

In Morris and other cities, solving a salty problem in municipal water

Kirsti Marohn · Morris, Minn. · Mar 12, 2019

Environment



Morris City Manager Blaine Hill changes the settings on his water softener, which can be adjusted according to the hardness of the water. Hill says he may not need his softener when the new water treatment plant begins operating. *Kirsti Marohn | MPR News*

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4min 38sec (https://www.mprnews.org/listen?name=/minnesota/news/features/2019/03/12/090312_marohn_20190312_64.mp3)

About once a month, Blaine Hill heads to his basement and pours a bag of salt into his water softener, which helps remove minerals from the notoriously hard city water flowing into his house.

He recently upgraded to a more efficient model that only softens the water when it needs it, and uses far less salt. With his old softener, he was adding three bags a month.

But Hill, who is the Morris city manager, is still concerned about where the softener's leftover saltwater brine ends up: in the city's wastewater treatment plant and eventually, the nearby Pomme de Terre River.

Hill hopes to get rid of his softener altogether later this spring, when the city's new water treatment plant begins operating. It will use a combination of lime and soda ash to centrally soften water before it's piped to homes and businesses.

"It's a plant for the future," Hill said. "Plus, it's solving a problem with the river, and that's good for everybody around here, because we take that river very seriously."

There's a growing focus on water softeners as a significant contributor of chloride pollution in Minnesota's waters.

- **Study: Water softeners partly to blame for Minn.'s salty lakes, streams** (<https://www.mprnews.org/story/2018/07/15/water-softeners-partly-to-blame-for-minnesota-salty-lake-streams>)
- **4 ways: To stop wasting water softener salt (#tips)**
- **Think road salt won't reach your drinking water? Ask Madison** (<https://www.mprnews.org/story/2018/02/02/road-salt-trickling-into-drinking-water-madison>)



Morgan Salo, engineer with Bolton & Menk, points to a tank where lime will be stored to soften the city's water at the new treatment plant. *Kirsti Marohn | MPR News*

Chloride is a permanent pollutant, toxic to fish and aquatic life. About 50 Minnesota water bodies are considered impaired because of excess chloride levels.

Road salt washing into lakes and rivers is the major culprit, especially in the Twin Cities. But in smaller cities and rural areas with fewer roads, water discharged from wastewater plants can be a bigger source.

The majority of chloride coming into wastewater plants is from water softeners, and most plants aren't designed to remove chloride.

Morris is one of an estimated 100 Minnesota cities discharging too much chloride from their wastewater plants, and may need to take action to reduce that amount.

"For a lot of these wastewater treatment plants, road salt isn't going to be their No. 1 source," said Sara Heger, research engineer at the University of Minnesota's Water Resources Center. "If they are looking to reduce their effluent limit to an acceptable level that will let aquatic species thrive in that water, they're going to have to deal with water softeners."

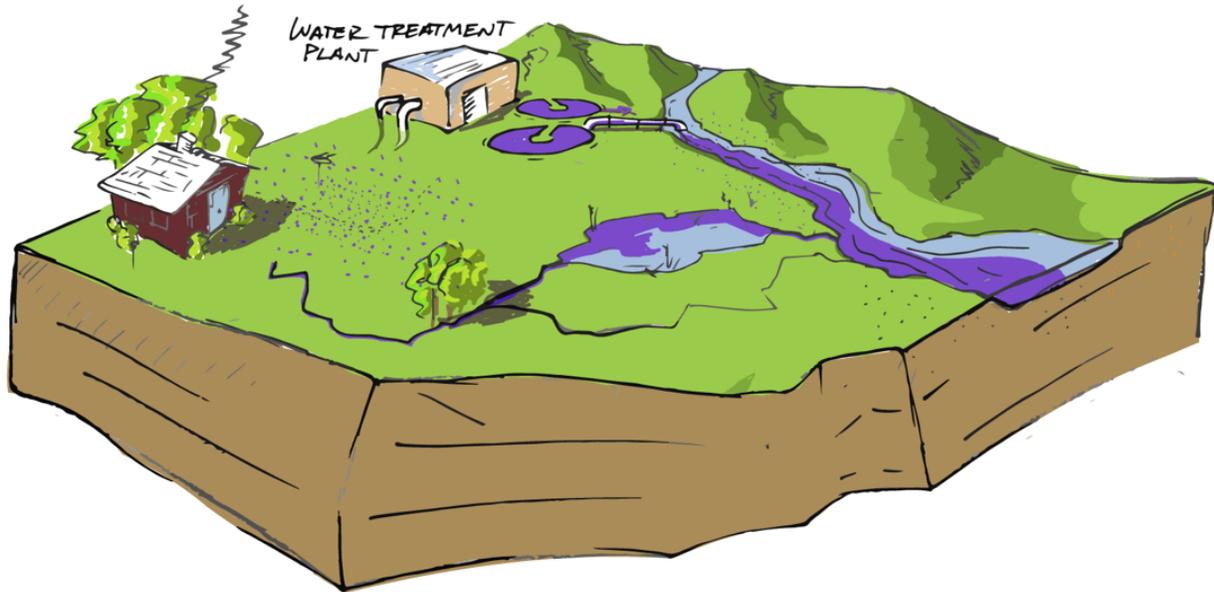
Heger and other researchers created a chloride "budget" to estimate how much salt enters in the environment each year from various sources.

