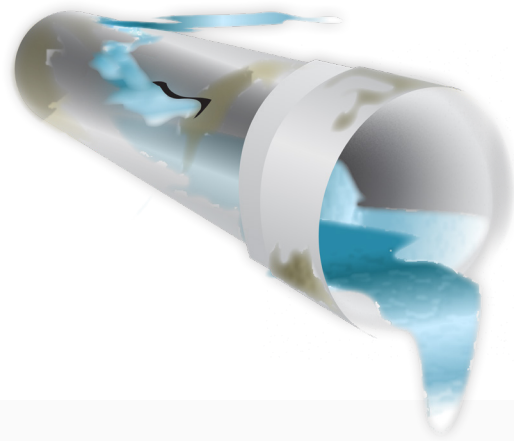


## I&I MITIGATION CHECKLIST

PRACTICAL STEPS FOR REDUCING  
INFLOW AND INFILTRATION



### 01

**CONDUCT FLOW STUDIES** at strategic locations to identify regions of concern that:

- Have a high differential between wet weather and dry weather flows.
- Have a high baseline level of flow for the number of connections served.

### 02

**IDENTIFY MAJOR I&I SOURCES WITH A VISUAL ASSESSMENT** in regions of concern. Inspections conducted during wet weather are preferred for revealing active infiltration. Otherwise, look for evidence of infiltration (staining, deposition of entrained soil) and pathways for infiltration (cracks, gaps, voids, collapses).

**Manholes:**

- Examine walls.
- Identify staining that indicates inflow between manhole lid and frame.
- Identify high-water marks on the wall indicative of surcharge events.

**Mainlines:**

- Identify structural damage to pipe sections.
- Identify offsets and gaps between sections.
- Identify gaps where service connections penetrate the wall of the sewer main.
- Identify gaps where the main enters the manhole.

**Laterals:** Use visual inspection, push camera inspection, and/or lateral launch inspection to:

- Check for roof drains, foundation drains and runoff drains improperly connected to sewer laterals.
- Check for cracks in lateral and cleanout pipes.

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03

**HONE IN ON SMALLER SOURCES OF INFILTRATION** where justified. Other technologies can help identify pathways for infiltration:

**Electronic leak detection:** Plugging a section, surcharging it and then using an electronic probe to find electrical current paths can help identify sources of infiltration, particularly miniscule ones not detectable by visual inspection.

**Smoke testing:** A portion of a collection system is filled with non-toxic smoke, sealed and pressurized. Leak points are revealed where smoke escapes.

**Dye testing:** Non-toxic dye is added to sewer effluent. Points where dye escapes to the environment indicate pathways for infiltration.

04

**PLAN REMEDIATION.** Focus on the largest sources first. A variety of rehab technologies may be employed:

#### **Mainlines and laterals**

**Point repair:** When the source of I&I is localized in a mainline, mechanical, cured-in-place and spray-applied solutions are options. Resin injection and grout are other alternatives.

**End-to-end rehab:** When multiple points of I&I are found in a section, end-to-end CIPP lining may be warranted. (Mechanical end caps, plus resin injection, grouting or tee-shaped liners at service connections, help prevent the gap between liner and wall from becoming a conduit for I&I.) Other technologies include slip-lining, pipe bursting, spray lining and fold-and-form. In severe cases, dig-and-replace may be warranted.

#### **Manhole**

**Walls and bench:** Lining, spray lining and grouting offer remediation.

**Manhole lid:** A poor fit between manhole lid and frame may require replacement of one or both.

**Lateral connections to mainline:** Resin injection or grout may be used to fill in gaps and voids where a lateral connection enters a sewer main. Cured-in-place tee-shaped liners are another option.