

Build Your Own Rain Garden



Residential Rain Gardens

A landscape tool to improve your water quality

This is a general guide to building your own rain garden at home. Every residence will be different and these gardens can be adjusted to your individual needs. For additional help and guidance, contact the Hellam Township office.

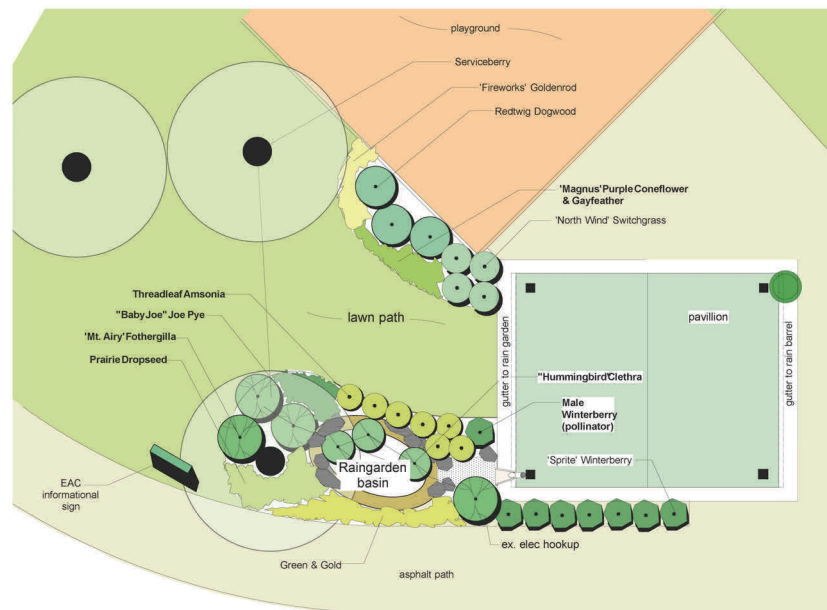
Do I need a permit to build a rain garden?

Permits would only be needed for storm water management credit, not for general landscaping.

If you are unsure or have questions, please call the Township office

For a list of annual native plant sales, visit

Pennsylvania's Native Plant Society website at www.panativeplantsociety.org



Native Planting at
Barshinger Pavillion Plan View
3
Scale: 1/4" = 1'-0"

Demonstration Rain Garden at Hellam Township's Barshinger Field

There are many situations where the development of a rain garden would be beneficial. Placing a rain garden in your yard is easier than you may think. Research your options, plan well, and have fun! Your investment of time and resources will reward you for many years to come.

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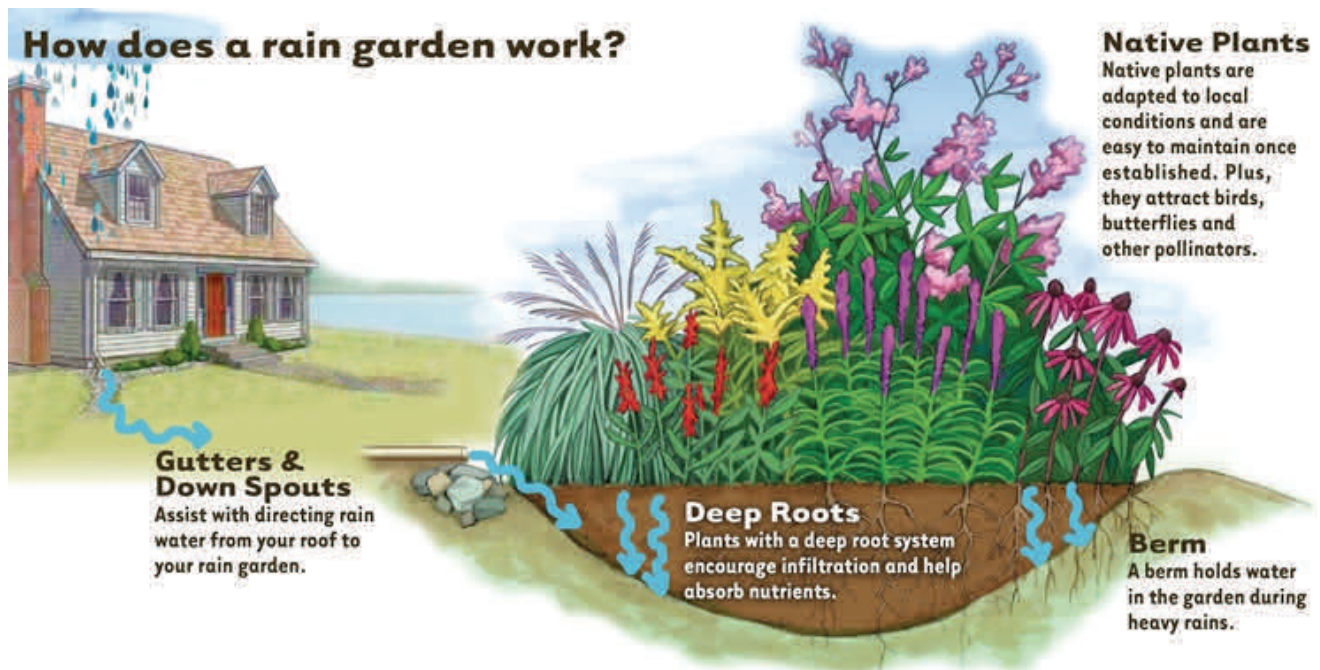


