APPLICATION REVIEW FOR
LOW IMPACT HYDROPOWER INSTITUTE RECERTIFICATION
of the
Methuen Falls Hydro Project
LIHI #111 FERC P-8093

June 7, 2019

Application Reviewer: Diane Barr, Camas, LLC

This report provides review findings and recommendations related to the application submitted to the Low Impact Hydropower Institute (LIHI) on February 19, 2019 from Olson Electric Development Co., Inc. (Applicant) for Low Impact Hydropower Recertification of the Methuen Falls Hydroelectric Project (the Project).

I. Background:

The 0.36 MW Methuen Falls Hydroelectric Facility ("Facility" or "Project") is located in the City of Methuen, Essex County, Massachusetts on the Spicket River near Route 28, south of the junction of Routes 28 and 213. Methuen Falls is the second of four existing dams on the river. The Project was certified by the Low Impact Hydropower Institute (LIHI) as a low impact hydropower facility in August 2013. LIHI Certificate No. 111 became effective on August 8, 2013, extended on December 17, 2018 and expires on May 31, 2019.

The Project dam was originally constructed in the late 1800's, is made of cut granite built on a bedrock foundation. The height is approximately 20 feet which incorporates three feet of flashboards on the crest. The Project also incorporates a 130 ft overflow spillway consisting of three sections separated by concrete piers. There are two, 3-foot-wide by 4-foot-high fully automated flood gates located on the southernmost pier.

The powerhouse is located in the historic Methuen Company Spinning Mill #5. The c. 1840 structure contains the following major components:

- Turbine #1: 405 hp Vertical Leffel - Francis Unit
  Generator #1: 285 kw Vertical General Electric
- Turbine #2: 120 hp Vertical S. Morgan Smith - Francis Unit
  Generator #2: 90 kw Vertical Westinghouse
- Switchgear, Excitation, HPU, & other Controls & Automation Equipment

II. Recertification Standards

In January 2018, LIHI notified the applicant of the upcoming expiration of the Low Impact Hydropower Institute certification for the Facility. The notification included an explanation of procedures to apply for an additional term of certification under the 2nd Edition LIHI Handbook (2016), including the new two-stage process starting with a limited review of a completed LIHI application, focused on three questions:

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

If the answer to any question is "YES," the application must proceed through a second stage, which consists of a more thorough review of the application using the LIHI criteria in effect at the time of the recertification application. The letter noted that because the new Handbook involves new criteria and a new process, all projects scheduled to renew after 2017 will be an automatic 'YES.' Therefore, all certificates applying for renewal after 2017 are required to proceed through both stage one and stage two of the recertification application reviews.

The Owner submitted an initial (Stage I) application for re-certification in August 2018. LIHI staff worked with the Owner to revise the application to comply with the new Handbook requirements. The Owner then re-submitted their Stage I application in early 2019, with the Stage I Reviewer's report released on February 9, 2019. The State I Reviewer's Report only recommended minor clarifications and corrections in the subsequent Stage II application. This Report comprises the Stage II Recertification Report.

III. Adequacy of the Recertification Package

The process of determining adequacy of the Recertification package involves evaluating the 2nd edition LIHI Handbook to the Applicant's submitted information, public comments, and regulatory compliance record. The Applicant provided a revised Recertification Application February 2019. The application package, supporting comments and documentation and public records on FERC e-library posted since the original certification report (Cueto, J, 2013) were reviewed.

The February 2019 application upon review was not complete as it did not include the requested additional supporting information required for Ecological Flows. The gaps in the application results in requiring prescribed conditions to be satisfied in order to recommend certification. The Application was publicly noticed and received no public comments during the comment period which ended May 25, 2019. Specific comments from Massachusetts Division of Fisheries and Wildlife were solicited as the applicant did not provide evidence of this personal communication in the application. In addition, phone communication with the US Fish and Wildlife Service was conducted to confirm that American eel passage is not currently required. The other state and federal agencies were not contacted as the application provided necessary evidence. The US Fish and Wildlife Service confirmed on June 4, 2019 via an email with Julianne Rosset, that American eel passage is not required at this time.

