

Pownal Hydroelectric Project

FERC No. 6795

Reviewer's Report for Full Certification



**Prepared by: Jean Baldrige
2/8/2019**

The Pownal Hydroelectric Project (Project) Full Application for Low Impact Hydropower Institute (LIHI) Certification has been reviewed by an independent third party to determine if their application and additional information filed on November 5, 2018 satisfies the LIHI criteria in accordance with the LIHI Handbook, 2nd Edition (updated 7/20/16). This report contains the findings and conclusions of Jean Baldrige, LIHI reviewer of the application. Based on the information provided in the application and additional information provided on November 5, 2018, the Reviewer recommends that the Pownal Hydroelectric Project receive LIHI Certification with 2 Plus standards, one under Ecological Flows and one under Water Quality for a total of 10 years of certification.

Introduction

The Pownal Hydroelectric Project is a small project (491 kilowatts or KW) located on the Hoosic River in southwest Vermont, near the town of North Pownal in Bennington County. The Project is located at River Mile (RM) 38.6, the location of the former Pownal Tannery Plant. This site has a legacy of severe industrial contamination.

The Hoosic River begins near Dalton, Massachusetts and flows northwest to Pownal, Vermont, where the Project is located (Figure 1). From Pownal, the Hoosic River flows north westerly into New York where it joins the Walloomsac River, a tributary to the Hudson River.

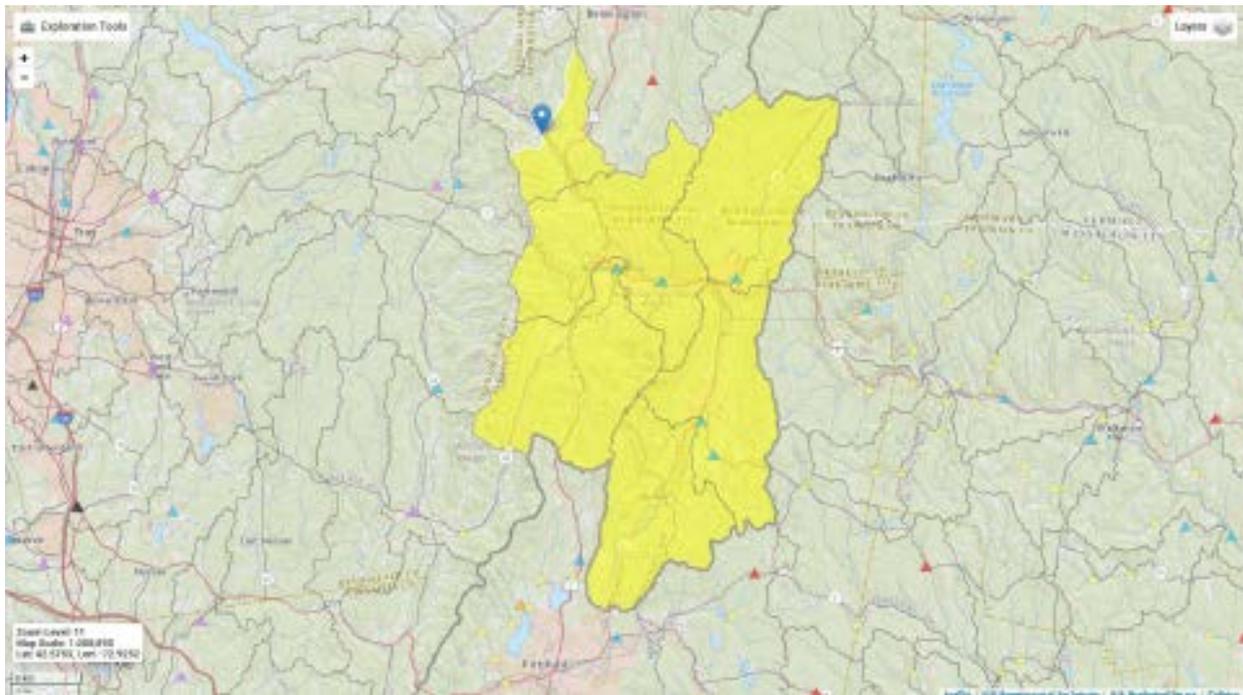


Figure 1. Watershed Overview Hoosic River and the Pownal Hydroelectric Project

There are four hydroelectric projects located on the Hoosic River downstream of the Project. The closest one is approximately twelve miles downstream. On the Hoosic River upstream of the Project, there are four non-power dams.

The Project received a FERC Order granting exemption from Licensing of a Small Hydroelectric Project of 5 megawatts or less (FERC No. 6795 issued April 1, 1983) and a Water Quality Certification (WQC) from the State of Vermont, Dept. of Water Resources and Environmental Planning. The original facilities were constructed and commenced operation in that same year. However, in 1988, the Project ceased functioning due to catastrophic equipment failure. The Town of Pownal acquired both the water rights and the FERC exemption for the Project, as a result of the prior Project owner's nonpayment of taxes.

