

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 West Point, we have devoted extensive effort to odor and noise control and native landscaping to minimize the impact of the plant on the surrounding community and Discovery Park. We also created a publicly accessible wetland. Water reclamation, community improvement and active public involvement are other ways we work to make sure West Point is a good neighbor.

Contact Us:
 West Point Treatment Plant
 1400 West Utah Street
 Seattle, WA 98199 206-263-3800

For **Treatment Plant Tours** or further information please call 206-296-8286 or 1-800-325-6165, ext. 68286, or see our Web site <http://dnr.metrokc.gov/wtdl>.

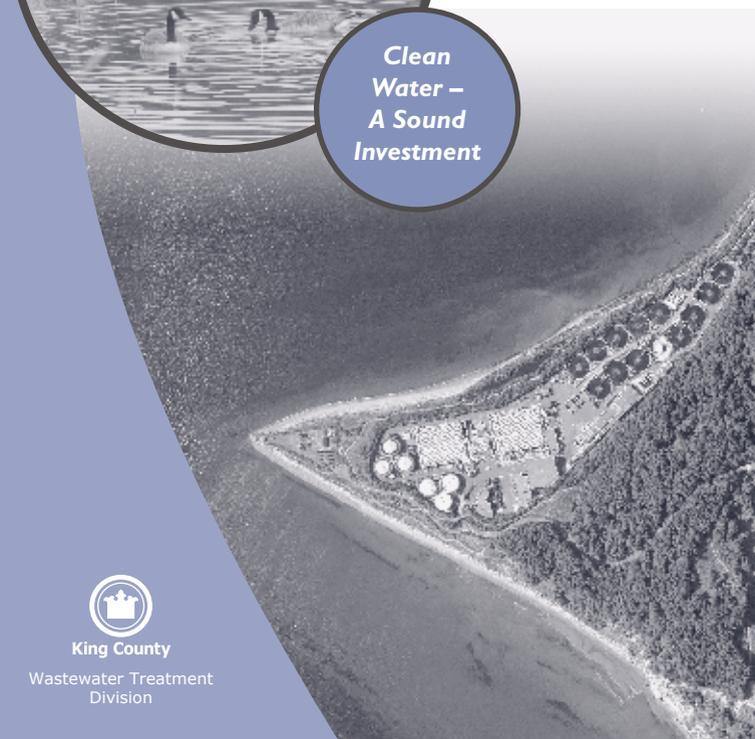
Alternative formats available
 206-684-1280 or TTY Relay: 711

WEST POINT 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 **West Point Treatment Plant** is part of the regional wastewater treatment system that serves more than 1.4 million people and covers 420 square miles. West Point cost-effectively treats wastewater and stormwater from homes, offices, schools, agencies, businesses and industries in Seattle, north King County, south Snohomish County, and some areas east of Lake Washington.

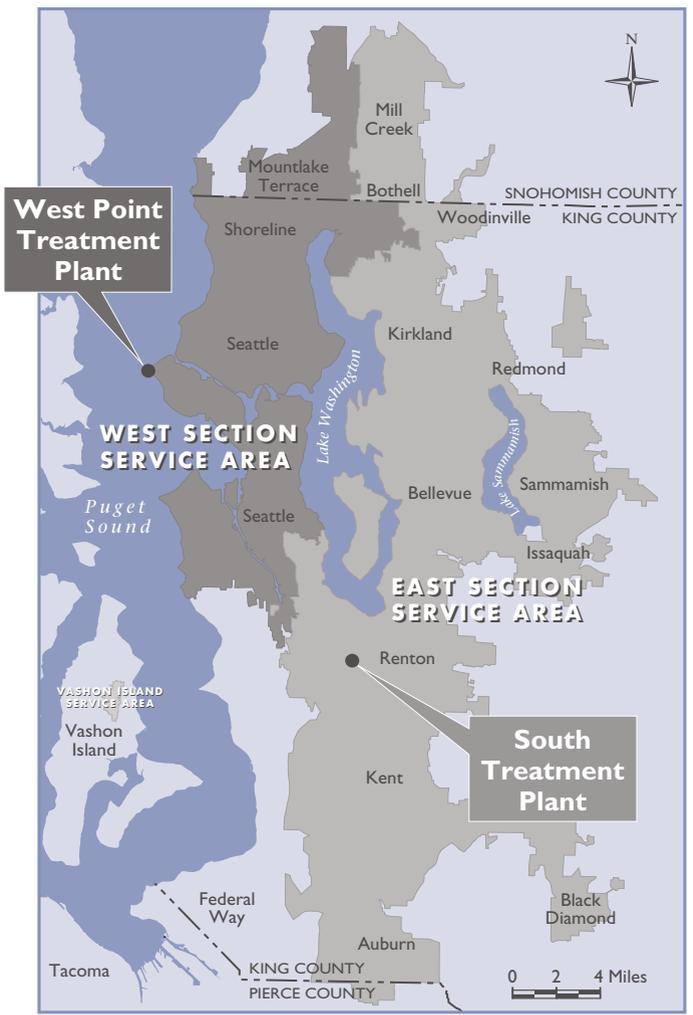
THE PEOPLE OF WEST POINT — '24/7'

