# Source Control Technical Requirements Manual

**Issued July, 2000**

**The City of Seattle**

Title 22.800 Stormwater, Grading & Drainage Control Code

Volume 1: Source Control Technical Requirements Manual
Volume 2: Construction Stormwater Control Technical Requirements Manual
Volume 3: Flow Control Technical Requirements Manual
Volume 4: Stormwater Treatment Technical Requirements Manual

# Contacts For More Information

## DRAINAGE & SIDE SEWER

*If you have questions regarding side sewer or drainage permitting, fees, codes and policies; drainage systems for new development; changes to existing drainage systems; drainage problems associated with development under construction; existing public and private drainage utilities; or complaints regarding existing drainage, please contact:*

**Seattle Department of Planning and Development**
*(formerly the Department of Design, Construction and Land Use)*

**Drainage Review Desk**

Location: Seattle Municipal Tower, 20th floor
Phone: (206) 684-5362

Mailing Address: 700 Fifth Avenue, Suite 2000
P.O. Box 34019
Seattle, WA 98124-4019

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Websites: www.seattle.gov/dpd
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## STORMWATER FACILITIES, SOURCE CONTROL & SURFACE WATER

*For questions regarding maintenance of private stormwater facilities, source control practices and surface water quality, contact:*

**Seattle Public Utilities**

Location: Seattle Municipal Tower, 44th floor
Phone: (206) 684-5800

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Seattle, WA 98124-4018

Websites: www.seattle.gov/util
www.seattle.gov/util/About_SPU *(click on "Drainage & Sewer System)*

**DCLU** Director's Rule 17-00

**SPU** Director's Rule 01-00

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| **Applicant:**<br>SEATTLE PUBLIC UTILITIES<br><br>DEPARTMENT OF DESIGN, CONSTRUCTION AND LAND USE | **Page iii of** | **Supersedes:** |
| | **Publication:**<br>**June 15, 2000** | **Effective:**<br>**July 5, 2000** |
| **Subject:**<br>**Source Control Technical Requirements Manual** | **Code and Section Reference:**<br>SMC 22.800 - 22.808 | |
| | **Type of Rule:**<br>Code Interpretation | |
| **Index:**<br>**Title 22.800 Stormwater Grading and Drainage Control Code** | **Ordinance Authority:**<br>SMC 3.06.040 | |
| | **Approved** Scott Haskins for **Date** 6-30-00<br>**Diana Gale, Director, SPU** | |
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# Introduction

## Context

Seattle's creeks, lakes and bays play an important role in the quality of life of the people who live, work, and play in the Puget Sound region. Many swim, boat, and fish in these waters, and many others enjoy the plants and wildlife these aquatic habitats support. However, these waters are vulnerable to pollution from a wide variety of human activities. Most homes and businesses within Seattle drain to a creek, lake or bay. Spills or debris may be washed from properties into the public drainage system and flow to these aquatic habitats.

Under the authority of the Federal Clean Water Act, the Washington State Department of Ecology regulates municipal stormwater discharges through the National Pollutant Discharge Elimination System (NPDES) municipal stormwater permit. As a condition of the City of Seattle's NPDES permit, the City regulates development and land use activities that impact the quality and quantity of stormwater runoff through the Seattle Municipal Code, Stormwater, Grading and Drainage Control Code (Stormwater Code).

In addition to fulfilling requirements of the City's municipal stormwater NPDES permit, the Stormwater Code is intended to accomplish the following:

- Protect, to the greatest extent practicable, life, property, and the environment
- Protect the public interest in drainage and related functions of drainage basins, water courses, and shoreline areas
- Protect surface waters and receiving waters
- Fulfill the responsibilities of the City as trustee of the environment for future generations.

The Stormwater Code outlines the City's authority to prohibit illicit discharges into the public drainage system, creeks, lakes or larger water bodies. Illicit discharges are defined as any discharge that is not composed entirely of stormwater. Illicit discharges are regulated in part through source control-specific requirements that prevent the contamination of stormwater runoff by controlling pollution at the source.

## Purpose of this Rule

This technical document is intended to clarify application of the source control requirements prescribed in the Seattle Municipal Code, Chapter 22.802, Stormwater, Grading and Drainage Control Code. Source control requirements are designed to control pollution at the source and prevent contamination of stormwater for all discharges and new development.

## Overview of Requirements

The *Stormwater Code* regulates source control in two ways—requirements for all stormwater discharges and requirements that apply only to development. *Structural* source controls for high-risk pollution-generating (HRPG) activities must be installed for development projects submitting applications after January 1, 2001. All reponsible parties must implement the *operational* controls for HRPG activities for all existing stormwater discharges. In addition, all reponsible parties must implement operational requirements for several good housekeeping source controls such as storm drain facility maintenance, identifying and eliminating illicit connections, and street, sidewalk and parking lot maintenance. HRPG activity requirements do not apply to normal residential uses, or to sites that drain to the public combined sewer.

## Organization of this Document

The next two chapters of this rule describe the specifications for meeting the source control requirements in the *Stormwater, Grading and Drainage Control Code.* The chapters are organized as follows:

### Chapter 1: Operational Requirements for all Discharges.

This chapter provides the technical specifications for three operational source controls that are required for all stormwater discharges (except those that discharge only to the public combined sewer.)

### Chapter 2: High-Risk Pollution-Generating Activities.

This chapter provides definitions for the eight high-risk pollution-generating (HRPG) activities. In addition this chapter outlines the operational and structural source control requirements for each HRPG activity. After July 5, 2000, all responsible parties must implement the *operational* HRPG requirements outlined in this rule for all stormwater discharges. For projects applying for permits after January 1, 2001, applicants must install the *structural* source controls prescribed in the HRPG requirement chapter.

These “informational” boxes include relevant information that is not required by the Stormwater, Grading and Drainage Control Code, but may be required by other codes or governmental agencies.

**good citizen measures**

These “Good Citizen Measures” boxes highlight best management practices that are recommended, but not required by the Stormwater, Grading and Drainage Control Code.

## Definitions

The following terms are defined in the *Stormwater, Grading and Drainage Control Code*. Refer to the Stormwater Code for additional definitions of terms that govern this rule.

**Source controls** mean structures or operations that prevent contaminants from coming in contact with stormwater through physical separation or careful management of activities that are known sources of pollution.

**Operational source controls** are those which require modified or additional behavioral practices, such as sweeping a parking lot or maintaining special equipment on site, such as spill response equipment.

**Structural source controls** are those which require the construction of a structure or other physical modification on the site.

**Public combined sewer** means a publicly owned and maintained sewage system which carries drainage water and sewage and flows to a publicly owned treatment works.

**Public drainage control system** means a drainage control system owned or used by The City of Seattle serving City streets and adjacent property.

**Responsible party** means all of the following persons:

1. Owners and occupants of property within The City of Seattle; and,
2. Any person causing or contributing to a violation of the provisions of the Stormwater, Grading and Drainage Control Code.

*Chapter Two*

# Operational Source Control Requirements for All Discharges

Source controls mean structures or operations that prevent contaminants from coming in contact with stormwater through physical separation or careful management of activities that are known sources of pollution. *Operational source controls* are those which require modified or additional behavioral practices, such as sweeping a parking lot or maintaining special equipment on site, such as spill response equipment. The Stormwater Code requires responsible parties to implement specific operational source controls for all stormwater discharges except those that drain only to a public combined sewer.

> ***SMC 22.802.013(A) Requirements for all discharges and land uses.***
>
> ***A. For all discharges except those that drain only to the public combined sewer, responsible parties shall implement and maintain operational source controls, including but not limited to the following, as further described in rules promulgated by the Director:***
>
> ***1. Maintaining drainage control systems such as conveyance systems, detention systems and treatment systems;***
>
> ***2. Maintaining streets, driveways, parking lots and sidewalks; and***
>
> ***3. Identifying and eliminating illicit connections to the drainage control system.***

The remainder of this chapter outlines the specifications for complying with these requirements.

# Storm Drain Facility Maintenance

**Applicability:** **Storm drain facility maintenance means maintaining private drainage control systems as defined in SMC 22.801.050 D, such as conveyance systems, including gutters, swales, catch basins and pipes; structural flow controls such as detention systems, infiltration systems and other approved means of controlling the stormwater discharge rate; structural source controls; and stormwater treatment systems such as oil/water separators, wet ponds and vaults, media filters, biofiltration swales, filter strips, and infiltration systems.**

**Description of Impacts:** Without adequate maintenance, sediment and other debris can quickly clog drainage facilities, which reduces their ability to regulate and treat stormwater runoff. It is important to maintain drainage facilities on a regular basis to prevent them from failing. Rehabilitation of failed drainage facilities is expensive and in the case of infiltration systems may require complete reconstruction. Clogged facilities can overflow causing flooding problems downstream or can back up and create onsite flooding. In addition, sediment and debris deposited during previous storm events can be flushed downstream during subsequent events, if these systems are not cleaned on a regular basis. Sediment flushed downstream can destroy aquatic habitat, clog downstream drainage facilities, and often contains other pollutants such as heavy metals, nutrients, and organic compounds that degrade water quality.

## Operational Requirements

Owners of private drainage structures and equipment are required to maintain these facilities according to the procedures and schedules described in the SMC and the associated Directors' Rules. In addition, the maintenance requirements included in Appendix A establish required inspection frequencies and identify conditions that trigger maintenance requirements for each type of drainage facility (e.g., catch basins and manholes; detention vaults, tanks, pipes; water quality treatment ponds and vaults; oil/water separators; culverts; media filters, biofiltration swales and filter strips). In addition, checklists are provided to facilitate inspections.

**The following BMPs or equivalent measures, methods, or practices are required of responsible parties for all stormwater discharges:**

1. Inspect all stormwater conveyance, detention, and treatment systems at least annually as described in the *Stormwater, Drainage, and Grading Control Code*. Clean or repair structures whenever the condition thresholds described in Appendix A are triggered. If leaves and woody debris accumulate on catch basins and inlets, clean on a weekly basis to prevent flooding.
2. Maintain grass and other vegetation that is integral to the stormwater system (e.g., biofiltration swales, filter strips, wet ponds) as described in the Rule.
3. Maintain records of when each structure was inspected and cleaned. If sediment deposition or other condition thresholds are found to significantly exceed the trigger at a particular structure, increase the inspection frequency to at least every 6 months, or appropriate schedule given the site conditions.
4. Structural defects identified during routine inspections must be repaired promptly. These defects include damaged or missing control structures, orifice plates, cleanouts,

control gates, valves, manhole covers, frames, and baffles; eroded channels, emergency spillways, and pond inlets; and leaking or cracked structures, pipes, and other equipment.

5. Dispose of water and sediment removed during cleaning operations in accordance with Seattle Solid Waste Code (SMC 21.36), the state dangerous waste regulations (WAC 173-303), and all applicable law.

6. Paint or emboss warning signs (e.g., “Dump No Waste - Drains to Ground Water”, “Streams”, “Lakes” etc.) on or adjacent to all private side sewer inlets that discharge to streams, lakes and designated receiving water bodies.

Sewer and drainage maps for the City of Seattle are available at the Street Use Permit counter in the City Municipal Building. These maps show the locations of sanitary sewers and storm drains located in the public right-of-way. Refer to these maps to determine whether storm drains on your property discharge to a lake, a stream, or to the sound.

# Illicit Connections to Storm Drains

**Applicability: Illicit connections to storm drains are unpermitted sanitary or process wastewater connections to the public drainage control system.**

**Description of Impacts:** Experience has shown that illicit connections are very common, even in buildings constructed after 1960. Illicit connections can contribute a variety of pollutants to the storm drain system and nearby waterways. Typical pollutants include oxygen-depleting materials (e.g., domestic and organic wastes), heavy metals, high temperature, pH, toxic organic compounds, nutrients, and pathogens which can adversely affect water quality.

## Structural Requirements

When illicit connections are discovered they must be eliminated. To eliminate illicit connections, the connection to the storm drain system must be permanently plugged, and the discharge must be plumbed to another approved location. It is the responsibility of the property owner or business owner to obtain authorization for a legal connection and reroute illicit storm drain connections to another approved location.

## Operational Requirements

1. Property owners are responsible for identifying and eliminating any illicit connections to the public drainage control system. Optional methods for identifying illicit connections are listed below.

- Review site plans, if available, to determine pipe and plumbing connections on the property. Identify all pipes or other conveyances that are connected to the storm drain system. Systems that drain toilets, sinks, appliances, showers and bathtubs, shop floors, industrial process water (including cooling water) cannot be connected to the storm drain system. Sewer and drainage maps for the City of Seattle are available at the Street Use Permit counter in the City Municipal Building. These maps show the locations of sanitary sewers and storm drains located in the public right-of-way, but typically do not show onsite drainage and plumbing. If a site plumbing/drainage map is not available, prepare a site sketch showing the locations of all buildings, floor drains, manholes, catch basins, inlets, and other drainage structures. Note the locations of pipes entering and exiting each drainage structure. If there is any question about pipe connections, these systems should be investigated further.

