

# Municipal Operations

## Pollution Prevention/ Good Housekeeping



**Public Health**  
Prevent. Promote. Protect.

Northeast Ohio Public Health Partnership



PREVENT + PROMOTE + PROVIDE™

# Cuyahoga County Board of Health

- Serves over 885,000 residents
- Represents
  - 36 cities  
(except Cleveland & Shaker Heights)
  - 19 villages
  - 2 townships



**Public Health**  
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# Watershed Protection

- ◆ Stormwater Program
- ◆ Household Sewage Program
- ◆ Semi-Public Sewage Program
- ◆ Beaches/Nowcast
- ◆ Marinas
- ◆ Water Quality Program
- ◆ Educational Outreach
- ◆ Watershed Planning Projects
- ◆ FOG (Fats, Oils, Greases)



# CCBH Stormwater Program Activities

- ◆ MS4 Outfall Inventory
  - Municipal Separate Storm Sewer System
- ◆ Dry Weather Inspections/Sampling
- ◆ Source Tracking
- ◆ Educational Outreach/Involvement
- ◆ **Good Housekeeping**
- ◆ Currently have contracts with approximately 50 communities to perform stormwater activities



# What is an MS4?

Conveyance or system of conveyances including:

- Roads with drainage systems
- Municipal streets
- Catch basins
- Curbs
- Gutters
- Ditches
- Manmade channels
- Storm Sewers





# NPDES Phase II

- 💧 U.S. EPA Regulations
- 💧 Effective March 10, 2003
- 💧 Second Amendment of the Clean Water Act



# NPDES Phase II

- ◆ **Communities Regulated:** Owners/operators of Municipal Separate Storm Sewer Systems in Urbanized areas
  - ◆ Townships, Villages, Cities, Counties
  - ◆ Communities under 100,000 in population are affected by this regulation
  - ◆ 56 communities in CCBH's jurisdiction are designated Phase II communities

# NPDES Phase II

## **Storm Water Management Program: Address Six Minimum Control Measures**

- ◆ Public Education & Outreach
- ◆ Public Involvement & Participation
- ◆ Illicit Discharge Detection & Elimination
- ◆ Construction Site Runoff Control
- ◆ Post Construction Runoff Control
- ◆ **Pollution Prevention/Good Housekeeping for Municipal Operations**



# Public Education & Outreach

💧 Outreach efforts to residents on stormwater impacts

- 💧 Brochures
- 💧 Fact Sheets
- 💧 Webpage
- 💧 Presentations in schools



# Public Involvement & Participation

- 💧 Public Meetings
- 💧 Community Clean-ups
- 💧 Storm Drain Stenciling



# Illicit Discharge Detection & Elimination

- ◆ Identify any discharge into a community's MS4 system that is not stormwater
- ◆ Sources of discharge into an MS4 other than stormwater or ground water must be detected and eliminated
- ◆ By 2008, communities had to identify & map all outfalls, and had to have their illicit discharge detection & elimination plan in place



# Outfall Inventory



## ACMB0010

### General Location Information

Receiving Stream: Abrams Creek - Main Branch  
 Stream Segment:  
 Watershed:  
 Community: Middleburg Heights  
 County: Cuyahoga  
 Parcel:  
 State Plane N: 626143.08407  
 State Plane E: 2164568.54333  
 CRGS N: 47120  
 CRGS E: 60910  
 Latitude: 41.3830923166867  
 Longitude: -81.7854995666667  
 Elevation (ft):  
 Location Description:  
 Big Creek Parkway

### Storm Sewer Map Information

Outfall on Map:  Yes  No  
 Map ID Number: 048-065  
 Map Source: CRGS  
 Outfall Located on (facing downstream)

### Pipe Characteristics

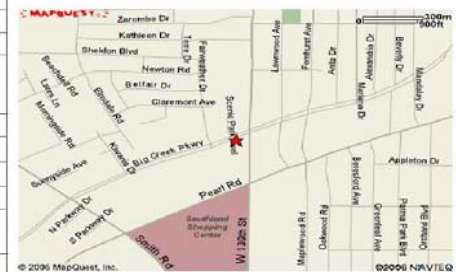
Pipe Shape:  
 Circular  Elliptical  
 Egg  Rectangular  
 Other, describe:  
 Pipe Height (in): 24  
 Pipe Width (in):  
 Pipe Material:  
 RCP  PVC  
 VCP  Cast Iron  
 CMP  Other, describe:  
 Pipe Condition:  
 Good  Poor  
 Fair  N/A  
 Height from: Invert to Stream Flow Level (ft.)

### Outfall Type/Ownership

Outfall Type: Public Storm - MS4  
 Owner:  
 Authority:  
 Other ID:  
 NPDES Permit:



