

Oregon's Water Treatment Plant Operations



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Overview

In today's world, people do not often think about where water comes from and the facilities required to deliver safe drinking water to homes and businesses. That is due, in part, to water pipelines typically being underground and out of sight. It is also not uncommon for a water treatment plant (WTP) to be located outside urban areas in rural locations near water sources.

This report evaluates the locations of Oregon water treatment facilities that provide drinking water to populations greater than 40,000 to determine site conditions, including zoning and surrounding land uses. These water treatment facilities are found in rural and urban areas across the state. As urban areas have expanded, some older water treatment facilities that were once isolated from populations are now near urban areas.

Of the 16 water treatment facilities that serve greater than 40,000 people, 10 are in rural areas and 6 are in urban areas. For purposes of this report, urban is defined as within an Urban Growth Boundary (UGB) and rural is defined as outside a UGB.

This analysis focuses on facilities using surface water sources. Water providers supplying drinking water from groundwater sources were not considered.

This report presents information about the following facilities serving populations larger than 40,000 people:

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| 1. Joint Water Commission: WTP (rural) | 9. City of Bend: Outback Water Filtration Facility (rural) |
| 2. City of Salem: Geren Island Water Treatment Facility (rural) | 10. South Fork Water Board: John D. Collins Water Purification Works (urban) |
| 3. Eugene Water & Electric Board: Hayden Bridge Water Filtration Plant (urban) | 11. Springfield Utility Board: Willamette Treatment Plant (rural) |
| 4. Lake Oswego-Tigard Water Partnership: WTP (urban) | 12. and 13. City of Albany: Albany-Millersburg WTP (rural) and Vine Street WTP (urban) |
| 5. and 6. Medford Water Commission: Big Butte Springs and Robert A. Duff WTPs (both rural) | 14. and 15. City of Corvallis: H.D. Taylor WTP (urban) and Rock Creek WTP (rural) |
| 7. Hillsboro Water Department: Cherry Grove Slow Sand Filter Plant (rural) | 16. Clackamas River Water: WTP (urban) |
| 8. North Clackamas County Water Commission: WTP (rural) | |

The following pages provide summary information about these 16 water treatment facilities, including zoning and maps where available. Of the 16 water treatment facilities serving larger populations (Medford, Corvallis, and Albany have two facilities each in operation), 10 are sited in rural areas, with some now surrounded by a mix of uses as cities have grown and encroached on what were formerly rural areas.



For example, Eugene Water & Electric Board's (EWEB's) Hayden Bridge Water Filtration Plant was developed in 1950, predating county zoning and far from an urban center, but is now within Springfield's UGB and is considered urban in this analysis. The locations of many facilities are dictated by proximity to a high-quality water source that can be gravity-fed to communities.

To develop this report, operations and management representatives from the water treatment facilities serving populations greater than 40,000 were contacted. Information from these interviews is incorporated into the summary information on the following pages. Additional interview highlights are provided later in this document.

1. Joint Water Commission: Water Treatment Plant (rural)

The Joint Water Commission (JWC) is the primary drinking water supplier in Washington County, providing water for approximately **450,000** customers. The cities of Hillsboro, Forest Grove, and Beaverton, along with the Tualatin Valley Water District share ownership of the JWC's WTP.



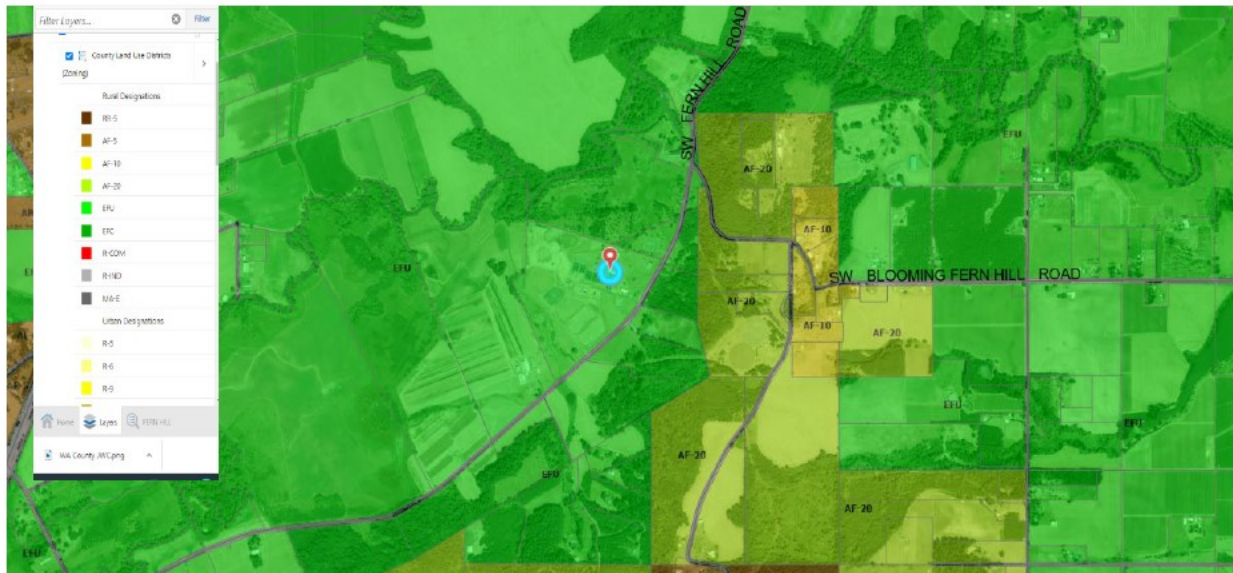
Aerial view of JWC WTP with view of basins.

The JWC WTP is located outside Forest Grove on approximately 62 acres. The site is outside the UGB and is zoned **Exclusive Farm Use**. The site is surrounded by EFU-zoned properties, with Agricultural and Forest District-zoned properties to the east.

