Seymour Lake, which is a natural lake with a man-made outlet structure, is 1,350 feet upstream from Echo Pond. Echo Pond is also a natural lake regulated by a man-made outlet structure.

Figure 1: Charleston, Vermont



There are two other hydroelectric developments located along the Clyde River. (see Figure 2). The Clyde River Hydroelectric Project (FERC No. 2306) is owned by Gravity Renewables, and consists of the West Charleston (0.675 MW) and Newport (4 MW) sites, located at river miles 10.8 and 1.2 respectively. The combined installed capacity of these projects is 4.675 MW. The Barton Village Hydroelectric Project is approximately 0.5 miles upstream of the West Charleston project and approximately 5.5 miles downstream of the confluence of the unnamed tributary and the Clyde River.

A Federal Energy Regulatory Commission (FERC) license for the Project was issued on June 9, 2004, with an effective date of October 2, 2004. A corresponding Vermont Water Quality Certification (WQC) was issued on May 19, 2003. The FERC license and WQC both require run-of-river operation of the Project.



Figure 2: Clyde River Watershed (FERC 1996)



Figure 2.1 Clyde River Watershed: View 2

PROJECT SITE PLAN AND AERIAL VIEWS

Barton Village's land ownership at the project consists of approximately ten acres. The land is located just below the Routh 105 bridge and extends downstream along the easterly and westerly sides of the Clyde River to Charleston Pond. Pensioner Pond Dam, the Great Falls of Clyde, and the project tailrace are all located within the project lands.





The bypassed reach associated with the Project is a significant natural falls. Known as the Great Falls of the Clyde, it is depicted on the cover page, and is characterized by a large vertical-walled limestone gorge with several waterfalls. As shown in Project Site Plan and Aerial Views

Barton Village's land ownership at the project consists of approximately ten acres. The land is located just below the Routh 105 bridge and extends downstream along the easterly and westerly sides of the Clyde River to Charleston Pond. Pensioner Pond Dam, the Great Falls of Clyde, and the project tailrace are all located within the project lands.

Figure 3, Pensioner Pond dam is located at the head of the falls, and the Project penstock lies along the east side of the gorge while the powerhouse is situated at the base of the falls. Beginning at the dam, there is a 200-foot long low-angle cascade, followed by a twenty-foot falls.



Figure 4: Aerial Views - Barton Village Hydroelectric Project

FACILITY DESCRIPTION & SPECIFICATIONS

Approximately 800 feet of the Clyde River is bypassed by the Project as shown in Figure 5, and it consists of the following existing facilities:

- 1. a 77-foot-long, 24-foot-high masonry and concrete gravity dam;
- 2. a 187-acre impoundment (Pensioner Pond) at a normal elevation of 1141.25 feet msl;
- 3. a 665-foot-long, 7-foot-diameter steel penstock;
- 4. two 105-foot-long, 5.5 and 5.8-footdiameter steel penstocks leading to:
- 5. a powerhouse containing two turbine/generating units with a total installed capacity of 1.4 MW; and
- 6. two tailraces.¹

The powerhouse contains two Francis turbines with a total installed capacity of 1,400 kw. The primary water conveyance structure at the dam is the flashboard topped spillway with a total length of approximately fifty-three feet (short section 94" + long section of 500.5" = 49.54 feet).

In addition, the west gate structure consists of three conveyances that allow water to pass into the bypass reach as well. These conveyances include a five-foot by five-foot low-level slide gate with a manual hoist. The sill elevation of the gate is approximately 1,131.94 feet, mean sea level (msl).

Figure 5: Project Site & River Bypass



Directly above the slide gate, there are two flashboard spanning arched openings. There is a five-foot-wide by five-foot-high opening and a smaller one point nine (1.9) foot wide by five-foot-high opening.

¹ Please see Appendix A.1.2 - Initial Consultation Document, Sections 2 and 3 for a detailed description of the facility with maps and diagrams.



Figure 6: Principle Project Works



PROJECT OPERATION

Barton Village employs an automation system to control and record operation of the project. The automation system is a hybrid system with both mechanical relays and a series of PLCs connected to an Human Machine Interface (HMI). The HMI enables remote login, programming and recording of key parameters such as pond level and unit power level. The control system automation routines continuously monitor the pressure transducer measured water level in front of the trash rack at the dam and makes adjustments in wicket gate position to load/unload the turbines under the constraint that the dam level be maintained at the minimum setting of 1,141.25 feet MSL. The pressure transducer is regularly calibrated using a staff gauge located close to the stilling well enclosed pressure transducer at the dam. Trip alarms are issued by the automation system to dispatch when a unit trips from any number of conditions including low dam water level, high bearing temperature, low cooling water flow rate or loss of grid frequency/voltage.

FACILITY DESCRIPTION INFORMATION

Information Type	Variable Description	Response (and reference to further details)
Name of the Facility	Facility name	Barton Village Hydroelectric Project
	River name (USGS proper name)	Clyde River
	River basin name	Clyde River Basin
T	Nearest town, county, and state	Charleston, Orleans, Vermont
Location	River mile of dam above next major river	11.3
	Geographic latitude	44.887286
	Geographic longitude	-72.055550
	Application Contact Names	
	- Facility Owner	Evan Riordan, Barton Village
Facility Owner	- Operating affiliate (if different from owner)	Not applicable
	- Representative in LIHI certification	Shawn Enterline, Vermont Public Power Supply Authority
Regulatory	FERC Project Number (e.g., P-xxxxx), issuance and expiration dates	 FERC No. 7725 Issuance Date: June 09, 2004 Expiration Date: October 31, 2043
Status	FERC license type or special classification (e.g., "qualified conduit")	"Subsequent License"

Table 1: Facility Description Information for Barton Village Hydro Project

Information Type	Variable Description	Response (and reference to further details)
	Water Quality Certificate identifier and issuance date, plus source agency name	 Water Quality Certification, May 19th, 2003 by; Vermont Department of Environmental Conservation, Water Quality Division
	Hyperlinks to key electronic records on FERC e-library website (e.g., most recent Commission Orders, WQC, ESA documents, etc.)	• Please refer to the Appendix for copies of the most recent key documents.
	Date of initial operation (past or future for operational applications)	• 1895
	Total name-plate capacity (MW)	• 1.400 MW
	Average annual generation (MWh)	 4,272,975 kWh 10-year average 2008-17
	Number, type, and size of turbines, including maximum and minimum hydraulic capacity of each unit	 Two Francis turbines Max Capacity: Turbine 1 = 145 ft^3/sec (est.) Turbine 2 = 122.5 ft^3/sec (est.) Min Capacity: Turbine 1 = 4 ft^3/sec (est.) Turbine 2 = 4 ft^3/sec (est.)
Power Plant Characteristics	Modes of operation (run-of-river, peaking, pulsing, seasonal storage, etc.)	• Run of River
	Dates and types of major equipment upgrades	 Powerhouse Control System Upgrade (1990s) Control System Upgrade (2011) Control System Upgrade (2017) Mechanical Rebuild of Unit #2 (2008)
	Dates, purpose, and type of any recent operational changes	 Fish Passage Installation (2015) Fish Passage Elbow Installation (2018) Sluice Gate Repair (2018) Pond Level Gauge Installation (2018) Stilling Well Cleaning and Transducer Calibration.²
	Plans, authorization, and regulatory activities for any facility upgrades	• Lower Penstock: We anticipate replacing it when funding becomes available.

