

Peter Drown
Cleantech Analytics LLC
6717 Cub Run Court
Centreville, VA 20121

May 09, 2017

Dr. Michael J. Sale
Senior Technical Advisor
Low Impact Hydropower Institute

Subject: Recertification Recommendation for the Slack Dam Hydroelectric Facility (FERC #8014, LIHI #78)

Dr. Sale:

This letter contains my Phase II Recertification Review of the Slack Dam Hydroelectric Facility. I am recommending the Facility be re-certified for one new, eight-year (8) due to PLUS eligibility, with the following two conditions:

Condition 1. If either the U.S. FWS or the state fisheries management agency requires the facility to provide upstream eel passage in the future, the owner shall notify LIHI within 30 days of receipt of such a notification. The owner shall then consult with the requesting agency to develop plans to implement such upstream passage and provide LIHI with a copy of these approved plans no later than one year after receiving the notification.

Condition 2. For the full term of the LIHI certification, the owner shall continue to operate the downstream fishway at Slack Dam in the spring from April 1 to June 15 and in the fall from September 15 to November 15 or as otherwise requested by the state fisheries agency. This condition is associated with the 8-year extended term of the new certificate.

Please contact me if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Peter Drown", with a stylized flourish at the end.

Peter Drown, President
Cleantech Analytics LLC

I. Background:

The 400-KW Slack Dam Hydroelectric Facility (“Facility”) is located on the Black River in Springfield, Vermont. Project works include a 92 foot-long and 30 foot-high concrete gravity dam that forms an impoundment with a surface area of approximately 0.9 acres. The 20’ x 20’ powerhouse contains one horizontal full Kaplan turbine, which discharges directly at the base of the dam (no bypassed reach.) The facility is located approximately 420 feet downstream of Comtu Falls (LIHI #124), and 4 additional hydropower facilities make use of the river’s significant drop through this small industrial town. The Black River is classified as “Good” water quality, with the exception of the 2.5-mile stretch prior to the confluence with the Connecticut River, which is impaired for municipal sewer discharges. The project received a FERC License Exemption (#8014) on September 30, 1985, and was originally certified by LIHI on February 28, 2011. The Facility is owned and operated by Springfield Hydroelectric Company and produces approximately 2,000 MWh annually. On January 17, 2017, Mathew Rubin submitted a timely application for Recertification. This application review for recertification was conducted using the new, 2nd Edition Handbook that was published in March 2016.

II. Recertification Standards

On December 22, 2015, LIHI notified the applicant of upcoming expiration of the Low Impact Hydropower Institute certification for the Slack Dam Hydroelectric Facility. The expiration was subsequently extended to July 31, 2017 to allow for review under the new LIHI Criteria. The letter included an explanation of procedures to apply for an additional term of certification under the 2nd Edition LIHI Handbook, including the new two-phase process starting with a limited review of a completed LIHI application, focused on two questions:

- (1) Has there been a material change in the operation of the certified facility since the previous certificate term began? and
- (2) Has there been a change in LIHI criteria since the certificate was issued?

If the answer to either question is “Yes,” the Application must proceed through a second phase, 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, the answer to question two for all projects scheduled to renew in 2016 will be an automatic ‘YES.’ Therefore, all certificates applying for renewal in 2016 will be required to proceed through both phase one and phase two of the recertification application reviews.”

This Review consists of the Phase Two Review.

III. Adequacy of the Recertification Package

I completed the Stage I Review of the Recertification Application on January 28, 2017, and noted several minor deficiencies for the applicant to resolve in the Stage II Application. We discussed the results over the phone on March 2, 2017, and after the Applicant provided me clarification on the noted items I determined that a new supplemental application was not necessary.

The Owner noted there “have been no material changes in the environmental conditions in the project vicinity since that most recent LIHI review.” To verify this, I have reviewed the application package, supporting comments and documentation and public records on FERC e-library posted since the original certification report (Dingfelder, October 2011). I also independently verified the submitted criteria were appropriate given the changes in the 2nd edition LIHI handbook.

