MEMORANDUM

EUGENE WATER & ELECTRIC BOARD

Rely on us.

TO:	Commissioners Brown, Carlson, Mital, Helgeson and Schlossberg
FROM:	Mel Damewood, Chief Water Engineering and Operations Officer
DATE:	December 28, 2018
SUBJECT:	Second Source (Willamette Water Treatment Plant) Level of Service Goals
OBJECTIVE:	Provide General Direction

Issue

The Water Long Term Financial Plan (LTFP) has construction starting on the Second Source – Willamette Water Treatment Plant (Plant) in 2023. For construction to start by this date, decisions will need to be made soon on the level of service goals and subsequent costs for the Plant so that adequate time is allowed for permitting, design, and financial planning to occur.

Background

EWEB has made numerous attempts to build a second water treatment plant over the last several decades. These have included attempts on both the McKenzie River and the Willamette River. Earlier efforts had a goal of additional capacity while later efforts were focused on enhanced resiliency. Three different properties have been purchased during these efforts and numerous engineering studies completed.

The most recent effort to develop a Second Source began in 2014 and the following activities occurred for that effort:

1. Water rights and a point of diversion were obtained for the Willamette River at a point just below the confluence of the Coast Fork and Middle Fork.
2. Property was obtained for both a river intake and a water treatment plant. This property is located in South Glenwood off Franklin Blvd.
3. Preliminary design was completed for the new river intake and treatment plant. The treatment plant was to be a robust normally operating plant with a capacity of approximately 15 million gallons per day (MGD).

Numerous updates have been provided to the Board on this project and reference is made to the materials provided at the October 4, 2016; March 7, 2017; and August 1, 2017 Board meetings.

As the different efforts progressed, the funds allocated to the Second Source project in the Water Capital Improvement Plan (CIP) varied. Over the last ten years the amount allocated to the Second Source project has varied from $120M in 2009-2011 to $0 last year. Currently there is approximately $40M in the CIP and the LTFP as a placeholder for the Second Source Project.

In 2017, a decision was made to put the Second Source project on hold and focus efforts on

development of Emergency Water Distribution Sites where water could be delivered to customers if EWEB loses its source of supply and/or distribution system. Work is currently occurring developing these sites. To date one site is operational at Kalupaya High/Prairie Mountain Middle School and a second site is nearing completion at Howard Elementary School. The current goal is to accelerate the number and locations of the Emergency Water Distribution Sites over the next few years to exceed the original goal of 5 sites in 5 years.

In 2018, a decision was made to bring the Second Source project back into the CIP and LTFP. Currently the LTFP has construction of the project occurring in 2023-2025.

Discussion

The recent Second Source effort resulted in the preliminary design for a robust, normally operating, water treatment plant (Normal Plant) with an estimated cost of $71M. As the preliminary design was wrapping up, concerns arose over the cost and the integrity of the distribution system following a seismic event. Responding to these concerns, an emergency only, scaled back treatment plant (Emergency Plant) was discussed as an alternative in the August 1, 2017 Board Update. This alternative had an estimated cost of $42M. As the project was being deferred, a decision was not made as to which alternative should be pursued. Note also that the estimates provided were in 2017 dollars. As the project is deferred these estimates will increase due to inflation.

Staff believes that it will be difficult to design and construct a river intake, an Emergency Plant, and the necessary transmission improvements for much less than the $42M (2017 dollars) presented in the August 2017 Board Update. As such this can be considered the lower 'bookend' for the project. At the other end is the Normal Plant developed as part of the preliminary design completed in 2017. This can be considered the higher 'bookend' for the project.

The final constructed project could be either of these scenarios or something in the middle. To facilitate a decision on how to proceed, the level of service goals and the respective funding mechanisms associated with each scenario are discussed below along with the operational impacts and the concept of a joint project with the Springfield Utility Board.

<u>Level of Service Goals</u>

Plant Capacity.

The plant capacity in both scenarios was based on the minimum demands projected. The Emergency Plant capacity was set at approximately 10 MGD which is enough to provide for residential use only with no landscaping or industrial/commercial use. During a regional event such as a large earthquake when everything is shut down, this would likely be enough to keep the distribution system or portions of it pressurized.

The Normal Plant capacity was set at 15 MGD which would be enough under current conditions to keep water flowing to industrial and commercial users assuming complete curtailment of landscape use. If a local event shut down the Hayden Bridge source, and everything else was normal, this would help keep business and industry going.

