Preserving our natural resources starts in your yard.

One of the most important ways to ensure good water quality is to limit the amount of phosphorus applied to our landscapes. The reason is simple. When too many products containing phosphorus are used, the nutrient can go directly to our water supply, causing serious pollution problems and health concerns. Thankfully, there is an easy solution.

Homeowners should test their soil before using fertilizers.

A simple test can quickly and accurately measure the levels of nitrogen, phosphorous, potassium, and pH present in your soil. If the test indicates that phosphorus is not needed, a fertilizer with zero phosphorus should be applied. If phosphorus is present in sufficient quantities, more phosphorus will not benefit your landscape, and it may go directly to our water supply. Soil testing prior to applying fertilizers will help to protect our water and environment.

How Does Phosphorus Cause Pollution and Health Problems?

Too much phosphorus in reservoir water stimulates the growth of unwanted vegetation such as algae (i.e. algae blooms) during warm weather. You have probably seen lakes and reservoirs that look like they are covered by a blanket of green slime – that's unwanted algae growth that may be caused in part by phosphorus coming from your over-fertilized property.

Algae blooms adversely impact drinking water quality by:

1. causing offensive taste, odors, and color
2. interfering with the disinfection process, which protects us from disease-carrying microorganisms
3. contributing to the formation of hazardous disinfection by-products, and
4. hurting fish and wildlife.

This resource is worth saving.

That's why a committee of dedicated scientists, government officials, and industry leaders have developed methods for protecting New York's water resources.

Help to protect our water by following sound landscape practices. ***You can make a difference.***

If you use the services of a landscaper, just ask for a soil test before fertilizer is applied. If you do your own yard work, it is easy to take a soil sample yourself. Instructions on how to sample your soil can be obtained from Cornell Cooperative Extension (CCE). The telephone numbers and addresses for the Putnam and Westchester County CCE offices are presented on the back of this brochure.

Once collected, the soil sample should be mailed to the Nutrient Analysis Lab at Cornell University or to a private soil testing laboratory for a modest fee. Contact information for private labs and additional information concerning soil testing can be obtained from your local CCE office. Remember, the water of New York is one of the most valuable resources we have. Let's all work together to preserve it!

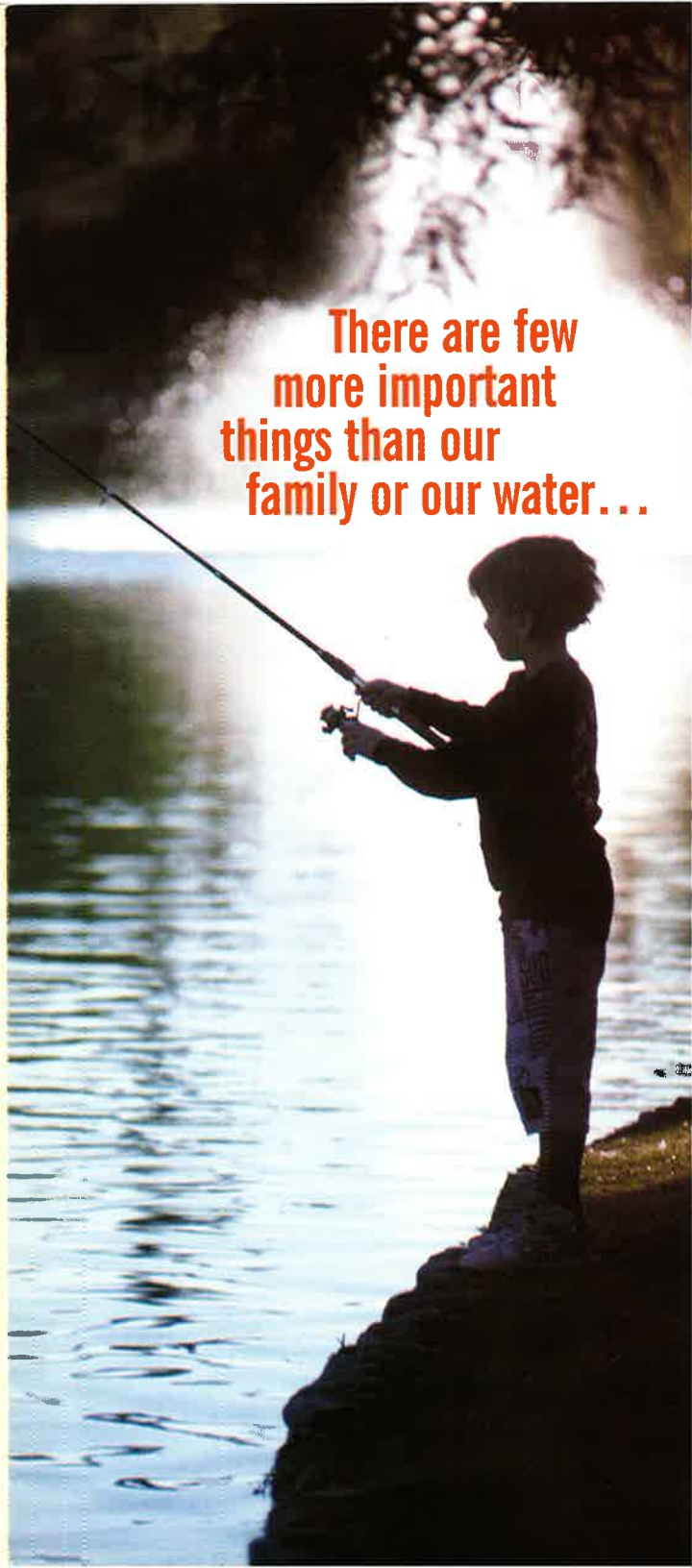
The following organizations are working together to protect water quality

