Inflow and infiltration causes sewage backups into basements throughout the District.

Directing your downspouts out into your yard helps keep your basement dry and reduces the inflow from your home.

Sump pump discharge should go out through the wall into your yard or into a ditch.

The Problem Facing Homeowners

Individual homes are the single largest cause of **inflow**. The main reason for this is age. Dwellings built before 1970 were rarely designed to control inflow. They may have basements that leak and foundation drains that direct rainwater straight into the sanitary sewers. If one home can create over a million excess gallons of water each year, imagine the problem when this number is multiplied by a thousand homes. It's simply too much for our treatment facility to handle. We do have an excellent storm sewer system. Unfortunately, too many homes divert rainwater into the sanitary sewers.

However, there is something you can do about solving the problem. You have a direct effect on the environment, and a few simple changes around your home can help keep the lakes and rivers clean.

What You Can Do

Check your rain gutters and downspouts. This is perhaps the easiest step in reversing the problem of **inflow**. Water needs to be aimed away from your home's foundation so that it can't soak into the footing drains and into the sanitary sewer system. A 1500 square foot home with roof drains connected to the sanitary sewer can add 1,000 gallons per hour to the wastewater flow. This is equal to the normal flow from 60 homes. To correct this problem, make sure all downspouts are pointed out into your yard, with the drain at least six feet from the outer edge of your house. This serves a dual purpose: keeping the sanitary sewer system free of excess water and keeping your basement dry.

Make sure your yard slopes away from your house. A little landscaping not only adds aesthetic value to your home, but it keeps it dry as well. If your yard slopes away from the edge of your home, water will run into the yard and not the basement. Rain draining towards the home will flow along the foundation and enter either directly into your basement, or go from the drain tiles to the sump. Unless this water is channeled away from the sanitary sewers, you are creating inflow. Also, when landscaping, remember to add a layer of plastic and crushed stone around the outer walls. This discourages weed growth and will aim excess water into the yard.

Inspect your sump. The sump system collects the water leaking into your basement and the water from the drain tiles. In most older homes the sump is designed to overflow into the home's sanitary sewer. The correct installation of a sump pump controls this source of **inflow**. If your home already has a sump pump, it must properly divert the water out of the sump. A correctly installed sump pump does not drain into the sanitary sewer, but instead sends its clean water back to your yard. The sump pump discharge piping should be rigid plastic pipe and pass the water through the outside wall and onto the lawn. If there is a connection between the sump pit and the sanitary sewer system, it must be blocked. The water that collects here is clean, and it should not be sent to WLSSD for treatment. **If you're unsure of your sump pump connections, call your City Building Inspector or a private contractor.** Many times the first consultation is free.

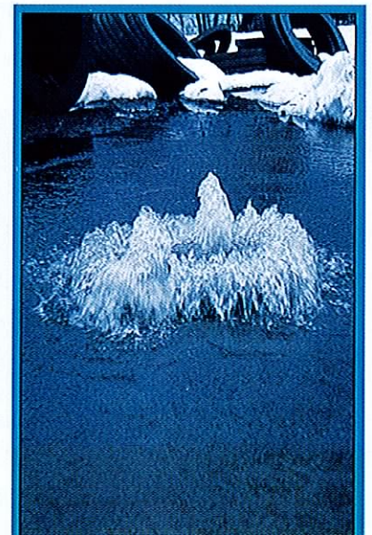
The Problems Belong to Both of Us

Inflow and Infiltration are polluting Lake Superior and the St. Louis River. I & I pushes too much water through the system and sends untreated water into the environment. If the problems are not corrected, the results will be catastrophic. We are doing all we can. The rest is up to you.

Western Lake Superior Sanitary District
2626 Courtland Street
Duluth, MN 55806-1894

The Problems of Inflow and Infiltration

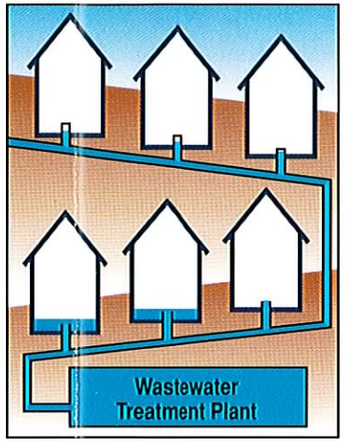
Money DOWN the Drain



Inflow and Infiltration. When Clean Water is a Problem.

The problems of Inflow and Infiltration belong to everyone. Excess rainwater can flow from one house to the next, causing trouble for homeowners as well as WLSSD.

Everyone agrees that water is vital. We use it in work and in play, and, most importantly, we need it to live. But when there's too much water, it creates problems for all of us. A look at your community's two sewage systems will help us understand the problem.



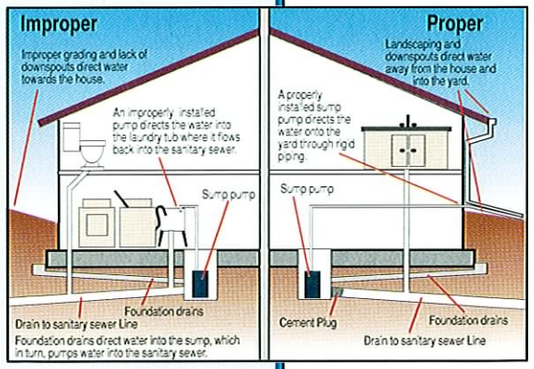
One type of sewer, the sanitary sewer system, directs household wastewater from sinks, toilets and baths to our wastewater treatment plants where we remove pollutants. The other sewer system, the storm sewers, are designed to direct runoff through a separate system directly into creeks, rivers and lakes.

