

Pipeline



Small Community Wastewater Issues Explained to the Public

First Aid for a Flooded Septic System

It's raining, it's pouring. . .and rivers are out of their banks, levees are bursting. Your back yard is now a lake – and somewhere out there is your wastewater treatment system! This issue of *Pipeline* will provide recommendations for homeowners for keeping their septic system functioning before, during, and after flooding situations. Be aware of flood hazards no matter where you live, but especially if you live in a low-lying area, near water, or downstream from a dam. Even very small streams, gullies, creeks, culverts, dry streambeds, or low-lying ground that appears harmless in dry weather can flood. Flash floods can occur in these areas with or without such typical warnings as rain clouds or heavy rain.



If your household uses a typical septic system, heavy rains and floods can halt its ability to treat wastewater from your home. When rainwater or flood waters pond over the drainfield, there is no place for wastewater from the household plumbing to drain because the drainfield and soil beneath are saturated, and your entire system can fail.



Flooding. Canton, NC, September 18, 2004 – Photo by Leif Skoogfors/FEMA Photo.

Recent national events, such as the flooding devastation brought about by Hurricane Katrina in the southern U. S. have prompted many homeowners to consider how they can protect their family, home, and wastewater treatment system in case such a situation should occur in their area.

While your major concern may be about your onsite treatment system, it is important to remember that if a septic system has been flooded, nearby wells may also have been inundated. Use

an alternate drinking water source until you can test and disinfect your water supply. Your local health department may have additional information and warnings. It is always wise to check in with them when the normal functioning of your septic system is in question.

Drainfields need to breathe

A traditional individual home septic system has two main components. A septic tank holds about one to two days of normal water use from the house and

traps solids. A drainfield receives the partially-treated septic tank effluent and discharges the effluent below ground into the natural soil for final treatment and dispersal. Where site conditions are suitable, subsurface soil absorption is usually the best method of wastewater dispersal for single dwellings. It is simple, stable, and low cost.

A typical drainfield is a series of trenches or a bed lined with crushed stone or gravel and buried one to three feet below the ground surface. Perforated pipes or drain tiles run through the trenches to distribute the partially-treated wastewater through the aggregate. The wastewater is treated by the soil as it eventually percolates down to the ground water.

Proper septic system performance relies on the soil's ability to treat and disperse wastewater. Under normal conditions, the soil is unsaturated, thus aerobic (that is, contains oxygen), and able to properly treat wastewater by removing pathogens and other contaminants. When the area of your yard where these drainfields are buried becomes waterlogged, the soil becomes anaerobic, causing the septic system to malfunction.

When drainfields are saturated, contaminants from the partially treated wastewater can enter ground and surface waters. In addition, when the water can't flow out of the septic tank to the drainfield because of these flooded conditions, the water backs up into the house.

If your drainfield area is flooded or very saturated, you might notice some of these signs indicating that your septic system is in distress:

- Drains in the house will flow slowly
- Toilets drain slowly or sound strange when flushed
- Water may back up into floor drains in the basement.

The drainfield was designed to accept the amount of water normally discharged from the house. When additional water from rain, snow, or flooding is added to the drainfield, its ability to handle household water becomes seriously limited. See figure 1.

Before the flood

A well-maintained septic system is better able to withstand the stresses of heavy rains or flooding, so it is recommended to keep the system pumped and in good working order at all times.

In the event that you are forewarned of impending flooding, you should take these steps to minimize the adverse

effects of floodwater on your septic system:

1. Seal all possible points of excess flow to the system. If possible, seal the manhole and inspection ports to keep excess water out of the septic tank.
2. Turn off the pump at the circuit box before the area floods. If you have a pump in the lift station of a mound system, turn off the electricity. (Don't forget to turn the pump back on before you use the system again.) If possible, remove the pump from the tank to prevent sediment damage.
3. Waterproof all electrical connections to avoid electrical shock or damage to wiring, pumps, and the electrical system.

