



The Great Falls of Tinker's Creek

Stormwater Management Sensible Salting Practices

This presentation accompanies the *Pollution Prevention & Good Housekeeping for Municipal Operations Program Guide* created by Tinker's Creek Watershed Partners.



Sensible Salting Practices

Environmental Impacts from Road Salt (Sodium Chloride):

❄ Damages:

❄ Soil

- ❄ Destroy stability
- ❄ Decreases ability to filter water
- ❄ Increases soil erosion
- ❄ Causes soil to release nutrients back to water

❄ Water

- ❄ **One teaspoon** can *permanently* pollute **five gallons** of water
- ❄ Chlorine not easily filtered out by water quality practices or natural environment
 - ❄ Diluted or transferred to soil or groundwater tables
- ❄ Groundwater tables hold high concentrations of chlorine
 - ❄ Source of water for streams during dry periods

❄ Vegetation

- ❄ Direct road splash capable of killing grass and plants

❄ Wildlife

- ❄ High levels: toxic to fish and insects
- ❄ Low levels: reduces fish/insect reproduction and survival rates

Sensible Salting Practices

Economic Impacts from Road Salt (Sodium Chloride):

- ❄ Corrosive to bridges, buildings, vehicles, and infrastructure
 - ❄ Increases maintenance costs – **billions of dollars**
- ❄ Threatens drinking water supplies
 - ❄ Wells
- ❄ High disposal costs
- ❄ **18.3 million** metric tons of salt sold in 2007
- ❄ Annual deicing costs for United States: **\$2.3 billion**



Sensible Salting Practices

Compliance Impacts from Road Salt (Sodium Chloride):

US EPA Water Quality Criteria: Chloride levels **at or above 230 mg/l for over four days** – harmful to aquatic life

- ❄ High levels of chloride in groundwater creates streams with high levels in the fall
 - ❄ Use groundwater as water source during dry periods like summer
 - ❄ Easier to raise to toxic levels in winter
- ❄ Sites with **50-100%** urban land cover
 - ❄ Exceed water quality criteria **100-200 days** each year
- ❄ Impairments likely to occur when:
 - ❄ At least 15% of watershed dedicated to urban development and transportation uses
 - ❄ Salt loading rates approximately 70 metric tons per square kilometer

Urban or impervious cover ranges from 6.16% in the south to 43.7% in the north in Tinker's Creek watershed.

Sensible Salting Practices

Alternatives to Traditional Road Salt:

Compound Name:	Cost (per ton):	Lowest Operational Temperature	Advantages:	Disadvantages:
Sodium Chloride	\$35	15°F	Low cost	Environmental, economic, and compliance impacts
Calcium Chloride	\$290 for flakes \$340 for pellets	-25°F	Requires less frequent use	Contains chlorine
Magnesium Chloride	\$260 for flakes \$300 for pellets	5°F	Least toxic deicer	Causes tracking and discoloration
Urea (Fertilizer)	\$280	20-25°F	Less corrosive	Inputs excess nutrients
Calcium Magnesium Acetate	\$2,000	22-25°F	Less toxic	High cost
Sand	\$15	No melting capacity	Provides traction	Source of sediment pollution

Sensible Salting Practices

Salt Storage:

- ❄ Addresses NPDES Permit Part III.B.6.d.iii.2
 - ❄ TMDL pollutants addressed: TSS, Nutrient, Habitat, DO, Bacteria, Flow
- ❄ Salts are very soluble in water
 - ❄ Major stormwater threat
- ❄ Store in closed area
 - ❄ Salt dome
- ❄ Street sweeping and materials handling BMPs implemented
 - ❄ Further reduce chance of pollution



Salt storage dome in Philadelphia,
PA



Salt storage dome in Baltimore,
MD

Salt clean-up will be conducted within 48 hours of the last snow plowing and salting operations from the previous snowfall event.

All salt will be stored in salt domes.

Sensible Salting Practices

Snow Disposal:

- ❄ Addresses NPDES Permit Part III.B.6.d.iii.2
 - ❄ TMDL pollutants addressed: TSS, Nutrient, Habitat, DO, Bacteria, Flow
- ❄ Snow plowed from roads contains many pollutants like road salt
- ❄ Choose snow disposal areas to minimize spread of these pollutants to stormwater and surrounding water bodies
 - ❄ Near wide vegetated buffers
 - ❄ Near berms
- ❄ Reduce amount of snowfall hitting roads
 - ❄ Vegetation and snow fences next to roadways prevent snow from coming onto roads
- ❄ Reuse water from snow melt for brine production
 - ❄ Pre-wet granular salt or apply directly to roads in combination with salt
 - ❄ Pre-wetting reduces amount of deicer ending up in shoulders or roadside ditches

Sensible Salting Practices

Salt Application:

- ❄ Addresses NPDES Permit Part III.B.6.d.iii.2
 - ❄ TMDL pollutants addressed: TSS, Nutrient, Habitat, DO, Bacteria, Flow
- ❄ Utilize combination of road salt and other deicers
- ❄ New technologies for salt trucks reduce over-application rates:
 - ❄ Temperature sensors
 - ❄ Computerized salt spreaders
 - ❄ GPS systems
- ❄ Reducing over-application **saves money**
- ❄ Prioritize streets
 - ❄ Similar method as for street cleaning
 - ❄ Focus on hills, curves, and intersections
- ❄ Train municipal staff and private contractors on application procedures

