

REVIEW OF APPLICATION FOR RE-CERTIFICATION BY THE LOW IMPACT HYDROPOWER INSTITUTE OF THE WORUMBO HYDROELECTRIC FACILITY

Prepared by Patricia McIlvaine

September 11, 2018

I. INTRODUCTION

This report summarizes the review findings of the application submitted by the Brown Bear II Hydro Inc. (Brown Bear Hydro or Applicant) to the Low Impact Hydropower Institute (LIHI) for re-certification of the Worumbo Hydroelectric Project FERC P-3428 (Worumbo or Project). The project was owned by Miller Hydro Group, which changed its name to Brown Bear II Hydro LLC in March 2015. Eagle Creek Renewable Energy, LLC took ownership of Brown Bear II Hydro LLC in November 2016. The Project was initially approved by LIHI as a Low Impact Certified hydropower facility in May 2004 and recertified with an effective date of March 3, 2013. LIHI Certificate No. 10, expired on March 3, 2018 and was extended to September 30, 2018 to allow sufficient time for the recertification review. This re-certification review was conducted in compliance with LIHI's Handbook, 2nd Edition, dated March 7, 2016.

The 2013 re-certification Report can be accessed via the link below. Details on the project and several figures incorporated into this Report were taken from the 2013 Report.

https://lowimpacthydro.org/wp-content/uploads/2014/05/Recertification-Review-FL_2013.pdf

One condition was incorporated into the 2013 LIHI Certification:

“The facility owner shall file an annual report to LIHI summarizing the recent fish passage monitoring results and other efforts related to Atlantic salmon restoration in the vicinity of the Worumbo dam. The relevant restoration activities include those associated with the Interim Species Protection Plan for Atlantic salmon and the transition from that interim plan to a more permanent Species Protection Plan under the Endangered Species Act that will occur during the term of the new LIHI Certification. This report to LIHI need not repeat contents of other reports to FERC, National Marine Fisheries Service (NMFS), or other agencies, but should provide references to such reports and where they can be accessed. Further, the annual report to LIHI shall describe any areas where the owner's position differs from resource agency positions on Atlantic salmon recovery and the reasons why. LIHI reserves the right to judge whether the facility owner is making sufficient progress toward salmon restoration to qualify as Low Impact Certified hydropower. The annual report on salmon restoration shall be due to LIHI on the date of the facility's annual certification fee.”

The annual compliance statements provided the annual updates on restoration activities for

Atlantic salmon required by the Condition, although they did not identify if Brown Bear Hydro had positions that differed from the agencies. Review of the annual reports did not identify any differences. The final application submitted to LIHI confirmed this finding.

II. RECERTIFICATION PROCESS AND INITIAL ASSESSMENT

Under the 2016 LIHI Handbook, reviews are a two-phase process starting with a limited review of a completed LIHI application, focused on two 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?

In accordance with the Recertification Standards, if the only issue is that there is some missing information, the applicant will have the opportunity to provide the missing information, and this may or may not trigger a Stage II review. These standards also state that "material changes" mean non-compliance and/or new or renewed issues of concern that are relevant to LIHI's criteria. If the answer to either question (2) or (3) 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, and development of a complete Stage II Report. Because the new Handbook involves new criteria and a new process, the answer to question two for all projects scheduled to renew in 2017 is an automatic 'YES.' Therefore, all certificates applying for renewal in 2017 are required to proceed through both phases of the recertification process.

A review of the initial application, dated December 2017 resulted in a Stage I or Intake Report, dated January 29, 2018. The response to the Stage I Report was provided in the form of a revised Application received in June 2018. Responses to a few follow-up inquiries were answered in a timely fashion.

This Stage II assessment included review of the application package, public records in FERC's eLibrary since the most recent LIHI Certification in March 2013, public comments and agency responses to questions received and annual compliance statements received by LIHI during the past term of certification.

III. PROJECT'S GEOGRAPHIC LOCATION

The Worumbo Hydroelectric Project (Project), FERC-3428, is located on the Androscoggin River at river mile (RM) 14.1, in Lisbon Falls and Durham, Maine. The Worumbo Project is the third dam on the Androscoggin River, upstream from the Brunswick Hydroelectric Project (FERC-2284) and the Pejepscot Hydroelectric Project (FERC-4784). Other FERC regulated hydro projects above Worumbo are Rumford Falls (FERC-2333) in Rumford, Maine, the Riley- Jay-Livermore sites (FERC-2375) in Riley/Jay/Livermore, Maine, Otis (FERC-8277) in Chisholm, Maine, Gulf Island-Deer Rips (FERC-2283) in Lewiston, Maine, Lewiston Falls (FERC-2302) in Lewiston, Maine and Upper Androscoggin (FERC-11006) in Lewiston, Maine; as well as additional projects located farther upstream in New Hampshire.

Figures and photographs are in Appendix A. Figure 1 shows the location of the Worumbo Project and other dams on the Androscoggin River. The Zones of Effect (ZOE) are designated on Figure 2. Figure 3 is an aerial that shows key Project features as well as labeling the ZOE. Photographs showing the impoundment and downstream reach are also in Appendix A.

IV. PROJECT AND IMMEDIATE SITE CHARACTERISTICS

The Project consists of gated and non-gated spillway sections. The non-gated spillway is comprised of two sections; a concrete ogee spillway with a crest elevation at 97.0 ft., and a center rock ledge section containing a concrete dike with a crest elevation at 97.0 ft. Both sections have two-foot-high hinged flashboards installed. The gated section is a 520-foot long concrete spillway with three independently operable pneumatic flashboard sections; seventeen 2.17 ft. panels, eight 1.75 ft. panels, and twenty-one 2.25 ft. panels. This crest gate/flashboard system is designed to fail when overtopped by two feet of water. The dam creates an impoundment with a surface area of 190 acres and a volume of 2,000 acre-feet at a normal full pond elevation of 98.5 ft. All elevations are referenced to mean sea level (MSL).

The power facilities consist of an intake section; and an integral powerhouse equipped with two turbine-generator units having a rated total capacity of 19.4 MW at a net operating head of 30.5 ft. The average annual generation from the Project is approximately 93.4 GWh.

The project is primarily operated as a run-of-river facility. However, during power system emergencies, current operation permits the impoundment to be drawn down a maximum of 1.5 feet (98.5 ft. to 97.0 ft.). Power system emergencies can be initiated to allow to provide short-term reserve capacity to the interstate power grid or to provide ancillary services (i.e., Automatic Generation Control) to the power grid under deregulated market conditions. Minimum flow releases from the project are maintained at the lesser of 1,700 cfs or inflow during impoundment refilling. The project is also operated to provide seasonally-varied minimum flows into the 850-foot long bypassed river reach between the Durham-side dam and the end of the tailrace training wall.

The dam creates an impoundment with a surface area of 190 acres and a volume of 2,000 acre-feet at a normal full pond elevation of 98.5 feet.

The upstream fish passage was constructed in 1988, which consists of a vertical lift system with two entrance gates, a connecting gallery, four attraction water pumps, a mechanically operated fish crowder, a cable-operated fish lift, and upper level canal, a fish counting room, and an automatic control system. The project passage facilities pass migratory species, including eels, based upon agency recommendations. The project's downstream fish passage facilities include three entrance gates (only one is used based on a study conducted in consultation with agencies in 1999) with trashracks (12-inch clear spacing) located at the surface of head pond 11.30 feet above the top of the turbine intakes, sectional gates to close individual entrances, a collection gallery between the entrances, a 36-inch-diameter plastic transfer pipe, and a stop log-controlled plunge pool that measures 30-feet by 20 feet and is kept at a depth of 10-feet under normal operating conditions.

