

What is a CSO?

Like many U.S. cities, portions of Seattle's sewer system are designed to carry sewage and stormwater runoff in a single pipe. King County works with the City of Seattle to maintain and improve the combined sewer system in the city. Suburban sewers are typically two-pipe systems that carry stormwater and sewage independently of each other.


Because Seattle's combined system collects greater flows of rainwater and runoff during and after storms, there is an increased potential for these sewers to back up into Lake Washington, Puget Sound, the Duwamish Waterway and other regional waters. When these overflows happen, they are called CSOs, or combined sewer overflows.

King County is among the national leaders in reducing CSOs and protecting water quality of our surrounding water bodies. The Henderson/ML King CSO project is part of a countywide effort to monitor and divert combined storm flows away from our communities and natural water bodies. Because of efforts like the new Henderson CSO project, our neighborhood beaches are cleaner and safer for all to enjoy.



Signs like this at the Atlantic City Boat Ramp warn people not to swim during or after storms because of the potential of sewer overflows. Because of the Henderson CSO control project, overflows to Lake Washington from the Rainier Beach area will occur far less often.



 **King County**
Department of Natural Resources and Parks
Wastewater Treatment Division
201 S. Jackson St., KSC-NR-0505
Seattle, WA 98104-3855

The Henderson/ ML King CSO project is done. Help us celebrate!

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HENDERSON/ML KING CSO PROJECT

 **King County**
Department of Natural Resources and Parks
Wastewater Treatment Division

Providing a cleaner Lake Washington and
an improved Rainier Beach community

October 2005

COMPLETE! A clean-water project in the Rainier Beach area of south Seattle

The three-and-a-half-year \$77 million project will reduce sewer overflows in your neighborhood and Lake Washington.

The project is one of King County's largest combined sewer overflow control projects. Besides helping protect the water quality of Lake Washington, it provides many needed improvements to the Rainier Beach sewer system, much of which is more than 50 years old.

Before this project, 30 million to 60 million gallons of combined waste and stormwater overflowed to Lake Washington every year. With the project complete, combined sewer overflows, or CSOs, will be dramatically reduced, and our beaches will be cleaner and safer.

Construction in Rainier Beach occurred along South Henderson Street, 42nd Avenue South and South Norfolk Street between January 2002 and August 2005. The project included six tunnels. Top right, King County Executive Ron Sims meets with neighbors Jan and Hal Barker and Lucille and Ed Wypych as work progresses.



TIME TO CELEBRATE!

King County and the entire project team would like to thank all our neighbors—businesses, residents, commuters and park users—for their patience and help during this important construction.



With work complete, we hope you will join us for a dedication ceremony with King County Executive Ron Sims. As part of our event, you may also tour the new facilities.

WHEN: 11 a.m. - noon, Wednesday, Oct. 26, 2005

WHERE: Atlantic City Boat Ramp, 8702 Seward Park Ave. S., Seattle
Snacks and refreshments provided. Hope to see you there!

For more information about the dedication ceremony, please contact John Phillips at 206-263-6543. More detail about the project is also available at <http://dnr.metrokc.gov/wtd/henderson-cso/>.

How the new CSO project helps protect Lake Washington and Rainier Beach



Today, the original 1970s brick sculpture on the west side of the Henderson Pump Station, "Quest for Clean Water" by well-known local artist Richard S. Beyer, is more visible for public view and framed by added architectural details and landscaping.



Three new pumps have been installed in the main pump room on the lower level of the Henderson Pump Station. Each unit can pump more than

4 million gallons per day. Two submersible pumps are in an adjacent underground "wet pit," each with the capacity to pump about 6 million gallons per day.



The inlet regulator diverts wet-weather flows into the combined sewer tunnel for treatment and temporary storage. During dry weather, flows are directed to the Henderson trunk sewer along Martin Luther King Jr. Way South. Odor control units use activated charcoal.

The newly completed Henderson Combined Sewer Overflow Control Project has several important features, including more than two miles of tunnels and pipelines, an expanded Henderson Pump Station and flow regulator facilities. All are now operating but do their most important work during and after heavy rains.

Pumping storm flows away from Lake Washington

The Henderson Pump Station—located across from Lake Washington, the Atlantic City Boat Ramp and Beer Sheva Park at Seward Park Avenue South and South Henderson Street—is the project's most visible facility. The former Municipality of Metropolitan Seattle (Metro) built it in the mid-1970s with a capacity to pump 7.5 million gallons per day of combined sewage. It replaced an older, smaller City of Seattle pump station that sat across the street next to Rainier Beach High School. Today, the newly expanded Henderson Pump Station has nearly tripled in capacity while maintaining the same footprint. It can carry more than 20 million gallons of storm-water and wastewater a day away from the lake during and after heavy rainfalls.

Most of the pump station's expansion is not obvious from the street because it's taken place underground. With five variable speed pumps, this state-of-the-art facility can now collect peak wet-weather flows, which previously overflowed to Lake Washington. From the pump station, flows are pumped west below Henderson Street through new 42- to 72-inch pipelines to a new combined sewer storage tunnel.

Regulating incoming flows to the combined sewer storage tunnel

The beginning of the storage tunnel is at 42nd Avenue South between Fairbanks Avenue South and Carkeek Drive South. Flows entering the tunnel pass through an inlet regulator, a multilevel underground facility that diverts wet weather flows into the combined sewer storage and treatment tunnel.

The inlet regulator is a fairly small, one-story building above ground in a parklike setting. But the facility reaches 80 feet underground in five levels to house advanced electrical controls, an emergency generator, flow control gates, odor control equipment and a hypochlorite disinfection system.

Inside the combined sewer overflow storage tunnel

The underground storage tunnel has an inside diameter of about 15 feet. It runs two-thirds of a mile to the south under Beacon Hill at depths of 30 to 100 feet beneath 42nd Avenue South.

The tunnel can hold and treat up to 4 million gallons of combined wastewater and stormwater. Temporarily storing combined sewage in the tunnel provides time for storms to pass and flow levels to subside in pipelines throughout the King County wastewater system. Similar underground storage facilities are also located under Denny Way just north of downtown Seattle and at Alki Point in West Seattle.

After flows have decreased and the system's regional wastewater treatment facilities have enough capacity, all flows that have been stored and treated in the new Beacon Hill tunnel are drained through an outlet regulator at the south end of the tunnel. The regulator is in the Norfolk Industrial Park at 42nd Avenue South and South Norfolk Street.

As the flows are drained from the tunnel, they are conveyed west in 72-inch pipelines under Interstate 5 and rail lines to Airport Way South. From there, flows can be sent to either the West Point Treatment Plant in Seattle's Magnolia area or the South Treatment Plant in Renton, depending on existing capacities and system needs. In rare occasions after severe storms, and if the region's two treatment facilities are at capacity, treated flows could also be safely released to an outfall in the Duwamish Waterway.



The CSO tunnel runs 3,100 feet under Beacon Hill and is King County's second largest CSO storage facility.



The outlet regulator is designed with an environmentally friendly "green roof" that collects and reuses stormwater runoff and keeps it from entering the combined sewer system.

Henderson/ML King CSO Project in Seattle's Rainier Beach Community