² <u>https://elibrary.ferc.gov</u>, Supplemental Information of BARTON VILLAGE ELECTRIC DEPARTMENT under P-7725. "Stilling Well Cleaning and Transducer Calibration"

Information Type	Variable Description	Response (and reference to further details)
	Date of construction	• 1894. Original construction.
	Dam height	• 24 feet
	Spillway elevation and hydraulic capacity	• 1,141 ft MSL
	Tailwater elevation	• 1,064 ft MSL
Characteristics of Dam, Diversion, or Conduit	Length and type of all penstocks and water conveyance structures between reservoir and powerhouse	 <u>Spillway:</u> The primary water conveyance structure at the dam is the flashboard topped spillway with a total length of approximately fifty-three feet (short section 94" + long section of 500.5" = 49.54 feet). <u>Gate:</u> The west gate structure consists of three conveyances that allow water to pass into the bypass reach as well. These conveyances include a five-foot by five-foot low- level slide gate with a manual hoist. The sill elevation of the gate is approximately 1,131.94 feet, mean sea level (msl). <u>Penstock</u>: 665-foot-long, 7-foot-diameter steel <u>Penstock</u>: Two 105-foot-long, 5.5 and 5.8-foot- diameter steel penstocks
	Dates and types of major, generation-related infrastructure improvements	 Powerhouse Control System Upgrade (1990s) Control System Upgrade (2011) Control System Upgrade (2017) Mechanical Rebuild of Unit #2 (2008)
	Designated facility purposes (e.g., power, navigation, flood control, water suppy, etc.)	• Power
	Water source	• Clyde River at Pensioner Pond, a 187-acre impoundment at a normal elevation of 1,141.25 feet msl;
	Water discharge location or facility	West Charleston Pond
Characteristics of Reservoir and Watershed	Gross volume and surface area at full pool	• <u>Volume</u> : Gross storage capacity of 560 acre- feet; net storage capacity of 187 acre-feet (see "Initial Consultation Document" section 2-1 for further information)

Information Type	Variable Description	Response (and reference to further details)
		• <u>Surface Area</u> : 187 acres at elevation 1,140.9 ft mean sea level
	Maximum water surface elevation (ft. MSL)	• As a run of river facility, there is no managed maximum water surface elevation.
	Maximum and minimum volume and water surface elevations for designated power pool, if available	• As a run of river facility, there is no managed maximum water surface elevation.
	Upstream dam(s) by name, ownership, FERC number (if applicable), and river mile	• None.
	Downstream dam(s) by name, ownership, FERC number (if applicable), and river mile	 West Charleston, Gravity Renewables, FERC No 2306, RM 10.8 Newport, Gravity Renewables, FERC No 2306, RM 1.2
	Operating agreements with upstream or downstream reservoirs that affect water availability, if any, and facility operation	• No operating agreements are in place.
	Area inside FERC project boundary, where appropriate	• 10 acres
	Average annual flow at the dam	 297.5 ft³/sec (1997-2017) Source: USGS 04296500, Clyde River at Newport, VT
Hydrologic Setting	Average monthly flows	 Jan - 269 ft^3/sec (1997-2017) Feb - 172 ft^3/sec (1997-2017) Mar - 299 ft^3/sec (1997-2017) Apr - 735 ft^3/sec (1997-2017) May - 451 ft^3/sec (1997-2017) Jun - 303 ft^3/sec (1997-2017) Jul - 212 ft^3/sec (1997-2017) Aug - 172 ft^3/sec (1997-2017) Sep - 144 ft^3/sec (1997-2017) Oct - 232 ft^3/sec (1997-2017) Nov - 282 ft^3/sec (1997-2017) Dec - 304 ft^3/sec (1997-2017) Source: USGS 04296500, Clyde River at Newport, VT
	Location and name of relevant stream gauging stations above & below the facility	• USGS #04296500, Newport, VT
	Watershed area at the dam	• 108 acres

Information Type	Variable Description	Response (and reference to further details)
	Number of zones of effect	• Three
	Upstream and downstream locations by river miles	• Please refer to Section II – Zones of Effect & Criteria Selection for an estimate of the locations by river mile.
	Type of waterbody (river, impoundment, by-passed reach, etc.)	• The project includes two ponds (one of which is an impoundment), a bypass reach, and the Clyde River.
Designated	Delimiting structures	 Please refer to Section II – Zones of Effect & Criteria Selection for a discussion of the delimiting structures.
Designated Zones of Effect	Designated uses by state water quality agency	 According to items 28 and 29 of the WQC, The waters of the Clyde River are designated cold water fish habitat for the protection and management of fisheries. (Standards, Section 3-05) Class B waters 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 a water quality that consistently exhibits good aesthetic value; uses are public water supply with filtration and disinfection, irrigation and other agricultural uses, swimming, and recreation. (Standards, Section3-04(A)).
Additional	Names, addresses, phone numbers, & e-mail for local state and federal resource agencies	• Please refer to the Contacts Form
Information	Names, addresses, phone numbers, & e-mail for local non-governmental stakeholders	• Please refer to the Contacts Form
Photographs and	Photographs of key features of the facility and each of the designated zones of effect	• Please refer to Figures 3 – 8.
Maps	Maps, aerial photos, and/or plan view diagrams of facility area and river basin	• Please refer to Figure 2-7.

II. ZONES OF EFFECT & CRITERIA SELECTION

The Project includes three zones of effect (ZoE) which are numbered from upstream to downstream.

