Leaburg Canal Update

The Leaburg Hydroelectric Project has been a feature of the McKenzie Valley for over 90 years, providing the local community with clean power, recreational opportunities, and an irrigation source for many neighbors. Due to structural issues complicated by the canal's age and original building materials, EWEB closed the Leaburg Canal's intake in October of 2018, after observing internal erosion of the canal embankment. Since closing the canal intake at Leaburg Dam and dewatering the canal, the only water that flows through the canal comes from creeks that flow into the canal from the north side of the valley. The canal carries those tributaries back to the McKenzie River – a function the canal provides called "stormwater conveyance."

With the canal dewatered, EWEB initiated a comprehensive risk assessment of the entire canal to better understand the level of investment that would be required to ensure long-term safe and reliable operation. This assessment determined that the Net Present Value (NPV - the current value of all future cash flows generated by a project, including the initial capital investment) for the Leaburg Project would be substantially negative for the rest of its current Federal Energy Regulatory Commission (FERC) operating license, which expires in 2040.

As a result, EWEB's Board of Commissioners directed staff to pursue near-term risk reduction measures for safe stormwater conveyance while, in parallel, performing a Triple Bottom Line (TBL) analysis of long-term options. The TBL will evaluate the financial, social, and environmental impacts of several alternatives so the Board may select a path forward for the future of the project. Fundamentally, the decision is between returning to service for power generation (return-to-service/ relicense) or moving toward permanent decommissioning.

EWEB staff continues to work with the risk assessment team, led by Cornforth Consultants, to implement near-term risk reduction measures. These measures will include changes to the canal's configuration, such as isolating portions of the canal from high flow creeks. These near-term risk reduction measures can be reversed if EWEB Commissioners decide to pursue a return-to-service scenario but, in the meantime, will ensure safe operation until a long-term plan is implemented.

EWEB retained a consulting team, led by GEI Consultants, to assist with developing detailed analyses of the TBL considerations for various scenarios to provide the Board with information needed to make an informed decision on the long-term use of the canal. Four alternatives were selected for further in-depth analysis following a thorough evaluation by a team of over two dozen engineers, geologists, environmental professionals, compliance specialists, dam safety experts, and EWEB staff.

Of the four alternatives, two are on opposite ends of the "stormwater conveyance" vs. "return-to-service" spectrum. **Alternative 1** represents the full removal of all facilities to pre-project conditions – as if the Leaburg Project were never built. **Alternative 2** would entail a full return-to-service, with renovation of all facilities back to peak performance configuration. These bookended scenarios would be the most expensive due to the extensive construction and repairs required throughout the entire project and facilities. **Alternatives 3 and 4** each represent a "middle ground" return-to-service or decommissioning scenario.

The four alternatives for further assessment are:

Alternative 1: Decommission the entire Leaburg Project by returning the site to pre-construction conditions.

Alternative 2: Full return-to-service, restoring the facility to its pre-existing power generation configuration.

Alternative 3: Building a new hydro powerhouse near the Luffman Spillway (about a mile from the dam) and converting the rest of the canal downstream to a stormwater conveyance canal.

Alternative 4: Decommissioning the Project with a combination of stormwater conveyance and return to pre-project conditions, including a new spillway at Johnson Creek and modification to the Luffman spillway. This alternative converts short-term risk reduction measures into a long-term solution.

EWEB understands that many McKenzie Valley community members have interest in understanding the impacts of the current and future status of the canal, as well as the near-term and long-term strategies currently under evaluation. We invite feedback from the community on the information provided to date, and any information that will be provided in upcoming reports or meetings. EWEB staff will continue to communicate the latest information and status updates on our investigation and the Board's decision throughout the remainder of 2022. Additionally, as part of our decision-making process, we will continue to listen to the community to understand how the Board's direction will impact you and your neighbors.

If you are interested in following along, please visit our website: **eweb.org/leaburgcanal**. There, you can also sign up for a newsletter about the progress of the investigation.

