

DEPARTMENT OF TRANSPORTATION

Because of the 1984 Wisconsin Groundwater Law, the Department of Transportation (DOT) regulates the storage of highway salt (ss. 85.17 and 85.18, Wis. Stats.) to protect the waters of the state from harm due to contamination by dissolved chloride. DOT is also responsible for potable well sampling at 28 rest areas and some seasonal waysides. Other DOT groundwater related activities include: groundwater investigation or remediation of contaminated properties; subsurface hydrogeologic investigations for infrastructure development; compensatory wetland restoration including hydrology performance monitoring (surface water/groundwater interaction); storm water management; and coordination with USGS and WGNHS for locational use and access for groundwater level monitoring points incorporated into the Wisconsin Groundwater-Level Monitoring Network.

FY 2024 Highlights

- Maintains social media partnership with WI Salt Wise: <https://www.wisaltwise.com>.
- Continues to research the effectiveness of brine chemicals and brine application rates for varying weather conditions in partnership with Clear Roads (National Research Consortium <https://clearroads.org>) and the UW Traffic and Safety Laboratory (TOPS Lab).
- Created the Brine Technical Advisory Committee (TAC) in 2018 and provides ongoing training to County winter maintenance crews regarding Direct Liquid Application (DLA).
- Organized a Winter Tech Talk in December 2023 which was a large scale one-day in-person event held at the University of Wisconsin – Oshkosh Fond du Lac Campus. The event was for winter maintenance operators from the counties to meet, learn, discuss, and share information regarding winter maintenance practices, more specifically related to improvement in liquid use, including direct liquid application.
- 30 Counties used Direct Liquid Application (DLA) and some Mostly Liquid Route (MLR) last season.
- Results of new brine application techniques are showing significant reduction in overall salt use while maintaining clear roads and level of service for the traveling public.
- Less salt was used last winter season (194 million pounds) yielding cost savings (\$8.8 Million).
- Total salt used was 255,000 tons, the least amount on the state highway network since the 1988/1989 winter.
- 14.5 million gallons of brine solution was used last season, down from the record year before but use was limited due to the very mild winter.

Details of Ongoing Activities

Salt Storage

Highway salt is stored statewide by suppliers, counties, cities, villages and private companies. Annual inspections occur and reports are provided for salt storage sites to ensure storage practices are in accordance with ch. Trans 277, Wis. Adm. Code (Highway Salt Storage Requirements). The intent of the Code is to help prevent entry of highway salts into waters of the state from storage facilities. All salt must be covered and stored

on an impermeable base. The base for stockpiles is required to function as a holding basin and to prevent runoff. The covers must consist of impermeable materials or structures to prevent contact with precipitation. State funded facilities are being added to the DOT salt storage program to provide greater capacity of indoor storage. This will improve groundwater protection and create greater flexibility for scheduling salt purchase at optimal prices.

The DOT annually updates salt storage facility records into a database and assists the DNR Wellhead and Source Water Protection program in locating salt storage facilities for GIS mapping applications. There are currently 1,323 salt storage site locations listed in the database with a total of over 2,410 buildings, brine tanks and stockpiles identified in the state. Facility inventories, inspections, repairs and improvements are included in the database.

Salt Use

The DOT Bureau of Highway Maintenance produces the Annual Winter Maintenance Report describing statewide salt use based on weekly reports from each county. Current policy in the State Highway Maintenance Manual restricts the spreading of deicer salts to a maximum of 400 pounds per lane mile per initial application, and up to 300 pounds per lane mile for subsequent applications. Electronic controls for salt spreader trucks are calibrated to record and verify application rates and coverage effectiveness. Other technology is used on county highway patrol trucks to keep salt on pavement surfaces (e.g., zero-velocity spreaders, ground speed controllers and onboard liquid pre-wetting units). Additional efforts to minimize and conserve salt applications include the use of an in-situ weather monitoring system. Pavement temperature sensors on most trucks and at 75 weather stations along major highway routes are used to determine application rates and effectiveness. Annual training for snowplowing and salt spreading techniques is provided for county snowplow operators.

Salt Usage Tracking and Initiatives

The DOT is working to ensure the right materials and resources are available and used before, during and after each storm event. The department continues to identify best practices based on national studies, pilot winter projects involving salt and brine use, plowing practices and snow plow route optimization.

The newest DOT initiatives over the last 6 winter seasons in winter maintenance is called "Mostly Liquid Routes" (MLRs). Multiple Counties used MLRs this past winter using brine or brine mixtures to keep the snow from sticking to the road between plow cycles, and rarely put rock salt on the road. These projects can result in a reduction of about 50% road salt application while still achieving the "time to bare/wet" goals.

Research and Additional Information

In December 2021 two research projects were completed in coordination with the Department:

1. *Evaluation of Winter Maintenance with Salt Brine Applications in Wisconsin*

- <https://topslab.wisc.edu/research/tse/evaluation-of-winter-maintenance-with-salt-brine-applications-in-wisconsin/>
2. *Expanding Application Rate Guidance for Salt Brine Blends for Direct Liquid Application and Anti-icing*
- [Expanding Application Rate Guidance for Salt Brine Blends for Direct Liquid Application and Anti-icing | Clear Roads](#)

DOT winter maintenance and response performance measures can be found at these webpage links:

- <https://wisconsindot.gov/Pages/doing-bus/local-gov/hwy-mnt/winter-maintenance/default.aspx>
- <https://mapss.wisconsindot.gov/Public/Measure/6>
- Explanations of liquid brine applications are provided on WisDOT podcast (Feb 25, 2020 – Transportation Connects – Clear Roads, Less Salt – Winter Road Maintenance) below and refer to the DOT social media for occasional postings and new information pertaining to Winter Maintenance and chloride reduction initiatives:
- <https://wisdot.libsyn.com/clear-roads-less-salt-wisconsin-winter-road-maintenance-0>

For more information

Visit <https://wisconsindot.gov>

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