The locations of the fish passage features are shown on Figure 3. Photographs of the Project, the fish passage facilities, as well as details on the fish passage facilities are contained in the final application.

V. ZONES OF EFFECT

Three Zones of Effect (ZOE) were designated by the applicant and were determined to be appropriate. These are identified on Figures 2 and 3 in Appendix A.

- ZOE #1 – Impoundment
- ZOE #2 – Bypass Reach
- ZOE #3 – Tailrace and regulated Reach

VI. REGULATORY AND COMPLIANCE STATUS

The original 40-year license for the Project was issued on December 24, 1985. On September 24, 1987 FERC approved in part, and modifying in part, a water quality monitoring plan. An order amending the license and revising annual charges was issued on October 3, 1990, reflecting as-built conditions. On August 13, 1998, based on consultations with state and federal resource agencies, the license was once more amended by FERC. The amendment covers changes to modify the dam, operate the project at a normal reservoir level of 98.5 feet, and fluctuate reservoir levels between 97 and 98.5 ft. An amendment was approved, with limited exceptions, by FERC on May 11, 2018, adopting the terms of a Final Species Protection Plan (Final SPP) and Biological Opinion for Atlantic salmon. On June 11, 2018, Eagle Creek filed a request for rehearing on the order, taking issue with three of the ten terms and conditions of the Biological Opinion (Condition #6, 7, and 8). Eagle Creek does not take issue with the terms as a whole, but is seeking modification of the compliance timeframes in order to address noted concerns including operator safety (e.g., changing a requirement to remove debris “immediately upon inspection” to “immediately after environmental and weather conditions permit such work to commence in a safe manner”).

A Water quality Certification (WQC) (#L-10930-35-N-M) was issued by the Maine Department of Environmental Protection (MEDEP) on June 14, 1985 and an updated certification issued on July 13, 1998 in response to an amendment to the FERC license.

The only compliance issues identified by review of FERC’s eLibrary, was associated with deviations from either run-of-river operation or release of minimum flows and failure to submit the 2012 and 2013 Mitigation Plans for use of required funding made to the Maine Department of Inland Fish and Wildlife (MIF&W). These are discussed further under Ecological Flows. No new or continuing environmental issues were identified by public comments received or outreach to regulatory agencies. My review also confirmed that no material changes in the facility design or operation have occurred since the previous LIHI review.

VII. PUBLIC COMMENT RECEIVED OR SOLICITED BY LIHI

The deadline for submission of comments on the LIHI certification application was September 10, 2018. No comments were received. No agency support letters were included in the application.

Outreach was made to the following stakeholders as part of this review:

- Jeff Murphy – National Marine Fisheries Service (NMFS) - jeff.murphy@noaa.gov
- Kristen Puryear – Maine Natural Areas Program (MNAP) - Kristen.puryear@maine.gov
- James Pellerin – Maine Department of Inland Fish and Wildlife (MIF&W)- james.pellerin@maine.gov
- Gail Wippelhauser – Maine Department of Marine Resources (MDMR)- gail.wippelhauser@maine.gov
- Kathy Howett – Maine Department of Environmental Protection (MEDEP) - Kathy.Howatt@maine.gov.

A response to my inquiry was received from NMFS and MEDEP. Their information is incorporated into the applicable criterion sections. Appendix B includes a copy of their emails.

VIII. SUMMARY OF COMPLIANCE WITH CRITERIA

The following tables show the Standards selected for each criterion for the three ZOE's.

ZOE #1 – Impoundment

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			

ZOE #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				

ZOE #3 – Tailrace and regulated Reach

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			
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			

The Reviewer found that these standards are appropriate, and sufficient supporting data was provided which demonstrated compliance with the criteria and standard selected. Details of compliance with the criteria are presented in Section IX.

IX. 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.

Standards: All river reaches where stream flows are altered by the facility shall be defined. In all locations, appropriate flow management should apply an ecosystem-based approach that supports fish and wildlife resources by considering base flows, seasonal variability, high flow pulses, short-term rates of change, and year-to-year variability. Compliance with one of the alternative standards identified in the Low Impact Hydropower Certification Handbook issued March 7, 2016 must also be demonstrated.

Assessment of Criterion Passage

The Applicant has selected and demonstrated compliance with **Standard A-2, Agency Recommendation** to pass the Ecological Flow Regimes criterion for all ZOEs because there are flow requirements and impoundment drawdown limits. This standard requires:

“**STANDARD A-2. Agency Recommendation:** The flow regime at the Facility was developed in accord with a site--specific, science--based agency recommendation.”

No changes in the flow related requirements have occurred since last certified in 2013. The seasonal bypass flows were established based upon instream flow study and results filed with FERC on December 30, 1991 and approved by FERC, with modifications, on January 26, 1994.

According to the initial 2004 LIHI reviewer's report, comments related to flows during the 1998 license amendment were provided in April, 1998 by the Maine Department of Inland Fisheries & Wildlife, Maine Department of Environmental Protection, U.S. Fish and Wildlife Service, and Maine Department of Marine Resources. All of these agencies either concurred with, or did not object to, the requested amendment. Thus, it can be assumed that these requirements were based on site-specific requirements found appropriate by these agencies. The project is primarily operated as a run-of-river facility, (affecting ZOE#3) although during power system emergencies, current operation permits the impoundment to be drawn down a maximum of 1.5 feet (98.5 ft. to 97.0 ft) (affecting ZOE#1). Minimum flow releases from the project (affecting ZOE#2) are maintained at the lesser of 1,700 cfs or inflow during impoundment refilling. The project is also operated to provide seasonally-varied minimum flows into the 850-foot long bypassed river reach between the Durham-side dam and the end of the tailrace training wall. The impoundment cannot be drawdown during bass spawning season which is typically between May to July.

Based on data provided in the application and found on FERC eLibrary, a number of deviations from either run-of-river operation or release of required minimum flows have occurred since last certified in 2013, as noted below. The Applicant stated that FERC did not find any of these deviations to be considered a violation of the license.

Year	No. of Deviations
2013	6
2014	10
2015	None reported
Jan 2016 to Oct 2016	None reported
Nov 2016 to Dec 2016	3
2017	35

It is important to note that the project was owned by Miller Hydro Group, which changed its name to Brown Bear II Hydro LLC in March 2015. Eagle Creek Renewables took ownership of Brown Bear II Hydro LLC in November 2016. It is unclear if the lack of deviations in 2015 and most of 2016 was because the staff of Brown Bear II Hydro LLC at that time did not make the required reports to FERC or if for some reason, no deviations actually occurred. Eagle Creek likewise did not have any records in the project files that may have noted deviations but did not get incorporated into FERC's eLibrary. Since the data gap occurred before they assumed ownership I did not feel it was necessary for them to review the archived monitored data. Of the 38 deviations since Eagle Creek took ownership, only two were minimum flow deviations due to repair of the mechanical flashboards at the Project and both received prior approval from MIF&W. Many of the run-of-river deviations were due to ice conditions requiring load reduction.

A letter from FERC dated May 23, 2014, identified that the owner of the project at that time did not file the Mitigation Plan for 2012 or 2013 (that are required by the FERC Order dated January 26, 1994 which approved the Minimum Flow Release Plan) on a timely basis. FERC found these oversights to be due to human error and preventable, and therefore considered a violation of the license. FERC however did not take any enforcement action.