In 2016, the City of Pownal contracted with Hoosic River Hydro (HRH) to revitalize the Project and take over the power plant operations. HRH recommended several improvements to Project facilities and operations. In 2016, FERC issued three orders amending the 1983 exemption and changing the capacity from 400 to 500 KW. Vermont Agency of Natural Resources (VANR), U.S. Fish and Wildlife Service (USFWS) and Vermont State Historic Preservation Office (VSHPO) concurred that the increased capacity would be consistent with the FERC exemption issued in 1983. The FERC order issued on April 15, 2016, amending the exemption and revising Project Description, included comments from USFWS and VDEC. Agency support for revitalizing the Project was predicated on the generation threshold remaining at 110 cfs, even though the new equipment was able to generate at lower flows.

Rehabilitation of the Project was completed by HRH in 2018. After conducting operational tests for the new generator, FERC amended their capacity order reducing the station capacity from 500 KW to 491 KW, as verified in the testing following rehabilitation. HRH is now operating the Project and became the Exemptee for the Project on March 29, 2018.

Site and Facility Characteristics

The Project is located on a site where previous industrial activities, including the Pownal Tannery Plant, resulted in extensive contamination of the site by heavy metals. The entire 7-mile length of the Hoosic River in Vermont is listed as an impaired waterbody by Vermont Department of Environmental Conservation (VDEC). In addition to contaminated sediments, elevated levels of PCBs were found in brown trout collected from the Hoosic River in Massachusetts. This led to VDEC designating the Hoosic River within Vermont as being impaired for drinking water and fish consumption. (VDEC 2016).

The Pownal Tannery Plant site is currently enrolled in both the U.S. Environmental Protection Agency (EPA) Superfund Program and the EPA Brownfields Program. The Superfund Program focused on land-based contamination, whereas the Brownfields Program focused on wetland-based contamination. The primary remediation efforts related to the hydro development were Brownfields and focused on PCB contaminated sediments upstream of the Dam and Powerhouse (HRH 2018). A Phase 1 Environmental Site Assessment, conducted in 2009,

identified Polychlorinated biphenyls (PCBs), polynuclear aromatic hydrocarbons (PAHs), and metals to the contaminants of concern for the surface sediments located in the impoundment Zone. As of 2017, all contaminated sediment likely to be mobilized by operation of the Project were either removed or mitigated, with oversight from VDEC and EPA (HRH 2018, p 25-26).

The Project facilities include a 135 ft-long Ogee dam, which spans the Hoosic River and has a maximum height of 18 feet. The dam was constructed in 1955 and used a combination of break-away flashboards and a manually-operated crest gate. The flashboards added about ten percent to the generation potential of the Project by increasing water depth in the impoundment by 2.5 feet above the crest elevation of the dam. HRH replaced the former crest gate and flash boards with automated crest gates, which provide better control of impoundment levels and bypass flow rates. The impoundment extends approximately 2.5 miles upstream of the dam, creating a small reservoir with a storage capacity of 490 acre-ft. The Project operates in run-of-river mode, with streamflow below the powerhouse being equal to streamflow entering the impoundment. Water is diverted through a 20-ft wide by 40-ft-long intake canal which flows into a 20-ft wide by 34-ft long forebay. After the forebay the water passes through a 93-ft long 8-ft diameter steel penstock, encased in concrete, to a vertical double-regulated Kaplan turbine in the powerhouse. The powerhouse, which discharges directly into the river, is located approximately 120 ft downstream of the intake gates (HRH 2018).



Figure 2. Pownal Hydroelectric Project Site Overview.

The installation of automated crest gates benefitted both the powerhouse operations and the riverine environment. The crest gates stabilize the impoundment's water surface elevation, resulting in a stable head on the turbine and retarding the entrainment and downstream transport of PCB-laden sediment. The former flashboard system resulted in frequent and rapid changes to the water surface elevation of the impoundment, which dewatered and rewatered shallow areas, periodically desiccating aquatic habitat and then mobilizing contaminated sediments when inflow increased. The previous system also required an extended period of time to restore control over water levels in the impoundment. When the previous pin and flashboard technology responded to high flow events, the flashboards broke away from their anchors and it could take weeks or months before streamflow receded sufficiently such that it was safe to manually replace the flashboards. During this time, the water surface elevation of the impoundment could not be restored to a normal operating level and flow into the Bypass Reach could only be influenced by adjusting generation flow. The new automated gates restore control over impoundment water surface elevations immediately following a high streamflow.

Zones of Effects

The Applicant has appropriately described three Zones of Effect: Impoundment Zone, Bypass Reach, and Confluence Reach (where the powerhouse outflow joins the Hoosic River).

