

**Dwight, Indian Orchard, Putts Bridge and Red Bridge Projects**  
**LIHI Mid-Term Review by Patricia McIlvaine**  
**October 17, 2023**

**I. Introduction**

On August 16, 2023, Patriot Hydro<sup>1</sup>, submitted a combined application to the Low Impact Hydropower Institute (LIHI) for a mid-term review for the following Projects: Dwight (FERC P-10675, exempt 1992, LIHI #170), Indian Orchard (FERC P-10678 exempt 1992, LIHI #112), Putts Bridge (FERC P- 10677 exempt 1992, LIHI #102), and Red Bridge (FERC-P-10676 exempt 1992, LIHI #96). In accordance with Section 5.3.4 of the 2nd Edition LIHI Handbook, Revision 2.05, issuance of a material amendment to a FERC license or license exemption constitutes a “material change” and triggers a mid-term LIHI Certification review. Continued certification, with a new certification term, is contingent upon the facility remaining in compliance and continuing to satisfy the LIHI criteria in effect at the time of review.

The License Exemptions for all four Projects were amended by FERC on March 13, 2023 in a single document. The amendment application was submitted to FERC as a result of negotiations with resource agencies to reduce bypass minimum flow releases thought to be excessive, in exchange for run-of-river (ROR) operations. Negotiations resulted in a settlement agreement between the Projects’ owner, US Fish and Wildlife Service (USFWS) and Massachusetts Division of Fish and Wildlife (MDFW).

All discussed documents, including previous certification reports, can be found on each Project’s LIHI website. The original certification date, and effective and expiration dates for the current LIHI Certificates for the four Projects are shown below.

<b>Project</b>	<b>Original Certification</b>	<b>Effective Date of Current Certification</b>	<b>Expiration Date of Current Certification</b>
Dwight	2020	April 3, 2020	April 2, 2030
Indian Orchard	2013	July 19, 2018	July 18, 2028 (option to extend to July 18, 2031)
Putts Bridge	2012	December 20, 2017	December 19, 2027
Red Bridge	2012	March 27, 2017	March 26, 2027

The Indian Orchard Project has an option for an extended certification term based on the following optional Certification Condition No. 4, which has not yet been satisfied:

*“The Owner shall seek to collaborate with local recreational interests and abutting landowners on potential options for providing a cartop put-in far enough downstream from the confluence of the bypass and tailrace to minimize hazards from sudden release of flows to the bypass in the event the generating unit suddenly trips offline. If a put-in is installed, whether or not on Project land, the Owner can request a PLUS standard at any*

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<sup>1</sup> Previous applications to LIHI were submitted by Central Rivers Power, MA, LLC, a subsidiary of LS Power/ Patriot Hydro, LLC

*time prior to six months before the expiration of the Certification term. LIHI will determine whether or not to award a PLUS standard for recreation and extend the Certificate term for three additional years.”*

All Projects hold FERC License Exemptions issued in 1992. All have operated in limited store and release mode. The License Exemption amendment authorized run-of-river (ROR) operation for all four Projects, and as discussed below, included new minimum flow requirements for three of the four Projects. This new mode of operation started on March 21, 2023, based on consultation with the Applicant (See Appendix A).

There are no Water Quality Certifications for any of the four Projects.

## II. Facilities and Operations

The following are summaries of each Project, starting from the most downstream dam. All Projects are located on the Chicopee River in Massachusetts, as shown in Figure 1.



**Figure 1 – Project Locations**

The order of the hydroelectric dams, starting with the lowest dam on the Chicopee River is [Dwight Project, LIHI #170](#) (P-10675) at river mile 1.2, [Chicopee Falls Project](#) (P-6522) at river mile 3.0, [Indian Orchard Project, LIHI #112](#) (P-10678) at river mile 7.8, [Putts Bridge Project, LIHI #102](#) (P-10677) at river mile 9.2, [Collins Project, LIHI #88](#) (P-6544) at river mile 12.6 and [Red Bridge Project, LIHI #96](#) (P-10676) at river mile 15.2.

The following summarizes key features at each of the four Projects included in this mid-term review. More detailed descriptions can be found in the previous certification reports and on LIHI's website.

### **Dwight**

The Project includes a stone masonry dam, a canal headgate house, a power canal, intake structure for three operable penstocks, a powerhouse with three operable turbines, a tailrace channel, and appurtenant facilities. The dam, which was built ca. 1860, consists of a 306-foot-long spillway and abutments. The northern abutment measures approximately 12 feet by 25 feet. The stone masonry overflow spillway is 15 feet high by 306 feet long, with a permanent crest elevation of 77.0 feet. The southern abutment measures approximately 9 by 23 feet, and also serves as the north abutment of the headgate house. The dam creates an impoundment extending approximately 1,500 feet upstream with a surface area of approximately 32 acres, and a bypassed reach approximately 1,600 feet long.

The canal headgate house houses six intake gates that control the flow to the power canal. The 80-foot-wide power canal extends 1,500 feet from the headgates to the penstock intake structure. The power canal extends another 1,500 feet further downstream where historically other industrial water users on the canal diverted the water from the downstream end of the canal. The canal is about 6 to 8 feet deep during normal operation. The intake structure measures approximately 69 feet by 22 feet. Steel trashracks span the three operable penstocks. The powerhouse was built in 1920 to contain three turbine-generator units that replaced the existing hydromechanical units at the site. The Project has an installed capacity of 1.464 MW. Upstream and downstream passage for American eel has been installed at Dwight.