Cornell Cooperative Extension
Gaia Institute
GreenPoint of New York
NYC Department of Environmental Protection
NYS Department of Environmental Conservation
NYS Department of Health
NYS Office of the Attorney General
NYS Turf and Landscape Association
Putnam County
United States Environmental Protection Agency
Westchester County

You may obtain soil testing information from:

Cornell Cooperative Extension of Westchester County
26 Legion Drive
Valhalla, NY 10595
914-285-4640
www.cce.cornell.edu/westchester

Cornell Cooperative Extension of Putnam County
Terravest Corporate Park
1 Geneva Road
Brewster, NY 10509
845-278-6738
www.cce.cornell.edu/putnam



Rain Garden Plants

Choose plants that have a variety of heights, textures and bloom times. It is important to select plants that can tolerate both wet and dry conditions, and that are suited to the sun/shade exposure of your garden.

Below are some good examples of plants to use in YOUR rain garden. They are all NATIVE to NEW YORK STATE and are able to tolerate periodic flooding.

Andropogon gerardii	*Lobelia siphilitica*
Big Bluestem	Great Blue Lobelia
Aquilegia canadensis	*Mertensia virginica*
Columbine	Virginia Bluebells
Asclepias incarnate	*Monarda didyma*
Swamp Milkweed	Beebalm
Aster novae-angliae	*Onoclea sensibilis*
New England Aster	Sensitive Fern
Chelone glabra	*Oenothera fruticosa*
White Turtlehead	Narrow Sundrops
Chelone obliqua	*Osmunda cinnamomea*
Pink Turtlehead	Cinnamon Fern
Cimicifuga racemosa	*Osmunda regalis*
Black Snakeroot	Royal Fern
Eupatorium fistulosum	*Panicum virgatum*
Joe Pye Weed	Switch Grass
Geranium maculatum	*Rudbeckia laciniata*
Cranesbill	Green-headed Conelflower
Iris versicolor	*Solidago rugosa*
Blue Flag Iris	Rough Goldenrod
Lobelia cardinalis	*Tiarella cordifolia*
Cardinal Flower	Foamflower

How MUCH does it cost?