Thanks to about 150 dedicated employees, the West Point treatment system runs 24 hours a day, seven days a week. Trained professionals — operators, lab technicians, maintenance employees, process control personnel and administrative staff — ensure the West Point plant and the pipelines and pump stations that supply it with wastewater operate effectively. Our goal is to provide the region with the best wastewater treatment service available while operating as efficiently and effectively as possible.



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

SERVICE AREA MAP



The **West Point Treatment Plant** is four miles north of downtown Seattle on 32 acres next to Puget Sound and Seattle's Discovery Park. Plant workers operate facilities for treating wastewater and stormwater, producing biosolids, reclaiming water, recovering energy, and testing alternative or advanced treatment processes.

WEST POINT 100 YEARS AGO...

In 1911, the City of Seattle built what is called the Fort Lawton Tunnel to discharge untreated wastewater from the city into Puget Sound at West Point. This wastewater included sewage from homes and businesses, stormwater from city streets, and litter and horse manure that washed into the pipes. Increased population and public concerns about water pollution, however, led to the creation of a regional wastewater treatment system.

HISTORY

1958	1966	1991	1993	1996
Construction of the West Point primary treatment plant was completed.	Metro began an expansion of West Point to provide secondary treatment.	King County voters created the Municipality of Metropolitan Seattle (Metro) to provide wastewater treatment and clean the waters of Lake Washington and Elliott Bay.	Voters decided to merge Metro with King County, and King County assumed responsibility for West Point.	Upgrade to secondary treatment was completed.

MANAGING COMBINED SEWER SYSTEMS

A combined sewer system is one in which stormwater and sewage both go in the same pipe to the treatment plant.



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.

While the combined sewer system in Seattle remains in operation today, all new construction after 1940 provided separate systems for sewage and stormwater flows.

Because it is largely on a combined system, West Point treats a lot of stormwater that would otherwise flow untreated into Puget Sound. During heavy rains, the volume of excess flow exceeds the capacity of the pipes and can cause a release of sewage and untreated water (called a combined sewer overflow or CSO.)

Because these CSOs can affect water quality, the existing combined systems need significant upgrades. It is prohibitively expensive to replace the entire combined system with a separate system in which sewage and stormwater would flow in separate pipes.

As a result, King County is working with state agencies to minimize the number of untreated discharges each year. The plan focuses on upgrading some parts of the system, working to keep the inflow of rainfall and infiltration of groundwater out of the sewer system, and maximizing the use of CSO control facilities. Within the West Point service area, excess flows can be directed to one of two combined sewer treatment plants for primary treatment and to new facilities that store the flows until they can be treated.

REGULATION AND PERMITTING

Like most other treatment plants throughout the United States, West Point discharges treated wastewater every day into a local water body, Puget Sound. To ensure these waters stay safe for human and wildlife use, the U.S. Congress passed the Clean Water Act in 1972 to regulate the discharge of pollutants.

