MEMORANDUM

EUGENE WATER & ELECTRIC BOARD

Rely on us.

TO:	Commissioners Helgeson, Brown, Mital, Simpson and Carlson
FROM:	Mel Damewood, Chief Engineering and Operations Officer Brad Taylor, Water Operations Manager Wally McCullough, Water Engineering Supervisor
DATE:	February 24, 2017
SUBJECT:	Water Utility 2nd Source Project - Update and Strategic Discussion
OBJECTIVE:	Confirmation of Project Direction

Issue
Preliminary design efforts are underway on the Water Utility's proposed New Water Filtration Plant. This memo provides an update on the work to date as well as the projects proposed capital and operations costs. In addition, a discussion is included on how the 2nd Source Project fits in with the strategic goals of the Water Utility.

Background
Staff have been working towards a redundant water source for years and in 2014 a point of diversion was solidified on the Upper Willamette River below the confluence of the Middle Fork and Coast Fork. Preliminary design began in May 2016 for the proposed new Water Filtration Plant with the goal of having the redundant Filtration Plant operational by the end of 2021.

A project update was provided to the Board at the October 4, 2016 Board Meeting (October Update). Other than a brief summary, this memo only discusses changes which have occurred since the October Update.

Discussion
Update on Preliminary Design Work
The proposed level of service goals and treatment process for the proposed Filtration Plant have not changed since the October Update. These are summarized below:

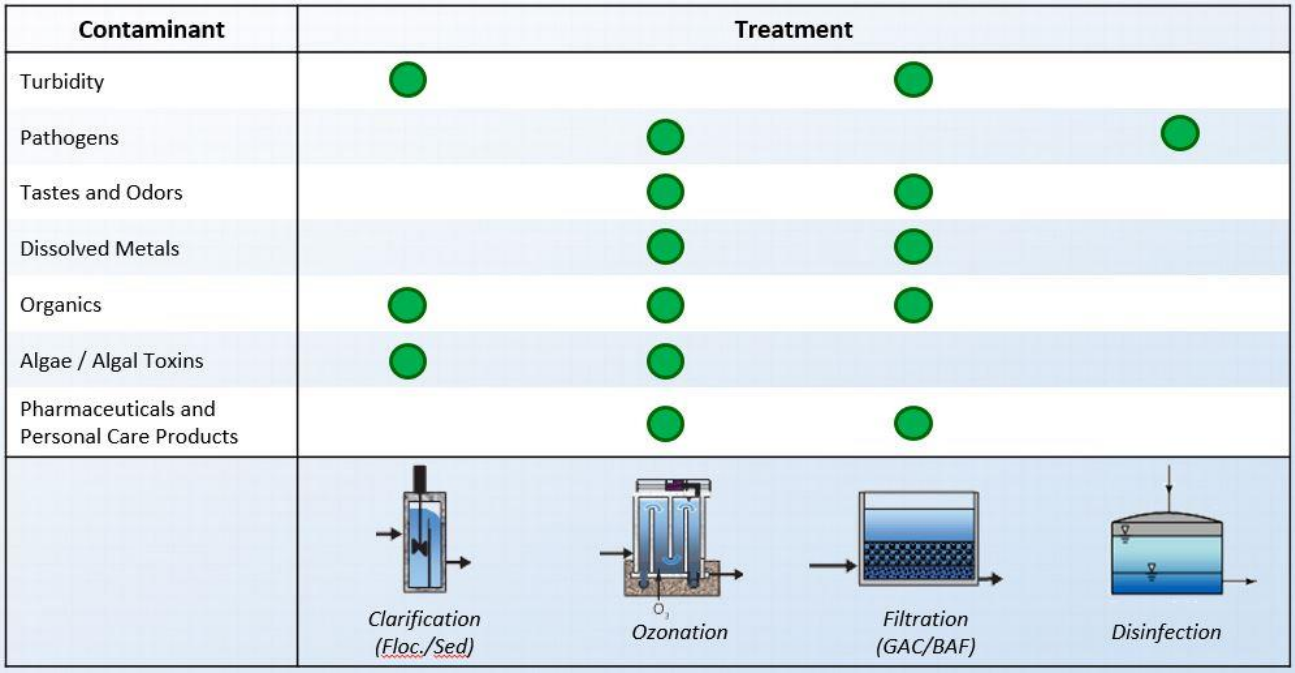
- Primary Level of Service Goals:
  - Routine plant operation must achieve water quality better than or equal to Hayden Bridge.
  - Under emergency operation plant must meet regulatory requirements at all times. A plant with higher capacity meeting minimum water quality goals (still above regulatory requirements) would be acceptable under emergency conditions.

