

Sanitary Sewer Overflows: Lexington, Kentucky Remedial Measures and Helpful Tips

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A sewer system is an underground network of pipes that carries sewage and wastewater from homes and businesses to a treatment plant. There are two types of sewer systems. Modern sanitary sewer systems are designed to be a separate network of pipes and infrastructure from those that manage stormwater; these are known as separate sanitary sewers. Some municipalities still have combined sewers that manage both sanitary sewage and stormwater in the same pipes; these are known as combined sewers.

Under high-flow conditions, combined sewer systems are designed to overflow into nearby waterways, which results in the discharge of untreated sewage. This is known as a combined sewer overflow (CSO). In a separate sanitary sewer system, overflows are not a planned design component, but untreated sewage can still be discharged in what is called a sanitary sewer overflow (SSO). SSOs can be caused by power failures or bypasses of the wastewater treatment plant or pump stations, spills, diversions, leaks, broken or damaged lines, cross-connections, or blockages. However, SSOs happen most often during periods of sustained, heavy rainfall that can cause water to enter sanitary sewer systems by means of inflow (stormwater) or infiltration (groundwater) through cracks, holes, or damaged joints in pipes.

SSOs are an important concern because they can potentially result in the discharge of the contents of the sanitary sewer (raw sewage), which can ultimately end up in local waterways (Figure 1). Exposure to untreated sewage can lead to illness from pathogens that are often present in human waste (e.g., *E. coli*, norovirus, hepatitis A). Sewage also contains significant concentrations of nutrients (specifically nitrogen and phosphorus) that can lead to algal blooms or eutrophication (nutrient enrichment



Figure 1. A sanitary sewer manhole in a separate system overflowing into a nearby storm sewer that discharges directly to a local waterway.

that can alter ecosystem processes) in downstream waterways. SSOs can also occur in the basements or crawlspaces of private residences when a sanitary sewer system's contents back up into the lines of the home.

When an SSO is actively occurring, it is important to avoid impacted areas to prevent exposure to sewage and potentially harmful pathogens. If you use waterways for recreation, such as kayaking, it is also important to be aware of potential upstream SSOs. Avoid entering waterways

downstream from an SSO during and after overflow events. If you witness an active SSO or see evidence of a recent SSO (i.e., water flowing from a manhole, toilet paper residue, displaced manhole lid, smell of sewage, or grey water), please notify the appropriate local authority in your municipality (local urban government hotline or police non-emergency line). It is also important to communicate these precautions to neighbors and community members who may not be aware of the issue.

Helpful Tips

There are several easy ways that individuals can do their part to help address SSOs:

1. Only flush appropriate items down the toilet (Figure 2.) Do not flush anything down the toilet other than water, toilet paper, and human waste. Items listed in the non-flushable list should not be put down the sink drain either, even if a garbage disposal is present.
2. Properly dispose of fats, oils, and grease. Proper disposal of fats, oils, and grease can be accomplished by cooling and collecting them in old glass containers or cans that can be disposed of in the landfill when full. Any remaining residue can be wiped from the cooled pan with a paper towel and disposed of in the garbage. Minimize the amount of fats, oils, and grease that enters your sink, because it ultimately ends up in the sanitary sewer system, where it can solidify and cause clogs.
3. Disconnect any sump pumps or downspouts that may be connected to your home's sanitary sewer lateral line, which connects to the municipal sewer system. Water from a sump pump or downspout does not need to be disposed of in a sanitary sewer. Explore options for discharging your sump pump or downspouts away from your home into a grassy, low-slope part of your yard that slopes away from your home, where it can infiltrate into the soil. Water should be discharged well away from your home to ensure it does not flow back toward your foundation.
4. Homeowners should be aware of the age and condition of their lateral lines. The maintenance and condition of the lateral lines is the responsibility of the homeowner. Depending on the age and material of these lines, they can develop cracks, failing joints, corrosion, or other structural issues that compromise the integrity of the lateral line for transporting sewage from the home. Sewage that leaks from these lateral lines can be a significant source of bacteria and nutrients into local groundwater, which can often find its way into surface water resources. Also, rainwater

can enter the sanitary sewer system through these cracks and overload the system. Having a plumber inspect the condition of your lateral lines is a good step toward investigating this potential issue.

