



CHLORIDE REDUCTION MODEL ORDINANCE LANGUAGE

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1. Background and Purpose

Chloride is easily transmitted into lakes, streams and groundwater, threatening drinking water supplies, as well as the health of freshwater fish and other aquatic life. This document discusses chloride-based deicers, specifically sodium chloride (NaCl), magnesium chloride (MgCl₂), and calcium chloride (CaCl₂). For purposes of discussion, these deicers are sometimes generally referred to as 'salt'. Deicers can enter into the environment during storage, transport, and application. It takes only one teaspoon of salt to permanently pollute five gallons of water. Once in the water, there is no easy way to remove the chloride. Minnesota residents experience the impacts of chloride contamination in many ways:

- **Drinking water.** Salt has contaminated groundwater in some areas of the state; 75 percent of Minnesotans rely on groundwater for drinking water. Excess salt could affect the taste and healthfulness of drinking water. Twenty-seven percent of monitoring wells in the Twin Cities metro area had chloride concentrations that exceeded EPA drinking water guidelines. Thirty percent of Twin Cities wells had chloride concentrations that exceeded the water quality standard.
- **Fish and aquatic bugs.** High amounts of chloride are toxic to fish, aquatic bugs, and amphibians. Chloride can negatively affect the fish and insect community structure, diversity and productivity, even at lower levels
- **Increased corrosivity in drinking waters.** High chloride can increase tendency of water to cause corrosion in distribution systems and can increase the rate of release of lead into the water.
- **Plants.** Road salt splash can kill plants and trees along the roadside; plants that take up salty water through their roots can also suffer. Chloride in streams, lakes, and wetlands harms aquatic vegetation and can change the plant community structure.
- **Soil.** Salt-laden soil can lose its ability to retain water and store nutrients and be more prone to erosion and sediment runoff (which also harms water quality).
- **Pets.** Salt can sicken pets that consume it, lick it off their paws, or drink salty snow melt/runoff. It can also irritate their paw pads.
- **Infrastructure.** Chloride corrodes road surfaces and bridges and damages reinforcing rods, increasing maintenance and repair costs.
- **Wildlife.** Some birds, like finches and house sparrows, can die from ingesting deicing salt. Some salt-sensitive species are particularly at risk.

The 2019 [Statewide Chloride Management Plan](#) states that winter maintenance activities are a primary source of chloride discharges into lakes, streams, wetlands and groundwater. A municipality should evaluate which of these winter maintenance activity sources has the highest level of concern based on field observations, complaints or facility inspections. Other resources helpful in understanding sources of chlorides are provided on MPCA's Statewide Chloride Resources website at:

<https://www.pca.state.mn.us/water/statewide-chloride-resources>.

Model ordinance language contained in this document serves as guidance for municipal officials who want direction in regulating the use of deicers to protect water quality, animals, human health and infrastructure. Model ordinance language has been adapted from existing code from mid-western localities and Minnesota Pollution Control Agency (MPCA) Smart Salting and deicer management guidance. Local governments may want to institute regulatory options voluntarily or as part of their MS4 program.

Model ordinance language focuses on four areas:

- **Occupational Licensure for Winter Maintenance Professionals.** If over- or improper application of salt and other deicing materials is an identified issue, a municipality may wish to utilize model ordinance language requiring winter maintenance professionals (internal or contracted) and/or private winter maintenance professionals to become certified in MPCA's Smart Salting program in order to operate within their jurisdiction.
- **Deicer Bulk Storage Facility Regulations.** If improper storage, transfer, and placement of bulk amounts of salt or other deicers is an identified issue, a municipality may wish to include bulk storage regulations in their municipal code.
- **Land Disturbance Activities.** A municipality may wish to address chloride management as part of their post-construction stormwater requirements. Model language is provided that would require a land disturbance permit applicant to provide chloride use information and Smart Salting Certification when conducting new or redevelopment activities.
- **Parking Lot, Sidewalk and Private Road Sweeping Requirements.** If salt and other deicing materials remain on surfaces after the winter season, a municipality may wish to include sweeping requirements in their zoning regulations.