Zone of Effect #1: Impoundment

The Project's 2.5-mile impoundment (colored green in Figure 3) has a surface area of 77 acres and a storage capacity of 490 acre-feet. This impoundment is created by the dam and crest gates. The water surface elevation of the impoundment can be modulated by the crest gates as much as 2.5 feet. Following inspections, maintenance, or crest gate operation that results in lowering the impoundment below its normal operating level (517.9 ft msl), the impoundment refill is accomplished by storing 10 percent of the inflow above 56 cfs, until the normal water level for the impoundment is restored. The Operation and Flow Management Plan dated January 31, 2017 specifies operational protocols to maintain a normal impoundment elevation of 517.9 ft msl, over a broad range of impoundment inflow rates.

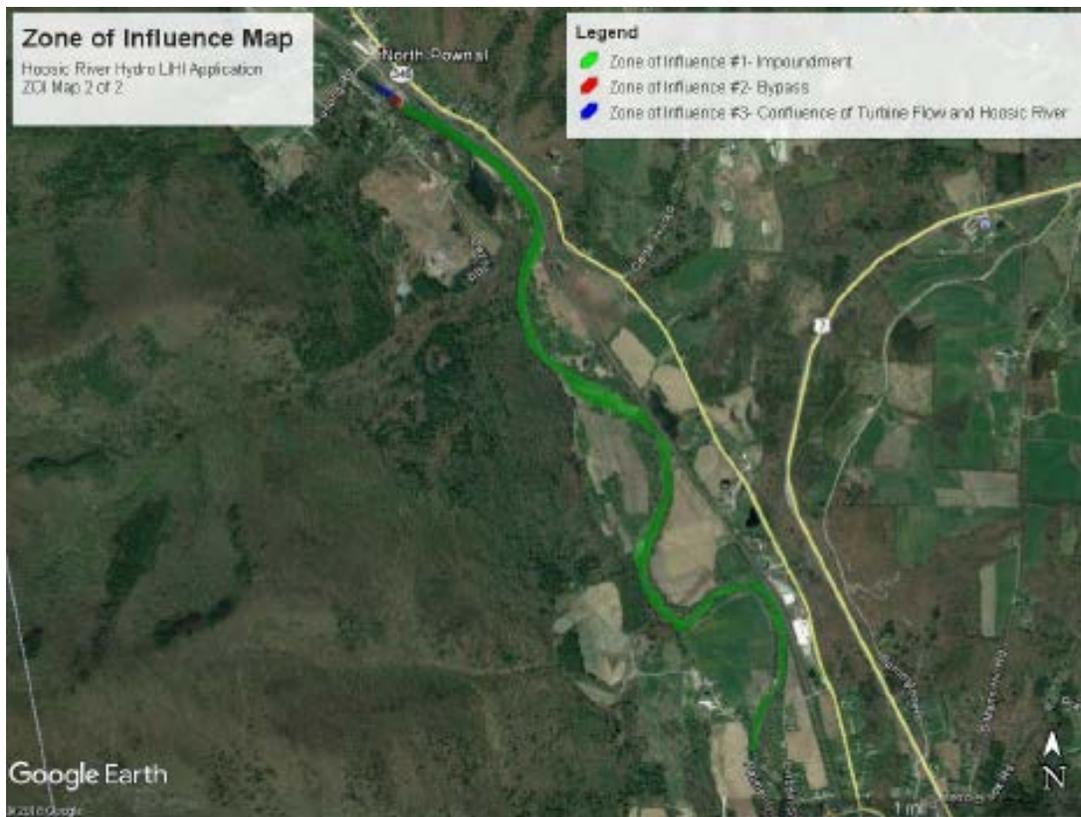


Figure 3. The Project impoundment extends 2.5 miles upstream of the dam 9 shown in green).

Zone of Effect #2: Bypass Reach

Figure 4 shows the relative lengths of the Bypass Reach and the Confluence Zone where the powerhouse outfall returns the diverted water to the Hoosic River. The intake canal is located upstream of the dam, near the right abutment. The water flows from the impoundment through the intake canal and into the forebay. Near the middle of the forebay, there is a trashrack which has a 1.25-inch bar spacing. During normal project operation, the flow rate in the canal ranges from 110 to 350 cfs, depending on the impoundment inflow.

The Project's Bypass Reach extends 192 feet downstream from the dam to the powerhouse (Figure 5). No diversion for generation is allowed until Hoosic River streamflow at the dam equals or exceeds 166 cfs, the sum of the 56 cfs minimum by-pass flow and the 110 cfs for minimum generating flow. For inflows between 166 cfs and 406 cfs, the Project is required to maintain a minimum flow of 56 cfs in the Bypass Reach. When inflow is greater than 406 cfs, the required bypass flow is equal to Project inflow minus 350 cfs, the maximum generating capacity of the turbine. The Operation and Flow Management Plan specifies operation protocols for generation flows over a broad range of impoundment inflow rates.



