

Infiltration and Inflow

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 takes up capacity in King County conveyance and treatment systems and, along with population growth and other factors, drives the need to build additional capacity.

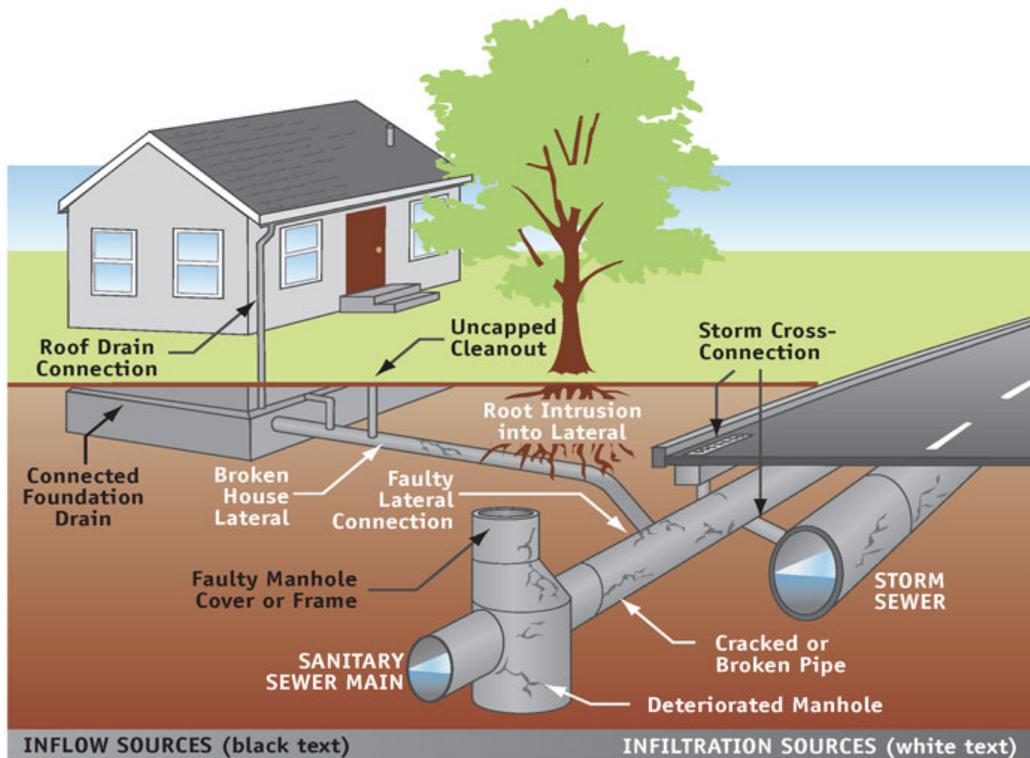


Figure 4-1. Sources of Infiltration and Inflow

In 2007, I/I control program efforts focused on implementing the *Executive's Recommended Regional Infiltration and Inflow Control Program* that was approved in May 2006 by the King County Council via adoption of Motion 12292.¹ The recommended program calls for the county and the local agencies to select, implement, and evaluate two to three initial I/I reduction projects to test the effectiveness of I/I reduction on a larger scale than pilot projects that were completed

¹ The *Executive's Recommended Regional Infiltration and Inflow Control Program* report is available at <http://dnr.metrokc.gov/wtd/i-i/library/ExecRec/report.htm>.

in 2004.² A primary goal 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 some otherwise needed regional conveyance system improvement projects.

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

4.1 Progress on Initial I/I Reduction Projects

In 2006, WTD worked with the Metropolitan Water Pollution Abatement Advisory Committee's (MWPAAC) Engineering and Planning (E&P) Subcommittee to select four potential project areas that would undergo further evaluation prior to selecting four candidate initial I/I reduction projects. The project areas are in the Cities of Bellevue, Issaquah, and Renton; and in the Skyway Water and Sewer District's service area (Figure 4-2).



Figure 4-2. Initial I/I Reduction Project Areas

² The purpose of the pilot projects was to evaluate the effectiveness of various sewer rehabilitation techniques. Details on the pilot projects were provided in the 2005 and 2006 RWSP annual reports and are also available at <http://dnr.metrokc.gov/wtd/i-i/pilotprojects.htm>.

Activities in 2007 included completing interlocal agreements with host jurisdictions; selecting consultants for predesign and sewer system evaluation survey (SSES) work; and starting SSES, predesign, and flow monitoring work. The sections below describe these efforts.