Because the current known flow deviations were beyond the control of the Project, and that the required Mitigation Plans have been filed on-time since 2013, I believe the Project satisfies this criterion.

This Project passes Criterion A – Ecological Flow Regimes- Go to B

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.

Standards: Compliance with the appropriate state/provincial or federal water quality standards must be demonstrated with all waterbodies where water quality is directly affected by the facility, including those affected areas outside the facility boundary. In all cases, if any waterbody directly affected by the facility has been defined as being water quality limited (for example, on a list of waters with quality that does not fully support designated uses), it must be demonstrated that that the facility has not contributed to that substandard water quality. Compliance with one of the alternative standards identified in the Low Impact Hydropower Certification Handbook issued March 7, 2016 must also be demonstrated.

Assessment of Criterion Passage

The Applicant has selected and demonstrated compliance with **Standard B-2, Agency Recommendation** to pass the Water Quality criterion for all ZOE. This Standard requires:

“STANDARD B-2. Agency Recommendation: The facility is in compliance with all water quality conditions contained in a science-based agency recommendation providing reasonable assurance that water quality standards will be met for all waterbodies that are directly affected by the facility (for example, a recent Water Quality Certification issued pursuant Section 401 of the Clean Water Act). Such recommendations, whether based on a generally applicable water quality standard or one that was developed on a site-specific basis, must include consideration of all water quality components necessary to preserve healthy fish and wildlife populations, human uses and recreation.”

The operating requirements established by both the license and WQC were developed to provide for maintenance of compliance with water quality standards and fish protection, thus adherence to these are key to continued protection of water quality in this section of the Androscoggin River. As noted above, the Applicant has reported that Project has substantially met these flow requirements in 2013, 2014 and 2017.

The Androscoggin River from the Ellis River in Rumford to a line formed by the extension of the Bath-Brunswick boundary across Merrymeeting Bay, which includes all Project waters, are classified by the State of Maine as Class C. Class C waters are of quality suitable for the designed uses of drinking water supply after treatment; fishing; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation; and as habitat for fish and other aquatic life.

Project waters are being classified as impaired for dioxin and legacy PCBs under the MEDEP's 2014 Integrated Water Quality Monitoring Report. The Applicant noted that these impairments are not associated with project operations and have been identified in MEDEP's reports dating back to at least 2006, prior to the project's initial LIHI Certification. The MEDEP was requested by the Applicant to submit confirmation that the Project is not the cause of this impairment but such confirmation has not yet been received by application filing. The application did state that no issues were raised by MEDEP staff during an inspection in 2016, which although was primarily focused on spill prevention, nonetheless did not identify water quality concerns at the Project.

As noted in previous reviewer reports, the MEDEP, on January 18, 2002, issued a ruling that all compliance conditions within the WQC have been satisfied. MEDEP's Biological Monitoring Program, conducted an Aquatic Life Classification Attainment in 2010 at station Number S-956, located above Pejepscot Dam, which is approximately 3.4 miles downstream of the Worumbo Project. That data continued to verify that the waters below the Worumbo Project are Class C. No more recent sampling data is available.

In response to my inquiry, Kathy Howatt, Hydropower Coordinator for the MEDEP, in an email dated August 7, 2018 (see Appendix B), raised a concern that while the source is bio-accumulative contaminants from upstream mills, based on "demonstration in studies of other rivers that dams trap sediments leading to increased contamination in fish, the Department cannot say that the Worumbo dam does not cause or contribute to increased contamination of fish and non-attainment of the water quality standards." Based on the requirements of the 2016 LIHI Handbook, this issue would need to be resolved to confirm satisfaction of this criterion. Because the Project is generally operated as run-of-river and with limited times of one-foot pond fluctuations, I am recommending that a condition be included to determine if in fact the Project has such an impact.

Although the WQC is greater than ten years old, I believe that the Applicant provided sufficient information to support the Water Quality criterion and the Project is therefore conditionally in compliance this criterion because:

- the minimum flow established by the license and WQC were developed by the appropriate resource agencies and have remained unchanged. Sampling conducted in 2010 confirmed Class C standards were met at that time;
- required minimum flows and run-of-river operations have been substantially met;
- dissolved oxygen which can be an issue with hydro facilities is not a concern in the Project waters;
- significant and regular agency interface is ongoing regarding restoration of anadromous species, including the federally endangered Atlantic salmon. I believe that if there were significant water quality concerns, such issues would arise at some point during these regular agency discussions; and
- the only impairment issues found in the river are legacy PCBs and dioxin. A concern was raised about the possibility that levels of these contaminants may be increased due to sediments behind the dam, and thus a condition to address this potential issue is recommended.

This Project Conditionally Passes Criterion B – Water Quality- Go to C

C. UPSTREAM FISH PASSAGE

Goal: The facility allows for the safe, timely, and effective upstream passage of migratory fish. This criterion is intended to ensure that migratory species can successfully complete their life cycles and maintain healthy, sustainable fish and wildlife resources in areas affected by the facility.

Standards: The applicant shall list all migratory fish species (for example, anadromous, catadromous, and potamodromous species) that occur now or have occurred historically at the Facility. Maintenance of upstream passage sufficient to support sustainable populations of these migratory species must be demonstrated by compliance with one of the alternative standards identified in the Low Impact Hydropower Certification Handbook issued March 7, 2016.

Assessment of Criterion Passage

The Applicant has selected and demonstrated compliance with **Standard C-1, Not Applicable/De Minimis Effect** as applicable to ZOE #1 (Impoundment) and **Standard C-2, Agency Recommendation** for the Bypass and tailrace/downstream reach ZOE. to pass the Upstream Fish Passage criterion. These standards require:

“STANDARD C-1. Not Applicable/De Minimis Effect: The facility does not create a barrier to upstream passage, or there are no migratory fish in the vicinity of the facility and the facility is not the cause of extirpation of such species if they had been present historically.”

“STANDARD C-2. Agency Recommendation: The facility is in compliance with science-based fish passage recommendations from appropriate resource agency(ies) which have been issued for the facility and which include provision for appropriate monitoring and effectiveness determinations.”

Standard C-1 is appropriate for ZOE #1 as no obstacles to upstream passage exist once fish have entered the impoundment.

The facility has an upstream fish lift, which has been operating since 1990. This passage supports anadromous species, including Atlantic salmon, American shad and river herring, along with American eel. The passage was designed based on agency recommendations and has been subject to effectiveness testing in the mid-1990s. Monitoring and operations of the fish passage facilities occurs annually, generally between mid-April through Mid-November. Monitoring is conducted by staff of both the applicant and MDMR. There is also an annual report submitted for agency review and an associated meeting with resource agencies. As well as staff from Brookfield White Pine Hydro LLC, owner of the Brunswick Hydropower Project which is the first dam on the Androscoggin River. Notes from the most recent meetings were provided with the application. The conclusion of these meetings typically is that the fish lift should continue to operate as typically done. Successful fish passage at the downstream Brunswick Project is key to the restoration efforts on the river and in part, affects the activities required at Worumbo.

An upstream eel passageway was constructed and operation initiated on July 13, 2012. The eel passage is an aluminum cable tray with varying sized substrate affixed to it, with a floating trap.

Annual counts since 2012 showed a low of 17 eels passed in 2012 and a high of 541 eels passed in 2014. The passage system is installed annually upon recession of high flows in the spring and operated until August 31 each year, in consultation with MDMR. Brown Bear Hydro monitors the holding tank during this period and eels captured are regularly counted, measured by estimating their lengths only and released into the impoundment. No agency concerns have been expressed regarding the upstream passage of eels according to the Applicant.

