Chloride Pollutant Minimization Program/Source Reduction Measures

Madison Metropolitan Sewerage District - 2023 Annual Report

SECTION I: GENERAL INFORMATION

Name of Permittee: Madison Metropolitan Sewerage District (MMSD), Nine Springs Wastewater Treatment Plant

Permit Number: WI 0024597-09

This is: the first permit issuance requiring implementation of a PMP/SRM.

Permit Effective Date: 05-01-2020

Date of First PMP/SRM: 05-24-2017

This variance is for: Chloride

Concentration targets:

Chloride Weekly Avg 465 mg/l, November 1 through March 31 annually.

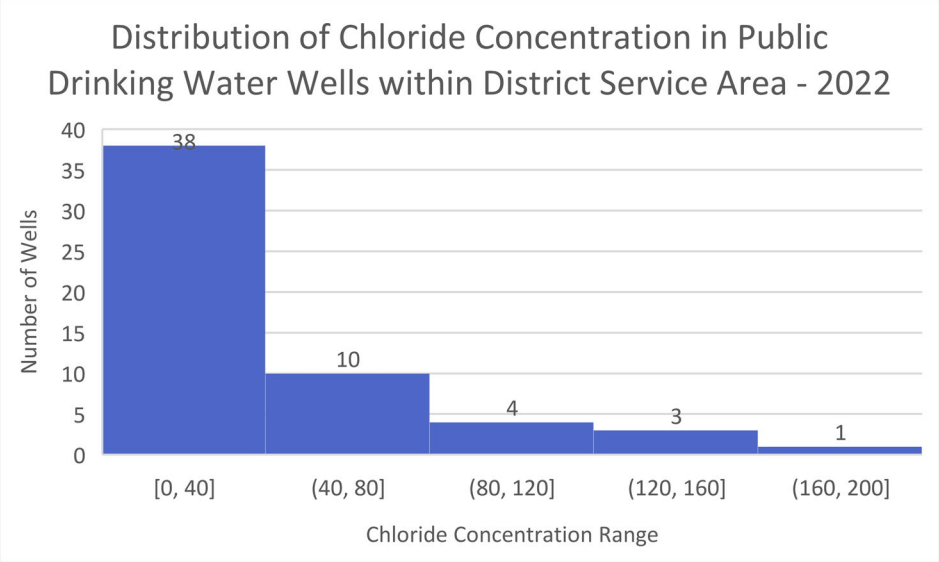
Chloride Weekly Avg 430 mg/L, April 1 through October 31 annually.

SECTION II: SUMMARY OF POLLUTANT REDUCTION WORK DONE IN 2023

A. Actions to Identify Pollutant Sources – 2023 Actions	
User Charge Sampling: Analyze user Charge Program samples for chloride. Evaluate the viability of adding chloride as a billing parameter.	Through its Salt Savers pilot projects (2019-2022), the District made significant progress in understanding requisite labor and cost inputs, data cleaning and interpretation steps, and limitations in using a freshwater conductivity logger for estimating chloride concentration in a given sewershed. To synthesize these learnings, and compare this method to the other known methods for chloride measurement, as an aid in future policy discussions (such as adding chloride as a billing parameter), we began to compile a report to be included in a future PMP report. Analysis of chloride in one primarily residential sewershed (via the User Charge sampling program), as well as special

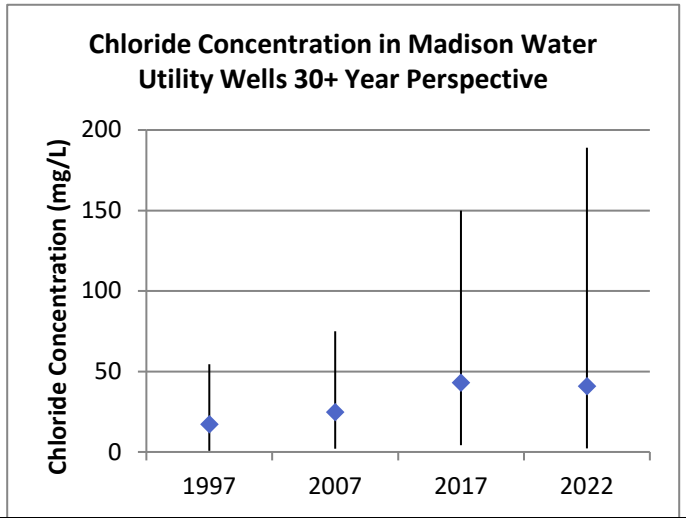
	sampling and analysis of the primary influent stations ring the winter, both continued in 2023. See Attachment B
Road Salt Practices: Evaluate the current status and improvements through a re-survey of customer communities.	Current status of customer community road salt practices was captured through Sewer Use Ordinance required reporting (section 4.7.2, a&c). A summary of results, including identified areas for improvement are included in Attachment E.
Baseline social-science survey: Study existing sources of chloride and gather information specifically for development of future outreach strategies; measure awareness and attitudes; collect information about barriers to homeowner action through scientific survey.	The District successfully completed a survey of residents in 2023, "The 2023 Community Values Survey", capturing opinions of a representative sample of service area residents on a variety of utility-related topics. Relevant to the chloride source reduction initiative, notable findings include positive results for overall credibility and impression of the District: • 89% of respondents indicated they had an overall favorable impression of the District. • 93% of respondents view the District as a credible source of information on wastewater management – an equal rate to the perceived credibility of University of Wisconsin-Madison Scientists, and slightly more credible than Dane County and local government. When asked, "Blending valves are a low-cost device that can be added to your home water softener to help reduce the amount of salt your water softener uses. Is this something you would consider using in your home?", an overwhelming majority of respondents who said they are responsible for decisions about home systems, 80% said "Yes", they would consider adding it. Even with only very limited information to go off of, the majority of homeowners are curious and open-minded about this relatively little-used plumbing device that has a huge potential for reduction in household softener- salt use.
If any source is not controllable, please explain why.	

Through the District's Sewer Use Ordinance, owner communities are required to submit analytical results for chloride concentration in all their public drinking water wells. As of 2022, five wells in the District's



service area contain chloride concentrations greater than 100 mg/L. Three of those are >=150 mg/L. As the water is pumped out of the ground, before people ever touch it or it even gets to homes/businesses, is already at more than a quarter of the water quality standard the WWTP discharge permit is asked to meet.

Data from wells in one community show a trend of increasing concentration over 30 years (see graph to the right). This means independent of any source reduction efforts, the baseline for how much chloride is coming to the plant, just in the drinking water alone is on the rise. The municipal drinking water quality could be considered an 'uncontrollable source' because of the multitude of factors outside of any one entity's control that influence the groundwater quality.



B. Actions to Minimize Pollutant Sources – 2023 Actions	
Administer training programs: SaltWise Soft Water Training; Winter Maintenance Training and develop/roll-out homeowner information and training program.	The WI Salt Wise Partnership continued to offer Road Salt Reduction Training and other educational content for both public and private winter maintenance professionals throughout 2023; a full list of all WI Salt Wise actions throughout the year is included in Appendix C.

	In partnership with Plumber's Union Local 75, SaltWise Soft Water continuing education for plumbers was continued and expanded in 2023. The class expanded from a 3 credit hour, one evening class to a two-evening class worth 6 credit hours. In the new format, the first day of training is led by MMSD Pollution Prevention staff and covers the existing SaltWise Soft Water material: environmental impacts of salt, identifying 'clunker models', and setting up softeners for efficiency. The second day is led by an experienced plumber and focuses more on the basic information about softener installation, troubleshooting, and hands-on operation of common control heads. In 2023, this new format for continuing education was offered twice in Madison and twice in Milwaukee (one class series in spring and fall in each location). In total, about 60 plumbers were trained this year. In addition to the trainings MMSD and Local 75 led, one local plumbing company did an in-house training with all of their service plumbers and installers for new construction, to cover installation of blending valves. This training was prompted by the District engaging this plumbing company on the use of blending valves to reduce salt.
Offer and expand salt-reduction rebate programs: simplify administration/ quantification for programs, evaluate new or expanded programs to target specific markets.	In 2023, WI Salt Wise transitioned to its new organizational home with the Capital Area Regional Planning Commission, a move which allowed the organization to serve a larger geographic area. As WI Salt Wise has begun teaching across the state, the need for funding assistance and incentive beyond the MMSD service area has become apparent. WI Salt Wise was able to work with the WI DNR to begin evaluating the feasibility of a state-wide low-cost loan to assist both public and private sector salt applicators to get assistance with purchase of the equipment they need to be salt wise. We continued to offer both innovation and road salt grants in 2023. Evaluation of the efficacy and administration of Road Salt Equipment Grants is ongoing and will likely lead to update in 2024. In 2024, the District awarded one new Innovation Grant, to Sustain Dane so that they could add water softener inspections and upgrades to their efficiency navigator program.

Offer Road Salt Equipment Grants: Target private and municipal operations; Incentivize salt-reducing innovations and develop leaders in the 'new normal;' measure change in winter maintenance policy & practices through follow up to 2014 & 15 surveys.	In 2023, WI Salt Wise made huge strides in creating a 'new normal' using policy. In nearly every round of road salt training since the beginning, fear of liability (getting sued) has been cited by salt applicators as one of the things that prevents minimizing salt use. The fear of incurring a slip/fall lawsuit oftentimes outweighs moderate salt application. Bills to create limited liability protection for salt applicators who are trained and can demonstrate use of best management practices were introduced to the WI State Legislature this year. A similar law has already been established in Vermont, and bills are being introduced in Minnesota and Illinois currently. In the early stages of the law-making process, these bills appear to have bi-partisan support and have been supported by the salt and winter equipment industry, including SIMA the Snow and Ice Management Association.
Behavior Change Initiatives: Develop programs to change behavior/social norms with businesses and individuals; leverage WISaltWise to change behavior and social norms.	Sometimes the most impactful change strategy can be to not change behavior at all, but instead change defaults. After developing a relationship with engineers at Clack Corp. over many years, we were finally able to work with them to change the default salt dose (to low) for all outgoing softener models. In addition to the explicit/direct impact that this will have, the most current research into social psychology/behavior change suggests that changing defaults also signals important information about underlying values and assumptions; that low salt is the norm. After completing the Salt Savers Pilot, understanding more about the scalability constraints on a household softener efficiency incentivization, we began pivoting to exploring interventions that minimize soft water use altogether: using blending valves, plumbing conversions (from full-line to hot-only), and other alternatives. Blending valves are of particular interest for the District because they are a simple, inexpensive plumbing change that offers a compromise between totally soft and totally hard water. The question now is how receptive customers and softener installers are to slightly hard water, compared to the status quo of totally soft water. In 2023, the District initiated discussions with several partners about blending valve

	implementation, some of which have already translated to action. The District offered a grant to a local water softener company to increase its promotion of a built-in blending valve in its softeners, representing a step away from the status quo of maximum softness/maximum salt use. The District also spurred a change at a local home builder, Tim O'Brien Homes, facilitated by Dave Jones Plumbing. The District pitched the benefits of blending valves to Tim O'Brien Homes, who were immediately receptive to the idea. Several staff at Tim O'Brien tested out blending valves in their homes and did not notice a difference in their water quality compared to totally soft water. In October 2023, Tim O'Brien Homes began installing blending valves on all softeners in its new homes – a relatively easy change that could have significant salt reduction potential if scaled to a large number of homes. Over the year, we've also been in conversation with one municipality, strategizing on how to pilot install and trial of blending valves. We plan to build from these initial discussions into a pilot program in 2024 to explore how to incentivize residents to retrofit existing softeners with blending valves.
Capitalize on low-hanging fruit: Develop outreach kit; focus industrial contacts on chloride reduction opportunities; attend community events as appropriate, with emphasis on chloride information.	The District continues to invest in general community outreach, offering free monthly "first Friday" plant tours for the public, scheduling group tours upon request, supporting another cohort of Water Stewards training class for 2023, and continuing the Shop One Artist/Educator residency program. Dane County is a seller's market right now – homes are tending to turn over very quickly at high prices, often times with sellers asking buyers to waive contingencies, making the home inspection an important educational step for home buyers. The Wisconsin Association of Home Inspectors' Madison chapter, has been working with the District to educate their members (licensed about important pollution prevention topics, ranging from household renovation/hazardous waste clean out to water softeners. District staff gave this group a tour of the wastewater treatment plant and gave a presentation at one of their chapter meetings in 2023. We distributed >200 informational packets for them to give to their clients.