- Filtration Plant capacity following a seismic event should be 100% of minimum winter demand within 24 hours after event.

- Treatment Process:

  The minimum recommended treatment process is shown in Figure 1 and includes four steps; clarification, ozonation, filtration, and disinfection. Each are discussed in the October Update. Combined, these four steps provide multiple barriers for all current and future anticipated contaminants of concern.

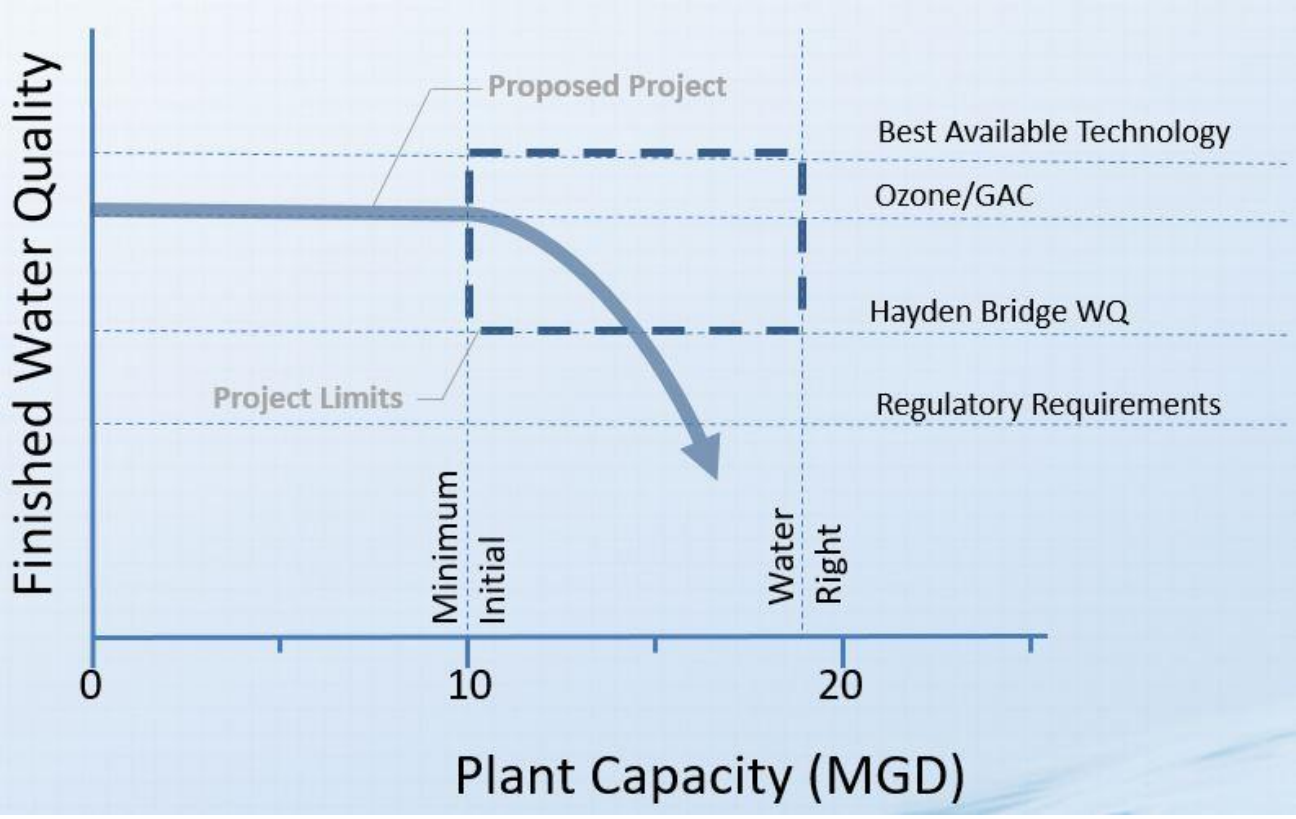
Figure 1. Recommended Treatment Process



Much of the work which has occurred since the October Update has been the development of the Filtration Plant and its specific components in order to meet the level of service goals using the treatment process shown above. The number of process trains and loading rates have been defined for each process and flexibility has been built in, both with respect to water quality and capacity. The proposed Filtration Plant is being configured to be easily expanded to provide additional capacity and to treat for potential future raw water quality contaminants as needed.

