

Straight talk on monochloramines

The City of Craig clarifies myths about the upcoming switch to monochloramine in its water distribution system

Brought to you by the City of Craig

As many of you know, the City of Craig is under a compliance order that must be met by April of 2020. Due to low chlorine residuals in the water distribution system, the City has been evaluating alternatives to mitigate low chlorine residuals for the past 2 years.

This effort was needed in order to select the best alternative that would meet both our compliance deadline and take into consideration and ensure a reasonable capital expenditure would be proposed to complete the project implementation.

The following questions and answers from the American Water Works Association are meant to provide detailed information regarding the switch to monochloramine as the City's secondary disinfectant for the distribution system.

WHAT IS MONOCHLORAMINE?

Monochloramine, a combination of chlorine and ammonia which is commonly known as "chloramine," has been widely and successfully used as a drinking water disinfectant since 1917. While monochloramine is used rarely as a water system's primary disinfectant, it is often added as a secondary disinfectant into the distribution system to ensure that the water remains safe as it is delivered to your home.

HOW PREVALENT IS MONOCHLORAMINE USE IN THE UNITED STATES?

The U.S. Environmental Protection Agency estimates that more than 30 percent of the United States' large water systems currently use monochloramine at some point in their systems. That number is likely to rise as more communities seek to reduce exposure to potentially harmful byproducts that can form during the disinfection process. In 1998, over 68 million U.S. customers safely used water that was treated by monochloramine as a secondary disinfectant. At present, it's estimated that monochloramine serves 100 million U.S. customers.

WHY DO UTILITIES USE MONOCHLORAMINE?

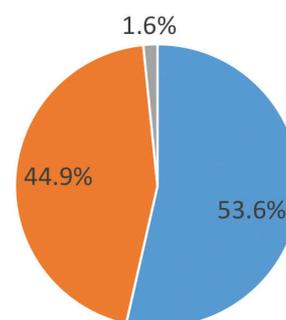
Monochloramine is a disinfectant used to kill bacteria and other microbes as a part of drinking water treatment. While chlorine is the most commonly used primary disinfectant, an increasing number of water providers are using monochloramine to help them comply with new regulations. The new regulations are designed to limit certain "disinfectant byproducts" in

45% of U.S. Population Is Served by Public Water Supplies Using Chloramine

Data Courtesy of Chad Seidel, Corona Environmental Consulting
Analysis of EPA UCMR3 Data

Percent of U.S. Population on Public Water Supply Using Chloraminated Water

100,000,000 people in United States use chloraminated water



Equates to around 30% of Public Water Supply Systems

■ Using Free Chlorine ■ Using Chloramine ■ Unclassified

MONOCHLORAMINES IN CRAIG

For more information about the City of Craig's water system and monochloramines, visit: ci.craig.co.us/departments/water

finished water. These disinfectant byproducts — which are potentially harmful to humans — are formed when organic and inorganic matter in the water react with chlorine or other disinfectants.

Many water systems also favor the use of monochloramine because they experience fewer taste and odor complaints from customers than when they use chlorine.

WHEN DID UTILITIES START USING MONOCHLORAMINE TO DISINFECT WATER?

It is likely that monochloramine formed in wastewater and in waters containing natural ammonia for some time before the term "chloramine" existed.

In the early 1900s, the chlorine-ammonia combination received attention when it was found that the cost of chlorination might be reduced if ammonia was added. The practice of monochloramine treatment was adopted in 1916 at the treatment plant in Ottawa, Ontario.

The first installation in the United States was in 1917 in Denver. Both locations used ammonia and hypochlorite and noted improvements in taste.

More than 400 utilities were using monochloramine disinfection by 1938. During World War II, when ammonia supplies were low, the use of monochloramine was reduced.

Monochloramine was used sparingly until the 1970s when the potentially harmful disinfection byproducts trihalomethanes (THMs) were discovered. Depending on local circumstances, monochloramine produces fewer THMs than free chlorine does, so the use of monochloramine increased. Haloacetic acids (HAAs), another set of

disinfection byproducts, were regulated in 1998, further supporting the use of monochloramine.

HOW DOES MONOCHLORAMINE AFFECT THE KIDNEYS?

Monochloramine has been widely and successfully used as a drinking water disinfectant since the 1930s. However, there are specific considerations that need to be taken into account by those who are kidney dialysis patients.

Like chlorine, monochloramine can harm kidney dialysis patients during the dialysis process if it is not removed from water. This is a result of water coming into contact with patients' bloodstream during the dialysis process. It is safe for dialysis patients to drink, cook with and bathe in monochloraminated water because the digestive process neutralizes monochloramine before it enters the bloodstream. Two methods are typically used to remove monochloramine from water before dialysis: ascorbic acid, or a granular-activated carbon filtration system specifically designed to remove monochloramine. Home dialysis patients should work with their home dialysis facility and physician to ensure that any necessary adjustments to their equipment are made. It is important to know that monochloramine cannot be removed by boiling water or adding salt. Additional information about current dialysis standards can be found on the website of the Association for the Advancement of Medical Instrumentation.

Monochloramine is formed by a reaction between chlorine and ammonia. It is commonly used because it results in reduced levels of certain disinfection byproducts

(DBPs) while still maintaining adequate disinfection. This is important because some studies have indicated that high levels of DBPs may cause health problems. Monochloramine also favored is less reactive and remains in solution longer, providing added protection from contamination.

WILL MONOCHLORAMINE BE REGULATED IN THE FUTURE?

If there is scientifically compelling evidence that shows a large number of U.S. drinking water systems have detected monochloramine at levels that exceed the HALs set forth by the EPA, it's possible the agency may decide to regulate monochloramine in the future.

CAN MONOCHLORAMINE AFFECT MY PETS?

Though safe for drinking by humans, monochloramine, like chlorine, is toxic to fish and other aquatic organisms at levels used for drinking water. Fish hobbyists or home aquarium owners must neutralize or remove monochloramine from water used in aquariums or ponds.

As with chlorine, fish (including fresh and salt water fish), amphibians, and reptiles are harmed by monochloramine as it passes through the gills, directly entering their bloodstream.

Products are available at fish and pet supply stores to remove monochloramine from aquarium water including: treatment products (drops or tablets) that remove both ammonia and chlorine, or filters (for ammonia) and chemical agents (for chlorine).

Aquarium owners should routinely test their water for ammonia and chlorine concentrations. Test kits are available at pet shops and aquarium products suppliers.