



Targeted Constituents

Significant Benefit
 Partial Benefit
 Low or Unknown Benefit

<input type="radio"/> Sediment	<input checked="" type="radio"/> Heavy Metals	<input type="radio"/> Floatable Materials	<input type="radio"/> Oxygen Demanding Substances
<input type="radio"/> Nutrients	<input checked="" type="radio"/> Toxic Materials	<input checked="" type="radio"/> Oil & Grease	<input type="radio"/> Bacteria & Viruses
		<input type="radio"/> Bacteria & Viruses	<input type="radio"/> Construction Wastes

Description

Procedures and practices to reduce the discharge of pollutants to the storm drain system or to watercourses as a result of vehicle and equipment maintenance by conducting these activities offsite or in a designated area designed to contain spills and prevent stormwater runoff. This management practice is likely to create a significant reduction in heavy metals, toxic materials, and oil and grease.

Approach

Vehicle or equipment maintenance is a potentially significant source of stormwater pollution. Activities that can contaminate stormwater include engine repair and service (parts cleaning, spilled fuel or oil), replacement of fluids, and outdoor equipment storage and parking (dripping engines).

Maintain vehicles and equipment using indoor facilities protected from stormwater. If this is not possible, then use offsite repair shops which are protected from stormwater. As a last resort, vehicle maintenance may be conducted outdoors if spill and leak prevention practices are followed.

General Guidelines

- A Spill Prevention Control and Countermeasure (SPCC) Plan, which is required by law for some facilities, is an effective program to reduce the number of accidental spills. Keep the SPCC Plan up-to-date by regular inventory of chemicals, liquids, cleanup equipment and supplies.
- Train employees to carefully handle chemicals and liquids to avoid spills and leaks, including periodic review of the SPCC Plan. For a quick reference on disposal alternatives for specific wastes, see Table AM-01-1 in the Employee Training BMP fact sheet.
- An outdoor maintenance area, if needed, should be located on paved surfaces, preferably concrete, in order to facilitate cleanup. Use a barrier made of sandbags, blocks, or other material to prevent stormwater runoff from entering the area.
- Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids. Keep a drip pan under the vehicle when unclipping hoses, unscrewing filters, or removing other parts.

- Place a stockpile of spill cleanup materials where it will be readily accessible. Inform all employees where the materials are located and when they should be used.
- Clean leaks, drips, and other spills with as little water as possible. Use rags for small spills, a damp mop for general cleanup, and dry absorbent material for larger spills. Use the following three-step method for cleaning floors:
 1. Clean spills with rags or other absorbent materials.
 2. Sweep floor using dry absorbent material.
 3. Mop floor. Mop water may be discharged to sanitary sewer via a toilet or sink.
- Infrequent steam cleaning or pressure washing may be appropriate if conducted by a licensed company that recycles and/or treats the washwater prior to discharge. Verify that no washwater is discharged during the cleaning process. Call the Knoxville Water Quality Hotline if a violation is suspected.
- Provide spill containment dikes or secondary containment (curbs, berms, walls) around stored oil and chemical drums.
- Paint messages on storm drain inlets to indicate that they are not to receive liquid or solid wastes. Post signs as necessary to prevent disposal of liquid or solid wastes into natural channels or the stormwater drainage system.
- Inspect and clean nearby stormwater inlets regularly and especially after large storms. Call the Knoxville Water Quality Hotline of spills and leaks that contribute to stormwater pollution.

Vehicle and Equipment Maintenance

- Inspect vehicles and equipment for damaged hoses and leaky gaskets routinely. Repair or replace immediately to prevent fluids and oil from leaking.
- Keep equipment clean. Do not allow excessive buildup of oil and grease on equipment surfaces and engines. Make sure that incoming vehicles are checked for leaking oil and fluids.
- Keep drip pans or containers under the areas that might drip. Use several drip pans to collect different fluids, which can then be recycled if kept separate.
- Do not change motor oil or perform equipment maintenance near storm drains or stormwater channels. Use a vehicle maintenance area designed to prevent stormwater pollution.
- Inspect stored equipment for leaks on a regular basis. Keep drip pans or containers under areas that might drip. Consider storing vehicles and equipment indoors. Long-term storage should include draining oil and other fluids.
- Be especially careful with wrecked vehicles as well as vehicles kept onsite for scrap or salvage. Wrecked or damaged vehicles often drip oil and other fluids for several days.

