Stormwater Guide for Homeowners

June 2021

Partying With Pollution

Where Responsibility Meets Fun

June 2021: Rain Gardens / Leaf Litter / Clean Stormwater / Septic Systems / Flooding & Preparedness 7th Ed.

Partying With Pollution

Warm weather days bring cookouts, weddings, graduations, pool parties, and more. With all of this fun, balloons are often part of the festivities. They add sparkle, flair, color, and joy to almost any event. But, when released into the sky, balloons provide a serious source of pollution for creeks and streams. Balloons and all of their attachments *(plastic ribbons, valves, tie-off disks, and clips)* also present a threat to birds, horses, cows, turtles, and other animals, which may become entangled in or ingest these products.

As cited in a report by the Clean Virginia Waterways of Longwood University, "latex balloons, foil balloons, and plastic ribbons are deadly forms of litter, and they are a top source of debris found on Virginia's remote beaches." In fact, "litter was surveyed on Virginia's barrier islands, Fisherman Island National Wildlife Refuge, Back Bay National Wildlife Refuge, and other beaches between 2013 and 2020 revealing that balloon-related litter items are often the #1 most frequently found type of debris." Another alarming fact about balloons, and their attachments, is that they can travel hundreds of miles before bursting or deflating, which means their negative impacts to the environment may occur great distances from their point of release.[1]

Virginia has taken a proactive approach to address balloon pollution. As of this writing, HB 2159 has passed the House and Senate; this bill prohibits the intentional releasing, discarding, or causing to be released or discarded any non-biodegradable balloon outdoors and provides that any person convicted of such violation is liable for a civil penalty of $25 per balloon, to be paid into the Game Protection Fund. Note that current law prohibits a person from knowingly releasing 50 or more such balloons within an hour and sets the civil penalty at $5 per balloon, with the proceeds deposited into the Lifetime Hunting and Fishing Endowment Fund.

BOTTOM LINE: Party on, but please don't release any balloons! Instead, try releasing some "flying wish papers" or send some flower petals down the river.

Balloons and plastic ribbons: Deadly litter for Virginia's waterways, beaches, and the wildlife that frequent them.

[1] *Clean Virginia Waterways* http://www.longwood.edu/cleanva/OurWorkBalloonLitter.html

Leaves, Leaves, Where Do They Go?

"Right down the street to neighbor Joe."

Sounds like a Dr. Seuss rhyme, doesn't it? But seriously, the County of Roanoke is blessed with natural beauty: Beautiful mountains, heavily adorned with a wide variety of trees, overlook gurgling streams, meandering creeks, and the mighty Roanoke River. This landscape is truly a sight to behold. And in the fall, it gets even better. The trees are so spectacular that their vibrant colors draw visitors from near & far "just to look at them!" Splashes of red, orange, and yellow cover the mountains, which provide a scenic view for observers and artists alike. But what happens when all of these leaves wither and fall from the trees? Where do they go? Well, that depends. . . For those leaves that fall in the forest, *Mother Nature* does her job in helping them decay. As they rot, they become part of the decaying matter that eventually becomes organic material on the forest floor. According to Jane Marks, a biologist at Northern Arizona University in Flagstaff who studies leaf litter, leaves that end up in or near waterways "provide a primary food base for life all the way up the food chain in and around streams, from the fungi and bacteria that initially colonize the leaves, and the insects that chew them, down to the birds and fish that eat those insects, and so on. Different organisms prefer different types of leaves, so the greater the variety of trees along a stream bank, the greater variety of life they support."[1]

But don't be fooled into thinking that it is OK to put leaves into the streams, street, or storm drainage system. WHY? An overabundance of leaves in the waterways can be stifling for the aquatic life therein. AND, leaves that are raked or blown into the street, drainage swales, drainage inlets and ditches, and curb and gutter system may clog the storm drainage structures and drainage ways, which will increase street flooding.

Spectacular views, glorious colors, and lots of leaves signal fall. And then the leaves fall. Some end up clogging drainage systems, which increases street flooding!

So what should a conscientious homeowner do? BE PROACTIVE! Gather up the leaves that fall on your yard, roof, gutters, patios, and other surfaces. Consider turning them into compost. This may be accomplished by putting the leaves into a compost bin and adding fresh food scraps and other biodegradable substances. To aid in the composting process, turn and periodically sift the leaves. If they become dry, spray them with water. After a few months, the entire contents of the compost bin will transform into a mulch that is rich in nutrients. This can be added into a garden, flowerbed, or yard, and the mulch can facilitate growth of new plants, shrubs, and trees.