Expand digital presence: expand WiSaltWise.com/campaign and web resources (MMSD website, social media, videos)	District communication and pollution prevention teams reviewed all existing collateral and public-facing pollution-prevention resources (brochures/poster/hand-outs/kits) in late 2023. A number of materials will be retired, with the replacement being mostly just a web page, and a few will be updated and reprinted to include new messaging. One of the major updates as a result of this process was to the hose-bibb test kit material and process (see Attachment D), including a new webpage and video to explain testing water for hardness. In support of its focus on blending valve implementation, the District posted both a blog and a new web page on blending valves. The web page includes an embedded calculator to help users see the quantifiable benefit of installing a blending valve. District social media typically posted about once a month on salt related topics (including Twitter, Facebook, and Linked In platforms. Fifteen salt-related topics ranging from supporting/sharing WI Salt Wise initiatives, to winter safety/snow removal, to water softener blending valves were featured on District social media in 2023. In 2023, as far as digital presence, there was a lot of "earned media" (ie. content that was produced/written about salt reduction that the District didn't pay for or created ourselves). Local news, newsletters, and blogs picked up salt issues a number of times.
If any action was not implemented, please explain why.	

C. Mainteance of Source Reduction – 2023 Actions	
Quantifications/Data Mining: analyze historic data; determine magnitude of previous reductions; develop estimates of and future viability.	Q1-Q2 2023, District staff worked with a UW Statistics graduate student cohort to both evaluate the Salt Savers Pilot program impact on wastewater chloride levels, and to

	continue evaluating novel use of freshwater conductivity logger in wastewater environment. In depth statistical analysis from these groups, in terms of quantifying the Salt Savers Pilot program's impact were consistent with findings reported in the Salt Savers Pilot white paper included in last year's annual report: the pounds reduced as a result of the program were not sufficient to make a clear, statistically significant change in chloride concentration levels in this sewershed. Some internal chloride data handling processes were reassessed this year, specifically how missing values are dealt with. Prior to 2020, data was tabulated by hand transcription from a database into a spreadsheet. In 2021, scripting was developed using the programming language "R" in order to minimize possibility for transcription error, and to save time on repetitive processes. The code that produced 2021 and 2022 reports removed missing data points, which represented a departure from the previous method of data handling, which used interpolation (averaging the day before and day after). Code was updated for 2023 so that missing data points will now be interpolated. Overall this change represents a very small nuance – doesn't change the overall trends since days with missing data are generally very sparse (under 5 per year usually), but still worth noting on this report because of the staff time required for these changes.
Cultivate relationships/leverage partnerships: leverage existing social networks, build new relationships with hotels/apartments/industry; continue to facilitate conversations between salt reduction champions and their peers; partner with sustainability focused programs in the region to identify and leverage synergies and speak in venues where our messages can reach broad audiences.	Staff remained engaged with: The Salt Symposium Planning Committee, CSWEA Government Affairs Planning Committee, Peers working on salt reduction such as Waukesha and Waterloo, Plumbers Local 75 / Building Wisconsin TV, our municipal customer communities and the WI Salt Wise Partnership.

Communications: Develop and roll out videos/case studies and industry/large water user focused messages; target outreach and develop messaging.	Materials such as the training workbook were updated and continually developed this year. The 2023 Salt Wise Soft Water handbook is at https://www.madsewer.org/do-business-with-us/for-water-softener-professionals/ . Worked on negotiating and developing a second TV Show episode in partnership with Plumber's Union Local 75 will be filmed in early 2024, for release in Q2 2024. This time it will be "Today's Home Remodeler" different audience than the first episode, which was on Building WI TV. This episode will focus on softener inspections upgrade in the context of general home plumbing audits.
Wisconsin Salt Wise: undertake strategic planning to establish the future structure of Wisconsin Salt Wise.	We remain a funding WI Salt Wise Partner, a technical resource, and help with strategic direction for Wisconsin Salt Wise. Participate in all Salt Wise meetings/calls and coordinate with the Salt Wise staff closely.
Funding and staffing: maintain on-going staffing and budget to support Chloride Source Reduction Program	Two full-time and one part-time staff person will be retained for pollution prevention work in 2024. Additionally, support will be available from district communications team, an LTE in pretreatment will be available, and intern has been budgeted for year-round assistance.

If any action was not implemented, please explain why.

In 2023, plans to estimate the magnitude of commercial salt contribution, and actions on that were not taken, mainly due to a change in how our pretreatment program operates.

Planning, however, for a different approach to attain chloride reduction from commercial softener efficiencies was underway throughout 2023. In March, the City of Madison joined nearly 40 other units of local government across the nation, by passing an ordinance requiring building energy benchmarking. In Madison, the program is called the Building Energy Savings Program (BESP). From the City's website: "Under the new code, non-residential commercial buildings 25,000 square feet and larger are required to benchmark energy use annually via EPA's ENERGY STAR Portfolio Manager. Non-residential commercial buildings 50,000 square feet and larger are also required to complete a building tune-up every four years." We have been in conversation with the program manager for Madison BESP about including softeners as they are an integral part of the hot water system, a key component in the building benchmarking process. The City of Madison, as the District's largest customer, representing about 63% of total flow to Nine Springs (as of 2022), has majority of the area's commercial buildings within their jurisdiction; incorporating softeners into the ordinance-mandated inspection, performance benchmarking and tune-up process

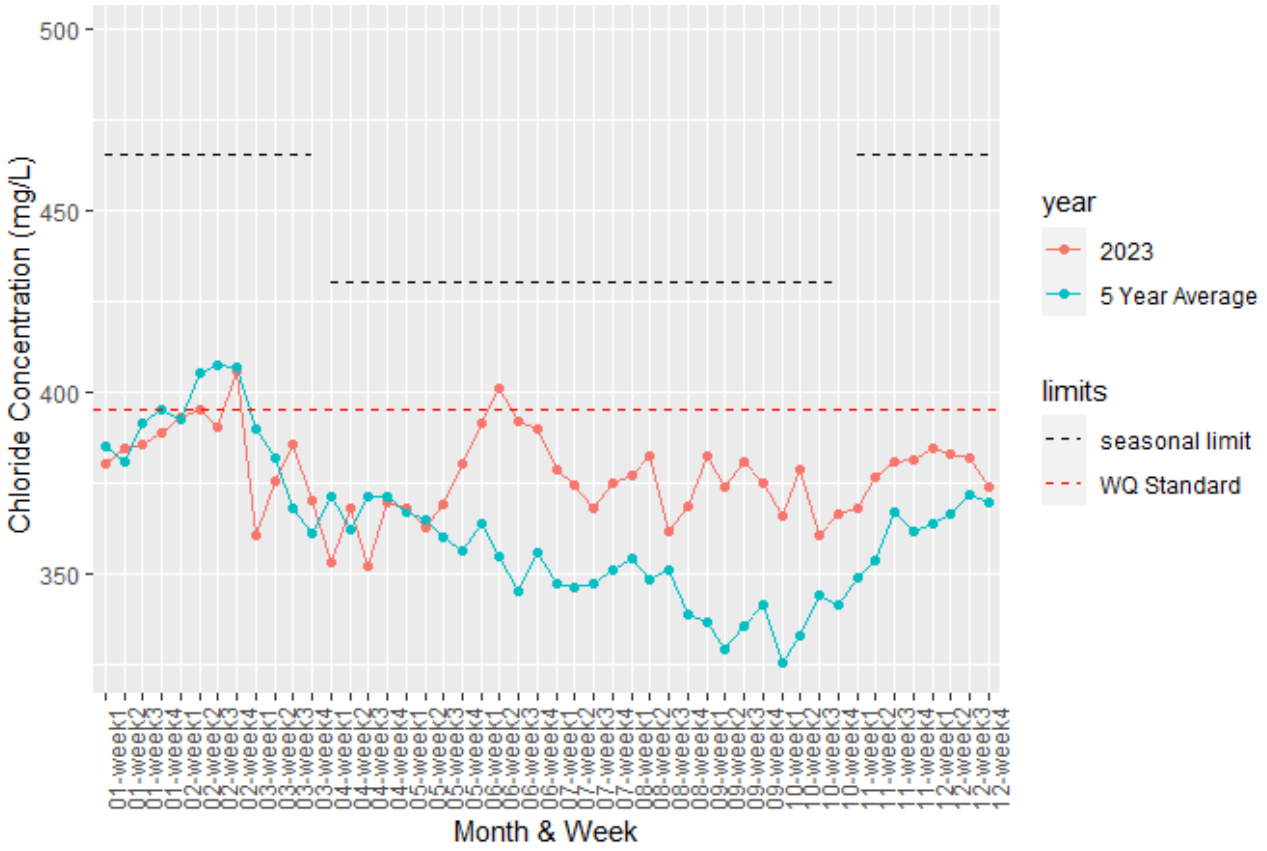
required by the BESP has huge potential to not only get a foot in the door with commercial facilities that have been so difficult to reach, but also to create a process for sustainable and ongoing upkeep of softener efficiency (vs. the 1-off approach). The program has a phase-in plan: benchmarking will begin June 2024 with the largest buildings, medium in June 2025, and smallest in June 2026. After that, building tune-ups also phase in by building size, with the largest buildings being required to complete an initial tune-up by October 2025, and the remainder by October 2026.

SECTION III: SUMMARY OF PROGRESS AND BARRIERS TO PMP EFFECTIVENESS

Average Pollutant Concentration in 2022: 388 mg/l

Average Pollutant Concentration in 2023: 377 mg/l

Variance pollutant concentration data over the last five years:



Have you encountered any barriers that have limited pollutant minimization program/source reduction measure effectiveness? If so, what adjustment will you make to the program during the next year to help address these barriers?

The main barrier, as reported in previous annual reports, remains the fact that as one wastewater treatment plant, can only do so much as far as changing long-held, pervasive norms, behaviors and attitudes.