Zone 1: Impoundment

- Starting at the southernmost point of Pensioner Pond.
- Ending at the Project's dam on the Clyde River.
- Estimated Dimensions
- River Distance = 1.4 miles
- Waterbody Perimeter = 3 miles
- Area = 187 acres

Zone 2: Bypassed Reach

- Starting immediately downstream of the Project's dam on the Clyde River,
- Ending at the end of the tail race.
- Estimated Dimensions
- River Distance = 800 feet
- Waterbody Perimeter = 1,600 feet
- Area = 10 acres

Zone 3: Downstream Reach

- Starting immediately downstream of the Project's tail race to and including West Charleston Pond.
- Ending at the Clyde River Project's West Charleston dam.
- Estimated Dimensions
- River Distance = 3,000 ft
 Waterbody Perimeter = 1.4 miles
- Area = 41 acres



ZONE 1 CRITERIA

	Criterion	1	2	3	4	Plus
А	Ecological Flow Standards		~			
В	Water Quality Standards		~			
С	Upstream Fish Passage Standards	~				
D	Downstream Fish Passage Standards		~			
Е	Shoreline and Watershed Protection Standards	~				
F	Threatened and Endangered Species Standards		~			
G	Cultural and Historic Resources Standards		~			
Н	Recreational Resources Standards		~			

Table 2: Selected LIHI Standards Selected for Zone of Effect No. 1

ZONE 2 CRITERIA

Table 3: LIHI Standards Selected for Zone of Effect No. 2

	Criterion	1	2	3	4	Plus
А	Ecological Flow Standards		>			
В	Water Quality Standards		>			
С	Upstream Fish Passage Standards		~			
D	Downstream Fish Passage Standards		>			
Е	Shoreline and Watershed Protection Standards	~				
F	Threatened and Endangered Species Standards		>			
G	Cultural and Historic Resources Standards		~			
Н	Recreational Resources Standards		~			

ZONE 3 CRITERIA

	Criterion	1	2	3	4	Plus
А	Ecological Flow Standards		>			
В	Water Quality Standards		>			
С	Upstream Fish Passage Standards		~			
D	Downstream Fish Passage Standards		~			
Е	Shoreline and Watershed Protection Standards	~				
F	Threatened and Endangered Species Standards		~			
G	Cultural and Historic Resources Standards		~			
Н	Recreational Resources Standards		~			

Table 4: LIHI Standards Selected for Zone of Effect No. 3

III. CRITERIA DISCUSSION

ECOLOGIAL FLOWS

Criterion A.2 – Agency Recommendation was selected for all three zones.

Criterion	Standard	Instructions
A	2	 Agency Recommendation (see Appendix A for definitions): Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally stringent). Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is or is not part of a Settlement Agreement. Explain how the recommendation relates to agency management goals and objectives for fish and wildlife. Explain how the recommendation provides fish and wildlife protection, mitigation and enhancement (including in-stream flows, ramping and peaking rate conditions, and seasonal and episodic instream flow variations).

Table 5 – Information Required to Support Ecological Flow Standards

ZONE 1 DISCUSSION

- Sources
 - Appendix A.1.1 FERC License Order P-7725: Order Issuing Subsequent License, Project No. 7725, FERC, June 9, 2004
 - Appendix A.3 Water Quality Certification: Barton Village Hydroelectric Project, Vermont Department of Environmental Conservation, May 19th, 2003
 - o Appendix A.9 Letter of Support: Vermont Agency of Natural Resources, December 2018
- Discussion
 - "The waters of the Clyde River are designated cold-water fish habitat for the protection and management of fisheries." [WQC Section 29]
 - "The Clyde River basin contains a diversity of recreationally important fishery resources in lake and riverine habitats. In addition to its resident fish populations, the river supports spawning runs of Atlantic salmon, brown and rainbow trout, walleye, yellow perch, and suckers, contributing significantly to those lake populations." [WQC Section 48]
 - "Under the Class B criterion for aquatic biota, wildlife and aquatic habitat, the Standards require "[n]o change from the reference condition that would prevent the full support of aquatic biota, wildlife, or aquatic habitat uses. Biological integrity is maintained, and all expected functional groups are present in a high-quality habitat. All life-cycle functions,

including overwintering and reproductive requirements are maintained and protected." [WQC Section 33]

• Fish and wildlife protection, mitigation and enhancement are accomplished by operating the Project in a true run-of-river mode, as required by Condition B (page 19) of the Vermont Water Quality Certification,

"Flow and Water Level Management. Except as provided in Condition C below, the facility shall be operated in a true run-of-the-river mode (see footnote 1, p. 4). When the facility is not operating, all flows shall be spilled at the dam. A flow of 45 cfs, or inflow if less, shall be released into the bypass at all times."

• Condition C on page twenty of the WQC also includes a 90%/10% impoundment refill requirement that protects fish and wildlife. Specifically,

"When restoring the elevation of Pensioner Pond after replacement of failed flashboards, or an approved drawdown related to dam maintenance or an emergency, the applicant shall release at least 90 percent of instantaneous inflow below the project. While the pond is being refilled, bypass flow requirements shall be met at all times."

• In its December 2018 support letter, the Vermont Agency of Natural Resources affirmed that the Project is in compliance with its water quality certification (WQC) and LIHI criteria. Specifically,

"Barton Village completed repair work on the low-level sluice gate at the project in fall 2018. These investments will allow the project to operate in full compliance with the certification."

• The scientific and technical basis for the aforementioned requirements are explained in the 'Other Issues' section of the FERC Order Issuing Subsequent License.

"Barton Village proposes that the minimum flows in the bypassed reach would be increased to a continuous 45 cfs or inflow to Pensioner Pond, whichever is less. FWS and Vermont ANR recommend the same minimum flow release proposed by Barton Village. Because the minimum flow would be increased from the current level of 21 cfs from June 15 to September 15, and 10 cfs at all other times of the year, the water quality in the bypassed reach and downstream of the project in the Clyde River would likely be improved over those experienced under the current conditions."

"Increased flows in the bypassed reach would likely improve dissolved oxygen levels downstream of the project as flows are spilled over the dam's crest and through increased turbulence and rapids within the bypassed reach. Additionally, the increased volume of water within the bypassed reach would likely reduce warming during the summer months by lessening the effect of solar radiation. Larger volumes of water require greater amounts of solar energy than do smaller amounts of water to accomplish the same amount of thermal warming. For these reasons, we believe that Barton Village's proposal would protect and enhance the water quality of the Clyde River downstream of the project. Article 401 requires the release into the bypassed reach of a minimum flow of 45 or the inflow to Pensioner Pond, whichever is less."

ZONE 2 DISCUSSION

- Sources
 - Appendix A.1.1 FERC License Order P-7725: Order Issuing Subsequent License, Project No. 7725, FERC, June 9, 2004
 - Appendix A.3 Water Quality Certification: Barton Village Hydroelectric Project, Vermont Department of Environmental Conservation, May 19th, 2003
 - o Appendix A.9 Letter of Support: Vermont Agency of Natural Resources, December 2018
- Discussion
 - The same discussion points in Zone 1 are applicable to Zone 2.
 - Although much of the bypass consists of steep riffle habitat, habitat in the bypass is very heterogeneous. As a result, a habitat-flow study was conducted in the project bypass to determine flow needs for aquatic life. The methodology and results of this study are outlined in sections 57-68 of the WQC, and culminate in the following statement in section 69,

"Overall, much of Transect 1 and part of Transect 2 are too shallow for the target organisms. [brown trout and landlocked salmon] Channel structure is complex and heterogeneous, and velocities tend to be a mix at all measured flows."

As a result, fish and wildlife protection, mitigation and enhancement are not required by the WQC in the bypassed reach.