If you don't want to compost your leaves, Roanoke County offers bagged leaf collection during your regularly scheduled bulk/brush collection day. To find your bulk/brush collection day, please visit the "Find Your Collection Day" on the following webpage: http://www.roanokecountyva.gov/index.aspx?NID=94

[1] *Knowable Magazine. Laura Poppit. October 4, 2020. "What happens to all of the dead leaves?"* https://theweek.com/articles/930434/what-happens-all-dead-leaves

Septic Systems: The Down & Dirty

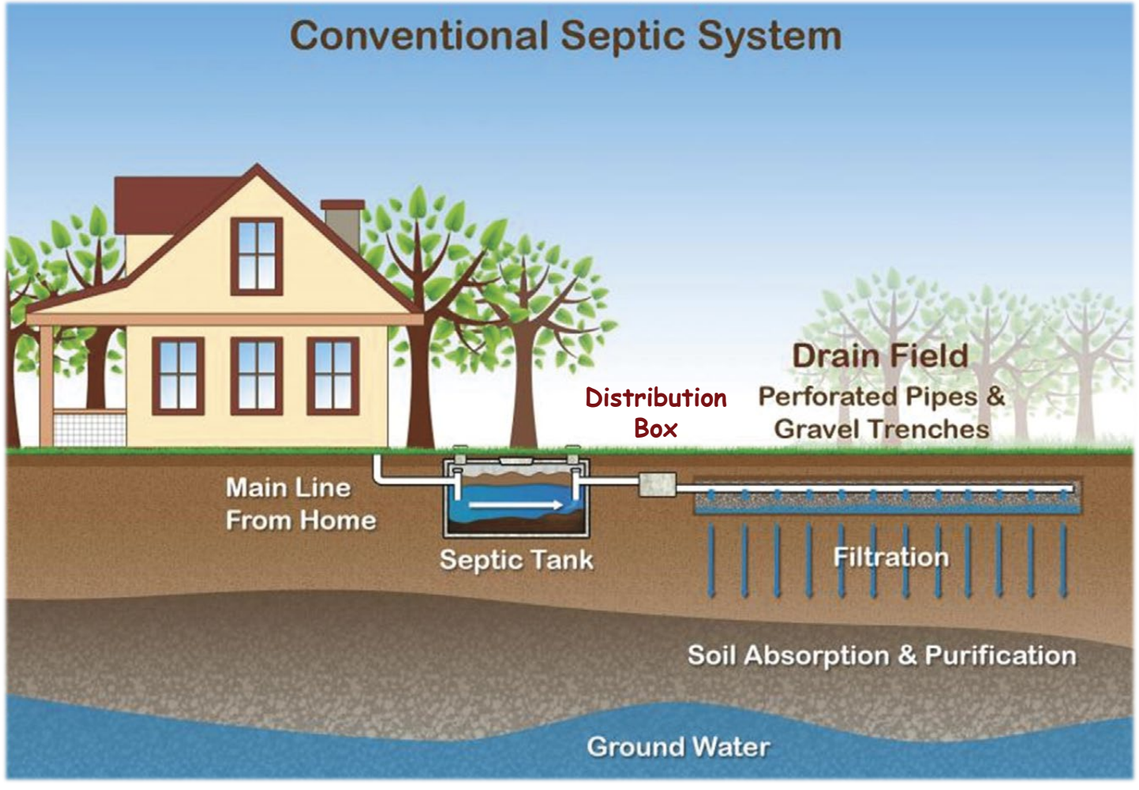
Did you know there are more than 12,000 homes in Roanoke County that rely on septic systems to treat household wastewater? That is nearly 1/3 of all of the homes in the County. This is significant, because septic systems have the ability to pollute groundwater if they are improperly maintained and/or malfunctioning. They can also negatively affect downstream waterways into which they ultimately drain.