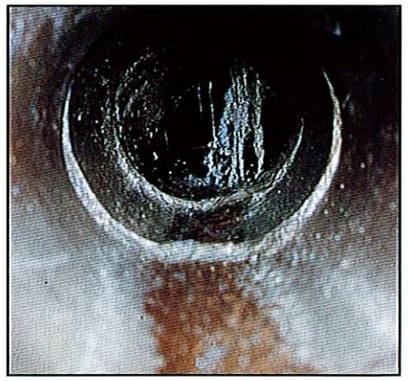
The first problem affecting these sewer systems is INFLOW — excess rainmater in the sanitary sewer system. When it rains, water that should be channeled into a storm sewer system is misdirected. Water from roofs, foundation drains and sump pumps flows directly into the sanitary sewer system. The problem is a large one. An average home can produce as much as 1400 gallons of inflow in a typical rainstorm. Our plant handles an average of 41 million gallons of wastewater per day, and that amount can more than triple after an intense rainfall. During these times of inflow, the amount of water exceeds plant capacity. Sanitary sewers back up, overflowing into streets and basements, causing obvious headaches for the homeowner. Raw sewage on the streets drains into the storm sewers and into the lake.

INFILTRATION is the second problem faced when there is too much water. Ground water, from excess rain or high water tables, can leak into the sewer system through old or defective pipes; once again causing overflows into the streets and basements.

Two problems creating pollution in our waterways—Inflow and Infiltration (I & I). Two simple solutions: you and the Western Lake Superior Sanitary District (WLSSD).

Improper runoff feeds into the sanitary sewer and not the storm sewer.





Infiltration occurs when ground water leaks into the sanitary sewer through old or defective pipes.

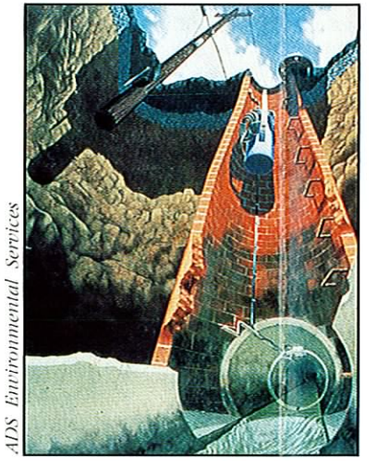
The Role of WLSSD

Keeping the water clean has always been a primary goal of WLSSD. But we cannot do it alone. We work with community leaders to determine where and how improvements can be made.

- WLSSD has mobilized city and social leaders to recognize that I & I is a serious hazard to the people who live here and to the environment as a whole.
- We've begun training and awareness operations to focus public attention on I & I.
- Working with local governments, we have made reporting all overflows an enforced requirement.

WLSSD has also worked to improve the technologies involved in the control of these problems.

- We have installed computerized flow meters that measure the amount of water at any point in the sewers at a given time. These flow meters show where the largest problems lie, and where to go first when planning improvements.
- Pump stations have been upgraded to handle the increased amounts of wastewater from the growing communities.
- We've installed miles of new sewers to meet the needs of a growing community. However, for each of these additions, we need to reduce I & I. We cannot bring sewers to new homes without correcting present problems.
- In the City of Duluth, the sewer system has been inspected using video cameras looking for signs of infiltration. This allows for early detection and early resolution.



ADS Environmental Services

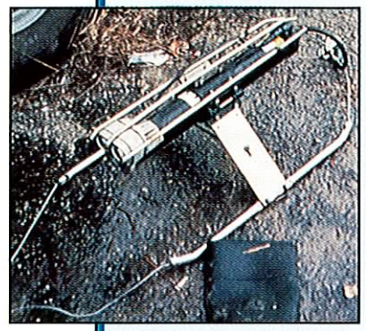
Computerized flow meters help the WLSSD measure the flow at key locations in the sewer system.

WLSSD and the Future of I & I

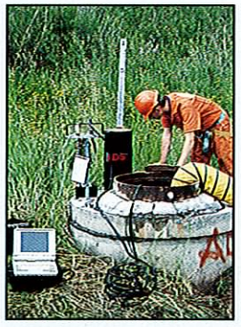
Controlling a problem involving hundreds of miles of sewers, hundreds of thousands of people and millions of gallons of water takes special long-range planning.

WLSSD is keying in on low-cost solutions and long-term maintenance. Complete replacement of current sewer systems is neither economically feasible or physically possible. Experts are working to anticipate governmental standards and controls so that they can be "ahead of the game" in wastewater management. Eventually, existing flow meter and television technology will be able to pinpoint specific homes and other buildings contributing to the inflow problem. We are working with city leaders to best utilize the resources available and regulate the problem in the most efficient way possible.

WLSSD has taken all of these measures as part of the solution to I & I. But more needs to be done. This is where you come in.



Inspecting sewer pipe with special video cameras helps WLSSD and cities locate leaks inexpensively without digging.



The latest technologies and continual upkeep help monitor I & I, but a solution requires community-wide effort.