• Finally, according to section 55 (page 9) of the WQC, "a substantial amount of salmonoid spawning is not anticipated in the bypass due to the coarse nature of the substrate." As a result, fish and wildlife protection, mitigation and enhancement are not necessary for this species in the bypassed reach.

ZONE 3 DISCUSSION

- Sources
 - Appendix A.1.1 FERC License Order P-7725: Order Issuing Subsequent License, Project No. 7725, FERC, June 9, 2004
 - Appendix A.3 Water Quality Certification: Barton Village Hydroelectric Project, Vermont Department of Environmental Conservation, May 19th, 2003
 - o Appendix A.9 Letter of Support: Vermont Agency of Natural Resources, December 2018
- Discussion
 - The same discussion points in Zone 1 are applicable to Zone 3.
 - In addition, the downstream reach should be unaffected by the Project because of its true run-of-river mode of operation.

WATER QUALITY

Criterion B.2 – Agency Recommendation was selected for all three zones.

Table 6 – Information Required	l to Support Water Quality Standards
--------------------------------	--------------------------------------

Criterion	Standard	Instructions
В	2	 Agency Recommendation: If facility is located on a Water Quality Limited river reach, provide an agency letter stating that the facility is not a cause of such limitation. Provide a copy of the most recent Water Quality Certificate, including the date of issuance. Identify any other agency recommendations related to water quality and explain their scientific or technical basis. Describe all compliance activities related to the water quality related agency recommendations for the facility, including on-going monitoring, and how those are integrated into facility operations.

ZONE 1 DISCUSSION

- Sources:
 - Appendix A.3 Water Quality Certification: Barton Village Hydroelectric Project, Vermont Department of Environmental Conservation, May 19th, 2003
 - Appendix A.6 Impound Flow Management Plan: Flow Management and Impoundment/Flow Monitoring Plan, Barton Village, August 2005
 - o Appendix A.9 Letter of Support: Vermont Agency of Natural Resources, December 2018
- Discussion:
 - According to Sections 26 & 28 of the WQC,

"The Clyde River has been designated by the Vermont Water Resources Board as Class B waters. Class B waters 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 a water quality that consistently exhibits good aesthetic value; uses are public water supply with filtration and disinfection, irrigation and other agricultural uses, swimming, and recreation."

• According to Section 38 of the WQC,

"On July 15, 2002, the Department forwarded to US EPA, under Section 303(d) of the Federal Clean Water Act, a list of waters considered to be impaired based on water quality monitoring efforts. No waters affected by the project are listed."

As a result of this statement and the fact that the Project operates in a true run-of-river mode, we believe that the Water Quality criterion for this zone are met.

- Water quality compliance activities are listed in the Flow Management & Impoundment / Flow Monitoring Plan (Appendix A.6). These include requirements related to:
 - Run-of-River Operation
 - Flashboard Maintenance and Repair
 - Impoundment Refilling
 - Minimum Bypass Flows
 - Water Levels
 - Rating Curves
 - Monitoring of Water Level Elevations and Flows & Maintenance of Records

The letter of support from the VT ANR indicates that the automation and monitoring requirements of the WQC have been met.

• As a result, we believe that the project meets the criterion for this zone.

ZONE 2 DISCUSSION

- Sources:
 - Appendix A.3 Water Quality Certification: Barton Village Hydroelectric Project, Vermont Department of Environmental Conservation, May 19th, 2003
 - Appendix A.6 Impound Flow Management Plan: Flow Management and Impoundment/Flow Monitoring Plan, Barton Village, August 2005
 - o Appendix A.9 Letter of Support: Vermont Agency of Natural Resources, December 2018
- Discussion:
 - The same discussion points in Zone 1 are applicable to Zone 2.

ZONE 3 DISCUSSION

- Sources:
 - Appendix A.3 Water Quality Certification: Barton Village Hydroelectric Project, Vermont Department of Environmental Conservation, May 19th, 2003
 - Appendix A.6 Impound Flow Management Plan: Flow Management and Impoundment/Flow Monitoring Plan, Barton Village, August 2005
 - o Appendix A.9 Letter of Support: Vermont Agency of Natural Resources, December 2018
- Discussion:
- The same discussion points in Zone 1 are applicable to Zone 3.

UPSTREAM FISH PASSAGE

Criterion C.1 – Not Applicable / De Minimis Effect was selected for Zone 1, and Criterion C.2 – Agency Recommendation was selected for Zones 2 and 3.

Criterion	Standard	Instructions
С	1	 Not Applicable / De Minimis Effect: Explain why the facility does not impose a barrier to upstream fish passage in the designated zone. Document available fish distribution data and the lack of migratory fish species in the vicinity. If migratory fish species have been extirpated from the area, explain why the facility is or was not the cause of this.
С	2	 <u>Agency Recommendation:</u> Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally stringent). Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is or is not part of a Settlement Agreement. Describe any provisions for fish passage monitoring or effectiveness determinations that are part of the agency recommendation, and how these are being implemented.

Table 7 –	Information	Required	to Support	Upstream	Fish Passage	Standards

ZONE 1 DISCUSSION

- Sources:
 - Appendix A.1.1 FERC License Order P-7725: Order Issuing Subsequent License, Project No. 7725, FERC, June 9, 2004
 - Appendix A.3 Water Quality Certification: Barton Village Hydroelectric Project, Vermont Department of Environmental Conservation, May 19th, 2003
- Discussion:
 - Once fish are past the dam and in the impoundment, there are no further project related barriers to upstream passage. As a result, we believe that the criterion for this zone are met.

ZONE 2 DISCUSSION

- Sources:
 - Appendix A.1.1 FERC License Order P-7725: Order Issuing Subsequent License, Project No. 7725, FERC, June 9, 2004
 - Appendix A.3 Water Quality Certification: Barton Village Hydroelectric Project, Vermont Department of Environmental Conservation, May 19th, 2003

- Discussion:
 - There are two dams downstream of the project; West Charleston and Newport. While the Newport project has both up and downstream fish passage, the West Charleston project has neither. As a result, the project is not the primary barrier to upstream fish passage.
 - In addition, according to the FERC license,

"By letter dated May 8, 2003, the Secretary of the Interior requested reservation of its authority to prescribe, through the U.S. Fish and Wildlife Service (FWS), the construction, operation, and maintenance of appropriate fishways at the Barton Village Hydroelectric Project."

We note that no agency has requested any fish passage requirements since 2003 when the FERC license was issued. As a result, we believe that the project complies with the criterion for this zone.

• Finally, the WQC did not identify a need for or a requirement to install upstream fish passage. Specifically, Section 70 states,

"The Department of Fish and Wildlife (VDFW) is restoring landlocked Atlantic salmon to the Clyde River. However, VDFW does not anticipate the inclusion of habitat upstream of the Barton project in this restoration."

As a result, we believe that the project is compliant with this criterion.