Outfall Photograph



Location Map

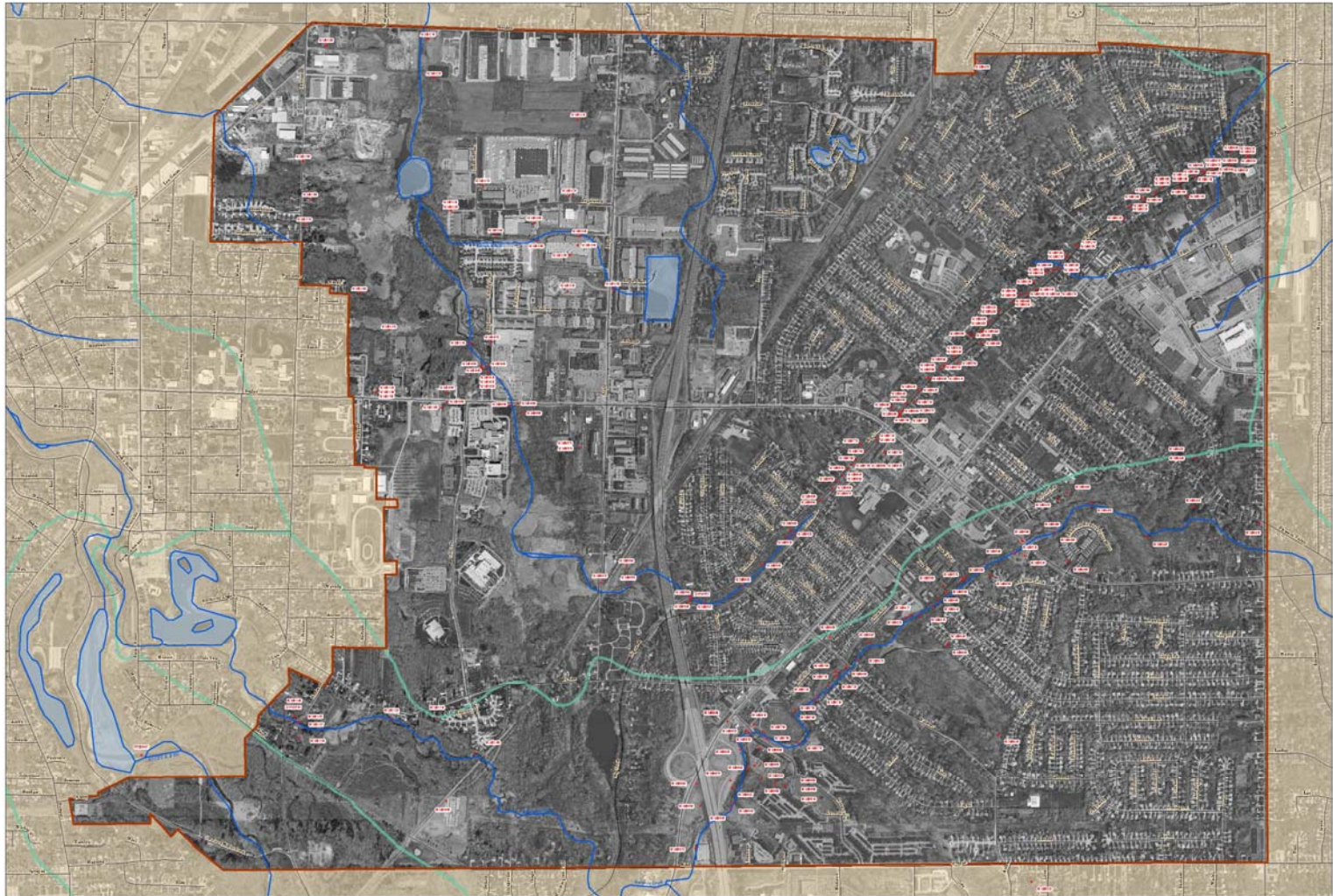
### Additional Details

### Comments

Concrete headwall



# Outfall Map





# Inspection of Outfalls

- Visual inspections of outfalls
- Dry weather - 72 hours with no rainfall (0.1")
- Notify public during field component
- Look for obvious signs of pollution, flow of water



# Water Sampling and Testing

- Utilize water testing as a tool
- Certain parameters can serve as indicators of an illicit discharge
  - Fecal coliform
  - pH
  - Ammonia
  - Conductivity
  - Dissolved Oxygen
  - Phosphorus



# Illicit Discharge Source Tracking

- Once an illicit discharge is located at an MS4 outfall, tracing is the next step:
  - Visual Inspections
  - Dye Testing
  - Televising
  - Water Quality Monitoring
    - Bacterial Source Tracking
  - Smoke testing
  - Optical Brightener Monitoring



# Construction Site Runoff Control

- ◆ Includes oils/greases, sediment, concrete, debris
- ◆ Includes sites under 5 acres, but greater than 1 acre





# Post Construction Runoff Control

- 💧 Increase in runoff due to more impervious surfaces
- 💧 Increase in quantity of pollutants as water runs over land
- 💧 Detention basins – typical BMP





# Pollution Prevention & Good Housekeeping for Municipal Operations

## **Communities must:**

- ◆ Develop/implement an operation & maintenance program with goal of preventing/reducing runoff from municipal operations
- ◆ Provide staff training in pollution prevention
- ◆ Determine appropriate BMPs and measurable goals

**Meant to improve/protect receiving water quality by altering municipal or facility operations**

# Potential Pollution Sources in Municipal Operations

- ◆ Salt/Sand Storage
- ◆ Fueling Island
- ◆ Dumpsters
- ◆ Vehicle Maintenance/Repair Areas
- ◆ Equipment Storage
- ◆ Vehicle Washing
- ◆ Construction Sites
- ◆ Illicit Discharges
- ◆ Chemical/Battery Storage
- ◆ Roof Drains
- ◆ Scrap Metal/Auto Parts
- ◆ Truck Loading/Unloading



# Potential Pollution Sources in Municipal Operations

## Salt/Sand Storage



# Potential Pollution Sources in Municipal Operations

## Outside Storage





# Potential Pollution Sources in Municipal Operations

## Fueling Island





# Potential Pollution Sources in Municipal Operations

## Dumpsters



# Potential Pollution Sources in Municipal Operations

## Vehicle Maintenance/Repair Areas





# Potential Pollution Sources in Municipal Operations

## Equipment Storage



# Potential Pollution Sources in Municipal Operations

## Chemical/Battery Storage





# Pollution Prevention

## Step 1: Complete a Materials Inventory

- ◆ Document existing materials & their purpose
- ◆ Consider material reduction
- ◆ Evaluate alternative materials











# Pollution Prevention

## Step 2: Inspect for Potential Cross Connections



# Cross Connections

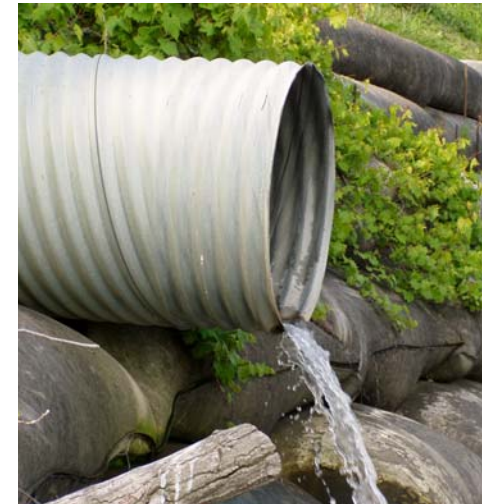
- ◆ Inspect storm water flows from facilities to confirm proper connections

## Interior

- ◆ Wastewater service
- ◆ Utility/mop sink
- ◆ Floor drains
- ◆ Laundry
- ◆ Vehicle wash area
- ◆ Equipment wash area

## Exterior

- ◆ Parking lot drains
- ◆ Dumpsters
- ◆ Pipes in ditches
- ◆ Pipes in storm sewer
- ◆ Fueling areas



# Illicit Discharge Self Inspection

## Illicit Discharge Self Inspection

Inspection Date \_\_\_\_\_ Location Address \_\_\_\_\_

Name of Facility \_\_\_\_\_

Owner/Manager's Name \_\_\_\_\_

Mailing Address \_\_\_\_\_

Phone \_\_\_\_\_

### Interior Premise Checklist: (check applicable categories)

**Wastewater Service:**  Unknown  Sanitary Sewer  On-Site Sewage System.

If on-site system, where is it located? \_\_\_\_\_

**Floor Drain/Laundry Area:**  Yes  No

If yes, give details \_\_\_\_\_

Where do floor drains/laundry drain to?  Sanitary Sewer  On-site sewage system  
 Storm Sewer  Unknown