What is a Rain Garden? Exactly what it sounds like!

A rain garden is a garden planted with native plants that can be placed within your yard and that captures the first flush or runoff from a rain event. By capturing the runoff in the Rain Garden, you will not only provide runoff reduction benefits, you may also produce substantial neighborhood and community environmental benefits, such as:

- An increase in the vegetation mixture in your yard
- An enhancement of the beauty of your yard, thereby improving the landscape in your neighborhood
- An increase in the amount of groundwater renewal
- The bringing together of your family and neighbors for a fun, physical activity
- Plant material that can provide shade and a light or noise screen
- A layer of vegetation to include a canopy, understory and ground cover

One square foot of rain garden, on average York County soils, can capture, treat, and infiltrate up to 20.78 gallons per year!



Rain gardens are designed to collect storm water runoff from a roof, driveway or other impervious surfaces—and keep this water out of storm sewers or local waterways. Rain gardens work by collecting storm water in a shallow depression in your yard. This area is planted with native grasses and wildflowers that are specially selected for their ability to gradually absorb and filter storm water.

Studies from the U.S. Environmental Protection Agency (EPA) have shown that as much as 70 percent of the pollution in streams, rivers and lakes has been carried there by storm water. During a downpour, water can gush out of downspouts, across lawns treated with pesticides and fertilizers, into an oily street, and, finally, down a storm drain that dumps that pollution along with the water into a stream, river, and eventually the Chesapeake Bay. By planting a rain garden, you can divert your gutter water into an attractive planting bed that works like a sponge and natural filter to clean the water and let it percolate slowly into the surrounding soil.

You may think that a small, individual garden will not make a difference, but collectively they can make a great impact to reduce storm water damage.



Examples of the damage storm water runoff can cause.

Besides diverting storm water, adding a rain garden to your yard will also provide food and shelter for wildlife, and give you a whole new garden that's hardy, low maintenance and naturally beautiful. Here are some basic steps to give you a good start planting your own rain garden.

Find a Location

The rule of thumb suggests that you place the garden at least 10 feet away from your home to prevent flooding in your house. Do not locate the garden over a septic field. Based on the PA Code for horizontal isolation distances, a rain garden should be located at least 10 feet from a septic field or septic tank. You should try to choose a naturally occurring low spot in your yard or position the garden where your downspouts or sump pump outlet can be used to direct rainwater into your garden. Try to choose a location in the sun either full or partial.

Measure the Drainage Area

If you are building the rain garden in a low spot in your yard, you do not need to measure the drainage area. Just ensure the area receives water regularly during a rainstorm. If you are capturing water from a roof or other hard surface you will need to measure the specific drainage area of that surface and multiply by the number associated with the type of soil you have. For sandy soil, multiply by 20 percent, for loam use 30–35 percent and for clay use 45–60 percent. These numbers are somewhat inflated but they will ensure the garden holds as much water as possible.



Another method of measuring your rain garden can be found below. The size of your garden must be large enough to hold the water within the drainage area. The kind of surface the water is flowing over is important because it will determine how much will run off and how much infiltrates into the surface. For this reason a “runoff value” can be determined.

Type of Surface	Runoff Value
Roof, parking lot, concrete walks, decks, patios, and driveways	0.9
Lawn, woodlot, turf, playing fields, and planted garden beds	0.25

1. Calculate the square footage of the impervious surfaces

Roof - 50 ft. x 50 ft. = 2500 sq. ft.

Driveway - 12 ft. x 20 ft. = 240 sq. ft.