### **Indian Orchard**

The Indian Orchard Hydroelectric Project was constructed at an existing masonry, cut-stone dam that has been in place since before 1885. The powerhouse is at the end of a 1,300-ft-long diversion canal that bypasses approximately 1,600 feet of the main Chicopee River channel below the dam. The major project works include the dam with a crest elevation of 159.4 feet (NGVD), topped with 1.6-foot flashboards, an impoundment, a canal headgate house, a power canal approximately 1,300 feet long by 76 feet wide at the gatehouse, narrowing to 52 feet wide at the penstock intake, an intake structure for two operating underground penstocks (and two that were closed in 1970), a powerhouse with two operating turbine-generating units having capacities of 1.5 MW and 2.2 MW, a tailrace channel (El. 125.25 feet msl, NGVD) and appurtenant facilities.

When inflows to the Indian Orchard impoundment are greater than around 500 cfs (minimum flow plus minimum generating capacity on the smaller turbine), Indian Orchard is operated in a limited store and release mode, utilizing the useable storage capacity (35 acre-feet) afforded by a 0.5-foot drawdown year-round. The station is operated automatically by float controls. There are no fish passage facilities at the Project.

## **Putts Bridge**

The Project includes an approximate 223-foot-long by 22-foot-high dam with a crest elevation of 203.6 feet (NGVD), an impoundment that extends approximately 3.3 miles upstream, a 1,700-foot-long bypassed reach, a minimum flow gate, a concrete headgate structure, two conduits, a forebay, trashrack, and intake structure, a powerhouse with two turbine-generating units, a tailrace channel (normal tailrace elevations 160.9 feet) and appurtenant facilities. Wooden headgates isolate the forebay from the generating units. The tailrace canal runs 355 feet from the powerhouse in a westerly direction to where the flow re-enters the Chicopee River. Installed capacity is 3.9 MW. The station operates in a limited store and release mode with a year-round maximum one-foot drawdown. There are no fish passage facilities at the Project.

## **Red Bridge**

The Project includes a dam, canal headgate house, power canal, two operating penstocks, a powerhouse with two turbine-generating units, a tailrace channel and appurtenant facilities. Two flood control dikes are located on the northeast shore of the impoundment upstream of the dam. The dam is composed of three sections: the northern (165 feet long) and southern (363 feet long) sections of the dam are composed of earthen embankment with a concrete core, and the middle section is a 300-foot-long overflow spillway consisting of rubble stone with a cut-granite facing. The maximum height of the dam is approximately 51 feet. The dam creates a bypassed reach approximately 2,160 feet long.

The canal headgate houses 10 intake gates that control flow from the impoundment to the power canal. The 340-foot-long, 73-foot-wide power canal extends from the headgates to the penstock intake structure for the two operating and two abandoned 13-foot-diameter, 100-foot-long steel underground penstocks. Adjacent to the trashracks on the upstream face of the intake is a cut-stone ice sluice that crosses beneath Red Bridge Road and discharges back into the Chicopee River. The two inoperable penstocks were taken out of service in 1938. The flows from the two operating units discharge through two tailrace bays into the tailrace canal. The tailrace canal runs 735 feet in a southerly direction to where the flow re-enters the Chicopee River.

The powerhouse is constructed of brick and cut stone. The original circa 1901 equipment included horizontal waterwheels and 40-cycle generators. The original waterwheels for Unit Nos. 1 and No. 2 were retired in 1938. The Project has a total installed capacity of 4.5 MW. It operates in a limited store and release mode and impounds a 185-acre reservoir. Reservoir fluctuations are limited to two feet, but the Project owner voluntarily limits fluctuations to one foot. The Project provides a minimum bypass flow of 237 cfs at the base of the spillway. There are no fish passage facilities at the Project.

On August 22, 2023, a partial collapse of the powerhouse occurred. As noted in an August 25, 2023, letter submitted to FERC by Central Rivers Power LLC. (CRP), due to the extent of visible damage, a full assessment of the situation and development of a plan and schedule for repair

and restoration of the facility, is not expected to be submitted to FERC until December 15, 2023. On September 16, 2023 FERC authorized a plan to temporarily dewater the tailrace to remove powerhouse debris that had fallen in the water, and to conduct a geotechnical investigation to install a semi-permanent cofferdam in the tailrace.

As the powerhouse is a recognized historic resource, CRP has committed to ensure their assessment and future plans will be conducted according to the Project's exemption and specifically Articles 12 and 13. It is anticipated that generation will remain shut down until the building has been fully repaired. That date is not yet known.

