

## COMMON HOME DRAINAGE

### Foundation Drains:

Many homes have special drain pipes installed around the base of the foundation to catch and drain water that runs down the outside of the house. These foundation drains direct water into the sump pit in the basement, where it should be pumped out by a sump pump into the yard. Clear rainwater runoff from foundation drains should never be allowed to drain into the sanitary sewer.

### Gutters:

Rain that falls onto roofs should be directed by gutters and downspouts onto the yard where the excess water can soak into the soil or drain into storm sewers. Gutters should never drain directly into a home's sanitary sewer connection.

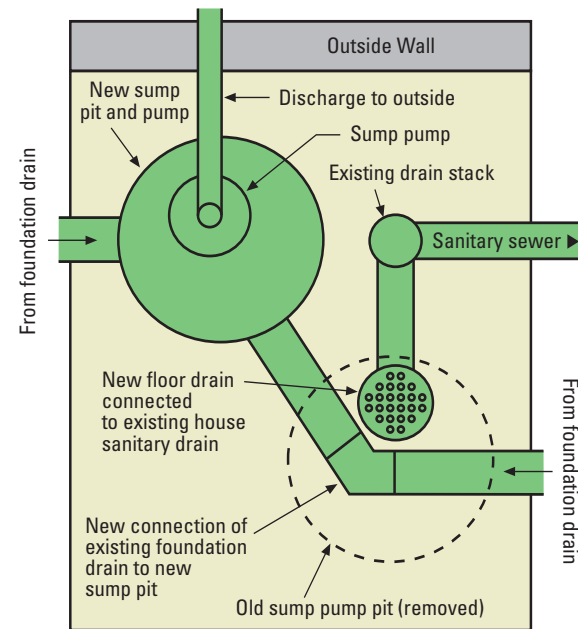
### Sump Pumps and Pits:

The sump pit is a basic feature in the basement floor of most homes. Water is directed to this pit from sources such as your foundation drains through pipes in the floor. If the sump pit drains into the main sanitary sewer line servicing your home, this source of inflow must be eliminated.

A sump pump is designed to fit into a sump pit and pump water out of the pit. Some older homes may need to have a larger sump pit built to accommodate modern pumps. A properly installed sump pump discharges the clear rainwater outside the home, where most is absorbed into the ground and excess water can drain into the storm sewer system.

In some homes, sump pumps were installed to discharge water directly into a drain pipe or the basement sink. This method still allows clear rainwater to enter the sanitary sewer. To redirect your sump pump, a new rigid outlet pipe should be installed to exit through the exterior wall of your basement. This pipe should carry water at least four feet away from the foundation through an above or below ground extension.

After a sump pump is installed, it may be necessary to redirect your foundation drains to the sump pump pit. A new floor drain may need to be installed. The homeowner or plumber must ensure that this drain is only for spills and cleaning and is not the outlet for the sump pit. Your contractor will know what's right for your home.



Inflow and infiltration is a problem that affects everyone in area communities. Clean water is essential, but can cause problems if misdirected around homes and sewers.

Determine if your home is part of the problem. You can stop inflow and infiltration from your home through some quick and easy solutions. Properly installed gutters and a sump pump can direct water away from your foundation, solving most inflow problems. In some parts of Duluth, city grant money may be available to help defray the cost of sump pump installation. Call the City of Duluth Utility Operations at (218) 730-4130 for more information about I & I home inspections.