Sensible Salting Practices

Sensible Salt Program:

- ❄ Program developed by the Cuyahoga County Service Directors Association
 - ❄ Goals:
 - ❄ Reduce salt usage by 30%
 - ❄ Keep environment cleaner
- ❄ Community practices:
 - ❄ Limit salting on secondary roads
 - ❄ Limit overnight salting
 - ❄ Focus application at intersections, hills, curves, and bridges
 - ❄ Spot salting
 - ❄ Salt at 150 ft intervals on main roads
- ❄ Adopted by the City of Euclid in 2008

Sensible Salting Practices

City of Euclid's Sensible Salt Program:

- ❄ Limited salting during late evening and early morning hours
 - ❄ Limited salting from 11 PM to 4 AM
 - ❄ Not effective – low traffic volumes
 - ❄ Ensure “passable roads” only
 - ❄ Salt only intersections, hills, curves, and bridges

- ❄ Salting during snow events
 - ❄ Plow roads as frequently as possible during periods of at least 1 inch snowfall per hour
 - ❄ Salt at intersections, hills, curves, bridges, and school zones
 - ❄ Utilize spot salting

- ❄ Limited salting on secondary roads
 - ❄ Side streets
 - ❄ Plowed as often as possible
 - ❄ Salted only at intersections, bridges, hills, curves, and school zones
 - ❄ 200 ft intervals

Sensible Salting Practices

City of Euclid's Sensible Salt Program:

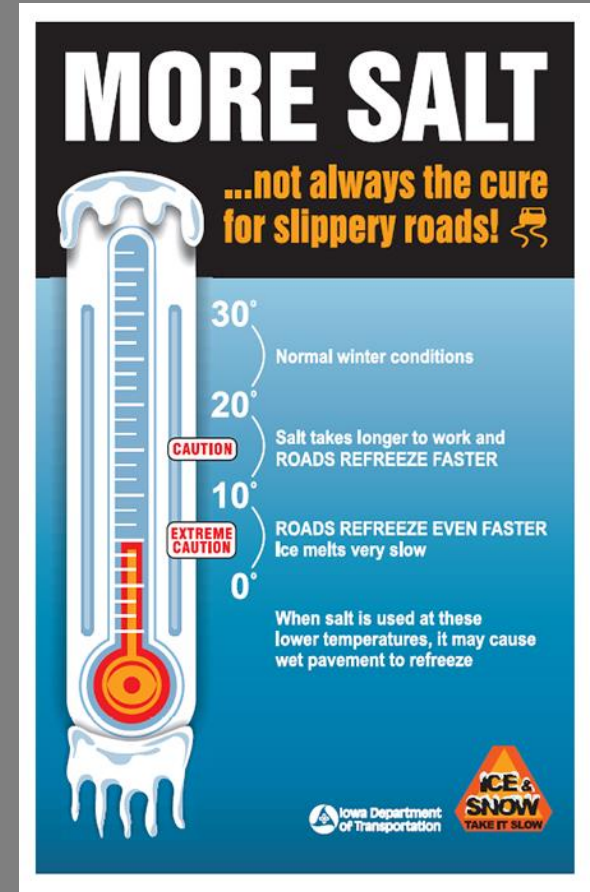
- ❄ Proper training of employees and communication of this policy
 - ❄ Responsibility of Service Director
- ❄ Proper calibration of equipment
 - ❄ Ensures proper implementation
 - ❄ *Saves money by reducing over-application*
- ❄ Investigation of alternative products
 - ❄ Service Director continues to investigate, purchase, and use other alternative deicing products

“When conditions warrant, such as those found during and after an ice storm, the City has the ability to salt as necessary, as the safety of the residents and visitors of South Euclid remains the number one priority.”

Sensible Salting Practices

Education & Outreach – Tips at Home:

- ❄ Shovel snow
 - ❄ Remove snow and ice during snowstorm, if possible
 - ❄ Reduces salt required
 - ❄ Increases efficiency
- ❄ Follow application instructions
 - ❄ More salt does not correspond to quicker melting
- ❄ Reduce chemical application
 - ❄ Only apply where really needed
 - ❄ Create paths instead of removing all snow



Sensible Salting Practices

Education & Outreach – Tips at Home:

- ❄ Consider temperature
 - ❄ Most salts are ineffective below 15°F
 - ❄ Sand coupled for traction but must be swept up after
- ❄ Sweep up extra
 - ❄ No longer working
- ❄ Pet safety
 - ❄ Sodium chloride, calcium chloride, and magnesium chloride can burn paws
 - ❄ Potassium acetate is a safer alternative
 - ❄ Wash paws after walking pets



Sensible Salting Practices

For more information:

- ❄ Contact Tinker's Creek Watershed Partners
 - ❄ Template for PPGHP
 - ❄ *Pollution Prevention and Good Housekeeping Program Guide* (pages 13-15)
 - ❄ More information on individual BMPs and incentives

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- ❄ Sources:
 - ❄ <http://www.cityofsoutheuclid.com/>
 - ❄ <http://www.saltinstitute.org/>
 - ❄ <http://www.cuyahogawcd.org/>
 - ❄ <http://stormwater.wef.org/>
 - ❄ <http://www.tmacog.org/>
 - ❄ *Additional information retrieved from the Guide*