

**EXHIBIT A**  
**LP22-0001**  
**Wastewater Treatment Plant Master Plan**  
**Planning Commission Public Hearing Record Index**  
**FINAL (December 13, 2023)**

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**PLANNING COMMISSION AND CITY COUNCIL MEETINGS**

December 13, 2023 - Planning Commission Public Hearing  
Resolution LP22-0001  
Staff Report and Attachments  
Presentation  
Affidavit of Notice of Hearing

November 6, 2023 - City Council Work Session  
Staff Report and Attachments  
Presentation  
Action Minutes

October 11, 2023 - Planning Commission Work Session  
Staff Report and Attachments  
Presentation  
Minutes Excerpt

October 12, 2022 - Planning Commission Public Hearing - Cancelled  
Cancellation Memo  
Minutes Excerpt

September 14, 2022 - Planning Commission Work Session  
Staff Report and Attachments  
Presentation  
Minutes Excerpt

August 1, 2022 - City Council Work Session  
Staff Report and Attachments  
Presentation  
Action Minutes

July 13, 2022 - Planning Commission Work Session  
Staff Report and Attachments  
Presentation  
Minutes Excerpt

**PUBLIC ENGAGEMENT**

Project Website: <https://www.letstalkwilsonville.com/wastewater-treatment-plant-master-plan>

Open House - September 28, 2022: <https://www.ci.wilsonville.or.us/engineering/page/public-open-house-waste-water-treatment-plant-master-plan>

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**COMMENTS/ARTICLES**

Boones Ferry Messenger – September

Spokesman Article for Original Public Hearing notification and cancellation

Emailed Comment 10/2/2022 – Thomas Hooker



# **PLANNING COMMISSION**

## **WEDNESDAY, DECEMBER 13, 2023**

### **PUBLIC HEARING**

2. Wastewater Treatment Plant Master Plan (Nacrelli) (30 minutes)

**PLANNING COMMISSION  
RESOLUTION NO. LP22-0001**

**A RESOLUTION OF THE CITY OF WILSONVILLE PLANNING COMMISSION  
RECOMMENDING THE WILSONVILLE CITY COUNCIL ADOPT AN UPDATE TO THE  
WASTEWATER TREATMENT PLANT MASTER PLAN.**

WHEREAS, the City of Wilsonville Wastewater Treatment Plant was last upgraded in 2014, pursuant to Resolution No. 2131; and

WHEREAS, the Capital Improvement Program identified the completion of a Wastewater Treatment Plant Master Plan (“Plan”) for FY 2023-24; and

WHEREAS, the Plan provides a detailed framework for expanding treatment process capacity to accommodate future development, comply with environmental regulations, and replace aging assets; and

WHEREAS, the concepts and information contained in the proposed update to the Wastewater Treatment Plant Master Plan were presented at a virtual public meeting on September 28, 2022; and

WHEREAS, the Planning Commission of the City has the authority to review and make recommendations to the City Council regarding the Capital Improvement Program pursuant to Wilsonville Code Sections 2.322 and 4.032; and

WHEREAS, the Planning Commission conducted work sessions on the draft Plan at their regular meetings of July 13 and September 14, 2022 and October 11, 2023; and

WHEREAS, the Planning Commission, after Public Hearing Notices were mailed to property owners within the City limits and a list of interested citizens and agencies, and were posted in three locations throughout the City and on the City website, held a Public Hearing on December 13, 2023, to review the Plan and to gather additional testimony and evidence regarding the proposed Master Plan update in accordance with the public hearing and notice procedures that are set forth in Sections 4.008, 4.010, 4.011 and 4.012 of the Wilsonville Code (WC); and

WHEREAS, the Planning Commission has afforded all interested parties an opportunity to be heard on this subject and has entered all available evidence and testimony into the public record of their proceeding; and

WHEREAS, the Planning Commission has duly considered the subject, including the staff recommendations and all the exhibits and testimony introduced and offered by all interested parties.

NOW, THEREFORE, THE CITY OF WILSONVILLE PLANNING COMMISSION RESOLVES AS FOLLOWS:

Section 1. The Wilsonville Planning Commission does hereby adopt the Planning Staff Report (attached hereto as Exhibit A) and Attachments, as presented at the December 13, 2023, public hearing, including the conclusionary findings and recommendations contained therein.

Section 2. The Planning Commission does hereby recommend that the Wilsonville City Council adopt the proposed Wastewater Treatment Plant Master Plan, attached as Exhibit B.

Section 3. Effective Date. This Resolution is effective upon adoption.

ADOPTED by the Wilsonville Planning Commission at a regular meeting thereof this 13th day of December, 2023, and filed with the Planning Administrative Assistant on this date.

  
Wilsonville Planning Commission

ATTEST:

  
Mandi Simmons, Administrative Assistant III

SUMMARY OF VOTES:

Ronald Heberlein, Chair

Yes

Jennifer Willard, Vice-Chair

Yes

Nicole Hendrix

Yes

Andrew Karr

Yes

Kamran Mesbah

Yes

Kathryn Neil

Yes

EXHIBITS:

A. Staff Report and Attachments



**PLANNING COMMISSION  
STAFF REPORT**

<b>Meeting Date:</b> December 13, 2023		<b>Subject:</b> Wastewater Treatment Plant Master Plan	
		<b>Staff Member:</b> Mike Nacrelli, Senior Civil Engineer	
		<b>Department:</b> Community Development	
<b>Action Required</b>		<b>Advisory Board/Commission Recommendation</b>	
<input checked="" type="checkbox"/> Motion <input checked="" type="checkbox"/> Public Hearing Date: 12/13/2023 <input type="checkbox"/> Ordinance 1 <sup>st</sup> Reading Date: <input type="checkbox"/> Ordinance 2 <sup>nd</sup> Reading Date: <input checked="" type="checkbox"/> Resolution <input type="checkbox"/> Information or Direction <input type="checkbox"/> Information Only <input type="checkbox"/> Council Direction <input type="checkbox"/> Consent Agenda		<input type="checkbox"/> Approval <input type="checkbox"/> Denial  <input type="checkbox"/> None Forwarded <input checked="" type="checkbox"/> Not Applicable	
		<b>Comments:</b> N/A	
<b>Staff Recommendation:</b> A motion to approve a recommendation to the City Council adopting the Wastewater Treatment Plant Master Plan			
<b>Recommended Language for Motion:</b> I move to approve Resolution LP22-0001 recommending approval of the Wastewater Treatment Plant Master Plan			
<b>Project / Issue Relates To:</b>			
<input checked="" type="checkbox"/> Council Goals/Priorities: Strategy 1. Develop an Infrastructure resilience plan and reprioritize / fund recommended projects.	<input type="checkbox"/> Adopted Master Plan(s):	<input type="checkbox"/> Not Applicable	

**ISSUE BEFORE PLANNING COMMISSION:**

The City of Wilsonville is completing a Wastewater Treatment Plant Master Plan to accommodate anticipated development within the City, replace aging assets, and comply with regulatory requirements. The Plan requires a formal adoption process that includes a hearing

before the Planning Commission, a recommendation from the Planning Commission to the City Council, and adoption by the City Council.

### **EXECUTIVE SUMMARY:**

This new City of Wilsonville (City) Wastewater Treatment Plant (WWTP) Master Plan (the Plan) has been developed to satisfy requirements associated with the State of Oregon Department of Environmental Quality (DEQ) guidance document entitled “Preparing Wastewater Planning Documents and Environmental Reports for Public Utilities.” To accommodate future Wilsonville flows and loads, projections were developed based on population projections and referencing WWTP historical data and DEQ wet weather project methodologies. Similarly, to accommodate future water quality regulations, the Plan is adaptive and considers potential future regulatory changes.

The City prepared the Plan with the goal of developing a capital plan that identifies improvements required through the planning period (today through 2045) to comply with requirements of the WWTP National Pollutant Discharge Elimination System (NPDES) permit and potential future regulatory requirements, while accommodating growth identified in the City of Wilsonville Comprehensive Plan (October 2018, updated June 2020 - the 2018 Comprehensive Plan). These improvements are designed to provide the best value to the City’s ratepayers by maximizing the use of existing infrastructure and improving system operation while continuing to protect water quality and human health and supporting economic development, consistent with goals and policies contained in the 2018 Comprehensive Plan and 2021-2023 City Council Goals.

The City’s WWTP was originally built in 1971 and discharges treated effluent to the Willamette River. The WWTP underwent major upgrades in 2014 to expand the average dry weather capacity to four million gallons per day (mgd) to accommodate the City’s continued growth. The WWTP processes include headworks screening and grit removal facilities, aeration basins, stabilization basins, secondary clarifiers, biosolids processing, cloth filtration, and disinfection processes. Additionally, the City contracts with Jacobs for operation of the wastewater treatment plant, located at 9275 Southwest Tauchman Road.

This Plan identifies needed capital improvements within the planning period, taking into consideration:

- The age and condition of existing process equipment and structures,
- Growth in demand for sewer service due to increased population and economic development over the planning period,
- Potential changes to water quality regulations impacting process needs in order to meet effluent limitations and discharge prohibitions imposed by the DEQ, and
- Consistency with the 2018 Comprehensive Plan and City Council 2023-2025 Strategy 1.

### ***WWTP Condition Assessment***

Carollo reviewed prior condition assessments performed by others, conducted geotechnical investigations and performed seismic assessments at the WWTP in the course of Plan development.



In 2019, Jacobs Engineering Group Inc. (Jacobs) and Brown and Caldwell both completed condition assessments at the City's WWTP. A total of 322 major assets (per Jacobs' report), including process and mechanical equipment, motors and drives, control panels, generators, instrumentation, and structures, were examined for a variety of conditions that may signify their need for maintenance or replacement.

### ***Seismic Analysis***

In 2021, Carollo performed a seismic evaluation and analysis of the City's WWTP as part of the overall plant condition assessment. Because the WWTP was substantially upgraded and expanded in 2014, most of its infrastructure is designed in accordance with the 2010 Oregon Structural Specialty Code (OSSC) and follows modern seismic design and detailing. During Tier 1 evaluations, Carollo identified potential deficiencies and areas for additional investigation. A Tier 1 seismic analysis is an initial evaluation performed to identify any potential deficiencies, whether structural or non-structural, in a building based on the performance of other similar buildings in past earthquakes. Subsequent to the Tier 1 analysis, a more detailed seismic evaluation of five older and potentially seismically vulnerable structures on the WWTP site was conducted. Those structures receiving a more detailed evaluation included the following:

- Operations Building
- Process Gallery
- Workshop
- Aeration Basins and Stabilization Basins
- Sludge Storage Basins and Biofilter

The five potentially vulnerable structures were compared against an S-4 Limited Safety structural performance level and N-B Position Retention non-structural performance level for an M9.0 Cascadia Seismic Zone (CSZ) earthquake. The M9.0 CSZ is reflective of a catastrophic natural disaster event that has an estimated 35 percent likelihood of occurring within the next 50 years. Following the Tier 1 evaluation, Carollo began Tier 2 evaluations for a select number of identified deficiencies. Although none of the structures showed significant irregularities, the team did identify seismic deficiencies. The recommended seismic retrofits are included in the CIP for the Plan.

Prior to the 2021 seismic evaluation, Carollo's subconsultant, Northwest Geotech, Inc. (NGI), completed a seismic response and geologic hazards assessment of the City's WWTP. Through past and present site investigations and engineering analyses, NGI determined that the native soils beneath the site's granular pit backfill have low risk of liquefaction and its slopes do not pose undue risk. NGI concluded that the WWTP's primary site hazard is the differential settlement that may be caused by soil piping (development of subsurface air-filled voids), which raises the risk of sinkholes forming beneath structures and pipelines. Soil piping usually develops in unsaturated soils when a water source percolates into the ground. While the site is mostly paved and stormwater is being collected, there may be areas where infiltration is occurring next to structures or below pipelines. Recommended actions from NGI to mitigate the risk of soil piping are presented in the Plan.

### ***Wastewater Flow and Load Projections***

The Plan evaluates the historical and projected wastewater flows and loads generated in the City of Wilsonville’s service area. The load projections include total suspended solids (TSS), biochemical oxygen demand (BOD5), ammonia (NH3), and total phosphorous (TP) loads.

Service area, residential population, industrial contribution, and rainfall records were all considered in the flow and load projection analyses.

### ***Capacity Analysis***

Summaries of plant process area capacity assessments and conclusions are presented in the Plan. These assessments focus on the need for improvements or upgrades to existing facilities to address capacity deficiencies identified in the course of Master Plan evaluations.

### ***Regulatory Considerations and Strategy***

Several possible regulatory actions by the Oregon DEQ could drive investments in future improvements at the City’s WWTP. The plant discharges to the Willamette River and existing and future effluent limitations contained in the NPDES permit dictate, in large part, the necessary treatment processes and configuration at the WWTP necessary to maintain compliance. The existing permit limits for the Wilsonville WWTP are effective September 1, 2020 through July 30, 2025.

### ***Alternative Development and Evaluation***

The Plan presents the methodology and findings of a process improvements alternatives evaluation. The plant’s treatment process needs were defined by comparing the plant’s existing condition, capacity and reliability, with the projected flows, loads, and regulatory constraints for the recommended alternatives. Where capacity deficiencies were predicted, at least two alternatives were analyzed for each corresponding unit process.

<b>Project Description</b>	<b>Timeframe</b>	<b>Cost*</b>
Dewatering Performance Optimization	2025	\$150,000
Fiber Optic Conduit Addition	2025	\$60,000
UV System Improvement	2026	\$1,705,000
Seismic Improvements	2026	\$1,082,000
Geotechnical Foundation Mitigation	2026	\$2,000,000
New Aeration Basin and Blower	2025 – 2027	\$10,222,000
Replace Secondary Clarifier Mechanisms	2026 - 2027	\$1,775,000
Membrane Bioreactor (MBR) Phase 1 (includes new blower, fine screens, electrical and hydraulic upgrades)	2028 – 2031	\$69,727,000
New Solids Dryer	2031 – 2033	\$17,130,000
Thickening and Dewatering Improvements	2031 – 2033	\$3,701,000
New Cooling Tower	2035 – 2036	\$642,000
MBR Phase 2 (includes new blower)	2037 – 2039	\$2,330,000
UV Equipment Replacement and Outfall Upsizing	2039 – 2040	\$2,571,000
UV Equipment Replacement and Outfall Upsizing	2039 – 2040	\$1,244,000
MBR Phase 3 (includes 2 new blowers)	2042 – 2044	\$8,117,000
<b>Total</b>		<b>\$122,456,000</b>

\*Costs are shown in 2023 dollars and include 25% for engineering, legal, and administration.

The most significant impact to the required level of capital investment is the need for membrane bioreactor (MBR) facilities. These are state-of-the-art, compact facilities that provide a high level of treatment. Due to the limited amount of space available at the existing WWTP site, MBR facilities are the only feasible means of providing the necessary treatment to accommodate build out of the Wilsonville urban reserve areas.

**EXPECTED RESULTS:**

The Plan includes a list of recommended capital improvements, along with an anticipated schedule for completion and preliminary cost estimates. The total estimated amount of capital investment over the planning period is approximately \$122 million, of which \$17 million is anticipated in the next 5 years. The recommended capital improvements will provide the basis for an analysis of sewer rates and system development charges (SDCs) that are necessary to adequately fund the upgrades needed to meet the projected growth.

**TIMELINE:**

A public hearing before City Council for the Plan adoption is anticipated in January 4, 2024, with a second reading on January 18, 2024.

**CURRENT YEAR BUDGET IMPACTS:**

The amended FY24 Budget for CIP #2104, Wastewater Treatment Plant Master Plan, includes \$130,000 in sewer operations and system development charge funds. The remaining budget is sufficient to complete the remaining work to update and adopt the Plan.

**COMMUNITY INVOLVEMENT PROCESS:**

A virtual town hall meeting to present the findings of the Plan and solicit public input was held in September 2022 and posted on the City’s online calendar and Let’s Talk Wilsonville page, where a project overview and periodic updates to the Executive Summary have also been posted. In addition, draft versions of the Executive Summary have been sent to the ten largest industrial customers for review and comment. The public hearings listed above will provide further opportunity for public input. The forthcoming Sewer System Rate Study and SDC Update will also include a public engagement process with outreach to utility customers and the development community.

**POTENTIAL IMPACTS or BENEFIT TO THE COMMUNITY:**

A technically and financially sound plan for providing reliable wastewater treatment, capacity to accommodate future development, and compliance with environmental regulations.

**ALTERNATIVES:**

The project team considered and evaluated numerous technologies and alternatives to provide the needed wastewater treatment plant capacity to meet future demands and recommend a capital improvement program that implements the needed improvements in a way that is efficient and cost effective.

**ATTACHMENTS:**

1. Wastewater Treatment Plant Master Plan (dated December 2023)
2. Wastewater Treatment Plant Master Plan Appendices (dated December 2023)
3. Conclusionary Findings
4. Master Plan Record (electronic only)

WWTP Master  
Plan attached  
separately

The Wastewater Treatment Plant Master Plan (LP22-0001) Appendices can be found at this link:

<https://www.ci.wilsonville.or.us/comm-dev/page/wastewater-treatment-plant-master-plan>

## CONCLUSIONARY FINDINGS

The updated Wastewater Treatment Plant Master Plan has been found to be consistent with the applicable criteria as follows.

<b>COMPREHENSIVE PLAN COMPLIANCE</b>
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### **Standards for Approval of Plan Amendments**

***In order to grant a Plan amendment, the City Council shall after considering the recommendation of the Development Review Board (quasi-judicial) or Planning Commission (legislative), find that:***

#### ***a. Conformance with Other Portions of the Comprehensive Plan***

CP1. **Review Criteria:** “The proposed amendment is in conformance with those portions of the Plan that are not being considered for amendment.”

**Finding:** These criteria are satisfied.

**Explanation of Finding:** The proposed updated Wastewater Treatment Plant Master Plan has been found to be in conformance with the Comprehensive Plan. See Findings CP2 through CP30 below.

#### ***b. Amendment is in the Public Interest***

CP2. **Review Criterion:** “The granting of the amendment is in the public interest.”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** Development Code Subsection 4.198 (.01) A. implements this standard. It is in the public interest to periodically update the master plans for critical public facilities such as the wastewater treatment plant to ensure the system provides for adequate service for current and future residents and businesses to ensure proper treatment of wastewater.

#### ***c. Public Interest and Timing of Amendment***

CP3. **Review Criterion:** “The public interest is best served by granting the amendment at this time.”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** Facility master plans such as the wastewater treatment plant must be updated periodically to provide updated current condition information and use updated data to forecast future needs. The last update to the Wastewater Treatment Plant Master Plan was in 2004, so the public interest is best served by updating the master plan as soon as possible making the current timing appropriate.

#### ***d. Adequately Addressing Specific Factors***

CP4. **Review Criteria:** “The following factors have been adequately addressed in the proposed amendment: the suitability of the various areas for particular land uses and improvements; the land uses and improvements in the area; trends in land improvement; density of development; property values; the needs of economic enterprises in the future development of the area; transportation access; natural resources; and the public need for healthful, safe and aesthetic surroundings and conditions.”

**Finding:** These criteria are satisfied.

**Explanation of Finding:**

*Suitability of the Various Areas for Particular Land Uses and Improvements:* The plan only considers serving areas otherwise acknowledged as future growth areas. The plan includes analysis of the current location and how to best expand within the limited footprint.

*Land Uses and Improvements in the Area:* The updated Wastewater Treatment Plant Master Plan considers the current land uses throughout the city as well as potential land uses in future growth areas.

*Trends in Land Improvement:* The amended Wastewater Treatment Plant Master Plan supports the trends identified in other master plans and studies.

*Density of Development:* The updated Wastewater Treatment Plant Master Plan considers planned densities throughout the City and growth areas over the planning horizon.

*Property Values:* Planning for an adequate wastewater treatment plant helps enable a functional system long term which supports sanitation. Lack of proper sanitation and ability to properly dispose of wastewater would negatively affect property values.

*The Needs of Economic Enterprises in the Future Development of the Area:* Planning for an adequate wastewater treatment plant helps support economic enterprise in areas planned for business growth by planning adequate capacity and service.

*Transportation Access:* No transportation access is impacted by the plan.

*Natural Resources:* The updated Wastewater Treatment Plant Master Plan doesn't specifically address how facility siting will affect natural resources. However, the improvements will be within a confined previously disturbed area and the City has regulations in place to look at conservation of resources during the design and final siting of future improvements.

*Public Need for Healthful, Safe and Aesthetic Surroundings and Conditions:* Functional and sanitary treatment of wastewater, which is the aim of the updated Wastewater Treatment Plant Master Plan, supports healthful, safe, and aesthetic surroundings by



preventing unsanitary or environmentally detrimental disposal or treatment of wastewater.

#### ***e. Conflict with Metro Requirements***

- CP5. **Review Criteria:** “Proposed changes or amendments to the Comprehensive Plan do not result in conflicts with applicable Metro requirements.”  
**Finding:** These criteria are satisfied.  
**Explanation of Finding:** No conflicts with Metro requirements have been identified.

#### **Citizen Involvement**

***Goal 1.1: To encourage and provide means for interested parties to be involved in land use planning processes, on individual cases and City-wide programs and policies.***

#### ***Policy 1.1.1: Wide Range of Public Involvement***

- CP6. **Review Criterion:** “The City of Wilsonville shall provide opportunities for a wide range of public involvement in City planning programs and processes.”  
**Finding:** This criterion is satisfied.  
**Explanation of Finding:** A number of different media and venues have been used to encourage public involvement. Wastewater treatment tends to be a subject in which the community does not express a lot of interest as long as the system is functioning well. While a reasonable effort has been made to notify and solicit community involvement, limited interest has been expressed. Information was published in the Boones Ferry Messenger, a community newsletter mailed to every address within Wilsonville’s 97070 zip code, the Planning Commission held work sessions, and project staff made information about the project available on the City’s website. Required public noticing for the Planning Commission and upcoming City Council public hearings has occurred.

#### ***Implementation Measure 1.1.1.a. Early Public Involvement***

- CP7. **Review Criterion:** “Provide for early public involvement to address neighborhood or community concerns regarding Comprehensive Plan and Development Code changes. Whenever practical to do so, City staff will provide information for public review while it is still in “draft” form, thereby allowing for community involvement before decisions have been made.”  
**Finding:** This criterion is satisfied.  
**Explanation of Finding:** The City solicited feedback from the Planning Commission and public early in the planning process while the plan was still in draft form. Any feedback has been considered in preparation of the plan.

***Goal 1.2: For Wilsonville to have an interested, informed, and involved citizenry.***

***Policy 1.2.1: User Friendly Information***

CP8. **Review Criterion:** “The City of Wilsonville shall provide user-friendly information to assist the public in participating in the City planning programs and processes.”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** The City has produced user-friendly notices for the project, as well as provided other information, and opportunities, both in person and online, to examine the materials related to the updated Wastewater Treatment Plant Master Plan.

***Implementation Measures 1.2.1.a.-c. Clarification, Publicity, and Procedures for Public Involvement***

CP9. **Review Criteria:** These measures address the City’s responsibility to help clarify the public participation process, publicize ways to participate, and establish procedures to allow reasonable access to information.

**Finding:** These criteria are satisfied.

**Explanation of Finding:** The City has produced user-friendly notices for the project, as well as provided other information, and opportunities, both in person and online, to examine the materials related to the updated Wastewater Treatment Plant Master Plan.

***Policy 1.3.1. Implementation Measures 1.3.1.b. Clarification, Publicity, and Procedures for Public Involvement***

CP10. **Review Criteria:** “The City of Wilsonville shall coordinate with other agencies and organizations involved with Wilsonville’s planning programs and policies.” “Where appropriate, the City shall continue to coordinate its planning activities with affected public agencies and private utilities. Draft documents will be distributed to such agencies and utilities and their comments shall be considered and kept on file by the City.”

**Finding:** These criteria are satisfied.

**Explanation of Finding:** The appropriate agencies have been notified through the DLCD notice and/or the Public Hearing Notice. Any comments will be entered into the public hearing record and be considered.

**Urban Growth Management**

***Goal 2.1: To allow for urban growth while maintaining community livability, consistent with the economics of development, City administration, and the provision of public facilities and services.***

***Implementation Measure 2.1.1.d. Establish and Maintain Revenue Sources for Public Services and Facilities***

CP11. **Review Criterion:** “Establish and maintain revenue sources to support the City’s policies for urbanization and maintain needed public services and facilities.”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** While the scope of the Wastewater Treatment Plant Master Plan includes prioritizing short-term and long-term projects for the Capital Improvement Program and developing budget level cost estimates, the update does not evaluate funding tools. The City is examining and will continue to examine revenue sources to support the CIP.

***Implementation Measure 2.1.1.e. Concurrency of Facilities and New Development***

CP12. **Review Criterion:** “Allow new development to proceed concurrently with the availability of adequate public services and facilities as specified in Public Facilities and Services Section (Section C) of the Comprehensive Plan.”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** The City’s current policies supporting concurrency of public services and facilities with new development are not altered by the proposed update to the Wastewater Treatment Plant Master Plan.

***Policy 2.2.1. Plan for Urbanization***

CP13. **Review Criterion:** “The City of Wilsonville shall plan for the eventual urbanization of land within the local planning area, beginning with land within the Urban Growth Boundary.”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** By updating the plan for wastewater treatment infrastructure, including ensuring adequate capacity and service to land within the Urban Growth Boundary and Urban Reserves around the City, the City is supporting the effort to plan for the eventual urbanization of these areas.

***Implementation Measure 2.2.1.b. Fair Share to Increase Development Capacity***

CP14. **Review Criterion:** “The City of Wilsonville, to the best of its ability based on infrastructure provided at the local, regional, and state levels, shall do its fair share to increase the development capacity of land within the Metro UGB.”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** By updating the plan for wastewater treatment infrastructure, including ensuring adequate capacity and service for planned densities, the City is supporting the effort to provide for its fair share of development within the UGB.

***Implementation Measure 2.2.1.g. Urban Services to Not be Extended Outside City Limits***

CP15. **Review Criterion:** “Urban sanitary sewer and water service shall not be extended outside the City limits, with the following exceptions:

1. Where an immediate demonstrable threat to the public health exists, as a direct result of the lack of the service in question;
2. Where a Governmental agency is providing a vital service to the City; or

3. Where it is reasonable to assume that the subject area will be annexed to the City within a reasonable period of time.”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** The updated Wastewater Treatment Plant Master Plan does not allow for or encourage provision of City services outside City limits.

### **Public Facilities and Services**

**Goal 3.1 To assure that good quality public facilities and services are available with adequate, but not excessive, capacity to meet community needs, while also assuring that growth does not exceed the community’s commitment to provide adequate facilities and services.**

#### **Policy 3.1.1. The City to Provide Public Facilities**

- CP16. **Review Criterion:** “The City of Wilsonville shall provide public facilities to enhance the health, safety, educational, and recreational aspects of urban living.”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** By updating the plan for wastewater treatment infrastructure, including ensuring adequate capacity for land within the Urban Growth Boundary and Urban Reserves around the City, the City is supporting the effort to continue to provide for all aspects of urban living affected by wastewater treatment.

#### **Implementation Measure 3.1.1.a. City to Prepare and Implement Facility/Services Master Plans**

- CP17. **Review Criterion:** “The City will continue to prepare and implement master plans for facilities/services, as sub-elements of the City’s Comprehensive Plan. Facilities/services will be designed and constructed to help implement the City’s Comprehensive Plan.”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** The City is continuing the practice to prepare and implement facility/services master plans as sub-elements of the Comprehensive Plan by updating the 19-year-old Wastewater Treatment Plant Master Plan.

#### **Implementation Measure 3.1.1.d. City to Review Development Densities and Facilities/Services Capacity**

- CP18. **Review Criterion:** “The City shall periodically review and, where necessary, update its development densities indicated in the land use element of the Plan, based on the capacity of existing or planned services and/or facilities.”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** The updated Wastewater Treatment Plant Master Plan incorporates the most up to date growth forecast information to plan enough capacity for the expected growth; it has not identified any areas where planned development densities need to be adjusted based on the capacity to serve with the waste water treatment plant.

***Policy 3.1.2. Concurrency***

CP19. **Review Criterion:** “The City of Wilsonville shall provide, or coordinate the provision of, facilities and services concurrent with need (created by new development, redevelopment, or upgrades of aging infrastructure).”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** By updating the Wastewater Treatment Plant Master Plan the City is coordinating its efforts over the planning horizon to provide wastewater treatment facilities and services concurrent with need, whether it involves new development, redevelopment, or upgrading aging infrastructure.

***Implementation Measure 3.1.2.a. Urban Development only in Serviceable Areas***

CP20. **Review Criterion:** “Urban development will be allowed only in areas where necessary facilities and services can be provided.”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** In addition to analyzing the condition of existing infrastructure the updated Wastewater Treatment Plant Master Plan identifies deficiencies and needed improvements to serve areas expected to develop. The City will continue to follow concurrency policies for public facilities and development and thus allow development only in areas where wastewater treatment services can be provided.

***Policy 3.1.3. Payment for and Benefits from Facilities and Services***

CP21. **Review Criterion:** “The City of Wilsonville shall take steps to assure that the parties causing a need for expanded facilities and services or those benefiting from such facilities and services, pay for them.”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** The City’s current practices to require parties causing a need for expanded facilities pay for them are not changed by the scope of the updated Wastewater Treatment Plant Master Plan.

***Implementation Measure 3.1.3.a. Developers and SDC’s***

CP22. **Review Criterion:** “Developers will continue to be required to pay for demands placed on public facilities/services that are directly related to their developments. The City may establish and collect systems development charges (SDCs) for any or all public facilities/services, as allowed by law. An individual exception to this standard may be justified, or SDC credits given, when a proposed development is found to result in public benefits that warrant public investment to support the development.”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** The City’s current SDC practices are not affected by the updated Wastewater Treatment Plant Master Plan.

***Implementation Measure 3.1.3.b. Capital Improvement Program***

CP23. **Review Criterion:** “The City will continue to prepare and implement a rolling five- year Capital Improvement Program, with annual funding decisions made as part of the municipal budget process.”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** The updated Wastewater Treatment Plant Master Plan is part of the City’s continuing effort to prepare and implement a rolling five-year Capital Improvement Program by prioritizing short-term and long-term wastewater treatment plant projects for the CIP.

***Implementation Measure 3.1.3.c. Pay-back Agreements***

CP24. **Review Criterion:** “The City shall continue to employ pay-back agreements, development agreements, and other creative solutions for facilities that are over-sized or extended from off-site at the expense of only some of the benefited properties.”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** The City’s policies towards and use of pay-back agreements, development agreements, and other creative infrastructure financing solutions are not affected by the updated Wastewater Treatment Plant Master Plan.

***Policy 3.1.4. City Operations of Sanitary System to Standards***

CP25. **Review Criterion:** “The City of Wilsonville shall continue to operate and maintain the wastewater treatment plant and system in conformance with federal, state, and regional water quality standards.”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** The updated Wastewater Treatment Plant Master Plan will continue to allow the wastewater system to operate to applicable standards.

***Implementation Measure 3.1.4.a. City to Maintain Sewer Service Monitoring and Expansion Program***

CP26. **Review Criterion:** “The City shall continue to maintain a sewer service capacity monitoring and expansion program to assure that adequate treatment and trunk main capacity is available to serve continued development, consistent with the City's urban growth policies and the concurrency standards noted above.”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** By updating the plan for wastewater treatment infrastructure, including ensuring adequate capacity and service to land within the Urban Growth Boundary and Urban Reserves around the City, the City is supporting this implementation measure.

### ***Implementation Measures 3.1.4.b. Sanitary Sewer Capacity***

CP27. **Review Criteria:** “The City shall continue to manage growth consistent with the capacity of sanitary sewer facilities.”

**Finding:** These criteria are satisfied.

**Explanation of Finding:** An updated Wastewater Treatment Plant Master Plan will enable the City to better manage growth consistent with the capacity of the wastewater treatment plant by identifying needed upgrades to current infrastructure as well as infrastructure needed for growth in different planned growth areas.

### ***Implementation Measure 3.1.4.e. All Urban Development Served by Sanitary Sewer***

CP28. **Review Criterion:** “The City shall continue to require all urban level development to be served by the City's sanitary sewer system.”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** By updating the plan for wastewater treatment infrastructure, including ensuring adequate capacity for land within the Urban Growth Boundary and Urban Reserves around the City, the City is supporting the ability to provide sanitary sewer service to all urban level development. The updated Wastewater Treatment Plant Master Plan does not affect the City’s policy of requiring sanitary sewer system service as part of urban level development approval.

### ***Implementation Measure 3.1.4.f. Cost of Individual Services and Line Extensions***

CP29. **Review Criterion:** “The cost of all line extensions and individual services shall be the responsibility of the developer and/or property owners(s) seeking service. When a major line is to be extended, the City may authorize and administer formation of a Local Improvement District (LID). All line extensions shall conform to the City Sanitary Sewer Collection System Master Plan, urbanization policies, and Public Works Standards.”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** The City’s current practices regarding LID’s and costs for services are not affected by the updated Wastewater Treatment Plant Master Plan.

### ***Parks/Recreation/Open Space, Environmental Resources and Community Design***

#### ***Policies 3.1.11., 4.1.5. and Implementation Measures 3.1.11.a. ,4.1.5.d.-g.,aa. . Conservation of Natural, Scenic, and Historic Areas***

CP30. **Review Criteria:** These policies and implementation measures require and encourage conservation of natural resources, as well as scenic and historic areas.

**Finding:** These criteria are satisfied.

**Explanation of Finding:** The updated Wastewater Treatment Plant Master Plan doesn’t specifically address how facility siting will affect natural resources. However, the improvements will be within a confined previously disturbed area and the City has

regulations in place to look at conservation of resources during the design and final siting of future improvements.

<b>COMPLIANCE WITH PLANNING AND LAND DEVELOPMENT ORDINANCE</b>
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***Section 4.003 Consistency with Plans and Laws***

- PL1. **Review Criterion:** “Actions initiated under this Code shall be consistent with the Comprehensive Plan and with applicable State and Federal laws and regulations as these plans, laws and regulations now or hereafter provide.”  
**Finding:** This criterion is satisfied.  
**Explanation of Finding:** Consistency with the Comprehensive Plan and applicable state laws has been reviewed and summarized in this report.

***Section 4.008 General Application Procedures***

- PL2. **Review Criterion:** “The general application procedures listed in Section 4.008 through 4.024 apply to all land use and development applications governed by Chapter 4 of the Wilsonville Code. These include applications for all of the following types of land use or development approvals:  
 H. Changes to the text of the Comprehensive Plan, including adoption of new Plan elements or sub-elements, pursuant to Section 4.198;”  
**Finding:** This criterion is satisfied.  
**Explanation of Finding:** Adoption of the updated Wastewater Treatment Plant Master Plan is being reviewed pursuant to Section 4.198.

***Subsection 4.009 (.02) Who Can Initiate Application***

- PL3. **Review Criterion:** “Applications involving large areas of the community or proposed amendments to the text of this Chapter or the Comprehensive Plan may be initiated by any property owner, business proprietor, or resident of the City, as well as the City Council, Planning Commission, or Development Review Board acting by motion.”  
**Finding:** This criterion is satisfied.  
**Explanation of Finding:** The application has been initiated by the City as part of its responsibility to periodically update facility master plans.

***Subsection 4.032 (.01) B. Authority of Planning Commission***

- PL4. **Review Criterion:** This Section states that the Planning Commission has authority to make recommendations to the City Council on “legislative changes to, or adoption of new elements or sub-elements of the Comprehensive Plan.”  
**Finding:** This criterion is satisfied.



**Explanation of Finding:** The proposed legislative change is being considered by the Planning Commission as a recommendation to the City Council. The issue before the Planning Commission is a legislative review of an amended sub-element of the Comprehensive Plan.

***Subsection 4.033 (.01) B. Authority of City Council***

PL5. **Review Criterion:** This Section states that the City Council has final decision-making authority on “applications for amendments to, or adoption of new elements or sub-elements to the maps or text of the Comprehensive Plan, as authorized in Section 4.198.”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** Final action will be taken by the City Council following a recommendation from the Planning Commission.

***Subsection 4.198 (.01) A. Comprehensive Plan Changes: Public Need***

PL6. **Review Criterion:** “That the proposed amendment meets a public need that has been identified;”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** It is in the public interest to periodically update the master plans for critical public facilities such as the wastewater treatment plant to ensure the system provides for adequate service for current and future residents and businesses to ensure proper sanitation.

***Subsection 4.198 (.01) B. Comprehensive Plan Changes: Meets Public Needs As Well As Other Options***

PL7. **Review Criterion:** “That the proposed amendment meets the identified public need at least as well as any other amendment or change that could reasonably be made;”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** As a sub-element of the Comprehensive Plan the Wastewater Treatment Plant Master Plan aims to provide for the public need of adequate wastewater treatment service. An updated Wastewater Treatment Plant Master Plan better meets the public need than the current plan by using updated information about the condition of existing infrastructure and growth projections.

***Subsection 4.198 (.01) C. Comprehensive Plan Changes: Statewide Planning Goals***

PL8. **Review Criterion:** “That the proposed amendment supports applicable Statewide Planning Goals or a Goal exception has been found to be appropriate; and;”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** Please see compliance with Statewide Planning Goals section below.

***Subsection 4.198 (.01) D. Comprehensive Plan Changes: Conflict with Other Portions of the Comprehensive Plan***

PL9. **Review Criterion:** “That the proposed change will not result in conflicts with any portion of the Comprehensive Plan that is not being amended.”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** No conflicts between the updated Wastewater Treatment Plant Master Plan and other portions of the Comprehensive Plan have been identified.

<b>COMPLIANCE WITH OREGON STATEWIDE PLANNING GOALS</b>
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**Statewide Planning Goals**

***Goal 1 Citizen Involvement***

OR1. **Review Criterion:** “To develop a citizen involvement program that insures the opportunity for citizens to be involved in all phases of the planning process.”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** The citizen involvement process defined in Wilsonville’s Comprehensive Plan has been acknowledged to be in conformance with Goal 1. Findings CP6 through CP10 demonstrate compliance with the citizen involvement component of the Comprehensive Plan and thus Goal 1.

***Goal 2 Land Use Planning***

OR2. **Review Criterion:** “To establish a land use planning process and policy framework as a basis for all decision and actions related to use of land and to assure an adequate factual base for such decisions and actions.”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** The City is currently in compliance with Goal 2 because it has an acknowledged Comprehensive Plan and regulations implementing the plan. The Wastewater Treatment Plant Master Plan is a sub-element supporting this plan. A Wastewater Treatment Plant Master Plan will continue to be a sub-element of the Comprehensive Plan and the scope of the update will not change conformance with this goal, but rather provide updated information to better support land use planning in Wilsonville.

***Goal 5 Natural Resources, Scenic and Historic Areas, and Open Spaces***

OR3. **Review Criterion:** “To protect natural resources and conserve scenic and historic areas and open spaces.”

**Finding:** This criterion is satisfied.

**Explanation of Finding:** The updated Wastewater Treatment Plant Master Plan doesn’t specifically address how facility siting will affect natural resources. However, the

improvements will be within a confined previously disturbed area and the City has regulations in place to look at conservation of resources during the design and final siting of future improvements.

### ***Goal 6 Air, Water and Land Resource Quality***

OR4. **Review Criteria:** “To maintain and improve the quality of the air, water and land resources of the state.”

**Finding:** These criteria are satisfied.

**Explanation of Finding:** The proposed updated Wastewater Treatment Plant Master Plan provides for sanitary disposal of wastewater to prevent the wastewater from polluting and degrading water and land resources. It supports the planning guideline of this rule to only designate residential use where approvable sewage disposal alternatives have been clearly identified.

### ***Goal 7 Areas Prone to Natural Disasters and Hazards***

OR5. **Review Criteria:** “To protect life and property from natural disasters and hazards.”

**Finding:** These criteria are satisfied.

**Explanation of Finding:** The wastewater Treatment Plant has been evaluated for risks associated with natural disasters and hazards; see Chapter 2.

### ***Goal 11 Public Facilities and Services***

OR6. **Review Criteria:** “To plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development.”

**Finding:** These criteria are satisfied.

**Explanation of Finding:** The updated Wastewater Treatment Plant Master Plan is among the utility plans that are sub-elements of the City’s Comprehensive Plan. Using updated information on the condition of existing infrastructure as well as updated growth forecasts will better enable the timely, orderly and efficient arrangement of wastewater treatment facilities and services.

### **Oregon Administrative Rules**

#### ***Division 660 Public Facilities Planning***

#### ***OAR 660-11-0010 The Public Facility Plan***

OR7. **Review Criteria:** This OAR identifies what a Public Facility Plan, such as the updated Wastewater Collection System Master Plan, must contain.

**Finding:** These criteria are satisfied.

**Explanation of Finding:** The updated Wastewater Treatment Plant Master Plan inventories and assesses Wilsonville’s wastewater treatment plant in support of current

and planned land uses; and it includes a list of projects and prioritized projects for short-term and long-term improvements, budget-level cost estimates of projects. The master plan also identifies the City as the service provider in City limits and in areas expected to be annexed into the City in the future. A discussion of the City's funding mechanisms is included in the Comprehensive Plan, but is not affected by this update.

***OAR 660-11-0015 Responsibility for Public Facility Plan Preparation***

OR8. **Review Criteria:** This OAR identifies who is responsible for preparing public facility plans.

**Finding:** These criteria are satisfied.

**Explanation of Finding:** The City of Wilsonville has the responsibility to prepare facility plans for public facilities including the wastewater treatment plant. An existing facility plan, which is a sub-element of the City of Wilsonville's Comprehensive Plan, is being updated to ensure an up-to-date facility plan.

***OAR 660-11-0020 Public Facility Inventory and Determination of Future Facility Projects***

OR9. **Review Criteria:** This OAR identifies components of public facility inventories.

**Finding:** These criteria are satisfied.

**Explanation of Finding:** The updated Wastewater Treatment Plant Master Plan includes an inventory of the City's wastewater treatment plant including all the required components listed in this OAR: information on capacity and size, assessment of conditions, identification of projects supportive of the City's Comprehensive Plan land use designations, and acknowledgment of future flexibility based on impact studies, facility design, and further master planning efforts.

***OAR 660-11-0025 Timing of Required Public Facilities***

OR10. **Review Criteria:** This OAR requires public facility plans include a general estimate of the timing for planned public facility projects.

**Finding:** These criteria are satisfied.

**Explanation of Finding:** The updated Wastewater Treatment Plant Master Plan includes information on short-term and long-term projects. See Chapter 7.

***OAR 660-11-0030 Location of Public Facility Projects***

OR11. **Review Criteria:** This OAR requires public facility plans include a general location of projects

**Finding:** These criteria are satisfied.

**Explanation of Finding:** The updated Wastewater Treatment Plant Master Plan includes information on project location.

***OAR 660-11-0035 Determination of Rough Cost Estimates***

OR12. **Review Criteria:** This OAR requires public facility plans include rough cost estimates for projects.

**Finding:** These criteria are satisfied.

**Explanation of Finding:** The scope of the updated Wastewater Treatment Plant Master Plan includes budget level cost estimates for identified projects.

***OAR 660-11-0045 Adoption and Amendment Procedures for Public Facility Plans***

OR13. **Review Criteria:** This OAR identifies public facility plans as supporting documents to the comprehensive plan and identifies related items to be in the comprehensive plan.

**Finding:** These criteria are satisfied.

**Explanation of Finding:** The Wastewater Treatment Plant Master Plan is a sub-element of the City of Wilsonville's Comprehensive Plan and includes a list of projects, a map of projects, and policies on urban growth and the provision public facilities. The updated Master Plan is being considered a land use decision with the appropriate noticing and hearing processes being followed.

**LP22-0001**  
**Wastewater Treatment Plant Master Plan**  
**Planning Commission Public Hearing Record Index**  
**DRAFT (December 13, 2023)**

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**PLANNING COMMISSION AND CITY COUNCIL MEETINGS**

December 13, 2023 - Planning Commission Public Hearing  
Resolution LP22-0001 (*included above, adoption pending*)  
Staff Report and Attachments (*included above, adoption pending*)  
Presentation (*not included at this time*)  
Affidavit of Notice of Hearing

November 6, 2023 - City Council Work Session  
Staff Report and Attachments  
Presentation  
Action Minutes

October 11, 2023 - Planning Commission Work Session  
Staff Report and Attachments  
Presentation  
Minutes Excerpt

October 12, 2022 - Planning Commission Public Hearing - Cancelled  
Cancellation Memo  
Minutes Excerpt

September 14, 2022 - Planning Commission Work Session  
Staff Report and Attachments  
Presentation  
Minutes Excerpt

August 1, 2022 - City Council Work Session  
Staff Report and Attachments  
Presentation  
Action Minutes

July 13, 2022 - Planning Commission Work Session  
Staff Report and Attachments  
Presentation  
Minutes Excerpt

**PUBLIC ENGAGEMENT**

Project Website: <https://www.letstalkwilsonville.com/wastewater-treatment-plant-master-plan>

Open House - September 28, 2022: <https://www.ci.wilsonville.or.us/engineering/page/public-open-house-waste-water-treatment-plant-master-plan>

**LP22-0001**  
**Wastewater Treatment Plant Master Plan**  
**Planning Commission Public Hearing Record Index**  
**DRAFT (December 13, 2023)**

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**COMMENTS/ARTICLES**

Boones Ferry Messenger – September

Spokesman Article for Original Public Hearing notification and cancellation

Emailed Comment 10/2/2022 – Thomas Hooker

The Wastewater Treatment Plant Master Plan (LP22-0001) Record can be found on the December 13, 2023 Planning Commission meeting page, in the “Agenda Packet” (<https://www.ci.wilsonville.or.us/bc-pc/page/planning-commission-72>)



# City of Wilsonville Wastewater Treatment Plant Master Plan

Planning Commission

December 13, 2023



# Project Overview and Update



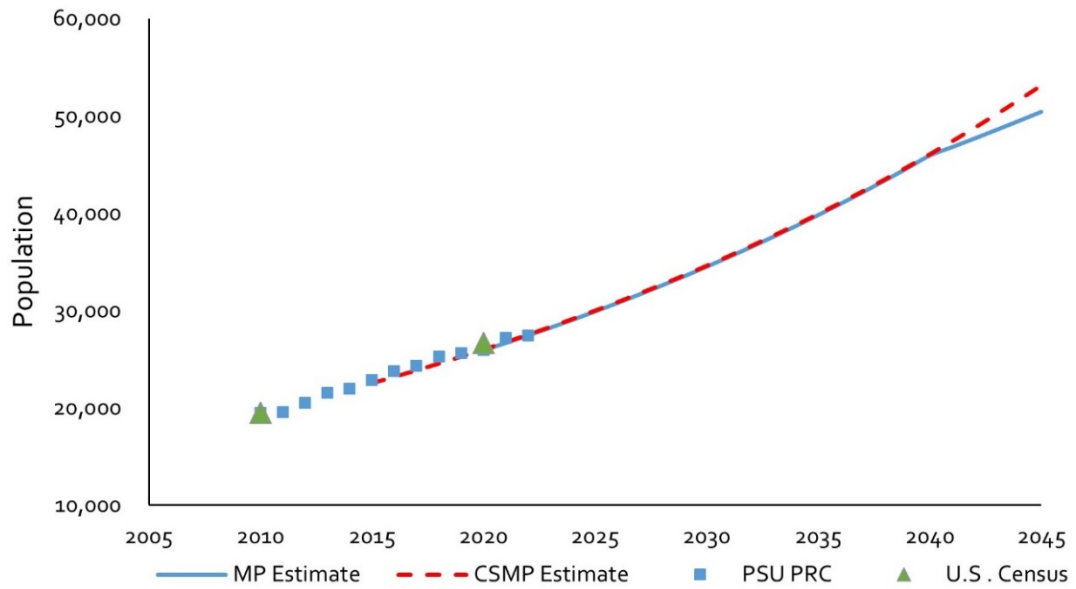
- Accommodating Expected Build-Out by 2045
  - Growth projections consistent with recent planning efforts
  - Increased industrial discharges to permitted limits
- Capacity Assessment Complete
  - Includes hydraulic modeling of WWTP
- Equipment Replacement and Seismic Retrofits
- Costs and Schedule for Updated CIP

# Capital Planning and Expected Growth - 2045

- Buildout of Service Area through 2045
  - Adjusted population growth rate, consistent with recent planning efforts
  - Modified service area boundary, per Basalt Creek Concept Plan

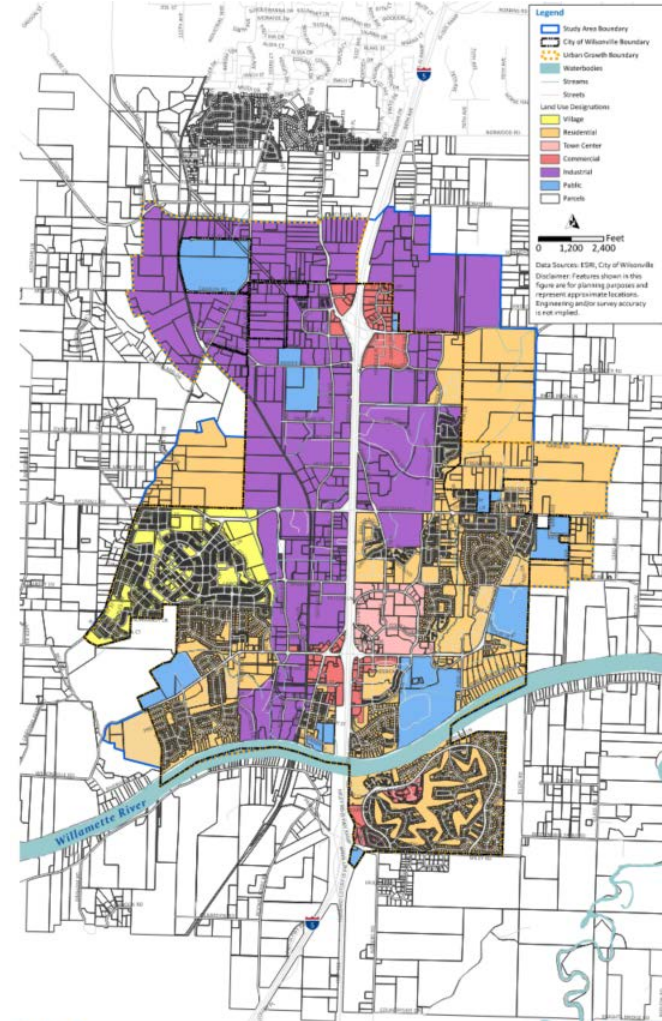
*Buildout Population Projections (High 2.9%)*

2020	2030	2040	2045
25,915	34,491	45,904	50,388



# Buildout Service Area - 2045

Land Use	Acreage
Commercial	224
Industrial	2,383.2
Public	482.9
Residential	2,278.3
Town Center	136.1
Village	367.4



# Facility Capacity Assessment



- Flows & Loads Updated to reflect Buildout of Service Area
- Projected 2045 flows and loads exceed design criteria (~2X current)

Item	2022	Rated Capacity	Projected 2045
Average Dry Weather Flow, mgd	2.06	4.00	4.17
Average Annual Flow, mgd	2.39	4.48	4.77
Maximum Month Wet Weather Flow, mgd	4.00	6.68	7.76
Max Month BOD <sub>5</sub> , ppd	11,456	12,900	22,301
Max Month TSS, ppd	9,504	12,500	18,116



# Existing Vicinity Map

# Selection of MBR Process



Alternative	Advantages	Challenges
Membranes (Selected)	<ul style="list-style-type: none"> <li>• Space-efficient</li> <li>• High-quality effluent</li> <li>• Provides capacity for reliable full nitrification</li> <li>• No need to expand tertiary filtration</li> </ul>	<ul style="list-style-type: none"> <li>• Expensive (&gt;2x cost of 4<sup>th</sup> AB)</li> <li>• Requires Fine Screening</li> <li>• High O&amp;M Costs (Power, Chemicals, etc.)</li> <li>• Highest aeration rate</li> <li>• Redundancy requirements</li> </ul>
BioMag <sup>®</sup>	<ul style="list-style-type: none"> <li>• Space-efficient</li> <li>• High-quality effluent</li> <li>• Potentially no need to expand tertiary filtration</li> <li>• Utilizes secondary clarifier capacity (no stranded assets)</li> </ul>	<ul style="list-style-type: none"> <li>• Requires Magnetite Recovery Facility</li> <li>• Increased maintenance requirement from the magnetite</li> <li>• Reports of solids smoldering, may require inert gas system</li> <li>• Will not provide sufficient capacity under projected 2045 F&amp;L</li> </ul>
IFAS	<ul style="list-style-type: none"> <li>• Space-efficient</li> <li>• Utilizes secondary clarifier capacity (no stranded assets)</li> </ul>	<ul style="list-style-type: none"> <li>• Will not provide sufficient capacity under projected 2045 F&amp;L</li> <li>• Significant basin modifications needed</li> </ul>

# Selected Capacity Upgrades



- **Secondary Process**
  - Add new aeration basin & additional blower
  - Phased implementation of MBR technology (includes hydraulic and electrical upgrades, new building, new fine screens, and additional blowers)
- **Effluent Cooling**
  - Add new cooling tower
- **Outfall Piping**
  - Increase hydraulic capacity for UV disinfection