4.1.1 Interlocal Agreements

WTD completed separate interlocal agreements with host jurisdictions in early 2007. The agreements cover communication protocols, environmental review processes, securing private property right-of-entry agreements, and use of the draft standards that were developed jointly by the county and local agencies for use in long-term I/I control.³

4.1.2 Consultant Selection Process

A request for proposal for the predesign work and a request for bids for the SSES work were issued in early 2007. A representative from the MWPAAC's E&P Subcommittee participated in the selection process. A notice to proceed for the SSES work was awarded in April 2007 and for the predesign engineering work in July 2007.

4.1.3 Sewer System Evaluation Survey Work

SSES work is being conducted in the sewer drainage basins in each of the four project areas. The methods being used include closed-circuit TV (CCTV) inspection, smoke testing, and dye testing.

CCTV inspection uses cameras to record conditions in specific sections of a sewer line. The recordings can identify breaks, root intrusion, leaking water (especially infiltration from groundwater), and general deterioration. Camera equipment usually is operated from manholes located in streets or in public rights-of-way. Occasionally, access to easements in backyards or alleys is required to inspect the public sewer in these areas.

Smoke testing involves pumping smoke through sewer pipes from manholes in streets or in public rights-of-way and observing and documenting where smoke exits. Depending on the specific circumstances, the exiting smoke can indicate the location of places where I/I might enter the sanitary sewer system, such as broken pipes, manholes, catch basins, or connections of roof or foundation drains to the sewer system.

Dye testing is another way to locate I/I entry points into the sewer system. Non-toxic dyed water is introduced into roof drain leaders, driveway drains, or area drains or is injected into the ground around foundations. The sewer is then checked downstream for the presence of dyed water.

The SSES work for all four project areas will be completed in summer 2008. Prior to conducting the SSES work, WTD and the host jurisdiction notified residents and businesses in the areas where work was going to take place. Public notification materials and right-of-entry agreements,

³ The draft standards are available at <http://dnr.metrokc.gov/wtd/i-i/library/ExecRec/docs/AppB.pdf>.

if needed, were developed in accordance with the guidelines established in the interlocal agreements. Materials included information on the type of work taking place, the purpose of the work, what to expect, and a contact name and number, including a 24-hour information hotline, in the event of any questions or concerns. People were notified through mailings and door hangers.

During 2007, about 550 rights-of-entry were acquired for smoke testing in the Skyway project area to allow field inspection crews to enter onto properties to record smoke exiting from roof drains, yard drains, and other storm drainage that cannot be seen from the public right-of-way.

4.1.4 Predesign Engineering Efforts

Geotechnical and environmental field assessments of the project areas began in late 2007. Other efforts under way include predesign cost estimating, mapping, and analysis of SSES data. The results of this analysis are expected to be complete in 2008 and then will be presented to the MWPAAC E&P Subcommittee for project selection.

4.2 Schedule, Decisions, and Milestones for Initial I/I Reduction Projects

Figure 4-3 shows the schedule, including decision points and milestones, for the initial I/I reduction projects. Schedule highlights are as follows:

- Complete predesign in third-quarter 2008.
- Select projects in October 2008, in consultation with host local local agencies and the MWPAAC E&P Subcommittee.
- Complete the predesign report in November 2008.
- Begin final design in December 2008 and complete final design by the end of 2009.
- Construct projects between 2010 and 2012.

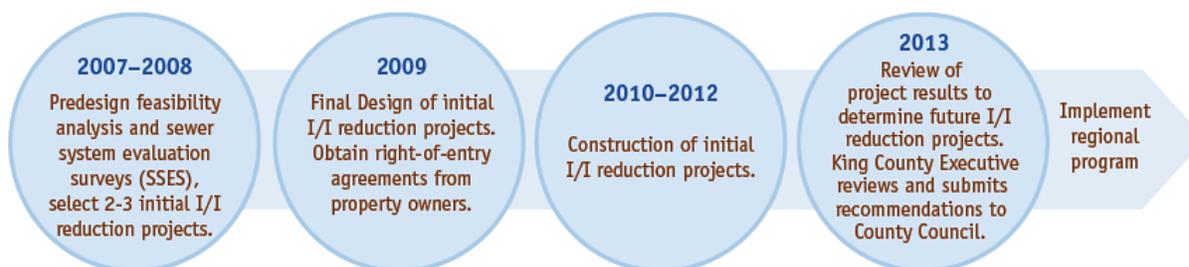


Figure 4-3. Schedule, Decisions, and Milestones for Initial I/I Reduction Projects

More information on King County’s regional I/I control program can be found at <http://dnr.metrokc.gov/wtd/i-i/>.