The application was public noticed and received one comment (see Attachment 1).

IV. There have not been any “material changes” at the facility that would affect recertification, and the Owner successfully met all conditions during the most recent term. However, given recent resource agency recommendations for fish passage at the site, a new condition is required.

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, I found that there are no areas of noncompliance or new or renewed issues of concern. The previous LIHI certificate included the following conditions:

- *“Upon receipt of certification, Springfield Hydroelectric Company (“Springfield”) must initiate consultation with the USFWS and the Vermont Department of Fish and Wildlife Department (collectively, the agencies) to determine whether the current downstream passage at its project is appropriately protective, and to report to LIHI by March 1, 2012 as to whether the agencies have deemed it appropriately protective. If the agencies determine that it is not appropriately protective, Springfield shall provide proof that an agreement has been reached with the agencies providing for either fishway modifications or downstream passage effectiveness testing by Springfield in 2012.”*
- *If downstream effectiveness testing is required, Springfield shall report to LIHI by November 1, 2012 on the results of the testing unless a different date is mutually agreed upon by Springfield and the agencies.*
- *If results do not show adequate effectiveness to be appropriately protective, Springfield shall also report to LIHI as to whether agreement has been reached on fishway modifications that will be implemented and operational by April 1, 2013.*
- *LIHI reserves the right to suspend certification if the above steps are not completed, if no agreement is reached with the agencies, or if required measures to ensure downstream passage is appropriately protective of the Atlantic salmon resource are not made by April 1, 2013.”*

On July 11, 2014, LIHI Deputy Director Dana Hall requested the Owner provide evidence of compliance with this condition. On July 25, 2014, the owner responded with a memo that stated they complied with additional fish passage improvements at the request of US Fish and Wildlife Service (USFWS) and Vermont Fish and Wildlife (VF&W.) These have included: (1) Discontinuing the original pipe passage and replacing with downstream chute cut into the dam; (2) extending the chute; (3) closing the chute; and (4) installing a new sluice and slide. The Owner also provided documentation of correspondence with USFWS and VF&W following LIHI certification to comply with the Conditions. This included a hydrologic analysis of flows on the Black River during spring and fall migration season to determine whether the existing configuration was appropriately protective.

Although the Owner provided these communications, there was no evidence of approval from the involved resource agencies. To confirm that the LIHI Condition was successfully met, I reached out to Vermont Department of Environmental Conservation for comment. Eric Davis, River Ecologist for VDEC's Watershed Management Division provided a letter issued April 14, 2016, noting that the Agency has adopted a practice to recommend operation of downstream passage facilities to benefit resident species (see Attachment 1). They recommended the facility continue to operate downstream fish passage facilities during the Spring (April 1 – June 15) and fall (September 15 – November 15) time periods. The 2nd Edition LIHI Handbook defines valid resource recommendations as “those issued pursuant to a legal or administrative proceeding or other legally enforceable agreements between a resource agency and the dam owner/operator.” This recommendation does not meet this definition, however it does provide the Facility Owner with an opportunity to meet PLUS certification if they choose to comply with the recommendation and receive three extra years of certification. This is in accordance with the basin-scale redevelopment strategy, entitled the *Basin 10 Water Quality Management Plan*

for the *Ottawaquechee River & Black River*,¹ the stated purpose of which is: “to further improve water quality and to protect and enhance the resources and uses the community values.” As noted by the agency, this new operational regime could benefit riverine fish species in the vicinity of the project.

V. LIHI certification criteria are satisfied in all zones

The Applicant properly selected 2 Zones of Effect for the Slack Dam Hydroelectric Facility. Zone 1 is the regulated river reach from the mouth of the Black River (RM 0.0) to the dam (RM 4.2), and Zone 2 is the impoundment impacted by the Facility from RM 4.2 – RM 4.36. There is one downstream dam between the Facility and the Connecticut River, the Lovejoy Tool Company Dam (P-9649) approximately 0.2 below the Slack Dam. However, it is unclear what level of flow control or environmental conditions are present at this dam so the Owner’s more conservative definition of Zone of Effect 2 (extending all the way to Connecticut River confluence) is acceptable.

