Scenarios

http://www.fairfaxcounty.gov/dpz/projects/reston/scenarios.htm

The following slides will present you with several Scenarios & Questions that address pollution prevention and good housekeeping.

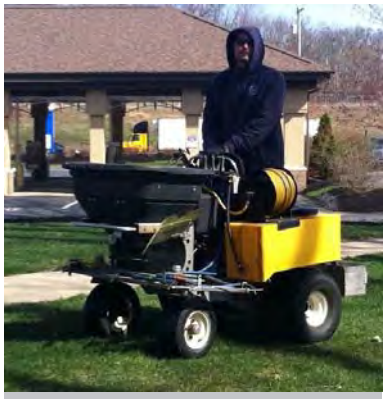
Questions will be asked to help further your understanding of MCM #6.

Scenario #1

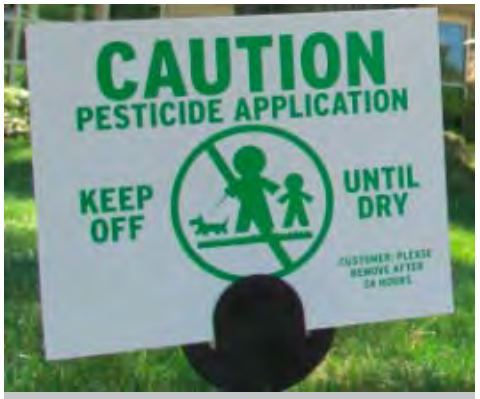
Municipal

Landscaping

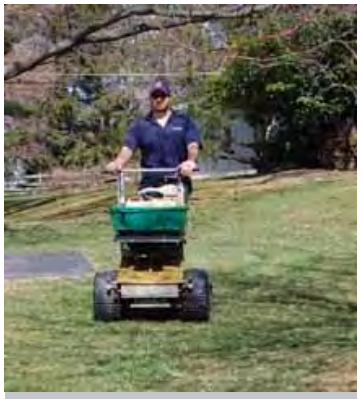
What are some of the ways in which municipalities can promote environmentally friendly landscaping / maintenance techniques?



http://www.alleghenyfront.org/story/international-call-pa-limit-lawn-chemicals



http://www.planetnatural.com/organic-lawn-care-101/pesticides-health/

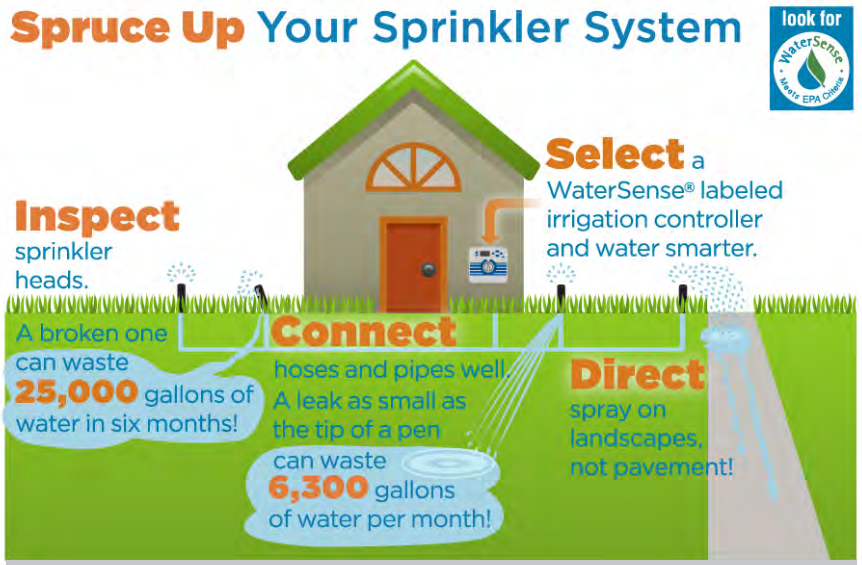


http://mda.maryland.gov/pages/fertilizer.aspx

Scenario #1

Solutions

- Create an effective public education campaign
- Recommended native plant species
- Encourage soil analysis & testing
- Teach efficient irrigation techniques
  - Drip-type or sprinkler systems
- Discourage the use of fertilizers & pesticides
  - Recommend less-toxic alternatives (composted organic material, garlic)
- Properly dispose of Landscape Residuals



http://www3.epa.gov/watersense/our_water/spring2015.html

Scenario #2

Municipal

Vehicle Fueling

- What are some important maintenance considerations for fuel-dispensing areas?
- What methods should be used for cleaning up fuel-dispensing areas?