Patio - 15 ft. x 12 ft. = 180 sq. ft.

Total impervious surface = 2920 sq. ft. = runoff surface area

2. Calculate the square footage of the pervious surfaces

Lawn area - 50 ft. x 30 ft. = 1500 sq. ft.

3. Multiply the square footage obtained in steps 1 and 2 by the appropriate runoff value from the table above and by the 16% of runoff. In storm water management, the garden size should be 16% of the runoff surface area multiplied by the runoff value.

2920 sq. ft. (impervious surfaces) x 0.16 (percent of runoff) x 0.9 (runoff value) = 420.48 sq. ft.

1500 sq. ft. (lawn area) x 0.16 (percent of drainage) x 0.25 (runoff value) = 60 sq. ft.

4. Add both impervious and turf areas together to get total rain garden size

420.48 sq. ft. + 60 sq. ft. = 480.48

Cost

To determine the approximate cost of the sample garden (210 sq. ft.), use the calculations and prices provided below.

1. Calculate the amount of compost, topsoil, and sand you will need. Find the cubic footage of your garden. Multiply the size of the rain garden by three feet of soil amendments.

$$210 \text{ sq. ft.} \times 3.0 \text{ sq. ft.} = 630 \text{ cu. ft.}$$

Determine the percentage of each item to be included. The recommended soil replacement mix is 50% sand, 25% topsoil (no clay) and 25% compost or leaf mulch.

Sand: 50% of the 630 cu. ft. is 315 cu. ft.

Topsoil: 25% of the 630 cu. ft. is 157.5 cu. ft.

Compost or leaf mulch: 25% of the 630 cu. ft. is 157.5 cu. ft.

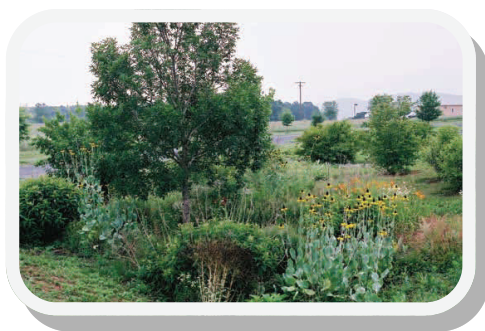
2. Calculate the amount of mulch you will need. You will want to mulch to be at least 3 inches deep. So to find the cubic feet of mulch, multiply the square footage of your garden by the depth

$$210 \text{ cu. ft.} \times 0.25 \text{ ft.} = 52.5 \text{ cu. ft. of mulch}$$

Note: 1 cu. yard = 27 cu. ft.

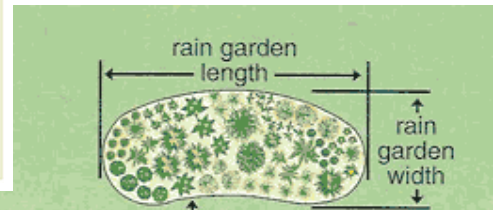
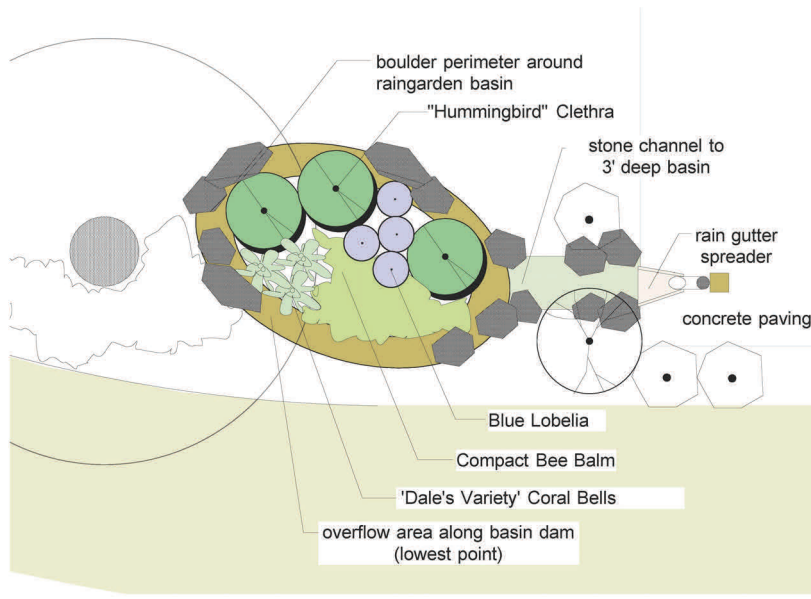
3. Calculate your excavation costs. If you choose to amend your soils and decide to rent a small piece of equipment, such as a backhoe, this will need to be factored in as an additional charge.

