4-2. Source Control BMPs

Source control consists of measures to prevent pollutants from coming into contact with stormwater runoff. Preventing pollutant exposure to rainfall and runoff is an important management technique that can reduce the amount of pollutants in runoff and the need for stormwater treatment.

Source control practices and pollution prevention can include a wide variety of management techniques that address nonpoint sources of pollution. These practices are typically non-structural, require minimal or no land area, and involve moderate effort and cost to implement, when compared to structural treatment practices. Therefore, project planning and design should consider measures to minimize or prevent the release of pollutants so they are not available for mobilization by runoff. Source control measures typically address the following:

- Materials management, to prevent contact between substances handled on-site and precipitation or runoff;
- Lawn care and landscaping practices, to manage and control the storage and use of fertilizers, herbicides, and pesticides;
- Management of pet wastes, to minimize this source of nutrients and pathogens in stormwater;
- Street sweeping and cleaning of other pavement surfaces, to remove sand applied for winter ice management, as well as sediments, debris, and trash deposited by vehicle traffic, to prevent these materials from being introduced into the storm drainage system;
- Snow and ice management, particularly the application of sand and deicing agents (such as salt);
- Long-term BMP maintenance, to maintain the effectiveness of stormwater treatment measures and prevent the re-entrainment and discharge of pollutants previously captured by these structures.

Chapter 5 includes information on the development of source control plans for projects, particularly when the projects involve land uses with high volumes of traffic and other sites with higher potential pollutant loads. Chapter 5 also discusses long-term operation and maintenance.

The following Source Control practices are presented in this Section:

1. Street Sweeping
2. Snow and Ice Management

STREET SWEEPING

General Description

Street sweeping is a pollution prevention practice that removes sediment, debris and trash that accumulates along streets and roads from winter sanding practices and everyday use. Street sweeping is often performed to improve aesthetics and to reduce the export of sand to the drainage network and receiving waters. In addition to sediment, debris and trash, other pollutants that may be minimized through street sweeping include some nutrients, oxygen-demanding substances and trace metals.

There are three types of street sweepers commonly used. These include:

- Mechanical Sweepers: Mechanical sweepers use rotating brooms to force debris from the street surface into a hopper by a conveyor system. Water is usually sprayed on the pavement surface to control dust. This type of sweeper typically removes only coarse particles and therefore is less effective at removing nutrients, oxygen demanding materials, and toxic substances that are typically attached to fine particles.
- Regenerative-air Sweepers: Regenerative-air sweepers combine the rotating brooms of mechanical sweepers with forced air to dislodge the remaining dirt and use a high-power vacuum to pick up the dislodged particles. This allows for greater removal of fine particles and the associated pollutants.
- Vacuum-assisted Sweepers: Vacuum assisted sweepers combine the rotating brooms of mechanical sweepers with a high-power vacuum. Some will spray water to control dust and others operate completely dry with a continuous filtration system.

Vacuum sweepers and regenerative air sweepers are considered the more effective than the mechanical sweeper. The overall effectiveness of street sweeping to remove pollutants from a given area will depend on a number of variables including the type of street sweeper used, the frequency and location of sweeping, the ability to sweep on heavily traveled roads, the number of passes made and the operation speed of the sweeper.

Maintenance Requirements

- Inspect and maintain street sweeping equipment in accordance with manufacturer's recommendations.

Design References

- EPA (2006b)
- Zarriello, et al. (2002)

Design Considerations

- Identify areas of concern based on traffic volume, land use, field observations of sediment and trash accumulation and proximity to surface waters. Increase sweeping frequency in these areas to maximize pollutant removal benefits.
- Consider maintaining logs of the amount of waste collected by district, road, or area and use this information to develop/amend a street sweeping plan that targets areas that accumulate greater amounts of material, along with the appropriate frequency to achieve the greatest removal.
- Consider instituting parking policies to restrict parking in problematic areas during periods of street sweeping.
- Street sweeping waste must be disposed of or reused in accordance with *NHDES Environmental Fact Sheet WMD-SW-32 Management of Street Wastes*.

