

Roanoke County

Stormwater Guide for Homeowners

April 2023



From Storms
TO STORMWATER

From Storms to Stormwater: Prepare for the Aftermath

Spectacular storms rage across the Roanoke Valley from time to time, and they often bring dramatic lightning, damaging winds, and excessive rainfall. Of these three, excessive rainfall probably does the most damage in the form of the resultant flooding that often occurs. The following information is provided from the Department of Conservation & Recreation (DCR), Division of Dam Safety and Floodplains.

FLOODING

People often associate flooding with major storms like hurricanes and northeasters, but flooding can occur anywhere it rains. In recent years, some western Virginia communities, including areas in Roanoke County, have experienced severe flooding following heavy rain to the extent that residents had to be rescued from their homes or vehicles, buildings suffered damage, and roads had to be closed due to their impassability.¹

INSURANCE

The single most important thing you can do to protect yourself and your home is to buy flood insurance. Why? Because “flooding is the most common and costly natural disaster. All homes have some flood risk yet only 3% of Virginians have flood insurance. According to the National Flood Insurance Program, 1 inch of flooding can cause upwards of \$25,000 in damages to a home. That’s a cost few Virginians can afford.”¹

According to DCR, “homeowners and renters insurance policies typically do not cover flood damage. Because it takes 30 days for flood insurance policies to go into effect, it is important to plan ahead. Buy flood insurance now, so that your property is covered. Contact an insurance agent or visit [FloodSmart.gov](https://www.floodsmart.gov) to discuss your options.”¹

FLOOD RISK

“Protect your property! Find out if you live in a high-risk flood zone by entering your address on the [Virginia Flood Risk Information System](https://www.floodsmart.gov).”¹



Homes and property can be quickly inundated following heavy rain.



Inaccessible home during flooding event in Roanoke County May 2020.



Little Bear Road impassible due to flooding from Stykes Branch Sept. 2015.

¹ Department of Conservation & Recreation. <https://www.dcr.virginia.gov/dam-safety-and-floodplains/floodawareness>

Storm Drain Stenciling Program: Seeking Volunteers

Roanoke County is actively seeking volunteers to participate in this year’s Storm Drain Stenciling Program. Stenciling storm drain inlets is an easy way to provide a visual reminder that stormwater goes untreated to nearby waterways. And, it is a direct and cost-effective project to remind people not to dump anything into the storm drainage system. This educational activity will raise awareness and educate citizens about stormwater runoff and nonpoint source pollution.

*Who Should Participate?

Storm drain stenciling projects can be a tool for:

- **Business and Industry:** Show your commitment to water quality in the community by stenciling storm drains at your place of business.
- **Conservation Organizations:** Stencil storm drains to help protect Virginia’s natural resources and reduce nonpoint source pollution.
- **Educators:** Stencil storm drains as a service learning project or a student field trip.
- **Girl and Boy Scouts:** Stencil neighborhood storm drains to earn a conservation badge.
- **Individuals:** Stencil inlets in your neighborhood to raise awareness that stormwater is untreated.
- **Neighborhood Associations, PTAs, Churches:** Stencil storm drains as a community-based service project to protect water quality.

Volunteer storm drain stenciling projects offer an educational pollution prevention activity with a lasting effect. Storm drain stenciling is a practical, positive, easy first step toward public education, involvement, and support. Stenciled storm drains help raise citizen awareness and educate the public about stormwater runoff and nonpoint source pollution. Stencils tell people not to dump and why.

For more information about the program, click here: <https://www.roanokecountyva.gov/DocumentCenter/View/25190/Storm-Drain-Stenciling-Program?bidId=>

The County, through its Department of Development Services, will provide a storm drain stenciling kit to those who wish to participate. The kit includes a Mylar stencil, non-toxic paint, a whisk broom, work gloves, safety vests, and trash bags. The County will also provide a map of the drainage system so that you can mark off which inlets you stencil. Once your event is complete, the County will collect the supplies and your data. The stenciling locations will be recorded in the County’s GIS Mapping System.