ANATOMY OF A SEPTIC SYSTEM

Wastewater from household sinks, toilets, and showers is collected into an underground pipe, called the main line, which leaves the house and enters the septic tank. From here, solids fall to the bottom of the tank, a scum layer forms on the water surface, and the liquid in the middle is pushed up into the outlet pipe. The liquid leaves the septic tank via the outlet pipe and flows to the distribution box, where it is dispersed into several perforated pipes, which make up the drain field. Each perforated drain pipe is installed in a gravel trench. As the water seeps out of the perforations in each pipe, it percolates into the gravel and then into the soil around it. Microbes in the soil "digest" or remove most of the contaminants from the wastewater before it eventually reaches groundwater. From here, the groundwater and "treated" wastewater travel to the nearest stream, creek, or river.

MAINTENANCE

To get the best performance from your septic system, have the septic tank pumped every 3 to 5 years to prevent the buildup of sludge and floating scum. This is the cheapest way to keep your system working well. And, try not to overload the drain field on any given day. Too much liquid may cause a sewage overflow onto the ground or a sewage backup in your home. For more maintenance tips, refer to "A Homeowners Guide to Septic Systems" at *https://www.roanokecountyva.gov/DocumentCenter/View/11174/EPA-Homeowners-Guide-to-Septic-Systems?bidId=*



Flood Insurance News

The Federal Emergency Management Agency (FEMA) is updating the National Flood Insurance Program's (NFIP) risk rating methodology through the implementation of a new pricing methodology called **Risk Rating 2.0**. The methodology leverages industry best practices and cutting-edge technology to enable FEMA to deliver rates that are actuarially sound, equitable, easier to understand, and which better reflect a property's flood risk.[1] To access this data, visit *Risk Rating 2.0: Equity in Action | FEMA.gov*

- Floods are the #1 natural disaster in the United States
- Real-time flooding updates: www.usgs.gov
- Other useful websites:
  - www.fema.gov
  - www.weather.gov
  - www.floods.gov

Preparing Children for Emergencies

Emergencies and disasters can happen at any time. Disaster planning, response, and recovery efforts should always consider the unique needs of children, who make up roughly a quarter of the U.S. population. That is why Roanoke County Emergency Management and Development Services are taking steps to promote youth emergency preparedness.

INVOLVE CHILDREN IN DISASTER PREPAREDNESS:

- Promote interactive activities with your family. One way to do this is to involve children in the development of a family emergency plan.
- Use real world events to teach about emergency situations and disasters. Using current media coverage of floods, tornadoes, hurricanes, or power outages, talk to your children about how your family would respond if one of these events were to happen to you. Using your family emergency plan, discuss where you would go, what would you do, and how you would ensure their safety during an emergency.
- Children who are prepared experience less anxiety and feel more confident during actual emergencies and disasters.
- For younger children, the Federal Emergency Management Agency (FEMA) has collaborated with the American Red Cross to produce a disaster preparedness activity book, "Prepare with Pedro." Please visit *https://www.redcross.org/get-help/how-to-prepare-for-emergencies/teaching-kids-about-emergency-preparedness/prepare-with-pedro.html*
- For more information about emergency preparedness, please visit *https://www.ready.gov/*

What is Your Property's Flood Factor?

On August 26, 2020, Realtor.com® announced a new property listing feature called Flood Factor™, an online flood risk visualization tool developed by the First Street Foundation. The feature enables consumers to access comprehensive flood data for each listing.

Since it is a relatively new resource, the National Association of REALTORS (NAR) has published frequently asked questions and helpful tips on what to do if customers ask you about Flood Factor. Some of the questions include:

- *How is this information different than what FEMA provides?*
- *Does a property's Flood Factor impact the buyer's mortgage requirements?*
- *Why does the information from my lender or other sources contradict First Street's estimate of FEMA's flood risk zones?*

Find Your Home's Flood Risk | Flood Factor by click here: *https://www.floodfactor.com/*[2]

[1] *FEMA. Risk Rating 2.0: Equity in Action | FEMA.gov*

[2] *National Association of REALTORS, October 29, 2020. https://www.nar.realtor/washington-report/flood-insurance-update-1*

Clean Stormwater

Starts right here, under the trees.