The WTP was built in **1976** by the cities of Hillsboro and Forest Grove and has undergone multiple upgrades. In 2020, JWC completed capacity expansion and resilience upgrades.

The treatment facility uses conventional filtration to clean water drawn from the upper-Tualatin River and provide up to **85 million gallons per day (mgd)** of high-quality water.

Neighbors include private property owners, including a farmer who has crops and livestock. Recent outreach efforts included a construction open house and facility tour for neighbors, as well as periodic coordination regarding road maintenance. Neighbors have been given a direct line of communication to the facility operations staff.



Zoning map showing facility location.

2. City of Salem: Geren Island Water Treatment Facility (rural)

The City of Salem's Geren Island WTP provides drinking water for nearly **200,000** people and about 3,000 commercial businesses.

The Geren Island WTP is located on a 250-acre island roughly 17 miles east of Salem. The site is located outside the UGB and is zoned **Public**. To the north is Marion County zoning Exclusive Farm Use, Farm Timber, Urban Transition, and Acreage Residential. To the south, the site is bordered by property in Linn County zoned Farm/Forest and Aggregate Resource Overlay.

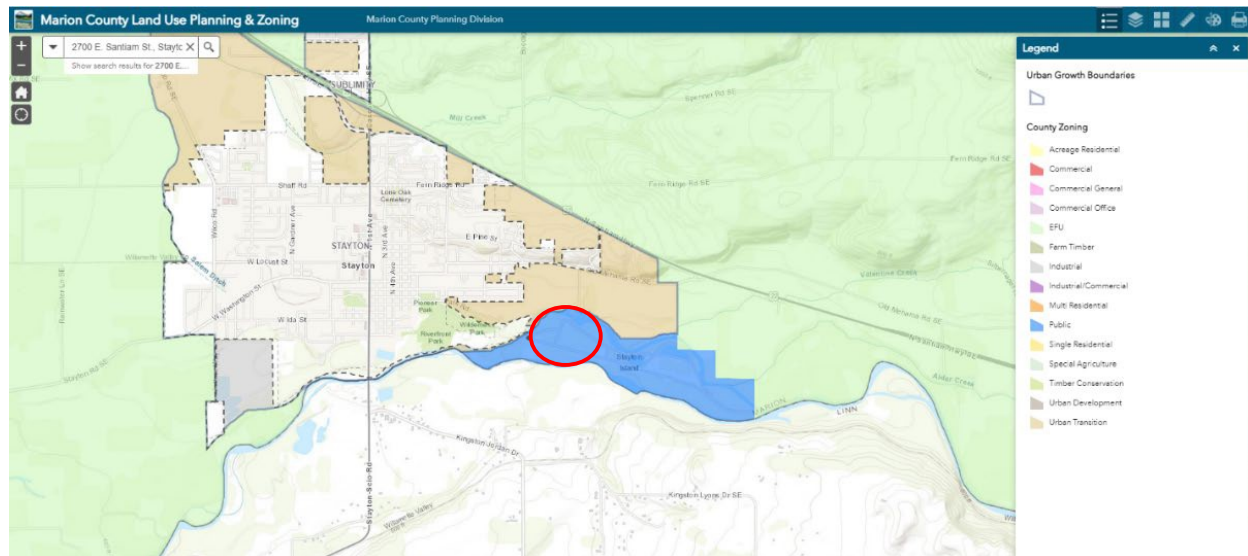


Photo of Geren Island WTP with view of filters and new ozone facility in background.

The City purchased the site in the **1930s** and began delivering North Santiam drinking water to Salem, then developed more treatment facilities there in the 1970s. The City recently completed construction of ozone and other improvements to make the water system more resilient to potential water quality events such as harmful algal blooms.

The facility uses ozonation and slow sand filtration to clean water from the North Santiam River and provide about **45 mgd** of drinking water.

There is currently no public access to the island and the facilities are not visible from neighboring properties. The closest neighbors are off-island and do not receive drinking water from the facility, so routine communication and outreach is not needed. There are active timber, blueberry, raspberry, wheat, clover, and other forestry and farming practices nearby.



Marion County zoning map showing facility location.

3. Eugene Water & Electric Board: Hayden Bridge Water Filtration Plant (urban)

EWEB is a customer-owned utility providing drinking water and electricity to a population of about **200,000** in the Eugene metropolitan area and lower McKenzie River Valley.

EWEB's Hayden Bridge Water Filtration Plant is located in Springfield. The site is about 50 acres and is zoned **Public Land and Open Space**. The surrounding zoning is Low Density Residential and Heavy Industrial. The facility was initially outside of a UGB. However, as Springfield's population grew, the UGB was expanded and the treatment facility is now within the UGB.



Photo of Hayden Bridge Water Filtration Plant with filters shown in foreground.

The treatment facility was established in **1950**. Over time, the facility has undergone several upgrades, including expansions to the treatment capacity and water storage. The facility uses filtration treatment to clean water from the nearby McKenzie River and provide up to **88 mgd** of drinking water. Recently, EWEB transitioned from use of chlorine gas to onsite sodium hypochlorite for disinfection.

Site neighbors include residential subdivisions, heavy industrial development, and farmland to the east across the McKenzie River. While the original facility was designed to be open to the public, the facility now has a security fence. There are also trees around the perimeter to provide visual screening.

Typical neighbor coordination includes communicating when needed about maintenance of natural and open areas on the site or nearby easements.



Aerial image showing location of Hayden Bridge Water Filtration Plant.

4. Lake Oswego-Tigard Water Partnership: WTP (urban)

The Lake Oswego-Tigard WTP is located in the City of West Linn. Through a regional partnership, the WTP provides drinking water to residents and businesses in the cities of Lake Oswego and Tigard.

