



Best Practices Guidelines for Sustainable Salt Use

BENCHMARK YOUR SNOW REMOVAL OPERATION

SIMA[®]
snow & ice management association

Goal

The purpose of this checklist is to serve as an informal ‘audit’ of any site, company, or organization that utilizes salts (Calcium Chloride, Magnesium Chloride, Sodium Chloride, etc.) to deice or anti-ice in winter. It provides a set of policies and activities that when engaged together can reduce salt output, with the goal of increasing the training, knowledge, and skill of the organization. It should be used with additional training, research, and real-world experiences to build a more thoughtful approach to using salts to manage winter events.

A note on application rates: This document does NOT contain recommended application rates. Current research, especially in parking lot/facilities settings, is still being conducted and more information is needed. SIMA does encourage organizations to participate or review the following information and programs:

- **Sustainable Salt Initiative:** An ongoing research and salt application technology program from SIMA and Viaesys - www.sima.org/sustainablesalt
- Snow and Ice Control for Parking Lots, Platforms, and Sidewalks (SICOPS) research study available at www.sicops.ca - a multi-year research project.

Methodology

The project started in the winter of 2016 as an initiative by SIMA to create a simple, vetted list of processes, policies, and activities that any organization or facility could begin to adopt over time to use all salt more efficiently.

Pulling from many internal resources, SIMA created an initial draft and then underwent a review process that included 17 stakeholder reviewers, representing snow contractors, facility management, deicing material supply, municipal, and equipment supply. The geographical distribution included reviewers from Canada, the Midwest, the Northeast, and the Mid-Atlantic. SIMA also engaged three subject matter experts in the review process. Over 125 comments and recommendations from stakeholders were received and individually reviewed by SIMA, and a final draft was circulated amongst stakeholder reviewers prior to publishing.

Leadership

This document is not simply meant to be handed off to the operations staff for implementation. It requires leadership from all levels of an organization. In the guideline, any written policies are noted, and leadership teams responsible should make all efforts to create and implement policies. The policies outlined in the document support the activities and processes that are essential to managing salt efficiently, and can empower operational personnel to be accountable and supported during the process.

Understanding the Document

The guidelines are divided into 3 major sections: Purchasing, Storage and Transport, and Operations. The Operations section is further divided into 2 levels of competency, due to the initial operational, training, and investments that are typically required to make what will often be a paradigm shift for those managing winter precipitation.

SIMA's Best Practices Commitment

Open Access: The guidelines are available to all industry stakeholders at no cost, regardless of whether they are members of SIMA.

Quality Control & Transparency: The Best Practices are a living document, and suggestions, recommendations, or concerns can be submitted online at www.sima.org/bestpractices. All comments submitted to SIMA will be reviewed and vetted by a group of stakeholders if needed.

Education: SIMA is spearheading educational partnerships and communication programs to help all parties adopt the timeline.

Comprehensive: The guidelines were reviewed by a large and diverse group of stakeholders and several subject matter experts

Purchasing

Purchasing forecasts based on total estimated square footage/acres of service area, averaged with a minimum of 5 years of weather history (and salt use history if available). [Written Policy]

Establish purchase agreements with multiple suppliers to optimize control of supply and quality and mitigate risk due to fluctuations in supply availability and cost. [Written Policy]

Deicing inventory to include most efficient products to apply / blend for use in markets that experience pavement temperatures below 15 degrees F (the temperature where NaCl is no longer effective). [Written Policy]

Contract or purchase a minimum of 50-75% of estimated deicing material (solids and brines) inventory by the end of summer (pre-season ordering). [Written Policy]

Storage and Transport

Minimum of 5 'average' events-worth of material (solids and brines) inventory on-hand during the season. [Written Policy]

All stored bulk salt is covered and on an impervious surface that avoids run-off or water entering the storage area, meeting local, state/provincial and federal requirements. Long-term storage of salt brines meeting all local/state/provincial and federal regulations, along with secondary containment measures in place. [Written Policy]

Site-dedicated salt inventory is stored in self-contained bins (i.e. has a floor and cover) or storage containers, meeting local, state/provincial and federal requirements. [Written Policy]

Transporting bulk material should be well covered during transport between locations, following all local and state/provincial regulations for securing and covering loads. [Written Policy]

Weekly monitoring of stored salt inventories for quality control (integrity of storage, leaching, etc.), and post-storm monitoring for inventory management.