Figure 4. Detailed view of the lower portion of the Impoundment Zone (green), Bypass Reach (red) and Confluence of the turbine flow and Hoosic River (blue).



Figure 5. Aerial view of the Project Facilities.

Zone of Effect #3: Powerhouse Discharge Confluence

The Powerhouse discharges directly into the Hoosic River (Figure 6). The FERC Project Boundary is approximately 300 ft downstream from the Powerhouse. Thus, the Third Zone of Effect, the Confluence Zone is a 300 ft-long portion of the Hoosic River between the Powerhouse and the downstream FERC boundary. This Zone is referred to as the Powerhouse Confluence Zone.



Figure 6. Downstream view of the Pownal Powerhouse outflow into the Hoosic River

Outflows from the Powerhouse range from 110 cfs to 350 cfs. The Hoosic River bypass flow is at least 56 cfs, and total streamflow within the Confluence Zone equals the inflow to the impoundment.

Regulatory Status

The Project is currently operating under FERC Exemption P-6795. It was exempted from licensing on April 1, 1983 (Pownal Hydro Corporation 23 FERC (62,037; 1983). On April 15th, April 22 and June 16, 2016 FERC modified the exemption to allow the capacity of the plant to increase to 491 KW, as produced by the new generating equipment. The Agencies (VANR, USFWS, and VSHPO) concurred with the proposed change in generation capacity.

Public Comments

LIHI received a public comment letter on January 8, 2019 from the Hoosic River Watershed Association (Association), a 30+ year old non-profit corporation dedicated to the conservation, habitat restoration and enjoyment of the Hoosic River and its watershed. The Association supports the certification of the Pownal Hydroelectric Project as a low-impact hydroelectric generating site. The Association writes (see Appendix A):

“The Board of Directors believes this is a beneficial hydroelectric project in that it uses an existing dam and will not negatively impact the Hoosic River by its operation. Furthermore, the power generated does not create carbon emission that negatively affect climate change issues.”

Additional information received

Vermont Trout Unlimited Board member Mr. Joseph Kraus spoke with the Reviewer by phone on February 2, 2019. Mr. Kraus indicated that Trout Unlimited was not aware of HRH seeking LIHI certification for the Pownal Hydroelectric Project. Trout Unlimited has not been engaged in the Project since 2016. Mr. Kraus said that, at this time, Trout Unlimited neither supports nor objects to the certification.

The Reviewer sent emails to VDEC and USFWS to solicit their comments. As of the filing of this report, they have yet to respond.

Compliance with Standards

The following LIHI standards were selected for the three zones (by the Applicant in black, and as recommended by this review in red).

Zone of Effect # 1: Impoundment

Criterion		<i>Alternative Standards</i>				
		<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>Plus</i>
A	Ecological Flow Regimes	X				X
B	Water Quality		X			X
C	Upstream Fish Passage	X				
D	Downstream Fish Passage	X	X			X
E	Watershed and Shoreline Protection	X				
F	Threatened and Endangered Species Protection	X				
G	Cultural and Historic Resources Protection	X				
H	Recreational Resources	X		X		

Zone of Effect # 2: Bypass Reach

Criterion		Alternative Standards				
		1	2	3	4	Plus
A	Ecological Flow Regimes		X			X
B	Water Quality		X			
C	Upstream Fish Passage	X				
D	Downstream Fish Passage	X				
E	Watershed and Shoreline Protection	X				
F	Threatened and Endangered Species Protection	X				
G	Cultural and Historic Resources Protection	X				
H	Recreational Resources	X		X		

Zone of Effect # 3: Confluence of Turbine Flow and Hoosic River

Criterion		Alternative Standards				
		1	2	3	4	Plus
A	Ecological Flow Regimes	X				
B	Water Quality	X	X			X
C	Upstream Fish Passage	X				
D	Downstream Fish Passage	X				
E	Watershed and Shoreline Protection	X				
F	Threatened and Endangered Species Protection	X				
G	Cultural and Historic Resources Protection	X				
H	Recreational Resources	X		X		

Criterion A - Ecological Flow Regimes

LIHI Goal: The flow regime within reaches affected by the facility, support habitat and other conditions suitable for healthy fish and wildlife resources

Standards Applied:

Zone 1 and 3: A1 - De Minimis Effect

Zone 2: A2 - In Compliance with Agency Recommendation

The ecological flow regime criteria are satisfied within Zones 1 and 3 by the Project’s run-of-river operation. Water is not diverted from impoundment storage to supplement natural inflow for the purpose of increasing generation. On a real-time basis, streamflow below the point of Powerhouse outflow is the same as inflow into the impoundment. This type of operation satisfies Standard A-1 De Minimis effect for Zones 1 and 3.

