

Use of Road Deicers

City of Greater Sudbury

Operations Committee

May 14th, 2018



Road Deicing

The Role of Salt in Ice Removal*

- 1 Salt is spread on surface.
- 2 Salt melts through snow/ice forming brine.
- 3 Brine breaks bond with road surface and remaining snow/ice floats on brine.
- 4 Vehicle traffic breaks through the surface, reducing snow/ice to plowable slush and moving it to sides of road.



* The Salt Institute



- Deicing is the process of applying solids or liquids to a road to melt snow/ice

Municipal Comparison

- 12 Municipalities/agencies were polled
- All use road salt deicers
- Northern Municipalities use road salt and winter sand (similar to CGS)

Common Types of Road Deicers

- Sodium Chloride (most common)
- Calcium Chloride
- Calcium Magnesium Acetate
- Potassium Acetate
- Organic Compounds (sugar by=products)

Deicer Cost Comparison

Product	Cost per Tonne	Cost per Litre	Cost Magnitude as compared to Salt or Salt Brine
Salt (NaCl)	CAN \$90	-	-
CMA	US \$650	-	9 x Salt
CaCl ₂	CAN \$660	CAN \$0.26	7 x Salt
Salt Brine	-	CAN \$0.03	-
KAc	-	CAN \$2.95	11,375 x Salt Brine
Beet Juice	-	CAN \$0.65	21 x Salt Brine

Road Salt – Application Rates

- Road salt application rate
60 – 150 kg/2 lane km's
- Winter sand application rate
100 – 310 kg/2 lane km's
- Salt application rate is reduced by 20%
using salt brine (pre-wetting)

Current Winter Control Service Policy

In 2005, BMA Management Consultants undertook an Internal Audit of Winter Maintenance Activities

Audit includes:

- Review existing practices
- Identify opportunities for efficiencies
- Review best management practices

Salt Management Plan (SMP)

Objective

“provide effective winter maintenance to ensure the safety of road users in keeping with applicable legislation and accepted standards while striving to minimize adverse impacts to the environment”



2016 Salt Management Plan

City of Greater Sudbury

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Realizing the Objective of the SMP

- Adhere to SMP procedures
- Comply with applicable laws & regulations
- Review & upgrade SMP periodically
- Staff training
- Annual monitoring

Operational Changes (due to SMP)



Notable Operational changes:

- Staff training
- Equipment calibration
- Onboard brine systems

Source Water Protection



- Improved monitoring of road salt activities
- Improved signage in source water protection areas
- Sand/salt storage & handling at various CGS depot operations

Risk Management Plan (RMP)

Frobisher Depot



Risk Management Plan Assessment

Frobisher Depot
1800 Frobisher Street
Sudbury, Ontario

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- Frobisher site requires Risk Management Plan (RMP) for road salt handling & storage activities
- Assessment completed in 2017

Salt Optimization Plan

The Salt Optimization Plan was prepared to assess potential risk/vulnerability to environmental receptors with the application of road salt with the CGS road network.



Salt Optimization Plan

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Salt Vulnerability Index

- Source water protection (SWP)
- Wellhead protection (WHPAs)
- Intake protection zones (IPZs)
- Highly vulnerable aquifers
- Significant/sensitive groundwater recharge areas
- Lake trout & fish spawning areas
- Wetlands & provincially tracked species sensitive to salt application

Conclusion

- Continue to improve effective delivery of winter maintenance services
- Present alternatives & recommendations addressing Infrastructure facility needs, including construction of new sand/salt handling facilities

Questions