To schedule your event please contact:

Cynthia S. Linkenhoker, MPA
Stormwater Program Manager
540-772-2036
clinkenhoker@roanokecountyva.gov

KEEP IT CLEAN



DRAINS TO POND

DUMP NO WASTE



DRAINS TO CREEK

Choose from a variety of stencils for your next stenciling project!

*The County will provide documentation for community service hours worked, if desired.

Free Septic System Pump-Outs for Qualified Applicants!

Roanoke County is pleased to be partnering with the Roanoke Valley Alleghany-Regional Commission (RVARC) on a septic pump-out program provided through grant funding from the Virginia Environmental Endowment's (VEE) Community Conservation Program (CCP). The awarded funds are being used to implement a "Septic System Education and Pump-out Program" for residents across Roanoke County over a three (3) year period. The program will include:

- At least five (5) in-person Education Workshops focused on septic system maintenance, one in each of the five magisterial districts in Roanoke County.
- One virtual Education Workshop focused on septic system maintenance.
- 96 cost-free septic tank pump-outs for residents who attend one of the workshops.

This is an exciting opportunity for Roanoke County, because it will help support bacteria-related (E. coli) Total Maximum Daily Load (TMDL) goals that have been developed for various waterways in the County within its Municipal Separate Storm Sewer System (MS4) Permit area and beyond. Roanoke County currently implements a public education program to encourage citizens to properly maintain and periodically pump out their septic systems. The

County uses its annual Stormwater Newsletter for Homeowners to disseminate pertinent information. By supplementing this outreach effort with in-person educational workshops, as listed above, Roanoke County will achieve its goal of enhancing targeted environmental education while directly connecting with septic system owners and affecting "on the ground" improvements with cost-free septic pump-outs.

In addition, this opportunity will help the County address bacteria impairments in its streams that are located outside of the MS4 urban area. This is significant because the non-MS4 area is rural, and the properties lack access to public infrastructure (i.e., sanitary sewer and potable water). With septic systems being the only option to treat household sanitary sewage and wastewater in this region, maintaining these systems becomes even more important.

The RVARC has its own initiatives to address stormwater runoff and land use impacts on water quality. These goals complement those described above for Roanoke County, and they underpin this strong partnership. Together, RVARC and Roanoke County will successfully implement a "Septic System Education and Pump-out Program," which will benefit water quality in the area's waterways, and help citizens in need of this important service.



FREE SEPTIC PUMP-OUTS

Apply for your free five-year pump-out today! Qualified applicants will be contacted to schedule their appointment.



SCAN ME

 Roanoke Valley-Alleghany
REGIONAL
commission

<https://www.roanokecountyva.gov/2963/Septic-Pump-Out-Program>

A Foxy Choice: To Feed or Not to Feed. . .

According to the Virginia Department of Wildlife Resources, "the major problems associated with foxes involve their ability to invade houses or trashcans. They are very adaptable to urban areas, and they are nocturnal, meaning they come out mostly at night. Note, however, that just seeing them during the day is not a sign of rabies. Foxes are commonly seen during the day in urban and suburban areas and are usually attracted there by a food source or an easily accessed area to make a den such as under porches/decks, crawl spaces, or out-buildings. The best way to prevent them from becoming a problem is to not give them a reason to come.

Follow these tips to keep foxes and other critters away from your home:

- If you are feeding wildlife, stop! Feeding wild animals will cause them to lose their natural fear of humans.
- Keep trash inside until the morning of trash pick-up or place trash in an animal proof container, such as a metal trashcan with latches on the lids.
- Do not leave pet food outside; keep pet feeding areas clean.
- Remove bird feeders when problem species have been seen around them.
- Close up all openings under and into your buildings. Animals look for places to den and raise their young, so don't give them that opportunity.
- Clear fallen fruit from around trees.
- Install fox-proof fencing around chicken coops or rabbit pens to keep predators out of them.
- You can try using reflective tape, lights, or noise, as these occasionally work, but foxes and other wild animals will eventually become accustomed to these methods, so this is only a temporary solution.

Please, pass along this information to your friends and neighbors. If anyone in your neighborhood is directly or indirectly feeding wildlife, it can cause trouble for everyone.