- Visually inspect all discharge points (e.g., floor drains, pipe outfalls) and manholes/catch basins on the storm drain system during an extended dry period to check the system for abnormal flow, odors, unusual color, or elevated temperature. Visual inspections are conducted under dry weather conditions to minimize interference from stormwater discharges. Note any unusual conditions on the site map.

- Onsite storm drains should be dry within a few days following the last rainstorm. In some cases, ground water may infiltrate into underground drainage pipes, thus contributing a small amount of flow in the pipe. However, infiltrating ground water should be clear and free of unusual odor or high temperatures. If any unusual conditions are

observed (e.g., excessive flow, odors, color, or high temperature) during the dry weather inspection, further investigation is needed to determine the source of the non-stormwater flows. Options for further investigation include:

- Dye testing involves releasing a nontoxic dye into onsite floor drains, sinks, basins, or other fixtures that may discharge to the storm drain system and examining suspected downstream discharge points in the storm drain system for discoloration. If possible, isolate the suspect drain by shutting off all other drains and outlets during the dye test. Place dye in the suspect fixture or drain and flush with water to force the flow to reach the downstream observation points. Any observations of dye in the storm drain system must be noted and the corresponding indoor drains identified so that they can be rerouted to an appropriate location.
- Video inspections are performed by qualified contractors and involve inserting a small video camera into the drain line to view the inside of the pipe. The self-propelled camera is inserted at a maintenance hole and tracks through the drainage system allowing the inside of the pipe to be visually inspected . Look under pipe inspection services in the yellow pages to identify contractors that provide this service.
- Smoke testing is also conducted by a qualified contractor and involves temporarily blocking off the storm drain system, filling the pipe system with smoke, and then inspecting at the base of toilets, sinks, or floor drains in the buildings onsite for the appearance of smoke.

Businesses that are required to obtain an industrial stormwater permit (see list of qualifying businesses under Outside Manufacturing Activities) must inspect their facility each year to identify illicit discharges. Illicit connection investigations are required to be completed as part of the required annual dry season inspections. For further information regarding illicit connection surveys required under the industrial stormwater permit program contact Ecology at (425/649-7000).

If an illicit connection is discovered, options for relocating the discharge include:

- Connect to the sanitary sewer;
- Direct the wastewater to a dead-end sump or holding tank from which the wastewater can either be removed and discharged offsite or discharged to a closed-loop water recycling system;
- Route wastewater to an onsite treatment system.

Refer to the Seattle Side Sewer Code (SMC 21.16) and contact the Side Sewer permit counter (206/ 684-5282) for specific requirements regarding relocating the connection.

The King County Industrial Waste Program also regulates discharges to the sanitary sewer in Seattle. King County must approve any discharge of material other than sanitary waste. Industrial process wastewater may need to be treated before discharging to the sanitary sewer. Contact the King County Industrial Waste Program at (206) 263-3000 for permission to discharge to the sanitary sewer and for information regarding pretreatment requirements.

Offsite disposal of process wastewater must comply with the Seattle Solid Waste Code (SMC 21.36, the state dangerous waste regulations (WAC 173-303) and all other applicable law. If wastewater cannot be recycled or discharged to the sanitary sewer, it may be possible to obtain an NPDES permit to continue discharging to the storm drain system. However, the wastewater will have to be treated prior to discharge. Contact Ecology at (425) 649-7000 for information about how to obtain an NPDES permit.

# Street, Driveway, Parking Lot and Sidewalk Maintenance

**Applicability: Street, driveway, parking lot and sidewalk maintenance applies to parking lots, fleet vehicle lots and yards, car rental yards or car dealerships, business sidewalks, driveways, private streets, and residential sidewalks and driveways.**

**Description of Impacts:** Stormwater runoff from these areas can contain oil and grease, petroleum hydrocarbons, and heavy metals from automobiles, nutrients and particulate material from litter and leaf debris, and other inorganic/organic residues from weed killers and sealants, surface coatings, and deicing products used to maintain these paved surfaces.

## Operational Requirements

**The following BMPs or equivalent measures, methods, or practices are required of responsible parties for all stormwater discharges:**

1. Sweep paved areas regularly by either manual sweeping or using mechanical/vacuum sweepers to remove debris, litter, and other material that accumulates. Remove and dispose collected material in accordance with Seattle Solid Waste Code (SMC 21.36), state dangerous waste regulations (WAC 173-303) and all other applicable law. Do not sweep loose litter and solids into the street or gutter unless material will be immediately removed for disposal. Debris and other material shall not be disposed in the public drainage control system. The frequency of sweeping shall be monthly, or as needed, depending on site conditions. However, industrial sites and high litter areas (e.g., special events) may need to be swept more regularly.
2. Inspect and clean gutters, drains, and catch basins at least annually and more frequently if gutters fill or sediment deposition in catch basins exceeds 60% of the sump depth in less than one year's time.

### good citizen measures

The following BMPs are not required, but are recommended to provide additional pollution prevention:

1. Hosing down pavement and walkways to the public drainage control system is discouraged.
2. Homeowners and small businesses should consider parking vehicles in a garage or installing a cover or canopy over vehicle storage areas to prevent contact with rain and stormwater runoff.
3. Where mechanical sweepers are used, train operators on how to adjust sweeper speed, brush alignment and rotation rate, sweeping pattern, and number of passes to maximize performance. When purchasing new sweepers, consider vacuum or regenerative air sweepers, because these units are more effective than mechanical sweepers.
4. Post signs banning oil changes and other vehicle maintenance activities in parking lots and exterior yard areas.

***continued***

**Good Citizen Measures** *continued*

5. Provide and maintain garbage cans in parking lots to reduce litter.
6. Manually remove weeds rather than using pesticides if possible. If pesticides are required, use spot applications rather than broadcast methods and follow instructions on the label. Apply only during dry weather. Do not apply if rain is predicted.
7. If deicing materials are used, implement the following controls:

— Apply deicing salts and sand only when snow or ice is present, not as a preventative measure.

— Use less toxic deicers such as calcium magnesium acetate (CMA) or potassium acetate rather than sodium chloride and other salts.

— Avoid excessive application of all deicing chemicals. Follow manufacturer's instructions.

— Sweep up remaining deicing residue and grit from pavement as soon as snow and ice has melted. Recycle or dispose deicing residues in accordance with Seattle Solid Waste Code (SMC 21.36).

*Chapter Three*

# Requirements for High-Risk Pollution-Generating Activities

## General Requirements and Applicability

All responsible parties conducting high-risk pollution-generating (HRPG) activities (defined below) must implement specific source controls as outlined in this chapter. HRPG activity requirements do not apply to normal residential uses, or to sites that drain only to the public combined sewer. This chapter provides definitions for the eight high-risk pollution-generating (HRPG) activities and outlines the operational and structural source control requirements for each HRPG activity. As prescribed in the Stormwater Code below, after July 5, 2000, responsible parties must implement the *operational* HRPG requirements outlined in this chapter for all stormwater discharges. In addition, all responsible parties must implement spill prevention for all HRPG activities as prescribed in the Stormwater Code and in this chapter in the section on Spill Prevention.

> ***SMC 22.802.013(B) For high-risk pollution generating activities except those that discharge only to the public combined sewer:***
>
> ***1. Operational source controls shall be implemented for the high-risk pollution generating activities as specified in rules promulgated jointly by the Directors of SPU and DCLU. Operational source controls for high-risk pollution generating activities shall include, but are not limited to, enclosing, covering, or containing the activity, developing and implementing inspection and maintenance programs, sweeping, and training employees on pollution prevention.***
>
> ***2. Spill prevention shall be required. Parties responsible for undertaking, operating, or maintaining the high-risk pollution generating activities are required to do the following (see page 13 of this rule), as further defined in rules promulgated by the Director.***

As prescribed in the Stormwater Code below, for projects applying for permits after January 1, 2001, applicants must install the *structural* source controls prescribed in this chapter. For all development projects:

> ***SMC 22.802.015(C)(4) Source Control.***
>
> ***a. Effective January 1, 2001, structural source controls shall be installed for high-risk pollution generating activities to the maximum extent practicable to the portion of the site being developed, in accordance with rules promulgated by the Director, except in the following circumstances:***
>
> ***i. When that portion of the site being developed discharges only to the public combined sewer; or***
>
> ***ii. For normal residential activities unless the Director determines that these activities pose a hazard to public health, safety or welfare; endanger any***

***property; or adversely affect the safety and operation of city right-of-way, utilities, or other property owned or maintained by the City.***

***b. The structural source controls shall include, but not be limited to, the following, as further defined in rules promulgated jointly by the Directors:***

***i. Enclose, cover, or contain within a berm or dike the high-risk pollution generating activities;***

***ii. Direct drainage from containment area of high-risk pollution generating activity to a closed sump or tank for settling and appropriate disposal, or treat prior to discharging to a public drainage control system;***

***iii. Pave, treat, or cover the containment area of high-risk pollution generating activities with materials that will not interact with or break down in the presence of other materials used in conjunction with the pollution generating activity; and***

***iv. Prevent precipitation from flowing or being blown onto containment areas of high-risk pollution generating activities.***

## Definitions

The term, **High-risk pollution generating (HRPG) activities**, as defined in the Stormwater Code (SMC 22.801.090) includes:

**Fueling operations** that involve transferring fuel into mobile vehicles or equipment at permanent stations, temporary stations, and mobile fueling stations. Permanent stations include facilities, such as, but not limited to, commercial gas stations, maintenance yards, and private fleet fueling stations, where fuel is transferred from a dedicated fueling station. Temporary fueling stations include, but are not limited to, construction sites and any other site where fuel is temporarily stored and dispensed into vehicles or equipment. Mobile fueling stations are fueling operations where fuel is delivered to vehicles and equipment via mobile tank trucks.

**Vehicle, equipment or building washing or cleaning,** including any of the following: mobile vehicle steam cleaning operations or vehicle washing at commercial car wash facilities, charity car washes, or permanent parking lots such as new, used, and rental car lots and fleet lots; outside washing of tools or other manufacturing equipment; outdoor cleaning of commercial cooking equipment such as filters and grills; or washing of buildings, including exteriors or mobile interior building cleaning services.

**Truck or rail loading or unloading of liquid or solid materials** that involves transferring non-containerized bulk liquids from truck or rail, or loading/unloading materials at a commercial or industrial loading dock.

**Liquid storage in stationary above ground tanks,** including storing liquid chemicals, fertilizers, pesticides, solvents, grease, or petroleum products in stationary above ground tanks.

**Outside portable container storage of liquids, food wastes, or dangerous wastes** including storing any of the following: vegetable grease, animal grease, or other accumulated food wastes; used oil; liquid feedstock; cleaning compounds; chemicals; solid waste as defined by SMC 21.36; or dangerous waste.

**Outside storage of non-containerized materials, by-products, or finished products** including outside storage of any of the following: non-liquid pesticides or fertilizers; contaminated soil; food products or food wastes; metals; building materials,

including but not limited to lumber, roofing material, insulation, piping, and concrete products; or erodible materials, including but not limited to sand, gravel, road salt, topsoil, compost, excavated soil, and wood chips.

**Outside manufacturing activity** including any of the following: processing; fabrication; repair or maintenance of vehicles, products and equipment; mixing; milling; refining; or sand blasting, coating, painting, or finishing of vehicles, products, and equipment.

**Landscape construction or maintenance** including any of the following: land disturbing activities as described in SMC 22.801.130; fertilizer and pesticide application near public drainage control systems; and disposal of yard waste near a public drainage control system or riparian corridor.

# Spill Prevention and Cleanup

**Applicability:** **Spill prevention and cleanup means operational measures, such as the establishment and implementation of plans and procedures to prevent spills or accidental releases of illicit discharges as defined in SMC 22.802.012 to the public drainage control system.**

**Description of Impacts:** Spills can contribute a variety of pollutants to the storm drain system and nearby waterways and are often preventable if appropriate chemical/waste handling and response practices are implemented. Depending on the type of material being handled, pollutants associated with spills may include oxygen-depleting materials (e.g., oxidizing materials such as organic wastes), heavy metals, caustic or acidic materials, toxic organic compounds, and nutrients, which can adversely affect water quality.

## Operational Requirements

As prescribed below, the Stormwater Code requires a spill prevention and clean up plan for all HRPG activities.

