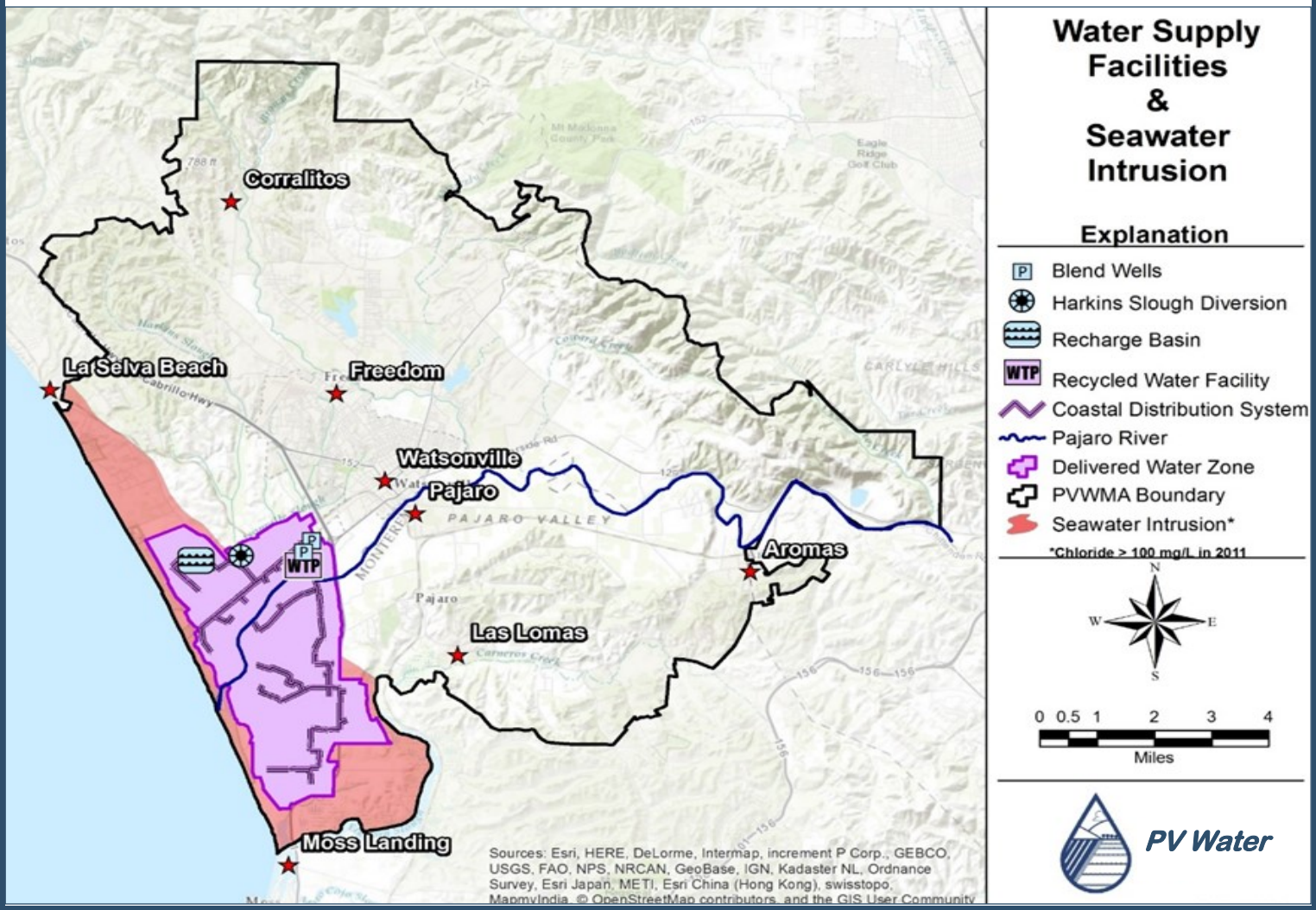
The Pajaro Valley Water Management Agency (PV Water), *a Groundwater Sustainability Agency*, works to achieve sustainable water resources in our agriculturally rich groundwater basin. Located adjacent to the Monterey Bay, the Pajaro Valley produces nearly $1 billion of conventional and organic, high-value fruit, vegetable, and flower crops annually, and is home to the City of Watsonville (City) and a few small towns. Chronic groundwater overdraft threatens the Valley's water resources by causing groundwater storage depletion and seawater intrusion. PV Water partnered with the City to construct and operate the Watsonville Area Water Recycling Facility (Facility) as a key component in its stakeholder developed program to eliminate groundwater overdraft and halt seawater intrusion.