### **III. Scope of the Mid-Term Review**

This review evaluated the Projects' continued compliance with the current LIHI criteria that might be affected by the amendment made to the FERC Exemption for the four Projects. Criteria review included:

- Ecological Flow Regimes
- Water Quality
- Shoreline and Watershed Protection

This review noted that three of the Projects have conditions in the current certifications that remain fully or partially open based on Annual Compliance Submittal reviews (conditions and current status are included in Appendix B). The conditions apply to criteria different from the three reviewed in this mid-term review. The Indian Orchard and Putts Bridge Projects have conditions associated with upstream and downstream fish passage and endangered or threatened species. Dwight has conditions for upstream and downstream fish passage, historic and cultural resources and recreational facilities. As noted previously, Indian Orchard also has an optional condition for recreational facilities that if satisfied, would extend the current certification period. Red Bridge had no conditions. A review by LIHI staff of annual compliance submittals indicates that the Projects are in compliance with the conditions, as summarized on each Project's webpage.

Public notice of the application was issued on August 17, 2023. The 60-day public comment period closed on October 16, 2023 and no comments were received.

This evaluation included a review of the application to LIHI, documents found on the FERC eLibrary, annual LIHI compliance statements submitted during the current LIHI term, and responses to reviewer questions provided by the Owner. Key documents are posted in the Files section at the bottom of each Project's webpage.

The License Exemption amendment authorized ROR operation for all four Projects, and as discussed below, included new minimum flow requirements for all Projects except Putts Bridge.

#### IV. Zones of Effect

There are three Zones of Effect (ZOE) at each of the Projects, including an impoundment, bypass reach and tailrace/downstream reach. The following tables show, for the three noted LIHI criteria, the standards selected for each Project’s ZOE, given the newly issued FERC Exemption Amendment. The same standards have been selected for each Project’s ZOEs.

##### ZOE #1 – Impoundment – All Projects

Criterion		Alternative Standards				
		1	2	3	4	Plus
A	Ecological Flow Regimes		X			
B	Water Quality		X			
E	Watershed and Shoreline Protection	X				

##### ZOE #2 – Bypass Reaches – All Projects

Criterion		Alternative Standards				
		1	2	3	4	Plus
A	Ecological Flow Regimes		X			
B	Water Quality		X			
E	Watershed and Shoreline Protection	X				

##### ZOE #3 – Tailrace and Downstream Regulated Reaches – All Projects

Criterion		Alternative Standards				
		1	2	3	4	Plus
A	Ecological Flow Regimes		X			
B	Water Quality		X			
E	Watershed and Shoreline Protection	X				

#### V. Detailed Criteria Review

##### A. Ecological Flow Regimes

**Goal:** *The flow regimes in riverine reaches that are affected by the facility support habitat and other conditions suitable for healthy fish and wildlife resources.*

**Assessment of Criterion:** At all four Projects, the most recent certifications applied Standard A-1, Not Applicable/De Minimis Effect for all impoundments. However, as the application states, and the reviewer agrees, Standard A-2, Agency Recommendation is now more appropriate, due to the agency settlement agreement and revised agency terms and conditions mandating requirements (discussed below) on the management of the impoundments. New impoundment elevation restrictions and refill requirements for the impoundments after dam maintenance (including flashboard replacement at the Putts Bridge and Indian Orchard projects) or emergency

drawdown, requires that 90 percent of inflow to each Project is released below each Project and the impoundment is refilled on the remaining 10 percent of inflow. Lower levels of bypass minimum flows were also established for all but the Putts Bridge Project.

**Discussion:** CRP began discussions with USFWS and MDFW a number of years ago to reduce bypass minimum flows thought to be excessive in exchange for changing operations from limited store and release mode to run-of-river (ROR) mode. A Settlement Agreement (SA) was signed on October 12, 2021, which formed the basis of the requirements for ROR operation and changes in the minimum flows that would be released from each Project. CRP filed their Exemption Amendment request to FERC on January 6, 2022. In response to this request, on July 15, 2022, FERC issued an Additional Information Request (AIR) requesting the reports for the empirical studies, conducted in consultation with agencies, be filed with FERC. This AIR also requested that CRP provide an environmental analysis of water quality, water quantity, and aquatics/fisheries resources, using current operational conditions as the baseline. (CRP's response to the AIR regarding water quality is discussed later under that Criterion.) On September 9, 2022, CRP filed the requested Instream bypass flow studies for Red Bridge, Indian Orchard & Dwight, as well as a habitat study downstream of Red Bridge to quantify the abundance and distribution of riverine mainstem mesohabitat potentially affected by the run-of-river proposal. No bypass or habitat studies were conducted for Putts Bridge because the proposed flows were the same as the existing minimum flows.

The September 9, 2022 AIR response by CRP also included an Environmental Resource Analysis (ERA) addressing water quality, water quantity and fish and aquatic resource impacts. The conclusions reached by the ERA regarding flow change effects on aquatic resources were:

*“A minimum flow in the Red Bridge bypass of 100 cfs year-round maintains 80-99% of the habitat suitability (across all species) of the current minimum flow of 237 cfs. As such, the proposed reduction in bypass flows is not anticipated to adversely affect aquatic resources because the majority of existing useable habitat remains. A reduced spring flow of 144 cfs in the Indian Orchard bypass reach will be beneficial to juvenile resident life stages in the spring/early summer (April through June) and a lesser minimum flow of 104 cfs will maintain suitable habitat the remainder of the year and thereby not likely adversely affect fisheries resources. Site specific fisheries habitat studies demonstrate that lower than existing minimum flows have little effect on usable habitat across resident species and may actually increase usable area in the Dwight bypass. Maintaining the existing minimum flow (258 cfs) at Dwight, being the first facility on the Chicopee River, will maintain any existing migratory species habitat in the spring/early summer (April through June), but a lower flow of 134 cfs will likely provide more suitable habitat for resident species life stages than at 258 cfs and therefore be beneficial to these species.”*