IV. There have not been any "material changes" at the facility that would affect recertification

In accordance with the Recertification Standards, "material changes" mean non-compliance and/or new or renewed issues of concern that are relevant to LIHI's criteria. Based on my review of materials provided, review of FERC's public records, and consultation with the noted individuals, there are no areas of noncompliance or new or renewed issues of concern. The current LIHI certification includes three conditions:

Condition 1: *Effective immediately upon receipt of this grant of certification, Olson shall increase the minimum bypass flow to 16 cfs, or instantaneous inflow if less.*

Status: This condition was satisfied in 2013 upon certification. It is recommended that this condition be extended into the new certification term, see Section V.A and Section VI below.

Condition 2: *Within 90 days of LIHI's grant of certification, Olson shall develop a flow monitoring and record keeping plan in consultation with the United States Fish and Wildlife Service "USFWS") and the Massachusetts Division of Fisheries & Wildlife ("MassWildlife") and file the plan with LIHI. The plan shall include the information on the mechanism for maintaining the bypass minimum flow (noting that at least 3 cfs should be provided as full-crest spillage for consistency with the license). Before filing the plan with LIHI, Olson shall seek written approval from the agencies and include any written responses to LIHI at the same time the plan is filed.*

Status: This condition was satisfied in 2014 and the final plan was included in the 2019 recertification application.

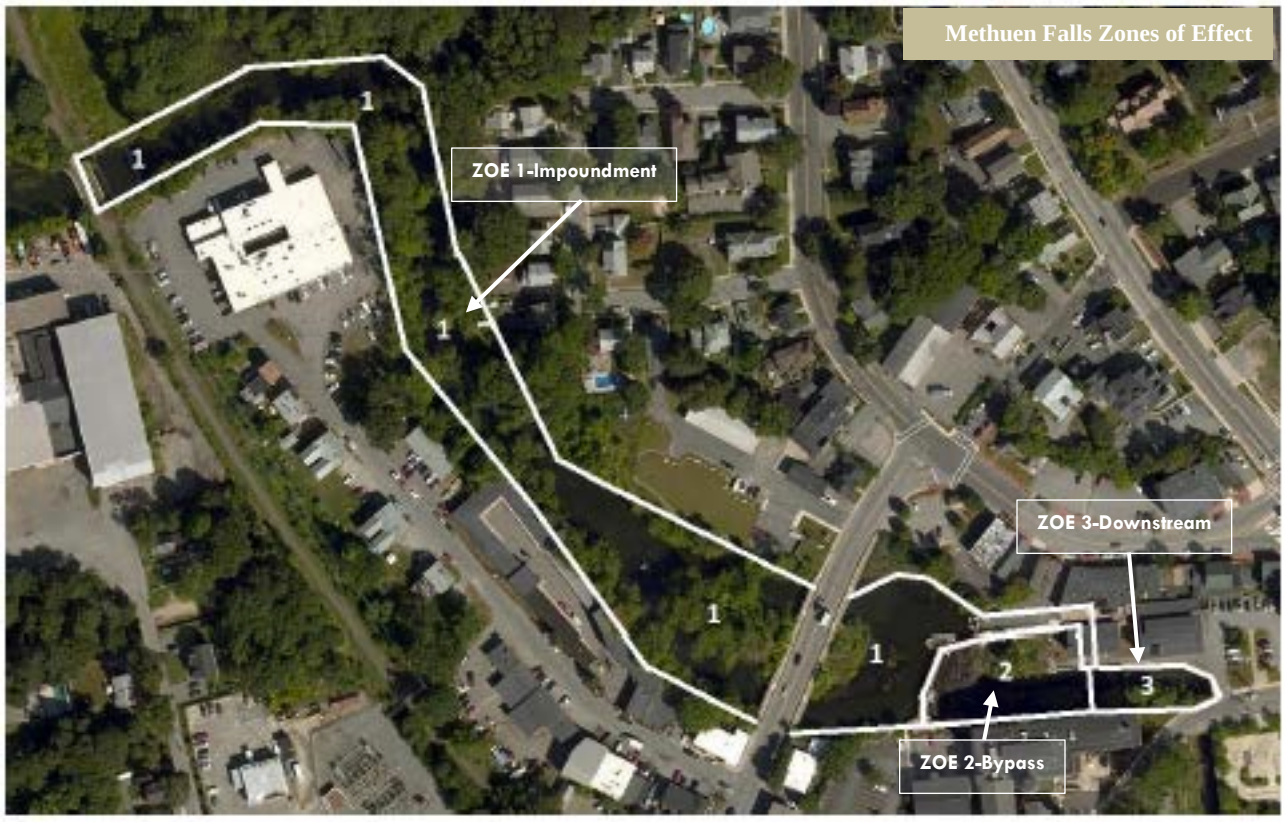
Condition 3: *Upon notification by the USFWS that a final determination has been made that fish passage is required for American eel at Methuen Falls dam, Olson shall immediately start work to establish a cooperative Agreement with USFWS and MassWildlife to implement and provide such eel passage, including both permanent and interim measures that are requested by these agencies. Olson shall notify LIHI within 30 days of this notification on the eel passage requirement, and the Agreement shall be in place within 90 days of such notification. The interim measures that are identified in the Agreement shall be put in place within 120 days of the notification, and permanent eel passage measures shall be in place no later than two years after notification of the requirement. Two weeks after the eel passage Agreement is in place, Olson shall provide a report to LIHI describing the planned passage and protection measures and the implementation schedule for design, installation, and operations, along with a copy of the Agreement. Progress and any monitoring data collected shall be reported to LIHI in Olson's annual compliance letter.*

