

Protecting Our Waters from Combined Sewer Overflows

Combined sewer systems are wastewater collection systems designed to carry sanitary sewage (consisting of domestic, commercial, and industrial wastewater) and stormwater in a single piping system to a treatment facility. In periods of rainfall or snowmelt, total wastewater flows can exceed the capacity of the sewer collection systems and/or treatment facilities. When this occurs, the combined sewer system is designed to overflow directly to nearby streams, lakes, and harbors, discharging untreated sewage and stormwater. These overflows are called combined sewer overflows (CSOs) and can cause significant water quality problems.

Contaminants in CSOs can include pathogens, oxygen consuming pollutants, solids, nutrients, toxics, and floatable matter – all of which can harm the health of people, fish and wildlife. CSOs can contribute to shellfish harvesting restrictions, impairment of the aquatic habitat, and aesthetic degradation due to unsightly floating materials associated with raw sewage.

State's CSO program

There are 11 municipalities with CSOs in Washington State. Due to their intermittent nature and variable pollutant and flow characteristics, CSOs are very difficult to control. In 1985, the state Legislature amended the state Water Pollution Control Act ([Chapter 90.48.480 RCW](#)) requiring the state Department of Ecology (Ecology) and local governments to develop reasonable plans and compliance schedules for the greatest reasonable reduction of CSOs at the earliest possible date. To implement this legislation, Ecology adopted [Chapter 173-245 WAC](#) in 1987.

This regulation defines the greatest reasonable reduction for controlling each CSO as an average of one untreated discharge per year. Most other states rely on the U.S. Environmental Protection Agency's CSO policy to direct their CSO reduction efforts and regulatory enforcement.

WHY IT MATTERS

Eleven Washington communities have combined sewer systems that carry both sanitary sewage and stormwater. These can overflow due to storm events, releasing untreated sewage and polluted stormwater into Puget Sound and other receiving waters

Pollution in combined sewer overflows (CSOs) can adversely affect habitat, prompt shellfish harvest closures, harm the health of people, fish and other wildlife, and impair the surrounding aesthetic environment.

CSO control programs and projects prevent or reduce these releases, so the sewage and stormwater can receive treatment prior to discharge.

On the Web:

www.ecy.wa.gov/programs/wq/permits/cso.html

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All CSO municipalities in the state have developed and received approval of their CSO reduction plans from Ecology in accordance with the state CSO regulation. Ecology incorporates the requirement to comply with CSO reduction plans in each municipality's wastewater discharge permit or in an administrative order. While some communities have achieved the goal of one untreated CSO event per outfall per year, other communities continue to make progress in reducing CSOs. Ecology estimated that, in 1988, the average volume of untreated CSOs discharged to the state waters was 3.3 billion gallons per year. Since then, Washington has made good progress with a reduction of CSOs to less than one billion gallons in 2009.

[Polluted stormwater runoff](#) – the largest component of CSO by volume – is one of the leading pollution threats to Washington's lakes, rivers and marine waters. Areas served by combined sewers control stormwater pollution through CSO control. With overflows reduced or eliminated, stormwater combines with sewage and goes to treatment plants. The CSO reduction programs in Washington's 11 combined sewer communities address the polluted stormwater runoff problems in those areas.

National CSO control efforts

Nationwide, combined sewer systems serve about 40 million people in approximately 772 communities. On April 19, 1994, EPA published a CSO control policy ([59 Federal Register 18688](#)). The policy establishes guidelines for communities to develop CSO controls. EPA estimated that it will cost about \$41 billion to control these CSOs.

Summary of federal CSO policy

Due to the site-specific nature of the combined sewer systems, the variability of receiving water conditions, and the associated CSO harm to lakes, streams and bays, the EPA policy provides flexibility to communities for developing control programs to fit local needs. However, the EPA policy requires that all CSO communities implement nine minimum controls specified in the policy, and develop comprehensive long-term control plans tailored to site-specific conditions. The long-term CSO control plans must also meet a level of CSO discharge controls to ensure state water quality standards will not be violated.

Comparison between state and federal CSO requirements

Many of the federal CSO control policy requirements are similar to Washington state requirements. Compliance with the state water quality standards is a requirement that must always be achieved under both the state CSO regulation and EPA national CSO control policy. The compliance with the state water quality standards regulation, [Chapter 173-201A WAC](#), is achieved by meeting the numeric standards for concentration levels as well as protecting the designated uses – such as swimming, drinking, fish supporting – of a water body.

Some differences are worth noting. The EPA policy requires immediate implementation of the nine minimum controls specified in the policy. Major issues associated with implementation of the nine minimum controls are the requirement for monitoring CSO impacts and the requirement

for public notification of CSO occurrences. Under the state CSO regulation, communities are not required to monitor the CSO impacts, although they do have to monitor the frequency and volume of their CSOs. The state has implemented the requirement for public notification of CSOs when updating wastewater discharge permits.

Under the EPA policy, CSO control plans must achieve one of three optional control levels. These control levels are presumed adequate to protect beneficial uses unless there is information that indicates otherwise. However, CSO discharges in excess of those levels are also allowed if the community demonstrates that it will not violate the state water quality standards. For example, the EPA policy allows communities to develop and implement CSO control plans that achieve an ultimate frequency of 4-6 CSOs per year.

CSO Strategies

CSO communities employ combinations of any or all of the following approaches to reducing overflows:

1. **Separation.** Create separate sewer and storm sewers.
2. **Storage.** Construct large tunnels to store combined flows until after storm events, and then convey the flow to the treatment plan.
3. **CSO treatment.** Provide satellite facilities that operate during high flows, providing screening of solids, primary treatment and disinfection
4. **Green stormwater infrastructure.** Construct projects such as roadside rain gardens, permeable pavement and downspout-to-ground disconnects that reduce or eliminate the inflow of stormwater into the combined sewer.

CSO Communities in Washington

NPDES Permittees with CSO Outfalls	CSO Outfalls
Anacortes	3
Bellingham	2
Bremerton	15
Everett	13
King County- West Point Treatment Service Area	34
LOTT (Olympia)	1
Mount Vernon	2
Port Angeles	4
Seattle Public Utilities – City of Seattle	92
Snohomish	2
Spokane	22