**Utility/Mop Sink(s):**  Yes  No

If yes, state number of sinks \_\_\_\_\_. Location \_\_\_\_\_

Sinks drain to:  Sanitary  Floor Drains  Storm Sewer  Unknown

Explain in detail what they are used for: \_\_\_\_\_

**Chemical Storage/Waste Oil:**  Yes  No

If yes, what chemicals are stored? \_\_\_\_\_

How are chemicals stored? \_\_\_\_\_

**Chemical/Hazardous Waste generation:**  Yes  No

If yes, explain storage and disposal practices in detail \_\_\_\_\_

**Grease Trap/Oil Separator:**  Yes  No  Unknown

If yes, give details \_\_\_\_\_

How often is it pumped? \_\_\_\_\_

Pumped by whom? \_\_\_\_\_

**Equipment Wash/Rinse Area:**  Yes  No

If yes, explain practices in detail \_\_\_\_\_

Where does wastewater from this area drain to? \_\_\_\_\_

# Good Housekeeping

## Measures & Controls Checklist

- ✓ Vehicle washing should take place indoors, in an area where the wash water discharges to an approved grit separator, or to a holding tank or sanitary sewer
- ✓ Use drip pans when changing fluids
- ✓ Clean up spills immediately with an absorbent
- ✓ Use funnels to minimize drips or leaks when transferring fluids
- ✓ Keep oily wastes separate from other wastes, especially solvents



# Good Housekeeping

## Measures & Controls Checklist

- ✓ Store dirty rags in a covered container
- ✓ Keep spent radiator coolants (antifreeze) in a covered container
- ✓ Promptly sweep up all spills occurring during addition to/removal from sand & salt piles
- ✓ Change all fluids indoors in the maintenance garage, where there are no floor drains, or where floor drains discharge to a holding tank

# Good Housekeeping Measures & Controls Checklist

- ✓ Store all drums and used pallets **indoors** and **covered**
- ✓ Re-cover salt piles promptly after use
- ✓ Keep hydraulic equipment in good repair, and clean up drips promptly
- ✓ Confine liquid & dry material storage to a specific indoor area, with proper containment and separation of potentially volatile materials

# Parking Lot & Street Sweeping

◆ Regular sweeping of streets, highways, & parking lots minimizes the pollutants that enter the storm drainage system

- Sediment
- Debris
- Leaves
- Trash
- Grass Clippings
- Oil & Grease
- Road Salt



**Street sweeping can improve the aesthetics of municipal roadways, control dust, and decrease the accumulation of pollutants in catch basins.**

# Parking Lot & Street Sweeping

- Three different types of street sweepers:
  - Mechanical
  - Regenerative air
  - Vacuum Filter
  
- Factors to Consider:
  - Pollutant type & size
  - Type of surface
  - Travel distance
  - Noise ordinances
  - **Cost**





# Parking Lot & Street Sweeping

Estimated costs for two types of street sweepers:

<b>Sweeper Type</b>	<b>Purchase Price</b>	<b>Life (Years)</b>	<b>O&amp;M Cost (\$ / curb mile)</b>
Mechanical	\$75,000	5	30
Vacuum-assisted	\$150,000	8	15

Source: U.S. EPA, <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Rbutton=detail&bmp=99>

# Parking Lot & Street Sweeping

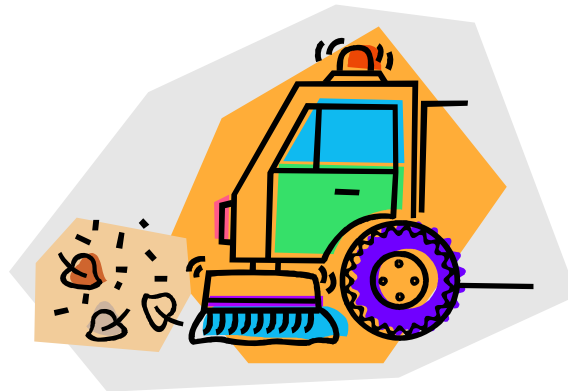
**A schedule can increase the efficiency of the street sweeping program.**

- ◆ The schedule, if flexible, can accommodate climate conditions and areas of concern:
  - Traffic volume
  - Land use
  - Construction
  - Observed sediment/trash accumulation
  - Proximity to surface waters
- ◆ Street sweeping should be done as soon as possible after winter to remove accumulated road salt and debris

# Parking Lot & Street Sweeping

**Timing of sweeping is important and minimizes costs!**

- ◆ Fall – removal of leaves reduces the amount of debris in the storm sewer system – reduces maintenance
- ◆ Spring – removes built up road salt and other pollutants collected over the winter months
- ◆ Summer – cleans up sediment on roadway from construction activities



# Parking Lot & Street Sweeping

**The volume of debris collected from sweeping must be included in your annual stormwater report to the Ohio EPA!**

- ◆ Municipalities should maintain accurate logs of the number of curb-miles swept and the amount of waste collected
- ◆ This information can be used to develop and re-evaluate the street sweeping plan & schedule
  - ➔ Amount of debris can be measured per city, street, season, mile swept, etc.





# Parking Lot & Street Sweeping

**All debris collected from sweeping must be properly disposed of.**

- ◆ Debris collected must be disposed of at an Ohio EPA approved site → Landfill
- ◆ Municipal operations can stockpile the debris at their maintenance facilities until disposed of
  - Must be stored away from receiving waters and covered to prevent runoff to a storm drain or stream
- ◆ Storage locations should be sized accordingly to completely contain the volume of the disposed sweepings.

# Parking Lot & Street Sweeping

## Points to Remember:

- ◆ Sweeping debris must be disposed of at an Ohio EPA approved site – usually a landfill
- ◆ Street sweeping can significantly reduce pollutants in the storm sewer system
- ◆ Ohio EPA Phase II Stormwater regulations **require** regular street sweeping



# Municipal Landscaping

- ◆ Fertilizer, pesticides, pet waste, & general lawn maintenance are the primary causes of stormwater pollution from grounds maintenance activities
- ◆ Fertilizers have been found in stormwater at toxic levels, even when used in accordance with the label instructions



**It is important for municipalities to set a good example for residents!**

# Municipal Landscaping

Appropriate plant selection involves the use of local or regional flowers, trees, and shrubs when landscaping.

- ◆ Indigenous plant species are generally more water efficient
- ◆ Native plants require less pesticide
- ◆ Non-native plants can invade local waterways





# Municipal Landscaping

**Fertilizers should be used in accordance with the label instructions.**

- ◆ Fertilizer should not be applied on a windy day or immediately before a heavy rain
- ◆ The simplest alternative to fertilizer use is to mulch grass clippings as you mow
- ◆ If fertilizer use is necessary, periodic tests of the soil should be conducted to determine proper fertilizer requirements
- ◆ Fertilizer application equipment should be properly calibrated to prevent excess application

**Fertilizer should not be used adjacent to water bodies!**

# Municipal Landscaping

**Pesticides should be used on lawns and gardens only when necessary.**

- ◆ The least toxic pesticide that targets the specific pest in question should be chosen

**Grass clippings should be mulched as you mow, or collected and composted.**

- ◆ Grass clippings should never be dumped in a waterway, catch basin, or storm sewer