5. Report any active SSO to the appropriate authority in your municipality to ensure that it is documented and addressed in a timely manner.

FLUSHABLE

Water

Toilet Paper

Human Waste



NON-FLUSHABLE

Wipes (Even If Labeled "Flushable")

Disposable Mop Heads

Disposable Diapers

Feminine Hygiene Products

Condoms

Paper Towels

Napkins

Fats, Oils, and Grease

Egg Shells

Coffee Grounds

Nut Shells

Medications

Vitamin Supplements

Bandages

Needles or Syringes

Dental Floss

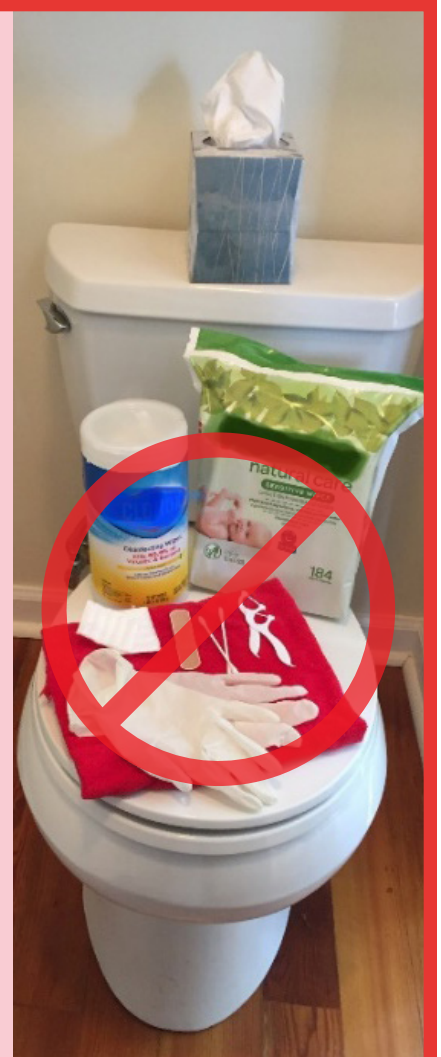


Figure 2. Only flush appropriate items (above). Use a trash can to dispose of other items (below).

Addressing the Sanitary Sewer Overflow Issues in Lexington, KY

In 2006 the city of Lexington was cited by the United States Environmental Protection Agency (US EPA) and the state of Kentucky for violations of the Clean Water Act associated with SSOs. As a result, Lexington entered into a consent decree in 2011 that requires sanitary sewer system upgrades, management/operational changes, education efforts, and increased monitoring and reporting. The city is currently taking remedial measures to address the issue. Specific details on Lexington's consent decree can be found online at <https://www.lexingtonky.gov/epa-consent-degree>. Maps have been developed and made public to identify known SSOs in the city of Lexington, and can be found online at <https://bit.ly/2Y92W2N>.

The city of Lexington is taking a multifaceted approach to addressing the SSO issue. The general approach is to replace sewer lines and upgrade the capacity of the sanitary sewer system (Figure 3). The city is also installing wet-weather storage tanks (Figure 4) to handle excess loads during prolonged, intense rainfall events. The wet-weather tanks can store raw sewage and allow for later treatment, when sewer capacity has recovered from the event. The final major component of



Figure 3. A staging yard for a sewer line replacement project in the Wolf Run Watershed.

the city's approach to addressing the issue is through public outreach and education. It is important that individuals do their part to address their potential impact on the sanitary sewer system by following the guidance presented within the Helpful Tips section of this publication. There are multiple resources available online and through partnering organizations to raise awareness and provide details on

steps citizens can take to directly help with the issue.

Areas with documented SSO issues in Lexington, Kentucky, are identified with warning signs that provide information on the potential hazards associated with SSO exposure (Figure 5). If you witness an active SSO in Lexington or see evidence of a recent SSO, please notify LexCall at 311 or (859) 425-2255.



Figure 4. A wet-weather storage tank designed to handle excess sanitary sewer load during high-flow events.



Figure 5. A warning sign notifying residents of the health risks associated with SSOs.

References and Further Reading

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