As a result of the designation of the Gulf of Maine (GOM) Distinct Population Segment of Atlantic salmon as a federally endangered species in 2009, and that this section of the Androscoggin River is within the designated critical habitat for this species, consultation was required under Section 7(a)(2) of the Endangered Species Act. A summary of regulatory activities associated with this designation is discussed under the *Threatened and Endangered Species Protection Criterion*.

As a result of this endangered designation, an Interim and Final Species Protection Plan (SPP) were developed, approved and incorporated into the FERC license. The Interim Species Protection Plan (SPP) was part of the formal consultation and included upstream and downstream passage monitoring studies necessary to develop a final SPP. Under the SPP, the upstream fishway is operated from May 1 to November 15 from 9:00 am to 5:00 pm, river conditions permitting, or if an alternative date is approved by MDMR, US Fish and Wildlife Service (USFWS), and NMFS. Monitoring studies were conducted in 2013, 2014, and 2015. These measures are followed to help minimize impacts to Atlantic salmon at the Project. The upstream study objective involves implant of Passive Integrated Transponder (PIT) tags into adult Atlantic salmon at the downstream Brunswick Project by MDMR and then this study would monitor PIT-tagged adults as they used the Worumbo fish lift. The following summarizes the results:

- 2013 – Two adult salmon were passed at Brunswick, but they were recaptured and released downstream of Brunswick again. They did not re-enter the Brunswick ladder but were later tracked in the Kennebec River.
- 2014 – Four adult salmon passed upstream at Brunswick. Only one was detected at the Worumbo tailrace. It did not use the lift.
- 2015 – MDMR did not radio tag adult salmon at the Brunswick Project so no upstream data was collected.

As of the 2017 season, no adult Atlantic salmon were observed or passed upstream by the Worumbo upstream fish lift.

The Biological Opinion defines “sufficient numbers” to trigger effectiveness testing for upstream passage to be two consecutive years of passage of 40 or more pre-spawn Atlantic salmon at the Brunswick Project fishway. Agencies and the Applicant have agreed that performance standards for the Worumbo lift would be established once upstream passage here is better understood.

The annual meeting minutes report that the agencies have required continued use of the Worumbo upstream fish and eel passage as typically done. As such, it appears that the Project currently conditionally meets the standards for this Criterion. To ensure that requirements identified by NMFS deemed necessary to protect the endangered Atlantic salmon are conducted, the annual compliance reports to LIHI shall confirm that the activities under the Terms and Conditions of the

Biological Opinion have been conducted, as needed, that year.

This Project Conditionally Passes Criterion C – Upstream Fish Passage- Go to D

D. DOWNSTREAM FISH PASSAGE AND PROTECTION

Goal: The facility allows for the safe, timely, and effective downstream passage of migratory fish. For riverine (resident) fish, the facility minimizes loss of fish from reservoirs and upstream river reaches affected by Facility operations. All migratory species are able to successfully complete their life cycles and to maintain healthy, sustainable fish and wildlife resources in the areas affected by the Facility.

Standards: The applicant shall list all fish species (for example, riverine, anadromous, catadromous, and potamodromous) that occur now or have occurred historically in the area affected by the Facility. To pass the downstream fish passage and protection criterion, compliance with one of the alternative standards identified in the Low Impact Hydropower Certification Handbook issued March 7, 2016 must be demonstrated.

Assessment of Criterion Passage

The Applicant has selected and demonstrated compliance with **Standard D-1, Not Applicable/De Minimis Effect** for ZOE #3 (Regulated Reach) and **STANDARD D-2. Agency Recommendation** for the impoundment and bypass ZOEs to pass the Downstream Fish Passage and Protection criterion. These standards require:

“STANDARD D-1. Not Applicable/De Minimis Effect: The facility does not create a barrier to downstream passage, or there are no migratory fish in the vicinity of the facility; if migratory fish had been present historically, the Facility is not responsible for extirpation of such species; the Facility does not contribute adversely to the sustainability of riverine fish populations or to their access to habitat necessary for the completion of their life cycles.”

“STANDARD D-2. Agency Recommendation: The Facility is in compliance with a science-based resource agency downstream fish passage or fish protection recommendations, which may include provisions for ongoing monitoring and effectiveness determinations that have been issued for the Facility.”

Standard D-1 is appropriate for ZOE #3 as no obstacles to downstream passage exist once fish have entered the Regulated Reach.

The project’s downstream fish passage facilities include three entrance gates (only one is used based on a study conducted in consultation with agencies in 1999) with trashracks (12-inch clear spacing) located at the surface of head pond 11.30 feet above the top of the turbine intakes, sectional gates to close individual entrances, a collection gallery between the entrances, a 36-inch-diameter plastic transfer pipe, and a stop log-controlled plunge pool that measures 30-feet by 20 feet and is kept at a depth of 10-feet under normal operating conditions. The downstream passage is operated from April 1 and run through December 15th. The Applicant coordinates with the NMFS and MDMR prior to modifying the fishway operational dates.

In compliance with the SPP and Biological Opinion, studies were performed in 2013, 2014 and 2015 to evaluate the route of passage and survival of Atlantic salmon smolts at the Worumbo Project. The downstream passage routes available to treatment smolts during the study included over the spillway, through the downstream fish bypass, or through the turbines. These studies provided site-specific information to evaluate whole station survival and assist in developing additional measures to increase downstream passage survival. These studies showed that smolts passed through the floodgate and at a higher rate when the floodgate was at its lowest flow discharge setting. Therefore, Brown Bear Hydro proposed to operate the floodgate at its lowest setting as an additional passage route nightly between May 7 and May 21 of each year. This represents a significant increase in non-turbine flow, reducing generation. Combined with bypass flow (300 cfs), this proposal allows for an expected passage flow of 800 cfs. However, Brown Bear Hydro proposed that this measure will only be implemented if it is known that at least two adult Atlantic salmon were passed upstream two years prior (and thus may have successfully spawned and produced out-migrating smolts), or if an Atlantic salmon stocking program is established upstream of the Project. The Biological opinion adopted this proposal. As noted above, as of the 2017 season, no adult Atlantic salmon were observed at the Worumbo upstream fish lift.

Brown Bear Hydro proposed to conduct a smolt survival study in 2025 to verify that the standard is being met, and to monitor “take” at the project. Additionally, if the standard is not achieved, Brown Bear Hydro “...will evaluate additional measures designed to direct migrating salmon to the most effective passage routes, and will then monitor passage survival again the year following...”. The 2017 Biological Opinion incorporated this proposal unless sufficient adult salmon are passed at the Brunswick Project before 2025 such that effectiveness testing can be conducted at Worumbo. However, as the study was proposed for the final year of the SPP, NMFS’s position was that this additional study year, if it is necessary, would occur under the term of the next license, presumably under a new SPP. The Biological Opinion defines “sufficient numbers” to trigger effectiveness testing for downstream passage to be two consecutive years of passage of 40 or more adult pre-spawn Atlantic salmon at the Brunswick Project. This number has not been reached.

The project is not currently required to have a specific downstream eel passage facility.

Review of the annual meeting notes indicate that the agencies have consistently recommended that the downstream passage activities be continued as typically performed. The March 2018 meeting minutes note that “Juvenile alewife downstream passage efficiency study will be put on hold for another year until the proper conditions for the study are present. These studies have been pending for a number of years and environmental conditions have not existed in order for the studies to take place. Consideration should be given to dropping these study requirements.”