# Municipal Landscaping

## Mulches & Irrigation

- ◆ Use low-volume watering approaches
- ◆ When water is applied too quickly, it is lost as runoff along with the top layers of soil
- ◆ Mulches help retain water, reduce weed growth, and prevent erosion



# Municipal Landscaping

## Points to Remember:

- ◆ Stormwater pollution can result from municipal grounds maintenance activities
- ◆ Fertilizers should be used properly and should not be applied adjacent to water bodies
- ◆ NEVER dump grass clippings into a storm sewer or stream



# Salt Storage & Application

- ◆ The application and storage of road salt can lead to water quality problems in surrounding areas
- ◆ Municipalities must ensure proper storage and application for equipment and materials
- ◆ Improper storage of deicing materials can contaminate both surface water and groundwater



# Salt Storage & Application



**BAD →**



# Salt Storage & Application

OK ↓



BEST ↓



# Salt Storage & Application

- ◆ Properly storing road salt prevents the salt from lumping together, which makes it easier to load and apply
- ◆ Covering salt storage piles reduces salt loss from stormwater runoff and potential contamination to streams and aquifers
- ◆ Salt storage piles should be located outside the 100-year floodplain for further protection against surface water contamination





# Salt Storage & Application

The goal of a winter road de-icing/snow removal program is to provide **safe road conditions**, without losing sight of the cost implications and potential **negative impacts to the environment** due to misuse of chemicals.

- ◆ Reduced application or use of alternative agents, consistent with the need for safety, will reduce pollution of area waterways.



# Salt Storage & Application

Road salt is the least expensive material for deicing operations, however, alternative products are available and may be feasible options

Substance	Cost	Characteristics
Calcium Chloride (CaCl <sub>2</sub> )	Flake \$290/ton, pellet \$340/ton	Melts ice at temps. of -25°F; If used as recommended will not harm vegetation
Magnesium Chloride (MgCl <sub>2</sub> )	Flake \$260/ton, pellet \$300/ton	Lowest practical temperature: 5°F; If used as recommended will not harm vegetation
Potassium Chloride (KCl)	\$240/ton	Lowest practical temperature: 12°F; Will not harm vegetation
Urea	\$280/ton	Lowest practical temperature: 15°F; Will not harm vegetation
Calcium Magnesium Acetate (CMA)	\$2,000/ton	Will work below 0°F; Low toxicity and biodegradable

Source: U.S. EPA, <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Rbutton=detail&bmp=106>

# Salt Storage & Application

- ◆ When snowfall is not significant, salt only “critical areas” (main roads, main intersections, near schools) in order to reduce the application, and therefore the cost, of road salt
- ◆ To minimize possible stormwater runoff issues, special protective measures should be used to restrict the application of salt near waterways
- ◆ Alternative materials, such as sand or gravel, should be used in especially sensitive areas.

# Salt Storage & Application

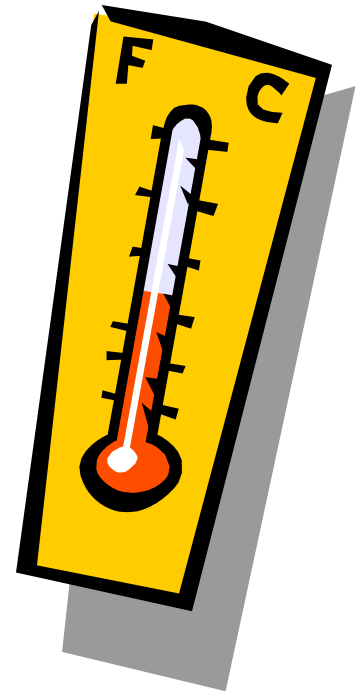
- ◆ Instead of manual control, automatic spreaders should be used for application of road salt in order to eliminate over- or under-application of salt
- ◆ The amount of salt applied should be varied to reflect site-specific characteristics, such as road width and design, traffic concentration, and proximity to surface waters.



# Salt Storage & Application

## Temperature is a major factor in the effectiveness of road salt!

- ◆ Salt applied at 30°F can be effective in melting snow and ice, but the same amount applied at 0°F will have little benefit
- ◆ Roadway temperature is generally different from air temperature – infrared sensors on the bottom of plows can measure the temperature of the roadway, in order to more accurately determine how much salt is needed





# Salt Storage & Application

## Points to Remember:

- ◆ Proper storage of road salt can prevent contamination of nearby waterways
- ◆ To reduce costs, road salt application should be reduced to the minimum amount necessary to successfully perform the job
- ◆ Applying salt with automatic spreaders minimizes the amount of road salt used

# Catch Basin Maintenance/Cleaning

**Inspection & maintenance of the storm sewer system should be done on a regular basis:**

- 💧 Identify & correct structural issues
- 💧 Remove pollutants
- 💧 Prevent/remove clogs in the system



# Catch Basin Maintenance/Cleaning

**What storm sewer system components should be inspected?**

**What areas should be prioritized for cleaning?**

**How frequently do catch basins need to be cleaned?**



# Catch Basin Maintenance/Cleaning

- ◆ Regular inspection of the storm sewer system should be performed
- ◆ Repairs should be made to any component with deteriorating structural integrity



# Catch Basin Maintenance/Cleaning

- ◆ Catch basins, storm drain inlets, and other conveyance structures in areas with high pollutant loading and near sensitive water bodies should be prioritized for cleaning
- ◆ Catch basins should be cleaned before the sump is 40% full, in order to reduce sediment & pollutant loading in waterways





# Catch Basin Maintenance/Cleaning

## Points to Remember:

- ◆ Repairs to storm water structures should be done immediately where structural integrity is in question
- ◆ Catch basin cleaning should be prioritized in areas with high pollutant loadings and sensitive waters nearby
- ◆ Cleaning of catch basins should occur before the sump is 40% full

# Spill Prevention and Clean-up

Many items at your maintenance facility, if spilled, can lead to the pollution of stormwater:

- ◆ Pesticides
- ◆ Paints
- ◆ Cleaners
- ◆ Fertilizers
- ◆ Solvents
- ◆ **Petroleum Products**



Facilities that use or store these materials should have a spill prevention and control plan.

# Spill Prevention and Clean-up

## Spill response and prevention plans should clearly state:

- ◆ The individuals responsible for implementing the plan
- ◆ Safety measures to take with each kind of waste
- ◆ How to notify appropriate authorities, such as police and fire departments, hospitals, or publicly-owned treatment works for assistance
- ◆ Procedures for containing, diverting, isolating, and cleaning up the spill
- ◆ Spill response equipment to be used, including safety and cleanup equipment

# Spill Prevention and Clean-up

**Actions should be taken to reduce spill potential and impacts on stormwater quality.**

- ◆ Recycle, reclaim, or reuse materials
- ◆ Use material transfer or filling procedures that minimize spills from tanks and other equipment
- ◆ Replace toxic materials with less or non-toxic products
- ◆ Perform preventative maintenance on pumps, pipes, and other equipment

# Spill Prevention and Clean-up

There are many ways that petroleum products can enter the storm drainage system at a maintenance facility:

- ◆ Dripping from vehicles/machinery
- ◆ Accidental spills



A very small amount of oil can pollute a very large quantity of water.

