Southern Indiana Stormwater Advisory Committee

Municipal Stormwater Resource Handbook

SWAC
SOUTHERN INDIANA

Stormwater Reference Materials for Municipal Employees and Facilities

Revised: May 2022

by the Southern Indiana Stormwater Advisory Committee

Also available online at:

www.SISWAC.org

Acknowledgements

This document, developed through the Southern Indiana Stormwater Advisory Committee partnership, serves as a reference to assist municipal employees with stormwater management at municipal facilities. This document would not have been possible without the dedication and commitment of the Southern Indiana Stormwater Advisory Committee (SWAC) communities including the City of Jeffersonville, the City of New Albany, the City of Madison, the Town of Clarksville, the Town of Sellersburg, the Oak Park Conservancy District, Floyd County, and the Town of Georgetown. Through this robust partnership, the SWAC strives to safely, efficiently, and professionally enhance the quality of life for citizens by guiding the community on stormwater issues and protecting the environment for future generations.

Our Mission

The Southern Indiana Stormwater Advisory Committee is a regional partnership whose core function is to guide stormwater quality programs in a cost-effective, consistent, and efficient manner, striving through collaborative efforts to educate all constituents, encourage involvement, and implant new planning approaches to improve the quality of life for the region, and thus society, now and into the future.

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Table of Contents

Table of Revisions

The following table summarizes revisions, additions, deletions, etc. to the Drainage Detention Systems – Guidebook for Inspection:

Date	Affected Sections	Summary of Change
10/30/14	Multiple sections	Minor wording changes throughout for clarity.
07/22/19	Introductory pages	Minor updates.
05/3/22	Contacts	Contact updates.

Chapter 1
Introduction

1. Introduction

7.1 ENVIRONMENTAL MISSION AND GOALS

> Safely, efficiently, and professionally enhance the quality of life for the citizens of Madison by improving water quality through public education and outreach, public involvement, illicit discharge detection and elimination, construction site storm water runoff control, post-construction storm water management, and pollution prevention/good housekeeping for municipal operations.

This policy encourages environmental stewardship for current and future generations. Successfully implementing this policy is important because we all want a clean, healthy environment for our families and grandchildren. Each of us can contribute to this goal through our daily work.

As we conduct our municipal operations, we perform many activities that benefit the safety and quality of life for the citizens of the City of Madison. Our municipal work duties include de-icing local roads, street sweeping, repaving, debris removal from streams, fertilizer and pesticide application and numerous other activities that benefit the community. These activities are performed out in the community. We also perform many activities at municipal facilities such as vehicle washing and maintenance, chemical storage, and solid waste management. The way we perform these activities can have an impact on environmental quality, that is, the quality of our air, water and land. A description of the ways in which municipal practices and responsibilities can impact environmental quality follows.

Air, water and soil can become contaminated by oils, pesticides, and other chemicals. Contaminants can be transported from the site of a spill or inappropriate waste disposal by water or wind from facilities and roadways and can contaminate streams or groundwater, or other areas. Madison's Public employees must do their part to avoid causing or contributing to environmental contamination.

Some of the key pollutants of concern at municipal facilities are road salt/brine, sediment (solids), oil and grease, pesticides, fertilizers, and materials that influence the acidity of runoff. These chemicals may be harmful to people, plants, and animals that breathe in or touch the chemical or contaminated water or soil.

Chlorides from de-icing operations dissolve easily in water and can harm fish and other aquatic life.

Sediments (solids) from erosion, borrow pits or poorly stored soil stockpiles can reduce the amount of light in streams and lakes and can smother young fish when they settle to the bottom. Sediment fills voids in stream beds which are the habitat for aquatic insects and biota that are food for fish.

Oil and grease can be toxic to fish and other aquatic life.

Pesticides can sicken people, kill fish and other aquatic life, and pollute surface water, groundwater, and soil when a spill occurs, especially of concentrated material.

Runoff from too much *fertilizer* can cause algae blooms that use up oxygen in the water. In severe cases, fish kills can occur.

The acid or alkaline quality of water is measured using *pH*. Fish and other aquatic life need water that is not too acidic or alkaline (pH between 6 and 9 pH units).

Table 1.1 Summary of Pollutants of Concern at Municipal Facilities

Pollutant	Environmental Concern	Sources	Management
Chlorides	Stress aquatic life, cause soil to not support plant growth, pollute ground water.	De-icing materials	Apply minimum amount needed. Don't dump left over salts. Clean up after operations and spills.
Sediment	Reduces light in water bodies, can smother young fish.	Erosion, runoff from bare dirt & soil stockpiles	Repair eroding embankments promptly. Divert runoff away from stockpiles.

Oil and Grease	Harmful to plants and animals and ground water.	All fuels, all oils	Don't expose to weather. Use drip pans. Clean up spills promptly. Manage containers properly.
Pesticides	Harmful to people, plants, and animals if not applied properly or spilled.	Roadside agronomy, golf courses	Handle with caution. Don't apply if rain is forecasted. Apply minimum amounts needed. Clean up spills promptly.
Volatile Organic Compounds	Greenhouse gases.	Fuels, paints	Use products as directed.
Fertilizer	Can lead to algae blooms in rivers and lakes that use up oxygen, stressing or even killing fish.	Roadside agronomy, golf courses	Store indoors. Don't apply if rain is forecasted. Apply minimum amounts needed. Clean up spills promptly.
pH	Harmful to fish outside the range of 6 to 9 pH units.	Roof runoff, contact with stockpiles	Divert runoff away from stockpiles.

It is always cheaper and easier to prevent pollution than it is to clean it up later. This handbook describes how to prevent pollution while conducting your everyday tasks. Through this approach, you will contribute to the safety of the municipal employees and citizens, as well as protecting local natural resources for future generations.

7.2 DOCUMENT PURPOSE

The purpose of this document is to provide a source of environmental information related to work in the right of way, highway maintenance and operations, facility based operations, waste management, spills and emergencies. This Handbook is a companion for other City of Madison's ordinances, policies and manuals that together protect the environment.

7.3 WHAT IS COVERED

This Handbook describes many of the environmental requirements and practices that apply to public works facilities and responsibilities. It is not a

substitute for the actual regulations, ordinances, permits or plans and cannot cover every possible situation. Therefore, contacts and sources for additional information are provided to help you find answers to questions not covered in this handbook.

7.4 WHAT IS NOT COVERED

This Handbook does not address new road or bridge construction, although some information may be relevant to these activities. It does not address bridge painting, or the application of pesticide and fertilizer.

7.5 USE OF THIS HANDBOOK

This Handbook provides practical information that you can use to protect our natural environment and comply with federal and state environmental regulations. This Handbook describes environmental practices required by ordinances and regulations and other acceptable environmental practices. Issues that may require special attention are identified.

7.6 PERIODIC UPDATES

This Handbook binder is designed to be easily updated; new or revised fact sheets should be added to the binder. Outdated fact sheets should be replaced, or removed if no longer applicable.

Chapter 2
Street Operations and Maintenance

Follow all environmental and safety procedures when using solvents to clean asphalt tools and equipment.

DO

- ✓ At the job site, scrape asphalt from tools and put back into the mix for reuse.
- ✓ Clean remaining asphalt from tools using a minimal amount of approved cleaner.
- ✓ At the facility, outside work is to be in a designated area that leads to a stormwater Best Management Practice or secondary containment
- ✓ Clean asphalt from the truck bed with shovels and other hand tools to decrease the amount of solvent needed for cleaning.
- ✓ Use approved cleaners to remove remaining asphalt.
- ✓ Collect cleaning materials that have solvents, cleaners and contaminated asphalt in drip pans, buckets or other storage container.
- ✓ Follow all safety procedures and Material Safety Data Sheets (MSDS) when using solvents.
- ✓ Store and handle wastes as hazardous materials.

DON'T

- ✖ Don't do this job until you have had training.
- ✖ Don't allow asphalt scrapings, diesel fuel or tool cleaners to contaminate soil, streams, ponds, storm drains or floor drains.
- ✖ Don't clean concrete tools and equipment near streams, ditches with running water, ponds, storm drains or floor drains.
- ✖ Don't pour cleaning wastes on the ground.
- ✖ Don't place asphalt wastes in used oil to be burned in used oil furnaces.

Materials & Waste Management

- ▲ Store waste cleaners, diesel and asphalt in 55 gallon drums labeled "Asphalt Waste".
- ▲ Conduct hazardous waste determination prior to disposal.

Facility Checklist

- ☐ Check the job site and facility-based cleanups ***MONTHLY*** during periods of active cleanup.
- ☐ Check the vehicle wash area ***MONTHLY*** to make sure it is clear of residual asphalt, concrete and cleanup wastes.
- ☐ Check ***MONTHLY*** to ensure that cleaning wastes and contaminated asphalt are properly stored in drums labeled "Asphalt Waste".

Tips and Tricks

- ! Asphalt wastes can clog oil furnaces.
- ! Work residual materials that are not contaminated with diesel into the asphalt stockpile.

If…Then

- ➤ If diesel or cleaners containing asphalt wastes are spilled, see **Chapter 7. Spills and Emergencies.**
- ➤ If a diesel fuel cleaning tank is available, use diesel for cleaning tools and equipment.
- ➤ If a diesel fuel cleaning tank is not available to keep it off the ground, use approved cleaners.
- ➤ If drip pans are not used, clean up work area to avoid exposure to drainage and rain.

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality	○ GWPP
	○ 401/404/WQC	● Waste
	● NPDES	○ Pesticides

2.1 CLEANING ASPHALT TOOLS AND EQUIPMENT

Leaves and other debris can clog storm drains and cause driving hazards.

Materials & Waste Management

▲ Transport gutter waste to the City of Madison Transfer Station.

▲ Transport leaf debris to the composting facility at the City of Madison Transfer Station.

▲ See **Chapter 6. Waste Management Fact Sheets** for wastes requiring special management.

Facility Checklist

☐ Ensure wastes requiring special management are handled appropriately within timeframes specified on **Chapter 6. Waste Management Fact Sheets**.

DO

✓ Inspect the leaf machine or Vac prior to use and maintain as needed.

✓ Plan the route to optimize useful road time.

✓ Use required safety equipment.

✓ Separate wastes requiring special management. (See **Waste Management Fact Sheets)**

✓ Operate the leaf machine according to the Operating Procedures.

✓ For leaf pickup, rake leaves to loosen them, pick up with leaf machine.

✓ When cleaning by hand, dislodge the debris with shovels, and use the bobcat to transfer the debris to a dump truck.

DON'T

✖ Don't perform gutter cleanout in areas where spills have not yet been cleaned up.

✖ Don't haul street sweeping to landfill.

Tips and Tricks

! Since routine gutter debris is considered non-hazardous, it can be disposed with street sweep waste.

If…Then

➤ Contact the Southeastern Indiana Solid Waste District for assistance with potentially dangerous waste.

➤ If an illegal dump is found, call the Southeastern Indiana Solid Waste District.

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality	○ GWPP
	○ 401/404/WQC	● Waste
	○ NPDES	○ Pesticides

2.2 GUTTER CLEANOUT AND LEAF REMOVAL

Improper disposal of animal carcasses can contaminate waterways, wells and spread disease.

DO

- ✓ Wear gloves.
- ✓ Promptly remove animal carcasses that are causing a traffic hazard.
- ✓ Respond promptly to complaints.
- ✓ Bury animal carcasses pursuant to local ordinances.
- ✓ Avoid areas where there are utilities when burying on the right of way.
- ✓ Bury animal carcasses at least 4 feet (preferred) deep and cover with 4 feet (preferred) of earth at least 100 feet from any waterway.
- ✓ Burial pits must be at least 50 feet from each other and any residence.
- ✓ Use lime to reduce odors and quicken decomposition.
- ✓ Animal carcasses may be taken to a nearby licensed animal renderer, or approved solid waste landfill.

DON'T

- ✗ Don't bury animal carcasses within 100 feet of any water, including wells, sinkholes, streams, ponds, or springs.
- ✗ Don't bury animal carcasses in groundwater.
- ✗ Don't dispose of animal carcasses next to a pasture or field containing livestock.
- ✗ Don't dispose of animal carcasses near any home or subdivision.
- ✗ Don't bury animal carcasses on private property without a consent release.
- ✗ Don't bury more than 10 animals in a pit.

Materials & Waste Management

- ▲ Contact the Jefferson County Animal Shelter.
- ▲ Burial on the right of way is an acceptable alternate method.
- ▲ Use of a licensed animal renderer or approved solid waste landfill is an acceptable alternative disposal method.

Facility Checklist

- ☐ Check to ensure that proper disposal methods are followed**.**
- ☐ Be sure utilities are not damaged when burying dead animals.
- ☐ Ensure complaints are addressed promptly**.**

Tips and Tricks

- ! Maintain a list of licensed animal renderers and approved solid waste landfills that will accept animal carcasses.
- ! Solid waste landfills may accept large carcasses if notified in advance.
- ! Composting may be a way to handle dead animals.

If…Then

- ➤ Contact the Southeastern Indiana Solid Waste District for assistance with potentially dangerous waste.
- ➤ If an illegal dump is found, call the Southeastern Indiana Solid Waste District.

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality	● GWPP
	○ 401/404/WQC	● Waste
	○ NPDES	○ Pesticides

2.3 DEAD ANIMAL PICKUP

Carefully pour pesticide directly into the sprayer tank and use a water supply with a backflow preventor to dilute to the needed concentration.

DO

- ✓ Place drums on pallets to move with a forklift.
- ✓ Store pesticides in the original container in a clean, dry location.
- ✓ Check spray equipment for leaks before use.
- ✓ Pump or pour pesticides directly into the spray tank of the sprayer unit.
- ✓ Use a water supply that has a backflow preventor to dilute pesticides to the needed concentration.
- ✓ Carefully watch the fill sight tube to avoid overfilling the spray tank.
- ✓ Rinse empty containers three times and pour rinse water into the spray tank.
- ✓ Apply all pesticides per label directions.
- ✓ Have a spill kit and an empty container available when pesticides are delivered or moved.
- ✓ Replace used spill kit materials within ***ONE MONTH***.

DON'T

- ✖ Don't accept leaking containers from delivery trucks.
- ✖ Don't overfill the spray tank.
- ✖ Don't reuse or burn empty pesticide containers.

Materials & Waste Management

- ▲ Return refillable pesticide containers to the vendor if agreed in the purchase contract.
- ▲ Store containers in a designated location to protect from damage, stormwater, destruction or theft.
- ▲ Containers that cannot be returned or recycled will be punctured and sent to a solid waste landfill that has agreed to accept the containers.
- ▲ See **Chapter 6. Waste Management** for handling absorbed materials and soils that contain pesticides and are hazardous.

