



Good Housekeeping Training for Municipal Operations

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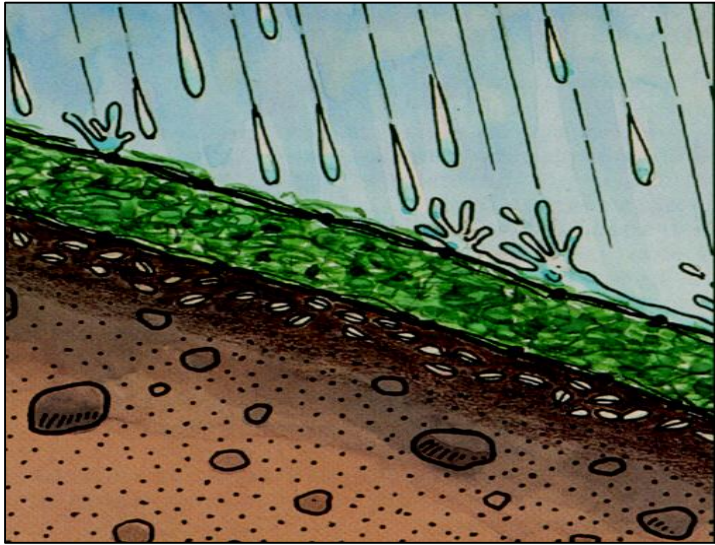
May 2nd, 2018



AGENDA

- Background of good housekeeping and stormwater regulations
- Dive deeper into the different components of good housekeeping
 - Look into how day to day tasks and maintenance operations should be performed for adequate good housekeeping
 - Discuss good housekeeping reporting, documentation, and training
- Finish up with questions and an open discussion

What is Stormwater?



As runoff flows over impervious surfaces (paved streets, parking lots, rooftops, etc.) it picks up debris, sediment and other pollutants. Storm water is collected by the storm sewer system, which discharges directly to the streams, creeks, and rivers of Greenville County.

Why is Stormwater Important?

- Protect water quality and minimize negative impacts
- Public health
- Municipal permit required – EPA and/or state enforcement
- Set the right example – can't expect others to follow if we don't



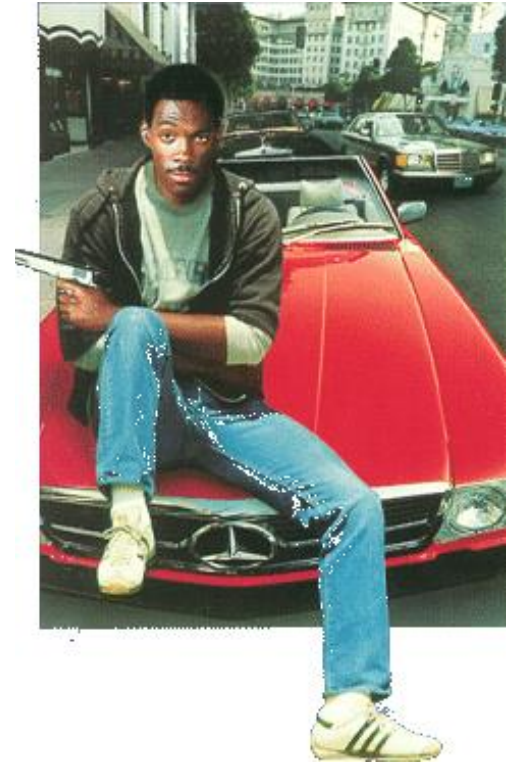
Stormwater Management Ordinance – No.4281

Purpose

- To protect, maintain, and enhance the environment of Greenville County and the short-term and long-term public health, safety, and general welfare of the citizens by establishing requirements and procedures to control the potential adverse effects of increased storm water runoff associated with both future development and existing developed land.

Penalties and Enforcement

- South Carolina Storm Water General Permit SCR100000 allows:
- Civil penalties of up to \$10,000 per day per violation
- Criminal penalties of up to \$25,000 per day per violation
- Imprisonment is included in the criminal penalties as options
- Each day of a violation is considered a new and separate offense



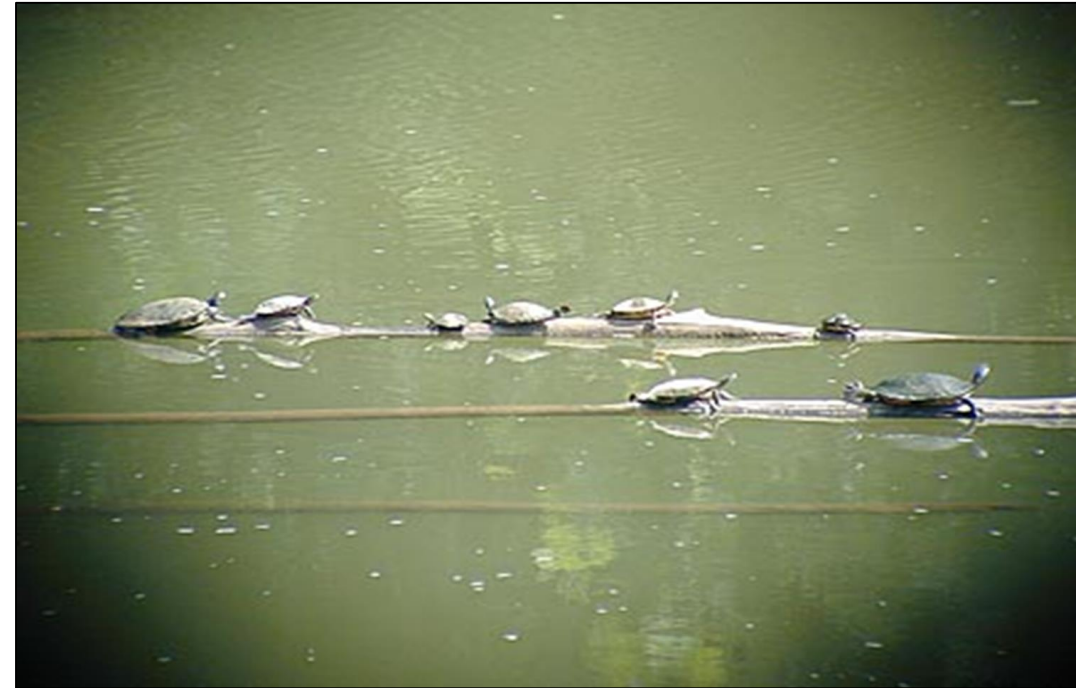
Why am I Here?