Encouraging voluntary actions within a limited geographic area (our service area) can only push against long-held industry standards, existing products, and beliefs so much.

Leveraging partnerships and supporting state-wide and nation-wide initiatives, such as the WI Salt Wise Partnership, the WI DNR Chloride Working Group, the Salt Symposium, Building Wisconsin TV, Plumbers Union Local 75 and the EPA Chloride Working Group, is one way we can push existing norms to change the status quo. By attempting to move the needle on a large scale, we will also improve source reduction in MMSD's service area. Efforts such as the Department now requiring MS4 permits to assess and report back on their winter maintenance processes/use of deicing chemicals and US EPA's Chloride Clearinghouse are examples of state/national leadership are improving local authorities' ability to track, manage/reduce pollution sources.

Within the District's direct control, in addition to existing voluntary pollutant minimization initiatives we will continue evaluating policy options, such as ordinances, rules and requirements, to make chloride reduction more serious and urgent.

SECTION IV: PLANNED ACTIONS

A. Actions to Identify Pollutant Sources

PMP Action	2024 Planned Action
User Charge Sampling: Analyze user Charge Program samples for chloride. Evaluate the viability of adding chloride as a billing parameter.	**AD HOC QUERY RESULTS** ◉ Modified ○ Original Date 31271 31268 4/16/2019 1:25 PM 8.24* 4/17/2019 1:25 PM 1120 9/24/2019 9:18 AM 322 14.6* 3/18/2020 7:40 AM 716 18.7 9/16/2020 7:20 AM 40.1 9/17/2020 6:30 AM 1340 3/17/2021 7:40 AM 800 9.41* 9/27/2021 7:30 AM 1150 26.4* 3/16/2022 7:30 AM 1190 30.1* 9/21/2022 7:20 AM 689 0* 3/22/2023 9:30 AM 490 0* User charge sampling has shown that chloride and mercury are elevated in concentration at the Rodefeld Landfill. This indicates a possible source of chloride as well as mercury. Flow and loading will be analyzed for this location as well as

	for other specific industries to refine the possible magnitude of each source. The concept of billing parameter for chloride would be required if the district were unable to meet the water quality standard. Our pollution prevention work has been successful and we continue to see reductions. We are continuing to refine the cost analysis memorandum which will help inform what would be necessary to set baseline for billing parameters. Challenges have already been identified. The most significant is that residential sources far exceed the water quality standard as a baseline.
Road Salt Practices: Evaluate the current status and improvements through a re-survey of customer communities.	We will be undertaking this reassessment in 2024 through interviews with municipal staff. Our goal is to determine what has changed over the tenure of the staff interviewed.
Baseline social-science survey: Study existing sources of chloride, and gather information specifically for development of future outreach strategies; measure awareness and attitudes; collect information about barriers to homeowner action through scientific survey.	This activity is periodic and occurred in 2023 and will reoccur in 4-6 years.

B. Actions to Minimize Pollutant Sources

Administer training programs: SaltWise Soft Water Training; Winter Maintenance Training and develop/roll-out homeowner information and training program.	We have scheduled trainings in both Milwaukee and Madison, with Plumbers Local 75 and at the union training facilities and in conjunction with the union's training professionals.
Offer and expand salt-reduction rebate programs: simplify administration/ quantification for programs, evaluate new or expanded programs to target specific markets.	The Salt Savers pilot program identified two interesting directions to further reduce softening salt. These will be tested with rebate programs in 2024. First, we will be piloting blending valve programs with the city of Middleton and local plumbers and water quality professionals. We are also working to find a partnership with a plumbing company that

	will work to remove fixtures from the soft water supply (ie: remove toilets). In addition, we will continue the multi-family residential salt reductions through a pilot project with Sustain Dane Partnership and their NOAH (naturally occurring affordable housing) project.
Offer Road Salt Equipment Grants: Target private and municipal operations; Incentivize salt-reducing innovations and develop leaders in the 'new normal;' measure change in winter maintenance policy & practices through follow up to 2014 & 15 surveys.	The district continues to allocate funding to this program and are working to reassess and potentially refocus the program to better align resources with the needs of applicants. We are working to assess municipal needs with the in-person discussions with local municipalities. If changes are needed, we will revamp the program prior to the winter of 2024-25. On the private applicator side, we advertise our funding during winter maintenance training programs as well as our website. We continue to monitor the limited liability legislation and will work with local companies to be responsive if their needs change for future years. Both the private and public companies outside of our service area do not have funding available. We look to organizations like DNR to work to find a way to make this available.
Behavior Change Initiatives: Develop programs to change behavior/social norms with businesses and individuals; leverage WI SaltWise to change behavior and social norms.	We continue to provide funding and technical and communications' support services to Wisconsin Salt Wise. 2024 is our second year of a three year contract with Wisconsin Salt Wise.
Capitalize on low-hanging fruit: Develop outreach kit; focus industrial contacts on chloride reduction opportunities; attend community events as appropriate, with emphasis on chloride information.	One specific kit that has been developed in one for Home Inspectors to hand out to new homeowners. This will be distributed in early 2024 to the home inspectors. There were over 200 kits assembled. These will be handed out throughout 2024. District staff will be identifying 7-10 community events to participate in during 2024. We expect that over half of these events will involve discussions on chloride and salt reduction.
Expand digital presence: expand WiSaltWise.com/campaign and web	In 2023, the district worked to identify web, digital and handout resources that need to be updated and improved.

resources (MMSD website, social media, videos)	District staff has been assigned to upgrading these resources in 2024.

C. Maintenance of Source Reduction	
Quantifications/Data Mining: analyze historic data; determine magnitude of previous reductions; develop estimates of and future viability.	The district continues to gather data from pumping stations and user charge sampling. We are able to monitor and compare this data over a variety of timescales. We have noticed some differences in influent pumping stations and will be digging into those further in 2024.
Cultivate relationships/leverage partnerships: leverage existing social networks, build new relationships with hotels/apartments/industry; continue to facilitate conversations between salt reduction champions and their peers; partner with sustainability focused programs in the region to identify and leverage synergies and speak in venues where our messages can reach broad audiences.	There are many exciting chloride related happenings to continue in 2024. We have extended our grant with Sustain Dane's NOAH project to continue to make chloride reductions happen for naturally occurring affordable housing in the multifamily/apartments sector. We initiated conversations with Dave Jones Plumbing and Tim O'Brien Homes that led to Tim O'Brien Homes installing blending valves by default in their newly constructed homes, a change that demonstrates acceptance in the community of softening less water (thus using less salt). We have worked with Clack Corp and over 2023, they changed their standard salt settings – across the board – to low. This change has ripple effects throughout the world. In addition, we continue to work with Clack and recently worked to get them to speak on their innovations at the Salt Symposium in August. Our pollution prevention staff is on the organizing committee for both the Government Affairs Seminar and the Salt Symposium and they work to get speakers who can truly move the needle with pollution prevention initiatives.
Communications: Develop and roll out videos/case studies and industry/large water user focused messages; target outreach and develop messaging.	This is an important part of our 2024 work plan. The year is starting out with a joint funded episode of Wisconsin Home Remodeler which focuses on reducing salt use from softening and includes scenes from the wastewater plant and district staff. In addition, we are working on an improved version of the blending valve video and developing a social plan and posts. The 2023 Customer Survey found that the district is trusted messenger for water related information and messaging.

Wisconsin Salt Wise: undertake strategic planning to establish the future structure of Wisconsin Salt Wise.	The district continues to support Wisconsin Salt Wise in its current home of the Capital Area Regional Planning Commission. We do not expect changes in 2024.
Funding and staffing: maintain on-going staffing and budget to support Chloride Source Reduction Program	The district was able to maintain its funding for three pollution prevention staff and one intern for 2024. In addition, the operating budget continues to include funding for chloride-reduction related tasks.

SECTION V: NOTES

Attachment A: MMSD Nine Springs Effluent Analysis
- -Effluent Concentration
- -Effluent Mass
- -Comparison to Previous Years' Data
- -Seasonal Average Chloride Data

Attachment B: MMSD Collection System Data Analysis
Attachment C: WI Salt Wise 2023 Activities Summary
Attachment D: Hosebibb Test Kit Evaluation Report
Attachment E: Summary of Sewer Use Ordinance Reporting

SECTION VI: CERTIFICATION

I certify that the information contained in this document and all attachments were gathered and prepared under my supervision and based on inquiry of people directly under my supervision and that, to the best of my knowledge, the information is true, accurate and complete.

Authorized Representative Signature: _____
Date of PMP Annual Report Submittal to WDNR: January 31, 2024

ATTACHMENTS

Attachment A: MMSD Nine Springs Effluent Analysis

The average of all daily combined effluent sample concentrations in **2023 was 377 mg/L**

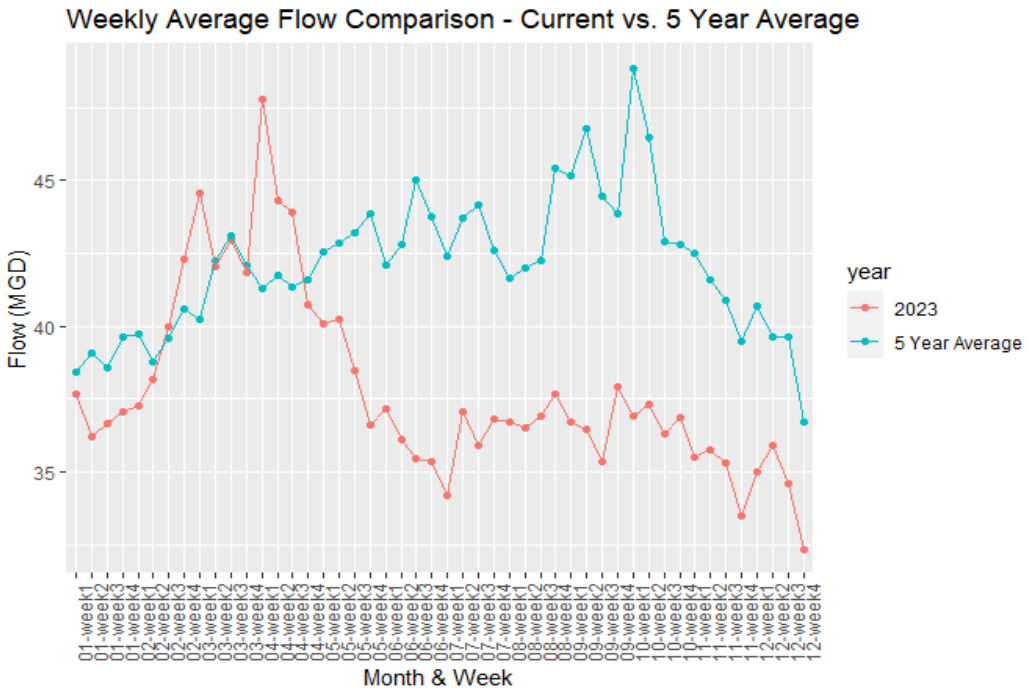
Median: 376 mg/L

Minimum: 310 mg/L

Maximum: 476 mg/L

The overall annual average for 2023 is on par with previous years. Annual average for 2021 was 384, and 2022 was 388, for example. The past three years have showed overall higher annual concentration averages than the previous three years, likely due to decreased overall flows during these comparatively drier years.