Leaburg Canal Frequently Asked Questions

1. Is the canal safe?

Safety is our highest priority: There is not an imminent danger of a canal breach. EWEB staff carefully monitors the performance of the Leaburg Canal throughout the near-term risk mitigation process and the longer-term Triple Bottom Line Assessment. Because the canal is not carrying the large amounts of water that it conveys for power generation [2500 cubic feet per second (cfs)], the risk of a potential failure is greatly reduced. EWEB will monitor the canal in the wet weather season and during storm events when tributary creek flows rise. These creeks, including Johnson Creek, Cogswell Creek, Hansen Creek, and others, deposit their waters into the Leaburg Canal, and then the canal conveys those waters back to the McKenzie River. EWEB staff members are poised to identify and respond to any unexpected developments along the full length of the canal and will inform canal neighbors of any changes of concern.

2. What do the "Near-term Risk Reduction Efforts" include?

EWEB is evaluating the canal on a near-term, risk reduction basis to mitigate the risk of structural failure from landslides, earthquakes, floods, and erosion. These measures include:

- isolating portions of the canal from the high flow creeks, such as Johnson and Cogswell Creeks,
- removing hazard trees above the canal that may fall during a storm and obstruct the canal, causing water to pool up and potentially flood or cause an undue burden on the canal embankment
- installing pressure transducers that monitor water levels and trigger alarms if water levels extend beyond our currently desired levels
- deploying LIDAR and developing a drilling plan to better understand the canal's structure and critical subsurface conditions.

3. What is a "Triple Bottom Line Assessment?" and how does it direct the process to determine the "Long-term Evaluation of the canal?"

While implementing the near-term risk reduction efforts, EWEB is conducting a Triple Bottom Line Assessment to identify the financial, environmental, and social impacts of long-term repairs to the canal. This TBL assessment will help Commissioners decide the alternative future services of the canal. The principal decision is whether EWEB should invest in a **"Return-to-Service"** of the canal as a hydroelectric generation facility, or to decommission the project and reconfigure its **"Stormwater conveyance"** function.

4. What does "Return-to-Service" mean?

The Leaburg Project is currently out of service. In order to bring the Leaburg Project back online - to "Return-to-Service" – EWEB Commissioners must calculate if it is worth the investment to repair the canal's structural issues to the extent that it can reliably convey enough water (2500cfs) to generate. Along with the financial costs, there are environmental and social costs to consider, such as the impacts of large construction projects to the Leaburg community, closures to recreation facilities during maintenance, fisheries concerns with diverting water from the McKenzie River into the canal, the carbon footprint associated with the project work, etc.

5. How much electricity does the Leaburg Project generate?

The Leaburg Project has a rated capacity – its maximum ability to produce energy – of 15.9 Megawatts (MWs). But like most other energy generation resources, Leaburg rarely produces the maximum amount possible. Assuming normal water supply conditions, Leaburg can produce, on average, 92,000 MWhs

of electricity per year, which represents 3.8% of EWEB's total annual retail consumption – or enough electricity to power about 4,750 average single-family homes.

6. What does "Stormwater Conveyance" mean?

Since closing the canal intake, the only water in the canal comes from tributary creeks and from stormwater run-off. The canal carries these waters back to the McKenzie River, as it cut off these creeks from the McKenzie when built in the 1920s. This function is called **"Stormwater conveyance."** If EWEB Commissioners direct the utility to decommission the project, EWEB will have to figure out how to keep the tributaries on the north side of the valley connected to the watershed. They could do that by working with canal neighbors to reconnect these creeks to their historic pathways (repatriating the tributaries), or by repairing and maintaining the canal to be a permanent tributary of the McKenzie that conveys these tributaries to the river.