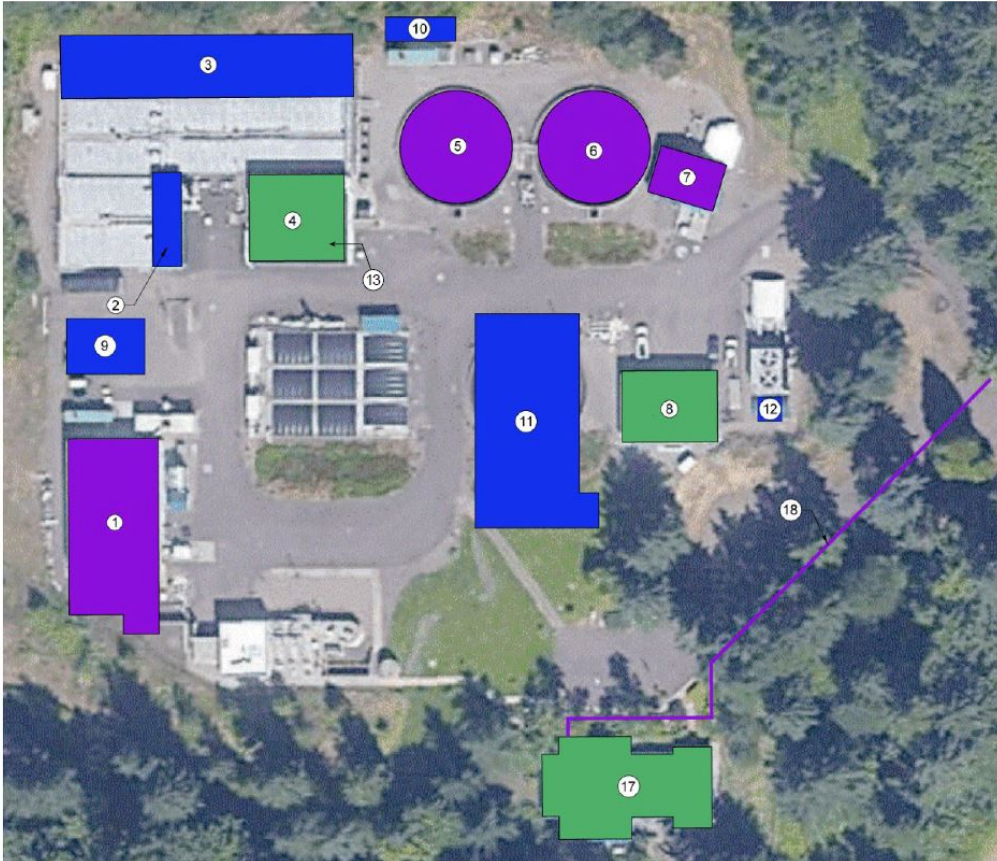


# Asset Replacement and Seismic Resilience



- Secondary Process
  - Replace secondary clarifier mechanisms
- Solids Thickening and Dewatering
  - Replace GBTs and centrifuge units
- UV System
  - Replace 1997 unit in the near term
  - Replace 2014 unit near the end of the planning period
- Solids Dryer
  - Add redundant unit (requires building expansion)
- Seismic Resilience
  - Structural retrofits to Administration Building, Process Gallery, and Maintenance Workshop

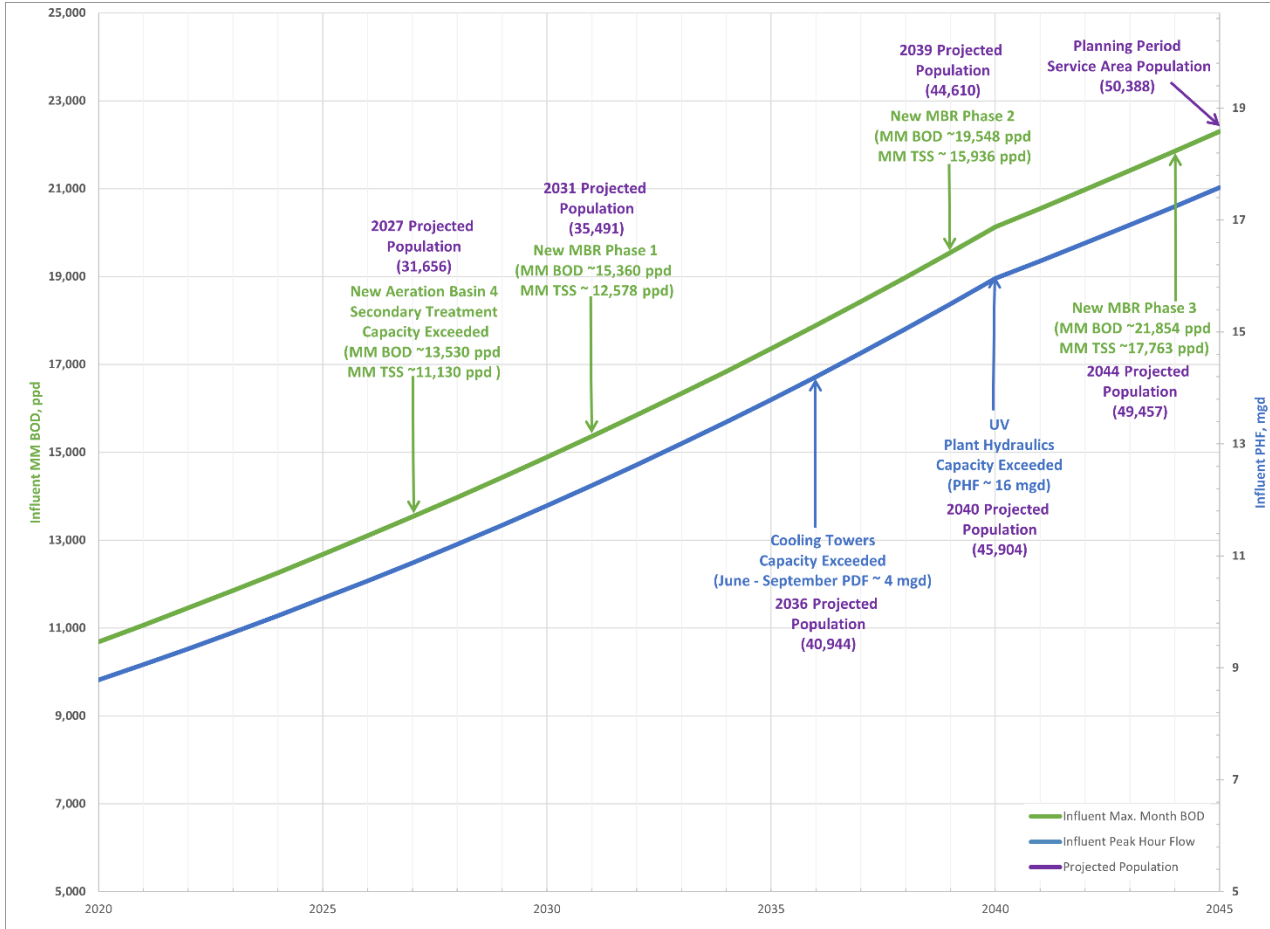
# Recommended Plan



- 3** New Aeration Basin
- 2** Additional Aeration Blowers
- 9** New Fine Screens
- 10** New Emergency Generator
- 11** New MBR Facility
- 12** New Cooling Tower
- 13** Replace Gravity Belt Thickeners
- 7** Replace backup UV system
- 1** Replace Solids Dryer & Centrifuges
- 5** **6** Replace Clarifier 1 & 2 mechanisms
- 4** **8** **17** Seismic retrofits of buildings
- 18** New fiber optic connection
- Solids process study



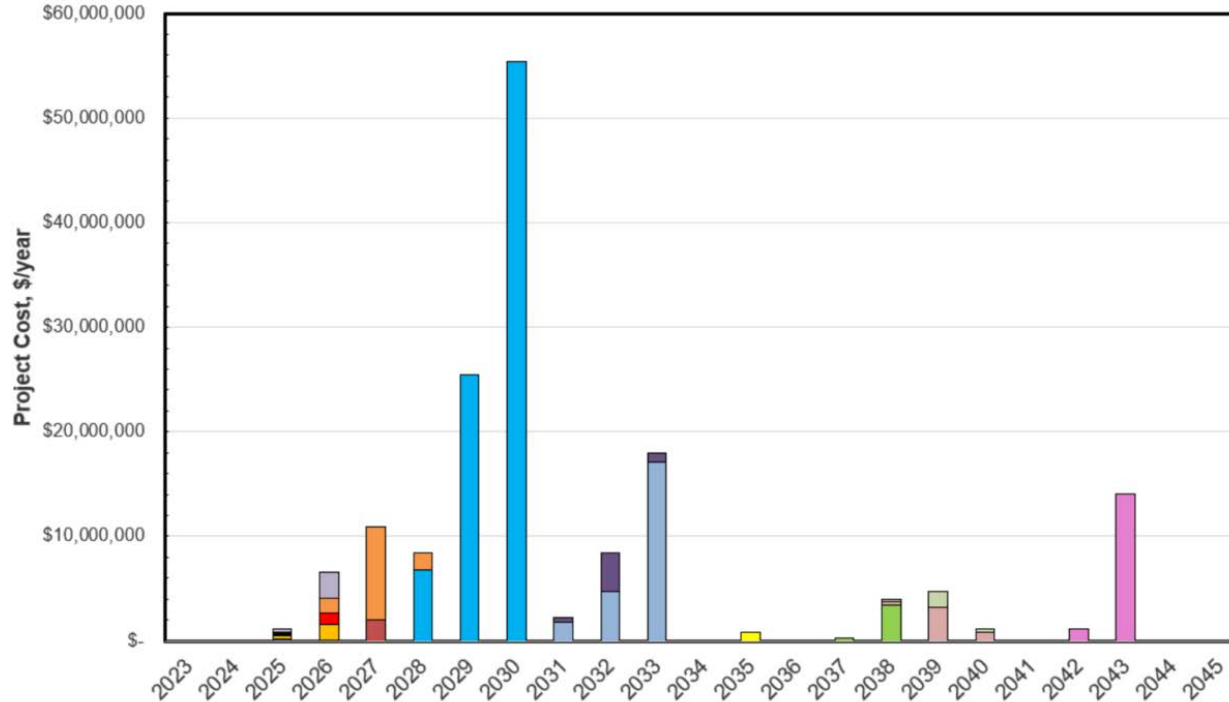
# Capacity Trigger Plot



# Project Cost

DESCRIPTION	ESTIMATED TIMEFRAME	AUGUST 2023 PROJECT COST
Dewatering Performance Optimization	2025	\$150,000
Fiber Optic Cable Addition	2025	\$60,000
Backup UV System Replacement	2026	\$1,705,000
Seismic Improvements	2026	\$1,082,000
Geotechnical Foundation Mitigation	2026	\$2,000,000
New Aeration Basin + Blower + Retaining Wall	2025 – 2027	\$10,222,000
Replace Secondary Clarifier Mechanisms	2026 – 2027	\$1,775,000
MBR Phase 1 + 2 Blowers + Fine Screens + Electrical Upgrades	2028 – 2031	\$69,727,000
Solids Dryer Addition	2031 – 2033	\$17,130,000
Existing Centrifuge and GBT Replacement	2031 – 2033	\$3,701,000
Additional Cooling Tower	2035 – 2036	\$642,000
MBR Phase 2 + 2 Blowers	2037 – 2039	\$2,330,000
UV Equipment Replacement	2039 – 2040	\$2,571,000
Outfall Improvements	2039 – 2040	\$1,244,000
MBR Phase 3 + 2 Blowers	2042 – 2044	\$8,117,000
<b>TOTAL</b>		<b>\$122,456,000</b>

# Estimated Cash Flow



- Dewatering Performance Optimization (Allowance)
- New Secondary Clarifier Mechanisms
- Backup UV System Improvement
- Existing Centrifuge and GBT Replacement
- MBR Phase 3 + 2 Blower
- Seismic Improvements
- Outfall Improvements
- Solids Dryer Improvement
- MBR Phase 1 + 2 Blowers + Fine Screens + Electrical Upgrades
- MBR Phase 2 + 2 Blowers
- Cooling Tower
- Fiber Optic Cable Addition
- New Aeration Basin + Blower + Retaining Wall
- Geotechnical Foundation Mitigation

# Next Steps



- City Council Public Hearing 1st Reading 1/4/24
- City Council 2nd Reading 1/18/24
- Sewer System Rate Study and SDC Update 2024

**Questions?**

**AFFIDAVIT OF MAILING AND POSTING NOTICE OF  
PUBLIC HEARING IN THE CITY OF WILSONVILLE**

STATE OF OREGON )

COUNTIES OF CLACKAMAS )  
AND WASHINGTON )

CITY OF WILSONVILLE )

I, Mandi Simmons, do hereby certify that I am Administrative Assistant for the City of Wilsonville, Counties of Clackamas and Washington, State of Oregon, that the attached copy of Notice of Public Hearing is a true copy of the originals of the following that I did cause to be mailed/displayed copies of said public hearing in the exact form hereto attached:

- Single-paged notice was emailed on November 22, 2023 to the attached list of affected agencies
- Single-paged notice was emailed on November 22, 2023 to the attached list of interested parties
- Single-paged notice was sent to the Wilsonville Spokesman for publication in the November 30, 2023 newspaper issue
- The content of the notice was posted on November 22, 2023 on the City's website
- Single-paged notice was posted at physical locations listed below on November 22, 2023
  - City Hall, 29799 SW Town Center Loop, East, Wilsonville OR 97070
  - Wilsonville Community Center, 7965 SW Wilsonville Road, Wilsonville, OR 97070
  - Library, 8200 SW Wilsonville Road, Wilsonville OR 97070

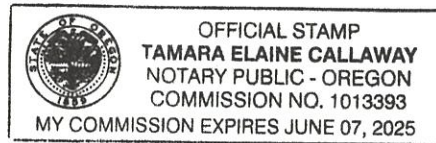
Witness my hand this 4<sup>th</sup> day of December 2023

  
Mandi Simmons, Administrative Assistant

Acknowledged before me this 4<sup>th</sup> day of December 2023, in Clackamas County, Oregon

  
Signature of Oregon Notary

Tamara E. Callaway  
Printed Notary Name



NOTARY PUBLIC

My Commission Expires 6/7/25



# NOTICE OF LEGISLATIVE PUBLIC HEARING BEFORE THE PLANNING COMMISSION AND CITY COUNCIL

## WASTEWATER TREATMENT PLANT (WWTP) MASTER PLAN LP22-0001

**OREGON STATE LAW ORS 227.186.** The City has not determined how or if this particular proposal will reduce or otherwise impact either the value or use of properties within Wilsonville. Any changes to permitted land uses may reduce or increase property values, depending on various factors. A written notice has been mailed to potentially impacted property owners as required.

### PLANNING COMMISSION

On **Wednesday, December 13, 2023, beginning at 6 pm**, the Planning Commission will hold a public hearing on **the Wastewater Treatment Plant Master Plan**, and will consider whether to recommend to City Council adoption of the Plan.

You will not receive another mailed notice unless you: submit a request in writing or by phone, or submit testimony or sign-in at the hearing.

### CITY COUNCIL

On **Thursday, January 4, 2024 beginning at 7 pm**, the City Council will hold a public hearing regarding **the Wastewater Treatment Plant Master Plan** after which it may make the final decision.

The hearings will take place at **Wilsonville City Hall**, 29799 SW Town Center Loop East. A complete copy of the project record, including staff report, findings, and recommendations, will be available online and at City Hall for viewing 7 days prior to each public hearing.

### SUMMARY OF PROPOSAL

The City of Wilsonville is updating its Wastewater Treatment Plant Master Plan. The improvements detailed in this Plan are designed to provide optimal value to the City's ratepayers by maximizing the use of existing infrastructure and improving system operation while continuing to protect water quality and human health and supporting economic development.

The City's Wastewater Treatment Plant, along I-5 between the river and Old Town, was originally built in 1971. A major 2014 upgrade expanded the capacity to accommodate population growth. This Plan, which satisfies requirements established by the State of Oregon Department of Environmental Quality (DEQ), considers:

- The age and condition of existing process equipment and structures
- Upgrades to accommodate population growth and new economic development over the planning period (through 2045). Projections are based on land use, historical data, and DEQ wet weather flow methodologies.
- Potential changes to water quality regulations established by the DEQ
- City of Wilsonville Wastewater Collection System Master Plan (2014), and
- Consistency with the 2018 Comprehensive Plan and City Council 2021-2023 Goals 5, 6 and 7

For more details, visit <https://www.letstalkwilsonville.com/wastewater-treatment-plant-master-plan>

**HOW TO COMMENT:** Oral or written testimony may be presented at the public hearings. Written comment on the proposal is welcome prior to the public hearings. To have your written comments or testimony distributed to the Planning Commission before the meeting, it must be received by 2 pm on December 5, 2023. **Direct written comments to Mandi Simmons, Administrative Assistant** 29799 SW Town Center Loop East, Wilsonville, Oregon, 97070 | [msimmons@ci.wilsonville.or.us](mailto:msimmons@ci.wilsonville.or.us) | (503) 682-4960

**Note: Assistive Listening Devices (ALD) are available for persons with impaired hearing and can be scheduled for this meeting. The City will also endeavor to provide qualified sign language interpreters and/or bilingual interpreters, without cost, if requested at least 48 hours prior to the meeting. To obtain such services, please call Mandi Simmons, Administrative Assistant at (503) 682-4960.**

Pat McGough  
West Linn/Wilsonville School District 3J  
2755 SW Borland Road  
Tualatin, OR 97062

Andy Back  
Wash. County Long Range Planning  
155 N. First Avenue  
Hillsboro, OR 97124

Steve Koper  
City of Tualatin  
18880 SW Martinazzi Avenue  
Tualatin, OR 97062

Attn: Development Review  
ODOT Region 1  
123 NW Flanders Street  
Portland, OR 97209

Ben Baldwin  
Tri-Met Project Planning Dept  
4012 SE 17th Avenue  
Portland, OR 97202

Bill Ferber, Region Manager  
Oregon Water Resources Department  
725 Summer Street, NE  
Salem, OR 97301

Dr. Kathy Ludwig  
West Linn/Wilsonville School District 3J  
22210 SW Stafford Road  
Tualatin, OR 97062

Tracy Wilder, Department of Corrections  
Facilities Services  
3601 State Street  
Salem, Oregon 97301

Steve Hursh, Service & Design Supervisor  
Portland General Electric  
2213 SW 153<sup>rd</sup> Drive  
Beaverton, OR 97006

Land Use Contact, Planning Department  
Metro  
600 NE Grand Ave  
Portland, OR 97232

Nina Carlson  
NW Natural Gas  
250 SW Taylor St.  
Portland, OR 97204

John Olivares, Operations Manager  
Republic Services of Clackamas &  
Washington Counties  
10295 SW Ridder Road  
Wilsonville, OR 97070

City Planner  
City of Canby  
P.O. Box 930  
Canby, OR 97013

Diane Taniguchi-Dennis  
Clean Water Services  
2550 SW Hillsboro Hwy.  
Hillsboro, OR 97123

Department of Corrections  
2575 Center Street NE  
Salem, OR 97310

John Lilly  
Department of State Lands  
775 Summer Street, NE  
Salem, OR 97301

Roseann Johnson, Assistant Director of  
Government Affairs  
Home Builders Associations  
15555 SW Bangy Road, Suite 301  
Lake Oswego, OR 97035

Sherwood School Dist Admin Office  
23295 SW Main Street  
Sherwood, OR 97140

Clackamas County Planning Director  
150 Beaver Creek Road  
Oregon City, OR 97045

Oregon Dept of Environ Quality  
700 NE Multnomah Street, Suite 600  
Portland, OR 97232

Tualatin Valley Water District  
1850 SW 170th Ave.  
Beaverton, OR 97005

Planning Director  
City of Sherwood  
22560 SW Pine Street  
Sherwood, OR 97140

James Clark  
BPA, Realty Department  
2715 Tepper Lane  
Keizer, OR 97013

Tualatin Valley Fire and Rescue  
29875 SW Kinsman Road  
Wilsonville, OR 97070

Tualatin Valley Fire and Rescue  
South Division  
8445 SW Elligsen Road  
Wilsonville, OR 97070

Elizabeth Kenney  
12451 Orchard Hill Rd  
Lake Oswego, OR 97035

# PamplinMediaGroup

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<p><b>Date:</b> 11/22/23 <b>Account #:</b> 108863 <b>Reference #:</b> LP22-0001 WWTP MASTER PLAN <b>Company Name:</b> WILSONVILLE, CITY OF <b>Contact:</b> <b>Address:</b> 29799 SW TOWN CENTER LOOP E WILSONVILLE</p> <p><b>Telephone:</b> (503) 570-1510 <b>Fax:</b> (503) 682-1015</p>	<p><b>Ad ID:</b> 308944 <b>Start:</b> 11/29/23 <b>Stop:</b> 11/30/23</p> <p><b>Total Cost:</b> \$208.79 <b>Ad Size:</b> 12.069 <b>Column Width:</b> 1 <b>Column Height:</b> 12.069</p> <p><b>Ad Class:</b> 1202 <b>Phone #</b> <b>Email:</b> <a href="mailto:spenn@pamplinmedia.com">spenn@pamplinmedia.com</a></p>
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### Run Dates:

Wilsonville Spokesman 11/30/23

**NOTICE OF LEGISLATIVE PUBLIC HEARING  
BEFORE THE  
PLANNING COMMISSION AND CITY COUNCIL:**

**WASTEWATER TREATMENT PLANT (WWTP)  
MASTER PLAN LP22-0001**

**OREGON STATE LAW ORS 227.186.** The City has not determined how or if this particular proposal will reduce or otherwise impact either the value or use of properties within Wilsonville. Any changes to permitted land uses may reduce or increase property values, depending on various factors. A written notice has been mailed to potentially impacted property owners as required.

**PLANNING COMMISSION:**

On **Wednesday, Dec. 13, 2023, beginning at 6 pm**, the Planning Commission will hold a public hearing on the **Wastewater Treatment Plant Master Plan**, and will consider whether to recommend to City Council adoption of the Plan.

You will not receive another mailed notice unless you: submit a request in writing or by phone, or submit testimony or sign-in at the hearing.

**CITY COUNCIL:**

On **Thursday, Jan. 4, 2024 beginning at 7 pm**, the City Council will hold a public hearing regarding the **Wastewater Treatment Plant Master Plan** after which it may make the final decision.

The hearings will take place at Wilsonville City Hall, 29799 SW Town Center Loop East. A complete copy of the project record, including staff report, findings, and recommendations, will be available online and at City Hall for viewing 7 days prior to each public hearing.

**SUMMARY OF PROPOSAL:**

The City of Wilsonville is updating its Wastewater Treatment Plant Master Plan. The improvements detailed in this Plan are designed to provide optimal value to the City's ratepayers by maximizing the use of existing infrastructure and improving system operation while continuing to protect water quality and human health and supporting economic development.

The City's Wastewater Treatment Plant, along I-5 between the river and Old Town, was originally built in 1971. A major 2014 upgrade expanded the capacity to accommodate population growth.

This Plan, which satisfies requirements established by the State of Oregon Department of Environmental Quality (DEQ), considers:

- The age and condition of existing process equipment and structures
- Growth to accommodate population growth and new economic development over the planning period (through 2045). Projections are based on projections, historical data and DEQ wet weather project methodologies.
- Potential changes to water quality regulations established by the DEQ
- City of Wilsonville Wastewater Collection System Master Plan (2014), and
- Consistency with the 2018 Comprehensive Plan and City Council 2021-2023 Goals 5, 6 and 7

For more details, visit <https://www.letstalkwilsonville.com/wastewater-treatment-plant-master-plan>.

**HOW TO COMMENT:**

Oral or written testimony may be presented at the public hearings. Written comment on the proposal is welcome prior to the public hearings. To have your written comments or testimony distributed to the Planning Commission before the meeting, it must be received by 2 pm on Dec. 5, 2023. Direct written comments to Mandi Simmons, Administrative Assistant 29799 SW Town Center Loop East, Wilsonville, Oregon, 97070 | [msimmons@ci.wilsonville.or.us](mailto:msimmons@ci.wilsonville.or.us) | (503) 682-4960

*Note: Assistive Listening Devices (ALD) are available for persons with impaired hearing and can be scheduled for this meeting. The City will endeavor to provide qualified sign language interpreters and/or bilingual interpreters, without cost, if requested at least 48 hours prior to the meeting. To obtain such services, please call Mandi Simmons, Administrative Assistant at (503) 682-4960.*

Publish November 30, 2023

WS308944



**CITY COUNCIL**  
**MONDAY, NOVEMBER 6, 2023**

**WORK SESSION**

Wastewater Treatment Plant Master Plan (Nacrelli)



**CITY COUNCIL MEETING  
STAFF REPORT**

<b>Meeting Date:</b> November 6, 2023		<b>Subject:</b> Wastewater Treatment Plant Master Plan Update	
		<b>Staff Member:</b> Mike Nacrelli, Senior Civil Engineer	
		<b>Department:</b> Community Development	
<b>Action Required</b>		<b>Advisory Board/Commission Recommendation</b>	
<input type="checkbox"/> Motion <input type="checkbox"/> Public Hearing Date: <input type="checkbox"/> Ordinance 1 <sup>st</sup> Reading Date: <input type="checkbox"/> Ordinance 2 <sup>nd</sup> Reading Date: <input type="checkbox"/> Resolution <input checked="" type="checkbox"/> Information or Direction <input type="checkbox"/> Information Only <input type="checkbox"/> Council Direction <input type="checkbox"/> Consent Agenda		<input type="checkbox"/> Approval <input type="checkbox"/> Denial <input type="checkbox"/> None Forwarded <input checked="" type="checkbox"/> Not Applicable <b>Comments:</b> N/A	
<b>Staff Recommendation:</b> Review Wastewater Treatment Plant Master Plan updates and provide feedback on the recommended capital improvement plan.			
<b>Recommended Language for Motion:</b> N/A			
<b>Project / Issue Relates To:</b>			
<input checked="" type="checkbox"/> Council Goals/Priorities: Strategy 1. Develop an Infrastructure resilience plan and reprioritize/ fund recommended projects.	<input type="checkbox"/> Adopted Master Plan(s):	<input type="checkbox"/> Not Applicable	

**ISSUE BEFORE COUNCIL:**

The project team will provide an update on the additional analysis included in the Wastewater Treatment Plant (WWTP) Master Plan and the proposed changes made since the previous Council discussion on August 1, 2022.

## **EXECUTIVE SUMMARY:**

The City of Wilsonville (City) Wastewater Treatment Plant (WWTP) Master Plan (the Plan) has been developed to satisfy requirements associated with the State of Oregon Department of Environmental Quality (DEQ) guidance document entitled “Preparing Wastewater Planning Documents and Environmental Reports for Public Utilities.” To accommodate future flows and loads, projections were developed based on population projections and referencing WWTP historical data and DEQ wet weather project methodologies. Similarly, to accommodate future water quality regulations, the Plan is adaptive and considers potential future regulatory changes.

The City prepared the Plan with the goal of developing a capital plan that identifies improvements required through the planning period (today through 2045) to comply with requirements of the WWTP National Pollutant Discharge Elimination System (NPDES) permit and potential future regulatory requirements, while accommodating growth identified in the City of Wilsonville Comprehensive Plan (October 2018, updated June 2020). These improvements are designed to provide the best value to the City’s ratepayers by maximizing the use of existing infrastructure and improving system operation while continuing to protect water quality and human health and supporting economic development, consistent with goals and policies contained in the Comprehensive Plan and 2023-2025 City Council Goals.

The City’s WWTP was originally built in 1971 and discharges treated effluent to the Willamette River. The WWTP underwent major upgrades in 2014 to expand the average dry weather capacity to four million gallons per day (mgd) to accommodate the City’s continued growth. The WWTP processes include headworks screening and grit removal facilities, aeration basins, stabilization basins, secondary clarifiers, biosolids processing, cloth filtration, and disinfection processes. Additionally, the City contracts with Jacobs for operation of the wastewater treatment plant, located at 9275 Southwest Tauchman Road.

This Plan identifies needed capital improvements within the planning period, taking into consideration:

- The age and condition of existing process equipment and structures,
- Growth in demand for sewer service due to increased population and economic development over the planning period,
- Potential changes to water quality regulations impacting process needs in order to meet effluent limitations and discharge prohibitions imposed by the Oregon Department of Environmental Quality (DEQ), and
- Consistency with the 2018 Comprehensive Plan and City Council 2023-2025 Strategy 1.

### **Plan Updates**

Since the previous Council Work Session on August 1, 2022 growth projections have been updated to an assumed 2.9% annual population increase, consistent with recent planning documents adopted by the City, including the Wastewater Collection System Master Plan (November 2014), the Willamette River Water Treatment Plan Master Plan Update (March 2018), and the Basalt Creek Concept Plan (August 2018). In addition, the wastewater flow and load projections for biochemical oxygen demand (BOD) and total suspended solids (TSS) have been



further updated to account for increases in industrial discharges, as allowed under existing permits. The project team also performed a more in depth seismic and resiliency analysis of the wastewater treatment plant facilities to address the City Council 2023-2025 goal to develop an infrastructure resilience plan and reprioritize/ fund recommended projects. These changes result in a higher level of capital investment over the planning period than previously reported, as reflected in the table below.

<b>Project Description</b>	<b>Timeframe</b>	<b>Cost*</b>
Dewatering Performance Optimization	2025	\$150,000
Fiber Optic Conduit Addition	2025	\$60,000
UV System Improvement	2026	\$1,705,000
Seismic Improvements	2026	\$1,082,000
New Aeration Basin and Blower	2025 – 2027	\$10,222,000
Replace Secondary Clarifier Mechanisms	2026 - 2027	\$1,775,000
Membrane Bioreactor (MBR) Phase 1 (includes new blower, fine screens, electrical and hydraulic upgrades)	2028 – 2030	\$69,727,000
New Solids Dryer	2031 – 2033	\$17,130,000
Thickening and Dewatering Improvements	2031 – 2033	\$3,701,000
New Cooling Tower	2037 – 2038	\$642,000
MBR Phase 2 (includes new blower)	2037 – 2038	\$2,330,000
UV Equipment Replacement	2039 – 2040	\$2,571,000
Outfall Upsizing	2039 – 2040	\$1,244,000
MBR Phase 3 (includes 2 new blowers)	2042 – 2043	\$8,117,000
<b>Total</b>		<b>\$120,456,000</b>
*Costs are shown in 2023 dollars and include 25% for engineering, legal, and administration.		

The most significant impact to the required level of capital investment is the need for membrane bioreactor (MBR) facilities. These are state-of-the-art, compact facilities that provide a high level of treatment. Due to the limited amount of space available at the existing WWTP site, MBR facilities are the most feasible means of providing the necessary treatment to accommodate build out of the Wilsonville urban reserve areas.

**EXPECTED RESULTS:**

The Plan includes a list of recommended capital improvements, along with an anticipated schedule for completion and preliminary cost estimates. The total estimated amount of capital investment over the planning period is approximately \$120 million, of which \$15 million is anticipated in the next five (5) years. The recommended capital improvements will provide the basis for an analysis of sewer rates and system development charges (SDCs) that are necessary to adequately fund the upgrades needed to meet the projected growth.

**TIMELINE:**

The project team will incorporate feedback received by both the Planning Commission (October 11, 2023 Work Session) and the City Council (November 6, 2023 Work Session) into the Plan.

Currently, a public hearing for the Plan adoption recommendation by the Planning Commission is scheduled for December 13, 2023. A public hearing before City Council for the Plan adoption is anticipated in January 2024.

**CURRENT YEAR BUDGET IMPACTS:**

The amended fiscal year 2023 -2024 Budget for capital improvement project (CIP) #2104, Wastewater Treatment Plant Master Plan, includes \$130,000 in sewer operations and system development charge funds. The remaining budget is sufficient to complete the remaining work to update and adopt the Plan.

**COMMUNITY INVOLVEMENT PROCESS:**

A virtual town hall meeting to present the findings of the Plan and solicit public input was held in September 2022 and posted on the City’s online calendar and Let’s Talk Wilsonville page, where a project overview and periodic updates to the Executive Summary have also been posted. In addition, draft versions of the Executive Summary have been sent to the ten (10) largest industrial customers for review and comment. The public hearings listed above will provide further opportunity for public input. The forthcoming Sewer System Rate Study and SDC Update will also include a public engagement process with outreach to utility customers and the development community.

**POTENTIAL IMPACTS OR BENEFIT TO THE COMMUNITY:**

A technically and financially sound plan for providing reliable wastewater treatment, capacity to accommodate future development, and compliance with environmental regulations.

**ALTERNATIVES:**

The project team considered and evaluated numerous technologies and alternatives to provide the needed wastewater treatment plant capacity to meet future demands and recommend a capital improvement program that implements the needed improvements in a way that is efficient and cost effective.

**CITY MANAGER COMMENT:**

N/A

**ATTACHMENT:**

- 1. Wastewater Treatment Plant Master Plan Draft Executive Summary (dated October 2023)

## EXHIBIT A

## EXECUTIVE SUMMARY

This new City of Wilsonville (City) Wastewater Treatment Plant (WWTP) Master Plan (the Plan) has been developed to satisfy requirements associated with the State of Oregon Department of Environmental Quality (DEQ) guidance document entitled “Preparing Wastewater Planning Documents and Environmental Reports for Public Utilities.” To accommodate future flows and loads, projections were developed based on population projections and referencing WWTP historical data and DEQ wet weather projection methodologies. Similarly, to accommodate future water quality regulations, the Plan is adaptive and considers potential future regulatory changes.

The City prepared the Plan with the goal of developing a capital plan that identifies improvements required through the planning period (today through 2045) to comply with requirements of the WWTP National Pollutant Discharge Elimination System (NPDES) permit and potential future regulatory requirements, while accommodating growth identified in the City of Wilsonville Comprehensive Plan (October 2018, updated June 2020 - the 2018 Comprehensive Plan). These improvements are designed to provide the best value to the City’s ratepayers by maximizing the use of existing infrastructure and improving system operation while continuing to protect water quality and human health and supporting economic development, consistent with goals and policies contained in the 2018 Comprehensive Plan and 2021-2023 City Council Goals.

The City’s WWTP was originally built in the early 1970’s and discharges treated effluent to the Willamette River. The WWTP underwent major upgrades in 2014 to expand the average dry weather capacity to four million gallons per day (mgd) to accommodate the City’s continued growth. The WWTP processes include headworks screening and grit removal facilities, aeration basins, stabilization basins, secondary clarifiers, biosolids processing, cloth filtration, and disinfection processes. Additionally, the City contracts with Jacobs for operation of the WWTP, located at 9275 Southwest Tauchman Road.

This Plan identifies improvements taking into consideration:

- The age and condition of existing process equipment and structures,
- Growth in demand for sewer service due to increased population and economic development over the planning period,
- Potential changes to water quality regulations impacting process needs in order to meet effluent limitations and discharge prohibitions imposed by DEQ,
- City of Wilsonville Wastewater Collection System Master Plan (2014, MSA), and
- Consistency with the 2018 Comprehensive Plan and City Council 2023-2025 Strategy 1.

## ES.1 Planning Area Characteristics

Chapter 1 summarizes the City’s wastewater service area characteristics relevant to assessing WWTP facility needs. The planning area considered by this Plan is consistent with the City’s 2014 Collection System Master Plan and 2018 Comprehensive Plan including the urban growth boundary (UGB). The Basalt Creek Concept Plan, adopted in 2018, resulted in a modification of the future boundary between the cities of Tualatin and Wilsonville relative to the 2014 Wastewater Collection System Master Plan (CSMP). This decision is reflected in Figure ES.1, which shows the Study Area Boundary as analyzed in the 2014 CSMP, with the portion likely to annex to Tualatin now shown outside the current Study Area Boundary.

The northern portion of the City of Wilsonville is located within Washington County, and the majority of the City lies in the southwestern part of Clackamas County.

The City sits within the jurisdictional boundaries of Metro, the regional government for the Portland metropolitan area. By state law, Metro is responsible for establishing the Portland metropolitan area’s UGB, which includes Wilsonville. Land uses and densities inside the UGB require urban services such as police and fire protection, roads, schools, and water and sewer systems. A figure of the City’s existing land use is presented in Chapter 1. Also presented in

Chapter 1 are the City’s physical characteristics, water resources, and population and employment information, which are all significant factors in planning for wastewater conveyance and treatment facilities.

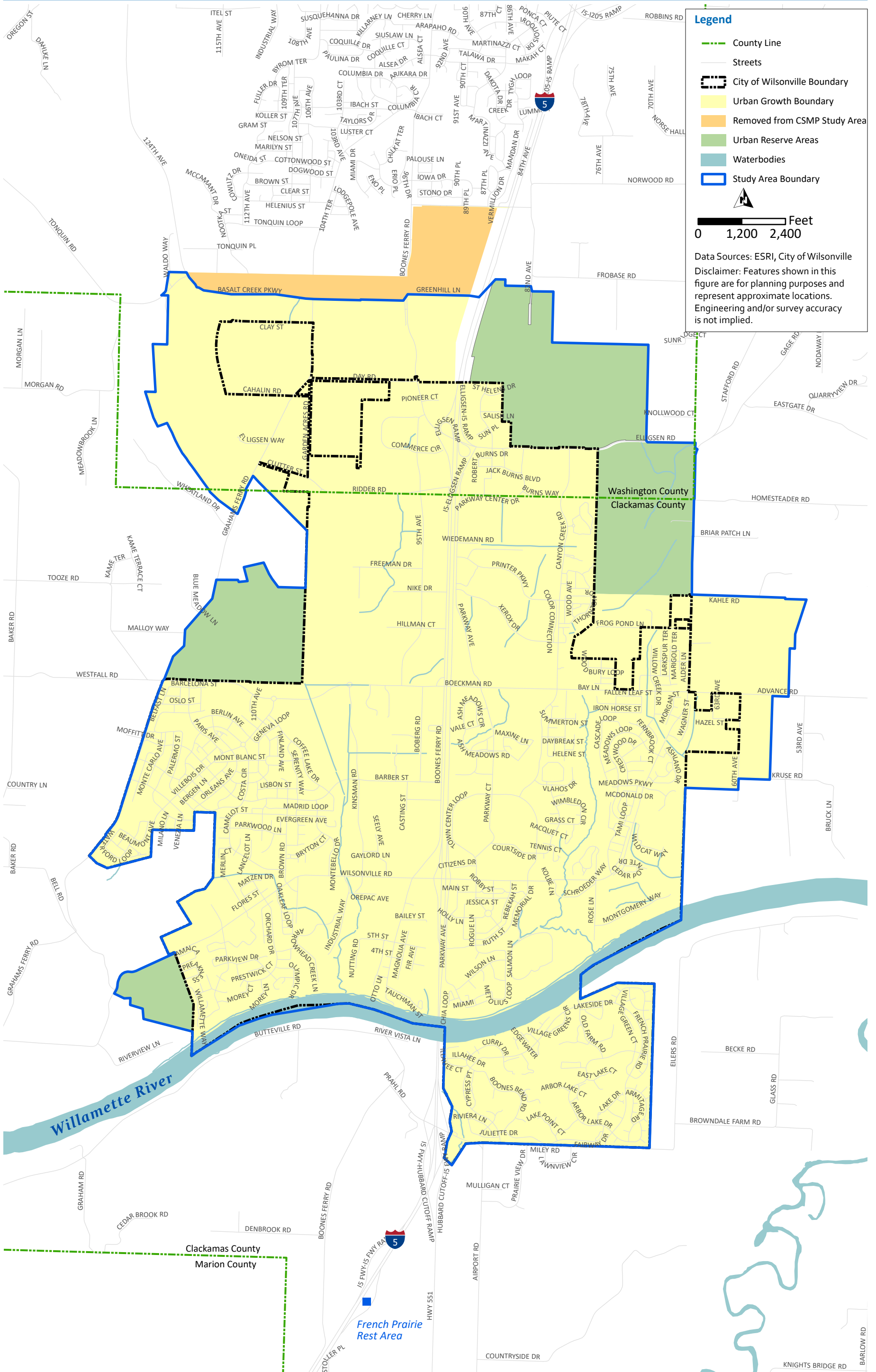


Figure ES.1 Planning Area



The Portland State University Population Research Center (PSU PRC) publishes annual estimates of populations for the previous year for cities in Oregon while Metro develops population projections for the future within the Portland metropolitan area, including Wilsonville. The PSU PRC estimated the City’s population as 27,414 in 2022.

The historical per capita flow and loads presented in this master plan are based on the PSU PRC certified population estimates while future flow and load projections are based on the CSMP estimates to maintain consistency with prior water and sewer enterprise planning (with the slight modification to exclude the portion of the Basalt Creek Planning Area (BCPA) mentioned above). Figure ES.2 details the current population along with the historical population and growth expected for the City using the CSMP projections. As is shown in Figure ES.2, the WSMP (2003) assumption of a 2.9 percent growth rate lines up well with the PSU PRC and US census data for the years 2010 through 2022. Current and future population are described in greater detail in Chapter 3.

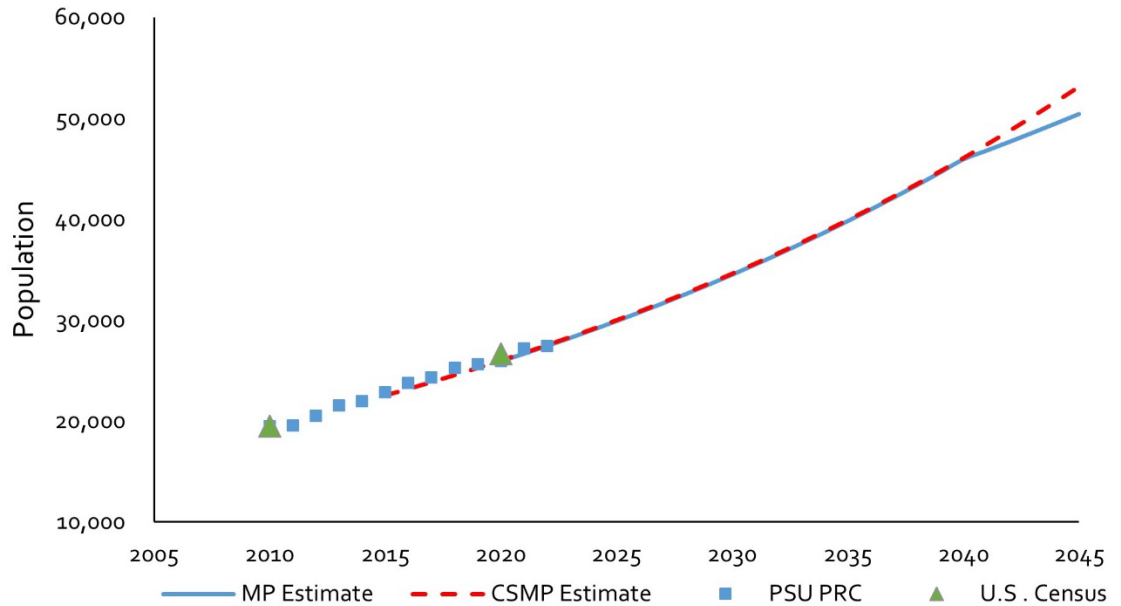


Figure ES.2 Historical Population and Expected Growth for the City of Wilsonville

**ES.2 WWTP Condition Assessment**

Carollo Engineers, Inc. (Carollo) reviewed prior condition assessments performed by others, conducted geotechnical investigations and performed seismic assessments at the WWTP in the course of Plan development.

In 2019, Jacobs Engineering Group Inc. (Jacobs) and Brown and Caldwell both completed condition assessments at the City's WWTP. A total of 322 major assets (per Jacobs' report), including process and mechanical equipment, motors and drives, control panels, generators, instrumentation, and structures, were examined for a variety of conditions that may signify their need for maintenance or replacement. Chapter 2 presents a summary of critical assets that require short term rehabilitation or replacement, as well as a list of assets that are less critical to operations, or have minor condition issues, but may be included in a short-term improvements project or a task order for Jacobs operations personnel. Table ES.1 displays the condition driven rehabilitation or replacement projects from Chapter 2 that were included in the recommended Capital Improvement Plan (CIP) in Chapter 7. The City undertook an updated assessment of WWTP condition in the summer of 2023. The 2023 assessment did not identify additional issues requiring significant capital outlays compared to the 2019 assessments.

Table ES.1 CIP Condition Driven Replacement Projects

Asset	Description
Trojan UV 4000 System	While only used as a backup to the Suez UV system, the Trojan system's HMI has errors that prevent it from showing the status of the lamps in module 3. Since it is used infrequently, the system's condition is largely unknown. After review of the 2019 condition assessment reports and discussion with the City and Jacobs staff, it was concluded that the UV 4000 unit must be replaced.
Secondary Clarifiers No. 1 and No. 2	Ovivo completed a field review of the plant's secondary clarifiers No. 1 and No. 2 in April 2022. Although both units were operational, repairs were identified to improve the operation of the clarifiers. The recommended repairs include drive controls for both units, new skimmers for both units, squeegees for both tanks rake arms, EDI chains, one motor and reducer assembly, one skimmer arm assembly, and new secondary clarifier mechanisms.

Notes:

Abbreviations: EDI - electronic data interchange; HMI - human-machine interface; No. - number; UV - ultraviolet.

### ES.3 Seismic Analysis

In 2021, Carollo performed a seismic evaluation and analysis of the City's WWTP as part of the overall plant condition assessment. Because the WWTP was substantially upgraded and expanded in 2014, most of its infrastructure is designed in accordance with the 2010 Oregon Structural Specialty Code (OSSC) and follows modern seismic design and detailing. During Tier 1 evaluations, Carollo identified potential deficiencies and areas for additional investigation. A Tier 1 seismic analysis is an initial evaluation performed to identify any potential deficiencies, whether structural or non-structural, in a building based on the performance of other similar buildings in past earthquakes. Subsequent to the Tier 1 analysis, a more detailed seismic evaluation of five older and potentially seismically vulnerable structures on the WWTP site was conducted. Those structures receiving a more detailed evaluation included the following:

- Operations Building.
- Process Gallery.
- Workshop.
- Aeration Basins and Stabilization Basins.
- Sludge Storage Basins and Biofilter.



The five potentially vulnerable structures were compared against an S-4 Limited Safety structural performance level and N-B Position Retention non-structural performance level for an M9.0 Cascadia Seismic Zone (CSZ) earthquake. The M9.0 CSZ is reflective of a catastrophic natural disaster event that has an estimated 35 percent likelihood of occurring within the next 50 years. Following the Tier 1 evaluation, Carollo began Tier 2 evaluations for a select number of identified deficiencies. Although none of the structures showed significant irregularities, the team did identify seismic deficiencies. The recommended seismic retrofits are included in the CIP for this Plan.

Prior to the 2021 seismic evaluation, Carollo's subconsultant, Northwest Geotech, Inc. (NGI), completed a seismic response and geologic hazards assessment of the City's WWTP. Through past and present site investigations and engineering analyses, NGI determined that the native soils beneath the site's granular pit backfill have low risk of liquefaction and its slopes do not pose undue risk. NGI concluded that the WWTP's primary site hazard is the differential settlement that may be caused by soil piping (development of subsurface air-filled voids), which raises the risk of sinkholes forming beneath structures and pipelines. Soil piping usually develops in unsaturated soils when a water source percolates into the ground. While the site is mostly paved and stormwater is being collected, there may be areas where infiltration is occurring next to structures or below pipelines. In spring 2023, NGI performed a visual crack survey and mapped existing cracks at accessible structure floor and foundation stem wall locations. In addition, NGI completed a 50-foot boring utilizing a sonic drilling technique to assist in determining grouting conditions, prior maximum excavation depths, and fill materials present in the vicinity of secondary clarifier 3. Recommended actions from NGI to mitigate the risk of soil piping and considerations for new structure foundations are presented in Chapter 2.

#### ES.4 Wastewater Flow and Load Projections

Chapter 3 of the Plan evaluates the historical and projected wastewater flows and loads generated in the City of Wilsonville's service area. The load projections include total suspended solids (TSS), biochemical oxygen demand (BOD<sub>5</sub>), ammonia (NH<sub>3</sub>), and total phosphorous (TP) loads.

Service area, residential population, industrial contribution, and rainfall records were all considered in the flow and load projection analyses. Facility planning involves estimating rates of growth in wastewater generation within the service area which are unlikely to align precisely with the actual growth observed. During the planning period, City staff will need to assess service area growth at regular intervals and revisit the analysis presented in this Plan.

The City previously estimated population for build-out of their service area. These estimates were taken from the City's Collection System Master Plan (2014, MSA) and as assumed in that document, projected the UGB reaches build-out in 2045. Figure ES.2 details the historical population and growth expected for the City. In addition, the City service area boundary upon which 2045 UGB build-out projections were based on the 2014 CSMP, has been altered slightly to account for a portion of the Basalt Creek Planning Area (BCPA) which is now expected to annex to the City of Tualatin and therefore will not receive wastewater service from the City of Wilsonville. Figure ES.2 illustrates the 2014 UGB build-out population projections from the CSMP compared to those based on the modified service area boundary.

The flow and load projections presented in Chapter 3 are based on the Collection System Master Plan projections (with the slight modification to exclude the portion of the BCPA mentioned above).

A determination will need to be made whether projected flows and loads (which drive assessments of unit process capacity) are aligned with calendar projections presented in this plan and consider if conclusions presented regarding capacity and timing of recommended improvements remain valid. If not, adjustments to the plan will need to be undertaken to ensure sufficient capacity remains available to serve anticipated growth. As actual future wastewater generation rates may also be slightly different than the unit factors considered in this Plan, operations staff at the plant will need to be familiar with the flow and load triggers for planning and design of logical increments of treatment capacity presented in this plan. If growth rates are higher, the schedule for improvements in this plan will need to align with calendar dates presented herein. If growth occurs more slowly, the City will be able to phase WWTP improvements on a less aggressive schedule.

Analysis of flow projections were completed through two different methods: (1) analysis of historical plant records and (2) DEQ Guidelines for Making Wet-Weather and Peak Flow Projections for Sewage Treatment in Western Oregon, which is referred to as the DEQ methodology in this Plan. Since there is no DEQ methodology for load analysis, all projections were developed based on historical plant records. Figure ES.3 summarizes the measured and projected maximum month, peak day and peak hour flows. The projections for the remaining flow elements can be found in Chapter 3. As is shown in Figure ES.3, the peak hour flow is projected to exceed the peak hour flow of 16 mgd listed on the 2014 Improvements Drawings close to the year 2040. The projected 2045 peak hour flow is based on a 10-year (rather than a 5-year) design storm and does not account for storage or flow attenuation in the collection system. In 2023 the City undertook a hydraulic analysis of the WWTP concluding that certain elements will be deficient as the service area develops. This is discussed in greater detail in Chapter 4. This has important implications for facility improvement costs recommended in this Master Plan, which are based on estimates and projections of flows and loads which may not align with the timelines presented in this Master Plan. As such it is recommended the City perform additional evaluation of the WWTP and collection system, along with monitoring actual flows, to further evaluate whether future flow equalization can be achieved and whether recommended improvements at the WWTP will all be triggered within the planning period.

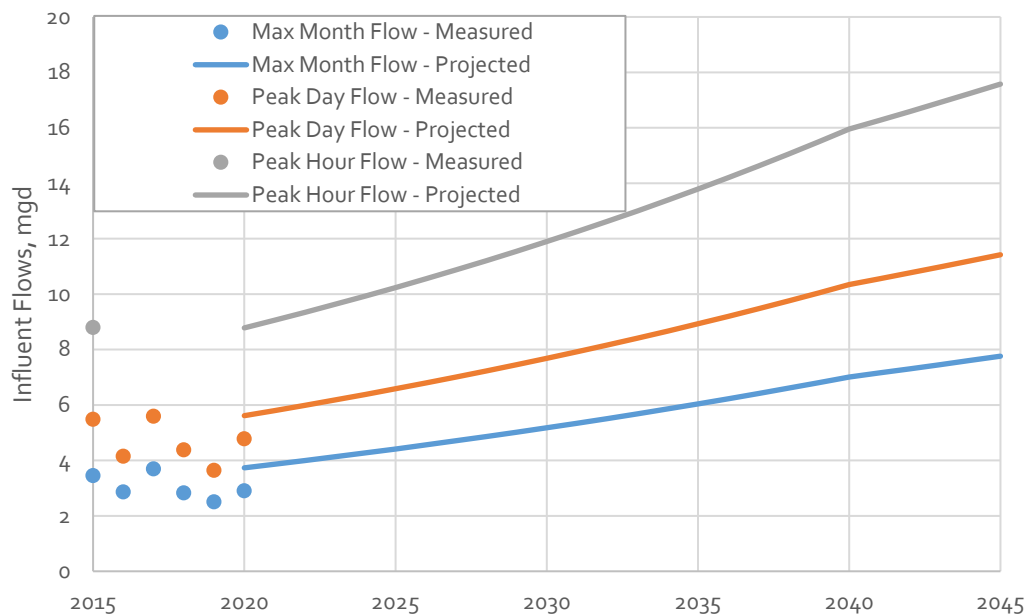


Figure ES.3 Flow Projection Summary

Load projections were calculated for influent TSS, BOD<sub>5</sub>, NH<sub>3</sub>, and TP. Figure ES.4 summarizes the measured and projected influent maximum month BOD and TSS loads. The projections for the remaining load elements can be found in Chapter 3.

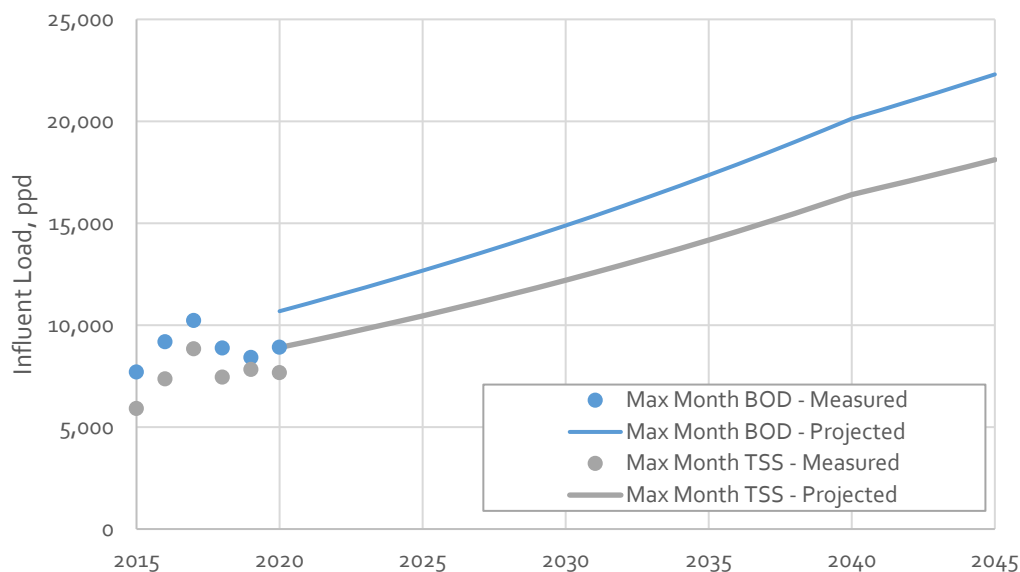


Figure ES.4 Load Projection Summary

The projected flows and loads developed in Chapter 3 were compared against the rated capacity for each of the WWTP's unit processes to determine whether expansion would be required within the planning period. The findings of this capacity analysis are discussed in the next section.