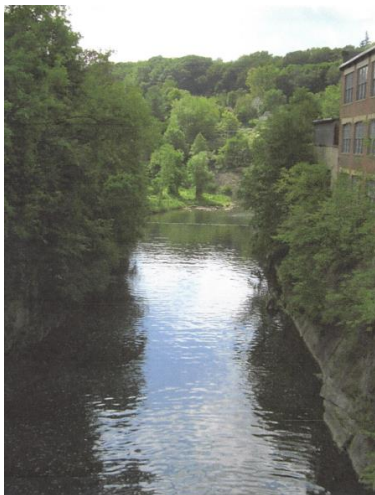


Figure 1 – Impoundment Zone

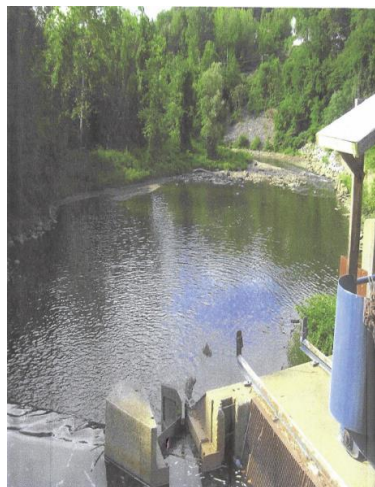


Figure 2 – Tailrace Zone

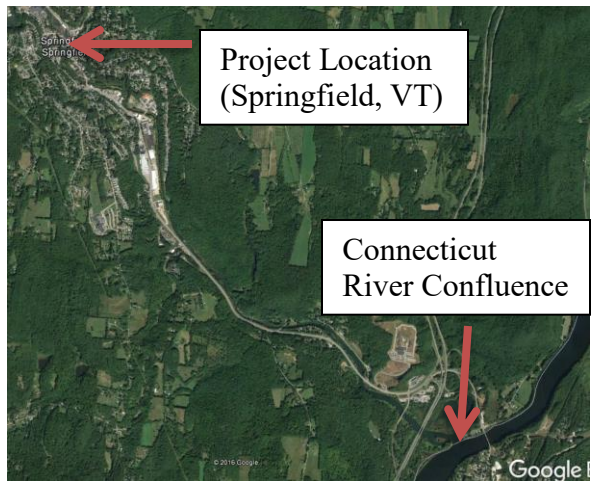


Figure 3 - Zone Aerial Map

- A. *Ecological Flows* – The Owner originally applied Standard 1 (Not Applicable/De Minimis), but in my opinion Standard 2 (Agency Recommendation) is more appropriate. This is due to Agency Recommendations in the Exemption and Water Quality Certificate that require run-of-river operation and minimum flow of 0.5” over the dam crest. Furthermore, the Applicant has provided a flow analysis of the Black River during spring and fall migration season, in compliance with the LIHI Condition as described above. This analysis found that during these seasons, flows are either too high or too low to damage gills of downstream migrants 80% - 96% of the time.
- B. *Water Quality* – The Black River is classified as “Good” water quality, with the exception of the 2.5-mile stretch prior to the confluence with the Connecticut River, which is impaired for municipal sewer discharges. The Owner originally applied Standard 1 (Not Applicable/De Minimis), but in my opinion Standard 2 (Agency Recommendation) is more appropriate due to flow recommendations present in the Water Quality Certificate and subsequent recommendations to operate their fish passage chute to reduce turbulence at the entrance. See response for Ecological Flows above.
- C. *Upstream Fish Passage* – There is no recommendation for upstream fish passage at the project. All recommendations pertain to downstream fish passage, see below. However, during the 2015 LIHI review

