



STAFF REPORT

To: Joint Water Commission
From: Negar Niakan, Engineering Manager
Date: July 14, 2023
Subject: Agenda Item 4.2 –Consider approval of Resolution 139-J, adopting the Joint Water Commission Water Master Plan, including the Capital Improvement Plan

Staff Recommendation:

Approve Resolution 139-J, adopting the Joint Water Commission (JWC) Water Master Plan (WMP), including the Capital Improvement Plan.

Background:

Draft Review Process:

The JWC Master Plan Draft including the Capital Improvement Plan (CIP), was presented to the JWC commissioners at their regular meeting on April 14, 2023. A draft was submitted to Oregon Health Authority (OHA) for review. OHA issued a concurrence letter on April 16, 2023 (see Attachment 1). JWC staff received 47 questions and comments from the JWC Commission. The comments were shared with Carollo Engineers, and they prepared draft responses. The draft responses were reviewed by the JWC General Manager, JWC staff, and JWC partner staff. Revisions have been submitted back to Carollo for incorporation into the JWC Master Plan, and the comments will be shared with the Commission.

Project Overall Schedule:

Table 1 - Project Schedule

Task	Completion Date
Contract Execution, Kick-off Meeting	Feb-2021
Existing System Condition	Jun-2021

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Planning Considerations	Sep-2021
Water Quality	Nov-2021
Demand Projections	Dec-2021
Transmission System Evaluation	Mar-2022
WTP and Intake Evaluation	Mar-2022
Electrical Evaluation	Jun-2022
CIP Development	Aug-2022
Draft Master Plan	Aug-2022
WTP Siting Study	Mar-2023
OHA Draft Review	Mar-2023
JWC Master Plan Adoption	Jul-2023

JWC Master Plan Level of Service Goals and CIP:

In 2008, a seismic evaluation study of the Joint Water Commission (JWC) Water Treatment Plant (WTP) was performed. The purpose of the evaluation was to assess the reliability of the WTP and associated facilities following potential seismic events and to develop recommended improvements to mitigate identified vulnerabilities. The raw water intake facility, raw water pipelines, and the WTP were all analyzed as part of this effort. Table 2 shows the assumed existing WTP capacity, including the timeline to reach the listed capacities, following the various seismic events.

Table 2 - JWC WTP Capacity following Seismic Events – Existing Condition			
	72-year event (Local)	475-year event (CSZ)	2,475-year event (MCE)
WTP Capacity	0 MGD for 7 days	0 MGD for 3 weeks	0 MGD for 3 weeks
	20 MGD for 7 weeks	5 MGD for 6 months	5 MGD for 6 months
	40 MGD for 18 weeks	40 MGD after 6 months	40 MGD after 6 months

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Notes:

- 72-year is based on a local fault event (50% chance in 50 years)
- 475-year event is based on a Cascadia Subduction Zone (CSZ) earthquake (10% chance in 50 years)
- 2,475-year (2% chance in 50 years) - Maximum Considered Event (MCE)
- Liquefaction-induced settlement and lateral spreading are expected to be the same for the 475-year and 2,475-year events.

Level of Service (LOS) goals for the JWC regarding the three above mentioned seismic events were established in terms of treatment capacity, outage or reduced capacity duration, and water quality. The below LOS goals in Table 3 were presented and approved by JWC in January 2008.

Table 3 - Existing JWC Level of Service Goals

Seismic Event	Immediate Capacity (MGD)	Short-Term Capacity (MGD)	Short-Term Restoration Time (Days)	Water Quality
72-year event	42 (ADD)	42 (ADD)	0	Potable
M9.0 CSZ event	0	28 (WADD)	1	Potable
2,475-year event	0	14 (1/2 WADD) 28 (WADD) 42 (ADD)	3 7 to 14 60 to 90	Potable

Notes:

- ADD – Average Daily Demand
- WADD – Winter Average Daily Demand
- As part of current master plan effort, the assumed capacities for immediate and short-term operations will be updated.