The cost of a rain garden is based on several factors including:

- The area of the rain garden
- The depth of the rain garden
- Whether or not the soils found on site can be used in the garden (if they are less than 10% clay)
- If curb cuts are required to direct the flow from a roadway or parking lot into the garden
- If the site requires an underdrain (a perforated pipe placed under the rain garden in order to receive a desired discharge rate)
- If you are going to design and install the garden yourself or use contractors

If you grow your own plants or borrow plants from neighbors there can be very little or no cost at all. If you do all the work but use purchased prairie plants, a rain garden will cost approximately $3 to $5 per square foot. If a landscaper does everything, it will cost approximated $10 to $12 per square foot.

It might seem easiest to sow native wildflower seed over the garden, but experience shows that seeding a rain garden has its problems. Protecting the seeds from wind, flooding, weeds, and garden pests is very difficult, and the rain garden will be mostly weeds for the first two years. Growing plugs from seed indoors or dividing a friend's plants is much better. If you grow plugs, start them about four months before moving them to the rain garden. When the roots have filled the pot and the plants are healthy, they may be planted in the rain garden.

Dutchess County Soil and Water Conservation District

2715 Route 44, Suite 3

Millbrook, New York 12545

Phone: 845-677-8011 x3

Fax: 845-677-8345

http://dutchesswcd.org/

DCSWCD would like to thank the Greene County Soil and Water Conservation District for use of this brochure.

Rain Gardens

Gardening with

Water Quality

In Mind

Enhancing *your home* landscape and improving water quality in YOUR community

What IS a Rain Garden?

A rain garden is a natural or dug shallow depression designed to capture and soak up stormwater runoff from your roof or other impervious areas around your home like driveways, walkways, and even compacted lawn areas. They can be used as a buffer to shoreline areas to capture runoff from the home landscape before it enters a lake, pond, or river. The rain garden is planted with suitable trees, shrubs, flowers, and other plants allowing runoff to soak into the ground and protect water quality.

Rain is natural; stormwater isn't.

Stormwater runoff is considered one of the main sources of water pollution nation-wide. Stormwater runoff can result in:

- Overall reduction in groundwater charge
- Long-term lowering of groundwater tables and loss of stream flow during dry weather
- Increased erosion
- Increased water quality impacts caused by pollutants in stormwater runoff
- Flooding—especially more frequent "flash flooding"

Rain gardens are an inexpensive, simple to implement and environmentally sound solution to urban stormwater runoff.

A rain garden will:

- Filter runoff pollution
- Recharge local groundwater
- Conserve water
- Improve water quality
- Protect rivers and streams
- Remove standing water in your yard
- Reduce mosquito breeding
- Increase beneficial insects and eliminate pest insects
- Reduce potential of home flooding
- Create habitat for birds and butterflies
- Survive drought seasons
- Reduce garden maintenance
- Enhance sidewalk appeal
- Increase garden enjoyment

Knowing the basics to building a rain garden

- **Before you dig the garden** ***call the power company!*** Or call Dig Safe NY (1-800-962-7962) to locate any underground utility lines!

- **Put the garden at least 10 feet from the house to keep your foundation dry.**
  - A low area can work. Native plants will break up the soil and allow infiltration.
  - Border gardens are usually more attractive than circular gardens in the middle of the yard.

- **Make the garden 150-300 square feet**
  - Aesthetics and maintenance should determine the size of a home garden. Even an undersized garden will do a lot of work to infiltrate water.
  - If the soil is clay, the garden should be large and shallow; If the soil is sandy, any size or depth is okay.
  - Rule of thumb for sizing a rain garden: Make the garden 30% of the roof area if the soil is clay, 20% if sand.

- **Make the bottom of the garden flat.**
  - It should look like a saucer, not like a bowl. This allows infiltration everywhere and reduces the likelihood of standing water.
  - If you know someone with a surveyor's level, that'll make the job much easier.

- **Make a low berm around the garden to hold water.**
  - The garden only needs to be about 3-inches deep.
  - Think about where the garden will overflow during the heaviest rainfall. It should empty away from the house, not toward it.

- **On slopes you may need a small terrace wall.**
  - The downslope wall should be half as high as the rise to the top of the slope.
  - On steep slopes, plant natives directly on the hill without digging a depression. The plants will infiltrate runoff. A tall retaining wall can fail *catastrophically* if it gets too wet.