Facility Checklist

- ☐ Check ***EACH*** delivery shipment and do not accept leaking containers.
- ☐ Check pesticide mixing and spraying operations ***WEEKLY.***
- ☐ Check equipment including sprayers and pumps ***WEEKLY*** during application season.
- ☐ Check pesticide spill kits in accordance with **Chapter 7. Spills and Emergencies**
- ☐ Check pesticide storage locatio***n ANNUALLY.***
- ☐ Review pesticide handling procedures ***ANNUALLY***, improve as needed.
- ☐ Ensure MSDS sheets are current and available ***ANNUALLY.***
- ☐ Ensure personnel handling and applying pesticides are trained and certified.

Tips and Tricks

- ! Park delivery vehicle on the uphill side of the tank to drain delivery hose easily.

If…Then

- ➤ Quickly contain and clean up spills or leaks using absorptive devices from spill kits.
- ➤ Return spilled pesticide to the spray tank.
- ➤ Contain absorbed material from spills or leaks and distribute it at a target pesticide application site.
- ➤ If absorbed pesticide material cannot be used, conduct a waste determination. Clean-up from spilled materials that are found to be non-hazardous can be disposed in a solid waste landfill.
- ➤ Contact the Fire Department for guidance regarding spills
- ➤ See **Chapter 7. Spills and Emergencies** for large spills.

Training: 1 per Year **Season**: Spring

Proper storage and use of fertilizer protects ground water, wells and streams from nutrient pollution.

DO

- ✓ Store bags of fertilizer indoors, on pallets, in clean, dry, weather-tight facilities.
- ✓ Use a storage area with a concrete or paved floor.
- ✓ Spread bulk fertilizer immediately.
- ✓ Apply fertilizer when dry weather is predicted for the next several days.
- ✓ Use a distribution buggy (spreader), tractor mounted Lely spreader or similar equipment to spread fertilizer evenly.
- ✓ Keep brooms, shovels, bags or other containers in the work area to clean up spills.

DON'T

- ✖ Don't store any fertilizer outside an assigned area.
- ✖ Don't store fertilizer outdoors.
- ✖ Don't store bulk fertilizer.
- ✖ Don't store fertilizer in wet locations or where rainwater runs toward the storage location.
- ✖ Don't store bags of fertilizer on dirt floors.
- ✖ Don't dispose of remaining fertilizer in streams, storm drains or sinkholes.

Materials & Waste Management

▲ Excess fertilizer should be properly stored or transferred to another location for use.

Facility Checklist

☐ Check the storage area ***MONTHLY***. Clean up any spilled materials.
☐ Inspect storage buildings ***ANNUALLY*** for weather tightness.

Tips and Tricks

If…Then

- ➤ If fertilizer is spilled then it must be swept up for reuse.
- ➤ If storage area is located in an area that floods, elevate or remove potentially hazardous materials from floodprone areas.

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality	● GWPP
	○ 401/404/WQC	○ Waste
	○ NPDES	○ Pesticides

2.5 FERTILIZER STORAGE AND APPLICATION

Chapter 3
Work In or Near Waterbodies

Loose rock and sediment may deposit at culvert and bridge openings and should be removed to prevent misalignment of the stream and erosion of the structures and nearby roadway.

DO

- ✓ Plan and obtain necessary approvals for waste disposal method(s) prior to beginning the job.
- ✓ Work only during no flow or low flow periods unless it's an emergency.
- ✓ Remove sediment from the site using the "One Step" method.
- ✓ Access the stream at one location.
- ✓ Plan to reuse sediment as fill for roadway maintenance activities.
- ✓ Seed and mulch disturbed areas along the stream bank.
- ✓ Install required erosion prevention and sediment controls correctly, inspect and maintain it per requirements.

DON'T

- ✖ Don't begin work without approvals from the regulatory agencies.
- ✖ Don't remove stream bank vegetation unless absolutely necessary.
- ✖ Don't remove large trees.
- ✖ Don't undercut banks.
- ✖ Don't channelize the stream or deepen the channel during this activity.
- ✖ Don't use equipment of any type in the stream without approval, or an approved permit as required, from the USACE or IDEM.
- ✖ Don't place sediment in the stream channel or floodplain.
- ✖ Don't flush the sediment into or within the stream.
- ✖ Don't remove materials during fish-spawning season.

Materials & Waste Management

▲ Separate trash from woody debris.

Facility Checklist

- ☐ Evaluate whether the "One Step" method shown in **Appendix 1** can be used to remove sediment.
- ☐ Ensure vehicles, equipment and safety equipment is available and in working order
- ☐ Inspect work in progress to ensure that stream disturbance is minimized.

Tips and Tricks

If…Then

➤ If equipment is placed in the water body, minimize the number of access points to the stream by **permit only**. Before equipment is put into a water body, a permit must be acquired and the permit must be followed.

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality	○ GWPP
	● 401/404/WQC	● Waste
	○ NPDES	○ Pesticides

3.1 SEDIMENT REMOVAL FROM STRUCTURES

Large debris jam on bridge.

"One-Step Method" for debris jam removal

DO

- ✓ Notify regulatory agencies if the "One Step" method cannot be used.
- ✓ Plan and obtain approvals for drift disposal method(s) prior to beginning the job.
- ✓ Work only during no flow or low flow periods unless it's an emergency.
- ✓ Obtain approval from Transportation Engineering Branch Manager for Operations for emergency work performed April 15th to June 15th.
- ✓ Use cable and einch to remove large trees from the stream.
- ✓ Use chain sawa to cut up large logs into smaller, more manageable pieces then lift to trucks for disposal.
- ✓ Put a front end loader inside large culverts to move th debris to the opening. Then use the "One Step" method to lift the debris from the stream.
- ✓ Where available, use long boom excavators to reach from the roadway to the streambed.
- ✓ When necessary, equipment designed to lift and trucks can be placed in the streambed.

DON'T

- ✖ Don't perform drift removal activity between April 15th to June 15th unless it's an emergency.
- ✖ Don't place bulldozers in the stream without approvals from the regulatory agencies.

Facility Checklist

- ☐ Before starting work, determine whether regulatory notification is required.
- ☐ Evaluate whether the "One Step" method shown in **Appendix 1** can be used.
- ☐ Ensure vehicles, equipment and safety equipment is available and in working order

Materials & Waste Management

- ▲ Separate trash, tires, barrels, unknown or hazardous wastes.
- ▲ Manage wastes according to **Chapter 6. Waste Management**

Tips and Tricks

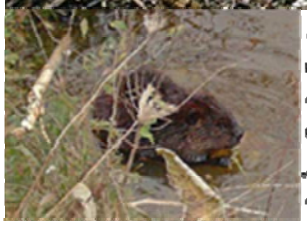
- ! Local transportation agencies should obtain approval for emergency work between April 15th and June 15th from the County Judge Executive.

If…Then

- ➤ If equipment such as front end loaders or cranes is placed in the waterbody, minimize the number of access points to the stream.

Training: 1 per Year **Season:** Spring

Relevant Environmental Programs	○ Air Quality ○ 401/404/WQC ● NPDES	○ GWPP ● Waste ○ Pesticides



Both the beaver and the dam must be removed to fully address potential flooding caused by beaver dams.

DO

- ✓ Work with a Nuisance Animal Control Officer to remove the beaver.
- ✓ Plan and obtain approvals for drift disposal method(s) prior to beginning the job.
- ✓ Work only during no flow or low flow periods unless it's an emergency.
- ✓ Obtain approval from for emergency work performed April 15th to June 15th.
- ✓ Prior to breaching the dam, inspect properties downstream of the dam site to evaluate flooding concerns.
- ✓ Breach the dam slowly so that discharge from the dam does not exceed normal high flows in the stream.
- ✓ Monitor the breach until normal flows have returned.
- ✓ Remove dam materials from the site using the "One Step" method and dispose away from the site.

DON'T

- ✖ Don't breach the dam until downstream flooding concerns have been addressed.
- ✖ Don't place bulldozers in the stream without approvals from the regulatory agencies.

Materials & Waste Management

- ▲ Separate trash from woody debris.
- ▲ Manage wastes according to **Chapter 6. Waste Management**

Facility Checklist

- ☐ Evaluate whether regulatory notification is required.
- ☐ Evaluate whether the "One Step" method shown in **Appendix 1** can be used.
- ☐ Ensure vehicles, equipment and safety equipment is available and in working order.
- ☐ Ensure that flooding concerns are addressed.

Tips and Tricks

- ! **Regulatory agencies typically do not need to be notified for this activity.**
- ! Local transportation agencies should obtain approval for emergency work between April 15th and June 15th.
- ! Remove dam materials from the site so that the beaver do not return and rebuild the dam.

If…Then

- ➢ If equipment is placed in the waterbody, minimize the number of access points to the stream.

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality	○ GWPP
	○ 401/404/WQC	● Waste
	● NPDES	○ Pesticides

3.3 BEAVER DAM REMOVAL

This bridge replacement includes stream isolation to minimize sediment discharge to the stream.

DO

- ✓ Obtain necessary approvals and permits prior to beginning work.
- ✓ Plan and obtain necessary approvals for waste disposal method(s) prior to beginning the job.
- ✓ Work only during no flow or low flow periods unless it's an emergency then get approval from supervisor and/or Utility Director.
- ✓ Work from the roadway and avoid using equipment in the stream unless permits are obtained.
- ✓ Access the stream at one location and use the "One Step" Method if equipment is placed in the stream.
- ✓ Work from the road to remove the old structure with a backhoe, Gradall, loader, hoe-ram or crane.
- ✓ Backfill as needed with broken concrete, crushed rock or creek rock from within the project area.

DON'T

- ✖ Don't begin work without approvals from the regulatory agencies.
- ✖ Don't place equipment in the stream.
- ✖ Don't use bulldozers in the stream.
- ✖ Don't remove streambank vegetation without approval.
- ✖ Don't remove large trees.

Materials & Waste Management

- ▲ Remove excavated materials and broken concrete from the stream and floodplain and stockpile for reuse on the project or at the facility.
- ▲ Remove timber concrete forms.

Facility Checklist

- ☐ Evaluate whether the "One Step" method shown in **Appendix 1** can be used to construct bench.
- ☐ Check work in progress to ensure that stream disturbance is minimized.

Tips and Tricks

- ! Repair eroding banks as soon as possible to protect roadways and aquatic life in streams.
- ! Check to see if permits are required before stream banks are disturbed then follow the permit requirements.
- ! Avoid removing materials during fish-spawning season.

If…Then

- ➤ If equipment is placed in the waterbody, determine if permit are required, **obtain necessary permits before starting work,** and use one access point to the stream.
- ➤ If demolition waste is dropped in the stream, remove it for reuse as rip rap or landfill disposal.
- ➤ If there is the potential for sediment runoff from disturbed soils, use erosion prevention and sediment controls that are approved. Inspect and maintain them until site is stable..

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality	○ GWPP
	● 401/404/WQC	○ Waste
	○ NPDES	○ Pesticides

3.4 BRIDGE AND CULVERT REPLACEMENT

Chapter 4
Winter Operations

Storing rock salt in a covered dome helps to protect surface and ground water from chloride contamination.

DO

- ✓ Check for, and correct, deficiencies in salt storage units.
- ✓ Keep salt dry by covering the entrance or the face of the salt pile with tarps.
- ✓ Sweep the storage areas clean before salt delivery and sweep up spilled salt after delivery.
- ✓ Move delivered salt into storage immediately.
- ✓ If salt is stored on an uncovered concrete or asphalt pad, shape the salt pile to avoid pooling water and cover immediately with a tarpaulin weighted with sand bags, cinder blocks, tires on ropes, etc.
- ✓ Store dry calcium chloride indoors on pallets.
- ✓ Load salt trucks on a paved surface.
- ✓ Sweep the paved staging area prior to loading trucks and sweep spilled salt back into storage.
- ✓ Load what is needed for the job and return unused product to storage.
- ✓ Use grading, berms, swales, curbs and dikes to prevent stormwater run-on and run-off; direct downspouts away from storage and loading areas.

Tips & Tricks

- ! Traffic dividers can be used to improve stockpiles of salt.

DON'T

- ✖ Don't leave salt unprotected from weather.
- ✖ Don't store salt on permeable surfaces.
- ✖ Don't use building walls as a backing for loading.
- ✖ Don't overfill storage areas.

Materials & Waste Management

- ▲ Dry calcium chloride or rock salt that becomes dirty is to be worked into future snow and ice operations.

Facility Checklist

- ☐ Check ***EACH*** salt delivery operation.
- ☐ Check salt pads ***DAILY*** for proper cover with tarps and signs of runoff when in use.
- ☐ Check salt storage areas ***DAILY*** during snow and ice season (October to April) for water-tight roof & floors, tarpaulin covers for entrances, ventilation fans, lights, and building damage. Immediately report repair needs to the facility superintendent.
- ☐ Check salt storage areas for white chloride deposits ***DAILY*** during snow and ice season and ***WEEKLY*** during the rest of the year.
- ☐ Check salt domes, sheds and pads ***MONTHLY*** between May and September for structural integrity and runoff issues.
- ☐ Check salt pads ***ANNUALLY*** during summer for cracks and wear; repair as needed.
- ☐ To prevent salt tracking watch for and move salt away from storage entrances where rain is blown in.

If…Then

- ➤ If bags of dry calcium chloride break open, sweep up and put into a new bag or clean container for future use.
- ➤ If rainfall pools around salt storage areas, construct a drainage ditch, dikes or re-grade the area to send runoff to an area treated by a BMP.
- ➤ If possible, the entrances of new salt storage facilities will face away from prevailing weather.

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality	○ GWPP
	○ 401/404/WQC	○ Waste
	● NPDES	○ Pesticides

4.1 STORING AND LOADING ROAD SALTS

Loading and calibrating salt trucks on impermeable surfaces will make loading and cleaning much easier.

DO

- ✓ Calibrate equipment each season to apply the correct amount of salts.
- ✓ Load salt trucks on an asphalt or concrete surface, return spilled salt to the storage area for reuse.
- ✓ Bring unused salt and liquid deicers back to the maintenance garage for re-stocking and use in other snow and ice events.
- ✓ Use shovels and hand tools to remove caked salt from the truck bed and return it to the salt storage area.
- ✓ Clean remaining salt with water only.
- ✓ Wash equipment in designated areas that drain to a stormwater quality BMP.

DON'T

- ✖ Don't overload the spreader avoid spilling salt.
- ✖ Don't store equipment without cleaning it first.
- ✖ Don't wash trucks in an area that is not designated for equipment cleaning.
- ✖ Don't dispose of unused salt along roadways, in ditches or near surface waters.

Materials & Waste Management

▲ Return caked salt to the covered storage facility for reuse.

