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Storm Drains and Water Quality

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Improving water quality: The responsibility rests on all our shoulders

Government regulation of business and industry has improved Missouri's water quality. However, not all pollution comes from these sources. Improper disposal of motor oil, pet wastes, yard debris, litter, and misuse of pesticides and fertilizers also threaten our water resources.

This guide describes how storm drains are linked to water quality and what you can do to prevent water pollution.

The U.S. Environmental Protection Agency has determined that nonpoint source pollution is a major cause of our nation's water quality problems.

Household wastes are a significant source of nonpoint source pollution. Household wastes often enter our waterways via storm drains, negatively impacting water quality by depleting oxygen reserves and contaminating the water.

Aquatic plants and animals need sufficient oxygen and clean water to survive. Storm drains should never be used to dispose of household wastes.

Storm drains

Storm drains or catch basins are the square metal grates at the sides or curbs of streets. They are designed to collect stormwater to prevent streets and property from flooding. When it begins to rain, the first raindrops soak into the ground.

But once the soil is saturated, or if the soil has been replaced by cement or another impervious barrier, the rain runs along the surface and is caught in storm drains.

Any debris or garbage from driveways, backyards or streets, including products and wastes applied to the ground, can be washed into the storm sewer system.

For many communities, the storm sewer system carries runoff water through pipes to larger pipes or trunk lines buried underground. These pipes then take the water and empty it untreated into the nearest waterway, such as a stream, river or lake. In parts of Missouri, the storm sewer trunk line empties into a sinkhole, which is a direct conduit to groundwater.

In some communities, the storm sewer system (stormwater) is combined with the municipal sewer system (wastewater). This is called a combined sewer system. Both water streams are carried through pipes to the wastewater treatment plant.

The water is treated at the plant according to the level of available treatment. However, when there is a large flow of water from a storm, the water at the wastewater treatment plant may be released with minimal treatment. As a result, raw sewage and stormwater enter the waterway.

What you can do
Following is information on specific types of wastes that enter our waterways through storm drains and how you can prevent this pollution.

**Antifreeze**

Antifreeze is primarily composed of ethylene glycol, a sweet and poisonous compound which can kill or injure pets, birds, fish, and other wildlife when carelessly disposed into the environment.

It can also contain heavy metal contaminants picked up from vehicle engines during use.

**Solutions**

- Repair any leaks in your vehicle's radiator system.
- If available in your community, take your used antifreeze to an antifreeze recycling center.
- If recycling is not an option, contact your local wastewater treatment plant to determine if you can dispose of the antifreeze down a drain connected to the wastewater treatment plant. Never pour antifreeze into a septic system or lagoon.
- If no options are available, antifreeze must be saved for a household hazardous waste collection. Do not mix antifreeze with any other substance.

**Fertilizers**

Fertilizers contain large amounts of phosphorus and nitrogen which can cause algal blooms in aquatic areas. These blooms deplete the oxygen in water, resulting in fish kills.

**Solutions**

- Sweep and collect any fertilizer from driveways and walkways. Do not wash these materials into storm drains.
- Avoid overusing fertilizers. Determine the mineral needs of your soil and apply the necessary amendments. Contact MU Extension for assistance.
- Never apply fertilizer before it rains.
- Donate unwanted fertilizer to a friend, local garden club, or other organization that can use it up.
- Save unusable fertilizer for a household hazardous waste collection.

**Motor oil**

Motor oil can damage or kill underwater vegetation and aquatic life.

Each year in the United States, do-it-yourself motor oil changers improperly dispose of 192 million gallons of used motor oil into our environment.

This is more than 17 times the oil spilled by the Exxon Valdez. One gallon of used motor oil can contaminate 1 million gallons of water. When used motor oil is applied to roads, more than 90 percent of it leaves the road surface on dust particles or in surface runoff.

The use of motor oil as a dust suppressant on a road, a parking lot, a driveway or other similar surface is prohibited in Missouri.

Since Jan. 1, 1991 Missouri solid waste disposal areas cannot accept used motor oil for disposal.

**Solutions**
- Repair any leaks in your vehicle.
- Put used motor oil into a sealed container (a plastic milk jug with a screw-on cap works well) and take it to a used motor oil collection site. Do not mix used motor oil with any other substance.
- If recycling is not available, used motor oil must be saved for a household hazardous waste collection. Do not mix used motor oil with any other substance.

**Paint**

Paint, even latex paint, can contain a variety of hazardous ingredients including lead, mercury, and organic solvents, all of which can impact the environment when disposed of improperly.

Paint rinse water can also contain sufficient hazardous materials to harm the environment.

**Solutions**

- Never rinse painting equipment where the rinse water can run into the storm drain.
- If it is usable and less than 10 years old, donate the paint to a friend or a community group, such as a theater or school, that can use it up.
- If the paint is unusable or older than 10 years, save it for a household hazardous waste collection.

**Pesticides**

Pesticides contain toxic materials that are harmful to humans, animals, aquatic organisms, and plants.

When it rains these toxic materials can run into storm drains and waterways.

**Solutions**

- Minimize the use of pesticides by using Integrated Pest Management practices. Contact MU Extension or HHWP for more information.
- Always determine what the pest is and if the pesticide is specific for that pest.
- If you must use a pesticide, follow the label directions very carefully.
- Never apply a pesticide before rain unless instructed to do so by the label.
- Never rinse pesticide application equipment where the rinse water can run into the storm drain.
- Consult with lawn care companies about the products they use on your property. Request that they use environmentally safe practices and ask to see material safety data sheets on their products.
- If a pesticide is usable, is not banned or restricted, and you no longer have a use for it, donate it to a friend, neighbor or community group who will safely use it. Contact MU Extension to determine if the pesticide is banned or restricted.
- Save unusable, unwanted or leftover pesticides for a household hazardous waste collection.

