



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION



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GOVERNOR

GERALD D. REID  
COMMISSIONER

June 30, 2020

Ms. Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First Street, N.E.  
Washington, DC 20426

RE: FERC 4784, Pejepscot Hydroelectric Project  
Draft License Application Comments

Dear Secretary Bose:

The Maine Department of Environmental Protection (Department) reviewed the Draft License Application (DLA) submitted to FERC on April 3, 2020 by the Topsham Hydro Partners (Applicant) for the Pejepscot Hydroelectric Project (FERC 4784), located on the Androscoggin River in the towns of Topsham, Durham, Lisbon, and Brunswick, located in Cumberland, Sagadahoc, and Androscoggin Counties, Maine.

The existing Pejepscot Hydroelectric facilities consist of a 560-foot-long, 48-foot-high, rock and gravel filled timber crib overflow structure that is topped with a 5-foot-thick reinforced concrete slab; a spillway consisting of five 96-foot-long by 3-foot -high bascule gates; a 225-acre impoundment at full pool elevation of 67.5 feet; a powerhouse containing three horizontal Francis turbine-generator units with a combined rated capacity of approximately 1,580 kW and maximum hydraulic capacity of approximately 1,050 cfs; a powerhouse containing a vertical-shaft propeller type (Kaplan)turbine rated at 17,000 hp with a maximum hydraulic capacity of approximately 7,100 cfs and a generator rated at approximately 12,300 kW; an upstream fish passage facility consisting of a vertical fish lift; a downstream fish passage facility consisting of two-four-foot wide entry weirs that pass fish through 30-inch and 24-inch outlet pipes respectively; and appurtenant facilities.

Formal and informal recreation facilities associated with the Project include impoundment boat launches and fishing access; parking for the recreational facilities is limited.

The Department understands that there are no proposed changes in facilities or operations of the Pejepscot Project at this time.

**Water Quality Study Comments**

The Department requested certain water quality studies, conducted in substantial conformance with established sampling protocols that were provided to the Applicant, to evaluate current

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water quality conditions and to determine whether current and proposed project operations meet the designated uses, including recreation in and on the water and habitat for fish and other aquatic life among others, as well as numeric standards for dissolved oxygen and narrative criteria, demonstrating attainment of Maine's water quality standards. Requested studies included:

1. Impoundment Trophic State Study
2. Impoundment Aquatic Habitat Study and Aquatic Habitat Cross-Section flow Study, or at least three years of impoundment elevation and inflow/outflow data to demonstrate run-of-river operations
3. Downstream Temperature and Dissolved Oxygen Study
4. Benthic Macroinvertebrate Study

The DLA presents methodologies, data results, analysis and discussions on each of the studies completed. The Department reviewed the information submitted by the Applicant and has the following comments on the completed studies:

1. Trophic State Study in the Pejepscot Impoundment

The Applicant performed trophic state sampling in the Pejepscot impoundment twice per month from June through October 2018 in accordance with the *Lake Trophic State Sampling Protocol for Hydropower Studies (MEDEP 2017)*. Water quality samples were collected in the deepest location in the impoundment. Analysis of sampling results indicates that the Pejepscot impoundment is mesotrophic, with a trophic state index of 36; a trend analysis requires ten years of data and so it is not possible to evaluate whether or not the trophic state is improving. Impoundment water temperature and dissolved oxygen (DO) profiles indicate that the Pejepscot impoundment does not stratify thermally and that dissolved oxygen in the impoundment is in attainment with Maine's water quality standards throughout the sampling period.

Based on results provided by the Applicant in the Initial Study Reports (ISR) and DLA, the Department concludes that the applicant has provided sufficient information regarding the trophic state of the impoundment to determine that the Project impoundment is in attainment of Maine's water quality standards.

Electrical generation facilities are in line with the Project Dam and there is no bypass reach associated with this Project. In lieu of an impoundment habitat study and aquatic habitat cross-section flow study the Applicant must provide sufficient information to establish that the Project operates in run-of-river mode, that water level fluctuations in the impoundment are limited, and that outflow from the impoundment is essentially equal to inflow. Pending receipt of water the requested three years of impoundment water level and flow data, aquatic habitat studies in the impoundment and in the Project tailwater may be necessary.