> ***SMC 22.802.013 Spill Prevention shall be required.***
>
> ***Parties responsible for undertaking, operating, or maintaining the high-risk pollution generating activities are required to do the following, as further defined in rules promulgated by the Director:***
>
> ***a. Develop and implement plans and procedures to prevent spills and other accidental releases of materials that may contaminate stormwater. This requirement may be satisfied by a Stormwater Pollution Prevention Plan prepared in compliance with an NPDES industrial stormwater permit for the site;***
>
> ***b. Implement procedures for immediate containment and other appropriate action regarding spills and other accidental releases to prevent contamination of stormwater; and***
>
> ***c. Provide necessary containment and response equipment on-site, and training of personnel regarding the procedures and equipment to be used.***

Additional requirements for implementing spill prevention are described below:

1. Develop and implement an emergency spill prevention plan. Update this plan when business activities or designated spill response personnel change, or otherwise annually. Post a written summary of the plan at appropriate points in the building, identifying the spill cleanup coordinators, location of cleanup kits, and phone numbers of regulatory agencies to be contacted in the event of a spill. Required components of a spill prevention plan are listed below:

   - Describe the facility including the owner's name, address, and phone number, the nature of the facility activity, and the general types of chemicals used in the facility.
   - Designate spill response employees to be on site during business activities. Provide a current list of the names, addresses, and phone numbers (office and home)

of designated spill response employee(s) responsible for implementing the spill prevention plan.

- Provide a site plan showing the location of storage areas for chemicals, the locations of storm drains, the direction of slopes towards those drains, and the location and description of any devices that are installed to stop spills from leaving the site (e.g., containment berms, positive control valves).
- Describe emergency cleanup and disposal procedures.
- List the names and numbers of agencies to contact in the event of a spill.

Examples of Important agencies to list in a spill prevention plan include:

For all spills to storm drains, sanitary sewer, rivers, lakes, or streams:

- Washington Department of Ecology (425/649-7000)
- Seattle Public Utility (206/386-1218)
- Seattle Surface Water Quality Hotline (206/684-7587)

For spills of flammable or hazardous materials

- Seattle Fire Department (911)

For spills to the sanitary sewer:

- King County Industrial Waste (206/263-3000): Monday thru Friday 8:00 am to 5:00 pm
- West Point Treatment Plant (206/263-3801): Weekend and after-hours

For spills to Lake Union, Ship Canal, or Puget Sound:

- U.S. Coast Guard (206/217-6232)
- Washington Department of Ecology (425/649-7000)
- Seattle Harbor Patrol (206/684-4071)

2. To reduce the potential for spills to occur, implement the following practices at your site:
   - Store and transport liquid materials in appropriate containers with tight-fitting lids.
   - Place drip pans underneath all containers, fittings, valves, where materials are likely to spill or leak.
   - Use tarps, ground cloths, or drip pans in areas where materials are mixed, carried, and applied to capture any spilled materials.
   - Train employees in the safe techniques for handling materials used on site and encourage them to check for leaks and spills.
3. Store emergency spill containment and cleanup kit(s) nearby areas that have a high potential for spills or other accidental releases so they are readily available during a spill situation. Contents of the spill kit must be appropriate to the type and quantities of materials stored or otherwise used at the facility.
4. Train designated spill response personnel in the use of the plan. All employees should have a basic knowledge of spill control procedures.

5 In the event of a spill:

- Begin spill cleanup immediately. Use cloth rags to clean up spills. Do not use emulsifiers or dispersants such as liquid detergents or degreasers.
- Contact employee(s) responsible for implementing the spill control plan.
- Block off and seal the nearby inlet(s) to the storm drain system to prevent materials from entering the drainage system should a spill occur.
- Immediately report all spills that could reach storm drains, the sanitary sewer, rivers, lakes, Puget Sound, or streams to the appropriate agency (see list provided above).
- Do not wash absorbent material down interior floor drains or exterior storm drains. Dispose of used spill control materials in accordance with the Seattle Solid Waste Code (SMC 21.36), state dangerous waste regulations (WAC 173-303) and all applicable law.

## good citizen measures

The following BMPs are not required, but are recommended to provide additional spill protection:

1. Evaluate all activities involving storage, handling, or use of liquid and solid materials that could contaminate stormwater by spilling or leaking.
2. Conduct high-risk activities in locations well away from storm drains and waterways.

The following federal and state regulations also contain requirements for spill prevention and emergency control plans. If your business falls under any of these regulations, refer to the appropriate regulation to determine the specific requirements for spill prevention that apply to your business.

- 40 CFR Part 112: Some facilities that store, process, or refine oil and/or oil products are required to implement a spill prevention, control, and countermeasure plan (SPCC).
- WAC 173-303: Businesses that handle dangerous wastes must develop a contingency plan to be used in emergency situations to prevent releases of dangerous materials that could otherwise threaten human health and the environment.
- Washington State Department of Ecology permit for stormwater discharges associated with industrial activities: All facilities that fall under the industrial stormwater permit program must develop a stormwater pollution prevention plan (SWPPP) that describes spill containment and response procedures that will be implemented in the event of a spill.

# Fueling Operations

**Applicability: Fueling operations that involve transferring fuel into mobile vehicles or equipment at permanent stations, temporary stations, and mobile fueling stations. Permanent stations include facilities, such as, but not limited to, commercial gas stations, maintenance yards, and private fleet fueling stations, where fuel is transferred from a dedicated fueling station. Temporary fueling stations include, but are not limited to, construction sites and any other site where fuel is temporarily stored and dispensed into vehicles or equipment. Mobile fueling stations are fueling operations where fuel is delivered to vehicles and equipment via mobile tank trucks.**

**Description of Impacts:** Spills and leaks from fueling operations, if not properly contained, can discharge into nearby drainage systems and streams. Fuels contain organic compounds, oil and grease, and metals that are harmful to aquatic life.

## Permanent Fueling Stations

### Structural Requirements

**The following BMPs or equivalent measures, methods, or practices are required for all permanent fueling stations for projects applying for permits after January 1, 2001:**

1. Cover the fuel-dispensing area with an overhanging roof structure or canopy so that rain and windblown rain cannot come in contact with the fuel-dispensing equipment and the vehicles/equipment in the fueling area. Roofs and canopies 10 feet or less in height shall have a minimum overhang of 3 feet on each side. The overhang shall be measured relative to the berm or other hydraulic grade break (see below for explanation of hydraulic grade break). Roofs or canopies greater than 10 feet in height shall have a minimum overhang of 5 feet on each side. Convey all roof drains to storm drains outside the fueling area.

   The Seattle Fire Code (SFC) has additional requirements for roofs and covers constructed over flammable and hazardous material storage areas. Refer to the SFC for details.

2. Construct the fuel-dispensing area to contain spills (See Figure 1. Details of Fuel Island.). Pave the fuel-dispensing area with Portland cement concrete or equivalent. Asphalt is not considered an equivalent material because fuel will deteriorate and penetrate asphalt. The containment area beneath the roof or canopy must be hydraulically isolated from other portions of the site using either grading, berms, or drains. Direct drainage from the paved area beneath the covered fuel-dispensing area to a dead-end sump or other approved onsite containment structure. Drains shall be installed with a slope of not less than 1 percent.

   For fueling operations that store fuel in underground tanks, the capacity of the containment system for the fuel-dispensing area shall be 50 gallons. For fueling operations that store fuel in above ground tanks, the containment system must have the capacity to store the volume of either 10 percent of the total enclosed tank volume or 110 percent of the volume contained in the single largest tank, whichever is greater as prescribed in sections on liquid storage in stationary above ground tanks and outside portable container storage elsewhere in this Rule.

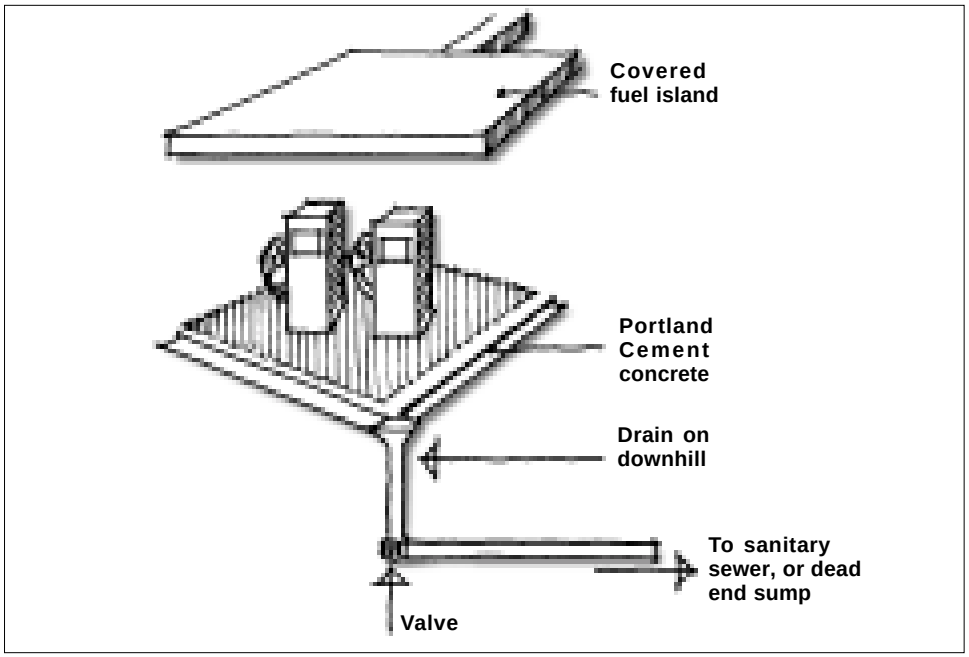



**Figure 1: Details of Fuel Island**

The Washington State Underground Storage Tank Regulations specify additional requirements for spill and overfill prevention for underground storage tank installations. Refer to WAC 173-360 for details on underground storage tanks requirements.

3. Material that accumulates in the sump must be regularly removed and disposed. Disposal requirements are contained in the Seattle Solid Waste Code (21.36) and Washington State Dangerous Waste Regulations (WAC 173-303).
4. Direct stormwater runoff from areas outside the fueling area to the stormwater drainage system or approved discharge location, not to the sanitary sewer.
5. Transfer of fuel from delivery tank trucks to the onsite storage tank shall occur in an impervious contained area. (See requirements for truck loading or unloading of liquid materials in this Rule).

### Exception

For industrial complexes or port facilities where very large mobile equipment is used, the fuel-dispensing area does not need to be covered. However, if not covered, the fueling area must be designed to collect all rainwater that falls within the fueling area and to prevent stormwater runon from other adjacent areas from entering the fueling area.

## Operational Requirements

**The following BMPs or equivalent measures, methods, or practices are required of responsible parties for all stormwater discharges from fueling operations:**

1. Prepare and implement an emergency spill cleanup plan as described under the Spill Prevention and Cleanup requirements for HRPG activities, and have designated trained person(s) available either on site or on call at all times to promptly and properly implement the plan. Keep suitable cleanup materials, such as dry absorbent materials, on site to allow prompt cleanup of a spill.
2. Clearly post instructions for safe operation of the dispensing equipment, the name and telephone number of the owner or operator of the facility and the person responsible for spill response1in a prominent location on site.

3. Ensure that spills are reported to the Seattle Fire Department (911) and the Northwest Regional Office of the Washington State Department of Ecology (425/649-7000).

## Mobile Fueling Operations

### Structural Requirements

There are no structural requirements for mobile fueling or fleet fueling operations under the stormwater, grading, and drainage code.

### Operational Requirements

**The following BMPs or equivalent measures, methods, or practices are required of responsible parties for all stormwater discharges from mobile fueling operations:**

1. Train fuel delivery vehicle operators annually in spill control measures and emergency procedures.
2. The fuel delivery vehicle operator shall be present at all times during fuel transfer operations.
3. Ensure that the following procedures are implemented at fuel transfer locations:
   - Place a drip pan under each mobile fueling location prior to and during all dispensing operations. Include an adsorbent pad in the drip pan. The pan must be liquid tight and have a capacity of at least 5 gallons. Spills retained in the drip pan need not be reported. Dispose of spent absorbent any other spilled material in accordance with Seattle Solid Waste Code (SMC 21.16), the state dangerous waste regulations (WAC 173-303) and all applicable law.
   - Maintain and replace equipment on fueling vehicles, particularly hoses and nozzles, at established intervals to prevent failures.
4. Maintain the following spill clean-up materials in all mobile fueling vehicles:
   - Non-water absorbents capable of absorbing 16 gallons of diesel
   - A storm drain cover/plug kit
   - A containment boom of a minimum 10 feet in length.

Permanent and mobile motor vehicle fuel-dispensing stations must be approved and permitted by the Seattle Fire Department and are required to comply with the Seattle Fire Code (SFC). The water quality requirements presented in this manual are separate from and in addition to requirements stated in the SFC (Articles 52, 79 and 80). SFC specifies requirements for fuel storage tanks, fuel dispensing equipment, area lighting, spill control and secondary containment, signage, maintenance, and operations. Refer to the SFC for current requirements.