## ES.5 Capacity Analysis

Summaries of plant process area capacity assessments and conclusions are presented in this Plan. These assessments focus on the need for improvements or upgrades to existing facilities to address capacity deficiencies identified in the course of Master Plan evaluations. A site plan of the City's existing WWTP is presented in Figure ES.5.

Chapter 4 identifies existing capacity ratings and deficiencies for the liquid and solids stream treatment processes at the City's WWTP. Analyses are based on operational practices in place at the time and existing effluent limits established by the WWTP's NPDES permit. Biological process modeling was performed using BioWin version 6.2 to predict plant performance under current and future flow and loading conditions to assess when unit process capacities may be exceeded within the planning period (present through 2045).

A summary of the capacity assessment completed using growth projections described in Section ES.1 is detailed below in Table ES.2. Chapter 4 presents the methodology and findings in greater detail.

- LEGEND:**
- 1 - DEWATERING & DRYING BUILDING
  - 2 - PROCESS GALLERY
  - 3 - SECONDARY CLARIFIER NO. 1
  - 4 - SECONDARY CLARIFIER NO. 2
  - 5 - UV DISINFECTION SYSTEM
  - 6 - WORKSHOP
  - 7 - SECONDARY PROCESS FACILITY
  - 8 - STABILIZATION BASIN
  - 9 - SLUDGE STORAGE BASINS AND BIOFILTERS
  - 10 - HEADWORKS
  - 11 - DISK FILTERS
  - 12 - COOLING TOWERS
  - 13 - W3 REUSE PUMP STATION
  - 14 - OPERATIONS BUILDING
  - 15 - SITE ENTRANCE



0 30' 60' 120'  
SCALE: 1" = 60'

**Figure ES.5**  
**EXISTING WILSONVILLE WWTP**  
CITY OF WILSONVILLE

Plot Date: 6/28/2022 9:15:35 AM  
FILE NAME: 11962A00\_FIGURE\_SEED.DWG  
LAST SAVED BY: bhawes



Table ES.2 Unit Process Capacity Assessment

Unit Process	Capacity Assessment
<b>Preliminary Treatment</b>	
Screening	There is sufficient hydraulic capacity with both mechanical screens operational to accommodate a PHF of 17.6 mgd. Hydraulic modeling conducted by Jacobs in 2023 indicates that hydraulically the influent screening can pass the projected PHF.
Grit Removal	The 2012 WWTP Improvement documents indicate a design capacity of 16 mgd for the vortex grit basin. However, Hydraulic modeling conducted by Jacobs in 2023 indicates that hydraulically, the grit removal system can pass a PHF of 17.6 mgd. At this flow rate the anticipated performance would be poor.
<b>Secondary Treatment</b>	
Secondary Treatment	Based on maximum week MLSS predicted from BioWin modeling at peak day flow with all clarifiers in service (and assuming a 5-day SRT), there is only sufficient capacity through 2027. Upsized process piping is expected to be necessary to convey flow from the headworks to the secondary process and to return activated sludge within the secondary process under future flow conditions
Aeration Blowers	The air demands of the secondary treatment process are projected to exceed the firm capacity of the aeration blowers under peak conditions by 2027.
<b>Tertiary Treatment and Disinfection</b>	
Disk Filters	The existing disk filter capacity is expected to be exceeded by 2032 with one unit out of service or in backwash mode based on effluent limitations included in the City's DBO Contract with Jacobs. At this time the City expects to relax these contract limitations rather than invest in additional capacity.
Secondary Effluent Cooling Towers	The projected peak day flow during the months of June through September is expected to exceed the capacity of the cooling tower by the year 2036.
UV Disinfection	The existing UV channels do not have adequate capacity to disinfect the 2045 PHF with all units in service. However, the firm capacity of the UV system is sufficient to treat the PDDWF through the year 2045 with one channel out of service. The City currently has an older UV unit in place as an emergency backup to the primary system. That backup unit is aging and the City plans replacement during the planning period. By the year 2040, the UV channels are expected to exceed their hydraulic capacity.
Outfall	Even with the Willamette River at its 100-year flood elevation, it is expected that the outfall pipeline can accommodate approximately 19 mgd before the UV channel effluent weirs are at risk of submergence upstream. Since this flow is well above the hydraulic capacity of the rest of the plant, no expansion will be needed until after 2045. <sup>(1)</sup> Jacobs found that under projected 2045 PHF conditions certain process and effluent piping, including piping just upstream of the Willamette River outfall and diffuser system, may be hydraulically deficient. At PHF 17.6 mgd and assuming a 0.8 mgd recycle scenario the headworks screens and grit removal systems are expected to be unsubmerged. However, upsized outfall piping between MH-B and MH-D2 is expected to be necessary to convey flow from the headworks to the secondary process under these conditions
<b>Solids Handling</b>	
Gravity Belt Thickener	Assuming continuous operation, the capacity analysis results indicate adequate capacity for thickening the current and projected maximum week WAS loads with one unit out of service. These units are aging and the City plans replacement during the planning period.
TWAS Storage	The TWAS storage volume is sufficient to accommodate the expected maximum week solids loads for two days (assuming TWAS is thickened to 4 percent).
Dewatering Centrifuges	The rated capacity of the current centrifuges is sufficient to process the maximum week load with one unit out of service through 2042 assuming operating times of 24 hours per day for 7 days per week, per the criteria detailed in Chapter 4. <sup>(2)</sup> These units will reach the end of useful life during the planning period and the City plans replacement accordingly.
Biosolids Dryer and Solids Disposal	The capacity of the biosolids dryer is adequate for handling the current and projected max week solids loads (in year 2045) on the basis of its design evaporation rate, assuming dewatered cake is dried from 20 percent TS to 92 percent TS and the dryer is operated for 24 hour per day for 7 days per week. <sup>(3)</sup> This unit is aging, has had recent performance issues and the City plans replacement during the planning period.

## Notes:

(1) The existing outfall was recently modified and equipped with five parallel diffuser pipes equipped with duckbill check valves to improve the mixing zone characteristics in the Willamette River.

(2) The centrifuges have exhibited inconsistent performance. The City recently refurbished these units and expects they will provide sufficient capacity through 2045.

(3) The existing solids dryer has sufficient capacity through 2045 but has exhibited inconsistent performance.. See Alternative 2B, Chapter 6.

Abbreviations: DBO - Design-Build-Operate; gpd/sf - gallons per day per square foot; MLSS - mixed liquor suspended solids, SPA - State Point Analysis; SRT - solids residence time; TS - total solids; TWAS - thickened waste activated sludge.





Table ES.3 further summarizes the capacity assessment by listing each unit process, associated design parameters and year of possible capacity exceedance.

Table ES.3 Unit Process Capacity Year Summary

Unit Process	Design Parameter	Redundancy Criteria	Year of Capacity Exceedance
Influent Screening	PHF	Bypass channel with manual bar rack in service and one mechanical screen out of service	>2045
Grit Chamber	PHF	All units in service	>2045 <sup>(1)</sup>
Secondary Treatment	MW MLSS Inventory at PDF	All units in service	2027
Secondary Effluent Cooling Towers	June 1 - Sept 30 PDF	All units in service	2036
Disk Filters	MWDWF	One unit in backwash	2032 <sup>(2)</sup>
UV Disinfection Channels	PHF	All units in service	2040 <sup>(1)</sup>
Outfall	PHF	-	>2045
Gravity Belt Thickening	MW Load	One unit out of service	2042
Dewatering Centrifuges	MW Load	One unit out of service	>2045 <sup>(3)</sup>
Biosolids Dryer	MW Load	All units in service	>2045 <sup>(3)</sup>

Notes:

- (1) The plant hydraulic modeling done as a part of the 2012 WWTP Improvements Project only evaluated plant flows as high as 16 mgd. The projected peak hour flows presented in Chapter 3 exceed this flow by the year 2045. There are some unit processes including the grit removal system, secondary clarification and UV disinfection that have a peak hydraulic capacity of 16 mgd. The hydraulic analysis conducted by Jacobs in 2023 found that under projected 2045 PHF conditions certain process and effluent piping may be hydraulically deficient. At PHF 17.6 mgd and assuming a 0.8 mgd recycle scenario the headworks screens and grit removal systems are expected to be unsubmerged. However, upsized piping is expected to be necessary to convey flow from the headworks to the secondary process under these conditions.
- (2) Existing Disk Filters are predicted to exceed reliable capacity (one unit out of service) in 2028 based on vendor provided design criteria. This conclusion assumes limitations for effluent total suspended solids contained in the WWTP DBO contract, which are far more stringent than the City's NPDES permit. At this time the City expects to relax these contract limitations rather than invest in additional capacity. Following startup of secondary treatment membrane bioreactors in 2030, the tertiary filters will be required less to meet the effluent requirements of the NPDES permit. It is anticipated the City will maintain these facilities to allow flexibility in operation to account for servicing and membrane facility downtime.
- (3) As noted previously, the existing centrifuges and biosolids dryer appear to have sufficient capacity through the planning year 2045, however condition and age are likely to require replacement during the planning period. It is recommended the City reassess available replacement technologies prior to replacement and consider loading appropriate to the planning horizon of any new units selected.

Abbreviations: MW - maximum week

## ES.6 Regulatory Considerations and Strategy

It is the responsibility of the Oregon DEQ to establish and enforce water quality standards that ensure the Willamette River's beneficial uses are preserved. Discharges from wastewater treatment plants are regulated through the (NPDES). All discharges of treated wastewater to a receiving stream must comply with the conditions of an NPDES permit. The Wilsonville WWTP discharges to the Willamette River at River Mile 38.5 just upstream of the Interstate 5 bridge. The existing permit limits for the Wilsonville WWTP are shown in Table ES.4. This permit became effective on September 1, 2020 and expires July 30, 2025.

Table ES.4 Current Effluent Permit Limits

Parameter	Average Effluent Concentrations		Monthly Average, (ppd)	Weekly Average, (ppd)	Daily Maximum, (lbs)
	Monthly	Weekly			
<b>May 1 - October 31</b>					
CBOD <sub>5</sub>	10 mg/L	15 mg/L	190	280	380
TSS	10 mg/L	15 mg/L	190	280	380
<b>November 1 - April 30</b>					
BOD <sub>5</sub>	30 mg/L	45 mg/L	560	840	1100
TSS	30 mg/L	45 mg/L	560	840	1100
<b>Other Parameters Limitations</b>					
E. coli Bacteria	<ul style="list-style-type: none"> <li>Shall not exceed 126 organisms per 100 ml monthly geometric mean.</li> <li>No single sample shall exceed 406 organisms per 100 ml.</li> </ul>				
pH	<ul style="list-style-type: none"> <li>Instantaneous limit between a daily minimum of 6.0 and a daily maximum of 9.0</li> </ul>				
BOD <sub>5</sub> Removal Efficiency	<ul style="list-style-type: none"> <li>Shall not be less than 85% monthly average</li> </ul>				
TSS Removal Efficiency	<ul style="list-style-type: none"> <li>Shall not be less than 85% monthly average</li> </ul>				
ETL June 1 through September 30	<ul style="list-style-type: none"> <li>Option A: 39 million kcal/day 7-day rolling average</li> <li>Option B: Calculate the daily ETL limit</li> </ul>				

**Notes:**

Abbreviations: CBOD<sub>5</sub> - five-day carbonaceous biochemical oxygen demand; ETL - excess thermal load; kcal/day - kilocalories per day; lbs - pounds, mg/L - milligrams per liter; ml - milliliter.

The WWTP has been compliant with NPDES permit limits, generally. However due to construction issues that required that aeration basins be offline, equipment failure and issues with solids processing, the WWTP did violate their NPDES permit over eight months between 2015 and 2020 (December 2015, February 2017, April 2017, January 2018, August 2018, May 2020, June 2020 and July 2020). Most of these violations were due to the daily effluent TSS load exceeding the maximum daily load limit in the NPDES permit. It is anticipated that once the issues with solids processing are addressed, the City's current treatment process will be able to meet permit limits.

Chapter 5 details potential regulatory issues the City will need to take into consideration in coming years. Several possible regulatory actions by the Oregon DEQ could drive investments in

future improvements at the City's WWTP. The plant discharges to the Willamette River and existing and future effluent limitations contained in the NPDES permit dictate, in large part, the necessary treatment processes and configuration at the WWTP necessary to maintain compliance.

Future treatment upgrades may be required when DEQ establishes total maximum daily loads (TMDL) for the lower Willamette River. Dissolved oxygen and nutrient limits, such as phosphorus limitations, are possible. The dissolved oxygen in the lower part of the river does not always meet water quality standards, and indications of excessive nutrients, such as chlorophyll-a, aquatic weeds, and harmful algal blooms, are present in the lower Willamette River. DEQ has begun its triennial review of Oregon's water quality criteria. The review could result in more stringent or new discharge requirements, but this process will take several years. For planning purposes, providing plant footprint to accommodate future treatment to remove phosphorus and address dry weather seasonal limits on dissolved oxygen should be anticipated. In addition, the City should continue to engage with DEQ regarding any proposed receiving water temperature regulatory actions.

### ES.7 Alternative Development and Evaluation

Chapter 6 presents the methodology and findings of a process improvements alternatives evaluation. The plant's treatment process needs were defined by comparing the plant's existing condition, capacity and reliability, with the projected flows, loads, and regulatory constraints for the recommended alternatives. Where capacity deficiencies were predicted, at least two alternatives were analyzed for each corresponding unit process. Process modifications associated with each alternative were modeled in BioWin to evaluate the overall impact on plant operations.

As identified in Chapter 4, the secondary treatment process is expected to require additional capacity during the planning horizon (2045). Chapter 6 details two alternatives to address these capacity limitations. The two alternatives considered to increase secondary capacity are:

1. Expansion of the existing conventional activated sludge process; and
2. Intensification of the existing treatment process using membrane bioreactor (MBR) technology.

Due to the higher capital and operating costs of intensification, construction of a new conventional aeration basin is recommended as the first phase to increase secondary capacity. As flows and loads increase, or regulatory requirements become more stringent, it is expected to become necessary to intensify treatment. It is recommended the City revisit this evaluation as the need for 1) additional capacity to accommodate growth nears or 2) more stringent effluent limitations are considered. This offers the opportunity to take advantage of potential advances in technology as well as confirming the predicted time frame of capacity exceedance. A new aeration basin project is included in the Capital Improvement Plan in Chapter 7. As loads continue to increase, this plan includes the gradual conversion of the existing conventional activated sludge process to a membrane bioreactor process.

The existing aeration blower system firm capacity is expected to be deficient by 2027. An additional aeration blower (with approximately double the capacity of the current blowers) would provide for the first phase of capacity expansion. As loads continue to increase, the plan includes the gradual upsizing of the existing blowers.

The projected peak day flow between June through September is expected to exceed the capacity of the existing cooling tower. Since the existing cooling tower system was designed to be expanded with the addition of one more tower, the plan assumes the expansion of the existing cooling tower process by the year 2036 to meet the projected summer peak day flows.

Additional tertiary filtration capacity is predicted to be needed by 2032 to provide full treatment of the MWDWF with one disc filter out of service or in backwash mode. As the City has selected an intensification technology utilizing membranes, this is likely to eliminate tertiary filtration capacity concerns as the membranes replace the filtration process for TSS removal in plant effluent.

While the capacity assessment findings presented in Chapter 4 determined existing gravity belt thickeners and dewatering centrifuges have sufficient capacity assuming continuous operation, the remaining equipment service life may require replacement within the planning horizon. The centrifuges, installed in 2014, were recently refurbished, but by 2045, will have been in service for over 30 years. In addition, the gravity belt thickeners (GBT) which thicken the sludge prior to delivery to the centrifuges for dewatering, have been in service even longer. The City should plan for their replacement within the planning horizon and consider whether a capacity increase is needed at the time of replacement based on projections of solids production and processing needs. Additionally, the secondary process was modified in 2020 and has experienced extended periods where mixed liquor concentrations have been elevated above typical ranges for conventional activated sludge or extended aeration processes. Due to the complications with secondary process operation and performance issues with the centrifuges, it is recommended the City study the secondary treatment and dewatering processes to confirm that the assumptions and conclusions regarding centrifuge capacity in Chapter 4 may be relied upon. A dewatering performance optimization study is recommended so the City can collect and analyze secondary treatment and solids processing performance data. For budgeting purposes, an opinion of probable cost for replacing the existing centrifuges is presented in Chapter 7. Timing of that equipment replacement will depend on performance of the existing units, future loading assumptions, and observed condition.

The existing solids dryer has experienced operational issues in recent years, including a fire that caused extensive damage to the equipment in April 2019 and a leaking rotary joint and damaged seal in 2021. As of February 25, 2022, the dryer has been repaired and is operating. Because of the City's commitment to solids drying as the preferred process to achieve Class A biosolids, the alternatives evaluation presented in this Plan for future dryer replacement was conducted with a focus on thermal drying options only.

Chapter 6 details an analysis of the following alternatives to improve the drying system:

1. Alternative 1 - Continue operating the existing biochemical reactor (BCR) paddle dryer and defer replacement.
2. Alternative 2 - Modify the existing Dewatering and Drying Building to accommodate a different solids dryer technology or a redundant dryer.
3. Alternative 3 - Construct a new dryer building with a different solids dryer technology.

While it is anticipated the existing dryer has useful life through at least 2026 (current DBO contract expiration), by 2031 the dryer will have been in operation for over 15 years. It is recommended the planning and design of upgrades to provide reliable dryer capacity begin in 2031, or sooner if further operational concerns arise. The City has indicated a preference for a

variation of Alternative 2 which involves expanding the existing Dewatering and Drying Building to accommodate a second solids paddle dryer. This alternative provides backup capacity to allow the City to continue delivering Class A solids during periods of downtime if a mechanical failure occurs or to accommodate regular maintenance of one dryer train. As mentioned previously, this Plan recommends the City complete a study of the secondary sludge quality, performance of that process, chemical addition types and locations, and solids handling process performance overall prior to making a final selection of the preferred dryer alternative from the alternatives detailed in Chapter 6. For purposes of capital planning, this Plan assumes the City will implement Alternative 2b (modification of Dewatering and Drying Building to accommodate a second paddle dryer) with a study and confirmation of this selection beginning in 2031.

Lastly, the City wants to establish a direct connection between the City’s fiber optics network and the WWTP. This addition consists of routing two new conduits (one spare) and fiber optic cabling from the WWTP’s Operations Building to the site entrance, where the conduits will be tied into the City’s fiber optics network. Chapter 6 details one potential routing from the Operations Building to the site entrance that would minimize impact to existing yard utilities. The fiber optic cable addition is included in Chapter 7 and the City’s 5-year CIP.

Table ES.5 below summarizes the alternatives evaluated in Chapter 6 including recommendations for future WWTP improvements.

Table ES.5 Summary of Alternatives

Unit Process	Alternatives Considered	Selected Alternative
Secondary Treatment	<ul style="list-style-type: none"> <li>Expansion of the existing conventional activated sludge process.</li> <li>Intensification of the existing treatment process.</li> </ul>	<ul style="list-style-type: none"> <li>Expansion of the existing conventional activated sludge process through the addition of another aeration basin. Further phased expansion of capacity through addition of membrane bioreactor (MBR) and fine screening facilities.</li> </ul>
Solids Dryer	<ul style="list-style-type: none"> <li>Continue operating the existing BCR paddle dryer and defer replacements.</li> <li>Modify the existing Dewatering and Drying Building to accommodate a different solids dryer technology or a redundant dryer.</li> <li>Construct a new dryer building with a different solids dryer technology.</li> </ul>	<ul style="list-style-type: none"> <li>Modify the existing Dewatering and Drying Building to accommodate a different solids dryer technology or a redundant dryer by expanding the Dewatering and Drying Building to accommodate a second solids paddle dryer.</li> </ul>

### ES.8 Recommended Alternative

Figure ES.6 presents a WWTP site plan identifying locations of recommended improvements resulting from condition and capacity assessments, including evaluation of alternatives, as described.

Summaries of opinions of probable costs and anticipated phasing for the improvements recommended for inclusion in the City’s WWTP CIP are provided in Table ES.6.

The expected cash flow for the planning period was determined for the recommended improvements summarized in Table ES.6. The cash flow through 2045 includes an escalation rate of three percent, and the estimated peak expenditure for any fiscal year is

approximately \$55,434,000 in fiscal year 2030. The projected CIP expenditures are presented in Figure ES.7. Capital costs estimated in the Plan will be considered as the City assesses the need to adjust sewer enterprise rates and charges in coming months. It will be important to distinguish capacity and condition (repair and replacement) driven improvements in assigning costs to existing rate payers and future users.

Table ES.6 WWTP CIP - Recommended Alternative Opinion of Probable Cost and Phasing

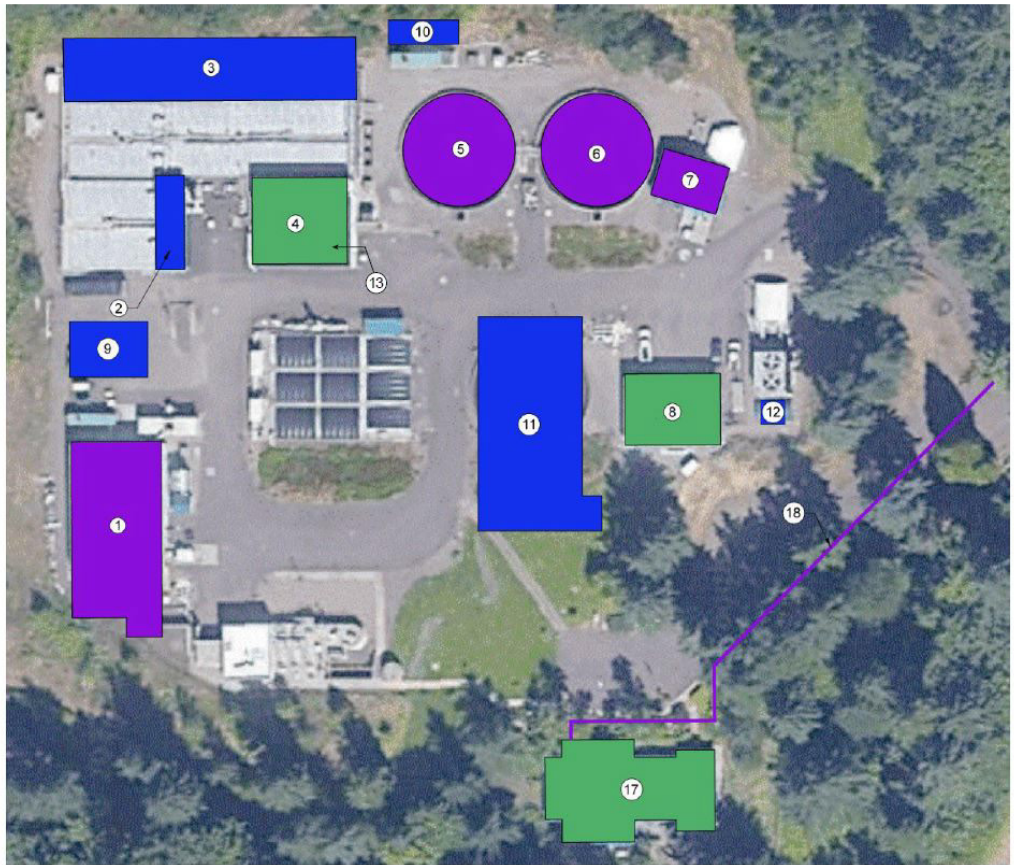
Plant Area	Project <sup>(1)</sup>	Opinion of Probable Cost <sup>(2)</sup>	Approximate Year Online
Solids Handling	Dewatering Performance Optimization	\$150,000	2025
Communications/IT	Fiber Optic Cable Addition	\$60,000	2025
UV System	Backup UV System Improvement	\$1,705,000	2026
Support Buildings	Seismic Improvements	\$1,082,000	2026
Secondary Treatment	New Conventional Aeration Basin and Blower	\$10,222,000	2027 <sup>(3)</sup>
Secondary Treatment	New Secondary Clarifier Mechanisms	\$1,775,000	2027
Secondary Treatment	New MBR, Blowers and Fine Screens (Phase 1)	\$69,727,000	2031
Solids Handling	Solids Dryer Improvement	\$17,130,000 <sup>(7)</sup>	2033
Solids Handling	Existing Centrifuge and GBT Replacement	\$3,701,000 <sup>(4,6)</sup>	2033 <sup>(5)</sup>
Cooling Towers	New Effluent Cooling Tower	\$642,000	2036
Secondary Treatment	Additional MBR and Blower Capacity (Phase 2)	\$2,330,000	2039
UV System	UV Equipment Replacement	\$2,571,000	2040
Outfall	Outfall Improvements	\$1,244,000	2040
Secondary Treatment	Additional MBR and Blower Capacity (Phase 3)	\$8,117,000	2044
<b>TOTAL</b>		<b>\$120,456,000</b>	

Notes:

White rows indicate projects that are in the City's 5-year CIP and blue rows indicate projects that are outside the 5-year CIP window.

- (1) Details of each project can be found in Chapter 2 or Chapter 6 of this Master Plan.
- (2) The estimated opinion of probable costs include the construction costs plus ELA (or soft costs). Details on the estimated project costs can be found in Chapter 2 or Chapter 6 of the plan, with the exception of costs for the backup UV system and centrifuges which are presented earlier in Chapter 7. All costs presented are based on an August 2023 ENR index of 13473.
- (3) As identified in Chapter 4, the secondary treatment process at the Wilsonville WWTP is expected to require additional capacity by the year 2027. Since design and construction of a new aeration basin may take longer than the year 2027, the City will likely need to operate at SRTs lower than 5 days during the maximum week condition if growth occurs as predicted in Chapter 3.
- (4) For budgeting purposes, the Option B centrifuge cost from Table H-2 in Appendix H is used for the project cost summary and the CIP.
- (5) Replacement timing dependent upon satisfactory equipment performance.
- (6) The centrifuges installed with the City's 2014 upgrade project have exhibited inconsistent performance in recent months. The City recently refurbished these units and expects they will provide sufficient capacity through 2042. However, by that time, the units will have been in service for over 30 years. It is recommended the City plan for replacement of these units during the planning horizon of this Master Plan. Assuming replacement occurs in the mid-2030's the City should reassess capacity needs of those units beyond the 2045 horizon, consistent with the expected service life of the new equipment.
- (7) The existing solids dryer has sufficient capacity through 2045. As with the dewatering centrifuges, the dryer equipment will soon have been in operation for a decade. It is recommended the City plan for replacement of the dryer during the planning horizon of this Master Plan. The City plans to replace the existing dryer with a new piece of equipment using similar technology and potentially rehabilitate the existing unit to serve as a backup. See Alternative 2B, Chapter 6.

The years in which key processes are projected to exceed capacity are presented in Figure ES.8. The green line illustrates projected MM BOD triggers for existing and proposed new secondary treatment facilities. Projected PHF is shown in blue indicating capacity exceedance of the cooling tower and certain elements of plant hydraulics. Prior to the year of projected exceedance, planning, design, and construction activities will be required to allow upgrades to be commissioned to prevent capacity exceedances. It is important to note that the timing of improvements should be driven by the rate of growth in influent flow and load. Dates indicated in Figure ES.8 and elsewhere in this document should be considered best, conservative estimates based on projections presented herein and professional judgment.



- ③ New Aeration Basin
- ② Additional Aeration Blowers
- ⑨ New Fine Screens
- ⑩ New Emergency Generator
- ⑪ New MBR Facility
- ⑫ New Cooling Tower
- ⑬ Replace Gravity Belt Thickeners
- ⑦ Replace backup UV system
- ① Replace Solids Dryer & Centrifuges
- ⑤ ⑥ Replace Clarifier 1 & 2 mechanisms
- ④ ⑧ ⑬ Seismic retrofits of buildings
- ⑮ New fiber optic connection
- ⑯ Solids process study

Figure ES.6 Proposed WWTP Improvements Site Plan



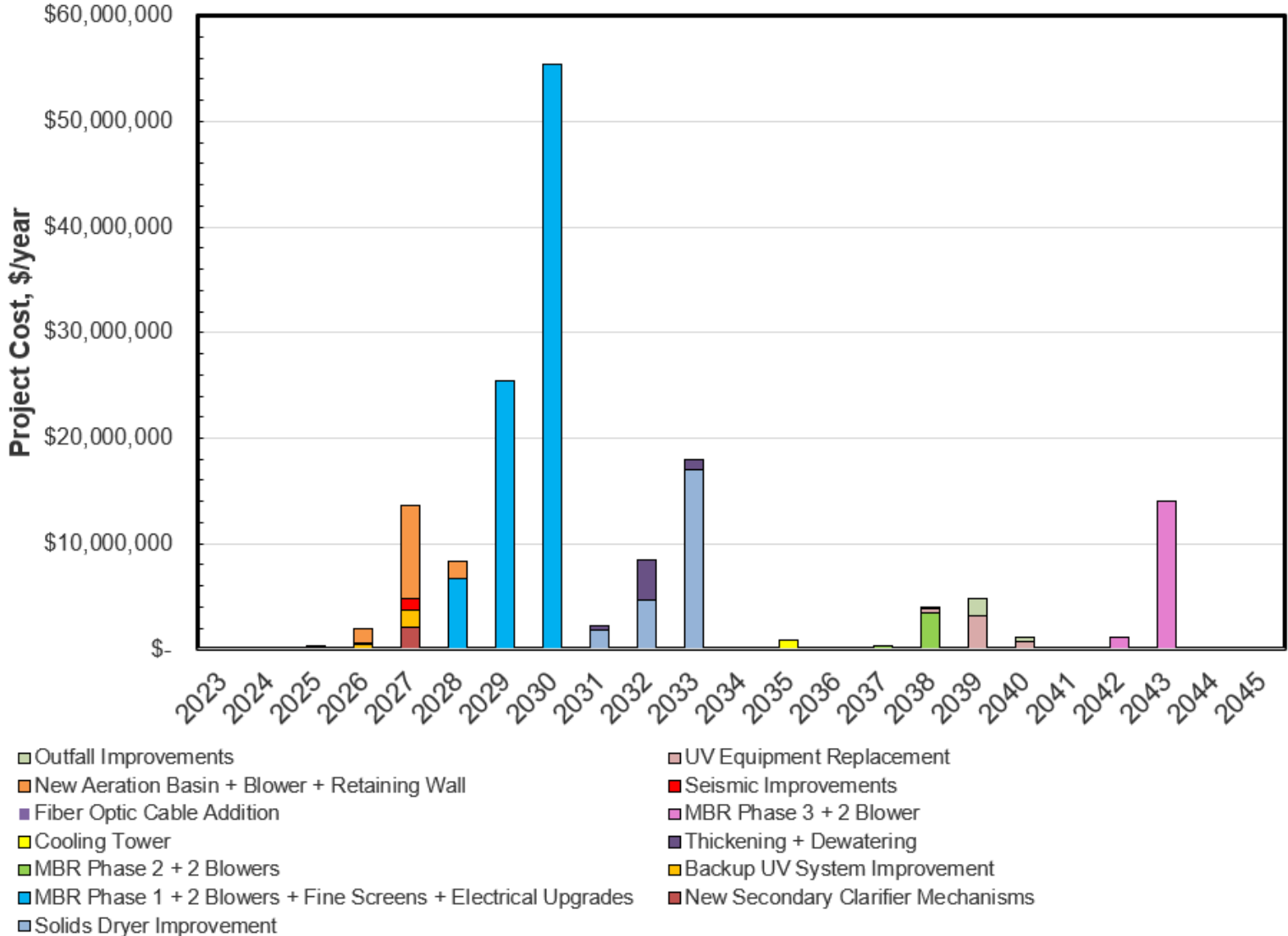


Figure ES.7 Projected 20-Year CIP Expenditures

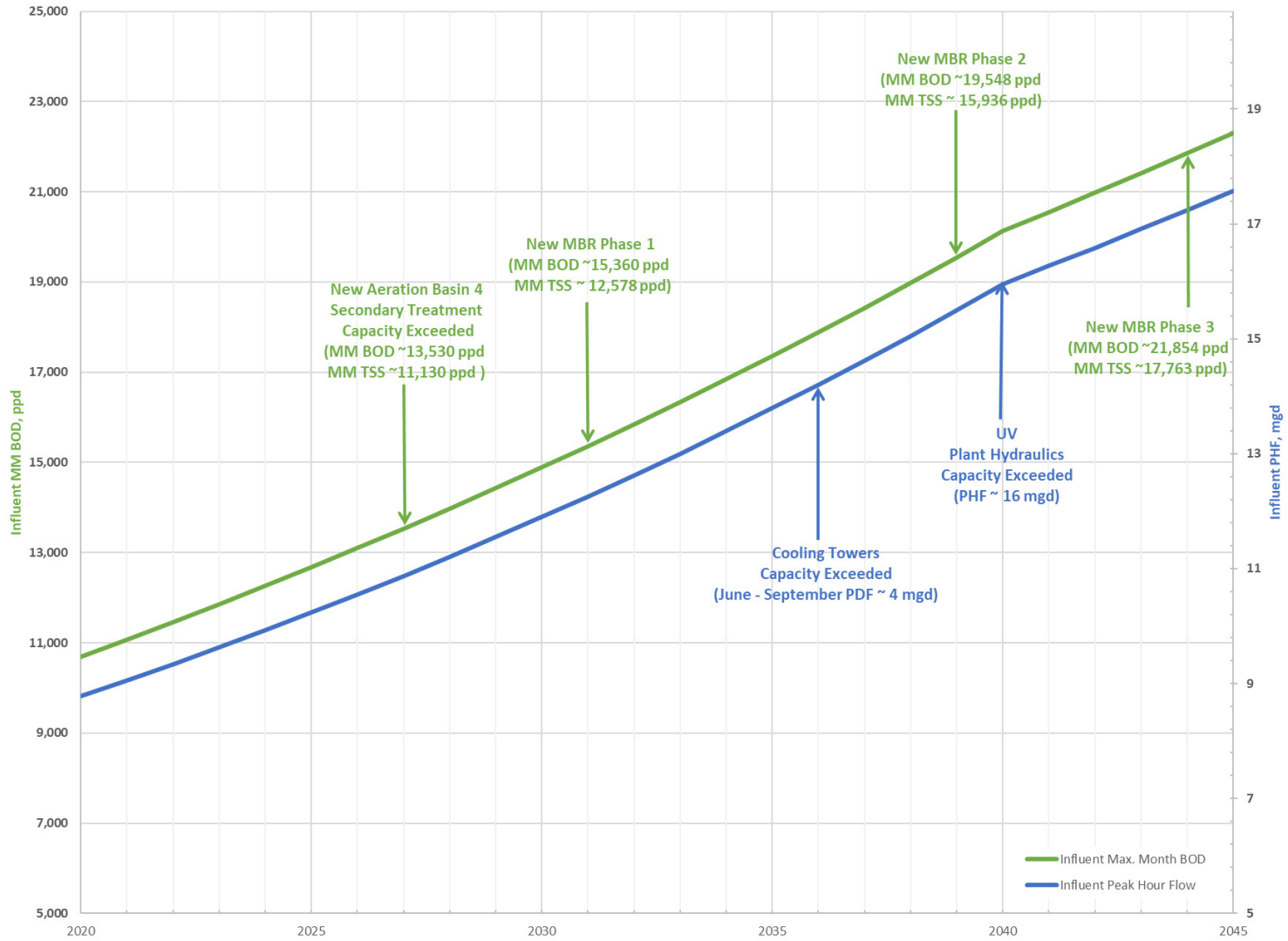


Figure ES.8 Capacity Trigger Graph

# City of Wilsonville Wastewater Treatment Plant Master Plan

City Council Work Session

November 6, 2023



**WILSONVILLE**  
OREGON

# Project Overview and Update



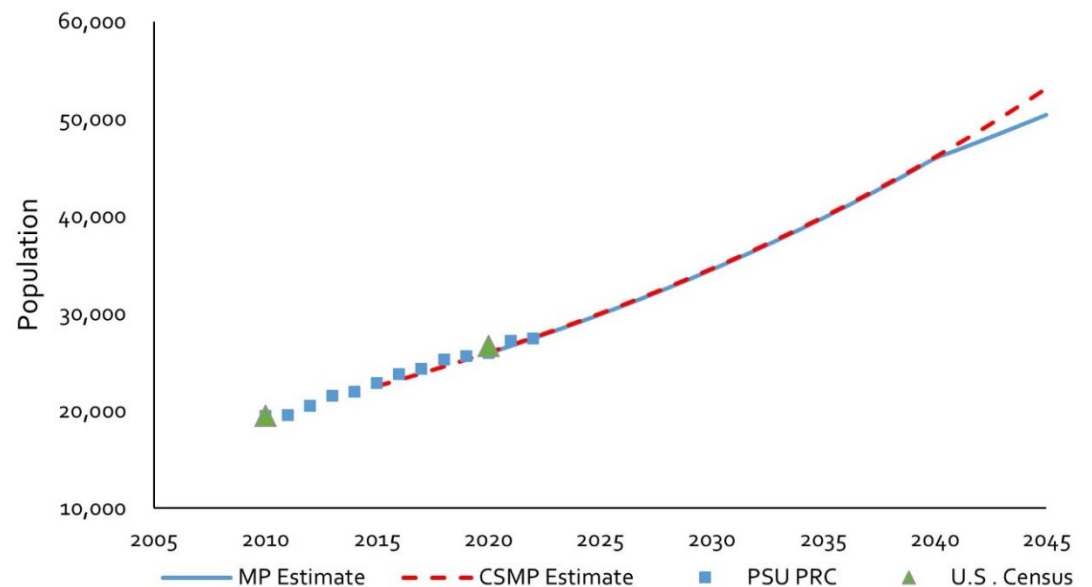
- Work Completed Since Last Work Session
  - Updated population growth projections and service area boundary
  - Increased existing industrial discharges to maximum allowed by permit limits
  - Expanded seismic resilience analysis
  - Hydraulic modeling of WWTP
  - Updated capital project list and schedule

# Capital Planning and Expected Growth - 2045

- Buildout of Service Area through 2045
  - Adjusted population growth rate, consistent with recent planning efforts
  - Modified service area boundary, per Basalt Creek Concept Plan

*Buildout Population Projections (High 2.9%)*

2020	2030	2045	2050
25,915	35,163	46,798	50,388

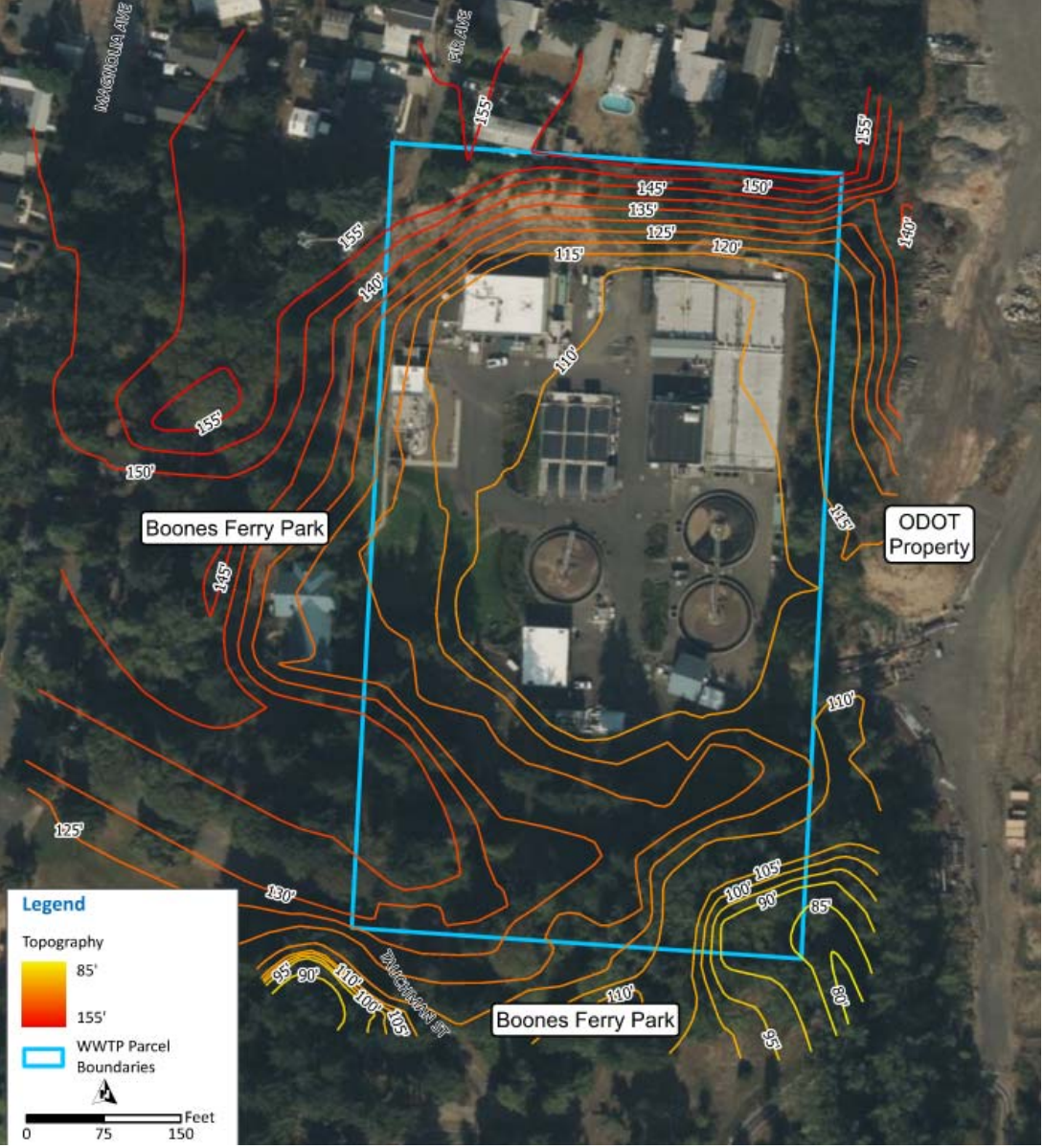


# Facility Capacity Assessment



- Flows & Loads Updated to reflect Buildout of Service Area
- Projected 2045 flows and loads exceed design criteria (~2X current)

Item	2022	Rated Capacity	Projected 2045
Average Dry Weather Flow, mgd	2.06	4.00	4.17
Average Annual Flow, mgd	2.39	4.48	4.77
Maximum Month Wet Weather Flow, mgd	4.00	6.68	7.76
Max Month BOD <sub>5</sub> , ppd	11,456	12,900	22,301
Max Month TSS, ppd	9,504	12,500	18,116



# Existing Vicinity Map

# Selection of MBR Process

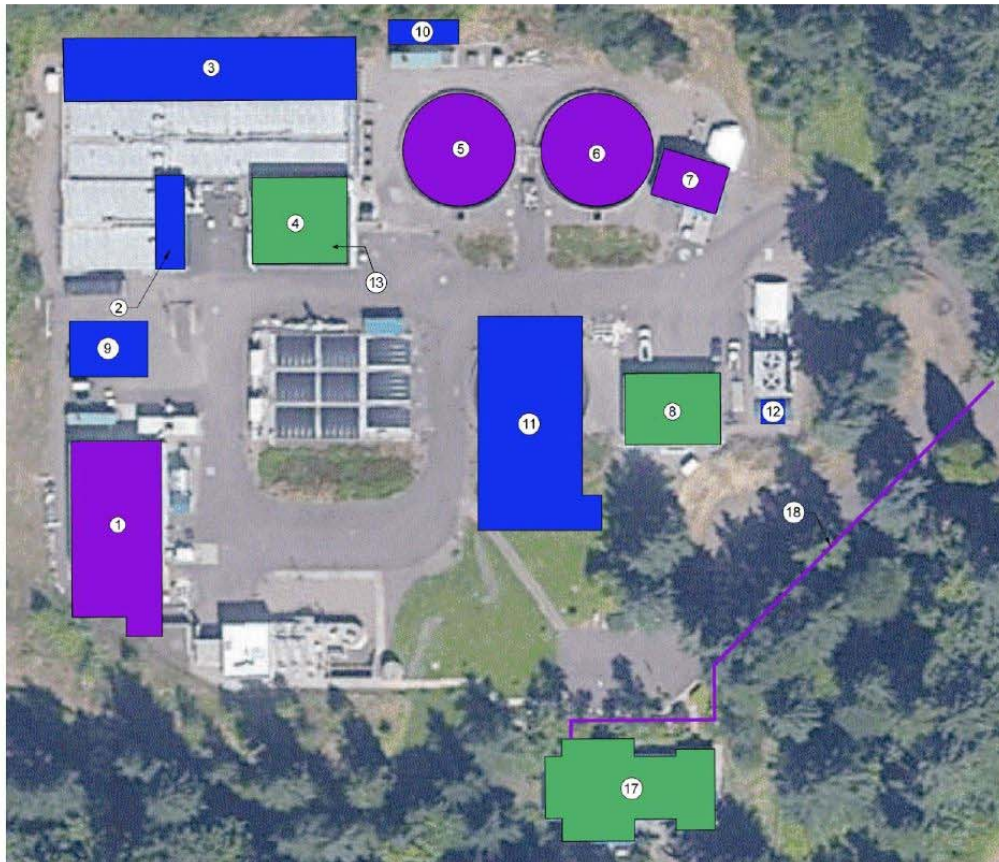


Alternative	Advantages	Challenges
Membranes (Selected)	<ul style="list-style-type: none"> <li>Space-efficient</li> <li>High-quality effluent</li> <li>Provides capacity for reliable full nitrification</li> <li>No need to expand tertiary filtration</li> </ul>	<ul style="list-style-type: none"> <li>Expensive (&gt;2x cost of 4<sup>th</sup> AB)</li> <li>Requires Fine Screening</li> <li>High O&amp;M Costs (Power, Chemicals, etc.)</li> <li>Highest aeration rate</li> <li>Redundancy requirements</li> </ul>
BioMag <sup>®</sup>	<ul style="list-style-type: none"> <li>Space-efficient</li> <li>High-quality effluent</li> <li>Potentially no need to expand tertiary filtration</li> <li>Utilizes secondary clarifier capacity (no stranded assets)</li> </ul>	<ul style="list-style-type: none"> <li>Requires Magnetite Recovery Facility</li> <li>Increased maintenance requirement from the magnetite</li> <li>Reports of solids smoldering, may require inert gas system</li> <li>Will not provide sufficient capacity under projected 2045 F&amp;L</li> </ul>
IFAS	<ul style="list-style-type: none"> <li>Space-efficient</li> <li>Utilizes secondary clarifier capacity (no stranded assets)</li> </ul>	<ul style="list-style-type: none"> <li>Will not provide sufficient capacity under projected 2045 F&amp;L</li> <li>Significant basin modifications needed</li> </ul>





# Recommended Plan

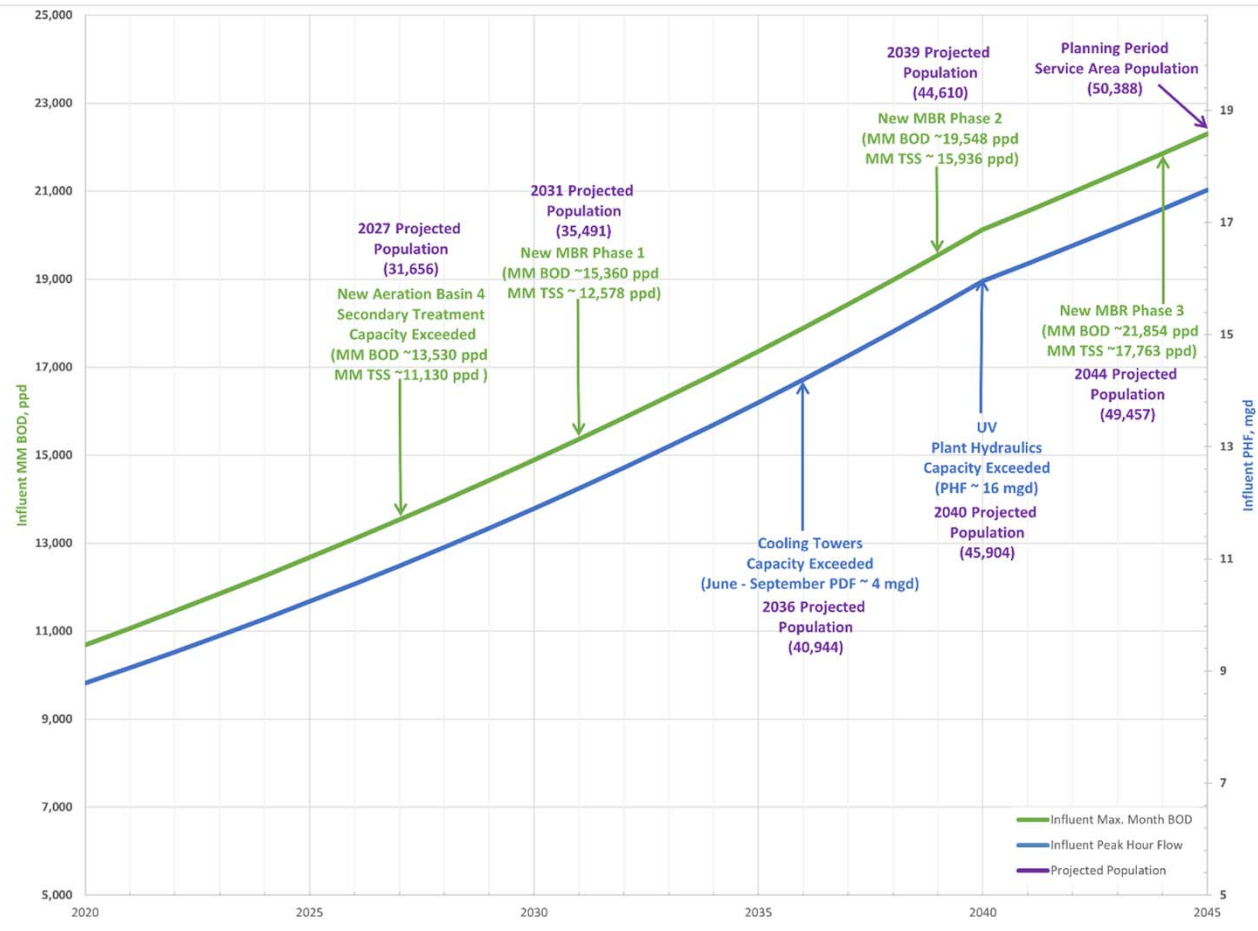


- ③ New Aeration Basin
- ② Additional Aeration Blowers
- ⑨ New Fine Screens
- ⑩ New Emergency Generator
- ⑪ New MBR Facility
- ⑫ New Cooling Tower
- ⑬ Replace Gravity Belt Thickeners
- ⑦ Replace backup UV system
- ① Replace Solids Dryer & Centrifuges
- ⑤ ⑥ Replace Clarifier 1 & 2 mechanisms
- ④ ⑧ ⑰ Seismic retrofits of buildings
- ⑱ New fiber optic connection
- ⑲ Solids process study

# Project Cost

DESCRIPTION	ESTIMATED TIMEFRAME	AUGUST 2023 PROJECT COST
Dewatering Performance Optimization	2025	\$150,000
Fiber Optic Cable Addition	2025	\$60,000
Backup UV System Replacement	2026	\$1,705,000
Seismic Improvements	2026	\$1,082,000
New Aeration Basin + Blower + Retaining Wall	2025 – 2027	\$10,222,000
Replace Secondary Clarifier Mechanisms	2026 – 2027	\$1,775,000
MBR Phase 1 + 2 Blowers + Fine Screens + Electrical Upgrades	2028 – 2030	\$69,727,000
Solids Dryer Addition	2031 – 2033	\$17,130,000
Thickening + Dewatering	2031 – 2033	\$3,701,000
Additional Cooling Tower	2034 – 2035	\$642,000
MBR Phase 2 + 2 Blowers	2037 – 2038	\$2,330,000
UV Equipment Replacement	2039 – 2040	\$2,571,000
Outfall Improvements	2039 – 2040	\$1,244,000
MBR Phase 3 + 2 Blowers	2042 – 2043	\$8,117,000
<b>TOTAL</b>		<b>\$120,456,000</b>

# Capacity Trigger Plot



# Next Steps



- Planning Commission Public Hearing 12/13/23
- City Council Public Hearing 1st Reading 1/4/24
- City Council 2nd Reading 1/18/24
- Sewer System Rate Study and SDC Update 2024

**Questions?**

City Council Meeting Action Minutes  
November 6, 2023

**COUNCILORS PRESENT**

Mayor Fitzgerald  
Council President Akervall – Arrived 7:00 p.m.  
Councilor Linville  
Councilor Berry  
Councilor Dunwell – Arrived 5:07 p.m.

Erika Valentine, Arts & Culture Program Coordinator  
Jeanna Troha, Assistant City Manager  
Kerry Rappold, Natural Resources Manager  
Kimberly Veliz, City Recorder  
Kris Ammerman, Parks and Recreation Director  
Mark Ottenad, Public/Government Affairs Director  
Mike Nacrelli, Civil Engineer  
Stephanie Davidson, Assistant City Attorney  
Zach Weigel, City Engineer  
Zack Morse, Parks Maintenance Specialist  
Zoe Mombert, Assistant to the City Manager

**STAFF PRESENT**

Bryan Cosgrove, City Manager  
Amanda Guile-Hinman, City Attorney  
Dan Pauly, Planning Manager  
Delora Kerber, Public Works Director  
Dustin Schull, Parks Supervisor

AGENDA ITEM	ACTIONS
<b>WORK SESSION</b>	<b>START: 5:06 p.m.</b>
A. Wastewater Treatment Plant Master Plan Update	Staff shared analysis that informs an updated draft of the Wastewater Treatment Plant Master Plan.
B. Stormwater Master Plan Update – Executive Summary and Capital Improvement Project	Staff presented an executive summary of the draft Stormwater Master Plan, a 20-year plan detailing the City’s work plan and identifying capital needs to effectively maintain, restore and enhance local watersheds and to meet engineering, environmental and land use needs.
C. Frog Pond East and South Development Code	Staff sought the Council’s feedback to inform development code amendments drafted for the Frog Pond East and South Master Plan.
D. Boones Ferry Park Projects Update	Staff provided a combined presentation on Resolution Nos. 3088 and 3089, both of which provide upgrades to Boones Ferry Park.
<b>REGULAR MEETING</b>	
<u>Mayor’s Business</u>	
A. Upcoming Meetings	Upcoming meetings were announced by the Mayor as well as the regional meetings she attended on behalf of the City.

