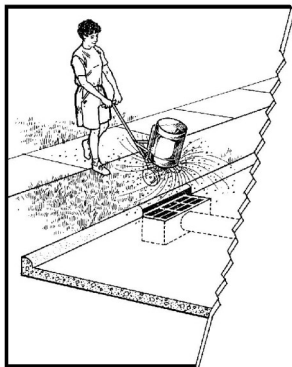


PROTECTING WATER QUALITY

Increased Pollutant Loads

Urbanization increases the variety and amount of pollutants carried into streams, rivers, and lakes. The pollutants include:

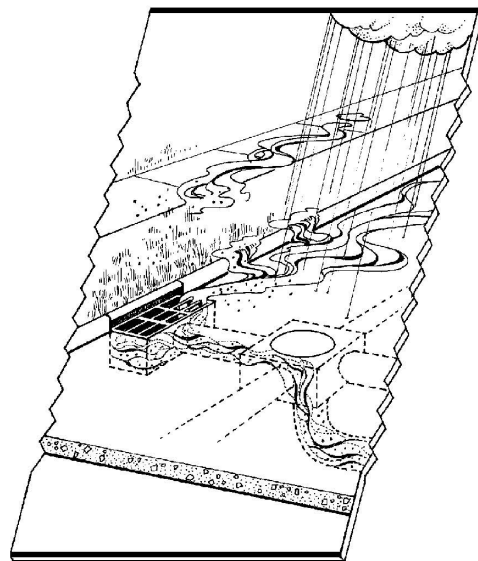
- Sediment
- Oil, grease and toxic chemicals from motor vehicles
- Pesticides and nutrients from lawns and gardens
- Viruses, bacteria, and nutrients from pet waste and failing septic or sewer systems
- Road salts
- Heavy metals from roof shingles, motor vehicles, and other sources
- Thermal pollution from dark impervious surfaces such as streets and rooftops



These pollutants can harm fish and wildlife populations, kill native vegetation, foul drinking water supplies, and make recreational areas unsafe and unpleasant.

CLEAN WATER IS EVERYBODY'S BUSINESS

In urban and suburban areas, much of the land surface is covered by buildings and pavement, which do not allow rain and snowmelt to soak into the ground. Instead, most developed areas rely on storm drains to carry large amounts of runoff from roofs and paved areas to nearby waterways. The stormwater runoff carries pollutants such as oil, dirt, chemicals, and lawn fertilizers directly to streams and rivers, where they seriously harm water quality. To protect surface water quality and ground water resources, development should be designed and built to minimize increases in runoff.



HOW URBANIZED AREAS AFFECT WATER QUALITY—INCREASED RUNOFF

The porous and varied terrain of natural landscapes like forests, wetlands, and grasslands traps rainwater and snowmelt and allows them to filter slowly into the ground. In contrast, impervious (nonporous) surfaces like roads, parking lots, and rooftops prevent rain and snowmelt from infiltrating, or soaking, into the ground. Most rainfall and snowmelt remains above the surface, where it runs off rapidly in unnaturally large amounts. Storm sewer systems concen-

trate runoff into smooth, straight conduits. This runoff gathers speed and erosional power as it travels underground. When this runoff leaves the storm drain and empties into a stream, its excessive volume and power blast out streambanks. Damaging streamside vegetation and wiping out aquatic habitat. These increased storm flows carry sediment loads from construction sites and other denuded surfaces and eroded stream banks. They often carry higher water tem-

peratures from streets, roof tops, and parking lots, which are harmful to the health and reproduction of aquatic life. The loss of infiltration from urbanization may also cause profound groundwater changes. Although urbanization leads to great increases in flooding during and immediately after wet weather, in many instances it results in lower stream flows during dry weather. Many native fish and other aquatic life cannot survive when these conditions prevail.

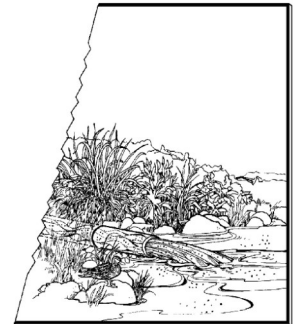
MANAGING URBAN RUNOFF

WHAT HOMEOWNERS CAN DO

To decrease polluted runoff from paved surfaces, households can develop alternatives to areas traditionally covered by impervious surfaces. Porous pavement materials are available for driveways and sidewalks, and native vegetation and mulch can replace high maintenance grass lawns. Homeowners can use fertilizers sparingly and sweep driveways, sidewalks, and roads instead of using a hose. Instead of disposing of yard waste, they can use the materials to start a compost pile. And homeowners can learn to use Integrated Pest Management

