



MEMORANDUM

EUGENE WATER & ELECTRIC BOARD

Rely on us.

TO: Commissioners McRae, Barofsky, Schlossberg, Brown, and Carlson

FROM: Lisa Krentz, Electric Generation Manager; Mark Zinniker, Generation Engineering Supervisor; Laura Ohman, Chief Dam Safety Engineer

DATE: September 20, 2024

SUBJECT: Walterville Canal Forebay Repair

OBJECTIVE: Information

Issue

This memorandum provides an update on the development of a repair plan for excessive seepage conditions at the Walterville Canal forebay. Staff expect to be requesting approvals on repair-related contracts at upcoming Board meetings, so are providing important background information to invite Board feedback and questions.

Background

On February 27th, 2024, flow from a known area of seepage that has been under close surveillance at the Walterville Canal forebay spiked from approximately 30 gallons per minute (gpm) to over 100 gpm in less than an hour. The seepage flow was temporarily turbid, indicating the potential for active internal erosion within the canal embankment. Operations staff immediately intervened by lowering the water level in the forebay, essentially eliminating the seepage flow. EWEB spoke with engineers from the Federal Energy Regulatory Commission's Division of Dam Safety and Inspections (FERC D2SI) on February 28th and March 1st. FERC D2SI issued an Order on March 5th directing EWEB to maintain a drawdown of the Walterville Canal until they authorize increased water levels.

Since this incident, EWEB has been working closely with consulting engineers to develop a repair plan for the forebay. Results of the investigation indicate that it is fiscally feasible for EWEB to invest in a targeted repair to address the excessive seepage issue and bring the project back online as soon as possible to maximize the benefit under the current operating license that expires in 2040.

If additional repairs to address broader seismic stability issues are required by FERC, further cost-benefit analysis would be needed to determine both the scope and cost of those repairs and if the expense is recoupable within the current license period.

Discussion

A new plastic liner is likely to resolve the excessive seepage issue, allowing another fifteen years of generation under the current license at a cost of about three years of generation revenue from the project.

The repair planning work has focused on the relatively thin concrete liner located immediately upstream of the more massive concrete gravity walls of the forebay structure. This concrete liner has extensive construction joints, expansion joints, and settlement cracks that have required ongoing re-sealing throughout its more than 100-year service life. Available evidence indicates the poor performance of the

liner system is responsible for the excessive seepage conditions, and the consultant team determined that a new liner system is necessary. After completing an assessment of alternative repair strategies, consultants have recommended that EWEB install a proprietary flexible plastic liner over the existing concrete liner. Initial estimates for the new liner system range from \$3 million to \$7 million. Since the value of power generation from Walterville equates to \$1.6 to \$4.6 million per year, there currently appears to be a reasonable economic basis for performing the repair work.

Although FERC D2SI understands EWEB's position to focus on forebay repairs, their responsibility to oversee dam safety may lead to additional repair requirements.

Results from the investigation, evaluation of repair alternatives, and recommended liner improvements were presented to FERC D2SI staff on July 16th. During the discussion, FERC staff inquired about the potential for addressing any seismic deficiencies as part of the repair effort. FERC D2SI had recently provided their approval of EWEB's updated Seismic Hazard Assessment on July 3rd and pointed out that the information necessary to conduct seismic stability analyses is now available. EWEB's intent has been to focus the repairs on the excessive seepage conditions only because we view the dam safety hazards associated with internal erosion as the highest priority given they are present at all times during normal operating conditions. In contrast, the risks associated with seismic hazards are relatively unlikely. Since there are only 15 years left on the FERC operating license, we indicated that our intent would be to invest in seismic improvements only if we decided to relicense Walterville and continue generating power for an additional 40 years or more, noting that an important advantage of the flexible plastic liner system is that it could be temporarily detached from the embankment to construct seismic improvements and then re-installed once complete. Though FERC understands EWEB's rationale, it is clear that they will need to review seismic stability results for the forebay structures before they can determine the acceptability of a repair plan that focuses solely on the excessive seepage condition.

To enable a timely repair, EWEB plans to proceed with both the repair planning and the seismic analysis concurrently, rather than waiting for the results of the seismic analysis before developing repair plans.

Preparing the detailed design documents for a new liner system, obtaining FERC approvals to construct, procuring the construction materials/services, and then implementing the construction work will be time intensive. Expedited performance of this work will require approximately a year. The time requirements seismic analyses and FERC review could easily take six months. As such, to maintain the potential for 2025 construction or repairs, schedule compression is necessary. EWEB will need to steadily advance the liner design work in the near term while performing the seismic stability analyses in parallel. Sequential performance of the seismic analyses followed by detailed design could easily add a year to the outage duration, thus forgoing the value of Walterville generation for another year while also increasing the potential for deterioration of the dewatered canal embankments due to drying of the embankment soils.

Staff intend to develop engineering design and construction contracts for the forebay repairs in a manner that accommodates cancellation in the event of adverse seismic analysis results or FERC determinations regarding the necessary timing for seismic improvements. Contract language will include hold points that allow EWEB to ensure that regulatory approvals are progressing favorably before committing to subsequent phases of the repair work.

Requested Board Action

No Board action is requested at this time. Liner design and construction contract approval requests may come to the Board as soon as November 2024. Staff welcome questions and feedback from the Board regarding the proposed approach for schedule compression.