Facility Checklist

- ☐ Check equipment and identify repair and replacement needs ***EACH SPRING.***
- ☐ Check equipment ***EACH FALL*** to ensure proper maintenance and initial calibration .
- ☐ Check and repair vehicles after ***EACH STORM.***
- ☐ Review calibration sheets to ensure proper applications.
- ☐ Maintain stormwater quality BMPs designated for equipment maintenance.

Tips and Tricks

! Critical calibration components include the automatic ground speed controller, the flight chain or belt, the gate opening, the chute, the liquid nozzles, the spinner and the deflectors.

If…Then

- ➤ If the floor drain is connected to a sewer or holding tank that is treated at a treatment facility equipment may be washed inside the facility.
- ➤ If the floor drain is discharged to a sediment pond or by permitted land application, equipment may be washed inside the facility.
- ➤ If the floor drain discharges to surface water or to a septic tank, do not wash equipment inside the building.
- ➤ If the pressure washer or steam cleaner is used, see the **Pressure Washers Fact Sheet.**

Training: 1 per Year **Season**: Fall

Relevant Environmental Programs	○ Air Quality ○ 401/404/WQC ● NPDES	○ GWPP ○ Waste ○ Pesticides

Goal: Provide acceptable level of service while using the minimum amount of materials.

DO

- ✓ Training in Snow and Ice Management is recommended for this activity.
- ✓ Evaluate road and weather conditions to tailor the type and timing of snow removal operations.
- ✓ Consider pavement temperatures instead of air temperatures when selecting treatment strategies.
- ✓ Plow snow or slush first, then apply salt.
- ✓ Control spreading speeds to reduce bounce and scatter.
- ✓ Apply materials to the middle of the road, where they are most effective.
- ✓ When re-applying, consider partial applications and spot treatments.
- ✓ Consider alternative treatments (e.g., plow only, use of snow fencing) which do not involve materials usage where applicable.

DON'T

- ✖ Don't overload the spreader.
- ✖ Don't do heavy "end of shift" applications that empty the trucks.
- ✖ Don't dispose of unused salt along roadways, in ditches or near surface waters; return it to the facility for reuse.

Materials & Waste Management

▲ Return salt to the covered storage facility for reuse.

Facility Checklist

☐ Check areas used to load deicing materials and clean up spilled materials.

Tips and Tricks

If…Then

- ➤ If you receive any citizen complaints about possible salt contamination, see the Contact Sheet to identify and call the appropriate contact.
- ➤ If there is a salt spill, recover as much salt as possible from the site when it is safe to do so.

Training: 1 per Year **Season**: Fall

Relevant Environmental Programs	○ Air Quality ○ 401/404/WQC ● NPDES	○ GWPP ○ Waste ○ Pesticides

4.3 PLOWING AND SPREADING OPERATIONS

This salt brine generator provides an environmentally sound method to generate brine.

DO

- ✓ Locate salt brine generators in an enclosed, heated shed near the salt storage area.
- ✓ Provide containment units made with concrete floors and walls.
- ✓ Include a five hundred (500) gallon concrete sump designed to contain the "end of operation" brine that cannot be moved when the brine maker is serviced. The division of Property and Supply Services has a standard drawing for brine generator buildings.
- ✓ Flush remaining brine from the generator to the sump, pump it into the storage tank or back into the generator or discharge to floor drains only when they are connected to city sewers.
- ✓ Sweep up spilled salt around the brine generator and on the grounds for reuse.
- ✓ Clean brine generator weekly when in use.
- ✓ Repair all problem areas prior to use.

DON'T

- ✖ Don't store salt brine in sump area for long periods when it can become contaminated.
- ✖ Don't release salt brine into or onto the ground.

Materials & Waste Management

- ▲ End of operation brine is to be contained and re-introduced into the process. It is not to be discharged to the lot.
- ▲ Gravel waste from the generator that is free of excess salt can be put in material stockpiles or scattered on the lot.

Facility Checklist

- ! Check the salt brine generator ***WEEKLY*** when in use. Look for releases of excess salt or brine and correct to eliminate them.

Tips and Tricks

- ! Calculate or predict the amount of salt needed to produce the target concentration for the volume of brine being generated. Make a higher concentration at the beginning and then flush the system to clear out the salt at the end. Then, the concentration of salt in the generator is relatively low when it is shut down for maintenance.
- ! The hydrometer can be used to check for an acceptable release concentration of salt in water. It should float no higher than one of the least division marks for the water to be safe for release.

If…Then

- ➤ See **Chapter 7** for spills outside the containment unit.

Training: 1 per Year **Season**: Fall

Relevant Environmental Programs	○ Air Quality	● GWPP
	○ 401/404/WQC	○ Waste
	● NPDES	○ Pesticides

4.4 GENERATING SALT BRINE

Secondary containment helps to protect surface and ground water from chloride contamination.

The containment wall drain plug remains closed except to release rainwater or snow melt.

DO

- ✓ Keep all storage tank connecting valves closed except when pumping to and from the tank.
- ✓ Ensure hoses and connections are not leaking before and during transfer of liquid de-icers.
- ✓ Put storage tanks in containment units with concrete floors and walls.
- ✓ Keep the containment wall drain plug closed except to release rainwater or snowmelt.
- ✓ Release rainwater or snowmelt before the depth inside the containment until reaches one (1) foot.

DON'T

- ✖ Don't open the containment wall drain plug if you know or suspect that liquid de-icers have leaked.

Materials & Waste Management

Facility Checklist

- ☐ Check containment unit after rains of 1" or more and at least ***MONTHLY*** for accumulation of water, ensure drain cap is on and product valves are closed.
- ☐ Test hoses and pipes for leaks and inspect for cracks ***EACH FALL*** prior to use.
- ☐ Check containment structure and drain plugs ***EACH FALL*** prior to use.

Tips and Tricks

- ! The hydrometer can be used to check for an acceptable release concentration of salt in water. It should float no higher than the lowest division mark for the water to be safe for release.

If…Then

- ➤ If you know or suspect that liquid de-icers have leaked, measure using a brine hydrometer or Total Dissolved Solids (TDS) meter.
- ➤ If there is a liquid de-icer spill, call Division of Environmental Analysis immediately.
- ➤ See **Chapter 7** for spills outside the containment unit.

Training: 1 per Year **Season**: Fall

Relevant Environmental Programs	○ Air Quality ○ 401/404/WQC ● NPDES	● GWPP ○ Waste ○ Pesticides

Clean trucks in an approved location that drains to a surface water monitoring point.

DO

- ✓ Work in locations that drain to a designated stormwater quality BMP.
- ✓ Clean trucks indoors only after obtaining the appropriate approval.
- ✓ Use shovels or other hand tools to scrape salt from the truck bed.
- ✓ Return loosened salt to the covered salt storage area for reuse.
- ✓ Use water to clean remaining salt from the vehicle and spreader.
- ✓ When washing trucks indoors, keep overspray off of the walls and doors of the maintenance building. Salt corrodes the metal parts.
- ✓ Keep water from running into storage stock piles or storage buildings.
- ✓ Inspect equipment during cleaning operation and maintain as needed, as per the **Vehicle and Equipment Parts Cleaning and Maintenance Fact Sheet.**

DON'T

- ✖ Don't let overspray collect on overhead doors and walls when cleaning vehicles indoors.
- ✖ Don't wash equipment in areas not designated for this activity on the Facility Stormwater BMP Plan.

Materials & Waste Management

- ▲ Return loosened salt to the covered salt storage area for reuse.

Facility Checklist

- ☐ Ensure that trucks are being washed in the location specified in the Facility Stormwater BMP Plan.
- ☐ Ensure loose salt is returned to the covered salt storage area.
- ☐ Check all storage locations and ensure all salt is under cover and cleaned up.
- ☐ Check truck washing and salt staging areas for white salt deposits; adjust operations to avoid salt build-up.
- ☐ Ensure that salt stored on pads is covered with tarps that are secured to keep them in place under windy conditions.
- ☐ Maintain stormwater quality BMPs designated for outside washing or equipment maintenance.

Tips and Tricks

- ! Tarps can be held in place using tires with ropes affixed to keep them spaced evenly over the stock piles.

If…Then

- ➤ If the pressure washer or steam cleaner is used, see **Pressure Washer Fact Sheet.**
- ➤ If salt builds up on the pavement or the ground, correct drainage and/or improve housekeeping to prevent salt accumulation.

Training: 1 per Year **Season**: Winter

Relevant Environmental Programs	○ Air Quality	○ GWPP
	○ 401/404/WQC	○ Waste
	● NPDES	○ Pesticides

4.6 POST STORM AND POST SEASON CLEANUP

Chapter 5
Facility-Based Operations and Maintenance

Don't pour waste fluids into floor drains

DO

- ✓ Use floor drains to dispose of wash water only.
- ✓ Floor drains are required to have a grit collector and oil/water separator.
- ✓ Remove accumulated materials from the oil trap if spills enter the drain.
- ✓ Clean the floor drain at least annually.
- ✓ Promptly repair leaks to the floor drain sump.
- ✓ Determine if a floor drain is necessary. If not, fill the drain with a plumber's plug or concrete.

DON'T

- ✖ Don't use the floor drain like a trash can.
- ✖ Don't pour waste oil, antifreeze, paint, cleaning fluids or other material into the floor drain.
- ✖ Don't allow spilled chemicals to get to the floor drain.
- ✖ Adding oil from the oil/water separator to the used oil tank is not recommended.

Materials & Waste Management

- ▲ Air dried sludge from floor drain may be disposed in a dumpster.
- ▲ Hazardous sludge from a spill must be managed by a hazardous waste vendor. (See the **Hazardous and Non-Hazardous Spills at the Facility Fact Sheet**)
- ▲ If the facility is connected to a sewer, the water (not the oil) from the oil/water separator may be discharged to the sewer system.
- ▲ An industrial cleaning service should be used to clean floor drains and oil/water separators at least annually or more often as needed. Non-hazardous oils may be added to the used oil tank.

Facility Checklist

- ☐ Check the drain trap ***MONTHLY*** for oil accumulation and leaks.
- ☐ Check grit collector and oil/water separators ***ANNUALLY.***
- ☐ Check the floor drain ***MONTHLY*** for solids accumulation on the bottom and floating material on the surface.
- ☐ Check spill kit in accordance with **Spills and Emergencies Fact Sheets.**

Tips and Tricks.

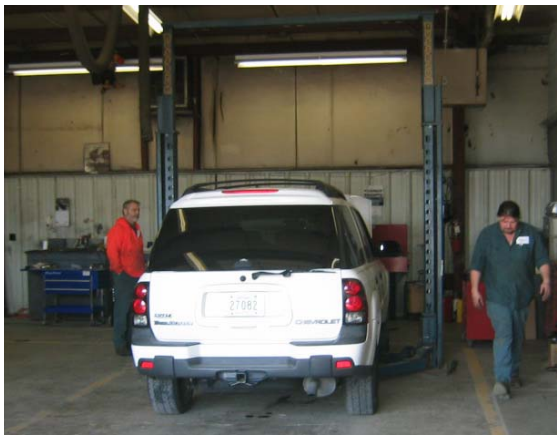
If…Then

- ➤ If used oil from the oil/water separator is contaminated with solvents or due to a spill, conduct a hazardous waste determination.

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality ○ 401/404/WQC ● NPDES	○ GWPP ● Waste ○ Pesticides

5.1 FLOOR DRAINS AND OIL-WATER SEPARATORS



Hydraulic fluid may contaminate groundwater if it is released.

DO

- ✓ Clean all exposed parts of the lift with a biodegradable cleaner prior to monthly equipment check.
- ✓ Record the date and amount of hydraulic oil that is added to the lift.
- ✓ If significant or frequent additions of hydraulic oil are needed, investigate for leaks.
- ✓ Report leaks promptly to the Manager.
- ✓ Ensure that all hydraulic oil is removed from the lift and sump prior to closure.

DON'T

- ✖ Don't exceed the rated capacity of the lift.
- ✖ Don't use the hydraulic lift if it is leaking.

Materials & Waste Management

- ▲ Remove hydraulic oil from the sump for reuse or dispose in the used oil tank. (See **Used Oil and Oil Filters Fact Sheet)**.
- ▲ Lifts that cannot be repaired will be decommissioned.
- ▲ Coordinate lift closure with the Engineer.
- ▲ All oils and sludges will be removed from the lift pit and a waste determination will be conducted.
- ▲ Non-hazardous oils may be added to the used oil tank.
- ▲ Sludge may be removed by an industrial waste vendor or air-dried and disposed in the dumpster.

Facility Checklist

- ☐ Identify equipment and vehicles that exceed the rated capacity of the lift.
- ☐ Check lift operations ***MONTHLY*** to ensure proper use.
- ☐ Check the lift sump and pump for leaks ***MONTHLY.***
- ☐ Check exposed piping, oil reservoir and controls for leaks ***MONTHLY.***
- ☐ Promptly issue a work order for repairs to the facility superintendent.

Tips and Tricks

- ! This fact sheet applies to lifts with a hydraulic oil capacity of 55 gallons or greater.

If…Then

- ➤ Use spill kits to intercept spills of hydraulic oil before they reach the oil/water separator or floor drain.

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality	○ GWPP
	○ 401/404/WQC	● Waste
	● NPDES	○ Pesticides

5.2 HYDRAULIC LIFTS

Leaking above ground storage tanks can cause fires or explosions. In addition, leaking ASTs can contaminate nearby surface and ground water.

DO

- ✓ Tanks must be located on an asphalt or concrete base or on impermeable soil.
- ✓ Secondary containment for tanks must be at least 110% of tank capacity.
- ✓ Keep product transfer valves closed when not in use.
- ✓ For waste tanks, report to the Facility Manager when levels reach 80% of tank capacity.
- ✓ Check the condition of the tank for damage, spills, leaks or other issues each time the tank is used.
- ✓ Promptly report concerns to the Facility Manager.
- ✓ A trained employee shall be present during all filling operations.
- ✓ Ensure that all connections are tight before filling or pump out operations begin.
- ✓ Record the date and volume of waste removed, hauler and treatment facility receiving the waste.
- ✓ Remove collected oil before release of rain water.
- ✓ Release rainwater or snowmelt before the depth inside the containment unit reaches one foot.

DON'T

- ✖ Don't accept deliveries or continue to use tanks that are known or suspected to be leaking.
- ✖ Don't add to waste storage tanks that are full.
- ✖ Don't allow release of oil or other contaminants.

Materials & Waste Management

▲ See **Used Oil and Oil Filters Fact Sheet** for used oil storage tank management.