Ecological flow regime criteria are satisfied within Zone 2, the Bypass Reach, as a result of operating the Project in compliance with Standard A-2, Agency Recommendations, including the agency-approved Operations and Flow Management Plan. A flow of 56 cfs was specified by VDEC in the Water Quality Certificate (WQC) as the minimum streamflow required for the Bypass Reach (VDEC 1983). This minimum flow is based on the estimated 7-day 10-year flow (7Q10 flow), which is 56 cfs at the Project location. This flow is a commonly accepted instream flow requirement for eastern streams (Stalnaker and Arnette 1976). The Bypass Flow requirements were reviewed by VDEC and USFWS and their comments were incorporated into the Order Amending Exemption and Revising the Project Description issued by FERC April 15, 2016 (HRH 2018).

The Project releases all inflow into the Bypass Reach, until inflow exceeds 166 cfs. Once inflow is greater than 166 cfs, the Project diverts 110 cfs to the powerhouse to begin generation and passes the minimum instream flow (56 cfs), over the dam into the Bypass Reach. A minimum generation flow of 110 cfs was requested by the agencies, such that the modern-day operating range of the powerhouse would remain the same as that agreed to in 1983 (USFWS letter from Thomas Chapman to William Scully filed with FERC March 2, 2016). The HRH agreed to the 110 cfs minimum flow, even though the turbine can operate with as little as 66 cfs. When inflows to the impoundment exceed 406 cfs, all flows greater than 350 cfs (the maximum generating capacity) will pass over the dam and the Bypass Reach. Operations are monitored and verified by a programmable logic controller which operates the crest gate to maintain the forebay and impoundment water surface elevations near 516.6 ft. msl.

Criterion A Plus Standard

A Plus standard was requested for the impoundment and Bypass Reach zones because of the significant improvement made to streamflow control with the replacement of flashboard technology with automated crest gates. With the former pin-and-board technology, flashboards would break away from their installed position during high streamflow events with the goal of reducing upstream damage caused by high water surface elevations. As streamflow receded and flashboards were not in place, and control of the flow rate within the Bypass Reach was substantially compromised. In addition, the lower elevation of the impoundment water surface elevation caused shallow impoundment areas to be dewatered exposing the contaminated sediments to wind and wave erosion. A powerhouse operator was required to adjust the turbine flows in order to affect the Bypass Reach flow rate. This was a trial and error adjustment because of the uncontrolled head elevation on the turbine. Control could not be reestablished until streamflow receded sufficiently for the safe replacement of the boards manually. This period of time could be days, weeks or months.

The use of multiple automated crest gates and programmable logic controllers ensures that Bypass Reach streamflow (and impoundment elevation) remains under control as high streamflow events recede. This effort was made voluntarily by the Applicant and typically, such

very small projects do not make the significant investment required for advanced flow control that provides a net benefit to aquatic resources. The 2nd Edition LIHI Handbook states:

“In addition to the alternative standards, each criterion also includes a “PLUS” standard, which allows an applicant to extend the LIHI Certificate term if the applicant can demonstrate significant additional effort to implement environmental and social mitigation, enhancement, and restoration. Some examples include implementing advanced technologies, science-based adaptive management, basin-scale redevelopment strategies, and supporting a watershed enhancement fund...”

The Applicant has demonstrated significant additional effort in implementing measures at the Project that provide a net benefit to the environment through greater flow control and monitoring.

Finding

Based on the Application and review of supporting documents, the Project satisfies the ecological flow criterion by meeting run of river operation criteria in Zone 1 and 3 and by compliance with terms and conditions established by VDEC and USFWS in Zone 2. Additionally, the Project also qualifies for a Plus Standard for significantly improving flow control in the impoundment and Bypass Reach.

Criterion B - Water Quality

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

Standards Applied:

All Zones: B2 – In Compliance with Agency Recommendation

The Applicant selected Standard B2 in Zones 1 and 2, and B1 in Zone 3, however, this review finds that Standard B2 is most appropriate in all three Zones. The Hoosic River has a legacy of severe water quality problems attributable to industrial pollution that predates the development of the Project. VDEC has listed the entire 7-mile length of the Hoosic River in Vermont as an impaired water body (2016 State of Vermont 303(d) List of Impaired Waters). The Pownal Tannery Company site, where the hydroelectric facility is located, has been both an EPA Superfund site and a Brownfield site. The Hoosic River is classified as Class B waters by the Vermont Water Resources Board and appears on the State’s 303(d) list of impaired waters for PCB contamination from previous industrial activity.

At present, water quality conditions include PCBs and heavy metal pollutants (which are not listed as an impairment but cause the river to be considered “stressed” for primary and secondary contact recreation). These conditions, which occur in all three zones, are the result of past industrial activities, unrelated to the Pownal hydroelectric Project. And, they likely suppress migratory and resident fish population throughout the Hoosic River (WQC). During the

1980's, three fish kills occurred that were attributed to industrial discharge into the Hoosic River. As a result of the poor water quality and contaminated sediments associated with historical pollution, the Vermont Department of Fish and Game (VDFG) abandoned fish stocking efforts in the Hoosic River (HRH Application Page 12).

