



January 7, 2022

Low Impact Hydropower Institute
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Subject: Red Rock Project Comments

The Low Impact Hydropower Institute (LIHI) has requested the Iowa Department of Natural Resources (IDNR) to provide input on the Western Minnesota Municipal Power Authority (WMMPA) application for renewable energy credits based on the performance of the hydropower facility at Red Rock Lake, Iowa.

Missouri River Energy Services (MRES) provides administrative services to manage WMMPA's portfolios, including the Red Rock hydropower facility. Local MRES staff at the hydropower facility have been great partners with IDNR. MRES has provided the IDNR with timely water quality reports, shared water quality data, and quickly adjusted operation strategies to mitigate water quality issues in the operation's outflow (i.e., low Dissolved Oxygen levels).

Persistent drought conditions in the Red Rock Lake watershed have restricted utilization of the hydropower facility at full capacity for an extended period of time since it became operational in May 2021. Variation in discharge rates over time will provide a better opportunity for performance evaluation and evaluation of ecological effects on the Red Rock Lake tailrace.

Fish health in the tailrace remains a concern among the IDNR Fisheries Bureau. Downstream emigration of hatchery-stocked sport fishes (e.g. Walleye, Hybrid Striped Bass, Muskellunge) from reservoirs is well-documented, particularly in Iowa. Sport fish populations exist in the Red Rock tailrace primarily due to annual reservoir and river stockings by the IDNR upstream of the Red Rock Lake Dam. The tailrace is an extremely popular resource among both shore and boat anglers.

The IDNR expressed concerns regarding entrainment and turbine-related mortality/injury during the Federal Energy Regulatory Commission (FERC) licensing process, and these concerns still exist. In fact, the IDNR implemented an evaluation in 2021 to monitor the health of the tailrace fish community. Preliminary results suggest that fish of multiple species are experiencing physical injury while passing downstream through either the dam or hydropower facility. However, a more detailed study is necessary to determine whether these injuries are being caused by passage through the hydropower facility.

The IDNR recommends that the applicant (in coordination with the IDNR Fisheries Bureau) implements a multi-species balloon tag study. This study exposes tagged fish to turbine passage by releasing them inside the inlet, ensuring they pass through the power-generating turbines and emerge downstream. The tags are then activated in the tailrace inflating a balloon which forces the fish to the surface, allowing it to be retrieved and analyzed for injury or mortality. At minimum, the IDNR recommends examination of important sport fish species including Walleye, Hybrid Striped Bass, White Bass, and White Crappie. A balloon tag study would require consultation from a balloon tag service provider, along with IDNR collaboration to collect fish.

The IDNR's evaluation of fish health in the tailrace also revealed continuing issues with Gas Bubble Disease (GBD) possibly related to the dam outflow. GBD can cause sublethal stress, delayed mortality, and immediate mortality to fish, causing damage to the sport fishery and the fish community as a whole. Based on 2021 data

collection, the IDNR suspects there may be a mitigative effect of hydropower operations on GBD occurrence in the Red Rock Dam tailrace, due to pressurization of water and expression of dissolved gases during turbine passage. Potential positive effects of hydropower operation could defray damages caused by turbine-related injuries.

Therefore, the IDNR also recommends that the applicant (in coordination with the IDNR Fisheries Bureau and other partners) establish continuous monitoring of total dissolved gases in the tailrace. Optimal placement of total dissolved gas sondes would entail four locations: one on the far left side of the dam, one in the middle between the dam and hydropower facility, one on the far right side of the hydropower facility, and one immediately downstream. Together, these sondes would facilitate an understanding of how the tailrace waters mix, as well as how conditions change with varying outflow management. It is possible MRES could benefit the fish community further by reducing the severity of GBD in the tailrace.

We look forward to continued partnership with WMMPA and MRES in the future. Feel free to contact one of our local Fisheries Biologists (Ben Dodd ben.dodd@dnr.iowa.gov, or Rebecca Krogman at rebecca.krogman@dnr.iowa.gov) if you have any further questions.

Respectfully submitted for your consideration,

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