Facility Checklist

- ☐ Check tank filling and containment draining ***DAILY*** or during activity.
- ☐ Visually check the secondary containment and tank area ***WEEKLY*** and report leaks, spills and maintenance issues to the Manager immediately.
- ☐ Check valves, automatic shut-off valves and pipes ***MONTHLY*** and before materials transfer.
- ☐ Check waste tank level indicators ***MONTHLY***, and plan waste management accordingly.
- ☐ Check corrosion resistant tanks and pipes at the manufacturer's recommended schedule.
- ☐ Check spill kit in accordance with **Chapter 7. Spills and Emergencies.**

Tips and Tricks

- ! Above Ground Storage Tanks include: asphalt, used oil, and tack oil.
- ! A container is any tank or drum with a capacity of 55 gallons or more and includes stationary and mobile (fuel or hydraulic) tanks.

If…Then

- ➤ Contain and clean-up spills and leaks immediately. Spilled materials that are wastes or are suitable for use can be returned to the tank or similar container
- ➤ If there is a release or confirmed contamination, report it immediately to the Fire Department. (See **Chapter 7. Spills and Emergencies**)

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality	○ GWPP
	○ 401/404/WQC	○ Waste
	○ NPDES	○ Pesticides

5.3 ABOVE GROUND STORAGE TANKS (ASTs)

DO

- ✓ Any underground storage tank subject to the federal UST rules must be registered by the Indiana Division of Waste Management and follow the UST program regulations. This fact sheet applies to tanks used for wastewater management and to other tanks not regulated by the UST rules.
- ✓ For tanks used to store a delivered product, a designated employee shall be present during all filling operations.
- ✓ Remove contents from leaking tanks and do not use until the tank is repaired.
- ✓ Remove contents form tanks before taking the tank out of service.
- ✓ Service tanks storing floor drain wastes or other wastewater when the tank approaches 80% full.
- ✓ Record the date and volume of wastewater removed, hauler and treatment plant receiving the waste.
- ✓ Peform tightness inspections or tank tightness tests once every three years.

DON'T

- ✖ Don't accept delivery of new product or continue to use tanks that are known or suspected to be leaking.
- ✖ Don't continue to use wastewater storage tanks that are full.

If…Then

- ➤ Contain and clean-up spills and leaks immediately.
- ➤ If there is a release or confirmed contamination, report it immediately to the Division of Environmental Analysis. (See **Section 5**)
- ➤ If the tank is not part of a closed system or cannot be inspected or tested for leaks, take it out of service.

Materials & Waste Management

▲ Tank removal must be coordinated through the Division of Environmental Analysis RCRA Coordinator and performed by a certified removal operator.

Leaking underground storage tanks can cause fires or explosions. In addition, leaking UST's can contaminate nearby groundwater.

Facility Checklist

- ☐ Designate a trained employee to oversee product delivery to underground storage tanks.
- ☐ Check wastewater tank level indicators ***MONTHLY.***
- ☐ Check corrosion resistant tanks and pipes at the manufacturer's recommended schedule.
- ☐ Check all active underground storage tanks for leaks ***EVERY 3 YEARS.***

Tips and Tricks

- ! This factsheet applies to ***unregulated UST's.*** If the UST must be registered, contact the Division of Environmental Analysis.
- ! ***Unregulated underground*** storage tanks include:
  - Any underground heating oil storage tank;
  - Any underground tank used to store products other than petroleum; and
  - Any underground petroleum storage tank with less than 1,100 gallon capacity.
- ! Petroleum products include fuel, kerosene, used oil, etc.
- ! Regulated underground storage tanks are used to store petroleum with a capacity of more than 1,100 gallons. These tanks have been removed from service.
- ! Detailed information regarding UST requirements is available from USEPA's UST Program at http://www.epa.gov/swerust1/ustsystm/index.htm

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality	○ GWPP
	○ 401/404/WQC	○ Waste
	○ NPDES	○ Pesticides

5.4 UNDERGROUND STORAGE TANKS (ASTs)

Carefully check the tank, containment unit and all connections prior to product delivery or waste pump out.

DO

- ✓ The Facility Manager will provide training and designate a trained employee to oversee tank trucks on the lot.
- ✓ Carefully check the tank, containment unit and all connections prior to product delivery or waste pump out.
- ✓ The designated employee or Facility Manager will inspect the tank truck upon arrival and departure to prevent spills while in transit on the lot.
- ✓ Park and properly brake the truck in the designated zone near the storage tanks.
- ✓ Check the product level in tank prior to filling.
- ✓ Check all hoses and connections before beginning material transfer.
- ✓ Constantly monitor material transfer and levels in the tank.
- ✓ Close the truck valve and drain the hose, then close the tank valve.
- ✓ Close and check all tank valves and connections.
- ✓ Record the material transfer as required.
- ✓ See **Above Ground Storage Tanks Fact Sheet** for more information regarding storage tanks.

DON'T

- ✖ Don't leave the area for any reason while materials are transferred between the tank and the truck.
- ✖ Don't overfill the tank.

Materials & Waste Management

Spilled materials that are suitable for reuse can be returned to the tank or similar container.

Facility Checklist

- ☐ Supervise filling or pumping out ***DAILY*** or during activity.
- ☐ Check valves, automatic shut-off valves and pipes ***MONTHLY*** and before materials transfer.
- ☐ Check spill kit in accordance with **Chapter 7. Spills and Emergencies**.

Tips and Tricks

- ! Park delivery vehicle on the uphill side of the storage tank to drain delivery hosing easily.

If…Then

- ➤ Contain and clean-up spills and leaks immediately.
- ➤ If there is a release or confirmed contamination, report it immediately to the Fire Department. (See **Chapter 7. Spills and Emergencies**).

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality	○ GWPP
	○ 401/404/WQC	● Waste
	● NPDES	○ Pesticides

5.5 LOADING AND UNLOADING TANK TRUCKS

Secondary containment is used to protect the area in the event of a spill

DO

- ✓ Locate the bulk liquid storage area where spill containment can be readily accomplished, away from floor drains, or where spills could reach water in the area designated in the permit.
- ✓ Secondary containment requirements (100% for indoor drums, 110% for outdoor drums) apply to bulk oil (motor, hydraulic, tack) and grease.
- ✓ Place containers that are in use on spill pallets.
- ✓ Bulk liquids may be moved with front-end loader, backhoe, forklift or other equipment. The container should be secured with chains or other restraining devices.
- ✓ Forklifts should have a barrel or tote lifter.
- ✓ Use a pump or valve and tilt rack to transfer bulk liquids to smaller containers or for use.
- ✓ Completely empty containers.

DON'T

- ✖ Don't allow any leaking containers to be unloaded from delivery trucks.
- ✖ Don't dispose of unused bulk liquids in any floor drains, streams, sinkholes, storm sewers, sanitary sewers or on the ground.
- ✖ Don't store drums upright in the outdoors where water can damage the container and contaminate the contents.
- ✖ Do not store materials that can freeze in unheated areas.

Materials & Waste Management

- ▲ Empty drums that are not collected by the vendor shall be sent to a solid waste landfill.
- ▲ Spilled materials that are suitable for use can be returned to the tank or similar container.

Facility Checklist

- ☐ Check ***ALL*** bulk liquid deliveries to ensure all containers are intact before unloading.
- ☐ Check liquid bulk storage areas ***WEEKLY*** to ensure containers are intact.
- ☐ Check drums for labeling, bulging, rusting or other damage.
- ☐ Check spill kit in accordance with **Chapter 7. Spills and Emergencies.**

Tips and Tricks

- ! Purchase oil in small containers to help keep from having to implement an SPCC plan.
- ! ***Bulk liquids*** are stored in 55 gallon or larger containers.
- ! AST's shall be clearly labeled and handled separately.
- ! ***Empty*** means "no removable residue" remains in the container.
- ! ***Empty*** for 55 gallon drums means less than 1 inch of liquid remains in the drum.
- ! SPCC requirements apply to bulk oil and grease storage.
- ! Empty drums found on Right of Way should be checked by the Fire Department and disposed of properly.
- ! Before sending marked or labeled drums to landfill, call vendor to request pick up.

If…Then

- ➤ Have a spill kit and an empty barrel available at all times to contain spills or leaks.
- ➤ Contain and clean up spills using spill kits. See **Chapter 7. Spills and Emergencies.**

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality	○ GWPP
	○ 401/404/WQC	● Waste
	● NPDES	○ Pesticides

5.6 HANDLING BULK LIQUIDS

Proper storage and use of fertilizer protects ground water, wells and streams from nutrient pollution

DO

- ✓ Store bags of fertilizer, dry calcium chloride or other bulk materials indoors, on pallets, in clean, dry, weather-tight facilities.
- ✓ Use a storage area with a concrete or paved floor.
- ✓ Keep brooms, shovels, bags or other containers, in the work area to clean up spills.
- ✓ Bulk materials not in bags are to be applied when purchased.

DON'T

- ✖ Don't store any fertilizer, calcium chloride or other bulk materials outside.
- ✖ Don't store bulk materials that are not in bags.
- ✖ Don't store bulk materials in wet locations or where rainwater runs toward the storage location.
- ✖ Don't store bags of bulk materials on dirt floors.
- ✖ Don't dispose of un-used bulk materials in streams, storm drains or sinkholes.

Materials & Waste Management

▲ Excess fertilizer should be properly stored in a dry location.

Facility Checklist

- ☐ Check storage areas ***MONTHLY*** for proper storage.
- ☐ Check the storage area ***ANNUALLY*** to ensure it is weather tight.
- ☐ Review storage procedures ***ANNUALLY***, improve as needed.

Tips and Tricks

! This fact sheet does not apply to bulk storage of road salt.

If…Then

- ➤ If the storage area is located in an area that floods, protect stored materials from water damage, and potential water pollution, by elevating or removing from floodprone areas.
- ➤ Spilled bulk materials must be swept up for reuse.
- ➤ If spilled materials can not be re-used, the Utility Director should be contacted for guidance on disposal.
- ➤ Notify the Fire Department if flammable bulk dry materials are spilled and are, or can be, exposed to weather.

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality ○ 401/404/WQC ○ NPDES	○ GWPP ○ Waste ○ Pesticides

5.7 BULK DRY MATERIALS STORAGE

Clean trucks and equipment in the designated location.

DO

- ✓ Wash vehicles only in designated vehicle wash stations that drain to a grit collector and oil/water separator.
- ✓ Outside washing areas must drain to a designated stormwater quality BMP.
- ✓ Keep vehicles and equipment in clean and good working order.
- ✓ Repair leaks of oil, transmission and hydraulic fluid, radiators, etc., promptly.
- ✓ Collect waste wash water from degreasing and place it in containers for removal and proper disposal.
- ✓ See the **Pressure Washers Fact Sheet** when using pressure washers and steam cleaners.
- ✓ See the **Post Storm and Post Season Cleanup Fact Sheet** for post storm cleanup.
- ✓ Operate parts washer per the manufacturer's instructions.

DON'T

- ✖ Don't allow pressure washer overspray to collect on building walls or doors.
- ✖ Don't allow spilled solvent or degreasing wastes to reach the floor drain.
- ✖ Don't use soaps or detergents for outdoor cleaning operations.

Materials & Waste Management

- ▲ Store collected drip pan waste in clearly labeled drums.
- ▲ Conduct a hazardous waste determination for collected degreasing wastes.
- ▲ Dispose of collected wastes using an industrial waste vendor.

Facility Checklist

- ☐ Check to ensure vehicle and equipment cleaning is being done in the designated location.
- ☐ Maintain stormwater quality BMPs designated for outside washing or equipment maintenance.

Tips and Tricks

- ! Know whether floor drains are connected to a sanitary sewer system or holding tank and waste water is removed to a treatment facility.

If…Then

- ➤ If solvents or degreasing wastes are spilled, contain the spill and clean up using a spill kit. See **Chapter 7. Spills and Emergencies.**

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality ○ 401/404/WQC ● NPDES	○ GWPP ● Waste ○ Pesticides

Wastes from pressure washers must be carefully managed to prevent contamination and ensure permit compliance.

DO

- ✓ Operate the pressure washer as per the manufacturer's operating instructions.
- ✓ Collect all wastewater from water-based or solvent-based *degreasing operations* in drip pans.
- ✓ Store drip pan waste in drums and conduct a hazardous waste determination.
- ✓ For outdoor cleaning, use water only (no soap).
- ✓ For outdoor *cleaning operations*, wastewater must flow to an approved BMP such as an oil/water separator.
- ✓ Remove dirt from heavy equipment outdoors.
- ✓ See the **Post Storm and Post Season Cleanup Fact Sheet** for cleaning salt and deicer trucks.

DON'T

- ✖ Don't allow pressure washer overspray to get on building walls or doors.
- ✖ Don't allow spilled solvent or degreasing wastes to reach the floor drain.
- ✖ Don't use soaps or detergents for outdoor cleaning operations.
- ✖ Don't degrease outdoors.

Materials & Waste Management

- ▲ Store collected drip pan waste in clearly labeled drums.
- ▲ Conduct a hazardous waste determination for collected degreasing wastes.
- ▲ Dispose of collected degreasing wastes using an industrial waste vendor.

Facility Checklist

- ☐ Identify and approve work locations and conditions for pressure washers.
- ☐ Check use of pressure washers ***MONTHLY*** to ensure proper procedures are being followed.
- ☐ Check runoff from outdoor use ***AT RANDOM*** several times per year to ensure that use will not cause a violation of the permit limits.
- ☐ Check spill kit in accordance with **Chapter 7. Spills and Emergencies.**

Tips and Tricks

- ! Cleaning operation means removing deicers or dirt from equipment and vehicles using water only.
- ! Degreasing operation means using the pressure washer with water or solvents to remove grease, tar, oils, etc., from engines, vehicles and equipment.
- ! The preferred discharge location for pressure washer cleaning operations is to a floor drain that is connected to a sewer system.
- ! Soaps and detergents can cause emulsions and lead to failure of oil/water separators.

If…Then

- ➤ If solvents or degreasing wastes are spilled, contain the spill and clean up using a spill kit.

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality	○ GWPP
	○ 401/404/WQC	● Waste
	● NPDES	○ Pesticides

5.9 PRESSURE WASHERS

If maintained properly, the hot water parts washer and solvent washer provide environmentally sound, no discharge methods for cleaning parts.

DO

- ✓ Operate parts washers per the manufacturer's instructions.
- ✓ Use a contract vendor to service and manage wastes from solvent washers.
- ✓ Use the "cook down" cycle to clean the hot water parts washer.
- ✓ Air dry the waste residue from the hot water parts washer and dispose in the dumpster.
- ✓ Transfer the contents of the hot water parts washer to drums during maintenance and return them to the washer for reuse or elimination.
- ✓ Have a waste determination done on the residue from the hot water washer once each year and when types of soap or additives are changed.

DON'T

- ✖ Don't drain the solvent washer or hot water parts washer to the floor drain.
- ✖ Don't use mineral spirits, citrus-based cleaner or other cleaners in the hot water washer.