The annual meeting minutes report that the agencies have required continued use of the Worumbo downstream fish as typically done. It appears that the Project currently conditionally meets the standards for this Criterion. To ensure that requirements identified by NMFS deemed necessary to protect the endangered Atlantic salmon are conducted, the annual compliance reports to LIHI shall confirm that the activities under the Terms and Conditions of the Biological Opinion have been conducted, as needed, that year.

***The Project Conditionally Passes Criterion D – Downstream Fish Passage and Protection -
Go to E***

E. SHORELINE AND WATERSHED PROTECTION

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

Standards: To pass the watershed protection criterion for LIHI certification, the applicant shall demonstrate compliance with one of the alternative standards identified in the Low Impact Hydropower Certification Handbook issued March 7, 2016.

Assessment of Criterion Passage

The Applicant has selected and demonstrated compliance with **Standard E-1, Not Applicable/De Minimis Effect** to pass the Shoreline and Watershed Protection criterion for the Project. This standard requires:

“STANDARD E-1. Not Applicable/De Minimis Effect: There are no lands associated with the facility under ownership and control of the applicant that have significant ecological value for protecting water quality, aesthetics, or low-impact recreation, and there has been no Shoreline Management Plan (SMP) or similar protection required at the facility; or the facility has no direct or indirect project-related land ownership, excluding lands used for power generation and transmission, flowage rights and required developed recreational amenities.”

The existing shoreline is relatively steep and rocky with stable soils. As part of the amended license in 1998, a shoreline monitoring program (SMP) was conducted after consultation with the MEDEP and the USFWS to investigate potential erosion of the reservoir shoreline due to the new proposed operating regime. No license article, settlement agreement or shoreline management plan requires that a buffer zone be dedicated for conservation purposes or that a watershed enhancement fund is required. As noted above, agencies accepted results of erosion surveys at the project, which was the only shoreline related issues identified in the prior license proceeding.

The application notes that the surrounding Project lands consist of hilly, rural residential areas that include scattered farms and commercial establishments. No State or municipally designated Area having unique ecological value has been identified in the vicinity of the project. The only critical habitat identified by the US Fish and Wildlife Service is for the Atlantic salmon.

It does not appear that Project lands include any areas of significant ecological value.

The Project Passes Criterion E – Shoreline and Watershed Protection - Go to F

F. THREATENED AND ENDANGERED SPECIES PROTECTION

Goal: The Facility does not negatively impact listed species.

Standards: Facilities shall not have caused or contributed in a demonstrable way to the extirpation of a listed species. However, a facility that is making significant efforts to reintroduce an extirpated species may pass this criterion. To pass the Threatened and Endangered Species criterion compliance with at least one of the alternative standards identified in the Low Impact Hydropower Certification Handbook issued March 7, 2016 must be demonstrated.

Assessment of Criterion Passage

The Applicant has selected and demonstrated compliance with **Standard F-1, Not Applicable/De Minimis Effect** to pass the Threatened and Endangered Species Protection criterion for the Project. This standard requires:

“• **STANDARD F-3. Recovery Planning and Action.** The facility is in compliance with relevant conditions in the species recovery plan, with relevant conditions in an incidental take permit or statement, biological opinion, habitat conservation plan, or similar government document and the incidental take document and/or biological opinion issued relevant to the facility was designed to be a long-term solution for protection of the listed species.”

Regarding federally listed species, the project is located on the Androscoggin River in Maine, within designated critical habitat for the endangered Gulf of Maine (GOM) Distinct Population Segment of Atlantic salmon, and as a result, formal consultation as required by Section 7 of the Endangered Species Act (ESA). Based on an official USFWS List (IPaC Receipt) populated on October 29, 2017, the federally threatened Northern Long-eared Bat (*Myotis septentrionalis*) may occur within the Project Vicinity. In addition, the bald eagle which was de-listed and removed from the federal list of endangered and threatened species in 2007, is considered a potential transient species only.

On May 14, 2012, the Licensee filed an Interim Species Protection Plan (Interim SPP) describing measures it would take in the years 2013 through 2016 to avoid and minimize impacts to the Atlantic salmon during Project operation. The Licensee also filed a plan for study of upstream and downstream passage of Atlantic salmon on December 19, 2012, pursuant to the Interim SPP. On July 6, 2016, the Licensee filed its draft Final SPP.

FERC requested formal consultation on October 14, 2016, between NMFS and USFWS, with the Species Protection Plan and Draft Biological Assessment. Formal Consultation under Section 7(a)(2) of the Endangered Species Act, was completed and a Biological Opinion and Incidental Take Statement (ITS) was ordered on April 3, 2017 by NOAA. In the Biological Opinion, NMFS concluded that the continued operation of the project consistent with the terms of the SPP may adversely affect but is not likely to jeopardize the continued existence of the Gulf of Maine Distinct Population Segment of Atlantic salmon. The ITS exempts a certain amount of incidental take of Atlantic salmon from activities associated with the ongoing operation of the hydroelectric facility as well as upstream and downstream passage and survival studies, this number is 63 Atlantic salmon over a nine-year period. FERC amended the license to incorporate the SPP, with limited

exceptions, on May 11, 2018. The Licensee is seeking minor revisions to timing requirements for three of the conditions due to potential safety concerns.

Regarding state listed species, no rare botanical features have been documented specifically within the project area based on data provided by the Maine Natural Area Program (MNAP) on November 14, 2017. Consultation with MIF&W in December 2017, indicated that Little Brown Bat (State Endangered), Northern Long-eared Bat (State Endangered) and Eastern small-footed bat (State Threatened) may be found in the Project area. MIF&W also noted that no known Significant Wildlife Habitat areas have been documented at the project. The Applicant stated that given that the Project continues to operate as licensed and no significant project modifications are proposed, Eagle Creek does not believe operations will have adverse effects on State listed threatened or endangered species. Should Eagle Creek have a need for construction or maintenance that would require land clearing or large tree removal, they would consult with the appropriate state agencies to ensure that planned activities are in accordance with state agency requirements. Such consultation would likely require assessment of the presence of / impact to these species.

In an email response to my inquiry (see Appendix B), NMFS stated that a concern they raised in 2014 about impacts to Atlantic salmon had been addressed in a 2017 biological Opinion. To ensure that requirements identified by NMFS deemed necessary to protect the endangered Atlantic salmon are conducted, a condition has been recommended. To help ensure that state protected species are not affected by future activities, a separate condition has been recommended to confirm satisfaction of this criterion.

*The Project Conditionally Passes Criterion F – Threatened and Endangered Species
Protection - Go to G*

G. CULTURAL AND HISTORIC RESOURCE PROTECTION

Goal: The Facility does not inappropriately 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: To pass the Cultural and Historic Resource criterion compliance with one or more of the alternative standards identified in the Low Impact Hydropower Certification Handbook issued March 7, 2016 must be demonstrated.

Assessment of Criterion Passage

The Applicant has selected and demonstrated compliance with **Standard G-1, Not Applicable/De Minimis Effect** to pass the Cultural and Historic Protection criterion for the Project for all ZOEs. This standard requires:

“STANDARD G-1. Not Applicable/De Minimis Effect: There are no cultural or historic resources present on facility lands that can be potentially threatened by construction or operations of the facility, or facility operations have not negatively affected those that are present, either recently or in the past.”