JWC existing conditions and proposed level of service goals in Table 4 were reviewed by JWC commissioners during the meeting on January 12, 2022.

Table 4 – Proposed JWC Level of Service Goals

Seismic Event	Consequences (Existing System Condition)	Proposed Immediate Capacity Goal (MGD)	Proposed Short Term Capacity Goal (MGD)	Short Term Restoration Time Goal (Days)
72-year Event	0 MGD for 7 days 20 MGD for 7 weeks 40 MGD for 18 weeks	42 (ADD)	42 (ADD)	0
475-year Event	0 MGD for 3 weeks 5 MGD for 6 months 40 MGD after 6 months	0	28 (WADD)	1
2,475-year Event	0 MGD for 3 weeks 5 MGD for 6 months 40 MGD after 6 months	0	14 (1/2 WADD) 28 (WADD) 42 (ADD)	3 7 to 14 60 to 90

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Notes:

- *ADD – Average Daily Demand*
- *WADD – Winter Average Daily Demand*
- *The LOS goals were reviewed during JWC CIP Update (2015) and Facility Plan Study (2018)*

Master Plan Capital Improvement Program (CIP) was developed by considering the level of service goals and combining the recommended projects and studies from previous chapters of this WMP, as well as previous studies and tasks that were conducted for JWC in the last 10-15 years. The CIP consists of costs estimates and prioritization for each recommended improvement project. The CIP serves as a guideline for the future planning, budgeting, and financial evaluation.

This WMP encompasses a 20-year planning horizon and includes a 20-year CIP through fiscal year (FY) 2042-43. Oregon Health Authority requires water utilities to address seismic deficiencies within their systems. Therefore, this Plan also includes a 40-year seismic resilience CIP, which contains projects beyond the 20-year planning horizon in Phase 4: FY2043-44 through FY 2062-63.

JWC recognizes that seismic repairs are very expensive and several of the JWC Partners may not be able to afford all the improvements in the near term. Therefore, seismic improvements projects were prioritized based on a risk evaluation over the next 40 years. To address the affordability concerns related to the seismic upgrades, this master plan developed a 40-year resilience CIP, aligning with the level of service goals expected within that.

CIP Development:

- **Capital Project Categories:**

JWC classifies capital projects into the following categories:

- Land
- Treatment Facilities
- Transmission Lines
- Supervisory Control and Data Acquisition (SCADA)

Recommended improvement projects from this Plan were classified based on the JWC's project categories.

- **Project Drivers:**

The project drivers, and benefits, for each project were also identified to further define the recommended improvement programs. The projects were assigned one or more of the following project drivers:

- Age/Condition
- Operation & Maintenance (O&M)
- Capacity
- Water quality
- Resilience
- Safety

- **Cost Estimating:**

Recommended CIP projects identified in previous studies and plans included cost estimates. These costs estimates have been escalated from the original cost estimate year to 2022 dollars using the July 2022 Engineering News-Record’s U.S. 20-City Construction Cost Index.

Cost estimates were developed for recommended projects identified in this WMP. These cost estimates are planning level costs approximately equivalent to Association for Advancement of Cost Engineering Class 5 estimates.

- **Project Prioritization and Phasing:**

Recommended CIP projects were reviewed and prioritized according to risk scores and categorizes into CIP phases.

A methodology to prioritize the recommended CIP projects was developed by considering the consequence of failure and likelihood of failure of the infrastructure or asset involved.

Consequence of failure, or criticality, describes what effect a failure of the infrastructure or asset would have on the JWC system. Criticality considers the ability and cost to mitigate, the cost of repairs, effect of the failure on water system functionality, the effect of the failure on the built environment, and the effect of the failure on the natural environment.

Likelihood of failure, or vulnerability, describes how likely an asset is to fail. Vulnerability considers the age of the asset or its remaining useful life, maintenance records, estimated condition, and the estimated seismic damage.