http://www.fenleynicolenvir.com/fueling_facilities.html

http://www.pjsi.com/portfolio_item.php?id=16

Scenario #2

Solutions

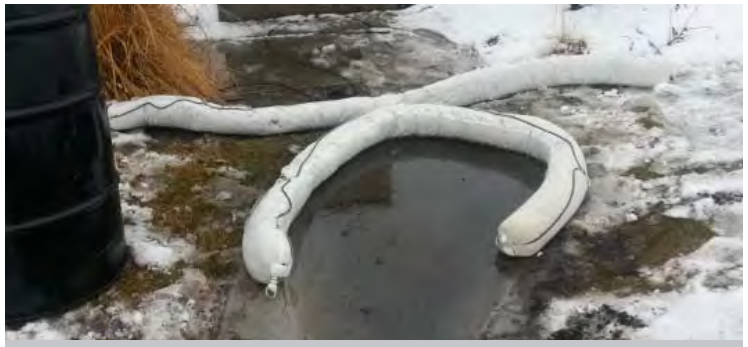
Maintenance Considerations

- **Prevent offsite run-on / on-site run-off**
- **Keep spill kits nearby** fueling/storage areas
- Check for external corrosion & structural failure in aboveground tanks
- **Check for spills & overfills** due to operator error
- Check for failure of any piping systems
- Check for leaks or spills during pumping of liquids or gases from a truck or rail car to a storage facility or vice versa
- **Visually inspect** tank or container installations for loose fittings, poor welds, & improper or poorly fitted gaskets
- Inspect tank foundations, connections, coatings, tank walls, and piping systems. Look for corrosion, leaks, cracks, scratches, & other physical damage that may weaken the tank or container system
- Above-ground tanks should be tested periodically for integrity by a qualified professional

Scenario #2

Solutions

Cleanup Methods



http://water.epa.gov/polwaste/npdes/swbmp/Municipal-Vehicle-Fueling.cfm

Should use dry cleanup methods

- Sweeping to remove litter & debris, rags & absorbents for leaks & spills
- Protect runoff into adjacent storm drains with diversion practices

Avoid the use of water to wash these areas

- Damp cloth on pumps & damp mop on pavement
- Avoid using hoses to prevent runoff into storm drain systems

Scenario #3

Municipal

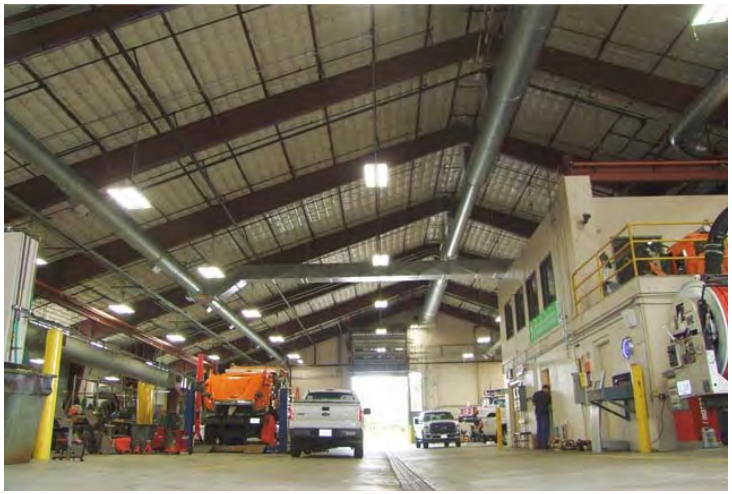
Vehicle & Equipment Maintenance

- Small auto repair shop is performing car repairs outdoors as shown in the photo on the right. Identify major pollution prevention/good housekeeping concerns with this practice.
- What are some good housekeeping techniques associated with municipal vehicle & equipment management?

http://water.epa.gov/polwaste/npdes/swbmp/Municipal-Vehicle-and-Equipment-Maintenance.cfm

Scenario #3

Solutions

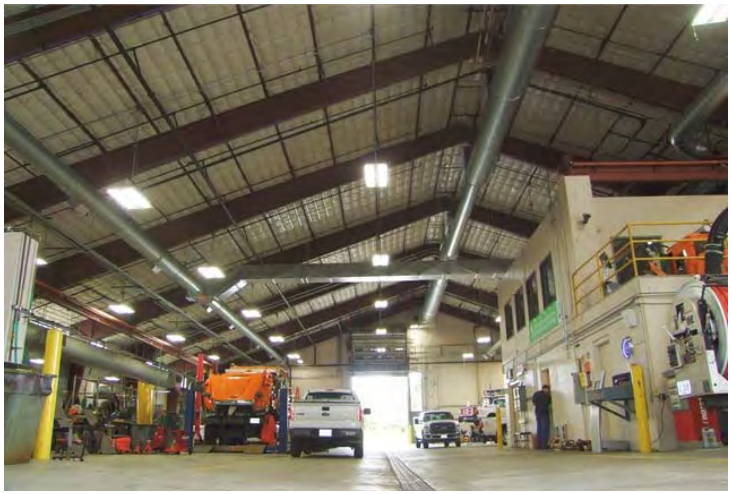


All maintenance activities should be performed inside or under cover to minimize air pollution & runoff into adjacent storm drains

- Becomes more difficult to control spills & leak outdoors as compared to indoors
- If spill were to occur, it should be cleaned up immediately. Avoid the use of water whenever possible. Clean up materials must be properly disposed of (very similar to Scenario #2)

Scenario #3

Solutions



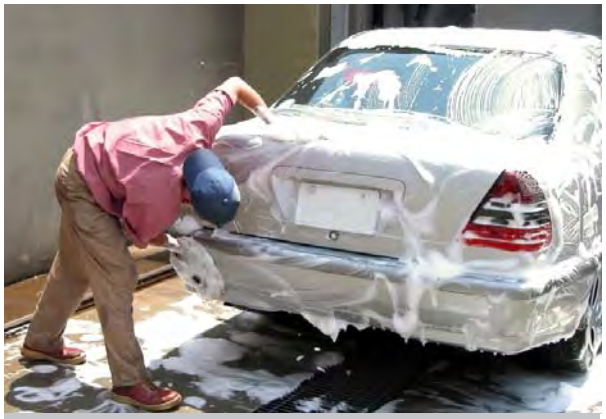
Good housekeeping techniques include:

- Employee training & public outreach to reinforce proper disposal practices
- **Conduct maintenance work indoors** (such as fluid changes)
- Update facility schematics to accurately reflect all plumbing connections
- Closely monitor parked vehicles for leaks & place pans under any leaks to collect the fluids for proper disposal or recycling
- **Promptly transfer used fluids** to recycling drums or hazardous waste containers
- Dispose of liquid waste properly
- In the event of a spill, **cover drains with drain mats**
- Store cracked batteries in leak-proof secondary containers

Scenario #4

Municipal

Vehicle & Equipment Washing

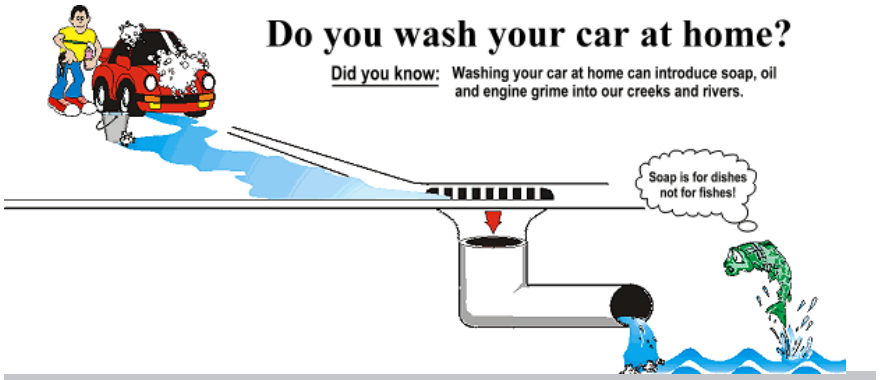


http://bestcarwashsoap.info/tag/car-washing-at-home/

- What are the negative impacts of washing your car?
- What are some of the popular vehicle washing BMPs that can eliminate/reduce contaminated wash water discharges?

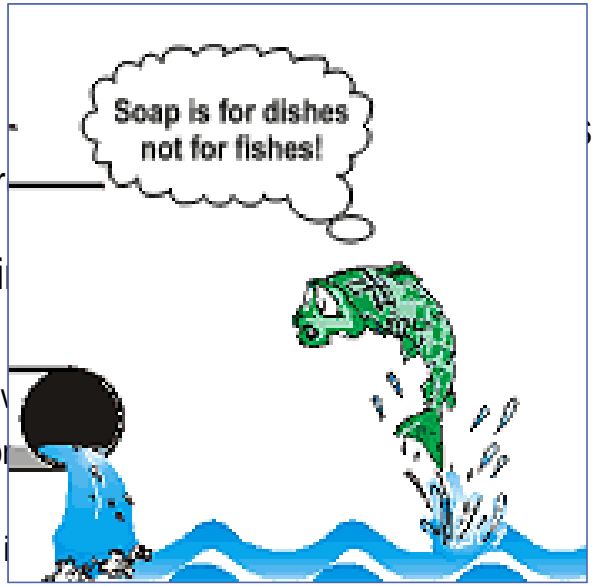
Scenario #4

Solutions



http://www.imagesautospa.com/Environmental.html

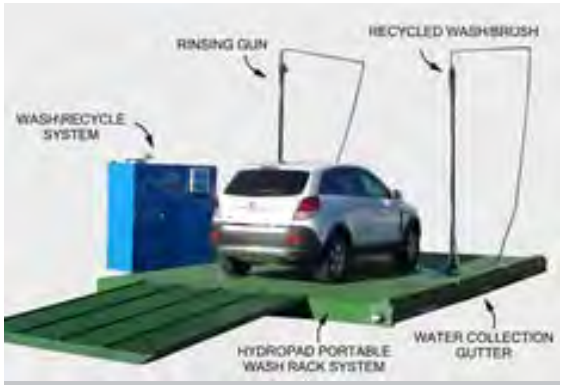
Outdoor car washing allows for a greater opportunity for polluted runoff to enter the storm drain system



- Using detergents to wash … of nutrients, metals and hydr…
- Things to do to avoid the i… inlets include:
  - Avoid using detergent whenev…
  - Wash cars on gravel, grass o… to promote infiltration
  - Block storm drains or use an i…
  - Direct flow into sanitary sewer drains

Scenario #4

Solutions



http://www.prweb.com/releases/car_wash/pressure_washer/prweb2942814.htm

Wash Racks

- A designated wash area should be paved & bermed or sloped to contain & direct wash water to a sump connected to the sanitary sewer or to a holding tank, process treatment system or enclosed recycling system.
  - Must seek permission of sewer authority before discharging wastewater to sanitary sewer
  - If wash rack designed to recycle wash water, can eliminate pretreatment costs of discharging to sanitary sewer
- Can become an expensive practice