7. Well, has EWEB thought about…?

Most likely, yes. EWEB has been working for several years with multiple teams of construction, geotechnical, and civil engineers, dam safety specialists, hydrologists, fisheries biologists – you name it – to study the Leaburg Project for the safest, most prudent paths forward. These teams have considered multiple reconfigurations, construction interventions, and functions of the project, and have landed on these four alternatives after lengthy analyses considering the likely financial costs and social and environmental impacts of each alternative. To learn more about all of the alternatives we've studied so far, please consult the Alternatives Glossary below.

8. When will EWEB make its decision?

EWEB's elected Commissioners have directed EWEB staff to complete the Triple Bottom Line Assessment so that they can make an informed **decision on the future of the Leaburg Project by the end of 2022**.

9. How can I contribute to evaluating the social impacts of EWEB's decision?

EWEB Commissioners carry the great responsibility of making this important decision for the future of EWEB's power generation portfolio, and they recognize the impact their decision will have for EWEB, its customers, and particularly the Leaburg community. EWEB will continue to communicate with the community, keeping our ears open to understand the social impacts implied by each of these four alternatives.

- You can start by visiting **eweb.org/leaburgcanal** to sign up for our newsletter for updates about the decision
- On the website, we will post a survey (coming in June) to be able to identify what impacts our decision may create, and how we can work with the community to mitigate those impacts
- We will also send out letters to canal neighbors with the survey
- You can also contact **EWEB Communications Specialist Adam Spencer** with any questions or concerns: **email: adam.spencer@eweb.org, phone: 541-685-7539**

10. Will the Leaburg Canal trail, Leaburg Lake, and Lloyd Knox Park all stay open?

These facilities will continue to remain open and accessible to the public until further notice.

Leaburg Canal Alternatives Glossary

Four Alternative Scenarios Selected for Further Evaluation:

Alternative 1: Decommission by returning the site to pre-construction conditions (Bookend Scenario Selected for Further Evaluation):
This alternative was selected for further evaluation and consists of returning the site to "pre-construction conditions" to the extent necessary to meet FERC decommissioning and all other regulatory requirements. The Project features, including the dam, canal, and power generating facilities would be entirely removed, and the pre-construction drainage patterns intercepted by the canal would be re-established. The consultant team estimates that there are 8 to 11 drainage pathways that would be routed directly to the river, many of which would require crossing Highway 126. A new access bridge would be required to be constructed in place of Leaburg Dam to provide access to the south side of the river.

Alternative 2: Full facility restoration of existing power generation configuration (Bookend Scenario Selected for Further Evaluation):
This alternative was selected for further evaluation and consists of a "full facility renewal" to the extent necessary to meet FERC and all other regulatory requirements. The Project features, including the dam, canal intake, canal, and power generating facilities would be rehabilitated and remediated to meet required specifications. The rehabilitated canal embankment would include lining alternatives to reduce seepage and improve slope stability where necessary. Certain reaches, such as the Ames and Cogswell reaches, would be entirely removed and reconstructed to mitigate the identified seismic liquefaction and internal erosion issues. The canal would continue to function as a full-length power canal and the existing intake at the upstream end of the canal would be rehabilitated and maintained.

Alternative 3: New powerhouse near the Luffman Spillway and conversion to stormwater conveyance downstream of the proposed powerhouse ("Middle Ground" Alternative Selected for Further Evaluation):
This alterative was selected for further evaluation and consists of a new powerhouse constructed near the Luffman Spillway (Sta. 66+00), with rehabilitation of the upstream length of the canal to the new powerhouse. The canal downstream of the new Luffman Spillway powerhouse location would be remediated to allow for stormwater conveyance. Due to identified seismic stability and seepage issues, certain reaches like the Cogswell and Ames reaches would be modified to provide adequate stability for stormwater conveyance. Leaburg Dam would be maintained to continue controlling Leaburg Lake at current levels. The existing intake at the upstream end of the canal would be rehabilitated and maintained.

