

# When It Rains, It Drains

## Understanding Storm Water and How It Can Affect Your Money, Safety, Health, and the Environment

PENNSTATE



### What is storm water?

Storm water from precipitation that flows across the ground and pavement when it rains or when snow and ice melt. The water seeps into the ground or drains into what we call storm sewers. These are the drains you see at street corners or at low points on the sides of streets. Collectively, the draining water is called storm water runoff.

### Why is storm water "good rain gone wrong"?

Storm water becomes a problem when it picks up debris, chemicals, dirt, and other pollutants as it flows or when it causes flooding and erosion of stream banks. Storm water travels through a network of pipes and roadside ditches that make up storm sewer systems. It eventually flows directly to a lake, river, stream, wetland, or coastal water. All of the pollutants storm water carries along the way empty into our waters, too, because storm water does not get treated.

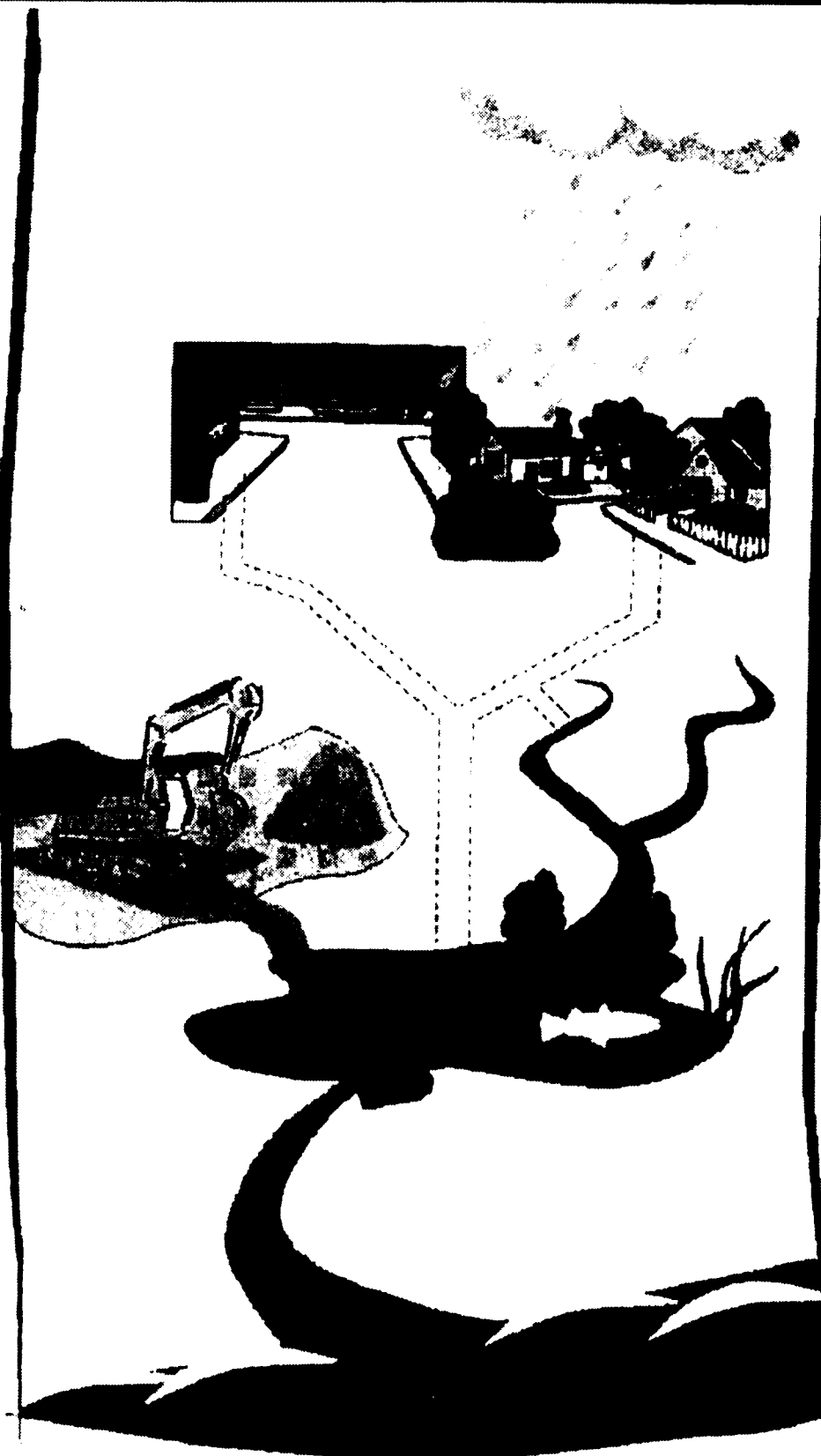
- Pet wastes left on the ground get carried away by storm water, adding harmful bacteria, parasites, and viruses to our water.
- Vehicles drip fluids (oil, grease, gasoline, antifreeze, brake fluids, etc.) onto pavement areas where storm water runoff carries them through our storm drains and into our water.
- Chemicals used to grow and maintain beautiful lawns and gardens, if not used properly, can run off into the storm drains when it rains or when we water our lawns and gardens.