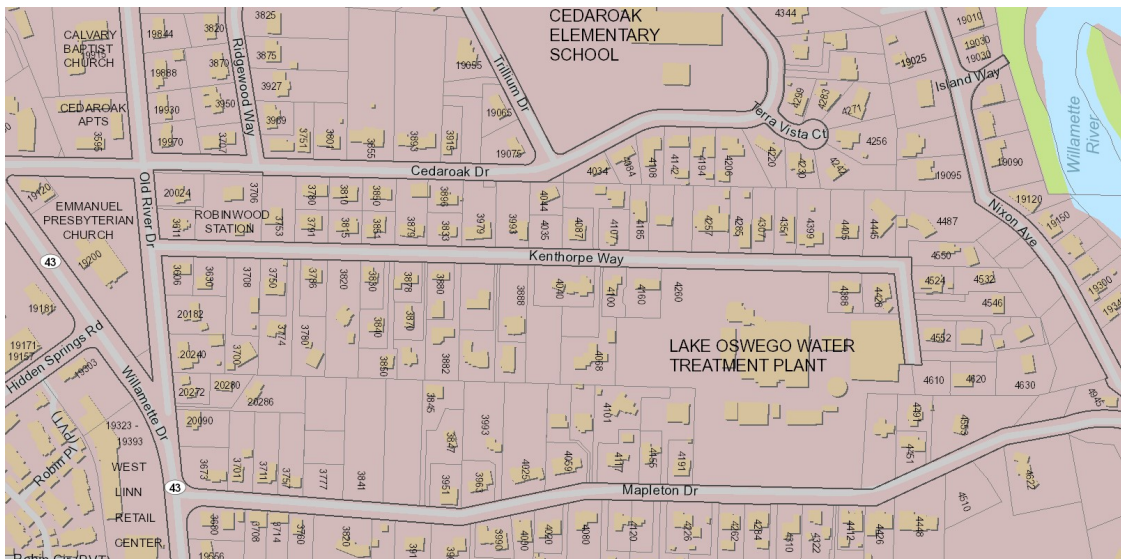


Photo of Lake Oswego-Tigard WTP.

The roughly 9-acre WTP site is zoned and surrounded by other properties zoned **Residential-10**. The treatment facility was initially built in an undeveloped unincorporated area, but over time the location became part of West Linn's UGB.

The treatment facility was established in **1968**. In 2015 and 2016, the treatment facility went through a significant upgrade. The current facility uses conventional filtration with ozone to clean water drawn from the Clackamas River. The treatment facility provides an average of **22 mgd** of drinking water.

Neighbors are primarily residences but also include an elementary school to the north and Mary S. Young Park to the south. As part of the facility upgrade, a Good Neighbor Plan was developed that outlined design features to limit disruption and provide community amenities. For example, the grass-covered surface of the clear well and a new footpath are publicly accessible to the local Robinwood and Kenthorpe neighborhoods. Following construction, communication with neighbors has been less frequent and most often related to activities such as maintenance of landscaping or fencing.



Map showing the property boundaries for the Lake Oswego-Tigard WTP and surrounding parcels.

5. and 6. Medford Water Commission: Big Butte Springs and Robert A. Duff WTPs (both rural)

Medford Water Commission provides drinking water for about 140,000 people in the Rogue Valley, including City of Medford residents. Big Butte Springs is the primary water source and is about 30 miles northeast of Medford between Mount McLoughlin and the town of Butte Falls. The Robert A. Duff WTP in Central Point, provides a second source.

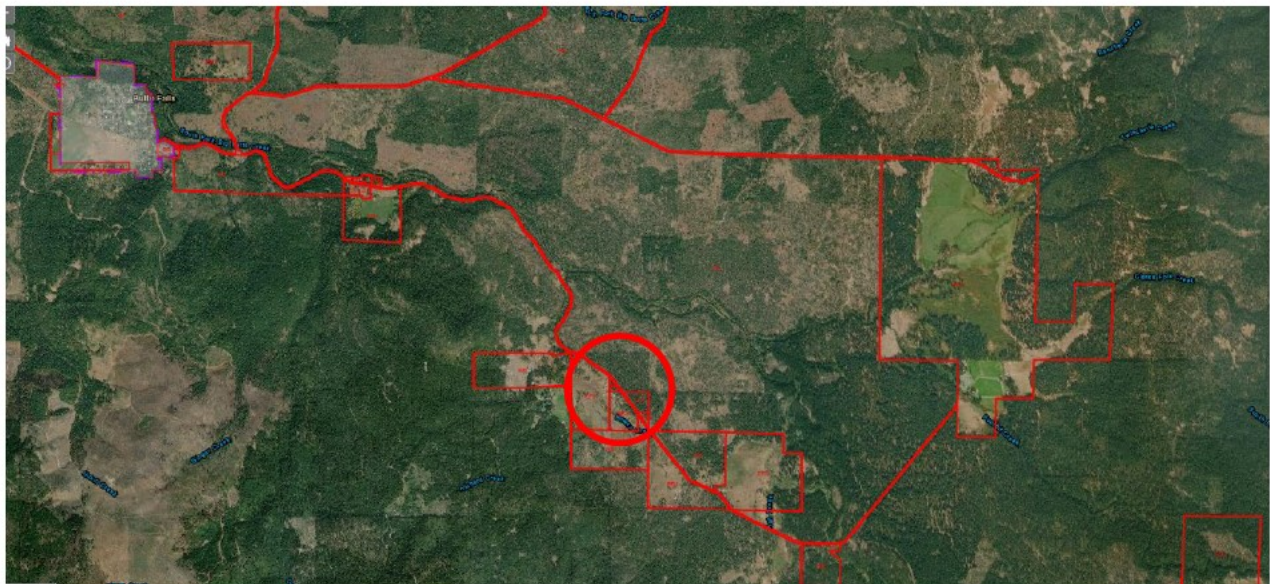


Photo of the Duff WTP buildings.

