

A GOOD NEIGHBOR

King County is committed to protecting the water resources of the region and the health and well-being of our customers and future generations. We work to ensure safety and minimize impacts of all projects affecting the natural environment, wastewater facility neighbors and our employees.



At South Plant, we have devoted extensive effort to odor control, water reclamation and native landscaping to minimize the impact of the plant on the surrounding community.

Waterworks Gardens opened next to South Plant in 1996 as a system for incorporating stormwater treatment with public art. With trails, art, native plants, wildlife and ponds, this eight-acre public park naturally cleans storm water from South Plant.

Contact Us:

South Treatment Plant
1200 Monster Road Southwest
Seattle, WA 98057 206-684-2400

For **Treatment Plant Tours** or further information please call 206-296-8286 or 1-800-325-6165, ext. 68286, or see our Web site www.kingcounty.gov/wtd/.

Alternative formats available

206-684-1280 or TTY Relay: 711



Department of Natural Resources and Parks
Wastewater Treatment Division
201 S. Jackson Street, Suite 500
Seattle, WA 98104-3855
206-263-6028 or 1-800-325-6165, ext. 36028
www.kingcounty.gov/wtd/

0811southplantBRO.indd wgab 12/20/24



King County
Department of
Natural Resources and Parks
Wastewater Treatment Division

SOUTH TREATMENT PLANT

Protecting Public Health and the Environment



Clean Water – A Sound Investment

For more than 40 years, the people of King County's Wastewater Treatment Division have been committed to protecting public health and the environment by transporting, treating and reclaiming wastewater and its byproducts. We work continually to improve and protect regional water quality.



Lake Washington — the '50s

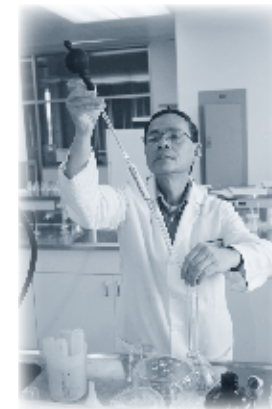


Lake Washington — fishable and swimmable today

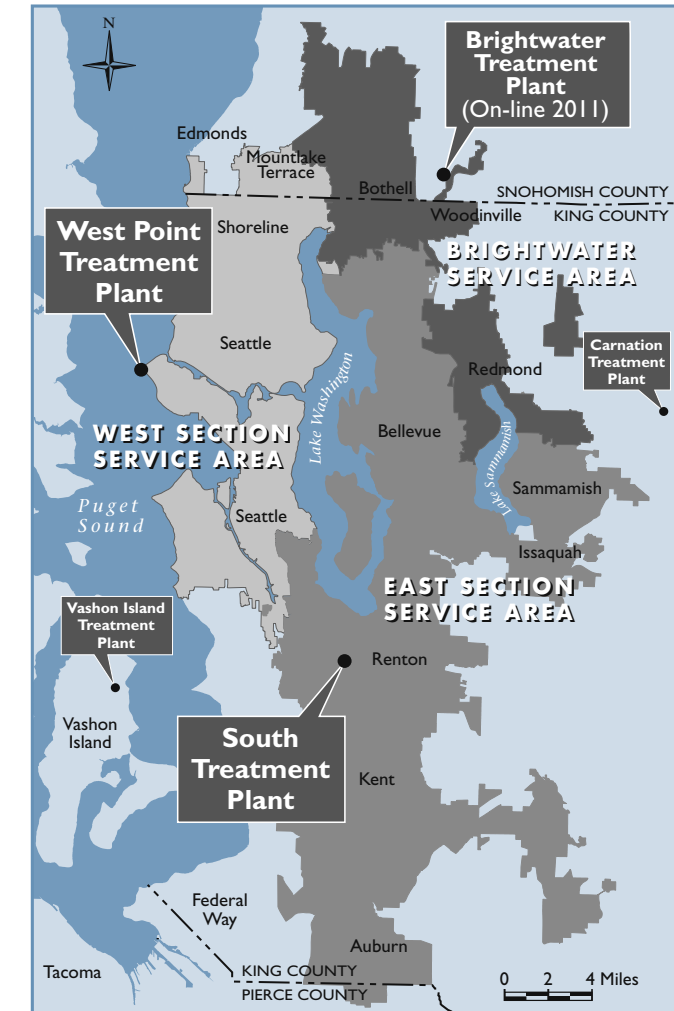
The **South Treatment Plant** is part of the regional wastewater treatment system that is funded by monthly sewer rates and serves more than 1.4 million people and covers 420 square miles. South Treatment Plant cost-effectively treats wastewater from homes, offices, schools, agencies, businesses and industries along the east side of Lake Washington from south Snohomish County to north Pierce County.