Scenario #4

Solutions

http://water.epa.gov/polwaste/npdes/swbmp/Residential-Car-Washing.cfm

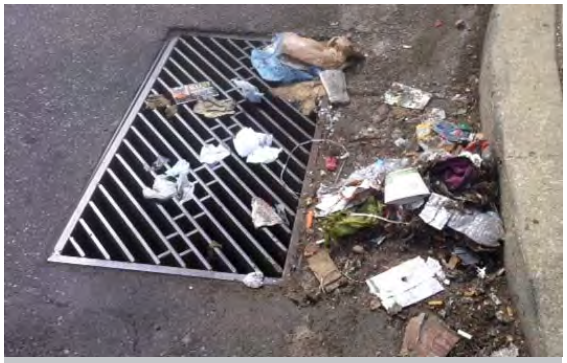
Commercial Car Washes

- Municipalities can negotiate with commercial car washes to handle their fleet vehicles
- Eliminates building costs & liability of operating a wash facility
- Often recycle their water or are required to treat their wash water discharge
- May be limited to small vehicles

Scenario #5

Parking Lot

& Street Sweepers



http://www.passyunkpost.com/2015/03/16/new-bills-could-help-reduce-trash-on-city-streets/

- What are some of the things to consider when determining the type of street sweeper to use?
- What are some of the components that an effective municipal street sweeping program should address?
- What are some of the actions you can take to deal with street sweeping (& landscape) residuals?

Scenario #5

Solutions

http://water.epa.gov/polwaste/npdes/swbmp/Parking-Lot-and-Street-Cleaning.cfm

Street Sweeper Considerations

- Type of pollutant being targeted
- Type of surfaces
- Travel distances
- Noise generated
- Costs

Street Sweeping Program Components

- Street Sweeping Schedule
- Street Sweepings Storage & Disposal
- Street Sweeping Reuse Practices
- Parking Policy
- Operation & Maintenance Program

Scenario #5

Solutions

What to do with Street Sweeping/ Landscape Residuals?

Containment

- Earthen Berm or Structural Containment Area

Disposal

- TCLP – Toxicity Characteristic Leaching Procedure
  - Determine if Hazardous (D-list)
- TPH – Total Petroleum Hydrocarbon
- Nutrients – TP, TN
- Daily Landfill Cover
- Record amount of residuals – apply sediment & nutrient removal rates

Scenario #5

Solutions

What to do with Street Sweeping/ Landscape Residuals?

Case Study – VDOT

- Some levels of Arsenic from brake pad residuals
- Some levels of Petroleum
- Not tested for Nutrients
- Determined that residuals are typically not a Hazardous Waste

Scenario #5

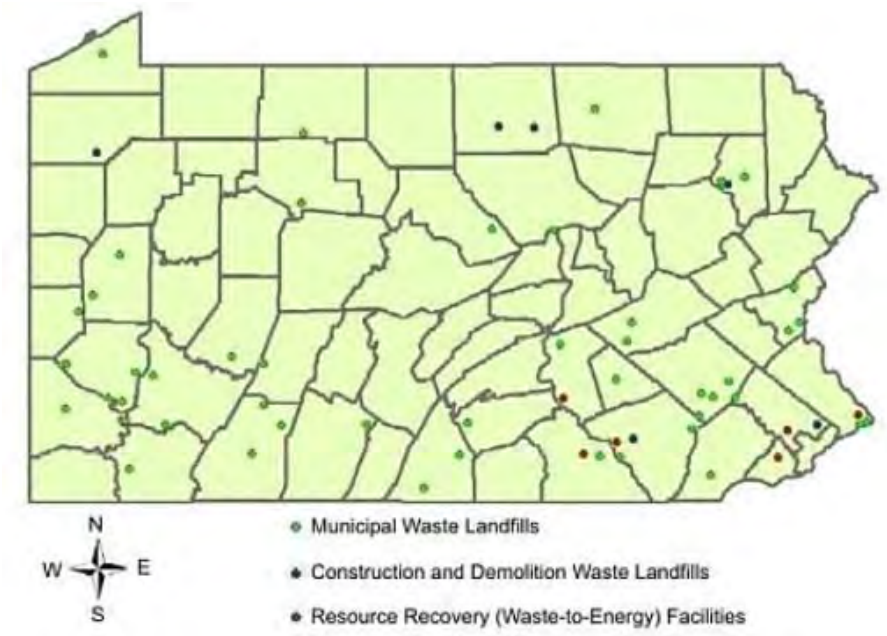
Solutions

Here is a link to a webpage containing a list of landfills in all the regions:

http://www.portal.state.pa.us/portal/server.pt/community/permitting/14092/mw_landfills_and_resource_recovery_facilities/589660

The region is indicated in the “Host County” column.