Following their review of the studies, in MDFW's January 5, 2022 letter and USFWS's January 3, 2022 letter to FERC, which included their revised Terms and Conditions for the Projects, both agencies concluded:

*“Lowering flows in the Dwight, Indian Orchard, and Red Bridge bypass reaches will reduce the quality and quantity of habitat in 1.23 miles of river relative to current conditions. However, converting CRP’s projects from a cycling mode of operation to ROR operation will minimize anthropogenic flow fluctuations in over 5 miles of below-project riverine habitat. Further, ROR operation will minimize headpond fluctuations, stabilizing impoundment habitat. Overall, CRP’s proposal will restore naturalized flows for the entire 17-mile length of the Chicopee River.”*

Thus, it appears both agencies supported the proposed operational changes.

The following table excerpted from the FERC Environmental Assessment (EA) summarizes the changes in the flow requirements in place from the 1992 Exemptions and what are now the new requirements included in the 2023 Exemption Amendment (shown as “proposed” on this table).

Project	FERC No.	Operation		Period	Target Headpond Elevation (NGVD29)		Bypass Flow	
		Current	Proposed		Current	Proposed	Current	Proposed
Dwight	10675	Cycle	ROR	April 15 to June 30	min. elevation of 0.25-ft below top of boards	≥77.0 feet	258 cfs	258 cfs
				Rest of Year		≥76.8 feet		134 cfs
Indian Orchard	10678	Cycle	ROR	April 1 to September 30	0.5-ft drawdown (4/1-6/30)	161.3±0.25 feet	247 cfs	144 cfs
				Rest of Year				1-ft drawdown
Putts Bridge	10677	Cycle	ROR	April 1 to June 30	1-ft drawdown	205.3±0.25 feet	25 cfs	25 cfs
				Rest of Year				2-ft drawdown
Red Bridge	10676	Cycle	ROR	April 1 to June 30	1-ft drawdown	272.3±0.25 feet	237 cfs	100 cfs
				Rest of Year				2-ft drawdown

The 2023 Exemption Amendment includes a number of requirements for the Projects. These are based on the requirements specified in the October 12, 2021, Settlement Agreement signed by CRP, USFWS, and MDFW and in the revised Terms and Condition issued by MDFW (issued January 5, 2022) and USFWS (issued January 3, 2022) which are consistent with the SA. The stated goal of the SA was to provide for the continued operation of the Projects with appropriate long-term environmental protection, enhancement, and mitigation measures that would maintain a balance of non-power and power values on the Chicopee River. The stated goal of the Terms and Conditions was to ensure the new operation modes would be beneficial to aquatic and fishery resources and would benefit shoreline and instream stability at the Projects.

In summary, the Exemption Amendment requires the following<sup>2</sup>:

<sup>2</sup> USGS gage [#01177000](#) Chicopee River at Indian Orchard is the only stream gage on the river. Upstream gages on tributaries above Red Bridge are [#01175500](#) Swift River at West Ware and [#01173500](#) Ware River at Gibbs Crossing

- Dwight- Requires a minimum bypass flow release of 258 cfs or inflow if less from April 15 through June 30, and 134 cfs or inflow if less the remainder of the year. Requires the Project to operate in instantaneous ROR mode whereby inflow equals outflow with target elevation of at least 76.92 ft NGVD from April 15 – June 30, and at least 76.75 ft NGVD during the remainder of the year.
- Indian Orchard- Requires a minimum bypass flow release of 144 cfs (or inflow, if less) from April 1 through September 30, and 104 cfs (or inflow, if less) the remainder of the year. Requires instantaneous ROR mode operation whereby inflow equals outflow within +/- 0.25 ft of target headpond elevation of 161.0 ft NGVD.
- Red Bridge- Requires a minimum bypass flow release of 100 cfs or inflow if less year-round. Requires instantaneous ROR mode operation whereby inflow equals outflow within +/- 0.25 ft of target headpond elevation of 272.3 feet NGVD.
- Putts Bridge- Requires a minimum bypass flow release of 25 cfs or inflow if less year-round which did not change from the existing FERC exemption. Requires the Project to operate in instantaneous ROR mode whereby inflow equals outflow with +/- 0.25 ft of target headpond elevation of 205.3 feet NGVD (top of flashboards); and
- an Operations and Compliance Monitoring Plan (OCMP) which was provided in CRP's Exemption amendment application filing. The OCMP replaces the operating requirements defined by the August 2012 Minimum Flow and Impoundment Fluctuation Monitoring Plan. The OCMP was approved by USFWS, MDFW, and Massachusetts Department of Environmental Protection (MDEP) by email dated January 3, 2022 (USFWS and MDFW) and January 4, 2022 (MDEP). These letters are contained in the OCMP Appendix A included on LIHI's website. The March 13, 2023 Exemption Amendment approved the OCMP. The OCMP includes:
  - how the ROR operation and the bypassed reach flow releases would be provided during periods when the headponds are drawn down for dam maintenance (including flashboard replacement) including the refill protocol;
  - the means and frequency of recording data on Project operations to verify proper operations and minimum flow releases, and for inspection by the Commission and the state and federal fish and wildlife agencies;
  - reporting requirements for deviations from ROR operation and mandated bypass flows. Planned short variances are allowed upon approval of FERC, USFWS and the MDFW. Operating emergencies beyond the control of the operator that require curtailment of ROR or bypass flows, shall only extend the time period necessary to rectify such an operating emergency. Such deviations require notification to FERC, USFWS and the MDFW as soon as possible, but no later than ten (10) business days after any such operating emergency. Review of FERC's eLibrary did not show any deviations as having occurred since the new mode of operation was implemented in March 2023; and
  - a plan for water quality monitoring (temperature and dissolved oxygen) in the Projects' bypass reaches during the first low flow period following the Commission's issuance of the amended exemptions. This is discussed further below under Water Quality.