ZONE 3 DISCUSSION

- Sources:
 - Appendix A.1.1 FERC License Order P-7725: Order Issuing Subsequent License, Project No. 7725, FERC, June 9, 2004
 - Appendix A.3 Water Quality Certification: Barton Village Hydroelectric Project, Vermont Department of Environmental Conservation, May 19th, 2003
- Discussion:
 - The same discussion points in Zone 2 are applicable to Zone 3.

DOWNSTREAM FISH PASSAGE

Criterion D.2 – Agency Recommendation was selected for all three zones.

Table 8 – Information Required to Support Downstream Fish Passage Standards

Criterion	Standard	Instructions
D	2	 <u>Agency Recommendation:</u> Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally stringent). Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is part of a Settlement Agreement or not. Describe any provisions for fish passage monitoring or effectiveness determinations that are part of the agency recommendation, and how these are being implemented.

ZONE 1 DISCUSSION

- Sources:
 - Appendix A.1.1 FERC License Order P7725: Order Issuing Subsequent License, Project No. 7725, FERC, June 9, 2004
 - Appendix A.3 Water Quality Certification: Barton Village Hydroelectric Project, Vermont Department of Environmental Conservation, May 19th, 2003
 - Appendix A.8.1 Environmental Inspection Report Fish Passage: Environmental Inspection Report, FERC, July 2012
 - Appendix A.8.2 Environmental Inspection Report Follow Up: Environmental Inspection Follow Up, FERC, July 2016
 - o Appendix A.9 Letter of Support: Vermont Agency of Natural Resources, December 2018
- Discussion
 - According to Item 49 of the WQC, the Clyde River above Pensioner Pond is known to contain white sucker, longnose sucker, smallmouth bass, slimy sculpin, chain pickerel, brook trout, brown trout, and several minnow species. In addition, lake trout, landlocked Atlantic salmon, rainbow trout, round whitefish, burbot, rainbow smelt, largemouth bass, yellow perch, walleye, pumpkinseed, rock bass and brown bullhead are found in through downstream drift.

- According to the Flow Management Plan³, the trash rack spacing is one inch clear is installed forward of the penstock to keep fish out of the turbines.
- Procedures to maintain minimum flows into the bypassed reach were established in the Impound Flow Management Plan starting on page 4. Specifically,

"During project operation, Barton Village will release the required minimum bypass flow via an opening in the flashboards and through the low-level slide gate. The opening will be part of the downstream fish bypass-see Section 3.71. The flashboard opening will be sized to pass 25 cfs, while the remaining portion of the minimum flow (approximately 20 cfs) will be passed through the low-level slide gate.

The water level corresponding to the required minimum bypass flow will be marked on a boulder just below the dam. This mark will be used to visually confirm that the minimum flow is being provided.

When the project is not operating, the additional river flow will be allowed to spill over the flashboard crest to the bypass reach. The low-level slide gate will not be adjusted in this situation.

When inflow falls below 45 cfs, the flow through the flashboard opening would decrease accordingly. During periods of extreme low flow (flows less than approximately 20 cfs)₂, operation of the low-level slide gate will be instituted to avoid making releases at the dam that are greater than inflow, which would otherwise result in the Pensioner Pond elevation falling below 1,140.94 feet msl (the top of the flashboards)."

• Section 71 of the WQC states,

"...The project intake bar screen has 1.0-inch clear spacing, which should minimize entrainment of resident fish attempting to move downstream. A section of flashboards adjacent to the intake should be removed so that fish attempting to move downstream can do so safely. However, additional measures will be necessary to convey fish downstream without injury."

- To compy with the requirements of Section 71, Barton removed the adjacent flashboards and installed an additional fish passage with an elbow to direct the water into water of adequate depth.
- According to the support letter from VT ANR (2018),

"Barton installed the fish passage facility in 2015 and modifications to ensure safe, timely and effective downstream fish passage have been completed. Additionally, through consultation with the Department it was determine that repairs were needed to a low-level sluice gate at the dam in order to maintain the water level of Pensioner Pond during low flow periods. Barton Village completed repair work on the low-level sluice gate at the project in fall 2018. These investments will allow the project to operate in full compliance with the certification."

³ Appendix A.6 – Impound Flow Management Plan, Section 3.7 Downstream Fish Bypass, page 20 of 26

• According to the Environmental Inspection Report Follow Up (2016),

"During the inspection, it was found that the fish passage facility was installed according to the approved exhibits and functioning adequately."

• As a result, we believe that the project meets the criterion for this zone.

ZONE 2 DISCUSSION

- Sources:
 - Appendix A.1.1 FERC License Order P7725: Order Issuing Subsequent License, Project No. 7725, FERC, June 9, 2004
 - Appendix A.3 Water Quality Certification: Barton Village Hydroelectric Project, Vermont Department of Environmental Conservation, May 19th, 2003
 - Appendix A.8.1 Environmental Inspection Report Fish Passage: Environmental Inspection Report, FERC, July 2012
 - Appendix A.8.2 Environmental Inspection Report Follow Up: Environmental Inspection Follow Up, FERC, July 2016
 - o Appendix A.9 Letter of Support: Vermont Agency of Natural Resources, December 2018
- Discussion
 - The same discussion points in Zone 1 are applicable to Zone 2.

ZONE 3 DISCUSSION

- Sources:
 - Appendix A.1.1 FERC License Order P7725: Order Issuing Subsequent License, Project No. 7725, FERC, June 9, 2004
 - Appendix A.3 Water Quality Certification: Barton Village Hydroelectric Project, Vermont Department of Environmental Conservation, May 19th, 2003
 - Appendix A.8.1 Environmental Inspection Report Fish Passage: Environmental Inspection Report, FERC, July 2012
 - Appendix A.8.2 Environmental Inspection Report Follow Up: Environmental Inspection Follow Up, FERC, July 2016
 - o Appendix A.9 Letter of Support: Vermont Agency of Natural Resources, December 2018
- Discussion
 - The same discussion points in Zone 2 are applicable to Zone 3.

SHORELINE AND WATERSHED PROTECTION

Criterion E.1 – Not Applicable / De Minimis Effect was selected for all three zones.

Criterion	Standard	Instructions
Ε	1	 <u>Not Applicable / De Minimis Effect:</u> If there are no lands with significant ecological value associated with the facility, document and justify this (e.g., describe the land use and land cover within the project boundary). Document that there have been no Shoreline Management Plans or similar protection requirements for the facility.

Table 9 – Information Required to Support Shoreline and Watershed Protection Standards

BACKGROUND

According to the FERC license, "Barton Village's land ownership at the project consists of approximately 14 acres..." including ten acres at "Plunkett or Great Falls". This compares to the size of the bypassed reach (800 feet), Charleston Pond (40 acres), Pensioner Pond (187 acres), and the Clyde River basin itself, which, "drains 142 square miles of Vermont's Northeast Kingdom, spanning 2 counties and 10 towns. The basin encompasses 40 miles of river, over 35 miles of tributary, and more than 10 lakes and ponds totaling more than 4,500 acres."