<p>B. Proclamation</p>	<p>The Mayor read a proclamation declaring November 2023 as National American Indian Heritage month.</p>
<p><u>Communications</u> A. None.</p>	
<p><u>Consent Agenda</u></p> <p>A. <b><u>Resolution No. 3088</u></b> A Resolution Of The City Of Wilsonville Approving A Construction Contract With Romtec, Inc. For The Boones Ferry Restroom Construction Project.</p> <p>B. <b><u>Resolution No. 3089</u></b> A Resolution Of The City Of Wilsonville Approving A Construction Contract With Buell Recreation LLC For The Boones Ferry Playground Project.</p> <p>C. <b><u>Resolution No. 3090</u></b> A Resolution Of The City Of Wilsonville Authorizing The City Manager To Execute A Master Services Agreement With OpenGov, Inc. For Asset Management Software Services.</p> <p>D. <b><u>Resolution No. 3092</u></b> A Resolution Of The City Of Wilsonville Authorizing The City Manager To Execute A Professional Services Agreement With Century West Engineering For Engineering Consulting Services For The 2024 Street Maintenance Project (Capital Improvement Project No. 4014, 4118, 4725).</p> <p>E. <b><u>Resolution No. 3093</u></b> A Resolution Of The City Of Wilsonville Accepting The Jurisdictional Surrender For A Portion Of SW Stafford Road And SW Frog Pond Lane By Clackamas County Pursuant To Oregon Revised Statute 373.270.</p> <p>F. Minutes of the October 16, 2023 City Council Meeting.</p>	<p>The Consent Agenda was adopted 5-0.</p>
<p><u>New Business</u></p> <p>A. <b><u>Resolution No. 3081</u></b> A Resolution Of The City Of Wilsonville Approving The City Of Wilsonville Public Art Policy And Guidelines.</p>	

<p><b>B. <u>Resolution No. 3083</u></b>  A Resolution Of The City Of Wilsonville Adopting The Arts, Culture, And Heritage Commission (ACHC) FY 2023/24 Five-Year Action Plan And Annual One-Year Implementation Plan.</p> <p><b>C. <u>Resolution No. 3091</u></b>  A Resolution Of The City Of Wilsonville Adopting The Findings And Recommendations Of The “Solid Waste Collection Rate Report, October 2023” And Modifying The Current Republic Services Rate Schedule For Collection And Disposal Of Solid Waste, Recyclables, Organic Materials And Other Materials, Effective January 1, 2024.</p>	<p>Resolution No. 3083 was adopted 5-0.</p> <p>Resolution No. 3091 was tabled until the December 4, 2023 City Council meeting.</p>
<p><u>Continuing Business</u></p> <p>A. None.</p>	
<p><u>Public Hearing</u></p> <p>A. <b><u>Ordinance No. 883</u></b>  An Ordinance Of The City Of Wilsonville Adopting A Franchise Agreement For Solid Waste Management And Collection Within The City And Repealing Ordinance No. 814.</p>	<p>After a public hearing was conducted, Ordinance No. 883 was adopted on first and second reading by a vote of 5-0.</p>
<p><u>City Manager’s Business</u></p>	<p>The City Manager shared staff would arrange a training for Council to prepare them for their trip to Kitakata, Japan.</p>
<p><u>Legal Business</u></p>	<p>The City Attorney, who is also a running coach at the Coffee Creek Correctional Facility, shared some feedback from adults in custody who participate in the running program.</p>
<p><b>ADJOURN</b></p>	<p>10:10 p.m.</p>





# **PLANNING COMMISSION**

## **WEDNESDAY, OCTOBER 11, 2023**

### **WORK SESSION**

4. Wastewater Treatment Plant Master Plan (Nacrelli) (15 minutes)



**PLANNING COMMISSION WORK SESSION  
STAFF REPORT**

<b>Meeting Date:</b> October 11, 2023		<b>Subject:</b> Wastewater Treatment Plant Master Plan	
		<b>Staff Member:</b> Mike Nacrelli, Senior Civil Engineer	
		<b>Department:</b> Community Development	
<b>Action Required</b>		<b>Advisory Board/Commission Recommendation</b>	
<input type="checkbox"/> Motion <input type="checkbox"/> Public Hearing Date: <input type="checkbox"/> Ordinance 1 <sup>st</sup> Reading Date: <input type="checkbox"/> Ordinance 2 <sup>nd</sup> Reading Date: <input type="checkbox"/> Resolution <input checked="" type="checkbox"/> Information or Direction <input type="checkbox"/> Information Only <input type="checkbox"/> Council Direction <input type="checkbox"/> Consent Agenda		<input type="checkbox"/> Approval <input type="checkbox"/> Denial <input type="checkbox"/> None Forwarded <input checked="" type="checkbox"/> Not Applicable	
		<b>Comments:</b> N/A	
<b>Staff Recommendation:</b> Provide requested input regarding recommended capital improvement plan.			
<b>Recommended Language for Motion:</b> N/A			
<b>Project / Issue Relates To:</b>			
<input checked="" type="checkbox"/> Council Goals/Priorities: Align Infrastructure Plans with Sustainable Financing Sources	<input type="checkbox"/> Adopted Master Plan(s):	<input type="checkbox"/> Not Applicable	

**ISSUE BEFORE PLANNING COMMISSION:**

Provide feedback and input on components of the Wastewater Treatment Plant (WWTP) Master Plan.

## **EXECUTIVE SUMMARY:**

This new City of Wilsonville (City) Wastewater Treatment Plant (WWTP) Master Plan (the Plan) has been developed to satisfy requirements associated with the State of Oregon Department of Environmental Quality (DEQ) guidance document entitled “Preparing Wastewater Planning Documents and Environmental Reports for Public Utilities.” To accommodate future flows and loads, projections were developed based on population projections and referencing WWTP historical data and DEQ wet weather project methodologies. Similarly, to accommodate future water quality regulations, the Plan is adaptive and considers potential future regulatory changes.

The City prepared the Plan with the goal of developing a capital plan that identifies improvements required through the planning period (today through 2045) to comply with requirements of the WWTP National Pollutant Discharge Elimination System (NPDES) permit and potential future regulatory requirements, while accommodating growth identified in the City of Wilsonville Comprehensive Plan (October 2018, updated June 2020 - the 2018 Comprehensive Plan). These improvements are designed to provide the best value to the City’s ratepayers by maximizing the use of existing infrastructure and improving system operation while continuing to protect water quality and human health and supporting economic development, consistent with goals and policies contained in the 2018 Comprehensive Plan and 2021-2023 City Council Goals.

The City’s WWTP was originally built in 1971 and discharges treated effluent to the Willamette River. The WWTP underwent major upgrades in 2014 to expand the average dry weather capacity to four million gallons per day (mgd) to accommodate the City’s continued growth. The WWTP processes include headworks screening and grit removal facilities, aeration basins, stabilization basins, secondary clarifiers, biosolids processing, cloth filtration, and disinfection processes. Additionally, the City contracts with Jacobs for operation of the wastewater treatment plant, located at 9275 Southwest Tauchman Road.

This Plan identifies improvements taking into consideration:

- The age and condition of existing process equipment and structures,
- Growth in demand for sewer service due to increased population and economic development over the planning period,
- Potential changes to water quality regulations impacting process needs in order to meet effluent limitations and discharge prohibitions imposed by the Oregon Department of Environmental Quality (DEQ), and
- Consistency with the 2018 Comprehensive Plan and City Council 2021-2023 Goals 5, 6, & 7.

### ***Updated Growth Projection and Capital Improvement Plan***

At the previous work session (9/14/2022), the team presented the capital improvement plan based on an assumed 2.9% annual population increase, consistent with recent planning documents adopted by the City, including the Wastewater Collection System Master Plan (CSMP, November 2014) and the Willamette River Water Treatment Plan Master Plan Update

(March 2018). The flow and load projections have been further updated to account for increases in industrial discharges, as allowed under existing permits. This change results in a higher level of capital investment over the planning period, mainly due to hydraulic upgrades, as reflected in the table below.

Project Description	Timeframe	Cost*
Dewatering Performance Optimization	2025	\$150,000
Fiber Optic Conduit Addition	2025	\$60,000
UV System Improvement	2026	\$1,705,000
Seismic Improvements	2026	\$1,082,000
New Aeration Basin and Blower	2025 – 2027	\$10,179,000
Replace Secondary Clarifier Mechanisms	2026 - 2027	\$1,775,000
Membrane Bioreactor (MBR) Phase 1 (includes new blower, fine screens, electrical and hydraulic upgrades)	2028 – 2030	\$69,637,000
New Solids Dryer	2031 – 2033	\$17,130,000
Thickening and Dewatering Improvements	2031 – 2033	\$3,701,000
New Cooling Tower	2037 – 2038	\$642,000
MBR Phase 2 (includes new blower)	2037 – 2038	\$2,242,000
UV Equipment Replacement and Outfall Upsizing	2039 – 2040	\$2,571,000
UV Equipment Replacement and Outfall Upsizing	2039 – 2040	\$1,244,000
MBR Phase 3 (includes 2 new blowers)	2042 – 2043	\$8,030,000
<b>Total</b>		<b>\$120,148,000</b>
*Costs are shown in 2023 dollars and include 25% for engineering, legal, and administration.		

As shown in the table above, the most significant impact to the required level of capital investment is the need for membrane bioreactor (MBR) facilities. These are state-of-the-art, compact facilities that provide a high level of treatment. The adjusted growth projection results in an approximate doubling of the City population over the planning period. Due to the limited amount of space available at the existing WWTP site, MBR facilities are the only feasible means of providing the necessary treatment to accommodate such a substantial rate of growth.

Question for the Planning Commission:

What input does the Planning Commission have on the updated capital improvements list for the Wastewater Treatment Plant Master Plan?

**EXPECTED RESULTS:**

The Plan includes a list of recommended capital improvements, along with an anticipated schedule for completion and preliminary cost estimates. These improvements will provide the basis for an analysis of sewer rates and system development charges (SDCs) that will be necessary to provide adequate funding to implement to required upgrades.

**TIMELINE:**

This is the third in a series of presentations to the Planning Commission and City Council. Completed and planned meetings are as follows:

- Planning Commission Work Session 7/13/22 (completed)

- City Council Work Session 8/1/22 (completed)
- Planning Commission Work Session 9/14/22 (completed)
- Planning Commission Work Session 10/11/23 (current)
- City Council Work Session 11/6/23
- Planning Commission Public Hearing 12/13/23
- City Council Public Hearing 1st Reading 1/4/24
- City Council 2nd Reading 1/18/24

**CURRENT YEAR BUDGET IMPACTS:**

The remaining contract balance for finalizing the Plan will be expended this fiscal year. An additional \$92,450 has been budgeted in FY 23/24 for the Sewer System Rate Study and SDC Update, using a combination of Sewer Operating funds and SDCs.

**COMMUNITY INVOLVEMENT PROCESS:**

The public hearings listed above will provide opportunity for public input. In addition, the Sewer System Rate Study and SDC Update will include a robust public engagement process.

**POTENTIAL IMPACTS or BENEFIT TO THE COMMUNITY:**

A technically and financially sound plan for providing reliable wastewater treatment, capacity to accommodate future development, and compliance with environmental regulations.

**ALTERNATIVES:**

The Plan is based on a projected population growth rate that is somewhat aggressive but is consistent with other recently adopted planning documents and with historical growth data. The capital project schedule can be adjusted as appropriate if actual growth rates differ significantly from the projected growth included in the Plan. In addition, some of the recommended hydraulic upgrades might be avoided, depending on the results of more detailed analysis of storage and attenuation in the wastewater collection system, when the next CSMP update is completed.

**ATTACHMENTS:**

N/A

# City of Wilsonville Wastewater Treatment Plant Master Plan

Planning Commission Work Session  
October 11, 2023



**WILSONVILLE**  
OREGON

# Introduction



Presenters:

Mike Nacrelli, PE, Senior Civil Engineer

Dave Price, PE, Carollo Engineers

# Status Update



- Accommodating Expected Build-Out by 2045
  - Increased industrial discharges to permitted limits
- Capacity Assessment Complete
  - Includes hydraulic modeling of WWTP
- Costs and Schedule for Updated CIP
- Update of Master Plan

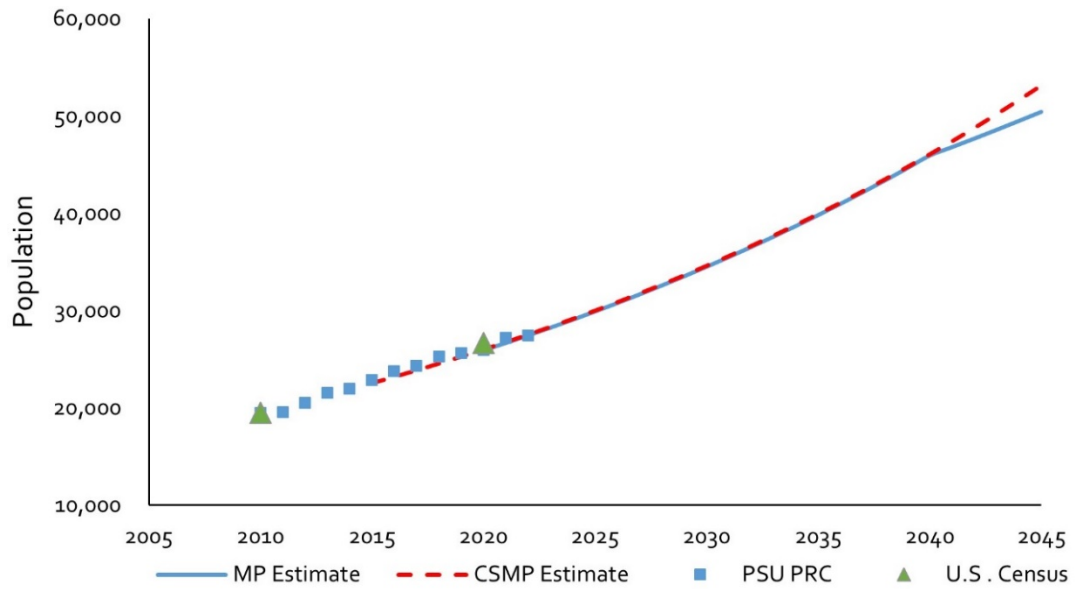


# Capital Planning and Expected Growth - 2045

- Current Service Area needs
  - 20+ years through 2045
  - Population and associated economic development

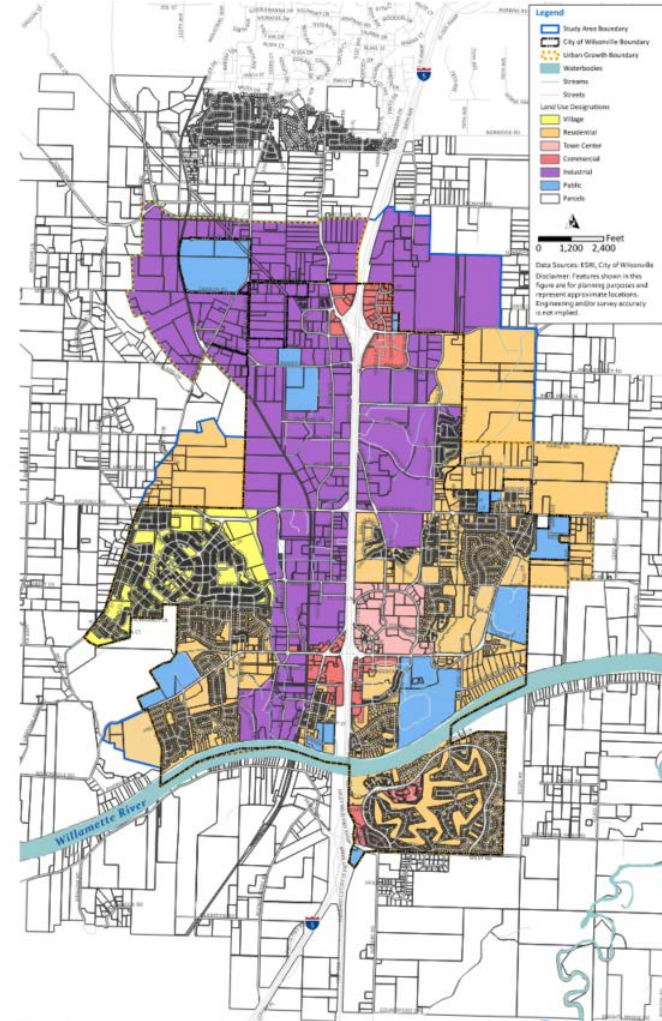
*Buildout Population Projections (High 2.9%)*

2020	2030	2045	2050
25,915	35,163	46,798	50,388



# Buildout Service Area - 2045

Land Use	Acreage
Commercial	224
Industrial	2,383.2
Public	482.9
Residential	2,278.3
Town Center	136.1
Village	367.4



# Facility Capacity Assessment



- Flows & Loads Updated to reflect Buildout of Service Area
- Projected 2045 flows and loads exceed design criteria (~2X current)

Item	2022	Rated Capacity	Projected 2045
Average Dry Weather Flow, mgd	2.06	4.00	4.17
Average Annual Flow, mgd	2.39	4.48	4.77
Maximum Month Wet Weather Flow, mgd	4.00	6.68	7.76
Max Month BOD <sub>5</sub> , ppd	11,456	12,900	22,301
Max Month TSS, ppd	9,504	12,500	18,116

# Unit Process Capacity Summary

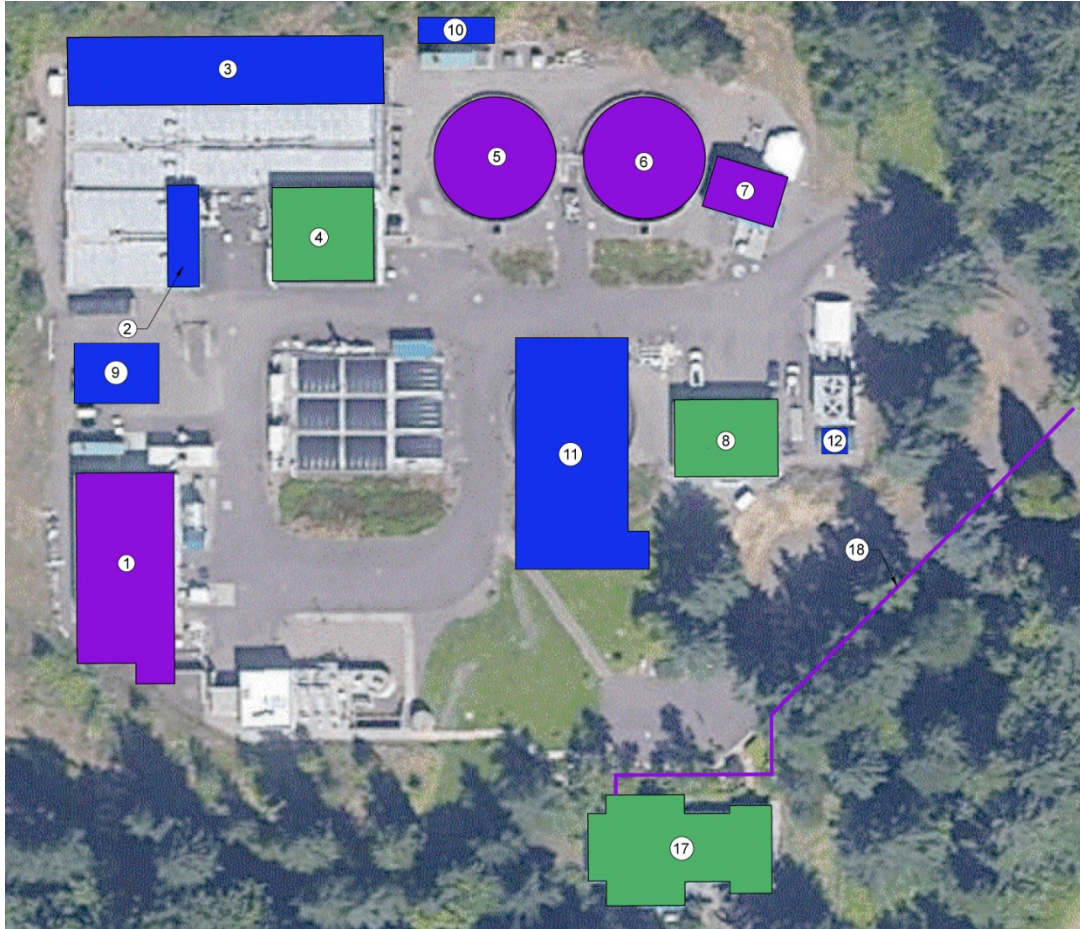
Unit Process	Capacity Limit	Redundancy Criteria	Possible Year of Capacity Exceedance	Identified Alternatives
<b>Secondary Treatment</b>	MW MLSS inventory @ PDF	All units in service	<b>2027</b>	<ul style="list-style-type: none"> <li>New Aeration Basin</li> </ul>
<b>Additional Secondary Treatment</b>	MM MLSS inventory @ PDF	One train out of service	<b>2031, 2039, 2044</b>	<ul style="list-style-type: none"> <li>Membrane Bioreactor</li> </ul>
<b>Effluent Cooling Towers</b>	6 MGD (May 1 – October 31)	All units in service	<b>2039</b>	<ul style="list-style-type: none"> <li>Additional Cooling Tower</li> </ul>
<b>UV Effluent/Outfall</b>	16 MGD	All units in service	<b>2041</b>	<ul style="list-style-type: none"> <li>Upsizing outfall piping of MH-B to future MH-E</li> </ul>

# Alternatives Evaluation



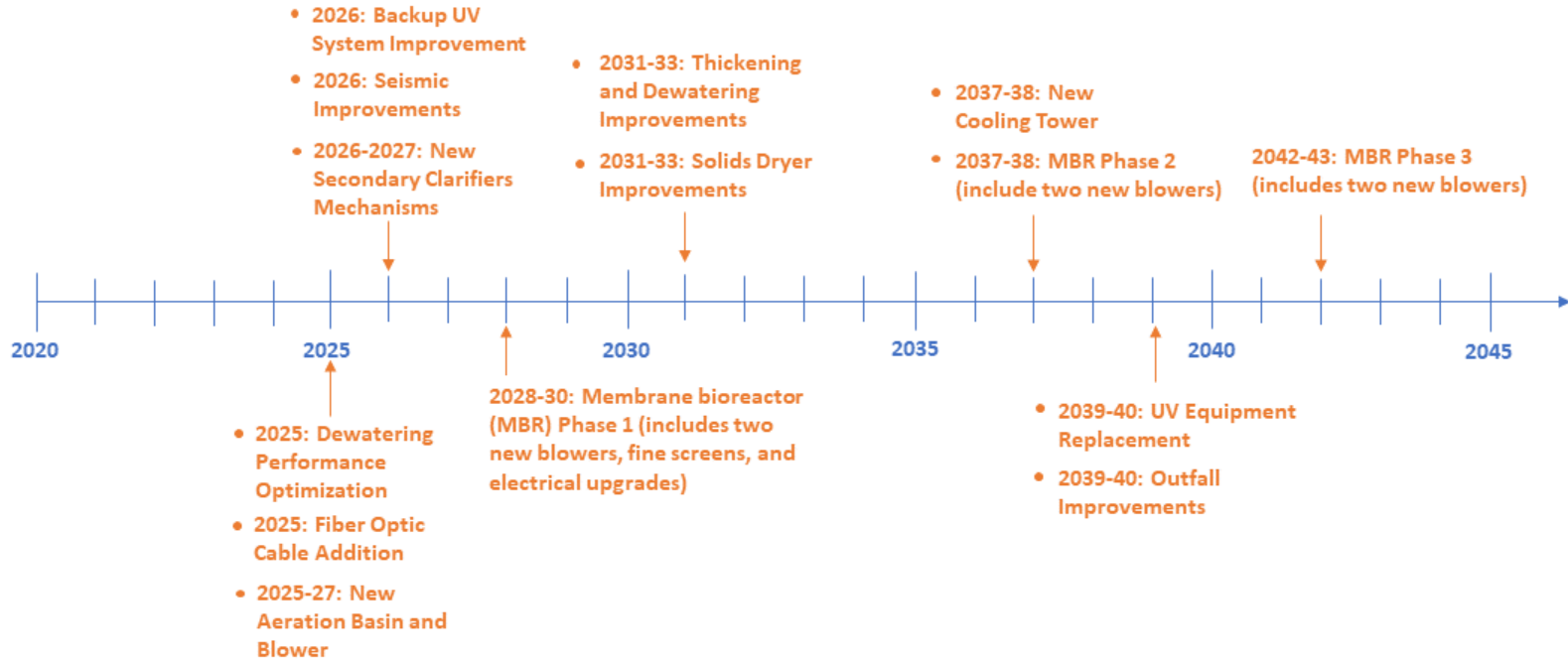
- Consider alternatives for process units identified as capacity deficient
- Secondary Process
  - Add new Aeration Basin & additional blower
  - Phase MBR technology (includes hydraulic upgrades)
- Solids Thickening and Dewatering
  - Replace GBTs and Centrifuge units during the planning period – expected useful life
- UV System and Outfall Piping
  - Replace aging equipment and upgrade hydraulic capacity
- Prior conclusions – plan to replace based on condition/age during planning period:
  - Backup UV system
  - Solids dryer
  - Dewatering Centrifuges
  - Thickening GBTs

# Recommended Plan



- ③ New Aeration Basin
- ② Additional Aeration Blowers
- ⑨ New Fine Screens
- ⑩ New Emergency Generator
- ⑪ New MBR Facility
- ⑫ New Cooling Tower
- ⑦ Replace backup UV system
- ① Plan to replace Solids Dryer & Centrifuges
- ⑤ ⑥ Replace Clarifier 1 & 2 mechanisms
- ④ ⑧ ⑰ Seismic retrofits of buildings
- ⑱ New fiber optic connection
- Solids process study

# Proposed Project Phasing Schedule

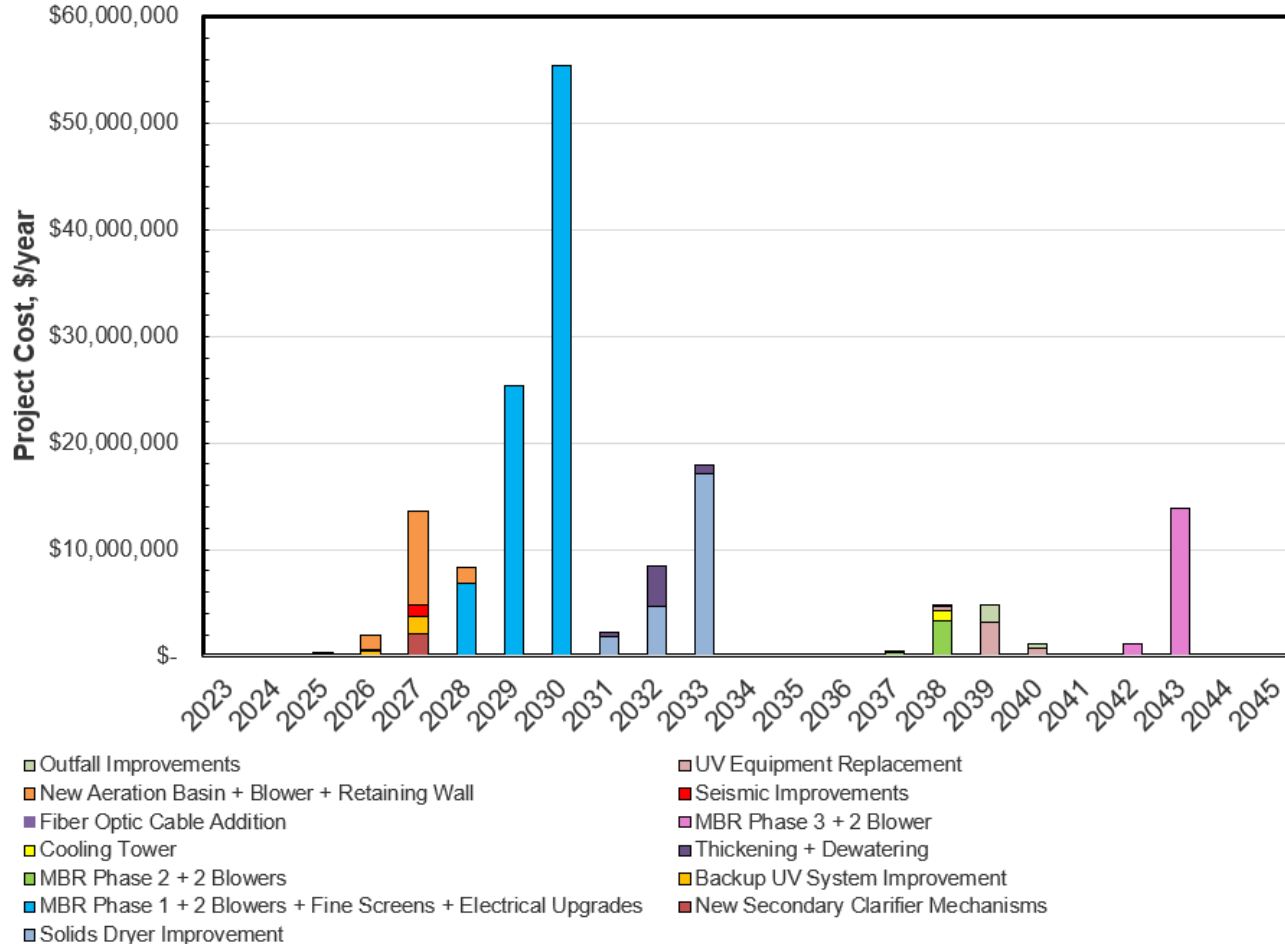


# Project Cost

DESCRIPTION	ESTIMATED TIMEFRAME	AUGUST 2023 PROJECT COST
Dewatering Performance Optimization	2025	\$150,000
Fiber Optic Cable Addition	2025	\$60,000
Backup UV System Improvement	2026	\$1,705,000
Seismic Improvements	2026	\$1,082,000
New Aeration Basin + Blower + Retaining Wall	2025 – 2027	\$10,179,000
New Secondary Clarifier Mechanisms	2026 – 2027	\$1,775,000
MBR Phase 1 + 2 Blowers + Fine Screens + Electrical Upgrades	2028 – 2030	\$69,637,000
Solids Dryer Improvement	2031 – 2033	\$17,130,000
Thickening + Dewatering	2031 – 2033	\$3,701,000
Cooling Tower	2037 – 2038	\$642,000
MBR Phase 2 + 2 Blower	2037 – 2038	\$2,242,000
UV Equipment Replacement	2039 – 2040	\$2,571,000
Outfall Improvements	2039 – 2040	\$1,244,000
MBR Phase 3 + 2 Blower	2042 – 2043	\$8,030,000
<b>TOTAL</b>		<b>\$120,148,000</b>



# Estimated Cash Flow



# Next Steps



- City Council Work Session 11/6/23
- Planning Commission Public Hearing 12/13/23
- City Council Public Hearing 1st Reading 1/4/24
- City Council 2nd Reading 1/18/24
- Sewer System Rate Study and SDC Update 2024

**Questions?**

- Ms. Weiland added that LID and vegetated stormwater facilities provided truly good pollutant removal in accordance with effectiveness information that was well documented. Different processes were used, and vegetation enhances uptake. Through these facilities, retention and infiltration of stormwater was encouraged, which was another means to remove pollutants before they discharged via overland flow or pipe flow into receiving water, so the types of facilities proposed were intentionally in alignment with the City's design standards and MS4 permit requirements.

#### 4. Wastewater Treatment Plant Master Plan (Nacrelli)

Mike Nacrelli, Senior Civil Engineer, and Dave Price, Senior Civil Engineer, Carollo Engineers, presented on the update Wastewater Treatment Plant Master Plan via PowerPoint, reviewing key components of the Master Plan which would accommodate expected demand for build out by 2045. Highlights included details regarding the completed facility capacity assessment, costs and a schedule for the updated Capital Improvements Program (CIP), an alternatives evaluation and a breakdown of costs by project, estimated cash flow, and the next steps for advancing the Master Plan for adoption.

and the additional changes since the last work session with the Commission.

Discussion and feedback from the Planning Commission was as follows with responses by Staff to Commissioner questions as noted:

- In September 2022, the estimate was \$75 million which moved to \$120 million in the span of a year with the increased industrial discharges.
  - Mr. Nacrelli noted an oversight in the presentation, stating the \$75 million had not included the engineering portion, it was only construction. The actual cost should have been in the \$90,000s.
- If the project were not space constrained, what would the project cost and overall plan look like? Would clarifiers be added instead of adding a membrane bioreactor (MBR)? Considering the huge sum of money involved, maybe it would be cheaper overall to acquire some additional land south of the existing facility to add more equipment, rather than this huge increase for the MBR. The river was south of the facility, but there were a lot of trees that could be cut down.
  - Mr. Nacrelli responded Staff could cost out what a conventional expansion would take and how much land would be required; however, the direction provided was that there was no room to grow.
  - Ms. Guile-Hinman understand the facility was all surrounded by Boones Ferry Park, and there were deed restrictions that did not allow the City to use it for anything other than a recreational use.
  - Mr. Nacrelli clarified the land on the east side had a large grade adjacent to where the new aeration basin would go in the northeast corner.
  - Mr. Price added a significant retaining wall would have to be built there in order to put in the additional aeration basin, so the area was already tight due to the slopes.
- At a high level, it would be good to double check that there is no physical space to put in a conventional facility, because this was a huge sum of money, especially with the \$60 million outlay in 2030. It would be good to make sure the City was looking at all the options out there.

- Mr. Nacrelli stated they could run the numbers and understand how much space would be needed, but he was pretty satisfied with the property footprint; perhaps he could come up with a map that extended beyond the area.
- If deed restrictions prevented the City for adding land, no additional analysis was needed, but if there was space or an opportunity to be creative, then be creative about a more conventional plant. If not, then just let the Commission know.
  - Mr. Price added access was also required on the site for trucks with trailers, so there was limitations with travel ways and the plan did not show the slopes on three sides of the site. Based on the team's analysis, there were not too many square feet on the site that were not already being used. When the facility was upgraded in 2011/2012, one notion was that beyond the three existing aeration basins and clarifiers that the next step was to put some [inaudible] but he believed that project predated the collection system at the time, so it did not evaluate the full indications of what that might be. He wanted to make sure the Commission considered the conventional options as well as the expectations coming out of the Master Plan update and whether things could be [inaudible] or reduced. A scenario that would reduce the cost of Phase 1, but would be at least \$10 million to eliminate the need for some of those future projects, which would be something to think about, because in that scenario the City would be running kind of a combined conventional/membrane plant. The two distinct clarifiers would not go away until Phase 3. The project team was trying to preserve the City's conventional facility for as long as possible, but it would cost to maintain the existing facilities and give you less energy for chemicals to operate that facility than a more complicated, high intensity system line an MBR.
  - Mr. Nacrelli suggested they could add property lines and contours to the site plan. (Slide 9)
- Regarding an increase in industrial discharge, what was the current industrial discharge versus what was in the plan versus what is the maximum? And where was the City in that window, right at the maximum of what was theoretically possible from the permits in this plan, or some amount lower than that? That information would be helpful to have for the next go around.
  - Mr. Nacrelli believed they could provide those numbers, which would be in the Master Plan attached to the Staff report. He confirmed the assumption was that all the City's permanent industries would be discharging the maximum amount, which they were not currently doing, so that was a pretty significant impact, especially since they were higher dischargers. The lows were just as important to evaluate capacity. Those numbers would be incorporated into the slides.
- Incorporating the risks of not implementing the recommended plan in the master plan was suggested. Communities along the Willamette were having wastewater failures and having boil orders for water. Articulate the consequences of not doing this to our river environment would be great.
  - Mr. Nacrelli responded a chapter in the regulatory constraints essentially stated that once you start exceeding your limits, you get financial [inaudible], and the City could get to a point where a moratorium would have to be issued until the issues were fixed.
  - Mr. Price added that typically with improvement at this scale, community outreach would be incorporated into the more detailed planning and design steps to help educate people about rates and charges and to make sure the message got out there about why these improvements were needed.

- With only two funding sources noted, rates and SDCs, at the current rates and expected SDCs, what was the City's shortfall and how would that shortfall be made up?
  - Mr. Nacrelli responded [inaudible] not part of the Master Plan's scope, noting the rate study would delve into those details.
  - Mr. Price added also need to consider the condition-related verses capacity-related improvements.
- Mr. Nacrelli confirmed the rate study would be completed after City Council adopted the Master Plan.
  - A comment was made that the City was creating the Master Plan without knowing how to pay for it, which was not how budgeting worked in real life.
- Zach Weigel, City Engineer, added further context on how the master planning worked. The City was going to grow to a certain population, and these projects were needed for the treatment plant to meet the population demand. When master planning, the needs were identified, then a rate study determined the impact on fees and development costs.
- Mr. Weigel confirmed a certain portion of development fees went toward wastewater, and each CIP project would be split on base with a portion that serves new development and serves existing customers, and that portion of new growth gets figured into the SDC cost.
- SDCs affect affordability.
- The Commission discussed growth rates when the housing report came out, and the City's actual growth numbers were outpacing Metro's projections. Which numbers were used in the Master Plan engineering?
  - Mr. Weigel stated the project team used the same numbers from the collection system master plan, which was an aggressive growth rate that was trending with what the City has been seeing over the last 10 years on average. It was hard to know what was going to happen. Was it going to slow down? Was Metro going to put limits on the City to meet certain housing projections? Staff believed the aggressive growth rate was the right measure to use for this Master Plan.
  - Mr. Nacrelli noted the Master Plan numbers were compared with Metro's Transportation Analysis projections, and they were very close.
  - Mr. Weigel confirmed there was really no way to avoid MBR. There were ways to avoid additional chambers of MBR that Staff would be tracking over time, but that was typical with a master plan; the needs were identified, population growth, flow, and needs were tracked over time, and the projects were implemented when they were needed. And then, every 10 years or so, the Master Plan is updated when a deeper dive is taken into the data to make sure the City was following those projections and then updating the Master Plan as needed.

Chair Heberlein called for a brief recess and reconvened the meeting at 8:45 pm.

## **INFORMATIONAL**

### 5. 2023 Transportation Performance Monitoring Report (Pepper)

Amy Pepper, Development Engineering Manager, presented a report card on the City's performance of the City's Transportation System Plan (TSP), its policies, programs, and projects, and how the City's projects had measured up to Goals 1 through 7 of the TSP, along with recommended actions to lead to desired outcomes. A full update of the report was included in the packet.



# PLANNING COMMISSION

## WEDNESDAY, OCTOBER 12, 2022

### PUBLIC HEARING

2. Wastewater Treatment Plant Master Plan (Nacrelli) *(No staff presentation)* - CANCELLED



**MEMO**  
**Engineering Division**

DATE: October 5, 2022

TO: Planning Commission

FROM: Mike Nacrelli, PE  
Senior Civil Engineer

**RE: *Cancellation of October 12, 2022 Public Hearing for the Wastewater Treatment Plant Master Plan***

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The Wastewater Treatment Plant (WWTP) Master Plan has used a study area boundary consistent with recently completed master planning documents, including the 2012 Water System Master Plan, the 2014 Wastewater Collection System Master Plan, and the 2017 Water Treatment Plant Master Plan. However, the 2018 Basalt Creek Concept Plan has altered the future service area that will send flows to the WWTP, requiring further analysis of the projected wastewater flows and loads and the planned capital improvements to provide the needed treatment capacity. In order to allow adequate time to complete this additional analysis, I request that the public hearing for the WWTP Master Plan currently scheduled with the Planning Commission for October 12, 2022 be cancelled and rescheduled for February 8, 2023.

Respectfully,

*Michael Nacrelli*

Project Manager



Commissioner Mesbah asked if **Mr. Nacrelli** meant a certain quality of effluent since anything produces effluent; perhaps, “high quality effluent” should be used.

**Mr. Nacrelli** agreed something might be missing there, but without hearing the recording, the quality of effluent was the only thing that made sense.

**Amanda Guile-Hinman, City Attorney**, advised postponing the consideration of the minutes to allow time to check the audio recording.

Chair Heberlein stated consideration of the September 14, 2022 Planning Commission Minutes would be delayed to the next Planning Commission meeting to clarify the language on Page 9.

## LEGISLATIVE HEARING

### 2. Wastewater Treatment Plant Master Plan (Nacrelli) (No staff presentation) - CANCELLED

Chair Heberlein noted tonight’s public hearing had been cancelled and would be rescheduled to a later date.

**Miranda Bateschell, Planning Director**, asked that anyone present for the hearing add their contact information to the sign in sheet to receive notification about the new public hearing date. She also offered to provide the project manager’s business card.

## WORK SESSION

### 3. Transit Master Plan (Lewis)

**Kelsey Lewis, SMART Grants and Programs Manager**, introduced the City consultant who would present information about the public engagement conducted on the Master Plan over the summer.

**Brenda Martin, Consultant, EnviroIssues**, presented via PowerPoint a summary of the engagement conducted as part of the SMART Transit Master Plan Update. She highlighted the purpose of the Master Plan Update and described the outreach methods used to gather public input from various stakeholders and diverse groups of citizens, including underrepresented communities. She also reviewed the key findings from the data collected from surveys and the stakeholder’s workshop which identified ridership patterns and included requests for transit time and frequency changes, as well as additions to SMART’s service routes, which included connections to other destinations in the region.

Questions from the Commission were as follows with responses as noted:

- Why was there such a low turnout for the in-person stakeholder workshop where only 18 people attended after more than 100 invites were sent out?
  - **Ms. Martin** noted the project team made about 150 calls and sent emails, but she believed that ultimately, it was just the day and time, coupled with not being able to invite the right people to come from certain organizations due to changes in employment. The team did share the survey with most of those invitees, so the team did collect some feedback from those organizations. She believed having one time and place for attendance was difficult for some people.



# PLANNING COMMISSION

## WEDNESDAY, SEPTEMBER 14, 2022

### WORK SESSION

3. Wastewater Treatment Plant Master Plan (Nacrelli) (30 minutes)



## PLANNING COMMISSION WORK SESSION STAFF REPORT

<b>Meeting Date:</b> September 14, 2022		<b>Subject:</b> Wastewater Treatment Plant Master Plan	
		<b>Staff Member:</b> Mike Nacrelli, Senior Civil Engineer	
		<b>Department:</b> Community Development	
<b>Action Required</b>		<b>Advisory Board/Commission Recommendation</b>	
<input type="checkbox"/> Motion <input type="checkbox"/> Public Hearing Date: <input type="checkbox"/> Ordinance 1 <sup>st</sup> Reading Date: <input type="checkbox"/> Ordinance 2 <sup>nd</sup> Reading Date: <input type="checkbox"/> Resolution <input checked="" type="checkbox"/> Information or Direction <input type="checkbox"/> Information Only <input type="checkbox"/> Council Direction <input type="checkbox"/> Consent Agenda		<input type="checkbox"/> Approval <input type="checkbox"/> Denial <input type="checkbox"/> None Forwarded <input checked="" type="checkbox"/> Not Applicable <b>Comments:</b> N/A	
<b>Staff Recommendation:</b> Provide requested input regarding recommended capital improvement plan.			
<b>Recommended Language for Motion:</b> N/A			
<b>Project / Issue Relates To:</b>			
<input checked="" type="checkbox"/> Council Goals/Priorities: <small>Align infrastructure plans with sustainable financing resources.</small>	<input type="checkbox"/> Adopted Master Plan(s):	<input type="checkbox"/> Not Applicable	

### ISSUE BEFORE PLANNING COMMISSION:

Provide feedback and input on components of the Wastewater Treatment Plant (WWTP) Master Plan.

## **EXECUTIVE SUMMARY:**

This new City of Wilsonville (City) Wastewater Treatment Plant (WWTP) Master Plan (the Plan) has been developed to satisfy requirements associated with the State of Oregon Department of Environmental Quality (DEQ) guidance document entitled “Preparing Wastewater Planning Documents and Environmental Reports for Public Utilities.” To accommodate future flows and loads, projections were developed based on population projections and referencing WWTP historical data and DEQ wet weather project methodologies. Similarly, to accommodate future water quality regulations, the Plan is adaptive and considers potential future regulatory changes.

The City prepared the Plan with the goal of developing a capital plan that identifies improvements required through the planning period (today through 2045) to comply with requirements of the WWTP National Pollutant Discharge Elimination System (NPDES) permit and potential future regulatory requirements, while accommodating growth identified in the City of Wilsonville Comprehensive Plan (October 2018, updated June 2020 - the 2018 Comprehensive Plan). These improvements are designed to provide the best value to the City’s ratepayers by maximizing the use of existing infrastructure and improving system operation while continuing to protect water quality and human health and supporting economic development, consistent with goals and policies contained in the 2018 Comprehensive Plan and 2021-2023 City Council Goals.

The City’s WWTP was originally built in 1971 and discharges treated effluent to the Willamette River. The WWTP underwent major upgrades in 2014 to expand the average dry weather capacity to four million gallons per day (mgd) to accommodate the City’s continued growth. The WWTP processes include headworks screening and grit removal facilities, aeration basins, stabilization basins, secondary clarifiers, biosolids processing, cloth filtration, and disinfection processes. Additionally, the City contracts with Jacobs for operation of the wastewater treatment plant, located at 9275 Southwest Tauchman Road.

This Plan identifies improvements taking into consideration:

- The age and condition of existing process equipment and structures,
- Growth in demand for sewer service due to increased population and economic development over the planning period,
- Potential changes to water quality regulations impacting process needs in order to meet effluent limitations and discharge prohibitions imposed by the Oregon Department of Environmental Quality (DEQ), and
- Consistency with the 2018 Comprehensive Plan and City Council 2021-2023 Goals 5, 6 and 7.

### ***Updated Growth Projection and Capital Improvement Plan***

The previous (7/13/2022) work session included a capital improvement plan based on population growth projections over the planning period obtained from Metro. The growth projections have since been updated to an assumed 2.9% annual population increase, consistent with recent planning documents adopted by the City, including the Wastewater Collection System Master Plan (November 2014) and the Willamette River Water Treatment Plan Master Plan Update (March 2018). This change results in a considerably higher level of capital investment over the planning period, as reflected in the table below.

<b>Project Description</b>	<b>Timeframe</b>	<b>Cost*</b>
Dewatering Performance Optimization	2023	\$155,724
UV System Improvement	2023	\$1,370,369
Fiber Optic Conduit Addition	2023	\$45,679
Seismic Improvements	2024	\$841,323
New Aeration Basin and Blower	2025	\$6,928,208
Replace Secondary Clarifier Mechanisms	2026	\$1,382,827
Membrane Bioreactor (MBR) Phase 1 (includes new blower, fine screens, and electrical upgrades)	2028 – 2029	\$31,811,200
New Solids Dryer	2031 – 2032	\$13,371,479
MBR Phase 2 (includes new blower)	2033 – 2034	\$6,211,200
Thickening and Dewatering Improvements	2035	\$2,854,359
New Cooling Tower	2036 – 2037	\$452,138
MRB Phase 3 (includes 2 new blowers)	2038	\$4,742,400
MBR Phase 4 (includes 2 new blowers)	2040 – 2041	\$5,142,400
<b>Total</b>		<b>\$75,309,306</b>
*Costs are shown in 2022 dollars and include 25% for engineering, legal, and administration.		

As shown in the table above, the most significant impact to the required level of capital investment is the need for membrane bioreactor (MBR) facilities. These are state-of-the-art, compact facilities that provide a high level of treatment. The adjusted growth projection results in an approximate doubling of the City population over the planning period. Due to the limited amount of space available at the existing WWTP site, MBR facilities are the only feasible means of providing the necessary treatment to accommodate such a substantial rate of growth.

**EXPECTED RESULTS:**

The Plan includes a list of recommended capital improvements, along with an anticipated schedule for completion and preliminary cost estimates. These improvements will provide the basis for an analysis of sewer rates and system development charges (SDCs) that will be necessary to provide adequate funding to implement to required upgrades.

**TIMELINE:**

This is the third in a series of presentations to the Planning Commission and City Council. Completed and planned meetings are as follows:

- Planning Commission Work Session 7/13 (completed)
- City Council Work Session 8/1 (completed)
- Planning Commission Work Session 9/14
- Planning Commission Public Hearing 10/12
- City Council Work Session 11/7
- City Council Public Hearing 1st Reading 11/21
- City Council 2nd Reading 12/5

**CURRENT YEAR BUDGET IMPACTS:**

The remaining contract balance for finalizing the Plan will carry over into FY 22/23. An additional \$92,450 has been budgeted in FY 22/23 for the Sewer System Rate Study and SDC Update, using a combination of Sewer Operating funds and SDCs.

**COMMUNITY INVOLVEMENT PROCESS:**

The public hearings listed above will provide opportunity for public input. In addition, the Sewer System Rate Study and SDC Update will include a robust public engagement process.

**POTENTIAL IMPACTS or BENEFIT TO THE COMMUNITY:**

A technically and financially sound plan for providing reliable wastewater treatment, capacity to accommodate future development, and compliance with environmental regulations.

**ALTERNATIVES:**

The Plan is based on a projected population growth rate that is somewhat aggressive but is consistent with other recently adopted planning documents and with historical growth data. The capital project schedule can be adjusted as appropriate if actual growth rates differ significantly from the projected growth included in the Plan.