Note that it is illegal in the State of Virginia to trap and relocate an animal to another area.

Contact your local health department if a fox or other wild animal exhibits signs of rabies such as stumbling, foaming at the mouth, or aggression.

If these techniques do not solve the problem, contact a licensed trapper or a critter removal service."¹



¹Virginia Department of Wildlife Resources. <https://dwr.virginia.gov/wildlife/nuisance/foxes/>

Minimizing Illicit Discharges in Stormwater

Because stormwater runoff is untreated, pollutants picked up along its overland journey are transported and then discharged into the nearest receiving waterway. Pollutants include a wide variety of materials, such as cigarette butts, leaves/grass clippings, trash, motor oil, PCBs, sediment, and more. Some of these products are toxic to fish and animals, some damage waterways, and others clog storm drainage systems, which may exacerbate street flooding. None of them are allowed in the storm drainage system, which is comprised of inlets, roadside gutters, swales/ditches, and underground drainage pipes. Please, do your part in keeping the drainage system and stormwater runoff clear and pollutant-free by learning more about how to prevent such pollution in the first place.



Cigarette Butts

According to National Geographic, “trillions of cigarette butts are thrown into the environment every year, where they leach nicotine and heavy metals before turning into micro-plastic pollution.”¹ In addition, the vast majority of the 5.6 trillion cigarettes manufactured worldwide each year come with filters made of cellulose acetate, a form of plastic that takes a decade or more to decompose. As many as 2/3 of those filters are irresponsibly dumped each year, and most eventually wind up in nearby waterways. These filters are toxic to fresh- and saltwater fish, and they are poisonous if ingested by children or other living organisms.² **This monumental worldwide pollution issue can be easily solved by NOT throwing toxic cigarette butts on the ground or overboard.**



Leaves/Grass/Lawn Debris

Leaves, grass clippings, and other lawn debris that are deliberately swept, raked, or blown into the street, ditches, swales, drainage inlets, or local receiving waters (creeks, streams, or rivers) constitute an illicit discharge into the County’s drainage system! Such plant material clogs the drainage structures and drainage-ways, exacerbating street flooding. **Please bag, mulch/mow, or compost your leaves and grass clippings.** Roanoke County offers bagged leaf collection during your regularly scheduled bulk/brush collection day. To determine your bulk/brush collection day, please visit the “Find Your Collection Day” on the following web page: [Find Your Trash Collection Day | Roanoke County, VA - Official Website \(roanokecountyva.gov\)](https://www.roanokecountyva.gov/DocumentCenter/View/9349/PCB-Facts-May-2017?bidId=)



Trash

Trash in the Roanoke River and her tributaries mars the majestic scenery, ensnares wildlife, and degrades water quality. Trash, especially plastic trash, is stuck on trees, wound up in shoreline grasses, and caught on rocks and tree limbs. It is everywhere that it doesn’t belong, both in and along waterways. How does the trash actually get into the river? Well, it travels from the very spot where it was discarded, sometimes quite far upstream, by way of stormwater runoff. This runoff finds its way to the nearest stream, ditch, underground pipe system, or drainage swale, where it is then carried, untreated, to the Roanoke River or her tributaries. Trash can also be dropped or blown directly into the river. So, how do we stop trash pollution? **We stop littering, and we bag the trash.**

¹ National Geographic. <https://www.nationalgeographic.com/environment/article/cigarettes-story-of-plastic>

²Cigarette Butt Pollution Project. <https://www.cigwaste.org/about-us>

Pet Waste

Pet waste left on streets or lawns does not just go away or fertilize the grass. Pet waste, along with the bacteria in it, washes into storm drains, ditches, streams, and lakes, and it can travel for miles in the water. When present in large concentrations, the harmful bacteria in pet waste (i.e., fecal coliform and *E. coli* (Escherichia coli)) may contaminate local receiving waters and make them unfit for human contact. While it may not seem like a big deal if a pet “contributes” some of its waste to the environment, think about how many animals are out there. In Roanoke County, there are ~ 22,000 dogs that generate about 1,686 tons of fecal material per year. That is a lot of poop! So please, **“bag it and trash it.”**