Do Your Part. . . Be STORMWATER SMART:

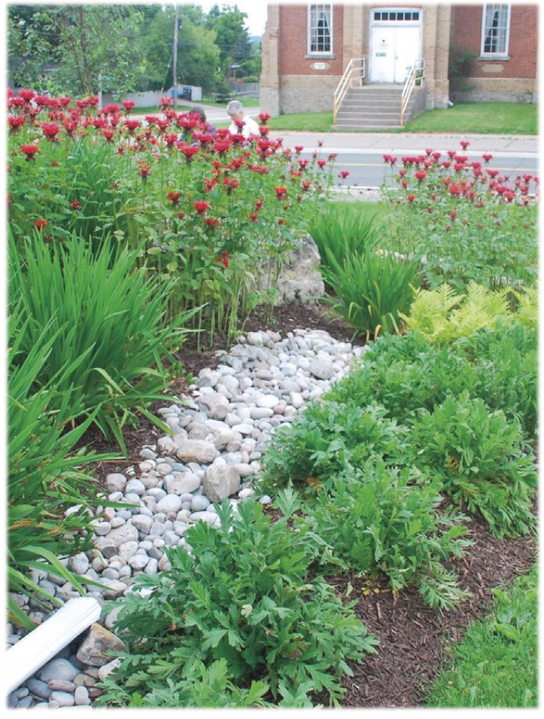
- *Bag or compost leaves and grass clippings*
- *Remove leaves from roadside gutters and swales*
- *Do NOT blow leaves or grass clippings into the street, storm drains, ditches, or drainage swales*

Rain Gardens for Runoff

Each time it rains, stormwater runoff flows across impervious surfaces (i.e., rooftops, sidewalks, driveways, etc.) and picks up pollutants, such as dirt, fertilizer, chemicals, oil, trash, and bacteria, along its journey. This pollutant-laden stormwater enters the nearby storm drains - UNTREATED - and flows directly to local streams and creeks, which may include the Roanoke River. In fact, the U.S. Environmental Protection Agency (USEPA) estimates that pollutants carried by stormwater runoff account for 70% of all water pollution.[1]

An easy way for homeowners to filter out pollutants from the runoff on their own property is to build a rain garden. Rain gardens collect runoff, the vegetation planted within them filters the runoff, after which the runoff percolates into the soil and recharges groundwater aquifers. This is a win-win for the homeowner and the natural environment.

With some careful thought and planning, rain gardens can also add some curb appeal to your property.



Rain gardens add beauty to your yard and remove pollution from runoff.

WHAT IS A RAIN GARDEN?

The Groundwater Foundation describes a rain garden as "a garden of native shrubs, perennials, and flowers [that are] planted in a small depression, which is generally formed on a natural slope. It is designed to temporarily hold and soak in rain water runoff that flows from roofs, driveways, patios or lawns. Rain gardens are effective in removing up to 90% of nutrients and chemicals and up to 80% of sediments from the rainwater runoff. Compared to a conventional lawn, rain gardens allow for 30% more water to soak into the ground.

A rain garden is not a water garden. Nor is it a pond or a wetland. Conversely, a rain garden is dry most of the time. It typically holds water only during and following a rainfall event. Because rain gardens will drain within 12-48 hours, they prevent the breeding of mosquitoes."[1]

BUILD YOUR RAIN GARDEN

Once you have decided where to build your rain garden, The Groundwater Foundation suggests that you remove the top six to twelve inches of soil, and till in a mixture of compost and sand; this will help increase infiltration into the surrounding soil. NOTE: The type of alteration to the soil depends on the current soil type, so it is a good idea to obtain a soil test before you start.[1]