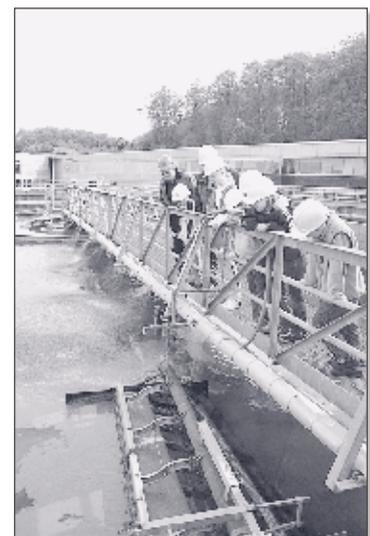
One way the state Department of Ecology enforces the law is by issuing a National Pollution Discharge Elimination System Permit. This permit (available on our Web site) sets water quality standards and specifications for monitoring, treating and discharging treated wastewater through the West Point outfall in Puget Sound and occasional untreated overflows from the combined system.



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

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 our division.



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

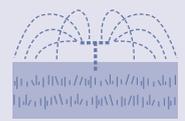
CUTTING-EDGE TECHNOLOGIES

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. We also test new energy recovery technologies and have operated several pilot projects in recent years. West Point is King County's main location for testing new and advanced wastewater treatment technologies.

WASTEWATER TREATMENT - REUSE AND RECYCLE!

West Point's wastewater treatment process produces many valuable byproducts that can be reused within the plant and throughout the region.

WATER REUSE
Some secondary effluent is reused on-site for cleaning and as a heat and water source for the treatment process.



BIOSOLIDS
Biosolids are the nutrient-rich organic matter produced

by treating wastewater. King County is one of the first utilities in the U.S. to earn a prestigious national certification for a management system for producing high-quality environmentally safe biosolids.



Most of West Point's biosolids are sold as a soil amendment for agriculture in Eastern Washington. The rest is used in forest fertilization or composted for landscaping and gardening.

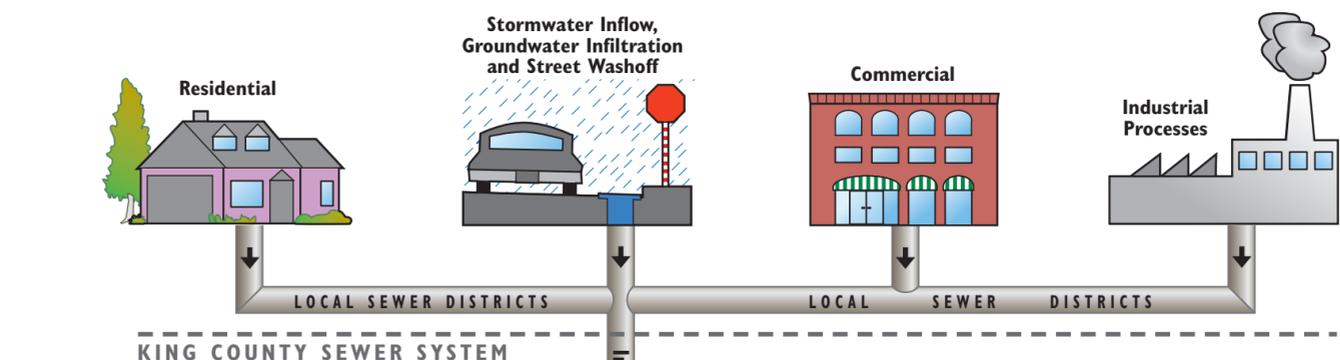
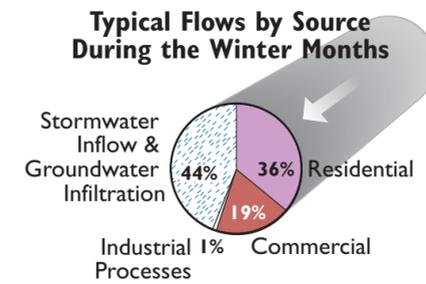
ENERGY RECOVERY Digester gas is a byproduct of the biosolids digestion process. It is a gas composed of methane and carbon dioxide produced by active anaerobic bacteria. This gas is collected and used on-site in generators that produce electricity, and for powering pumps. The electricity offsets as much as 25 percent of the plant electrical demand and frees up an equivalent amount of power for use in homes and businesses.