- EPA requires that an operation and maintenance program be developed and implemented that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations
- Program must include employee training to prevent and reduce storm water pollution from activities such as park, open space, storm water system, fleet and building maintenance, and new construction and land disturbance



Why am I Here?

- Employees should walk away with a better understanding of how to perform good housekeeping and why it's important
- Treat presentation as a discussion
 - Interrupt with questions or concerns as they arise
 - Available after presentation or by email to answer any additional questions



Good Housekeeping – What is it?



Good Housekeeping

- All day to day municipal activities can influence water quality – can either be positive or negative
- Includes activities and functions at:
 - Parks
 - Roads
 - Fueling facilities
 - Vehicle/fleet maintenance shops
 - Landscaped areas
 - Physical plants
- Good housekeeping is an integral part of all stormwater management programs
- Many items related to good housekeeping are common sense



Possible Impacts from Poor Housekeeping

- Sediment – poor or failed erosion control
- Nutrients – fertilizer application, sewage
- Toxins – pesticides
- Bacteria – pet waste or sewer leakage/spills
- Metals – vehicle/equipment maintenance
- Hydrocarbons – fueling or maintenance
- Trash



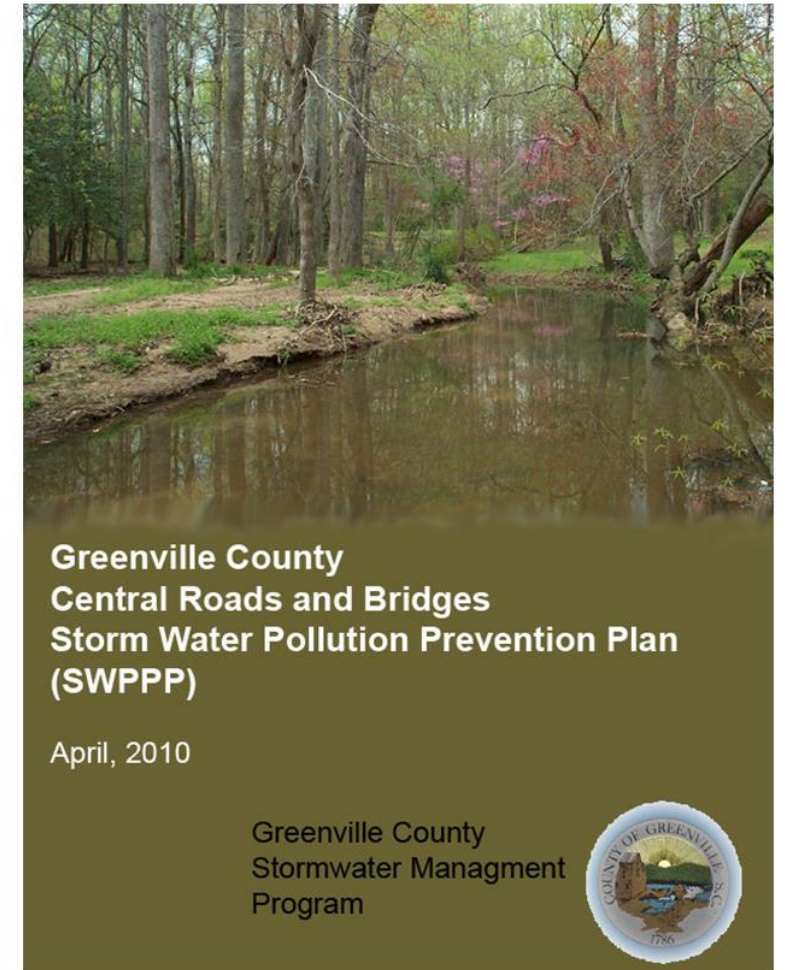
Some of the Main Components of Good Housekeeping:

- MS4 (Municipal Separate Storm Sewer System) Control Structure Inventory/Mapping, Inspection Program, and Maintenance Program
- Erosion Prevention and Sediment Control
- Municipal Operations
- Spill Prevention and Response
- Materials Management
- Employee Training



Stormwater Pollution Prevention Plan (SWPPP)

- Follow if available at municipal facility
- Inspections have been performed and SWPPPs developed/updated at the following facilities
 - Greenville County
 - Central Roads and Bridges, Northern Roads and Bridges O'Neal, Northern Roads Travelers Rest, Southern Roads, Vehicle Service Center
 - Fountain Inn, Mauldin, Simpsonville, and Travelers Rest Public Works Buildings



