



Targeted Constituents

● Significant Benefit ◐ Partial Benefit ○ Low or Unknown Benefit

◐ Sediment	◐ Heavy Metals	◐ Floatable Materials	◐ Oxygen Demanding Substances
◐ Nutrients	◐ Toxic Materials	◐ Oil & Grease	◐ Bacteria & Viruses
			◐ Construction Wastes

Description

Prevent or reduce the discharge of pollutants to stormwater systems or natural channels from material delivery and storage by minimizing the onsite storage of hazardous materials, storing materials in a designated area, installing secondary containment, conducting regular inspections, and training employees and subcontractors.

This best management practice covers only material delivery and storage. Procedures for material delivery and storage must include the requirements in AM-07, Spill Prevention and Control. Additional discussion of material delivery and storage for bulk materials, and the very important activity of spill prevention, is included in the following BMPs:

- IC-02 Outdoor Loading and Unloading of Materials
- IC-03 Outdoor Storage of Materials
- AM-07 Spill Prevention and Control

Approach

The following materials are commonly stored on large and small construction sites; this list also applies to residential and commercial properties.

- Soil
- Concrete compounds
- Pesticides and herbicides
- Fertilizers
- Detergents
- Plaster or other products
- Petroleum products (fuel, oil, grease)
- Chemicals (acids, lime, glues, paints, solvents, curing compounds)

Storage of these materials can pose various degrees of the following risks:

- Injury to workers or visitors
- Stormwater pollution
- Groundwater pollution
- Soil contamination

Training

- Train employees and subcontractors on material delivery and storage. Employees trained in emergency spill cleanup procedures should be present when dangerous materials or liquid chemicals are unloaded. Personnel who use pesticides should be trained in their use.
- Have proper storage instructions posted at all times in an open and conspicuous location. Periodically review this with field supervisors and inspectors.
- For quick reference on disposal alternatives for many types of waste materials, see Table AM-01-1 which is part of the Employee Training BMP fact sheet.
- Contain and clean all spills immediately. Report actions to supervisor and to emergency response personnel as necessary.

Site Layout and Procedures

- Designate areas of the site for material delivery and storage. Place areas near the entrances and away from drainage paths and waterways. Surround with earth berms, dikes, swales or other containment practices. Ideally, storage areas will be located in paved areas, or in areas to be paved if it is a construction site.
- Storage of reactive, ignitable, or flammable liquids must comply with the fire codes such as NFPA 30, Flammable and Combustible Liquids Code. Contact the City of Knoxville Fire Inspections Division to review site materials, quantities, and proposed storage area to determine specific requirements.
- Follow manufacturer's instructions regarding uses, protective equipment, ventilation, flammability, and mixing of chemicals.
- Keep accurate, up-to-date inventory of materials delivered and stored on the site. Maintain current material safety data sheets (MSDS) in a central location.
- Minimize hazardous materials stored on the site and handle hazardous materials as infrequently as possible.
- There are several commercially available products that can temporarily seal storm drains or sewer drains. These products can be activated in a variety of ways, including magnetically. Place emergency sealing devices in conspicuous locations proximate to the point of use and train personnel appropriately.
- Consider storing materials in a covered area. Store materials in secondary containment structures such as an earthen dike, horse trough, or even a children's wading pool for non-reactive materials such as detergents, oil, grease and paints. Small amounts of material may be secondarily contained in buckets or concrete mixing trays.
- Do not store chemicals, drums, or bagged materials directly on the ground. Place these items on a pallet.

- Try to keep chemicals in the original containers, and make sure that all chemicals are adequately labeled. Use other containers only if compatible with the stored chemical. All containers must be adequately sealed to protect against spilling, and then stored in an appropriate place.
- Do not overapply fertilizers, herbicides, and pesticides. Prepare only the amount needed. Follow the recommended usage instructions. Overapplication is expensive and environmentally harmful. Till fertilizers into the soil. Apply surface dressings in several smaller applications, as opposed to one large application, to allow time for infiltration and to avoid excess material being carried away by runoff. Do not apply these chemicals just before it rains.
- Stockpile soil in a central location and protect the stockpile from stormwater. Apply suitable controls to prevent sediment from stockpile by measures such as silt fences, straw bale barriers, sand bag barriers, sediment traps or basins. If the stockpile will be inactive for an extended period, plant temporary vegetation or install long-term perimeter controls. Small stockpiles may be protected with tarps.

Maintenance

- Keep the designated storage area clean and well-organized.
- Conduct routine weekly inspections and check for external corrosion of material containers.
- Keep an ample supply of spill cleanup materials near the storage area.
- Inspect storage areas before and after rainfall events, and at least weekly during other times.
- Repair and replace perimeter controls, containment structures, and covers as needed to keep them properly functioning.

Limitations

- Space or other construction site limitations may preclude indoor storage.
- Storage sheds often must meet building and fire code requirements.

References

30, 31, 33, 34, 35, 43, 100, 127, 137 (see BMP Manual Chapter 10 for list)