**ATTACHMENTS:**

N/A

# City of Wilsonville Wastewater Treatment Plant Master Plan

Planning Commission Work  
Session

September 14, 2022



# Introduction



Presenters:

Mike Nacrelli, PE, Senior Civil Engineer

Dave Price, PE, Carollo Engineers



# Status Update



- July 13 Work Session Comments
- Accommodating Expected Build-out UGB Growth
- Capacity Assessment Complete
- Costs and Schedule for Updated CIP Drafted
- Update of Master Plan Chapters in Progress
- September 28 Open House

# Facility Capacity Assessment



- Flows & Loads - Updated to reflect Build-out of USB
- Existing WWTP design (2014 expansion) – ADWF – 4 mgd
- Projected 2045 flows and loads exceed design criteria (~2X current)

Item	Existing	Projected 2045
Average Dry Weather Flow, mgd	1.93	4.16
Average Annual Flow, mgd	2.23	4.77
Maximum Month Wet Weather Flow, mgd	3.78	7.92
Average Annual BOD <sup>5</sup> , ppd	7,534	16,333
Average Annual TSS, ppd	6,484	13,789

# Unit Process Capacity Summary

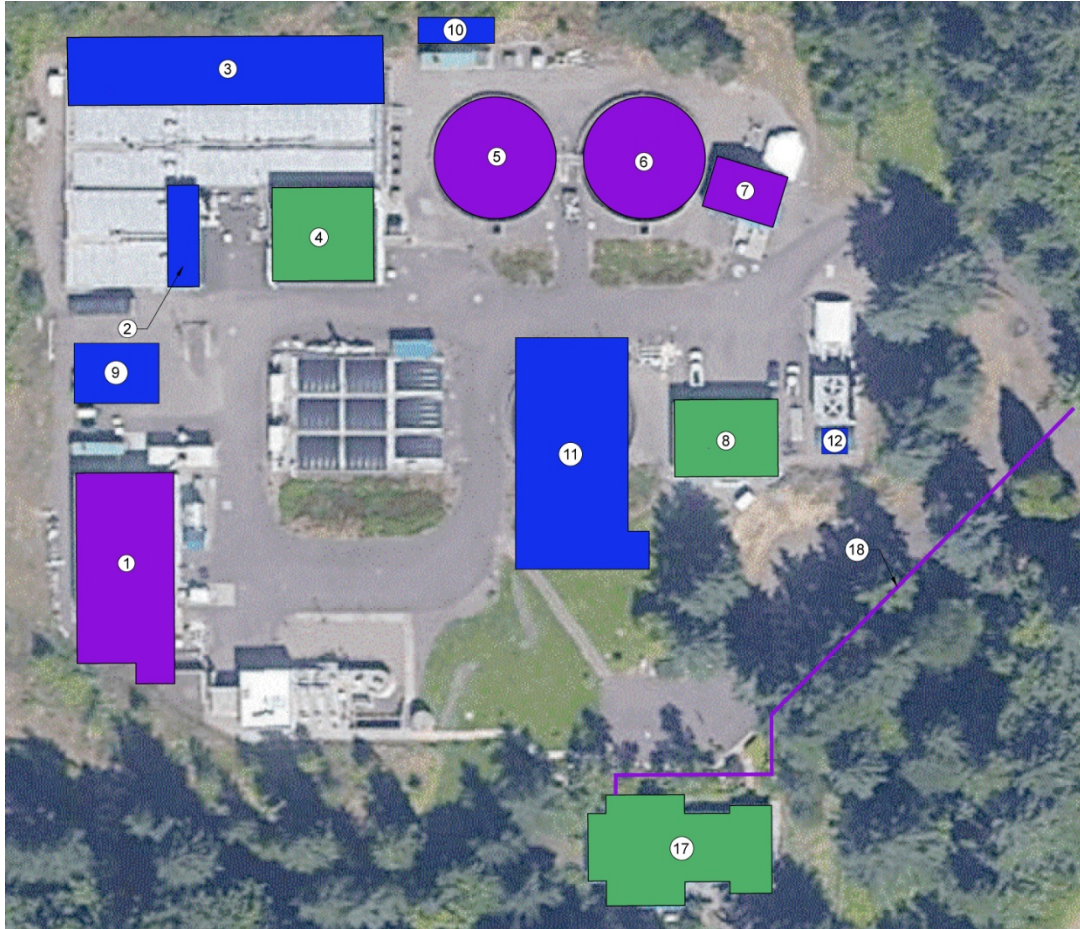
Unit Process	Design Parameter	Redundancy Criteria	Possible Year of Capacity Exceedance	Identified Alternatives
<b>Secondary Treatment</b>	MM MLSS inventory @ PDF	All units in service	<b>2026</b>	<ul style="list-style-type: none"> <li>• New Aeration Basin</li> <li>• New Secondary Clarifier</li> </ul>
<b>Aeration Blowers</b>	Peak BOD Load	Largest unit out of service	<b>2026</b>	<ul style="list-style-type: none"> <li>• Additional Blower</li> </ul>
<b>Additional Secondary Treatment</b>	MM MLSS inventory @ PDF	One train out of service	<b>2031, 2034, 2038, 2042</b>	<ul style="list-style-type: none"> <li>• Membrane Bioreactor</li> </ul>
<b>Effluent Cooling Towers</b>	6 MGD (May 1 – October 31)	All units in service	<b>2037</b>	<ul style="list-style-type: none"> <li>• Additional Cooling Tower</li> </ul>

# Alternatives Evaluation



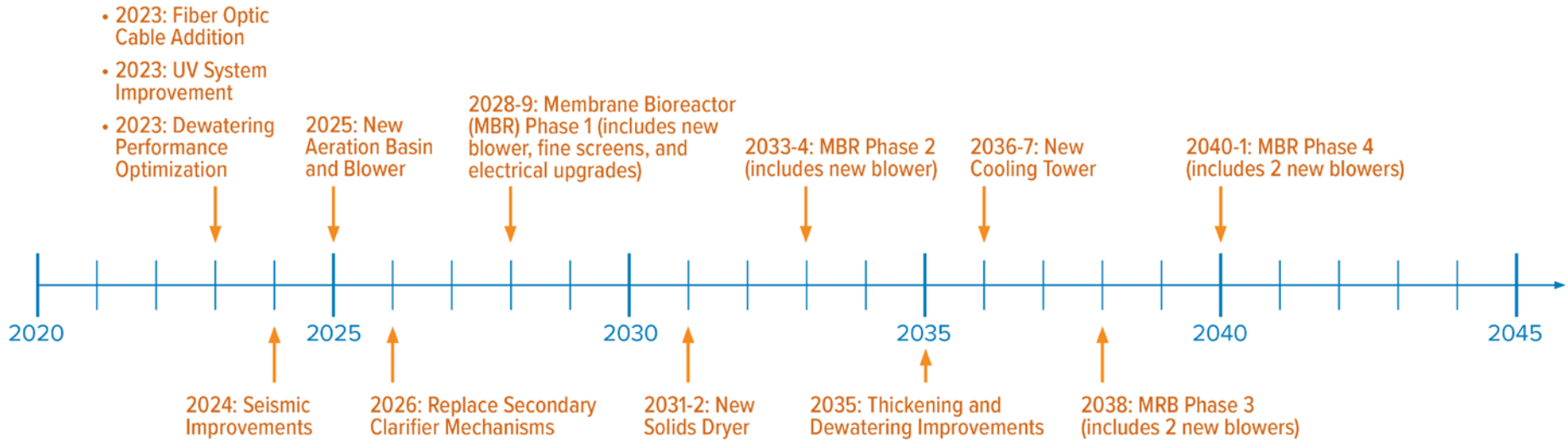
- Consider alternatives for process units identified as capacity deficient
- Secondary Process
  - Add new Aeration Basin & additional blower 2026
  - Phase MBR technology starting later
- Solids Thickening and Dewatering
  - Replace GBTs and Centrifuge units during the planning period
    - expected useful life
- Prior conclusions – plan to replace based on condition/age during planning period:
  - Backup UV system
  - Solids dryer
  - Dewatering Centrifuges
  - Thickening GBTs

# Recommended Plan



- ③ New Aeration Basin
- ② Additional Aeration Blowers
- ⑨ New Fine Screens
- ⑩ New Emergency Generator
- ⑪ New MBR Facility
- ⑫ New Cooling Tower
- ⑦ Replace backup UV system
- ① Plan to replace Solids Dryer & Centrifuges
- ⑤ ⑥ Replace Clarifier 1 & 2 mechanisms
- ④ ⑧ ⑰ Seismic retrofits of buildings
- ⑱ New fiber optic connection
- Solids process study

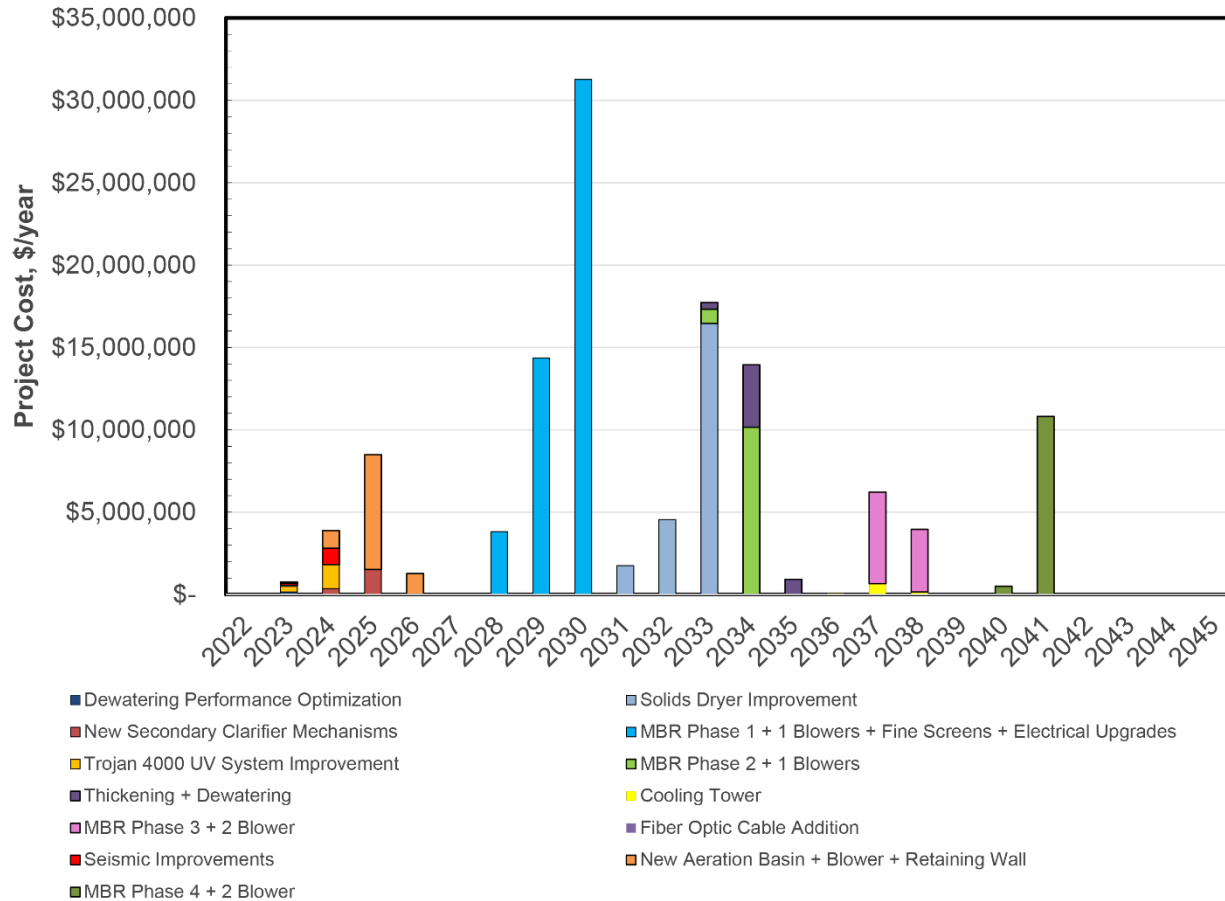
# Proposed Project Phasing Schedule



# Project Costs (2022 Dollars)

DESCRIPTION	TIMEFRAME	ESTIMATED COST	TOTAL WITH 25% E, L, & A
Dewatering Performance Optimization	2023	\$ 155,724	\$ 155,724
Trojan 4000 UV System Improvement	2023	\$ 1,370,369	\$ 1,712,961
Fiber Optic Conduit Addition	2023	\$ 45,679	\$ 57,099
Seismic Improvements	2024	\$ 841,323	\$ 1,051,654
New Aeration Basin + Blower + Retaining Wall	2025	\$ 6,928,208	\$ 8,660,260
Replace Secondary Clarifier Mechanisms	2025 – 2026	\$ 1,382,827	\$ 1,728,534
MBR Phase 1 + 1 Blower + Fine Screens + Electrical Upgrades	2028 – 2030	\$ 31,811,200	\$ 39,764,000
New Solids Dryer	2031 – 2033	\$ 13,371,479	\$ 16,714,349
MBR Phase 2 + 1 Blower	2033 – 2034	\$ 6,211,200	\$ 7,764,000
Thickening + Dewatering	2035	\$ 2,854,359	\$ 3,567,948
New Cooling Tower	2037	\$ 452,138	\$ 565,173
MBR Phase 3 + 2 Blowers	2037 – 2038	\$ 4,742,400	\$ 5,928,000
MBR Phase 4 + 2 Blowers	2040 – 2041	\$ 5,142,400	\$ 6,428,000
<b>TOTAL</b>		<b>\$ 75,309,306</b>	<b>\$ 94,097,702</b>

# Draft Cash Flow





# Next Steps



- Virtual Public Open House (9/28)
- Planning Commission Public Hearing 10/12
- DEQ review and approval of Plan
- City Council Work Session 11/7
- City Council Public Hearing 1<sup>st</sup> Reading 11/21
- City Council 2<sup>nd</sup> Reading 12/5
- Sewer System Rate Study and SDC Update FY23

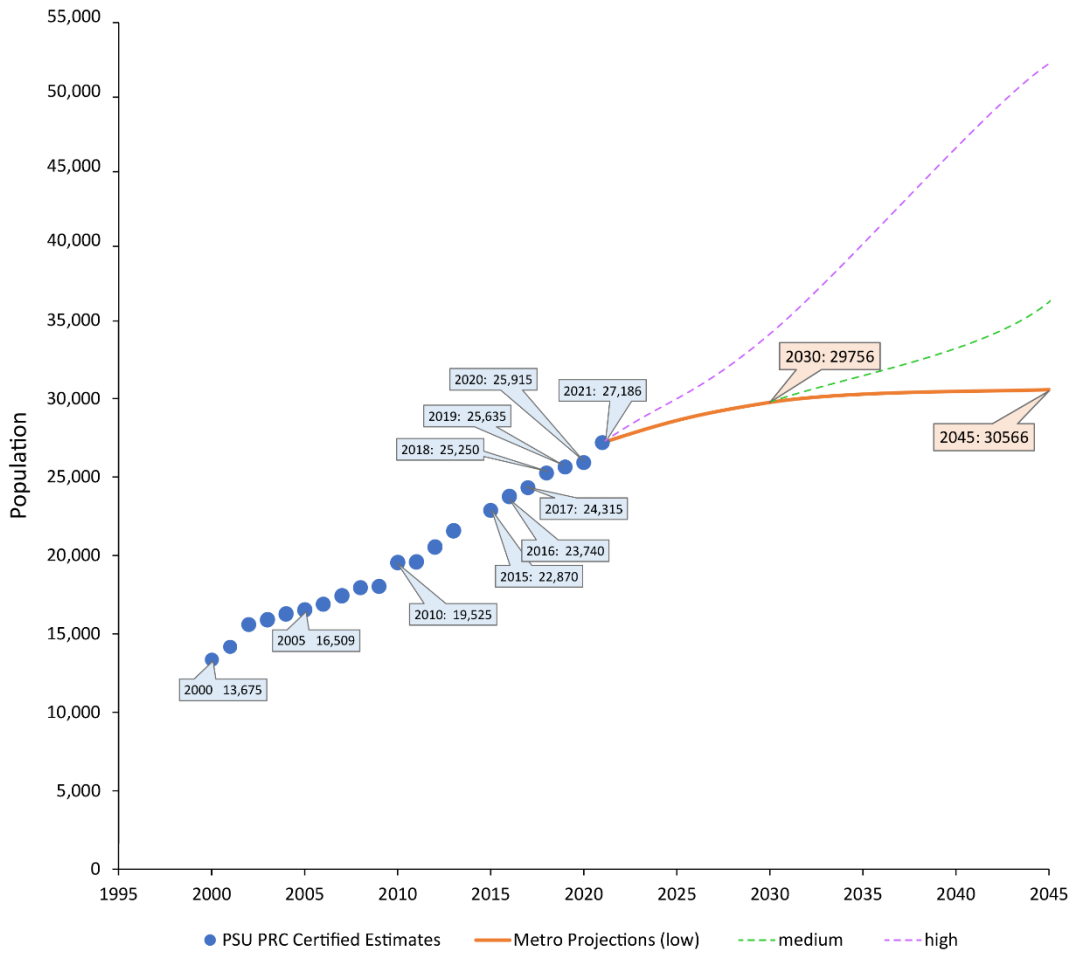
**Questions?**

# Reference Slides

# Capital Planning and Expected Growth - 2045

- Current Service Area needs
  - 20+ years through 2045
  - Population and associated economic development

2015	2020	2030	2045
22,870	25,915	29,756	30,566



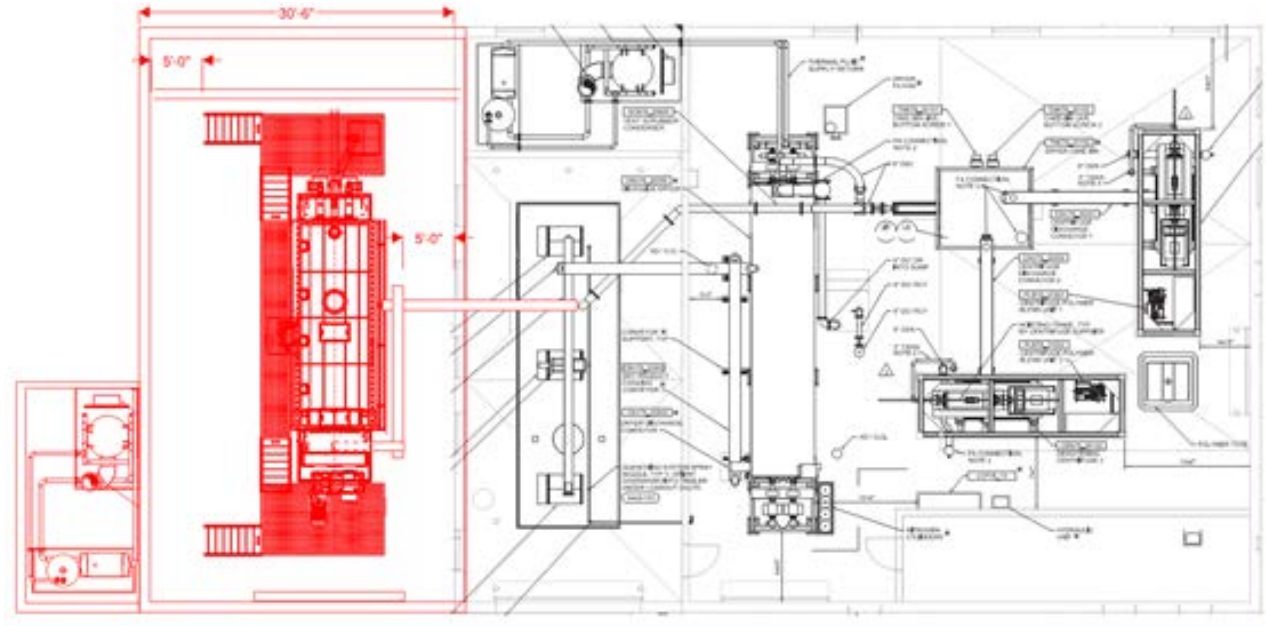
# Condition Assessment



- Prioritize 2019 findings of consultant assessments
  - Secondary clarifiers
  - UV system
- Geotechnical and seismic evaluations
  - Older buildings found to present moderate risk
  - Identified mitigations to address seismic concerns
    - Operations Building
    - Process Gallery
    - Workshop

# Alternatives Evaluation

- Solids Dryer – driven by performance, not capacity
  - Further study, placeholder to expand dewatering and drying building, add new paddle dryer, refurbish existing dryer (backup)
  - Largest potential investment in Master Plan



# Asset Condition Assessment



- Process Condition/Age Drivers
  - 2014 project facilities and equipment in service > 30 years by 2045
  - Solids facilities –
    - Performance issues
      - Solids Dryer fire (2019), component failures (2021), uneven performance
      - Solids Dewatering Centrifuges uneven performance (2020/21)
  - Secondary clarifiers – Pre-date 2014 upgrades, near term mechanism replacements, clarifiers no. 1 and 2
  - UV Disinfection – backup unit pre-dates 2014 upgrades, near term replacement

# Potential Regulatory Drivers



- DEQ - Total Maximum Daily Load (TMDL)  
Lower Willamette River
- Dissolved oxygen & nutrients
  - Nutrients can contribute to low oxygen conditions
  - Anticipate and accommodate future phosphorous, possibly nitrogen limits
- Pay attention to Willamette River  
temperature concerns



- **Mr. Green** replied some probability or possibility of growth happening was anticipated if there was an expansion of the airport area, resulting in the development area potentially expanding outward as well.
  - He clarified these were not necessarily trying to anticipate specific events happening that would lead to development in those areas. It was saying development in the area around the airport, such as an industrial development located one parcel away from the through the fence, might occur due to its proximity to the airport.

**Ms. Bateschell** clarified the project team had a work session with the City Council on Monday to review the draft policies and get Council's input. The collective input received would refine what came before the Commission in November.

### 3. Wastewater Treatment Plant Master Plan (Nacrelli)

**Mike Nacrelli, Senior Civil Engineer** updated on the progress of the Wastewater Treatment Master Plan (WWTP) process via PowerPoint noting the growth projections presented to the Commission in July were based on lower growth projections from Metro. Following discussions with the Planning Commission and internal with management, the project team [we] went back and looked at the higher growth curve, which was just under 3 percent annually, and reran the numbers for the modeling of the flows and loads at the plant, as well as the impact on plant capacity and the capital investment required to handle that level of growth, which resulted in substantial changes. (Slide 3) An updated project phasing schedule and cost estimates were created for the projects and all the other portions of the Master Plan document impacted by these changes were being updated as well. An online public open house would begin September 28<sup>th</sup> for any members of the general public who wanted to provide input.

**Dave Price, Carollo Engineers**, continued the PowerPoint presentation on the WWTP Master Plan process, reviewing the updates made to the Facility Capacity Assessment and Unit Process Capacity Summary, given the higher growth projections from Metro; the Alternatives Evaluation and Recommended Plan for the required improvement projects, including new capacity upgrades, as well as the now more accelerated Project Phasing Schedule. With the higher growth scenario, the Project Costs had increased to more than three times the approximately \$31 million reported in July. The Draft Cash Flow chart provided a visual representation of the Project Costs along the timeline. (Slide 10)

Discussion and feedback from the Planning Commission was as follows with responses to Commissioner questions as noted:

- Looking at the Draft Cash Flow, the membrane bioreactor (MBR) was the biggest outlay of cash in years. Was the City doing any pro-planning of the funds that would be needed for that?
  - **Mr. Nacrelli** replied that upon completion of this plan and part of next steps, the City planned to do a rate and SDC study within this current budget year to look at the details of how to fund the improvements through a combination of rate adjustments and SDCs, and maybe other mechanisms available.
- Assuming some monies were already in reserve, at what point would the rate and SDC changes need to happen for the monies to be there for the 2028, 2029, 2030 MBR expenditures?

- **Mr. Nacrelli** replied the timing was one of the questions the study would have to be able to answer. He suspected rate and SDC increases would be phased in over time, but that would have to be fleshed out in that study, accommodating the growth expected and how those rates would have to be adjusted as growth occurs in order to provide the necessary funding. Once the study and public involvement process were completed, and the fee increases adopted, the new rates would probably have to start right away to make those adjustments.
- How would rate changes for future expansion be explained to existing customers?
  - **Mr. Nacrelli** stated that was ultimately a Council decision. He agreed the majority of the investment was driven by capacity needs; however, some components involved replacing old equipment, so it was not entirely growth driven. He anticipated the impact on SDCs would be far greater than the impact on rates.
- **Mr. Nacrelli** confirmed the improvements would be triggered by threshold population growth; as growth reached a certain place, a new unit gets triggered which provides some flexibility, so the project costs/schedule were not cast in concrete
- Regarding the cost of growth, this was an interesting exercise because in simulating a doubling of the size and the cost tripled, which slows growth because some of the growth occurs because it was competitive price wise. People come to Wilsonville because it was cheaper than Tualatin, for example, and the city has a growth spurt. Growth slows as costs catch up. The schedule was not cast in concrete, growth triggers the decisions for these units to come in.
  - **Mr. Nacrelli** displayed the Capital Planning and Expected Growth – 2045, explaining the numbers in the table on the left were for the orange curve, but the numbers presented in the PowerPoint were based on the purple curve, which was the same growth rate Mr. Price mentioned was used in the 2014 Collection System Master Plan, as well as the Water Treatment Plant Master Plan, and possibly several other planning documents. (Slide 14)
- **Commissioner Mesbah** noted in a previous life, he would be reviewing the Master Plan. A community's Comprehensive Plan was a wish that did not necessarily come true. A cost-effective analysis was needed of some of this projection, growth, and units, especially since by taking this population growth curve, the City had managed to say the only option was the MBR treatment, which was a more expensive treatment, which he understood was to meet higher water quality standards. It was taking away a lot of choices that the City may do well to consider. Maybe the City decides it does not want to double in size—ever—to avoid dealing with higher water quality impacts on city water. These were necessary to explain to rate payers in a comprehensive and understandable way why the City was planning what it was planning. Questions like, “Am I paying for someone else’s growth?” were divisive and not helpful to a sense of community. This was a community service, and it should be approached as a benefit for all and the environment that was receiving the City’s treated waste.
- In terms of the current analysis for flow rates and the details in some of the earlier slides, what baseline population numbers were used as the starting point, 2021 or 2015?
  - **Mr. Price** explained typically 5 to 6 years' worth of data were used, adding this could be considered a 2021 number. When looking at existing data, they often analyzed the flow meter and data being collected from operators at the plant, then they projected out using unit factors and numbers that were conservative to a certain extent, making sure it provided for some flexibility in terms of how the facility was being planned. If the numbers being used were too conservative, and growth did not occur as that particular projection envisioned, then the Plan needed to adjust to that.

- The projected flows made sense, but did the City really expect to be at that 2045 population level to drive all the necessary infrastructure requirements that had been defined. (Slide 14) In July, the projection seemed low and now, was it too high? Was there a middle ground that was a more realistic growth scenario or, if that were to come to pass, would the system's design be done differently from a planning perspective if 45,000 people were expected rather than 52,000.
  - **Mr. Price** responded not necessarily, given the space available at the existing treatment plant site. The City would likely wind up with the same recommendation.
  - **Mr. Nacrelli** noted it might push the timeline further into the future, but to serve the ultimate build out, whether that happened in 2045 or later, there was no more space to do something different.
  - **Mr. Price** agreed, adding they had looked at other options to provide capacity and other processes to intensify secondary treatment, and the conclusion was that the MBR was the direction the City should go no matter the timeline. This was a plan the team believed would provide a very robust facility that the City could feel confident would meet its requirements on the water quality side, while also being flexible to the degree to which it could be made flexible; some additional variations could be added should different criteria or scenarios apply over the next 23 years. At this time, the July and this current proposal bracketed the range of options.
  - **Mr. Nacrelli** stated the Rate and SDC Study would certainly look at how the funding would be impacted by changes in growth. If growth slowed way down for some reason and the projected flows were not achieved, then the City would likely push some of these projects out. To serve the ultimate population within the UGB around Wilsonville with the limited existing site, what would be built would not change, just possibly when things were built.
  - **Mr. Price** noted none of the scenarios accounted for any significant changes on the regulatory side. There were processes in place, underway, or pending to potentially look at other pollutants that might be regulated. This particular plan provided a very firm basis upon which to build, which was why the aeration basin was proposed first as opposed to going right to the membranes. Having that additional volume and capacity in the plant would provide flexibility for the City in the future in being able to address potential future regulatory concerns.
    - He noted that when the membrane facility was in place, the filters and the two secondary clarifiers that are not demolished would effectively become redundant facilities because the MBR would produce **effluent that** would not be necessary to run through clarifiers and filters because of the process of the liquid separation that occurs with the membrane.
    - The membrane facility was chosen due to the site constraints at the treatment plant, but when the facilities are in place, some space would be freed up providing the City with some flexibility in the future should additional regulatory issues arise in addition to the growth.
- **Commissioner Mesbah** said he wanted to clarify his earlier comments. The proposed plan was based on population that was currently baked into the City's plans and would eventually happen, so the projects would be necessary. As long as this plan was based on need and the projects were pushed out if the population growth did not happen, it was a sound plan. The City still needed to explain it very clearly, so it did not create an impression that this was cost for newcomers versus cost for what was not done before, etc. He was unsure whether the fiscal impacts of growth were looked at ahead of planning. Since it was a separate process, it did not get considered when the City adopted new areas to grow into. He suggested doing this kind of thinking before adding areas would be helpful in the overall process.

- **Commissioner Karr** believed the original concern with following the orange line was the fact that the Commission knew of future developments that were going to exceed the orange line. If those developments come to fruition, the orange line was not usable, and that becomes the problem of, "It's an essential service and it has to be in place". Even though there was a timeline, it sounded like the project list would not change, only the timing of the project list and representative costs. He proposed amending the chart on Page 3 to state, "**potential** timeframe based on expected growth" to provide a clearer picture. Since the expenditures for these projects depended upon seeing the anticipated growth, the timeframe should be a little more 'squishy'. (Slide 9)
  - **Mr. Nacrelli** confirmed that whether build out was reached around 2045 or 10 years later, the facilities would still be needed, but perhaps not as soon. (Slide 9)
  - **Chair Heberlein** suggested adding "estimated timeframe" as well as "estimated costs" to clarify there was no hard date.
  - **Mr. Nacrelli** stated that even with the orange population curve, the aeration basin would be done fairly soon.
  - He clarified the first few projects before the aeration basin were not substantial and that the funding for those first few was available, adding the projects were not necessarily even growth projects. (Slide 9)
- The new aeration basin was more growth driven than current population, replace secondary clarifier mechanisms was maintenance, but all the "new" projects were growth-driven. The majority of the estimated cost was growth related and if the timeline was not certain, it would be better to state an estimated timeframe instead of a timeframe which leads people to think a project was certain to happen at that point.
  - **Mr. Nacrelli** agreed that could be presented better and they would make it clear in the document.
- Rather than 'squishy' the project team was encouraged to use 'commensurate to population threshold numbers' and hopefully, the team could show at least a range population levels that would trigger an action, so that it gave some guidance to decision makers.
  - **Mr. Price** agreed including an assumed population column would be helpful.
  - **Mr. Nacrelli** reminded there was a significant element of industrial use in the projections, so population could be a guide, but it was not 100 percent.
- **Commissioner Gallagher** said she fully supported taking care of infrastructure, but she reacted to the projection of growth. Did the City really plan on doubling the population of Wilsonville? Is that what was wanted? Was that what this was all about or was that what the City was concerned about?
  - **Mr. Nacrelli** displayed the City Land use Designations Map, noting most of the service area was mostly already within the city limits. If the available land developed as planned, the projects in the Master Plan was what would be needed, unless there were Zoning or Comprehensive Plan changes.
- The Commissioners discussed where 50,000 people would come from, noting Frog Pond would be 6,000 people. If the study area was based on this Land Use Map boundary, then the population estimates should be based on that boundary as well. Either the boundary or the population estimate was off, as well as what the density would permit.
  - **Mr. Nacrelli** clarified these numbers were consistent with the planning done for the sewer system, as well as the water treatment plant currently under expansion. The numbers were not really a departure from other projections the City had been using to plan for infrastructure.

- As long as it was timebound, or population or use based, then it was okay. This was the plan for infrastructure when Wilsonville needed it, regardless of what the boundary said.
- If the team low balled it and blew the water quality standards because the City was now discharging raw sewage or polluted wastewater, it would penalize the City, and potentially put a total stop to any new growth, etc. until it was addressed. The City did not want to be in that position, which was why planning was done ahead of time.

The Planning Commission took a brief recess, reconvening at 7:48 pm

#### 4. Frog Pond East and South Master Plan (Pauly)

**Dan Pauly, Planning Manager**, stated this was the Commission's eighth work session on the Frog Pond East and South Master Plan. He introduced the project team and began the PowerPoint presentation, noting tonight's discussion would be around infrastructure, continued discussion on Housing Variety Policy, next steps, and what the finish line looked like at this point.

- He explained the preliminary work done during the 2015 Frog Pond Area Plan provided a foundation for the list of needed infrastructure projects as well as the cost estimates to develop a program for funding them.
- A sensitivity test for a hypothetical higher residential unit count was included in the water and sewer memorandum, and not in the current draft of the transportation memo. During the State administrative rule making for implementation of House Bill 2001, a variety of options was provided that jurisdictions could take, one of which was to plan for 20 units per net acre. How much more expensive would infrastructure be if 20 units per acre were planned versus what the City anticipated would be built during the initial buildout.

**Jenna Bogert, Transportation Engineer Consultant, DKS Associates**, continued the PowerPoint, highlighting the transportation analysis process and the housing unit and job counts used in the traffic model to identify failing intersections and needed improvements, including for bike and pedestrian facilities. She noted the traffic operations, identified deficiencies, and proposed improvements within the subject area, and described four main intersection improvements, which included roundabouts. (Slide 7) She reviewed the pros and cons of single lane roundabouts, as well as proposed pedestrian and bicycle treatments to address gaps and deficiencies, and the proposed street cross sections on Stafford and Advance Rds.

- **Mr. Pauly** noted the Stafford Rd/65th Avenue intersection was a high-priority project for the County to fix. The team's scenario assumed that those improvements were built within the 2040 baseline being considered. (Slide 6)
- **Ms. Bogert** added City Staff had been informing the County of the changes and plans for the Frog Pond Area throughout the master planning process.

Commissioner comments regarding the transportation infrastructure was as follows with responses to questions by the project team as noted:

- With the Advance Road and 60<sup>th</sup> roundabout so close to the school and park, what advanced safety precautions beyond the crosswalks would be taken because school children would be crossing there?
  - **Mr. Pauly** replied the project team talked directly with the School District this week on how to plan it. The District likes the roundabout for bus and traffic circulation, having buses go out that



**CITY COUNCIL**  
**MONDAY, AUGUST 1, 2022**

**WORK SESSION**

Wastewater Treatment Plant Master Plan (Nacrelli)



**CITY COUNCIL MEETING  
STAFF REPORT**

<b>Meeting Date: August 1, 2022</b>		<b>Subject:</b> Wastewater Treatment Plant Master Plan	
		<b>Staff Member:</b> Mike Nacrelli, Senior Civil Engineer	
		<b>Department:</b> Community Development	
<b>Action Required</b>		<b>Advisory Board/Commission Recommendation</b>	
<input type="checkbox"/> Motion <input type="checkbox"/> Public Hearing Date: <input type="checkbox"/> Ordinance 1 <sup>st</sup> Reading Date: <input type="checkbox"/> Ordinance 2 <sup>nd</sup> Reading Date: <input type="checkbox"/> Resolution <input checked="" type="checkbox"/> Information or Direction <input type="checkbox"/> Information Only <input type="checkbox"/> Council Direction <input type="checkbox"/> Consent Agenda		<input type="checkbox"/> Approval <input type="checkbox"/> Denial <input type="checkbox"/> None Forwarded <input checked="" type="checkbox"/> Not Applicable	
		<b>Comments:</b> N/A	
<b>Staff Recommendation:</b> Provide input on components of the Wastewater Treatment Plant (WWTP) Master Plan.			
<b>Recommended Language for Motion:</b> N/A			
<b>Project / Issue Relates To:</b>			
<input checked="" type="checkbox"/> Council Goals/Priorities: Align infrastructure plans with sustainable financing resources.	<input type="checkbox"/> Adopted Master Plan(s):	<input type="checkbox"/> Not Applicable	

**ISSUE BEFORE COUNCIL:**

Provide feedback and input on components of the Wastewater Treatment Plant (WWTP) Master Plan.

**EXECUTIVE SUMMARY:**

This new City of Wilsonville (City) Wastewater Treatment Plant (WWTP) Master Plan (the Plan) has been developed to satisfy requirements associated with the State of Oregon Department of Environmental Quality (DEQ) guidance document entitled “Preparing Wastewater Planning Documents and Environmental Reports for Public Utilities.” To accommodate future flows and loads, projections were developed based on population projections and referencing WWTP historical data and DEQ wet weather project methodologies. Similarly, to accommodate future water quality regulations, the Plan is adaptive and considers potential future regulatory changes.

The City prepared the Plan with the goal of developing a capital plan that identifies improvements required through the planning period (today through 2045) to comply with requirements of the WWTP National Pollutant Discharge Elimination System (NPDES) permit and potential future regulatory requirements, while accommodating growth identified in the City of Wilsonville Comprehensive Plan (October 2018, updated June 2020). These improvements are designed to provide the best value to the City’s ratepayers by maximizing the use of existing infrastructure and improving system operation while continuing to protect water quality and human health and supporting economic development, consistent with goals and policies contained in the Comprehensive Plan and 2021-2023 City Council Goals.

The City’s WWTP was originally built in 1971 and discharges treated effluent to the Willamette River. The WWTP underwent major upgrades in 2014 to expand the average dry weather capacity to four million gallons per day (mgd) to accommodate the City’s continued growth. The WWTP processes include headworks screening and grit removal facilities, aeration basins, stabilization basins, secondary clarifiers, biosolids processing, cloth filtration, and disinfection processes. Additionally, the City contracts with Jacobs for operation of the wastewater treatment plant, located at 9275 Southwest Tauchman Road.

This Plan identifies improvements taking into consideration:

- The age and condition of existing process equipment and structures,
- Growth in demand for sewer service due to increased population and economic development over the planning period,
- Potential changes to water quality regulations impacting process needs in order to meet effluent limitations and discharge prohibitions imposed by the Oregon Department of Environmental Quality (DEQ), and
- Consistency with the 2018 Comprehensive Plan and City Council 2021-2023 Goals 5, 6 and 7.

***WWTP Condition Assessment***

Carollo reviewed prior condition assessments performed by others, conducted geotechnical investigations and performed seismic assessments at the WWTP in the course of Plan development.



In 2019, Jacobs Engineering Group Inc. (Jacobs) and Brown and Caldwell both completed condition assessments at the City's WWTP. A total of 322 major assets (per Jacobs' report), including process and mechanical equipment, motors and drives, control panels, generators, instrumentation, and structures, were examined for a variety of conditions that may signify their need for maintenance or replacement.

### ***Seismic Analysis***

In 2021, Carollo performed a seismic evaluation and analysis of the City's WWTP as part of the overall plant condition assessment. Because the WWTP was substantially upgraded and expanded in 2014, most of its infrastructure is designed in accordance with the 2010 Oregon Structural Specialty Code (OSSC) and follows modern seismic design and detailing. During Tier 1 evaluations, Carollo identified potential deficiencies and areas for additional investigation. A Tier 1 seismic analysis is an initial evaluation performed to identify any potential deficiencies, whether structural or non-structural, in a building based on the performance of other similar buildings in past earthquakes. Subsequent to the Tier 1 analysis, a more detailed seismic evaluation of five older and potentially seismically vulnerable structures on the WWTP site was conducted. Those structures receiving a more detailed evaluation included the following:

- Operations Building
- Process Gallery
- Workshop
- Aeration Basins and Stabilization Basins
- Sludge Storage Basins and Biofilter

The five potentially vulnerable structures were for an M9.0 Cascadia Seismic Zone (CSZ) earthquake. The M9.0 CSZ is reflective of a catastrophic natural disaster event that has an estimated 35 percent likelihood of occurring within the next 50 years. Following the Tier 1 evaluation, Carollo began Tier 2 evaluations for a select number of identified deficiencies. Although none of the structures showed significant irregularities, the team did identify seismic deficiencies. The recommended seismic retrofits are included in the CIP for the Plan.

Prior to the 2021 seismic evaluation, Carollo's subconsultant, Northwest Geotech, Inc. (NGI), completed a seismic response and geologic hazards assessment of the City's WWTP. Through past and present site investigations and engineering analyses, NGI determined that the native soils beneath the site's granular pit backfill have low risk of liquefaction and its slopes do not pose undue risk. NGI concluded that the WWTP's primary site hazard is the differential settlement that may be caused by soil piping (development of subsurface air-filled voids), which raises the risk of sinkholes forming beneath structures and pipelines. Soil piping usually develops in unsaturated soils when a water source percolates into the ground. While the site is mostly paved and stormwater is being collected, there may be areas where infiltration is occurring next to structures or below pipelines. Recommended actions from NGI to mitigate the risk of soil piping are presented in the Plan.

### ***Wastewater Flow and Load Projections***

The Plan evaluates the historical and projected wastewater flows and loads generated in the City of Wilsonville's service area. The load projections include total suspended solids (TSS), biochemical oxygen demand (BOD5), ammonia (NH3), and total phosphorous (TP) loads.

Service area, residential population, industrial contribution, and rainfall records were all considered in the flow and load projection analyses.

### ***Capacity Analysis***

Summaries of plant process area capacity assessments and conclusions are presented in the Plan. These assessments focus on the need for improvements or upgrades to existing facilities to address capacity deficiencies identified in the course of Master Plan evaluations.

### ***Regulatory Considerations and Strategy***

Several possible regulatory actions by the Oregon DEQ could drive investments in future improvements at the City's WWTP. The plant discharges to the Willamette River and existing and future effluent limitations contained in the NPDES permit dictate, in large part, the necessary treatment processes and configuration at the WWTP necessary to maintain compliance. The existing permit limits for the Wilsonville WWTP are effective September 1, 2020 through July 30, 2025.

### ***Alternative Development and Evaluation***

The Plan presents the methodology and findings of a process improvements alternatives evaluation. The plant's treatment process needs were defined by comparing the plant's existing condition, capacity and reliability, with the projected flows, loads, and regulatory constraints for the recommended alternatives. Where capacity deficiencies were predicted, at least two alternatives were analyzed for each corresponding unit process.

### **EXPECTED RESULTS:**

The Plan includes a list of recommended capital improvements, along with an anticipated schedule for completion and preliminary cost estimates. The total estimated amount of capital investment over the planning period is approximately \$31 million, of which \$4.5 million is anticipated in the next 5 years. The recommended capital improvements will provide the basis for an analysis of sewer rates and system development charges (SDCs) that will be necessary to ensure adequate funding to implement to required upgrades.

### **TIMELINE:**

This is the second in a series of presentations to the Planning Commission and City Council. Completed and subsequent planned meetings are as follows:

- Planning Commission Work Session - July 13 (completed)
- City Council Work Session - August 1 (current)
- Planning Commission Public Hearing - September 14
- City Council Public Hearing 1st Reading - October 3
- City Council 2nd Reading - October 17

**CURRENT YEAR BUDGET IMPACTS:**

The remaining contract balance for finalizing the Plan will carry over into FY 22/23. An additional \$92,450 has been budgeted in FY 22/23 for the Sewer System Rate Study and System Development Charge (SDC) Update, using a combination of Sewer Operating funds and SDCs.

**COMMUNITY INVOLVEMENT PROCESS:**

A virtual town hall meeting to present the findings of the Plan and solicit public input will be scheduled in August and posted on the City's online calendar. The public hearings listed above will provide additional opportunity for public input. The forthcoming Sewer System Rate Study and SDC Update will also include a robust public engagement process.

**POTENTIAL IMPACTS OR BENEFIT TO THE COMMUNITY:**

A technically and financially sound plan for providing reliable wastewater treatment, capacity to accommodate future development, and compliance with environmental regulations.

**ALTERNATIVES:**

The Plan includes alternatives for several of the recommended improvements. The selected alternatives were determined to be the most economically viable. Some of the more capital intensive alternatives can be revisited if necessary due to changing regulatory requirements.

**CITY MANAGER COMMENT:**

N/A

**ATTACHMENT:**

1. Draft Wastewater Treatment Plant Executive Summary (dated July 2022)



City of Wilsonville  
Wastewater Treatment Plant Master Plan

**EXECUTIVE SUMMARY**

DRAFT | July 2022







City of Wilsonville  
Wastewater Treatment Plant Master Plan

EXECUTIVE SUMMARY

DRAFT | July 2022



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## Abbreviations

AA	average annual
AAF	average annual flow
ABF	average base flow
ADWF	average dry-weather flow
AWWF	average wet weather flow
BCR	biochemical reactor
BOD <sub>5</sub>	biochemical oxygen demand
Carollo	Carollo Engineers, Inc.
CIP	Capital Improvement Plan
City	the City of Wilsonville
CBOD <sub>5</sub>	five-day carbonaceous biochemical oxygen demand
CSZ	Cascadia Seismic Zone
DBO	Design-Build-Operate
DEQ	Department of Environmental Quality
DMR	Discharge Monitoring Reports
ETL	excess thermal load
gpd/sf	gallons per day per square foot
HMI	human-machine interface
Jacobs	Jacobs Engineering Group Inc.
kcal/day	kilocalories per day
lbs	pounds
MBR	membrane bioreactor
mg/L	milligrams per liter
mgd	million gallons per day
MGI	Northwest Geotech, Inc.
ml	milliliter
MLSS	mixed liquor suspended solids
MM	maximum month
MMDWF	maximum month dry weather flow
MMWWF	maximum month wet weather flow
MW	maximum week
MWDWF	maximum month dry weather flow
MWWWF	maximum week wet weather flow
NH <sub>3</sub>	ammonia
No.	number
NPDES	National Pollutant Discharge Elimination System
OSSC	Oregon Structural Specialty Code

PD	peak day
PDDWF	peak day dry weather flow
PDWWF	peak day wet weather flow
PHF	peak hour flow
ppd	pounds per day
PSU PRC	Portland State University Population Research Center
R/C	residential/commercial
SPA	State Point Analysis
SRT	solids residence time
the Plan	Master Plan
TMDL	total maximum daily loads
TP	total phosphorous
TS	total solids
TSS	total suspended solids
TWAS	thickened waste activated sludge
UGB	urban growth boundary
UV	ultraviolet
WWTP	wastewater treatment plant

## EXECUTIVE SUMMARY

This new City of Wilsonville (City) Wastewater Treatment Plant (WWTP) Master Plan (the Plan) has been developed to satisfy requirements associated with the State of Oregon Department of Environmental Quality (DEQ) guidance document entitled “Preparing Wastewater Planning Documents and Environmental Reports for Public Utilities.” To accommodate future flows and loads, projections were developed based on population projections and referencing WWTP historical data and DEQ wet weather project methodologies. Similarly, to accommodate future water quality regulations, the Plan is adaptive and considers potential future regulatory changes.

The City prepared the Plan with the goal of developing a capital plan that identifies improvements required through the planning period (today through 2045) to comply with requirements of the WWTP National Pollutant Discharge Elimination System (NPDES) permit and potential future regulatory requirements, while accommodating growth identified in the City of Wilsonville Comprehensive Plan (October 2018, updated June 2020 - the 2018 Comprehensive Plan). These improvements are designed to provide the best value to the City’s ratepayers by maximizing the use of existing infrastructure and improving system operation while continuing to protect water quality and human health and supporting economic development, consistent with goals and policies contained in the 2018 Comprehensive Plan and 2021-2023 City Council Goals.

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This Plan identifies improvements taking into consideration:

- The age and condition of existing process equipment and structures,
- Growth in demand for sewer service due to increased population and economic development over the planning period,
- Potential changes to water quality regulations impacting process needs in order to meet effluent limitations and discharge prohibitions imposed by the Oregon Department of Environmental Quality (DEQ),
- City of Wilsonville Wastewater Collection System Master Plan (2014, MSA), and

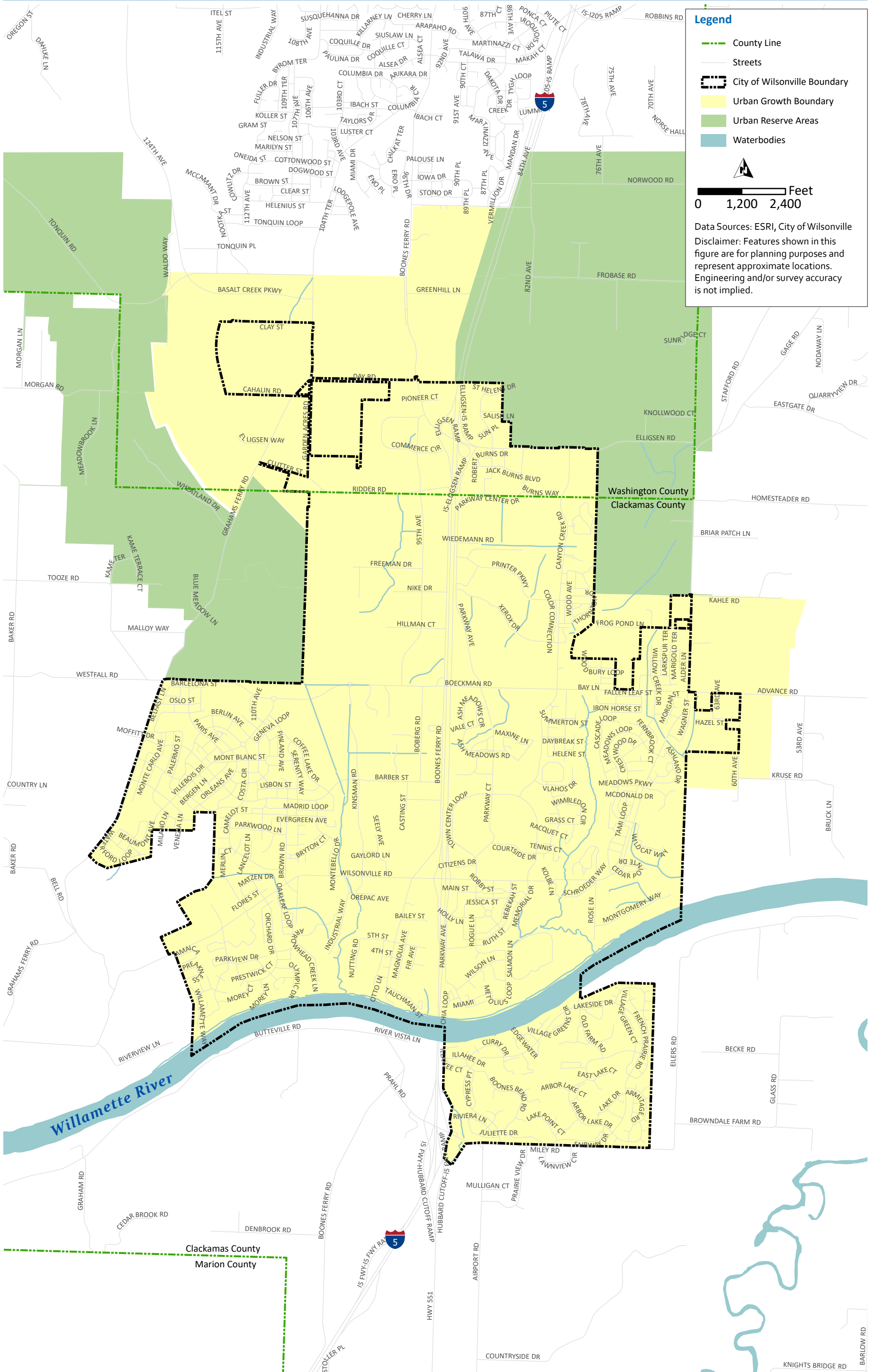
- Consistency with the 2018 Comprehensive Plan and City Council 2021-2023 Goals 5, 6 and 7:
  - Goal 5: Align infrastructure plans with sustainable financing sources.
  - Goal 6: Engage the community to support emergency preparedness and resiliency.
  - Goal 7: Protect Wilsonville's environment and increase access to sustainable lifestyle choices.

### ES.1 Planning Area Characteristics

Chapter 1 summarizes the City's wastewater service area characteristics relevant to assessing WWTP facility needs. The planning area considered by this Plan is consistent with the City's 2014 Collection System Master Plan and 2018 Comprehensive Plan including the urban growth boundary (UGB), which is currently the limit of City sewer service as shown in Figure ES 1.

The northern portion of the City of Wilsonville is located within Washington County, and the majority of the City lies in the southwestern part of Clackamas County.

The City sits within the jurisdictional boundaries of Metro, the regional government for the Portland metropolitan area. By state law, Metro is responsible for establishing the Portland metropolitan area's UGB, which includes Wilsonville. Land uses and densities inside the UGB require urban services such as police and fire protection, roads, schools, and water and sewer systems. A figure of the City's existing land use is presented in Chapter 1. Also presented in Chapter 1 are the City's physical characteristics, water resources, and population and employment information, which are all significant factors in planning for wastewater conveyance and treatment facilities.



**Legend**

- County Line
- Streets
- City of Wilsonville Boundary
- Urban Growth Boundary
- Urban Reserve Areas
- Waterbodies

0 1,200 2,400 Feet

Data Sources: ESRI, City of Wilsonville  
 Disclaimer: Features shown in this figure are for planning purposes and represent approximate locations. Engineering and/or survey accuracy is not implied.

Figure ES.1 Planning Area



The Portland State University Population Research Center (PSU PRC) publishes annual estimates of populations for the previous year for cities in Oregon while Metro develops population projections for the future within the Portland metropolitan area, including Wilsonville. The PSU PRC estimated the City’s population as 27,186 in 2021. Metro estimates the City’s population to reach 30,566 people by 2045.

For establishing a per capita basis for flow and load projections for the Plan, certified PSU PRC historical population estimates were used for 2015 through 2019. Metro’s future population forecasts were used for 2020 through 2045. Figure ES.2 shows the historical population and future growth predicted for the City. Figure ES.2 also identifies growth projections developed to allow the City to assess capital requirements possibly resulting from more aggressive growth than projected by Metro. Analysis of possible growth scenarios is described in greater detail in Chapter 4.

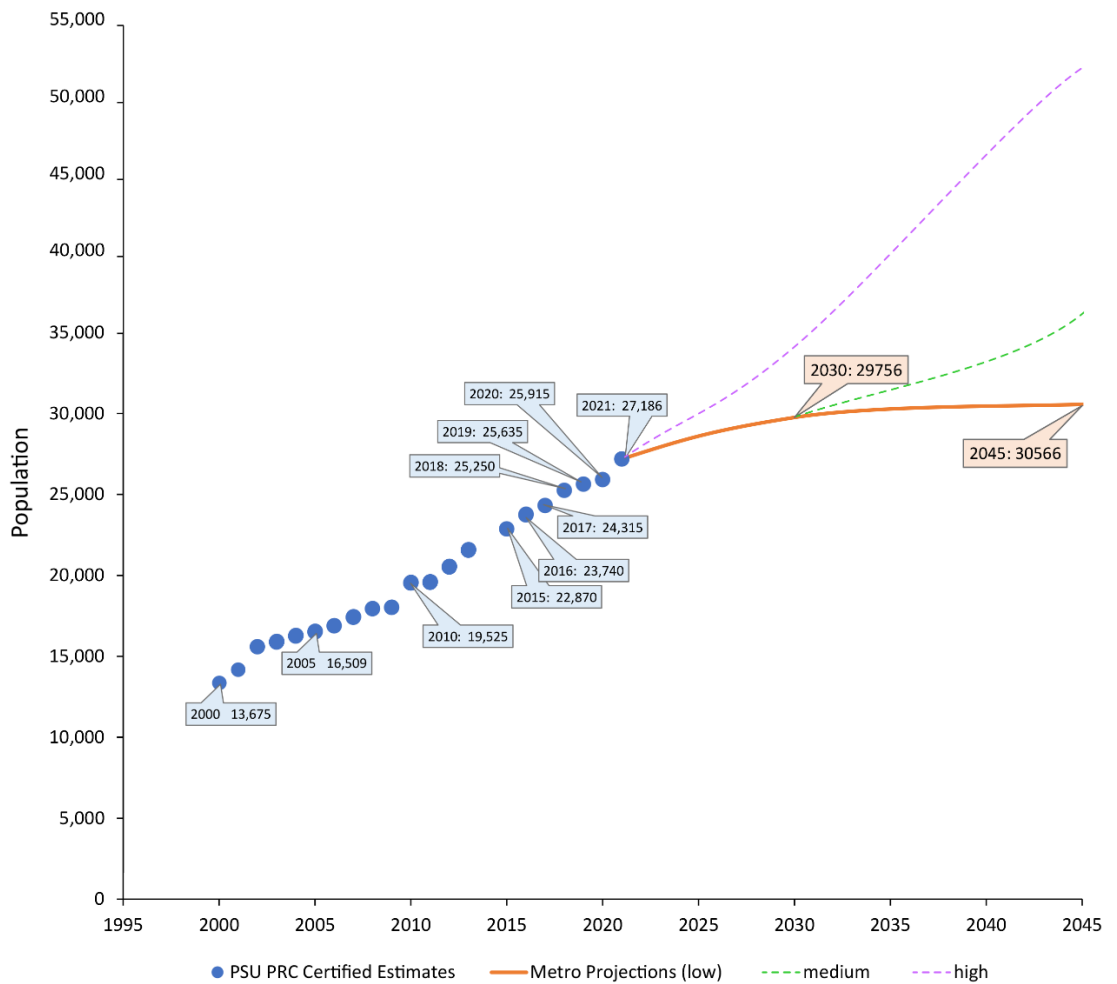


Figure ES.2 Historical Population and Expected Growth for the City of Wilsonville



## ES.2 WWTP Condition Assessment

Carollo Engineers, Inc. (Carollo) reviewed prior condition assessments performed by others, conducted geotechnical investigations and performed seismic assessments at the WWTP in the course of Plan development.

In 2019, Jacobs Engineering Group Inc. (Jacobs) and Brown and Caldwell both completed condition assessments at the City's WWTP. A total of 322 major assets (per Jacobs' report), including process and mechanical equipment, motors and drives, control panels, generators, instrumentation, and structures, were examined for a variety of conditions that may signify their need for maintenance or replacement. Chapter 2 presents a summary of critical assets that require short term rehabilitation or replacement, as well as a list of assets that are less critical to operations, or have minor condition issues, but may be included in a short-term improvements project or a task order for Jacobs operations personnel. Table ES.1 displays the condition driven rehabilitation or replacement projects from Chapter 2 that were included in the recommended Capital Improvement Plan (CIP) in Chapter 7.