Big Butte Springs was established in 1927 and is located in a multiple-use watershed with private and publicly managed lands. The roughly 1,300-acre site is zoned **Forest Resource**, and is surrounded by Exclusive Farm Use, Woodland Resource, and other Forest Resource-zoned properties. There is some property zoned Rural Residential 5 acres per unit south of the water treatment facility.

The springs provide between **25 and 35 mgd** of drinking water. The primary treatment at the springs is chlorine disinfection, with corrosion control treatment expected to be added soon. The onsite chlorination treatment facility was built in **1993**.

Neighbors of the facility site include the Forest Service, private ranching and timber properties, and a couple of residences. Medford Water Commission works routinely with area stakeholders on source water protection.



Aerial image showing the facility location and surroundings.

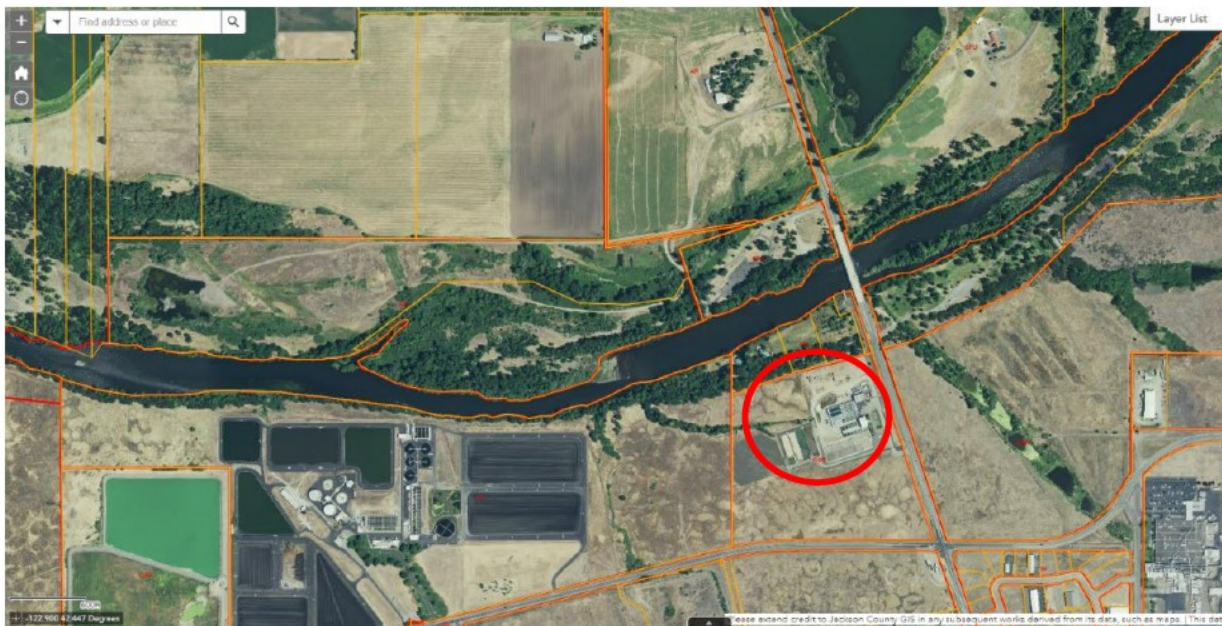
The Duff WTP supplements the Big Butte Springs source in summer months, drawing water from the Rogue River, which results in a blended water supply.

The Duff WTP site is zoned **Open Space Reserve**, directly south of Exclusive Farm Use-zoned land and the Rogue River. Across river properties are in farm use and zoned for resource uses—either Aggregate Removal or Exclusive Farm Use. To the south of the Duff WTP site, properties are zoned General Industrial and used for industrial purposes.

The Duff WTP was built in 1968 and has undergone multiple capacity expansions. The facility uses ozone and conventional filtration treatment to provide up to 65 mgd of drinking water.

The facility buildings are designed with an architectural style and earth tone materials to help blend with the surroundings, and the lighting is designed to be fully shielded.

Neighbors of the Duff WTP include a residence, a park across the river with a boat ramp, and a pear orchard and grape vineyard. The wastewater treatment facility and a municipal solid waste transfer station are also nearby. Onsite staff communicate directly with neighbors as needed.



Map of Duff WTP location and surroundings.

7. Hillsboro Water Department: Cherry Grove Slow Sand Filter Plant (rural)

Hillsboro's Cherry Grove Slow Sand Filter Plant is located near the community of Cherry Grove in Washington County. The site is zoned **Exclusive Forest and Conservation District** and is surrounded by properties zoned the same.

The facility provides drinking water to Hillsboro Water Department's upper system customers, as well as the Joint Water Commission WTP and some of the Department's wholesale customers.

The Cherry Grove facility was built in the **1990s** at the Department's original intake site established in 1940. The facility uses a biological process called slow sand filtration to clean water drawn from the upper-Tualatin River and is capable of treating up to **3 mgd**.

Neighbors of the facility include the Oregon Department of Forestry, forested private timber lots, and a few residences. Haines Falls, which draws hikers, is also nearby. Communications with neighbors are typically ad-hoc to coordinate activities such as seasonal maintenance of a gravel road or planned replacement of a sand filter.



Photo of facility showing the filter basins.



Illustration showing water system.

8. North Clackamas County Water Commission: WTP (rural)

The North Clackamas County Water Commission WTP is owned by a regional partnership, which provides water to more than **80,000** residents in the City of Gladstone, Oak Lodge Water Services, and Sunrise Water Authority (cities of Happy Valley and Damascus).

The treatment facility site is located along the Clackamas River and is zoned **Rural Residential Farm Forest 5-Acre**. The surrounding parcels are also zoned Rural Residential Farm Forest 5-Acre, and the parcels across the river are a mix of Exclusive Farm Use and Rural Residential Farm Forest 5-Acre. The site and surrounding parcels are outside the UGB.