Alternative 4: Decommissioning with a combination of stormwater conveyance and return to pre-project conditions ("Middle Ground" Alternative Selected for Further Evaluation):
This alternative includes construction of a new spillway at Johnson Creek and modifications to the Luffman spillway. The canal downstream of Luffman spillway would be modified to allow for tributary isolation and stormwater conveyance. Due to identified seismic stability and seepage issues, the Cogswell and Ames reaches would be modified to provide adequate stability in those reaches for stormwater conveyance. Leaburg Dam would be removed, and the McKenzie River would be restored to a "pre-construction" configuration. A new access bridge would replace Leaburg Dam to provide access to the south side of the river. This alternative is a flexible option that converts short-term risk reduction measures that are under consideration into a long-term solution.

Alternative Scenarios NOT Selected for Further Evaluation:

New powerhouse at Luffman Spillway and canal returned to pre-construction conditions downstream of the proposed powerhouse: New powerhouse constructed near Luffman Spillway, with rehabilitation of the upstream length of the canal to the new powerhouse and full decommissioning of the canal length downstream of the new powerhouse. The portion of canal extending downstream of the newly constructed powerhouse would be entirely decommissioned, i.e. cut and filled to match the grade adjacent to the canal, to the extent possible, prior to construction, and the pre-construction drainage patterns intercepted by the canal would be re-established.

New powerhouse at Hansen Creek and (A) stormwater conveyance downstream of the proposed powerhouse OR (B) canal returned to pre-construction conditions downstream of the proposed powerhouse: New powerhouse constructed at Hansen Creek, with rehabilitation of the upstream length of the canal to the new powerhouse. The rehabilitated canal embankment upstream of the new powerhouse at would include lining alternatives to reduce seepage and improve slope stability.
The canal downstream of the new powerhouse would remain in service to allow for stormwater conveyance OR the portion of canal extending downstream of the newly constructed powerhouse would be entirely decommissioned, i.e. cut and filled to match the grade adjacent to the canal, to the extent possible, and the pre-construction drainage patterns intercepted by the canal would be re-established.

Close-coupled powerhouse at Leaburg Dam (A) with stormwater conveyance downstream of the proposed powerhouse OR, (B) with canal returned to pre-construction conditions downstream of proposed powerhouse: New close-coupled powerhouse constructed at Leaburg Dam, with rehabilitation of the immediate upstream length of the canal to the new powerhouse. The remaining portion of the canal downstream of the new powerhouse would be modified to allow for stormwater conveyance OR The portion of canal extending downstream of the newly constructed close-coupled powerhouse would be entirely decommissioned, i.e. cut and filled to match the grade adjacent to the canal, to the extent possible, prior to construction.

Canal converted into an environmental amenity: This alternative consists of the canal being converted into an environmental amenity through removing the existing powerhouse and penstocks and rehabilitating portions of embankment along the length of the canal. The existing powerhouse and penstocks located at the end of Leaburg Canal would be removed or decommissioned. The remaining existing canal would be maintained to continue to route runoff and convey a limited amount of flow from the McKenzie River (less than 100 cfs compared to up to 2,500 cfs for power generation). No lining alternatives would be constructed within the canal. Leaburg Dam would be maintained to continue controlling Leaburg Lake at current levels. This alternative would allow for continued water conveyance to the McKenzie fish hatchery and irrigators as well as other environmental uses of the canal, such as serving as a fish rearing habitat and possibly spawning habitat. This alternative would require a highly unlikely permanent transfer of the canal to a partnering State or Federal agency for ongoing operation and maintenance.

Alternatives Evaluation Criteria Summary

The primary considerations used to select the alternatives for further evaluation include upfront capital investment, operational & maintenance (O&M) costs, potential power generation revenues vs. investment and O&M costs, likelihood of economic and regulatory feasibility, preliminary TBL considerations, flexibility to incorporate near-term canal modifications into long-term solution(s) with minimal re-work, retention of hydroelectric generation water rights and the FERC operating license, and the bookended alternatives will help define the maximum base-line scenarios from cost, regulatory compliance, and complexity perspectives.