Municipal Waste Landfills & Resource Recovery Facilities



Scenario #6

Salt Storage

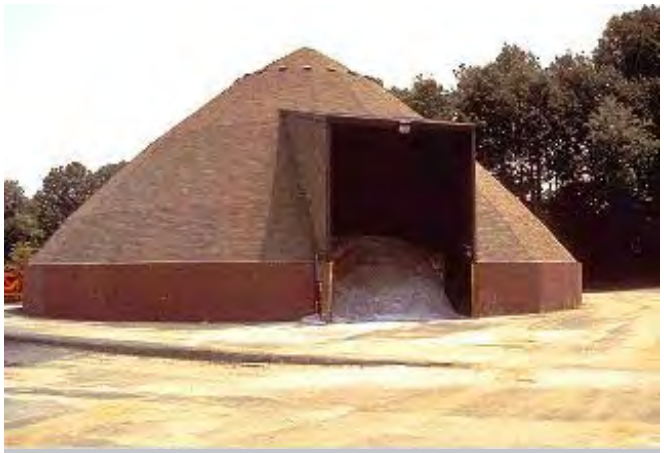
& Road Application

http://badwaterjournal.com/Bad_Water_Journal/East_End_Bridge.html

- What is the major issue with the way road salt is being stored in the photo?
- What are some of the variables to consider when determining the amount of salt to apply to a specific area?
- What are some of the alternatives to road salt?

Scenario #6

Solutions



http://water.epa.gov/polwaste/npdes/swbmp/Road-Salt-Application-and-Storage.cfm

The road salt in the previous photo is not being covered

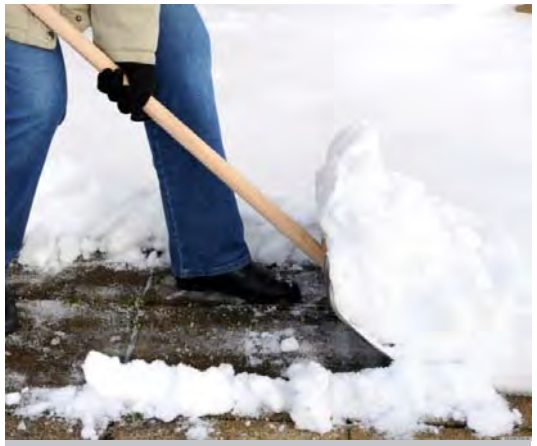
- Costly to cover road salt, but benefits greater than perceived costs
  - Prevents salt from lumping together (easier to load and apply)
  - Reduces salt loss from stormwater runoff & prevents contamination of adjacent waterways
  - Make sure salt storage located outside the 100-year floodplain

Variables to consider for salt application include:

- Snow storm intensities & frequency
- Road width & design
- ADT
- Proximity to surface waters

Scenario #6

Solutions



http://www.huffingtonpost.com/bruce-lubin/easiest-way-to-shovel-snow_b_2301979.html

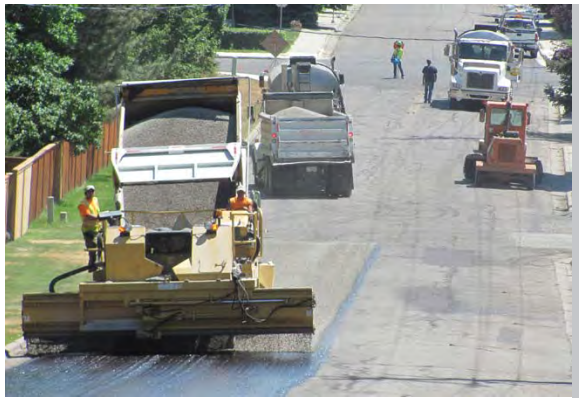
Alternatives to road salt application include:

- Sand/Gravel
- Anti-skid
- Proper plowing
- Shoveling
- Anti-icing / Pre-wetting allows for more direct applications
- Alternatives should be prioritized in sensitive areas (100-year floodplain, adjacent to wetlands, etc.)

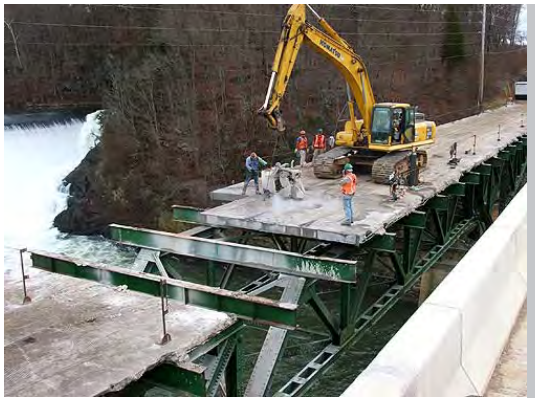
Scenario #7

Roadway & Bridge Maintenance

- What are some of the major roadway & bridge runoff constituents & their primary sources?
- What are some popular road & bridge maintenance management practices?



http://hardrives-asphalt.com/maintenance-repair/chip-seal/



http://blalockcompanies.com/category/featured-slider-show-page/road-construction-slider

Scenario #7

Solutions

What are some of the major roadway & bridge runoff constituents & their primary sources?

CONSTITUENT	PRIMARY SOURCES
Particulates	Pavement wear, vehicles, atmosphere
Nitrogen, Phosphorus	Atmosphere, roadside fertilizer application
Lead	Tire wear, auto exhaust
Zinc	Tire wear, motor oil, grease
Iron	Auto body rust, steel highway structures, moving engine parts
Copper	Metal plating, brake lining wear, moving engine parts, bearing & bushing wear, fungicides & insecticides
Cadmium	Tire Wear, insecticides

Scenario #7

Solutions

What are some of the major roadway & bridge runoff constituents & their primary sources?