As noted previously in Ecological Flow Regime Section, the 56 cfs minimum flow within the Bypass Reach was based on the goal of protecting water quality during periods of low streamflow (Stalnaker and Arnette 1976). In addition, the agreed upon minimum flow to begin generation is 110 cfs through the powerhouse. This flow, in conjunction with required bypass of 56 cfs, will cause the Project to cease operations when inflow to the impoundment is less than 166 cfs. Such conditions regularly occur during summer months (HRH Application, Page 6 and page 12). Thus, when water temperatures have the greatest potential to be elevated and dissolved oxygen is likely to be low, the Project will not usually be operating, and all inflow will pass over the dam. As it passes over the dam, it will entrain air and increase downstream dissolved oxygen levels (See Figure 7).



Figure 7. The crest gates on top of the dam control spill across the length of the dam, maximizing air entrainment increasing dissolved oxygen content of downstream river flow.

Criterion B: Plus Standard

A water quality Plus standard was requested for actions that address the legacy of contaminated sediments in the Project Area. The first action is the voluntary excavation and off-site disposal of approximately 1159 cubic yards of contaminated sediments from the forebay and impoundment that otherwise, could be entrained by generation flows and transported downstream (Figure 8). The remediation work was conducted in compliance with VDEC standards, as a voluntary action by the Applicant. This significant action benefits both aquatic and riparian habitats in the impoundment, in the Bypass Reach, and downstream from the Powerhouse.



Figure 8- Remediation of the impoundment Zone and removal of contaminated substrate.

The second action taken by the Applicant, also worthy of a water quality Plus standard, is the installation of automated crest gates and programmable logic controllers that enable stabilization of the impoundment water surface elevation, described above in the Flows section. This action allows the Project to operate in a true run-of-the-river mode, over a broad range of inflows, while substantially reducing the potential for entrainment and transport of contaminated sediment from within the Impoundment Zone. However, since a Plus standard for the same action is already recommended in the Flows criterion section above, it cannot be awarded for Water Quality as well.

Finding

The Project complies with Standard B-2, Agency Recommendation, in all three reaches and is eligible for a Plus standard for excavating contaminated sediments from the forebay and a portion of the impoundment that demonstrates significant effort which has improved and continues to protect water quality throughout the Project area and further downstream in the Hoosic River.

C – Upstream Fish Passage

LIHI Goals: For upstream passage, the facility allows for safe, timely, and effective passage of migratory fish.

Standard Applied:

All Zones: C1 - De Minimis Effect

There are no known migratory species present in the Project vicinity or dependent on the portion of the Hoosic River affected by the Project (Application, Page 31). Additionally, the next downstream dam from the Project (Hoosick Falls) has no upstream passage facilities and thus serves as a barrier to passage.

The Project does not currently have, nor is required to have, upstream fish passage facilities, but HRH has agreed to provide passage facilities if requested by State or federal resource agencies. In the WQC, USFWS and VDEC reserved the right to require fish passage at a future date. This reservation was recently reiterated by VDEC and USFWS in an email exchange with HRH, dated July 31, 2018. Jeff Crocker (VDEC) and Melissa Grader (USFWS) indicated that neither the USFWS, nor VDEC, have requested the construction of passage facilities. Mr. Crocker indicated that fish passage is not a top priority due to larger passage issues downstream and would not likely be requested during a term of LIHI certification.

Finding

The Project satisfies the upstream fish passage criterion by meeting Standard C1 in all zones.

D – Downstream Fish Passage

LIHI Goals: For downstream passage, the facility allows for downstream passage of migratory fish and minimizes loss of fish from upstream river reaches affected by the facility.

Standard Applied:

Zone 1: D2 - In Compliance with Agency Recommendations

Zone 2 and 3: D1 - De Minimis Effect

The Applicant selected Standard D1 in all Zones, but this review finds that Standard D2 is more appropriate in Zone 1. There are no known migratory fish in the vicinity of the Project. Poor

water quality associated with past industrial practices has reduced resident fish populations in the Hoosic River. However, low numbers of resident fish may occupy the impoundment. To address the potential presence of fish, the Project provides downstream fish passage over the dam at all flows. Fish in the impoundment are free to pass downstream over the dam into the Bypass Reach or travel further downstream. The minimum flow of 56 cfs provides downstream passage over the dam and through the bypass reach. No action, other than providing the minimum instream flow, has been requested for Zone 2.

