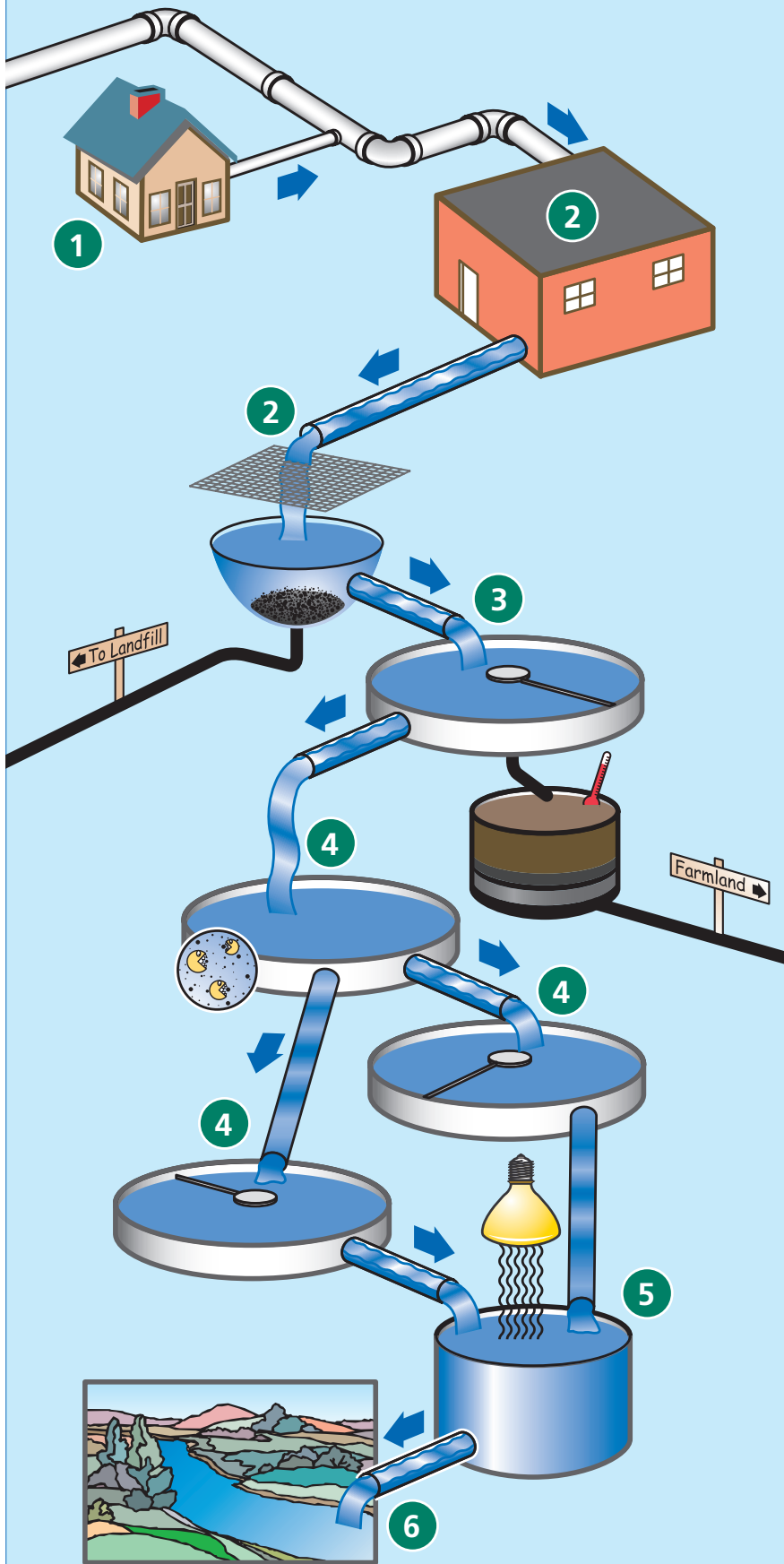




# Where does the water go? Welcome to “Wastewater 101”

You’ve turned off the faucet on your sink or pushed the lever on your toilet and your unwanted water disappears. Good riddance. You don’t have to worry about it, it’s gone. But do you really know where it goes and what happens to it?

In very simple fashion, let’s follow the process and learn the basics. Welcome to “Wastewater 101.”



## 1 Leaving your house

Regardless of their locations within your house, all the drains from your sinks and toilets funnel down to a main outlet in the basement or below your house. A pipe, usually 4 inches in diameter, carries the wastewater 12 inches or more below ground out to the street where it connects to the City’s line, usually about 8 inches in diameter. Until reaching the main line connection, any leaks, blockages or other drainage issues are the property owner’s problem, not the City’s.

## Heading toward treatment

The City’s main sewer lines that run under streets are like the branches of a tree. The skinnier 8-inch lines collect the wastewater from hundreds of buildings, converging with other main lines and flowing into larger pipes. The pipes continue to converge and get larger until eventually feeding into five tree-trunk 30-33 inch interceptor lines that bring the water to the treatment plant at 920 S. Boise Avenue. The present plant was originally constructed in 1960.

## At the plant

As you’d expect, the process becomes far more complicated at the treatment plant. Basically, there are four stages; preliminary treatment, primary treatment, secondary treatment and disinfection.