CONSTITUENT	PRIMARY SOURCES
Chromium	Metal plating, moving engine parts, brake lining wear
Nickel	Diesel fuel & gasoline, lubricating oil, metal plating, brake lining wear, asphalt paving
Manganese	Moving engine parts
Cyanide	Anticake compound used to keep deicing salt granular
Sodium, Calcium, Chloride	Deicing salts
Sulphate	Roadway beds, fuel, deicing salts
Petroleum	Spills, leaks or blow-by of motor lubricants, antifreeze & hydraulic fluids, asphalt surface leachate

Scenario #7

Solutions

What are some popular road & bridge maintenance management practices?

PRACTICES	EFFECTIVENESS (% REMOVAL)[A]		COST
Maintaining Roadside Vegetation	Sediment Control: 90% average P and N: 40% average COD, Lead, & Zinc: 50% average TSS: 60% average		Natural succession allowed to occur Average: $100/acre/year Range: $50-$200/acre/year
Street Sweeping	Smooth Street Frequent Cleaning TSS: 20% COD: 5% Lead: 25%	Smooth Street Infrequent Cleaning TSS: N/A COD: N/A Lead: 5%	Average: $20/curb mile Range: $10-$30/curb mile
Litter Control	N/A		All are accepted as economical practices to control or prevent stormwater impacts.
General Maintenance	N/A		
Minimizing Deicer Application	N/A		

[a]P=phosphorus; N=nitrogen; TSS=total suspended solids; COD=chemical oxygen demand

Scenario #8

Polluted Storm Drains

- What are some of the most popular pollutants found in storm drain systems?
- What are some of the benefits of routinely cleaning out storm drain systems?

http://ci.yreka.ca.us/utilities/storm-drains

Scenario #8

Solutions

Flat grades & low flow areas should be given special attention (known deposition areas).

Storm Drain Pollutants

- Trash & debris
- Sediments
- Oil & grease
- Antifreeze
- Paints
- Cleaners & solvents
- Pesticides
- Fertilizers
- Animal waste
- Detergents
- Similar pollutants as Scenario #7

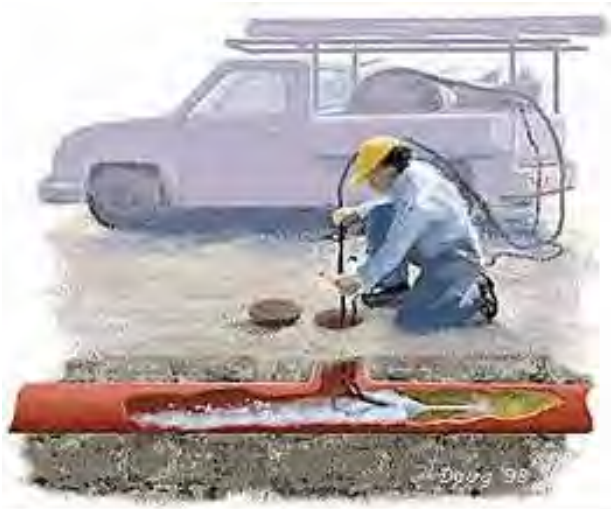
Benefits of Cleaning Storm Drains

- Removal of pollutants, trash & debris
- Reduces roadway flooding by unclogging drains
- Increases dissolved oxygen
- Reduces levels of bacteria
- Supports in-stream habitat

Scenario #8

Solutions

http://www.bluewaterbaltimore.org/about/programs/storm-drain-art/



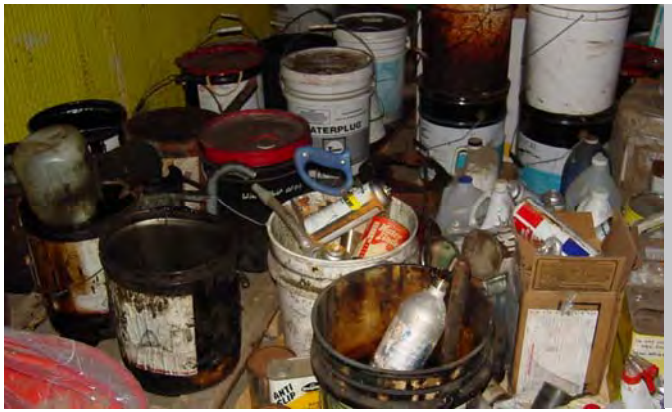
Municipalities can hire professional plumbing services to remove trapped sediment and debris from storm drains with periodical flushing (Source: Drain Patrol, no date)

http://water.epa.gov/polwaste/npdes/swbmp/Storm-Drain-System-Cleaning.cfm

Scenario #9

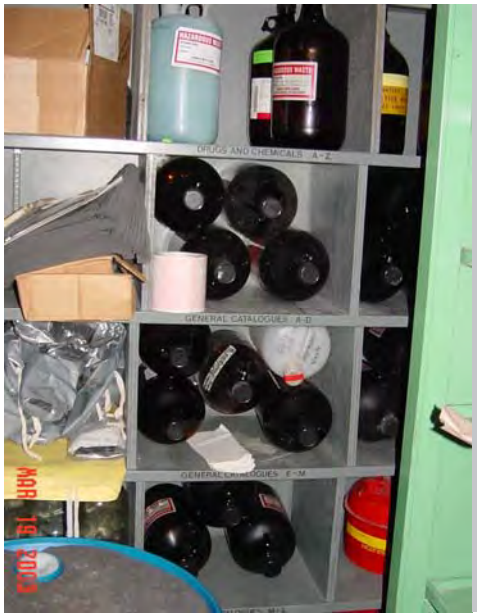
Hazardous

Material Storage & Materials Management



http://www.maine.gov/dep/waste/hazardouswaste/images/ugly2.jpg

What is wrong with these photos?