- Place drip pans under a wrecked car immediately, even if all of the fluids appear to have leaked out beforehand.
- Build a shed or roof over areas with wrecked or stored vehicles awaiting repair or salvage.
- Drain all fluids, including air conditioner coolant, from wrecked vehicles and vehicles to be salvaged.

Material Disposal and Recycling

- Do not dump fuels and lubricants onto the ground. Do not place used oil or fluids into a dumpster. Recycle used oil and antifreeze at automotive retail stores.
- Do not bury used tires. Recycle tires at approved recycling centers or commercial establishments that accept tires.
- Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries, even if the acid appears to already be drained out. If a battery is dropped, treat it as if it were cracked by placing into a container.
- Collect leaking or dripping fluids in fluid specific drip pans or containers. Fluids are easier to recycle if kept separate.
- Promptly transfer used fluids to the proper waste or recycling drums. Do not leave full drip pans or other open containers lying around.
- Segregate liquid, solid and hazardous wastes for easier recycling and reduced treatment costs. Recycle greases, used oil or oil filters, antifreeze, cleaning solutions, automotive batteries, hydraulic, and transmission fluids. Keep hazardous and non-hazardous wastes separate.
- Do not mix used oil and solvents. Keep all types of chlorinated solvents (such as 1,1,1-trichloroethane) separate from non-chlorinated solvents (like kerosene and mineral spirits).
- Many automotive products made of recycled (i.e., refined or purified) materials are available. Engine oil, transmission fluid, antifreeze and hydraulic fluid are available in recycled form. Buying recycled products supports the market for recycled materials.
- If possible, eliminate or reduce the amount of hazardous materials and waste by substituting non-hazardous or less hazardous materials. For example:
 - Use non-caustic detergents instead of caustic cleaning agents for parts cleaning (ask automotive suppliers about alternative cleaning agents).
 - Use detergent-based or water-based cleaning systems in place of organic solvent degreasers.
 - Replace chlorinated organic solvents (1,1,1-trichloroethane, methylene chloride, etc.) with non-chlorinated solvents. Non-chlorinated solvents like kerosene or mineral spirits are less toxic and less expensive to dispose

properly. Check list of active ingredients to see whether it contains chlorinated solvents. The term “chlor” indicates that the solvent is probably chlorinated.

- Parts are often cleaned using hazardous solvents such as trichloroethylene, 1,1,1-trichloroethane or methylene chloride. Many of these cleaners must be disposed of as a hazardous waste. Clean without using liquid cleaners (such as using a wire brush) whenever possible to reduce waste.
- Do all liquid cleaning at a centralized station so that solvents and residues stay in one area. Locate drip pans, drain boards, and drying racks to direct drips back into a solvent sink or fluid holding tank for re-use.
- Oil filters, when disposed into trash cans or dumpsters, can leak oil and contaminate stormwater. Place the oil filter in a funnel over the waste oil recycling collection tank to drain excess oil before disposal. Oil filters can be crushed and recycled; ask automotive suppliers about recycling used oil filters.

Maintenance

- Maintain waste fluid containers in leak-proof condition. Recycle waste fluids on a regular basis before container capacity is reached.
- Vehicle and equipment maintenance areas shall be inspected regularly. A safe and organized work area will prevent most spills and leaks.
- Keep ample supplies of spill cleanup materials available.

Limitations

- Space and time limitations may preclude all work being conducted indoors in a controlled automotive shop.
- Some drain pans are generally too small to contain antifreeze, which may gush from some vehicles. Keep several sizes of drain pans available; use the right size for each fluid.

References

19, 20, 22, 30, 31, 33, 34, 35, 43, 98, 99, 100, 108, 127, 138
(see BMP Manual Chapter 10 for list)