Motor Oil

Did you know that just one quart of oil can contaminate up to 250,000 gallons of water and can cause an oil slick almost 2 acres in size? And, according to the National Ocean Service, oil destroys the insulating ability of fur-bearing mammals, like sea otters, and the water repellency of a bird's feathers; without the ability to repel water and insulate from the cold water, birds and mammals will die from hypothermia. Oil is especially damaging to fish eggs and larvae, and it can make fish and shellfish unsafe for humans to eat.¹ As a homeowner, you can combat these unwanted hazards by cleaning up spilled oil using kitty litter! Once the oil is absorbed, sweep up the litter and toss it in the trash.



PCBs

PCBs are a group of man-made compounds that were widely used in the past, mainly in electrical equipment due to their non-flammability and chemical stability. PCBs have no taste or smell, and they range in consistency from oil-like to a waxy solid. Their manufacturing was banned in the U.S. in 1979 because of growing health/environmental concerns. PCBs are no longer commercially produced, but they may be present in products made before the ban, such as: oil used in motors and hydraulic systems, old electrical devices or appliances containing capacitors having PCBs, adhesives and tapes, oil-based paint, caulking, plastics, fluorescent light ballasts, and more. Take precautions during renovations so that building materials with PCBs don’t contaminate surrounding surfaces. For more tips, see the County’s PCBs Fact Sheet: <https://www.roanokecountyva.gov/DocumentCenter/View/9349/PCB-Facts-May-2017?bidId=>



Sediment

Sediment clouds waters, clogs storm drain pipes, smothers fish eggs, and limits the ability of water plants to use light as their energy source. Many of the County’s waterways, including the Roanoke River, are impaired due to excess sediment. To prevent further degradation, make sure that you maintain a healthy lawn. When you engage in outdoor land-disturbing projects, employ these strategies to prevent soil erosion and the offsite sedimentation it may cause: (1) install silt fence around bare areas, be sure it is entrenched; (2) cover dirt or mulch stockpiles when not in use; and (3) install straw mulch or erosion control matting over newly seeded areas.



¹ National Ocean Service. National Oceanic and Atmospheric Administration. <https://oceanservice.noaa.gov/facts/oilimpacts.html>

I Keep You Safe

**YOU
Scoop
My
Poop**

*Our Missions
are CLEAR!*

Denise Circle Slated for Drainage Improvements

In 2022, Roanoke County identified available funding for certain drainage improvements to address several long-standing drainage issues in the County that are characterized by persistent maintenance and operations concerns, property owner complaints, or both.

Denise Circle is one of the selected sites, as it has been a maintenance issue for Roanoke County and the Virginia Department of Transportation (VDOT) for decades, complete with clogged structures, and failing storm drainage pipes and structures. Its contributing drainage area is steep and wooded (with mature hardwoods and heavy forest litter), and it contains relatively few homes. The steep terrain contributes to a very fast rainfall-to-runoff response time, causing localized flooding and the movement of large amounts of leaves and woody debris. The leaves and woody debris clog the storm drainage inlets, which exacerbates the localized flooding issue.