MS4 Control Structure Inventory

- Need to know where municipally owned structures are to know what needs to be maintained/ cleaned
 - Catch basins/ inlets, pipes (storm drain lines), ditches, post construction BMPs (detention/ retention ponds, bio-retention, engineered devices, etc.)
- Good to have an asset management system to store information and track activities



MS4 Inspection Program

- Essential to keeping municipally owned structures operational
- Regular inspection interval of once per permit cycle (5 year period) suggested, but not required
- May include closed circuit TV, pole cameras, or other visual observations
- Record and maintain inspection data



MS4 Maintenance Program

- Track all maintenance performed
 - Type/number of structures maintained
 - Type of maintenance
 - If cleaning – track volume/ weight of material disposed off
- Useful for MS4 Annual Report



Erosion Prevention and Sediment Control (EPSC)

- Sediment can be harmful to aquatic organisms, carry pollutants, and increase risk of flooding when deposited into waterways.
- Purpose of Erosion Prevention is to limit the amount of bare soil and sediment that is exposed to storm water runoff
- Should be implemented whenever soil is disturbed and exposed to precipitation.



EPSC Regulations

- Most land disturbing activities on private property are approved and regulated through the Greenville County Land Development Division (LDD).
 - LDD permits, inspects, and regulates activity on the site.
- Municipal land disturbance (in general > 1 acre) require a permit from SCDHEC, but may also require review from LDD
- Small municipal maintenance projects which do not require permits are still required to implement EPSC measures.
- If there are questions about whether a project requires a permit contact the LDD or SCDHEC.



EPSC Best Management Practices (BMPs)

During any kind of construction or work that involves exposing soils, always use erosion control products to keep sediment on site and out of catch basins and the storm sewer system.



Silt Fence to keep materials onsite, even for small projects



Proper inlet protection for catch basins



Rolled erosion control products and natural or manufactured ditch checks to slow down runoff and trap sediment

EPSC Best Management Practices (BMPs)

- Implement EPSC when performing maintenance on storm drainage systems (pipes, ditches and other conveyances)
- Outlet protection at the end of storm water pipes reduces the energy of concentrated storm water flows which reduces erosion at and below the pipe.
 - Outlet protection may include stone or riprap, concrete aprons, and paved sections.
- Stabilize ditches until they can withstand the force of flowing water
 - Stabilization techniques may include riprap, stone, concrete, and turf reinforcement mats(TRM)



Seeding and Mulching – Sediment Control

- Refer to County specifications for seeding and mulching in LDD design manual, Appendix E
- Proper seeding and mulching practices include:
 - Rolled erosion control products to enhance seed germination
 - Application of the correct seed mixture
 - Application of correct amounts of lime and fertilizer as per soil test results
 - Proper mulch application with or without hydroseeding application



Post Construction BMPs

- Installed to reduce runoff rates and pollution loading from a developed property