From the impoundment, water also flows into a 20-ft wide by 34-ft long forebay on its way to the powerhouse. Fish in the impoundment may enter the forebay. HRH voluntarily installed an automated trashrack with 1.25-inch spacing located about half way through the forebay. Figure 9 shows the close spacing, which in association with low velocities through the trash rack, reduces the potential for large fish to pass through the trashrack and become entrained by the flow entering the penstock. The approach velocity at the trashrack was calculated to be 1.1 feet per second (fps) which the Applicant indicated is about half of the usual agency guidelines of 2 fps to reduce entrainment (HRH 2018, page 31).

Larger fish would be protected from passing through the trashrack based on the close spacing of the trashrack bars. Small fish, however, may be entrained by the flows into the powerhouse having passed through the 1.25-inch openings in the trashrack. The VDEC and USFWS have not expressed concern regarding potential entrainment of small fish (HRH Application). The Applicant also requested a Plus standard for downstream passage since the narrow spacing trashrack was voluntarily installed; however, this review finds that that action does not satisfy the Plus standard.



Figure 9. The close spacing of vertical bars on the trashrack prevent large fish from entering the turbine.

Finding

No downstream passage facilities have been requested by State or Federal agencies. The local fish populations have been severely affected by the historical industrial contamination that occurred decades ago, resulting in very low abundance of fish near the Project site. The Project satisfies the downstream passage criterion. Standard D-2 for downstream passage in Zone 1. The Bypass Reach minimum flow provides downstream passage and is consistent with Agency recommendations for minimum instream flows for Zone 2 (WQC). Run-of-River operations have a De Minimis effect on downstream passage in Zone 3, as here, the channel carries the full flow of the river.

Criterion E - Watershed and Shoreline Protection

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

Standards applied:

All Zones: E1 - De Minimis Effect

There are no agency recommendations for shoreline or watershed protection specific to the Project. Nor does any mention of such protections appear in the WQC or FERC License. There is no requirement for the Project to have a watershed protection plan or a watershed enhancement fund. No significant ecological land exists at, or near, the location of the Project, the former site of the Pownal Tannery Plant.

During the FERC exemption process, HRH did not receive any specific agency recommendations for either shoreline or watershed protection measures. Nor were any included in the WQC. Surrounding lands are primarily agricultural, residential or forested. The Project operates in a true run-of-river mode. The Impoundment Zone responds to the natural variation of flow in the river and is not drawn down, or refilled, in response to electrical power demand. Additionally, automated crest gates and programmable logic controllers are used to minimize the rate of change in water surface elevation of the impoundment. A stable impoundment water surface elevation results in less shoreline erosion and entrainment of impoundment sediments. The degree to which current Project operations affect watershed or shoreline conditions is minimal, although it is a positive change from prior operations.

Finding

The Project satisfies the watershed and shoreline protection criterion by meeting Standard E-1 in all Zones of Effect.

Criterion F – Threatened and Endangered Species

Goal: The facility does not negatively impact any federal or State-listed species.

Standards applied:

All Zones: F1 - De Minimis Effect

Based on the August 9, 2018 letter from USFWS, there are no federally-listed fish or amphibian species in the Project area, or immediately downstream of the Project, that depend on aquatic habitat. USFWS has identified one listed species that may occur in the vicinity of the Project.



Figure 10. Northern Long-eared Bat is present in the vicinity of the Project.

The Northern long-eared bat is listed by USFWS as threatened. No critical habitat has been identified for this species and this species does not rely on aquatic habitat. The Project would have no effect on bats or bat habitat. <http://anrmaps.vermont.gov/websites/BioFinder2016/>

Finding

The Project satisfies the threatened and endangered species protection criterion by meeting Standard F-1, De Minimis Effect in all Zones.

Criterion G: Cultural and Historic Resources Protection

Goal: The facility does not 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.

Standards Applied:

All Zones: G-1 - De Minimis Effect

No cultural or historic resources have been identified within the FERC Project boundary that could potentially be affected by operation or maintenance of the Facility. A letter dated June 21, 1982 from the Vermont Agency of Development and Community Affairs regarding the Project contained the following paragraph.

“Replacement of the historically existing flashboards and necessary rehabilitation of the penstock, powerhouse, and other existing facilities will not cause significant impacts to undisturbed surfaces. Therefore, the Project, as planned, will not affect any known, or potentially existing, archeological properties that may be eligible for inclusion in the National Register of Historic Places.”

This statement is reiterated in a February 6, 2017 letter from the Vermont Division for Historic Preservation (VDHP) to Mr. William F. Scully of Hoosic River Hydro which stated:

“Based on our review of the current plans, the VDHP concludes that this Project will have No Adverse Effect on any historic sites that are listed in, or eligible for, inclusion in the National Registrar of Historic Places. This finding includes the proposal to install crest gates instead of flashboards over most of the dam.”

Finding

The Project satisfies with the cultural and historic resource protection criterion by meeting standard G-1, De Minimis effect in all zones.

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 water without fee or charge.