**Do your part to ensure that your home is not contributing to the problem of sewer overflows in our communities.**

### How do I get started?

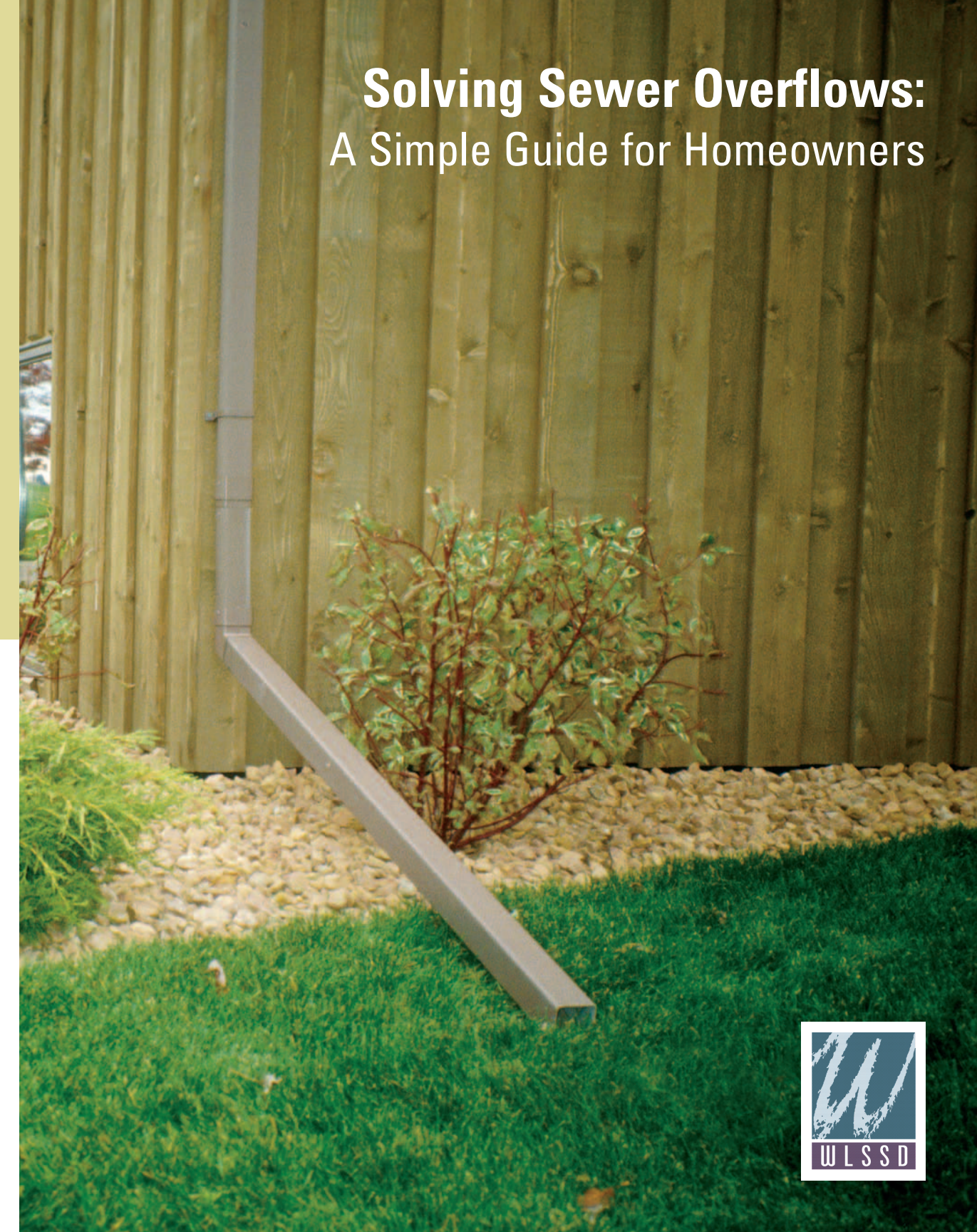
Read this brochure to learn more about I & I and possible solutions. Then, contact your municipal wastewater utility. They will be able to direct you to local programs and information about I&I in your community.