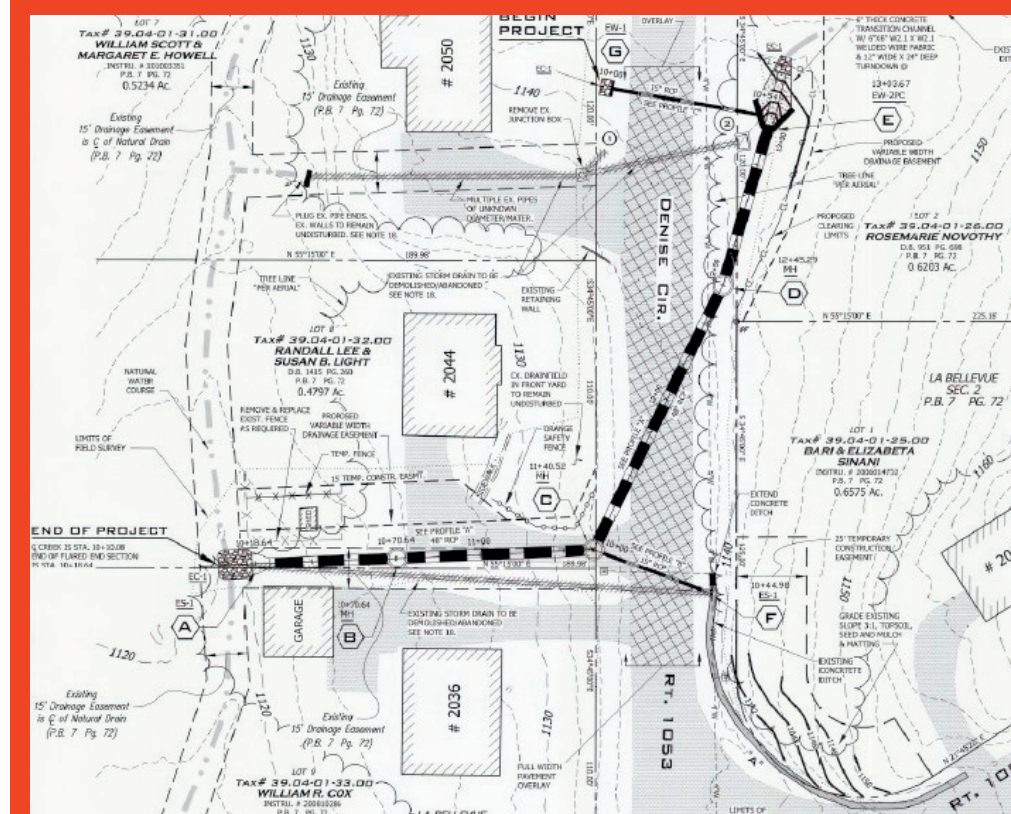
Roanoke County staff met with VDOT and property owners to identify the major issues. Subsequently, the County developed a preliminary design, located existing utilities, and completed a field survey of the existing conditions. The County used its new GPS and Total Station survey equipment to complete the field survey, which facilitates its in-house surveying and engineering work, just like it did for this project.

Following completion of the survey, County staff prepared the design and construction drawings for proposed improvements to address some of the worst drainage problems. County staff also prepared easement drawings and worked with residents and the County attorney's office to obtain drainage easements for the new pipes. County staff met with property owners, explained the proposed work, and answered questions regarding the proposed work and easements.

The proposed design will replace existing failing and undersized drainage pipes and structures with a new 48" diameter Reinforced Concrete Pipe (RCP) and new drainage structures. This new, larger pipe will do a much better job of collecting and transporting stormwater runoff to the existing natural watercourse below Denise Circle, and it should do so without much impact from the leaves and woody debris.

Construction is expected to commence this spring, with a duration of about six months. The estimated cost for this construction is approximately \$300,000.

This project is expected to save residents, the County, and VDOT significant amounts of ongoing maintenance and alleviate the worst localized flooding issue along Denise Circle.



Denise Circle Drainage Improvements

- Construction expected to begin in Spring 2023 and last for about 6 months.
- Existing failing and undersized drainage pipes and structures will be replaced.
- Anticipated construction cost is about \$300,000.

Stormwater Best Management Practices for Homeowners

Introduction

The County of Roanoke has a Municipal Separate Storm Sewer System (MS4) program to protect and improve water quality in its receiving waters, which includes the Roanoke River and all of its tributaries. Currently, many of these waters are impaired due to excess levels of sediment, bacteria, and PCBs.

Many pollutants from lawns, such as grass clippings, leaf litter, sediment from bare lawn areas, and nutrients from fertilizers end up in the storm drain system where they are carried - **UNTREATED** - to the nearest stream, creek, or river.

Also, new paved surfaces like rooftops, driveways, and sidewalks associated with the construction of new homes and businesses cause an increase in the volume and velocity of stormwater runoff, because rainwater cannot percolate through such hard surfaces. This results in more flooding and erosion damage on neighboring properties and in local waterways.

As part of the County's efforts to protect and improve its local waters, business owners and residents alike are being asked to take a proactive part in protecting water quality and to become part of the bigger effort to clean up these waterways.