Annual flow for 2023 was down from the past five years even more than it was in 2022.



However, when comparing average mass, both weekly and annual averages, less chloride overall has passed through the treatment plant in 2023:

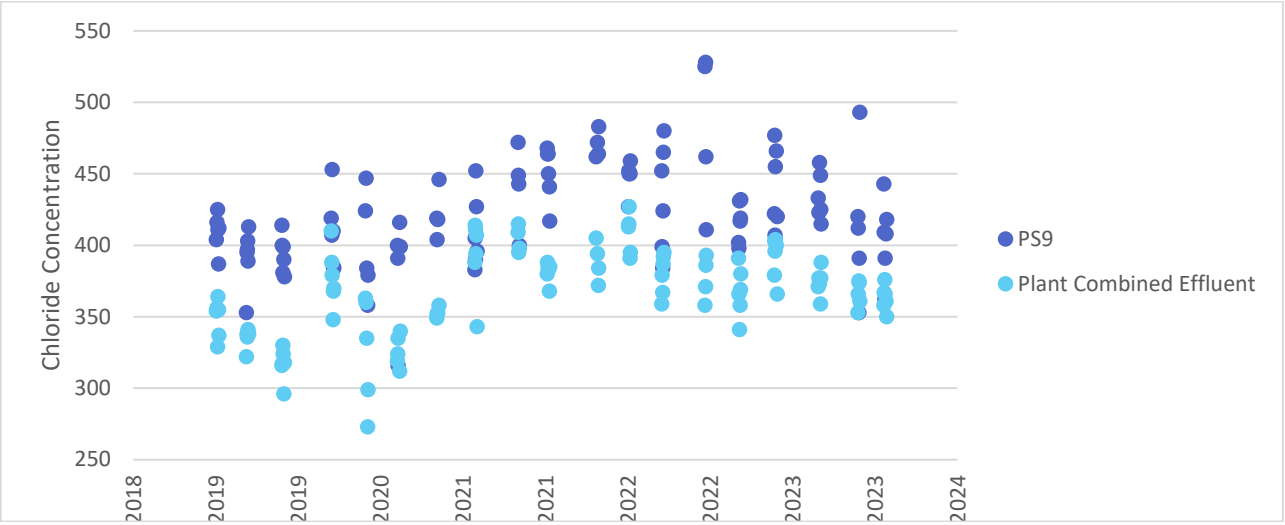
43,743,379 pounds of chloride cumulatively passed through the plant in in 2022, vs.
43,340,300 in 2023.

Winter limits within our variance remain important – in 2023, there were still over 50 days, and 3 permit weeks where combined effluent concentration was at or above the water quality standard of 395. The total number of days and permit weeks above the water quality standard in 2023 was less than in 2021 and 2022 respectively, however, it is still more than other years in recent history- it may be too soon to tell if this is a trend or if it is due to low-flow conditions in 2023.

Attachment B: MMSD Collection System Data Analysis

Continued Monitoring of a Mostly-Residential Sewershed

Looking at data from about 100 daily composite samples, it appears that wastewater from a mostly-residential sewershed has a higher concentration than plant effluent overall. On average, wastewater from the mostly-residential sewershed is about 16% higher in concentration than plant effluent overall.



2023 marks the fifth year that we have undertaken daily influent composite sampling from each of the five main influent lines during the winter. For a coarse comparison, a table showing the annual average concentration of daily composite samples taken December through March for each influent pumping station (compared to average concentration of combined effluent daily samples in the same period) is shown below:

Average Concentration December - March					
	2019	**2020**	**2021**	**2022**	**2023**
Plant CE	370	362	391	408	383
PS 7	385	370	398	409	374
PS 2	342	287	316	321	309
PS 8	406	381	408	425	388
PS 11	367	351	382	404	374
PS 18	392	374	407	410	377

Pumping Station 2 tends to consistently be the lowest overall winter concentration from year to year. Pumping station eight tends to be the highest concentration.

This comparison is coarse in that it doesn't give us much information to interpret the findings. Further analysis with GIS will be undertaken in 2024, to look at dimensions of these pumping station service areas that may help us understand more about this data. For example, relative sizes (land area, density), age of sewer infrastructure and/or housing stock, quality of pipes (potential for I&I), average flows, % commercial vs. residential.

Attachment C: WI Salt Wise Activities Summary

WISCONSIN SALT WISE

2023 Annual Report

Presented to *Fund for Lake Michigan*

Presented by *Allison Madison*

Wisconsin Salt Wise

TABLE OF CONTENTS

Wisconsin Salt Wise

INTRODUCTION

2023 has been a whirlwind. We kicked off the "Fall" training season with a Smart Salting Workshop and Open House at UW-Eau Claire on August 24. December 6, we wrapped it up by co-facilitating the Wisconsin DOT Tech Talk in Fond du Lac. In total, we led **ten Smart Salting Workshops, eight Equipment Open Houses,** and **nine individual agency trainings.**

Developing curriculum and **teaching the Smart Salting workshops in-house and with Salt Wise partners** was a major accomplishment in 2023. It's incredibly rewarding when veteran operators - who've been plowing for 20, 30, even 40 years - say **"this is fun"** and **"you're really good at your job."** In 2024, we will continue transitioning Salt Wise trainings to a more audience-focused workshop format with large and small-group discussion and a focus on empowering participants to be change agents.

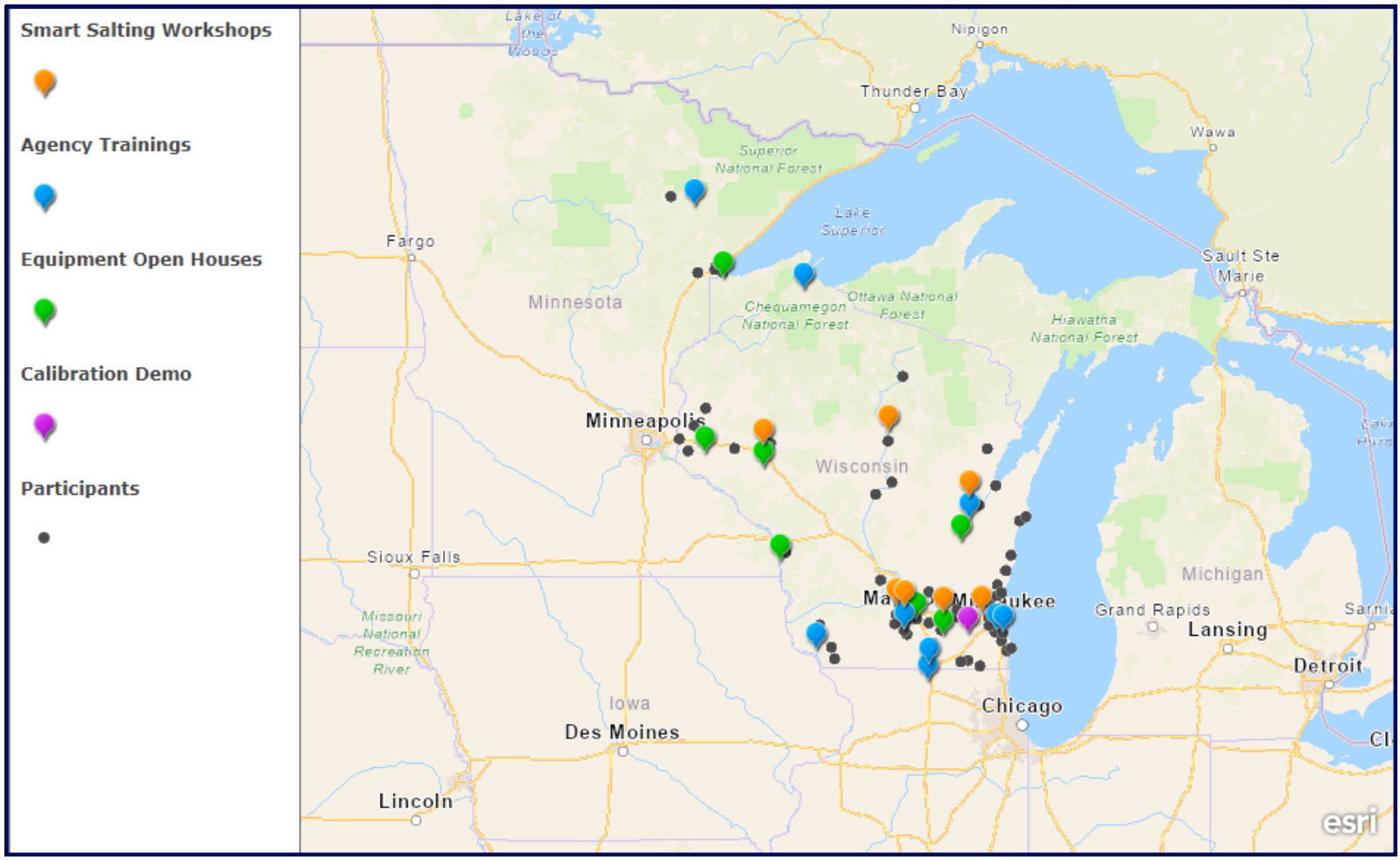
Media attention this year was stellar from a January interview on **PBS Wisconsin "Here and Now"** to a December interview on **Charlie Berens' Cripescast** (Episode 181, would recommend). Other media highlights include the episode **"Being Salt Wise with Water Softeners" on Building Wisconsin TV**, the airing of two PSAs we developed with the City of Milwaukee's DPW: **"Keep Milwaukee Moving" and "Salt Wise Winter Prep List,"** two Fox TV segments profiling our work with the City of Milwaukee and salt pollution in local waterways, **"Public Works in Private,"** an article in the Snow and Ice Management Association's magazine **Snow Business (February 2023)**, a Snow and Ice Management Association's Snow Talk podcast **(Episode 8: Salt Applicator Liability, November 2023)**, and coverage of our collaboration with the City of Madison on a Snowplow Naming Contest in January/February and the roll-out of trading cards for the named plows in November.

Thank you for believing in this work from the beginning and supporting the program as we develop a sustainable foundation.