WASTEWATER TREATMENT PROCESS

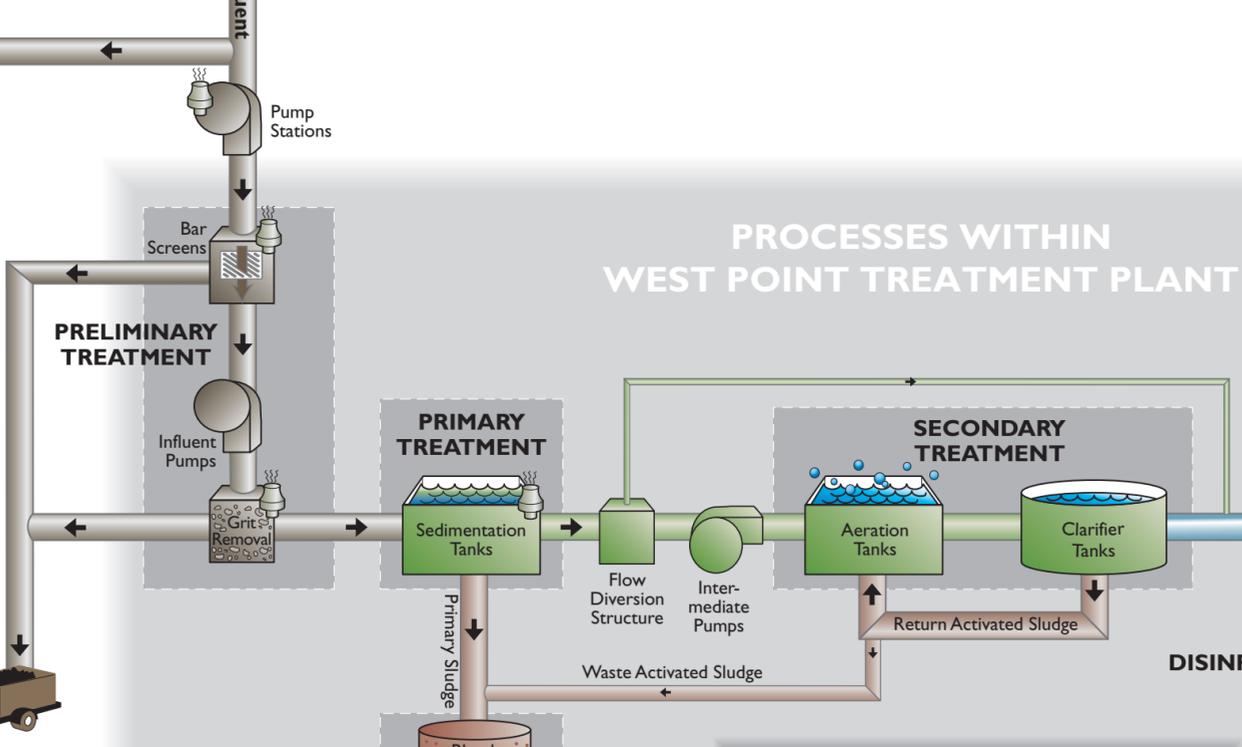
How is wastewater treated at King County's West Point Treatment Plant?

WHAT'S COMING INTO THE PLANT?



PROCESSES WITHIN WEST POINT TREATMENT 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.



PRELIMINARY TREATMENT — 'Taking out the trash'

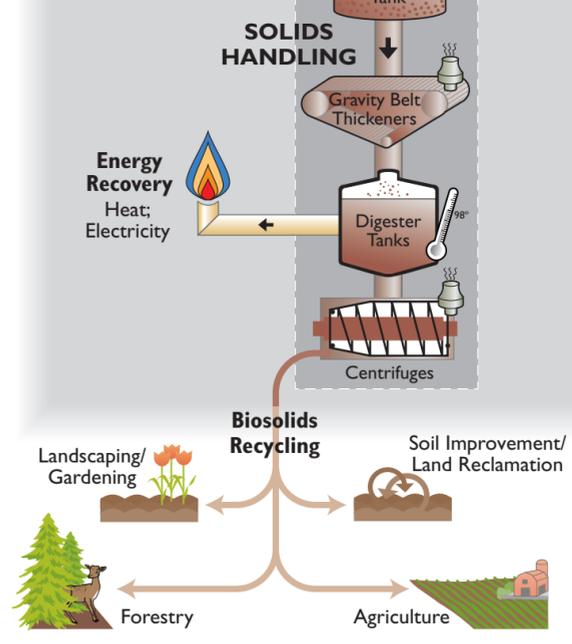
- Bar screens screen raw wastewater (called influent) as it enters West Point to remove large debris like rags, paper, and leaves.
- After screening, wastewater is pumped into aerated grit chambers that remove sand and gravel.
- The debris and grit removed during this process are trucked to a landfill.

