

# Inflow and Infiltration:

## When Clean Water Causes 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. Meanwhile, the storm sewer system is designed to carry snowmelt and rain runoff from streets and parking areas through a separate collection system and discharges directly into creeks, rivers and lakes.

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

The term **Inflow** is used to refer to clear water from rain and snowmelt that inappropriately 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 referred to as **I & I**.

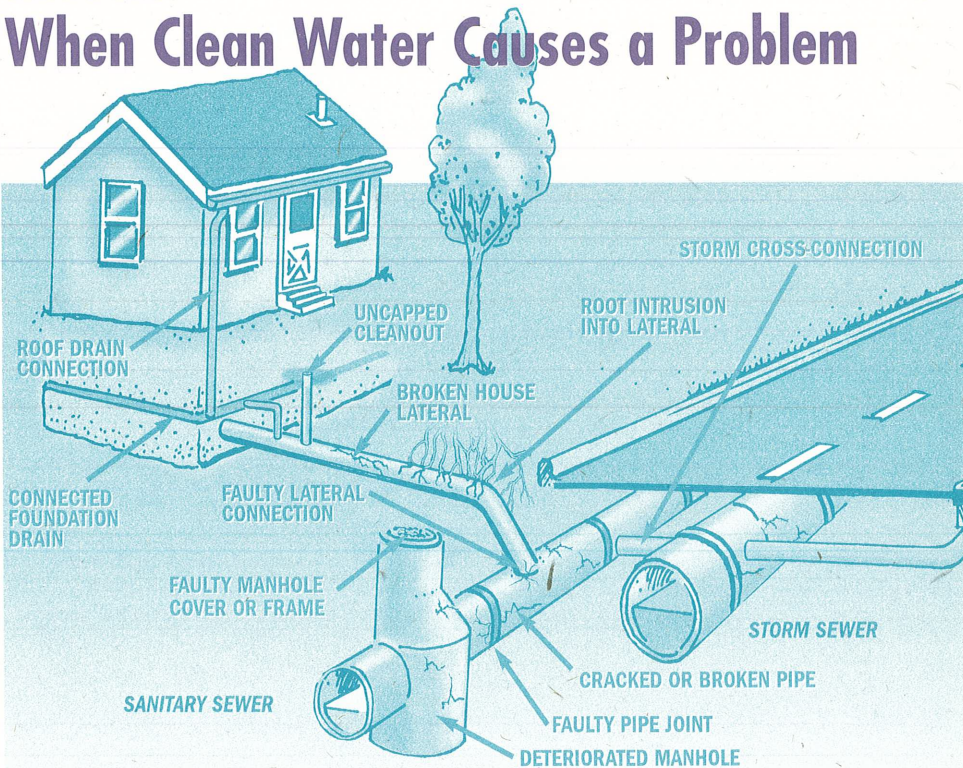
### Why is I & I a problem?

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 designed capacity. This occurs when I & I allows clear water to find its way into the sewers, 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 and eventually onto city streets. 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. An average home can contribute as much as 1,400 gallons of inflow in a typical rainstorm or over a **million**



**gallons** each 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 main sewer system in the street. These lines are often cracked and leak as a result of poor design, installation, age or maintenance.

### 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.

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

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 sump pumps can direct water away from your foundation, solving most inflow problems easily. 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 730-4130 to inquire about I & I home inspections or call the WLSSD Hotline, at 722-0761, for more information on how to make your home part of the I & I solution.