Allison Madison

STATEWIDE REACH

1383 Industry Professionals



*Two virtual workshops

Ten workshops

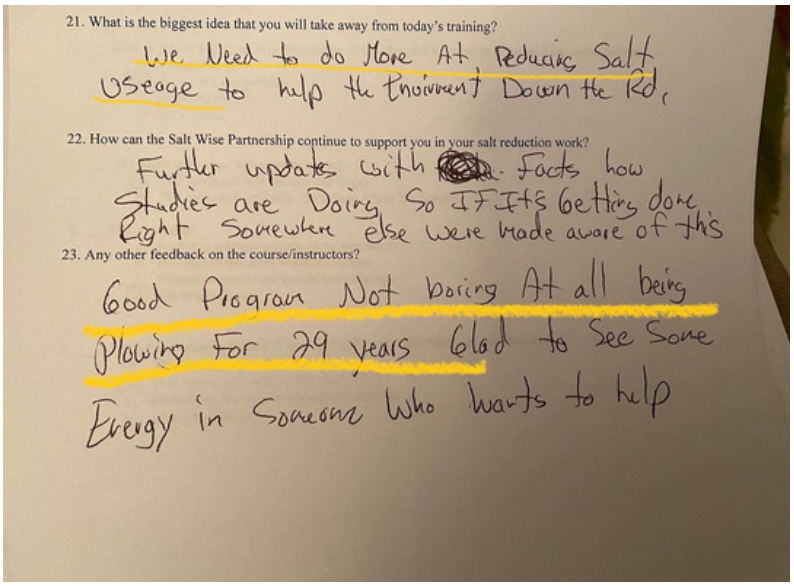
Nine agency trainings

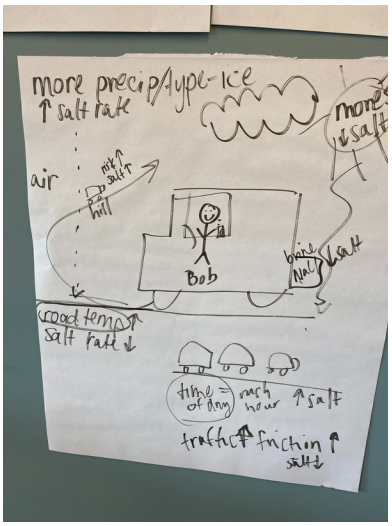
Eight open houses

One calibration demo

AGENCY TRAININGS

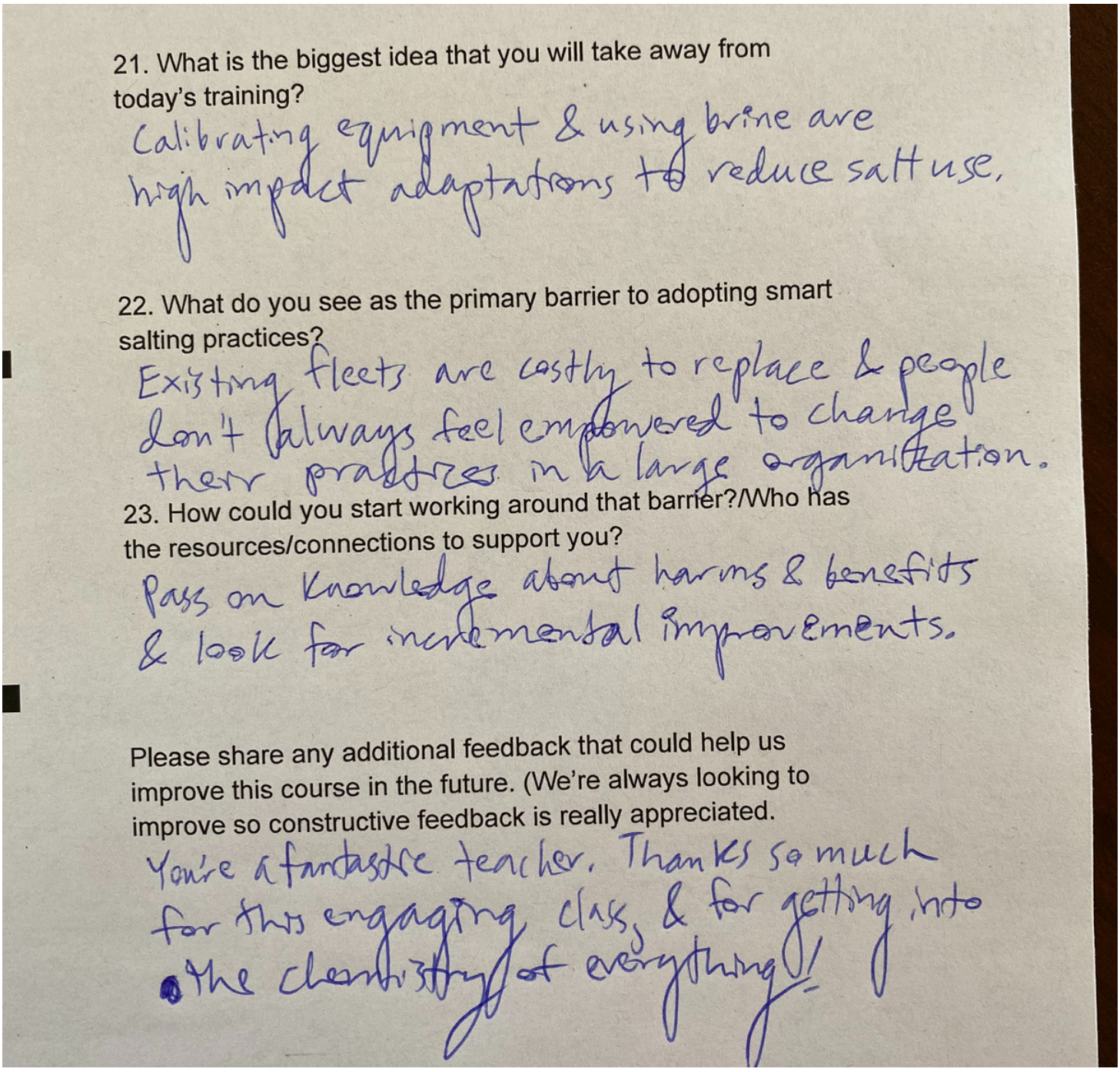
Wauwatosa, Dane County, Beloit, Milwaukee, Outagamie County, St. Croix County, Grant County, Bayfield County, Janesville


21. What is the biggest idea that you will take away from today's training?
We Need to do More At Reducing Salt Useage to help the Enviroment Down the Rd,
22. How can the Salt Wise Partnership continue to support you in your salt reduction work?
Further updates with Facts how Studies are Doing So IF Its getting done Right Somewhere else were made aware of this
23. Any other feedback on the course/instructors?
Good Program Not boring At all being Plowing For 29 years Glad to See Some Energy in Someone Who wants to help



COURSE EVAL

Smart Salting Workshop, Madison



21. What is the biggest idea that you will take away from today's training?

Calibrating equipment & using brine are high impact adaptations to reduce salt use.

22. What do you see as the primary barrier to adopting smart salting practices?

Existing fleets are costly to replace & people don't always feel empowered to change their practices in a large organization.

23. How could you start working around that barrier?/Who has the resources/connections to support you?

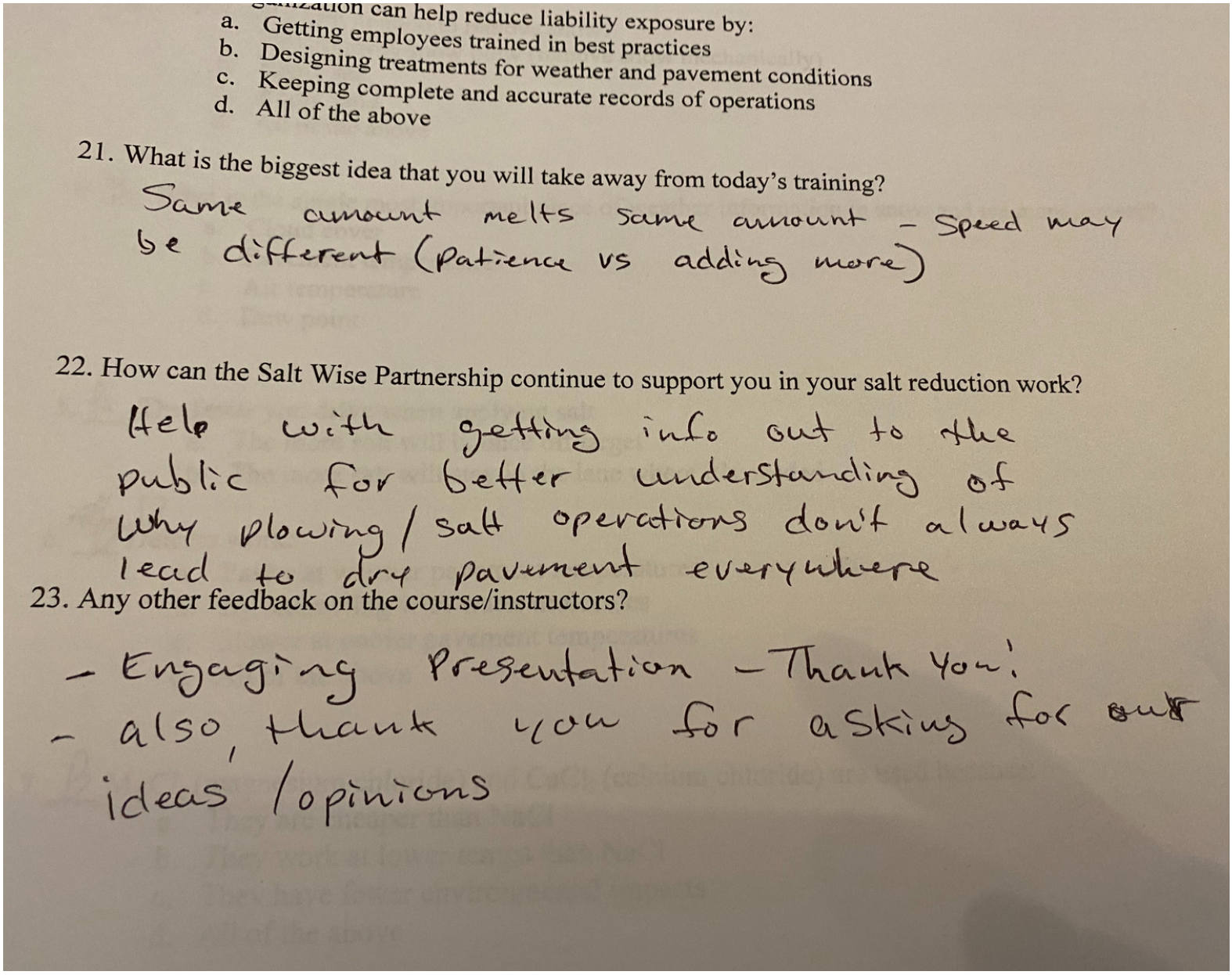
Pass on knowledge about harms & benefits & look for incremental improvements.

Please share any additional feedback that could help us improve this course in the future. (We're always looking to improve so constructive feedback is really appreciated.

You're a fantastic teacher. Thanks so much for this engaging class, & for getting into the chemistry of everything!

COURSE EVAL

City of Janesville Agency Training



...ization can help reduce liability exposure by:
a. Getting employees trained in best practices
b. Designing treatments for weather and pavement conditions
c. Keeping complete and accurate records of operations
d. All of the above

21. What is the biggest idea that you will take away from today's training?

Same amount melts same amount - Speed may be different (Patience vs adding more)

22. How can the Salt Wise Partnership continue to support you in your salt reduction work?

Help with getting info out to the public for better understanding of why plowing / salt operations don't always lead to dry pavement everywhere

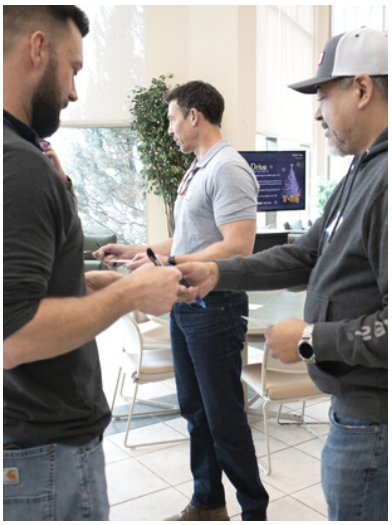
23. Any other feedback on the course/instructors?