Resilience/Recovery Time.

The EWEB water system has approximately 1 to 2 days demand's worth of water in reservoirs when the Hayden Bridge source is lost i.e. no home water delivery or sanitation after a couple days.

Given this fact, the recovery time criteria for the Normal Plant was set at 24 hours. This would ensure near normal water use (without landscaping) following loss of our existing source and if the distribution system is intact.

The recovery criteria for the Emergency Plant was based on the 2013 Oregon Resiliency Plan which set recovery targets following a subduction zone earthquake. Targets were set for water and other services based on the location. For the Willamette Valley, the recovery target, for water supply capacity is 50 to 60% within 3 days and 80 to 90% within two weeks.

With the Emergency Plant, if the Hayden Bridge Source is lost, residents may have to rely on the emergency water distribution sites for up to two weeks or longer depending on the duration of the source disruption.

Water quality.
With the Emergency Plant only delivering water into the distribution system during a loss of the Hayden Bridge Source, as such its water quality criteria was set to the minimum to meet regulatory requirements and there is no treatment for taste and odor.

The Normal Plant would operate daily, delivering water into the distribution system. As such, the water quality criteria was set to exceed that achieved from the Hayden Bridge Plant up to 10 MGD. Above that capacity the water quality would be allowed to drop to minimum regulatory requirements.

Confidence.
There would be higher confidence that the Normal Plant would meet its start-up and capacity goals than the Emergency Plant. This is primarily due to the following with respect to the Normal Plant:

- It would be operated on a daily basis. Starting a treatment plant after it sits idle for extended periods is challenging and requires a significant effort. In addition, treatment plants have many pieces of equipment which in general is more reliable if operated regularly.
- It has redundancy in process and equipment. When failures do occur, there is a backup. Many of these were removed in the Emergency Plant to reduce costs.
- It has the appropriate treatment process to handle most river quality situations with ease. To reduce cost, the Emergency plant has minimal capacity to accommodate difficult raw water conditions.

A comparison of the level of service goals for each scenario is presented in Table 1 below. As mentioned previously, the values shown are bookends and do not require an either/or decision.

Table 1. Level of Service: Emergency Only – Normal Operating Plant Comparison

Parameter	Emergency Only Plant	Robust Normal Operating Plant
Operation:		
Normal	None	Daily
During Emergency - Loss of Hayden Bridge Source	Continuous	
Level of Service:		
Capacity/Water Quality		
Quality Equal or Better than Hayden Bridge	No	Up to 10 MGD
Quality Meeting regulatory limits	To 10 MGD	To 15 MGD
Ability to Treat during Fuel Spill	With Difficulty	Yes
Ability to Treat Following Fire in Watershed	With Difficulty	Yes
Ability to Treat for Algae Toxins	With Difficulty	Yes
Ability to Meet Anticipated Future Regulations	With Difficulty	Yes
Resiliency/Recovery Time	2 Weeks to 85% Capacity - 8.5 MGD (Meets Oregon Resilicency Plan)	24 Hours to 100% Capacity - 15 MGD
Confidence that LOS goals for capacity and recovery time will be achieved	Medium	High

Funding/Rate Actions

With respect to funding, two alternative scenarios were developed for the long term financial plan. One for the Emergency Plant and One for the Normal Plant.

Both of alternative scenarios are shown below following a summary of the current LTFP. The yellow shaded cells in Scenarios 1 and 2 show what changes are anticipated if a decision were made to proceed with these scenarios. The costs presented reflect an assumed annual inflation rate of 3% between 2017 and the anticipated time of construction.

As indicated, the bond amount increases by about $10 million for the Emergency Only Plant and $40 million for the Normally Operating Robust Plant. Anticipated changes in revenue requirements, debt service coverage and day's cash are also shown.