Statewide, road salt is the biggest culprit — responsible for about 42 percent of chloride in the environment. Second was fertilizer use, which accounted for about 23 percent.

Close behind, at 22 percent, was chloride discharged from wastewater treatment plants. And the majority of that chloride — 65 percent of it — came from household and commercial water softeners.

Minnesota: Home of hard water

MORE THAN HALF OF THE CHLORIDE DISCHARGED FROM WASTEWATER TREATMENT PLANTS COMES FROM WATER SOFTENERS. MOST TREATMENT PLANTS AREN'T DESIGNED TO REMOVE IT.



More than half of the chloride released by wastewater treatment plants comes from water softeners. Most plants aren't designed to remove chloride from discharged water. *William Lager | MPR News*

Hard water is caused by minerals like calcium and magnesium, which can leave spots on dishes, hair feeling dry and laundry stiff. They also can leave damaging mineral deposits in pipes and water heaters.

Anything over 10.5 grains of calcium carbonate per gallon of water is considered very hard, and that includes almost all of Minnesota's groundwater. Three-quarters of Minnesotans get their drinking water from groundwater sources.

Most in-home water softeners remove minerals using a process called ion exchange, in which calcium and magnesium ions switch places with sodium ions. It takes place in a tank filled with small plastic beads called resin.

When the beads need to be recharged, they are soaked in a sodium chloride solution — salt water — during the regeneration cycle. The leftover saltwater brine is discharged down the drain, and ends up at municipal wastewater treatment plant or in a septic system.

Removing chloride from water is a difficult and expensive process, so it's not cost-effective for wastewater treatment plants to do it.

"There's no easy fix," Heger said. "You can't just put a technology in to take out all the chloride. You have to go back to the source."

Hooked on salt



The Pomme de Terre River flows through the city of Morris. The city's wastewater treatment plant is discharging too much chloride into the river, largely due to water softeners. *Kirsti Marohn | MPR News*

That's a difficult task, because people like softened water, said Brooke Asleson, a water pollution prevention specialist with the Minnesota Pollution Control Agency.

"We have this personal preference," Asleson said. "People like when they wash their hair and the soap gets really sudsy and lathery."

Asleson said homeowners should consider upgrading to an on-demand water softener like Blaine Hill's new model, which only softens the water and recharges when it's needed. They reduce the amount of chloride leaving the home by 40 to 60 percent compared to the old models, which operated on a timer.

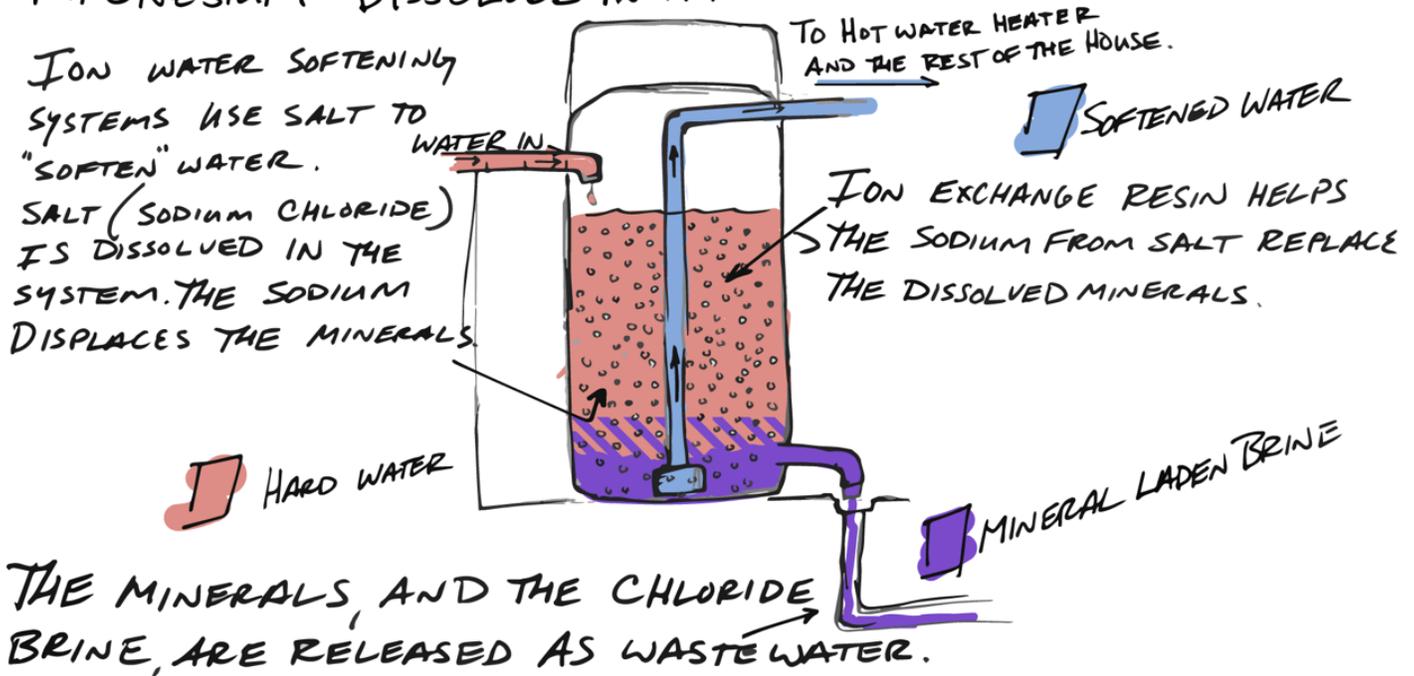
"Every six hours, they're going to go ahead and run that water through that salt and soften it whether it really needs it or not, or whether you're using the water or not," Asleson said.