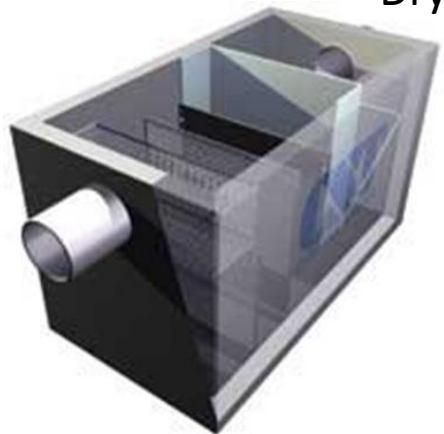
Dry Detention Pond



Wet Detention Pond



Vegetative Filter Strip



Manufactured Treatment Device



Bioretention Cell



Cistern



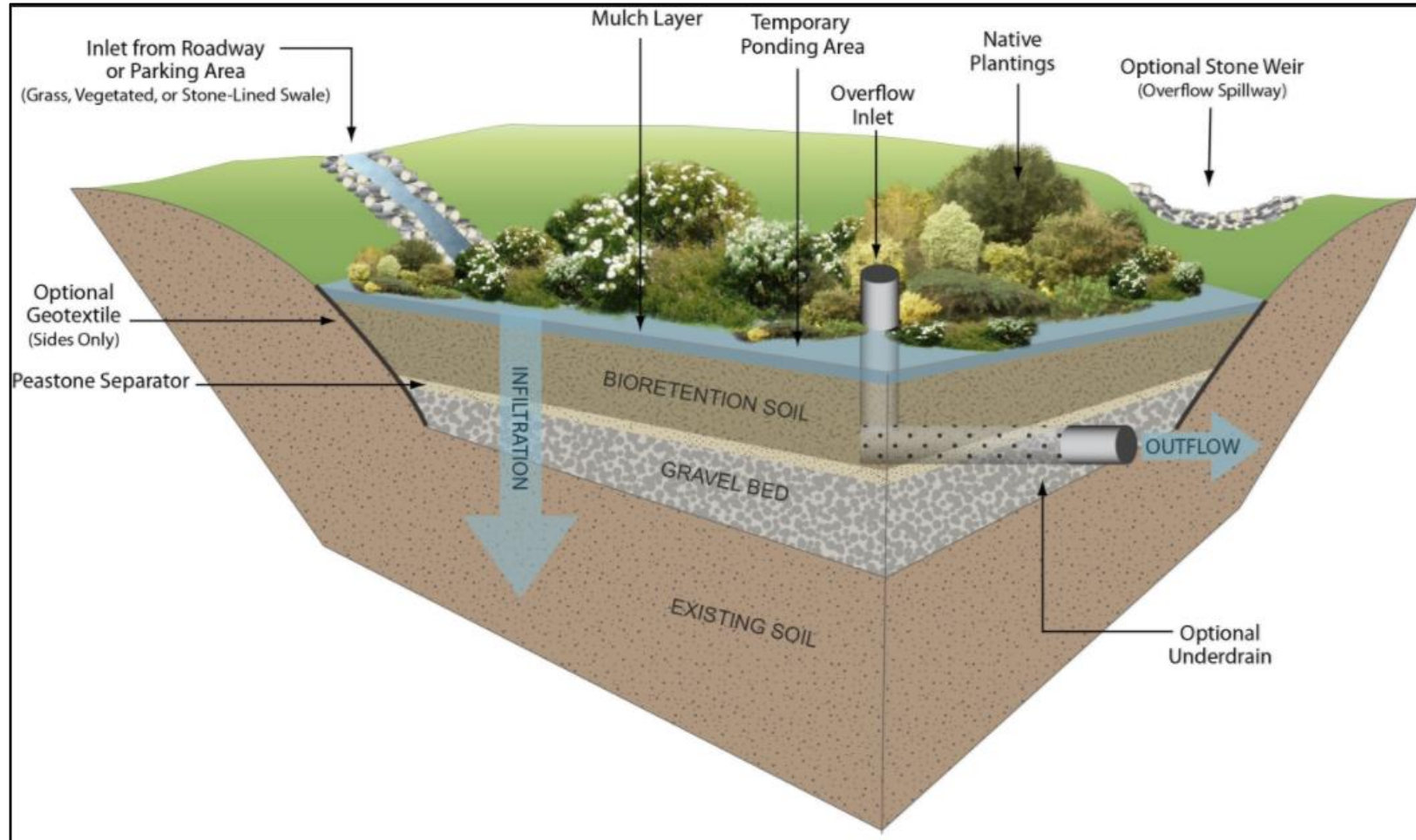
Sand Filter

Detention Ponds

- Dry vs Wet
 - Dry ponds are typically designed to release all collected rainfall 72 hours after a rain event
 - Wet ponds are designed with a permanent pool
- Maintenance
 - Keep the pond free of trash and debris
 - Manage vegetation so pond maintains functionality
 - Keep pond stabilized to prevent erosion



Post Construction BMPs – BioRetention Cell



Street and Parking Lot Cleaning

- Street and parking lot cleaning is performed to remove sediment buildup and large debris from curb gutters
- Past study determined that street sweeping was not preferred for Greenville County
 - Alternatively, the County has been utilizing a litter vacuum truck for cleaning
- Street sweeping may still be a feasible option in some cases
- Document miles swept and amount of debris removed



Greenville County Litter Vacuum



- Litter Ends Here Program
- Litter Tracker App
- Vacuum truck has collected more than 12,000 pounds of litter in less than 2 months
- LitterEndsHere.org

Roadway, Bridge, and Parking Lot Management

- Changes in the methods used for maintaining road surfaces, removing debris and sediments from roads, and cleaning of runoff control structures can help improve the overall storm water quality discharging from roads and bridges



Roadway, Bridge, and Parking Lot Management

- The following are good practices:
 - Proper materials staging to reduce spillage during repair of potholes
 - Sweep and/or vacuum heavily traveled roadways and/or parking lots
 - Regularly clean off runoff control structures
 - Restrict use of pesticides and herbicides on roadside vegetation
 - Allow roadside ditch vegetation to grow taller than typical turf grass height
 - Use rip rap or turf reinforcement mats (TRM) at pipe outlets & in ditches to minimize erosion



Spill Prevention and Response

- Documentation and spill response equipment at every facility where a spill could occur
- Step by step instructions for spill response
- Spill response plan can be a handbook or even a sign
- Place spill kits in locations where easily accessible and in close proximity to where materials are stored or used
- Ensure spill kits are labeled



Emergency Spill Kit
Spill Kit Type

↓ ↓

Last Used		Last Checked		Last Refilled	
Signature	Date	Signature	Date	Signature	Date

www.seton.net.au



Spill Prevention and Response



Spill Prevention and Response

- If a spill is severe or potentially dangerous contact the fire department or hazardous waste response entity specified in the facilities SWPPP
- Spill prevention and control plans - may be needed
 - Measures to stop source of a spill
 - Contain the spill
 - Clean up the spill
 - Properly dispose of contaminated materials
- Public and employee safety is always number one
- Provide training for municipal staff in spill response



Hazardous Materials DO NOT Cross / Hazardous Materials DO NOT Cross / Ha



Illicit Discharges

- Any discharge into a storm drain system that is not composed of entirely stormwater
- All potential illicit discharges should be reported to Greenville County Land Development Division (LDD)