Materials & Waste Management

- ▲ Reuse fluids recovered from spills if possible.
- ▲ If fluids cannot be reused, contact the vendor for the solvent washer for recovery and replacement or conduct a waste determination and use an industrial waste vendor for removal of wastes.
- ▲ If dry wastes are non-hazardous, dispose with the solid waste.

Facility Checklist

- ☐ Check use of parts washer ***QUARTERLY*** to ensure proper procedures are being followed and that the unit is kept clean.
- ☐ Check spill kit in accordance with **Chapter 7. Spills and Emergencies**.

Tips and Tricks

If…Then

- ➤ If spills or leaks from the solvent parts washer occur, contain the spill and protect the floor drain.
- ➤ Use a spill kit to clean up the solvent.

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality ○ 401/404/WQC ○ NPDES	○ GWPP ● Waste ○ Pesticides

5.10 PARTS WASHERS

Chapter 6
Waste Management

Reducing, reusing, recycling, and exchanging reduce environmental concerns, improve safety and reduce costs.

DO

- ✓ Reduce, reuse, recycle and exchange as the first step in managing solid waste.
- ✓ ***Reduce*** the amount of wastes generated and toxicity of products used to the greatest extent possible.
- ✓ ***Reuse*** concrete, asphalt and soil for road repair.
- ✓ ***Recycle*** newspaper, cardboard, glass, plastic and metal containers and items, copper wire and tubing, rubber, and other items at local recycling facilities.
- ✓ ***Exchange*** vehicle batteries, water pumps, carburetors, alternators, pesticide containers, etc., with vendors or when local purchases are made.
- ✓ Use available recycling contracts.
- ✓ Store materials for recycling in a location that is consistent with the permit.
- ✓ Divert runoff from recycling storage locations.
- ✓ Always ask for a Material Safety Data Sheet (MSDS) before ordering any new product.
- ✓ Keep lids on all solvents and turn off solvent parts washer when not in use.
- ✓ Have qualified personnel service equipment that contains Freon.

DON'T

- ✖ Don't throw away items that can be reused, recycled or exchanged.
- ✖ Don't accumulate batteries; avoid regulation.

Materials & Waste Management

- ▲ Follow appropriate guidelines from recycling contracts, vendors or recycling centers for allowable items, materials management, separation, and transportation arrangement.
- ▲ Double wrap broken or cracked vehicle batteries in heavy plastic and exchange promptly.

Facility Checklist

- ☐ Check storage areas for recyclable materials to ensure that the handlers' conditions are being met.
- ☐ Check to ensure that materials are routinely transferred to a recycling vendor or facility.

Tips and Tricks

- ! Containers that can be recycled: washer fluid, new oil, new anti-freeze, battery acid gas line anti-freeze, diesel conditioner, radiator cleaner, brake fluid, starting fluid, liquid soap, solvents, brake cleaner, carburetor cleaner, paints, toluene, hand cleaner, janitorial products, etc.
- ! Recycling contracts may be available for tires, batteries, anti-freeze, vehicle oils, oil filters, fuel filters, parts cleaning machine systems, etc.
- ! Recycling and exchanging materials is a good housekeeping practice and ensures compliance with hazardous waste and solid waste regulations and avoids costly penalties.
- ! Remember that "biodegradable" does not necessarily mean environmentally safe or that the product is exempt from regulations.
- ! Solvent losses due to evaporation, equipment leaks or spills and inappropriate usage can range from 25-40 percent.

If…Then

- ➤ If you are not sure whether an item can be recycled, contact the IDEM Office of Pollution Prevention and Technical Assistance (OPPTA).

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality	○ GWPP
	○ 401/404/WQC	● Waste
	● NPDES	○ Pesticides

Your gateway to the landfill for solid wastes.

DO

- ✓ Arrange for solid waste service that provides covered dumpsters.
- ✓ Place trash in dumpster and close the lids.
- ✓ Keep dumpsters closed from weather.
- ✓ Have damaged dumpsters replaced or repaired.
- ✓ Use plastic bags for litter patrols and other solid waste.
- ✓ Store potentially hazardous left over products in a compatible, intact container.
- ✓ Keep water from running through stored solid waste.
- ✓ Have wastes hauled off before they over fill containers.
- ✓ Recycle as much material as feasible (cardboard, metals, glass, etc.) to keep it out of landfills. See the **Reduce, Reuse, Recycle and Exchange Fact Sheet**.
- ✓ Obtain approval for spill cleanup waste from the landfill owner.
- ✓ Store spent lamps, waste mercury thermostats and non-lead acid batteries in closed, structurally sound containers.
- ✓ Clearly label containers of re-usable or waste antifreeze.

DON'T

- ✖ Don't dispose of hazardous wastes in the dumpster.
- ✖ Don't dispose of whole tires, lead-acid batteries, liquids, large spill clean-up.
- ✖ Don't store solid wastes that are not in a dumpster on site for more that 30 days.
- ✖ Don't place spill cleanup in the dumpster unless approved by waste handler.

Materials & Waste Management

▲ Waste from hazardous materials may or may not be hazardous wastes. Have these wastes evaluated. Contact the Fire Department for assistance when needed.

▲ Solid waste landfills are the authority on what may or may not be disposed at their facility.

Facility Checklist

☐ Check solid waste storage areas ***WEEKLY***.

Tips and Tricks

- ! Most things that may go into the dumpster are empty containers and wastes that are not hazardous waste and wastes that do not have free liquids.
- ! Clean-up from small spills (one or two bags) of "un-used" oil may go into the dumpster.
- ! Clean-up waste of spills of any fluids from equipment must be contained and evaluated.
- ! Liquid wastes generally cannot drip to be accepted at the landfill.

If…Then

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality	○ GWPP
	○ 401/404/WQC	● Waste
	● NPDES	○ Pesticides

6.2 SOLID WASTE MANAGEMENT

DO

- ✓ Store ***spent lamps*** that contain hazardous components in boxes, drums or other containers.
- ✓ Store waste ***mercury thermostats*** and ***non-lead acid batteries*** in closed, structurally sound containers.
- ✓ Repackage damaged universal waste containers in a closed, structurally sound container that is compatible with the waste and protects against damage and leaks.
- ✓ Clearly label the container "Universal Waste – (contents)".
- ✓ Store Universal Wastes for up to 1 year.
- ✓ Contact IDEM Hazardous Waste Management for assistance with traffic switches that contain mercury and other questions regarding universal waste.

DON'T

- ✖ Don't crush spent lamps.
- ✖ Don't remove mercury ampules from thermostats.
- ✖ Don't put Universal Wastes in the dumpster.

Materials & Waste Management

- ▲ Separate fluorescent lamp ballasts from bulbs and manage as a hazardous waste.
- ▲ Manifests are not required for shipment.
- ▲ Contact the Southern Indiana Solid Waste District for universal waste management information.

Facility Checklist

- ☐ Check and approve Universal Waste storage location and methods.
- ☐ Check containers ***QUARTERLY*** to ensure containers are closed, sound and properly labeled.
- ☐ Ensure that Universal Wastes are removed by an appropriate handler ***ANNUALLY.***

Tips and Tricks

- ! Universal Wastes are:
  - lamps
  - mercury thermostats
  - non-lead acid batteries
- ! Spent lamps include: fluorescent lamps, high pressure sodium, mercury vapor, metal halide, high intensity discharge (HID) and neon bulbs or tubes.
- ! Lead acid batteries are typically exchanged when the new battery is purchased.

If…Then

- ➤ Use a mercury spill cleanup kit to immediately clean up broken ampules.
- ➤ Sweep broken lamps and dispose of glass in the dumpster; include remaining lamp parts with Universal Waste.

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality	○ GWPP
	○ 401/404/WQC	● Waste
	○ NPDES	○ Pesticides

Antifreeze that contains more than 5 mg/l (ppm) TCLP lead must be managed as a hazardous waste.

DO

- ✓ Collect all antifreeze drained from vehicles.
- ✓ If the antifreeze is usable, return it to the vehicle.
- ✓ The garage is to manage all of the antifreeze not returned to vehicles.
- ✓ Clearly label containers of re-usable or waste antifreeze.
- ✓ Store waste antifreeze in re-sealable, plastic, 30 gallon, or smaller, drums.
- ✓ Store waste antifreeze indoors, in a secure location.
- ✓ Maintain a log for each drum of waste antifreeze to record the first date antifreeze is added and the date the drum is filled.
- ✓ Drums of waste antifreeze will be tested for TCLP lead when 25 gallons has accumulated, or as needed.
- ✓ If the lead test result is over 5 mg/l TCLP lead, manage the waste as a hazardous waste.
- ✓ The facility must register as a Hazardous Waste Generator if more than 25 gallons per month of waste antifreeze is collected and it is hazardous.

DON'T

- ✖ Don't pour waste antifreeze in a floor drain, storm drain, septic system, dry well or on the ground.
- ✖ Don't mix other wastes, used oil, cleaners, solvents or brake fluid with waste antifreeze.

Materials & Waste Management

- ▲ Contact a Laboratory to request tests for total lead and TCLP lead.
- ▲ A chain of custody form, provided by the laboratory, must accompany each sample.
- ▲ Send a copy of the chain of custody and test results to the Facility Manager.
- ▲ Waste antifreeze is non-hazardous if total lead or TCLP lead is less than 5 mg/l (ppm).

Facility Checklist

- ☐ Monitor re-useable and waste antifreeze storage drums for leaks, spills and housekeeping ***DAILY.***
- ☐ Check waste antifreeze volumes ***MONTHLY.***
- ☐ Check recordkeeping ***MONTHLY.***
- ☐ Check spill kit in accordance with **Spills and Emergencies Fact Sheets**

Tips and Tricks

- ! A 30 gallon drum of antifreeze weighs 270 pounds

If…Then

- ➤ Immediately contain and clean up all spills, using a spill kit. (**See Spills and Emergencies Fact Sheets**)
- ➤ Immediately protect floor drains from a spill with absorbent socks or pillows.
- ➤ Immediately pump waste antifreeze from leaking drums into a secure container.

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality ○ 401/404/WQC ○ NPDES	○ GWPP ● Waste ○ Pesticides

6.4 WASTE ANTIFREEZE

This used oil tank is stored indoors, clearly labeled and the work area is orderly

DO

- ✓ Maintain a 250 to 660 gallon used oil storage tank above ground**,** indoors protected from weather, in good condition, on an asphalt or concrete base and clearly labeled.
- ✓ Motor oil, hydraulic oil, transmission and power steering fluid, gear and lube oil are "used oils".
- ✓ Drain oil filters on the drain rack for 24 hours and place in the Used (Waste) Oil Filter drum.
- ✓ Notify the Facility Manager when the tank reaches 80% full.
- ✓ The Facility Manager will promptly request vendor removal.
- ✓ Notify IDEM if a spill is 25 gallons or more of a petroleum product within a 24-hour period or 75 gallons or more of diesel fuel in a 24-hour period or any amount that creates a visible sheen on surface waters.

DON'T

- ✖ Don't add other wastes such as cleaners, brake fluid or used antifreeze to used oil.
- ✖ Adding oil from the oil/water separator to the used oil tank is not recommended when the oil is part of a used oil furnace fuel supply.
- ✖ Don't pour used oil in a storm drain, septic system, floor drain, dry well, sewer or on the ground for disposal, dust or weed control.

Materials & Waste Management

- ▲ Drained used oil filters should be recycled.
- ▲ Small amounts of used absorbent materials can be sent to an approved solid waste landfill.
- ▲ Use an approved vendor to move used oil and oil filters to recycling facilities
- ▲ Hot drained oil filters may be sent to a solid waste landfill, with prior approval from the operator.
- ▲ Notify the facility superintendent of all spills at the facility.

Facility Checklist

- ☐ Check for leaks, spills and housekeeping ***DAILY.***
- ☐ Check oil levels ***WEEKLY.***
- ☐ Check spill kits in accordance with **Spills and Emergencies Fact Sheets**.

Tips and Tricks

- ! Run equipment until operating temperature is reached (about 20 minutes) to completely drain oil.
- ! Crushing oil filters conserves space.
- ! The use of oil for dust control is prohibited

If…Then

- ➤ If the spill can't be safely and effectively handled by facility personnel, the facility superintendent will promptly **call 911 or the Fire Department.**
- ➤ If the spill reaches a waterbody or storm drain, immediately notify the **Fire Department.**

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality	○ GWPP
	○ 401/404/WQC	● Waste
	● NPDES	○ Pesticides

6.5 USED OIL AND FILTERS AND SPILLS

Concrete may be reused as road fill or in gabion baskets. Metal guardrails can be straightened.

DO

- ✓ Reuse or recycling are the preferred options.
- ✓ Disposal in a construction and demolition (C&D) or an approved solid waste landfill are less preferable options.
- ✓ Reuse concrete for road repair and in-stream projects (gabion baskets, rip rap, fill).
- ✓ Reuse aluminum and steel guardrails for road repair projects.
- ✓ Reuse metal drums for storing wastes.
- ✓ Use a drum recycling vendor to remove excess empty drums.
- ✓ Divert runoff from storage locations.
- ✓ Store concrete and metal in an orderly way to encourage reuse and recycling.
- ✓ Remove excess materials periodically to keep the lot in good order.

DON'T

- ✖ Don't allow water to collect on or in stored materials or drums.

Materials & Waste Management

- ▲ Concrete is considered "inert" material by the IDEM and may be used as "clean fill" for projects.
- ▲ Concrete waste that can not be used in projects may be disposed in C&D waste landfills.
- ▲ Use a metal recycling vendor for metal items that cannot be reused.
- ▲ Metal items may be sent to an approved solid waste landfill.

Facility Checklist

- ☐ Check storage locations to ensure compliance with the permit.
- ☐ Check drainage to ensure runoff is diverted away from storage locations.
- ☐ Check to ensure wastes are stored separately by type of material.

Tips and Tricks

- ! C&D landfill disposal fees are lower than solid waste landfill fees.
- ! Metal and concrete wastes do not cause ground water pollution and are therefore excluded from the Ground Water Protection Plan.

If…Then

- ➤ Use spill kits to intercept spills of hydraulic oil before they reach the oil/water separator or floor drain.

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality	○ GWPP
	○ 401/404/WQC	● Waste
	● NPDES	○ Pesticides

6.6 METAL AND CONCRETE WASTE

Covered storage for waste tires reduces mosquitoes that may carry disease. This tire storage container needs to be covered.

DO

- ✓ Facilities that handle more than 100 waste tires must be registered with the Division of Waste Management. Size is not a factor when counting to determine if registration is required.
- ✓ Un-registered facilities may accumulate less than 100 waste tires.
- ✓ Un-registered facilities should plan for disposal when 90 waste tires have accumulated.
- ✓ Stack all tires neatly in a designated Tire Storage Area.
- ✓ Stack tires for salvage sale separately.
- ✓ Cover stacks of tires to prevent accumulation of water which fosters breeding mosquitoes that my carry diseases.
- ✓ Registered facilities must: store tires 30 feet from utility easement, property line or highway right of way and 250 feet from a residence, karst feature or stream, store tires where fire fighting equipment will have access in case of fire, obatin and keep receipts for disposal of tire for three years.