Status: To date, no agencies have requested fish passage, but it is recommended that this condition, or a similar condition be extended into the new certification term, see Section V.D and Section VI below.

V. LIHI certification criteria are satisfied in all zones

The applicant properly selected three zones of effect for the Facility (Figure 1). The applicant defined the following zones:

Zone 1) Impoundment, 8.7-acre impoundment.
Zone 2) Bypassed Reach, 150 feet long.
Zone 3) Downstream: Project Tailrace to Harvey Falls Dam



The Applicant selected the following Standards for the three Zones of Effect (ZOE).

Zone 1-Impoundment and Penstock

	Criterion	*Alternative Standards*				
		1	*2*	*3*	*4*	*Plus*
A	**Ecological Flow Regimes**	***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***				

Zone 2-Bypass Reach

	Criterion	*Alternative Standards*				
		1	*2*	*3*	*4*	*Plus*
A	**Ecological Flow Regimes**		***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***				

Zone 3-Downstream

	Criterion	*Alternative Standards*				
		1	*2*	*3*	*4*	*Plus*
A	**Ecological Flow Regimes**	***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***				

A. *Ecological Flow Regimes*

The Applicant selected Standard 1, Not Applicable/De Minimis for the Impoundment and Downstream ZOE, and Standard 2, Agency Recommendation for the Bypass ZOE. LIHI allows Standard 1 to be selected for all Impoundment zones, with an accompanying description of how impoundment levels are managed. For the bypass ZOE, selection of Standard 2, Agency Recommendation is accurate, but referred to their original LIHI certification documentation and for meeting Standard 2 in the bypass reach. Instream flow study and consultation with the resource agencies, which along with the LIHI initial Certification stipulated the minimum flow of 16 cfs to protect instream habitat. The Project, under the FERC licensed condition is only required to maintain a 3 cfs minimum flow. Therefore, per their original LIHI Certification condition the Project maintains a minimum flow of 16 cfs. As for the Downstream ZOE, the Facility will continue, consistent with Article 21 of the license, to operate in a strictly run-of-river mode, which should protect habitat below the tailrace. Therefore, the Project conditionally satisfies this criterion.

B. *Water Quality*

The Applicant selected Standard 2, Agency Recommendation, for all three ZOEs at the Project. The Spicket River is designated as a Class B warm water fishery in the state's water quality standards and that Class B waters are designated as a habitat for fish, other aquatic life, and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation.
The river is on the Massachusetts State draft 2016 list of impaired waters as requiring a TMDL. Specific impairments along the 5.8 mile stretch from the New Hampshire state line to the confluence with the Merrimack River include the following…

- Debris/Floatables/Trash
- Physical substrate habitat alterations (hydromodification & channelization)
- Aquatic Macroinvertebrate Bioassessments
- Copper
- Escherichia coli
- Other (Unspecified Nutrients).

The Applicant has satisfied the LIHI recertification standard by providing a supporting letter from the Massachusetts Department of Environmental Protection, Division of Watershed Management. The letter states that the departments findings are the same as they were under the initial LIHI Certification, and that the hydro operations do not contribute to the impaired conditions of the Spicket River.