- **Water transport.**
  - If your garden is in a natural low area, just direct your downspouts toward the garden.
  - You can dig small swales that lead from the downspout to the garden. Plant the swales with grass or line with rocks.
  - Buried pipe from the downspout to the garden is another option.

- **Digging the garden.**
  - It's usually not too expensive to hire someone to prepare the site.
  - If you dig by hand, take your time and enjoy the work.
  - Mix in compost if you feel like it. Compost absorbs water, but it can encourage too-tall plants.

- **Use native plants.** The long roots infiltrate water.
  - 1 plant per square foot.
  - 15 different species, or more. Avoid cultivars (i.e., named varieties).
  - 30-50% sedge (some grasses work, too). They help the plants stand up.
  - Choose plants mostly based on their height and on their light requirements.

- **Maintenance.**
  - Cover with wood chip mulch the first year.
  - Water the first year.
  - Weed the first 2-3 years. Minor weeding thereafter.
  - In winter, leave the dry stems for habitat and seeds. Cut them down in April and compost them.

- **Enjoy!**
  - Your garden will not only infiltrate and clean stormwater, but provide wildlife habitat, too.

Make a Difference at the Water's Edge...

SIX SIMPLE STREAM SOLUTIONS

1. **Don't** mow to the edge of the streambank (e.g., into the stream's "Buffer Zone")!
2. **Do** plant trees and shrubs in your Buffer Zone for more anti-erosion power!
3. **Don't** dump anything in the stream!
4. **Do** help nature by removing trash and debris from streams!
5. **Don't** change the course of your stream!
6. **Do** keep septic systems in good working order!

"The goal of life is living in agreement with nature."

Zeno, Greek philosopher (335 BC - 264 BC)

at the Water's Edge...

Contact us for assistance:

DUTCHESS COUNTY SOIL & WATER CONSERVATION DISTRICT
2715 ROUTE 44, SUITE 3
MILLBROOK, NEW YORK 12545

PHONE: (845) 677-8011 X3
FAX: (845) 677-8354

WWW.DUTCHESS.NY.NACDNET.ORG
EMAIL: jennifer.smith@ny.nacdnet.net

THIS BROCHURE WAS ADAPTED FROM ONE DEVELOPED BY:

SUMMIT SOIL & WATER CONSERVATION DISTRICT

2795 FRONT STREET, SUITE D
CUYAHOGA FALLS, OHIO 44221

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SPECIAL THANKS TO THE WAPPINGER CREEK WATERSHED INTERMUNICIPAL COUNCIL

Make a Difference

Make a Difference

Living by a stream can be an enhancement or a hassle to your lifestyle. A lot depends on your approach to your stream and its "riparian area" (that strip of land that runs alongside a stream). Here are some simple solutions that you can use to make living by a stream more enjoyable—and help the stream stay healthy, too!

at the Water's Edge...

Keep it clean, keep it healthy

Your stream is an asset to your property. Keep it that way by clearing away any trash that you might find in it. And of course, don't dump ANYTHING into the stream. Even "natural" materials like grass clippings and leaves can pollute the stream.

Fertilizing? Do it sensibly!

Fertilizing directions are there for a reason. Many people use too much fertilizer. When it rains, the excess runs off the lawn and pavement, and into nearby water bodies. Once there, they pollute the water by encouraging too much algae growth.

Note: Bring a soil sample to the Cornell Cooperative Extension to find out what your soil needs prior to applying fertilizer.

Put that lawn mower away!

One of the best things you can do for your stream is to not mow right up to the edge of the bank. By allowing the native plants and grasses to grow, you help to prevent erosion as well as improve the quality of water that flows into the stream. The roots of these plants help to anchor the soil, while stems and leaves help to slow down the water entering the stream. The slower this runoff is, the more likely that harmful chemicals, such as pesticides and fertilizers, will never reach the stream to pollute it.

If you don't like the "natural" look, try landscaping with native plants! They look nice, and they do a great job of holding onto the soil. Check out the list in this brochure for ideas.