DON'T

- ✖ Don't allow more than 100 tires to accumulate at facilities that are not registered.
- ✖ Don't burn tires.
- ✖ Don't put waste tires in the dumpster or landfill; landfills do not accept tires.

Materials & Waste Management

The two methods of waste tire management apply:

- ▲ *Salvage Sale.* Tires with street value may be removed for the waste pile for salvage sale. These tires must be covered to keep water from accumulating.
- ▲ *Solid Waste Landfill.* Some solid waste landfills may accept shredded tires or pieces. Contact the landfill operator for procedures.

Facility Checklist

- ☐ Check the tire storage area ***MONTHLY*** to ensure tires are covered.
- ☐ Check the number of tires collected. For un-registered facilities, have tires removed before 100 tires have been accumulated.

Tips and Tricks

- ! The Central Office may establish price contracts for formal guidelines for recycling tires.
- ! The Division of Purchases may provide vendor lists, contacts and conditions for tire recycling.
- ! Disposal of whole tires in a solid waste landfill is prohibited by law.
- ! Keeping tires covered to prevent water entrapment keeps environmental inspectors happy.

If…Then

- ➤ Notify the Facility manager immediately if more than 100 tires are being stored at an un-registered facility.

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality ○ 401/404/WQC ● NPDES	○ GWPP ● Waste ○ Pesticides

6.7 WASTE TIRE MANAGEMENT

Chapter 7
Spills and Emergencies

The spill kit contains protective equipment and absorbent materials for emergency use. Place spill kits where materials are stored or used.

DO

- ✓ Treat spills of products or wastes that are flammable, toxic, reactive or corrosive as hazardous spills.
- ✓ Refer to the Material Safety Data Sheet (MSDS) for spill response procedures and personal protective equipment needs.
- ✓ Isolate the area.
- ✓ Safely ***stop the release*** if possible and protect streams, sewers and other waterways.
- ✓ ***Report all releases*** that are larger than a routine spill to IDEM; call **911 or the Fire Department when warranted.**
- ✓ If the spill exceeds reportable quantities on the "List of Lists" (40 CFR 302) or enters a water of the State of Indiana and call the National Response Center.
- ✓ ***Clean up*** the spilled material.
- ✓ Use an environmental consultant to oversee clean up of spills involving removal of soil.
- ✓ Store absorbent in drums and conduct a waste determination if a hazardous spill is known or suspected.
- ✓ Review emergency response actions after an incident to highlight appropriate responses and needed improvements.

DON'T

- ✖ Don't risk injury to yourself or co-workers.
- ✖ Don't panic, respond calmly and quickly.
- ✖ Don't stop the release if it is hazardous to do so.

Materials & Waste Management

- ▲ Store contaminated absorbent in drums until the results of a waste determination are available.
- ▲ Promptly manage spill cleanup waste with other hazardous wastes.

Facility Checklist

- ☐ Check product and waste storage areas for leaks, spills and housekeeping ***WEEKLY.***
- ☐ Check hazardous waste storage areas for leaks, spills and housekeeping ***WEEKLY.***
- ☐ Check spill response and cleanup procedures ***ANNUALLY.***
- ☐ Check for the presence of copies of MSDS sheets for all products handled at the facility ***ANNUALLY***.

Tips and Tricks

- ! Reportable quantities are 25 gallons or more of a petroleum product within a 24-hour period and 75 gallons or more of diesel fuel in a 24-hour period or any amount that creates a visible sheen on surface waters.
- ! The most recent "List of Lists" document, which identifies reportable chemicals, can be downloaded from EPA or IDEM websites. http://www.epa.gov/ceppo/pubs/title3.pdf
- ! Wring oil absorbent pads into a bucket to collect spilled material for reuse or disposal

If…Then

- ➤ If the materials can be reused, place them in a suitable container and label them.

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality	○ GWPP
	○ 401/404/WQC	● Waste
	● NPDES	○ Pesticides

Petroleum spills can contaminate surface water and groundwater.

DO

- ✓ District employees are the first responders to spills of oil or other petroleum products at the facility.
- ✓ Safely ***stop the release*** if possible by closing calves and/or turning power off.
- ✓ Notify the Facility Manager of all spills at the facility.
- ✓ If the spoll can't be safely and effectively handled by facility personnel, **call 911 or local emergency response team**
- ✓ Notify the Environmental Response Team **(800) 928-2380** or **(502) 564-2380** if the spill is 25 gallons or more of a petroleum product within a 24-hour period or 75 gallons or more of diesel fuel in a 24-hour period or any amount that creates a visible sheen on surface material.
- ✓ ***Clean up*** the spilled material.
- ✓ Coordinate any cleanup involving removal of soil with the local emergency response team.
- ✓ ***Local government*** should use an environmental consultant to oversee clean up of spills involving removal of soil.
- ✓ Return of any useable product to the container or store in drums for later use.
- ✓ Use sorbent materials to clean up spill residues with the secondary containment area.
- ✓ Excavate all visibly contaminated soil.
- ✓ Store sorbent materials and excavated soil in drums and perform tests as needed to secure approval for disposal.

DON'T

- ✖ Don't risk injury to yourself or co-workers.
- ✖ Don't panic, respond calmly and quickly.
- ✖ Don't stop the release if it is hazardous to do so.

Materials & Waste Management

- ▲ If the material is confirmed non-hazardous, wastes may be accepted by the Solid Waste Landfill.
- ▲ Material sent to a landfill must not drip.
- ▲ Follow the landfill's procedures and contact them if there are questions.
- ▲ If wastes are hazardous or not accepted by the landfill, use an approved hazardous waste vendor.

Facility Checklist

- ☐ Check spill kits ***QUATERLY*** and promptly restock after use.
- ☐ Check spill response and cleanup procedures ***ANNUALLY***.
- ☐ Ensure that all employees that handle petroleum product transfers are adequately trained.

Tips and Tricks

- ! Clean up of visibly contaminated soil is required even if there are no notification requirements.
- ! Notification requirements apply to all petroleum products, including asphalt.
- ! EPA Region 4 must be notified within 60 days if a facility has a SPCC plan and a single spill of petroleum product that is more than 1,000 gallons or more than 42 gallons is spilled in each of 2 spills in any 12 month period.
- ! Tests for disposal usually include BTEX and free liquids.

If…Then

- ➤ If the spill can't be safely and effectively handled by facility personnel, the District Manager will promptly **call 911 or local emergency response team.**
- ➤ If the spill reaches a waterbody or storm drain, immediately notify the IDEM Environmental Response Team.

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality	○ GWPP
	○ 401/404/WQC	● Waste
	● NPDES	○ Pesticides

7.2 PETROLEUM SPILLS

This spill requires immediate attention!

DO

- ✓ If the waste is known or suspected to be hazardous, a petroleum spill, or leaking material due to an accident, **immediately call 911 or the Fire Department**.
- ✓ Report any unknown wastes found to the Fire Department.
- ✓ Request that the emergency responders move the materials from the driving lane and place it behind a guardrail or barrier for traffic safety.
- ✓ Only trained, directly authorized personnel may investigate and handle hazardous or unknown materials.

DON'T

- ✖ Don't approach or come into contact with hazardous or unknown materials.

Materials & Waste Management

- ▲ If the material is confirmed non-hazardous, contact the IDEM for disposal instructions.

Facility Checklist

- ☐ Ensure that staff is adequately trained regarding emergency procedures.

Tips and Tricks

- ! After the emergency is over, the responsible party is required to obtain traffic encroachment permits to complete the cleanup and restoration.
- ! As a last resort, the foreman may call a waste removal company before approval has been given by the area engineer

If…Then

- ➤ If necessary and directed by an emergency responder, the facility may provide a crew to provide traffic control until the area is safe.
- ➤ The Fire Department will contact the Indiana Division of Waste Management's Superfund Branch to investigate the incident and arrange for cleanup.
- ➤ If the owner or responsible party is unknown or if immediate cleanup is needed, provide the name of person who discovered the waste, street name, location, type of container, markings or labels, contents and source of drum or spill to the facilities superintendent.
- ➤ If you are unsure whether a waste is hazardous or not, call the Fire Department.

Training: 1 per Year **Season**: Spring

Relevant Environmental Programs	○ Air Quality	○ GWPP
	○ 401/404/WQC	● Waste
	○ NPDES	○ Pesticides

7.3 HAZARDOUS WASTES OR SPILLS

Appendix 1
One-Step Method

SECTION 5.4

LOGJAM REMOVAL AND RIVER RESTORATION

SECTION 5.4
LOGJAM REMOVAL AND RIVER RESTORATION

Logjams restrict the flow and conveyance of natural streams and ditches which can cause increased flooding, destruction of property and wildlife habitat, and erosion and sedimentation. However, not all in-stream structures cause problems. Submerged and overhanging logs provide important wildlife habitat. In many cases, the ripples caused by obstructions oxygenate the water to improve water quality. It is therefore useful to classify in-stream obstructions based on severity, and employ management techniques based on each category.

Localized logjam removal practices (Practices 401 and 402) are considered superior over large-scale river restoration techniques (Practice 403) because they maintain streams' natural meander geometry with long-term environmental and economical benefits. Because of their non-interference with the geometry of the stream channel and in-channel sediments, localized logjam removal practices are also institutionally more acceptable (usually no permits required) and easier to implement than large-scale river restoration works such as that described in practice 403.

Large-Scale River Restoration (Practice 403) may be accomplished in various ways. The best documented of these methods is the "Palmiter Technique". The Palmiter Technique combines clearing & snagging and inexpensive streambank protection measures to restore the stream channel to its perceived original, non-obstructed capacity. It includes removing logjams and severely leaning trees and using some of the removed material for protection of eroding streambanks. The technique also involves removing or raking of sediment bars, when needed, and revegetating the banks with trees to provide shade.

Effectiveness of large-scale river restoration or clearing & snagging projects in reducing flooding is limited only to small annual floods. **Often times, the effect of these activities on reducing flood stages of larger less frequent floods is negligible or at best limited to 2 or 3 inches of stage reduction.** In most cases, similar hydraulic benefits may be achieved by following the American Fisheries Society Stream Obstruction Removal Guide, i.e., removing only localized logjams, at a fraction of cost and time. (See "Maumee Master Plan" and "Urban Surface Water Management" references for more details.)

Regardless of their effectiveness and despite their drawbacks (in particular, a lengthy and expensive permitting process), large-scale river restoration/clearing and snagging projects are still popular and are pursued by many jurisdictions. So long as the safeguards described in Practice 403 are adhered to, the project may be implemented with minimal impact to the environment.

In all cases, access routes for stream and ditch work should be selected to minimize disturbances to wetlands, floodplains, and riparian areas. All disturbed areas should be restored or replanted with native plant species.

The obstruction classification system used in this manual is based on the "American Fisheries Society Stream Obstruction Removal Guidelines" (see Section 6, References). Five conditions are described: Condition 1 (one) is the least severe, Condition 4 (four) is the most obstructive, and Condition 5 (five) describes special cases. The following discussions are taken from the above-noted document and a document entitled: "MRBC Obstruction Removal Assistance Program".

Condition 1

Minor flow impedance is present, but these obstructions are normally washed downstream or are naturally relocated during moderate flooding events. The obstructions do not pose a significant flood damage risk, and the overall conveyance is acceptable and expected to stay that way. It is recommended that obstructions in this class be left alone unless they are associated with or are within eye-sight of larger obstructions, in which case they may be removed using hand-held tools (Practice 401 Logjam Removal Using Hand-held Tools).

Exhibit 5.4a: Illustration of a Condition 1 Logjam (Source: American Fisheries Society Obstruction Removal Guidelines)

Condition 2

Stream or ditch segments contain small logjams that may be inter-locked and occasionally span the entire width of the stream. Logjams are isolated, but adjacent land use is such that a major obstruction at this location may cause damaging floods in the future. It is recommended that logjams be removed with hand-held tools such as axes, chain saws, and portable winches (Practice 401), unless the logjams are associated with, or are in close proximity to, larger obstructions that require heavy machinery to remove (Practice 402). The extent of the work should be limited to cutting, relocating, removing, or, if appropriate, securing (parallel to the streambanks) any free logs or affixed logs that are crossway in the channel. Isolated or single logs that are embedded, lodged, or rooted in the channel, but do not span the channel or cause any impediment to flow, do not need to be removed. Rooted stumps that do not pose potential blockage problems should remain in place where they will continue to protect the bank against erosion.

Exhibit 5.4b: Illustration of a Condition 2 Logjam (Source: American Fisheries Society Obstruction Removal Guidelines)

Condition 3

Stream or ditch segments contain large accumulations of lodged trees, root wads, and/or other debris that are inter-locked and frequently span the entire width of the stream. Large amounts of fine sediments have not yet covered or become lodged within the obstruction. Some flow can still move around the obstruction, though the flow is somewhat impeded. These obstructions pose an unacceptable flooding risk. It is recommended that stretches in this condition be restored using hand-held tools (Practice 401) if possible. Heavy machinery such as small tractors, bulldozers, log skidders, or other low ground pressure equipment may be used so long as they are not equipped for excavation (Practice 402). The extent of work shall be the same as Condition 2.

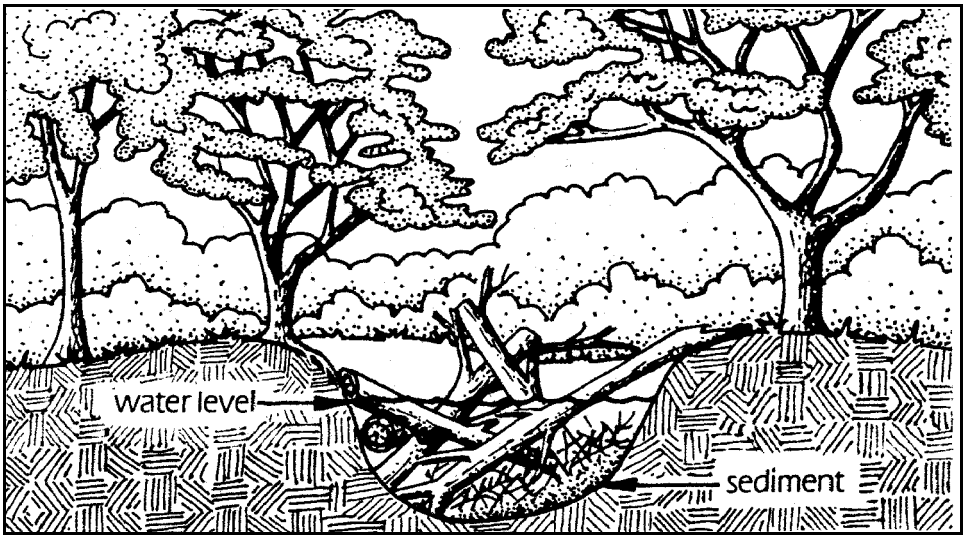


Exhibit 5.4c: Illustration of a Condition 3 Logjam (Source: American Fisheries Society Obstruction Removal Guidelines)

Condition 4

Stream or ditch segments contain major blockages that have caused severe and unacceptable flow conditions. Bank erosion and upstream ponding are evident. Existing flood potential will likely increase if the obstructions are not removed. The use of heavy machinery (Practice 402) is likely the only effective way to remove obstructions in this category. The extent of work shall be the same as Condition 2.