THE PEOPLE OF SOUTH TREATMENT PLANT — '24/7'

South Plant operates 24 hours a day, seven days a week. Nearly 130 trained professionals — operators, lab technicians, maintenance employees, process control personnel and administrative staff — ensure the South Treatment Plant, and the pipelines and pump stations that supply it with wastewater, operate effectively and efficiently.



SERVICE AREA MAP



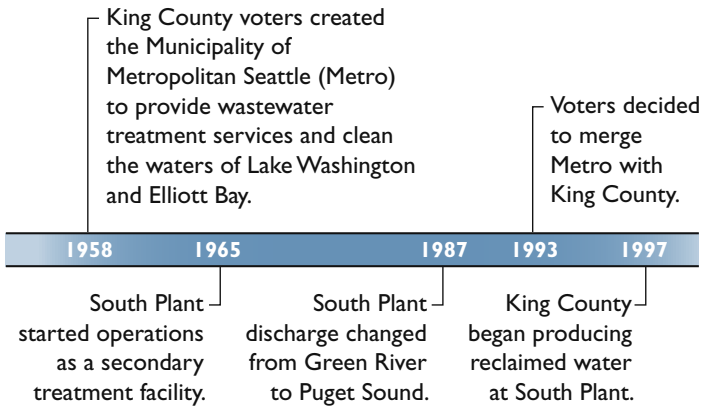
The **South Treatment Plant** sits on 94 acres in Renton, Washington. Our mission is to protect public health and enhance the environment by treating and reclaiming water, recycling solids, and generating energy.

King County, working in your neighborhood to protect public health and the environment.

THE STORY BEHIND SOUTH PLANT

During the 1950s, small treatment plants served many suburban areas of King County. Large amounts of untreated and minimally treated wastewater were discharged daily into Lake Washington, Lake Sammamish and Puget Sound. The water quality of Lake Washington became unfit for human use, raising citizen concern about pollution and prompting the creation of a regional wastewater treatment system.

HISTORY

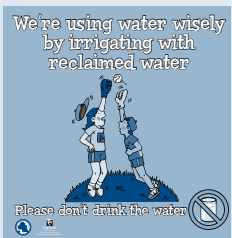


CREATING RESOURCES FROM WASTEWATER

South Treatment Plant's wastewater treatment facilities produce many valuable resources that can be used within the plant and throughout the region.

WATER REUSE AND RECLAIMED WATER

Wastewater treated to the secondary level is reused on-site for cleaning and as a water source for the treatment process. Some of the treated water undergoes further treatment for irrigation and industrial use by businesses, parks and nurseries near the treatment plant.



MANAGING SEPARATED SEWER SYSTEMS



Stormdrains in separated systems drain straight to the nearest waterway. In a combined system, the stormwater goes to the treatment plant. Either way, stormdrains are no place to dispose of motor oil or other pollutants.

In east and south suburban areas served by South Plant, most sewage and stormwater flows go to separate systems. Keeping stormwater and sewage separated reduces the overall operating and infrastructure costs of the sewage system. However, separated stormwater systems can still carry contaminated flows during rainstorms.

Because storm drains in the separate system discharge into local water bodies, all individuals must take responsibility to make sure oil, grease, detergent from car washing and pesticides do not end up in storm drains. For more information, check www.kingcounty.gov/wlr/stormwaterprogram.

Composted biosolids make a wonderful soil amendment for gardens and commercial landscapes.



BIOSOLIDS

Biosolids are the nutrient-rich organic product of treating wastewater. Biosolids provide organic matter that improves soil properties and enhances plant growth.

Some of South Treatment Plant's biosolids are sold as a soil amendment for agriculture in Eastern Washington. The rest is used in forest fertilization or composted for use in landscaping and gardening.

KEEPING RAINWATER OUT OF THE SEWER SYSTEM

Cracked sewer pipes, leaky manholes, and improperly connected storm drains and downspouts allow for the inflow of stormwater and the infiltration of groundwater into the treatment system. During heavy rain, inflow and infiltration may make up to 75 percent of the water treated at South Treatment Plant. Treating rainwater is unnecessary, expensive, and inefficient and can cause overflows. King County is working with local agencies and residents to control this problem.

REGULATION AND PERMITTING

Like most other treatment plants, South Treatment Plant discharges treated wastewater every day into a local water body, the Puget Sound. The 1972 federal Clean Water Act regulates "point" discharges of pollutants.