Operations – 3 implementation levels

LEVEL 1

General Policy and Implementation

Site documentation/service forms to include salt output estimates, per application. [Written Policy]

All application equipment (spreaders, sprayers, etc.) operators trained on company policies and general salt management/ice management techniques. [Written Policy]

Standard practice of clearing (i.e. plowing, blowing, sweeping, etc.) new snow accumulations prior to any deicing application (e.i. no 'burning off' 2 inches of fresh snow). [Written Policy]

Verification that any site where salt will be applied is not listed as a salt-sensitive area or zone by local, state/provincial or federal regulations. [Written Policy]



RECOMMEND
STARTING AT
LEVEL 1

Locate snow piles in areas that minimize the flow of water that may refreeze (warranting future deicing applications of the refreeze). Includes documentation (i.e. Site Engineering Plan) of drainage and slope issues on a site related to snow piles/snow storage.

Do not relocate/dump snow into bodies of water (lakes/ponds, rivers, streams, ocean, wetlands, stormwater management ponds, etc.). [Written Policy]

Proactive prevention of snow & ice bonding on driving and walking surfaces. Policy prioritizes anti-icing techniques as a standard practice. [Written Policy]

Policy: Spot-treating (vs. blanket treating) problem areas (i.e. north-facing areas etc.) as a standard process.

Keep salt covered (i.e. tarps, lids, covers) to protect from moisture and potential spillage during applications (sidewalks, lots, roads etc.) and during transport between routed sites.

Ongoing monitoring and documentation of any refreeze-related risks on a site caused by damaged or faulty infrastructure (i.e. broken downspout, clogged drain, etc.), with a focus on reducing the need for additional deicing applications.

Management of a defined ice monitoring (aka ice watch) process to ensure proactive and effective spot treatment.

Calibration Policy and Process

1. Spreader/Sprayer application rate(s) standardized across equipment types. Application rates calibrated for minimum output levels of salt required in various weather scenarios (surface temperature, moisture, etc.). [Written Policy]
2. Establish a calibration process for all salt application equipment (solid and liquid) that takes into account flow settings (gates, valve/nozzles, etc.), conveyor/auger and spinner speeds, ground speed, and material (size/density etc.). (Order #2 in grouping with app rates). [Written Policy]
3. Spreader/sprayer settings/rates and maximum salt output per site documented in all operations manuals/site binders and incorporated into pre-season training programs.
4. Spreaders/sprayers calibrated pre-season and mid-season and any time a change to the equipment is made (i.e. repair) or a significant change to the material occurs (i.e. fines, pre-treated, etc.).

Anti-Icing Policy and Process [level 1]

1. Anti-icing process defined in a snow response plan and trained as a Standard Operating Procedure. Training should include specific weather scenarios where anti-icing may be ineffective (i.e. heavy rain, specific temperature conditions, etc.).
2. Use of solid salt optimization techniques. Techniques include blended, pre-treated or pre-wetted rock salt with the goal of optimizing effectiveness to accelerate deicing and/or lower the effective temperature of the salt, and utilized for pre-application to prevent bonding of snow and ice in acceptable conditions.

LEVEL 2

Documentation and Policy

1. Utilize technology to accurately automate the process of tracking and reporting salt application data; useful for service verification/documentation and internal benchmarking of application rates. [Written Policy]
2. Standardized process to measure salt output by site, portfolio of sites, and per storm (per site). Goal of identifying potential material waste by benchmarking actual usage vs. inventory, and comparing application rates across operators and equipment types.

Anti-icing Practices [level 2]

1. Anti-icing process defined in a snow response plan and trained as a Standard Operating Procedure. Training should include specific weather scenarios where anti-icing may be ineffective (i.e. heavy rain, specific temperature conditions, etc.).
2. Use of salt brine (NaCl, MgCl, CaCl, etc.) or other liquid deicer (e.g Calcium Magnesium Acetate) as an efficiency strategy for direct liquid anti-icing of paved surfaces and for pre-wetting solid salts.
3. Pre-service audit of salt brine quality, checking for salt concentration accuracy and any agitation/mixing needs.

Team of experts

Thank you to all the individuals who helped contribute as stakeholder reviewers in the process, as follows:

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