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

- Wastewater settles in long tanks called primary sedimentation tanks. Heavy material sinks to the bottom (as sludge), and light material floats to the top (as scum).
- Skimmers remove scum from the surface of the water and scrapers remove sludge from the tank bottom. Both are then sent onto the solids handling process.
- At this point anything that could have settled out has. The treated water, now called primary effluent, flows to the flow diversion structure.
- West Point is designed to handle a peak combined flow of 440 million gallons a day (mgd).

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. Bacteria from the end of the treatment process are also recycled—'more hungry mouths to feed'—to speed up the reaction.



- Bacteria eat suspended and dissolved organic material in the water. In the process, they produce more bacteria.
- 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 to process ("eat") more organic material; the rest goes to the solids handling process.
- The remaining water—secondary effluent—leaves the clarifiers at least 85 percent cleaner than when it entered West Point.

DISINFECTION — 'Zapping pathogens'

- Secondary effluent is chlorinated, destroying most remaining pathogens, or disease-causing bacteria.

WEST POINT TREATMENT PLANT FACTS

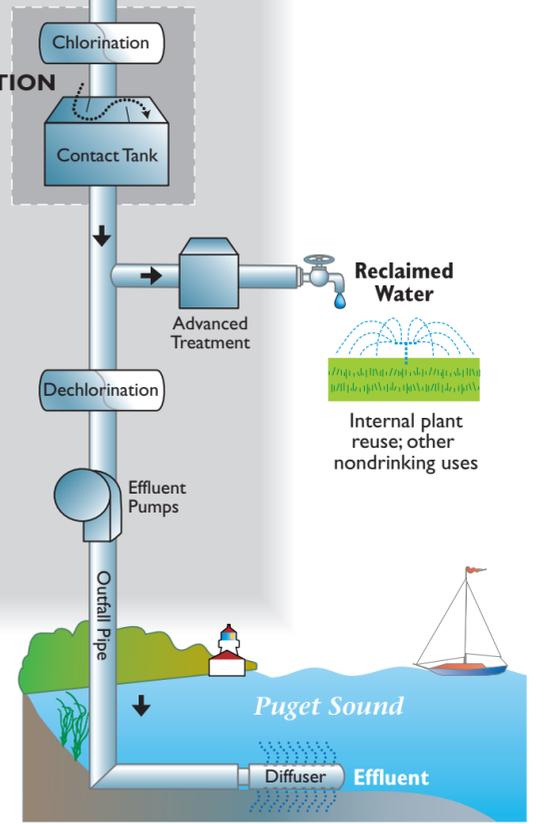
- Design average wet weather flow: 133 million gallons per day
- Design peak secondary capacity: 300 million gallons per day
- Design maximum capacity: 440 million gallons per day during peak storms
- Outfall pipe: 3,600 feet long, 240 feet deep, 500-foot diffuser
- Reclaimed water produced: up to 250 million gallons per year
- Biosolids produced: about 50,000 wet tons per year
- Electricity produced: up to 15 million kilowatt-hours per year

RECLAIMED WATER — 'Saving H₂O'

- After disinfection, some secondary effluent undergoes advanced treatment (coagulation, filtration, disinfection) to reduce use of potable water in plant processes.

SOLIDS HANDLING
Creating biosolids — 'Blend, thicken, digest, dewater'

- Raw organic solids—primary sludge and scum and secondary sludge—are blended in a large tank and then pumped to porous conveyor belts that use gravity to drain water off and thicken the material.



- The final effluent is dechlorinated before it is released through an outfall pipe and diffuser into Puget Sound.
- After thickening, the solids are combined with primary scum (not shown) and pumped to digester tanks where anaerobic bacteria at 98 degrees Fahrenheit break down organic material and 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 use centrifugal force to remove water from the solids.
- Water removed from the digested solids goes back to the wastewater treatment process. The resulting dewatered solid material is nutrient-rich biosolids.
- West Point is a nationally recognized member of the National Biosolids Partnership—through its environmental management system—aimed at producing biosolids that are safe for use as a soil amendment.