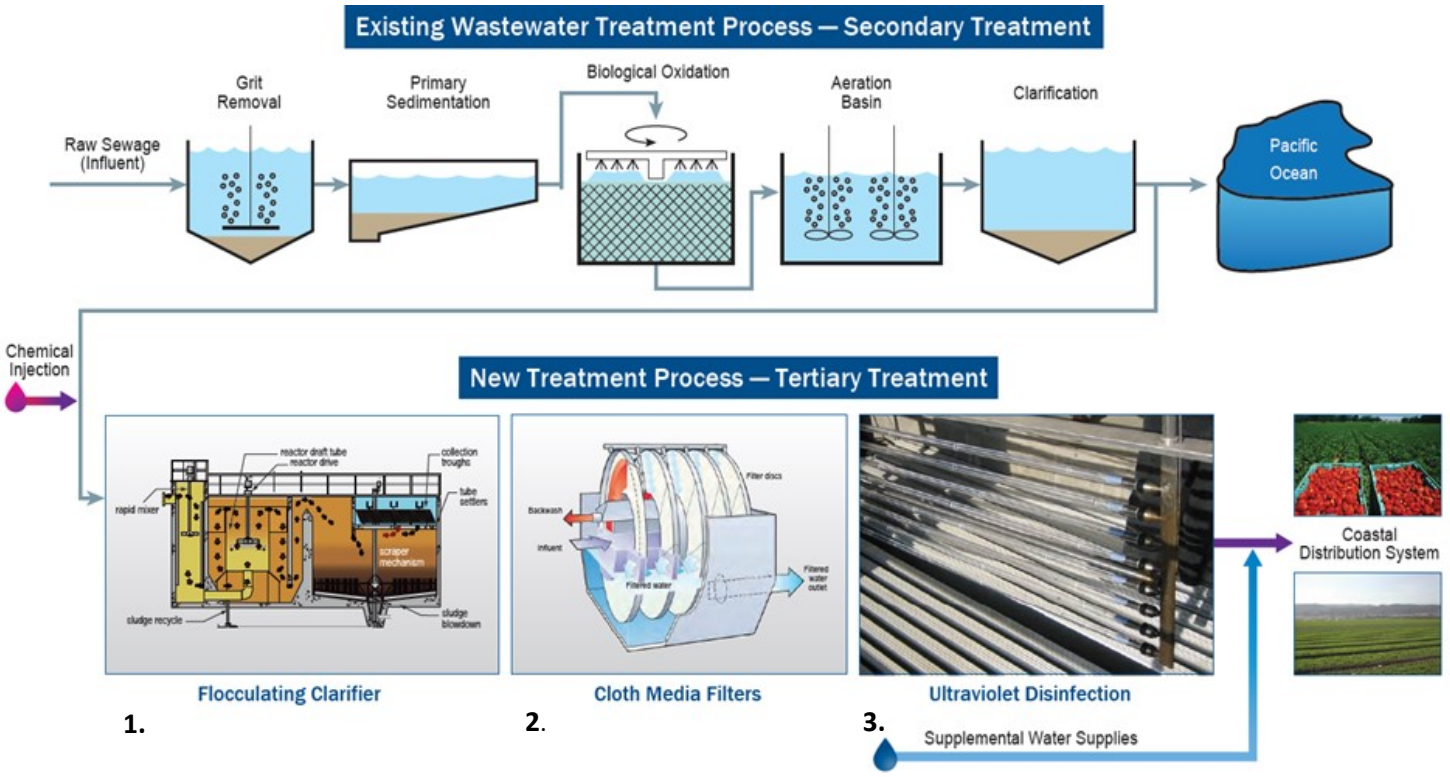


The Tertiary Treatment Process

At the Watsonville Water Resources Center, raw wastewater receives primary and secondary treatment, and then flows to the Recycled Water Facility for tertiary treatment.