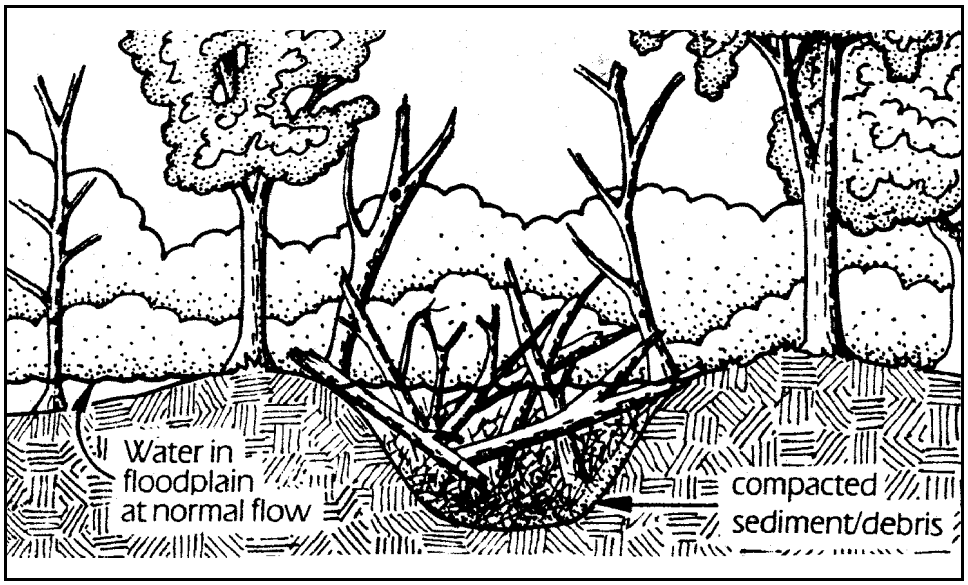


Exhibit 5.4d: Illustration of a Condition 4 Logjam (Source: American Fisheries Society Obstruction Removal Guidelines)

Condition 5

Stream or ditch segments possess unique, sensitive, or valuable ecological resources including rare plants and animals, and rare habitat. These include scenic or recreational rivers. The extent of obstructions may be similar to one of the four conditions described above. Removal of logjams in these streams must be approached on a case by case basis. Generally, obstruction removal using hand-held tools (Practice 401) is more acceptable than using heavy machinery.

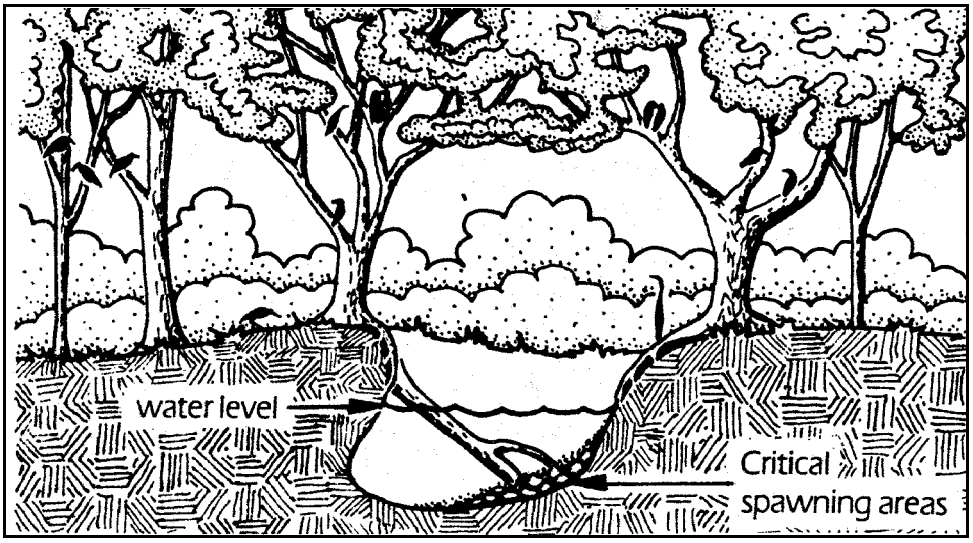


Exhibit 5.4e: Illustration of a Condition 5 Logjam (Source: American Fisheries Society Obstruction Removal Guidelines)

PRACTICE 401
LOGJAM REMOVAL USING HAND-HELD TOOLS

DESCRIPTION

- Removing logjams from natural streams and man-made ditches using hand-held tools.

Exhibit 401a: Logjam Removal Using Hand-Held Tools (Source: CBBEL Files)

PURPOSE

- To remove logjams causing flooding, sedimentation, or destruction of wildlife habitat.

WHERE APPLICABLE

- Streams and man-made ditches classified as Condition 2, possibly Condition 3, and Condition 5 (See Introduction).

ADVANTAGES

- Restores natural flow and conveyance of streams and ditches.
- Reduces erosion, sedimentation, and flood potential.
- May improve wildlife habitat and water quality.

CONSTRAINTS

- May be time consuming and labor intensive.
- Restricted to logjams where use of hand-held tools are practical.
- Usually requires restabilization (See Activity 5.11 Revegetation and Site Stabilization).
- May cause temporary sedimentation.

DESIGN AND CONSTRUCTION GUIDELINES

Materials

- Hand-tools such as axes, chain saws, hand winches, floats.
- Vegetative Restabilization (See Practice 1102).

Installation

- Hand-held tools that cause the least damage to the environment shall be selected for performing the work.
- Logjams, free logs, and/or affixed logs that are crossway in the channel should be cut, relocated, removed, or, if appropriate, secured parallel to the stream bank.

- Logjams may be disposed of by removing them from the floodplain and/or wetlands, or by piling and cabling logs at secured areas, as appropriate, with minimum amount of disturbance to vegetation.
- Isolated or single logs embedded, lodged, or rooted in the channel that do not span the channel or cause any impediment to flow should not be removed unless they are associated with or are in close proximity to larger obstructions, in which case they may be removed.
- Damaged, severely leaning trees should be removed if they pose a risk of falling and causing additional obstructions.
- Stumps and root systems should be left in place.

Special Considerations

- Employ appropriate siltation and erosion control practices during construction as necessary.
- Logjams that do not restrict the natural flow and conveyance of streams and ditches, and are not likely to cause further blockages, should not be removed.

MAINTENANCE

- Stream conditions should be monitored on a regular basis to avoid costly logjam removal in the future.

REFERENCES

Related Practices

- Practice 107 Clearing and Grubbing.
- Practice 301 Chemical Vegetation Control.
- Practice 302 Mechanized Debrushing Using Hand-held Equipment.
- Practice 303 Mechanized Debrushing Using Heavy Machinery.
- Practice 402 Logjam Removal Using Heavy Machinery.
- Practice 403 Large-Scale River Restoration.
- Practice 1301 Debris Disposal.

Other Sources of Information

- MRBC Obstruction Removal Program.
- American Fisheries Society Obstruction Removal Guidelines.

Last Print/Revision Date: October 13, 1996

PRACTICE 402
LOGJAM REMOVAL USING HEAVY MACHINERY

DESCRIPTION

- Removing logjams from natural streams and man-made ditches using heavy machinery.

Exhibit 402a: Logjam Removal Using Heavy Machinery (Source: NRCS Files)

PURPOSE

- To remove logjams causing flooding, sedimentation, or destruction of wildlife habitat.

WHERE APPLICABLE

- Streams and man-made ditches classified as Condition 2, Condition 3, and Condition 4 (See Introduction).

ADVANTAGES

- Restores natural flow and conveyance of streams and ditches.
- May reduce erosion, sedimentation, and flood potential.
- May improve wildlife habitat and water quality.

CONSTRAINTS

- Potentially more damaging to the environment than hand-held tools.
- May be time consuming and labor intensive.
- Usually requires restabilization (See Activity 5.11 Revegetation and Site Stabilization).
- May cause temporary sedimentation.

DESIGN AND CONSTRUCTION GUIDELINES

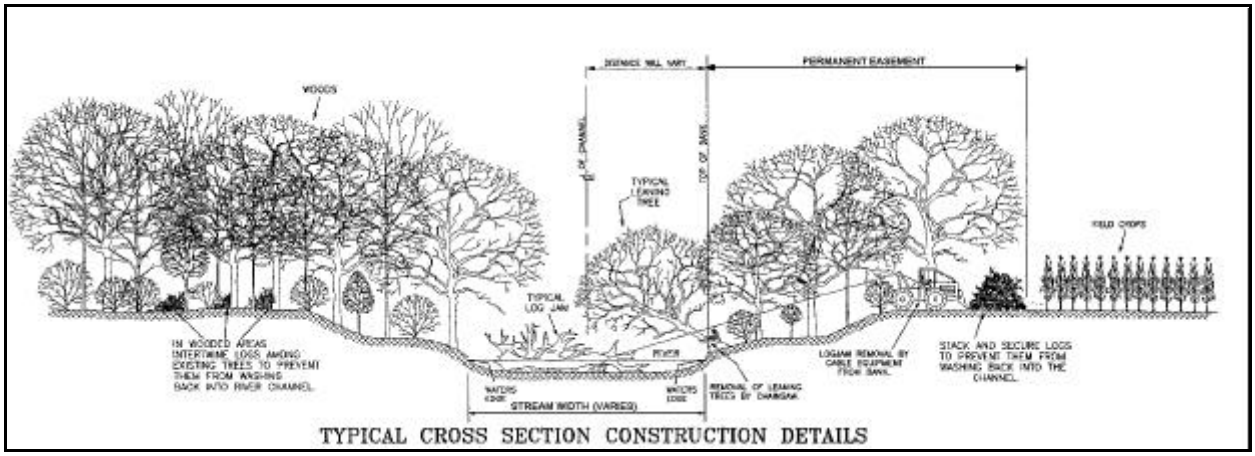
Materials

- Hand-tools such as axes, chain saws, hand winches, floats.
- Backhoes, bulldozers, log skidders, and other heavy, low psi machinery equipped only with brush hooks, snags, or hydraulic thumbs. Machinery equipped with excavation implements may not be used.
- Vegetative Restabilization (See Practice 1102).

Installation

- Machinery that causes the least damage to the environment shall be selected for performing the work.

- Logjams, free logs, and/or affixed logs that are crossway in the channel should be cut, relocated, removed, or, if appropriate, secured parallel to the stream bank.
- Logjams may be disposed of by removing them from the floodplain and/or wetlands, or by piling and cabling logs at secured areas, as appropriate, with minimum amount of disturbance to vegetation.
- Isolated or single logs embedded, lodged, or rooted in the channel that do not span the channel or cause any impediment to flow should not be removed unless they are associated with or are in close proximity to larger obstructions, in which case they may be removed.
- Damaged, severely leaning trees should be removed if they pose a risk of falling and causing additional obstructions.
- Stumps and root systems should be left in place.



TYPICAL CROSS SECTION CONSTRUCTION DETAILS

Exhibit 402b: Typical Cross-Section Construction Detail (Source: NRCS Files)

Special Considerations

- Employ appropriate siltation and erosion control practices during construction as necessary.
- Logjams that do not restrict the natural flow and conveyance of streams and ditches, and are not likely to cause further blockages, should not be removed.

MAINTENANCE

- Stream conditions should be monitored on a regular basis to avoid costly logjam removal in the future.

REFERENCES

Related Practices

- Practice 107 Clearing and Grubbing.
- Practice 301 Chemical Vegetation Control.
- Practice 302 Mechanized Debrushing Using Hand-held Equipment.
- Practice 303 Mechanized Debrushing Using Heavy Machinery.
- Practice 401 Logjam Removal Using Hand-held Tools.
- Practice 403 Large-Scale River Restoration.
- Practice 1301 Debris Disposal.

Other Sources of Information

- MRBC Obstruction Removal Program.
- American Fisheries Society Obstruction Removal Guidelines.

Last Print/Revision Date: October 13, 1996

PRACTICE 403
LARGE-SCALE RIVER RESTORATION

DESCRIPTION

- A technique (Palmiter Approach) which combines clearing & snagging and inexpensive streambank protection measures to restore the stream channel to its perceived original, non-obstructed capacity.

Exhibit 403a: Although trees stabilize the banks, they may become obstructions (Source: Ohio Stream Management Guide)

PURPOSE

- To provide relief from chronic low-intensity nuisance flooding, improve drainage in agricultural areas, reduce bank erosion due to smaller floods, and provide recreation benefits to canoeists as well as to hunters and fishermen.

WHERE APPLICABLE

- Applicable to streams that are obstructed by logjams and sand bars, and have bank erosion problems, particularly where larger structural measures are not justified.

ADVANTAGES

- Maintaining a stream channel's free-flowing characteristics ensures its capability to convey the annual flood.
- May reduce bank erosion and consequently sediment accumulation.
- May improve wildlife habitat and water quality.
- Is less expensive than larger structural measures.

CONSTRAINTS

- Potentially more damaging to the environment than logjam removal alone.
- May be time consuming and labor intensive.
- Usually requires restabilization (See Activity 5.11 Revegetation and Site Stabilization).
- Generally offer benefits similar to logjam removal but are more expensive and involve time delays due to permitting requirements.
- Not effective or appropriate for severe flood problems

DESIGN AND CONSTRUCTION GUIDELINES

Materials

- Hand-tools such as axes, chain saws, hand winches, or floats.
- Occasionally, front-end loaders, log skidders, or crawler tractors to help pull or move material.

Installation

- Palmiter approach consists of six basic techniques for restoring and maintaining normal streamflow as follows:

Step 1: Removal of Logjams and Debris

- Start from the upstream end of the stream and work your way downstream.
- Preferably use hand labor with the aid of small tools such as axes, chain saws, hand winches, and floats at time of low river stages to remove all obstacles. Some of the work may be done from boats or barges. Occasionally, tractors, horses, hoists, or front-end loaders may be used to help pull or move material.
- Material removed from the stream can be used to protect eroding banks and to direct streamflow against undesired sand bars. All woody material not used in bank stabilization should be pulled ashore and sold, piled, chipped, burned, or buried (See Practice 1301: Debris Disposal). NOTE: Original version of Palmiter approach includes allowing smaller logs to float on downstream. However, this aspect of the Palmiter's technique is discouraged in this Handbook. Allowing these logs to flow downstream may promote downstream obstructions, contribute to pile-up behind downstream bridges or culverts, or increase hazards downstream.