Cloquet .....	(218) 879-6758
Scanlon .....	(218) 879-4578
Duluth .....	(218) 730-4130
Hermantown .....	(218) 729-3625
Carlton .....	(218) 384-4429
Wrenshall .....	(218) 384-3680
Proctor .....	(218) 624-3641
Pike Lake .....	(218) 729-9007
Oliver, WI .....	(715) 394-3426
Rice Lake Township .....	(218) 729-9007
Midway Township .....	(218) 624-7985
Twin Lakes Township .....	(218) 384-4229
Thomson Township .....	(218) 879-6758
City of Thomson .....	(218) 384-3808



**Western Lake Superior Sanitary District**

2626 Courtland Street  
Duluth, MN 55806-1894



# Solving Sewer Overflows: A Simple Guide for Homeowners





## What is inflow and infiltration (I&I)?

The term **Inflow** refers to clear water from rain and snowmelt that improperly drains directly into the sanitary sewer system.

**Infiltration** is a term used to refer to ground water that leaks into the sewer system through cracked or faulty sewer pipes. Together, the terms **"Inflow and Infiltration"** are commonly called **I & I**.

## How can clean water create a problem?

Two sewer systems exist in area communities. The sanitary sewer system is designed to direct household wastewater from sinks, toilets, baths and other building drains to our wastewater treatment plant where it is safely treated and then discharged to the St. Louis River. The storm sewer system is designed to carry snowmelt and rain runoff from streets and parking areas through a separate collection system that discharges directly into creeks, rivers and lakes.

Normally, the sanitary sewer system works correctly and efficiently to carry wastewater from the communities that WLSSD serves. During heavy rainstorms, however, the sanitary sewers rapidly fill beyond their capacity. This occurs when clear water finds its way into the sanitary sewers through inflow and infiltration (I & I), where it

mixes with the untreated sewage. As a result, pipes become filled, and sewage backs up into the basements of private homes and businesses or onto city streets. Eventually, much of the overflow ends up in the St. Louis River and Lake Superior.

## Where does all the water come from?

The largest sources of inflow are individual homes and businesses. In an average home, the roof alone can contribute up to 20,000 gallons of inflow per year. Inflow is a direct cause of sewer overflows and basement backups.

Most homes built before 1970 were designed with drainage systems that are no longer acceptable. Many have foundation or roof drains that direct rainwater straight into the sanitary sewers. Some homes may also have sump pump discharges directed to the sanitary sewer.

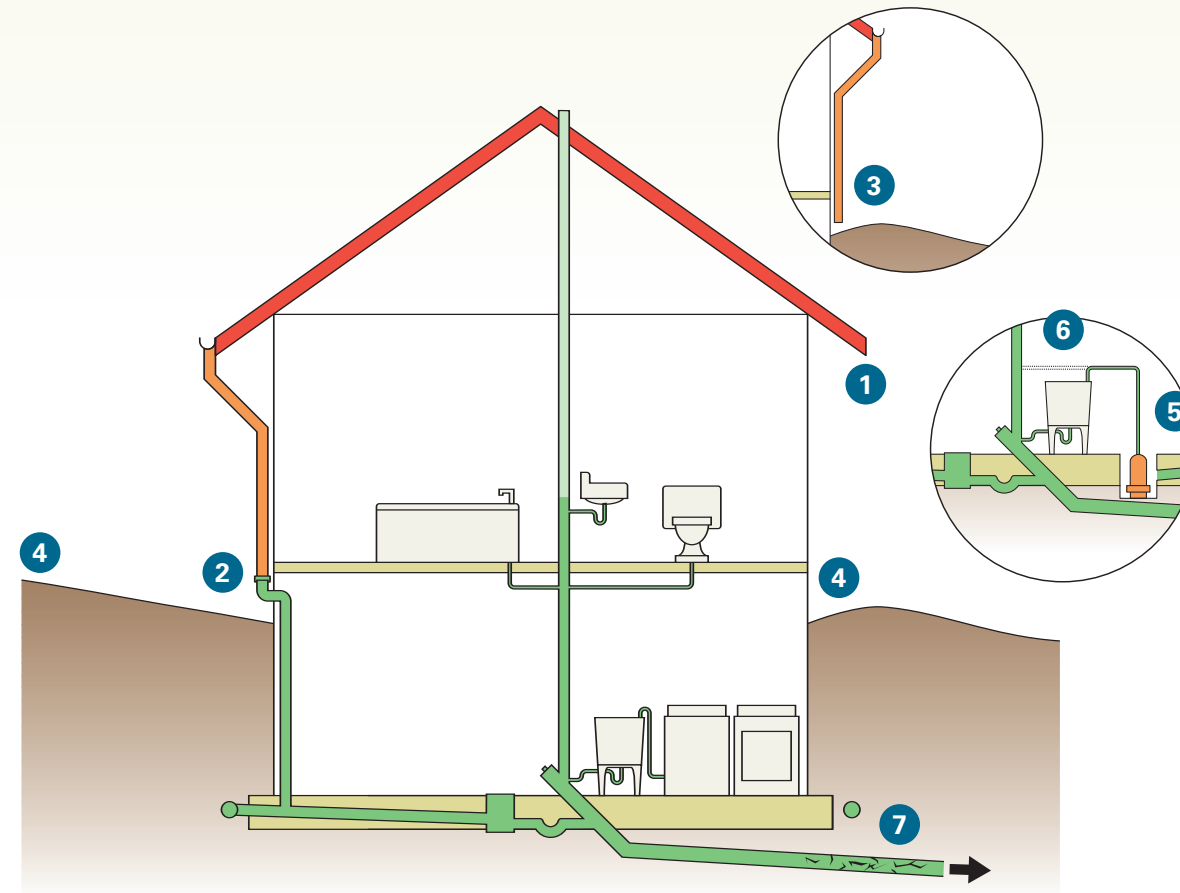
The largest sources of infiltration are private service lines that connect individual homes and businesses to the sanitary sewer system under the street. These lines are often cracked and leak as a result of poor design, installation, age or maintenance.

