King County
Department of Natural Resources and Parks
Wastewater Treatment Division

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Inflow and Infiltration Reduction to Control Combined Sewer Overflows

What is I/I, and what is King County doing about it?

The King County Regional Infiltration and Inflow (I/I) Control Program was created to identify cost-effective opportunities to reduce the amount of rain and groundwater that enter the portions of the County's wastewater conveyance system that are designed to carry only sewage .When rain or ground water enters the sewage system, it is called infiltration and inflow or I/I. Treating and conveying this excess water with sewage is expensive and can cause overflows if the system capacity is overwhelmed.

King County is testing the effectiveness of reducing I/I in a pilot project in Skyway in 2011-12. Two other proposed projects in Bellevue and Issaquah have been postponed. The Skyway project will test the County's ability to find numerous I/I sources as well as test the cost-effectiveness of I/I reduction on a scale large enough to potentially offset the need for larger conveyance or storage facilities. The results of the initial project will be used to develop recommendations to the King County Council regarding long-term I/I reduction and control, including applicable changes to policy or code.

What is required for I/I reduction to be a feasible approach for CSO control?

Sufficient sources of I/I that can be removed to meet target control volumes.

Flow monitoring and analysis is used to identify a target *control volume* for a specific CSO facility. This is the volume of wastewater and stormwater flow during a peak storm event that must be stored or removed from the conveyance system to prevent a CSO discharge.

Successful I/I reduction requires that many, often hundreds of individual leak points in sewer mains, manholes, and side sewers on private property must be found and fixed. To identify these leak points, extensive studies must be carried out on private property and in the local sewer system.

This approach has not yet been tested on a large scale in this region. King County is required to effectively reduce the number of combined sewer overflows in the system to no more than one event per year per location. The uncertainties of large scale I/I rehabilitation mean that it is risky to rely on this approach for meeting CSOs control requirements at this time.

Locations where I/I reduction is appropriate and cost-effective.

I/I projects are not recommended in critical areas such as slopes and shorelines, and those with historic flooding and drainage issues. In addition, sewer testing and repair requires access to sewer buried in streets that may also include underground utilities, and private property landscaping, driveways, and structures. Projects will require disruption to roadways, utilities and private property improvements that, if extensive enough, may limit the cost-effectiveness and feasibility of the project.

Availability of systems to manage water excluded from the sewer system.

Stormwater and groundwater that is excluded from entering the sewer system must be redirected to a stormwater conveyance or management system to prevent localized problems related to increased surface and ground water. Areas without developed stormwater systems, or without sufficient stormwater conveyance capacity are not good candidates for I/I reduction projects to control CSOs. Current water quality standards will require stormwater from streets to receive treatment before discharging to creeks, streams, lakes, and Puget Sound.

How can you help reduce I/I in your community?

Private property owners are responsible for maintaining the side sewer lines on their property. Regular inspection, followed by any needed maintenance and repair, can prevent both I/I and potential backups into homes.

People whose roof drains are connected to the sewer system can determine whether disconnecting this source of stormwater is feasible on their property. Property owners can also evaluate appropriate means of reducing stormwater runoff from their property, including installation of rain gardens, cisterns, or permeable pavement. These techniques may reduce I/I at locations away from the property, such as street catch basins. Seattle Public Utilities, through the Residential RainWise program, provides resources to participate in stormwater reduction programs.

Learn how King County evaluated I/I reduction for the North Beach basin as part of the Puget Sound Beaches CSO Control Projects.

Visit the project Web page at www.kingcounty.gov\CSOBeachProjects to view and download technical documents describing I/I analysis for the North Beach area.

For more information on Seattle Public Utility's stormwater control programs
Residential RainWise
https://rainwise.seattle.gov/systems/water

Natural Drainage Projects
http://www.seattle.gov/util/About_SPU/Drainage_&_Sewer_System/GreenStormwaterInfrastructure/NaturalDrainageProjects/index.htm

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