Each municipality should consider which of these ordinances is most appropriate to select based on the desired impact and the available administrative resources.

Section 2 provides general model ordinance language, including Definitions and Findings that can be used to provide the legal basis for the requirements in an ordinance. Section 3 includes the model ordinance language. The model ordinance language is meant to be a guide only and is not meant to be used verbatim. Grey highlighted text indicates language which would need to be tailored to a municipality's specific needs or example language to be considered.

Blue "tip" text boxes appear throughout the document to help explain rationale for aspects of the model ordinance language or provide options for implementation. The text boxes provide context for users of this document to determine how to use or interpret the model ordinance language and/or websites to refer to for more information.

2. General Model Ordinance Language

Municipalities can consider adding the following general language as needed to existing or proposed ordinances.

2.1. Definitions

Anti-icing means the application of a liquid deicer prior to the onset of a snow event.

Best Management Practice (BMP) means structural, vegetative or managerial practices used to treat, prevent or reduce water pollution.

Certified Salt Applicator means an individual who applies deicer and has completed Minnesota Pollution Control Agency Smart Salting training (Level 1 or 2).

Deicer means any substance used to melt snow and ice or used for its anti-icing effects.

Tip: Some or all of these terms may already be included in a municipality's code. If so, any revisions should utilize existing defined terms as appropriate.

Winter Maintenance Professional means an individual who applies deicer for hire (i.e., snow plow drivers, salt truck drivers).

2.2. Findings

Findings are typically used in municipal code to provide the legal basis for the requirements that follow. They can reference other policies or plans which provide additional rationale. Not all municipalities use findings within their local code, but they can be helpful when a municipality is introducing a new legal concept. Findings may be most appropriate for the ordinances described in Sections 3.1 and 3.2 of this Guidance. Sections 3.3 and 3.4 would likely involve the revision of existing language rather than new legal concepts. Municipalities can consider using the following Findings language:

- (a) The removal of snow and ice from roadways is essential to both public safety and to the local economy and in order to protect the public safety, during and after winter storm events, the use of pavement deicing chemicals is a widely accepted means of keeping roadways passable; and
- (b) Pavement deicing is typically accomplished through the use of deicers which can be corrosive to vehicles, roadway surfaces, and bridges and has been found to have adverse effects on the surface waters, ground water and to environmentally sensitive areas; and
- (c) The restoration of surface and ground water quality and ecosystems in such areas can be very difficult and costly, if not impossible, to rehabilitate through reverse osmosis, once the events of contamination occur; and
- (d) Proper utilization and management of deicing materials is critical to ensure that the environmental impacts of related practices are reduced to the maximum extent possible; and
- (e) Negative environmental impacts may occur when salt and other deicers are not properly stored and transported; and
- (f) One of the primary sources of chloride entering the ground water is salt spillage that is either plowed or washed from maintenance yards, unloading, and loading areas and it is necessary to regulate all persons engaged in the storage and use of bulk deicing materials on their property and elsewhere in order to reduce the costly impacts of such use to the surrounding vegetation, surface water and ground water; and
- (g) The [mayor and members of the city council/town board] believe that it is in the best interest of the [city or township] to regulate and require the permitting of such business under the terms and provisions as established herein.

3. Model Ordinance Language

3.1. Occupational Licensure for Winter Maintenance Professionals

Municipalities, which choose to utilize this regulatory strategy, could require:

1. Smart Salting certification,
2. storage of deicing materials BMPs, or
3. both

via occupational licensure of winter maintenance. For the purposes of this model language the term “license” is used, however, municipalities may utilize business permits or equivalent, instead. Municipalities can incorporate these requirements as appropriate into any existing licensure regulations.

The following model language incorporates both Smart Salting Certification and non-prescriptive BMPs into an occupational licensing requirement for winter maintenance professionals. This language should not be considered complete as individual municipalities may have their own unique insurance, liability and licensing requirements.