The landscape within the watershed is generally rough with steeply cut stream valleys. The elevation ranges from 3,330 feet msl at the summit of Gore Mountain to 1,148 feet msl on the Clyde River floodplain. The minimum basin elevation is 682 feet msl at Newport, Vermont. The maximum drainage basin slope is 14.5 percent, while the minimum slope is 0.17 percent.

The watershed lies within two separate physiographic provinces. The headwaters are in the Northern Highlands and the western margin of the White Mountains of New Hampshire. The remaining portion of the river is in the Vermont Piedmont, which consists of a plateau dissected by streams and modified by glaciation. The predominant vegetation cover in the project area is the spruce-fir forest type.

The botanical resources in the Project vicinity are generally consistent with those communities throughout northern New England. Wooded areas consisting of red maple, cedar, poplar, spruce, and aspen are interspersed throughout the area (George Buzzell Orleans County Forester, personal communication, March 6, 2001), although nearly 74% of the land in Orleans County is forested (USFS,1977). The lands in the project vicinity are also used for agriculture (corn, hay, pasture, fallow fields). The eastern shoreline of Pensioner Pond supports low to moderate densities of mixed deciduous and coniferous species, as well as grasses, whereas grasses cover almost all of the western shoreline. Similar woody vegetation is common along the banks of the Clyde River extending to the Project dam. Mixed deciduous and coniferous species are of moderate to high density along the steep western banks of the bypass reach to the tailrace; the eastern bank of the bypass reach is characterized by interspersed woody species. The parcel adjacent (east) to the penstock is primarily covered by grass. The area including the powerhouse parcel and tailrace supports moderate to high densities of mixed deciduous and coniferous species, similar to those found along the eastern shore of Pensioner Pond.

Wetlands throughout the Project area have been included in the U.S. Fish and Wildlife Service National Wetland Inventory (NWI), and are sporadically distributed around Pensioner Pond and along the Clyde River, Project bypass reach, and Project tailrace (See Figure 2.1). The area between Toad Pond and the inlet to Pensioner Pond is classified as a palustrine forested, saturated/semi-permanent/seasonal wetland (744 acres) dominated by broad-leaved deciduous vegetation (USFWS, 1994). A palustrine scrub-shrub, seasonally flooded wetland (2.3 acres) is located along the southwest shore of Pensioner Pond. Two other wetland areas (18.6 acres) associated with Pensioner Pond are located along the north shoreline near the pond outlet. These wetlands are classified as palustrine forested, palustrine scrub shrub, and lacustrine limnetic, permanently flooded wetlands (USFWS, 1994). A wetland (2 acres) in the NWI exists along the Clyde River reach near the Route 105 bridge. The wetland near the Route 105 bridge is a palustrine emergent, saturated area.

Charleston Pond (Lubber Lake) is a lacustrine limnetic, permanently flooded wetland area. In addition, the eastern bank of Charleston Pond includes a palustrine scrub-shrub, saturated/semipermanent/seasonal wetland approximately 14 acres in size. The forested areas along the east shoreline of the pond are composed of northern hardwoods such as cedar.

The Clyde River upstream from Pensioner Pond to Toad Pond is dominated by palustrine forested, interspersed emergent wetlands that are saturated/semi-permanent/seasonal in character. The vegetation within the wetland is characterized as broad-leaved deciduous and needle-leaved evergreen species (USFWS, 1994).

ZONE 1 DISCUSSION

- Sources:
 - Appendix A.3 Water Quality Certification: Barton Village Hydroelectric Project, Vermont Department of Environmental Conservation, May 19th, 2003
- Discussion:

Barton village owns ten acres that surrounds the project as shown in Appendix A.3 – Water Quality Certification: Barton Village Hydroelectric Project, Vermont Department of Environmental Conservation, May 19th, 2003 Discussion:

Figure 9: Approximate Property Boundaries

- The adjoining land east of the property is forested, while the land west of the property is a roadway and open residential land.
- Immediately north of the project is the recreational access to the Clyde River.
- Immediately south along the Clyde River is a mixed, open agricultural land with limited residential use.

Figure 9: Approximate Property Boundaries



- While there are no protected lands adjacent to the Project, the Vermont Land Trust does hold several conversation easements in the vicinity of the project.
- There is also a Vermont Land Trust easement at the inlet and outlet to Pensioner Pond as shown in the following Figure.

Sunset Dr Ro West Charleston E-Charleston-Rd-10 Rd 5A VT-R0 Pensioner Pond Stumpt Bro

Figure 10: Conservation Easements (shown in red) in the Vicinity of the Project

• Item 78 of the WQC states that no shoreline erosion problems are attributable to the project.

- Furthermore, there is no Shoreline Management Plans described in any of the permits, orders or certificates required for operation of the facility.
- As a result, we believe that the project meets the criterion for this zone.

ZONE 2 DISCUSSION

- Sources:
 - Appendix A.3 Water Quality Certification: Barton Village Hydroelectric Project, Vermont Department of Environmental Conservation, May 19th, 2003
- Discussion:
 - The same discussion points in Zone 1 are applicable to Zone 2.

ZONE 3 DISCUSSION

- Sources:
 - Appendix A.3 Water Quality Certification: Barton Village Hydroelectric Project, Vermont Department of Environmental Conservation, May 19th, 2003
- Discussion:
 - The same discussion points in Zone 1 are applicable to Zone 3.

THREATENED AND ENDANGERED SPECIES

Criterion F.2 - Finding of No Negative Effects was selected for all three zones.

Criterion	Standard	Instructions
F	2	 Finding of No Negative Effects: Identify all listed species in the facility area based on current data from the appropriate state and federal natural resource management agencies. Provide documentation of a finding of no negative effect of the facility on any listed species in the area from an appropriate natural resource management agency.

Table 10 – Information Required to Support Threatened and Endangered Species Standards

BACKGROUND

Federally listed or proposed endangered or threatened botanical species are not known to exist in the Project area. However, a search of the VANR's Nongame & Natural Heritage Program database⁴ revealed the occurrence of Slender naiad (*Najas gracillima*), which is considered rare, near Charleston Pond (Lubber Lake). Water bur-reed (*Sparaganium fluctuans*), a rare species, and Mare's-tail (*Hippuris Vulgaris*), a state endangered species, were found to occur near Pensioner Pond. In addition, Purple bladderwort (*Utricularia purpurea*), an uncommon species, is known to occur near Pensioner Pond as well.

Currently, there are no specific wildlife management plans for the Clyde River area. Regional management plans for deer and bear are applicable to the project area; however, neither of these species are significantly affected by project operation (Citizens, 1991).

There is no federally listed or proposed endangered or threatened wildlife species known to exist in the Project area. During the Citizens relicensing proceeding, the VDFW identified the sedge wren as the only rare or endangered terrestrial species possibly occurring within the project area. The sedge wren is listed as threatened by the State of Vermont. Results of habitat studies conducted by Citizens indicate that hydroelectric project operation has little, if any, effect on the suitability of the area as breeding habitat for this species (Citizens, 1991).