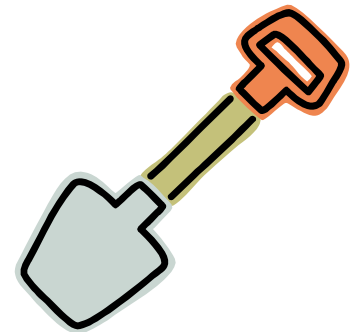
Clean-up is very important!



# Spill Prevention and Clean-up

## Small Petroleum Leaks:

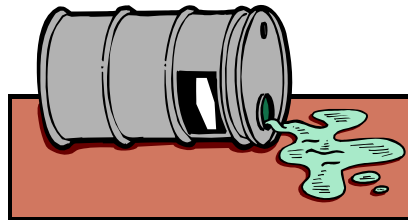
- ◆ If the leak is on a **hard surface** like pavement or concrete, spread kitty litter or sand over the area.
- ◆ If the leak occurs on a **gravel surface**, immediately use a shovel to collect the contaminated soil. If left, it can quickly contaminate a larger area.
- ◆ Shovel up the contaminated material and dispose of it in an approved location.



# Spill Prevention and Clean-up

## Petroleum Spills:

- ◆ If the petroleum spill is greater than 25 gallons, it must be reported to the Ohio EPA, the local fire department, and the local emergency planning committee
- ◆ If the spill is less than 25 gallons, all contaminated soil should be collected and disposed of in an approved location



# Spill Prevention and Clean-up

## Points to Remember:

- ◆ Municipal facilities should have a spill prevention and control plan.
- ◆ Fast response to a spill can limit the amount of contamination and reduce pollution
- ◆ Perform preventative maintenance and utilize procedures that minimize the occurrence of spills
- ◆ Petroleum spills greater than 25 gallons must be reported

# Construction Site Spill Response

There are several hazardous substances that, if spilled during construction operations, can lead to stormwater pollution.

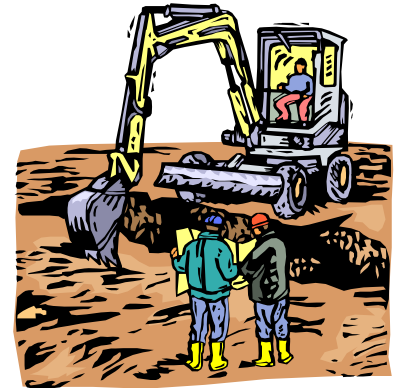
- Paints
- Cleaners
- Hydraulic Fluids
- Solvents
- **Petroleum Products**



# Construction Site Spill Response

There are many ways that pollutants can enter the storm drainage system at a construction site:

- ◆ Dripping from vehicles/machinery
- ◆ Accidental spills
- ◆ Disposal of waste material



**A very small amount of hazardous substance can pollute a very large quantity of water.**

**Clean-up is very important!**



# Construction Site Spill Response

**Do you know the proper way to clean up small leaks?**

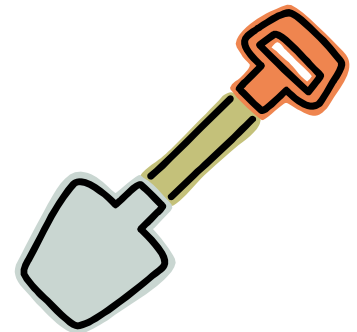
**Where do you dispose of equipment wash water?**

**Do you know what to do in the event of a larger spill?**

# Construction Site Spill Response

## Small Petroleum Leaks:

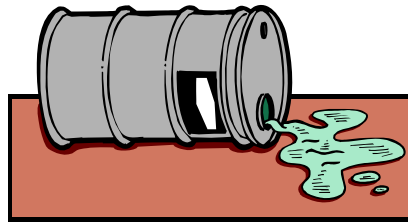
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# Construction Site Spill Response

## Petroleum Spills:

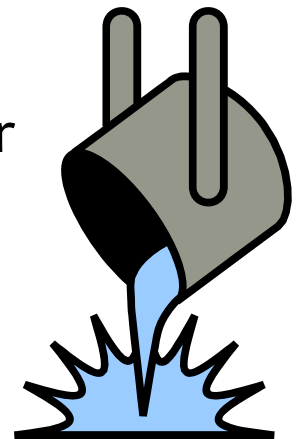
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- ◆ If the spill is less than 25 gallons, all contaminated soil should be collected and disposed of in an approved location



# Construction Site Spill Response

## Disposal of Wash Water

- ◆ Disposing of wash water in catch basins, ditches, creeks, rivers, and streams directly contaminates water resources and **is not permitted** under any circumstances
- ◆ Wash water should be disposed of down the sanitary sewer or placed in a holding tank for proper disposal
- ◆ If you observe an individual disposing of wash water in an inappropriate way, immediately tell your supervisor or contact the health department



# Construction Site Spill Response

## Points to Remember:

- ◆ Fast response to a spill can limit the amount of contamination and reduce pollution
- ◆ On a hard surface, use kitty litter or sand to clean up spills
- ◆ Spills greater than 25 gallons must be reported
- ◆ Never pour wastewater into catch basins, ditches, creeks, rivers, or streams
- ◆ Report any suspicious activity



# Erosion & Sediment Control: Silt Fences

- ◆ A silt fence is often the easiest way to trap sediment from construction activities before discharging to a watercourse
- ◆ Silt fences trap sediment behind the fence and don't allow it to move off the property
- ◆ Silt fences can only be used in areas that have sheet flow
  - Flow is uniform across the ground surface



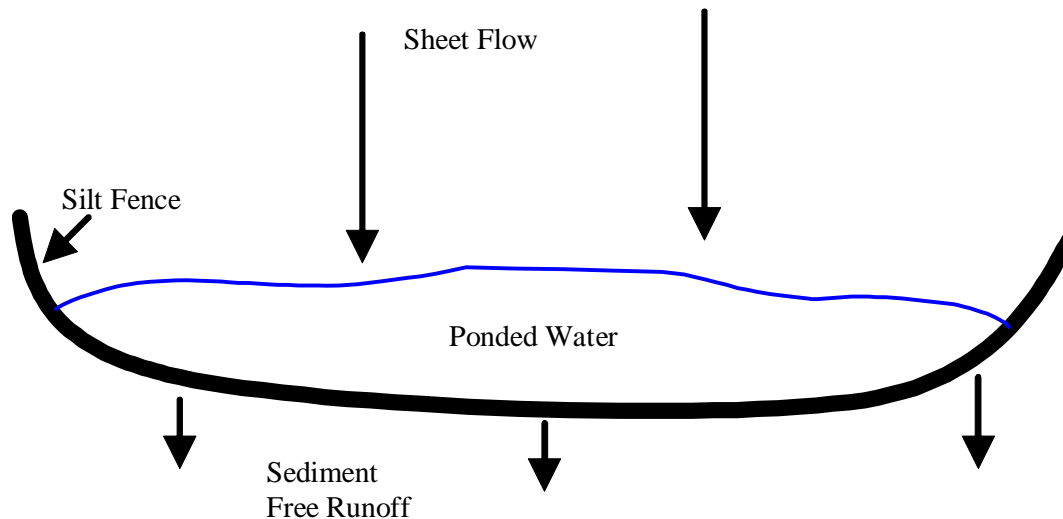
# Erosion & Sediment Control: Silt Fences