# Vehicle, Equipment, and Building Washing and Cleaning Operations

**Applicability:** **Vehicle, equipment or building washing or cleaning, including any of the following: mobile vehicle steam cleaning operations or vehicle washing at commercial car wash facilities, charity car washes, or permanent parking lots such as new, used, and rental car lots and fleet lots; outside washing of tools or other manufacturing equipment; outdoor cleaning of commercial cooking equipment such as filters and grills; or washing of buildings, including exteriors or mobile interior building cleaning services.**

**Description of Impacts:**
Wash water from vehicle and equipment cleaning can contain a variety of pollutants, such as petroleum hydrocarbons and other organic compounds, oil and grease, heavy metals, nutrients, and suspended solids, that are harmful to aquatic life. In addition, detergents often contain chemicals that are toxic to fish.

## Vehicle and Equipment Washing

Untreated wash water from vehicle and equipment washing operations may not be discharged to the public drainage control system and must be discharged to an approved discharge location in accordance with the Side Sewer Code (SMC 21.16) and the Stormwater, Grading and Drainage Control Code. The following options are available for disposing of wash water from vehicle washing operations:

- Discharge wash water to the sanitary sewer.

A side sewer permit is needed to connect to the City sanitary sewer. Call the Street Use Division at (206) 684-5283 to get information about side sewer permits. Discharges to the sanitary sewer are also regulated by the King County Industrial Waste Program. In some cases, wash water from vehicle washing operations may need to be pretreated before discharging to the sanitary sewer. Contact the Industrial Waste Program at (206) 263-3000 for approval before discharging wash water to the sanitary sewer.

- Transport wash water offsite to an approved treatment facility.
- Reuse wash water by installing a closed-loop water recycling system.
- Treat wash water prior to discharge to a public drainage control system.

Discharge of treated vehicle wash water to the public drainage control system requires an NPDES permit from the Washington State Department of Ecology (Ecology). Contact Ecology at (425) 649-7000 for information regarding NPDES permits and treatment requirements.

## Structural Requirements

**The following BMPs or equivalent measures, methods, or practices are required for washing of vehicles, tools, and other manufacturing equipment for projects applying for permits after January 1, 2001:**

1. Unless all responsible parties conduct equipment and vehicle washing operations in one of the locations indicated under operational requirements below, projects must install an outdoor paved wash pad, constructed specifically for vehicle washing operations. (See Figure 2. Requirements for an Uncovered Wash Area.) The wash pad must be paved with Portland cement and sized to extend out at least 4 feet on all sides of the vehicles being washed. Grade, dike, or berm the wash pad to prevent runon of stormwater from adjacent areas. Slope the wash pad so that all wash water is captured and collected. Discharge wash water to one of the locations listed above. For wash pads that discharge to the sanitary sewer, the uncovered portion of the wash pad shall be no larger than 200 square feet or must install an overhanging roof.

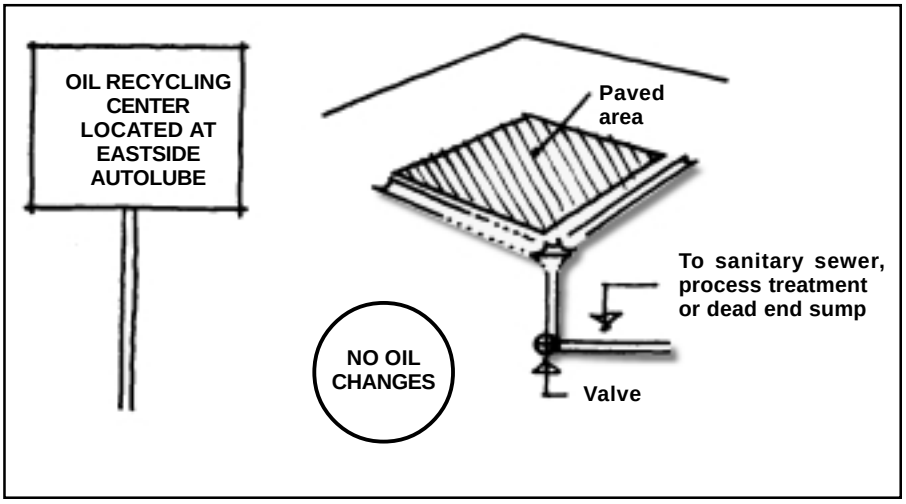



**Figure 2: Requirements for an Uncovered Wash Area**

## Operational Requirements

**The following BMPs or equivalent measures, methods, or practices are required of responsible parties for all stormwater discharges from vehicle and equipment washing:**

1. Vehicle and equipment washing operations may occur at one of the following locations:

   - At a commercial wash facility where washing occurs in an enclosure and drains to one the locations listed above.
   - Inside the business owner's building or other covered area, provided that the wash water is discharged to one of the locations listed above.
   - On an outdoor paved wash pad, constructed specifically for vehicle washing operations. (See Figure 2.) The wash pad must be paved with Portland cement and sized to extend out at least 4 feet on all sides of the vehicles being washed. Grade, dike, or berm the wash pad to prevent runon of stormwater from adjacent areas. Slope the wash pad so that all wash water is collected. Discharge wash water to one of the locations listed above. Uncovered portions of wash pads that discharge to the sanitary sewer shall be no larger than 200 square feet, or a roof must be installed.

- A mobile washing service may be utilized for vehicle washing provided that washing is conducted in a designated area where all washing wastewater can be collected for proper disposal by the washing company.

**Exemption for Vehicle Exterior Washing that Uses Only Cold Water**

Vehicle washing operations where only the exterior body of the vehicle is rinsed with cold water (washing of the engine compartment or underside of the vehicle and steam cleaning or washing with warm water are not permitted) and where no soap or other cleaning products are used are exempt from structural requirements and are permitted to discharge wash water from vehicle washing operations to the public drainage control system provided that these operations comply with the following operational requirements in addition to those listed in the following section:

- If the number of vehicles washed does not exceed 2 vehicles per day or 8 vehicles per week, direct wash water to a grass-lined swale or a landscaped area.
- If there is no suitable pervious area on site, the following options must be used:
  - Block off and seal the nearby inlet(s) to the storm drain system and pump the accumulated wash water to the nearest sanitary sewer.
  - Direct wash water to the nearest catch basin and install a commercially-available catch basin insert that is designed to remove both particulate material and oil and grease. Do not use filter fabric. Regularly clean or replace the insert to prevent wash water from overflowing and bypassing the filter.

2. Do not change oil or perform other vehicle maintenance in the wash area. Post signs prohibiting oil changing and vehicle maintenance in the wash area.

3. Train employees about washing requirements and/or wash pad operations. Designated wash areas must be clearly posted with signs instructing where and how washing must be done. Any inlets to the public drainage control system must be marked “Dump No Waste”.

**good citizen measures**

The following BMPs are not required, but should be implemented to reduce potential pollution from vehicle and equipment washing operations:

- Minimize water and detergent use in all wash operations.
- Use phosphate-free detergents.
- Washing of individual vehicles at privately-owned residences should occur at one of the following locations:
  - At a commercial car washing establishment, or
  - Over a lawn or other vegetated area or in an area that drains to a vegetated area, or
  - In the street or driveway as long as no soap or other cleaning products are used.

**Temporary vehicle washing operations**

Temporary vehicle washing operations such as charity car washes, should block off and seal the nearby inlet(s) to the storm drain system and pump the accumulated wash water to the nearest sanitary sewer. The Seattle Public Utility (SPU) has a limited number of kits available that contain the equipment needed for temporary car wash operations. Kits can be borrowed from SPU and are available on a first come first served basis. Contact SPU at (206) 684-7587 to borrow these kits and for instructions on how to use.

### Cleaning or Washing of Cooking Equipment

Wash water from these cleaning activities contains oil and grease, nutrients, suspended solids, biochemical oxygen demand, and chemical oxygen demand. It cannot be discharged to the public drainage control system. Cooking equipment wash water is considered process wastewater and must be discharged to one of the following locations:

- Sanitary sewer.
- Holding tank (and shipped offsite for disposal).
- Approved process treatment system.

Discharges of wastewater containing fats, oils, and greases (FOG) to the sanitary sewer are regulated under the Seattle Side Sewer Code ( SMC 21.16). Wash water from cleaning operations may need to be pretreated to remove FOG before discharging to the sanitary sewer. Contact the grease pretreatment administrator at SPU (206) 684-7750 for information regarding fats, oils, and grease.

## Structural Requirements

**The following BMPs or equivalent measures, methods, or practices are required for projects applying for permits after January 1, 2001 proposing businesses that wash cooking equipment outside of buildings:**

1. Unless all responsible parties conduct washing operations in one of the locations described under the operational requirements below, an outside designated wash area must be installed designed to discharge wash water to one of the locations listed above and provisions are made to prevent stormwater run-on from adjacent areas from entering the washing area.

## Operational Requirements

**The following BMPs or equivalent measures, methods, or practices are required of responsible parties for all stormwater discharges from cooking equipment cleaning or washing:**

1. Do not discharge washwater to the public drainage control system. Washing operations may occur at one of the following locations:
   - If the equipment to be washed is small, cooking equipment may be washed inside in a sink or washbin, or outside in a tub or other container to collect the wash water provided that wash water is discharged to one of the above locations.
   - Outside in a designated wash area provided that wash water is discharged to one of the locations listed above and provisions are made to prevent stormwater run-on from adjacent areas from entering the washing area.
2. Train employees about washing requirements and how to dispose of wash water appropriately.
3. Outdoor washing areas must be routinely swept to collect debris and other material for proper disposal.

**good citizen measures**

The following BMPs are not required, but should be implemented to reduce pollution:

- Wipe off the equipment before washing to remove oil and grease.
- Use phosphate-free detergents and minimize water and detergent.
- Use the least hazardous cleaning products that are available.

### Building Washing

Wash water from building washing operations can contain heavy metals, suspended solids, and other materials present on the building exterior or used in the cleaning process (e.g., paint residue, roofing materials, detergents, and other products). It cannot be discharged to the public drainage control system.

## Structural Requirements

No structural controls are required for building washing operations.

## Operational Requirements

**The following BMPs or equivalent measures, methods, or practices are required of responsible parties for businesses that wash large structures such as building facades, fences, masonry, and rooftops using low or high pressure water or steam: :**

1. For washing operations located on a pervious or vegetated area, disperse wash water evenly across the pervious area and allow to infiltrate into the ground. Install filter fabric on the ground around the building to collect debris such as paint chips and roofing materials that may be generated from washing operations. Install berms or other splash protection to prevent wash water from reaching paved areas and/or the storm drain system. Block off yard drains or landscape area drains to prevent wash water from entering the drainage system.
2. For washing operations located on impervious areas, when soaps, detergents, or other cleaning products are not used, wash water may be discharged to the storm drain system provided the following controls are implemented:
   - Install filter fabric on the pavement around the building to collect debris such as paint chips and roofing materials that may be generated from washing operations.
   - Install a commercially-available insert in catch basins that could receive direct runoff from the washing operations. Inspect inserts regularly during the washing operations to make sure that inserts have not clogged. Remove and dispose inserts in accordance with the Seattle Solid Waste Code (SMC 21.36) and state dangerous waste regulations (WAC 173-303) when washing operations are complete.
3. For washing operations located on impervious areas when using soaps, detergents, or other cleaning products, wash water must be discharged to the sanitary system or must be collected and disposed. (See Figure 2.)

Wash water and debris must be disposed in accordance with the Seattle Solid Waste Code (SMC 21.36), state dangerous waste regulations (WAC 173-303) and other applicable law.

If cleaning products other than detergent are used (e.g., alkaline/acidic wash products, metal brighteners), contact the King County Industrial Waste Program at (206) 263-3000 before discharging to the sanitary sewer to determine whether pretreatment is required to neutralize acidic or caustic materials or to remove metals generated by the cleaning operations.

### good citizen measures

The following BMPs are not required, but should be implemented to reduce potential pollution from washing operations:

- Minimize water and detergent use in all wash operations.
- Use phosphate-free detergents.
- Minimize the use of caustic and other cleaning products.

## Mobile Interior Washing Operations

Wastewater generated by these operations may contain nutrients, suspended solids, biochemical oxygen demand, and other organic compounds such as pesticides and chemicals used for insect and/or odor control. Wastewater cannot be discharged to the public drainage control system or discharged onto the ground outside the building. It must be collected and discharged to the sanitary sewer or transported offsite for disposal.

Discharges to the sanitary sewer are regulated by the King County Industrial Waste Program. Some of the products used for insect and odor control are toxic and may interfere with the operation of the municipal wastewater treatment plant. Contact the Industrial Waste Program at (206) 263-3000 for approval before discharging wastewater to the sanitary sewer.

# Operational Requirements

**The following BMPs or equivalent measures, methods, or practices are required of responsible parties for all stormwater discharges from mobile interior washing:**

1. Label all mobile cleaning equipment "Properly dispose all wastewater. Do not discharge to a storm drain, drainage ditch, stream, or to the ground." Also label equipment with instructions on how to properly dispose wastewater.
2. Dispose sludges left in tanks, containers, or trucks in accordance with Seattle Solid Waste Code (SMC 21.36) state dangerous waste regulations (WAC 173-303) and other applicable law.