Applicability

No person will engage in the operation of a winter maintenance business for the private operation of a snowplowing service or the use or storage of salt or other deicing materials, or to assist others in the same for the purpose of managing ice and snow from private roadways, parking areas and sidewalks and on commercial, industrial, institutional, office, multi-family and private single-family residential dwellings without being in compliance with the terms and provisions of this chapter. A license must be obtained from the clerk upon approval of [the director of public works]. The clerk will publish to the [city’s or township’s] website a list of all license holders.

Certification Required

All licensees must employ an individual who possesses current Smart Salting Level 1 and Level 2 Certification from the Minnesota Pollution Control Agency. This individual must be responsible for the application of appropriate deicing material at the proper amount and rate; the employment of correct procedures for temperature and conditions; accurate record-keeping and data recordation; and calibration of equipment as least [annually]. This individual and the license holder must be available for and respond to inquiries and record requests from the licensing official for purposes of determining compliance with this section. In the event of a major storm emergency, the licensing official may exempt winter maintenance professionals from the requirements of this section for services completed under contract with the [city/township].

Insurance Required

Any person desiring a [license] must file an application with the [city/township clerk]. Each applicant must file with the application one (1) or more certificates of insurance for public liability and property damage co-insuring the applicant and the [city/township] in amounts to be established by the [city council/town board] by resolution. The insurance must be approved as to form by the [city/township attorney].

Deicer Storage Requirements

All licensees must employ best management practices to minimize the discharge of polluted runoff from salt and deicer storage and application as follows:

- (1) Designated salt and deicer storage areas must be covered or indoors;

TIP: The BMPs specified are very general and non-prescriptive. A municipality may choose to be more prescriptive within licensure requirements (see Deicer Bulk Storage Facility Regulations model language).

- (2) Designated salt and deicer storage areas must be located on an impervious surface; and
- (3) Implementation of practices to reduce exposure when transferring material in designated salt and deicer storage areas (e.g., sweeping, diversions, and/or containment).

License Required

Upon submittal of the Minnesota Pollution Control Agency Smart Salting Level 1 and 2 Certification documents, filing the public liability insurance policy or certificate of insurance with the [city/township clerk], and upon payment of the license fee required in [insert cite] to the [city/township treasurer], the license will be issued. An updated certification document is required every two years per the Smart Salting Level 2 Certification requirements and every 5 years for Level 1 Certification.

TIP: MPCA Smart Salting requirements can be found at:
<https://www.pca.state.mn.us/water/salt-applicators>.

Penalty

Any person violating this section must forfeit to the [city/township] a penalty of not less than [insert amount] nor more than [insert amount] for each offense, and in default of payment thereof will be imprisoned for a period not to exceed [insert period], or until such penalty and costs must be paid.

3.2. Deicer Bulk Storage Facility Regulations

These regulations would apply to all properties within the municipality's jurisdiction. *General Requirements* are recommended as a basic level of control for bulk facilities. *Facility Siting, Snow Piles, Salt Truck Wash Water, and Transfer of Materials* below are optional and should be selected by municipalities as appropriate.

TIP: Amount of deicer specified in the model language is for example purposes only. Municipalities should decide at which point managers want these regulations to apply. Locality should decide if they want the regulations to apply to industrial facilities or if they should be exempt. Municipalities may want to specifically exclude commercially bagged salt or salt used for manufacturing.

Applicability

The following sections apply to all indoor and outdoor bulk deicer storage facilities (temporary and permanent) including salt piles, salt bag storage, sand piles and other storage of deicing materials. Bulk storage, as regulated by this chapter, is defined as storage of any material used for deicing and/or traction during winter conditions that is more than [for example, five tons in solid form (or 1,000 gallons in liquid form)].

General Requirements

- (1) Indoor operations for the storage of deicing materials must be provided wherever possible in order to prevent such materials from being affected by rain, snow and melt water.
- (2) All salt, sand and other deicing materials stored outdoors must be covered at all times.
 - (a) When not using a permanent roof, a waterproof impermeable, flexible cover must be placed over all storage piles (to protect against precipitation and surface water runoff). The cover must

prevent runoff and leachate from being generated by the outdoor storage piles. The cover must be secured to prevent removal by wind or other storm events. Piles must be formed in a conical shape and covered as necessary to prevent leaching.