The capacity-quality curve for the proposed Filtration Plant is shown in Figure 2.

Figure 2. Capacity Quality Curve



As shown the new Filtration Plant will be able to provide very high quality water at low flows and in emergencies will be able to provide up to approximately 16 Million Gallons Per Day (MGD) of water meeting all regulatory requirements. Sixteen MGD is the current minimum winter demand i.e. that which is sufficient to sustain the requirements for drinking water and basic industry without public curtailment.

Updated Cost Estimate
Concurrent with the development of the Filtration Plant, the cost estimate has been updated. The current project estimate is approximately $76 Million. This is $5 Million more than what was presented in the October Update. The increase is primarily due to higher estimated earthwork costs.

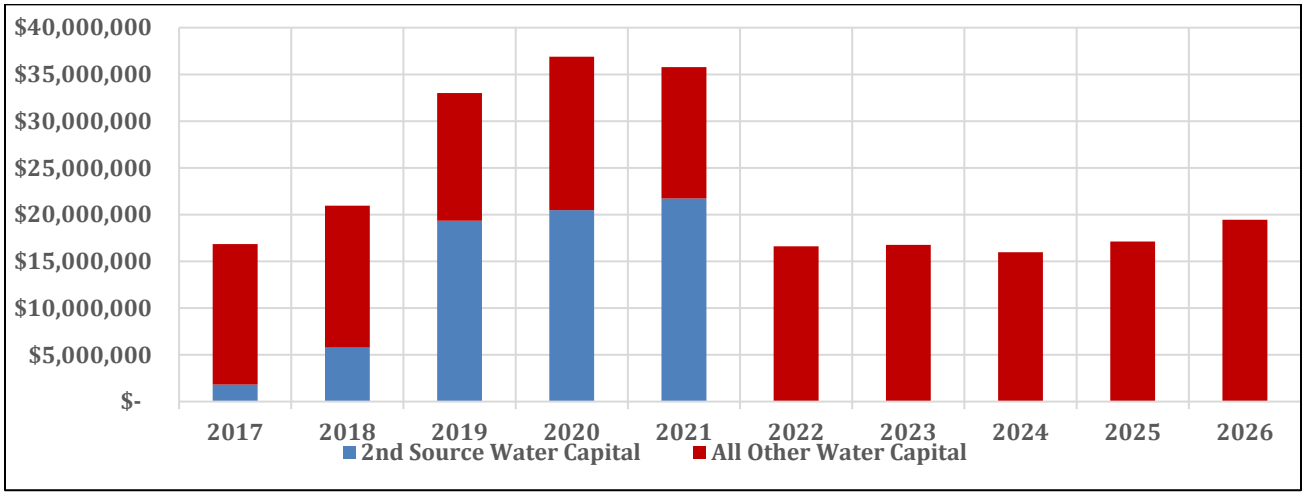
It is important to note however, that the project is still being developed, particularly the Raw Water Intake and Finished Water Transmission System. The project team is compiling a list of potential deduct items that can be removed or changed which will be evaluated as the estimates mature.

This estimate compares to approximately $68 Million currently in the Water Capital Improvement Plan (CIP) for the work. The amount in the CIP originated from the extrapolation of a 2009 estimate for a water filtration plant to be located at the Headquarters Site. At that time, the CIP included $120 Million for the 2nd Source Project.

Project Costs in Relation to Other Water Utility Expenditures

The projected 2nd Source capital expenditures and all other water utility capital expenditures for the next ten years is shown in Figure 3.