Article 36 of the FERC license requires consultation with the SHPO in the event any resources of historical or archaeological significance are found. On April 17, 1998, the Maine Historic Preservation Commission (MHPO) stated after reviewing the proposed amendment to license, “Although there are or may be properties in the project area of historic, architectural, or archaeological significance as defined by the National Historic Preservation Act of 1966, we find that the proposed undertaking will have no effect upon such properties, in that the proposed pool operation between 98.5 and 97.0 feet, which is less than the historic operating maximum of 99.0 feet, will not exacerbate erosion of any archaeological sites located above the pool elevation.” No other cultural resources issues were found.

The Worumbo Mill was listed in the National Register of Historic Places (NRHP); after a fire in 1987 destroyed the building, it was removed from the list. There are no other known sites in the project area that are listed or eligible for listing in the NRHP.

The Project Passes Criterion G - Cultural and Historic Resource Protection - Go to H

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 waters without fee or charge.

Standards: To pass the recreation criterion, compliance with at least one of the alternative standards identified in the Low Impact Hydropower Certification Handbook issued March 7, 2016 must be demonstrated. In all cases, it must be demonstrated that flow-related recreational impacts are mitigated to a reasonable extent in all zones where there is flow-related recreation. Where there is recognized, flow-related recreational use, the facility shall provide the public with relevant and up-to-date information on reservoir levels and river flows, preferably real-time updates. It is understood that recreational activities must be consistent with the assurance of reasonable safety of employees and the public, and with critical infrastructure protection dictated by state or federal authorities.

Assessment of Criterion Passage

The Applicant has selected and demonstrated compliance with **Standard H-1 Not Applicable/De Minimis Effect** for the bypass (ZOE#2) and **Standard H-2, Agency Recommendation** for the impoundment (ZOE #1) and tailrace/downstream reach (ZOE#3) to pass the Recreational Resources criterion for the Project for all ZOEs. This standard requires:

“STANDARD H-1. Not Applicable/De Minimis Effect: The facility does not occupy lands or waters to which the public can be granted access and does not otherwise impact recreational opportunities in the vicinity of the facility.

“STANDARD H-2. Agency Recommendations: If there are comprehensive resource agency recommendations for recreational access or accommodation (including recreational flow releases) on record, or there is an enforceable recreation plan in place, the Facility demonstrates that it is in compliance with those.”

Article 37 of the 1985 License requires the Licensee to construct a boat launch in the Town of Lisbon and a canoe portage at the project. This facility was constructed in 1987 at the upper end of the impoundment. Subsequently, these facilities were transferred to the Town of Lisbon. The Project also provides a canoe takeout located on the left side (looking downstream) of the reservoir that has a floating dock for ingress/egress, signage and fencing at the canoe facility, boat barrier, and warning signs at the dam in the Impoundment ZOE. Review of a 2016 FERC Inspection report showed that the Project provides recreational access “relative to the size of project lands and waters” and that all facilities were being properly maintained. Recreational features access is provided free of charge. Required Form 80 reports are also being appropriately submitted.

The Project Passes Criterion H – Recreational Resources

X. GENERAL CONCLUSIONS AND REVIEWER RECOMMENDATION

Based on my review, I believe that this Project conditionally meets the requirements for Low Impact Certification and recommend it be re-certified for a five-year period with the conditions noted below. These will ensure satisfaction of the Water Quality, Upstream and Downstream Fish Passage and Threatened and Endangered Species Protection criteria.

- The Owner shall contact the MEDEP by November 30, 2018 and establish a meeting with the MEDEP by March 31, 2019 regarding the agency comment in their email to the LIHI reviewer that the dam may be increasing the contaminant bio-accumulation in fish and non-attainment of the water quality standards from legacy PCB and dioxin pollutants from upstream sources. The Owner shall notify LIHI as to the results of this consultation to determine if this concern is warranted, within 60 days of the consultation. If consultation takes place over several meetings, then the Owner shall provide updates to LIHI as part of their annual compliance reports to LIHI.
- To ensure that requirements identified by NMFS that are deemed necessary to protect the endangered Atlantic salmon are conducted, the Owner shall confirm that the activities under the Terms and Conditions of the Biological Opinion have been conducted, as needed and applicable, each year. This update shall be provided in the annual compliance reports to LIHI.
- If the Owner undertakes any construction or maintenance activities that may affect lands not already developed, or structures/tree removal that may provide roosting habitat for listed state and federal bat species, LIHI shall be notified of such actions, along with the results of any mitigation measures that may be conducted to minimize species impacts, should they be found to be necessary based on agency consultation. Such LIHI notification shall be provided as part of the annual compliance reports to LIHI.