http://www.maine.gov/dep/waste/hazardouswaste/images/bad1.JPG

Scenario #9

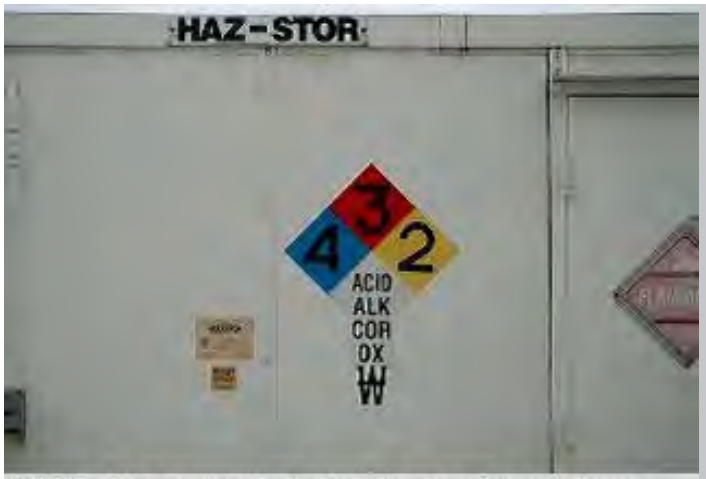
Solutions

- Need to have sufficient aisle space to provide access for inspections & improve ease of material transport.
- Containers must be stacked in accordance with manufacturers' direction to avoid damaging the container/product.
- All containers should be labeled with name of chemical, unit number, expiration date, handling instructions & health of environmental hazards.
- All materials should be covered & properly sealed
- Containers should be properly stored on pallets or equivalent structures to prevent containers & materials from coming in contact with the floor (reduces incidence of damage by pests).
- Hazardous materials should be handled by personnel trained & experienced in hazardous substance management.

Scenario #9

Solutions

http://www.dep.wv.gov/WWE/ee/hw/PublishingImages/insp%20with%20drums.jpg



Signs on hazardous material storage containers indicate the dangers associated with each substance

http://water.epa.gov/polwaste/npdes/swbmp/Hazardous-Materials-Storage.cfm

Scenario #10

Municipal

Facilities Management

Name & describe the 5 major phases of developing a pollution prevention plan that should be implemented at all municipal facilities.

http://www.uvm.edu/safety/lab/pollution-prevention

Scenario #10

Solutions

1. Planning & Organization

- Designate an individual who is responsible for developing and implementing a stormwater pollution prevention plan (SWPPP) and other environmental facility plans (pesticide use, hazardous material storage, etc.)

2. Assessment

- Assess all municipal facilities that have potential to contribute pollutants to storm drain systems
- Identify pollution sources, storm drains, drainage ditches, BMP opportunities etc.
- Conduct inventory of potentially pollution materials, evaluate past spills, evaluate existing stormwater data and create summary of all findings.

Scenario #10

Solutions

3. BMP Selection & Plan Design

- At a minimum, a plan should address appropriate good housekeeping, preventive maintenance, spill prevention & response, erosion & sediment control & structural stormwater management controls.
- Employee training, visual inspections, recordkeeping & reporting should be addressed & included in SWPPP.

4. Implementation

- Implement BMPs according to schedule that reflects the priority level and funding/labor constraints.
- All employees need training to understand and carry out goals of SWPP.

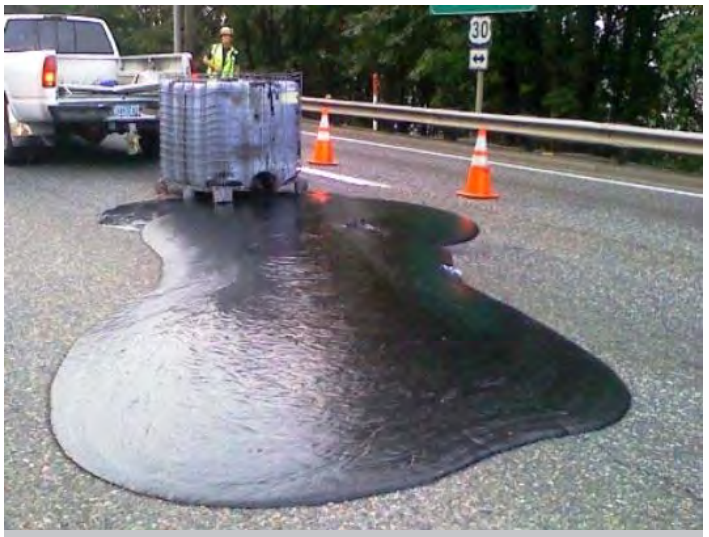
5. Evaluation & Site Inspection

- Periodic site evaluations and plan revisions as necessary.