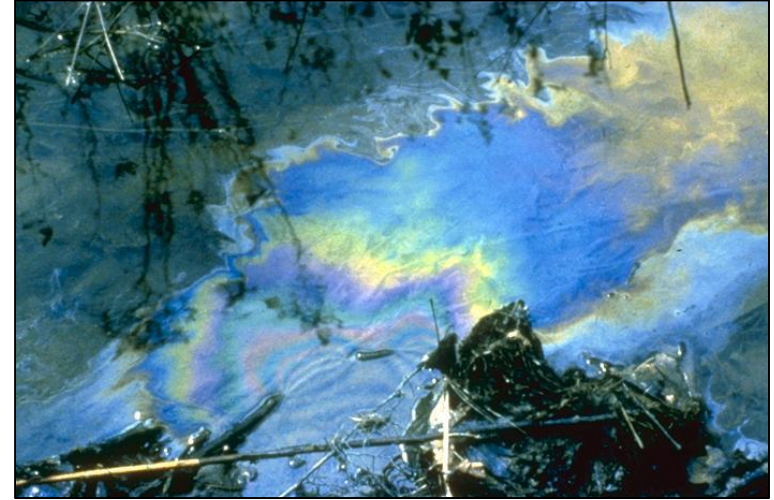


Illicit Discharges

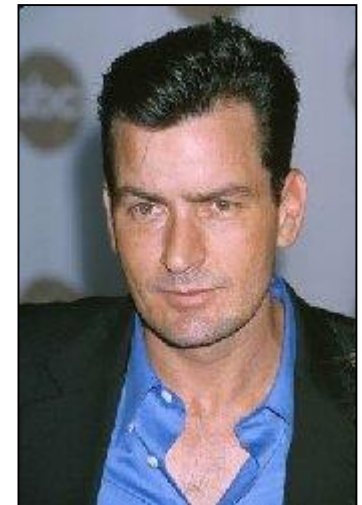
- LDD conducts inspections and dry weather screening
 - Investigation of source of stormwater flow during dry conditions
 - Color, oil sheen, smell, or chemical parameters



Oil Sheen



Charlie Sheen



Materials Management

- Management of chemicals such as
 - Pesticides, Herbicides, Fertilizers, - PHFs
 - Solvents
 - Fuel
 - Oils
- Proper storage and use of products in all stages of useful lives
- Select proper product for job
- Proper disposal



Materials Management

- Follow SWPPP if available
- Identify all hazardous and nonhazardous substances present in the facility
 - Maintain an inventory of all substances used/stored at each facility
- Label all containers with:
 - the name of the chemical
 - unit number
 - expiration date
 - handling instructions
 - health or environmental hazards



Materials Management

- Make note of chemicals that require special handling, storage, or disposal
- Safety Data Sheets (SDS) – formerly known as Material Safety Data Sheets or MSDS – needed for each chemical used or stored at a location
- Delegate the responsibility for management of hazardous materials to trained personnel
- Hazardous materials must be handled & stored to prevent contact with stormwater
- Look into alternative products

SAMPLE LABEL

CODE _____ Product Name _____	} Product Identifier	Hazard Pictograms Signal Word Danger
Company Name _____ Street Address _____ City _____ State _____ Postal Code _____ Country _____ Emergency Phone Number _____	} Supplier Identification	
<p>Keep container tightly closed. Store in a cool, well-ventilated place that is locked. Keep away from heat/sparks/open flame. No smoking. Only use non-sparking tools. Use explosion-proof electrical equipment. Take precautionary measures against static discharge. Ground and bond container and receiving equipment. Do not breathe vapors. Wear protective gloves. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Dispose of in accordance with local, regional, national, international regulations as specified.</p> <p>In Case of Fire: use dry chemical (BC) or Carbon Dioxide (CO₂) fire extinguisher to extinguish.</p> <p>First Aid If exposed call Poison Center. If on skin (or hair): Take off immediately any contaminated clothing. Rinse skin with water.</p>		
Precautionary Statements		

Hazard Statements Highly flammable liquid and vapor. May cause liver and kidney damage.	Supplemental Information Directions for Use _____ _____ _____ Fill weight: _____ Lot Number: _____ Gross weight: _____ Fill Date: _____ Expiration Date: _____

OSHA 3492-01R 2016

Materials Management

- Improper storage of materials dramatically increases the probability that they will end up in waterways
- Ensure sufficient aisle space
- Store materials well away from high traffic areas
- Stack containers in accordance with the manufacturer's directions
- Store containers on pallets (spill pallets suggested) or equivalent structures and/or with secondary containment



Spill Containment Pallet
<http://www.dawginc.com>

Landscaping and Vegetation Care

- Be conscious that equipment does not create or contribute to runoff pollution by ensuring:
 - Proper equipment maintenance
 - Proper disposal of waste products (used oil, degreasers, filters, etc.)
 - Proper transport of equipment to reduce potential for spills
- Avoid blowing landscape debris (leaves and grass clippings) into the roadway, catch basins, and/or waterways. Consider composting the waste.



Landscaping and Vegetation Care

- Follow all prescribed rates of application for PHFs
- Do not allow the use of PHFs in area adjacent to water bodies or in stormwater systems – including ditches and stormwater BMPs
- Document applications
 - Date applied
 - Amount used
 - Location of application
- Use native vegetation – minimizes need for chemicals and water
- Proper vegetation prevents erosion



Landscaping and Vegetation Care

- Refer to Clemson Extension Guidelines
- The following are good pre seeding practices:
 - Determine fertilizer application amounts and ratios of Nitrogen(N), Phosphorus(P), Potassium(K)
 - Example: 16-16-16 is 16% each N, P, K
 - Determine soil pH - if lime or sulfur is needed
 - More is not always better - over fertilization can kill vegetation
 - Fertilizer runoff can be a significant contributor to water quality problems



Pest Control

- Clemson Extension Department of Pesticide Regulation has information on the proper use of pesticides
- When pesticides are required, programs seek to have users try less toxic products such as insecticidal soaps
- Refer to Clemson Extension for tips on identifying pest problems and selecting treatment approaches that reduce environmental impacts