A National Pollution Discharge Elimination System (NPDES) permit (available on our Web site) sets water quality standards and specifications for monitoring, treating and discharging treated wastewater through the South Plant outfall in Puget Sound.

South Plant has consistently been recognized by the National Association of Clean Water Agencies for excellence in wastewater treatment as measured by our compliance with their NPDES permit.



CONTROLLING WASTES AT THE SOURCE

Responsibilities of the Wastewater Treatment Division begin even before wastewater enters pipes and treatment plants. The utility regulates business and industry to monitor and restrict the type and amount of waste that enters the system. We also work with the public to provide information about safe practices and alternatives.

Preventing contaminants from entering the sewer system is the easiest and least expensive way to protect people and the environment. Extensive information is available on our Web site or by calling us.



Students touring the treatment plant learn about wastewater treatment and what they can do to keep harmful substances out of the waste stream.

CUTTING-EDGE TECHNOLOGIES

King County is always on the lookout for new technologies that will enable us to do our work more efficiently and effectively. When possible, we test new wastewater technologies, many of which offer the potential for producing cleaner water, smaller facilities, easier operation and lower costs.



King County
 Department of Natural Resources and Parks
Wastewater Treatment Division
www.kingcounty.gov/wtd
 206-684-1280

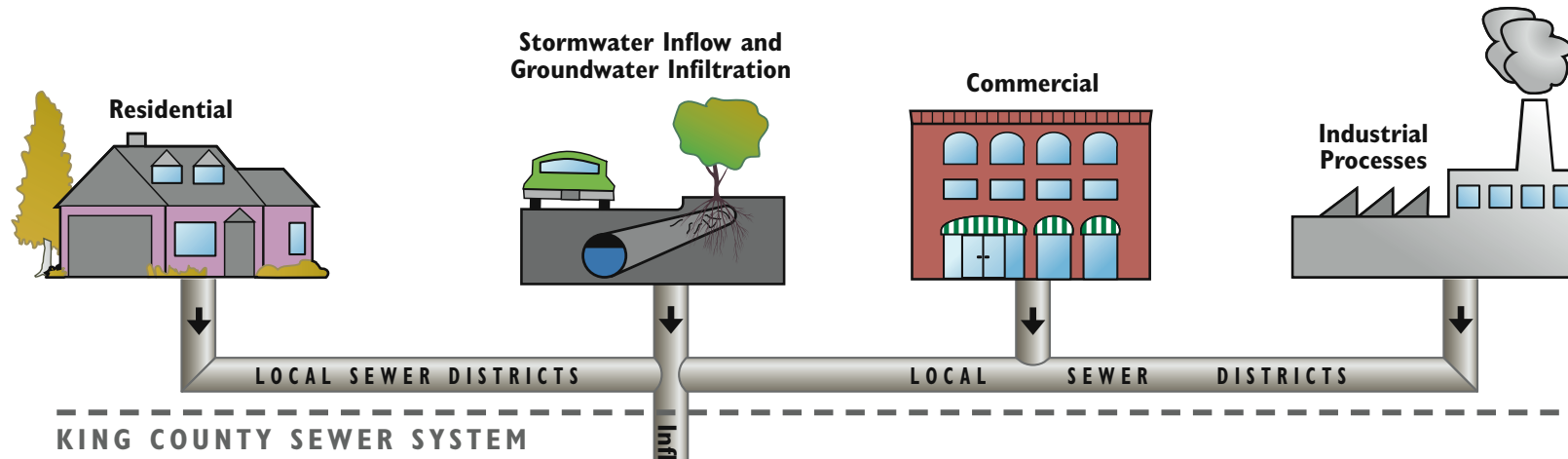
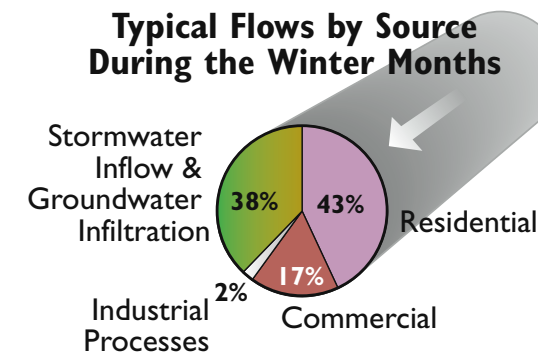


ENERGY RECOVERY Digester gas is a byproduct of the biosolids digestion process. It is a gas composed of methane and carbon dioxide produced by active anaerobic bacteria. This gas is sold to Puget Sound Energy (after being cleaned) and used on-site as an energy source. The energy produced could offset as much as 45 percent of the plant electrical demand and free up an equivalent amount of power for use in homes and businesses.