**For what type of projects would you use a silt fence?**

**Do you put the stakes holding the fence in place on the uphill or downhill side?**

# Erosion & Sediment Control: Silt Fences

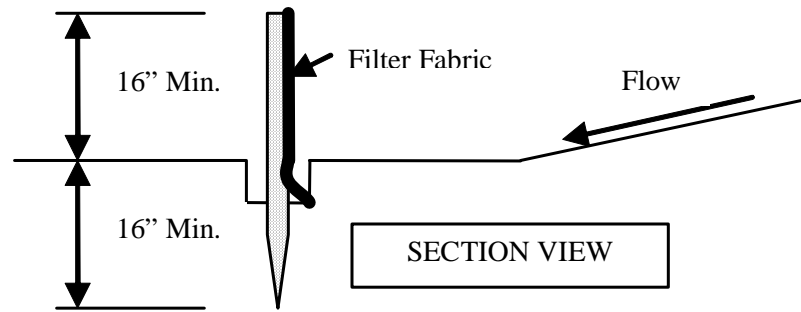
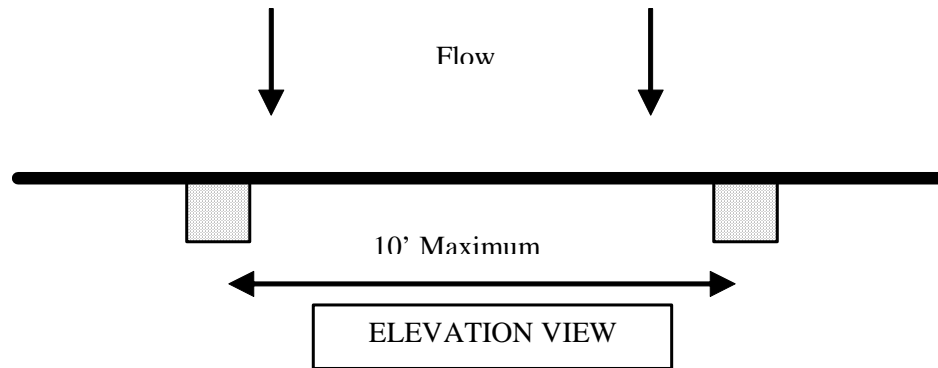
- All silt fences should be placed on the level contour – from one end of the fence to the other, it should be basically level.
- The ends of the fence should be placed slightly uphill, so that water doesn't run around the end of the fence.



# Erosion & Sediment Control: Silt Fences

- ◆ The stakes should be put on the down slope side of the silt fence – this provides added strength and prevents the fence from tearing away from the stakes.
- ◆ The fence material must be placed at least 6 inches into the ground so water cannot flow underneath it.
- ◆ The stakes must be placed at least 16 inches into the ground, with at least 16 inches above. The stakes can be placed a maximum of 10 feet apart.

# Erosion & Sediment Control: Silt Fences



# Erosion & Sediment Control: Silt Fences

## Points to Remember:

- ◆ Silt fences should be used in areas that have sheet flow only
- ◆ Always put the fabric on the uphill side of the stakes
- ◆ Silt fence should be inspected regularly and after rain events to make sure it is working properly





# Erosion & Sediment Control: Establishing Vegetation

- ◆ Seeding exposed soil can provide both temporary & permanent stabilization
- ◆ Vegetation reduces erosion, which decreases sediment transport from disturbed areas
- ◆ Ohio EPA's General Construction Permit contains specific guidelines on when vegetation must be established



# Erosion & Sediment Control: Establishing Vegetation

**Do you plant grass seed after exposing soil during your construction projects?**

**What types of projects require seeding?**

**Are the seeding requirements any different if you are working within 50 feet of a stream?**

**Do you need to stabilize your site before winter?**

# Erosion & Sediment Control: Establishing Vegetation

## Temporary Seeding

You must provide the following for areas that are temporarily disturbed:

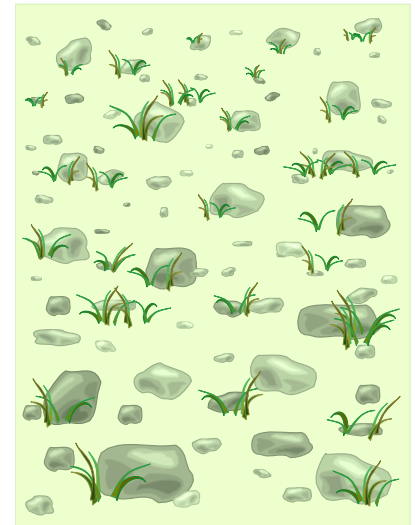
- ◆ **Within 50 feet of a stream** – Seeding must be applied within 2 days of the most recent disturbance if the area will remain idle for more than 21 days
- ◆ **Dormant for more than 21 days & less than 1 year** – Seeding must be applied within 7 days of the most recent disturbance
- ◆ **Dormant over the winter** – Seeding must be applied prior to November 1<sup>st</sup>

# Erosion & Sediment Control: Establishing Vegetation

## Permanent Seeding

You must provide the following for areas where construction is complete:

- ◆ **Within 50 feet of a stream** – Seeding must be applied within 2 days
- ◆ **Dormant for more than 1 year** – Seeding must be applied within 7 days of the most recent disturbance
- ◆ **Any areas at final grade** – Seeding must be applied within 7 days



# Erosion & Sediment Control: Establishing Vegetation

- ◆ All areas that have been seeded must produce 80% coverage – if the seed does not “take,” it must be reseeded until it reaches the 80% coverage goal
- ◆ In situations where seeding will not work, the site can be stabilized with mulch – straw mulch should be applied at a rate of 2-3 standard bales per 1,000 square feet of disturbed area



# Erosion & Sediment Control: Establishing Vegetation

## Points to Remember:

- ◆ You must make sure that the seed provides 80% coverage
- ◆ All exposed ground should be seeded within 2 to 7 days, unless work will continue in that area in less than 21 days
- ◆ Ohio EPA's General Construction Permit contains specific provisions to ensure that disturbed ground is seeded



# Erosion & Sediment Control: Storm Drain Inlet Protection

- ◆ Protecting storm drain inlets prevents sediment-laden water from entering the storm drainage system
  - Not the primary method of sediment control, but useful if water cannot be directed to another sediment trapping device
- ◆ Inlet protection causes water to pond around the inlet, allowing sediment to settle prior to entering the storm drainage system
  - Inlet protection should be constructed before the start of construction



