Chloride reduction program update

6/29/23

The District receives more salt than this pile per day – 110 tons on average

Treatment process does not remove salt, so it leaves in effluent



Chloride impacts

- Affects freshwater aquatic life
- Disrupts ecosystems
- Interferes with lake mixing

WI chloride criterion for surface water



Chloride concentrations in surface water bodies throughout Wisconsin

395 mg/L

Eventual target for WPDES permit as a weekly average



Treating for chloride

- Expensive 55-500% increase in rates
- Energy intensive would lead to higher GHG emissions





Pollution prevention as alternative to treatment

- There are known ways to reduce chloride sources
- Can be much less expensive than treatment

Source reduction is chosen path for compliance

- Permit reissued in 2020 with chloride variance
- Variance was granted based on overall environmental benefit of chloride source reduction vs. treatment

Variance limits for winter and summer

Chlorida	Weekly Avg	465 mg/L	Daily	24-Hr Flow Prop Comp	This is an interim limit in effect November 1 through March 31 annually. See subsections 3.2.1.11 for chloride source reduction measures and 6.2 for the Chloride Target Value schedule.
Chloride	weekly Avg	430 mg/L	Daily	24-Hr Flow Prop Comp	october 31 annually. See subsections 3.2.1.11 for chloride source reduction measures and 6.2 for the Chloride Target Value schedule.
Chloride		lbs/day	Daily	Calculated	Calculate the mass discharge of chloride in lbs/day on the same days chloride sampling occurs.



Sources of chloride to Nine Springs WWTP





Pollutant Minimization Plan (PMP)

← → C madsewer.org/pollution-prevention/chloride	2/		
💁 Mail - Catherine Ha 🜓 MMSD Intranet > H 🍘 AGOL 📃	GIS 💡 Maps 🖻 Active Campaign 🍦 Ac	cess Water Home 💉 ToDo 💧 Shop One \	Vebsite
Madison Metropolitan Sewerage District		COMMISSION CAREERS CONTACT	Select
Who We Are What We Do	Pollution Prevention Do Business W	/ith Us News & Resources	
Other resources CHLORIDE POLLUTANT MINIMIZATION PROGRAM REPORT A Pollutant Minimization Program (PMP) annual report outlining 2022 District chloride reduction efforts. Chloride PMP Report	WATER SOFTENER OPTIMIZATION STUDY A 2015 study by the District investigated how water softener optimization can aid wastewater utilities in chloride discharge limits.	CHLORIDE COMPLIANCE STUDY This 2015 study provides information on chloride sources to the plant, options for compliance, and the costs of compliance options. Chloride Compliance Study	CHLC COM A 201 reduc a visio
		SALT SAVERS PILOT PROGRAM	

Source reduction is...



Chloride PMP actions

Action	How
1) Identify chloride sources	 District chloride monitoring AECOM study Survey of commercial salt users
2) Assess compliance options	AECOM studyPaired watershed water softener study
3) Build partnerships	Engaged water softener industryConvened Wisconsin Salt Wise
4) Incentivize salt reduction	 Budgeted source reduction funding Developed water softener and road salt reduction grant programs Contacted stakeholders to encourage grant projects
5) Create "easy" ask for residents	 Developed Salt Savers reporting app and training curriculum Trained and certified softener technicians and plumbers Partnered with municipalities to issue discounts







Check your water softener to keep salt out of our streams

Every bag of salt you put in your water softener ends up in local freshwater streams. You can help protect fresh water from salt pollution – and save yourself trips to the basement to refill your softener – by making sure your softener is running as efficiently as possible.

Take the softener self-screen below to find opportunities to improve your softener and reduce salt use at home.

www.madsewer.org/SoftenerScreen





We conduct community outreach



We develop and support training



We research sources of chloride





Madison Metropolitan Sewerage District added 3 new photos. November 1 at 5:16pm · @

TRAINING UNDERWAY: WINTER SALT REDUCTION Did you know that many parking lots and sidewalks receive 10 to 20 times the amount of salt needed to fully melt the ice? This excess salt washes away, affecting area... More



We build awareness through media

Wisconsin Salt Wise A I

Home Successes 🔻 The Skinny on Salt 👻 Take Action 👻 Maintenance Professionals 👻 About Us 👻

Smart Winter Salting

Best Practices for Snow and Ice

You can keep sidewalks and driveways safe this winter while protecting our waters by following these simple steps:



1. Shovel

Clear walkways and other areas before the snow turns to ice. The more snow you remove manually, the less salt you will have to use and the more effective it will be.



2. Scatter

If you use salt, scatter it so that there is space between the grains. Believe it or not, a coffee mug of salt is enough to treat an entire 20-foot driveway or 10 sidewalk squares. If you see oversalting, follow these simple steps.



3. Switch

When pavement temperatures drop below 15 degrees, salt won't work. Switch to sand for traction or a different ice melter (PDF) that works at lower temperatures.

We convened and grew WISaltWise

There's still work to do



How can we change salt use norms?

- Softener salt and road salt used widely and there are barriers to reducing their use
- Education alone is not enough to change behavior when barriers exist other than lack of awareness
- Key question: what will motivate behavior change?



Salt Savers pilot program

 Project in Pump Station 9 pilot area from 2019-2022

• Goals:

- Test incentives
- Engage water softener service providers
- Test models of offering rebates through municipal partners

Incentives given to improve softeners





Trained service providers documented jobs

MMSD Evaluation and Optimization Form

\bigtriangledown Softener optimization

Check the settings in this section to determine whether this softener is operating at its highest salt efficiency. **Important:** Make changes to units only if you are familiar with the settings on that unit. Changing a softener setting without changing other related settings can cause the softener to operate improperly.

\bigtriangledown 1) Hardness setting

Are you able to access this softener's hardness setting?

Yes

×

⊖ No

Enter the previous hardness setting:

22

This hardness setting is above the actual hardness of the source water. Set the hardness setting equal to the hardness of the source water.

Enter the new hardness setting:

The default value is the entered water hardness for this location. Leave as-is if you set the hardness setting to match this hardness level or if this is already the setting of the softener.



Madison Metropolitan Sewerage District

16

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Program promoted through several channels

Total self-screens completed by McFarland residents and source of information



Evaluated data to assess program



Softener Permits as a Percentage of Total Plumbing Permits 2018-2022



Got feedback from participants



Outcomes

229

Softener services completed in pilot

45

Pounds of chloride reduced per day

\$7,420

Cost per pound of chloride reduced per day



Takeaways

- Most services were softener replacements
- Slight evidence of program influencing consumer behavior
- High effort for relatively small chloride reduction
- Rebates can be effective, but are limited and cannot be the only tool

Applying lessons to future strategy



Possible future policy direction

Target for Success (mg/l)



Pathways to salt reduction





Training and engaging softening and plumbing professionals



Blending valves to reduce salt use

- Can reduce salt use by up to 25-30%
- Allows for consumer preference in water softness level
- Pilots with Culligan, Dave Jones, Tim O'Brien Homes

Effect of softening less water

Assume three neighboring homes each use 6000 gallons of water per month (total). They all get water from a well with 20 grains per gallon hardness.

	House 1	House 2	House 3
Softener efficiency	4500 grains/lb.	3000 grains/lb.	4500 grains/lb.
Percent water softened in home	90%	60%	60%
Salt used/month	24 lbs.	24 lbs.	16 lbs.



Planned activities

- Strengthen partnerships with softener vendors and service providers
- Enhance resources for public and service providers
- Evaluate need and feasibility of policy to support chloride reduction
- Identify motivators for large commercial softener improvements



Thank you