Design Criteria

As outlined under 'Design Considerations', street sweeping programs should be developed that accommodate areas of concern based on traffic volume, land use, field observations of sediment and trash accumulation and proximity to surface waters. At a minimum, street sweeping should be performed once annually, preferably as soon as possible after the snow melts to reduce the amount of sand, grit, and debris and associated pollutants from winter sanding from entering surface waters.

SNOW & ICE MANAGEMENT

General Description

To address the concerns associated with the application of chlorides and other deicing materials, NHDES recommends the development of a Road Salt and Deicing Minimization Plan when a development will create one acre or more of pavement, including parking lots and roadways. The plan should address the policies that the development will keep in place to minimize salt and other deicer use after the project has been completed. A component of the plan should include tracking the use of salt and other deicers for each storm event and compiling salt use data annually.

New Hampshire does not yet have salt reduction guidance, but recommends following the guidelines available in reference cited below.

References

- *Minnesota Snow and Ice Control* handbook, available at: http://www.mnltap.umn.edu/pdf/snowicecontrolhandbook.pdf

Design Criteria

Deicing application rate guidelines and a form for tracking salt and other deicer usage are included in Figures 4-1 and 4-2.

Deicing Application Rate Guidelines

24' of pavement (typcial two-lane road)

These rates are not fixed values, but rather the middle of a range to be selected and adjusted by an agency according to its local conditions and experience.

			Pounds per two-lane mile			
Pavement Temp. (°F) and Trend (↑↓)	Weather Condition	Maintenance Actions	Salt Prewetted / Pretreated with Salt Brine	Salt Prewetted / Pretreated with Other Blends	Dry Salt*	Winter Sand (abrasives)
> 30° ↑	Snow	Plow, treat intersections only	80	70	100*	Not recommended
	Freezing Rain	Apply Chemical	80 - 160	70 - 140	100 - 200*	Not recommended
30° ↓	Snow	Plow and apply chemical	80 - 160	70 - 140	100 - 200*	Not recommended
	Freezing Rain	Apply Chemical	150 - 200	130 - 180	180 - 240*	Not recommended
25° - 30° ↑	Snow	Plow and apply chemical	120 - 160	100 - 140	150 - 200*	Not recommended
	Freezing Rain	Apply Chemical	150 - 200	130 - 180	180 - 240*	Not recommended
25° - 30° ↓	Snow	Plow and apply chemical	120 - 160	100 - 140	150 - 200*	Not recommended
	Freezing Rain	Apply Chemical	160 - 240	140 - 210	200 - 300*	400
20° - 25° ↑	Snow or Freezing Rain	Plow and apply chemical	160 - 240	140 - 210	200 - 300*	400
20° - 25° ↓	Snow	Plow and apply chemical	200 - 280	175 - 250	250 - 350*	Not recommended
	Freezing Rain	Apply Chemical	240 - 320	210 - 280	300 - 400*	400
15° - 20° ↑	Snow	Plow and apply chemical	200 - 280	175 - 250	250 - 350*	Not recommended
	Freezing Rain	Apply Chemical	240 - 320	210 - 280	300 - 400*	400
15° - 20° ↓	Snow or Freezing Rain	Plow and apply chemical	240 - 320	210 - 280	300 - 400*	500 for freezing rain
0° - 15° ↑↓	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	300 - 400	Not recommended	500 - 750 spot treatment as needed
< 0°	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	400 - 600**	Not recommended	500 - 750 spot treatment as needed

* Dry salt is not recommended. It is likely to blow off the road before it melts ice.

** A blend of 6 - 8 gal/ton $MgCl_2$ or $CaCl_2$ added to NaCl can melt ice as low as -10°.

Figure 4-1. Deicing Application Rate Guidelines

Anti-icing Route Data Form				
Truck Station:				
Date:				
Air Temperature	Pavement Temperature	Relative Humidity	Dew Point	Sky
Reason for applying:				
Route:				
Chemical:				
Application Time:				
Application Amount:				
Observation (first day):				
Observation (after event):				
Observation (before next application):				
Name:				

Figure 4-2. Example Documentation Form for Anti-Icing