The 2021 SA included a requirement to release year-round “default minimum flows” (Dwight – 258 cfs, Indian Orchard – 247 cfs, Red Bridge – 237 cfs, Putts Bridge – 25 cfs) “if any Project is not successfully converted to run-of-river operation by July 31, 2022”. Curt Mooney of Patriot Hydro, noted in a conversation with LIHI staff following his initial email that the default flows are in fact, the flows required by the 1992 Exemptions. Thus, these flows were being released until ROR operation began following FERC amendment issuance.

Review of FERC records and annual compliance reports found no or only limited minor excursions of minimum flow or headpond limits since last certified until ROR operation began on March 21, 2023. No excursions have been reported at any Project since March 2023, under about six months of the new ROR operation. Therefore, the Projects continue to satisfy the Ecological Flow Criterion.

## **B. Water Quality**

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

**Assessment of Criterion:** In past Certifications Standard B-1, Not Applicable/De Minimis Effect had been applied for Water Quality for all ZOE for all Projects as no Water Quality Certifications had been issued, the 1992 Project Exemptions did not contain any water quality monitoring requirements and correspondence from the MDEP during the prior reviews stated that it was not likely the Projects were affecting water quality. However, the current Exemption Amendment now requires water quality monitoring, so Standard B-2, Agency Recommendation is now appropriate.

**Discussion:** Water Quality Certifications were not issued for any of the Projects. However, the Exemption Amendment includes a provision for temperature and dissolved oxygen monitoring in the Dwight, Indian Orchard and Red Bridge bypass reaches in order to verify the new reduced bypass flows are appropriate. This five-week testing is to be conducted during the first low-flow period (July through September) following FERC issuances of the order amending the exemptions. A report on the results would be submitted by November 30 of the study year to USFWS and MDEP. Also, a Water Quality Monitoring Plan (WQMP) was to be developed and provided to agencies no later than March 31, 2022. The WQMP (Attachment A to the September 9, 2022, AIR response by CRP) was distributed to the USFWS and MDEP on March 30, 2022, with the intent of conducting the study in 2022. USFWS provided limited comments on April 10, 2022, which have been incorporated into the WQMP. It does not appear that MDEP commented. As the Exemption Amendment was issued in March 2023, these studies were slated for July-September 2023. However, these studies have been postponed to 2024 due to abnormally high river flows, with USFWS approval. (See Appendix A, C. Mooney email).

The FERC Environmental Assessment did not address water quality. CRP’s ERA noted that waters at each Project had some level of impairment based on The Final Massachusetts Year 2016

Integrated List of Waters (MDEP 2019) however they concluded that *“it is not anticipated that the projects contribute to degradation of the water quality of the Chicopee River.”*

The 2018/2020 state Integrated List of Waters lists the following water quality data for Project waters. There were no changes to the listed impairments in the most recent 2022 Integrated List. The document does not suggest Project operations are the cause for listed impairments, with the obvious exception of *“possible impacts of hydropower operation”* which were not detailed.

- Dwight – impaired for E coli. The reach is fully supporting of designated uses, with an alert for potential impacts of hydropower operations and Combined Sewer Operations.
- Indian Orchard - The Aquatic Life Use for this reach is assessed as Not Supporting. While the benthic, fish and water quality data were indicative of good conditions, an impairment for the presence of invasive water chestnut was added. There is an alert for potential impacts of hydropower operations.
- Putts Bridge - The Aquatic Life Use for this reach is assessed as Not Supporting. Impairments are listed for water chestnut, E coli and fecal coliform. There is an alert for potential impacts of hydropower operations.
- Red Bridge - the impoundment and upstream reach is impaired for invasive aquatic plants. Water Chestnut is being removed by Chicopee 4 Rivers and Patriot Hydro based on the LIHI Annual Compliance Verification Form. The downstream reach is fully supporting of designated uses, with an alert for potential impacts of hydropower operations.

Since the required water quality testing has not yet been conducted at Dwight, Indian Orchard, and Red Bridge, satisfaction of the Water Quality Criterion is conditional based on completion of these studies, acceptance of the results by the resource agencies, and implementation of any additional requirements that may result based on the results found.

### **C. Shoreline and Watershed Protection**

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

**Assessment of Criterion:** In the prior recertification application, the Applicant selected Standard E-1, Not Applicable/De Minimis Effect in the impoundment and downstream ZoEs. This review finds that this standard continues to be appropriate for all four Projects.