# Erosion & Sediment Control: Storm Drain Inlet Protection

**When should you use inlet protection?**

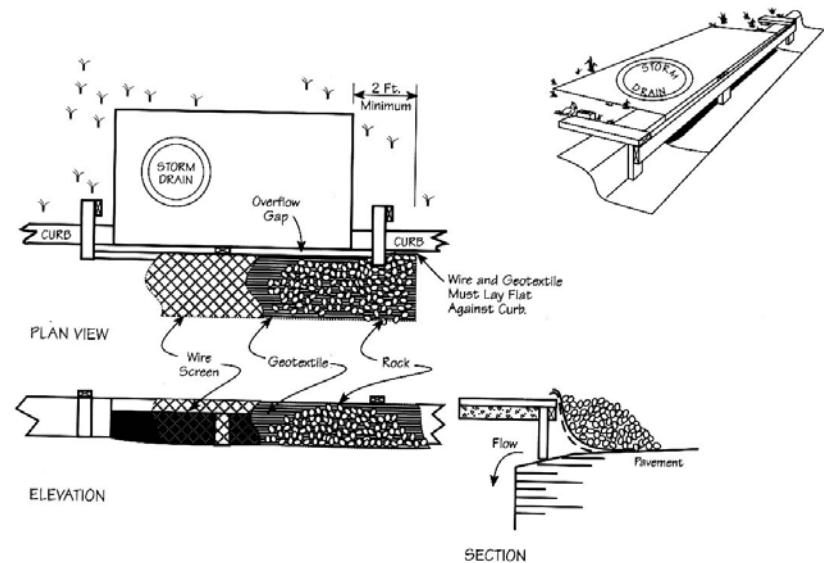
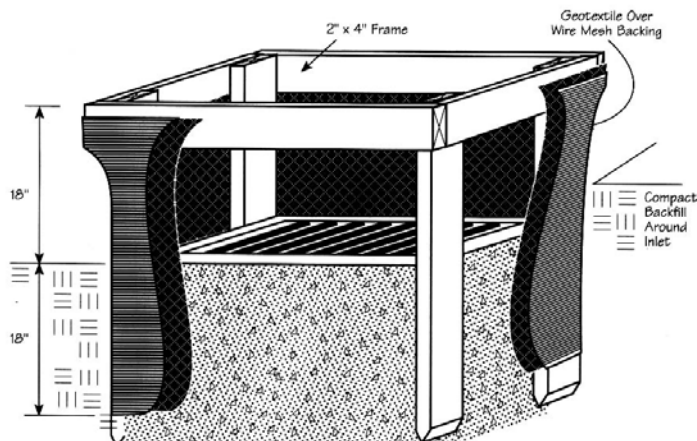
**What materials can you use to protect the inlet?**

**Is this the first type of sediment removal you should consider?**

# Erosion & Sediment Control: Storm Drain Inlet Protection

There are different methods of protecting storm drain inlets:

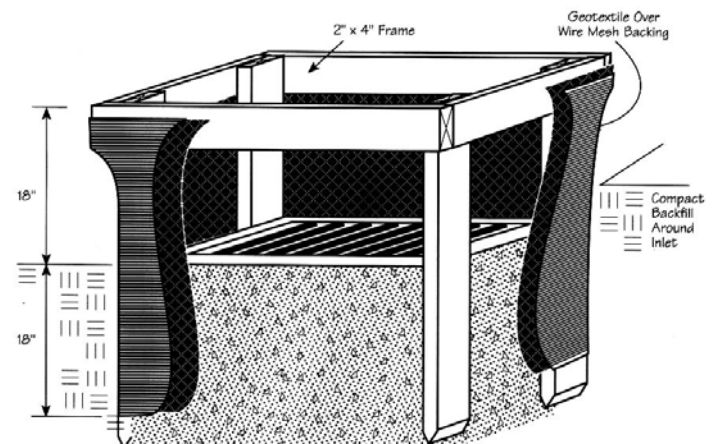
- Ditch Inlet
- Curb Inlet



# Erosion & Sediment Control: Storm Drain Inlet Protection

## Ditch Inlet

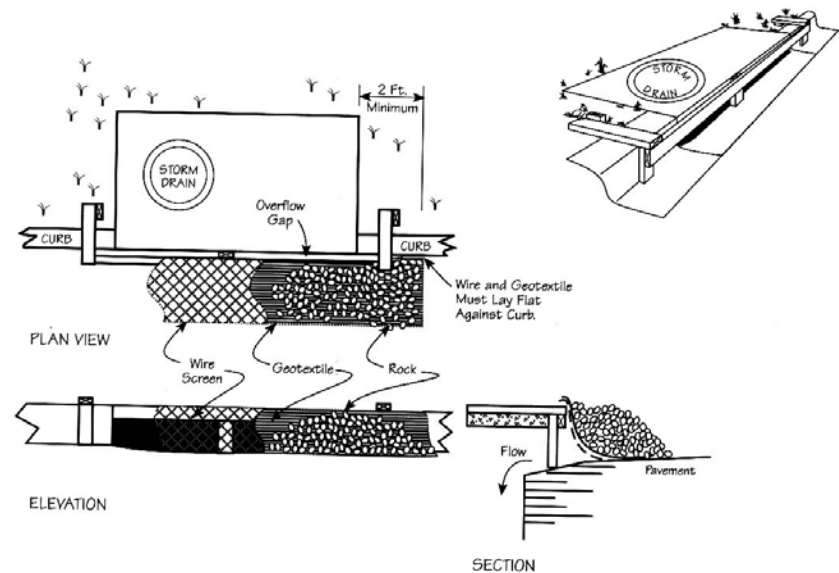
A wooden frame should be constructed around the inlet using 2"x4" wood. The posts should be driven 1' into the ground. Wire mesh is attached to the frame to provide strength to support the geotextile fabric on the outside of the structure. The geotextile fabric should have an opening size of 20-40 sieve and should also be resistant to sunlight. The fabric should be placed 18" below grade, and then backfill should be compacted around the inlet protection.



# Erosion & Sediment Control: Storm Drain Inlet Protection

## Curb Inlet

Again, a wooden frame must be constructed around the inlet using 2"x4" boards. Wire mesh is attached under the geotextile to provide strength. Stone is placed on top of the fabric to secure the fabric to the asphalt, and to provide additional filtration.



# Erosion & Sediment Control: Storm Drain Inlet Protection

## Points to Remember:

- ◆ The inlet protection should be constructed prior to upstream construction.
- ◆ There are 2 types of inlet protection, depending on the type of inlet.
- ◆ Inlet protection should be inspected regularly and after rain events to make sure it is working properly.



