Chapter 4

Infiltration and Inflow Control

The RWSP calls for improvements to reduce existing and future levels of infiltration and inflow (I/I) into local collection systems. I/I is clean stormwater and groundwater that enter the sewer system through cracked pipes, leaky manholes, or improperly connected storm drains, down spouts, and sump pumps. Most inflow comes from stormwater and most infiltration comes from groundwater (Figure 4-1). I/I affects the size of King County conveyance and treatment systems and, ultimately, the rate that businesses and residents pay to operate and maintain them.

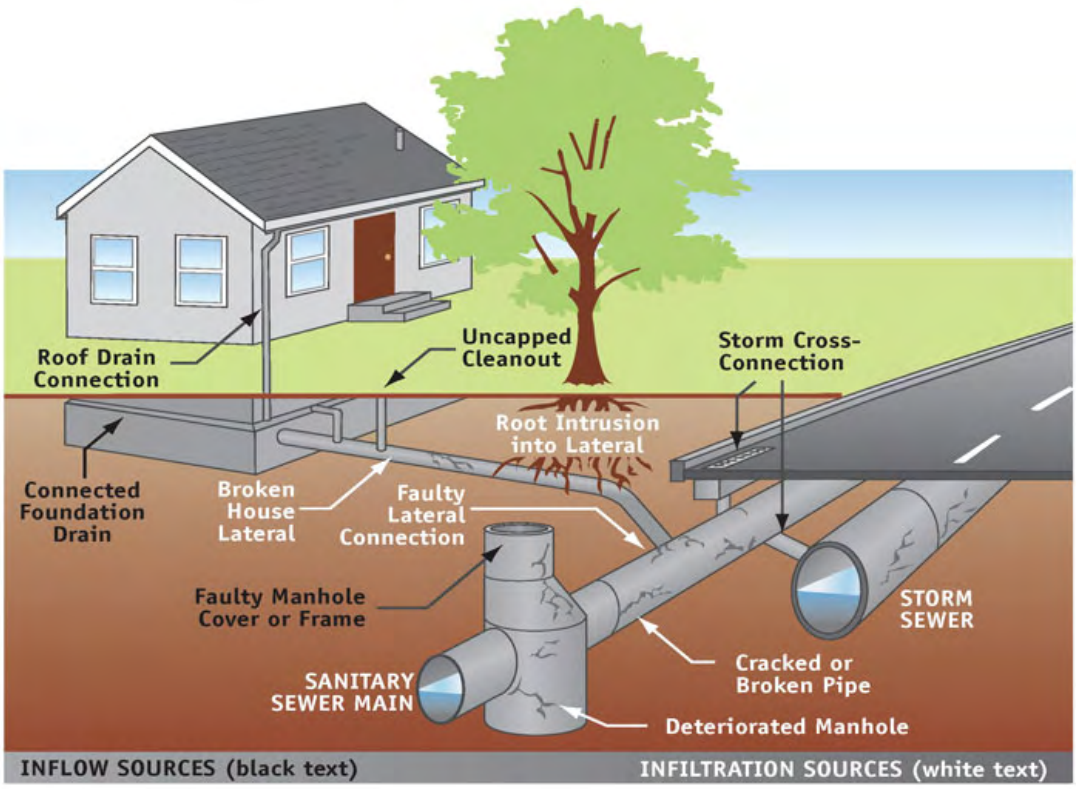

Figure 4-1. Sources of Infiltration and Inflow

In 2008, the I/I control program continued efforts to implement the Executive's Recommended Regional Infiltration and Inflow Control Program that was approved in May 2006 by the King County Council through Motion 12292.[1] The recommended program calls for the county and the local agencies to select, implement, and evaluate two or three "initial" I/I reduction projects to test the effectiveness of I/I reduction on a larger scale than the pilot projects that were completed

[1] The Executive's Recommended Regional Infiltration and Inflow Control Program report is available at http://www.kingcounty.gov/environment/wastewater/II/Resources/Reports/ExecutiveRecommendation.aspx.

in 2004.[2] A primary goal of the initial projects is to determine whether and under what conditions it is possible to cost-effectively remove enough I/I from the collection system to delay, reduce, or eliminate a planned regional conveyance system improvement project.

This chapter describes the progress made in 2008 to implement the initial I/I reduction projects and the overall schedule to complete the projects.

4.1 Initial I/I Reduction Project Progress

Efforts in 2008 focused on completing alternatives analysis within the four candidate project areas located in the Cities of Bellevue, Issaquah, and Renton, and in the Skyway Water and Sewer District (Figure 4-2). Elements of the alternatives analysis included sewer system evaluation survey work, flow monitoring during the 2007–2008 wet season, geotechnical and environmental field assessments, and development of I/I rehabilitation (sewer repair) cost estimates. The county's Wastewater Treatment Division (WTD) carried out these efforts in cooperation with the host agencies.

Figure 4-2. Candidate Areas for Initial I/I Reduction Projects

[2] The purpose of the pilot projects was to evaluate the effectiveness of various rehabilitation techniques. Details on the pilot projects are available at http://www.kingcounty.gov/environment/wastewater/II/Resources/Reports/PilotProject.aspx.