During a major rain or storm

While the storm is in progress, homeowners are advised to eliminate all non-essential water use and flush toilets as little as possible. If the drainfield becomes covered with water, do not use the system at all and avoid contact with any standing water that may contain sewage.

After the storm

Under flooded conditions, do not have the septic tank pumped. Pumping it out could cause the tank to float out of the ground, damaging the inlet and outlet pipes. The tank is not really the problem; it's the saturated soil around the drainfield. (Be aware that a recently installed system may pop out of the ground on its own since the soil has not had much time to settle and compact around it.)

The best thing you can do is to avoid using the system if at all possible, allowing time for the water to recede and the soil around the drainfield to dry out.



Pipeline

NESC Assistance. Solutions. Knowledge.

Pipeline is published quarterly by the National Environmental Services Center at West Virginia University, P.O. Box 6064, Morgantown, WV 26506-6064

Pipeline is funded through a grant from the U.S. Environmental Protection Agency, Washington, D.C.

Steve Hogue — *Project Officer*
Municipal Support Division,
Office of Wastewater Management

National Small Flows Clearinghouse
West Virginia University, Morgantown, WV

Dr. Richard Bajura — *Interim Executive Director*
Marilyn Noah — *Editor*

Clement Solomon — *Technical Advisor*
Jennifer Hause — *Technical Advisor*

Andrew Lake — *Technical Advisor*

John Fekete — *Senior Graphic Designer*

Jamie Bouquot — *Graphic Designer*

Permission to quote from or reproduce articles in this publication is granted when due acknowledgement is given. Please send a copy of the publication in which information was used to the *Pipeline* editor at the address above.

Some images in this issue © 2005-2006, www.clipart.com and www.photos.com.



an equal opportunity/affirmative action institution

ISSN 1060-0043

The contents of this newsletter do not necessarily reflect the views and policies of the U.S. Environmental Protection Agency, nor does the mention of trade names or commercial products constitute endorsement or recommendation for use.



Printed on recycled paper

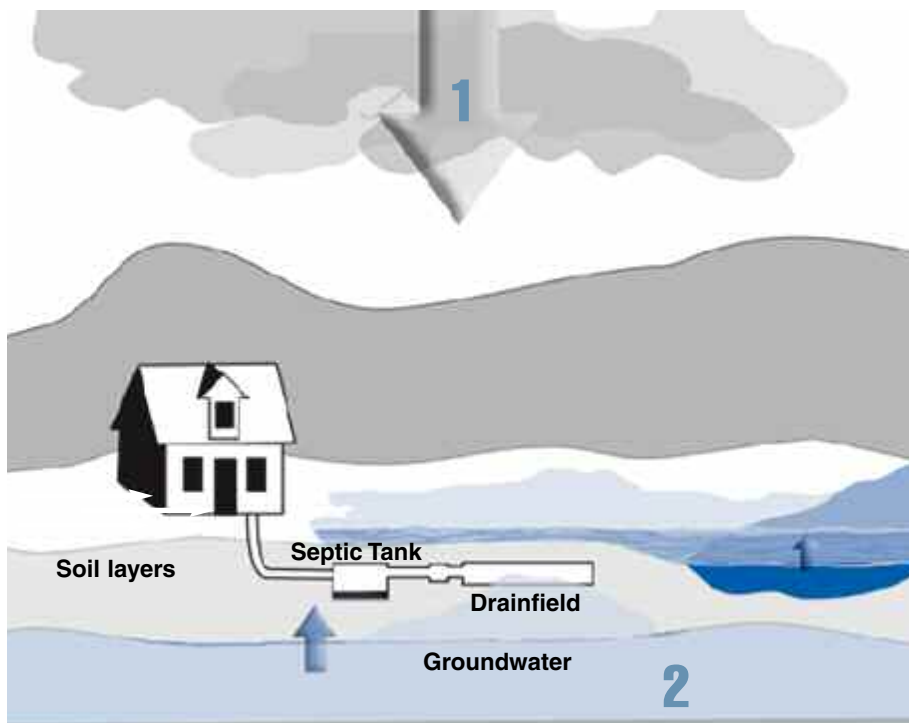


Figure 1

Septic system flooding may occur from any of these sources: 1) Excessive precipitation; 2) Rising local streams, waterways, and groundwater.