**Discussion:** There were no exemption requirements related to shoreline or watershed protection under the prior or amended exemptions. As previously noted, MDFW’s January 5, 2022 letter

and USFWS’s January 3, 2022 letter to FERC, which included their revised Terms and Conditions for the Projects, both stated:

*“Further, ROR operation will minimize headpond fluctuations, stabilizing impoundment habitat.”*

In their EA, FERC found:

*“Further, a ROR operation would minimize headpond fluctuations, stabilizing the impoundment shoreline and reducing erosion and bank sloughing.”*

Based on the mid-term review, the Projects’ new ROR operational modes continue to satisfy this Criterion.

## **VI. Conclusions and Recommendation**

This review determined that the Certification conditions from the past reviews should remain in effect since they were unaffected by the FERC Exemption amendment (see Appendix B).

Putts Bridge continues to satisfy the LIHI criteria and is recommended for recertification for a new 10-year term with the existing conditions and no new conditions.

Dwight, Indian Orchard, and Red Bridge are also recommended for recertification with new 10-year terms. These projects satisfy the Ecological Flows and Shoreline Protection criteria but only conditionally meet the Water Quality criterion. The following new condition is recommended for these three Projects. The condition number will be specific to each Project (see Appendix B).

**Condition:** The facility Owner shall provide LIHI a copy of the report on the results of the water quality testing to be conducted at Dwight, Indian Orchard and Red Bridge, along with comments received from USFWS and MDEP within 60 days of report finalization. Currently, the report is scheduled to be completed by November 30, 2024. If additional testing or other actions are found to be required as a result of this study, then the plan and schedule for implementing those actions shall also be provided to LIHI.

Lastly, for Red Bridge, a second new condition is recommended:

**Condition:** The facility Owner shall notify LIHI when powerhouse and related repairs are completed and operations resume. Notification shall include documentation of any permanent changes made to facility structures or operations as a result of the powerhouse collapse. LIHI reserves the right to modify the Certification or conditions in light of any changes made.

The complete list of recommended conditions is included in Appendix B.

## **Appendix A**

### **Communications With Applicant**

From: "Curt Mooney" <cmooney@patriohydro.com>  
To: "PBMwork@maine.rr.com" <PBMwork@maine.rr.com>  
Cc: "mfischer@lowimpacthydro.org" <mfischer@lowimpacthydro.org>, "Miley Kinney" <Mkinney@patriohydro.com>  
Bcc:  
Priority: Normal  
Date: Friday September 1 2023 7:56:24AM  
RE: Questions on The Chicopee River Mid-Term Review Application

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Good morning Pat,

Below are responses to your questions.

Best regards,

Curt

1) Can you tell me the date of when the four projects went to Run-of-river (ROR) operation? **March 21, 2023**

2) The Settlement Agreement on page 8 states that the default minimum flows shall be released by each Project if the projects did not initiate ROR by July 31, 2022. I also noticed that the Additional Information Request (AIR) response submitted to FERC on September 9, 2022 states a somewhat different "trigger" for initiating the default flows:

*"CRP MA notes that the associated settlement agreement contemplated converting operations of the projects to run-of-river mode immediately upon Commission approval. If this conversion is not completed by July 31, 2022, the default (existing) bypass flows shall be released."*

While it makes sense that you need to wait until the FERC Exemption is modified, I was wondering if this other "trigger" (i.e. FERC exemption amendment approval rather than ROR operation) was approved by USFWS and MADEP? Please elaborate on this apparent conflict. **I recall this language was placed in the settlement to make sure the parties (mainly CRP MA) acted upon the exemption amendment application process timely. Once the amendment application was submitted to FERC (1-6-22), it would be in FERC's hands. CRP MA implemented the new Operations & Compliance Monitoring Plan once FERC approved the exemption amendment request and associated Plan.**

Water Quality

1) SA page 10 also states that water quality monitoring during the first low-flow period (July through September) following FERC issuance of the exemption amendment, which would make the deadline by this September. Please provide an update on where you stand with this monitoring requirement. **The water quality monitoring study has been postponed to 2024 due to abnormally high river flows. I will forward you an email from the USFWS agreeing to the postponement of the study to 2024.**

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**From:** PBMwork@maine.rr.com <PBMwork@maine.rr.com>

**Sent:** Tuesday, August 22, 2023 10:31 AM

**To:** Curt Mooney <cmooney@patriohydro.com>; 'mfischer@lowimpacthydro.org' <mfischer@lowimpacthydro.org>

**Subject:** Questions on The Chicopee River Mid-Term Review Application

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Hi Mr. Mooney

I am the reviewer assigned to conduct the mid-term review of your Chicopee River projects which recently received a revised FERC Exemption Amendment. I have the following questions that perhaps you can help me with.

Flows

1) Can you tell me the date of when the four projects went to Run-of-river (ROR) operation?

2) The Settlement Agreement on page 8 states that the default minimum flows shall be released by each Project if the projects did not initiate ROR by July 31, 2022. I also noticed that the Additional Information Request (AIR) response submitted to FERC on September 9, 2022 states a somewhat different "trigger" for initiating the default flows:

*"CRP MA notes that the associated settlement agreement contemplated converting operations of the projects to run-of-river mode immediately upon Commission approval. If this conversion is not completed by July 31, 2022, the default (existing) bypass flows shall be released."*

While it makes sense that you need to wait until the FERC Exemption is modified, I was wondering if this other "trigger" (i.e. FERC exemption amendment approval rather than ROR operation) was approved by USFWS and

MADEP? Please elaborate on this apparent conflict.

