



# MEMORANDUM

EUGENE WATER & ELECTRIC BOARD

*Rely on us.*

TO: Commissioners Mital, Schlossberg, Helgeson, Brown and Carlson  
FROM: Michael McCann, Electric Generation Manager and Patty Boyle, Generation  
Contracts Supervisor  
DATE: June 5, 2020  
SUBJECT: Leaburg/Walterville Evaluation Project Update (Organizational Goal #7)  
OBJECTIVE: Information Only

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## **Issue**

These materials have been prepared to provide an update on the progress made to study and provide information to the Board regarding the Leaburg-Walterville Project. The materials describe and update the progress for achieving the 2020 EWEB organizational goal #7 to *work with the EWEB Commissioners, FERC, and the McKenzie Valley community to develop a TBL-based plan for the lower McKenzie River Hydroelectric Projects by the end of 2020.*

## **Background**

With approximately 20 years remaining on the FERC-issued operating license for the Leaburg-Walterville Project, EWEB must evaluate the near- and long-term options to resolve dam safety concerns associated with the Leaburg Canal. When in operation, water diverted at Leaburg Dam for power generation passes through a downstream migrant fish screen and enters the 5-mile-long, 15-foot deep cut and fill, partially lined, Leaburg Canal leading to the power plant forebay. The Leaburg Powerhouse contains two Francis turbines with a total installed capacity of 15.9 MW and produces approximately nine (9) average MW.

## Canal Condition - Internal Erosion of the Leaburg Canal

Since the Project was put in operation in the 1930s, there have been seepage areas along the entire length of both the Leaburg and Walterville Canals that have been visually monitored, and in some cases mitigated by performing canal repairs. On September 25, 2018, as part of a routine annual inspection, the first of two now known locations of internal erosion was discovered at a chronic seepage location.

This first area, known as Cogswell Creek Seepage Area, included an approximate 8-foot long, 6-inch diameter void where water is seeping out of the toe of the canal embankment. On September 28, 2019, EWEB received direction from the FERC Division of Dam Safety and Inspections - Portland Regional Office that included requirements for EWEB to drawdown the canal, notify nearby residents, increase canal inspections, develop a work plan to investigate the erosion, determine the susceptibility to failure, and prepare a plan for repair. The Leaburg Canal was

subsequently drawn down beginning in October 2018 and remains out of service for power production. The canal continues to convey water from tributary creeks back to the river, though generally remains at a very shallow depth except during significant storm events. Since the initial discovery, inspection and monitoring activities have revealed three additional areas exhibiting indications of potential internal erosion in the Cogswell Creek Seepage Area.

The second area of internal erosion, and referred to as the Ames Seepage Area, was identified after the canal had been dewatered and is located above the town of Leaburg. Indication of internal erosion in this area was discovered in April 2019 and is being similarly addressed like the Cogswell Creek seepage.

While in better condition, the Walterville Canal has similar known seepage issues and will likely be subject to the same level of inspection and improvement requirements as the Leaburg Canal for the remainder of the license term. Though the Walterville Canal does not currently exhibit indications of internal erosion in progress and normal operations are not restricted, the canal embankment construction methods and materials are similar to those at Leaburg. As such, the Walterville Canal is vulnerable to the same potential failure modes as the Leaburg Canal and EWEB's dam safety team is monitoring those risks, including internal erosion, accordingly.

In 2019, EWEB implemented a FERC-approved Drilling Program Plan (DPP) for the Cogswell Creek area to provide greater detail on the condition of the canal and completed temporary repairs to both problem areas in preparation for increased winter accretion flows from tributary streams. These repairs were not intended to be a solution to the issues at these areas but were put in place to stabilize the canal during anticipated higher winter and spring flows that enter the canal from side streams.

#### Seismic Stability of the Projects

Seismic stability of the canals is a long-term issue that EWEB has been evaluating relative to FERC requirements. Identified deficiencies relative to modern seismic standards will need to be addressed in any planning process for the two Projects. It is also important to note that both the Leaburg and Walterville powerhouses were built prior to modern seismic design requirements, and their seismic stability has not been evaluated.