Standards applied:

All Zones: H3 - Assured Accessibility

The Applicant selected Standard H-1 De Minimis Effect in all Zones; however, this review finds that Standard H-3 Assured Accessibility is more appropriate. There are no specific agency recommendations regarding recreational use. The Applicant allows general fishing access to

the river where safe, primarily in the impoundment. No requirements regarding recreational resources appear in the WQC or in the FERC Exemption.

Public access to the Bypass Zone between the dam and the powerhouse on the west side of the river where the Project facilities are located, may not be desirable from a public safety perspective. The Bypass Zone exists between the dam and the powerhouse discharge point and is less than 200-ft in length.

In general, the attractiveness of recreational activities on lands and waters is greatly diminished by the adverse water quality and heavy metal contamination of the Hoosic River. The entire seven-mile length of the Hoosic River within Vermont is listed on that State's 303(d) list of impaired waters. The dam site and the Impoundment Zone have been the subject of EPA Superfund and Brownfields clean-up efforts. Although considerable progress has been made, residual contaminants within the site and watershed detract from recreational use of the river.

Operations of the Project, in a run-of-river mode that minimizes water surface elevation changes within the impoundment zone, is a benefit for boating or canoeing within its 2.5-mile length. Fish in the Hoosic River in the vicinity of the Project are not recommended for consumption due to the extensive contamination of the site by previous industrial activity. Since PCBs can be absorbed through the skin, even handling fish from the vicinity of the Project posed a health risk (HRH Application, page 23).

Finding

The Project satisfies with the recreational resource protection criteria by meeting standard H-3 (Assured accessibility) in all Zones.

Certification Recommendation

Based on my review of the application, supporting materials and other publicly available information, the Project satisfies the LIHI criteria and satisfies two Plus standards for flows and water quality. Therefore, I recommend that the Pownal Project be LIHI Certified® for a period of 10 years.

Literature Cited

Federal Energy Regulatory Commission (FERC). 1983. Exemption for Pownal Hydroelectric Project. Issued April 1, 1983.

FERC 2016. Order Amending Exemption and Revising the Project Description issued April 15, 2016.

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Stalnaker, Clair B. and J. L Arnette. 1976. Methodologies for determination of stream resource flow requirements. US Fish and Wildlife Service, Office of Western Water Allocation, Utah State University

U.S. Fish and Wildlife Service. 2018, Letter dated August 8, 2018, Endangered and threatened species in the vicinity of the Project.

USFWS. 2016. Letter from Thomas Chapman (USFWS) to William Scully (HRH) filed with FERC March 2, 2016.

VDEC (Jeff Crocker) and USFWS (Melissa Grader) email exchange with HRH (William Scully) dated July 31, 2018. Email exchange regarding fish passage at Pownal Hydroelectric Project.

Vermont Agency of Natural Resources. 1983 (VTANR). 1983. Water Quality Certificate for the Pownal Hydroelectric Project issued on March 4, 1983.

Vermont Department of Environmental Conservation. 2016. State of Vermont Clean Water Act Section 303(d) List of Waters: State of Vermont 303 (d) List of Waters.

Vermont Division for Historic Preservation (VDHP). February 6, 2017. Letter to Mr. William F. Scully of Hoosic River Hydro.

Appendix A – Letter of Support



Hoosic River Watershed Association

Via email: comments@lowimpacthydro.org

January 8, 2019

Maryalice Fischer
Certification Program Director
Low Impact Hydropower Institute
P.O. Box 424
Strafford, NH 03384

Re: Certification of Pownal Hydroelectric Project

Ms. Fischer:

The Hoosic River Watershed Association (HooRWA), at its monthly Board meeting held on January 7, 2019, voted to support the application by Hoosic River Hydro, LLC to be certified as a Low Impact Hydroelectric generating site. HooRWA is a 30+ year-old non-profit corporation dedicated to the conservation, habitat restoration and enjoyment of the Hoosic River and its watershed through education, research and advocacy.

HooRWA has been supportive of this particular hydroelectric generating facility since its development by Hoosic River Hydro (group). Through its development, the owners/operators have kept the public informed of its progress and has periodically invited the public to view the construction process and operation. HooRWA believes the applicant has met the certification criteria as specified in the LIHI handbook.

The Board of Directors believes this is a beneficial hydropower project in that it uses an existing dam and will not negatively impact the Hoosic River by its operation. Furthermore, the power generated does not create carbon emissions that negatively affect climate change issues.

HooRWA wishes to thank LIHI for this opportunity to comment on Hoosic River Hydro's application.

Sincerely,

Andrew Kawczak
President

Board of Directors

President
Andrew Kawczak

Vice President
Thom Gentle

Treasurer
Karin Landry

Secretary
Wendy Hopkins

Directors
Gordon
Batcheller
Harold
Brotzman
John Case
Nick Howe
Tom Hyde
Mark Merrell
Elayne Murphy
Lauren Stevens

Executive Director
Steve McMahon