The project criticality and vulnerability scores were multiplied together to calculate a “risk score.”

Additionally, to address the affordability concerns related to the seismic upgrades, this master plan developed a 40-year resilience CIP, aligning with the LOS goals expected within that timeframe.

The risk score was then used to help prioritize the recommended CIP projects, with consideration of financial affordability for all JWC partners.

After each recommended CIP project was assigned a risk score, the projects were prioritized by JWC staff in a workshop setting. Then the projects were assigned to CIP implementation phases according to their priority. Within the planning horizon for the 20-year CIP, project timing was subdivided into the following phases:

- Phase 1: FY 2023-24 through FY 2027-28
- Phase 2: FY 2028-29 through FY 2032-33
- Phase 3: FY 2033-34 through FY 2042-43

Resilience projects are implemented beyond the 20-year planning horizon were assigned to Phase 4: FY2043-44 through FY 2062-63.

- **CIP Summary:**

Table 5 identifies the Master Plan CIP Summary by project category, and Table 6 shows JWC partners annual cost per each phase:

Table 5 - CIP Summary

Capital Improvement Plan Summary by Project Category					
Project Category	Total CIP Cost Estimate	CIP Phasing			
		Phase 1	Phase 2	Phase 3	Phase 4
		(FY2024-2028)	(FY2029-2033)	(FY2034-2043)	(FY2044-2063)
Total Cost	\$ 275,419,000	\$ 23,490,000	\$ 18,141,000	\$ 92,805,000	\$ 140,983,000
Land	\$ 1,000,000	\$ 1,000,000	\$ -	\$ -	\$ -
Treatment Facilities	\$ 201,697,000	\$ 15,019,000	\$ 3,190,000	\$ 72,505,000	\$ 110,983,000
Transmission Lines	\$ 67,770,000	\$ 4,376,000	\$ 13,094,000	\$ 20,300,000	\$ 30,000,000
SCADA	\$ 4,952,000	\$ 3,095,000	\$ 1,857,000	\$ -	\$ -
Annual Cost	\$ -	\$ 4,698,000	\$ 3,628,000	\$ 9,281,000	\$ 7,049,000

Table 6 - CIP Summary by Partners

Annual Capital Improvement Program Summary by Partner				
Partner	Annual Cost by CIP Phasing			
	Phase 1	Phase 2	Phase 3	Phase 4
	(FY2024-2028)	(FY2029-2033)	(FY2034-2043)	(FY2044-2063)
Annual Cost	\$ 4,698,000	\$ 3,628,000	\$ 9,281,000	\$ 7,049,000
Hillsboro	\$ 2,223,000	\$ 1,782,000	\$ 4,558,000	\$ 3,463,000
Forest Grove	\$ 553,000	\$ 427,000	\$ 1,088,000	\$ 829,000
TVWD	\$ 1,042,000	\$ 800,000	\$ 2,041,000	\$ 1,555,000
Beaverton	\$ 880,000	\$ 619,000	\$ 1,593,000	\$ 1,203,000

Attachments:

- 1) Oregon Health Authority Letter of Concurrence
- 2) Resolution 139-J



PUBLIC HEALTH DIVISION
Drinking Water Services

Tina Kotek, Governor



800 NE Oregon Street, #640
Portland, OR 97232-2162
Phone: 971-201-9794
Fax: 971-673-0694
www.healthoregon.org/DWP

April 26, 2023

Alena Thurman, PE
Planning Manager/Associate
Carollo Engineers
Via email: athurman@carollo.com

Re: **Water System Master Plan (PR#27-2023)**
Joint Water Commission (PWS ID#00379)
Concurrence with Master Plan

Dear Alena:

Thank you for your submittal to the Oregon Health Authority's Drinking Water Services (DWS) of plan review information for the 2023 Water System Master Plan for Joint Water Commission. On March 15, 2023, our office received a copy of the master plan. A plan review fee of \$4,125 was received on March 16, 2023.