Finally, no study requests were received for this resource area either during the FERC relicensing process nor since.

⁴ <u>https://vtfishandwildlife.com/conserve/conservation-planning/endangered-and-threatened-species</u>

ZONE 1 DISCUSSION

- Sources:
 - Appendix A.3 Water Quality Certification: Barton Village Hydroelectric Project, Vermont Department of Environmental Conservation, May 19th, 2003
 - The Vermont Agency of Natural Resources (ANR)
 - "Biofinder"⁵ GIS mapping site, with the added layer of "rare animals and rare plants". The yellow shaded areas indicate rare plant species. No rare animal species are indicated.
 - Nongame & Natural Heritage Program database.⁶
 - Natural Resources Atlas⁷
 - Vermont Land Trust's Protected Lands map.⁸
- Discussion:
 - The WQC, Item 75, indicates that there are no federally threatened or endangered species in the project area.
 - However, Item 77 identifies a state endangered species, the Mare's-tail, which is found along Pensioner Pond and a portion of Charleston Pond as indicated by the yellow shaded areas in Figure 11: Biofinder Map
 - The area surrounding the bypassed reach does not contain Mare's-tail, and because of the true run-of-river operation of the Project, we do not believe that the project has any negative effects on this species.
 - Since the time of the WQC, the USFWS has listed the northern long eared bat as threatened, and its range includes Orleans County⁹.
 - A search of ANR's Natural Resources Atlas did not reveal any nearby hibernacula or any special management zones as indicated in Vermont's

⁹ <u>https://www.fws.gov/midwest/endangered/mammals/nleb/pdf/BriefingFinal4dRuleNLEB13Jan2016.pdf</u>

Figure 11: Biofinder Map



⁵ <u>https://anr.vermont.gov/maps/biofinder</u>

⁶ <u>https://vtfishandwildlife.com/conserve/conservation-planning/natural-heritage-inventory</u>

⁷ <u>https://anrmaps.vermont.gov/websites/anra5/</u>

⁸ <u>http://vlt.maps.arcgis.com/apps/Styler/index.html?appid=4af250bb65c148119f84ebf8fa6321ac</u>

Regulatory Review Guidance for protecting Northern Long-eared Bats and Their Habitats. $^{\rm 10}$

- However, as shown in Figure 9, the ten acres of owned land around the project is forested, and includes a right of way for the Project's distribution line.
- As a result, any tree-trimming that is required along the right-of-way will be conducted between October 1st and April 14th, which conforms to Vermont's Regulatory Review Guidance for protecting Northern Long-eared Bats and Their Habitats.¹¹

ZONE 2 DISCUSSION

• The same sources and discussion points in Zone 1 are applicable to Zone 2.

ZONE 3 DISCUSSION

• The same sources and discussion points in Zone 1 are applicable to Zone 3.

¹⁰<u>https://vtfishandwildlife.com/sites/fishandwildlife/files/documents/Conserve/RegulatoryReview/Guidelines/Regu</u>

¹¹ Ibid.

CULTURAL AND HISTORIC RESOURCES

Criterion G.2 – Approved Plan was selected for all three zones.

Table 11 – Information Required to Support Cultural and Historic Resources Standards

Criterion	Standard	Instructions
G	2	 <u>Approved Plan:</u> Provide documentation of all approved state, provincial, federal, and recognized tribal plans for the protection, enhancement, and mitigation of impacts to cultural and historic resources affected by the facility. Document that the facility is in compliance with all such plans.

ZONE 1 DISCUSSION

- Sources:
 - Appendix A.1.1 FERC License Order P7725: Order Issuing Subsequent License, Project No. 7725, FERC, June 9, 2004
 - Appendix A.5 Historic Properties Management Plan: Historical Properties Management Plan, Barton Village, July 2005
 - Appendix A.5.1 Historic Properties Management Plan Report: Historical Properties Management Plan, Barton Village, July 2008

• Discussion:

• According to the FERC License,

"Section 106 of the National Historic Preservation Act requires the Commission to take into account the effects that a new license may have on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment. As part of a new license application for this project, a cultural resources inventory was conducted by Barton Village to identify existing and potential historic properties within the project area. The preliminary inventory and staff's analysis determined that there are existing and potential future project-related adverse effects that may occur on historic properties within the project area. As a result, and in order to fulfill the requirements under Section 106, the Commission executed a Programmatic Agreement (PA), on March 22, 2004, with the Vermont State Historic Preservation Officer to have Barton Village file for the Commission's approval a final Phase 1A Archeological study within nine months of the effective date of this license, and a Historic Properties Management Plan within one year of the effective date of this license. Article 408 of the license requires implementation of the PA."

• The HPMP was completed in July 2005, and compliance efforts with the State of Vermont Archaeologist are documented in Appendix A.5.1.

o According to the Preamble of the HPMP,

"...the Project is defined as the riverbank areas surrounding and including the impoundment (inclusive of, but not limited to, the Project's area of potential effect, as defined in 2000 36 CFR 800.16[d])."

"Barton Village will implement the HPMP along the 1.7-mile length of the river comprising the Project."

"The Phase IA studies show no known or potential archaeological sites are affected by current Barton Village Project operations and no further archaeological studies are recommended at this time."

- Actions completed for the HPMP include a series of background reports, an assessment of standing buildings, structures and objects and the environmental and cultural context for archaeological historic properties.
- The HPMP (page 7) indicates that the Project was nominated for the National Register of Historic Places. However, a search of the Register concluded that the Project is not presently included.¹²
- According to page 27 of the HPMP,

"Operation of the Project structures will be guided by the concept of management known as "continuity of use." ... Thus, the management of the structures by continuity of use will be based on continued operation of the Project, during which the prime management objective will be safe, efficient, cost-effective maintenance of historic buildings, structures and major Project components in relation to the Project as a whole."

- Finally, the HPMP requires that all proposed future actions must be in consultation with the State Historic Preservation Office (SHPO). (page 27)
- Because the HPMP has been adopted in compliance with the FERC license, we believe that the project meets the criterion for this zone.

ZONE 2 DISCUSSION

• The same sources and discussion points in Zone 1 are applicable to Zone 2.

ZONE 3 DISCUSSION

• The same sources and discussion points in Zone 1 are applicable to Zone 3.

¹² <u>https://nationalregisterofhistoricplaces.com/vt/orleans/state.html</u>

RECREATIONAL RESOURCES

Criterion H2 – Agency Recommendation was selected for all three zones.

Table 12 – Information Required to Support Recreational Resources Standards

Criterion	Standard	Instructions
Н	2	 <u>Agency Recommendation:</u> Document any comprehensive resource agency recommendations and enforceable recreation plan that is in place for recreational access or accommodations. Document that the facility is in compliance with all such recommendations and
		• Document that the facility is in compliance with all such recommendations and plans.