By following just a few Best Management Practices (BMPs) on your residential lot, you can improve the quality of stormwater runoff and the receiving waters into which it drains and still have a beautiful home, complete with a lush, green lawn.

Minimize Stormwater Runoff

To help slow down and decrease the volume of runoff from your property, follow these tips:

- Minimize paved areas.
- Mulch all flower beds.
- Build a rain garden planted with ornamentals.
- Keep lawn areas thick and healthy.
- Convert concentrated runoff from downspouts to sheet flow by directing it to well-vegetated areas rather than to pavement.
- If possible, grade your yard to drain to undisturbed, naturally-vegetated areas, like woods or meadows.

Maintain and Enhance Natural Waterways

- Avoid clearing, grading, and fertilizing directly adjacent to waterways.
- Avoid dumping grass clippings and leaves into waterways, storm drains, curb and gutter systems, ditches, and detention ponds.
- Plant native vegetation along drainage-ways to prevent erosion.

Reuse/Redirect Rainwater

- Install rain barrels attached to roof downspouts to capture rain for later use to water lawns, gardens, trees, shrubs, and other plants.
- Reusing rainwater decreases the amount of runoff and the amount of nutrients, sediment, and other pollutants that would be carried in that runoff to local creeks, streams, and rivers.
- Direct runoff from rooftops, concrete, asphalt, and other impervious areas to lawn areas, instead of into storm drains, to minimize runoff and enhance groundwater recharge.



Build your own rain barrel to capture and reuse rainwater.

Implement Alternative Lawn Maintenance Practices

- Install grass alternatives like ground cover, plants, shrubs, trees, and perennials to decrease runoff and pollutants, like fertilizer and herbicide, especially in areas with highly erodible soils and steep slopes.
- Utilize slow release fertilizer or till in some compost on lawns.
- Test the soil every year to ensure that the correct amounts of soil amendments are being used. <https://www.soiltest.vt.edu/>
- Use a Nutrient Management Plan, which is tailor-made for each lawn and details how much fertilizer to use and when to use it.

Discharge Non-Chlorinated Water from Pools

Most swimming pools hold ~19,000 gallons of water, which likely contains chlorine or bromine, algaecides, and biocides. Chemicals like these are toxic to the environment, wildlife, and fish. In fact, emptying water containing chemicals from decorative fountains, spas, or pools to nearby storm drains pollutes local streams and creeks. For this reason, such discharge is prohibited by Roanoke County's Illicit Discharge Ordinance. Follow these helpful tips:

- Let pool water sit for several days without treating it to allow chemicals to dissipate before discharging it.
 - * Add sodium thiosulphate, a salt that breaks down chlorine, to the water for faster results. (Levels should be below 0.1 milligrams per liter of chlorine or bromine.)
 - * The pH of the water should be between 6.5 and 8.5 before it is drained.
 - * Avoid the use of algaecides, such as copper and silver, by proper maintenance of your pool's chemicals.
- Drain water that still contains chemicals to grassy areas, where it will soak into the ground rather than flow to nearby storm drains or streams/creeks. (The lawn and soil serve as natural filters.)

