DEPARTMENT OF HEALTH

Chloride and Centralized Softening

DRINKING WATER PROTECTION SECTION

Link between chloride and centralized softening

Minnesota Department of Health (MDH) works with public water systems to ensure that drinking water is safe for consumers. Many public water systems in Minnesota currently have no need to treat drinking water before it is distributed.

Centralized softening removes mineral hardness from drinking water at the treatment plant, reducing the need household water softening. Household water softening uses salt to remove hardness and discharges the chloride from salt to wastewater treatment plants. Centralized water softening has been raised as a potential solution to reduce chloride pollution from home water softening and bring wastewater treatment plants into compliance with chloride standards.

However, drinking water treatment is a multi-faceted issue and there are many factors and trade-offs to consider, depending on characteristics of the community. MDH should be consulted early when considering any potential changes to treatment, including centralized softening.

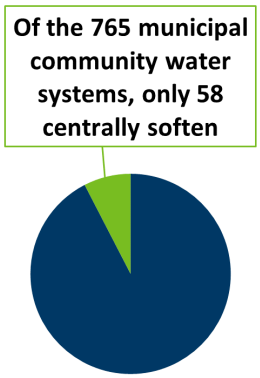
Considerations for centralized softening

Communities considering centralized water softening should consult early with MDH and take into consideration:

- community size;
- funding eligibility;
- impacts on water rates (operation and maintenance costs);
- waste disposal
- sources of chloride pollution;
- other potential contaminants in the source water;
- workforce availability; and
- other potential solutions.

Evaluating drinking water holistically and within local context

Drinking water sources and treatment have complex chemistry and should be evaluated using a holistic, public health approach. Water chemistry, geology, well construction, and local land use affect communities' drinking water quality and treatment. Each community has unique drinking water characteristics, and there are regional differences across Minnesota.



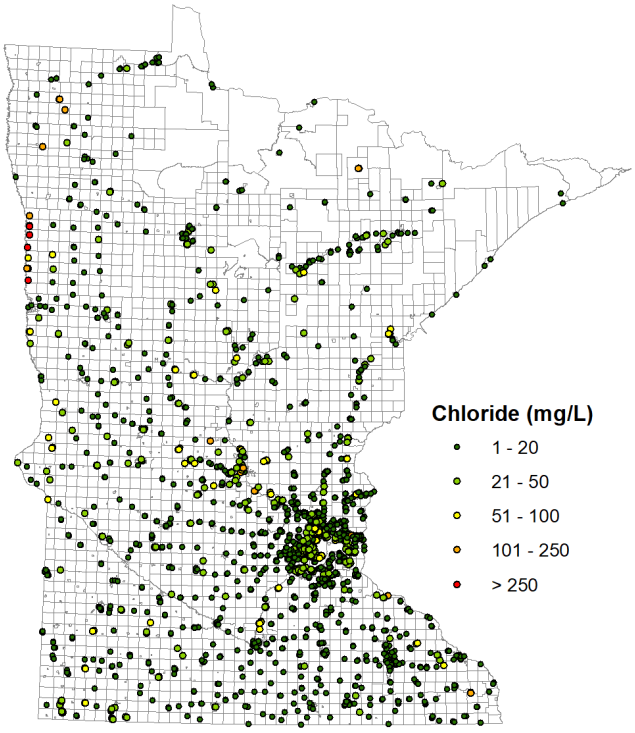
Changes to drinking water treatment can have cascading effects on other water chemistry parameters and treatment processes. With centralized water lime or lime soda ash softening, scale can be less likely to build up

in the pipes. Scale protects pipes from corrosion, and reduced scale build-up could lead to elevated lead detects. On the other hand, lime soda ash softening can reduce corrosion rates for other metals, particularly copper.

Chloride levels in community wells are generally low

The majority of community water system wells in Minnesota have chloride levels of 10 mg/L or under. There are almost 1,900 community water system wells with chloride data, and just six of them have chloride levels above the 250 mg/L non-enforceable secondary drinking water standard for taste and odor. These six wells are in a region of the state where some aquifers have naturally elevated chloride levels.

Research in some areas of the United States have shown that elevated chloride levels in source waters can affect drinking water corrosivity and lead release. Sampling data for Minnesota communities do not indicate a current concern for drinking water chloride levels and corrosivity. Additionally, MDH and public water systems carefully evaluate, plan, and monitor changes in drinking water quality and treatment.



Most community wells have low chloride levels of 10 mg/L or under

Reducing chloride pollution can preserve water quality

While chloride levels in community wells are generally low, reducing chloride pollution can benefit the environment and preserve the quality of drinking water sources. Using salt efficiently to soften water and deice paved surfaces can help maintain the quality of Minnesota's groundwater and surface water resources. Efficient salt use is particularly important within areas that could impact drinking water wells, surface water intakes, and in areas sensitive to contamination. Preventing contamination is the most cost-effective and equitable way to ensure high-quality drinking water for future generations of Minnesotans.

Minnesota Department of Health
PO Box 64975
St. Paul, MN 55164-0975
651-201-4700
health.drinkingwater@state.mn.us
www.health.state.mn.us

12/2022

To obtain this information in a different format, call: 651-201-4700.