Exhibit 403b: Fallen trees, logjams, and other debris can partially block stream channels (Source: Ohio Stream Management Guide)

Step 2: Sediment Bar Removal

- Clear vegetation from the sediment bar surface and rake, if necessary. Where a bar is well established, it may be necessary to remove stumps and trees. (However, note that removal of sediment bars are not always necessary. Also, removal of islands with mature trees may be objectionable by agencies in certain settings.)
- Induce erosion of the bar by deflecting the stream current against

it, or by establishing a "pilot channel" through it (Exhibit 403c). Good current deflectors can be made by piling and anchoring brush at selected locations in the channel, or by cutting trees part way through and pushing them over into the channel at appropriate places (Exhibit 403d).

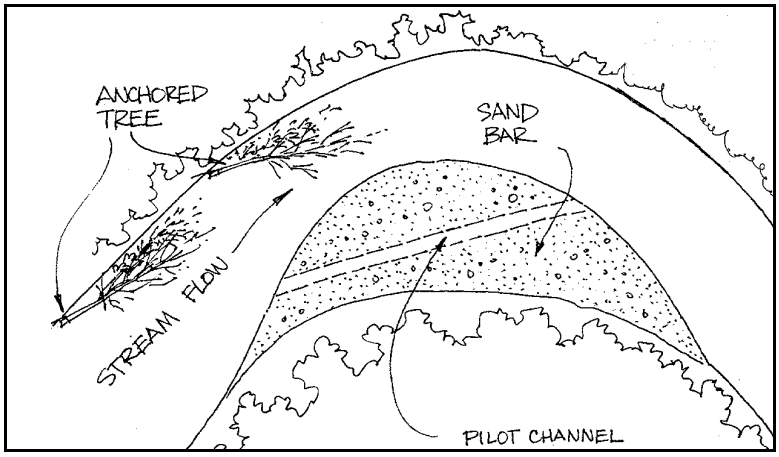


Exhibit 403c: Sand Bar Removal (Source: Ohio Stream Management Guide)

Exhibit 403d: Felled trees anchored to the streambank deflect flows away from the bank to prevent erosion (Source: Ohio Stream Management Guide)

Step 3: Removal of Potential Obstructions

- Severely leaning trees are the most common potential obstructions along a stream.
- Mark all trees or logs to be removed by spraying red, yellow, or orange paint on the upstream side of the trunks.
- Top the tree or cut off overhanging branches to reduce overhanging and to provide more sunlight for ground vegetation and faster growth of young trees. When a tree must be removed, its **stump and roots should be left in place to protect against erosion**.
- Old bridge piers, junked appliances, automobiles, and other kinds of man-made debris can also block streams and should be removed.

Exhibit 403e: Leaving the stumps and roots of severely leaning trees holds the streambank against erosion (Source: Ohio Stream Management Guide)

Step 4: Bank Erosion Protection

- Bank protection is provided in two ways:
  - (1) Removing fallen trees, logjams, and other obstructions (that had been directing the currents against the eroding bank) reduces erosion.
  - (2) Woody, brushy material removed from the channel is placed and secured along the side of eroding bank. These brush piles divert current away from the eroding bank and also reduce velocity of the current along the eroded bank, causing the stream to deposit sedimentation in those eroded areas most in need of fortification.

- Brush piles are placed along the eroded stream reach in a trial and error exercise to determine the most effective locations for placement. The brush is anchored to nearby stumps or trees. Where stream velocities are high, cable or wire is used to secure the brush. Where there are no existing stumps or trees to use as anchors, stakes or posts can be placed in the bank to meet the need.

Exhibit 403f: Anchored brush piles are an inexpensive but effective means of bank protection (Source: Ohio Stream Management Guide)

Step 5: Revegetation (Providing Shade)

- One of the most important steps in stream restoration is revegetation. Roots stabilize the bank and hold the soil together. Trees shade the channel and inhibit the growth of plants in the streambed which slow the flow of water. Maintaining a shade canopy over the stream, therefore, reduces sediment deposition in the main channel.
- The importance of shade is apparent if shade is removed. Within the first year after shade is removed, dense weedy growth appears in the stream channel. Annual maintenance costs increase because this growth must be removed year after year. Shade provides many benefits to a stream and its aquatic life.
- Utilize revegetation techniques described in Practice 1102: Vegetative Stabilization to provide adequate shade.

Exhibit 403g: Streams lacking shade become weed choked (Source: Ohio Stream Management Guide)

Step 6: Maintenance

- Good maintenance is both the final step and the key to success in stream restoration. Periodic examination and maintenance are essential to correct new problems as they arise, check on the success of previous work, and make adjustments where necessary. Without maintenance, the original work is only a short term solution.
- After restoration work is completed, the stream should be inspected following the next few periods of high water. In the absence of severe storms, annual or semi-annual inspections may be adequate. Late winter or early spring, before leaves develop, is an ideal time to look for problems.

Exhibit 403h: Periodic maintenance is an essential part of stream restoration (Source: Ohio Stream Management Guide)

Special Considerations

- Employ appropriate siltation and erosion control practices during construction as necessary.
- Effectiveness of river restoration or clearing & snagging practices in reducing flooding is limited only to small annual floods. Often times, the effect of these activities on reducing flood stages of larger less frequent floods is negligible or at best limited to 2 or 3 inches of stage reduction. Similar hydraulic benefits may be achieved by only removing isolated logjams at a fraction of the cost. (See "Maumee Master Plan" and "Urban Surface Water Management" references for more details.)

MAINTENANCE

- Noted as step 6 (above).

REFERENCES

Related Practices

- Practice 107 Clearing and Grubbing.
- Practice 301 Chemical Vegetation Control.
- Practice 302 Mechanized Debrushing Using Hand-held Equipment.
- Practice 303 Mechanized Debrushing Using Heavy Machinery.
- Practice 401 Logjam Removal Using Hand-held Tools.
- Practice 402 Logjam Removal Using Heavy Equipment.
- Practice 1202 Vegetative Stabilization.
- Practice 1301 Debris Disposal.

Other Sources of Information

- Ohio Stream Management Guide.
- Evaluation of River Restoration Techniques.
- Maumee Master Plan.
- Urban Surface Water Management.
- MRBC Obstruction Removal Program.
- American Fisheries Society Obstruction Removal Guidelines.

Last Print/Revision Date: October 13, 1996

Appendix 2
Acronyms and Abbreviations

Acronyms and Abbreviations

AST	Above-Ground Storage Tanks
BMP	Best Management Practice
BTEX	Benzene, Toluene, Ethyl benzene and Xylene
BYCIP	Backyard Drainage Capital Improvement Projects
C&D	Construction and Demolition (Landfill)
CFR	Code of Federal Regulations
EPSC	Erosion Prevention and Sediment Control
GWPP	Ground Water Protection Plan
HID	High Intensity Discharge (lamp)
IAC	Indiana Administrative Code
IDNR	Indiana Department of Natural Resources
INDOT	Indiana Department of Transportation
IDEM	Indiana Department of Environmental Management
Mg/l	Milligram per liter (same as ppm)
MSDS	Material Safety Data Sheet
NOI	Notice of Intent
NOS	Notice of Sufficiency
NOT	Notice of Termination
NPDES	National Pollutant Discharge Elimination System
NWP	Nationwide Permit
OPPTA	(IDEM) Office of Pollution Prevention and Technical Assistance
OSHA	Occupational Safety and Health Act
PPM	Parts Per Million (same as mg/l)
RCRA	Resource Conservation and Recovery Act
ROW	Right of Way
MS4	Municipal Separate Storm Sewer System
SWPPP	Stormwater Pollution Prevention Plan
SWQMP	Stormwater Quality Management Plan
TCLP	Toxicity Characteristics Leaching Procedure
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
TOX	Toxicity
UIC	Underground Injection Control
USACE	United States Army Corps of Engineers
USDW	Underground Sources of Drinking Water
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WQC	Water Quality Certificate

Appendix 3
Key Contacts

LOCAL CONTACT INFORMATION

CLARKSVILLE:

Stormwater Department…….……... (812) 283-8233
Tom Clevidence, Stormwater Coordinator
3 Leuthart Drive
Clarksville, IN 47129
Email: tclevidence@clarksvillesw.com

Street Department…….…….…… (812) 283-8233
Brad Cummings, Street Commissioner
107 Roy Cole Drive
Clarksville, IN 47129
Email: bcummings@townofclarksville.com

Clarksville Fire Department……..…… (812) 282-7619 or 911
Brandon Skaggs, Fire Chief
2249 Sam Gwin Drive
Clarksville, IN 47129
Email: bskaggs@cfdfire.com

FLOYD COUNTY:

Stormwater Department……..……...…..…….…….. (812) 949-5446
Chris Moore, Stormwater Coordinator
2524 Corydon Pike, Suite #201
New Albany, IN 47150
Email: cmoore@floydcounty.in.gov

Highway Department……..…….……..…… (812) 923-3041
Highway Superintendent
6412 Old Georgetown Road
Georgetown, IN 47122
Fax: (812) 923-9472
Email: fcroaddept@floydcounty.in.gov

Floyd County Volunteer Fire Department……..……..…….. 911

GEORGETOWN:

Public Works Department……..……...…….....(812) 951-3800
9111 State Road 64
P.O. Box 127
Georgetown, IN 47122

May 2022

MS4 Coordinator……. (502) 727-0079
Bob Woosley, Town Engineer w/ Heritage Engineering
603 North Shore Drive #204
Jeffersonville, IN 47130
Email: bwoosley@heritageeng.com

Fire Department…… (812) 951-2354 or 911
Richard Bader, Fire Chief
8910 State Road 64
Georgetown, IN 47122

JEFFERSONVILLE:

Stormwater Department……. (812) 285-6476
Matt Bell, MS4 Coordinator
500 Quartermaster Court
Jeffersonville, IN 47130
Email: MBell@CityofJeff.net

Streets and Sanitation…….. (812) 285-6455
Clark Miles, Streets and Sanitation Commissioner
2003 Renfroe Way, Suite 100
Jeffersonville, IN 47130

Jeffersonville Fire Department…… (812) 285-6445 or 911
Eric Hedrick, Fire Chief
2204 East 10th Street
Jeffersonville, IN 47130
Fax: (812) 285-3032

MADISON:

Public Works Department…….. (812) 265-8326
Brian Jackson, Utility Manager
101 W. Main St.
Madison, IN 47250
Email: utilitymanager@madison-in.gov

Stormwater Department…….. (812) 265-8328
Jay Thompson, MS4 Stormwater Coordinator
1213 W. First Street
Madison, IN 47250
Email: ms4@madison-in.gov

Madison Fire Department……..…….…..……. (812) 265-8350 or 911
Steve Horton, Chief
101 W. Main St.
Madison, IN 47250
Email: firedept@madison-in.gov

NEW ALBANY:

Stormwater Department ……..……..…….. (812) 945-1989
Phil Aldridge, Stormwater Coordinator
2113 Grant Line Road
New Albany, IN 47150
Email: paldridge@cityofnewalbany.com

Stormwater Department ……..……..…….. (812) 945-1989
Brandon Sailings, MS4 Coordinator
2113 Grant Line Road
New Albany, IN 47150
Email: bsailings@cityofnewalbany.com

Street Department ……...……..…….. (812) 948-3586
Joe Ham, Street Commissioner
2113 Grant Line Road
New Albany, IN 47150
Email: jham@cityofnewalbany.com

New Albany Fire Department……..…….. (812) 948-5314 or 911
Matthew Juliot, Chief
316 East Spring Street
New Albany, IN 47150

OAK PARK CONSERVANCY DISTRICT:

Stormwater Operations ……..……..…….. (812) 283-3960
Keith Ingram, Superintendent of Wastewater Treatment Operations
4230 Portage Place
Jeffersonville, IN 47130
Email: keithi@oakparkcd.us

Streets and Sanitation - Jeffersonville…….…….……..(812) 285-6455
Clark Miles, Streets and Sanitation Commissioner
2003 Renfroe Way, Suite 100
Jeffersonville, IN 47130

Fire Department – Jeffersonville……..(812) 285-6445 or 911
Eric Hedrick, Fire Chief
2204 East 10th Street
Jeffersonville, IN 47130
Fax: (812) 285-3032

SELLERSBURG:

Streets and Sanitation Department…….. (812) 246-3821, ext. 4
Bart Meyer, MS4/ADA Compliance Coordinator
316 E. Utica Street
Sellersburg, IN 47172
Email: ms4@sellersburg.org

Building Commissioner…….. (812) 246-3821, ext. 6
Building Commissioner
316 E. Utica Street
Sellersburg, IN 47172
Email: building@sellersburg.org

Fire Department……..…….…….. (812) 246-2232 or 911
Sellersburg Volunteer Fire Department
426 E. Utica Street
Sellersburg, IN 47172

SOIL AND WATER CONSERVATION DISTRICTS

Clark County:

Clark County Soil and Water Conservation District……..…. (812) 256-2330, ext. 107
Tami Kruer, Education Coordinator
9608 Highway 62
Charlestown, IN 47111
Fax: (855) 391-1921
Email: tami.kruer@in.nacdnet.net

Floyd County:

Floyd County Soil and Water Conservation District……..……..…. (812) 945-9936
Angela Jackson
2524 Corydon Pike, Suite 103
New Albany, IN 47150
Fax: (812) 948-5255
Email: ajackson@floydcounty.in.gov

Jefferson County:

Jefferson County Soil and Water Conservation District……..…. (812) 265-7609
Vicki Wehner, District Coordinator
3767 West State Road 256
Madison, IN 47250
Fax: (812) 873-6835
Email: vicki.wehner@jeffersoncounty.in.gov

STATE OF INDIANA CONTACT INFORMATION

Indiana Haz Mat (Hazardous Materials) Response Team……..… (800) 423-0765 (Office)
or (800) 669-7362 (Emergency)
Call the Indiana Haz Mat Response Team 24-hour hotline when there is a release or threatened release of a hazardous substance, pollutant or contaminant, petroleum or petroleum product.

Indianapolis – Central Office:
Office of Water Quality Stormwater Program ……..... (800) 451-6027
100 North Senate Avenue
MC 65-42, Room 1255
Indianapolis, Indiana 46204

IDEM Southeast Regional Office……..……..…...…… (812) 358-2027
Toll Free (within Indiana):……..…….. (877) 271-0074
820 West Sweet Street
Brownstown, Indiana 47220
Fax: (812) 358-2058

Illegal Dumping (24-hour hotline) ……..….. (800) 451-6027