

SC-22 Vehicle and Equipment Repair

Description

Vehicle and equipment maintenance and repair are potentially significant sources of stormwater pollution because of the harmful materials and wastes used during the maintenance and repair processes. Engine repair and service (e.g., parts cleaning), replacement of fluids (e.g., oil change), and outdoor equipment storage and parking (leaking vehicles) can impact water quality if stormwater runoff from areas where these activities are performed becomes polluted by a variety of contaminants. Implementation of the following activities must be done where applicable to prevent or reduce the discharge of pollutants to stormwater from vehicle and equipment maintenance and repair activities.

Approach

The best management practice (BMP) approach is to reduce the potential for pollutant discharges through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives. This fact sheet presents general pollution prevention protocols followed by applicable minimum BMPs as required by the Industrial General Permit.

General Pollution Prevention Protocols

- Designate a vehicle maintenance area designed to prevent stormwater pollution.
- Minimize contact of stormwater with outdoor operations through berming and appropriate drainage routing.
- Keep accurate maintenance logs to evaluate materials removed and improvements made.
- Switch to nontoxic chemicals for maintenance when possible.
- Choose cleaning agents that can be recycled.

Objectives

- *Cover*
- *Contain*
- *Educate*
- *Reduce/Minimize*
- *Substitute Products*

Targeted Constituents

<i>Sediment</i>	
<i>Nutrients</i>	
<i>Trash</i>	
<i>Metals</i>	✓
<i>Bacteria</i>	
<i>Oil and Grease</i>	✓
<i>Organics</i>	✓

Minimum BMPs Covered

	<i>Good Housekeeping</i>	✓
	<i>Preventative Maintenance</i>	✓
	<i>Spill and Leak Prevention and Response</i>	✓
	<i>Material Handling & Waste Management</i>	✓
	<i>Erosion and Sediment Controls</i>	
	<i>Employee Training Program</i>	✓
	<i>Quality Assurance and Record Keeping</i>	✓



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- Minimize use of solvents. Clean parts without using solvents whenever possible, or use water-based solvents for cleaning.
- Use drop cloths and drip pans.
- Recycle used motor oil, diesel oil, and other vehicle fluids and parts whenever possible.

Operational Protocols

- Move maintenance and repair activities indoors whenever feasible.
- Place curbs around the immediate boundaries of process equipment.



Good Housekeeping

- Store idle equipment under cover.
- Use a vehicle maintenance area designed to prevent stormwater pollution, minimizing contact of stormwater with outdoor operations through berming and appropriate drainage routing.
- Avoid hosing down your work areas. If work areas are washed, collect and direct wash water to a sanitary sewer. Use dry sweeping if possible.
- Paint signs on storm drain inlets to indicate that they are not to receive liquid or solid wastes.
- Post signs at sinks to remind employees not to pour wastes down drains.
- Clean yard storm drain inlets(s) regularly and especially after large storms.
- Do not pour materials down storm drains.
- Cover the work area to limit exposure to rain.
- Place curbs around the immediate boundaries of process equipment.
- Build a shed or temporary roof over areas where vehicles are parked awaiting repair or salvage, especially wrecked vehicles. Also build a roof over vehicles being kept for parts.



Preventative Maintenance and Repair

- Provide a designated area for vehicle maintenance.
- Inspect vehicles and equipment for leaks regularly, and repair identified leaks immediately.
- Make sure incoming vehicles are checked for leaking oil and fluids. Do not allow leaking vehicles or equipment on-site without correcting the source of the leak and cleaning up any spill.

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- Keep equipment clean; do not allow excessive buildup of oil and grease.
- Perform all vehicle fluid removal and changing inside or under cover if possible to prevent the run-on of stormwater and the runoff of spills.
- Use a tarp, ground cloth, or drip pans beneath the vehicle or equipment to capture all spills and drips if temporary work is being performed outdoors. Collected drips and spills must be disposed of, reused, or recycled properly.
- If the maintenance area is paved, it is important to sweep it weekly to collect loose particles and to wipe up spills with rags and other absorbent material immediately. Do not hose down the area to a storm drain.
- Establish standard procedures to prevent spillage/leakage of fluids, including:
 - ✓ Keeping a drip pan under the vehicle while you unclip hoses, unscrew filters, or remove other parts. Use a drip pan under any vehicle that might leak while it is being worked on to keep splatters and drips off the shop floor.
 - ✓ Promptly transferring used fluids to the proper waste or recycling drums. Do not leave drip pans or other open containers lying around.
 - ✓ Keeping drip pans or containers under vehicles or equipment that might drip during repairs.
 - ✓ Not changing motor oil or performing equipment maintenance in non-appropriate areas.
- If a vehicle or equipment is to be stored outdoors, first drain oil and other fluids. Elevate and tarp stored vehicles and equipment.
- Monitor parked vehicles closely for leaks. Pans should be placed under any leaks to collect the fluids for proper disposal or recycling.
- Mechanics should clean vehicle parts without using liquid cleaners whenever possible to reduce waste.
- Steam cleaning and pressure washing can be used instead of solvents for cleaning parts. The wastewater generated from steam cleaning must be discharged to an on-site oil water separator that is connected to a sanitary sewer or blind sump. Non-caustic detergents should be used instead of caustic cleaning agents, detergent-based or water-based cleaning systems in place of organic solvent degreasers, and non-chlorinated solvent in place of chlorinated organic solvents for parts cleaning. Refer to SC-21 Vehicle and Equipment Cleaning for more information on steam cleaning.
- Fifth-wheel bearings on trucks require routine lubrication. Typically chassis grease is applied to the fifth-wheel bearing at rates that result in grease dripping off the bearing into the environment. To address this concern, the following options are available:

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- ✓ Use specialized lubricants with good adhesion properties (e.g., they stay in place). Carefully follow manufacturer's label instructions regarding the use of adhesive lubricant for truck fifth wheels. Typically this means applying no more than 8 ounces of grease. No visible extrusion of lubricant should be present from the fifth-wheel bearing when the truck and trailer are connected.
- ✓ Use onboard truck or trailer automatic lubrication systems. If the system applies lube thinner than National Grease Lubrication Institute #2, equipment for collection of used lubricant is needed to prevent excess lubricant from dripping off the truck.
- ✓ Use plastic or Teflon plates instead of grease or other lubricants. Carefully follow manufacturer's instructions for installation and operation.
- Use one of the following for lubricating vehicle-trailer couplings:
 - ✓ Specialized adhesive lubricants
 - ✓ Grease-free fifth-wheel slip plates (e.g., plastic or Teflon coatings)
 - ✓ Onboard automatic lubricating systems



Spill and Leak Prevention and Response

- Keep your spill prevention, control, and countermeasure (SPCC) plan up to date.
- Place an adequate stockpile of spill cleanup materials where they are readily accessible.
- 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 the floor.

Mop water may be discharged to the sanitary sewer via a toilet or sink.

- When using adsorbent materials on small spills, remove the materials promptly and dispose of them properly.



Material Handling and Waste Management

- Designate a special area for draining and replacing motor oil, coolant, and other fluids where there are no connections to the storm drain or the sanitary sewer and drips and spills can be easily cleaned up.

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- Drain all fluids immediately from wrecked vehicles. Ensure that the drip pan is large enough to contain the drained fluids (e.g., larger pans are needed to contain antifreeze, which may gush from some vehicles).
- Do not pour liquid waste into floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections.
- Do not put used or leftover cleaning solutions, solvents, or automotive fluids in a sanitary sewer.
- Collect leaking or dripping fluids in 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 drip pans or other open containers lying around.
- Place oil filters in a funnel over a waste oil recycling drum to drain excess oil before disposing of them since municipalities prohibit or discourage disposal of these items in solid waste facilities.
- Oil filters can also be recycled. Ask your oil supplier or recycler about recycling oil filters. Oil filters disposed of in trash cans or dumpsters can leak oil and contaminate stormwater.
- Store cracked batteries in a nonleaking secondary container and dispose of them properly at recycling or household hazardous waste facilities.



Employee Training Program

- Train employees and contractors in the proper handling and disposal of engine fluids and waste materials.
- Employees should have the tools and knowledge to immediately begin cleaning up a spill should one occur.
- Conduct annual training to ensure that employees are familiar with the facility's SPCC plan and/or proper spill cleanup procedures. (You can use reusable cloth rags to clean up small drips and spills instead of disposables; these can be washed by a permitted industrial laundry. Do not clean them at home or at a coin-operated laundry business).
- Use a training log or similar method to document training.



Quality Assurance and Record Keeping

- Keep accurate maintenance logs to evaluate materials removed and improvements made.
- Establish procedures to collect and file maintenance logs in the central office.

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Other Facility-Specific Considerations

Parts Cleaning

Vehicle and equipment maintenance facilities often must clean parts as a part of day-to-day operations. The following practices should be considered:

- Clean vehicle parts without using liquid cleaners whenever possible to reduce waste.
- Steam cleaning and pressure washing can be used instead solvents for parts cleaning.
- Wastewater generated from steam cleaning must be discharged to an on-site oil/water separator that is connected to a sanitary sewer or blind sump.
- Use non-caustic detergents instead of caustic cleaning agents, detergent- or water-based cleaning systems in place of organic solvent degreasers, and non-chlorinated solvent in place of chlorinated organic solvents for parts cleaning. Refer to SC-21 Vehicle and Equipment Cleaning for more information on steam cleaning.