(IPM) to reduce dependence on harmful pesticides. In addition, households can prevent polluted runoff by picking up after pets and using, storing, and disposing of chemicals properly. Drivers should check their cars for leaks and recycle their motor oil and antifreeze when these fluids are changed. Drivers can also avoid impacts from car wash runoff (e.g., detergents, grime, etc.) by using car wash facilities that do not generate runoff. Households served by septic systems should have them professionally inspected and pumped every 3 to 5 years. They

should also practice water conservation measures to extend the life of their septic system. By practicing healthy household habits, homeowners can keep common pollutants like pesticides, pet waste, grass clippings, and



The most recent National Water Quality Inventory reports that runoff from urbanized areas is the leading source of water quality impairments to surveyed estuaries and the third-largest source of impairments to surveyed lakes.

MANAGING CONSTRUCTION AND DEMOLITION WASTE

During building construction and demolition, you may produce one or more of the following types of residuals:

- Clean fill
- Recoverable materials
- Regulated construction and demolition waste
- Hazardous materials and hazardous wastes, or
- Asbestos-containing materials

Clean fill is uncontaminated soil, rock, sand, gravel, concrete, asphaltic concrete, cinder blocks, brick, minimal amounts of wood and metal and inert (non-reactive) solids that can be used for fill, reclamation or other beneficial use.

Recoverable materials are those removed for reuse (lumber, doors, windows, ceramic tile and glass and those removed to be recycled into new products.

Regulated construction and

demolition wastes are those that are not classified as clean fill and that are not being reused or recycled. Regulated non-hazardous construction and demolition wastes must be disposed of at a permitted landfill or transfer station. They must not be burned to avoid violating air and solid waste laws. They must not be buried, except at a permitted landfill). They must not be hauled to private or public property and dumped or buried, even with the landowner's permission. If that happens, everyone involved, including the contractor, subcontractor, the hauler and the landowner can be held liable for the illegal disposal.

Hazardous Materials and Hazardous Wastes. Although you may find a variety of hazardous materials in old buildings, lead-based paint and asbestos are the most common ones that demolition contractors need to deal with.

Asbestos. All public, institutional, or commercial buildings, and in some instances residential, must be inspected for asbestos before renovation or demolition activities begin. Before planning a demolition project, bidding a project, letting a bid or beginning the demolition, it is important to know if the building has any asbestos-containing materials and who is responsible for removing them. Buildings may contain asbestos in materials such as ceiling or floor tile, as insulation or soundproofing on ceilings, pipes, ductwork or boilers, or on the outside as transite siding or in shingles. The presence of asbestos cannot be confirmed just by looking. A thorough inspection of any regulated building must be conducted by an inspector. Depending upon the results of the inspection, an asbestos abatement contractor may be required.

HEALTHY HOUSEHOLD HABITS FOR CLEAN WATER

Vehicle and Garage

- Use a common car wash or wash your car on a lawn or other unpaved surface to minimize the amount of dirty soapy water flowing into the storm drain and eventually into your local water body.
- Check your car, boat, motorcycle, and other machinery and equipment for leaks and spills. Make repairs as soon as possible. Clean up spilled fluids with an absorbent material like kitty litter or sand, and don't rinse the spills into a nearby storm drain. Remember to properly dispose of the absorbent material.
- Recycle used oil and other automotive fluids at participating service stations. Don't dump these chemicals down the storm drain or dispose of them in your trash.

Home Repair and Improvement

- Before beginning an outdoor project, locate the nearest storm drains and protect them from debris and other materials.
- Sweep up and properly dispose of construction debris such as concrete and mortar.
- Use hazardous substances like paints, solvents and cleaners in the smallest amounts possible, and follow the directions on the label. Clean up spills immediately, and dispose of the waste safely. Store substances properly to avoid leaks and spills.
- Purchase and use nontoxic, biodegradable, recycled, and recyclable products whenever possible.
- Clean paint brushes in a sink, not outdoors. Filter and reuse paint thinner when using oil-based paints. Properly dispose of excess paints through a household hazardous waste collection program, or donate unused paint to local organizations.
- Reduce the amount of paved area and increase the amount of vegetated area in your yard. Use native plants in your landscaping to reduce the need for watering during dry periods. Consider directing downspouts away from paved surfaces onto lawns and other measures to increase infiltration and reduce polluted runoff.

