
University of Wisconsin-Madison Outdoor Salt Use Policy August 2014

The *Outdoor Salt Use Policy* is one of several written Best Management Practices (BMPs) that has been prepared to describe how the University of Wisconsin-Madison (University) minimizes pollutants in stormwater runoff from University lands into area lakes, ponds and streams. The University's Wisconsin Pollutant Discharge Elimination System (WPDES) stormwater permit requires that BMPs be established for this purpose. This BMP focuses on salt (sodium chloride), which is used at the University to melt ice on campus streets, walkways and parking lots to improve their safety.

POLICY SOPE

A BMP establishes benchmark practices that, when employed, represent the most reasonable and modern "best practices" for preventing water pollution. It is meant to reflect community and peer institution standards for salt use. In many cases, these recommendations reflect common sense and practices that are already in use. The practices described in this BMP are optional, not mandatory. Not all salt users will be able to adopt every BMP recommendation. This BMP should be seen as a goal, and the University encourages all campus salt users to continually seek improvements in reducing salt while maintaining the safety of campus streets, parking lots and walkways. This BMP will change as new practices are discovered and deemed practical.

OBJECTIVE AND NEEDS

The objective of this BMP is to encourage the prudent use of salt at the University. Users should apply sufficient quantities of salt to keep streets, parking lots and walkways safe from ice; applications should be done carefully to minimize the amount of salt used. This BMP addresses a dual, sometimes conflicting need. Students, faculty, staff and visitors deserve safe streets, parking lots and walkways, which is often facilitated when salt is used to melt ice. However, salt is detrimental to our environment. Salt pits concrete walks and streets so that they eventually need to be replaced – often sooner than otherwise might be the case. Salt rusts and can destroy car exteriors, handrails and other items made of ferrous metals. Salt can injure and or kill grass, flowers and other vegetation along campus walkways. Perhaps most importantly, salt dissolved in rainwater and snowmelt may drain into the storm sewer system. This system subsequently discharges into lakes Mendota and Monona. Salt in lakes and streams is measured as the chemical pollutant chloride, and chloride, at elevated levels, is toxic to fish and other aquatic life. Winter salt use is a major contributor of chloride in our lakes. Because chloride is water soluble and does not degrade in the environment, it can accumulate in lakes and ponds. University and DNR scientists are very concerned that the salinity (i.e., chloride levels) of Lake Mendota has been rising for decades. To protect our environment, we need to minimize salt use. Most importantly, the need to protect our environment from the deleterious effects of salt use must be balanced with the need for safety.

APPLICABILITY

This BMP is applicable to everyone who uses salt on streets, parking lots and walkways on the University of Wisconsin-Madison campus, including the Arboretum and campus natural areas. Agricultural Research Stations, UW-Extension facilities and other non-contiguous properties are not included at this time. Private contractors who apply salt on campus streets and walkways are responsible for understanding this BMP and considering its recommendations whenever practicable.

UNIVERSITY SALT USE & REDUCTION EFFORTS

As shown by the table below, salt is used on campus by Physical Plant staff and staff of program revenue units (e.g., Union, Housing, Athletics and University Health Services). Salt that is applied by Physical Plant is stored on campus in a Physical Plant – Environmental Services shed on Herrick Drive. Two formulations are available to Physical Plant employees: pure salt and a carefully prepared sand mixture with 5% salt. Environmental Services staff choose between the two formulations or they may mix the formulations, depending on their judgment.

Campus Salt User	Application Location	Application Method	Salt Formulation
FP&M Physical Plant – Environmental Services	Streets	Road	Salt and sand mixture
	Parking ramps (tops and entrances/exits only)	Sidewalk spreaders	Sand mixture with 5% salt
	Walkways	Sidewalk spreaders	Salt and sand mixture
Hand thrown		Salt	
FP&M Physical Plant - Custodial Services Campus Building Managers	Entrances and walkways — from door to main sidewalk	Hand thrown	Salt
Program Revenue Units	Mostly entrances and walkways — from door to main sidewalk	Mostly hand thrown	Varies

Salt Alternatives

There are numerous deicing chemicals that can be used as an alternative to salt (sodium chloride). Campus salt users are encouraged to try salt alternatives and report findings to the Environment, Health & Safety Department (EH&S), who can track and assist others considering alternatives to salt use on campus. Notably, Physical Plant – Environmental Services uses a salt/sand mixture after pretreating steps and curb cuts with beet juice, brine or similar products when snow is expected over a weekend to minimize bonding with concrete. Environmental Services plans to expand this program to include more walkways and intersections for winter 2015 with the purchase of new road sanders equipped with liquid application equipment.