# Vehicle Washing

- ◆ Municipal vehicle washing can cause dry weather runoff to be polluted with oil, grease, detergents, and sediment
- ◆ Employees should be trained in proper vehicle washing procedures in order to avoid illicit discharges to the storm sewer system

**Wastewater from vehicle washing should NEVER go into a storm sewer!**



# Vehicle Washing

- 💧 Vehicle washing should take place indoors, in an area where the wash water discharges to an approved grit separator, or to a holding tank or sanitary sewer



# Vehicle Washing

- ◆ A designated wash area should be paved and bermed or sloped to contain and direct wash water to a sump connected to the sanitary sewer or to a holding tank, process treatment system, or enclosed recycling system.
- ◆ Avoid detergents whenever possible. If detergents are necessary, a phosphate-free, non-toxic, biodegradable soap is recommended.
- ◆ Municipal facilities that store vehicles should stencil their storm drains or post signs to remind employees to wash vehicles within the designated wash area.



# Vehicle Washing

- 💧 If vehicle washing must be done outdoors, it should be done in a designated area where the wash water drains to a sanitary sewer



# Vehicle Washing

💧 If a vehicle must be washed outside of a facility plumbed to the sanitary sewer, take precautions to avoid wash water discharges to the storm drain system:

- ✅ For small jobs, berm the area surrounding the vehicle and use a wet/dry vacuum to capture the wash water for discharge to the sanitary sewer.
- ✅ For larger jobs, use a combination of berms and a vacuum truck, such as those used to clean storm and sanitary sewer systems, to capture and safely dispose of wash water.
- ✅ If detergents are used, clean the pavement to prevent this material from being carried to the storm drain during the next rainstorm.

# Vehicle Washing

## Points to Remember:

- 💧 Wastewater from vehicle washing should NEVER go into a storm sewer
- 💧 If a vehicle must be washed in an area where there is no connection to a sanitary sewer, take precautions to prevent wash water from entering the storm sewer system
- 💧 A designated wash area should be paved and bermed or sloped to contain and direct wash water to the sanitary sewer or to a holding tank
- 💧 Stencil storm drains or post signs to remind employees to wash vehicles within the designated wash area



# Hazardous Waste Management

## What does the EPA consider a Hazardous Waste?

- The waste is listed
- The waste has a toxic or dangerous characteristics



# Hazardous Waste Management

## What is a listed waste?

- ◆ Specific lists published in the EPA regulations
- ◆ Each listed waste has its own unique waste code
- ◆ The waste code begins with a F, K, P, or U followed by three numbers
- ◆ “F” wastes are from common Industrial Processes
- ◆ “K” wastes are from specific Industrial Processes
- ◆ “P” wastes are discarded toxic commercial products
- ◆ “U” wastes are discarded acutely toxic commercial products

# Hazardous Waste Management

- ◆ **The Mixture Rule**

- ◆ If you mix a listed hazardous waste with a non-hazardous waste, the entire mixture becomes a listed hazardous waste

- ◆ Example: solvent + used oil, antifreeze, brake fluid, etc.

- ◆ **All wastes must be evaluated by the generator BEFORE being disposed of**



# Hazardous Waste Management

## What are toxic or dangerous characteristics?

- ◆ There are four hazardous waste characteristics
- ◆ Ignitability, Corrosivity, Toxicity, Reactivity
- ◆ A characterized hazardous waste has a code “D” and then three numbers



# Hazardous Waste Management

## Ignitability

- A liquid with flashpoint of less than 140°F
- Ignitable gasses and oxidizers
- Can create fire under certain conditions (friction)

# Hazardous Waste Management

## Corrosivity

- ◆ A liquid with a pH less than or equal to 2
- ◆ A liquid with a pH 12.5 or higher

## Reactivity

- ◆ Unstable under normal conditions
- ◆ Can detonate or explode
- ◆ Reacts violently or creates toxic gases when combined with water



# Hazardous Waste Management

## Toxicity

- ◆ Toxic contaminants like organics or heavy metals above regulatory limits
- ◆ Identified through TCLP test (toxic characteristic leaching procedure)
- ◆ Different “D” codes depending on specific contaminant

# Hazardous Waste Management

## Proper storage, disposal, and shipping of Hazardous Wastes

- ◆ Labeled properly
- ◆ Secured and closed containers
- ◆ Use registered hauler and complete required manifests



# Hazardous Waste Management

## Solvent Contaminated Rags and Wipers

- ◆ Previously, rags or wipers that were contaminated with a solvent that is a listed hazardous waste solvent must be regulated as a listed hazardous waste when disposed
- ◆ This policy was recently reviewed, it was concluded that rags and wipers contaminated with a listed solvent constituent do not fall within the listing description for spent solvents...
- ◆ **Except** in situations where the rag or wiper is used to clean up a spill of a used solvent that is a listed hazardous waste

# Hazardous Waste Management

## Most common violations for Hazardous Wastes

- ◆ Waste Determination - OAC rule [3745-52-11](#)
- ◆ Container Management - OAC rules [3745-66-73](#)  
and [3745-66-74](#)
- ◆ Annual Reports - OAC rule [3745-52-41](#)
- ◆ Used Oil Storage - OAC rule [3745-279-22](#)



# Hazardous Waste Management

## What is Used Oil?

- ◆ Petroleum based or synthetic oils that have been used and are contaminated with physical or chemical impurities
- ◆ Used oil is not defined as a hazardous waste on its own (unless mixed with materials such as solvents or other chemicals)
- ◆ Used oil is subject to its own set of regulations



# Hazardous Waste Management

## Examples of Used Oil

- ◆ Compressor oil
- ◆ Insulating oil
- ◆ Metal cutting fluid
- ◆ Hydraulic fluid
- ◆ Brake/transmission fluid
- ◆ Lubricating oil
- ◆ Engine oils from vehicles and equipment



# Hazardous Waste Management

## More on Used Oil...

- ◆ Most commonly citations are for not properly labeling containers, above ground tanks, and fill pipes with the words, “Used Oil”
- ◆ Used oil containers include those which collect drippings from equipment or machinery
- ◆ Do not label your used oil containers with the words, "Waste Oil" or "Hazardous Waste"



# Hazardous Waste Management

## Handling Used Oil...

- ◆ ***DON'T*** throw your used oil on the ground, down the sewer, in a septic tank, or down a floor drain.
- ◆ ***DON'T*** put liquid used oil in the trash dumpster with your solid waste. Solid waste landfills cannot take liquids.
- ◆ ***DON'T*** mix your used oil with other wastes that might cause the whole mixture to become a hazardous waste.

# Hazardous Waste Management

## Other Vehicle Liquids

- ◆ Fuels - reuse, recycle, or dispose of properly
- ◆ Antifreeze - recycle or dispose of properly



# For More Information...

💧 CCBH

<http://www.ccbh.net>

💧 Ohio EPA

<http://www.epa.state.oh.us/dsw/storm/index.html>

💧 ODOT

<http://www.dot.state.oh.us/stormwater>

💧 U.S. EPA

<http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm>

# Questions?

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