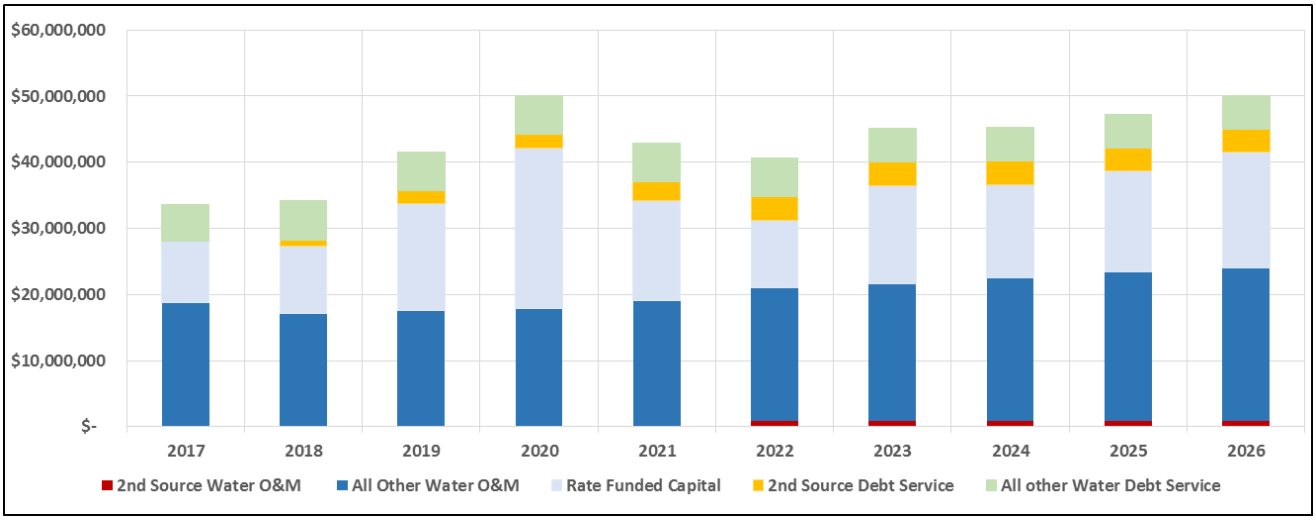
Figure 3. Capital Expenditures.



As shown 2nd Source capital expenditures peak in 2019 to 2021 which is the anticipated construction period for the new Filtration Plant, Intake, and related facilities.

A comparison of 2nd Source Operations & Maintenance (O&M) expenditures to all other water utility O&M expenditures for the next ten years is shown in Figure 4. Also shown is rate funded capital and a comparison between debt service for 2nd Source and all other debt service.

Figure 4. Water O&M and O&M 2nd Source Impacts, Rate Funded Capital, and Debt Service.



It is difficult to see in Figure 4 but anticipated 2nd Source O&M expenditures begin in 2019 with the

hiring of an additional water treatment plant operator. 2nd Source O&M expenditures become 'visible' in 2022 when the new Filtration Plant becomes operational.

Debt service for the project begins in 2018 which is the anticipated bond issuance date for the project.

The information shown in Figures 3 and 4 is based on the current long term financial plan.

Project Strategic View

The 2nd Source Project Relationship to Other Resiliency Efforts

EWEB's sole reliance on the McKenzie River and its Hayden Bridge Filtration Plant for water supply has been considered it biggest risk for some time. As such, efforts have been made for the last several decades to secure a 2nd source of supply.

This risk was affirmed in 2015 when EWEB completed an update of its Water Master Plan. A key element of this effort was completion of a Resiliency Plan which helped identify improvements to the water system critical to bringing it back in service after various possible events including the Cascadia Subduction Zone Earthquake. With these improvements, EWEB is basically creating a "resilient spine" in our system that we can get back in service quickly following some event.

At the top of the list was development of a 2nd Source of Supply. Following this priority project was the:

1) Strengthening of our primary pipeline transmission system in our Base Level (our lowest pressure zone with approximately 80% of our customers) including the transmission system from the 2nd Source,
2) Rehabilitating and/or replacing our large Base Level Reservoirs, and
3) Strengthening of our Pumping Level one Reservoirs and Pump Stations.

Improvements were laid out for the next ten years in our Capital Improvement Plan and work has begun in numerous areas. Our highest priority project, the 2nd Source of Supply, is currently in Preliminary Design. Other projects, particularly our reservoir upgrades need to be staggered as EWEB does not have the capacity to take more than one reservoir out of service at a time. EWEB's Capital Improvement Plan includes reservoir upgrades and/or replacements occurring for the next ten years with the first project beginning in 2017.