## good citizen measures

The following BMPs are not required, but should be implemented to reduce potential pollution from interior building washing operations:

- Minimize water and detergent use in all wash operations.
- Use phosphate-free detergents.
- Use the least toxic cleaner that will do the job.
- Recycle wash water.

Pressure washing boats in boat yards, marinas, and dry dock areas is regulated under Washington State Department of Ecology (Ecology). Under the general NPDES permit for boatyards, wash water from boat washing operations cannot be discharged to any surface water body. Refer to Ecology's *Boatyard National Pollutant Discharge Elimination System Waste Discharge General Permit* for boat washing operations requirements.

# Truck or Rail Loading and Unloading of Liquid and Solid Materials

**Applicability:** **Truck or rail loading or unloading of liquid or solid materials that involves transferring non-containerized bulk liquids from truck or rail, or loading/unloading materials at a commercial or industrial loading dock.**

**Description of Impacts:** Spills and leaks of liquid and solid material during loading/unloading operations can enter storm drains either via direct spillage into the system or via stormwater runoff that comes in contact with the spilled material. Because many storm drains in Seattle eventually discharge to local streams and waterways, spilled or leaked products can adversely affect water quality and thus can injure aquatic organisms and others that come in contact with the contaminated water. Possible contaminants associated with spilled materials include toxic organic compounds, oil and grease, heavy metals, nutrients, and acidic or alkaline products.

## Structural Requirements

### Truck Loading and Unloading Docks

**The following BMPs or equivalent measures, methods, or practices are required for all truck loading and unloading docks for projects applying for permits after January 1, 2001:**

1. Install a roof overhang or other cover over the loading area or install door skirts at each bay that enclose the end of the trailer to prevent contact with rain water during loading/unloading operations.
2. Install berms or grade the loading/unloading area to prevent runon of stormwater from areas outside the loading/unloading area.

**Figure 3:**
**Loading Dock with Door Skirt**

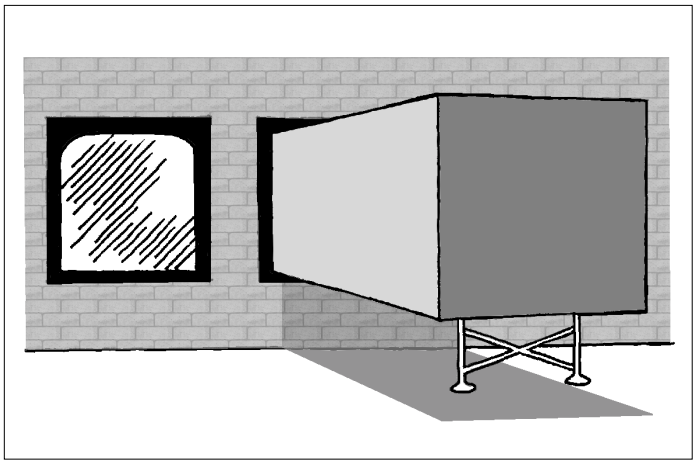
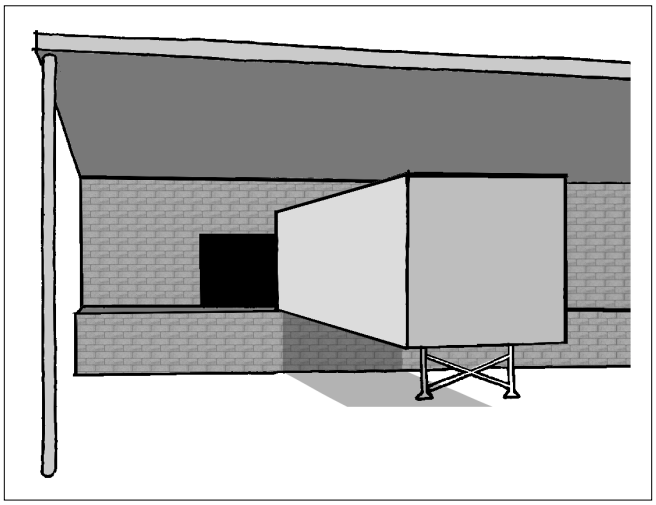


**Figure 4:**
**Loading Dock with Overhang**



## Rail transfer of bulk liquids to tanks

**The following BMPs or equivalent measures, methods, or practices are required for projects proposing rail transfer of bulk liquids to storage tanks and applying for permits after January 1, 2001:**

1. Install a drip pan system within the rails to collect spills and leaks from tank cars, hose connections, hose reels, and filler nozzles.

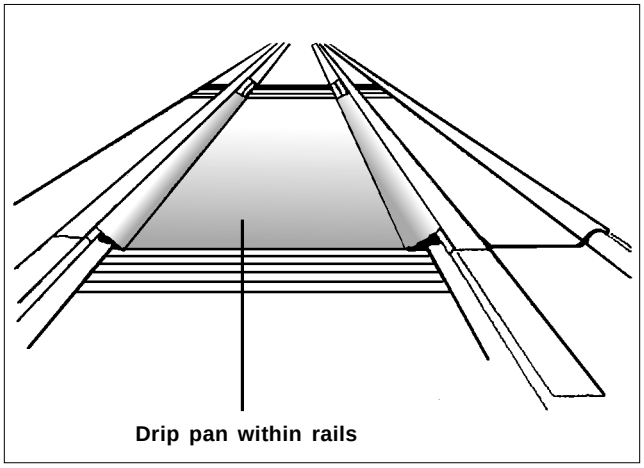



**Figure 5: Drip Pan Within Rails**

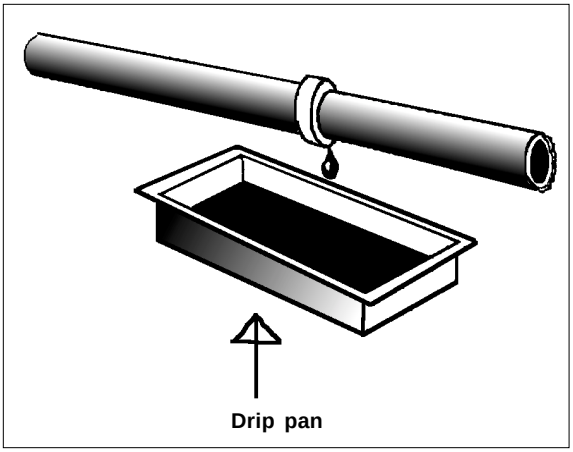
## Tanker truck transfer of bulk liquids to above or below ground tanks

**The following BMPs or equivalent measures, methods, or practices are required for projects proposing tanker truck transfer of bulk liquids to storage tanks and applying for permits after January 1, 2001:**

1. Designate an area for liquid transfer operations. Pave the loading/unloading area with material that is compatible with the material(s) to be transferred (e.g., use Portland cement concrete or equivalent if fuels such as gasoline will be transferred).
2. Grade, berm, or dike the transfer area to prevent stormwater entering from the surrounding area and to prevent spilled material from running off the site.
3. Install a containment system to capture all materials that may spill during transfer operations and direct to a dead-end sump or tank.

    - For covered transfer areas, the sump should have no outlet and function as a containment tank. Design the containment system to provide adequate capacity to hold the volume of material that would be discharged from the largest nozzle used to load/unload for a period of 15 minutes. Spilled material that collects in the sump must be removed for disposal.

**Figure 6: Drip Pan**




- For uncovered areas, design the containment system sump with capacity from the greater volume of the following: the volume that would be discharged from the largest nozzle used to load/unload over a 15-minute period, or the peak discharge rate from the 6-month, 24-hour storm. Equip the sump with a positive control valve that is closed during loading/unloading operations to contain spilled or leaked material. During periods when loading/unloading is not occurring, the valve shall remain open to allow stormwater runoff from the transfer area to be discharged to the storm drain system. Spilled material that collects in the sump must be removed and transported offsite for disposal before the control valve is reopened.

## Operational Requirements

**The following BMPs or equivalent measures, methods, or practices are required of responsible parties for all stormwater discharges from truck or rail loading and unloading of liquid and solid materials:**

1. Develop written procedures for conducting transfer operations. Train employees in proper transfer procedures/techniques to avoid spills. Post written procedures at a prominent location in the transfer area.
2. A trained employee must always be present during loading and unloading operations.
3. Equip pumps and hoses used to transfer material with control valves to enable quick shutoff if a leak or spill occurs.
4. Clearly identify and mark any shutoff valves.
5. Always use drip pans underneath hose and pipe connections and other leak-prone spots during transfer operations and when making or breaking connections. Store drip pans in a covered location adjacent to the transfer area so that they are always available, but protected from rain when not in use. Clean the drip pans after each use to remove any residual material. Dispose of residual material in accordance with the Seattle Solid Waste Code (21.36) and the Washington State Dangerous Waste Regulations (WAC 173-303).
6. Install temporary storm drain covers over nearby storm drain inlets to prevent any spilled material from entering the storm drainage system when materials are being transferred. If a spill does occur, all spilled material must be immediately collected and disposed of in accordance with the Seattle Solid Waste Code (21.36) and the Washington State Dangerous Waste Regulations (WAC 173-303).
7. Develop and implement an emergency response plan for handling spills. Train employees in emergency spill response and appropriate spill cleanup procedures.
8. Store and maintain appropriate spill control, containment, and cleanup materials in a location known to all that is near the transfer area and ensure that employees are adequately trained in the use and deployment of spill control and cleanup equipment.

### good citizen measures

The following BMPs are not required, but should be implemented to reduce potential pollution from loading/unloading operations:

- If the transfer area is not used for large equipment that cannot maneuver under a roof, the transfer area should be covered so that rainfall cannot come in contact with unloading/loading equipment and materials. Slope the transfer area to a sump or a holding tank to capture any spilled material. For covered transfer areas, the sump shall have no outlet and will function as a containment tank. Spilled material that collects in the sump must be removed and transported offsite for disposal.
- Wherever possible, choose less toxic materials for use in facility operations.

**Loading and Unloading Marine Vessels.**

Facilities and procedures for the loading or unloading of products from marine vessels must comply with Coast Guard requirements described in section titled Other Regulatory Requirements.

# Liquid Storage in Stationary Above Ground Tanks

**Applicability:** **Liquid storage in stationary above ground tanks, including storing liquid chemicals, fertilizers, pesticides, solvents, grease, or petroleum products in stationary above ground tanks.**

**Description of Impacts:** Spills and leaks from storage tanks can contain toxic organic compounds such as solvents and fuel, oil and grease, heavy metals, nutrients, acidic or alkaline materials, and chemical oxygen demand. These materials, if discharged to storm drains, can enter nearby surface waters and degrade water quality.

## Structural Requirements

**The following BMPs or equivalent measures, methods, or practices are required for projects applying for permits after January 1, 2001 proposing liquid storage in stationary above ground tanks:**

1. Install a tank overfill and siphon protection system to minimize the risk of spillage during tank filling operations.
2. Protect tanks against physical damage from vehicles and other equipment through the use of bollards or other traffic barriers.
3. Locate tanks as described below:
   - If possible, enclose or otherwise cover the tanks to prevent contact with rainwater. Convey runoff from roofs to an approved drainage control system.
4. For both inside and outside tank storage areas, the containment system shall be designed with the following features:
   - Install tanks in an impervious area equipped with secondary containment to prevent spilled or leaked materials from discharging into the building if inside or from entering the nearby drainage system and adjacent waterways if tanks are outside. Double-walled storage tanks may be exempt from the secondary containment requirements, if tanks are UL approved, equipped with a spill detection system, and appropriate provisions are made to control leaks and spillage from dispensing hoses or other fixtures associated with the tanks.
   - Pave the containment area with a material that is compatible with the material(s) that are stored (e.g., use Portland cement concrete or equivalent if fuels such as gasoline are stored).
   - The containment system must have the capacity to store the volume of either 10 percent of the total enclosed tank volume or 110 percent of the volume contained in the single largest tank, whichever is greater.
   - Slope the bottom of the containment area toward either trench drains or catch basins and connect to a dead-end sump or holding tank to capture any leaks or spills from the tank area. Drains shall be installed with slopes of not less than 1 percent.

- For uncovered, outdoor tank storage areas, equip the outlet from the containment system with a shutoff valve. The valve must be kept closed during normal operation. The valve may be opened only to release uncontaminated stormwater to the public drainage control system. Material that spills or leaks from tanks and contaminated stormwater cannot be discharged to the public drainage control system. These materials must be discharged either to the sanitary sewer, if approved, or collected and transported offsite for disposal.

A side sewer permit is needed to connect to the City sanitary sewer (SMC 21.16). Call the Street Use Division at (206) 684-5283 to get information about side sewer permits. Discharges to the sanitary sewer are regulated by the King County Industrial Waste Program. Contact the King County Industrial Waste Program at (206) 263-3000 for approval before discharging to the sanitary sewer.