¹ The Vermont Agency of Natural Resources. 2012. Basin 10 Water Quality Management Plan. Montpelier, Vermont

of the Comtu Falls Hydroelectric Facility, located immediately upstream of this project, Melissa Grader provided the following comment regarding upstream eel passage at Black River projects: “*As the Black River enters the CT River upstream of the Bellows Falls Project, and there is only one other obstruction between BF and Comtu Falls, it is likely that the agencies will be seeking eel passage at Black River projects within the next 5 to 10 years.*”² The Owner properly selected Standard 2, but I am including a condition that the Owner provides eel passage at the facility when requested to do so by USFWS.

- D. *Downstream Fish Passage* – The Owner properly selected Standard 2 (Agency Recommendation.) The original Agency Recommendations are contained in the Terms and Conditions of the License Exemption and Water Quality Certificate. The Owner has made several subsequent improvements to promote downstream passage, including (1) Discontinuing the original pipe passage and replacing with downstream chute cut into the dam; (2) extending the chute; (3) closing the chute; and (4) installing a new sluice and slide. In a letter dated April 14, 2016, Eric Davis from VDEC (see Attachment 1,) requested the applicant operate the downstream fish passage facilities during the Spring and Fall seasons to protect resident fish. As noted above, this would provide the applicant with PLUS Certification under the LIHI program.
- E. *Watershed and Shoreline Protection* – The project is located directly in the urban center of downtown Springfield, Vermont, and is surrounded by industrial buildings up to the on all sides with some tree-lined shorelines in the impoundment. The Owner properly selected Standard 1 (Not Applicable/De Minimis.)
- F. *Threatened and Endangered Species Protection* – The Owner stated: “there are no listed species present in the facility area or downstream reach, and the facility was not responsible for the extirpation of the listed species if they were previously there.” I reviewed the Comtu Falls LIHI Review to confirm whether any T&E species were identified in that review, and confirmed the Owner is correct. In that review, USFWS provided a letter stating no federally listed species are present, and the Vermont Biofinder tool was used to identify the possible existence of any state-listed species, and none occur in the project footprint or downstream reach of the project.
- G. *Cultural and Historic Resources Protection* – The Owner selected Standard 1 (Not Applicable/De Minimis,) but in my opinion Standard 2 (Agency Recommendation) is more appropriate. Standard Article 9 in the Exemption requires the Owner to implement any measures recommended by the SHPO to protect and preserve the historical integrity of the Slack Chimney. The 2011 LIHI Certification Report noted: “a letter dated 07/15/1996 from FERC states that the applicant is in compliance with the cultural provisions of their exemption”
- H. *Recreational Resources* – The Owner selected Standard 1 (Not Applicable/De Minimis,) but in my opinion Standard 3 (Assured Accessibility) is more appropriate. The Owner provides free pedestrian access to the downstream riverbank for recreation and fishing.

VI. Conclusion

In my opinion, the materials provided and referenced above are sufficient to make a recertification recommendation, and no further application review is needed. In conclusion, I recommend Recertification of the Slack Dam Hydroelectric Facility to one new, five-year term, with the following two conditions:

Condition 1. If either the U.S. FWS or the state fisheries management agency requires the facility to provide upstream eel passage in the future, the owner shall notify LIHI within 30 days of receipt of such a notification. The owner shall then consult with the requesting agency to develop plans to implement such upstream passage and provide LIHI with a copy of these plans no later than one year after receiving the notification.

Condition 2. For the full term of the LIHI certification, the owner shall continue to operate the downstream fishway at Slack Dam in the spring from April 1 to June 15 and in the fall from September 15 to November 15 or

² http://lowimpacthydro.org/wp-content/uploads/2015/07/Comtu-Falls-Full-App-Review_FINALsmall.pdf

as otherwise requested by the state fisheries agency. This condition is associated with the 8-year extended term of the new certificate.

Please contact me if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Peter R. Drown", written in a cursive style.