Supplies	Amount Needed	Price	Total Cost
Mulch	2 cu. yd.	\$26/cu. yd.	\$52
Sand	6 cu. yd.	\$16/cu. yd.	\$96
Compost	6 cu. yd.	\$32/cu. yd.	\$192
Topsoil	12 cu. yd.	\$26/cu. yd.	\$312
Native Plants	Approx. 30	\$2-\$15/plant	\$60-\$450
Approx. Cost	Check local sources for current pricing		\$712-\$1,102



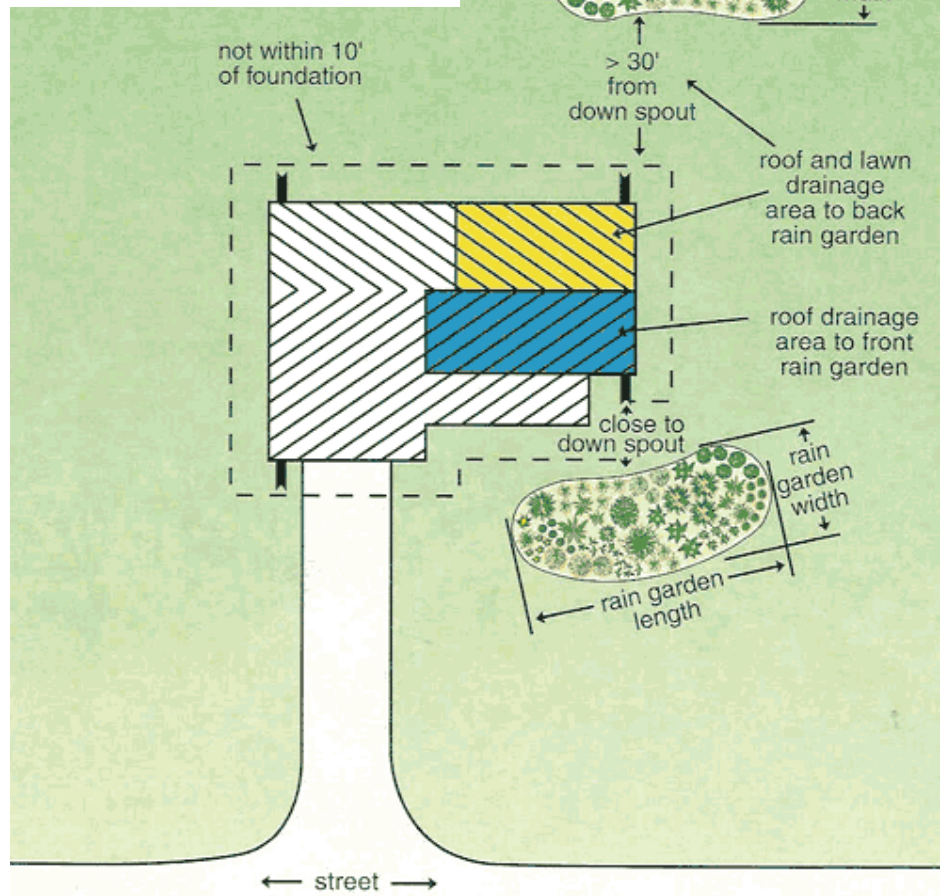
Create a Design

Whether your garden is large or small the same basic principles apply. By planning your garden on paper first, you will be able to create the best appearance possible for your rain garden.



Tips

- Avoid high traffic areas
- Do not disturb forest soils
- Pay attention to drainage problem areas
- Avoid planting over septic tanks



Choose Your Plants

Native plants are suggested for rain garden installations because they are best adapted for our climate. You will want to choose plants (flowers and grasses) that will grow well in both wet and dry areas because the rain garden will temporarily fill with rainwater from time to time.

Examples of Native Plants

Goldenrod
Asters
Sunflower
Joe Pye
Morning glory
Sedges
Honeysuckle
Lupine
Violets
Wild Geraniums
Black-eyed Susan
Iris
Evening Primrose
Milkweed
Verbena
Beardtongue
Phlox
Bee balm
Veronica
Little Bluestem
Cardinal Flower
Winterberry
Jack in the Pulpit
Red Twig Dogwood

Why Native Plants?