Pest Control

- Integrated Pest Management (IPM) is a popular way for program managers to educate residents and businesses on alternatives to chemical pesticides
- IPM reflects a holistic approach to pest control that examines the interrelationship between soil, water, air, nutrients, insects, diseases, landscape design, weeds, animals, weather, and cultural practices to select an appropriate pest management plan
- An IPM program incorporates preventative practices in combination with nonchemical and chemical pest controls to minimize the use of pesticides and promote natural control of pest species



Pest Control

Three different nonchemical pest control practices



biological (good bugs that eat pests)



cultural (handpicking of pests, removal of diseased plants, etc.)



mechanical (zappers, paper collars, etc.) are used to limit the need for chemicals

Alternative Products

- The promotion of safer alternative products should be coupled with other programs designed to reduce the presence of hazardous and toxic materials
- Examples of commonly used products and safer alternatives:
 - *Aerosols* - pump type or non-aerosols
 - *Batteries* - rechargeable batteries
 - *Chemical fertilizers* – compost
 - *Gasoline* - electric engine
 - *Diesel* - bio diesel
 - *Motor oil* - re-refined motor oil
 - *Pesticides* – *insecticidal soaps*, garlic oil, and marigold plants



Examples of alternative products include rechargeable batteries, baking soda, olive oil, vegetable oil, a lemon, a toothbrush, and a rag

Vehicle/Equipment Maintenance

- Most effective way to minimize the impacts of waste is by preventing its production
- Run a dry shop
 - Clean up spills immediately, and do not use water for clean up whenever possible
 - Seal off floor drains that are connected to the storm sewer
 - Hire a solvent service to supply parts and cleaning materials, and to collect the spent solvent
 - Do not allow spills or leaks to flow out of a shop and enter the storm drain



Fueling Operations

- Maintenance Yards, Vehicle Service Center, Environmental Service Center (old Central Maintenance)
- Fueling operations should be done carefully and spills should be cleaned up immediately
- Avoid topping off your tank
- Have spill kits available

Spill Kit (needs label)

Spilled/Dripped Fuel



Used Oil

- Motor oil is toxic to humans, wildlife and plants, and it should be disposed of at a local recycling or disposal facility.
- Used motor oil should be stored in a plastic or metal container with a secure lid, rather than dumped in a landfill or down the drain.
- Used motor oil should also never be mixed with other substances such as antifreeze, pesticides or paint strippers.



Vehicle/Equipment Washing



Vehicle/Equipment Washing

- If possible wash equipment at a commercial car wash
- If equipment is washed on site:
 - Confirm that wash racks and floor drains connect to a oil water separator prior to discharge to sanitary sewer
 - Wash on gravel, grass, or other permeable surfaces
 - Only use bio-degradable cleaners
- Clean parts in parts washer – proper handling/disposal of cleaning fluids via a disposal contractor



Building Maintenance

- Store trash cans with lids or upside down if empty
 - Regularly empty trash cans to avoid overtopping
 - Keep lids on dumpsters at all times
- Keep area free of trash and debris
- Encourage grass growth in areas where bare earth is exposed
- Exterior Cleaning



Municipal Facilities

- Industrial facility - ensure Stormwater Pollution Prevention Plan (SWPPP) is being followed
- Evaluate all facilities for potential to impact water quality
- Prioritize for inspection – recommend all at least once per permit cycle, high priority once per year or possibly more frequently
 - Inspections by someone other than at the facility – stormwater manager or even 3rd party inspections
 - Inspect area of facility where materials are stored – both indoors and out

Facility Name	Waste/Dumster	Building Area	Parking	Storage Area	Open Space	Other
Bakers Creek Park						
CMC-NorthEast Stadium						
Dale Earnhardt Tribute Plaza	N/A	N/A	N/A	N/A		
Fire Department						
Fire Station 2						
Fire Station 3						
Fire Station 4						
Fire Station 5						
Old Police Station						
Open Space	N/A	N/A	N/A	N/A		
Public Works Facility						
Safrit Park						
Train Station						
Veterans Park	N/A	N/A		N/A		
Village Park	N/A					
Water Treatment Plant						