2. Water Temperature and Dissolved Oxygen Study

Water temperature and DO measurements were collected downstream of the Pejepscot Dam in the project tailrace between August 2 and October 2 °C , 2018, in accordance with the *River and*

*Stream Sampling Protocol for Hydropower Studies (MEDEP 2017)*. DO measurements ranged from 7.8 to 9.7 mg/L, with percent saturating ranging from 94.3 to 106.2%. Instantaneous DO concentrations averaged 8.5 mg/L (percent saturation averaged 99.6%) over the monitoring period; measurements never fell below Maine's water quality standard. Water temperature in the tailwater reach ranged from 16.8°C to 27.3°C (water temperature averaged 23.5°C) throughout the sampling period.

Based on the results and information contained in the ISR and DLA, the Department concludes that the Applicant has provided sufficient information to demonstrate that the Pejepscot Project meets applicable Class C DO criteria downstream of the Project Dam.

### 3. Benthic Macroinvertebrate Study

The Applicant collected benthic macroinvertebrate samples approximately 600-700 feet downstream of the Pejepscot Dam following Maine's *Methods for Biological Sampling and Analysis of Maine Rivers and Streams (Tsomides and Davies 2014)*. Rock baskets were placed at the sample site on August 2, 2018 and allowed to colonize for 28 days (+/- 4 days) and retrieved August 28, 2018. Results indicate that the benthic macroinvertebrate community downstream of the Pejepscot Project is abundant, with 43 species represented, including some sensitive species. Data collected was analyzed by the Department's Division of Environmental Assessment, applying a linear discriminate model and was found to exceed applicable Class C criteria.

Based on the study results and information contained in the ISR and DLA, the Department concludes that the Applicant has provided sufficient information to demonstrate that the Pejepscot Project meets, at a minimum, Maine's applicable Class C aquatic life and habitat criteria.

### 4. Tailrace Aquatic Habitat Study

The Applicant conducted a Tailrace Aquatic Habitat Study in the tailrace reach of the Androscoggin River downstream of the Pejepscot Dam to characterize physical habitat and substrates in the unimpounded reach, downstream of the Project. The study identified six major mesohabitat categories, including backwater habitat (28% of total habitat area), pool habitat (38.1% of total habitat area), riffle habitat (6.1 % of total habitat area), run habitat (20.1% of total habitat area), glide habitat (1.0% of total habitat area), and an "other" category (6.1% of total habitat area). Primary, secondary, and tertiary substrates were then identified within each mesohabitat (gravel, cobble, sand, mixed bedrock, small boulder, rubble, and large boulder). Finally, fine substrate (sand, silt, mud, etc.) was recorded, found to be associated with backwater, pool, and (one) run habitat.

The Applicant was requested to submit three years of impoundment water level and flow data to demonstrate the run-of-river operations of the facility, to show that water levels in the impoundment do not fluctuate more than an unimpounded river, and that inflow is equal to outflow, showing that downstream habitats remain watered in the same manner as an undammed

river. Those data remain outstanding at this time and should be submitted for Department review as quickly as possible.

Based on the results and information contained in the ISR and DLA, at this time the Department cannot conclude that the Applicant has provided sufficient information to demonstrate that the Pejepscot Project meets applicable Class C aquatic life and habitat criteria, and the designated use of habitat for fish and other aquatic organisms; however, submission of water level and flow data may allow the Department to make such a determination.

Topsham Hydro Partners must demonstrate compliance with all designated uses as well as all numeric and narrative criteria in order for the Department to issue a water quality certification for the Pejepscot Project.

Thank you for the opportunity to comment. Please contact me by telephone at (207) 446-2642 or by email at [Kathy.Howatt@maine.gov](mailto:Kathy.Howatt@maine.gov) if you have questions.

Sincerely,



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Hydropower Coordinator  
Bureau of Land Resources