Some salt alternatives have the advantage of being usable at temperatures lower than sodium chloride's range. Salt is the least expensive deicing chemical, although lower application rates may make the more expensive alternatives cost competitive. Calcium magnesium acetate (CMA) may have the least environmental impact, while other alternatives can impact the environment to some degree. Alternatives, such as chlorides of calcium, magnesium and potassium can harm concrete, corrode metal and contribute to chloride levels in the lake. Sand and other abrasives can provide safe footing in some cases. Note that salt is often mixed with sand to keep sand from freezing (sand usually contains a small amount of moisture). Physical Plant has some experience in using the salt alternatives CMA and potassium acetate; please contact them directly for guidance.

Other Salt Minimization Activities

As mentioned elsewhere in this BMP, the University has made significant progress in some areas of salt reduction. Since 1995, "No Plow, No Salt" areas have been designated, removal equipment has been improved, Physical Plant's sand mixture has been reformulated, and salt alternatives have been tried. In addition, a low berm was constructed between the 1918 Marsh and the snow storage area to prevent salt-contaminated runoff from entering the Marsh. These activities have been summarized in the report, "Salt Reduction Status Report," by Daniel Einstein and Peter Wold, Physical Plant Environmental Management (19 March 1998).

BEST PRACTICES

Most salt users on campus will find the following salt minimization practices reasonable and worth considering. Many of these practices can achieve the same, or better, level of safety that we are used to, but with less salt.

Trust your judgment:

Because weather conditions and salt needs vary greatly, salt users must be free to exercise their judgment. The ultimate decision of how much salt to use and how to apply it must be left to the user. Over time, however, users will gain a better understanding of what works best to clear walkways, parking lots and streets while minimizing the use of salt.

Importantly, under some conditions, a little salt goes a long way. It would be easy to use the same practices under all conditions, to over salt, or to rely on traditional practices. Instead, every time you use salt, please take time to assess the conditions and your needs for that situation—then apply salt carefully. Practices to consider include:

- Prevent ice by keeping runoff from pooling; keep gutters and storm sewer drains open and clear of leaves, snow and ice. Should pooling occur, contact Environmental Services (262-2954) who will then assess the situation and take corrective action.
- Remove snow first; avoid salting snow.
- Use salt as necessary if ice formation is likely, due to forecasted weather conditions, shade, or run-on that is likely to freeze. However, unless certain that ice is about to form, do not salt in anticipation of ice. Avoid salting dry pavement that is free of ice.

- Do not use salt if below-zero temperatures are expected for a prolonged period; use sand instead. Salt works poorly below zero and does not work at all below -6°F .
- Whenever possible, use fine grain salt instead of rock salt, as large salt pieces melt ice very inefficiently. The same job can often be accomplished with a smaller amount of fine grain salt.
- Salt only walkways, streets and parking lots. Do not salt grass or planting beds.
- Use less salt when the surface is level or partially clear, or when packed snow provides safe traction.
- Use salt as necessary to clear accessible routes and other paths of travel used by people with disabilities. These routes should be given priority.
- Minimize or eliminate salt use if there is a warming trend or sun exposure that will melt ice quickly.
- Sweep up any excess or spilled salt. Reuse it or dispose of it in the normal trash; avoid sweeping the excess salt into the street.

Best Practices for Porous Pavement Areas

Since 2006, the University has installed porous pavement at several campus locations to improve stormwater management. The use of sand and/or sand-salt mixtures on these porous paving installations (porous asphalt, porous concrete or permeable pavers) is prohibited as sand clogs the pores that are meant to be open for infiltration during both the summer and winter months. Salt may be used sparingly and only when necessary to clear ice, although ice should not form on porous paving unless fully saturated and completely frozen. Sand can be used on permeable pavers but only when necessary. Salt should be avoided on stone or precast concrete pavers and again used sparingly only when necessary.

Best Practices for Walkways

Many people on campus are responsible for keeping walkways and entrances clear of ice and snow. Although time is always a constraint, early and frequent snow removal is the best practice to minimize salt use. Shoveling prevents ice formation that results from snow packing and the thaw/freeze cycle. Please do not use salt as an alternative to timely snow removal and shoveling. If time and weather allow, always try to shovel first before salting. Ramps on an accessible route or those providing access must be totally cleared of snow, handrail to handrail; there cannot be any snow left under the handrail. However, use salt as necessary:

- When ice is expected because of the weather forecast. For example, salt wet walkways (caused by sun or daytime temperatures) when freezing overnight temperatures are forecast.
- To prevent ice as an interim measure between snow removals.
- When it snows and no one will be available to clear it.
- To loosen thick ice for future removal. Prompt, complete snow removal is the best way to prevent packed ice. Although packed snow provides good traction for a while, it can soon turn to thick ice, which is very difficult to remove.