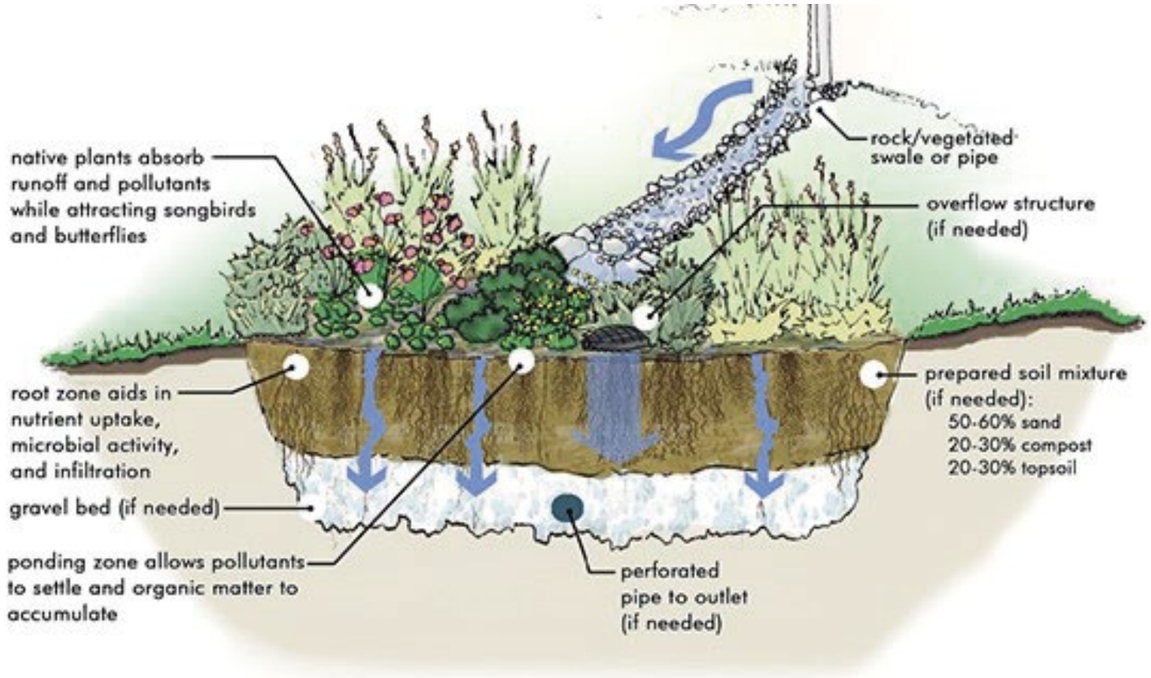
Rain gardens are generally constructed on the downside of a slope and collect rainwater [stormwater] runoff from the lawn, roof and/or the driveway. Once water collects in the rain garden, infiltration may take up to 48 hours after a major rainfall. Also, rain gardens incorporate native vegetation; therefore, no fertilizer is needed. After the first year, maintenance is usually minimal.[1]

There are many good websites and online videos that have step-by-step instructions for building a rain garden. Here are just a *few:*

- *Family Handyman.* https://www.familyhandyman.com/project/how-to-build-a-rain-garden-in-your-yard/
- *New Hampshire Dept. of Environmental Services.* https://www.youtube.com/watch?v=Q2EoHBnCCII
- *This Old House.* https://www.thisoldhouse.com/gardening/21016338/how-to-build-a-rain-garden-to-filter-run-off

[1] *Groundwater Foundation.* https://www.groundwater.org/action/home/raingardens.html

Anatomy of a Rain Garden



Do...

- Install the rain garden 10 feet away from structures.
- Choose an existing low spot in your yard if it normally drains quickly after a heavy rain.
- Place the rain garden where it will intercept water running off a roof, driveway, road, or other impervious surface.
- Plant perennials instead of annuals; perennials will come back every year and generally require less maintenance.
- Get a permit if you disturb more than 2,500 square feet of your yard.
- Build the rain garden in full or partial sun.
- Water, weed, and mulch your garden, as needed. Until a rain garden is fully established, it will need routine maintenance.

Don't. . .

- Place a rain garden in a spot where water pools or ponds for long periods.
- Install a rain garden underneath the canopy of existing trees.
- Start digging without knowing where your utility lines (electric, sewer, water, and gas) are located.
- Plant only tall-growing species or only low-growing plant species; choose a variety for vertical layering.
- Build a rain garden on a slope greater than 15%.
- Place a rain garden near a septic system.
- Plant only wetland plants; plants selected for rain gardens need to tolerate intermittent periods of both wet and dry conditions.