Let it wander a little

Streams need a little room to move from side to side, so don't be upset if the stream redirects its channel slightly from year to year. If a stream is threatening something on your property—don't redirect it—contact us—Dutchess County Soil & Water Conservation District (DCSWCD) for assistance. Changing the path of your stream not only requires a permit from the NYS Department of Environmental Conservation, but it can lead to increased flooding and bank erosion for you and your neighbors.

Know your watershed

Your stream collects water from its watershed, so become more aware of how that land is used. Is there construction activities taking place near where you live? Where are the industrial and commercial land uses?

Being involved in the decision-making processes within your community could help to assure the health of your stream. Contact your Town Hall for information on how you can get involved.

Develop a Plan for Planting

There are plants that work well beside a stream…and those you want to keep out! If you are interested in cultivating the area around your stream, contact the DCSWCD for assistance and become familiar with the beneficial plants as well as the bad ones. Here are some examples…

DESIRABLE Riparian Plants

Red or Black chokeberry
Common buttonbush
Silky, Redosier, or Gray dogwood
"Bankers" dwarf or "streamco" willow
Common winterberry
American elderberry
Viburnum
Common spicebush
Trumpetcreeper (vine)
Daylily
Sycamore
White spruce
River birch

Note: The DCSWCD holds an annual seedling sale each spring that includes most of the species listed above

UNDESIRABLE Plants

(Invasive Species)

Common reed grass (Phragmites)
Garlic mustard
Glossy and Common buckthorn
Japanese honeysuckle
Purple loosestrife
Reed canary grass (Phalaris)
Smooth brome

Why Bag Your Grass?

Cut it High & Let it Lie!

YOUR "WASTE,"
YOUR RESPONSIBILITY.

Baltimore County Bureau of Solid Waste Mgmt.

According to turf experts, grass clippings:

- reduce water evaporation from the lawn;
- reduce lawn wear by creating a cushioning layer; and
- facilitate better growth by keeping the soil temperature cooler.

Baltimore County Bureau of Solid Waste Mgmt.
www.baltimorecountymd.gov/recycling
410.887.2000 recycle@baltimorecountymd.gov

Adapted and reprinted with permission from:
Ramsey County, Minnesota - Public Health Department
Rev. 4/08

Baltimore County
Department of Public Works
Bureau of Solid Waste Management
111 West Chesapeake Avenue, Rm. 225
Towson, MD 21204

BALTIMORE COUNTY
MARYLAND

Printed on Recycled Paper

After all, lawn maintenance is work.

And bagging your lawn clippings is probably the most time-consuming part of the job. Sure, your lawn looks great afterwards. But, the bigger your lawn, the more clippings, bags, and the more exhausting the process.

Now, consider for a moment not bagging your grass.

Gone is the hassle of stopping every ten minutes to empty the mower bag, raking, and wrestling with expensive bags. Instead of causing you trouble, your clippings remain on the lawn, working their way back into the soil.

You may say,

not bagging your grass is unhealthy, and will cause excessive thatch build-up or even kill your lawn.

The fact is,

grass clippings can actually help you to maintain a vigorous, more durable lawn.

But, there is one added reason for leaving your clippings on the lawn.

During the summer months, grass clippings account for a whopping 24% of residential trash. Every grass blade you leave behind will keep one grass blade out of the collection truck. With yard materials management costs rising and an environment to protect, that just makes sense.

Now, this is not an all-or-nothing proposition...

to bag or not to bag. You may choose to collect your clippings every third time you mow... or every other time. Regardless, you are creating a savings for you and the environment. The more you can keep on your lawn, the better!

Of course, this process requires some attention to lawn maintenance...

but it's the kind of attention all lawns should have on a regular basis.

- Don't let your lawn become a hay field before mowing. The clippings should be no more than one inch long in order to fall through the grass and onto the soil.
- Use a sharp mower blade (a mulching mower if you have one). The sharper the blade, the finer the clippings, and the faster they decompose. (If you have trouble using your mower without the bagger, call your hardware store or dealer for assistance.)
- Avoid over-fertilizing your lawn. If it becomes too dense with growth, your clippings won't be able to reach the soil to decompose.
- Remove excessive thatch before leaving your clippings on the lawn. Although *1/2 inch of thatch is ideal*, a thick layer will keep clippings from reaching the soil.
- Always mow your lawn when it's dry. If the grass is wet, the clippings will clump under the mower and won't be able to filter down to the soil.