- Engaging Presentation - Thank You!
- also, thank you for asking for our ideas / opinions

WINTER TECH TALK

Fond du Lac, December 2023

1 day, 100 Wisconsin Practitioners



We designed and facilitated the WisDOT Winter Tech Talk to be a space for County Highway staff to share successes, ask questions, and get support from one another.

CITY OF MILWAUKEE

Road Salt Education Project

Our work with the City of Milwaukee has been three-pronged: training operators, educating the public, and briefing elected officials.

Operator Training included the facilitation of a Winter 2022-23 season debrief with patrol supervisors and managers in May and two operator trainings in November.

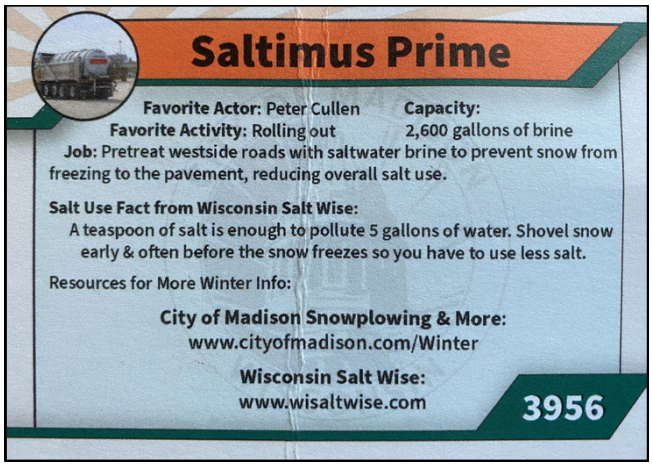
Our PSAs “Keep Milwaukee Moving” (pictured at right) and “Salt Wise Winter Checklist” are airing this fall and winter on Fox TV and streaming services.

A presentation to the City of Milwaukee Public Works Committee generated rich conversation and media attention.

CITY OF MADISON

Snowplow Naming and Trading Cards

We collaborated with the City of Madison Streets and Engineering Departments to run a snowplow naming contest early in the year. In November, we released trading cards for each of the named plows. Each card is rich with puns and Salt Wise facts that educate everyone 9-99.



PUBLIC OUTREACH

Monitoring, Signage, Media, Events

We partnered with UW-Arboretum, Friends groups, and UW-Madison Badger Volunteers to engage residents and businesses in impaired watersheds.

PUBLIC OUTREACH

Continued

Clockwise from upper left: Cripescast Podcast, WI Salt Awareness Week flyer, SIMA Snow Business article excerpt, Salt Awareness Week event poster.

SALT WISE WEBINARS

January: **WI Salt Awareness Week**
February: **Demystifying Deicers**
Stacey Balsley, Reinders, Inc.
March: **Granular & Liquid Deicer Calibration**
Bryan Pickworth, City of Farmington Hills, Michigan
April: **Green SnowPro: Liability Protection in New Hampshire**
Aubrey, Ted, Steve, New Hampshire Dept. of Env. Services
May: **Smart Salting: Reviewing the Basics**
Matt Wittum, Town of Linn
June: **The Why and How of Liquids**
Jordan Smith, VSI
July: **Chloride Impact Study**
Laura Herrick, Southeastern Wisconsin Regional Planning Commission
August: **Milwaukee Riverkeeper: Keeping Freshwater Fresh**
Cheryl Nenn, Milwaukee Riverkeeper
September: **Behind the Scenes of a Chloride TMDL**
Stephen McCracken and Hanna Miller, The Conservation Foundation
October: **Salt Wise Stories – UW-Whitewater**
Joe Post, UW-Whitewater
November: **Smarter Salting in 60 Minutes**
Allison Madison, WI Salt Wise
December: **On the Cutting Edge**
Mark DeVries and Wilf Nixon, American Public Works Association

3660
Webinar Views

OUTREACH SUMMARY

*Industry Presentations and Event Tabling**

WI County Highway Association Winter Road School
Lake Area American Public Works Association
City of Milwaukee Winter Season Debrief
WI APWA Spring Conference
WASBO Facilities Maintenance Conference
Chicago APWA Winter Road School
WI APWA Snowplow Roadeo*
APWA Western States Snow and Ice Conference
Michigan LTAP Winter Ops Conference
Wisconsin Sports Field Managers Association Conference

1342

Outreach attendees

*Public Presentations and Event Tabling**

DNR/UW-Extension presentation
Tip of the Mitt presentation
Nerd Nite, High Noon Saloon
WI Sustainable Business Council webinar
Salt Wise on Tap
Neenah Sustainability Committee
Spot Over Salting Pop-up
USDA Forest Products Lab Seminar
Frozen Assets Festival*
Marquette Univ. Env. and Water Resources Seminar
WI Association for School Business Officials Conference
Lake Wingra Stakeholder Roundtables (2)
WI Society of Science Teachers
UWSP Lakes Conference
WI EcoLatinos Earth Day Festival*
RPC-MPO Webinar
Friends of Starkweather Creek board meeting
Stevens Point Public Works Week
Master Naturalist presentation
Marquette Waterfront Festival*
ARPC Director Meeting
Dane County Town's Association Meeting
Milwaukee City Council Public Works Committee
Henry Vilas Zoo staff training
Town and Country Engineering Conference
City of Middleton Water Resources Committee

MEDIA COVERAGE

TITLE	MEDIA OUTLET	MONTH
Here and Now Highlights: Tony Evers and Allison Madison	PBS Wisconsin	January
Radio interview	As Goes Wisconsin	January
Manitowoc providing 'salt cups' to prevent over-salting in wintry weather	WLUK	January
This winter don't be salty, be Salt Wise	City of Monona Newsflash and The Voice of Monona radio	January
Wisconsin organization wants to reduce salt usage	WJFW	January
Keeping freshwater fresh by reducing salt usage	ABC12	January
WI Salt Awareness Week Press Release	Twin Ports Media Outlets	January
"It's pretty ironic": Officer who slipped while salting sidewalk brings awareness to winter fall risks	WKOW 27	January
Nathan Loper, City of Appleton and Allison Madison, WI Salt Wise	Focus Fox Valley Radio	January

MEDIA COVERAGE

TITLE	MEDIA OUTLET	MONTH
Salt leaving bad taste in Mother Nature's mouth: Research shows high chloride levels in Wisconsin Rivers	WFRV	January
Green Visions: Salt Awareness Week	The North 103.3	January
Salt Awareness Week	WGTD	January
Interview: WI Salt Awareness Week	WBAY ABC2	January
Wisconsin Salt Awareness Week	Kenosha News	January
Wisconsin Salt Awareness Week	Racine County Eye	January
WI Salt Awareness Week: How to reduce salt pollution	CBS58	January
City of Madison hosts Salt Awareness Week	Channel 3000	January
Local organizations bring awareness to salt usage	WTMJ	January
Driveway salt not effective in sub-zero temperatures	ABC9	January
Easy on the salt, water quality experts tell UW-Madison	Wisconsin State Journal	January

MEDIA COVERAGE

TITLE	MEDIA OUTLET	MONTH
Salt is ineffective at subzero temperatures	ABC27	January
Using Road Salt has its Drawbacks: Wisconsin Community Leaders seek to improve Wisconsin's water quality	WPR	February
These 3 bills from a bipartisan group of lawmakers seek to improve Wisconsin's water quality	Milwaukee Journal Sentinel	February
Winter Maintenance: Striving for safe roads while reducing environmental damage	AP	January
Wake Up Wisconsin	WKOW	January
Making inroads on road salt reduction	Baraboo News Republic	Feburary
Public Works in Private	Snow Business	February
Road salt pollution negatively affects freshwater environments	Badger Herald	February
Constantly falling sleet, freezing rain could dilute salt's effectiveness on roads	Channel 3000	Frebruary
Wisconsin residents name their snow plows in city contest	Fox News	March

MEDIA COVERAGE

TITLE	MEDIA OUTLET	MONTH
WI Eyes Deicer Training to Curb Salt Pollution	WXPR	March
St. Louis County hosts open house for winter road maintenance	Northern News Now	October
New snow maintenance techniques showcased at St. Louis County workshop	WDIO	October
Fox Valley public works departments explore sustainable salting practices ahead of winter	Fox11	October
Sun Prairie Public Works hosts snow removal open house	Sun Prairie Star	October
Sun Prairie crews talk best practices for clearing snow, ice	WMTV	October
Trading cards teach people about Madison's snow removal equipment	Channel 3000	November
Saltimus Prime and other Madison snow-clearing vehicles	Wisconsin State Journal	November
Madison to cut salted roads by 50 miles this winter, snow machines get baseball cards	WKOW	November
Milwaukee DPW road salt trending down; what drivers should know	Fox6	November
Hidden costs and impacts of salt use in Wisconsin	Fox6	November

THANKS FOR YOUR CONTINUED SUPPORT!

Wisconsin Salt Wise

allisonm@capitalarearpc.org
608-334-8698

Attachment D: Hosebibb Test Kit Evaluation Report

Hose Bibb Test Kit Evaluation 2018- Q2, 2023

Background

The District began offering "hose-bibb test kits" since 2018, as recommended in NR 106.90 Source Reduction Tier 1 actions:

> NR 106.90(2)(a)2.
> **2.** Educate homeowners on the impact of chloride from residential softeners, discuss options available for increasing softener salt efficiency, and request voluntary reductions.
>
> NR 106.90(2)(a)5.
> **5.** Educate licensed installers and self-installers of softeners on providing optional hard water for outside faucets for residences.

And, as a way to evaluate the reduction possibility and cost for completing a tier 3 action in the future:

> NR 106.90(4)(a)2.
> **2.** Evaluate the imposition of installation restrictions so that outside hose bibs are on unsoftened water. If restrictions are imposed, new homes and those in real estate transfers should be required to have plumbing restrictions for hard water by-passes, and the requirement should apply to self-installed equipment as well. https://docs.legis.wisconsin.gov/document/administrativecode/NR%20106.90(4)(a)2.

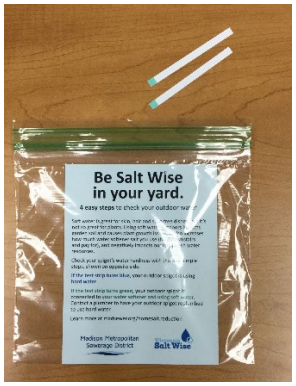
Hose bibb test kits are available for request through Madsewer.org. To date, advertisement for the kits has been passive; mainly by word-of-mouth (through events/webinars), handed out to tour groups as relevant and through internet searches. Kits have not been actively promoted on social media or other means.

The Kit

Each kit includes an instruction card and three to four LaMotte Insta-Test Analytic, **Low Range Hardness** Test strips (about $14/50 strips on Amazon.com (#B00EA9D8X8). The test strips only measure 0-10 grains, so they work really well to test a binary soft/not soft in our service area, because the lowest naturally occurring grains among local wells is 12-14 grains.