Peter R. Drown, President
Cleantech Analytics LLC

Attachment 1
Agency and Applicant Communications

Date: March 2, 2017
Contact Person: Mathew Rubin, Applicant
Agency: N/A

I spoke to Mathew Rubin several times regarding the Winooski 8 and Slack Dam applications. We discussed my intake review results and were able to resolve most of my concerns over the phone. He agreed with my suggestions to use more appropriate Standards for Criteria A, B, C and H. Given the minor revisions and additional information provided, I suggested that it was not necessary to file an entirely new application, and I could conduct a Phase Two review with the information provided along with agency substantiation. I mentioned I would need to contact the agencies specifically to resolve the question of fish passage (see below).

Date: March 10, 2017
Contact Person: Eric Davis, River Ecologist
Agency: Vermont Department of Environmental Conservation



Peter Drown <peter.drown@gmail.com>

2 Vermont Hydro Projects (LIHI Recertifications)

Davis, Eric <Eric.Davis@vermont.gov>
To: Peter Drown <peter.drown@cleantechanalytics.com>
Cc: "Crocker, Jeff" <Jeff.Crocker@vermont.gov>

Fri, Mar 10, 2017 at 10:17 AM

Good morning Peter,

I did get back to these projects as promised this week, however, at that point I realized that I needed input from our fisheries biologists as well. I'm still awaiting some feedback on Winooski-8, but I can provide information related to Slack dam at this point.

The Agency recently made a determination on the need for passage at Slack (attached). The Agency would recommend that certification include a condition requiring the downstream fish passage operate from April 1 – June 15 and September 15 – November 15.

I'll circle back on Winooski-8 soon, once I get feedback from our regional fish biologist.

Thank you,

Eric

Date: April 14, 2016
Contact Person: Eric Davis, River Ecologist
Agency: Vermont Department of Environmental Conservation

From: Davis, Eric
To: "Dennis Wilber"; Crocker, Jeff
Cc: Joanna Bombadilli; Mathew Rubin; Slack Dam; Will, Lee
Subject: RE: Springfield Hydroelectric Downstream Fish Chute
Date: Thursday, April 14, 2016 3:13:00 PM

Hi Dennis,

The Agency recommends that the fish chute be opened when the high water recedes.

While the U.S. Fish and Wildlife Service (USFWS) no longer cultures Atlantic salmon for restoration efforts in the Connecticut River Basin, the Connecticut River Atlantic Salmon Commission (CRASC) partners have recognized the value of returning salmon, including natural reproduction in natural habitat. Although natural reproduction capabilities and survival to emergence is unknown at this time, it should also be noted that downstream passage for stocked salmon smolts remains effective through 2016.

Additionally, since the decision by the USFWS to end its involvement in the salmon restoration program, it has been the practice of the Agency to recommend that operation of downstream passage facilities be continued where passage would also benefit resident species. The Agency recognizes the importance fish movement during different times of the year and during different life history stages in order to access the best available riverine aquatic habitat for spawning, rearing and feeding; avoid predator interactions; and promote genetic diversity. Examples of Agency recommendations to this effect include the construction of passage facilities at Ball Mountain and Townshend projects and the operation of passage facilities at the Comtu Falls project.

It is the recommendation of the Agency that downstream passage facilities shall continue to operate during the spring (April 1 – June 15) and fall (September 15 – November 15) periods, both in 2016 and for the foreseeable future. This recommendation shall be considered the most recent resource Agency recommendation regarding fish passage and protection.

Please let me know if you have any questions or would like to discuss further.

Thanks,
Eric

Eric Davis, River Ecologist

1 National Life Drive, Main 2
Montpelier, VT 05620-3522
802-490-6180 / eric.davis@vermont.gov
<http://www.watershedmanagement.vt.gov/rivers>
(Please note my new e-mail address, effective July 27, 2015)



VERMONT DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
**WATERSHED
MANAGEMENT DIVISION**
RIVERS PROGRAM