

Recommendation of the MWPAAC Inflow and Infiltration Task Force to the Engineering and Planning Subcommittee on Regional Best Management Practices for Implementation

March 4, 2021

Introduction

In 2018, the Metropolitan Water Pollution Abatement Advisory Committee (MWPAAC) in collaboration with King County Wastewater Treatment Division (WTD) recommended three I/I reduction program concepts be further defined and evaluated for their ability to reduce inflow and infiltration (I/I) in the separated sewer portion of the regional wastewater system. I/I reduction could lead to downsized, deferred or eliminated future planned capital projects. The three program concepts include 1) regional best management practices (BMPs), 2) an inspector training and certification program and 3) a private side sewer inspection program with financial assistance. The MWPAAC I/I Task force have been reviewing and discussing these program concepts to enhance the Regional I/I Control Program. This document presents recommended regional BMPs to advance to implementation. Recommendations on the other programs will be addressed separately in the future.

Problem

- Over time, the degradation of private side sewers leads to higher I/I, which in turn will lead to increased conveyance system, treatment system, and operational costs.
- \$1.7 billion of new regional conveyance pipe projects are planned through 2060 to account for growth and I/I. These costs are primarily driven by peak I/I assumptions.
- I/I from private side sewers accounts for roughly up to 50-70% of all I/I. The nature of private ownership and private maintenance responsibility creates challenges for agencies interested in reducing I/I from those private sources.

Recommendation of Regional BMPs

The Engineering and Planning (E&P) Subcommittee may choose to submit for MWPAAC's consideration the following recommendation to WTD regarding regionally applied side sewer BMPs to enhance the Regional I/I Control Program. MWPAAC can decide to accept these recommendations without change, accept recommendations with amendment, or reject these recommendations.

Summary of Recommendation

The I/I Task Force recommends to the E&P Subcommittee that King County WTD develop and make available the following BMPs for voluntary use and implementation by component agencies to develop regional consistency:

- A5. Unauthorized connection prohibition
- B3. Model courtesy notice to property owner / occupant regarding roots in lateral connections
- B5. Side sewer maintenance guideline documents
- C3. Illicit source disconnection public education materials

The recommended BMPs first clarify for customers what is allowed in relation to sewer connections and then provide multiple education resources and notices to help them maintain private side sewers.

Rationale for Recommendation

- Eliminating all degraded private side sewer systems would lead to significant cost savings for property owners, local agencies, and the WTD over the next 40 years.
- The recommended side sewer BMPs address the gradual increase in I/I that is expected if infrastructure is not maintained and degrades. Encouraging side sewer BMPs will help slow I/I increases due to degradation and lessen the need for future conveyance and treatment capacity projects.
- In addition to I/I reduction, implementing these BMPs can help all component agencies, individual property owners, and the County to meet their responsibility for being good stewards of their individual, local, and regional sewer systems.
- The recommended BMPs are broadly applicable to most agencies, and reasonably implementable.
- One of the main drivers for the recommendation is to grow regional coordination and cohesion on reducing I/I in side sewers as well as agency capacity to support customers in maintaining side sewers.
- Component agencies have wastewater expertise and a direct link to their customers, which provides an opportunity to support the customers' responsibility to maintain private side sewers.
- Consistency between cities and districts may result in increased knowledge of customers' side sewer responsibilities, helps to reduce customer confusion, and sets an even bar of quality for side sewer construction and inspection among member agencies.
- While it is difficult to measure, or even estimate the effect of each of the above measures, each one has a reasonable and logical connection between their implementation and a reduction (or avoided increase) in I/I from private sources.
- While other BMPs not included in this recommendation were deemed valuable and not rejected, challenges in implementation, narrow applicability, and/or the possibility of their inclusion as part of the private side sewer inspection program caused the Task Force to recommend deferral of their implementation.

The Task Force is relying on the expertise of the consultant team and their recommendation of the relative effectiveness of each of these BMPs. No quantitative analysis was provided.

The preliminary success factors are defined as:

- Achieve voluntary participation in the application of selected BMPs for the majority if not all component agencies.

1. A5. Unauthorized connection prohibition

Description: This BMP provides model code language for adoption of legal authority, which clearly states that unauthorized connections must be removed and provides appropriate enforcement mechanisms to accomplish proper disconnection on new construction or a substantial remodel. Additionally, the model language includes provisions to ensure only one side sewer connection from each structure is made to the main sewer in accordance with applicable regulations, and that the side sewer is directly connected to the appropriate draining fixtures within the structure. This BMP can cover townhouses, apartments, shared side sewers, houses with accessory dwelling units, or similar, depending upon the local agency

Rationale: While most jurisdictions have legal authority through code language prohibiting unauthorized connections, it is assumed that uniformly stronger language would give jurisdictions the tools needed to minimize such connections.

To increase voluntary participation by agencies, the Task Force recommends that developed materials include examples of effective and “less effective” legal language and to identify those agencies with “less effective” legal language.