Results from these efforts were used to evaluate the feasibility and cost-effectiveness of I/I reduction in the candidate project areas. WTD presented the results to the Engineering and Planning Subcommittee of the Metropolitan Water Pollution Abatement Advisory Committee (MWPAAC) in September 2008. In consultation with MWPAAC and the host agencies, two projects were selected as the initial I/I reduction projects for final design and construction—a combined Bellevue and Issaquah project and a Skyway project. These projects are described in the following sections.

The details and results of the alternatives analysis and the process to select the final initial I/I reduction projects will be documented in an alternatives analysis report. The report is expected to be available in spring 2009.

4.1.1 Combined Bellevue and Issaquah Initial I/I Reduction Project

The combined Bellevue and Issaquah initial I/I reduction project (Figure 4-3) includes repairing side sewers and laterals associated with 220 properties—107 properties in the Bellevue portion of the project (Basin BEL031) and 113 properties in the Issaquah portion (Basin ISS003). It is anticipated that this project will result in removing 0.85 to 1.04 million gallons per day (mgd) of peak I/I, which would reduce the sizes and costs of two planned RWSP conveyance system improvement projects—the Eastgate Parallel Pipe Storage facility and Issaquah Storage facility.

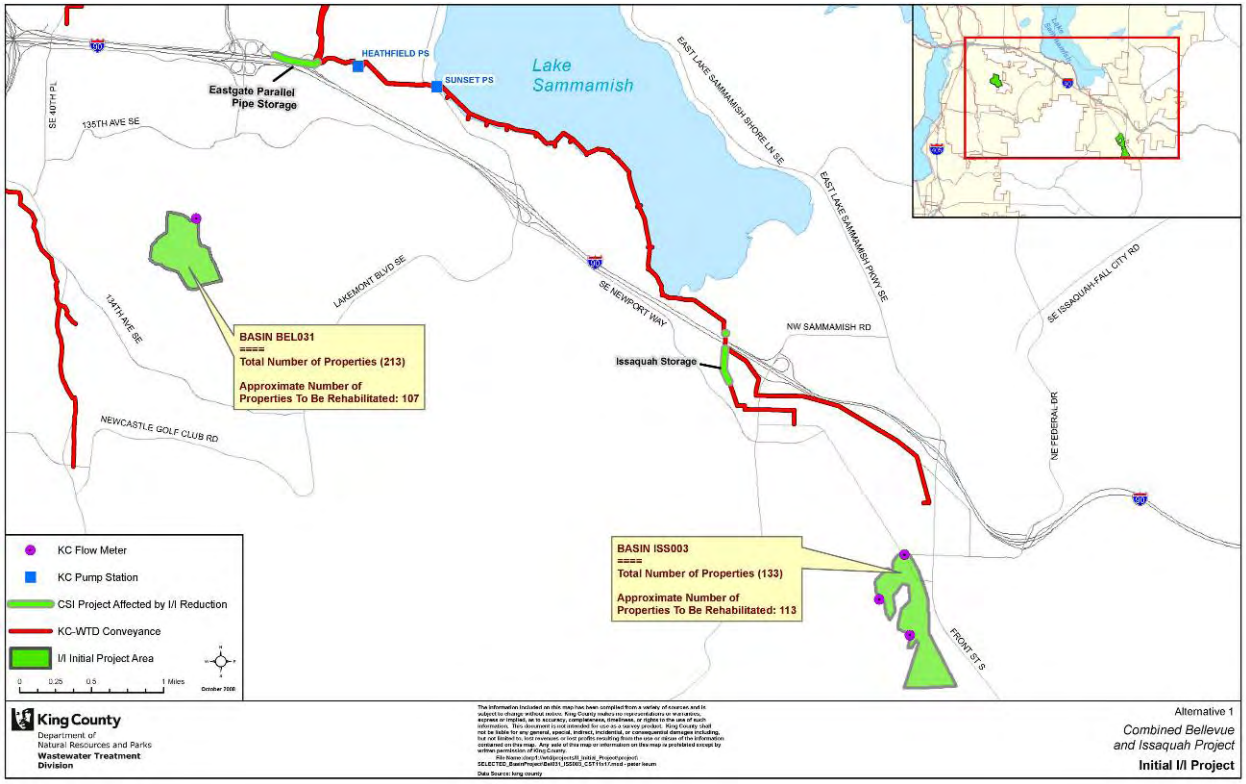

Figure 4-3. Combined Bellevue and Issaquah Initial I/I Reduction Project

4.1.2 Skyway Initial I/I Reduction Project

The Skyway initial I/I reduction project (Figure 4-4) includes repairing side sewers and laterals associated with 340 properties in Basin BLS002. It is anticipated that this project will result in removing 1.8 to 2.2 mgd of peak I/I, which would eliminate the need for one RWSP conveyance system improvement project—the planned Bryn Mawr Storage facility.

To make this I/I initial project cost-effective, the Skyway Water and Sewer District has agreed to fund a portion of the cost of this project. The district may contribute additional funds to add other elements to the project that will benefit its local system.