Clear water runoff does not belong in the sanitary sewer system. As a homeowner, you can help eliminate overflows by preventing clear water from entering the sanitary sewer.

## INCORRECT HOME DRAINAGE

This diagram shows common sources of I & I found around an improperly drained home. These sources of clear water I & I can be easy to fix.

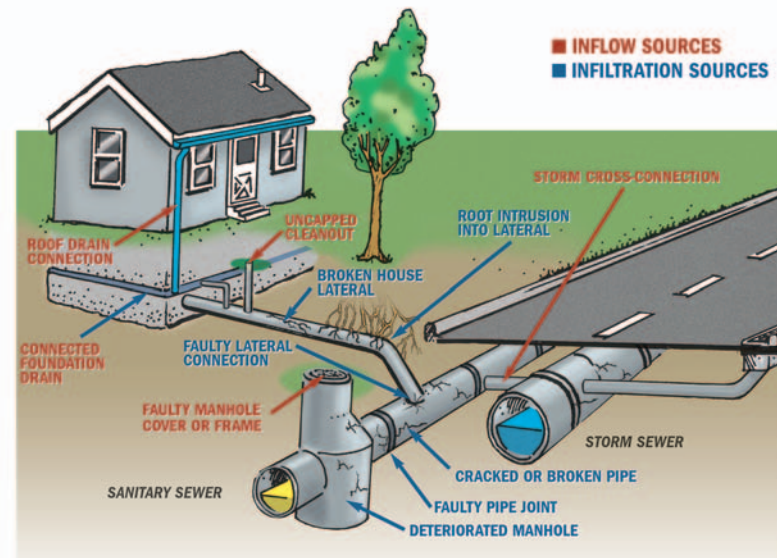
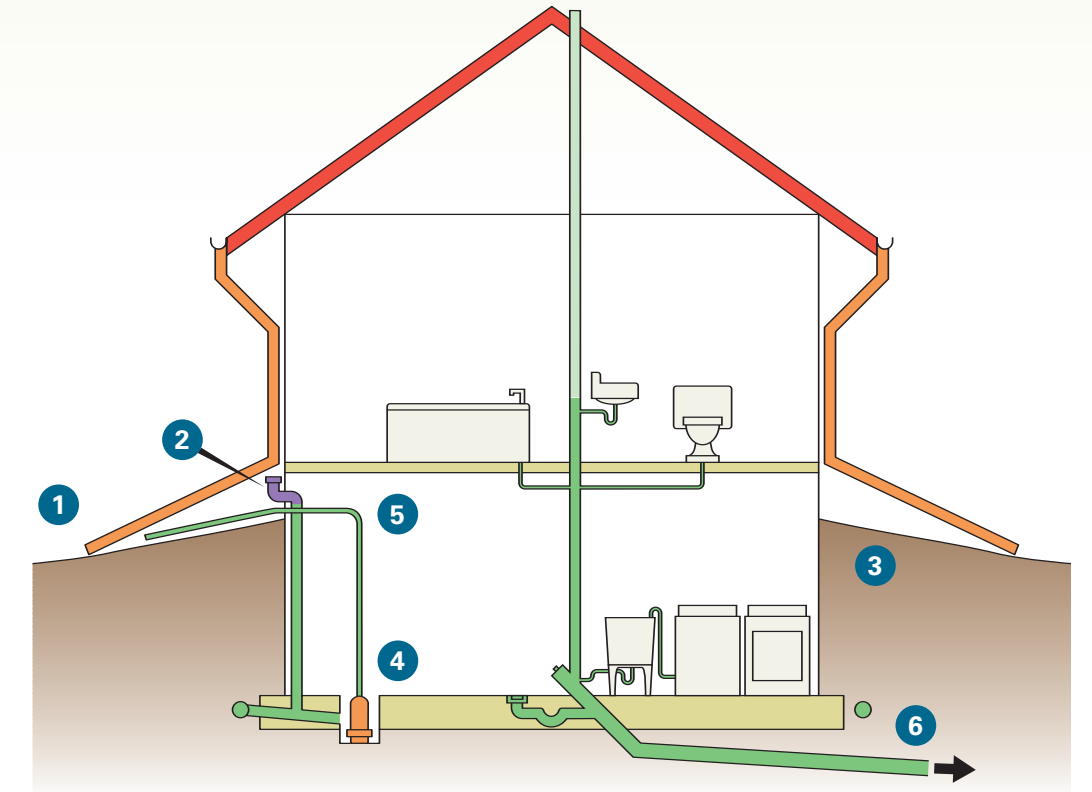
1. No gutter system to direct rainwater out onto the yard.
2. Improper downspout drains directly to the sanitary sewer line.
3. Downspout drains straight down and does not direct water away from the house.
4. Slope of the yard does not direct water away from house and foundation drains.
5. Sump pump outlet drains into washtub that drains into the sanitary sewer.
6. Sump pump drains directly to the sanitary sewer.
7. Cracked home service connection allows ground water to leak into the sanitary sewer.



## CORRECT HOME DRAINAGE

This diagram shows proper home drainage. A properly-installed gutter system and sump pump will keep your home dry and direct water out onto the yard where it won't cause a problem. Correct roof drainage alone will keep most rainwater away from your foundation, a quick and easy solution to many inflow problems.

1. Downspout extensions drain roof water a minimum of four feet from your house.
2. A plug and non-shrink grout seals the sanitary sewer line where the downspout had been connected.
3. Proper grading provides a gradual slope to direct water away from the house.
4. Sump pump installed in sump pit, connected to foundation drain.
5. Sump pit outlet exits through the exterior wall of home and empties at least four feet from the foundation through an above or below ground pipe.
6. Well-maintained and intact home service connection.



## What are the solutions to I & I?

Cities and the WLSSD have regular maintenance programs designed to address I & I problems in the miles of pipes that make up the regional sanitary sewer system.

Homeowners and businesses should have a similar maintenance plan to identify and correct sewer system problems on their property. Improperly connected drains and sump pumps need to be corrected and private service lines need to be repaired.

Learn how to check for and stop inflow in your own home. There are a few simple things you can do to have a positive impact on the water quality in your community.