The treatment facility was established in **1998** and uses slow sand filters and membrane filters to treat up to **20 mgd** of drinking water.

Neighbors of the facility include private property owners with horses and pigs. Onsite staff communicate directly with neighbors as needed.



Photo of facility with basin in the foreground.



Aerial image of treatment facility site and surrounding properties.

9. City of Bend: Outback Water Filtration Facility (rural)

The City of Bend's primary drinking water source is surface water from the Bend Municipal Watershed located in the Deschutes National Forest. The City's Outback Water Filtration Facility treats this surface water to serve about **67,000** customers. The City has a second groundwater supply that helps meet summer demands.



Photo of facility with storage reservoirs in the background.

The facility site is approximately 14 acres and is roughly three miles west of the city limits. The site is zoned **Rural Residential-10**, surrounded by Forest Use, Open Space & Conservation, Urban Area Reserve 10 acres/unit, and Westside Transect Zone.

The Outback Water Filtration Facility was built in **2016**, with potential treatment upgrades and expansion contemplated in the next 10 to 20 years to enhance supply resilience. The facility uses membrane filtration to clean water from the Bend Municipal Watershed and treats up to about **11.8 mgd** of drinking water.

The treatment facility is located in Deschutes National Forest, surrounded by forest land and Bend Parks and Recreation District facilities, with urban development encroaching to the east. The City maintains as-needed communication with neighboring agencies and environmental and recreational groups depending on what activities are happening in the area.



Map showing treatment facility location and surrounding parcels.

10. South Fork Water Board: John D. Collins Water Purification Works (urban)

The South Fork Water Board's John D. Collins Water Purification Works is in Oregon City. The Board was formed in 1915 to provide water for the cities of Oregon City and West Linn. Today, the Board serves drinking water to more than 65,000 people.

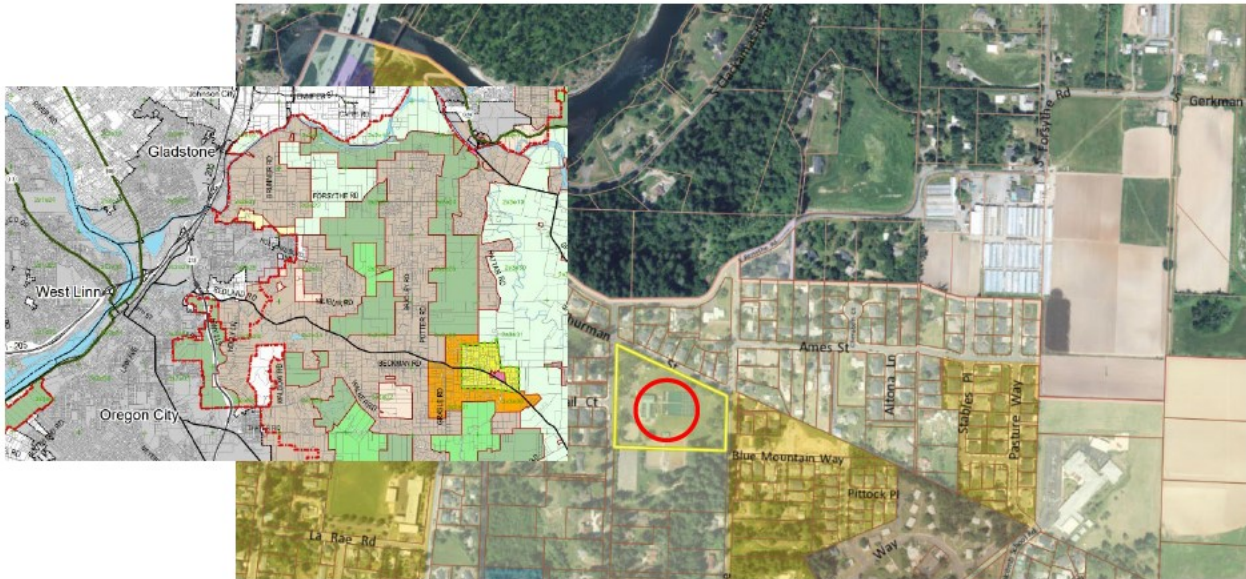
The treatment facility is located in the Park Place neighborhood on a site zoned **Residential-10**, surrounded by Residential-10 and Residential-8.

The Oregon City UGB is north of the site. Beyond the boundary is Clackamas County zoning for Rural Residential Farm Forest 5-Acre and Future Urban 10-Acre.

The treatment facility was built between **1958 and 1959** to augment the existing gravity water supply system. Over the years, the facility has undergone upgrades, expansion, and treatment modification. The facility currently uses conventional filtration treatment to clean water from the Clackamas River.



Photo of Collins Water Purification Works buildings.