WASTEWATER TREATMENT PROCESS

How is wastewater treated at King County's South Treatment Plant?

WHAT'S COMING INTO THE PLANT?



PROCESSES WITHIN SOUTH TREATMENT PLANT

PRELIMINARY TREATMENT 'Taking out the trash'

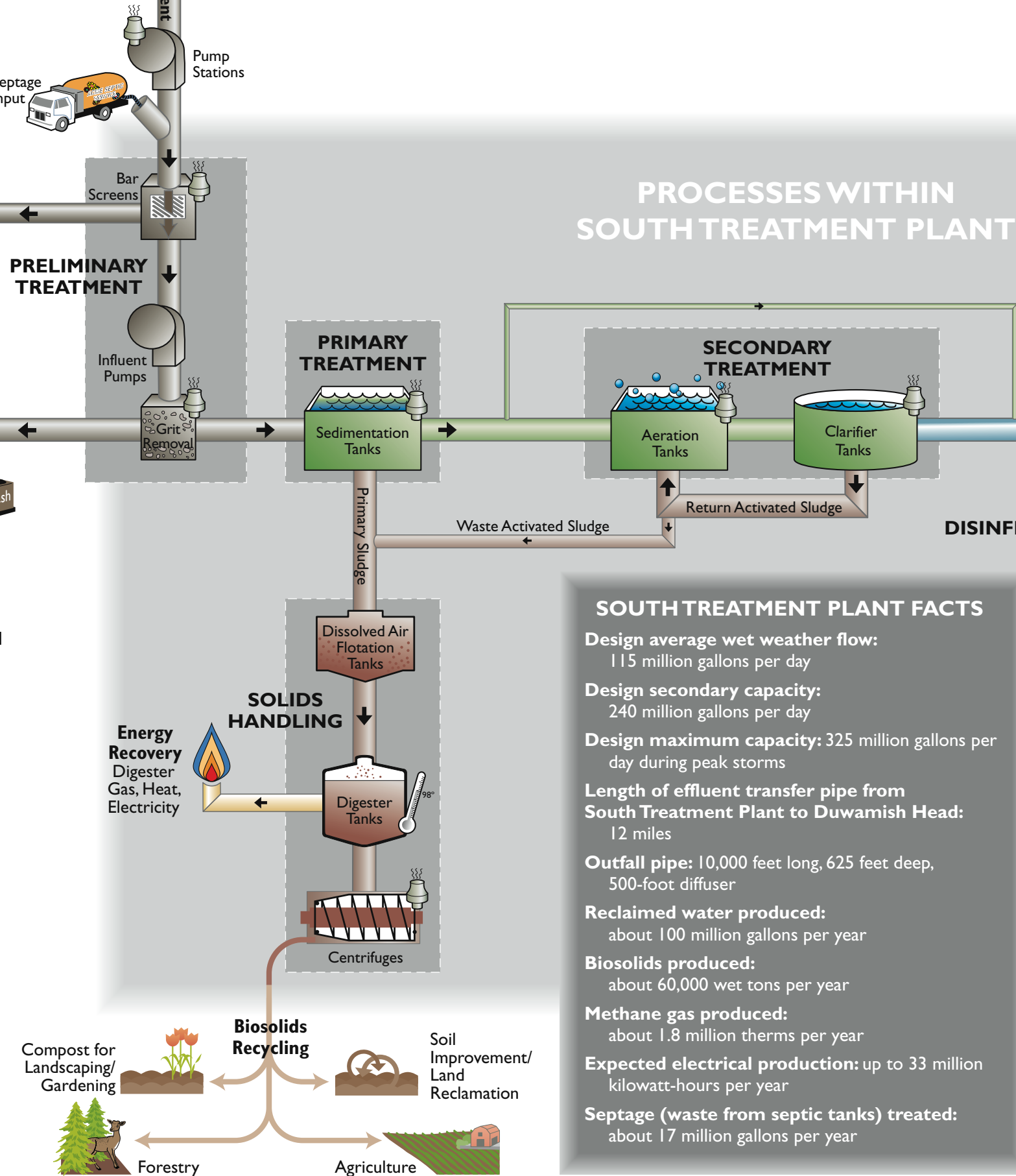
- Bar screens remove large debris like rags, paper, and leaves from wastewater (influent) as it enters South Plant.
- After screening, wastewater is pumped into aerated grit chambers that remove sand and gravel.
- The trash and grit collected during this process are trucked to a landfill.