**THE WORUMBO PROJECT
CONDITIONALLY MEETS THE LIHI
CRITERIA FOR CERTIFICATION AS A LOW
IMPACT FACILITY**

APPENDIX A

Figures and Photographs

Figure 1 – Dams on the Androscoggin River

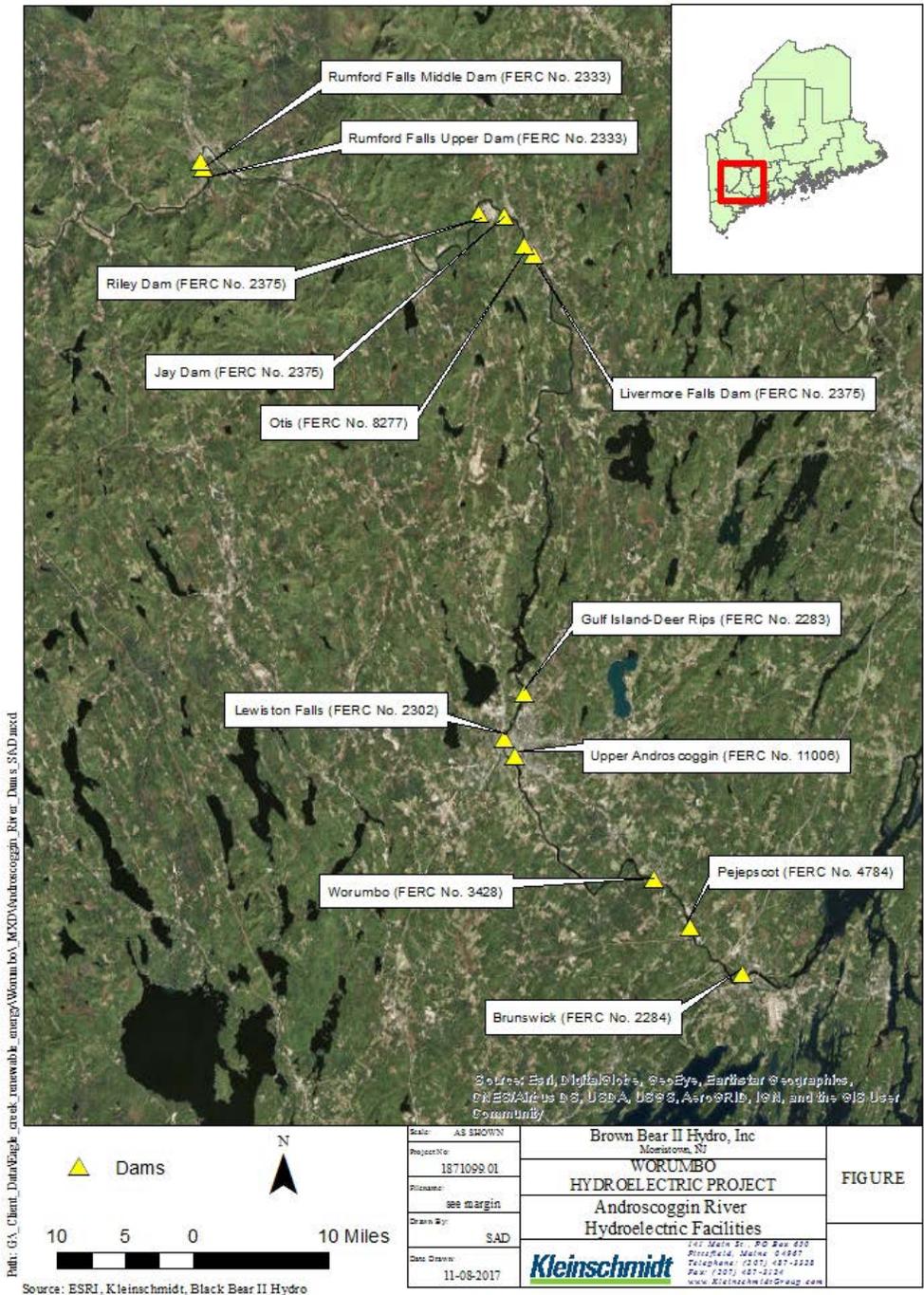


Figure 2 – Worumbo Project Zones of Effect

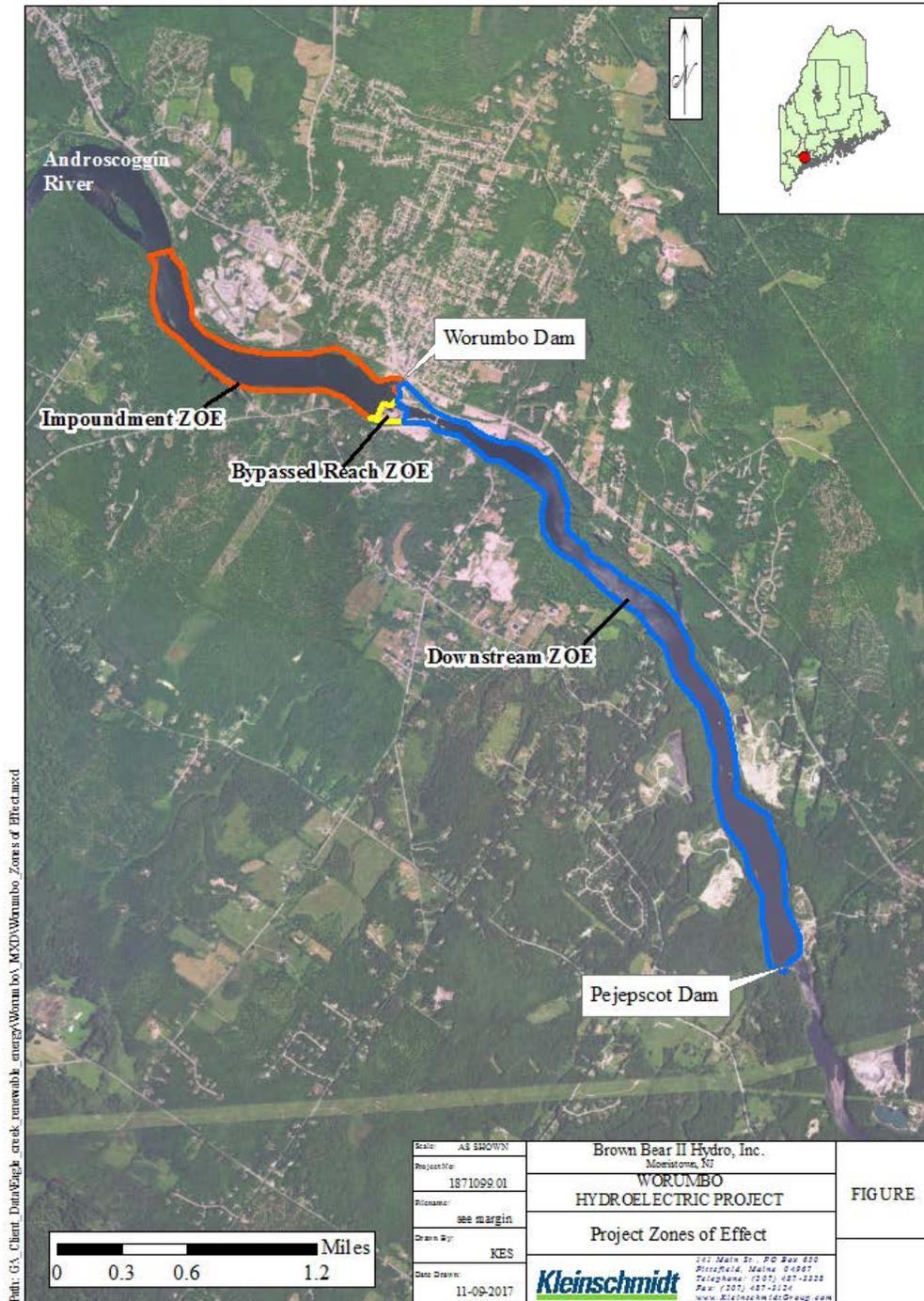
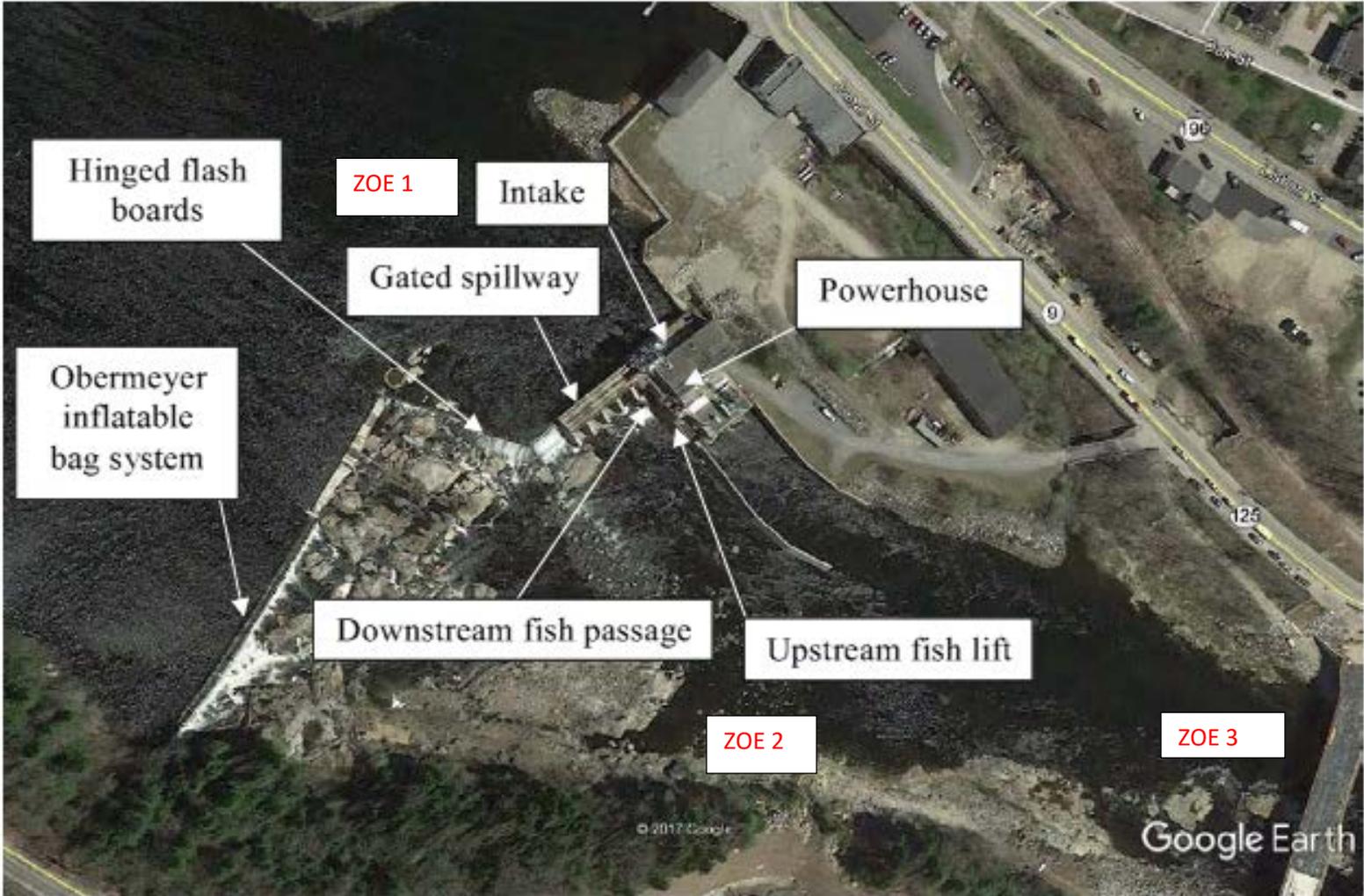


