

# HILLSBORO WATER RESOURCE RECOVERY



VIEW OF HILLSBORO WATER RESOURCE RECOVERY FACILITY CLARIFIERS

The Hillsboro Water Resource Recovery Facility, located in Hillsboro between Jackson Bottom Wetlands and downtown, is a nationally acclaimed, state-of-the-art facility, serving the cities of Hillsboro, Cornelius and Banks. Considered one of Clean Water Services' smaller facilities, it is part of a larger treatment system through its connection to Clean Water Services' Forest Grove and Rock Creek facilities.

Today, the facility cleans an average wet-weather flow of six million gallons each day to among the highest safety and quality standards in the nation as, water flows through a strategic process of liquids and solids recovery. The current liquids treatment processes includes screening, grit removal, primary clarifiers, and advanced biological activated sludge process, secondary clarifiers and disinfection using ultraviolet light. The water is returned to Washington County's only river – the Tualatin – so clean, it actually improves water quality.

During dryer months, the flow undergoes preliminary and primary treatment processes. Then, the liquid flow is pumped to Forest Grove for additional treatment. Solids removed from the Hillsboro facility are pumped to the Rock Creek facility for treatment.

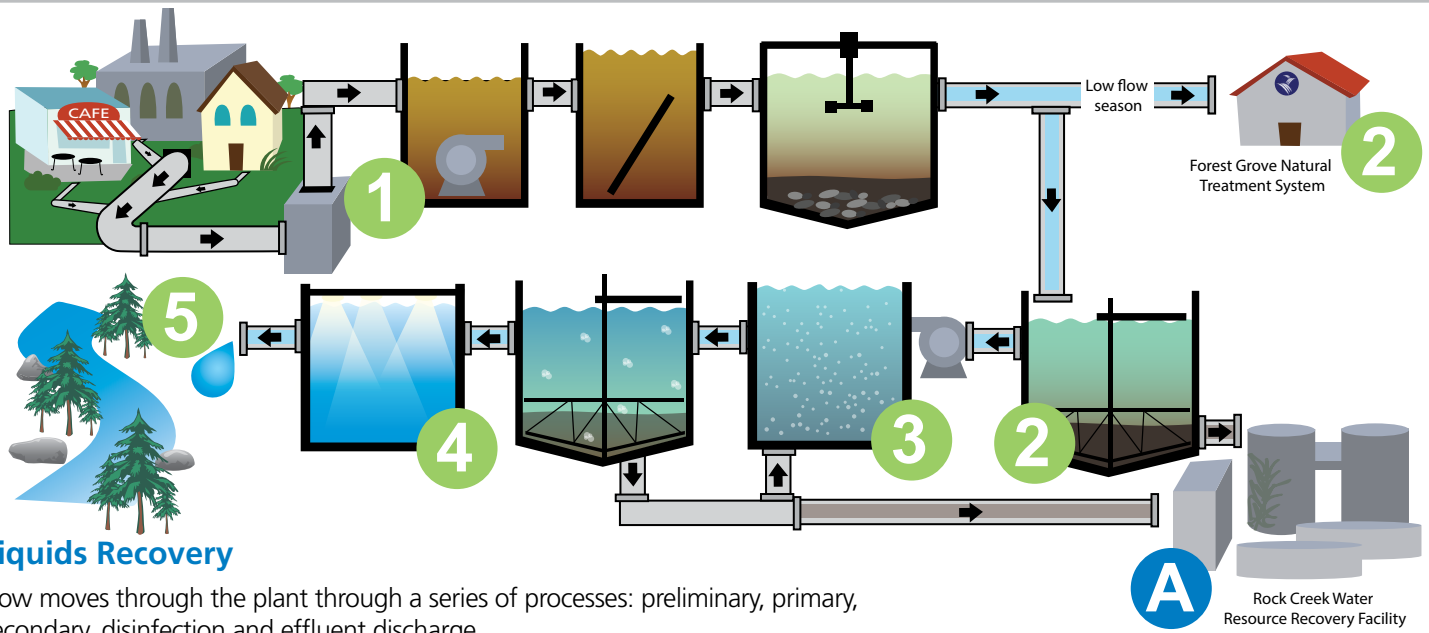
The Hillsboro facility was constructed in 1969 and significant modifications and upgrades were completed in 2014 to meet the demands of a growing population and increasing regulatory requirements.

## Hillsboro Facts

- Provides a higher level of treatment over many activated sludge systems, as it utilizes biological phosphorus and nitrogen removal
- Operates 24-hours a day, 365 days a year
- Meets over 1,000 permit conditions, including monthly, weekly and daily limits establish to protect the Tualatin River
- Cleans an average of approximately 6 million gallons of wastewater per day
- Takes advantage of resource sharing by utilizing the Rock Creek facility for solids treatment
- National Association of Clean Water Agencies (NACWA) Awards over multiple years



# HILLSBORO WATER RESOURCE RECOVERY — PROCESS



## Liquids Recovery

Flow moves through the plant through a series of processes: preliminary, primary, secondary, disinfection and effluent discharge.

### 1 Preliminary Process

Flow from homes and industry eventually end up at the Hillsboro Pump Station. From there, the flow is pumped to the Headworks Building. The Headworks Building prepares the incoming flow for downstream treatment by screening out large objects, allowing heavy objects to drop out, and measuring the flow.

### 2 Primary Treatment

Flow from Headworks is sent to up to two separate primary clarifiers. Primary clarifiers are large tanks that allow the flow to become quiescent, like water in a pond. This slowing down of the water allows particles to settle to the bottom of the tank and fats, oils and grease to float to the surface. Skimming arms remove any buildup on the water surface and sludge pumps remove the sludge off the bottom of the clarifiers. The solids removed from these tanks are pumped to the Rock Creek facility for further treatment. During the low-flow season, effluent from the primary clarifiers is routed to either the Rock Creek facility or the Forest Grove facility. During the high-flow season, the flow is routed to secondary treatment.

### 3 Secondary Treatment

The Hillsboro Water Resource Recovery Facility employs conventional activated sludge. This means an environment is created in aeration basins that allows the natural bacteria in wastewater to grow and thrive. This bacteria consumes contaminants in the water. The bacteria can also convert the nitrogen in the water into nitrogen gas. As the flow leaves the aeration basin, secondary clarifiers slow the water down much the same way as primary clarifiers. As the bacteria sink to the bottom of the clarifiers, sludge pumps return the bacteria to the front of the aeration basin to meet the incoming flow to remove further contaminants. A portion of the bacteria is removed (wasted) to maintain a stable aeration basin population and is sent to the Rock Creek facility, along with the primary sludge, for further treatment.

### 4 Disinfection

Disinfection is the process for inactivation/destruction of harmful microorganisms. At Hillsboro, this is accomplished by the use of ultraviolet (UV) light. The plant flow passes in front of UV light, which inactivates the bacteria so they can no longer multiply.

### 5 Effluent Discharge

After the flow leaves the plant, we return the water to the Tualatin River, helping it to maintain a healthy flow year-round.

## Solids Recovery

**A** The first half of the job at a water resource recovery facility is to remove foreign constituents from the liquid flow stream. Those foreign constituents are resources that can be reclaimed. The typical processes in solids treatment consist of thickening, digestion, dewatering, and phosphorus recovery. However, no solids treatment is performed at the Hillsboro Facility. The primary sludge and solids wasted from secondary treatment are pumped to the Rock Creek facility for further treatment.



**Clean Water Services**

2550 SW Hillsboro Highway  
Hillsboro, Oregon 97123  
503.681.5100  
cleanwaterservices.org