Total, the kit costs about $2.25 including the cost of the instruction card, the envelope, postage, and the test strips provided.

Pictured Below (left to right): V.2 envelope-sized kit used from 9/2020-12/2023, V.1 kit for in-person distribution used 2018-9/2020, Front and back of V.1 kit



Estimated Use 2020-2023

Between 8/2020 and 3/1/23, over 100 test kits were requested through Madsewer.org. An embedded webform collected the requestor's name, phone number, email, and mailing address. Once a request is received, it is fulfilled (mailed out) by District staff through USPS mail. Although over a hundred kits were requested, only 83 of them (approximately) were fulfilled due to the remainder of requests coming from addresses outside of Wisconsin. For the out of state and service area requests, an email response including details on the test strips and an encouragement to contact local water utility/authorities is sent (kit is not sent via USPS). In addition to those requested through the website, at least 100 kits have been handed out in person to individuals visiting the plant for tours, at outreach events, and through WI Salt Wise Partners. In total, we estimate 300 kits have been distributed since first offering them, about 250 kits mid 2020-early 2023.

Evaluation Process & Findings

To evaluate the efficacy of the hose bibb test kits, we reached out to everyone who had requested the kit via webform and email between 2020 and March 2023. These individuals were sent a questionnaire asking about motivations for requesting the kit, if they used it, what they found out, and if any changes were made due to their test results.

Overall, there was a low response rate for feedback. We only heard back from one in four requestors (21 out of the 83 contacted). Of those who responded, only about half said they had used the kit. The other half who did not use the kit mainly cited that they, hadn't received the kit or forgot/did not recall requesting it.

Of those who did use the kit, majority of respondents found the provided instructions easy to follow, and the kit easy to use overall. Primary motivation cited for using the kit stemmed from protecting freshwater and soil from saltwater production (environmental reasons). Among kit users, one person was able to positively identify a softened hose bibb, but did not subsequently take any action to change their plumbing source from soft to hard water, so ultimately, the results from sending out these hose bibb test kits ended with zero people changing their plumbing configurations to minimize salt use.

Recommendations

Based off of feedback during our evaluation process, we can deduce that over five years of offering the hose bibb test kit, we have no evidence that it has led to any direct chloride reduction. In its current

state, the kit has little efficacy. Simply offering a kit, sending it out, and then expecting it will be used for the intended purpose of testing hose bibbs has proven ineffective for both discovering softened outdoor water, and in prompting any change to be made as a result of discovery.

What is not captured in the evaluation however, is the opportunity offering this kit invites for dialogue around water softener improvements. Prompting discovery and interaction with home plumbing is not easily accomplished – having a physical artifact to encourage investigation helps. When the kit is given in person, it invites great dialogue and curiosity about home softening systems. Going forward, to justify investment in this resource, a few things should happen:

1) **Broaden scope of the kit:** pivot away from simply testing hose bibbs, and rebrand this tool as 'hardness test strips' that can be used to identify any soft-water-using fixtures.

This pivot not only expands the potential audience to include a broader pool beyond people for whom outdoor watering/gardening and irrigation is salient, it also offers a greater potential chloride reduction. Evidence indicates that prevalence of softened hose bibbs is very low. Among the >200 homes inspected by trained service providers as part of the Salt Savers Pilot Project, for example, none were found to have softened hose-bibbs. Full-line softening, however, is fairly common, and a potential opportunity for reducing soft water demand (thereby reducing softener regeneration cycles and chloride discharge overall). In the aforementioned pilot, both (Dunn and Mcfarland, 95% and 82%, respectively) majority of homes had full-line (all water in the home except for the kitchen sink is softened.)

Beyond broadening the potential audience and increasing salience, changing the name from 'hosebibb test kit' to 'hardness test strips' will also have the benefit of providing clarity. Our evaluation indicated that there was some confusion about what people should be looking for in the mail (ie. what is the 'kit' and what does it look like?). Feedback indicated that 'kit' implied a box, hence why people thought they didn't receive it, and may have been missing the kit which was just an envelope.

To accomplish this scope change, language surrounding the kit should be revised to be inclusive of checking multiple fixtures (hosebibb, toilet for example) on both the website and on the physical mailer.

2) **Improve communications:** clarify eligibility up-front, the kit's purpose (including wider scope), and increase follow-ups through use of automation tools.

Simple changes to the administration of the test strip request process, such as limiting survey evaluation to addresses within our service area, changing the look of delivery, and increasing prompts with automated follow up reminders, can all improve the use of the kit by keeping it top of mind. Showing pictures of the test strips on the website at the time they are requested will prepare requestors to know what they are looking for in the mail. Placing a sticker on the envelope, "Water Softener Testing Strips" may help distinguish the test strips from junk mail.

From test kit evaluation feedback, it's clear that forgetfulness is a barrier, so strategically timing email prompts to complete the tests will be key. Sending multiple reminders, including one to make sure the kit made it, a reminder to use the kit, and a prompt for feedback within two weeks should help follow-through.

3) **Increase Active Promotion**

Focusing on this tool as a way to start conversations, vs a means to an end in itself, by integrating the request into automations, could be a powerful way to elevate the conversation on chloride reduction solutions that reduce soft water demand overall.

Interest in hardness test strips and other tools should be integrated with marketing automation. Utilizing the request of test strips as a path to creating personalized, targeted campaigns across multiple channels, will help ensure relevant messages are sent to the right audience at the right time. This will enable lead nurturing, a way to efficiency fuel interest in the subject by giving step by step resources and advice. Use of these tools will provide detailed analytics and tracking that can deliver valuable insights, enabling continuous optimization for better engagement and conversion rates. Ultimately, marketing automation can transform education and outreach efforts into well-coordinated, data-driven processes that can help maximize impact and foster connections with our target audiences.

By actively promoting the hardness test strips and other tools such as the softener self-screen, we are able to create an ongoing relationship in which we can slowly, manageably feed individual information on a very complex and nuanced topic that taken all at once would be overwhelming.

To manifest this system, new web resources such as email drip campaigns, quizzes, webpages will need to be created and built into the workflow automation.

Q4, 2023 Initial Reworking & Testing

In mid November, 2023, a website specifically for hosebibb test kits, now rebranded as “hardness test strips”, was created: https://www.madsewer.org/pollution-prevention/chloride/for-residents/water-test-strips/ . The website includes a video explaining testing hardness, and a new request form.

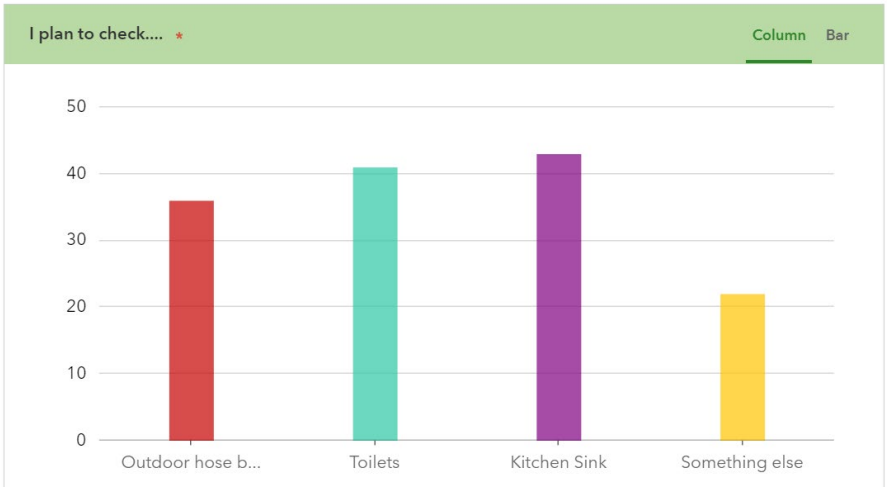
A new workflow, diagrammed in the flowchart below, including new automation features (drip campaign) was put into place:

On Nov. 30, 2023 the new automation was put to the test. The City of Madison Engineering newsletter, “Waterways” was delivered to every residential address in the city on this date. It included a very short article about the District’s Water Softener Self Screen Tool. There was an overwhelming response, including more than 10 phone calls from residents per day, numerous emails, and >170 self screens within the next five days. Forty-six city residents requested hardness test strips during those five days.

Effectiveness of the new automation system was immediately evident: the first confirmation email had a high open rate at 79%, and better than average click rate.

Having added questions about what residents intended to use the kit for included in the new request form, we received immediate feedback on what kind of information and resources residents are looking for. Interestingly, even without having rebranded the informational postcard to include an expanded

scope (to include testing toilets) yet, residents were already self determining they would like to check their toilets for hard water.

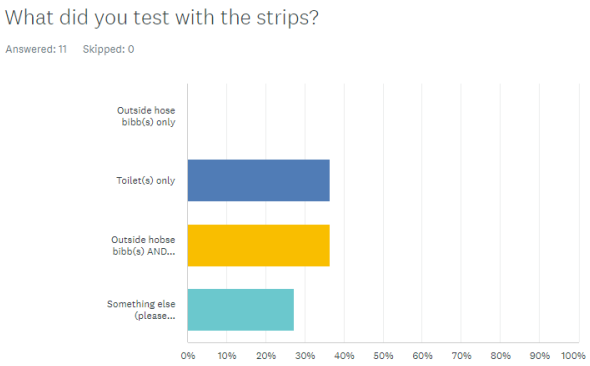


Initial Automation Workflow

Put in place mid November 2023.

By the end of 2023, 63 requests have been received through the new system. Of those requests, 11 requestors responded to the follow up survey. The good news is that 100% of those 11 who provided

feedback used their test strips! Of them, none actually planned to test only their hosebibbs (perhaps due to it being winter).



ANSWER CHOICES		RESPONSES	
Outside hose bibb(s) only		0.00%	0
Toilet(s) only		36.36%	4
Outside hobse bibb(s) AND Toilets		36.36%	4
Something else (please specify):	Responses	27.27%	3
TOTAL			11

Although the sample size is small, this gives a vote of confidence to the direction we'd like to go with rebranding the instruction card and advertisements for the test strips as a way to find soft water reductions vs. a preventative measure for outdoor watering.

Throughout 2024, we will continue to monitor requests and analyze our responses.

Attachment E: Summary of Sewer Use Ordinance Reporting 2022

Sewer Use Ordinance Chloride Reporting - 2022

Summary

Since 2015, when Madison Metropolitan Sewerage District added section 4.7.2 the Sewer Use Ordinance, requiring owner communities to undertake efforts to reduce chloride into community sewers, sample all community wells for chloride, and report back on both of these things, as well as provide a copy of the deicing activity summary from their MS4 permit reports, compliance has been spotty. Follow through in terms of completing source reduction actions, and then reporting on them has been limited. In 2023, (the year in which 2022 are completed), this continued to be the case, despite a new online reporting form and worksheet guidance. For the 2022 reporting period, District staff set up an online reporting form to partially automate a reporting reminder system and streamline follow-ups.

The 2021 reporting period (2022) was the first year with the automated system (reported on last year in the 2022 PMP Annual Report). At that time, 8 out of the 19 communities within the district turned in section A&C. For the 2022 reporting period (2023), overall compliance slightly increased, with 11/18 communities reporting.