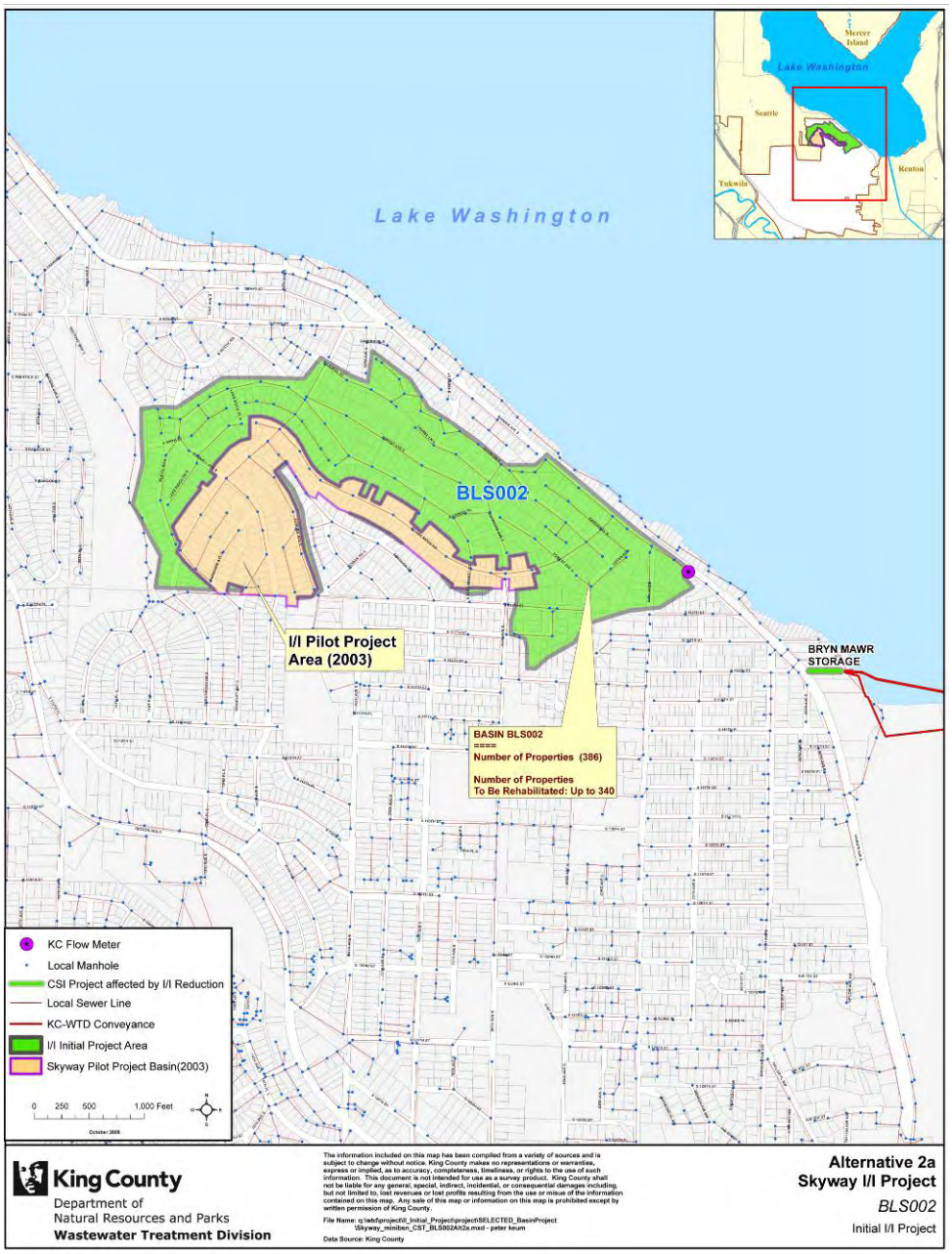

Figure 4-4. Skyway Initial I/I Reduction Project

4.2 Initial I/I Reduction Projects Schedule

Figure 4-5 shows the schedule, including decision points and milestones, for completing final design and construction of the initial I/I reduction projects. Schedule highlights are as follows:

- Predesign on the selected projects will begin in spring 2009 and is expected to be complete in fall 2009.
- Final design on the Skyway project is expected to be complete by the end of 2010. Construction on this project is scheduled to occur in 2011.
- Final design on the combined Bellevue and Issaquah project is expected to be complete in 2011. Construction on this project is expected to occur in 2012.
- Post-project flow monitoring will be conducted in winter of 2012–2013 to evaluate the results of implementing the initial I/I reduction projects.

WTD will continue to work closely with MWPAAC to review project results and develop conclusions and recommendations on long-term I/I reduction and control. The King County Executive is expected to forward recommendations on long-term I/I reduction and control to the King County Council in 2013.

Figure 4-5. Initial I/I Reduction Projects Schedule and Milestones

More information on King County's Regional I/I Control Program can be found at http://www.kingcounty.gov/environment/wastewater/II.aspx.