Remember,

these are practices all lawn owners should follow, whether or not they leave clippings on the lawn. With the right attention, your lawn should be able to recycle its clippings *and* retain its good health.

What's the difference?
Sanitary Sewer vs. Storm Drain

The water that drains down a sink or toilet in a home or business flows to the sanitary sewer and associated wastewater treatment plant or individual septic disposal system for treatment.

A storm drain system, on the other hand, is designated to carry rainwater from streets and driveways to prevent flooding. **The stormwater may not receive any treatment.** It flows directly into area streams, rivers, and lakes.

Unfortunately, as rainfall flows over the ground it picks up debris and pollutants and deposit them into our water bodies. Some of the pollutants that are commonly transported in the storm drain system include:

- Sediments
- Road Salt
- Fertilizers and Pesticides
- Metals
- Detergents
- Trash and Debris
- Oil and Grease
- Bacteria and Viruses

To Report Illegal Dumping or Discharges:

Call your local Highway Department

For Spill Emergencies:

Call your local Fire Department

For Soil Testing Prior to Applying Fertilizers:

Contact Cornell Cooperative Extension-Dutchess County: 845-677-8223 x115

For Stormwater Pollution Prevention Employee Training:

Call Dutchess County Soil and Water Conservation District

For more information, check out these websites:

Dutchess County Soil and Water Conservation District: www.dutchessswcd.org

NYS Department of Environmental Conservation: Division of Water Stormwater page: www.dec.state.ny.us/website/dow/mainpage.htm

US Environmental Protection Agency: National Pollutant Discharge Elimination System: www.epa.gov/npdes/stormwater
Polluted Runoff – Nonpoint Source Pollution: www.epa.gov/nps

US Department of Agriculture - Natural Resources Conservation Service: Backyard Conservation: http://www.nrcs.usda.gov/feature/backyard

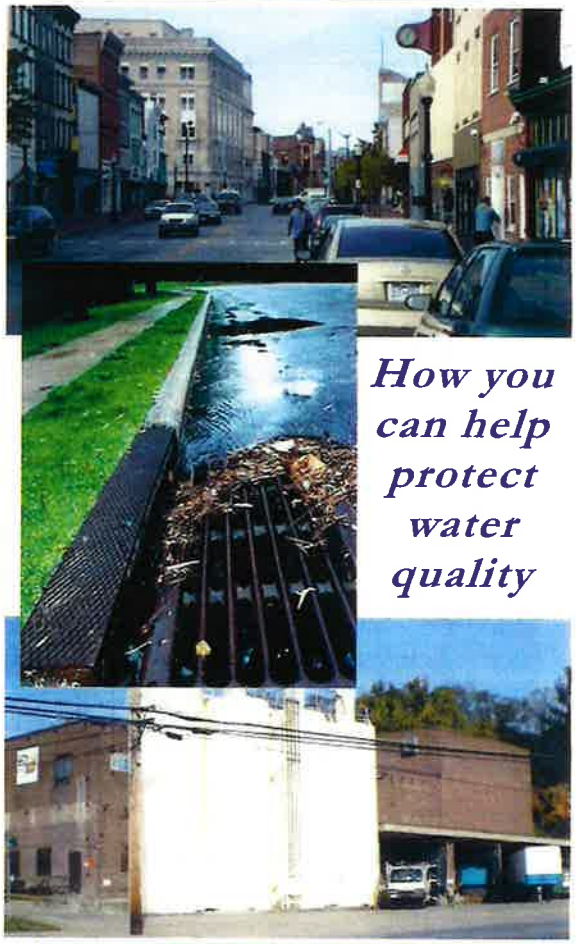
Center for Watershed Protection: www.cwp.org

Dutchess County Soil and Water
Conservation District
2715 Route 44, Suite 3
Millbrook, New York 12545

Phone: 845-677-8011 x3
Fax: 845-677-8354

This brochure was prepared with funding provided by the New York State Department of Environmental Conservation - Hudson River Estuary Program.