#### **Discussion**

Since the initial reporting in March, staff have made progress on the triple bottom line (TBL) analysis designed to support the Board's determination of the most beneficial approach to resolving the infrastructure issues and plan for the long-term management of the Project. This particular TBL will combine the financial forecast of the Project with a qualitative evaluation of the impacts to the environment and community. Our goal is to provide the Board with information that articulates the complex tradeoffs between the economic, community and environmental factors. Given the breadth of the issues, it is unlikely that there will be a clear path that is easily and economically implemented.

The analysis is intended to provide the Board with the information it needs to provide direction on the two identified scenarios that would either invest in the canal to return the Leaburg Powerhouse to operation or to invest in the canal to convert it to a system to convey water back to the river from creeks and springs that are currently intercepted by the canal.

Scenario #1 – Return to Service – In this scenario, the necessary investments would be made to resolve the dam safety concerns for operation of the Leaburg Canal. At a minimum, the areas of known internal erosion would need to be repaired or rebuilt and all other requirements as established with the Portland Regional Office of FERC Dam Safety would need to be satisfied. There would likely also be longer term requirements to address seismic issues along both the Leaburg and Walterville Canals.

Scenario #2 – Establish Water Conveyance – As noted in the background section, the Leaburg Canal intercepts several streams and springs and conveys that water past the homes and buildings that have been developed since the canal was constructed. In this scenario, EWEB would need to resolve any dam safety issues associated with the seasonal flows of the streams and creeks and establish a route or routes for those flows to return to the river. The Leaburg Powerhouse would no longer produce power and EWEB would work with FERC to modify or surrender the Leaburg portion of the Project license.

Close coordination with state and federal regulators will be required to implement either strategy including the resolution of existing water rights agreements with private parties that EWEB has historically served along the Leaburg Canal.

### **Financial Considerations**

At this stage, we assume that the cost to safely convey the seasonal flows of the streams and creeks will be significantly lower than the cost to bring the Leaburg Canal back to normal operation. This assumption will need to be validated as we get farther along in the engineering investigations. To be able to estimate the reinvestment required under each scenario, staff has initiated a Risk Informed Decision Making (RIDM) process with the support of Cornforth Consultants. In the first phase of the RIDM process, our consultants completed a review of the available information on the Leaburg Canal construction materials and methods, the existing maintenance records, historical engineering investigations, and all available monitoring reports. Based on those materials, EWEB and its consultants established ten segments to the canal and reviewed the features of each segment with FERC's dam safety personnel. The segments were established based on transitions in the underlying geology, the current condition of canal embankment, and potential risk associated with downstream residents and properties.

In July, EWEB, our consultants and FERC staff will meet again to review the failure modes of each of the ten segments to get an indication of where investments must be made to return to service. This process, known as a semi-quantitative risk analysis, characterizes risk by estimating the probability of potential failure modes along with their respective potential consequences. With that risk information in combination with feedback from FERC's dam safety professionals, EWEB can propose the appropriate locations and methods for repair of the canal. Required repair will vary by segment and range from minor modifications to extensive rebuilding efforts. Conceptual designs will then inform high level cost and timeline estimates for completion of the work. It is important to note that this information will only provide very early indications of both cost and timing of repairs.

In anticipation of the cost estimates for canal repair, staff have completed a baseline financial analysis that establishes expected value of the Leaburg power generation system as a stand-alone asset if returned to service or if converted to water conveyance. This baseline analysis does not yet

include the investments that will be required to return the canal to safe operation or convert the canal to a water conveyance. Three scenarios for the value of energy produced by the power generation system have been established in coordination with the assumptions used by the Fiscal Services and Power Planning Departments using the Aurora power market modeling tool. The estimated range for the value of energy is based on an industry standard approach using the natural gas price forecast and incorporating major economic indicators such as level of demand and technology changes. Because the analysis is based on the remaining life of the operating license, there is considerable uncertainty and variability in the value of power as shown in the table below.

Power Value	NPV <sup>1</sup> – Return to Service
High	\$3 million
Medium	(\$5 million)
Low	(\$8 million)

Alternatively, if the Project is returned to service as a water conveyance facility only, its net present value assuming no generation is negative \$17 million. Based on the baseline estimates, an additional investment of \$9-\$20 million could be made to return the Project to power production and would remain the financial equivalent of converting to a water conveyance system.

It is also important to acknowledge additional potential value streams associated with this plant although none are either certain enough or large enough to make a significant difference in the analysis at this time.