ZONE 1 DISCUSSION

- Sources:
 - Appendix A.7.1: License Article 407 Recreation Plan, Barton Hydroelectric Project, FERC No. 7775, August 16, 2005
 - Appendix A.8.1: Environmental Inspection Report Fish Passage, Federal Energy Regulatory Commission, July 24, 2012
- Discussion:
 - The recreation plan was developed under License Article 407 of the FERC license and Condition K of the Vermont Water Quality Permit.
 - As described in more detail in Appendix A.7.1 Recreation plan, it provides for two parking areas, a footpath to the bypass reach and a canoe/kayak takeout above the dam.
 - o Finally, page 4 of the July 2012 Environmental Inspection Report states,

"The licensee provides recreational facilities for canoeists/kayakers and fishermen at the project (Photo Nos. 9 through 13). The licensee provides parking for boaters and fishermen across from the powerhouse and along the entrance to the project. The licensee provides access to the tailrace for fishermen with a newly-constructed wooden stairway. A portage trail through the woods is provided for river access for fishermen and canoeists/kayakers into Charleston Pond. The recreational facilities appeared to be in good condition. The licensee's Recreation Report (Form 80), filed January 8, 2008, indicates minimal use of its recreational facilities. **The licensee appears to be in compliance with its requirements with regard to recreation resources.**"

• For these reasons, we believe that the project meets the criterion of this section.

ZONE 2 DISCUSSION

• The same discussion points in Zone 1 are applicable to Zone 2.

ZONE 3 DISCUSSION

• The same discussion points in Zone 1 are applicable to Zone 3.

IV. SIGNED SWORN STATEMENT & WAIVER FORM

SWORN STATEMENT

As an Authorized Representative of the <u>Village of Barton</u>, the Undersigned attests that the material presented in the application is true and complete.

The Undersigned acknowledges that the primary goal of the Low Impact Hydropower Institute's Certification Program is public benefit, and that the LIHI Governing Board and its agents are not responsible for financial or other private consequences of its certification decisions.

The undersigned further acknowledges that if certification of the applying facility is issued, the LIHI Certification Mark License Agreement must be executed prior to marketing the electricity product as LIHI Certified.

The undersigned Applicant further agrees to hold the Low Impact Hydropower Institute, the Governing Board and its agents harmless for any decision rendered on this or other applications, from any consequences of disclosing or publishing any submitted certification application materials to the public, or on any other action pursuant to the Low Impact Hydropower Institute's Certification Program.

Company Name: Village of Barton (D.B.A. Barton Village, Inc.)

Authorize Representative Name: Evan Riordan

Title: Electric Utility Manager /Plant Manager

Authorized Signature: Date: 1.29.2019

V. FACILITY AND AGENCY CONTACT FORMS

Project Owner:		
Name and Title	Evan Riordan, Electric Manager Barton Village Inc.	
Company	Barton Village Inc. Electric Department	
Phone	802-525-4747	
Email Address	ElectricManager@bartonVT.com	
Mailing Address	PO BOX 519, Barton, VT 05822	

Project Operator (if different from Owner):		
Name and Title	[Same as Owner]	
Company		
Phone		
Email Address		
Mailing Address		

Consulting Firm / Agent for LIHI Program (if different from above):		
Name and Title	Shawn Enterline, Sr. Power Supply Analyst	
Company	Vermont Public Power Supply Authority	
Phone	802-882-8508	
Email Address	senterline@vppsa.com	
Mailing Address	PO Box 126, Waterbury Center, VT 05677	

Compliance Contact (responsible for LIHI Program requirements):		
Name and Title	[Same as Owner]	
Company		
Phone		
Email Address		
Mailing Address		

Party responsible for accounts payable:		
Name and Title	Barton Village Inc. Electric Department	
Company	Barton Village Inc. Electric Department	
Phone	802-525-4747	
Email Address	ElectricManager@bartonVT.com	
Mailing Address	PO BOX 519, Barton, VT 05822	

Agency Contact (Check area of responsibility: Flows_, Water Quality, Fish/Wildlife Resources, Watersheds, T/E Spp, Cultural/Historic Resources, Recreation):		
Agency Name	Vermont Agency of Natural Resources (VT ANR)	
Name and Title	Jeff Crocker, River Ecologist	
Phone	(802) 490-6151	
Email address	jeff.crocker@vermont.gov	
Mailing Address	1 National Life Drive, Davis 2, Montpelier VT 05620-3901	

Agency Contact (Check area of responsibility: Flows_, Water Quality, Fish/Wildlife Resources, Watersheds, T/E Spp, Cultural/Historic Resources, Recreation):		
Agency Name	Vermont Agency of Natural Resources, Fish and Wildlife Division	
Name and Title	Tim Appleton, Fish and Wildlife Specialist	
Phone	802-476-0198	
Email address	tim.appleton@vermont.gov	
Mailing Address	5 Perry ST., Suite 40, Barre, VT. 05641	

Agency Contact (Check area of responsibility: Flows_, Water Quality, Fish/Wildlife Resources, Watersheds, T/E Spp, Cultural/Historic Resources, Recreation):		
Agency Name	US Fish and Wildlife Service	
Name and Title	Melissa Grader, Regional Director	
Phone	413-548-8002 Ext. 8124	
Email address	Melissa Grader@fws.gov	
Mailing Address	300 Westgate Center Drive, Hadley, MA 01035	

Agency Contact (Check area of responsibility: Flows_, Water Quality, Fish/Wildlife Resources, Watersheds, T/E Spp, Cultural/Historic Resources, Recreation):		
Agency Name	Vermont State Historical Preservation Office	
Name and Title	Laura Trieschmann, Officer	
Phone	802-828-3222	
Email address	laura.trieschmann@vermont.gov	
Mailing Address	1 National Life Drive, Deane Davis Bldg., 6th Floor, Montpelier, VT. 05620-0501	

VI. APPENDICIES

A.1.1 FERC LICENSE NO 7725 (2004)

A1.2 INITIAL CONSULTATION DOCUMENT

A.2.1 FINAL LICENSE APPLICATION – VOL 1

A.2.2 FINAL LICENSE APPLICATION – VOL 2

A.3 WATER QUALITY CERTIFICATION

A.4 DEBRIS DISPOSAL PLAN

A.5 HISTORIC PROPERTIES MANAGEMENT PLAN

A.6 IMPOUND FLOW MANAGEMENT PLAN

A.7.1 RECREATION PLAN

A.7.2 RECREATION REPORT AND FEE DATA

A.8.1 ENVIRONMENTAL INSPECTION REPORT – FISH PASSAGE

A.8.2 ENVIRONMENTAL INSPECTION REPORT – FOLLOW UP

A.9 LETTER OF SUPPORT – VERMONT AGENCY OF NATURAL RESOURCES