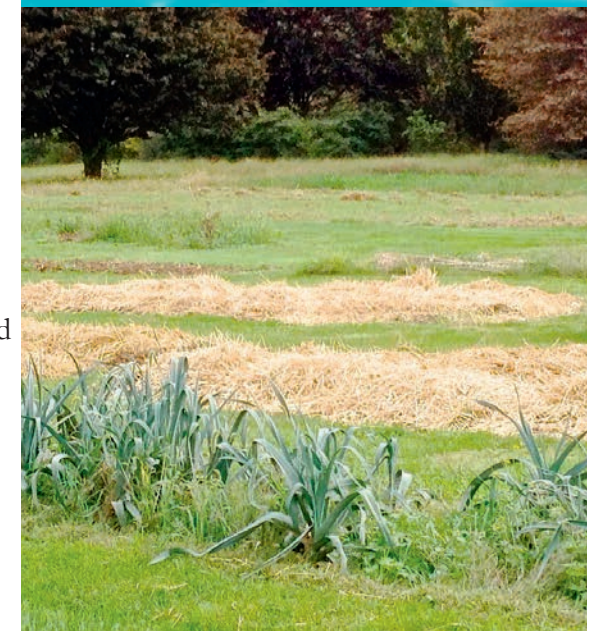
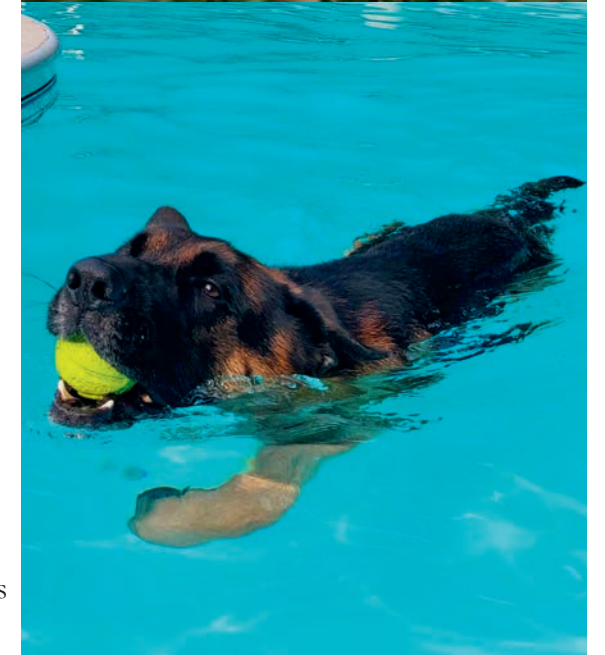
Cover Bare Soils

If you engage in a land disturbing project on your property, follow these tips to protect against soil erosion:

- Keep bare soils covered with straw mulch or hardwood mulch.
- Keep existing vegetation in place, if possible.
- Cover or vegetate soil stockpiles.
- Install sediment controls (like silt fence) before any upslope land disturbances begin.
- Bury the toe of silt fence in a 4" deep x 4" wide trench. This ensures that the dirt will not escape your property. Remove the collected sediment when it reaches 1/2 the height of the fabric.

For more information, contact:

Roanoke County Stormwater Program Manager
540.772.2036 or stormwater@roanokecountyva.gov





Division of Stormwater Management
5204 Bernard Drive, 2nd Floor
Roanoke, Virginia 24018
Phone: (540) 772-2036
Fax: (540) 772-2108
www.roanokecountyva.gov/Stormwater
Editor: Cynthia S. Linkenhoker, MPA

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This publication is a public service message brought to you by Roanoke County, Department of Development Services. As regulated by federal and state laws, the County's Stormwater Management Program must include public information strategies to encourage the prevention of stormwater pollution. For other publications or information on ways to prevent stormwater pollution, please call Cynthia S. Linkenhoker, Stormwater Program Manager, at 540-772-2036.



SCAN ME

Report Illicit Discharges



Report Illicit Discharges at
www.roanokecountyva.gov/ReportID or call the
Stormwater Program Manager at 540-772-2036.

Because stormwater runoff is untreated, any pollutants that it picks up along its travels are transported and then discharged into the nearest receiving waterway. Pollutants include a wide variety of materials, such as cigarette butts, leaves/grass clippings, trash, oil/grease, PCBs, sediment, and more.

If you see someone placing anything into the storm drainage system, which includes storm drainage inlets, curb and gutter systems, roadside ditches, and underground drainage pipes, please report the activity to the County by clicking the link or calling the number below. If possible, take a picture of the illicit discharge activity when it is occurring and send it to the Stormwater Program Manager in the Department of Development Services, Stormwater Division, 5204 Bernard Drive, 2nd Floor, Roanoke, VA 24018, or email it to stormwater@roanokecountyva.gov. County staff will investigate the incident and attempt to resolve the issue. Also, to learn more about the harmful effects of illicit discharges on the area's receiving waters, please see the County's various public education videos, posted here:

<https://www.roanokecountyva.gov/1598/Stormwater-Public-Education-Videos>