Patios and Extra-Wide Walkways and Stairs

Not every inch of paved surface on campus needs to be salted or cleared of snow and ice. It is better to do a good job of clearing a narrow path than not having the time to adequately clear a large area. If you wish to close a walk or area during the winter, consider:

- Building exits must be clear and allow emergency egress.
- Check with the Building Manager.
- Post the closed area or walkway with "Please Stay On Designated Path," "Closed For Winter," or "Do Not Enter: No Shovel/No Salt Area." You also may wish to cordon off the area. If you cordon off the area, the materials used to block off the area must be cane-detectable.
- Cleared paths should be at least four feet wide or the width of the building entrance, whichever is wider. You may want to clear a wider path for areas with heavy traffic, if it will facilitate snow removal in the future, or if it will prevent ice formation from re-freezing snow melt and run-on.
- Emergency exits should remain cleared.

University staff may decide to close certain walkways, areas and steps/stairs in the winter. To date, these closures have been limited to the Grainger courtyard (at Building Manager's request), the path to Picnic Point, a redundant and seldom-used sidewalk near the Willow Drive dorms, and redundant steps at: Agriculture Hall, Atmospheric Sciences, Biochemistry Addition, Educational Sciences, Chamberlin Hall, Lathrop Hall, Memorial Library, Science Hall, School of Human Ecology (including porous pavement sidewalk leading to the closed steps), Steenbock Library, Teacher Education, Vilas Hall and Wendt Commons. In addition to reducing salt use, these closures save labor and money. Please contact the Physical Plant if you wish to nominate an area for winter closure.

Best Practices for Environmental Services Staff

Environmental Services staff operate the road and sidewalk spreaders used on campus to spread salt. They also are responsible for clearing snow off of parking lots, roads and major walkways. Broom tractors are utilized on walkways in an attempt to limit salt use, thereby only applying salt as necessary based on temperatures, sun exposure and grade. Normally, staff plow only if more than one inch of snow has fallen. A salt/sand mixture is usually then applied. If less than one inch of snow falls, the salt/sand mixture is applied in lieu of plowing. Environmental Services staff should consider the following practices to minimize their salt use:

- As with walkways (see above) prompt and complete mechanical clearing of snow minimizes ice formation and the need for salt.
- Prevent ice formation by removing as much snow as possible. Environmental Services staff are encouraged to plow snow up to the curb. Curb cuts, designated paratransit drop off sites and DIS parking stalls at the curb need to have snow removed entirely. Ridges of snow cannot be left by a plowing operation.
- When loading salt and sand into the spreaders, minimize the use of pure salt whenever possible. Use the sand mixture with 5% salt, preferentially.

- Use the salt/sand mixture as necessary for safe intersections and hills; the application rate may be reduced for level and less-used routes.
- At snow depths of less than one inch, remove snow from DIS parking spaces, the adjacent access aisles and along a path of travel out of a parking lot.

Best Practices for Facility Managers and Designers

Facility managers and designers can help improve safety, reduce salt use and make maintenance easier. Abrasive coatings are helpful on some campus walkways, especially those prone to being slippery. As a result, less salt and sand is needed in those areas. In planning or remodeling, facility designers should consider:

- Avoid oversized patios, walkways or stairs. This can reduce both labor needed for snow removal and the need for salt.
- Design areas to facilitate snow removal. Sidewalks and ramps should be wide enough for a mechanical broom (i.e., a minimum of seven feet, although eight feet is preferred.).
- Provide snow storage areas adjacent to sidewalks, roads and around parking lots. These storage areas should be designed to prevent snowmelt from running across parking lots, roads and walkways.

Best Practices for Pedestrians

To maintain this balance between safety and the environment, the cooperation of all students, faculty, staff and visitors is imperative. Please be aware that it is not reasonable to expect every foot of paved surface to be free of snow and ice at all times. There are limits to University resources, the equipment we use, as well as the capabilities of salt. The University is dedicated to clearing a reasonable, safe path for pedestrians, but you must: Stay on cleared paths and plowed snow routes. Do not cut corners or make your own path. Use alternate routes to closed sidewalks and stairs posted "Closed for Winter."

Call Physical Plant CARS (263-3333) to report unsafe areas that need to be cleared of snow and ice. Your feedback is important for improving campus practices. Feel free to contact the Physical Plant, the Environment, Health & Safety Department or your Building Manager with any concerns regarding salting practices.

Document Revision:

Revision History		
Revision Number	Revision Date	Description of Revision
Original	1999	University committees, departments and units reviewed and commented on policy in the fall of 1998, then adopted original policy in February 1999, including: Building managers; General Safety and Chemical & Environmental Safety; Facilities, Planning & Management (FP&M); Environmental Health (University Health Services); Risk Management; Madison Fire Department; the Arboretum Committee; and the Chemical Safety Committee.
1	2014	Revision and update of 1999 policy version. Presented for review to representatives from FP&M Campus Planning & Landscape Architecture, Custodial Services, Environmental Services/Grounds, Environment, Health & Safety department, Heating Plants, Physical Plant Director's Office, Plumbing Shop, Transportation Services; Risk Management; and University Health Services. Approved by the UW-Madison Chemical Safety Committee on October 16, 2014.
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