Table 2. Current LTFP:

$40M Shown for Second Plant

Key Metrics	Current Target	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Reserves & Cash	$12,680	$27,400	$27,400	$24,700	$25,200	$26,200	$30,000	$32,600	$27,800	$23,600	$19,100
AWS Reserve Balance		$5,600	$5,200	$4,900	$4,500	$0	$0	$0	$0	$0	$0
AMI Reserve		$0	$0	$300	$800	$1,400	$2,000	$2,600	$3,100	$3,700	$4,300
Total Cash Reserves	$12,680	$33,000	$32,600	$29,900	$30,500	$27,600	$32,000	$35,200	$30,900	$27,300	$23,400
Second Plant Capital Outlay						$10M	$15M	$15M			
Bond Funding						$50M					
DSC	2.00-2.50	3.77	3.83	3.90	3.73	2.94	2.54	2.60	2.69	2.77	2.80
Days Cash	> 150 days	610	609	559	515	463	497	529	449	382	310
Average impact resulting from change in revenue requirement		0.00%	0.00%	0.00%	3.00%	3.00%	3.00%	3.00%	4.00%	4.00%	4.00%

Table 3. Scenario 1: Emergency Only Plant

$51.8M Second Plant ($42M inflated at a rate of 3% per year)

Key Metrics	Current Target	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Reserves & Cash	$12,680	$27,400	$27,400	$24,700	$25,200	$32,000	$32,400	$31,600	$27,000	$23,000	$18,700
AWS Reserve Balance		$5,600	$5,200	$4,900	$4,500	$0	$0	$0	$0	$0	$0
AMI Reserve		$0	$0	$300	$800	$1,400	$2,000	$2,600	$3,100	$3,700	$4,300
Total Cash Reserves	$12,680	$33,000	$32,600	$29,900	$30,500	$33,400	$34,400	$34,200	$30,100	$26,700	$23,000
Second Plant Capital Outlay						$14.3M	$18.5M	$19.0M			
Bond Funding						$60M					
DSC	2.00-2.50	3.77	3.83	3.90	3.73	2.86	2.44	2.55	2.57	2.65	2.68
Days Cash	> 150 days	610	609	559	515	558	535	515	438	373	305
Average impact resulting from change in revenue requirement		0.00%	0.00%	0.00%	3.00%	3.00%	4.00%	4.00%	4.00%	4.00%	4.00%

Table 4. Scenario 2: Normally Operating Robust Plant

$87.7M Second Filtration Plant ($71M inflated at a rate of 3% per year)

Key Metrics	Current Target	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Reserves & Cash	$12,680	$27,400	$28,300	$27,800	$30,600	$41,800	$38,600	$33,300	$28,500	$24,300	$20,000
AWS Reserve Balance		$5,600	$5,200	$4,900	$4,500	$0	$0	$0	$0	$0	$0
AMI Reserve		$0	$0	$300	$800	$1,400	$2,000	$2,600	$3,100	$3,700	$4,300
Total Cash Reserves	$12,680	$33,000	$33,500	$33,000	$35,900	$43,200	$40,600	$35,900	$31,600	$28,000	$24,300
Second Plant Capital Outlay						$21.5M	$32.6M	$33.6M			
Bond Funding						$90M					
DSC	2.00-2.50	3.77	4.03	4.32	4.19	2.82	2.21	2.26	2.24	2.31	2.34
Days Cash	> 150 days	610	627	617	605	721	630	540	459	391	321
Average impact resulting from change in revenue requirement		0.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	4.00%	4.00%	4.00%

Operational Impacts

Additional Operations and Maintenance (O&M) effort will be required for both scenarios. This effort will consist of both additional staffing and other non-labor components. At this time it is assumed that the O&M effort/cost will be equivalent for both scenarios during non-emergency conditions. The Normal Plant will have more continuous operating costs with some offset by reductions in capacity at Hayden Bridge. The Emergency Plant will have higher periodic O&M costs due to the greater level of effort to start up and shut down a normally idle plant for testing. There will also be costs associated with water disposal during periodic testing that still needs to be determined.

Joint Project with the Springfield Utility Board

The information presented above assumes that the Second Source Project is an EWEB only effort. It is acknowledged that a joint effort with the Spring Utility Board (SUB) to build a new Water Treatment to serve both utilities would be advantageous and potential result in lower costs for each. Discussions with SUB have not yet matured enough however to indicate that this is a viable alternative.

If a joint water treatment plant does become viable, decisions will still need to be made on the level of service goals mentioned herein.

Recommendation

None

Requested Board Action

Input is sought from the Board on the items presented herein and the direction for the Second Source Project.

Staff and consultants will summarize this topic and be available for discussion and to answer questions at the February 5, 2019 Board Meeting.

If you have any questions please contact Mel Damewood, Chief Water Engineering and Operations Officer at 541-685-7145 or email mel.damewood@eweb.org.