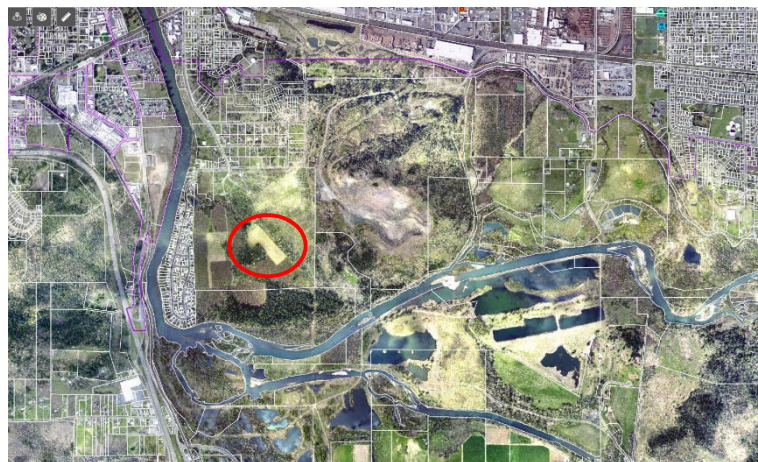
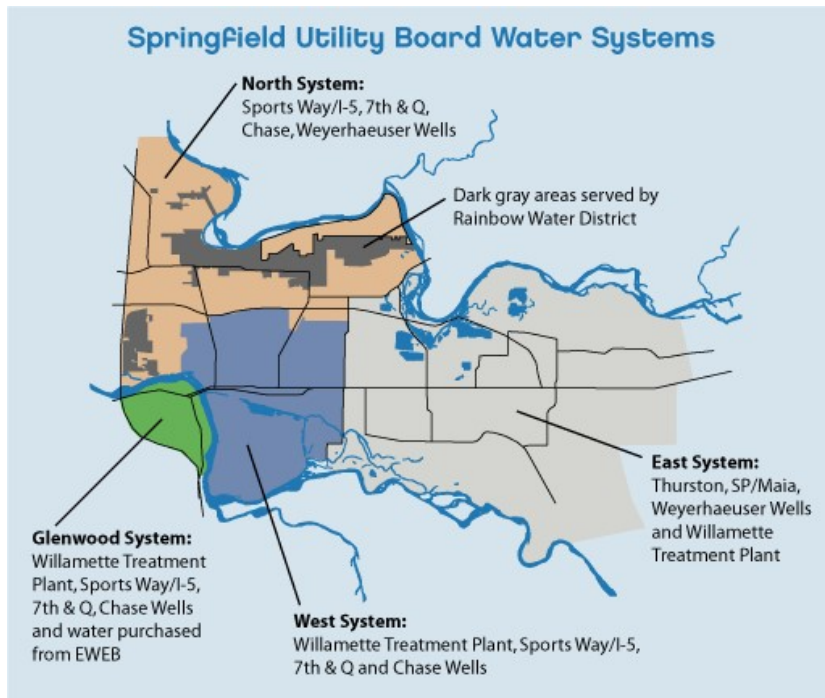


Aerial image of the Collins Water Purification Works site and surrounding properties.

11. Springfield Utility Board: Willamette Treatment Plant (rural)

The Springfield Utility Board provides drinking water to more than **60,000** customers. The Board's water comes from a groundwater aquifer and is augmented with water from the Middle Fork of the Willamette River.

The surface water is treated at the Willamette Treatment Plant. The treatment facility site is zoned **Public Land and Open Space**, surrounded by a mix of land use districts including Agriculture-Urban Holding Area, Quarry and Mine Operations, and other properties zoned Public Land.



Map showing facility location and surroundings.

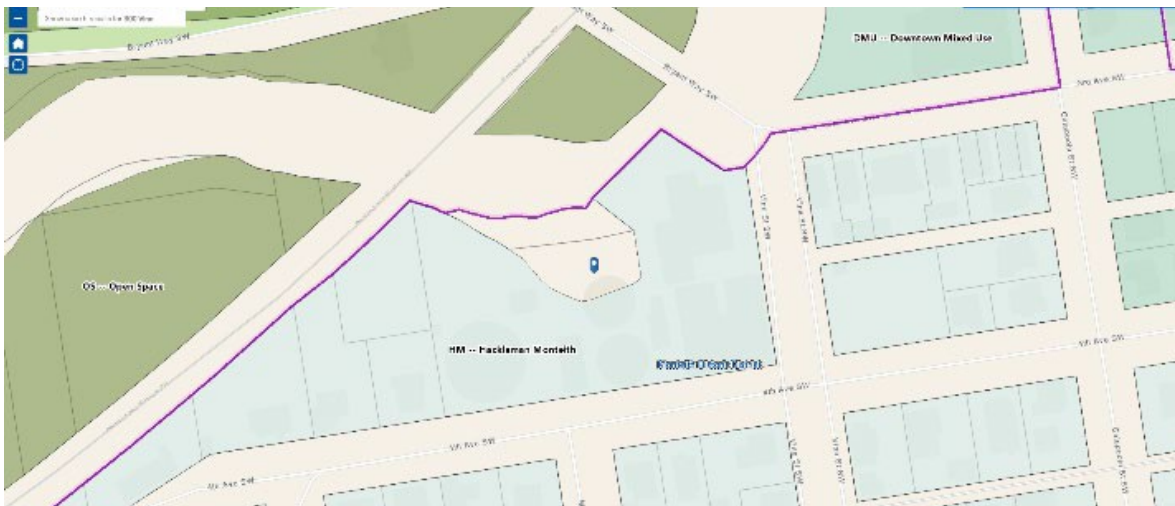
12. and 13. City of Albany: Albany-Millersburg WTP (rural) and Vine Street WTP (urban)

The City of Albany's drinking water is supplied by two water treatment facilities: the Albany-Millersburg WTP and the Vine Street WTP. The City has a population of roughly **60,000**.

The Albany-Millersburg WTP uses membrane filtration to clean water from the Santiam River and provide up to **12 mgd** of drinking water. The facility site is outside the UGB boundary.

The original Vine Street WTP was built in **1912**. The City of Albany purchased the WTP from Pacific Power & Light in 1984. The WTP has been expanded and upgraded on several occasions.

The Vine Street WTP uses filtration treatment to clean water from the South Santiam River and supply up to **16 mgd** of drinking water. The facility site is within the UGB and is surrounded by the Hackleman/Monteith Zoning District, with Open Space to the north.



Map showing Vine Street WTP location and surroundings

14. and 15. City of Corvallis: H.D. Taylor WTP (urban) and Rock Creek WTP (rural)

The City of Corvallis has two water treatment facilities. The Rock Creek Watershed was the sole supply of water for Corvallis until the Taylor WTP was built to augment supply.