Table ES.1 CIP Condition Driven Replacement Projects

Asset	Description
Trojan UV 4000 System	While only used as a backup to the Ozonia UV system, the Trojan system's HMI has errors that prevent it from showing the status of the lamps in module 3. Since it is used infrequently, the system's condition is largely unknown. After review of the 2019 condition assessment reports and discussion with the City and Jacobs staff, it was concluded that the UV 4000 unit must be replaced.
Secondary Clarifiers No. 1 and No. 2	Ovivo completed a field review of the plant's secondary clarifiers No. 1 and No. 2 in April 2022. Although both units were operational, repairs were identified to improve the operation of the clarifiers. The recommended repairs include drive controls for both units, new skimmers for both units, squeegees for both tanks rake arms, EDI chains, one motor and reducer assembly, one skimmer arm assembly, and new secondary clarifier mechanisms. <sup>(1)</sup>

Notes:

(1) The detailed Ovivo Field Service Report is included in [Appendix X](#).

Abbreviations: HMI - human-machine interface; No. - number; UV - ultraviolet.

## ES.3 Seismic Analysis

In 2021, Carollo performed a seismic evaluation and analysis of the City's WWTP as part of the overall plant condition assessment. Because the WWTP was substantially upgraded and expanded in 2014, most of its infrastructure is designed in accordance with the 2010 Oregon Structural Specialty Code (OSSC) and follows modern seismic design and detailing. During Tier 1 evaluations, Carollo identified potential deficiencies and areas for additional investigation. A Tier 1 seismic analysis is an initial evaluation performed to identify any potential deficiencies, whether structural or non-structural, in a building based on the performance of other similar buildings in past earthquakes. Subsequent to the Tier 1 analysis, a more detailed seismic

evaluation of five older and potentially seismically vulnerable structures on the WWTP site was conducted. Those structures receiving a more detailed evaluation included the following:

- Operations Building.
- Process Gallery.
- Workshop.
- Aeration Basins and Stabilization Basins.
- Sludge Storage Basins and Biofilter.

The five potentially vulnerable structures were compared against an S-4 Limited Safety structural performance level and N-B Position Retention non-structural performance level for an M9.0 Cascadia Seismic Zone (CSZ) earthquake. The M9.0 CSZ is reflective of a catastrophic natural disaster event that has an estimated 35 percent likelihood of occurring within the next 50 years. Following the Tier 1 evaluation, Carollo began Tier 2 evaluations for a select number of identified deficiencies. Although none of the structures showed significant irregularities, the team did identify seismic deficiencies. The recommended seismic retrofits are included in the CIP for this Plan.

Prior to the 2021 seismic evaluation, Carollo's subconsultant, Northwest Geotech, Inc. (NGI), completed a seismic response and geologic hazards assessment of the City's WWTP. Through past and present site investigations and engineering analyses, NGI determined that the native soils beneath the site's granular pit backfill have low risk of liquefaction and its slopes do not pose undue risk. NGI concluded that the WWTP's primary site hazard is the differential settlement that may be caused by soil piping (development of subsurface air-filled voids), which raises the risk of sinkholes forming beneath structures and pipelines. Soil piping usually develops in unsaturated soils when a water source percolates into the ground. While the site is mostly paved and stormwater is being collected, there may be areas where infiltration is occurring next to structures or below pipelines. Recommended actions from NGI to mitigate the risk of soil piping are presented in Chapter 2.

#### **ES.4 Wastewater Flow and Load Projections**

Chapter 3 of the Plan evaluates the historical and projected wastewater flows and loads generated in the City of Wilsonville's service area. The load projections include total suspended solids (TSS), biochemical oxygen demand (BOD<sub>5</sub>), ammonia (NH<sub>3</sub>), and total phosphorous (TP) loads.

Service area, residential population, industrial contribution, and rainfall records were all considered in the flow and load projection analyses. Facility planning involves estimating rates of growth in wastewater generation within the service area which are unlikely to align precisely with the actual growth observed. During the planning period, City staff will need to assess service area growth at regular intervals and revisit the analysis presented in this Plan. A determination will need to be made whether projected flows and loads (which drive assessments of unit process capacity) are aligned with calendar projections presented in this plan and consider if conclusions presented regarding capacity and timing of recommended improvements remain valid. If not, adjustments to the plan will need to be undertaken to ensure sufficient capacity remains available to serve anticipated growth.

Analysis of flow projections were completed through two different methods: (1) analysis of historical plant records and (2) DEQ Guidelines for Making Wet-Weather and Peak Flow Projections for Sewage Treatment in Western Oregon, which is referred to as the DEQ methodology in this Plan. Since there is no DEQ methodology for load analysis, all projections were developed based on historical plant records. Figure ES.3 summarizes the measured and projected maximum month, peak day and peak hour flows. The projections for the remaining flow elements can be found in Chapter 3.

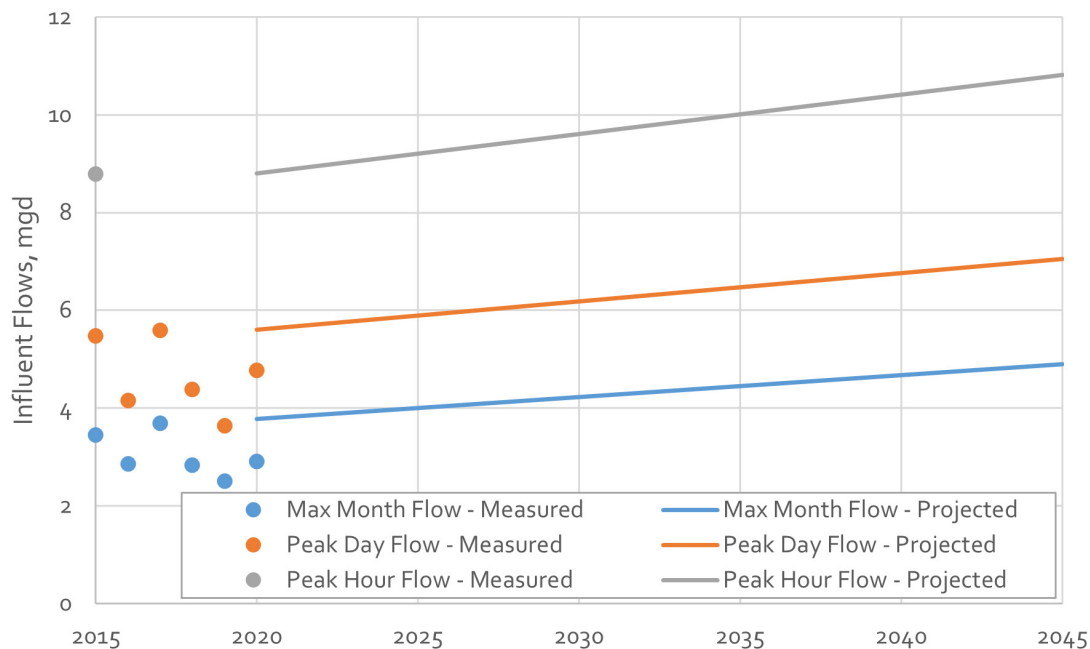


Figure ES.3 Flow Projection Summary

Load projections were calculated for influent TSS, BOD<sub>5</sub>, NH<sub>3</sub>, and TP. Figure ES.4 summarizes the measured and projected influent maximum month BOD and TSS loads. The projections for the remaining load elements can be found in Chapter 3.

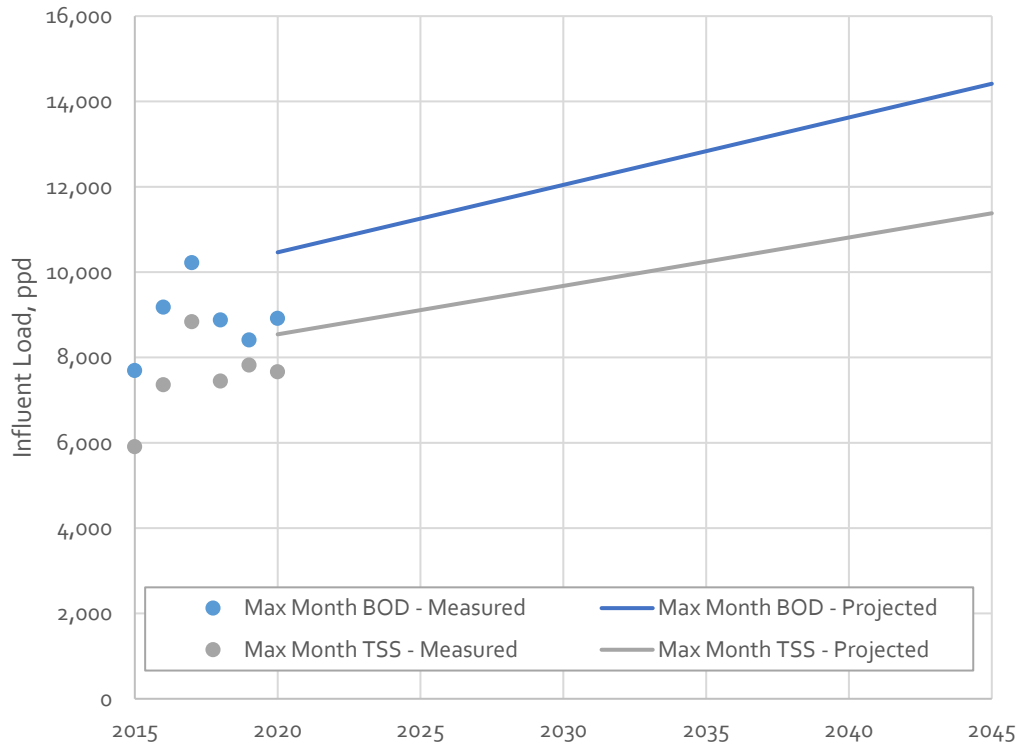


Figure ES.4 Load Projection Summary

The projected flows and loads developed in Chapter 3 were compared against the rated capacity for each of the WWTP’s unit processes to determine whether expansion would be required within the planning period. The findings of this capacity analysis are discussed in the next section.

**ES.5 Capacity Analysis**

Summaries of plant process area capacity assessments and conclusions are presented in this Plan. These assessments focus on the need for improvements or upgrades to existing facilities to address capacity deficiencies identified in the course of Master Plan evaluations. A site plan of the City’s existing WWTP is presented in Figure ES.5.

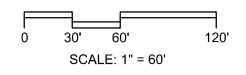
Chapter 4 identifies existing capacity ratings and deficiencies for the liquid and solids stream treatment processes at the City’s WWTP. Analyses are based on operational practices in place at the time and existing effluent limits established by the WWTP’s National Pollutant Discharge Elimination System (NPDES) permit. Biological process modeling was performed using BioWin version 6.2 to predict plant performance under current and future flow and loading conditions to assess when unit process capacities may be exceeded within the planning period (present through 2045).

A summary of the capacity assessment completed and presented in Chapter 4 is detailed below in Table ES.2.



**LEGEND:**

- 1 - DEWATERING & DRYING BUILDING
- 2 - PROCESS GALLERY
- 3 - SECONDARY CLARIFIER NO. 1
- 4 - SECONDARY CLARIFIER NO. 2
- 5 - UV DISINFECTION SYSTEM
- 6 - WORKSHOP
- 7 - SECONDARY PROCESS FACILITY
- 8 - STABILIZATION BASIN
- 9 - SLUDGE STORAGE BASINS AND BIOFILTERS
- 10 - HEADWORKS
- 11 - DISK FILTERS
- 12 - COOLING TOWERS
- 13 - W3 REUSE PUMP STATION
- 14 - OPERATIONS BUILDING
- 15 - SITE ENTRANCE



**Figure ES.5**  
**EXISTING WILSONVILLE WWTP**  
 CITY OF WILSONVILLE

Plot Date: 6/28/2022 9:15:35 AM  
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Table ES.2 Unit Process Capacity Assessment

Unit Process	Capacity Assessment
<b>Preliminary Treatment</b>	
Screening	There is sufficient hydraulic capacity for both mechanical screens to accommodate the projected 2045 PHF.
Grit Removal	Capacity is adequate for providing full treatment of the projected 2045 PHF.
<b>Secondary Treatment</b>	
Secondary Treatment	Based on maximum week MLSS predicted from BioWin modeling at peak day flow with all clarifiers in service (and assuming a 5-day SRT), there is only sufficient capacity through 2038.
Secondary Clarifiers	The secondary clarifiers are expected to stay under the maximum hydraulic loading criteria for the entirety of the planning period.
Aeration Blowers	The air demands of the secondary treatment process are projected to exceed the firm capacity of the aeration blowers under peak conditions by 2035.
<b>Tertiary Treatment and Disinfection</b>	
Disk Filters	The existing disk filter capacity is expected to be exceeded by 2037 with one unit out of service or in backwash mode based on effluent limitations included in the City's DBO Contract with Jacobs. At this time the City expects to relax these contract limitations rather than invest in additional capacity.
Secondary Effluent Cooling Towers	It is not expected that the total hydraulic capacity of the cooling towers will be exceeded by 2045.
UV Disinfection	The existing UV channels are adequately sized to fully disinfect the 2045 PHF with all units in service, as well as the PDDWF with one channel out of service. The City currently has an older UV unit in place as an emergency backup to the primary system. That backup unit is aging and the City plans replacement during the planning period.
Outfall	Even with the Willamette River at its 100-year flood elevation, it is expected that the outfall pipeline can accommodate approximately 19 mgd before the UV channel effluent weirs are at risk of submergence upstream. Since this flow is well above the hydraulic capacity of the rest of the plant, no expansion will be needed until after 2045. <sup>(1)</sup>
<b>Solids Handling</b>	
Gravity Belt Thickener	The capacity analysis results indicate adequate for thickening the current and projected maximum week WAS loads with one unit out of service.
TWAS Storage	The TWAS storage volume is sufficient to accommodate the expected maximum week solids loads for three days (assuming TWAS is thickened to 4 percent).
Dewatering Centrifuges	The rated capacity of the current centrifuges is sufficient to process the maximum week load with one unit out of service through 2045 assuming operating times of 24 hours per day for 5 days per week, per the criteria detailed in Chapter 4. <sup>(2)</sup>
Biosolids Dryer and Solids Disposal	The capacity of the biosolids dryer is adequate for handling the current and projected max week solids loads (in year 2045) on the basis of its design evaporation rate, assuming dewatered cake is dried from 20 percent TS to 92 percent TS and the dryer is operated for 24 hour per day for 5 days per week. <sup>(3)</sup>

## Notes:

- (1) The existing outfall was recently modified and equipped with five parallel diffuser pipes equipped with duckbill check valves to improve the mixing zone characteristics in the Willamette River.  
(2) The centrifuges have exhibited inconsistent performance in recent months. The City recently refurbished these units and expects they will provide sufficient capacity through 2045.  
(3) The existing solids dryer has sufficient capacity through 2045 but has exhibited inconsistent performance.. See Alternative 2B, Chapter 6.

Abbreviations: DBO - Design-Build-Operate; gpd/sf - gallons per day per square foot; MLSS - mixed liquor suspended solids; SPA - State Point Analysis; SRT - solids residence time; TS - total solids; TWAS - thickened waste activated sludge.





Table ES.3 further summarizes the capacity assessment by listing each unit process, associated design parameters and year of possible capacity exceedance.

Table ES.3 Unit Process Capacity Year Summary

Unit Process	Design Parameter	Redundancy Criteria <sup>(3)</sup>	Year of Capacity Exceedance
Influent Screening	PHF	One mechanical screen out of service	>2045
Grit Chamber	PHF	All units in service	>2045
<b>Secondary Treatment</b>	<b>MW MLSS inventory at PDF</b>	<b>All units in service</b>	<b>2038</b>
<b>Aeration Blowers</b>	<b>Peak BOD Load</b>	<b>Largest unit out of service</b>	<b>2035</b>
Secondary Effluent Cooling Towers	June 1 - Sept 30 PDF	All units in service	>2045
<b>Disk Filters</b>	<b>MWDWF</b>	<b>One unit in backwash</b>	<b>2037<sup>(1)</sup></b>
UV Disinfection Channels	PHF	All units in service	>2045
Outfall	PHF	-	>2045
Gravity Belt Thickening	MW Load	One unit out of service	>2045
TWAS Storage	MW Load	All units in service	>2045
Dewatering Centrifuges	MW Load	One unit out of service	>2045 <sup>(2)</sup>
Biosolids Dryer	MW Load	All units in service	>2045 <sup>(2)</sup>

Notes:

Unit processes in white are projected to run out of capacity before year 2045.

- (1) Existing Disk Filters are predicted to exceed reliable capacity (one unit out of service) in 2037 based on vendor provided design criteria. This conclusion assumes limitations for effluent total suspended solids contained in the WWTP DBO contract, which are far more stringent than the City's NPDES permit.
- (2) As noted previously, the existing centrifuges and biosolids dryer appear to have sufficient capacity through the planning year 2045, however condition and age are likely to require replacement during the planning period. It is recommended the City reassess available replacement technologies prior to replacement and consider loading appropriate to the planning horizon of any new units selected.
- (3) Reference [Appendix D](#) - Reliability requirements, Preparing Wastewater Planning Documents and Environmental Reports for Public Utilities, OR DEQ, 2018, Revised July 2019

## ES.6 Regulatory Considerations and Strategy

It is the responsibility of the Oregon Department of Environmental Quality (DEQ) to establish and enforce water quality standards that ensure the Willamette River's beneficial uses are preserved. Discharges from wastewater treatment plants are regulated through the National Pollutant Discharge Elimination System (NPDES). All discharges of treated wastewater to a receiving stream must comply with the conditions of an NPDES permit. The Wilsonville WWTP discharges to the Willamette River at River Mile 38.5 just upstream of the Interstate 5 bridge. The existing permit limits for the Wilsonville WWTP are shown in Table ES.4. This permit became effective on September 1, 2020 and expires July 30, 2025.

Table ES.4 Current Effluent Permit Limits

Parameter	Average Effluent Concentrations		Monthly Average, (ppd)	Weekly Average, (ppd)	Daily Maximum, (lbs)
	Monthly	Weekly			
<b>May 1 - October 31</b>					
CBOD <sub>5</sub>	10 mg/L	15 mg/L	190	280	380
TSS	10 mg/L	15 mg/L	190	280	380
<b>November 1 - April 30</b>					
BOD <sub>5</sub>	30 mg/L	45 mg/L	560	840	1100
TSS	30 mg/L	45 mg/L	560	840	1100
<b>Other Parameters Limitations</b>					
E. coli Bacteria	<ul style="list-style-type: none"> <li>• Shall not exceed 126 organisms per 100 ml monthly geometric mean.</li> <li>• No single sample shall exceed 406 organisms per 100 ml.</li> </ul>				
pH	<ul style="list-style-type: none"> <li>• Instantaneous limit between a daily minimum of 6.0 and a daily maximum of 9.0</li> </ul>				
BOD <sub>5</sub> Removal Efficiency	<ul style="list-style-type: none"> <li>• Shall not be less than 85% monthly average</li> </ul>				
TSS Removal Efficiency	<ul style="list-style-type: none"> <li>• Shall not be less than 85% monthly average</li> </ul>				
ETL June 1 through September 30	<ul style="list-style-type: none"> <li>• Option A: 39 million kcal/day 7-day rolling average</li> <li>• Option B: Calculate the daily ETL limit</li> </ul>				

## Notes:

Abbreviations: CBOD<sub>5</sub> - five-day carbonaceous biochemical oxygen demand; ETL - excess thermal load; kcal/day - kilocalories per day; lbs - pounds, mg/L - milligrams per liter; ml - milliliter.

The WWTP has been compliant with NPDES permit limits, generally. However due to construction issues that required that aeration basins be offline, equipment failure and issues with solids processing, the WWTP did violate their NPDES permit over eight months between 2015 and 2020 (December 2015, February 2017, April 2017, January 2018, August 2018, May 2020, June 2020 and July 2020). Most of these violations were due to the daily effluent TSS load exceeding the maximum daily load limit in the NPDES permit. It is anticipated that once the issues with solids processing are addressed, the City's current treatment process will be able to meet permit limits.

Chapter 5 details potential regulatory issues the City will need to take into consideration in coming years. Several possible regulatory actions by the Oregon DEQ could drive investments in future improvements at the City's WWTP. The plant discharges to the Willamette River and existing and future effluent limitations contained in the NPDES permit dictate, in large part, the necessary treatment processes and configuration at the WWTP necessary to maintain compliance.

Future treatment upgrades may be required when DEQ establishes total maximum daily loads (TMDL) for the lower Willamette River. Dissolved oxygen and nutrient limits, such as phosphorus limitations, are possible. The dissolved oxygen in the lower part of the river does not always meet water quality standards, and indications of excessive nutrients, such as chlorophyll-a, aquatic weeds, and harmful algal blooms, are present in the lower Willamette River. DEQ has

begun its triennial review of Oregon's water quality criteria. The review could result in more stringent or new discharge requirements, but this process will take several years. For planning purposes, providing plant footprint to accommodate future treatment to remove phosphorus and address dry weather seasonal limits on dissolved oxygen should be anticipated. In addition, the City should continue to engage with DEQ regarding any proposed receiving water temperature regulatory actions.

## ES.7 Alternative Development and Evaluation

Chapter 6 presents the methodology and findings of a process improvements alternatives evaluation. The plant's treatment process needs were defined by comparing the plant's existing condition, capacity and reliability, with the projected flows, loads, and regulatory constraints for the recommended alternatives. Where capacity deficiencies were predicted, at least two alternatives were analyzed for each corresponding unit process. Process modifications associated with each alternative were modeled in BioWin using a calibrated model to evaluate the overall impact on plant operations.

As identified in Chapter 4, the secondary treatment process is expected to require additional capacity during the planning horizon (2045). Chapter 6 details two alternatives to address these capacity limitations. The two alternatives considered to increase secondary capacity are:

1. Expansion of the existing conventional activated sludge process; and
2. Intensification of the existing treatment process using membrane bioreactor (MBR) technology.

Due to the higher capital and operating costs of intensification, construction of a new conventional aeration basin is recommended to increase secondary capacity. As flows and loads increase, or regulatory requirements become more stringent, it may be necessary to intensify treatment. It is recommended the City revisit this evaluation as the need for 1) additional capacity to accommodate growth nears or 2) more stringent effluent limitations are considered. This offers the opportunity to take advantage of potential advances in technology as well as confirming the predicted time frame of capacity exceedance. A new aeration basin project is included in the Capital Improvement Plan in Chapter 7.

The existing aeration blower system firm capacity is expected to be deficient by 2035. An additional aeration blower (same size and design air flow rate as the existing high-speed turbo blowers) would ensure there is sufficient blower capacity through the end of the planning period to meet current permit requirements. There is adequate space to add a fourth turbo blower to the same discharge header pipe as the existing turbo blowers. Additionally, intensification of the secondary treatment process would further increase the aeration demands because operating at a higher MLSS reduces oxygen transfer efficiency in the aeration basins. If intensification is reconsidered and selected for the planning period, or if nutrient limits are imposed within the planning period that requires intensification or operation at a higher MLSS, the blower air demands should be revisited.

Additional tertiary filtration capacity is predicted to be needed before 2045 to provide full treatment of the MWDWF with one disc filter out of service or in backwash mode. After discussions with the City, two alternatives were identified to increase capacity:

1. Increase filtration capacity, and
2. Modify the requirement in the WWTP DBO contract to relax effluent limitations which are currently more stringent than those contained in the City's NPDES permit.

The City's WWTP NPDES permit currently requires effluent to contain less than 10 mg/L TSS during the dry season (see Table ES.8). However, the DBO firm's contract with the City requires an effluent TSS of less than five mg/L, or half of the WWTP's permitted effluent quality. At this time, the City has decided to study the performance of the existing tertiary filters over time and expects to relax effluent TSS requirements in the DBO contract unless actual water quality impacts (exceedances of permit limitations) are realized. The City will also consider the option of new technologies for filtration, noting that if the City selected an intensification technology utilizing membranes, this may potentially eliminate tertiary filtration capacity concerns.

While the capacity assessment findings presented in Chapter 4 determined existing solids dewatering centrifuges have sufficient capacity, the remaining equipment service life may require replacement within the planning horizon. The centrifuges, installed in 2014, were recently refurbished, but by 2045, will have been in service for over 30 years. The City should plan for their replacement within the planning horizon and consider whether a capacity increase is needed at the time of replacement based on projections of solids production and processing needs. Additionally, the secondary process was modified in 2020 and has experienced extended periods where mixed liquor concentrations have been elevated above typical ranges for conventional activated sludge or extended aeration processes. Due to the complications with secondary process operation and performance issues with the centrifuges, it is recommended the City study the secondary treatment and dewatering processes to confirm that the assumptions and conclusions regarding centrifuge capacity in Chapter 4 may be relied upon. A dewatering performance optimization study is recommended so the City can collect and analyze secondary treatment and solids processing performance data. For budgeting purposes, an opinion of probable cost for replacing the existing centrifuges is provided in Chapter 7. Timing of that equipment replacement will depend on performance of the existing units, future loading assumptions, and observed condition.

The existing solids dryer has experienced operational issues in recent years, including a fire that caused extensive damage to the equipment in April 2019 and a leaking rotary joint and damaged seal in 2021. As of February 25, 2022, the dryer has been repaired and is operating. Because of the City's commitment to solids drying as the preferred process to achieve Class A biosolids, the alternatives evaluation presented in this Plan for future dryer replacement was conducted with a focus on thermal drying options only.

Chapter 6 details an analysis of the following alternatives to improve the drying system:

1. Alternative 1 - Continue operating the existing biochemical reactor (BCR) paddle dryer and defer replacement.
2. Alternative 2 - Modify the existing Dewatering and Drying Building to accommodate a different solids dryer technology or a redundant dryer.
3. Alternative 3 - Construct a new dryer building with a different solids dryer technology.

While it is anticipated the existing dryer has useful life through at least 2026 (current DBO contract expiration), by 2031 the dryer will have been in operation for over 15 years. It is recommended the planning and design of upgrades to provide reliable dryer capacity begin in 2029, or sooner if further operational concerns arise. The City has indicated a preference for a variation of Alternative 2 which involves expanding the existing Dewatering and Drying Building to accommodate a second solids paddle dryer. This alternative provides backup capacity to allow the City to continue delivering Class A solids during periods of downtime if a mechanical failure occurs or to accommodate regular maintenance of one dryer train. As mentioned previously, this Plan recommends the City complete a study of the secondary sludge quality, performance of that process, chemical addition types and locations, and solids handling process performance overall prior to making a final selection of the preferred dryer alternative from the alternatives detailed in Chapter 6. For purposes of capital planning, this Plan assumes the City will implement Alternative 2b (modification of Dewatering and Drying Building to accommodate a second paddle dryer) with a study and confirmation of this selection beginning in 2029.

Lastly, the City wants to establish a direct connection between the City’s fiber optics network and the WWTP. This addition consists of routing two new conduits (one spare) and fiber optic cabling from the WWTP’s Operations Building to the site entrance, where the conduits will be tied into the City’s fiber optics network. Chapter 6 details one potential routing from the Operations Building to the site entrance that would minimize impact to existing yard utilities. The fiber optic cable addition is included in Chapter 7 and the City’s 5-year CIP.

Table ES.5 below summarizes the alternatives evaluated in Chapter 6 including recommendations for future WWTP improvements.

Table ES.5 Summary of Alternatives

Unit Process	Alternatives Considered	Selected Alternative
Secondary Treatment	<ul style="list-style-type: none"> <li>Expansion of the existing conventional activated sludge process.</li> <li>Intensification of the existing treatment process.</li> </ul>	<ul style="list-style-type: none"> <li>Expansion of the existing conventional activated sludge process through the addition of another aeration basin.</li> </ul>
Tertiary Treatment	<ul style="list-style-type: none"> <li>Increase filtration capacity.</li> <li>Eliminate the requirement on the DBO firm to meet effluent limits more stringent than the NPDES permit.</li> </ul>	<ul style="list-style-type: none"> <li>Eliminate the requirement on the DBO firm to meet effluent limits more stringent than the NPDES permit.</li> </ul>
Solids Dryer	<ul style="list-style-type: none"> <li>Continue operating the existing BCR paddle dryer and defer replacements.</li> <li>Modify the existing Dewatering and Drying Building to accommodate a different solids dryer technology or a redundant dryer.</li> <li>Construct a new dryer building with a different solids dryer technology.</li> </ul>	<ul style="list-style-type: none"> <li>Modify the existing Dewatering and Drying Building to accommodate a different solids dryer technology or a redundant dryer by expanding the Dewatering and Drying Building to accommodate a second solids paddle dryer.</li> </ul>

## ES.8 Recommended Alternative

Figure ES.6 presents a WWTP site plan identifying locations of recommended improvements resulting from condition and capacity assessments, including evaluation of alternatives, as described.

Summaries of opinions of probable costs and anticipated phasing for the improvements recommended for inclusion in the City's WWTP CIP are provided in Table ES.6.

The expected cash flow for the planning period was determined for the recommended improvements summarized in Table ES.6. The cash flow through 2045 includes an escalation rate of three percent, and the estimated peak expenditure for any fiscal year is approximately \$13,906,000 in fiscal year 2031. The projected CIP expenditures are presented in Figure ES.7.

Table ES.6 WWTP CIP - Recommended Alternative Opinion of Probable Cost and Phasing

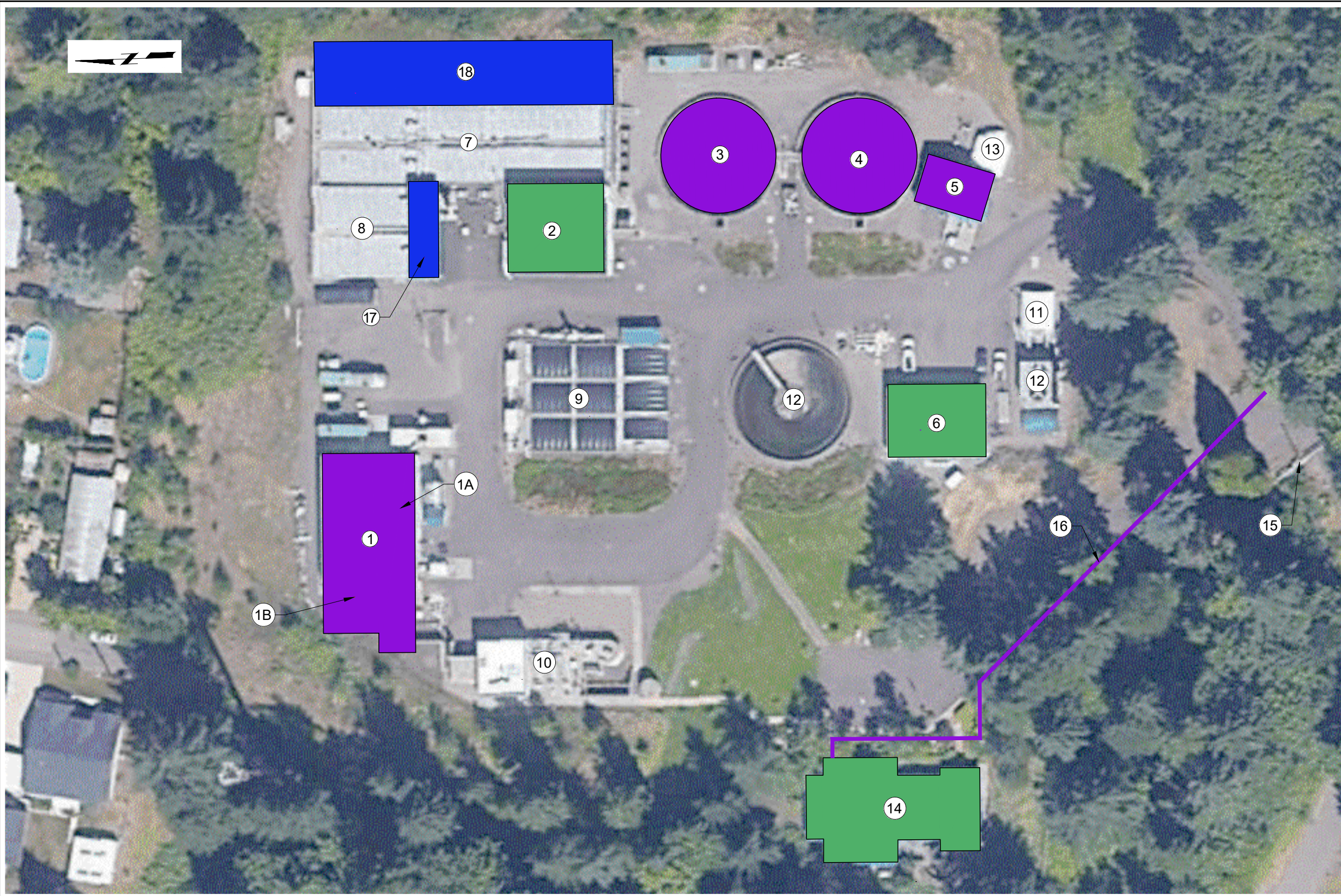
Plant Area	Project <sup>(1)</sup>	Opinion of Probable Cost	Approximate Year Online
Solids Handling	Dewatering Performance Optimization	\$150,000	2023
Communications/IT	Fiber Optic Cable Addition	\$55,000	2023
UV System	Trojan 4000 UV System Improvement	\$1,650,000	2024
Support Buildings	Seismic Improvements	\$1,015,000	2024
Secondary Treatment	New Secondary Clarifier Mechanisms	\$1,665,000	2026
Solids Handling	Solids Dryer Improvement	\$16,100,000 <sup>(6)</sup>	2031
Solids Handling	Existing Centrifuge Replacement	\$2,200,000 <sup>(3,5)</sup>	2033 <sup>(4)</sup>
Secondary Treatment	New Aeration Blower	\$394,000	2035
Secondary Treatment	New Conventional Aeration Basin	\$7,895,000	2038
<b>TOTAL</b>		<b>\$31,124,000</b>	

**Notes:**

White rows indicate projects that are in the City's 5-year CIP and blue rows indicate projects that are outside the 5-year CIP window.

- (1) Details of each project can be found in Chapter 2 or Chapter 6 of this Master Plan.
- (2) The estimated opinion of probable costs include the construction costs plus Engineering, legal and administration fees (ELA, or soft costs). Details on the estimated project costs can be found in Chapter 2 or Chapter 6 of the plan, with the exception of costs for the backup UV system and centrifuges which are presented earlier in Chapter 7.
- (3) For budgeting purposes, the Option B centrifuge cost from Table 7.4 is used for the project cost summary and the CIP
- (4) Replacement timing dependent upon satisfactory equipment performance
- (5) The centrifuges installed with the City's 2014 upgrade project have exhibited inconsistent performance in recent months. The City recently refurbished these units and expects they will provide sufficient capacity through 2045. However, by that time, the units will have been in service for over 30 years. It is recommended the City plan for replacement of these units during the planning horizon of this Master Plan. Assuming replacement occurs in the mid-2030's the City should reassess capacity needs of those units beyond the 2045 horizon, consistent with the expected service life of the new equipment.
- (6) The existing solids dryer has sufficient capacity through 2045. As with the dewatering centrifuges, the dryer equipment will soon have been in operation for a decade. It is recommended the City plan for replacement of the dryer during the planning horizon of this Master Plan. The City plans to replace the existing dryer with a new piece of equipment using similar technology and potentially rehabilitate the existing unit to serve as a backup. See Alternative 2B, Chapter 6.

Capital costs estimated in the Plan will be considered as the City assesses the need to adjust sewer enterprise rates and charges in coming months. It will be important to distinguish capacity and condition (repair and replacement) driven improvements in assigning costs to existing rate payers and future users.



- LEGEND:**
- CONDITION OR ADDITION PROJECTS** ■
  - 1 - DEWATERING & DRYING BUILDING
  - 1A - EXISTING CENTRIFUGE REPLACEMENT
  - 1B - SOLIDS DRYER IMPROVEMENT
  - 3 - SECONDARY CLARIFIER NO. 1 - REPLACE MECHANISMS
  - 4 - SECONDARY CLARIFIER NO. 2 - REPLACE MECHANISMS
  - 5 - STANDBY UV SYSTEM REPLACEMENT
  - 16 - FIBER OPTIC CABLE ADDITION
  - CAPACITY PROJECTS** ■
  - 17 - NEW AERATION BLOWER
  - 18 - NEW AERATION BASIN NO. 3, ACCESS IMPROVEMENTS & GRADING
  - SEISMIC RETROFIT PROJECTS** ■
  - 2 - PROCESS GALLERY
  - 6 - WORKSHOP
  - 14 - OPERATIONS BUILDING
  - OTHER FACILITIES**
  - 7 - SECONDARY PROCESS FACILITY
  - 8 - STABILIZATION BASIN
  - 9 - SLUDGE STORAGE BASINS AND BIOFILTERS
  - 12 - SECONDARY CLARIFIER NO. 3
  - 10 - HEADWORKS
  - 11 - DISK FILTERS
  - 12 - COOLING TOWERS
  - 13 - W3 REUSE PUMP STATION
  - 15 - SITE ENTRANCE

**Figure ES.6**  
**PROPOSED WILSONVILLE WWTP IMPROVEMENTS**  
 CITY OF WILSONVILLE

Plot Date: 6/3/2022 1:45:48 PM  
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 LAST SAVED BY: bhawes

0 30' 60' 120'  
 SCALE: 1" = 60'





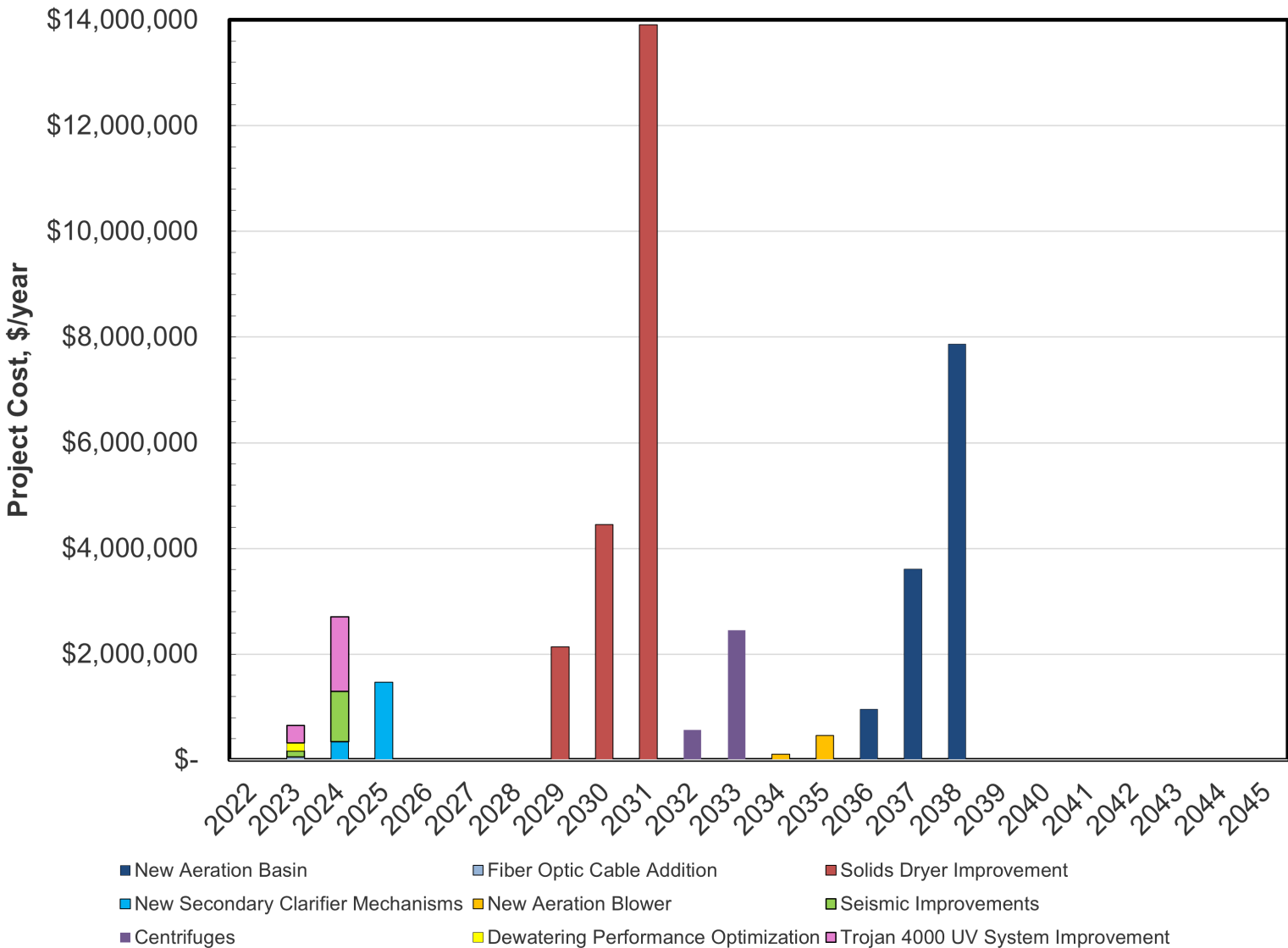


Figure ES.7 Projected 20-Year CIP Expenditures

# City of Wilsonville Wastewater Treatment Plant Master Plan

City Council Work Session

August 1, 2022



**WILSONVILLE**  
OREGON

# Introduction



Presenters:

Mike Nacrelli, PE, Senior Civil Engineer

Dave Price, PE, Carollo Engineers

# Master Plan Drivers



- City Capital Planning
- Accommodating Expected Growth
- Addressing Asset Condition and Replacement needs
- Assessing Potential Regulatory Drivers

# Facility Capacity Assessment



- Flows & Loads - Drive core process needs
- Existing WWTP design (2014 expansion) – ADWF – 4 mgd

Item	Existing	Projected 2045
Average Dry Weather Flow, mgd	1.94	2.68 (~38% > existing)
Average Annual Flow, mgd	2.24	3.03 (~35% > existing)
Maximum Month Wet Weather Flow, mgd	3.78	4.90 (~30% > existing)
Average Annual BOD <sup>5</sup> , ppd	7,470	10,613 (~40% > existing)
Average Annual TSS, ppd	6,427	8,714 (~35% > existing)

# Asset Condition Assessment



- Process Condition/Age Drivers
  - 2014 project facilities and equipment in service > 30 years by 2045
  - Solids facilities –
    - Performance issues
      - Solids Dryer fire (2019), component failures (2021), uneven performance
      - Solids Dewatering Centrifuges uneven performance (2020/21)
  - Secondary clarifiers – Pre-date 2014 upgrades, near term mechanism replacements, clarifiers no. 1 and 2
  - UV Disinfection – backup unit pre-dates 2014 upgrades, near term replacement

# Potential Regulatory Drivers



- DEQ - Total Maximum Daily Load (TMDL)  
Lower Willamette River
- Dissolved oxygen & nutrients
  - Nutrients can contribute to low oxygen conditions
  - Anticipate and accommodate future phosphorous, possibly nitrogen limits
- Pay attention to Willamette River  
temperature concerns



# Unit Process Capacity Summary

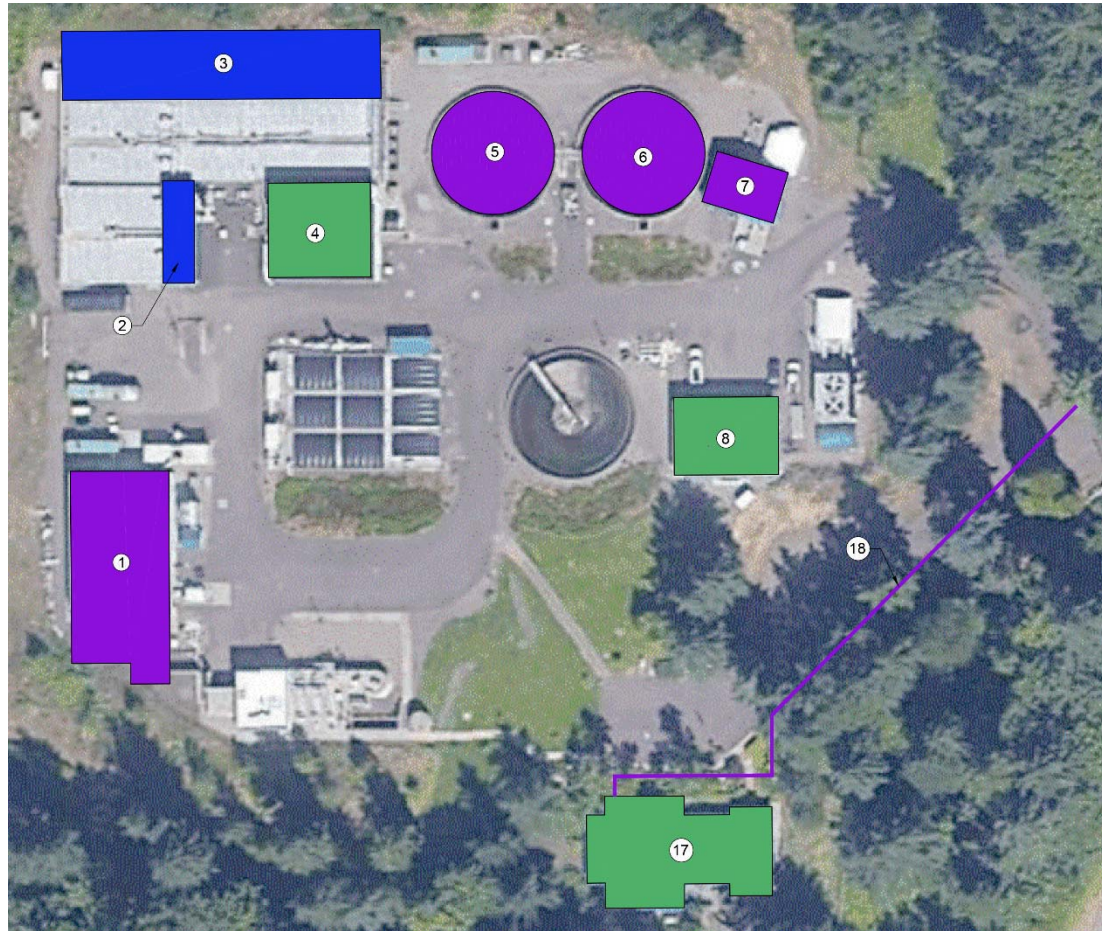
Unit Process	Design Parameter	Redundancy Criteria	Possible Year of Capacity Exceedance	Identified Alternatives
<b>Secondary Treatment</b>	MW MLSS inventory @ PDF	All units in service	<b>2038</b>	<ul style="list-style-type: none"> <li>• New Aeration Basin</li> <li>• New Secondary Clarifier</li> </ul>
<b>Aeration Blowers</b>	Peak BOD Load	Largest unit out of service	<b>2035</b>	<ul style="list-style-type: none"> <li>• Additional Blower</li> </ul>
<b>Disk Filters</b>	MWDWF	One unit in backwash	<b>2037</b>	<ul style="list-style-type: none"> <li>• Third Disc Filter</li> <li>• Relax DBO limits</li> </ul>
<b>Biosolids Dryer</b>	MW Load	<b>All units in service</b>	>2045	<ul style="list-style-type: none"> <li>• Emergency Biosolids Management Plan</li> <li>• Redundant Dryer, similar technology</li> <li>• Different Dryer technology</li> </ul>

# Alternatives Evaluation



- Consider alternatives for process units identified as capacity deficient
- Secondary Process
  - Add new Aeration Basin
  - Add new blower
- Tertiary Disk Filters
  - Relax DBO effluent TSS limits
- Solids Dryer – driven by performance, not necessarily capacity
  - Further study, placeholder to expand dewatering and drying building, add new paddle dryer, refurbish existing dryer (backup)

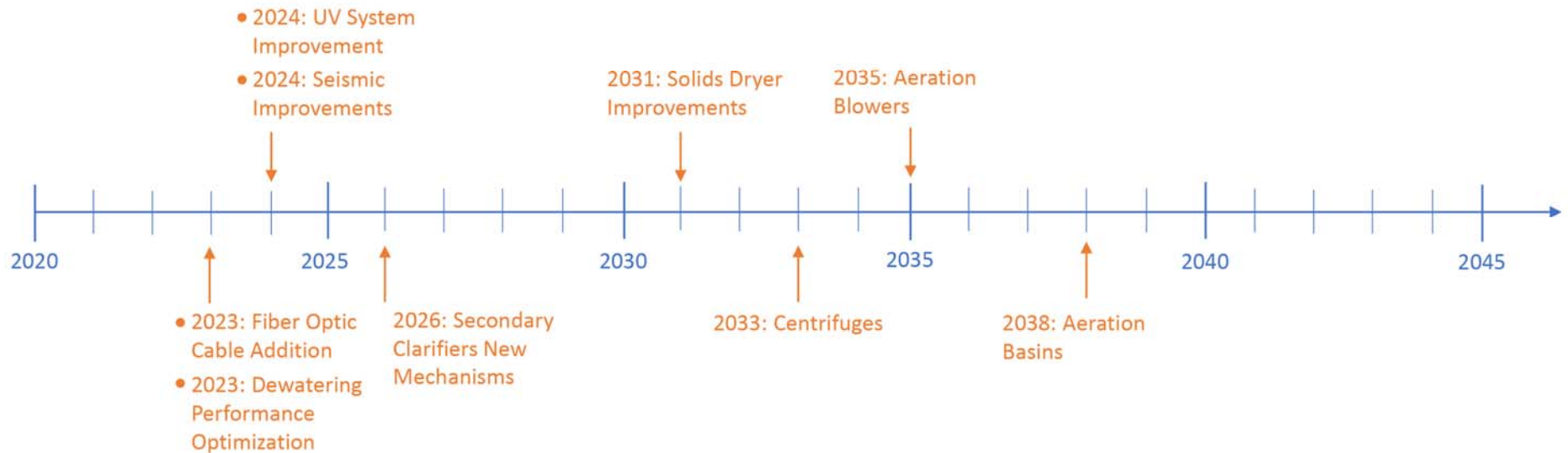
# Recommended Plan



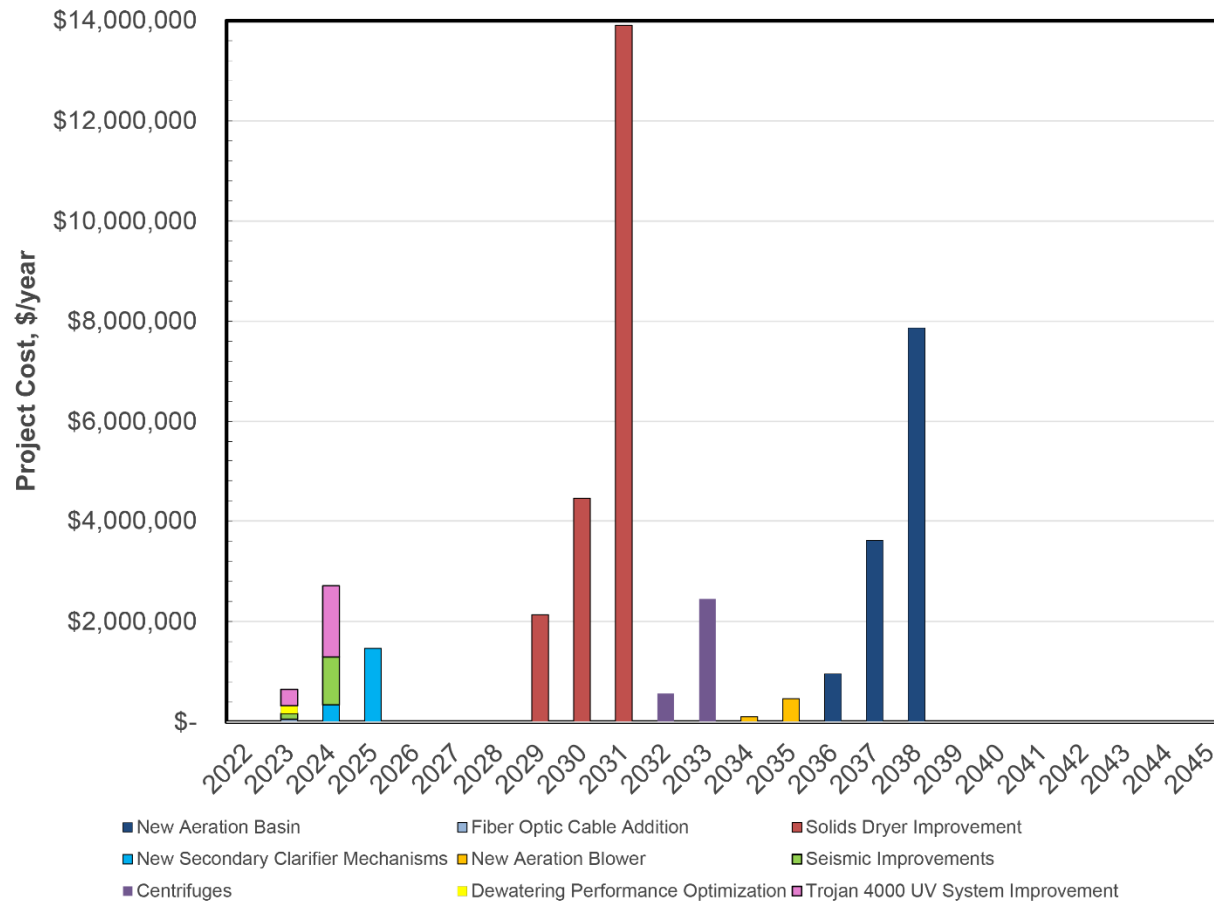
- ③ New Aeration Basin
- ② Additional Aeration Blower
- ⑦ Replace backup UV system
- ① Plan to replace Solids Dryer & Centrifuges
- ⑤ ⑥ Replace Clarifier 1 & 2 mechanisms
- ④ ⑧ Seismic retrofits of buildings
- ⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯ ⑰ ⑱ ⑲ ⑳ ㉑ ㉒ ㉓ ㉔ ㉕ ㉖ ㉗ ㉘ ㉙ ㉚ ㉛ ㉜ ㉝ ㉞ ㉟ ㊱ ㊲ ㊳ ㊴ ㊵ ㊶ ㊷ ㊸ ㊹ ㊺ ㊻ ㊼ ㊽ ㊾ ㊿
- ⑱ New fiber optic connection