Capacity Value

Although EWEB currently has sufficient resources to meet load on an average basis, under certain peak load conditions there are forecasted shortages. This condition is not unique to EWEB and there is an effort to ensure the region has sufficient resources to meet peak load. While we recognize that there is a value of capacity to Leaburg, as it can be relied on to produce power during peak load periods, it is difficult to estimate a value on it at this time. The current timeline for implementing a regional resource adequacy measure is 2023/2024. There are currently many unknown factors and we will have a better understanding of the probability of success for that schedule late this fall.

Carbon Value

Based on research conducted by E3, a WECC wide carbon tax imposed in 2031 that is structurally similar to the carbon tax currently in place in California would add \$2 million in value to the present value of energy produced at Leaburg.

Renewable Portfolio Standard (RPS)

Under Oregon’s current renewable standards, the Leaburg Plant qualifies as legacy hydroelectricity. If our hydro generating resources, including Bonneville resources, generate beyond what is required to serve load, our RPS reequipment is satisfied. In the case that our load exceeds our resources, our RPS requirement is offset based on the statutory regulations by our hydro generation. Only in the cases of a large increase in load, severe drought or prolonged outages of other generation facilities do we expect to need to pledge renewable energy credits to meet the RPS as currently configured. Based on its legacy hydro status,

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<sup>1</sup> Net present value over 20 years of remaining life utilizing a 7.5% discount rate.

EWEB may avoid approximately \$200,000 over the remaining life of the plant.

### **Societal Considerations**

Both the Leaburg and Waltherville Projects have been fixtures in the lower McKenzie valley for almost 100 years, and the communities around the Projects have grown and developed with the Projects in place. The public uses of the canals include recreation (walking and biking) and the withdrawal of water for irrigation. Neighborhoods have developed in areas below the canals, along the Leaburg Lake shoreline and along the Waltherville tailrace. Any change to Project operations will ultimately impact these other uses in the vicinity of the Project.

The local community will also likely have strong opinions on what should happen and will need to be an engaged partner in the development of a plan moving forward. When the financial and environmental aspects of this issue are better established, EWEB Communications staff will launch a public information and outreach process. Major components of the outreach will include education and community engagement that inspires customer confidence. The outreach plan will include a wide variety of tools such as direct outreach to the upriver customers via EWEB meeting and other community group meetings, published articles in EWEB's Pipeline publication and news outlets, on-line surveys, etc. Some tactics may be modified depending on the extent of COVID 19 precautions and guidance at any particular time.

### **Environmental Considerations**

Because development over the past 100 years has been made with the canals in place, there are no current streambeds between the canals and the river that would allow precipitation-derived water to pass freely to the river without impacting current development. As the water conveyance strategy is better developed, the environmental impacts of rerouting streams and creeks can be evaluated.

The Leaburg Project serves as an unofficial demarcation between the lower and upper portions of the McKenzie River. Hatchery chinook and steelhead are not supposed to exist above Leaburg Dam. The dam and associated fish ladders provide a point of separation. The Leaburg Project also serves as a source of gravity fed water for both ODFW fish hatcheries near Leaburg. Both hatcheries would need to procure alternate water supplies should the Project cease to exist.

The Waltherville Canal diversion and tailrace facilities are located on alluvial material that is subject to changes in the McKenzie River route. Over time the river may move away from either or both the diversion and tailrace facilities, rendering them ineffective and requiring a significant reinvestment in those facilities by EWEB.

Both Projects also impact water temperature in the lower McKenzie. The impacts, however, are most pronounced with respect to the operation of the Waltherville Canal. During the critical low flow periods in the summer and fall water diversions can increase stream temperatures in the bypassed reaches. Elevated temperatures are known to be detrimental to cold water species such as salmonids and other aquatic organisms. With Oregon summers expected to get hotter and dryer, these impacts are only expected to get worse over time.

A Board meeting has been rescheduled for September 22, at the McKenzie Fire Training Center whereas part of the Leaburg Canal Update, staff will take feedback and present a plan for strategies and tactics to engage the upriver community on these issues. Subsequent updates, either through correspondence or Board presentations, will be scheduled throughout the remainder of the year.

**Recommendation**

Staff have no recommendation at this time. These materials are for information only. Please contact Mike McCann or Patty Boyle with questions.

**Requested Board Action**

None.