

Willamette River Water Treatment Plant



Pictured: Willamette River Water Treatment Plant

In April 2002, Wilsonville began operation of the new water treatment plant on the Willamette River. The plant is capable of processing 15 million gallons of water per day (MGD). The Willamette River Water Coalition, of which TVWD is a member, holds a 130 MGD water right on the Willamette River. Although TVWD partnered with the City of Wilsonville on the initial construction of the plant, the District has no infrastructure that connects the Willamette Water Treatment Plant to the District's water delivery system. The District's Board of Commissioners has passed an ordinance that requires an affirmative vote of our customers before water from the Willamette can be delivered to District customers.

The plant is located on the banks of the Willamette River, 14 miles upstream from the Oregon City Falls and 28 miles upstream from Downtown Portland. Water from the Willamette River has been the subject of considerable analysis. In 1994, a pilot-scale water treatment facility was set up to demonstrate how "raw water" could be treated to meet all federal and state drinking water standards. Since 1994, programs to monitor the water quality were implemented to characterize physical, chemical and biological parameters. More recently, a Willamette River Water Quality Study was conducted to collect and analyze samples of water before it entered the plant and after it was treated (see below).

Willamette River Water Treatment Plant at A Glance

GENERAL

- o Began operating in April 2002 and currently serves the City of Wilsonville
- o TVWD participated in the construction of the plant
- o Many of the treatment plant components were designed with expansion in mind
- o Willamette River water is taken near Wilsonville, upstream from Portland, Oregon City, and the Oregon City Falls
- o Treated water is as good or better than all drinking water standards

TREATMENT PLANT PROCESS

- o The 6 step process includes:
 - **Intake Screens** protect fish and prevent debris from entering the treatment facility.
 - **Enhanced Sedimentation** removes materials that are small enough to pass through the intake screens.
 - **Ozonation** destroys microbial contaminants.
 - **Granular Activated Carbon** removes remaining particles, organic material and dissolved chemicals
 - **Sand Filter** improves particle removal.
 - **Secondary Disinfection** protects treated water as it's delivered to customer's tap.
- o The plant can process 15 million gallons of water per day

WILLAMETTE RIVER WATER QUALITY STUDY (CONDUCTED IN OCT. 2003)

- o Raw (untreated) and finished (treated) water were tested for more than 140 organic chemicals
 - Finished water: All of the organic chemicals tested were below the laboratory detection limit - with the exception of trace amounts of byproducts from the disinfection process, which is normal in properly disinfected water.
 - Raw water: All of the organic chemicals tested were below the laboratory detection limit. This demonstrates that before water enters the treatment plant, the Willamette River at Wilsonville easily meets drinking water standards for these organic chemicals.
 - River Sediment Quality: All of the organic chemicals tested were below the laboratory detection limit, with the exception of DDT (which is no longer in use). The level of DDT found was only a trace amount, barely above the laboratory detection limit.







For more detailed information about this study or for more information about the plant, visit the City of Wilsonville's Web site at www.ci.wilsonville.or.us.

Water Treatment Process

During the 1990's pilot tests were conducted here in Wilsonville using conventional treatment methods. These tests confirmed that under "worst case" conditions, treated water from the Willamette could consistently meet drinking water standards. As a further margin of safety, enhanced methods of treatment were tested and incorporated into the design of the multi-barrier system used at the water treatment plant. The resulting water supplied from this facility is even purer than required by current drinking water standards (as well as proposed future drinking water standards).

The treatment facility is "over-designed" in the sense that drinking water standards can be met without such extensive treatment. Nonetheless, the plant is operated using all steps at all times - - whether or not they are all needed to meet drinking water standards. In addition, the treatment plant has redundant (i.e., back-up) systems for all these processes.

Here's a brief description of the "step-by-step" process used in the plant's multi-barrier water treatment process.

Intake Screens	Enhanced Sedimentation
<p>The intake screens protect fish and prevent debris from entering the treatment facility. The screens are located off the bottom of the river (to avoid bringing sediments into the treatment plant) and below the surface (to avoid bringing oils or other floating material into the treatment plant). The openings in these screens are approximately the diameter of a toothpick.</p> 	<p>Enhanced Sedimentation to remove materials that are small enough to pass through the intake screens. Conventional chemicals called coagulants cause the suspended materials to adhere to one another forming larger, heavier "floc" which settles out of the water. By adding very fine sand to the mixture, the weight of the "floc" is increased thereby causing the settling process to occur more quickly and more completely than conventional water treatment. The sand is then cleaned, recycled and reused.</p> 
Ozonation	GAC
<p>Ozonation serves multiple functions including disinfection (to kill bacteria, viruses, Giardia, Cryptosporidium); breakdown of organic chemicals; breakdown of taste/odor causing compounds; and enhanced removal of organic material by the filters. After bubbling through the water, the ozone quickly decomposes into harmless oxygen gas.</p> 	<p>Granular Activated Carbon charcoal filters (6 feet thick) further remove turbidity and pathogens; remove organic chemicals; and remove taste/odor compounds to assure consistently high quality of the treated water.</p> 
Sand Filter	Secondary Disinfection
<p>The Sand Filter is a "polishing" step to improve particle removal.</p> 	<p>Secondary Disinfection adds chlorine to prevent bacterial contamination as the treated water flows through the distribution system to customers.</p> 

This information was taken from the City of Wilsonville's Web site. Visit www.wilsonville.ci.or.us for more information.