Preventing Stormwater Pollution



How you can help protect water quality

Tips for Commercial and Industrial Businesses

If your business is in one of the Dutchess County municipalities listed below, the community you work in has been designated a **regulated MS4** (Municipal Separate Storm Sewer System) under the Phase II Stormwater Regulations.

City of Beacon
Town of Beekman
Town of East Fishkill
Town of Fishkill
Village of Fishkill
Town of Hyde Park
Town of LaGrange
Town of Pawling
Village of Pawling
Town of Pleasant Valley
City of Poughkeepsie
Town of Poughkeepsie
Town of Wappinger
Village of Wappingers Falls

This means that the municipality in which you work needs a permit under the State-wide Pollutant Discharge Elimination System (SPDES) in order to discharge stormwater. Each MS4 community needs help from each resident and business to minimize the impacts on stormwater runoff and thus your area streams, lakes, and rivers.

How You Can Help

The following are simple, but effective, things you can do at your workplace to protect and improve the water quality of our streams, lakes, and rivers through stormwater pollution prevention.

General

⇒ Regularly sweep and collect debris around your site, **do not hose down sidewalks or parking lots**
⇒ Train employees to recognize the impact they have on water quality
⇒ **NEVER** dump anything down a storm drain
⇒ Report any illegal dumping to a storm drain—call your local Highway Department

Landscaping

⇒ Only irrigate during early morning to avoid evaporation (it's also better for your plants)
⇒ Aim sprinklers to avoid watering non-target areas
⇒ Time sprinklers to avoid over watering and causing runoff onto paved areas
⇒ Get your soil tested prior to applying fertilizers **Save money by using only what's needed**
⇒ Minimize pesticide, herbicide, and fertilizer use. Always follow the manufacturer's instructions

Outdoor Material Storage

⇒ Store all potential pollutants indoors or under a covered area or secure tarp
⇒ **Clean up all spills immediately!** Use dry absorbents as necessary and dispose of waste materials properly. Protect the storm drains closest to the spill
⇒ Keep lids on all storage containers
⇒ Label all material storage containers
⇒ Regularly sweep and clean all outdoor storage areas to remove dirt and debris

Waste Management

⇒ Keep the ground around all outdoor garbage and dumpster areas free of trash, sediment, and debris
⇒ **Close the lids on dumpsters and trash cans after every use**
⇒ Do not use dumpsters for liquid wastes. They are rarely leak-proof
⇒ Clean up all spills immediately!

General Cleaning

⇒ Minimize the use of cleaning agents
⇒ Switch to more environmentally friendly cleaning products
⇒ Dispose of waste wash water to sanitary sewer not to storm drains

Vehicle/Equipment Maintenance

⇒ Perform all vehicle maintenance indoors when possible. If not, use a drop cloth or tarp
⇒ **Use drip-pans to collect leaking fluids**
⇒ Clean up all spills immediately! Use dry absorbents as necessary and dispose of waste materials properly

Vehicle/Equipment Washing

⇒ Wash vehicles at a commercial car wash when possible (their wastewater drains to the sanitary sewer)
⇒ If you must wash onsite, wash vehicle over a pervious (absorbent) area such as dirt, gravel or grass to prevent runoff
⇒ Minimize the use of soaps and water while washing. **Use biodegradable soaps**

Roof Runoff Management

⇒ Direct gutter downspouts to a vegetated or grassed area instead of pavement
⇒ **Do not store anything on your roof**

Construction

⇒ **Minimize the amount of exposed soil**
⇒ Cover construction material stockpiles
⇒ Use silt fence around perimeter of site to capture any sediment washed away
⇒ Store materials where not exposed to rain. Use a secured tarp as necessary

Preventing Pollution Is Good Public Relations

Let your customers know what you're doing to minimize stormwater pollution. It shows them that you're a good neighbor. Encourage your customers and other businesses to do the same.