- For petroleum tank farms, stormwater from the containment area must be treated in an API or coalescing plate oil/water separator before discharging to the public drainage control system.

## Operational Requirements

**The following BMPs or equivalent measures, methods, or practices are required of responsible parties for all stormwater discharges from liquid storage in stationary above ground tanks:**

1. Check tanks, fittings (e.g., valves, pipe connections), and containment sumps daily for leaks and spills. Replace or repair tanks and fittings that are leaking, corroded, or otherwise deteriorating.
2. Inspect, clean, and maintain the containment system each week to ensure that it remains water tight.
3. Comply with operational requirements set forth under Spill Prevention and Cleanup and Truck or Rail Loading and Unloading of Liquid and Solid Materials. Keep suitable cleanup materials, such as absorbent materials, on site to allow prompt cleanup of a spill. Train employees on how to clean up spills and properly dispose of collected/spent materials. An employee trained in emergency spill cleanup procedures must be present whenever liquid chemicals or other wastes are loaded or unloaded.
4. Spills must be cleaned up immediately.[2]
5. Train and encourage employees to check for leaks and spills.
6. Place drip pans and absorbent materials beneath all mounted taps, and at all potential drip and spill locations during filling and unloading of tanks. Any material collected must either be reused, recycled, or properly disposed.

[2]Collect all spilled material and dispose in accordance with Seattle Solid Waste Code (21.36) and Washington State Dangerous Waste Regulations (WAC 173-303). Discharges to the sanitary sewer must be authorized by King County Industrial Waste Program (206-263-3000).

Facilities that store flammable and combustible liquids or hazardous materials (liquid or solid) must comply with the Seattle Fire Code. The fire code specifies requirements for tank location, tank construction, fire protection, tank venting, overfill prevention, drainage control and diking, and secondary containment (see Articles 79 and 80). In addition, indoor storage tanks must also comply with the Seattle Building Code.

Indoor liquid storage of combustible liquids used in closed systems to fuel equipment such as emergency generators and fire pumps must comply with requirements regulated by the Department of Design Construction and Land Use (DCLU) and the Seattle Fire Code. For assistance, contact the DCLU intake center at 684-5045.

The requirements described in this section are in addition to requirements prescribed in the Seattle Fire Code, in the state dangerous waste regulations (WAC 173-303), in the Washington State Department of Ecology requirements (WAC 173-360) for underground storage tanks, and elsewhere.

**Figure 7: Above-Ground Tank Storage**

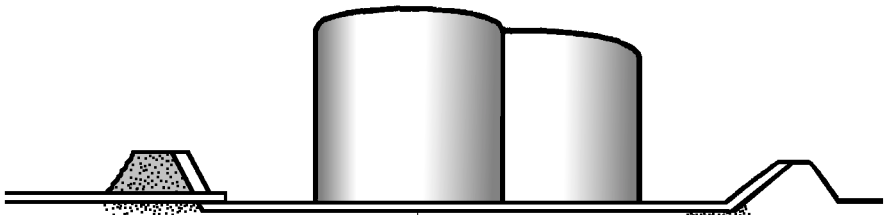



**Figure 8: Secondary Containment System**

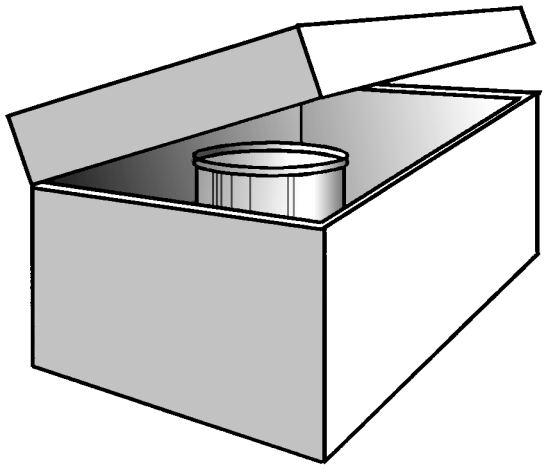
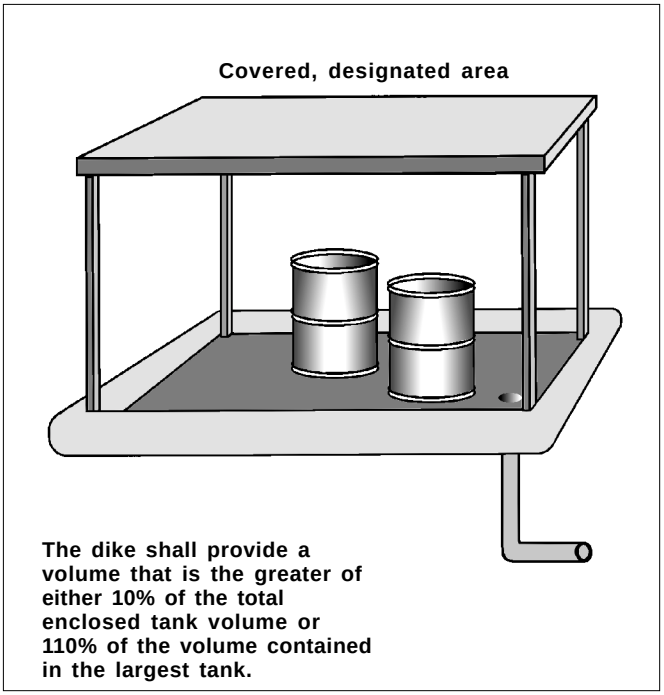



**Figure 9: Covered and Bermed Containment Area**



# Outside Portable Container Storage of Liquids, Food Wastes, or Dangerous Wastes

**Applicability: Outside portable container storage of liquids, food wastes, or dangerous wastes including storing any of the following: vegetable grease, animal grease, or other accumulated food wastes; used oil; liquid feedstock; cleaning compounds; chemicals; solid waste as defined by SMC 21.36; or dangerous waste.**

**Description of Impacts:** Like large stationary above ground tanks, spills and leaks from portable storage containers can contain toxic organic compounds such as solvents and fuel, oil and grease, heavy metals, nutrients, acidic or alkaline materials, BOD, and COD. These materials, if discharged to storm drains, can enter nearby surface waters and degrade water quality.

## Structural Requirements

### All storage areas

**For projects applying for permits after January 1, 2001, the following BMPs or equivalent measures, methods, or practices are required for all outside portable container storage of liquids, food wastes, or dangerous wastes:**

1. Store materials in containers that are compatible with the material being stored. All containers must be covered with a tight-fitting lid, and only leak-proof containers shall be used. Containers shall be in good condition without corrosion or leaky seams and shall be replaced if leaking is occurring.

Refer to the Seattle Solid Waste Code (SMC 21.36) and Title 10 of the Code of the King County Board of Health for other applicable requirements regarding dumpsters and other solid waste containers.

2. Protect tanks against physical damage from vehicles and other equipment through bollards or equivalent.

### Liquid storage areas

**For projects applying for permits after January 1, 2001, the following BMPs or equivalent measures, methods, or practices are required for all outside portable container storage of liquids, including dumpsters and other containers used to store liquid products and/or waste such as fertilizers, chemicals, oil and waste oil:**

1. Designate an impervious outdoor storage area that is covered to prevent contact with rainfall, or keep containers inside a building.

If adjacent to a building, or constructed over hazardous material storage areas, roofs and covers are also regulated by the Seattle Fire Code (SFC). Refer to the SFC for setback and other requirements regarding weather protection for outdoor storage areas. Structural building overhangs are also regulated by the Seattle Land Use Code. Refer to SMC 23.53 for clearance requirements.

2. The container storage area must be equipped with secondary containment to prevent spilled or leaked materials from leaving the building or entering the nearby drainage system and adjacent waterways. Outdoor storage areas must be graded or bermed to prevent runon from surrounding areas from entering the storage area. Pave or line the storage area with an impermeable material that is compatible with the material(s) that are stored (e.g., use Portland cement concrete or equivalent if fuels such as gasoline are stored).

   - The secondary containment system must have the capacity to store the volume of either 10 percent of the total enclosed tank volume or 110 percent of the volume contained in the single largest tank, whichever is greater. Slope the storage area toward either trench drains or catch basins and connect to a dead-end sump or holding tank to capture any leaks or spills from the tank area. Material that accumulates in the sump may be discharged to the sanitary sewer, if approved or collected and transported offsite for disposal. A side sewer permit is needed to connect to the City sanitary sewer. Call the Street Use Division at (206) 684-5283 to get information about side sewer permits.

Discharges to the sanitary sewer are also regulated by the King County Industrial Waste Program. Contact the Industrial Waste Program at (206) 263-3000 for approval before discharging to the sanitary sewer. Offsite disposal of wastes must comply with the Seattle Solid Waste Code (SMC 21.36), the State Dangerous Waste Regulations (WAC 173-303) and other applicable law.

   - For temporary tank storage areas that are used for less than 30 days, a portable secondary containment system like that shown in Figure 9 can be used in lieu of a permanent system as described above.
   - Double-walled storage tanks may be exempt from the secondary containment requirements, if tanks are UL approved, equipped with a spill detection system, and appropriate provisions are made to control leaks and spillage from dispensing hoses or other fixtures associated with the tanks.

### Dangerous waste storage areas

Storage areas for dangerous wastes that contain free liquids must comply with all of the requirements listed above. However, material accumulating in the containment area cannot be discharged to the sanitary sewer, but rather must be collected and transported offsite for disposal. Storage areas for dangerous wastes that do not contain free liquids (e.g., solid material) must comply with the requirements listed under all storage areas.

Refer to Washington State Dangerous Waste Regulations (WAC 173-303) or contact Ecology at (425) 649-7000 for requirements for dangerous waste storage areas.

## Operational Requirements

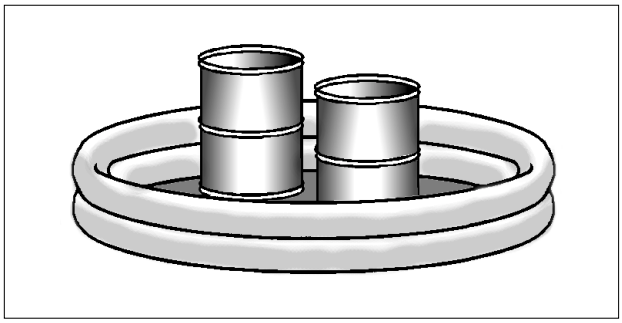
**The following BMPs or equivalent measures, methods, or practices are required of responsible parties for all stormwater discharges from outside portable container storage of liquids, food wastes, or dangerous wastes:**

1. Store materials in containers that are compatible with the material being stored. All containers must be covered with a tight-fitting lid, and only leak-proof containers shall be used. Containers shall be in good condition without corrosion or leaky seams and shall be replaced if leaking is occurring.

2. Containers stored in areas that are accessible to unauthorized personnel or the general public must be secured to prevent accidental spillage, vandalism, or any unauthorized use.
3. Material that accumulates in the containment area or sump must be regularly removed and disposed in accordance with the Seattle Solid Waste Code (21.36) and Washington State Dangerous Waste Regulations (WAC 173-303).
4. Check all storage containers, including solid waste dumpsters daily for leaks and spillage. Replace leaking containers. Inspect, clean, and maintain the containment system regularly to ensure that it remains watertight. Sweep and clean storage area regularly, if paved. Do not wash to public drainage control system.
5. Train and encourage employees to check for leaks and spills.
6. Comply with requirements set forth in Spill Prevention and Cleanup.
7. Place drip pans and absorbent materials beneath all mounted taps, and at all potential drip and spill locations during filling and unloading of tanks. Any material collected must either be reused, recycled, or properly disposed.

- Refer to the Seattle Solid Waste Code (SMC 21.36) and Title 10 of the Code of the King County Board of Health for other applicable requirements regarding dumpsters and other solid waste containers.
- Facilities that generate more than 220 pounds (approximately 25 gallons) per month of dangerous waste or 2.2 pounds per month of extremely hazardous waste as designated under WAC 173-303-100 fall under the state dangerous waste regulations. If your business qualifies as a dangerous waste generator or storage facility, you must obtain a state identification number and comply with the state dangerous waste regulations (see WAC 173-303).
- Stored reactive, ignitable, or flammable material must comply with the Seattle Fire Code.