PRIMARY TREATMENT a physical process 'Scum floats; sludge settles'

- Wastewater settles in primary sedimentation tanks. Heavy organic material sinks to the bottom (as sludge), and light material (oils) floats to the top (as scum).
- Skimmers remove scum from the surface and conveyor belts remove sludge from the tank bottom. Both are then sent onto the solids handling process.
- The treated water, now called primary effluent, flows to the secondary treatment process. Primary treatment removes approximately 60 percent of the organic solids.

SECONDARY TREATMENT a biological process 'Friendly bugs eating contaminants'

- Primary effluent is pumped to aeration tanks where oxygen is added to encourage growth of useful bacteria naturally present in the wastewater.
- These bacteria reproduce and consume suspended and dissolved organic material in the water.
- The wastewater then goes to secondary clarifiers, large round sedimentation tanks where bacteria settle to the bottom of the tank as secondary sludge.
- Most (90 percent) of secondary sludge goes back to the aeration tanks where bacteria continue the process and eat more organic material (return activated sludge). The rest goes to the solids handling process (waste activated sludge).
- The remaining water — secondary effluent — leaves the clarifiers at least 85 percent cleaner than when it entered South Plant.



ODOR CONTROL 'the Sniff Test'
In order to minimize odors, we cover or contain the potentially smelly processes and collect the air for treatment.

SOUTH TREATMENT PLANT FACTS

- Design average wet weather flow: 115 million gallons per day
- Design secondary capacity: 240 million gallons per day
- Design maximum capacity: 325 million gallons per day during peak storms
- Length of effluent transfer pipe from South Treatment Plant to Duwamish Head: 12 miles
- Outfall pipe: 10,000 feet long, 625 feet deep, 500-foot diffuser
- Reclaimed water produced: about 100 million gallons per year
- Biosolids produced: about 60,000 wet tons per year
- Methane gas produced: about 1.8 million therms per year
- Expected electrical production: up to 33 million kilowatt-hours per year
- Septage (waste from septic tanks) treated: about 17 million gallons per year

DISINFECTION 'Zapping pathogens'

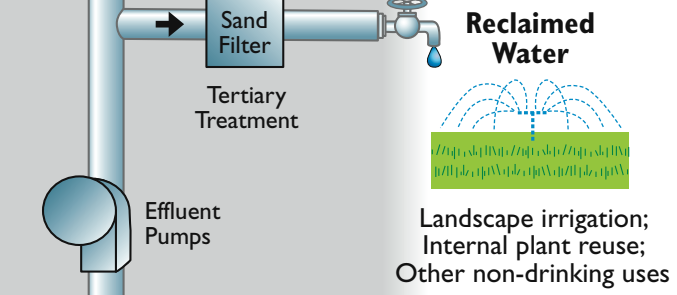
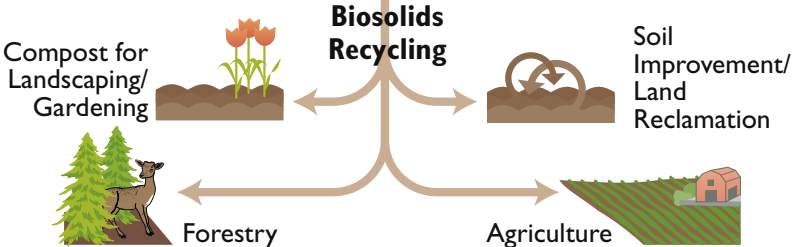
- Secondary effluent is chlorinated, destroying most remaining pathogens, or disease-causing bacteria.
- The chlorine dilutes as it flows through the 12-mile-long effluent transfer pipe and meets up with the outfall pipe to exit from the diffuser into Puget Sound.

RECLAIMED WATER 'Saving H₂O'

- After disinfection, some secondary effluent undergoes sand filter treatment (coagulation, filtration, disinfection). The water is used on-site for plant processes and cleaning and off-site for landscape irrigation and to replace drinking water use in industrial processes.

SOLIDS HANDLING

- Creating biosolids and energy, 'Blend, thicken, digest, dewater'**
- Organic solids — primary and secondary scum and sludge from the sedimentation and clarifier tanks — are blended and thickened in dissolved air flotation tanks. The solids are then pumped to digester tanks where anaerobic bacteria at 98 degrees Fahrenheit break down organic material and kill pathogens. The activity of the bacteria creates digester gas and reduces the solids mass by 50 percent.
 - The digested solids are then pumped from digesters to equipment that uses centrifugal force to remove excess water from the solids.



- The resulting dewatered solid material is nutrient-rich biosolids, safe for use as a soil amendment.
- South Treatment Plant has been nationally recognized for its environmental management system and commitment to continual improvement.