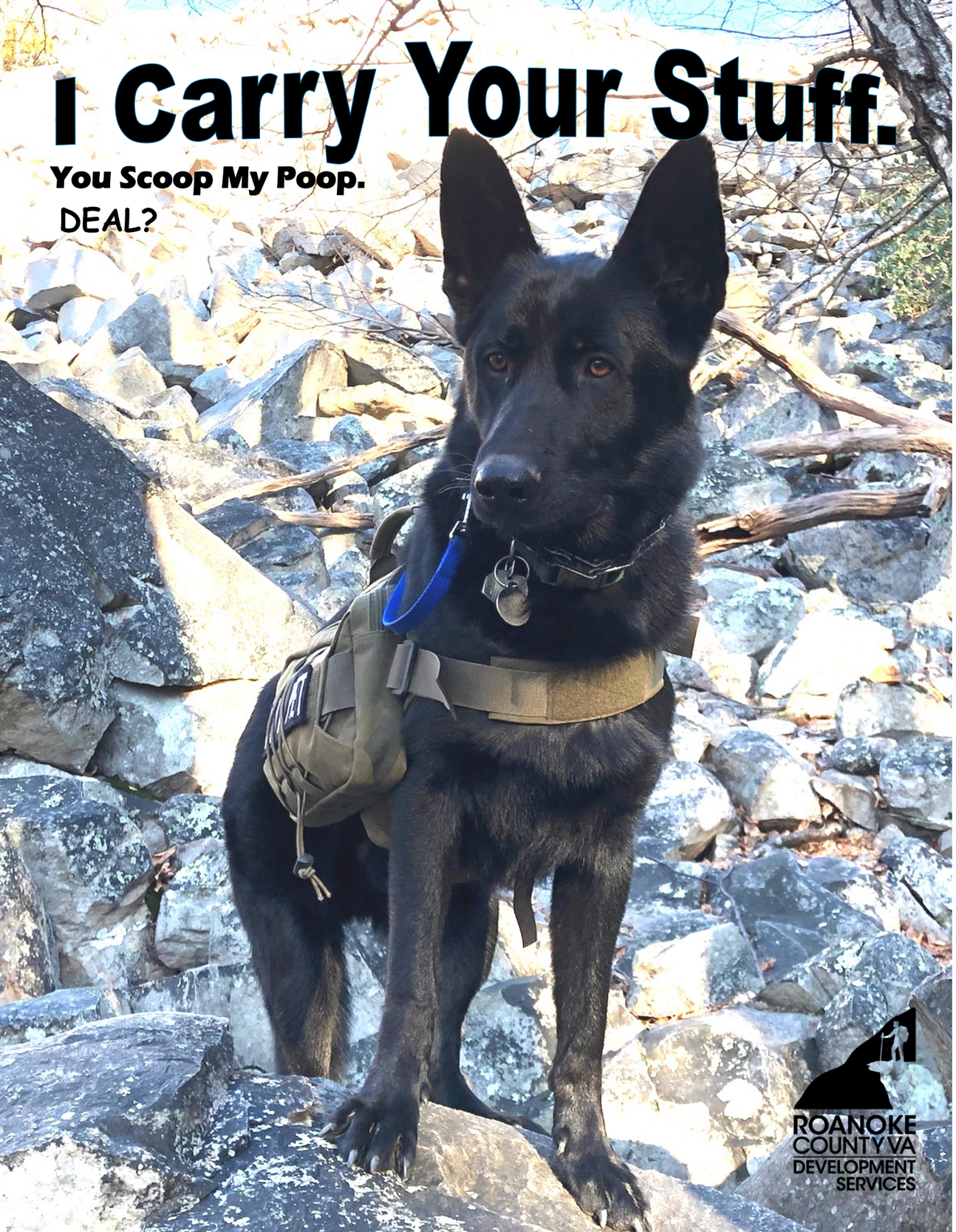
ADDITIONAL RESOURCES

Virginia Cooperative Extension, "Stormwater Management for Homeowners" fact sheet series, SPES-13P, by L. Fox. https://www.pubs.ext.vt.edu/

Virginia DWR, "Catch the Rain and Clean the Water: Rain Gardens and Living Shorelines for Wildlife" blog series by C. Heiser. https://dwr.virginia.gov/blog/rain-gardens-for-wildlife/

Northern Virginia Soil and Water Conservation District, "Rain Garden Design and Construction: A Northern Virginia Homeowner's Guide" publication. https://www.fairfaxcounty.gov/soil-water-conservation/rain-garden

Virginia Stormwater BMP Clearinghouse. "Virginia DEQ Stormwater Design Specification No. 9: Bioretention." https://www.swbmp.vwrrc.vt.edu/wp-content/uploads/2017/11/BMP-Spec-No-9_BIORETENTION_v1-9_03012011.pdf



Dog Walks, Public Parks, & Mutt Mitts®

Did You Know?

- Most of Roanoke County's Parks have "Mutt Mitts" for disposal of dog waste
- An online map shows the location of all Dog Waste Stations in the County & in the Town of Vinton

Roanoke County has taken proactive steps to limit the amount of dog waste that directly enters its waterways by installing dog waste stations along its greenways and in most of its parks. These stations contain "Mutt Mitt" bags and a trash can, giving pet owners the necessary supplies to "bag and trash" their dog's waste while walking them in the parks or along the greenways. And, each dog waste station has a coordinating sign to remind owners of their responsibility to pick up after their dogs.