Figure 3 – Facility Aerial and Key Features



Photograph 1 –Spillway and Impoundment (ZOE#1)



Photograph 2 – Tailrace and Downstream Reach (ZOE#3)



APPENDIX B
Agency Emails

Print

Date: Tuesday, August 7, 2018 9:16 AM
From: Howatt, Kathy <Kathy.Howatt@maine.gov>
To: pbmwork@maine.rr.com <pbmwork@maine.rr.com>
Subject: RE: Question on Worumbo project

Good morning Pat,

I have consulted with Barry Mower, a biologist with the Department's Division of Environmental Assessment, regarding your questions on the water quality issues in the Androscoggin River in the vicinity of the Worumbo Project. Although the sources of bioaccumulative contaminants (dioxins and mercury) are upstream mills and concentrations in sediment have probably declined a bit, a fish consumption advisory more restrictive than the statewide advisory due to mercury remains due to dioxins and PCBs, and therefore, the river is not attaining its water quality standards designated use of fishing. Some limited data from 1998 show levels of mercury in fish from the Androscoggin River in the Worumbo impoundment at 0.651 ppm in smallmouth bass. The MeCDC currently has 2 Fish Tissue Action Levels, at 0.02 ppm and 0.65 ppm. Given the presence of mercury and other contaminants from upstream sources and the demonstration in studies of other rivers tht dams trap sediments leading to increased contamination in fish, the Department cannot say that the Worumbo dam does not cause or contribute to increased contamination of fish and non-attainment of the water quality standards in its impoundment. One way to refute this would be for Worumbo to collect fish above and below the dam to see if there is any difference or enough difference to cause an exceedance of the upper Fish Tissue Action Level. The Department recommends collection of 15 smallmouth bass, analyzed as 5 composites of 3 fish each for mercury at two site; one in the impoundment and at a second site below the dam. There may be additional ways to assess this question, the Department is willing to consider other methods you may want to propose. Please let me know how you want to proceed.

Kathy

Kathy Davis Howatt
Hydropower Coordinator, Bureau of Land Resources
Maine Department of Environmental Protection
Phone: 207-446-2642
www.maine.gov/dep

Correspondence to and from this office is considered a public record and may be subject to a request under the Maine Freedom of Access Act. Information that you wish to keep confidential should not be included in email correspondence.

-----Original Message-----

From: pbmwork@maine.rr.com [pbmwork@maine.rr.com]
Sent: Tuesday, July 31, 2018 8:02 PM
To: Howatt, Kathy <Kathy.Howatt@maine.gov>
Subject: Question on Worumbo project

Hi Kathy

As you know, Eagle Creek has applied to LIHI for re-certification of their Worumbo Project on the Androscoggin River. I understand that a letter was requested from you regarding whether or not Project operations are the cause of the dioxin and PCBs impairment of the river in this area, and that your office is still looking at data on this issue. My question is more general...basically do you have any water quality related concerns regarding Project operations? Based on deviation reporting, it appears that in general, operations have been compliant with the run-of-river and minimum flow requirements. Attention to monitoring and reporting clearly appears to have significantly improved since Eagle Creek has purchased the Project in November 2016.

Thank you for your time. If you prefer to talk about the project, please feel free to give me a call at 207-688-4236.

Pat Mcilvaine

Print

Date: Wednesday, August 1, 2018 9:39 AM
From: Matt Buhyoff - NOAA Federal <matt.buhyoff@noaa.gov>
To: pbmwork@maine.rr.com
Cc: Jeff Murphy - NOAA Federal <jeff.murphy@noaa.gov>
Subject: Re: Worumbo Project application for LIHI re-certification

Good Morning, Pat -

The issues with the studies have been resolved. We issued a new Biological Opinion for the Worumbo project on April 3, 2017 and therefore, the Licensee is currently in compliance with the Endangered Species Act.

Please don't hesitate to contact me if you have any further questions.

Thanks,

Matt Buhyoff

On Tue, Jul 31, 2018 at 5:04 PM, <pbmwork@maine.rr.com> wrote:

The comments are noted on pages 5 and 6 of Appendix A of the attached report. Your comments on the 2015 study did not mention this issue so I assumed the issue was resolved somehow? If so, what was the resolution?

Thanks, Pat

---- Jeff Murphy - NOAA Federal <jeff.murphy@noaa.gov> wrote:

> Hello Pat - Matt Buhyoff is now working on this project for NMFS. I have
> copied him here. Could you please forward my 2015 comments to Matt for his
> review? Thanks, Jeff.

>

> On Tue, Jul 31, 2018 at 2:18 PM, <pbmwork@maine.rr.com> wrote:

>

> > Hi folks

> >

> > I am the reviewer for the Low Impact Hydropower Institute for Eagle
> > Creek's application to us for re-certification of their Worumbo Project.

> > All of you with the exception of Jeff received a previous email from

> > Maryalice Fischer, Certification Program Director about this

> > re-application. As Jeff was not listed as a contact in the application, he

> > did not receive this initial email.

> >

> > A general question that I have is associated with your thoughts on whether

> > or not you believe Eagle Creek has been conducting the appropriate

> > activities to support the restoration program for Atlantic salmon to the

> > Androscoggin River. A more specific question is whether or not the concern

> > expressed by Jeff in 2015 in response to the 2014 downstream passage

> > studies has been resolved to your satisfaction. In summary that concern is

> > about the exceedance of the "exempted take" of salmon identified in the ITS

> > and that there may be additional effects associated with the Project that

> > were not addressed in the Biological Opinion. At that time, the Project was
> > owned by Miller Hydro. Eagle Creek assumed ownership in 2016.
> >
> > I would appreciate your response in both of general terms, and
> > specifically for Jeff, whether the salmon take concern has been resolved to
> > your satisfaction.
> >
> > Thank you for your time. If its easier to call to discuss these issues I
> > can be reached at 207-688-4236. As I work from home, please leave me a
> > message if I am not at home and I'll call back ASAP.
> >
> > Pat McIlvaine
> >
>
>
>
> --
> Jeff Murphy
> NOAA's National Marine Fisheries Service
> Maine Field Station
> 17 Godfrey Drive
> Orono, Maine 04473
> PH: 207-866-7379
> FAX: 207-866-7342

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Matt Buhyoff
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