**Other household hazardous wastes**

Many other household products such as paint thinners, automotive waxes, cleaners, and swimming pool chemicals, contain hazardous ingredients that can be a threat to human health and the environment when improperly disposed.

**Solutions**

- Purchase products which are less hazardous.
- Give unwanted but usable products to someone who can safely use them.
- Save any unwanted or unusable portions of these products for a household hazardous waste collection.
**Pet wastes**

Pet waste is raw sewage. Allowing it to enter our waterways releases both potentially harmful bacteria and oxygen-consuming materials.

**Solutions**

- Dispose of pet wastes by flushing them down the toilet or by burying them away from any food-growing locations.

**Street litter and plastics**

Street litter, such as plastic bags, cups, candy wrappers and cigarette butts, are washed from the street by stormwater and end up floating in area streams and lakes.

Many animals mistake plastic for food and, as a result, become ill. Plastic can take hundreds of years to degrade and so will continue to contaminate our waterways and threaten their inhabitants.

**Solutions**

- Never throw garbage into the street or down storm drains.
- Dispose of all garbage, including cigarette butts and fast food containers, into garbage cans.
- Adopt your street and periodically collect any garbage that might be washed into a storm drain. Ask your family, friends and neighbors to do the same.

**Yard wastes and erosion**

Leaves and grass clippings allow bacteria, oxygen-consuming materials, phosphorus, and nitrogen to be released into our waterways. Yard wastes can also clog storm drains, making them ineffective and causing local flooding. Soil that erodes from your yard increases the sediment load in waterways, blocking sunlight essential for aquatic plants and suffocating animals.

**Solutions**

- Do not allow soil, leaves or grass clippings to accumulate on your driveway, sidewalk, or in the street.
- Collect leaves and grass clippings and compost them. Check with MU Extension for information on composting and the status of community composting services.
- Leave vegetation on steep slopes to hold soil in place. Mulch and seed exposed soil as soon as possible.
- Use hay bales to catch sediment that might wash off of bare soil areas.
- Leave vegetation along drainages and waterways to slow and filter yard runoff.

**Other water protecting activities**

- If you wash your car at home, wash it in a grassy area, using minimal amounts of no-phosphate soap (be careful not to drive over your septic system). Or better yet, take your car to a car wash that sends the wastewater to the wastewater treatment plant.
- Keep your engine-driven machines (for example cars, motorcycles and lawn mowers) well tuned. Gases and particulates from engine exhaust greatly contribute to stormwater pollution.
Current legislation

In November 1990, the U.S. Environmental Protection Agency (EPA) issued a final rule to implement Section 402(p) of the Clean Water Act, federal legislation aimed at preserving the quality of America's waters.

This final rule requires cities with populations greater than 100,000 that have separate storm sewer systems to obtain a National Pollutant Discharge Elimination System (NPDES) permit.

Cities must apply for this permit to ensure the EPA that their storm sewer systems are operating as efficiently and cleanly as possible.

Some privately owned businesses are also required to file for a permit if they discharge anything into the storm sewer system. Cities filing for an NPDES permit must, among other requirements, identify ways to improve the system and educate the public about nonpoint source pollution.

Although this permit application is only required for cities larger than 100,000 and for specified counties, all other cities, towns, and counties should be aware of the problems caused by nonpoint source pollution.

Local rivers and streams often receive pollutants that can damage the water quality of any town, regardless of size. The government is trying to improve water quality, but it is largely the responsibility of the citizens of Missouri to tackle nonpoint source pollution and stormwater runoff.

Missouri Storm Drain Stenciling Project

One way you can become involved in water protection is to participate in the Missouri Storm Drain Stenciling Project. Stencils bear the message "Dump No Waste, Drains To Stream," which serves as a reminder that storm drains should never be used to dispose of household wastes. Kits contain stencils and everything else needed to start a community education program.

The Missouri Storm Drain Stenciling Project was developed by the Household Hazardous Waste Project with assistance from the Missouri 4-H Youth Programs. Funding was provided by the Missouri Department of Natural Resources, and the Missouri Stream Team.

Contact the Household Hazardous Waste Project for information on how to obtain a free kit, or for information on storm drain stenciling in your area.

The Household Hazardous Waste Project is a program of the MU Extension System in cooperation with the Environmental Improvement and Energy Resources Authority.

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Related MU Extension publications

- WM6000, Safe Use, Storage and Disposal of Pesticides  
  http://extension.missouri.edu/p/WM6000
- WM6001, Safe Use, Storage and Disposal of Paint  
  http://extension.missouri.edu/p/WM6001
- WM6002, Selecting Household Safety Equipment  
  http://extension.missouri.edu/p/WM6002
- WM6003, Household Hazardous Products
http://extension.missouri.edu/p/WM6003
- WM6004, Managing Household Hazardous Waste
  http://extension.missouri.edu/p/WM6004
- WM6005, Store Hazardous Products Safely
  http://extension.missouri.edu/p/WM6005
- WM6006, Identifying Product Hazards: Material Safety Data Sheets
  http://extension.missouri.edu/p/WM6006
- WM6007, Setting Up a Used Antifreeze Collection Site
  http://extension.missouri.edu/p/WM6007
- WM6009, Setting Up a Used Latex Paint Collection Site
  http://extension.missouri.edu/p/WM6009
- WM6010, Setting Up a Used Oil Collection Site
  http://extension.missouri.edu/p/WM6010

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