## 2 Preliminary Treatment

The arriving wastewater flows through screens and grinders to remove the solids that have arrived - rags, coins, marbles, Happy Meal toys and other items that find their way down the sink drain or into the toilet bowl. (Ever flushed a goldfish??). These solids are separated out, ground up and sent to a Dumpster, eventually winding up in the county landfill like your household trash.

Small solid particles like sand and gravel are removed in an aeration tank. This grit settles to the bottom where it’s collected, stored and dried before it too heads for the landfill. Removing the grit is critical not only for the water quality process but to prevent damage to the pumps and other equipment during the treatment process.

## 3 Primary Treatment

Next, the water flows into large, open concrete-walled clarification basins. During its 3-hour visit there, more material will settle to the bottom of the tank while lighter material and non-water soluble liquids like cooking oil will float to the top. The bottom sludge moves into the anaerobic digestion tank where it is heated to about 95 degrees and remains for about a month while a biological process digests the organic material. It’s then collected, hauled away and used as soil conditioner on farmland.

Meanwhile, a rotating arm at the top of the tank skims off and collects the floating materials and fluids. Then those materials also go to the digester.

## 4 Secondary Treatment

The cleaning process continues with the water entering aeration basins. Here, it is exposed to hungry bacteria that digest and remove the unwanted organic pollutants. This biological process greatly accelerates the breakdown of the pollutants. After six or so hours of aeration, the mixture of bacteria and wastewater flow into two more settling clarifying basins. Eventually, the bacteria used to digest the pollutants becomes sludge, sinks to the bottom of that tank and joins the incoming sludge in the anaerobic digestion process and also becomes farmland conditioner.

## 5 UV Disinfection

At this point, the water has become pretty clean, having spent 6-8 hours going through the various processes. (Remember, this is “Wastewater 101”- just the basics and very simplified.) In the final step, the water flows down a concrete channel where it passes through several racks of submerged lights. The ultraviolet rays of the lights disinfect the water. This process replaces treatment by chlorine and eliminates the dangers and costs posed by storing large quantities of the gas.

## 6 And finally....

The treatment plant sits adjacent to the Big Thompson River. That’s no coincidence. After flowing through the disinfection lights, the treated water flows about 50 yards and is returned to the river. Most of Loveland’s fresh water originates from the Big Thompson northwest of town, where it enters a different type of treatment plant and is processed for your drinking pleasure.

Throughout the wastewater treatment process, the water must meet about two dozen quality tests. In every case, Loveland’s wastewater treatment process meets or exceeds the quality requirements before the water is returned to the river, about 5.5 million gallons a day.

## Common sense shouldn’t go down the drain

Common sense sometimes takes a brief timeout when it comes to materials that make their way into the sewer system. It’s amazing what some people flush.

These items can clog your property’s pipes, the City’s pipes, damage treatment plant equipment and make meeting wastewater treatment quality requirements more difficult. The result is money out of your pocket, directly or indirectly.

**Bottom line: If it’s large, solid and isn’t biodegradable, don’t flush it. Here are some common items that should not go down the drain:**

- |                      |                           |                      |
|----------------------|---------------------------|----------------------|
| • Tampons            | • Cotton swabs            | • Grease             |
| • Disposable diapers | • Cotton balls            | • Kitty litter       |
| • Nursing pads       | • Paper and cardboard     | • Coffee grounds     |
| • Mini- or maxi-pads | • Hair (in large amounts) | • Egg shells         |
| • Wipes of any kind  | • Small toys              | • Pesticides         |
| • Unused medications | • Razor blades            | • Insecticides       |
| • Bandage wrappers   | • Needles                 | • Flammable          |
| • Condoms            | • Oil                     | or explosive liquids |



**Do yourself and your wallet a favor—think twice before you flush.**



## Odor reduction efforts continue

Odor-free sewer plants simply don’t exist. Nor do quiet airports or highways without traffic accidents. Loveland’s Wastewater Treatment Plant has and continues to spend a great deal of effort and money to minimize odors.

In areas surrounding the treatment plant, odors sometimes exist. Sometimes a sweet musty smell emerges, caused by the biological treatment process. While noticeable, it’s typically not too unpleasant. And sometimes, the odor of sewage is present as it enters the plant from underground pipes and is exposed to the air, often unpleasant.

Quantity of incoming wastewater, atmospheric pressure, outdoor temperature, wind direction and velocity and other factors can affect whether odors occur and whether they are noticeable.

During the past 5 years, about \$10 million has been spent on plant expansion and improvement due to community growth and water quality requirements. Another \$6-10 million will be spent on plant projects during the next several years. Odor control is a consideration of every plant project, with some projects aimed exclusively at odor control. Upcoming odor control efforts include installation of a special biological filter at the flow convergence area where wastewater enters the plant, plus 2-stage chemical scrubbing system for use during the first treatment process. These upgrades should be in operation by summer, 2008.

Wastewater plant officials emphasize the operation’s commitment to continued odor control. Odor frequency or intensity has not increased during recent years, despite the increased effluent from the City’s growth. But odors tend to be more noticeable now due to new development nearer the treatment plant. The plant, originally constructed in 1960, is located at 920 S. Boise Ave.