Color Schematic

N/A = Not Applicable

= Meets or Exceeds Goals

= Low Priority / No Stormwater Quality Threat

= Moderate Priority / Minimal Stormwater Quality Threat

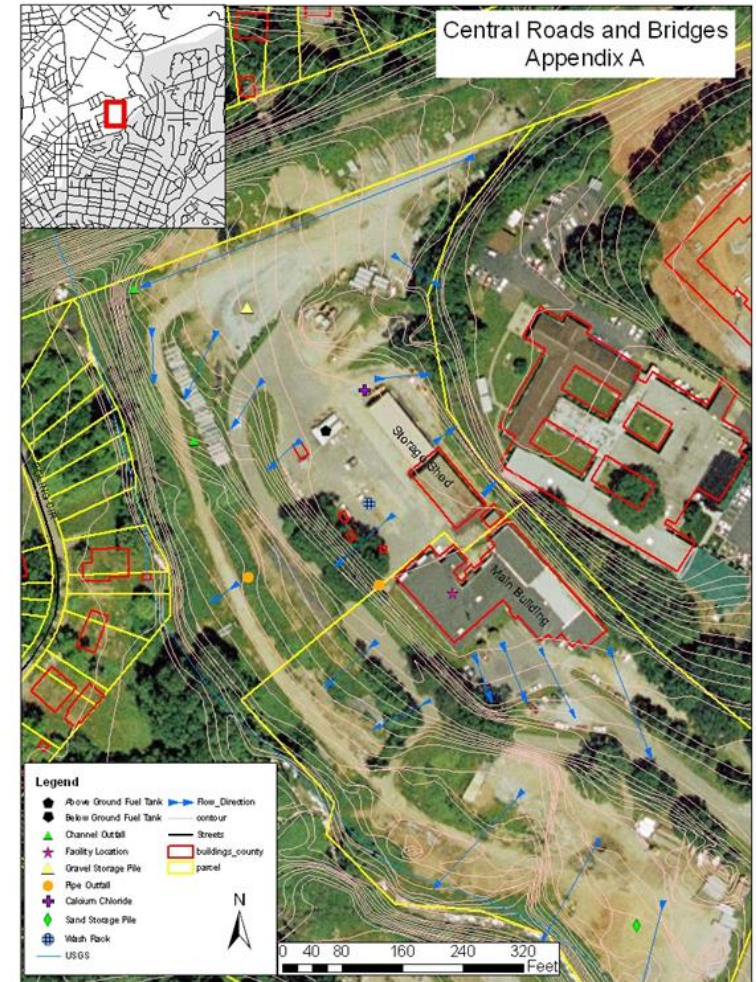
= High Priority / Stormwater Quality Threat

Municipal Facilities

All high priority facilities should be equipped with:

- facility specific SWPPP, spill response plan, and/or other stormwater planning documents
- Stormwater pollution prevention team
- Map showing location of all drainage systems and where materials are stored, handled, and/or disposed of

APPENDIX A: DRAINAGE SITE MAP



[illegible]

- Drums under cover
- Most drums are labeled
- Some signage
- Drums are not sitting directly on the ground
 - Better would be on spill pallet or at minimum on pallet to see if there are leaks
- Some absorbent pads

- No spill kit
- Evidence of leaks/spills
- Drums directly on concrete

Municipal Facilities – Good or Bad/Ugly?



Bad or Ugly Continued

- Missing bung (drum plug)
- Missing or non-legible labels
- Missing absorbent pad
- Rusted drums
- Drums directly on concrete – spill pallet is best, but at minimum get up on a pallet so leaks on the bottom of a drum can be observed

Municipal Facilities – Good or Bad/Ugly?



Good

- Drum is under cover, but is near opening where angled rain could hit it
- 5 gallon bucket is under cover
- Fuel cans and 5 gallon buckets on pallet and sealed



Bad/Ugly

- Spill evidence
- No label on drum/cans/buckets
- No bung in drum/no lid on bucket
- Fuel cans/buckets exposed to precipitation
- Fuel cans laying over on side and could be leaking
- Clean up and dispose of waste materials

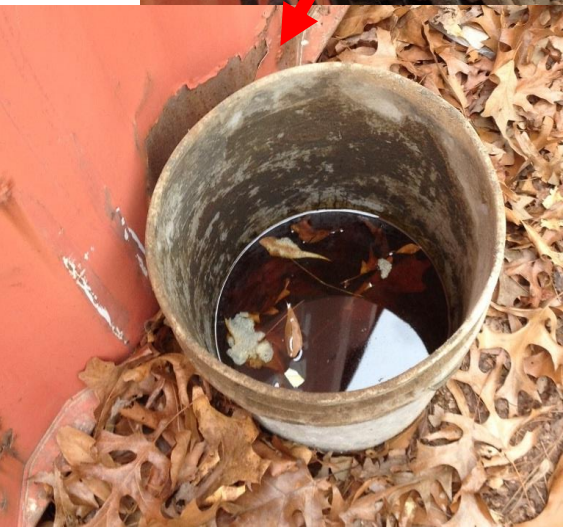
Municipal Facilities – Good or Bad/Ugly?

Good

- Not much
- Drums are at least sealed and in good condition, one has label that is partially readable

Bad/Ugly

- Mess
- Bucket of “oily” substance with no lid – might just be residue, but at minimum is mosquito breeding area
- Clean up and dispose of waste materials



Municipal Facilities – Good or Bad/Ugly?



Good

- Good signage
- Recycling is happening

Bad/Ugly

- Not following signage
- Not following good E-waste procedures
- Messy looking

Municipal Facilities – Good or Bad/Ugly?



Good

- All storage containers (totes/drums) are sealed and appear to be in good condition
- Some containers have labels
- Some containers are up off the ground – enabling better leak detection



Bad/Ugly

- Missing labels
- Containers near areas of traffic where could easily be hit by a vehicle
- Stored outside exposed to precipitation
- No secondary containment

Municipal Facilities – Good or Bad/Ugly?