Lawn and Garden

- Use pesticides and fertilizers sparingly. When use is necessary, use these chemicals in the recommended amounts. Avoid application if the forecast calls for rain; otherwise, chemicals will be washed into your local stream.
- Select native plants and grasses that are drought and pest resistant. Native plants require less water, fertilizer, and pesticides.
- Sweep up yard debris, rather than hosing down areas. Compost or Recycle yard waste when possible.
- Don't overwater your lawn. Water during the cool times of the day, and don't let water run off into the storm drain.
- Cover piles of dirt and mulch being used in landscaping projects to prevent these pollutants from blowing or washing off your yard and into local water bodies. Vegetate bare spots in your yard to prevent soil erosion.

Pet Care

- When walking your pet, remember to pick up the waste and dispose of properly. Flushing pet waste is the best disposal method. Leaving pet waste on the ground increases public health risks by allowing harmful bacteria and nutrients to wash into the storm drain and eventually into local water bodies.

Swimming Pool and Spa

- Drain your swimming pool only when a test kit does not detect chlorine levels.
- Whenever possible, drain your pool or spa into the sanitary sewer system.
- Properly store pool and spa chemicals to prevent leaks and spills, preferably in a covered area to avoid exposure to stormwater.

Septic System Use and Maintenance

- Have your septic system inspected by a professional at least every 3 years, and have the septic tank pumped as necessary (usually every 3 to 5 years).
- Care for the septic system drainfield by not driving or parking vehicles on it. Plant only grass over and near the drainfield to avoid damage from roots.
- Flush responsibly. Flushing household chemicals like paint, pesticides, oil, and anti-freeze can destroy the biological treatment taking place in the system. Other items, such as diapers, paper towels, and cat litter, can clog the septic system and potentially damage components.

Did you know that because of impervious surfaces like pavement and rooftops, a typical city block generates more than 5 times more runoff than a woodland area of the same size?

City of Duquesne
1501 S. Duquesne
Joplin, MO.
64801-5714
417-781-5085

We're on the web!
www.duquesnemo.org



Where do I get more Information

Missouri Department of Natural Resources
Solid Waste Management Program
P.O. Box 176
Jefferson City, Mo 65102-0176
1-800-361-4827 or (573)751-5401
www.dnr.mo.gov/env/swmp/index.html

Missouri Department of Natural Resources
Hazardous Waste Program
P.O. Box 176
Jefferson City, MO 65102-0176
1-800-361-4827 or (573)751-7560
www.dnr.mo.gov/env/hwp/index.html

Missour Department of Natural Resources
Water Protection Program
P.O. Box 176
Jefferson City, MO 65102-0176
1-800-361-4827 or (573)751-1300
www.dnr.mo.gov/env/wpp

Joplin Regional Recycling Center
1310 West A Street
Joplin, MO 64801
(417)624-0820 Ext. 501

U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460
www.epa.gov

City of Duquesne
1501 S. Duquesne
Joplin, MO. 64801-5714
(417)781-5085
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For questions for the City of Duquesne please email us at cityclerk@duquesnemo.org.

WHAT ABOUT HOUSEHOLD HAZARDOUS WASTE

Almost every home contains household products that are hazardous, such as cleaning products, automotive products, paint and lawn and garden chemicals. These are considered household hazardous products that contain chemicals that can present acute or chronic hazards to human health and to the safety of people handling it. Some household hazardous products, like paints, varnishes and pesticides accumulate in the attic or basement for years. Make sure all old household hazardous products being stored are in a non-leaking container that is clearly labeled. When household hazardous products are not used completely and are discarded, they become household hazardous waste.

Under state and federal law, these materials are not excluded from on-site disposal with you other residential waste. However, we strongly urge you to look into other options for managing household hazardous waste. The Joplin Regional Recycling Center operates a household hazardous waste collection center.

You can avoid having household hazardous waste by buying non-toxic or less hazardous products or by using up items before they become outdated and by trying to find an alternate use for your excess materials. For example, a community theatre group or youth group may be able to use donated paint or varnish to decorate sets or for various projects, or a homeless shelter could use donated cleaning supplies or paint.. If the above options are not utilized, you are encouraged to call the Missouri Department of Natural Resources, Hazardous Waste Program at 1-800-361-4827 for further information on methods for reuse, reduction and disposal of your household hazardous waste. Waste reduction publications are available through the Hazardous Waste Program.