**Figure 10:**
**Temporary Drum Containment System**



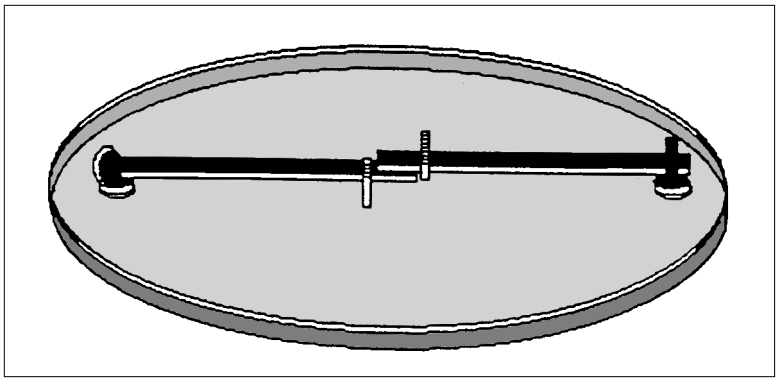


**Figure 11:**
**Mounted Container With Drip Pan**

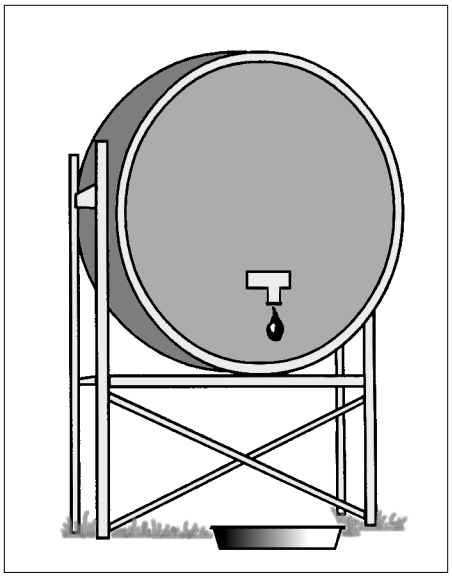


**Figure 12:**
**Locking System For Drum Lid**

# Outside Storage of Non-containerized Materials, By-Products or Finished Products

**Applicability: Outside storage of non-containerized materials, by-products, or finished products including outside storage of any of the following: non-liquid pesticides or fertilizers; contaminated soil; food products or food wastes; metals; building materials, including but not limited to lumber, roofing material, insulation, piping, and concrete products; or erodible materials, including but not limited to sand, gravel, road salt, topsoil, compost, excavated soil, and wood chips.**

**Description of Impacts:** Stockpiles are often stored outside where they are exposed to rainfall and stormwater runoff. Erosion of storage piles and leaching of chemicals present in the stored materials can contribute contaminants to the storm drain system and nearby waterways. Erosion of solid materials contributes suspended sediment and particulates to the drainage system. Large quantities of these materials can create maintenance problems for storm drainage systems because these materials tend to deposit in low energy areas of the system and can block or damage drainage structures. Suspended sediment can also contribute turbidity to downstream waterways, which degrades water quality and can adversely impact aquatic habitat and fish spawning areas. In addition, contaminants found in solid storage materials can leach into solution when contacted by rainwater or stormwater and thus contribute dissolved pollutants to the drainage system. Pollutants that may leach from material stockpiles include salts (e.g., sodium, calcium, magnesium), organic compounds, and heavy metals.

## Structural Requirements

**For projects applying for permits after January 1, 2001, the following BMPs or equivalent measures, methods, or practices are required for all outside storage of non-containerized materials, by-products or finished products:**

1. Cover the storage area to prevent contact with rainwater. Options for covering are listed below (in order of preference):
   - Store materials inside a building or other structure.
   - Construct canopy or other roof structure over storage area
   - Cover stockpiles with plastic sheeting or other impermeable material such as tarps. Secure covers with sand bags, tires, or other anchors to prevent wind damage. Keep covers in place whenever stockpile or storage pile is not in use.
2. Grade, dike, or berm area outside storage areas to prevent stormwater runon from surrounding areas from entering the storage area.
3. For large storage areas that cannot be covered, install a stormwater drainage system to collect and treat runoff from the material storage area as prescribed in the stormwater, drainage, and grading code (SMC 22.802) before discharging offsite. Grade the storage area to drain stormwater away from material stockpiles and toward a perimeter or internal collection system. Stormwater runoff must be treated if discharging to a public drainage control system.

Refer to the Seattle Flow Control Technical Requirements Manual and the Stormwater Treatment Technical Requirements Manual for details on how to design stormwater drainage and treatment systems.

## Operational Requirements

**The following BMPs or equivalent measures, methods, or practices are required of responsible parties for all stormwater discharges from outside storage of non-containerized materials, by-products or finished products:**

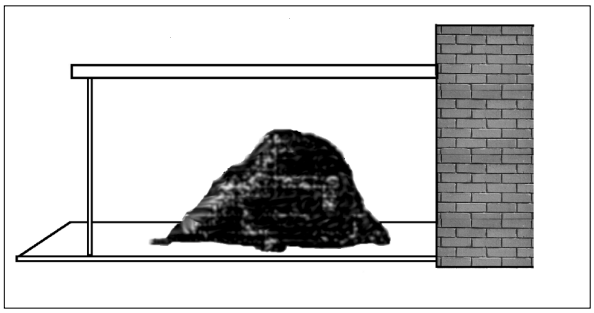
1. Cover the storage area to prevent contact with rainwater. Options for covering include:
   - Store materials inside a building or other structure.
   - Construct canopy or other roof structure over storage area
   - Cover stockpiles with plastic sheeting or other impermeable material such as tarps. Secure covers with sand bags, tires, or other anchors to prevent wind damage. Keep covers in place whenever stockpile or storage pile is not in use.
2. Sweep paved storage areas at least monthly, or as needed depending on site conditions to remove loose solid materials. Recycle material to the stockpile or dispose in accordance with applicable law. Water used to clean the storage area may not be discharged to the public drainage control system.
3. Store cleanup supplies and equipment (e.g., vacuum sweepers, brooms, dust pans) at the storage area for easy access by employees.
4. Temporarilycover nearby storm drain inlets to prevent material from entering the storm drainage system when loose materials are being transferred. When transfer is complete, sweep the area to clean up any loose material and replace under the protective cover. If material inadvertently enters the storm drain system during transfer operations, the material must be immediately removed and disposed.

### good citizen measures

The following BMPs are not required, but are recommended to reduce pollution:

- Store erodible or leachable materials away from storm drain inlets.
- Avoid stockpiling in lowlying areas where stormwater tends to accumulate. Grade the area in and around the storage piles to a minimum slope of 1.5% to prevent pooling and minimize leachate formation.
- Maintain existing vegetation down gradient of material storage areas to trap suspended solids before it reaches the drainage system.
- Limit access to the site to control the amount of dust and other loose material generated.

**Figure 13:**
**Covered Storage Area For Raw Materials**



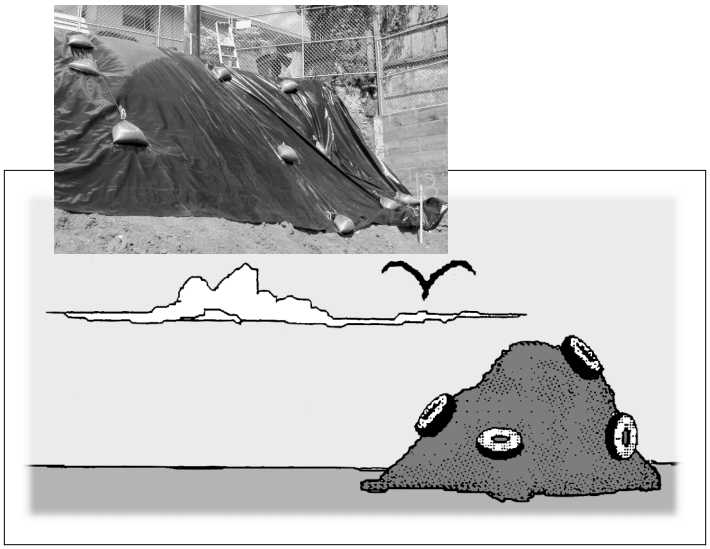


**Figure 14:**
**Material Covered With Plastic Sheeting**

# Outside Manufacturing Activity

**Applicability:** **Outside manufacturing activity including any of the following: processing; fabrication; repair or maintenance of vehicles, products and equipment; mixing; milling; refining; or sand blasting, coating, painting, or finishing of vehicles, products, and equipment.**

**Description of Impacts:** Potential pathways for contaminants to reach storm drainage systems include leaching of materials that come in direct contact with storm water and washoff of contaminants that have accumulated on paved surfaces either as a result of atmospheric deposition or from leaks and spills from manufacturing operations. Examples of possible pollutants include heavy metals, organic compounds, and nutrients.

## Structural Requirements

**For projects applying for permits after January 1, 2001, the following BMPs or equivalent measures, methods, or practices are required for all outside manufacturing activity.**

1. Isolate the potential storm water pollutant generating activities and cover to prevent contact with rain and storm water. Options include relocating the pollutant-generating activity inside a building or installing a roof or cover over the area. If a roof or cover is used, grade, dike, or berm the area to prevent storm water runon from surrounding areas from entering the manufacturing area.
2. If the manufacturing activity is too large to enclose or cover, isolate and segregate pollutant-generating activities, and install a storm water drainage system to collect and treat contaminated runoff from the process area before discharging offsite as prescribed in the Stormwater, Drainage, and Grading Control Code.

Refer to the Seattle Flow Control Technical Requirements Manual and the Stormwater Treatment Technical Requirements Manual for details on how to design stormwater drainage and treatment systems.

Facilities that operate their own wastewater treatment system for treating process wastewater can convey runoff from pollutant-generating process areas to their onsite treatment plant provided that the existing plant is sized to handle the volume of runoff anticipated and the owner obtains approval from Ecology under its NPDES permit to treat runoff.

## Operational Requirements

**The following BMPs or equivalent measures, methods, or practices are required of responsible parties for all stormwater discharges from outside manufacturing activity:**

1. Isolate the potential storm water pollutant generating activities and cover to prevent contact with rain and storm water. Options include relocating the pollutant-generating activity inside a building or installing a roof or cover over the area. If a roof or cover is used, grade, dike, or berm the area to prevent storm water runon from surrounding areas from entering the manufacturing area.

2. Frequently sweep the area to remove accumulated material, rather than washing with water. Do not wash to the public drainage control system. Dispose collected material in accordance with the Seattle Solid Waste Code (SMC 21.36.016) and the state dangerous waste regulations (WAC 173-303).

3. Place drip pans underneath leak-prone equipment. Clean the drip pans on a regular basis and dispose of residual material in accordance with the Seattle Solid Waste Code (SMC 21.36.0160) and the state dangerous waste regulations (WAC 173-303).Encourage employees to minimize waste from manufacturing operations and provide training in appropriate waste handling/disposal procedures.

4. Store spill containment and cleanup materials in the process area in a well marked location that is known to all employees. Train employees in proper cleanup and emergency response procedures.

The requirements described in this section are not applicable to discharges of process wastewater. Process wastewater must be treated before it can be discharged offsite. Options for discharging treated wastewater include the sanitary sewer (requires approval from the King County Industrial Waste Program at 206/263-3000), groundwater (requires a Washington State Waste Discharge permit), or discharge under a Nationwide Pollutant Discharge Elimination (NPDES) permit issued by the Washington State Department of Ecology (425/649-7000). Discharge of untreated process wastewater to the storm drain system or nearby waterways is not allowed.