The **H.D. Taylor WTP** in southeast Corvallis draws water from the Willamette River. The Taylor WTP's production varies between about **6 to 21 mgd**, providing the majority of the City's drinking water supply.



Photo of Taylor WTP buildings.

The Taylor WTP site is zoned **General Industrial**, with Agricultural Open Space to the north and south, and Benton County Public zoning to the east. The WTP site is within the UGB.

The Taylor WTP has undergone considerable changes and upgrades during its 60-year history. The WTP was built in **1949** on the west bank of the Willamette River at what was then the outskirts of Corvallis. In 1997, the WTP was upgraded and expanded to bring treatment processes up to date and provide capacity for the growing community.

There is a federal facility nearby and a public walking trail maintained by the parks department. Operations and public works staff communicate directly with neighbors as needed.



Map showing zoning of Taylor WTP site and surrounding parcels.

The Rock Creek WTP is located east of Philomath. The WTP takes water from the Rock Creek Watershed on the east side of Mary's Peak. Surface water is collected from three intake points—North Fork Reservoir, South Fork Rock Creek, and Griffith Creek. The raw water is conveyed to the WTP at the lower end of the Rock Creek Watershed.



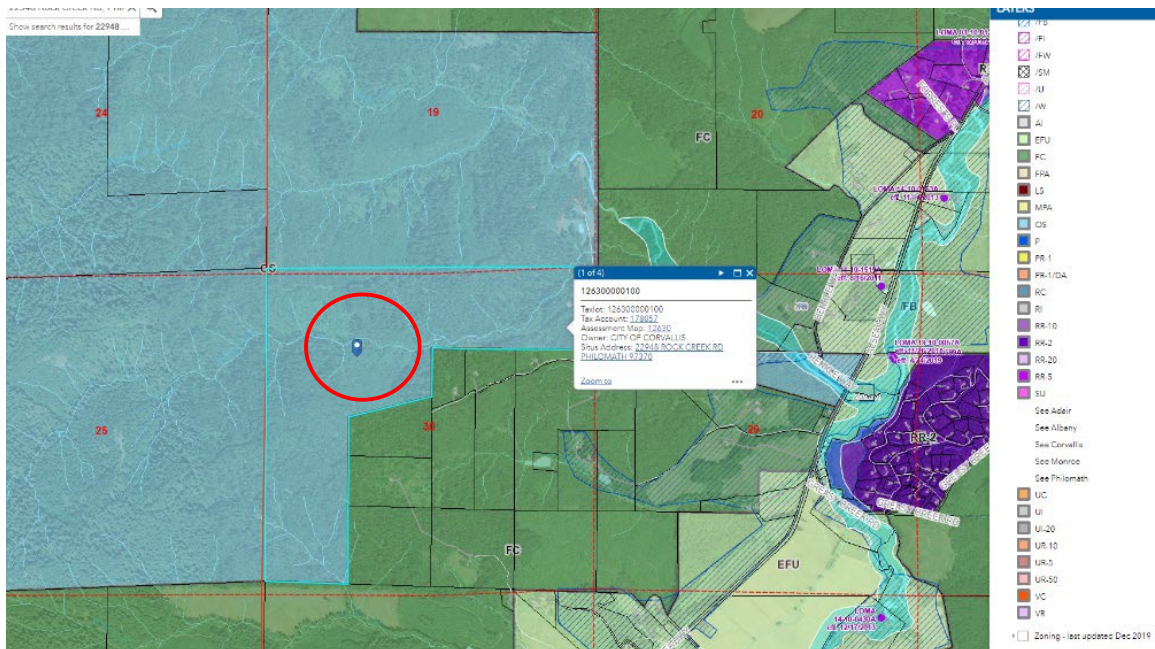
Photo of Rock Creek WTP basins.

The Rock Creek WTP site is zoned **Open Space**. The site is bordered by Forest Conservation-zoned properties.

The Rock Creek WTP is a conventional rapid sand filtration facility that treats about **3 mgd** of drinking water.

The Rock Creek WTP was built in **1955**. In 1959, an earthen dam reservoir with a capacity of 100 million gallons was constructed on North Fork Rock Creek. In the early 1980s, the WTP capacity was upgraded to 7 mgd; however, the current transmission pipeline hydraulic capacity is limited to about 3.5 mgd.

Communication is as needed and typically relates to providing notification when there is active logging in the area.



Map showing facility location and surroundings.

16. Clackamas River Water: WTP (urban)

Clackamas River Water's WTP is located in Clackamas County within the UGB. Clackamas River Water is a special district regional water provider formed in 1995 through consolidation of existing districts. Through two service areas, Clackamas River Water provides drinking water to up to **80,000** people.

The Clackamas (North) Service Area is supplied by the WTP, which uses filtration treatment to clean water from the Clackamas River.



Photo of Clackamas River Water WTP with basins in foreground.

The WTP site is zoned **General Industrial** and surrounded by properties zoned General Industrial and Open Space Management. Clackamas River Water also owns the public park between the WTP and the Clackamas River.

The WTP has been in operation since **1964** and has undergone three phases of upgrades to provide additional capacity. Currently, the facility treats about **30 mgd** of drinking water.

Site neighbors include a bottling facility and other industrial uses, with residences on the far side of the Clackamas River. Neighbor communications include routine customer outreach and direct coordination with operations staff when appropriate. Clackamas River Water works with other stakeholders throughout the basin on education and source water protection.



Aerial image showing location of the Clackamas River Water WTP near the Clackamas River.

Additional Facilities

The table below identifies water providers serving populations greater than 40,000 that do not operate a water treatment plant and were not considered in this analysis.