Other projects need more study to identify exactly the extent of improvements required. This is true for our transmission pipeline upgrades. Evaluations will be occurring in 2017 to better define this work and funds are in the ten year CIP for improvements.

Water Rights

In addition to being a key component of EWEB's resiliency strategy, the 2nd Source Project is extremely important with respect to Water Rights.

EWEB holds three municipal water right permits on the McKenzie River which EWEB currently relies on exclusively on for water supply. The water right permits authorize the use of up to approximately 300 cubic feet per second (cfs), approximately 194 MGD. All three of the water rights have a point of diversion located at EWEB's Raw Water Intakes located near the intersection

of Marcola and Hayden Bridge Roads in Springfield. The water right permits and their priority dates are summarized in Table 1 below.

Table 1. EWEB McKenzie River Water Rights

Permit No.	Priority Date	Quantity (cfs/MGD)	Status
8602	05/16/1925	27.08/17.5	Certificate No. 15180
17358	10/15/1976	90.0/58.2	Certificate No. 68537
27441	06/14/1961	183.0/118.3	Extension Application File #S-35037

EWEB's Certificates 15180 and 68537 are highly reliable based on priority dates.

EWEB submitted an extension application for permit S-27441 to the Oregon Water Resources Department (OWRD) requesting more time to develop it. On January 2, 2015, OWRD issued a final order for this permit. The deadline for applying water to full beneficial use within the terms and conditions of the permit is October 1, 2083. The Oregon Department of Fish and Wildlife (ODFW) identified flows necessary to "maintain the persistence" of listed fish and conditioned the permit to require a reduction in water use from the river if flows drops below 2,000 cubic feet per second (cfs) at Hayden Bridge. This condition only applies to water used above the 117.08 cfs (75.7 mgd) that is held under the two other McKenzie river certificates.

EWEB's holds a pre-1909 Surface Water Registration Claim on the Willamette River. The water claim was first used from March 26, 1887 through 1927. Prior to 1909, Oregon law recognized the right to obtain vested water rights in accordance with local custom. On February 24, 1909, the Water Rights Act, a comprehensive water code, was passed which established pre-existing rights to use water through a process known as adjudication. Adjudication for the Willamette River (with the exception of a few tributaries) has not been completed. In 1987, the Oregon legislature enacted a registration process for recording claims of water in unadjudicated areas. EWEB registered its Willamette River claim (Surface Water Registration 354) for 30.9 cfs (approximately 20 MGD) under this mandate.

The OWRD received hundreds of claims for water rights in unadjudicated areas, one of which was Portland General Electric (PGE) for a claim, with a priority date of June 3, 1889, of 11,754 cfs from the Willamette River at Willamette Falls. Flow data for the Willamette River shows that during low flow periods in the summer, the entire river flow is often less than PGE's claim. In 1993, House Bill 2110 was passed by the state legislature to protect municipalities that could be impacted by PGE's claim.

To increase the level of certainty for its authorization to use Willamette River water, on December 27, 2010, EWEB applied for a surface water permit (Application S-87675) that reflected the authorization provided by EWEB's existing Surface Water Registration. On February 28, 2013, OWRD issued Permit S-54805, which authorizes the use of up to 30.9 cfs (approximately 20 MGD) from the Willamette River for municipal use. Permit S-54805 maintains EWEB's previous total combined maximum authorized rate under all of its water rights at 300.08 cfs and stipulates that use

is only allowed when flows of 2,500 cfs in November through May and 2,000 cfs from June through October are met below the confluence of the Coast Fork and Middle Fork of the Willamette River.

In March 2014, EWEB submitted a request to modify the permit to add an upstream point of diversion to SW-354. The modification was granted provided EWEB dedicate a 1.5 cfs portion of SW-354 instream right. Based on this transaction, the municipal use portion of SW-354 has been reduced to approximately 29.4 cfs (approximately 19 MGD). EWEB has begun the process to redevelop this source of supply.

Recommendation
None. This is an information item only.

Requested Board Action
Input is sought from the Board on the items presented herein. This is an update on a long-term strategic project. Board feedback to help ensure we are moving in the right direction is requested. Staff will be available to answer questions at the March 7, 2017 Board meeting.

If you have any questions please contact Wally McCullough, Water Engineering Supervisor at 541-685-7435 or email wally.mccullough@eweb.org.