While softeners contribute far less chloride to the environment than road salt does, the softener industry does recognize it's part of the problem and is taking the issue seriously, said Jeff Hill, a board member of the Minnesota Water Quality Association, a trade association that represents the water treatment industry.

- Safer options: Are there eco-friendly alternatives to road salt? (<https://www.mprnews.org/story/2019/02/12/are-there-eco-friendly-alternatives-to-road-salt>)

HOW WATER SOFTENING WORKS

MUCH OF MINNESOTA'S GROUNDWATER IS CONSIDERED TO BE HARD, MEANING IT HAS MINERALS - LIKE CALCIUM AND MAGNESIUM - DISSOLVED IN IT.



Much of Minnesota's groundwater is considered to be hard water. It has minerals like calcium and magnesium dissolved in it. The water softening process removes those minerals, but creates chloride waste. *William Lager | MPR News*

Water softeners can be optimized to be much more efficient and use less salt, he said. A recent study in Madison, Wis., found that making sure softeners were adjusted to the correct settings for their water hardness and household size, or switching to on-demand softeners significantly reduced the chloride discharged from those homes.

"I would hope over the next three or four years, that every licensed water softener dealer in Minnesota would have this top of mind, to be selling and adjusting with a sense of urgency for chloride reduction," Hill said.

In the future, there could be a financial incentive in the future to get Minnesotans to reduce their softener salt use.

Gov. Tim Walz's budget proposal includes funding for communities to offer grants to homeowners who get rid of their softener or upgrade to an on-demand model.

Morris: Solving a salty problem



Holly Guggisberg is co-owner of EcoWater Systems, which has operated in Morris since 1972. She believes customers will still want to use water softeners after the new water treatment plant starts operating, although they will need less salt. *Kirsti Marohn | MPR News*

The city of Morris is getting \$12 million in state aid to help pay for the \$18 million plant, and city residents will pay higher water rates to help cover the city's share.

Still, they might save money by not having to buy salt. Once the plant starts operating this spring, city officials hope residents and businesses won't need to soften their water anymore.

"People aren't going to want to spend money softening water that they don't need to," Blaine Hill, the city manager, said. "They buy salt. They pay for the water. So it just makes no sense to continue using a bad system."

City officials also plan to adopt an ordinance requiring residents to switch to on-demand, high-efficiency water softeners if they continue to use one.

Holly Guggisberg, owner of the EcoWater softener store in Morris, said she thinks Morris residents will still want to use a home softener even after the new treatment plant starts operating.

Guggisberg said she advises residents to get an on-demand model of softener, or call to have their current softener settings adjusted once the new treatment plant starts operating. She said newer models of softeners even connect to your smartphone so you can track the amount of salt and water you use.

She noted the new plant is expected to soften the water down to about five to seven grains of hardness, not remove all of the minerals.

"People who have a water softener right now are used to zero soft, so their skin is used to that. Their hair is used to that," she said. "Getting rid of the water softener is only going to cause more issues."

Four ways to stop wasting water softener salt

Water softeners are a major contributor of chloride into lakes and rivers. Experts say there are some steps you can take to help reduce your salt use, so you're not using more than necessary to soften hard water.

Here are their suggestions:

1) Decide if you really need a softener

Have your water tested to determine its hardness, or how many minerals such as calcium or magnesium it contains. Some cities, including Minneapolis and St. Paul, centrally soften their water, so you probably don't need a separate softener in your home.

2) Upgrade to a high-efficiency, on-demand water softener

Those models only soften the water and recharge when it's needed, which reduces your salt use. And make sure it's the correct size for your household.

3) Use the least amount of salt necessary

Make sure your softener is set according to your water hardness. If you have an old softener that operates on a timer, extend the time between regeneration cycles. Don't soften water that goes to outdoor faucets and hoses.

4) Hire a professional

Water softeners should be inspected and maintained regularly to make sure they're working properly and efficiently.

Sources: Minnesota Pollution Control Agency, University of Minnesota Water Resources Center, Minnesota Water Quality Association

Stay Informed

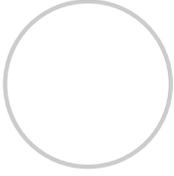
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