1. **Coagulation, Flocculation, Sedimentation (CFS):** In order to help reduce the turbidity, secondary treated water goes through the first process of Tertiary treatment known as the CFS process. Coagulation, Flocculation and Sedimentation occur through the addition of Alum (Aluminum Sulfate) and Polymers into the secondary treated wastewater. As the wastewater enters the CFS process, alum is added first to accomplish the coagulation of very small, destabilized particles. Polymers are added next to flocculate the coagulated particles to increase the size and weight of the particle. The final step of this process is the settling (sedimentation) of the large and heavy flocculated particles. Some of the settled solids are recirculated back to the coagulation stage to help that process; the rest of the settled solids are removed from the treatment process and pumped back to the wastewater treatment facility for further treatment.
2. **Filtration:** After the Flocculating Clarifier, the water gravity feeds to the **Cloth Media Filtration**. The water passes through two banks of cloth media disk filters. The two banks consist of 540 individual filters that make up the disks. The disks are self-cleaning and will rotate as water passes through, allowing the filters to be sprayed and cleaned to optimize the movement of water through this process. The mesh in the filters are 10 µm or 1/10th the width of a human hair.
3. **Disinfection:** The final step in tertiary is **Ultraviolet Disinfection**, which consists of 600 low pressure high output

Aerial View of the Recycled Water Facility



Recycled water is the central component of PV Water's supplemental water supply, which is distributed to growers for irrigation use in-lieu of groundwater to reduce seawater intrusion and groundwater storage depletion. Recycled water is a drought tolerant and cost-effective source of locally available water compared to other, more expensive potential sources of supplemental water. In addition, the unique collaboration between the City and PV Water to construct, operate, and distribute recycled water exemplifies the potential for municipal and state agency cooperation to preserve and protect water resources.

The Facility has the capacity to produce up to 4,000 acre-feet per year of tertiary treated, disinfected, Title 22 compliant recycled water at a max production flow rate of 4,500 gallons per minute (GPM). During daytime peak demand, the maximum distribution flow rate is 12,000 GPM. This flow rate includes pumping water from storage. The Facility has 2.5 million gallons of storage capacity in the form of 3 concrete tanks. Nighttime inflows to the Wastewater Treatment Plant are treated to recycled water standards and stored in the tanks for distribution during the day.

PV Water utilizes additional supplies of supplemental water in conjunction with recycled water to meet customers' irrigation demand and to achieve agronomic water quality objectives established by committee. Both the City of Watsonville and PV Water, the producer and distributor of recycled water, respectively, closely monitor water quality per Title 22 regulations. The salinity of finished, recycled water is dependent upon the quality of influent water flowing to the plant. Local food processors discharging wastewater used to wash fruits, vegetables, and, on occasion, seafood, may have a significant impact on water chemistry, including salinity. Supplemental water supplies consist of water from a managed aquifer recharge and recovery facility, and groundwater.

PV Water works with the customers to provide flexible, reliable water service through the Coastal Distribution System (CDS), which consists of 21 miles of pipeline along the coast. Staff provides water delivered at a pressure of 80 pounds

Distribution Pumps Send Recycled Water to the CDS

CDS Turnout

The distribution of supplemental water is not only helping to reduce groundwater overdraft and seawater intrusion, but it is also having a direct impact on the quality of crops grown in the area. As groundwater quality degrades in some areas due to the effects of seawater intrusion, the availability of supplemental water has led to the continued production of salt sensitive crops, such as strawberries. In 2016, the irrigation source for the strawberry plants below switched from a seawater-intruded well to supplemental water. Within 2 months the plants were more vigorous, green, and productive.

Strawberry Plants Irrigated with a Seawater-Intruded Well, June 2016

Strawberry Plants 2 Months After Switching to Recycled Water, August 2016

In our continued effort to increase the quantity and reliability of supplemental water supplies, PV Water recently completed construction of a 1.5 million gallon recycled water storage tank and an extension to the Coastal Distribution System to serve an area in north Monterey County intruded with seawater. These projects, which received funding by State and Federal grants, along with others that are in various stages of implementation, help us achieve our goal of sustainable water resources.

Water Recycling Facility, with New 1.5 Million Gallon Tank in Foreground