This might seem like an insignificant step to limiting bacteria from entering the already bacteria-impaired local waterways, but every little bit helps. Dog waste left on streets or lawns does not just go away or fertilize the grass. Dog 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 dog waste (i.e., fecal coliform and *E. coli* (Escherichia coli)) can 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 waste to the environment, think about how many animals are out there. In Roanoke County alone, it is estimated that there are more than 22,000 dogs that generate about 1,686 tons of fecal material per year. That is a lot of poop!

A custom map displaying the locations of dog waste stations installed throughout the public parks and greenways in Roanoke County and the Town of Vinton is annually updated by the Department of Development Services. These maps may be accessed here: *https://www.roanokecountyva.gov/2594/GIS-Mapping-Support*

In addition, this data is summarized in a table for each locality, and it provides the specific location of the dog waste station(s) at the given location. To access these tables, click on the links provided below.

As an example, here is a snapshot of the parks in Roanoke County that have dog waste stations:

- Darrell Shell Park
- Explore Park
- Garst Mill Park
- Goode Park
- Green Hill Park
- Starkey Park South
- Stonebridge Park
- Hanging Rock Greenway (Kessler Mill Office)
- Tinker Creek Trail Head
- Vineyard West I
- Walrond Park
- Starkey Park North
- Hollins Park
- Read Mountain Preserve
- Whispering Pines
- Mount Pleasant Park
- Jae Valley Park
- Mayflowers Hills Park
- Happy Hollow
- South County Library Boardwalk

The complete list of dog waste stations in Roanoke County may be accessed here: *https://www.roanokecountyva.gov/DocumentCenter/View/17687/DogWasteWebsiteList_RoCo*

The complete list of dog waste stations in Town of Vinton may be accessed here: *https://www.roanokecountyva.gov/DocumentCenter/View/17687/DogWasteWebsiteList_RoCo*

Mutt Mitt® dispensers like these are scattered across Roanoke County and the Town of Vinton in various parks and along greenways.

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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 more brochures or information on ways to prevent stormwater pollution, please call Cynthia S. Linkenhoker, Stormwater Program Manager, at 540-772-2036.

Curb Sediment Loss from Your Property

Virginia's Department of Environmental Quality has deemed the Roanoke River and most of its tributaries as impaired for sediment. This means that these waterways do not properly support aquatic life due to the excessive sediment, which settles over stream bottoms, removing habitat and smothering macroinvertebrates that form the foundation of the aquatic food chain for fish.

As a result of this impairment, Roanoke County is required to implement certain "best management practices" or "BMPs" to help minimize additional sediment loadings to these fragile waters. One of the BMPs that the County has implemented is to lower the threshold for compliance with its Erosion & Sediment Control Program.

Roanoke County's Erosion and Sediment Control Program regulates land-disturbing activities of **2,500 square feet or more**, which is less than the state's threshold of 10,000 square feet or more. This lower threshold has been implemented due to the County's steep terrain and highly-erodible clay soils. As land disturbing activities occur in such conditions, the possibility for erosion and resulting off-site sedimentation is high.

As a property owner, you can help the County in its mission to reduce sediment loadings to its waterways by employing the following practices:

- Keep bare soil covered up with temporary stabilization measures such as straw mulch or matting to protect it from raindrop and wind erosion.
- During home land-disturbing projects, ensure that proper sediment controls are in place. If you use silt fence for this purpose, make sure it is entrenched into the ground at least 4" deep, in a trench that is 4" wide.
- Make sure ALL active drainage inlets have proper inlet protection.
- BE SURE to obtain an Erosion & Sediment Control (ESC) Permit from the County if your project disturbs 2500 square feet or more. Note: Minor home landscaping and gardening projects are exempt from needing an ESC permit.

Home Projects That May Need an ESC Permit:

- **Detached Garages**
- **In-ground Swimming Pools**
- **Barns or Large Sheds**
- **Driveways**
- **Large Patios or Decks**

Remember . . .
Only Rain Down the Storm Drain

If you are uncertain as to whether or not your home improvement project needs a land-disturbing permit, please call the Department of Development Services at 540-772-2065. One of the County's inspectors will be happy to assist you with an evaluation of your project.