C. *Upstream Fish Passage*

The Applicant selected Standard 1, Not Applicable/De Minimis for all ZOEs. The river has been sampled by Massachusetts Division of Fisheries and Wildlife (MDFW). Documented fish species include American eel, bluegill, brown bullhead, common shiner, fallfish, largemouth bass, pumpkinseed, redbreast sunfish, redfin pickerel, tessellated darter, white sucker and yellow bullhead. This information was provided to the Applicant via a personal communication with Caleb Slater, MDFW. My outreach to Mr. Slater confirmed these conclusions. To date, the US Fish and Wildlife Service has not requested American eel passage. This is presumed as there are barriers downstream of the Project, and therefore upstream passage in the Spicket River is not occurring. The Applicant will be required to annually report to LIHI if resource agencies have requested passage.

D. Downstream Fish Passage

The Applicant selected Standard 1, Not Applicable/De Minimis for all ZOEs. As stated above in Upstream Passage, the river has been sampled by MDFW. The warm water species have not presented a requirement for installing downstream fish passage facilities. The project possesses trash racks with a ¾ inch spacing, which assists in the prevention of fish entrainment. The Applicant again referred to a personal communication with Caleb Slater at MDFW to support their findings. My outreach to Mr. Slater confirmed these conclusions. To date, the US Fish and Wildlife Service has not requested American eel passage. This is presumed as there are barriers downstream of the Project, and therefore upstream passage in the Spicket River is not occurring such that subsequent downstream passage is not occurring either. The Applicant will be required to annually report to LIHI if resource agencies have requested passage.

E. Shoreline Protection

The Applicant selected Standard 1, Not Applicable/De Minimis for all ZOEs. The area is zoned industrial and is used for power production. The FERC Boundary area is less than 1 acre and there is not a Shoreline Management Plan requirement in their FERC License. Therefore, the Project satisfies this LIHI criterion.

F. *Threatened and Endangered Species*

The Applicant selected Standard 2, Agency Recommendations, with a Finding of No Negative Effects. The potential protected species listed by the Commonwealth of Massachusetts are: Blue-spotted Salamander, Blanding's Turtle, Andrews' Bottle Gentian, Wood Turtle, Cobra Clubtail, Bald Eagle, Alternate-flowered Water-milfoil and Umber Shadowdragon. The Applicant reviewed the Natural Heritage Atlas, 14th edition establishing that these species do not reside in the Project area. In addition, the US Fish and Wildlife lists Piping Plover, Roseate tern, Red knot, Small whorled pogonia, Northern Long-Eared Bat, Hawksbill sea turtle, and Leatherback sea turtle as either endangered or threatened in Essex County. The application stated that the Project does not possess suitable habitat for these species based on lack of presence. Therefore, the Project satisfies this LIHI criterion.

G. *Cultural and Historic Resources Protection*

The Applicant selected Standard 2, Agency Recommendations, for all zones. The project is within the Spicket Falls Historic District. The Methuen Company Spinning Mill #5, which houses the power plant, has been preserved and restored in accordance with Historic District guidelines. The Applicant completed a Cultural Resources Management Plan in 1985 complying with License Article 20. In 2003, the Project was awarded a Preservation Award from the Methuen Historical Society for the restoration and preservation work listed above. There is no evidence of conflicts with respect to cultural resources protection, and therefore the Project satisfies this LIHI criterion.

H. *Recreation*

The Applicant selected Standard 1, Not Applicable/De Minimis for all ZOEs. There are no recreation facilities associated with the Project and only a footbridge over the dam provides public access (see figure below). The area is used by kayakers, with their put-in located outside the FERC boundary. Therefore, the Project satisfies this LIHI criterion.

Methuen Falls footbridge

VI. Conclusion and Recommendation

The materials provided and referenced above are sufficient to make a recertification recommendation, provided the following conditions are met, and no further application review is needed. It is recommended that the recertification of the Methuen Falls Hydroelectric Facility be valid for a five-year term, with the following two conditions:

1. The Facility Owner shall continue to voluntarily provide a minimum flow of 16 cfs into the bypassed reach.
2. Due to the potential for American eel presence in the Project area, the Facility Owner shall report whether US Fish and Wildlife Service and/or Massachusetts Department of Fish and Wildlife has requested fish passage facilities in annual compliance submittals to LIHI. If fish passage is required during the LIHI Certification term, the Owner shall provide annual updates on passage design, installation and acceptance by the resource agencies in annual compliance submittals to LIHI.