- They are best adapted to the local climate and once established, do not need extra water or fertilizer
- Many are deep rooted which allow them to survive droughts
- Many are attractive to native pollinators (bees, butterflies, beetles, and birds)
- Natives provide habitat and food for the native wildlife

Right Plant, Right Place



For suggested garden plants and layouts for various locations and conditions, contact the York County Conservation District www.yorkccd.org

Site Preparation

Before excavation begins, use your plan and mark the area on the ground with fluorescent spray paint. Also, make sure to mark the area where you will have the berm. Use appropriate erosion controls if necessary such as silt fences or straw bale barriers that can direct and contain sediment during construction. If you are amending your soil, you may need to rent machinery to assist with the project such as a backhoe, rototiller, or bobcat depending on how deep your garden will be. If digging by hand, try and recruit some volunteers who can be on site to help with the installation. Either way, you will need means to remove the extra soil (wheelbarrow, cart, or truck). After you have the soil amendments delivered, the equipment on site, and have called PA One Call, you are ready to dig. Please always use caution and wear the appropriate safety gear.

Call before you dig!
PA One Call
www.paonecall.com
1-800-242-1776
3 working days notice
is the law!

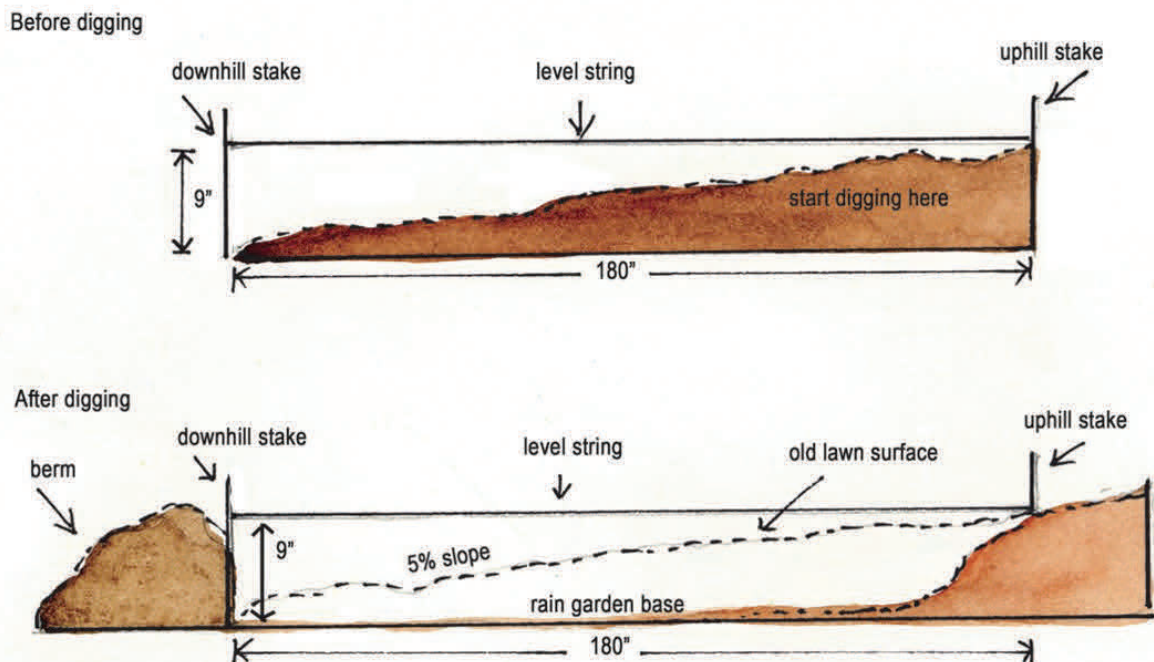


Excavation

Dig your garden the size, shape, and depth that you have determined for your location. Once you have excavated to the desired depth, use a hand level or survey equipment to make sure that the bottom of your garden is level throughout. If you have areas that are lower than the rest, you will have problems with too much ponding in that area.

Amending the Soil

After excavation is complete and the soil has been removed, you are ready to mix and add your amendments. It is sometimes best to mix and add small portions of the amendment at a time. Using a wood stake and a string, mark the depth of the ponding area that you plan to leave so that you do not overfill the garden. Allow this to settle overnight. After this time period, add additional soil if needed.



