



Source Water Protection Practices Bulletin

Managing Vehicle Washing to Prevent Contamination of Drinking Water

Vehicle washing is the cleaning of privately owned vehicles (cars and trucks), public vehicles (school buses, vans, municipal buses, fire trucks, and utility vehicles), and industrial vehicles (moving vans or trucks and tractors). The vehicle wash water can carry sediment and contaminants to surface waters, and can contaminate groundwater by infiltration or by drainage to subsurface wells and/or septic systems. This fact sheet focuses on management of vehicle washing to prevent contamination of drinking water sources.



PLACES WHERE VEHICLE WASHING OCCURS

Vehicle washing occurs at commercial car wash facilities (for both interior and exterior cleaning), public works garages, car dealerships, truck stops, and any other facility that washes vehicles. When vehicles are washed, contaminants in the wash water and the overspray can enter source water untreated through surface runoff (e.g., through storm drains) and underground discharge (e.g., through carwash wells or septic systems). Vehicle wash water contains oil, grease, metal (paint chips), phosphates, detergents, soaps, cleaners, road salts, and other chemicals that can contaminate source water.

EPA estimates that there are 7,200 carwash wells in the United States. These carwash wells, which inject wash water into the subsurface, are categorized by EPA as Class V underground injection wells. In a 1999 EPA study on Class V wells, concerns were raised about the use of carwash wells to dispose of wash water from “wand washes” such as coin-operated, manual facilities where people use hand-held hoses to wash vehicles. Because an attendant is not usually on site, individuals may wash their engines or undercarriages using degreasers, wash the exterior of their vehicles with chemicals other than common soap solutions, or may pour used oil, antifreeze, or other hazardous materials down these drains.

WHY IS IT IMPORTANT TO MANAGE VEHICLE WASHING NEAR THE SOURCES OF YOUR DRINKING WATER?

Managing vehicle washing near drinking water sources is important because the wash water can flow into storm water drains and enter surface water sources untreated. The wash water can also percolate through the soil or enter the subsurface through carwash wells, and contaminate ground water. The contaminants in vehicle wash water can cause a variety of health effects, including kidney damage, circulatory system problems, increased cancer risk, and delays in physical or mental development.

Once a water supply becomes contaminated, it is very difficult and costly to treat. Treating the water supply is a lengthy process and is not always successful. Using an alternative water source may also be costly and impractical.

AVAILABLE PREVENTION MEASURES TO ADDRESS VEHICLE WASHING

A variety of prevention measures, including nonstructural and structural activities, are available to address vehicle washing. Please keep in mind that individual prevention measures may or may not be adequate to prevent contamination of source waters. Most likely, individual measures should be combined in an overall prevention approach that considers the nature of the potential source of contamination, the purpose, cost, operational, and maintenance requirements of the measures, the vulnerability of the source waters, the public's acceptance of the measures, and the community's desired degree of risk reduction. Some of the more conventional prevention measures are described below.

Local governments can use a variety of *land use controls* to protect source water from potential contamination. For example, zoning can restrict certain activities to specific geographic areas that are distant from drinking water sources. Localities can also prohibit certain uses within certain areas. For example, prohibition of vehicle washing activities in source water protection areas can reduce the risk that harmful contaminants may enter source water. Local governments may also require permits that impose additional requirements such as setbacks, open spaces, buffers, walls and fences; street paving and control of site access points; and regulation of hours and methods of operation. Local municipal treatment plants may have a storm water treatment program; coordinate with your local municipal treatment plant to eliminate illicit discharges. States may require vehicle washing facilities to apply for ground water discharge permits. Many of these facilities discharge wastewater containing regulated contaminants above the State's ambient ground water standards.

Design and Operation of Washing Facilities

Warning signs should be posted for customers and employees instructing them not to dump vehicle fluids, pesticides, solvents, fertilizers, organic chemicals, or toxic chemicals into catch basins. Catch basins are chambers or sumps which collect runoff and channel it to the storm water drain or to the sanitary sewer. Vehicle wash facilities should *stencil* warnings on the pavement next to the grit trap or catch basin. All signs should be in a visible location and maintained for readability.