The Master Plan represents a 20-year planning horizon out to the year 2043. The plan includes a system goals and description, future demand estimates, engineering evaluation, evaluations of options to meet future demand, financing, and a list of recommended projects and cost estimates. A seismic risk assessment and mitigation plan is required and was included. Upon review of the Master Plan, it appears the elements listed in Oregon Administrative Rules (OAR) 333-061-0060(5) have been addressed.

Please note that OAR 333-061-0060 contains plan submission and review requirements for all major water system additions or modifications. Construction plans and specifications must be submitted to and approved by DWS before construction begins.

If you have any questions, please feel free to call me at (971) 201-9794.

Sincerely,

Carrie Gentry, PE
Regional Engineer
Drinking Water Services

cc: Nicole Alfafara, REHS, OHA/DWS
Negar Niakan, PE, Engineering Manager, Joint Water Commission

RESOLUTION NO. 139-J

A RESOLUTION OF THE JOINT WATER COMMISSION ADOPTING THE
RECOMMENDATIONS AND FINDINGS OF THE 2023 WATER MASTER PLAN AND
CAPITAL IMPROVEMENT PLAN

WHEREAS, the Joint Water Commission (JWC) is authorized as an intergovernmental entity to manage JWC water sources and provide treatment, storage and transmission of potable drinking water for distribution to water users served by the JWC Partners; and

WHEREAS, one ongoing task of the JWC is to plan for improvements necessary to supply the projected water demands of the Partners through coordinated expansion; and

WHEREAS, the current JWC Water Master Plan (Plan) was adopted by the Joint Water Commission in 2009; and the current Capital Improvement Plan was adopted by Resolution 124-J in 2015; and

WHEREAS, the JWC has recognized a need to update the Plan, in part, to account for a rapid increase in water demand as well as the recent upgrade of the existing Joint Water Commission (JWC) Water Treatment Plant, and future development of JWC capital projects involving treatment and transmission facilities; and

WHEREAS, to address these issues and for the general long-term planning of the JWC's water system, the JWC began the process to update the Plan in 2020 and has developed a new plan (2023 Plan); and

WHEREAS, the 2023 Plan identifies and defines capital improvement needs that will enable the JWC to satisfactorily serve future populations and development within a defined service area for a 20-year planning period; and

WHEREAS, the 2023 Plan addresses, among other things: planning and budgeting for replacement and upgrade of existing structures; planning for maintaining water quality; and planning for new infrastructure; and

WHEREAS, the 2023 Plan ensures that water provided to JWC Partners meets all water quality regulatory standards and supports the water quality needs of all water users; and

WHEREAS, the 2023 Plan coordinates with local and regional stakeholders to protect the quality of JWC's water source; and

WHEREAS, the 2023 Plan provides a technical basis for recommended improvements, budgets, schedules and recognition of important planning factors, and

WHEREAS, the 2023 Plan received concurrence from the Oregon Health Authority on April 26, 2023, that all master plan elements listed in Oregon Administrative Rules 333-061-0060(5) have been addressed; and

WHEREAS, the JWC Partner agencies have reviewed the 2023 Plan, and, upon advice from Staff, find that adoption of the 2023 Plan is in the best interests of the JWC and will help guide the Commission's capital program planning and budgeting;

NOW THEREFORE, THE JOINT WATER COMMISSION RESOLVES AS FOLLOWS:

Section 1: The Joint Water Commission adopts the 2023 Water Master Plan and Capital Improvement Plan attached as Exhibit A, which is incorporated herein.

Section 2: This Resolution takes effect immediately upon adoption by the Joint Water Commission.

THIS RESOLUTION WAS DULY ADOPTED BY the Joint Water Commission at its regular meeting on July 14, 2023.

JOINT WATER COMMISSION

ATTEST:

By: _____

By: _____

Joint Water Commission Chair

Recorder