Water Provider	Supply Description
Tualatin Valley Water District (including a portion of Tigard in their service district)	Receives water from JWC (#1) and Portland Water Bureau.
City of Gresham	Receives water from Portland Water Bureau. Forming a partnership with Rockwood PUD for future supplies.
City of Beaverton	Receives water from JWC (#1).
Rockwood PUD	Groundwater source.
Sunrise Water Authority	Provides water to the communities of Happy Valley, Damascus, and Clackamas County. Sunrise Water Authority relies on both surface and groundwater, with surface water treated before distribution at one of three plants: the North Clackamas County Water Commission (#7), Clackamas River Water (#15), or South Fork Water Board (#9) for emergency supplies only.

Operations Interviews

Representatives from 12 of the water treatment facilities (10 agencies) were interviewed in May and June of 2022 to learn more about their operations, understand what if any issues may have come up with other area land uses over time, and gather advice about best practices to maintain good neighbor relationships. An interview request was also made to the agencies that operate the remaining four water treatment facilities, but no response was received.

Highlights from the interviews are noted below with representative quotes shown in italics. In general, interviewees did not identify significant conflicts with other land uses in the area.

Communication

Interviewees described neighbor relationships as generally positive. They noted communication is typically ad-hoc to coordinate around landscape maintenance or similar considerations.

- *Get along very well, work to coordinate and find solutions if anything comes up*
- *Healthy relationship, no issues really*
- *Never heard any complaints about drinking water treatment plants—have worked at four or five cities and water treatment plants around Oregon*
- *Some easement areas around facility can become eyesores for neighbors if not routinely maintained*
- *Have worked to make accommodations when needed to address concerns about easement weed control and mowing, and turning lights on when operators arrive at the facility*

Odors

Interviewees noted odors at water treatment facilities are not an issue. A few noted proactive steps to address potential odors from operations and maintenance of their solids drying beds.

- *Not an issue*
- *Absolutely none—don't produce any odors*
- *Nothing really, even with drying beds, no concerns*
- *No direct complaints—aware of potential concerns from drying lagoons and take steps to mitigate*

Noise

Interviewees emphasized that operating water treatment facilities are quiet. A few noted design features that help attenuate potential sounds from pumps and other equipment.

- *Facility is very quiet—can't hear anything on other side of fence*
- *Everything happens inside enclosed buildings or is very quiet*
- *Pump station can be noisy, but contained in building with sound dampeners—can stand outside property and not notice*
- *Have occasionally received a construction period noise complaint, but not during regular operation*
- *No complaints, very quiet plant operations—worked to address concerns about mowing equipment*

Light

Interviewees noted facility lighting is important for site safety and security. Several noted design steps like shielded fixtures and directional lighting to help address potential concerns.

- *Have looked at ways to make lights more directional—always lit for security/safety, but making upgrade to shielded lights*
- *No concerns—very wooded area*
- *Heard some concerns about new parking lot lighting (directional) but were able to modify direction and resolve issue—have since changed type of lighting spec to shielded and pointing down*
- *Concerns have decreased as landscaping has matured—all lights directed downward*
- *No complaints, use shoebox style that face down, designed to be fully shielded*

Traffic

Interviewees had not fielded concerns about traffic in part based on small numbers of staff or facility access from main roadways.

- *Never had any real complaints about traffic through residential area—good about driving speed limit*
- *Not noticeable with trucking to other industrial facilities—neighbors have more employees and trucks*
- *Haven't had complaints—have a contractor route and a main route that are both on larger roadways, not near residential neighbors*
- *No concerns about traffic—have a shared main road, but no one ever comes to the WTP*
- *No complaints—made sure to communicate what to expect during recent construction*

Chemical Safety

Interviewees did not recall hearing concerns from the public about chemical safety. Many noted their water treatment practices are well established.

- *Haven't received any complaints or concerns*
- *No serious concerns from neighbors, tours have been helpful to show there are physical means to handle any spills and that chemicals are not as dangerous as they may think*
- *Don't recall this ever coming up—don't receive frequent treatment deliveries*
- *No concerns raised—did talk a bit about plant safety (chlorine gas) with neighbors*
- *Don't recall taking a single call about safety concerns or chlorine gas emergency protocols*

Public Access and Tours

Interviewees noted their facilities accommodate tours requested by interested groups, primarily school kids and educational audiences.

- *Accommodate group requests for tours at water treatment plant (college, high schools) by appointment*
- *Facility is open to anyone who wants to see how their water is treated*
- *Pre-COVID would have a few groups tour like cub scouts*
- *No regular tours, do ad-hoc scheduled tours for Clackamas Community College students and local school kids*
- *Open to scheduled tours, have a meeting room for staff that can be used for tour groups*

Additional Input

- *Introduce staff to neighbors, provide point of contact as needed, look for ways to coordinate/accommodate as needed to work through anything that comes up*
- *Keep neighbors in mind during design phase*

- *Make sure emergency generators are well sound attenuated, lighting can also be addressed during design*
- *Have some good open space and plantings (hedges, trees) to look nice and help screen operations activities, use neutral color on buildings to help structures blend in*
- *Have a regular maintenance contract to do weeding and routine care for plantings*

Interviewees

The following individuals were interviewed:

- Ben Klayman, Water Quality and Treatment Manager, Medford Water Commission
- Dan Perkins, Water Treatment Plant Supervisor, Medford Water Commission
- Sophia Hobet, Water Treatment and Distribution Manager, Hillsboro Water Department
- Todd Heidgerken, General Manager, Clackamas River Water
- Tom Hubbard, Utilities Division Manager, City of Corvallis
- Bret Bienerth, Water Treatment Plant Manager, Lake Oswego-Tigard Water Supply
- Susie Anderson, Administrative Lead, Lake Oswego-Tigard Water Supply
- Chris Wilson, Plant Supervisor, Joint Water Commission
- Dwayne Barnes, Water Operations Superintendent, City of Salem
- Joe Rogers, Plant Supervisor, North Clackamas County Water Commission
- Ray Leipold, Water Supply and Treatment Supervisor, Eugene Water and Electric Board
- Rod Mingus, Plant Supervisor, City of Bend