Solids process study

# Proposed Project Phasing Schedule



# Draft Cash Flow



# Next Steps



- DEQ review and approval of Plan
- Virtual Public Open House (8/24)
- Planning Commission Work Session 9/14
- Planning Commission Public Hearing 10/12
- City Council Public Hearing 1<sup>st</sup> Reading 11/7
- City Council 2<sup>nd</sup> Reading 11/21
- Sewer System Rate Study and SDC Update FY23

**Questions?**

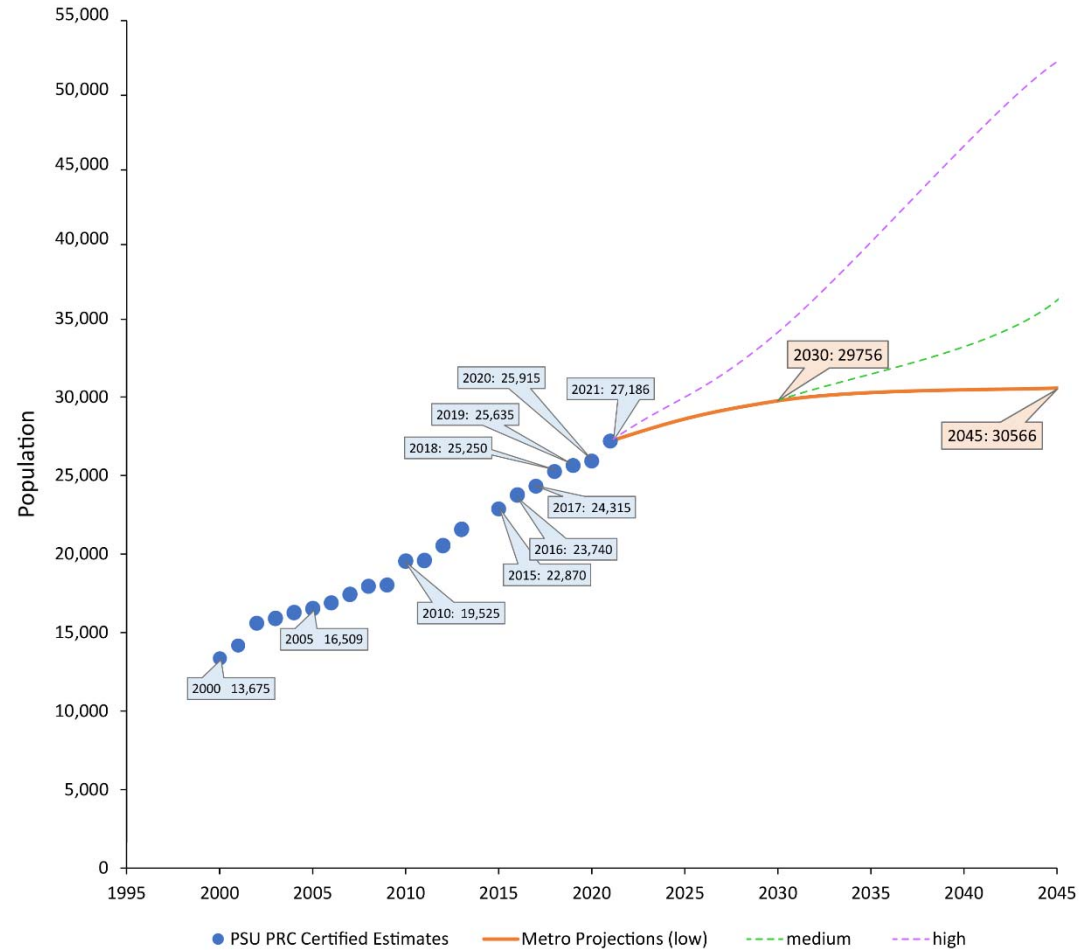
# Reference Slides



# Capital Planning and Expected Growth - 2045

- Current Service Area needs
  - 20+ years through 2045
  - Population and associated economic development

2015	2020	2030	2045
22,870	25,915	29,756	30,566



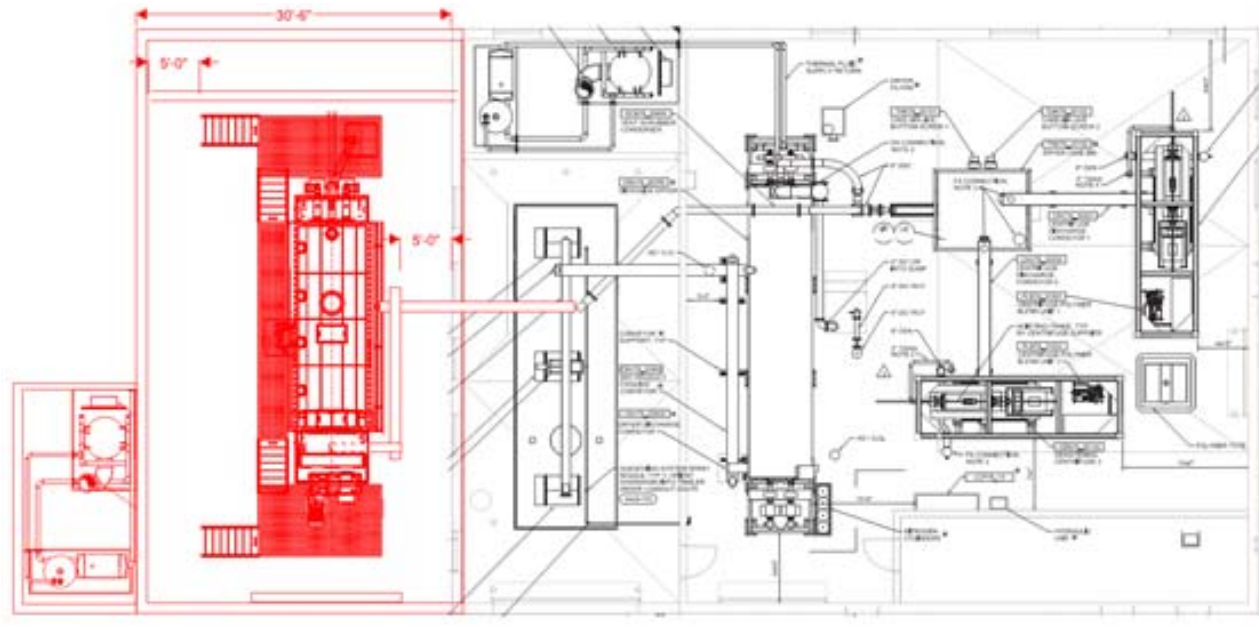
# Condition Assessment



- Prioritize 2019 findings of consultant assessments
  - Secondary clarifiers
  - UV system
- Geotechnical and seismic evaluations
  - Older buildings found to present moderate risk
  - Identified mitigations to address seismic concerns
    - Operations Building
    - Process Gallery
    - Workshop

# Alternatives Evaluation

- Solids Dryer – driven by performance, not capacity
  - Further study, placeholder to expand dewatering and drying building, add new paddle dryer, refurbish existing dryer (backup)
  - Largest potential investment in Master Plan



City Council Meeting Action Minutes  
August 1, 2022

**City Council members present included:**

Mayor Fitzgerald  
Council President Akervall  
Councilor Lehan  
Councilor West  
Councilor Linville

Jeanna Troha, Assistant City Manager  
Delora Kerber, Public Works Director  
Martin Montalvo, Public Works Ops. Manager  
Mark Ottenad, Public/Government Affairs Director  
Mike Nacrelli, Civil Engineer  
Cindy Luxhoj, Associate Planner  
Zach Weigel, City Engineer  
Martin Montalvo, Public Works Ops. Manager  
Zoe Mombert, Assistant to the City Manager  
Ryan Adams, Assistant City Attorney

**Staff present included:**

Amanda Guile-Hinman, City Attorney  
Kimberly Veliz, City Recorder

AGENDA ITEM	ACTIONS
<b>WORK SESSION</b>	
<b>START: 5:05 p.m.</b>	
A. Public Works Complex Construction Contract	Council was informed of Resolution No. 2988, which authorizes the City Manager to execute a construction contract with Emerick Construction Company for construction of the Public Works Complex Project.
B. Waste Water Treatment Plant Master Plan	Staff shared tenets of a draft Wastewater Treatment Master Plan that accommodates the City’s projected 20-year growth, addresses seismic resiliency and identifies assets to be upgraded and/or replaced.
C. 2023 League of Oregon Cities Legislative Priorities Ballot	The City’s lobbyist sought the Council’s direction to finalize the legislative priorities to be listed on the League of Oregon Cities’ (LOC) legislative priority ballot.
<b>REGULAR MEETING</b>	
<u>Mayor’s Business</u>	
A. July 30, 2022 Curtailment Event	Staff explained the water pump failure at the Willamette River Water Treatment Plant (WRWTP) and the subsequent Water Curtailment Notice for the cities of Wilsonville and Sherwood.
B. Upcoming Meetings	Upcoming meetings were announced by the Mayor as well as the regional meetings she attended on behalf of the City.

<p><u>Communications</u></p> <p>A. Tourism Promotion Committee Marketing</p>	<p>City Council heard highlights about the City’s current promotional activities displayed on ExploreWilsonville.com, which are designed to attract visitors for overnight lodging.</p>
<p><u>Consent Agenda</u></p> <p>A. <b><u>Resolution No. 2988</u></b>  Authorizing the City Manager to execute a construction contract with Emerick Construction Company for construction of the Public Works Complex Project (Capital Improvement Project #8113).</p> <p>B. <b><u>Resolution No. 2991</u></b>  A Resolution Of The City Of Wilsonville Authorizing The City Manager To Execute The Second Amendment To Construction Contract With Moore Excavation, Inc. For The 5th Street / Kinsman Road Extension Project.</p> <p>C. Minutes of the July 18, 2022 City Council Meeting.</p>	<p>The Consent Agenda was approved 5-0.</p>
<p><u>New Business</u></p> <p>A. None.</p>	
<p><u>Continuing Business</u></p> <p>A. None.</p>	
<p><u>Public Hearing</u></p> <p>A. <b><u>Ordinance No. 865</u></b>  An Ordinance Of The City Of Wilsonville Approving A Zone Map Amendment From The Future Development Agricultural – Holding (FDA-H) Zone To The Planned Development Industrial (PDI) Zone On Approximately 0.55 Acre Located At 28505 SW Boones Ferry Road; The Land Is More Particularly Described As Tax Lot 800, Section 14A, Township 3 South, Range 1 West, Willamette Meridian, Clackamas County, Oregon. Davidsons Boones Ferry Industrial LLC, Owner/Applicant.</p>	<p>After a public hearing was conducted, Ordinance No. 865 was approved on first reading by a vote of 5-0.</p>
<p><u>City Manager’s Business</u></p>	<p>No report.</p>
<p><u>Legal Business</u></p>	<p>No report.</p>

<b>URBAN RENEWAL AGENCY</b>	
<u>URA Consent Agenda</u> A. <b><u>URA Resolution No. 327</u></b> A Resolution Of The City Of Wilsonville Urban Renewal Agency Authorizing The City Manager To Execute The Second Amendment To Construction Contract With Moore Excavation, Inc. For The 5th Street / Kinsman Road Extension Project.  B. Minutes of the June 20, 2022 Urban Renewal Agency Meeting.	The URA Consent Agenda was approved 5-0.
<u>New Business</u> A. None.	
<u>URA Public Hearing</u> A. None.	
<b>EXECUTIVE SESSION</b>	Pursuant to ORS 192.660(2)(h) Legal Counsel/Litigation
<b>ADJOURN</b>	9:01 p.m.



# PLANNING COMMISSION

## WEDNESDAY, JULY 13, 2022

### WORK SESSION

2. Wastewater Treatment Plant Master Plan (Nacrelli) (45 minutes)



## PLANNING COMMISSION WORK SESSION STAFF REPORT

<b>Meeting Date:</b> July 13, 2022		<b>Subject:</b> Wastewater Treatment Plant Master Plan	
		<b>Staff Member:</b> Mike Nacrelli, Senior Civil Engineer	
		<b>Department:</b> Community Development	
<b>Action Required</b>		<b>Advisory Board/Commission Recommendation</b>	
<input type="checkbox"/> Motion <input type="checkbox"/> Public Hearing Date: <input type="checkbox"/> Ordinance 1 <sup>st</sup> Reading Date: <input type="checkbox"/> Ordinance 2 <sup>nd</sup> Reading Date: <input type="checkbox"/> Resolution <input checked="" type="checkbox"/> Information or Direction <input type="checkbox"/> Information Only <input type="checkbox"/> Council Direction <input type="checkbox"/> Consent Agenda		<input type="checkbox"/> Approval <input type="checkbox"/> Denial <input type="checkbox"/> None Forwarded <input checked="" type="checkbox"/> Not Applicable <b>Comments:</b> N/A	
<b>Staff Recommendation:</b> Provide requested input regarding recommended capital improvement plan.			
<b>Recommended Language for Motion:</b> N/A			
<b>Project / Issue Relates To:</b>			
<input checked="" type="checkbox"/> Council Goals/Priorities: Align infrastructure plans with sustainable financing resources.	<input type="checkbox"/> Adopted Master Plan(s):	<input type="checkbox"/> Not Applicable	

### ISSUE BEFORE PLANNING COMMISSION:

Provide feedback and input on components of the Wastewater Treatment Plant (WWTP) Master Plan.



## **EXECUTIVE SUMMARY:**

This new City of Wilsonville (City) Wastewater Treatment Plant (WWTP) Master Plan (the Plan) has been developed to satisfy requirements associated with the State of Oregon Department of Environmental Quality (DEQ) guidance document entitled “Preparing Wastewater Planning Documents and Environmental Reports for Public Utilities.” To accommodate future flows and loads, projections were developed based on population projections and referencing WWTP historical data and DEQ wet weather project methodologies. Similarly, to accommodate future water quality regulations, the Plan is adaptive and considers potential future regulatory changes.

The City prepared the Plan with the goal of developing a capital plan that identifies improvements required through the planning period (today through 2045) to comply with requirements of the WWTP National Pollutant Discharge Elimination System (NPDES) permit and potential future regulatory requirements, while accommodating growth identified in the City of Wilsonville Comprehensive Plan (October 2018, updated June 2020 - the 2018 Comprehensive Plan). These improvements are designed to provide the best value to the City’s ratepayers by maximizing the use of existing infrastructure and improving system operation while continuing to protect water quality and human health and supporting economic development, consistent with goals and policies contained in the 2018 Comprehensive Plan and 2021-2023 City Council Goals.

The City’s WWTP was originally built in 1971 and discharges treated effluent to the Willamette River. The WWTP underwent major upgrades in 2014 to expand the average dry weather capacity to four million gallons per day (mgd) to accommodate the City’s continued growth. The WWTP processes include headworks screening and grit removal facilities, aeration basins, stabilization basins, secondary clarifiers, biosolids processing, cloth filtration, and disinfection processes. Additionally, the City contracts with Jacobs for operation of the wastewater treatment plant, located at 9275 Southwest Tauchman Road.

This Plan identifies improvements taking into consideration:

- The age and condition of existing process equipment and structures,
- Growth in demand for sewer service due to increased population and economic development over the planning period,
- Potential changes to water quality regulations impacting process needs in order to meet effluent limitations and discharge prohibitions imposed by the Oregon Department of Environmental Quality (DEQ), and
- Consistency with the 2018 Comprehensive Plan and City Council 2021-2023 Goals 5, 6 and 7.

### ***WWTP Condition Assessment***

Carollo reviewed prior condition assessments performed by others, conducted geotechnical investigations and performed seismic assessments at the WWTP in the course of Plan development.

In 2019, Jacobs Engineering Group Inc. (Jacobs) and Brown and Caldwell both completed condition assessments at the City’s WWTP. A total of 322 major assets (per Jacobs’ report), including process and mechanical equipment, motors and drives, control panels, generators,

instrumentation, and structures, were examined for a variety of conditions that may signify their need for maintenance or replacement.

### ***Seismic Analysis***

In 2021, Carollo performed a seismic evaluation and analysis of the City's WWTP as part of the overall plant condition assessment. Because the WWTP was substantially upgraded and expanded in 2014, most of its infrastructure is designed in accordance with the 2010 Oregon Structural Specialty Code (OSSC) and follows modern seismic design and detailing. During Tier 1 evaluations, Carollo identified potential deficiencies and areas for additional investigation. A Tier 1 seismic analysis is an initial evaluation performed to identify any potential deficiencies, whether structural or non-structural, in a building based on the performance of other similar buildings in past earthquakes. Subsequent to the Tier 1 analysis, a more detailed seismic evaluation of five older and potentially seismically vulnerable structures on the WWTP site was conducted. Those structures receiving a more detailed evaluation included the following:

- Operations Building
- Process Gallery
- Workshop
- Aeration Basins and Stabilization Basins
- Sludge Storage Basins and Biofilter

The five potentially vulnerable structures were compared against an S-4 Limited Safety structural performance level and N-B Position Retention non-structural performance level for an M9.0 Cascadia Seismic Zone (CSZ) earthquake. The M9.0 CSZ is reflective of a catastrophic natural disaster event that has an estimated 35 percent likelihood of occurring within the next 50 years. Following the Tier 1 evaluation, Carollo began Tier 2 evaluations for a select number of identified deficiencies. Although none of the structures showed significant irregularities, the team did identify seismic deficiencies. The recommended seismic retrofits are included in the CIP for the Plan.

Prior to the 2021 seismic evaluation, Carollo's subconsultant, Northwest Geotech, Inc. (NGI), completed a seismic response and geologic hazards assessment of the City's WWTP. Through past and present site investigations and engineering analyses, NGI determined that the native soils beneath the site's granular pit backfill have low risk of liquefaction and its slopes do not pose undue risk. NGI concluded that the WWTP's primary site hazard is the differential settlement that may be caused by soil piping (development of subsurface air-filled voids), which raises the risk of sinkholes forming beneath structures and pipelines. Soil piping usually develops in unsaturated soils when a water source percolates into the ground. While the site is mostly paved and stormwater is being collected, there may be areas where infiltration is occurring next to structures or below pipelines. Recommended actions from NGI to mitigate the risk of soil piping are presented in the Plan.

### ***Wastewater Flow and Load Projections***

The Plan evaluates the historical and projected wastewater flows and loads generated in the City of Wilsonville's service area. The load projections include total suspended solids (TSS), biochemical oxygen demand (BOD5), ammonia (NH3), and total phosphorous (TP) loads.

Service area, residential population, industrial contribution, and rainfall records were all considered in the flow and load projection analyses.

### ***Capacity Analysis***

Summaries of plant process area capacity assessments and conclusions are presented in the Plan. These assessments focus on the need for improvements or upgrades to existing facilities to address capacity deficiencies identified in the course of Master Plan evaluations.

### ***Regulatory Considerations and Strategy***

Several possible regulatory actions by the Oregon DEQ could drive investments in future improvements at the City's WWTP. The plant discharges to the Willamette River and existing and future effluent limitations contained in the NPDES permit dictate, in large part, the necessary treatment processes and configuration at the WWTP necessary to maintain compliance. The existing permit limits for the Wilsonville WWTP are effective September 1, 2020 through July 30, 2025.

### ***Alternative Development and Evaluation***

The Plan presents the methodology and findings of a process improvements alternatives evaluation. The plant's treatment process needs were defined by comparing the plant's existing condition, capacity and reliability, with the projected flows, loads, and regulatory constraints for the recommended alternatives. Where capacity deficiencies were predicted, at least two alternatives were analyzed for each corresponding unit process.

### **EXPECTED RESULTS:**

The Plan includes a list of recommended capital improvements, along with an anticipated schedule for completion and preliminary cost estimates. These improvements will provide the basis for an analysis of sewer rates and system development charges (SDCs) that will be necessary to adequate funding to implement to required upgrades.

### **TIMELINE:**

This is the first in a series of presentations to the Planning Commission and City Council. Subsequent planned meetings are as follows:

- City Council Work Session 8/1
- Planning Commission Public Hearing 9/14
- City Council Public Hearing 1st Reading 10/3
- City Council 2nd Reading 10/17

### **CURRENT YEAR BUDGET IMPACTS:**

The remaining contract balance for finalizing the Plan will carry over into FY 22/23. An additional \$92,450 has been budgeted in FY 22/23 for the Sewer System Rate Study and SDC Update, using a combination of Sewer Operating funds and SDCs.

### **COMMUNITY INVOLVEMENT PROCESS:**

The public hearings listed above will provide opportunity for public input. In addition, the Sewer System Rate Study and SDC Update will include a robust public engagement process.

**POTENTIAL IMPACTS or BENEFIT TO THE COMMUNITY:**

A technically and financially sound plan for providing reliable wastewater treatment, capacity to accommodate future development, and compliance with environmental regulations.

**ALTERNATIVES:**

The Plan includes alternatives for several of the recommended improvements. The selected alternatives were determined to be the most economically viable. Some of the more capital intensive alternatives can be revisited if necessary due to changing regulatory requirements.

**ATTACHMENTS:**

Attachment 1 Draft Wastewater Treatment Plant Executive Summary (dated June 2022)



City of Wilsonville  
Wastewater Treatment Plant Master Plan

**EXECUTIVE SUMMARY**

DRAFT | June 2022







City of Wilsonville  
Wastewater Treatment Plant Master Plan

**EXECUTIVE SUMMARY**

DRAFT | June 2022





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## Abbreviations

AA	average annual
AAF	average annual flow
ABF	Average base flow
ADWF	average dry-weather flow
AWWF	average wet weather flow
BCR	biochemical reactor
BOD <sub>5</sub>	biochemical oxygen demand
CIP	Capital Improvement Plan
City	the City of Wilsonville
CBOD <sub>5</sub>	five-day carbonaceous biochemical oxygen demand
CSZ	Cascadia Seismic Zone
DBO	Design-Build-Operate
DEQ	Department of Environmental Quality
DMR	Discharge Monitoring Reports
ETL	excess thermal load
gpd/sf	gallons per day per square foot
HMI	human-machine interface
Jacobs	Jacobs Engineering Group Inc.
kcal/day	kilocalories per day
lbs	pounds
MBR	membrane bioreactor
mg/L	milligrams per liter
mgd	million gallons per day
MGI	Northwest Geotech, Inc.
ml	milliliter
MLSS	mixed liquor suspended solids
MM	maximum month
MMDWF	maximum month dry weather flow
MMWWF	maximum month wet weather flow
MW	maximum week
MWDWF	maximum month dry weather flow
MWWWF	maximum week wet weather flow
NH <sub>3</sub>	ammonia
No.	number
NPDES	National Pollutant Discharge Elimination System
OSSC	Oregon Structural Specialty Code
PD	peak day

PDDWF	peak day dry weather flow
PDWWF	peak day wet weather flow
PHF	peak hour flow
ppd	pounds per day
PSU PRC	Portland State University Population Research Center
R/C	residential/commercial
SPA	State Point Analysis
SRT	solids residence time
the Plan	Master Plan
TMDL	total maximum daily loads
TP	total phosphorous
TS	total solids
TSS	total suspended solids
TWAS	thickened waste activated sludge
UGB	urban growth boundary
UV	ultraviolet
WWTP	wastewater treatment plant

## EXECUTIVE SUMMARY

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The City prepared the Plan with the goal of developing a capital plan that identifies improvements required through the planning period (today through 2045) to comply with requirements of the WWTP National Pollutant Discharge Elimination System (NPDES) permit and potential future regulatory requirements, while accommodating growth identified in the City of Wilsonville Comprehensive Plan (October 2018, updated June 2020 - the 2018 Comprehensive Plan). These improvements are designed to provide the best value to the City’s ratepayers by maximizing the use of existing infrastructure and improving system operation while continuing to protect water quality and human health and supporting economic development, consistent with goals and policies contained in the 2018 Comprehensive Plan and 2021-2023 City Council Goals.

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This Plan identifies improvements taking into consideration:

- The age and condition of existing process equipment and structures,
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- Consistency with the 2018 Comprehensive Plan and City Council 2021-2023 Goals 5, 6 and 7.

## ES.1 Planning Area Characteristics

Chapter 1 summarizes the City's wastewater service area characteristics relevant to assessing WWTP facility needs. The planning area considered by this Plan is consistent with the City's 2014 Collection System Master Plan and 2018 Comprehensive Plan including the urban growth boundary (UGB), which is currently the limit of City sewer service as shown in Figure ES 1.



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The northern portion of the City of Wilsonville is located within Washington County, and the majority of the City lies in the southwestern part of Clackamas County.

The City sits within the jurisdictional boundaries of Metro, the regional government for the Portland metropolitan area. By state law, Metro is responsible for establishing the Portland metropolitan area's UGB, which includes Wilsonville. Land uses and densities inside the UGB require urban services such as police and fire protection, roads, schools, and water and sewer systems. A figure of the City's existing land use is presented in Chapter 1. Also presented in Chapter 1 are the City's physical characteristics, water resources, and population and employment information, which are all significant factors in planning for wastewater conveyance and treatment facilities.

The Portland State University Population Research Center (PSU PRC) publishes annual estimates of populations for the previous year for cities in Oregon while Metro develops population projections for the future within the Portland metropolitan area, including Wilsonville. The PSU PRC estimated the City's population as 25,625 in 2019. Metro estimates the City's population to reach 30,566 people by 2045.

For establishing a per capita basis for flow and load projections for the Plan, certified PSU PRC historical population estimates were used for 2015 through 2019. Metro's future population forecasts were used for 2020 through 2045. Figure ES.2 shows the historical population and future growth predicted for the City.

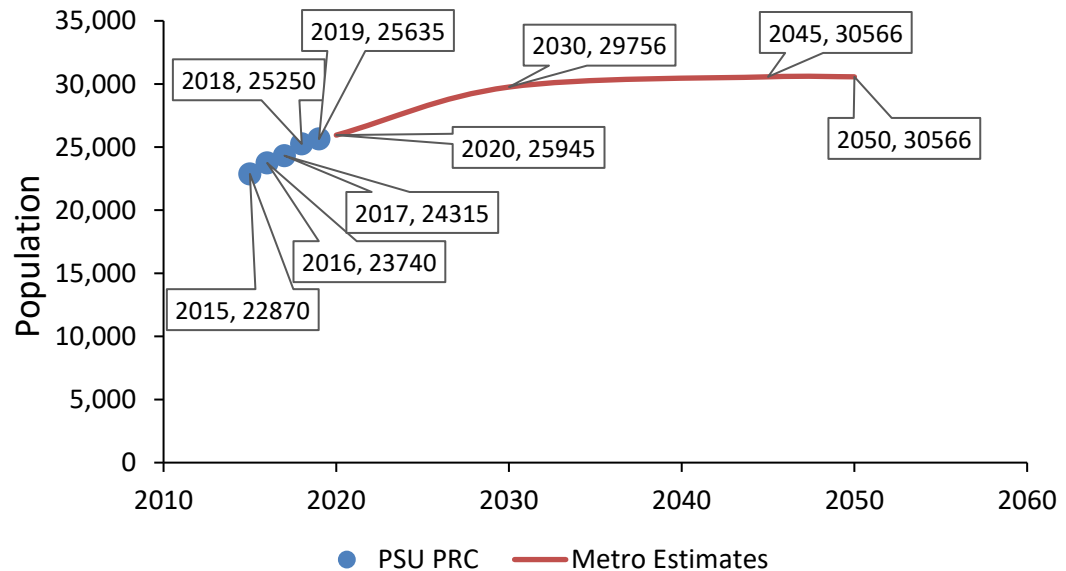


Figure ES.2 Historical Population and Expected Growth for the City of Wilsonville

## ES.2 WWTP Condition Assessment

Carollo reviewed prior condition assessments performed by others, conducted geotechnical investigations and performed seismic assessments at the WWTP in the course of Plan development.

In 2019, Jacobs Engineering Group Inc. (Jacobs) and Brown and Caldwell both completed condition assessments at the City's WWTP. A total of 322 major assets (per Jacobs' report), including process and mechanical equipment, motors and drives, control panels, generators, instrumentation, and structures, were examined for a variety of conditions that may signify their need for maintenance or replacement. Chapter 2 presents a summary of critical assets that require short term rehabilitation or replacement, as well as a list of assets that are less critical to operations, or have minor condition issues, but may be included in a short-term improvements project or a task order for Jacobs operations personnel. Table ES.1 displays the condition driven rehabilitation or replacement projects from Chapter 2 that were included in the recommended Capital Improvement Plan (CIP) in Chapter 7.

Table ES.1 CIP Condition Driven Replacement Projects

Asset	Description
Trojan UV 4000 System	While only used as a backup to the Ozonia UV system, the Trojan system's HMI has errors that prevent it from showing the status of the lamps in module 3. Since it is used infrequently, the system's condition is largely unknown. After review of the 2019 condition assessment reports and discussion with the City and Jacobs staff, it was concluded that the UV 4000 unit must be replaced.
Secondary Clarifiers No. 1 and No. 2	Ovivo completed a field review of the plant's secondary clarifiers No. 1 and No. 2 in April 2022. Although both units were operational, repairs were identified to improve the operation of the clarifiers. The recommended repairs include drive controls for both units, new skimmers for both units, squeegees for both tanks rake arms, EDI chains, one motor and reducer assembly, one skimmer arm assembly, and new secondary clarifier mechanisms. <sup>(1)</sup>

Notes:

(1) The detailed Ovivo Field Service Report is included in Appendix X.

Abbreviations: HMI - human-machine interface; No. - number; UV - ultraviolet.

## ES.3 Seismic Analysis

In 2021, Carollo performed a seismic evaluation and analysis of the City's WWTP as part of the overall plant condition assessment. Because the WWTP was substantially upgraded and expanded in 2014, most of its infrastructure is designed in accordance with the 2010 Oregon Structural Specialty Code (OSSC) and follows modern seismic design and detailing. During Tier 1 evaluations, Carollo identified potential deficiencies and areas for additional investigation. A Tier 1 seismic analysis is an initial evaluation performed to identify any potential deficiencies, whether structural or non-structural, in a building based on the performance of other similar buildings in past earthquakes. Subsequent to the Tier 1 analysis, a more detailed seismic

evaluation of five older and potentially seismically vulnerable structures on the WWTP site was conducted. Those structures receiving a more detailed evaluation included the following:

- Operations Building.
- Process Gallery.
- Workshop.
- Aeration Basins and Stabilization Basins.
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The five potentially vulnerable structures were compared against an S-4 Limited Safety structural performance level and N-B Position Retention non-structural performance level for an M9.0 Cascadia Seismic Zone (CSZ) earthquake. The M9.0 CSZ is reflective of a catastrophic natural disaster event that has an estimated 35 percent likelihood of occurring within the next 50 years. Following the Tier 1 evaluation, Carollo began Tier 2 evaluations for a select number of identified deficiencies. Although none of the structures showed significant irregularities, the team did identify seismic deficiencies. The recommended seismic retrofits are included in the CIP for this Plan.

Prior to the 2021 seismic evaluation, Carollo's subconsultant, Northwest Geotech, Inc. (NGI), completed a seismic response and geologic hazards assessment of the City's WWTP. Through past and present site investigations and engineering analyses, NGI determined that the native soils beneath the site's granular pit backfill have low risk of liquefaction and its slopes do not pose undue risk. NGI concluded that the WWTP's primary site hazard is the differential settlement that may be caused by soil piping (development of subsurface air-filled voids), which raises the risk of sinkholes forming beneath structures and pipelines. Soil piping usually develops in unsaturated soils when a water source percolates into the ground. While the site is mostly paved and stormwater is being collected, there may be areas where infiltration is occurring next to structures or below pipelines. Recommended actions from NGI to mitigate the risk of soil piping are presented in Chapter 2.

#### **ES.4 Wastewater Flow and Load Projections**

Chapter 3 of the Plan evaluates the historical and projected wastewater flows and loads generated in the City of Wilsonville's service area. The load projections include total suspended solids (TSS), biochemical oxygen demand (BOD<sub>5</sub>), ammonia (NH<sub>3</sub>), and total phosphorous (TP) loads.

Service area, residential population, industrial contribution, and rainfall records were all considered in the flow and load projection analyses.

Analysis of flow projections were completed through two different methods: (1) analysis of historical plant records and (2) DEQ Guidelines for Making Wet-Weather and Peak Flow Projections for Sewage Treatment in Western Oregon, which is referred to as the DEQ methodology in this Plan. Since there is no DEQ methodology for load analysis, all projections were developed based on historical plant records. Tables ES.2 and ES.3 below detail the existing and year 2045 flows that serve as the basis for the flow projections.

Table ES.2 Existing (2020) Flow Summary

Item	Selected Flow (mgd)	Industrial Flow (mgd)	R/C Flow (mgd)	R/C Peaking Factor
ABF	1.88	0.17	1.71	1.00
AAF	2.24	0.17	2.07	1.21
ADWF	1.94	0.17	1.77	1.03
AWWF	2.54	0.17	2.37	1.38
MMDWF	2.52	0.19	2.33	1.36
MMWWF	3.78	0.19	3.59	2.09
MWDWF	2.94	0.19	2.75	1.61
MWWWF	4.54	0.19	4.35	2.54
PDDWF	3.63	0.19	3.44	2.01
PDWWF	5.59	0.19	5.41	3.16
PHF	8.80	0.19	8.61	5.02

## Notes:

Abbreviations: AAF - average annual flow; ABF - average base flow; ADWF - average dry-weather flow; AWWF - average wet weather flow; MMDWF - maximum month dry weather flow; MMDWF - maximum month dry weather flow MMWWF - maximum month wet weather flow; MWWWF - maximum week wet weather flow; PDDWF - peak day dry weather flow; PDWWF - peak day wet weather flow; PHF - peak hour flow; R/C - residential/commercial.

Table ES.3 2045 Flow Projections

Item	Existing R/C Flow (mgd)	R/C Peaking Factor	2045 R/C Flow	2045 Industrial Flow (mgd)	Projected 2045 WWTP Flow (mgd)
ABF	1.71	1.00	2.02	0.6	2.62
AAF	2.07	1.21	2.43	0.6	3.03
ADWF	1.77	1.03	2.08	0.6	2.68
AWWF	2.37	1.38	2.79	0.6	3.39
MMDWF	2.33	1.36	2.75	0.7	3.42
MMWWF	3.59	2.09	4.23	0.7	4.90
MWDWF	2.75	1.61	3.24	0.7	3.92
MWWWF	4.35	2.54	5.12	0.7	5.80
PDDWF	3.44	2.01	4.05	0.7	4.72
PDWWF	5.41	3.16	6.38	0.7	7.05
PHF	8.61	5.02	10.15	0.7	10.82

Load projections were calculated for influent TSS, BOD<sub>5</sub>, NH<sub>3</sub>, and TP as detailed below in Table ES.4.

Table ES.4 Load Projections

Load Parameters	2045 R/C (ppd)	2045 Industrial (ppd)	2045 WWTP (ppd)
<b>BOD<sub>5</sub></b>			
AA BOD <sub>5</sub>	8,000	2,613	10,613
MM BOD <sub>5</sub>	11,437	2,978	14,415
MW BOD <sub>5</sub>	14,307	2,978	17,285
PD BOD <sub>5</sub>	21,656	2,978	24,634
<b>TSS</b>			
AA TSS	7,097	1,617	8,714
MM TSS	9,535	1,844	11,379
MW TSS	12,478	1,844	14,322
PD TSS	16,295	1,844	18,139
<b>NH<sub>3</sub></b>			
AA NH <sub>3</sub>	695	171	866
MM NH <sub>3</sub>	800	171	971
MW NH <sub>3</sub>	1,035	171	1,205
PD NH <sub>3</sub>	1,443	171	1,614
<b>Total Phosphorus (TP)</b>			
AA TP	222	73	295
MM TP	318	83	400
MW TP	397	83	480
PD TP	601	83	684

Notes:

Abbreviations: AA - average annual; MM - maximum month; MW - maximum week; PD - peak day; ppd - pounds per day.

### ES.5 Capacity Analysis

Summaries of plant process area capacity assessments and conclusions are presented in this Plan. These assessments focus on the need for improvements or upgrades to existing facilities to address capacity deficiencies identified in the course of Master Plan evaluations. A site plan of the City's existing WWTP is presented in Figure ES.3.

Chapter 4 identifies existing capacity ratings and deficiencies for the liquid and solids stream treatment processes at the City's WWTP. Analyses are based on operational practices in place at the time and existing effluent limits established by the WWTP's National Pollutant Discharge Elimination System (NPDES) permit. Biological process modeling was performed using BioWin version 6.2 to predict plant performance under current and future flow and loading conditions to assess when unit process capacities may be exceeded within the planning period (present through 2045).

A summary of the capacity assessment completed and presented in Chapter 4 is detailed below in Table ES.5.

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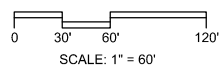


- LEGEND:**
- 1 - DEWATERING & DRYING BUILDING
  - 4 - PROCESS GALLERY
  - 5 - SECONDARY CLARIFIER NO. 1
  - 6 - SECONDARY CLARIFIER NO. 2
  - 7 - UV DISINFECTION SYSTEM
  - 8 - WORKSHOP
  - 9 - SECONDARY PROCESS FACILITY
  - 10 - STABILIZATION BASIN
  - 11 - SLUDGE STORAGE BASINS AND BIOFILTERS
  - 12 - SECONDARY CLARIFIER NO. 3
  - 13 - HEADWORKS
  - 14 - DISK FILTERS
  - 15 - COOLING TOWERS
  - 16 - W3 REUSE PUMP STATION
  - 17 - OPERATIONS BUILDING
  - 19 - SITE ENTRANCE

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**Figure ES.3**  
**EXISTING WILSONVILLE WWTP**  
 CITY OF WILSONVILLE



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Table ES.5 Unit Process Capacity Assessment

Unit Process	Capacity Assessment
<b>Preliminary Treatment</b>	
Screening	There is sufficient hydraulic capacity for both mechanical screens to accommodate the projected 2045 PHF. However, if one screen is out of service, the manual bar rack must be used to make up the loss in screening capacity.
Grit Removal	Capacity is adequate for providing full treatment of the projected 2045 PHF.
<b>Secondary Treatment</b>	
Secondary Treatment	Based on maximum week MLSS predicted from BioWin modeling at peak day flow with all clarifiers in service (and assuming a 5-day SRT), a SPA predicts that there is only sufficient capacity through 2038. SPA also indicates that there is sufficient capacity using the predicted average annual MLSS concentrations and the peak day dry weather flows with a clarifier out of service for the duration of the planning period.
Secondary Clarifiers	The secondary clarifiers are expected to stay under the maximum hydraulic loading criteria of 920 gpd/sf on peak day flow events with all units in service, as well as on max month dry weather flows with one unit out of service, for the entirety of the planning period.
Aeration Blowers	The air demands of the secondary treatment process are projected to exceed the firm capacity of the aeration blowers under peak conditions by 2035.
<b>Tertiary Treatment and Disinfection</b>	
Disk Filters	The existing disk filter capacity is expected to be exceeded by 2037 with one unit out of service or in backwash mode based on effluent limitations included in the City's DBO Contract with Jacobs. At this time the City expects to relax these contract limitations rather than invest in additional capacity. There is sufficient time for the City to reconsider this approach prior to 2037 and evaluate options for adding capacity to the filtration process.
Secondary Effluent Cooling Towers	It is not expected that the total hydraulic capacity of the cooling towers will be exceeded by 2045.
UV Disinfection	The existing UV channels are adequately sized to fully disinfect the 2045 PHF with all units in service, as well as the PDDWF with one channel out of service. The City currently has an older UV unit in place as an emergency backup to the primary system. That backup unit is aging and the City plans replacement during the planning period.
Outfall	Even with the Willamette River at its 100-year flood elevation, it is expected that the outfall pipeline can accommodate approximately 19 mgd before the UV channel effluent weirs are at risk of submergence upstream. Since this flow is well above the hydraulic capacity of the rest of the plant, no expansion will be needed until after 2045. <sup>(1)</sup>
<b>Solids Handling</b>	
Gravity Belt Thickener	The capacity analysis results show that the assumed operating times of 24 hours per day, 5 days per week are adequate for thickening the current and projected maximum week WAS loads with one unit out of service.
TWAS Storage	The TWAS storage volume is sufficient to accommodate the expected maximum week solids loads for three days (assuming TWAS is thickened to 4 percent). However, if one of the two storage tanks is taken out of service, there is insufficient storage volume for three days of storage under average annual solids loading conditions.
Dewatering Centrifuges	The rated capacity of the current centrifuges is sufficient to process the maximum week load with one unit out of service through 2045 assuming operating times of 24 hours per day for 5 days per week, per the criteria detailed in Chapter 4. <sup>(2)</sup>
Biosolids Dryer and Solids Disposal	The capacity of the biosolids dryer is adequate for handling the current and projected max week solids loads (in year 2045) on the basis of its design evaporation rate, assuming dewatered cake is dried from 20 percent TS to 92 percent TS and the dryer is operated for 24 hour per day for 5 days per week. <sup>(3)</sup>

## Notes:

- (1) The existing outfall was recently modified and equipped with five parallel diffuser pipes equipped with duckbill check valves to improve the mixing zone characteristics in the Willamette River.
- (2) The centrifuges installed with the City's 2014 upgrade project have exhibited inconsistent performance in recent months. The City recently refurbished these units and expects they will provide sufficient capacity through 2045. However, by that time, the units will have been in service for over 30 years. It is recommended the City plan for replacement of these units during the planning horizon of this Master Plan. Assuming replacement occurs in the mid-2030's the City should reassess capacity needs of those units beyond the 2045 horizon, consistent with the expected service life of the new equipment.
- (3) The existing solids dryer has sufficient capacity through 2045. As with the dewatering centrifuges, the dryer equipment will soon have been in operation for a decade. It is recommended the City plan for replacement of the dryer during the planning horizon of this Master Plan. The City plans to replace the existing dryer with a new piece of equipment using similar technology and potentially rehabilitate the existing unit to serve as a backup. See Alternative 2B, Chapter 6.

Abbreviations: DBO - Design-Build-Operate; gpd/sf - gallons per day per square foot; MLSS - mixed liquor suspended solids, SPA - State Point Analysis; SRT - solids residence time; TS - total solids; TWAS - thickened waste activated sludge.

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Table ES.6 further summarizes the capacity assessment by listing each unit process, associated design parameters and year of possible capacity exceedance.

Table ES.6 Unit Process Capacity Year Summary

Unit Process	Design Parameter	Redundancy Criteria <sup>(3)</sup>	Year of Capacity Exceedance
Influent Screening	PHF	One mechanical screen out of service	>2045
Grit Chamber	PHF	All units in service	>2045
<b>Secondary Treatment</b>	<b>MW MLSS inventory at PDF</b>	<b>All units in service</b>	<b>2038</b>
<b>Aeration Blowers</b>	<b>Peak BOD Load</b>	<b>Largest unit out of service</b>	<b>2035</b>
Secondary Effluent Cooling Towers	June 1 - Sept 30 PDF	All units in service	>2045
<b>Disk Filters</b>	<b>MWDWF</b>	<b>One unit in backwash</b>	<b>2037<sup>(1)</sup></b>
UV Disinfection Channels	PHF	All units in service	>2045
Outfall	PHF	-	>2045
Gravity Belt Thickening	MW Load	One unit out of service	>2045
TWAS Storage	MW Load	All units in service	>2045
Dewatering Centrifuges	MW Load	One unit out of service	>2045 <sup>(2)</sup>
Biosolids Dryer	MW Load	All units in service	>2045 <sup>(2)</sup>

Notes:

Unit processes in white are projected to run out of capacity before year 2045.

- (1) Existing Disk Filters are predicted to exceed reliable capacity (one unit out of service) in 2037 based on vendor provided design criteria. This conclusion assumes limitations for effluent total suspended solids contained in the WWTP DBO contract, which are far more stringent than the City's NPDES permit.
- (2) As noted previously, the existing centrifuges and biosolids dryer appear to have sufficient capacity through the planning year 2045, however condition and age are likely to require replacement during the planning period. It is recommended the City reassess available replacement technologies prior to replacement and consider loading appropriate to the planning horizon of any new units selected.
- (3) Reference Appendix D - Reliability requirements, Preparing Wastewater Planning Documents and Environmental Reports for Public Utilities, OR DEQ, 2018, Revised July 2019

## ES.6 Regulatory Considerations and Strategy

Chapter 5 details potential regulatory issues the City will need to take into consideration in coming years. Several possible regulatory actions by the Oregon DEQ could drive investments in future improvements at the City's WWTP. The plant discharges to the Willamette River and existing and future effluent limitations contained in the NPDES permit dictate, in large part, the necessary treatment processes and configuration at the WWTP necessary to maintain compliance. The existing permit limits for the Wilsonville WWTP are effective September 1, 2020 through July 30, 2025, and summarized below in Table ES.7

Table ES.7 Current Effluent Permit Limits

Parameter	Average Effluent Concentrations		Monthly Average, (ppd)	Weekly Average, (ppd)	Daily Maximum, (lbs)
	Monthly	Weekly			
<b>May 1 - October 31</b>					
CBOD <sub>5</sub>	10 mg/L	15 mg/L	190	280	380
TSS	10 mg/L	15 mg/L	190	280	380
<b>November 1 - April 30</b>					
BOD <sub>5</sub>	30 mg/L	45 mg/L	560	840	1100
TSS	30 mg/L	45 mg/L	560	840	1100
<b>Other Parameters Limitations</b>					
E. coli Bacteria	<ul style="list-style-type: none"> <li>Shall not exceed 126 organisms per 100 ml monthly geometric mean.</li> <li>No single sample shall exceed 406 organisms per 100 ml.</li> </ul>				
pH	<ul style="list-style-type: none"> <li>Instantaneous limit between a daily minimum of 6.0 and a daily maximum of 9.0</li> </ul>				
BOD <sub>5</sub> Removal Efficiency	<ul style="list-style-type: none"> <li>Shall not be less than 85% monthly average</li> </ul>				
TSS Removal Efficiency	<ul style="list-style-type: none"> <li>Shall not be less than 85% monthly average</li> </ul>				
ETL June 1 through September 30	<ul style="list-style-type: none"> <li>Option A: 39 million kcal/day 7-day rolling average</li> <li>Option B: Calculate the daily ETL limit</li> </ul>				

**Notes:**

Abbreviations: CBOD<sub>5</sub> - five-day carbonaceous biochemical oxygen demand; ETL - excess thermal load; kcal/day - kilocalories per day; lbs - pounds, mg/L - milligrams per liter; ml - milliliter.

Future treatment upgrades may be required when DEQ establishes total maximum daily loads (TMDL) for the lower Willamette River. Dissolved oxygen and nutrient limits, such as phosphorus limitations, are possible. The dissolved oxygen in the lower part of the river does not always meet water quality standards, and indications of excessive nutrients, such as chlorophyll-a, aquatic weeds, and harmful algal blooms, are present in the lower Willamette River. DEQ has begun its triennial review of Oregon's water quality criteria. The review could result in more stringent or new discharge requirements, but this process will take several years. For planning purposes, providing plant footprint to accommodate future treatment to remove phosphorus and address dry weather seasonal limits on dissolved oxygen should be anticipated. In addition, the City should continue to engage with DEQ regarding any proposed receiving water temperature regulatory actions.

## ES.7 Alternative Development and Evaluation

Chapter 6 presents the methodology and findings of a process improvements alternatives evaluation. The plant's treatment process needs were defined by comparing the plant's existing condition, capacity and reliability, with the projected flows, loads, and regulatory constraints for the recommended alternatives. Where capacity deficiencies were predicted, at least two alternatives were analyzed for each corresponding unit process. Process modifications associated with each alternative were modeled in BioWin using a calibrated model to evaluate the overall impact on plant operations.

As identified in Chapter 4, the secondary treatment process is expected to require additional capacity during the planning horizon (2045). Chapter 6 details two alternatives to address these capacity limitations. The two alternatives considered to increase secondary capacity are:

1. Expansion of the existing conventional activated sludge process; and
2. Intensification of the existing treatment process using membrane bioreactor (MBR) technology.

Due to the higher capital and operating costs of intensification, construction of a new conventional aeration basin is recommended to increase secondary capacity. As flows and loads increase, or regulatory requirements become more stringent, it may be necessary to intensify treatment. It is recommended the City revisit this evaluation as the need for 1) additional capacity to accommodate growth nears or 2) more stringent effluent limitations are considered. This offers the opportunity to take advantage of potential advances in technology as well as confirming the predicted time frame of capacity exceedance. Table ES.8 below illustrates the differences in cost between the two alternatives. A new aeration basin project is included in the Capital Improvement Plan in Chapter 7.

Table ES.8 Secondary Alternatives Opinion of Probable Cost Comparison

Description	New Aeration Basin	MBR
Site Work	\$1,273,000	\$62,000
Fine Screens	--	\$1,268,000
Aeration Basin	\$1,739,000	
MBR Tank	--	\$3,564,000
Electrical, Instrumentation, and Control	\$522,000	\$1,469,000
<b>Total Direct Cost</b>	<b>\$3,534,000</b>	<b>\$6,363,000</b>
<b>Total Estimated Construction Cost<sup>(1)</sup></b>	<b>\$5,812,000</b>	<b>\$10,465,000</b>
<b>Total Estimated Project Cost<sup>(2)</sup></b>	<b>\$7,265,000</b>	<b>\$13,081,000</b>

Notes:

(1) Assumes 30% Contingency, 10% General Conditions, and 15% Contractor Overhead and Profit.

(2) Assumes 25% Engineering, Legal, and Administrative Fees and ENR Construction Cost Index = 12683 (February 2022).

The existing aeration blower system firm capacity is expected to be deficient by 2035. An additional aeration blower (same size and design air flow rate as the existing high-speed turbo blowers) would ensure there is sufficient blower capacity through the end of the planning period to meet current permit requirements. There is adequate space to add a fourth turbo blower to the same discharge header pipe as the existing turbo blowers. Additionally, intensification of the secondary treatment process would further increase the aeration demands because operating at a higher MLSS reduces oxygen transfer efficiency in the aeration basins. If intensification is reconsidered and selected for the planning period, or if nutrient limits are imposed within the planning period that requires intensification or operation at a higher MLSS, the blower air demands should be revisited.

Additional tertiary filtration capacity is predicted to be needed before 2045 to provide full treatment of the MWDWF with one disc filter out of service or in backwash mode. After discussions with the City, two alternatives were identified to increase capacity:

1. Increase filtration capacity, and
2. Modify the requirement in the WWTP DBO contract to relax effluent limitations which are currently more stringent than those contained in the City's NPDES permit.

The City's WWTP NPDES permit currently requires effluent to contain less than 10 mg/L TSS during the dry season (see Table ES.8). However, the DBO firm's contract with the City requires an effluent TSS of less than five mg/L, or half of the WWTP's permitted effluent quality. At this time, the City has decided to study the performance of the existing tertiary filters over time and expects to relax effluent TSS requirements in the DBO contract unless actual water quality impacts (exceedances of permit limitations) are realized. The City will also consider the option of new technologies for filtration, noting that if the City selected an intensification technology utilizing membranes, this may potentially eliminate tertiary filtration capacity concerns.

While the capacity assessment findings presented in Chapter 4 determined existing solids dewatering centrifuges have sufficient capacity, the remaining equipment service life may require replacement within the planning horizon. The centrifuges, installed in 2014, were recently refurbished, but by 2045, will have been in service for over 30 years. The City should plan for their replacement within the planning horizon and consider whether a capacity increase is needed at the time of replacement based on projections of solids production and processing needs. Additionally, the secondary process was modified in 2020 and has experienced extended periods where mixed liquor concentrations have been elevated above typical ranges for conventional activated sludge or extended aeration processes. Due to the complications with secondary process operation and performance issues with the centrifuges, it is recommended the City study the secondary treatment and dewatering processes to confirm that the assumptions and conclusions regarding centrifuge capacity in Chapter 4 may be relied upon. A dewatering performance optimization study is recommended so the City can collect and analyze secondary treatment and solids processing performance data. For budgeting purposes, an opinion of probable cost for replacing the existing centrifuges is provided in Chapter 7. Timing of that equipment replacement will depend on performance of the existing units, future loading assumptions, and observed condition.

The existing solids dryer has experienced operational issues in recent years, including a fire that caused extensive damage to the equipment in April 2019 and a leaking rotary joint and damaged seal in 2021. As of February 25, 2022, the dryer has been repaired and is operating. Because of the City's commitment to solids drying as the preferred process to achieve Class A biosolids, the alternatives evaluation presented in this Plan for future dryer replacement was conducted with a focus on thermal drying options only.

Chapter 6 details an analysis of the following alternatives to improve the drying system:

1. Alternative 1 - Continue operating the existing biochemical reactor (BCR) paddle dryer and defer replacement.
2. Alternative 2 - Modify the existing Dewatering and Drying Building to accommodate a different solids dryer technology or a redundant dryer.
3. Alternative 3 - Construct a new dryer building with a different solids dryer technology.

While it is anticipated the existing dryer has useful life through at least 2026 (current DBO contract expiration), by 2031 the dryer will have been in operation for over 15 years. It is recommended the planning and design of upgrades to provide reliable dryer capacity begin in 2029, or sooner if further operational concerns arise. The City has indicated a preference for a variation of Alternative 2 which involves expanding the existing Dewatering and Drying Building to accommodate a second solids paddle dryer. This alternative provides backup capacity to allow the City to continue delivering Class A solids during periods of downtime if a mechanical failure occurs or to accommodate regular maintenance of one dryer train. As mentioned previously, this Plan recommends the City complete a study of the secondary sludge quality, performance of that process, chemical addition types and locations, and solids handling process performance overall prior to making a final selection of the preferred dryer alternative from the alternatives detailed in Chapter 6. For purposes of capital planning, this Plan assumes the City will implement Alternative 2b (modification of Dewatering and Drying Building to accommodate a second paddle dryer) with a study and confirmation of this selection beginning in 2029.

Lastly, the City wants to establish a direct connection between the City's fiber optics network and the WWTP. This addition consists of routing two new conduits (one spare) and fiber optic cabling from the WWTP's Operations Building to the site entrance, where the conduits will be tied into the City's fiber optics network. Chapter 6 details one potential routing from the Operations Building to the site entrance that would minimize impact to existing yard utilities. The fiber optic cable addition is included in Chapter 7 and the City's 5-year CIP.

Table ES.9 below summarizes the alternatives evaluated in Chapter 6 including recommendations for future WWTP improvements.