On the whole, details in the reports (quality of content) remained low, as can be seen in the transcription of report content included. We know anecdotally however, that there is more going on than what has been reported. Part of the challenge with these reports, both in terms of completion rates, and in usefulness of content, is the time lag between when the activities in the report take place and when the report is requested; by the time the 2023 report is solicited for example, it will already be the spring season of 2024.

So far, requiring reporting has not done much to stimulate action on its own. This finding is important because it lets us know that providing outreach 'tool kits' to owner communities is not enough. Meaningful action takes partnership and investment.

Because of this, in 2024, we will be attempting to meet with representatives of each customer community in-person to discuss pollution prevention in their community specifically. We are aware that passively sending one-size-fits-all solutions, resource packets and press kits, as expedient as they seem to be, is not a winning tactic for engaging and empowering our customer communities.

Ordinance Text Reference

4.7.2. Chloride Reduction.

a) All Community Customers shall undertake efforts to reduce chlorides into the Community Sewers including the source reduction measures set forth in Wis. Admin. Code § NR 106.90 as appropriate, measures to reduce inflow of road salt laden water into Community Sewers and measures to reduce the direct drainage of road salt laden water from storage or truck loading into Community Sewers. Each Community Customer shall notify the District annually of measures taken.

b) All Community Customers that own groundwater supply wells shall analyze at least one sample from each well annually for chloride and shall report the results to the District by March 1, for the preceding year.

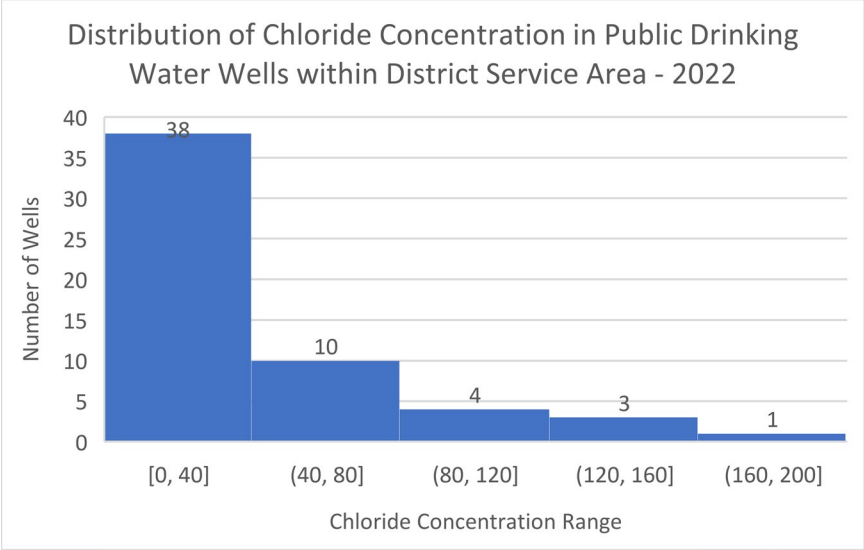
c) All Community Customers that hold a municipal separate storm sewer system(MS4) permit from the DNR, and report on deicing activities as part of their MS4 reporting requirements, shall send a copy to the District at the same frequency and at the same time that a report is submitted to DNR. Submittal may be in electronic form as a PDF.

Part B - Well Data

10/12 Submitted Reports

Reporting on chloride concentrations in public drinking water distribution systems has proven useful in characterizing source water, and estimating the uncontrollable portion of influent chloride. For some communities, it has been an eye-opening look at the impact of road salt on shallow groundwater wells.

Some communities have come forth and submitted supplemental data - in addition to concentrations, a few communities have included information about annual average pumping volume for each of the



wells.

In addition to chloride concentrations, we have also begun asking for voluntary submittal of hardness for each of these wells too. Hardness is used to populate an 'expected hardness map' which is distributed to area plumbers and water quality professionals to encourage efficient water softener set up. On the Madsewer.org website, this is the page with the highest traffic volume annually, indicating that it is a useful and trusted tool.

In one municipality, where hardness data has been available for the past years, nearly all wells in that area have been increasing in hardness in that time period. Some as much as 2 grains per gallon (or 30+ ppm). This is important, because as water contains more minerals, or becomes 'harder' softeners will need to use more salt overall to treat water to the same level. Increasing hardness over the long term could lead to increased salt use for water softening.

As far as collecting this information: response rate for this section, b), is overall higher than with the other provisions of 4.7.2. This is likely due to the fact that testing wells is something utilities already do – they typically have one individual point person from the water utility assigned, so getting the

information and scheduling the task of doing the analysis is straight forward. There has not been much friction in this process, even when there is turnover at the utilities.

Part C – MS4 Permits

Nearly all communities that submitted reports included a copy of their MS4 report. Again, as far as friction in this process, this seems to be fairly straight forward, and municipalities have not had any issue sending copies of these.

The format in which these reports are exported precludes usefulness of them to us in understanding outreach and education activities. For example, text field boxes do not allow scrolling so most of the writing is cut off and not viewable. Many of the communities are including supplemental attachments, which are not viewable/clickable in the export format.

Part A – Source ID & Reduction Measures

9/18 submitted something as part of A&C reporting form. This section of 4.7.2, a), is the one that has the lowest compliance rate. Giving communities a worksheet to work off of through the electronic system has increased reporting somewhat, but even still, only half of communities that should be reporting are doing so.

Winter Maintenance Practices

	% of reporting communities	
Best Management Practice	**2021**	**2022***
Have a written winter maintenance plan	25%	43%
Plow drivers/operators have attended winter maintenance training classes.	63%	57%
Supervisors have attended winter maintenance training classes.	63%	71%
Calibrate salt spreading equipment annually.	63%	57%
Pre-wet salt before application to roads.	38%	57%
Use pavement temperature sensors.	25%	57%
Use Dane County Application Rate charts to apply deicers (salt/chloride, beet juice, hot mix etc.).	38%	43%

*out of 8 communities

Comments:

- City of Madison: Founding members of Saltwise so we do I&E and we have trained all City Staff to be certified applicators.
- Village of Maple Bluff: We have an aggressive snow removal schedule in that we minimize how much the snow compacts onto the streets from traffic. We do not have a bare road policy. We treat intersections; hill ways and hairpins. Type and amount of precipitation as well as air and surface temperature are the driving factors for frequency of plowing and de-icing efforts. We train in house with an emphasis on routes and techniques for both plowing and de-icing. All of our de-icing equipment are manually operated.

Sewer Maintenance

Comments:

- The City of Fitchburg's goal is to televise 10% of the sanitary system each year. Videos are reviewed for signs of I&I. Sewers in need of maintenance are CIPP lined. Drinking water and wastewater volumes are also compared for discrepancies that could signify potential I&I issues.
- To reduce infiltration to the sewer system the City of Madison completes CIP lining of existing sanitary sewer annually. We also install new (water tight) sewer annually. In 2022 - we lined 20,150 LF of pipe and installed 27,545 of new pipe. Additionally we replace castings that have open pick holes with new water tight castings annually. In 2022 we replaced 22 castings.
- Verona: Manhole lining. Manhole frame and cover replacements. CIPP clay pipe. Previous replacement of east side interceptor. Base flows reduced from 1.15 MGD to 0.95 MGD.
- Village of Cottage Grove: Flow monitoring completed two years ago. Staff regularly visually inspects manholes in rain events and we rehabbed 27 last year (typically 20 - 30/year).
- Village of DeForest: tries to televise 10% of the Village sewer system a year. If we find an issue we look to having a repair made. Replace manhole covers that have open pick holes and install Mr. Manholes to prevent I/I.
- Maple Bluff: The sanitary system is inspected annually manhole to manhole to look for signs of inflow and infiltration. Annual inspections of the sanitary system for proper function and areas necessary for maintenance cleaning as well as inflow and infiltration. In 2019 we performed an inflow and infiltration survey performed by Town and Country Engineers. In 2023 a CIP will address off street sanitary and storm water systems with excavation replacement or trenchless repair to renew these systems.
- Village of McFarland: has 1/3 of the sanitary sewer cleaned and televised each year. In the past 3 years, the village has spent over $250,000 on sanitary pipe and manhole repairs to reduce infiltration.
- Windsor & Morrisonville: Manhole cover replacements and sewer lining.

Source Identification

Source Identification

Comments:

- Verona: None available due to staffing levels.
- Deforest: None
- Maple Bluff: We have five 2” meters in our water system: 1 Public Authority (Executive Residence); 1 Commercial (MBCC); 3 Residential. No industry.
- Village of McFarland: No actions to provide at this time.

Source Reduction Activities

Community Facility Improvement

Comments:

- Madison: City of Madison - upgrades facilities as budgets allow - all new buildings are Gold or better LEED certified including the use of modern and high efficiency softeners.
- Verona: none
- Village of Deforest: constructed a new salt shed in 2018.
- Village of Maple Bluff: The water softener in the Village Center in Maple Bluff was recalibrated a couple of years ago with very positive results. We maintain a small shed for salt/sand storage. Prior to maintenance and cleaning of our de-icing equipment we unload at the shed and broom and scrape the hoppers and augers.
- Village of McFarland: Replaced salt shed door at public works building and have begun sweeping the pad in front of the salt shed after loading.

Outreach

Outreach to Homeowners

Comments:

- Fitchburg: Educational information is available on the City webpage, and social media posts regarding salt use are made periodically. A link to the MMSD website is also available on the City webpage. Articles regarding winter salt use were published in the Fitchburg Star and Green E-Newsletter. Properties with excessive salt use may receive a mailer with educational materials.
- Madison: We are founding members of Saltwise and work with them on outreach. Additionally, we have publicized the idea of checking your water softeners via our Waterways mailing which goes to every resident in the City of Madison on an annual basis.
- Verona: Luke Melotik of AECOM on behalf of the City of Verona gave a “Smart Residential Salt Use” talk at the Verona Public Library on 12/8/2022 to homeowners.
- Cottage Grove: social media and educational materials on reducing road salt & salt on private property.
- Deforest: Uses Facebook to reach out to resident on salt use on side walks and driveways. September 23rd we shared water softener efficiency on Facebook. *attachment to report outlines all facebook post topics for 2023
- Village of Maple Bluff: With our newsletter we encourage our residents to maintain; recalibrate or re-new their water softener equipment. Likewise, we have messaged the residents to use the smallest amount of de-icing material to achieve a satisfactory outcome while treating their sidewalks and driveways.
- Village of McFarland: Postcards regarding Salt Savers Rebate program (water softeners rebate), Public Works Open House—In person event (banner and handouts about softeners), Outlook Newsletter articles (Fall.Winter 2022 Salt Wise & Winter.Spring 2022 Salt Savers Program)
- Windsor & Morrisonville: Community Facebook posts regarding salt reduction.

Outreach to Business & Building/Property Managers

Comments:

- Fitchburg: Properties with reported excessive salt use may receive mailers with educational material.

- Village of Deforest: none in 2022
- Village of Maple Bluff: We will provide similar information to the Executive Residence as well as the MBCC. We will also let them know of the offerings from MMSD.
- Village of McFarland: Discussion at Sustainability and Natural Resources Committee meeting.
- Windsor & Morrisonville: Community Facebook posts regarding salt reduction.