2. B3. Courtesy notice to property owner / occupant regarding roots in lateral connections

Description: Roots in laterals and service connections (side sewer connections) are commonly observed during routine sewer main CCTV inspections performed by many sewer utilities and their CCTV inspection contractors. When notifying property owner/residents of this finding, the property owner can also be made aware of their responsibility for maintaining the side sewer, including the need to hire a plumber to clear roots.

Rationale: Joint separation due to age, pipe integrity degradation, and damage caused by root intrusion allows groundwater to enter through cracks in side sewers.

To increase voluntary participation by agencies, the Task Force recommends that an estimate of the ranges of potential I/I reduction (or avoided increase) from this measure be developed and shared with the agencies. We understand that very broad assumptions must be made to develop such an estimate.

3. B5. Side sewer maintenance guideline documents

Description: Comprehensive and easily accessible side sewer maintenance guidelines to educate property owners on their responsibilities for maintaining, inspecting, and repairing their side sewers and provide information on resources, means, and methods for maintaining the side sewer.

Rationale: Providing these guidelines to property owners makes it more likely that side sewers are repaired, replaced, or rehabilitated, thereby reducing I/I. The information will also reinforce the interests that agencies and individuals share in having well maintained, reliable side sewers throughout their service area.

To increase voluntary participation by agencies, the Task Force recommends that an estimate of the range of potential I/I reduction (or avoided increase) from this measure be developed and shared with the agencies. We understand that very broad assumptions must be made to develop such an estimate.

4. C3. Illicit source disconnection public education materials

Description: Comprehensive and easily accessible illicit source information to educate property owners on types of illicit connections and disconnection of those sources. Utilities that experience excessive peak I/I flows will most likely opt to address both public and private property sources of I/I. Private property inflow sources (roof leaders, area drains, window well drains, foundation drains, etc.) can contribute significantly to peak flows that occur during wet weather events.

Rationale: Illicit connections contribute directly to inflow. Property owners may be unaware of the regulations surrounding sanitary and storm sewer systems. Providing these materials will encourage property owners to remove illicit connections, thereby reducing unpermitted inflow.

To increase voluntary participation by agencies, the Task Force recommends that an estimate of the potential I/I reduction (or avoided increase) from this measure be developed and shared with the agencies. We understand that very broad assumptions must be made to develop such an estimate.

Next Steps

If MWPAAC chooses to approve this recommendation, the next phase for the regional BMPs is voluntary implementation by local agencies. This step will not begin with implementation itself, but rather local agencies laying the groundwork by developing basic operating plans that tailors the side sewer BMPs to their service area.

King County will provide the technical memo with side sewer BMP information through the King County website as a regional toolkit for voluntary implementation by component agencies.

Before implementing these BMPs, all elements of the BMP should be carefully considered to encourage staff and customer buy-in to prevent unintended consequences and foster continued long-term success. A review of the sewer agency's resources should be conducted so that barriers or challenges can be identified and resolved by each sewer agency. This review includes:

- Staffing requirements, roles, and responsibilities (note: this may include resources from outside agencies e.g. if you are a sewer district working with one or more cities)
- Customer education and communication plan, including notice of changes in legal authority, enforcement response plan, and resources available for proper unauthorized connection disconnection/redirection compliance procedures
- Budget and funding impacts
- Information management system to track appropriate data

When adopting these BMPs, each local agency should review its legal authorities, including its current sewer use regulations, to gain a full understanding of the agency’s legal responsibilities and the private property/private system owners’ legal responsibilities for side sewer inspection, maintenance, and repair. This may require the involvement of the agency’s legal counsel and governing body (e.g., General Manager, Chief Executive Officers, Board, Directors, etc.). If needed, a written policy may be drafted to clearly delineate the limits of each party’s responsibilities.

The timeline for implementation is undefined, but may be defined by MWPAAC.