Enclosed carwash

Wash areas should be located on well-constructed and maintained, *impervious surfaces* (i.e., concrete or plastic) with drains piped to the sanitary sewer or other disposal devices. The wash area should extend for at least four feet on all sides of the vehicle to trap all overspray. Enclosing wash areas with walls and properly grading wash areas prevent dirty overspray from leaving the wash area, allowing the overspray to be collected from the impermeable surface.

The impervious surfaces should be marked to indicate the boundaries of the washing area and the area draining to the designated collection point. Washing areas should not be located near uncovered vehicle repair areas or chemical storage facilities; chemicals could be transported in wash water runoff.

Regular cleaning of wash areas and grit traps or catch basins can minimize or prevent debris such as paint chips, dirt, cleaning agents, chemicals, and oil and grease from being discharged into storm drains or injection wells.

Using *alternative cleaning agents* such as phosphate-free, biodegradable detergents for vehicle washing will reduce the amount of contaminants entering storm drains. Cleaning agents containing solvents and emulsifiers should be discouraged because they allow oil and grease to flow through the oil/water separator (see below) instead of being separated from the effluent. In addition, these cleaning agents will remain in the wastewater and can pollute drinking water sources.

Proper Management of Wastewater

There are several approaches for managing wastewater, depending on the size of the site and the resources available. These are described below.

Oil/water separators are tanks that collect oily vehicle wash water that flows along corrugated plates to encourage separation of solids and oil droplets. The oily solids or sludge can then be pumped out of the system through a different pipe. The sludge can be hauled off site, and the wash water can be discharged to vegetated areas or to a treatment plant. There are two types of oil/water separators, one that removes free oil that floats on top of water, and one that removes emulsified oil, a mixture of oil, water, chemicals, and dirt. Choose the separator that fits the needs of the vehicle wash facility.

Collection sumps are deep pits or reservoirs that hold liquid waste. Vehicle wash water accumulates in the collection sumps, and is pumped or siphoned to a vegetated area (such as a grassed swale or constructed wetland). *Sediment traps* can also be used to strain and collect the vehicle wash water, prior to pumping or siphoning the wash water to a vegetated area.

Recycling systems reduce or eliminate contaminated discharges to storm water drains and injection wells by reusing the wash water until the water reaches a certain contaminant level. The wastewater is then discharged to a collection sump or to a treatment facility.

Where wastewater is not to be disposed to a sanitary sewer, *grassed swales* (shallow, vegetated ditches) or *constructed wetlands* (retention ponds with emergent aquatic vegetation) can be used to hold wastewater and allow contaminant removal through infiltration and filtration. These devices are described in greater detail in the fact sheet on managing storm water runoff.



Carwash with vegetated area

Education and Training

Employee training is an important tool to prevent vehicle wash water from entering storm water drains and injection wells and contaminating source waters. Employees should be aware of operation and maintenance procedures, proper disposal practices, and general housekeeping activities. They should be aware of toxic chemicals, if any, with which they may come in contact, and have access to a chemical management plan, if applicable, and an emergency contact list.

At all designated washing areas, spill prevention, control, and management should be planned and designed to prevent any spills of pollutants from entering surface water, ground water, or a publicly or privately owned treatment works. A ***chemical management plan*** should be implemented for vehicle washes that use metal brighteners, caustics or acids, halogenated hydrocarbons, or solvents. The plan should include a list of the chemicals used, the method of disposal such as reclamation or contract hauling, and procedures for assuring that toxic chemicals are not discharged into source water.

ADDITIONAL INFORMATION

These sources contain information on vehicle wash facilities and provide prevention measures to avoid source water contamination. All of the documents listed are available for free on the Internet. EPA's Office of Science and Technology provides effluent guidelines, pretreatment standards and new source performance standards for transportation equipment cleaning (<http://www.epa.gov/ost/guide/teci/>).

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