Constructing the Berm

To construct the berm, you will need to reserve soil that has been excavated from the rain garden. Well packed soil, or soil with clay will work well. You will need to locate the highest part of the berm on the downhill side of your garden. The berm should not exceed 6" tall and should then taper down on either side until integrated into the existing lawn. This will act as a dam for runoff and will need to be firmly pressed together. As you compress, smooth it into a gradually rounded form as this will help with erosion. Once complete, seed the berm area with your choice of grass seed.

Planting

Now you are ready to plant the plants that you have selected. If you have chosen not to amend your soil, you may choose to add compost or potting soil into the planting holes.

- Dig the holes for planting shallow and broad and fill the holes gently but firmly. Do not step on the area to pack, as it may damage the root system.
- Choose plants that are established, usually one to two years old.
- If you have chosen a tree for your rain garden and the tree was dug properly at the nursery and is being planted under normal circumstances, staking the tree may not be necessary.
- Water plants immediately after planted, even if the soil is already moist.
- Retain the identification tags from the plants until the warranty period has ended.
- Follow the recommendations of each plant on placement and amount of space to leave for growth.

Mulching

Apply mulch over the soil area of the rain garden to maintain moisture, prevent erosion, provide weed control, and to help improve soil conditions over time. Shredded hardwood mulch or hardwood chips are recommended.

- Apply 3" of mulch after planting
- If you have planted a tree, mulch wide but not deep around the tree. Excessive mulch around the base of a tree can cause disease and damage to the tree.
- Use organic mulches, such as hardwood, instead of inorganic, such as recycled tires. Organic mulches decompose and benefit the soil.

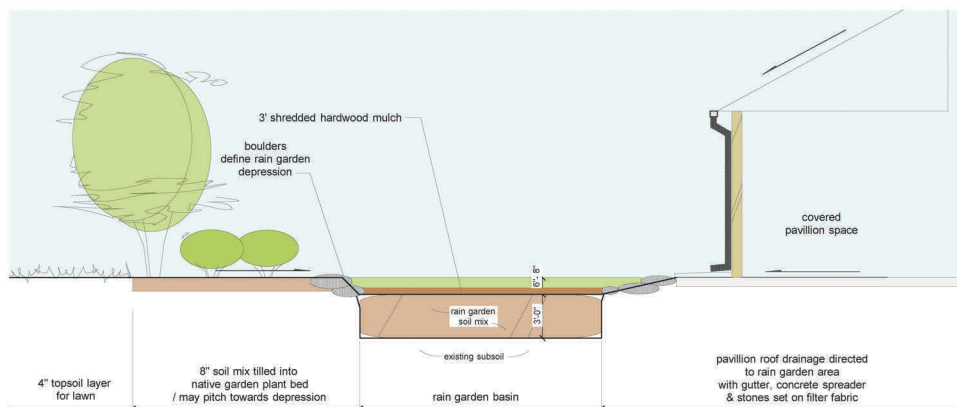
Maintenance

Maintaining your rain garden is not much different than maintenance already required by your landscaping. The first year the plants will need the most attention and water.



Water and Downspout Arrangements

After you've planted the garden, water it every other day for two weeks if it doesn't rain and until the garden looks to be growing on its own. Good water techniques and maintenance are the keys to a quality rain garden. The downspout from your roof or sump pump outlet from your basement should be directed toward your rain garden depression. This can be accomplished by a natural slope, by digging a shallow swale, or by piping the runoff directly to the garden through a buried four-inch diameter plastic drain tile.



Do you ever think about what happens to a drop of rain that falls onto the ground? It may land on a tree and evaporate; it may land on a farm field and be absorbed into the soil; or it may land on a rooftop, driveway or road and travels down the street into a stream or storm drain. Any precipitation in an urban or suburban area that does not evaporate or soak into the ground, but instead pools and travels downhill is considered storm water. Storm water is also referred to as urban storm water runoff and polluted runoff. Increased development across York County's watersheds has made storm water runoff the fastest growing source of flood damage and pollution to the creeks, river, and ultimately the Chesapeake Bay.

Slow it down, spread it out, and soak it in!

Reduce Runoff

Remove Pollutants

Recharge Ground Water

Resources and References:

York County Conservation District

www.yorkccd.org

Penn State Extension (MaeScapes)

www.extension.psu.edu

The Gardener of the Owl Valley

www.thegardeneroftheowlvalley.com

Rain Garden Technical Guide

www.dof.virginia.gov

Rain Garden How to Manual for Homeowners

dnr.wi.gov

Bringing Nature to Our Backyard

[Dr. Tallamy Native Plant List](#)

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