The less water sent to the system the better off the system will be. Several ways to reduce water use include:

- Don't send basement sump pump water into the septic system.
- Re-route water from roof gutters away from the drainfield area.
- Don't use the dishwasher or garbage disposal.
- Reduce the number of showers or baths. Consider one bath or shower every other day per person.
- Don't do laundry at home. Wash clothes at a laundromat if possible.

Additional suggestions for flooded systems:

- Homeowners should plug all drains in the basement and drastically reduce water use in the house.
- Do not dig into the tank or drainfield area while the soil is

still wet or flooded. Avoid working around the drainfield with heavy machinery while the soil is wet. These activities will ruin the soil's ability to treat the effluent.

- The floating crust of fats and grease in the septic tank may lift up and block the outlet tee. If the septic system backs up into the house, first check the tank's outlet for blockage.
- Avoid contact with any electrical devices that are part of the system until they are dry and clean.
- Aerobic plants, upflow filters, trickling filters, and other media filters can clog with mud and sediment brought in with flood waters. These systems must be washed and raked before putting them back in use.
- Have your onsite wastewater system professionally inspected and serviced if you suspect damage.

In the event that you and your family had to evacuate the premises, certain requirements must be in place before you can move back in. Check with your local health department to make sure the advisories have been lifted.

With a little bit of common sense, you and your septic system should weather the storm. By following some of these tips, you should be able to prepare, respond, and recover from a flooding situation with your onsite wastewater treatment system still operational. The drainfield may still be saturated and have insufficient percolation capacity for several weeks and the effluent might pond on the surface. As the floodwaters recede, the system should drain and begin to function properly. These adverse conditions should gradually correct themselves.

Additional sources

Winter 2003 *Pipeline* "Preparing for the Unexpected: An Assessment Process for Small Wastewater Systems," Volume 14, No. 1.

"Septic Systems and Flooding" at http://www.epa.gov/safewater/faq/emerg_septic.html. (Accessed 5/16/06)

Federal Emergency Management Administration's Website on Floods: <http://www.fema.gov/hazard/flood/index.shtm> (Accessed 6/20/06)

Reprint Info

Readers are encouraged to reprint *Pipeline* articles in local newspapers or include them in flyers, newsletters, or educational presentations. Please include the name and phone number of the National Environmental Service Center (NESC) on the reprinted information and send us a copy for our files. If you have any questions about reprinting articles or about any of the topics discussed in this newsletter, please contact the NESC at (800) 624-8301.

Related Resources Available



How to Keep Your Water Well

SFPLNL30 • \$0.40

Wastewater Treatment Protects Small Community Life, Health

SFPLNL06 • \$0.40

Alternative Household Cleaning Solutions

GNFSPE109 • \$0.35

Preventing On Lot Sewage System Malfunctions - Fact Sheet

WWFSPE70 • \$0.80

Help Us Protect Our Septic System and Keep Our Groundwater Clean.

WWPSPE94 • \$1.00

To order any of the following products, call the National Environmental Services Center at (800) 624-8301 or e-mail nsfc_orders@mail.nesc.wvu.edu. Shipping charges will apply.

To learn more about these and other products, visit our Web Site at www.nesc.wvu.edu/nsfc_products.htm

NESC Assistance. Solutions. Knowledge.

NONPROFIT
ORGANIZATION
U.S. POSTAGE PAID
PERMIT NO. 34
MORGANTOWN, WV

National Environmental Services Center
WVU Research Corporation
West Virginia University
P.O. Box 6064
Morgantown, WV 26505-6064
NESC