Water Quality

1) SA page 10 also states that water quality monitoring during the first low-flow period (July through September) following FERC issuance of the exemption amendment, which would make the deadline by this September. Please provide an update on where you stand with this monitoring requirement.

Thanks for your help.

Pat McIlvaine

From: "Curt Mooney" <cmooney@patriothydro.com>  
To: "Pat McIlvaine" <PBMwork@maine.rr.com>  
Cc: "mfischer@lowimpacthydro.org" <mfischer@lowimpacthydro.org>, "Miley Kinney" <Mkinney@patriothydro.com>  
Bcc:  
Priority: Normal  
Date: Friday September 1 2023 7:57:16AM  
FW: [EXTERNAL] RE: CRP MA Chicopee River Projects Water Quality Study

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Below is the email from the USFWS agreeing to postponing the water quality study to 2024.

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**From:** Grader, Melissa <melissa\_grader@fws.gov>  
**Sent:** Thursday, August 17, 2023 8:19 AM  
**To:** Curt Mooney <cmooney@patriothydro.com>; david.hilgeman@state.ma.us; Quinones, Rebecca (FWE) <rebecca.quinones@state.ma.us>  
**Cc:** Trested, Drew <dtrested@normandeau.com>  
**Subject:** Re: [EXTERNAL] RE: CRP MA Chicopee River Projects Water Quality Study

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The Service has no objection to postponing the water quality survey until 2024, given the prolonged high flows the Connecticut River and most of its tributaries have experienced this summer.

Regards,

Melissa Grader

Fish and Wildlife Biologist

Migratory Fish/Hydropower Program

U.S. Fish and Wildlife Service/New England Field Office

103 East Plumtree Road, Sunderland, MA 01375

p: (413) 239-2138 | e-mail: melissa\_grader@fws.gov

**\*Please note my new phone number**

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**From:** Curt Mooney <cmooney@patriothydro.com>  
**Sent:** Thursday, August 17, 2023 7:57 AM  
**To:** Grader, Melissa <melissa\_grader@fws.gov>; david.hilgeman@state.ma.us <david.hilgeman@state.ma.us>; Quinones, Rebecca (FWE) <rebecca.quinones@state.ma.us>

**Cc:** Trested, Drew <dtrested@normandeau.com>

**Subject:** [EXTERNAL] RE: CRP MA Chicopee River Projects Water Quality Study

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Good morning,

Please see the attached email from Drew Trested (Normandeau) regarding the status of deploying water quality data loggers in the bypass reaches at Red Bridge, Indian Orchard, and Dwight on the Chicopee River.

As reported earlier this season, river flows throughout New England have been way above normal. It seems we are past the period desired for sampling (summer low flows and high temperatures).

CRP MA is requesting to conduct the water quality study during the summer of 2024 instead of trying to gather some information during a non-representative timeframe.

Please let us know your thoughts and whether you concur with postponing sampling to 2024.

Regards,

Curt

---

**From:** Drew Trested <dtrested@normandeau.com>

**Sent:** Wednesday, August 16, 2023 8:00 PM

**To:** Curt Mooney <cmooney@patriohydro.com>

**Subject:** Chicopee WQ loggers

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Hi Curt –

I hope you are doing well. Just following up on our correspondence from mid-July regarding the Chicopee project bypass reach loggers. With the wet weather, inflows at each project remained high into August and we held off from installing loggers in hopes of capturing conditions where you had your min flow values flowing through those reaches. We have continued to watch the Chicopee River gage and flows through the first part of August continued to be above station capacity at Dwight and at Red Bridge (with only its single unit going). As of right now, stream flows are 1300 cfs so only Indian Orchard has its min flow in place. Given where we are in the summer period and our study plan specified window for carrying out our 5-week monitoring period (i.e., July-Sept), what are your thoughts on trying to deploy at only Indian Orchard (and Dwight if we see flows trending downward)? I am not sure how representative it would be and it would obviously not help you with compliance validation at Red Bridge. Curious if you think it might be a good idea to check in again with FWS and MADEP to see if they have an opinion on whether it might be a wise idea to table this sampling until 2024.

Happy to talk through if you would like.

Drew

Drew Trested, PhD

*Vice President | Senior Fisheries Scientist*

**Normandeau Associates, Inc.**

30 International Drive, Portsmouth, NH 03801

603-319-5310 (direct) 603-973-3179 (cell)



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## **Appendix B**

### **Existing and Recommended Certificate Conditions**

## Dwight

- **Condition 1:** The Owner shall consult with resource agencies on the need for interim and/or permanent upstream passage and, if warranted, downstream passage for American eel. The initial consultation request shall be made within 60 days of LIHI certification with completion of consultation activities within six months or as soon as possible after LIHI Certification, pending agency staff availability. ***This portion satisfied in 2021 with completion of initial consultation.***

***Condition modified in 2023:*** In annual compliance submittals to LIHI, the facility Owner shall provide a summary of any agency consultation that may occur regarding upstream or downstream American eel passage. If an agency requests passage studies or passage facilities during the LIHI term, a plan and schedule for implementation will also be provided in the applicable compliance submittal(s).