Scenario #11

Spill Response
& Prevention

- What are some BMPs to help reduce spill potential and impacts on stormwater quality?
- What are some of the topics that should be included in a spill response plan?



http://www.kgw.com/story/news/2014/07/24/12338448/

Scenario #11

Solutions

BMPs to Reduce Spill Potential & Impacts to Stormwater Quality

- Recycling, reclaiming, or reusing process materials, thereby reducing the amount of process materials that are brought into the facility
- Installing leak detection devices, overflow controls, & diversion berms
- Disconnecting drains from processing areas that lead to the storm sewer
- Performing preventative maintenance on storm tanks, valves, pumps, pipes, & other equipment
- Using material transfer or filling procedures that minimize spills from tanks & other equipment
- Replacing toxic materials with less or non-toxic products

Scenario #11

Solutions

http://www.cesvac.com/3d-environmental.html

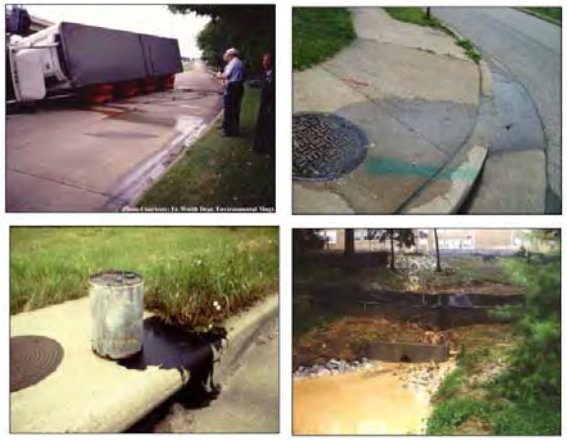
Spill Response Plan

- Identify individuals responsible for implementing the plan
- Describe safety measures to take with each kind of waste
- Specify how to notify appropriate authorities, such as police & fire departments, hospitals, or publicly-owned treatment works for assistance
- State procedures for containing, diverting, isolating, & cleaning up the spill
- Describe spill response equipment to be used, including safety & cleanup equipment
- Can be presented as a procedural handbook or a sign

Scenario #11

Solutions

PA DEP Emergency Response Program



REGION	EMERGENCY PHONE	COUNTIES SUPERVISED
Southeast	484-250-5900	Bucks, Chester, Delaware, Montgomery, Philadelphia
Northeast	570-826-2511	Carbon, Lackawanna, Lehigh, Luzerne, Monroe, Northampton, Pike, Schuylkill, Susquehanna, Wayne, Wyoming
Southcentral	866-825-0208	Adams, Bedford, Berks, Blair, Cumberland, Dauphin, Franklin, Fulton, Huntingdon, Juniata, Lancaster, Lebanon, Mifflin, Perry, York
Northcentral	570-387-3636 (24 hours)	Bradford, Cameron, Centre, Clearfield, Clinton, Columbia, Lycoming, Montour, Northumberland, Potter, Snyder, Sullivan, Tioga, Union
Southwest	412-442-4000 (24 hours)	Allegheny, Armstrong, Beaver, Cambria, Fayette, Greene, Indiana, Somerset, Washington, Westmoreland
Northwest	814-332-6945 After Hours: 800-373-3398	Butler, Clarion, Crawford, Elk, Erie, Forest, Jefferson, Lawrence, McKean, Mercer, Venango, Warren

Photos: Novotney, Michael. *Urban Restoration Manual No. 9: Municipal Pollution Prevention/Good Housekeeping Practices*. Version 1.0. Center for Watershed Protection. Copyright 2008. Dated September 2008.

Scenario #12

Construction

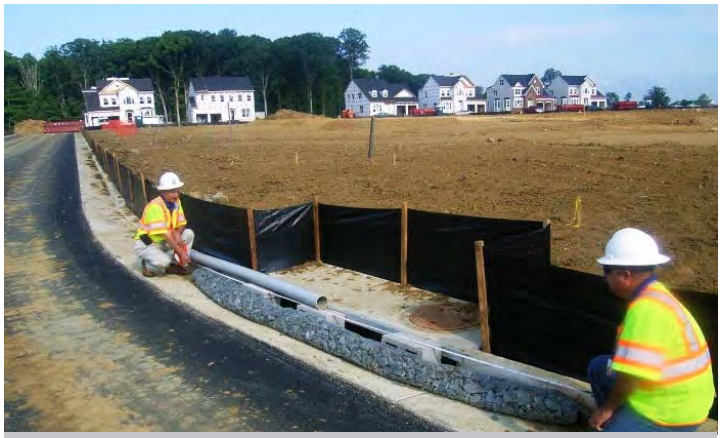
Project Management

What are some of the important questions one should ask themselves when determining if a construction site is being properly managed?

Novotney, Michael. *Urban Restoration Manual No. 9: Municipal Pollution Prevention/Good Housekeeping Practices*. Version 1.0. Center for Watershed Protection. Copyright 2008. Dated September 2008.

Scenario #12

Solutions



https://www.pwcgov.org/government/dept/publicworks/environment/Pages/Erosion-and-Sediment-Control.aspx

- Is the contractor minimizing clearing & grubbing wherever possible?
- Is the contractor protecting adjacent waterways & ensuring that all drainage ways are stabilized?
- Are steep slopes being protected & properly stabilized?
- Has the contractor installed the proper perimeter controls & other applicable erosion and sediment controls?
- Following major storm events, have all erosion & sediment controls been properly assessed?
- Has the public been properly notified about the project?