- Waste from chemicals and materials used in construction can wash into the storm sewer system when it rains. Soil that erodes from construction sites causes environmental degradation, including harming fish and shellfish populations that are important for recreation and our economy.

### What happens when it rains?

Rain is an important part of nature's water cycle, but there are times it can do more damage than good. Problems related to storm water runoff can include:

- Flooding caused by too much storm water flowing over hardened surfaces such as roads and parking lots, instead of soaking into the ground.
- Increases in spending on maintaining storm drains and storm sewer systems that become clogged with excessive dirt and debris.
- Decreases in sport fish populations because storm water carries sediment and pollutants that degrade important fish habitats.
- More expensive treatment technologies to remove harmful pollutants carried by storm water into our drinking supplies.
- Closed beaches due to high levels of bacteria carried by storm water that make swimming unsafe.



### Restoring Rain's Reputation: What Everyone Can Do to Help

We can help rain restore its good reputation while protecting our health and environment while saving money for our communities.

Rain by nature is important for replenishing drinking water supplies, recreation, and healthy wildlife habitats. It becomes a problem only when pollutants from our activities such as car maintenance, lawn care, and dog walking are left on the ground for rain to wash away.

Here are some of the most important ways to prevent storm water pollution:

- Properly dispose of hazardous substances such as used oil, cleaning supplies, and paint. Never pour them down any part of the storm sewer system and report anyone who does.
- Use pesticides, fertilizers, and herbicides properly and efficiently to prevent excess runoff.
- Look for signs of soil and other pollutants, such as debris and chemicals, leaving construction sites in storm water runoff or tracked into roads by construction vehicles. Report poorly managed construction sites that could impact storm water runoff to your community. (See the bottom of the page for contact information.)
- Install innovative storm water practices on residential property, such as rain barrels or rain gardens, that capture storm water and keep it on site instead of letting it drain away into the storm sewer system.
- Report any discharge from storm water outfalls during times of dry weather—a sign that there could be a problem with the storm sewer system.
- Pick up after pets and dispose of their waste properly. No matter where pets make a mess—in a backyard or at the park—storm water runoff can carry pet waste from the land to the storm sewer system to a stream.
- Store materials that could pollute storm water indoors and use containers for outdoor storage that do not rust or leak to eliminate exposure of materials to storm water.

### Test Your Storm Sewer System Savvy!

What makes up the storm sewer system in your community? See if you can identify which elements are part of the storm sewer system in this quiz. (Answers are below.)

The following items are part of the storm sewer system:

- 1 A ditch (True or False)
- 2 A fire hydrant (True or False)
- 3 A storm drain inlet (True or False)
- 4 A curb with a storm drain inlet (True or False)
- 5 A storm sewer outfall (True or False)
- 6 A toilet (True or False)
- 7 A septic system (True or False)
- 8 Roads and other paved areas (True or False)

### Answers to Test Your Storm Sewer System Savvy:

- 1 True—A ditch is part of the storm sewer system. Most people think that the system is just a series of underground pipes. It can also include ditches used to convey storm water from the land to a receiving lake, river, or stream.
- 2 False—A fire hydrant is not part of the storm sewer system. Water sprayed from fire hydrants is not storm water, but is allowed by law to enter the storm sewer system.
- 3 True—A storm drain inlet is part of the storm sewer system. Many people do not realize that this is an opening leading to the storm sewer system. Understanding what storm drains look like may prevent people from using them as trash receptacles. Storm drains are metal-framed openings at the side/bottom of a roadway. Some have grates over them.
- 4 True—A curb with a storm drain inlet is part of the storm sewer system. As is the case with a storm drain inlet (No. 3), anything that enters this drain will go directly to streams, rivers, and lakes without being treated first. Anything that goes into this inlet (e.g., trash, leaves, hazardous materials) travels directly to a receiving lake, river, or stream without being treated first. Many communities stencil storm drains with "Do Not Dump" messages to let people know.
- 5 True—A storm sewer outfall is part of the storm sewer system. An outfall is where storm water drains from the storm sewer system into a receiving lake, stream, or river. If there is a flow from an outfall when it isn't raining, there could be a problem with the system or someone has used a storm drain for illegally disposing of material.
- 6 False—A toilet is not part of the storm sewer system. Wastewater from sinks and toilets in houses and businesses travels through a sewer system constructed to carry sanitary waste. In some instances, older communities may have a combined sewer system designed to carry both storm water and sanitary waste.
- 7 False—A septic system is not part of the storm sewer system. Homeowners use septic tanks to manage sanitary wastes on-site. Improperly maintained septic systems can leak and contribute pollutants to the storm sewer system, as well as directly to lakes, rivers, and streams.
- 8 False—Roads and other paved areas are not part of the storm sewer system. Roads and other hardened surfaces such as parking lots and sidewalks can accumulate pollutants (e.g., oil, grease, dirt, leaves, trash, pet wastes) that storm water eventually washes into the storm sewer system.



Pennsylvania Department of Environmental Protection  
www.dep.state.pa.us

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For further information on storm water, visit: [www.opppsu.edu/MS4](http://www.opppsu.edu/MS4)

Contact Paul Ruskin, OPP Communications Coordinator at 814-863-9650 or [prk@psu.edu](mailto:prk@psu.edu)