(b) Any roof leaks, tears or damage should be temporarily repaired during winter to reduce the entrance of precipitation. Permanent repairs must be completed prior to the next winter season.

Facility Siting

(1) The facility must be in close proximity to the area in which the deicing materials are to be used, if practical.

(2) Each facility must be located outside of floodplains and [insert distance] from lakes, rivers, streams, ditches, storm drains, manholes, catch basins, wetlands and any other areas likely to absorb runoff. A facility must not be located [in close proximity to, within a certain distance of] surface water features, water supplies, wells or drywells.

(3) A facility must be located on impermeable surfaces.

(4) The property slope must be away from the facility's salt, deicer, and sand storage area.

(5) Salt vulnerable/intolerant natural areas should be avoided as storage facilities to the extent possible. Where they cannot be avoided, specific measures should be instituted to protect vulnerable areas. [Salt vulnerable/intolerant natural areas include, but are not limited to:

(a) Areas with salt sensitive vegetation

(b) Areas serving as a source of drinking water (surface water and ground water)

(c) Areas with bodies of water with low dilution, low volume or salt sensitive species

(d) Areas associated with ground water recharge zones or shallow water table, with medium to high permeable soils]

TIP: Municipalities may want to specify salt vulnerable areas, e.g., specific water bodies.

Snow Piles

Snow piles must be located downslope from salt and deicer storage areas to prevent the snow melt from flowing through storage areas and carrying material to the nearest drainage system or waterway.

Deicer Truck Wash Water

Deicer- and salt-containing truck wash water must be captured, treated, and recycled for use as salt-brine in pre-wetting and anti-icing activities.

Transfer of Materials

Practices must be implemented in order to reduce exposure (e.g., sweeping, diversions, and/or containment) when transferring salt or other deicing material.

3.3. Land Disturbance Permitting

The following language would be included as part of land use regulations and would apply to new and redevelopment projects which trigger the need for a land-disturbing permit. A chloride management plan is required per these regulations; the city or township could develop plan content requirements based on the regulatory strategies presented in this guidance, or per regional chloride management plans applicable to the city or township. These regulations apply to the property owner(s) rather than the winter maintenance professional(s).

Chloride Management

An applicant for a permit for land-disturbing activity on property other than individual single-family home sites must provide a plan for post-construction management of chloride use on the site that includes, at a minimum:

- (1) Designation of an individual authorized to implement the chloride-use plan; and
- (2) Designation of a Minnesota Pollution Control Agency Smart Salting-certified salt applicator engaged in the implementation of the chloride-use plan for the site.

TIP: To achieve MPCA certification, an applicator must first attend a Level 1 Smart Salting Training class and pass the required test. Additional information is available at:
<https://www.pca.state.mn.us/water/smart-salting-training>.

3.4. Parking Lot, Sidewalk and Private Road Sweeping Requirements

The below model language is designed to show how deicer sweeping can be incorporated into existing off-street parking, sidewalk and private roadway snow management requirements. Municipalities should incorporate sweeping language into existing code language as appropriate.

Sweeping of Parking Lot, Sidewalk, and Private Roads

Every owner or occupant of any dwelling or other residential building, proprietor or lessee of any business, commercial or public premises, or [insert other entities as appropriate such as homeowner's associations] within the [city/township], must conform to ice and snow removal specified under [code section]. If dry deicing material is spread, it must be properly swept and disposed of immediately after snow melt. If an owner, occupant, proprietor or lessee neglects or refuses to sweep excess deicing material, the [city/township] may sweep such material or authorize some person to do the same on behalf of the [city/township]. The [city/township], in its sole discretion, may issue notices of violation to an owner, lessee, proprietor, or occupant for violations of this section.

TIP: Municipalities may want to specify the process for deicer disposal. Some municipalities accept excess materials for disposal or require specific locations for landfill disposal. More information is available at:
<https://www.pca.state.mn.us/water/chloride-salts>.