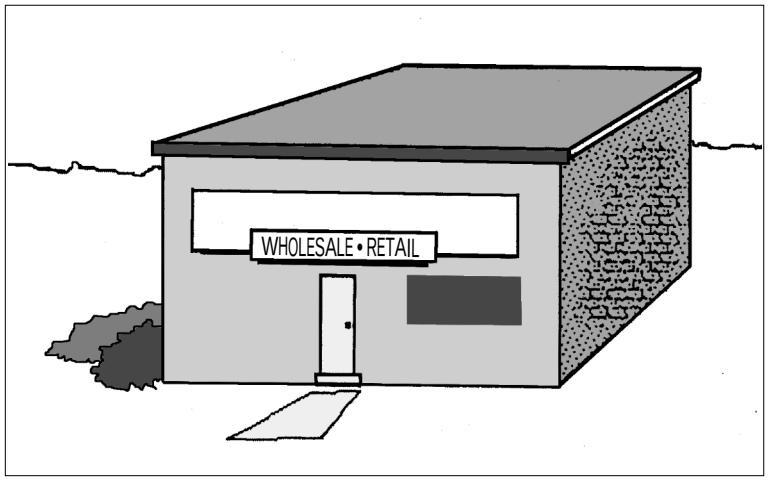
In addition, certain businesses that discharge storm water runoff from their property to adjacent waterways or nearby storm drain systems are required to obtain a storm water permit from the Washington State Department of Ecology. Businesses required to obtain a storm water permit are defined by standard industrial classification (SIC) as listed below:

- Lumber and wood product manufacturing (SIC 24)
- Paper and allied products manufacturing (SIC 26)
- Chemical and allied product manufacturing (SIC 28)
- Petroleum product manufacturing (SIC 29)
- Leather tanning and finishing (SIC 311)
- Stone, clay, and glass (except glass products made from purchased glass) product manufacturing (SIC 32)
- Primary metals industries (SIC 33)
- Fabricated structural metal (SIC 3441)
- Ship and boat building and repair (SIC 373)
- Mining and oil and gas facilities (SIC 10 through 14)
- Hazardous waste treatment, storage, and disposal facilities
- Landfills and land application sites
- Recycling facilities (SIC 5015, 5093)
- Steam and electric power generating facilities
- Transportation facilities that have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations.
- Sewage treatment plants
- Light manufacturing facilities listed below that have industrial activities exposed to storm water:
- Food and kindred products (SIC 20)
- Tobacco products (SIC 21)
- Textile mill products (SIC 22)

- Apparel and other textile products (SIC 23)
- Wood kitchen cabinets (SIC 2434)
- Furniture and fixtures (SIC 25)
- Paperboard containers and boxes (SIC 265)
- Converted paper and paperboard products (SIC 267)
- Printing, publishing, and allied industries (SIC 27)
- Drugs (SIC 283)
- Paints, varnishes, lacquers, enamels, and allied products (SIC 285)
- Rubber and miscellaneous plastic products (SIC 30)
- Leather and leather products (SIC 31)
- Glass products made of purchased glass (SIC 323)
- Fabricated metal products (SIC 34)
- Industrial and commercial machinery and computer equipment (SIC 35)
- Electronic and other electrical equipment (SIC 36)
- Transportation equipment (SIC 37)
- Measuring, analyzing, and controlling instruments, Photographic, medical, and optical goods, watches and clocks (SIC 38)
- Miscellaneous manufacturing industries (SIC 39)
- Farm products (SIC 4221)
- Refrigerated warehousing and storage (SIC 4222)
- General warehousing and storage (SIC 4225).

Contact the Ecology's Northwest Regional Office (425/649-7000) to determine whether your facility needs a permit and to obtain information about industrial storm water permit requirements.

**Figure 15:**
**Enclosure of the Activity**



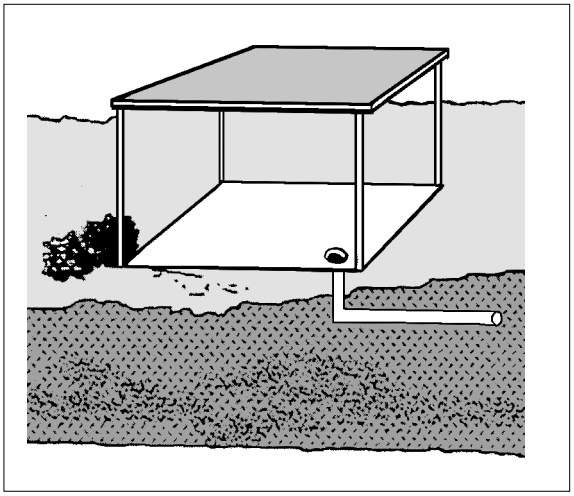



**Figure 16:**
**Covering the Activity**

# Landscape Construction and Maintenance

**Applicability:** **Landscape construction or maintenance including any of the following: land disturbing activities as described in SMC 22.801.130; fertilizer and pesticide application near public drainage control systems; and disposal of yard waste near a public drainage control system or riparian corridor.**

**Description of Impacts:** Landscaping activities can affect stormwater quality by removing vegetation and exposing soils to erosion, stockpiling erodible materials, application of fertilizers and pesticides to or near a public drainage control system; and disposal of vegetation or other landscaping debris in or near a public drainage control system. Contaminants associated with these sources include total suspended solids, nutrients, heavy metals, fecal coliform bacteria, pesticides, and organic debris (i.e., BOD and COD).

## Structural Requirements

**Commercial landscaping operations applying for development permits after January 1, 2001 must comply with other applicable structural controls described in this rule.**

## Operational Requirements

**Commercial landscaping operations must comply with other applicable source controls described in this rule. The following BMPs or equivalent measures, methods, or practices are required of responsible parties for all stormwater discharges from commercial landscaping operations:**

### Site Work and Land Clearing Activities

All land disturbing activity must comply with the temporary erosion and sediment controls described in SMC Chapter 22.800.

### Pesticide and Fertilizer Application

1. Do not use fertilizers on grass swales, filter strips, or buffer areas that are used for stormwater treatment or conveyance purposes.
2. Apply fertilizers and pesticides according to the directions on the label.
3. Do not apply pesticides within 100 feet of surface waters such as streams, lakes, ponds, or wetlands and any drainage ditch or channel that leads to open water except when approved by Ecology and the Washington Department of Agriculture.
4. Store pesticide containers in an enclosed area that is protected from the weather when not in use. Follow the BMP requirements described under the aboveground tank and container storage activities for proper storage and handling practices. Always mix pesticides and clean equipment used to apply pesticides in an area where accidental spills can be contained to prevent release into storm drains and other nearby soils, surface water or ground water resources. Immediately clean up any spilled material.

## Disposal of Landscape Debris

1. Do not dispose leaves, grass clippings, sticks, or other vegetation into waterways, gutters, or storm drain systems.

### good citizen measures

The following BMPs are not required, but are recommended to reduce the potential for pollution from landscaping activities:

**Site Work**

- Periodically clean out roof gutters to remove leaves, twigs, and other organic material that will decompose and wash into storm drains.
- Have site soil tested before adding fertilizers and other soil amendments. Consult a certified landscaper or contact the WSU/King County Cooperative Extension office at (206) 296-3900 for information about soil testing and appropriate soil amendments. Till fertilizers and other amendments into the soil rather than spreading or broadcasting onto the surface.
- If possible, grass clippings, sticks, or other vegetation should be composted. Otherwise, collect, bag, and place yard waste out for curbside collection on the designated yard waste collection day in your neighborhood (generally monthly during the winter and weekly during the spring and summer months).
- Soil quality is critical to protecting water quality. Native soils can retain and infiltrate rainfall, thereby reducing stormwater runoff. In addition, high quality, biologically-active soil can also filter out some urban pollutants and reduce the need for fertilizers and pesticides. These critical soil functions are often impaired by soil removal, soil compaction, poor soil preparation, loss of soil organic content, and loss of beneficial soil organisms due to pesticide use or heavy use of soluble fertilizers. Follow the guidelines listed below to maintain soil quality:
- Minimize soil compaction by limiting equipment traffic on soils, especially during wet weather.
- Stockpile topsoil that is removed during construction and replace it before planting landscape areas.
- Break up compacted soil before planting using a tractor-mounted ripper or other similar equipment.
- Prepare disturbed soil, thin glacial till soil, or any soil prior to planting new landscape areas by tilling 2 to 4 inches of mature, Grade A compost into the upper 8 to 12 inches of soil. Note: For turf areas, the minimum recommended depth of soil amendment and preparation is 6 inches, however 8 inches will provide better rooting depth and drainage. For shrub beds, the minimum recommended depth for soil amendments is 12 inches. Amending soil with compost is effective in enhancing the soil pollutant removal and drainage capacity, and has also been proven to increase plant survival and reduce maintenance costs.
- For more information on soil function and soil restoration, refer to the following web page: http://www.metrokc.gov/dnr/swd/ResRecy/soil4salmon.htm

**Continued**

## good citizen measures

The following BMPs are not required, but are recommended to reduce the potential for pollution from landscaping activities:

**Lawn Care**

- Select the appropriate turfgrass mixture for your site and soil conditions. Contact the WSU/King County Cooperative Extension office at (206) 296-3900 for advice about what types of grass are best suited to your site.
- Fertilizer may not be needed on lawns planted on compost-amended soil where grass clippings are left on the lawn. If fertilizer is used, apply fertilizer twice each year, in mid- to late May and again in early September using a natural organic or slow release [e.g., sulfur-coated, urea-formaldehyde compounds, or isobutylidene diruea (IDBU)] fertilizer. Do not apply fertilizers if rainfall is predicted to occur within 3 days of the application and do not apply during drought conditions. Do not use fertilizers on grass swales, filter strips, or buffer areas that are used for stormwater treatment or conveyance purposes. Follow the instructions on the label when applying fertilizers. Do not over apply.
- Mow when the grass is dry and mow more often in the spring (e.g., once per week). Set the blade height on your lawn mower to 2 inches (0.75 to 1 inch on bentgrass lawns) to develop deeper roots and discourage weeds. Leave the clippings on the lawn as a natural fertilizer. Clippings left scattered on the surface will break down quickly. Fertilizer use can typically be cut in half when grasscycling is employed. If the thatch layer builds up to more than 0.5 inches, rake or otherwise dethatch the lawn to allow air, water, and fertilizer to reach the grass roots.
- Water lawns about 1 inch per week during July and August and less in late spring or early fall, depending on weather conditions. Avoid frequent shallow watering that can cause shallow rooting. Overwatering can promote lawn disease and leach nutrients from the soil. Water slowly so the water penetrates the soil and does not puddle or runoff.
- Aerate the lawn if soil becomes compacted and water will not infiltrate. Compact soils should be aerated in the spring or fall. Rake the area after aerating and overseed with a perennial rye/fine fescue mix.
- Use manual or mechanical methods to remove unwanted vegetation rather than applying herbicides. If necessary, spot spray problem weeds with an appropriate herbicide. Requirements for pesticide application are described in the following section.
- Consider alternatives to lawns in shady areas, areas with steep slopes, and near streams or lakes. Contact the WSU/King County Cooperative Extension office at (206) 296-3900 for information on alternative plants or grasses that grow well in shady, steep, or wet sites (ask for Fact Sheet #77). Leave a buffer of native shrubs, trees, and groundcover along streams and lakes to protect fish and wildlife.

**Continued**

## good citizen measures

The following BMPs are not required, but are recommended to reduce the potential for pollution from landscaping activities:

**Pesticide Use/Application**

Pesticides refer to chemicals such as insecticides, herbicides, fungicides, and rodenticides that are used to control insects, unwanted vegetation, fungus, and rodents. These chemicals are toxic and can remain in the environment for a long period of time following application. Pesticides must be carefully selected, stored, and applied to avoid contaminating stormwater runoff and nearby surface water or ground water resources. To prevent damage to the environment, a comprehensive, long term approach to controlling pests , commonly referred to as integrated pest management (IPM) is recommended. IPM strives to minimize pesticide use by employing a combination of techniques including utilizing biological controls, selecting disease-resistant plants, identifying the specific pest problem, selecting appropriate products and tailoring application rates to site conditions, and routinely maintaining vegetation to keep it pest and disease resistant. IPM is applicable to commercial operations such as landscaping businesses, golf courses, and parks, as well as to homeowners and businesses that maintain lawns and landscaped areas.

The following general guidelines are recommended for businesses and residents that apply pesticides (e.g., herbicides, insecticides, fungicides, rodenticides):

- Select the least toxic pesticide available that is capable of reducing the infestation to acceptable levels. The pesticide should readily degrade in the environment and have properties that minimize release of the product via leaching into the ground water or wash off in stormwater. The Washington Toxics Coalition has summarized information that homeowners and business could use to select least hazardous products for use on their property. Refer to the following web page for this information: http://www.metrokc.gov/hazwaste/ipm/ipmback2.htm.
- If required or recommended by the local government, post public areas to be sprayed prior to the application. Flag all sensitive areas including wells, creeks and wetlands prior to spraying and maintain a buffer strip of approximately 100 feet.
- Use wash water from equipment cleaning and/or triple rinsing of pesticide containers prior to disposal as product.
- Consider alternatives to pesticides such as covering or harvesting weeds and manual removal.

Commercial pesticide applicators must be registered and must comply with the Seattle-King County Health Department regulations and Washington State Department of Agriculture regulations (WAC 16-228) regarding pesticide usage and application. Refer to these specific regulations if you are a commercial applicator.

**Continued**

**Additional Resources for Integrated Pest Management**

Persons interested in finding out more information on IPM and pesticides can refer to the following sources:

Bio-Integral Resource Center (BIRC), P.O. Box 7414, Berkeley, CA. 94707. BIRC publishes a number of reports and a periodical entitled “IPM Practitioner”.

Ecology. 1991. Pesticide applicators: Hazardous waste do’s and don’ts. #91-012d. Washington State Department of Ecology, Olympia, WA.

Ecology. 1994. Reducing and managing wastes from catch basins: A guide for pesticide secondary containment. #94-186. Washington State Department of Ecology, Olympia, WA.

Rountry, D. 1989. Hazardous waste pesticides: Determining if your pesticide waste is a hazardous waste and pesticide reduction. (#89-41). Washington Department of Ecology, Hazardous Waste and Toxics Reduction Program, Olympia, WA.

Rountry, D. 1993. Your home, your health, and pesticides. (90-br-017). Washington State Department of Ecology, Hazardous Waste and Toxics Reduction Program, Olympia, WA.

WSU Extension Home-Assistance Program at (253) 445-4556.