I/I Task Force Background

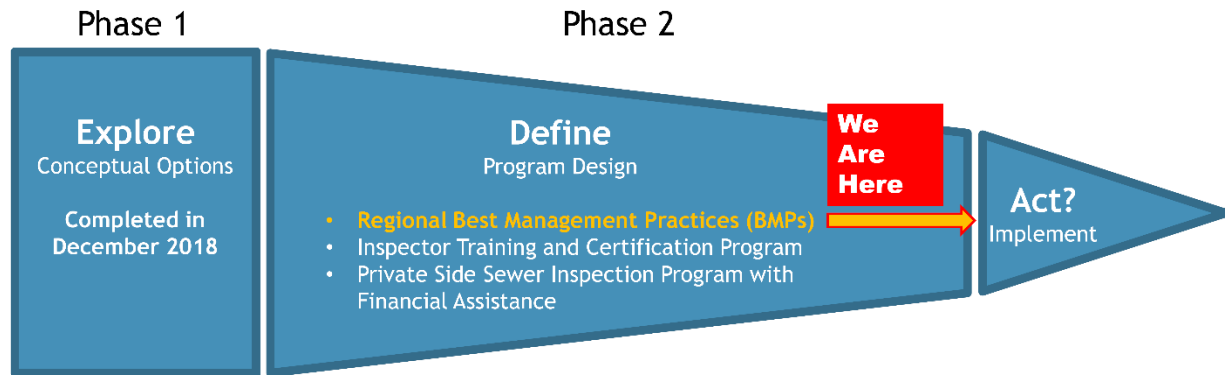
Current I/I Program Work

In 2015, the MWPAAC I/I Task Force was created as an ad hoc group to formulate ideas for I/I programs that could benefit the regional wastewater system by looking at long-term solutions to significantly reduce and remove I/I from the sewer system as a whole. The I/I Task Force developed a list of recommended options for future regional I/I Control Program actions. That list provided the basis for the current work being performed as part of the Evaluation of Inflow and Infiltration Reduction Concepts project. This project is expected to complement ongoing rehabilitation and repair as part of normal sewer operations and maintenance as well as location specific I/I reduction efforts completed by component agencies and the County.

The goal of the project is to identify implementable, long-term solutions to decrease future I/I throughout King County’s regional wastewater collection system. The work, to date, has been divided into the following phases:

- Phase 1, conducted from 2017 to 2019, reviewed a wide variety of program concepts and identified three I/I reduction concepts for further consideration:
 - Regional sewer and side sewer BMPs
 - Regional inspector training and certification program
 - Private side sewer inspection program with financial assistance
- Phase 2, initiated in 2019 and continuing through 2021, builds on the Phase 1 work and provides descriptions and considerations for those three identified programs to support discussions on scope and implementation. Results are not yet known, but may include:
 - Recommendations on side sewer BMPs for a web-based regional toolkit
 - Recommendations on regional inspector training and certification program topics and expectations
 - Options defined for private side sewer inspection programs

Figure 1 below illustrates the overall planning process. This recommendation occurs in the “Define” box in the middle.



* A recommendation on the inspector training and certification program is expected in Q2 2021, and no recommendation on the private side sewer inspection program is expected in advance of the Clean Water Plan.

**Figure 1. Overview of Planning Process
for Regional I/I Control Program Improvement**

This recommendation is one portion of the work being completed during Phase 2 of the project.

Technical work to support the development of regional BMPs is provided in a Draft Technical Memo (TM) available on the King County I/I Control Program website Library. The TM presents options for regional I/I BMPs for King County's separated sewer system and then qualitatively evaluates each option for benefits and applicability to local agencies. The TM also presents additional considerations that may influence whether an option is ultimately chosen for implementation, as well as any work that may need to be completed prior to implementing the selected option.

Summary of Regional Engagement Process

The Evaluation of I/I Reduction Concepts project was designed to assist MWPAAC and WTD in considering new elements for the Regional I/I Control Program. As part of the I/I Reduction Concepts project, the MWPAAC I/I Task Force was created to formulate ideas for I/I programs that could benefit the regional wastewater system by looking at long-term solutions to significantly reduce and remove I/I from the sewer system as a whole.

The following actions were performed to engage the I/I Task Force:

- King County and the Consultant team presented the initial list of 19 side sewer BMPs for consideration during a meeting held July 20, 2020.
- Following the meeting, members of the Task Force were asked to complete a web-based survey regarding the applicability and feasibility of the BMPs, as well as the preferences of their respective sewer districts.
- Results of the survey were presented and discussed during the next meeting held on October 19, 2020. Four of the initial 19 side sewer BMPs were selected by the consultant and the King County technical team to advance to further evaluation in next steps. The remaining BMPs that were not recommended for implementation are described below.
- A draft technical memo was compiled and shared in December 2020.

- At a meeting on December 12, 2020, the Task Force agreed to support the four BMPs and initiate a recommendation to MWPAAC.

Other BMPs Considered for Implementation Recommendation

The following BMPs were considered by the I/I Task Force and, although considered relevant, are recommended for implementation at a future date:

- A.1 Watertight side sewer specifications, standard drawings, and proper methods for new and repaired side sewers
- A.2. New side sewer construction inspection and product-specific inspection requirements
- A.3. Repair, rehabilitation, and replacement inspection requirements
- A.4 Side sewer contractor prequalification
- A.6. Side sewer design guidelines that address flood-prone areas
- A.7 Lake line guidelines and lakefront property provisions
- A.8 Over-water structure connection provision and recommendation
- A.9 Side sewer design guidelines in steep area
- A.10 Side sewer disconnection, reconnection, and demolition requirements
- B.1 Side sewer maintenance responsibility declaration and enforcement mechanism
- B.2 Tree and sewer main separation requirement
- B.4 Model web content for local agencies
- C.1 Side sewer CCTV inspection specifications
- C.2 Rainfall simulation and dye testing specifications
- C.4 Cleanout cap replacement program

Some of these BMPs are closely related to the side sewer inspection program and may be appropriate to consider for regional implementation if that program moves forward. These BMPs include:

- A.1 Watertight side sewer specifications, standard drawings, and proper methods for new and repaired side sewers
- A.2 New side sewer construction inspection and product-specific inspection requirements
- A.3 Repair, rehabilitation, and replacement inspection requirements
- A.4 Side sewer contractor prequalification
- A.10 Side sewer disconnection, reconnection, and demolition requirements