Potential Limitations and Work-Arounds

- Some facilities may have space constraints and time limitations that preclude any work from being performed indoors.
 - ✓ Designate specific areas for outdoor activities.
 - ✓ Require employees to understand and follow preventive maintenance and spill and leak prevention BMPs.
- It may not be possible to contain and clean up spills from vehicles/equipment brought on-site after working hours.
 - ✓ Provide a designated area for after-hours deliveries.
 - ✓ Install spill kits.
- Drip pans (usually 1 foot by 1 foot) are generally too small to contain antifreeze.
 - ✓ Purchase or fabricate large drip pans (3 feet by 3 feet) with sufficient volume to contain expected quantities of liquids based on equipment/vehicle specifications.
- Dry floor cleaning methods might not be sufficient for some spills.
 - ✓ Use the three-step method instead specified in “Spill and Leak Prevention and Response,” earlier in this fact sheet.
- Identification of engine leaks may require some use of solvents.
 - ✓ Minimize the use of solvents, and use drip pans to collect spills and leaks.
- Prices for recycled materials and fluids might be higher than those for nonrecycled materials.

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- Some facilities may be limited by a lack of providers of recycled materials and by the absence of businesses that provide services such as hazardous waste removal, structural treatment practice maintenance, and solvent equipment and solvent recycling.

Potential Facilities and Maintenance Requirements

Facility Requirements

- Facilities that already have covered areas for maintenance activities, have berms or other means to retain spills and leaks, and/or have other appropriate constructed systems for containment might not need to make any significant new capital investment. Capital costs will likely be required at some sites if they have inadequate cover and containment facilities and can vary significantly depending upon site conditions.

Maintenance Requirements

- Most of the operations and maintenance (O&M) activity associated with implementing this BMP are integrally linked to routine operations as previously described. Therefore, significant additional O&M efforts are not likely to be required.
- For facilities responsible for pretreating their wastewater prior to discharging, the proper functioning of structural treatment system is an important maintenance consideration. Routine cleanout of oil and grease is required for the devices to maintain their effectiveness, usually at least once a month. During periods of heavy rainfall, cleanout is required more often to ensure pollutants are not washed through the trap. Sediment removal is also required on a regular basis to keep the device working efficiently.
- If the maintenance area is paved, it is important to sweep it weekly to collect loose particles and to wipe up spills with rags and other absorbent material immediately. Do not hose down the area to a storm drain.

Supplemental Information

Waste Reduction

Parts are often cleaned using solvents such as trichloroethylene, 1,1,1-trichloroethane, or methylene chloride. Many of these cleaners are harmful and must be disposed of as hazardous waste. Cleaning without using liquid cleaners (e.g., using wire brush) whenever possible reduces waste. Prevent spills and drips of solvents and cleansers to the shop floor. Do all liquid cleaning at a centralized station so the 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 reuse. Reducing the number of solvents makes recycling easier and reduces hazardous waste management costs. Often, one solvent can perform a job as well as two different solvents.

- Clean parts without using liquid cleaners whenever possible to reduce waste.
- Prevent spills and drips of solvents and cleansers to the shop floor.

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- Do all liquid cleaning at a centralized station so the 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 reuse.

Recycling

Separating wastes allows for easier recycling and might reduce treatment costs. Keep hazardous and nonhazardous wastes separate, do not mix used oil and solvents, and keep chlorinated solvents (e.g., 1,1,1-trichloroethane) separate from non-chlorinated solvents (e.g., kerosene and mineral spirits).

Many 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.

- Recycling is always preferable to disposal of unwanted materials.
- Separate wastes for easier recycling. Keep hazardous and nonhazardous wastes separate, do not mix used oil and solvents, and keep chlorinated solvents separate from non-chlorinated solvents.
- Label and track the recycling of waste material (e.g., used oil, spent solvents, and batteries).
- Purchase recycled products to support the market for recycled materials.

Safer Alternatives

If possible, eliminate or reduce the amount of hazardous materials and waste by substituting nonhazardous or less hazardous material:

- Use non-caustic detergents instead of caustic cleaning for parts cleaning.
- Use detergent- or water-based cleaning systems in place of organic solvent degreasers. Wash water might require treatment before it can be discharged to the sewer.
- Replace chlorinated organic solvents with non-chlorinated solvents. Non-chlorinated solvents like kerosene and mineral spirits are less toxic and less expensive to dispose of properly. Check the list of active ingredients to see whether it contains chlorinated solvents.
- Choose cleaning agents that can be recycled.

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References and Resources

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