Recommended Procedures for Snow & Ice Control Chemical Handling, Storage, and Use

Scope

The scope of the procedure pertains to chemical handling, storage, and use on campus as it relates to stormwater management. The procedure is limited to snow and ice control chemicals where maintenance of roadways, sidewalks, travel paths, and other impermeable surfaces is the intended application. Related operations are most affected during winter and inclement weather events.

Introduction

Prior to 1938, travel on snowy U.S. highways was difficult as deicing agents were not utilized. In that same year, New Hampshire experimented with applying salt to roads to lower the freezing point of water, thus reducing ice formation. Road salt, or sodium chloride, consists of 40 percent sodium ions (Na^+) and 60 percent chloride ions (Cl^-). The success of New Hampshire's experiment quickly spread, and the use of road salt soon became a standard during the winter months. Today, up to 20 million tons of salt are used each winter. Due to it being inexpensive, effective, and easy to apply, salt seems to be the answer to decreasing winter road hazards. Salt, however, dissolves easily in water and is carried away in stormwater runoff, which ultimately harms the environment.

Recent research conducted by the Maryland Department of Natural Resources shows chloride concentrations in the Chesapeake Bay watershed have been steadily increasing since the 1960s. Much of the increase can be attributed to road salts. These chlorides never fully dissipate when stormwater runoff carries road salt into storm drains, streams, rivers, lakes, and groundwater. Once in the water, there is no way to remove the chloride, which can become harmful for fish and plant life. It takes only one teaspoon of road salt to permanently pollute five gallons of water. Natural processes are unable to filter out or remove chloride ions. These ions, if not sufficiently diluted with water, will build up over time. Since saltwater is denser than freshwater, it sinks to the bottom causing harm to aquatic plant and animal life. The usage of road salt also has an effect on groundwater. When salt reaches more than 250 mg/L in groundwater, the taste and odor become problems. Between 1983 and 2003, more than 424 private wells in New Hampshire required replacement due to salt contamination.

Procedure

A. Material Storage

Proper salt storage is key to preventing the introduction of potentially harmful contaminant loads to the environment. Due to their high potential for causing

groundwater, stormwater, and surface water pollution, salt storage facilities should not be placed in environmentally sensitive areas.

1. Basic Guidelines
    - Solid bagged materials should be stored securely indoors.
    - Salt should be stored on impervious pads of asphalt or concrete in well-maintained, covered, waterproof domes or barns.
    - Concrete pads and walls should be treated to prevent concrete deterioration (spalling).
    - The area should be sloped away to prevent stormwater from entering the loading areas or structure.
    - Salt storage structures should be inspected annually and promptly repaired as necessary.
    - If salt cannot be stored in a fixed structure, it should be completely covered with a secured tarp.

2. Using Three-Sided Building for Storage
    - The exposed salt at the open end should be covered.
    - Salt should be stored to prevent it from spilling out of the structure and to minimize any environmental impacts.
    - Place straw bales, aggregates, or wooden gates at structure doorways to contain salt runoff.

3. Storage of Liquid Deicing Materials
    - Store indoors or under cover in well-maintained, closed, and labeled DOT-approved containers, constructed of non-corrosive materials in appropriately-sized secondary containment.
    - Liquid storage tanks should be protected from impact from vehicles moving about the yard and be located such that spilled material can be contained and retrieved in the event of a tank or piping failure.
    - Routine maintenance should be performed on the storage tank fittings, valves, and pumps.
    - To minimize the possibility of leakage and spills from liquid storage tanks, a weekly inspection program should be implemented.
        - Whenever drips/leaks are found, maintenance and/or repairs should be made immediately. Until such time as the repair can be completed, the leak should be contained.

4. Loading of Materials
    - Only load salt on impervious surfaces
    - If possible, load salt in a covered area to reduce material loss from wind and rain.

• Spreaders should not be overloaded such that material spills off of the vehicle. A plan for loading operations to prevent overfilling vehicles and eliminating material spillage during transportation should be developed and implemented.
• After loading, immediately sweep loading area and return material to a covered vehicle, storage bin, or pile
• Avoid spills during loading. If a spill occurs, immediately sweep up all material into a covered pile.
• Immediately clean up spilled liquid deicing materials using an absorbent material such as clay floor sweep, double bag in plastic bags, and dispose as non-hazardous domestic waste.

5. Runoff of Materials
   • Protect stormwater drains from salt storage runoff. Install curbs, sandbags or hay bales, if needed, to protect storm drains.
   • Stormwater runoff from salt storage areas should be contained.
      o Drainage that is contaminated with salt should be directed to sanitary sewer drains or collected for use in pre-wetting activities or collected for proper off-campus disposal
   • Per TU Policy, all University vehicles will only be washed off-campus at the Facilities Management designated commercial carwash.
      o Only rinse salt-contaminated vehicles and equipment on an impervious rinse pad where wastewater is collected and treated in an appropriate system.
      o Vehicle rinse water can be used as a base for creating salt brine. • During the winter season, consider blocking storm drains that drain directly into campus waterways.

B. Report Mismanagement of Snow & Ice Control Chemicals

To report mismanagement of snow & ice control chemicals on campus, please contact stormwater@towson.edu as soon as possible after observing the incident. If possible, please provide the following information:

• Date & Time the Incident Occurred
• Campus Location Where Incident Occurred
• Brief Description of What was Observed
• Identity of Personnel Involved
   o TU Personnel, or Contractors
   o Others (Provide as much information as possible)
• Any photographs of the Incident
• Your Contact Information So We May Contact You for Additional Information If We Have Any Questions

Penalties, if any, for improperly-managed snow and ice control chemicals will depend on the situation. If off-campus regulatory agencies (MDE, EPA, etc.) are involved, any fines or penalties will be the responsibility of the violator.