Good

- Label on Recycle Oil Container
- Spill containment for Used Oil collection system

Bad/Ugly

- Leaked/spilled oil
- Stored outside exposed to precipitation
- Missing labels
- Containers near areas of traffic where could easily be hit by a vehicle
- Messy

Employee Training

- Typically required at least annually
- Different topics to keep employee attention
- Recommend more frequent trainings – some folks do monthly at safety meetings
- Different training for new employees
- Vendors will often do free lunch-n-learns
- Commercially available training videos
- Document type of training and who was trained
- Evaluate and revise training as needed – use anonymous employee awareness surveys



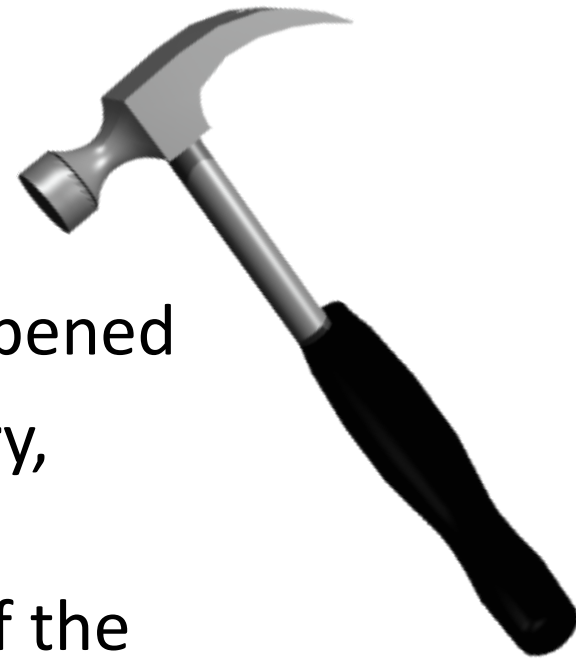
Documentation



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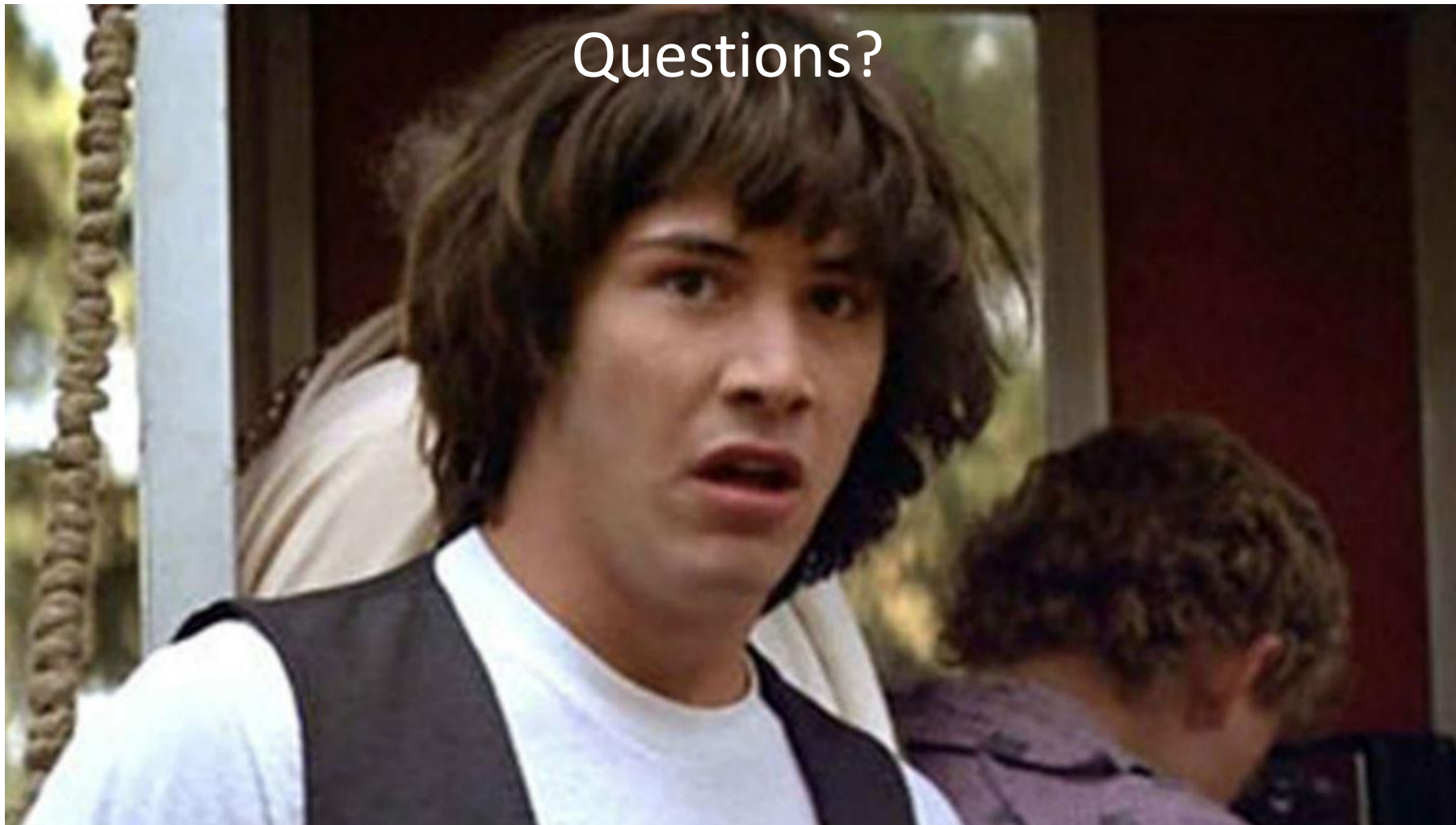
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Appendix F – SCDHEC Water Quality Report (s)	

Take-A-Ways



- If you don't document it then in a regulator's eyes it never happened
- Asset management systems can help with maintaining inventory, inspection, and maintenance performed
- Inspection by someone not at the facility – look at every part of the site and all activities
- Training is key
- Audits – do an internal audit or bring in a 3rd party
 - Better to get your “house” in order prior to a state or federal audit
- Document everything

Questions?



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