- **Condition 2:** The Owner shall consult with the SHPO before undertaking any ground disturbance, construction, repair, or modification to any site features listed in the documents describing the site features considered eligible for or listed on the National Registry of Historic Places. Should any such activities be conducted during the term of this LIHI Certification, such as the currently planned Project upgrades, a copy of the required notification/consultation with the SHPO and, if required, with FERC, shall be submitted to LIHI when such agency filings are made. The status of any work conducted following such review shall be filed as part of the annual compliance reports to LIHI.
- **Condition 3:** The Owner shall consult with the City of Chicopee to see if there are opportunities to support the City's currently planned expansion of the nature trail / Riverwalk along the Project area. Within six months of LIHI Certification, the Owner shall provide LIHI with evidence of consultation and any related agreements with the City. ***This portion satisfied in 2023 with completion of consultation.***

***Condition modified in 2023:*** The status of Chicopee Riverwalk development activities within or adjacent to the Project boundary shall be summarized in annual compliance submittals.

- **New Condition 4:** The facility Owner shall provide LIHI a copy of the report on the results of the water quality testing to be conducted at Dwight, Indian Orchard and Red Bridge, along with comments received from USFWS and MDEP within 60 days of report finalization. Currently, the report is scheduled to be completed by November 30, 2024. If additional testing or other actions are found to be required as a result of this study, then the plan and schedule for implementing those actions shall also be provided to LIHI.

## Indian Orchard

- **Condition Satisfied in 2022. Condition 1:** The Owner shall revise the Minimum Flow and Impoundment Fluctuation Plan to reflect the minimum flow gate, incorporating appropriate resource agency comments; and confirm the top-of-flashboard elevation. A copy of the plan shall be provided to LIHI within 60 days of FERC submission. LIHI shall also be provided a copy of FERC's final approval of the plan within 60 days of its receipt.
- **Condition 2:** Should the Owner receive notification during the term of this LIHI Certification from either the USFWS or MDFW that upstream and/or downstream passage for anadromous or catadromous fish is required, based on sound science / technical data that has shown that such passage is required at the Indian Orchard Project, the Owner shall forward a copy of that notification and its response to LIHI within 60 days of receipt of the notification.
- **Condition 3:** Should ground disturbance or removal of large trees be required during the term of this LIHI Certification that could affect habitat for bald eagles or Northern long-eared bats, the Owner shall consult with MDFW and USFWS to determine impacts to these species that may occur in the Project area. LIHI shall be provided copies of agency communications (e.g., approvals, denials, mitigation measures, etc.) associated with such activities. This information should be submitted as part of annual compliance submittals to LIHI.
- **Condition 4 (optional):** The Owner shall seek to collaborate with local recreational interests and abutting landowners on potential options for providing a cartop put-in far enough downstream from the confluence of the bypass and tailrace to minimize hazards from sudden release of flows to the bypass in the event the generating unit suddenly trips offline. If a put-in is installed, whether or not on Project land, the Owner can request a PLUS standard at any time prior to six months before the expiration of the Certification term. LIHI will determine whether or not to award a PLUS standard for recreation and extend the Certificate term for three additional years.
- **New Condition 5:** The facility Owner shall provide LIHI a copy of the report on the results of the water quality testing to be conducted at Dwight, Indian Orchard and Red Bridge, along with comments received from USFWS and MDEP within 60 days of report finalization. Currently, the report is scheduled to be completed by November 30, 2024. If additional testing or other actions are found to be required as a result of this study, then the plan and schedule for implementing those actions shall also be provided to LIHI.

## Putts Bridge

- **Condition 1:** Should the Facility Owner receive notification during the term of this LIHI Certification from either the USFWS or MDFW that upstream and/or downstream passage for anadromous or catadromous fish is required, based on sound science / technical data that has shown that such passage is required at the Putts Bridge Project, the Facility Owner shall forward a copy of that notification and its response to LIHI within 45 days of receipt of the notification.
- **Condition 2:** Should the Facility Owner determine that ground disturbance or significant changes in project operations are desired during the term of this LIHI Certification that could affect habitat for the swamp dock, the Facility Owner shall conduct studies and filings deemed necessary by the state to determine impacts to swamp dock that may occur in the Project area. LIHI shall be provided copies of agency communications (e.g., approvals, denials, mitigation measures, etc.) associated with such desired Project changes. This information should be submitted as part of the LIHI annual compliance statements.

## Red Bridge

- **New Condition 1:** The facility Owner shall provide LIHI a copy of the report on the results of the water quality testing to be conducted at Dwight, Indian Orchard and Red Bridge, along with comments received from USFWS and MDEP within 60 days of report finalization. Currently, the report is scheduled to be completed by November 30, 2024. If additional testing or other actions are found to be required as a result of this study, then the plan and schedule for implementing those actions shall also be provided to LIHI.
- **New Condition 2:** The facility Owner shall notify LIHI when powerhouse and related repairs are completed and operations resume. Notification shall include documentation of any permanent changes made to facility structures or operations as a result of the powerhouse collapse. LIHI reserves the right to modify the Certification or conditions in light of any changes made.