Table ES.9 Summary of Alternatives

Unit Process	Alternatives Considered	Selected Alternative
Secondary Treatment	<ul style="list-style-type: none"> <li>Expansion of the existing conventional activated sludge process.</li> <li>Intensification of the existing treatment process.</li> </ul>	<ul style="list-style-type: none"> <li>Expansion of the existing conventional activated sludge process through the addition of another aeration basin.</li> </ul>
Tertiary Treatment	<ul style="list-style-type: none"> <li>Increase filtration capacity.</li> <li>Eliminate the requirement on the DBO firm to meet effluent limits more stringent than the NPDES permit.</li> </ul>	<ul style="list-style-type: none"> <li>Eliminate the requirement on the DBO firm to meet effluent limits more stringent than the NPDES permit.</li> </ul>
Solids Dryer	<ul style="list-style-type: none"> <li>Continue operating the existing BCR paddle dryer and defer replacements.</li> <li>Modify the existing Dewatering and Drying Building to accommodate a different solids dryer technology or a redundant dryer.</li> <li>Construct a new dryer building with a different solids dryer technology.</li> </ul>	<ul style="list-style-type: none"> <li>Modify the existing Dewatering and Drying Building to accommodate a different solids dryer technology or a redundant dryer by expanding the Dewatering and Drying Building to accommodate a second solids paddle dryer.</li> </ul>

## ES.8 Recommended Alternative

Figure ES.4 presents a WWTP site plan identifying locations of recommended improvements resulting from condition and capacity assessments, including evaluation of alternatives, as described.

Summaries of opinions of probable costs and anticipated phasing for the improvements recommended for inclusion in the City's WWTP CIP are provided in Table ES.10.

The expected cash flow for the planning period was determined for the recommended improvements summarized in Table ES.10. The cash flow through 2045 includes an escalation rate of three percent, and the peak expenditure is approximately \$13,906,000 in fiscal year 2031. The projected CIP expenditures are presented in Figure ES.5.

Table ES.10 WWTP Recommended Alternative Opinion of Probable Cost and Phasing

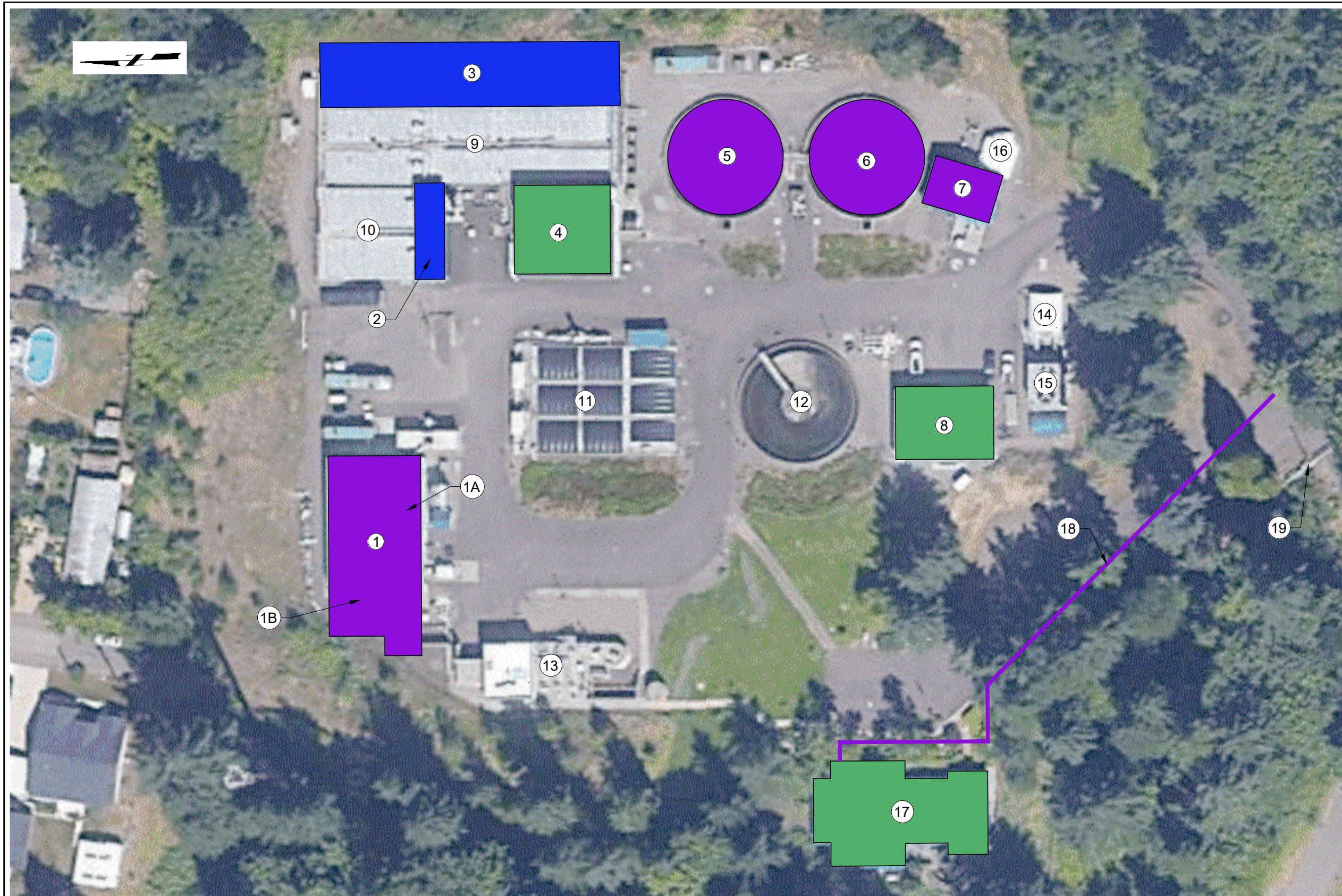
Plant Area	Project <sup>(1)</sup>	Opinion of Probable Cost	Approximate Year Online
Solids Handling	Dewatering Performance Optimization	\$150,000	2023
Communications/IT	Fiber Optic Cable Addition	\$55,000	2023
UV System	Trojan 4000 UV System Improvement	\$1,650,000	2024
Support Buildings	Seismic Improvements	\$1,015,000	2024
Secondary Treatment	New Secondary Clarifier Mechanisms	\$1,665,000	2026
Solids Handling	Solids Dryer Improvement	\$16,100,000 <sup>(6)</sup>	2031
Solids Handling	Existing Centrifuge Replacement	\$2,200,000 <sup>(3,5)</sup>	2033 <sup>(4)</sup>
Secondary Treatment	New Aeration Blower	\$394,000	2035
Secondary Treatment	New Conventional Aeration Basin	\$7,895,000	2038
<b>TOTAL</b>		<b>\$31,124,000</b>	

Notes:

White rows indicate projects that are in the City's 5-year CIP and blue rows indicate projects that are outside the 5-year CIP window.

- (1) Details of each project can be found in Chapter 2 or Chapter 6 of this Master Plan.
- (2) The estimated opinion of probable costs include the construction costs plus Engineering, legal and administration fees (ELA, or soft costs). Details on the estimated project costs can be found in Chapter 2 or Chapter 6 of the plan, with the exception of costs for the backup UV system and centrifuges which are presented earlier in Chapter 7.
- (3) For budgeting purposes, the Option B centrifuge cost from Table 7.4 is used for the project cost summary and the CIP
- (4) Replacement timing dependent upon satisfactory equipment performance
- (5) The centrifuges installed with the City's 2014 upgrade project have exhibited inconsistent performance in recent months. The City recently refurbished these units and expects they will provide sufficient capacity through 2045. However, by that time, the units will have been in service for over 30 years. It is recommended the City plan for replacement of these units during the planning horizon of this Master Plan. Assuming replacement occurs in the mid-2030's the City should reassess capacity needs of those units beyond the 2045 horizon, consistent with the expected service life of the new equipment.
- (6) The existing solids dryer has sufficient capacity through 2045. As with the dewatering centrifuges, the dryer equipment will soon have been in operation for a decade. It is recommended the City plan for replacement of the dryer during the planning horizon of this Master Plan. The City plans to replace the existing dryer with a new piece of equipment using similar technology and potentially rehabilitate the existing unit to serve as a backup. See Alternative 2B, Chapter 6.





- LEGEND:**
- CONDITION OR ADDITION PROJECTS** (Purple)
  - 1 - DEWATERING & DRYING BUILDING
  - 1A - EXISTING CENTRIFUGE REPLACEMENT
  - 1B - SOLIDS DRYER IMPROVEMENT
  - 5 - SECONDARY CLARIFIER NO. 1 - REPLACE MECHANISMS
  - 6 - SECONDARY CLARIFIER NO. 2 - REPLACE MECHANISMS
  - 7 - STANDBY UV SYSTEM REPLACEMENT
  - 18 - FIBER OPTIC CABLE ADDITION
  - CAPACITY PROJECTS** (Blue)
  - 2 - NEW AERATION BLOWER
  - 3 - NEW AERATION BASIN NO. 3, ACCESS IMPROVEMENTS & GRADING
  - SEISMIC RETROFIT PROJECTS** (Green)
  - 4 - PROCESS GALLERY
  - 8 - WORKSHOP
  - 17 - OPERATIONS BUILDING
  - OTHER FACILITIES**
  - 9 - SECONDARY PROCESS FACILITY
  - 10 - STABILIZATION BASIN
  - 11 - SLUDGE STORAGE BASINS AND BIOFILTERS
  - 12 - SECONDARY CLARIFIER NO. 3
  - 13 - HEADWORKS
  - 14 - DISK FILTERS
  - 15 - COOLING TOWERS
  - 16 - W3 REUSE PUMP STATION
  - 19 - SITE ENTRANCE

**Figure ES.4**  
**PROPOSED WILSONVILLE WWTP IMPROVEMENTS**  
 CITY OF WILSONVILLE



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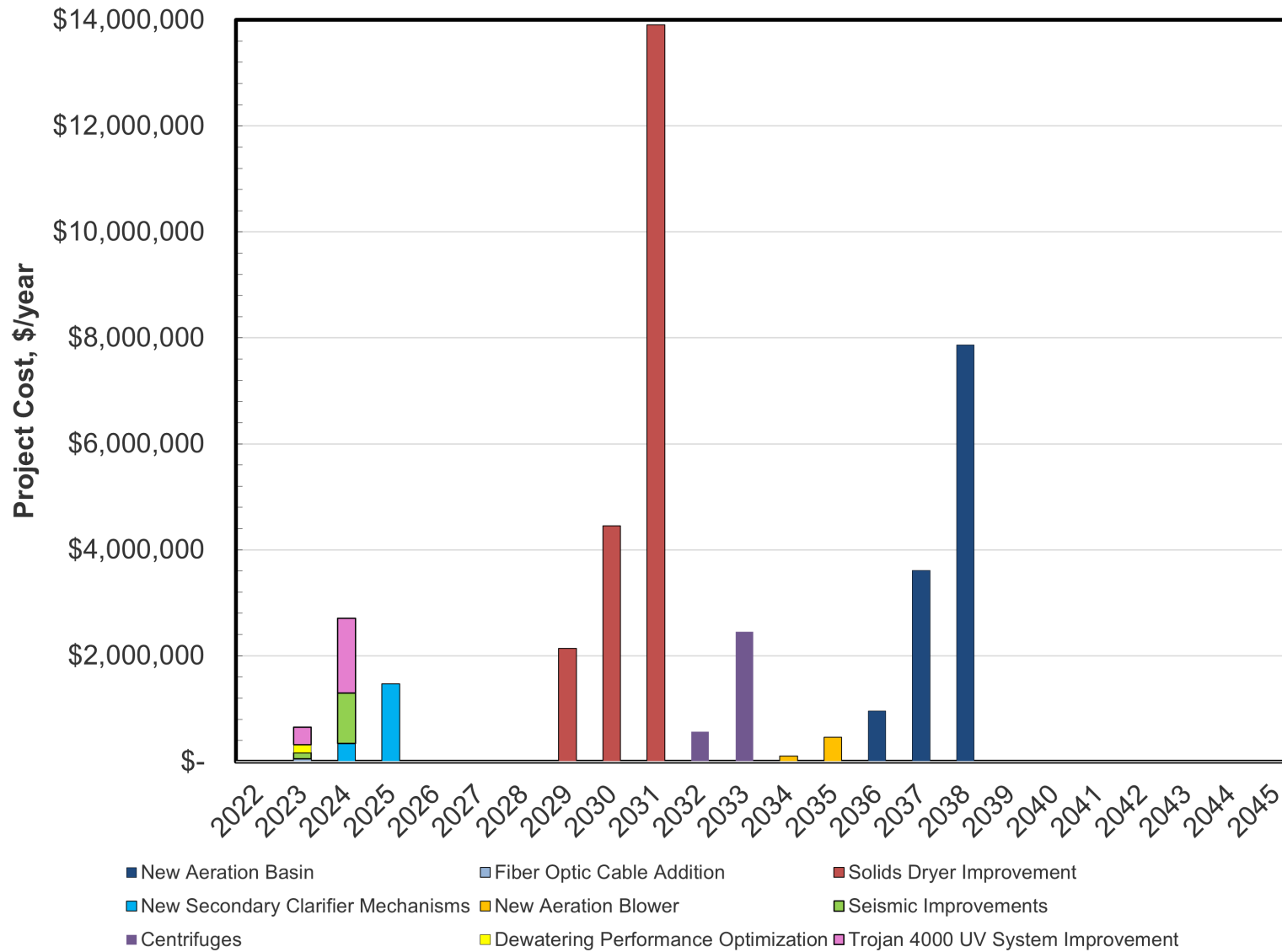


Figure ES.5 Projected 20-Year CIP Expenditures

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# City of Wilsonville Wastewater Treatment Plant Master Plan

Planning Commission

July 13, 2022



# Master Plan Drivers

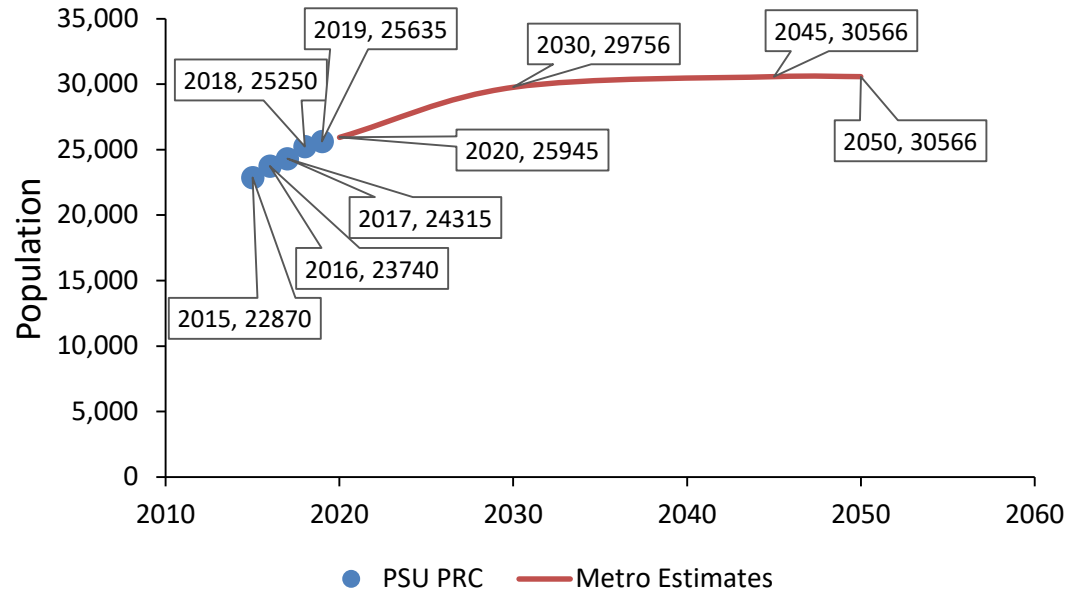


- City Capital Planning
- Accommodating Expected Growth
- Addressing Asset Condition and Replacement needs
- Assessing Potential Regulatory Drivers

# Capital Planning and Expected Growth - 2045

- Current Service Area needs – 20+ years through 2045
  - Population and associated economic development

2015	2020	2030	2045
22,870	25,945	29,756	30,566



# Facility Capacity Assessment



- Flows & Loads - Drive core process needs
- Existing WWTP design (2014 expansion) – ADWF – 4 mgd

Item	Existing	Projected 2045
Average Dry Weather Flow, mgd	1.94	2.68 (~38% > existing)
Average Annual Flow, mgd	2.24	3.03 (~35% > existing)
Maximum Month Wet Weather Flow, mgd	3.78	4.90 (~30% > existing)
Average Annual BOD <sub>5</sub> , ppd	7,470	10,613 (~40% > existing)
Average Annual TSS, ppd	6,427	8,714 (~35% > existing)



# Asset Condition Assessment



- Process Condition/Age Drivers
  - 2014 project facilities and equipment in service > 30 years by 2045
  - Solids facilities –
    - Performance issues
      - Solids Dryer fire (2019), component failures (2021), uneven performance
      - Solids Dewatering Centrifuges uneven performance (2020/21)
  - Secondary clarifiers – Pre-date 2014 upgrades, near term mechanism replacements, clarifiers no. 1 and 2
  - UV Disinfection – backup unit pre-dates 2014 upgrades, near term replacement

# Potential Regulatory Drivers



- DEQ - Total Maximum Daily Load (TMDL)  
Lower Willamette River
- Dissolved oxygen & nutrients
  - Nutrients can contribute to low oxygen conditions
  - Anticipate and accommodate future phosphorous, possibly nitrogen limits
- Pay attention to Willamette River  
temperature concerns

# Condition and Capacity Assessments

# Condition Assessment



- Prioritize 2019 findings of consultant assessments
  - Secondary clarifiers
  - UV system
- Geotechnical and seismic evaluations
  - Older buildings found to present moderate risk
  - Identified mitigations to address seismic concerns
    - Operations Building
    - Process Gallery
    - Workshop

# Unit Process Capacity Summary

Unit Process	Design Parameter	Redundancy Criteria	Possible Year of Capacity Exceedance	Identified Alternatives
<b>Secondary Treatment</b>	MW MLSS inventory @ PDF	All units in service	<b>2038</b>	<ul style="list-style-type: none"> <li>• New Aeration Basin</li> <li>• New Secondary Clarifier</li> </ul>
<b>Aeration Blowers</b>	Peak BOD Load	Largest unit out of service	<b>2035</b>	<ul style="list-style-type: none"> <li>• Additional Blower</li> </ul>
<b>Disk Filters</b>	MWDWF	One unit in backwash	<b>2037</b>	<ul style="list-style-type: none"> <li>• Third Disc Filter</li> <li>• Relax DBO limits</li> </ul>
<b>Biosolids Dryer</b>	MW Load	<b>All units in service</b>	>2045	<ul style="list-style-type: none"> <li>• Emergency Biosolids Management Plan</li> <li>• Redundant Dryer, similar technology</li> <li>• Different Dryer technology</li> </ul>

# ALTERNATIVES EVALUATION

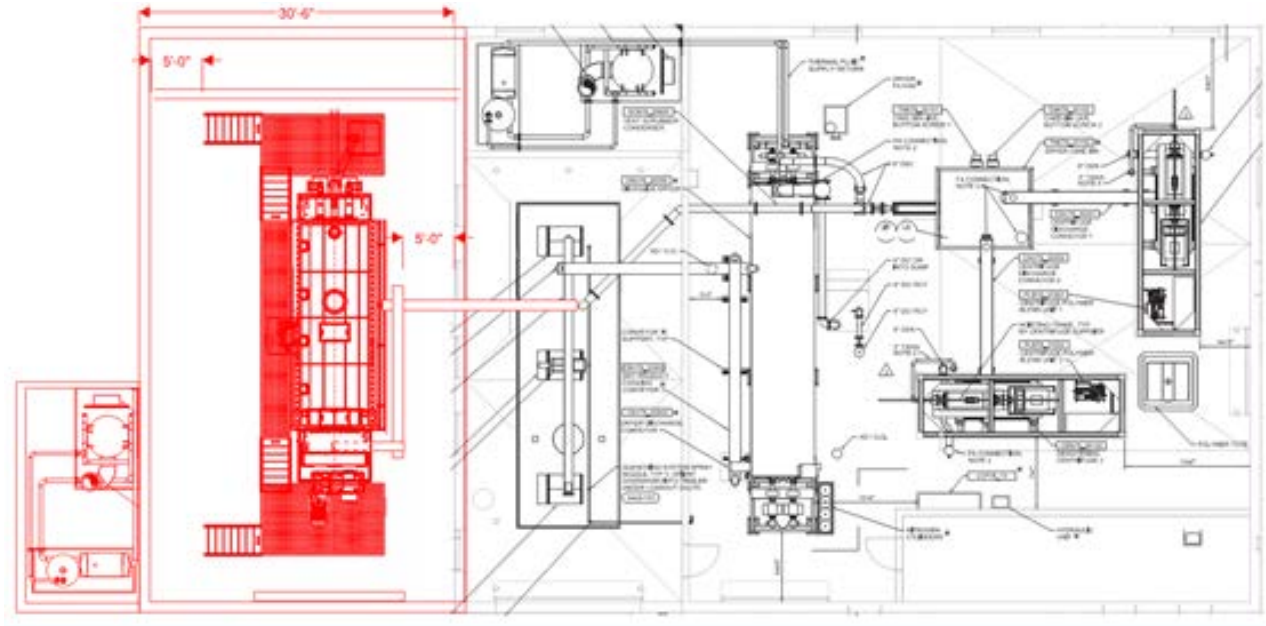
# Alternatives Evaluation



- Consider alternatives for process units identified as capacity deficient
- Secondary Process
  - Add new Aeration Basin
  - Add new blower
- Tertiary Disk Filters
  - Relax DBO effluent TSS limits
- Solids Dryer – driven by performance, not necessarily capacity
- Process Gallery
  - Further study, placeholder to expand dewatering and drying building, add new paddle dryer, refurbish existing dryer (backup)

# Alternatives Evaluation

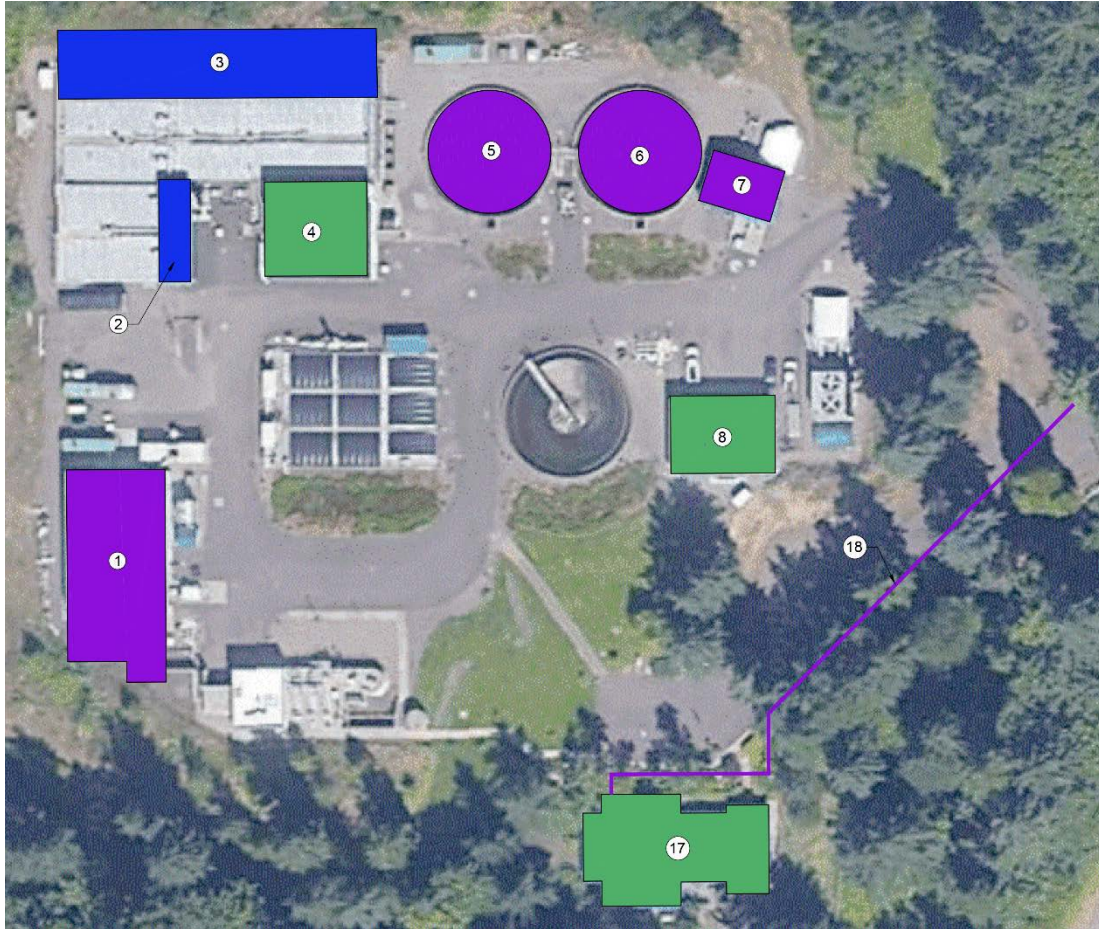
- Solids Dryer – driven by performance, not capacity
  - Further study, placeholder to expand dewatering and drying building, add new paddle dryer, refurbish existing dryer (backup)
  - Largest potential investment in Master Plan





# Recommended Plan

# Recommended Plan



- ③ New Aeration Basin
- ② Additional Aeration Blower
- ⑦ Replace backup UV system

- ① Plan to replace Solids Dryer & Centrifuges

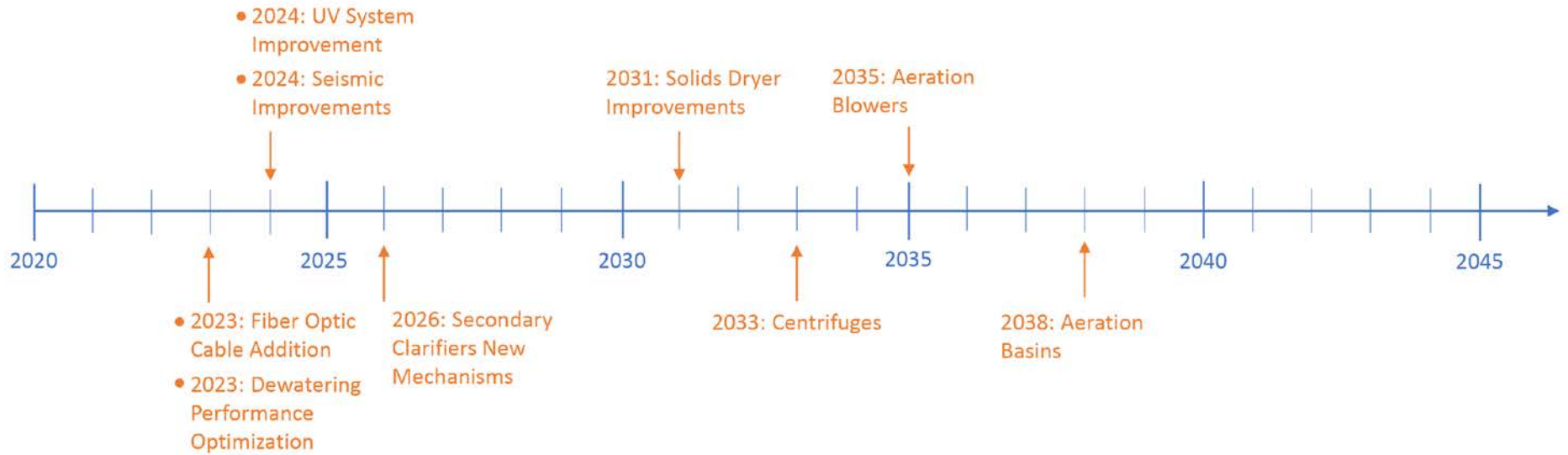
- ⑤ ⑥ Replace Clarifier 1 & 2 mechanisms

- ④ ⑧ Seismic retrofits of buildings

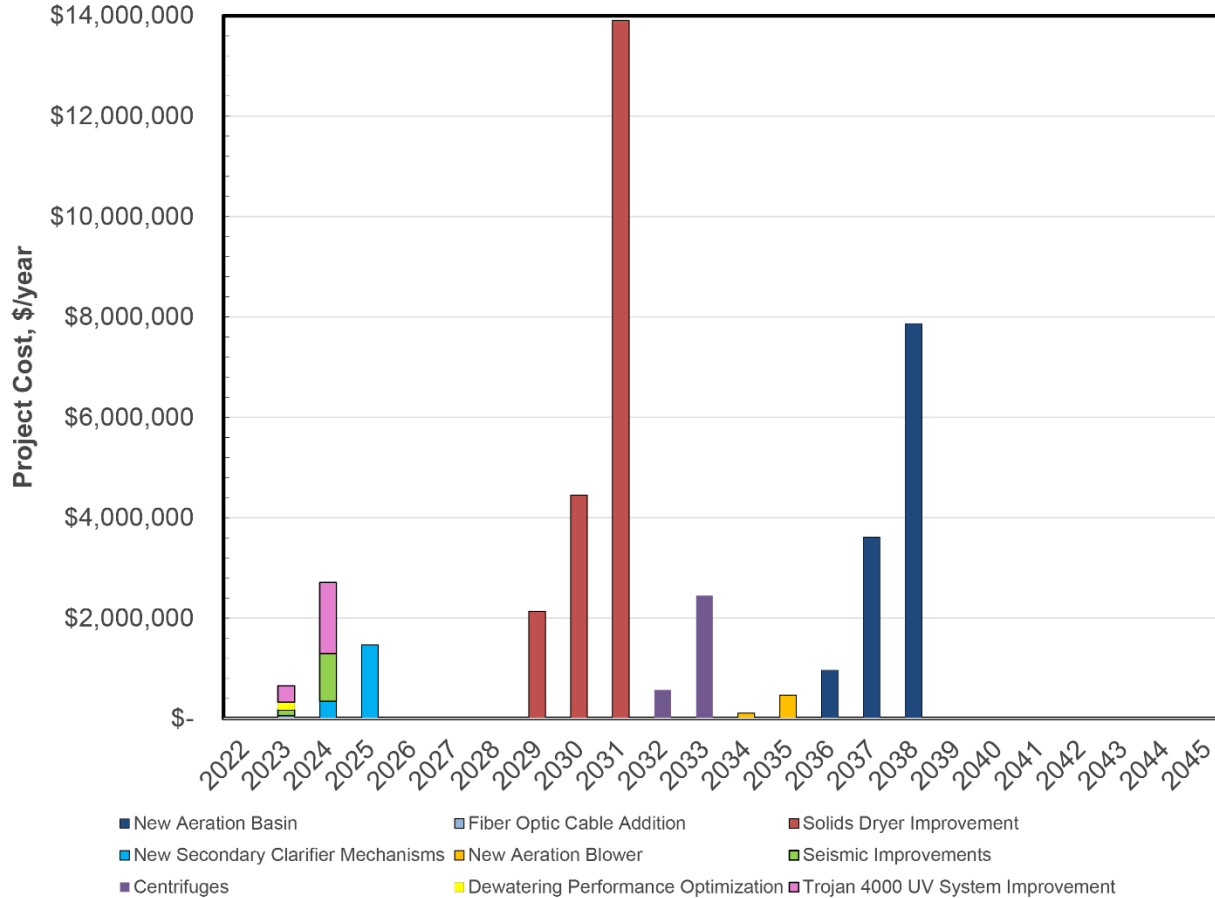
- ⑱ New fiber optic connection

Solids process study

# Proposed Project Phasing Schedule



# Draft Cash Flow



# Next Steps



- DEQ review and approval of Plan
- City Council Work Session 8/1
- Planning Commission Public Hearing 9/14
- City Council Public Hearing 1<sup>st</sup> Reading 10/3
- City Council 2<sup>nd</sup> Reading 10/17



**PLANNING COMMISSION  
MEETING MINUTES  
July 13, 2022 at 6:00 PM**

**City Hall Council Chambers & Remote Video Conferencing**

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*Draft PC Minutes were reviewed and approved as corrected at the September 14, 2022 PC Meeting. Corrections are bold and underlined. Commissioner Gallagher moved to approve the July 13, 2022 minutes as corrected. Commissioner Karr seconded the motion, which passed unanimously.*

**CALL TO ORDER - ROLL CALL**

A regular meeting of the Wilsonville Planning Commission was held at City Hall beginning at 6:00 p.m. on Wednesday, July 13, 2022. Chair Heberlein called the meeting to order at 6:01 p.m., followed by roll call. Those present:

Planning Commission: Ron Heberlein, Jennifer Willard, Aaron Woods, Andrew Karr, and Kamran Mesbah. Olive Gallagher arrived after roll call. Breanne Tusinski was absent.

City Staff: Daniel Pauly, Ryan Adams, Mike Nacrelli, and Mandi Simmons.

**PLEDGE OF ALLEGIANCE**

The Pledge of Allegiance was recited.

**CITIZEN'S INPUT**

This is an opportunity for visitors to address the Planning Commission on items not on the agenda. There was none.

**ADMINISTRATIVE MATTERS**

1. Consideration of the June 8, 2022 Planning Commission Minutes

The June 8, 2022 Planning Commission Minutes were accepted as presented.

**WORK SESSION**

2. Wastewater Treatment Plant Master Plan (Nacrelli)

Mike Nacrelli, Senior Civil Engineer, noted the Wastewater Treatment Plant Master Plan was the first since the last major upgrade to the Master Plan in 2012 and would look at the plant capacity, condition of the equipment, the regulatory landscape, and any issues that needed to be incorporated into a capital plan.

Dave Price, Project Manager & Vice President, Carollo Engineers, briefly highlighted his professional background. He presented the Wastewater Treatment Plant (WWTP) Master Plan via PowerPoint, noting Carollo based its planning around the City's Comprehensive Plan and the growth expected in the community through 2045 to ensure the treatment plant had capacity to treat in compliance with the NPDS permit to discharge to the Willamette River. Also reviewed were potential regulatory drivers, the WWTP condition and process capacity assessments, alternatives evaluation for addressing capacity deficiencies, as well as the recommended plan for new projects and infrastructure to provide additional capacity, the proposed phasing schedule, projected yearly cashflow, and next steps, which included the Master Plan's adoption anticipated in mid-October.

Discussion and feedback from the Planning Commission was as follows with responses to Commissioner questions as noted:

- Had the upcoming projects in 2023 and 2024 been estimated in the City's budget to provide the needed funding? (Slides 15 and 16)
  - Mr. Nacrelli replied the larger dollar amount projects, the UV System Improvement and Secondary Clarifier Mechanisms, were both in the Five-Year Plan of the recently adopted budget. The Seismic Improvements project could be accommodated in the City's Wastewater Capital Budget, and Staff would look into adding it to the Five-Year Plan in the next budget cycle. The Fiber Optic Cable Addition, at less than \$60,000, was a relatively small project. The Dewatering Performance Optimization project did **not** yet have a dollar amount and Staff would work with Jacobs Engineering Group Inc., the City's contract operator, to get that figure. The City might provide some funding through that operations contract, but the project would not have a major impact on the City's cash flow.
    - He confirmed a good amount of the near term proposed projects were in the Five-Year Plan, though a few things still needed to be addressed.
- What was the financing plan for 2031? Would funds come from CIP and is there adequate annual Capital Improvement Project (CIP) funding for the 2031 projects? (Slide 16)
  - Mr. Nacrelli noted the 2031 Solids Dryer Improvements project was the next big project. As mentioned in the Staff report, the current fiscal year budget identified a wastewater rate study and SDC analysis would be done in. The final Master Plan document would be used to see what the numbers and schedule meant for the monthly rates and the system development charges (SDCs) and how they might need to be adjusted. After the public hearings, over the next year, figuring out the finance plan would be the next step in implementation.
- Mr. Price clarified that grouting any soil voids around the existing piping was not part of the Seismic Improvements project but recommended in the geotechnical report and Northwest Geotech's study. When Northwest Geotech did its site work, no active erosion or piping was occurring; however, the City would need to pay attention to those requirements when doing the new improvements for the aeration basin, or if something was identified that appeared could be an issue, such as a hole showing up suddenly after some rain events. He did not know of anything to be worried about regarding the soils currently.
- Were there many complaints over odor and should the City do any projects to address odor?
  - Mr. Nacrelli responded he had not heard much about odor complaints from the operators at the site or from Delora Kerber, Public Works Director, who manages the contract.
  - Mr. Price added odor-control facilities were tied to the dryer and the solids building. He was not a solids processing expert, but there were risks when the process was interrupted and solids were not making it through the dewatering process to the dryer on a continual basis, which would occur because something broke or something else interrupted the normal flow. Under normal operations, the assumption was that the existing units were functioning as they were intended to control odor.
  - Mr. Nacrelli added he had not noticed any odor during his many times visiting the site.
- Mr. Nacrelli clarified the process for solids did not include a digester with gas harvesting, noting the digesters were eliminated with the last upgrade.
  - Mr. Price added there was no digestion, dewatered raw solids went from the centrifuge units right into the dryer unit, and that process was intended to function on a continual basis.
- Regarding plans for generating gas in the future, which was typical when dealing with solids, Mr. Nacrelli noted producing heat and electricity from harvested methane had been a big part of his previous job at

the City of Gresham, but it would be prohibitive for the City of Wilsonville to ~~try and~~ go back to using anaerobic digestion after eliminating the digesters.

- Mr. Price clarified that the percentage increases on Slide 4 were 2045 projections for an increase in the potential need for capacity based upon Staff's analysis using Metro numbers.
  - On how the percentage projections compared to the population increase percentage, Mr. Price replied the projected population of 30,000 in 2045 (Slide 3) was less than those represented in the table. (Slide 4) Often, conservative numbers were used when evaluating specific elements, like the loads or flows, for future growth and what would be produced. To ensure, Carollo was being conservative for planning purposes, the best-case scenario was not used. Every home built would not necessarily have the number of residents assumed by the Comprehensive Plan.
- The project assumed the same per capita load and flow generation seen today for 2045. The population increase would be around 18 percent, but the analysis showed increases of more than twice that in all categories. What infiltration inflow analysis information was available?
  - Mr. Price replied evaluations for treatment facilities looked at the actual flows received at the plant. Depending on the circumstance, the client's desires, and the needs of the community, the analysis might look at the collection system model to see the maximum amount of flow it could deliver. Typically, the flow numbers were generated based upon an evaluation using rolling averages, often a maximum month flow based upon a rolling 30-day average was used; not what the average was in one month compared to some time period, often it was the previous five years. The analysis did not necessarily utilize the same kinds of assumptions used in a collection system plan in part because with a treatment plant, no matter how tight the site was, the assumption was that more capacity could be built, expanded, or intensified. However, once pipe was put in the ground, it was difficult to make it any larger so often the collection system plan made very conservative assumptions, especially for peak flows it needed to convey to the plant to prevent wastewater protrusion from manholes.
- Did the City have a handle on clear water intrusion in the system?
  - Mr. Nacrelli replied the Wastewater Collection System Master Plan would have definitely looked at water intrusion and the Master Plan had a CIP to replace a lot of older pipes. He had been involved in several projects in Charbonneau, an older area where the age of the infrastructure had been a particular issue. The City was definitely addressing intrusion and the best way to do it was to either line or replace old pipes.
  - Commissioner Mesbah responded he had hoped to hear the City had a handle on any potential large inflow areas; not old pipes, but broken lines, especially in low areas with shallow ground water and he assumed some gravity lines were located where such water intrusion could occur, letting in water that was not efficient to treat. Was a conservation plan to reduce the loads in the future part of the WWTP Master Plan, assuming people would **not** be as wasteful as they were today?
    - Mr. Nacrelli noted the increases in BOD and TSS were a bit higher than the flows, which probably reflected that the influent was often trending stronger because less clean water, or rainwater, was coming into the system. The City was treating the same amount of solids, but the hydraulic impact was not as severe as it would have been in past years. (Slide 4) He agreed more efficient pipe materials, fixtures, and plumbing contributed to less water being treated.
      - A program to encourage more conservation would be more to do with the water distribution and plumbing side of things and was not part of this project's scope. However, the City was interested in conservation and pursuing it.
    - Mr. Price added one thing that came up with many of the planning studies he had done over the last 18 to 20 years was the idea that flows were very important, and they are however, as Mr.



Nacrelli had indicated, wastewater management tried to control the flow as well as ensure a process that could handle and treat the organic loads coming in, all of which included contaminants. In his experience, water conservation efforts did not always benefit wastewater treatment plants. For example, efforts in northern California, where constituents were regulated to a much lower level than DEQ, had resulted in the unintended consequence of water coming into the plants with a much higher concentration of pollutants. Water conservation was important, but it needed to be looked at carefully and watched at the wastewater plant, which was why the loads were looked at closely in the analysis which was often more important in some ways.

- Mr. Nacrelli noted the flows and loads increase was greater than the population increase and asked if that was because non-residential sources were also included.
  - Mr. Price confirmed the numbers did reflect non-residential sources, which included the prison and other industrial/commercial users within the service area, which were not reflected in the population numbers. Following Commissioner Mesbah's comments, he did want to take a hard look at the flows and loads analysis along with evolving land uses to make sure everything was in line.
- Industrial uses, like a brewery with higher loads to the treatment plant might exist in the city that the Commission was unaware of. Was the growth projection lowballed or would the City experience higher growth?
  - Mr. Nacrelli replied Metro's numbers were definitely on the low end, which was why they looked more closely at the medium projections indicated by the green line. (Slide 3, Green line)
- Historically, Metro numbers had been low, but the other aspect was that the City did have some say in how fast it grew. Some of the costs shown in the Draft Cash Flow chart were the costs of growth. (Slide 16) Perhaps those things should be thought about in addition to the expansion of load systems, etc. There were costs associated with choosing to grow which the City needed to be strategic about. The plan was conservative and seemed to have room to cover more than Metro's projections. Layering conservatism in the planning process should be avoided. Conservatism in facilities planning sometimes resulted in over-building unnecessarily that went unused long term.
  - Mr. Price replied that was a concern of his as well. Process engineers were conservative because no one wanted to under plan. The community should pay close attention to who was responsible for paying for which element of the need. Unfortunately, some elements might not be driven by capacity, but performance. There was an element of capacity embedded even in that large dryer unit that somebody would benefit from other than the existing users.
  - Mr. Nacrelli added because the City did not appear to have a capacity issue in the near-term, it could track what growth actually looks like over the next five years and then adjust accordingly, as the Master Plan would be adaptive. The City had not updated the Plan in 10 years, but he expected the City would not go longer than five years before assessing growth and making adjustments to the Master Plan as necessary.
- It would be helpful for the report to include a full built-out analysis. As the City built out areas it was adding, would it have adequate capacity, or would capacity go unused by the time the equipment needed to be replaced because it was not useful anymore; without having really used it? That would be a waste of taxpayer or ratepayer money. A full build-out analysis with timelines would provide some idea of whether the growth of the facility was being tracked in lockstep with the expected built-out of the areas added to the urban area.
  - Mr. Price noted the flows and loads had been projected out to the projection curves. Early in the analysis of the plant, Carollo Engineering, in conjunction with City Staff, decided not to necessarily

plan around the built-out numbers for the reasons pointed out. Including the build-out numbers would result in a more intense treatment plant site at the facility to account for the population nearly doubling, as shown by the projection on the higher rate curve. (Slide 3)

- Mr. Nacrelli clarified build-out was unrelated to the rate of growth. The current city boundaries and reserve areas would max out and fill up at some point according to how the areas were zoned. There was a number associated with build-out, though it was not necessarily tied to a time frame but to land use.
- Build-out could be tied to a time frame because the Planning Department had some idea of how fast the neighborhoods would develop. For example, 1680 units were planned for Town Center, 1750 units were planned in Frog Pond East and South. At 2.5 people per unit, 8500 residents would be living in developments the City knew were likely to be built between 2022 and 2035. Coffee Creek and Basalt Creek would likely be built out within a 20-year time period. While those were industrial uses, the City knew it would happen during the subject growth period.
- The expected growth chart should reflect the planning the City knew was already in progress. The city's population would increase from 27,000 to 37,000 just with the known development in Frog Pond East and South and Town Center, and that did not include Frog Pond West. The standard curve should include known development and another curve should address potential additional growth.
  - Additionally, the City should be explicit in its conservatism. Right now, the plan showed a 12 percent population growth from 2021 to 2045, but a 30 percent increase in load. The discrepancy between those two numbers should be explicit, especially as it the Master Plan progressed toward Council. The plan needed to be explicit in why the load increase was twice as much as the population growth, which was a big deal.
  - Mr. Nacrelli clarified Jacobs Engineering had taken over CH2MHill, the company that had the design/build/operate contract for the treatment plant, so Jacobs was now the City's contract operator for the treatment plant.
- As different population projections were done, Staff and the consultants were asked to use the same time frame for gathering historical data and for the future projection. For example, show 30 years' worth of previous data and then project 30 years into the future. A projection using 5 years of data to project 25 years in the future was not statistically defensible. The prior five years of growth could have been a growth spurt that was being extended 30 years into the future, which was not accurate. Growth, especially in a small city like Wilsonville, was choppy, so it should be averaged out to determine the long-term trends.

### 3. Frog Pond East and South Master Plan (Pauly)

Dan Pauly, Planning Manager, noted this was the Commission's sixth work session on the Frog Pond East and South Master Plan. He presented the Master Plan, including updates in response to the Commission's feedback via PowerPoint, reviewing the housing related design concepts and describing the similarities and differences between the three housing design types, displaying examples of each type using photographs from Villebois and Frog Pond West. He noted three housing design types were not set in stone, but the presentation addressed questions from Council and would be helpful for the Commission. Understanding the three housing types would be important in developing policy.

Joe Dills, MIG|APG continued the PowerPoint presentation, summarizing the feedback and preferences discussed by the Planning Commission last month, noting the aspiration to create and connect special destinations within the neighborhoods was still part of the physical planning. (Slide 29) He described the



## Open House Scheduled for Public Review of Waste Water Treatment Master Plan

The City of Wilsonville is conducting a virtual public open house to present the draft Wastewater Treatment Plant Master Plan, and to respond to questions and comments from community stakeholders.

The improvements detailed in this draft Plan are designed to provide optimal value to the City's ratepayers by maximizing the use of existing infrastructure and improving system operation while continuing to protect water quality and human health and supporting

**Waste Water Treatment Plant  
Master Plan Open House**  
*Wed, Sept. 28, 7 pm*  
Zoom Virtual Meeting

economic development, consistent with goals and policies contained in the 2018 Com-

prehensive Plan and 2021-2023 City Council Goals.

The plan accounts for the age and condition of existing process equipment and structures as well as projected residential and commercial growth and potential regulatory changes.

To learn more about this project, review the draft Plan or attend the open house, visit [letstalkwilsonville.com/wastewater-treatment-plant-master-plan](https://letstalkwilsonville.com/wastewater-treatment-plant-master-plan) or contact Mike Nacrelli, Senior Civil Engineer, at [mnacrelli@ci.wilsonville.or.us](mailto:mnacrelli@ci.wilsonville.or.us).

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This is the proof of your ad, scheduled to run on the dates indicated below. Please proofread carefully, and if changes are needed, please contact Sarah Penn prior to deadline at or [spenn@pamplinmedia.com](mailto:spenn@pamplinmedia.com).

<p><b>Date:</b> 09/20/22 <b>Account #:</b> 108863 <b>Reference #:</b> LP22-0001 Wastewater Treatment Plant Master Plan <b>Company Name:</b> WILSONVILLE, CITY OF <b>Contact:</b> <b>Address:</b> 29799 SW TOWN CENTER LOOP E WILSONVILLE  <b>Telephone:</b> (503) 570-1510 <b>Fax:</b> (503) 682-1015</p>	<p><b>Ad ID:</b> 258403 <b>Start:</b> 09/28/22 <b>Stop:</b> 09/29/22  <b>Total Cost:</b> \$206.38 <b>Ad Size:</b> 12.069 <b>Column Width:</b> 1 <b>Column Height:</b> 12.069  <b>Ad Class:</b> 1202 <b>Phone #</b> <b>Email:</b> <a href="mailto:spenn@pamplinmedia.com">spenn@pamplinmedia.com</a></p>
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### Run Dates:

Wilsonville Spokesman 09/29/22

**NOTICE OF LEGISLATIVE PUBLIC HEARING  
BEFORE THE CITY OF WILSONVILLE  
PLANNING COMMISSION AND CITY COUNCIL:**

**WASTEWATER TREATMENT PLANT (WWTP)  
MASTER PLAN LP22-0001**

**OREGON STATE LAW ORS 227.186.** The City has not determined how or if this particular proposal will reduce or otherwise impact either the value or use of properties within Wilsonville. Any changes to permitted land uses may reduce or increase property values, depending on various factors. A written notice has been mailed to potentially impacted property owners as required.

**PLANNING COMMISSION:**

On **Wednesday, Oct. 12, 2022, beginning at 6 pm**, the Planning Commission will hold a public hearing on the **Wastewater Treatment Plant Master Plan**, and will consider whether to recommend to City Council adoption of the Plan.

You will not receive another mailed notice unless you: submit a request in writing or by phone, or submit testimony or sign-in at the hearing.

**CITY COUNCIL:**

On **Monday, Nov. 21, 2022 beginning at 7 pm**, the City Council will hold a public hearing regarding the Wastewater Treatment Plant Master Plan after which it may make the final decision.

The hearings will take place at Wilsonville City Hall, 29799 SW Town Center Loop East. A complete copy of the project record, including staff report, findings, and recommendations, will be available online and at City Hall for viewing 7 days prior to each public hearing.

**SUMMARY OF PROPOSAL:**

The City of Wilsonville is updating its Wastewater Treatment Plant Master Plan. The improvements detailed in this Plan are designed to provide optimal value to the City's ratepayers by maximizing the use of existing infrastructure and improving system operation while continuing to protect water quality and human health and supporting economic development.

The City's Wastewater Treatment Plant, along I-5 between the river and Old Town, was originally built in 1971. A major 2014 upgrade expanded the capacity to accommodate population growth.

This Plan, which satisfies requirements established by the State of Oregon Department of Environmental Quality (DEQ), considers:

- The age and condition of existing process equipment and structures
- Growth to accommodate population growth and new economic development over the planning period (through 2045). Projections are based on projections, historical data and DEQ wet weather project methodologies.
- Potential changes to water quality regulations established by the DEQ
- City of Wilsonville Wastewater Collection System Master Plan (2014), and
- Consistency with the 2018 Comprehensive Plan and City Council 2021-2023 Goals 5, 6 and 7

For more details, visit <https://www.letstalkwilsonville.com/wastewater-treatment-plant-master-plan>

**HOW TO COMMENT:**

Oral or written testimony may be presented at the public hearings. Written comment on the proposal is welcome prior to the public hearings. To have your written comments or testimony distributed to the Planning Commission before the meeting, it must be received by 2 pm on Oct. 4, 2022. Direct written comments to Mandi Simmons, Administrative Assistant 29799 SW Town Center Loop East, Wilsonville, Oregon, 97070 | msimmons@ci.wilsonville.or.us | (503) 682-4960

*Note: Assistive Listening Devices (ALD) are available for persons with impaired hearing and can be scheduled for this meeting. The City will also endeavor to provide qualified sign language interpreters and/or bilingual interpreters, without cost, if requested at least 48 hours prior to the meeting. To obtain such services, please call Mandi Simmons, Administrative Assistant at (503) 682-4960.*

Publish September 29, 2022

WS258403

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<p><b>Date:</b> 10/05/22 <b>Account #:</b> 108863 <b>Reference #:</b> LP22-0001 Wastewater Treatment Plant Master Plan <b>Company Name:</b> WILSONVILLE, CITY OF <b>Contact:</b> <b>Address:</b> 29799 SW TOWN CENTER LOOP E WILSONVILLE  <b>Telephone:</b> (503) 570-1510 <b>Fax:</b> (503) 682-1015</p>	<p><b>Ad ID:</b> 260775 <b>Start:</b> 10/12/22 <b>Stop:</b> 10/13/22  <b>Total Cost:</b> \$33.02 <b>Ad Size:</b> 1.931 <b>Column Width:</b> 1 <b>Column Height:</b> 1.931  <b>Ad Class:</b> 1202 <b>Phone #</b> <b>Email:</b> <a href="mailto:spenn@pamplinmedia.com">spenn@pamplinmedia.com</a></p>
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### Run Dates:

Wilsonville Spokesman 10/13/22

**NOTICE OF CANCELLATION OF THE  
LEGISLATIVE PUBLIC HEARING  
BEFORE THE CITY OF WILSONVILLE  
PLANNING COMMISSION AND CITY COUNCIL:**

The public hearing before the Planning Commission for the **Wastewater Treatment Plant Master Plan (LP22-0001)** scheduled for Wednesday, Oct. 12, 2022 at 6pm has been cancelled. We are sorry for the short notification.

The public hearing before the City Council for the Wastewater Treatment Plant Master Plan scheduled for Monday, Nov. 21, 2022 at 7pm has also been cancelled.  
Publish October 12, 2022

WS258403

## Simmons, Mandi

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**From:** Thomas Hooker <thomas.hooker@gmail.com>  
**Sent:** Sunday, October 2, 2022 4:57 PM  
**To:** Simmons, Mandi  
**Subject:** Wastewater Treatment Plant Master Plan Comment / Request

**Follow Up Flag:** Follow up  
**Flag Status:** Completed

[This email originated outside of the City of Wilsonville]

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Mandi,

Thanks you for allowing me to comment on the proposed WWTP. I am a resident of Wilsonville, having live here for 30+ years. I am generally in agreement with the plan and its goals. Owing and RV and watching our community grow over the years, I have often thought a city of our size should have a waste dump for residents with RV's. Our process now is go to Tigard or other areas to dump our RV's, adding addition travel time in high traffic areas. I would like to request that an RV Dump be added to the WWTP Master Plan to support our residents with RV's.

Using Tigard as an example, it could be a highly functional perk for our residents as well as generating money to support the cost through Automated Dump Fees (TYP. \$5.00 per Dump or \$250.00 annual fee).

Tigard Link:

<https://cleanwaterservices.org/community-home/resources/dispose/rv-waste/>

Thank you for your time.

Thomas Hooker  
Park at Merryfield  
Roland Ct.  
[thomas.hooker@gmail.com](mailto:thomas.hooker@gmail.com)