



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Mid-Atlantic Fish and Wildlife Conservation Office
177 Admiral Cochrane Drive
Annapolis, MD 21401

October 24, 2019

Kathleen Lester
Compliance Manager
Brookfield Renewable
126 Lamberton Lane
Hawley, PA 18428

RE: 2019 Inspection of Safe Harbor Fish Passage Facilities

Ms. Lester,

Attached is the report of the U.S. Fish and Wildlife Service's (Service) inspection of the fish passage facility at Safe Harbor Dam. The Service has no follow-up recommendations at this time, but would urge staff at the project to continue to make note in the annual fish passage reports if observed fish behavior in the exit channel displays avoidance of the bubble curtain.

Please contact me if you have any questions or need further clarification of these items.

Sincerely,

Sheila Eyler
Project Leader
Mid-Atlantic Fish & Wildlife Conservation Office
U.S. Fish and Wildlife Service



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FISH AND WILDLIFE SERVICE

300 Westgate Center Drive
Hadley, MA 01035-9589



October 24, 2019

MEMORANDUM

To: Susquehanna River Coordinator, Mid-Atlantic Fish & Wildlife Conservation Office

From: Jesus Morales, Hydraulic Engineer, Fish Passage Engineering

Subject: Fishway Inspection at the Safe Harbor Hydroelectric Project (FERC #1025) on May 22, 2019

A seasonal inspection of the fish passage facilities at the Safe Harbor Hydroelectric Project (Project) was performed at 9:00 am on Wednesday, 05/22/2019. The Project is owned by the Safe Harbor Water Power Corporation (Licensee). The USFWS (Service) review team was led Sheila Eyler, and included Jesus Morales, Jessica Pica, John Wiley and Jessica Goretzke. Consultants from Normandeau Associates, personnel from the Pennsylvania Fish & Boat Commission, the Susquehanna River Basin Commission and the Maryland Department of Natural Resources were also present during the visit. On the day of the site inspection the Susquehanna River flow was approximately 70,000 cfs, as measured by the Marietta USGS water gage.

The site review focused on the inspection of the upstream fish passage facility, a fish elevator (fish lift) located in between the power house turbine units and the dam spillway. On the day of the site inspection, the operators performed a lift cycle while visitors from the various agencies observed. Two out of the three entrance gates were open on this day: gate-A (the one farthest away from the power house building) attracts fish into the fishway by discharging attraction flow into the downstream direction, parallel to the river flow; and gate-C (the one closest to the power house building) attracts fish by discharging flow perpendicular to the river flow, into the quiescent area upstream of the catwalk. The intent of this inspection report is to address operational deficiencies observed at the time of the site inspection.

Based on this review, the salient passage issues appear to center on the following:

Exit channel:

- Debris accumulation - On the day of the inspection, a significant amount of debris was observed in the vicinity of the fish lift exit channel surrounding its trash rack, on the western side of the power canal skimmer wall (Figure 1). This debris accumulation created a debris “halo” around the trash rack. There are currently no available mechanisms to flush the debris downstream at this site (e.g., trash sluice or pneumatic flash boards).
 - In an attempt to keep debris from plugging the exit channel trash rack, the Licensee has installed air pumps to push the debris away from the trash rack. The Service continues to



be concerned about the impact that these air bursts might have on the flow vectors within the zone of passage while fish exit the lift to continue their migratory journey upstream. Migratory fish rely on rheotaxis, or a fish's behavioral orientation to the water current, in order to navigate their upstream route to spawning habitat. The potential interruption of the zone of passage by these air bursts, as well as the amount of debris material surrounding the exit area, have the potential to cause delays and/or confusion to the migratory fish exiting this facility. Some type of biological evaluation (e.g., radio telemetry) could be useful to determining whether the Licensee's strategy for keeping the trash rack clean has a negative impact on migratory fish behavior or not.



Figure 1 – Debris accumulation in the vicinity of the exit channel trash rack

Additional observations made during this review:

- While the visiting group was in the upper level of the fish lift facility, and the lift began its passage cycle, vibration was felt throughout the super structure by some of the visitors. Excessive vibration, as well as the noise from whatever might be causing the vibration, could result in unwanted fish fallbacks. Loud noises and heavy vibration within the fish passage facility should be avoided as much as possible during the fish passage season.
- Flow over the floor diffusers in the various entrance channels continues to look good, with no visible upwelling or undesired eddies. The zone of passage appears to be successfully preserved in this lower level of the fish lift facility.

Thank you for the opportunity to participate in this review. For questions please contact Jesus Morales at 413-253-8206.