USE OF CHLORAMINES IN THE CONVERSION TO SURFACE WATER

BACKGROUND INFORMATION...

Since its creation in 2005, the North Fort Bend Water Authority (NFBWA) has been preparing to manage the conversion to surface or alternate water in compliance with Fort Bend Subsidence District (FBSD) mandates. The Authority encompasses 69 utility districts and two cities, Fulshear and Arcola. FBSD mandates require the NFBWA to reduce its dependence on groundwater 30 percent by 2014.

Over-pumping of groundwater is responsible for subsidence across the region, which can cause flooding and foundation problems, and can permanently impact the aquifer as well. Under the FBSD's mandate, alternate water supplies must replace a percentage of the groundwater now pumped by approximately 140 permitted wells within Authority boundaries. Reducing groundwater 30 percent means replacing roughly 11 million gallons per day (MGD)in 2014, and that number continues to grow as the area is developed.

Beginning in 2009, the Authority has provided periodic workshops and briefings for the districts in the first phase of converting to surface water. These sessions have addressed many specific issues related to the conversion process, including the use of chloramine disinfection and the reasons for this method.

The surface water the Authority receives under contract with the City of Houston is already disinfected using chloramines. While the well owners within the NFBWA conversion areas have traditionally relied on chlorine for disinfection of their groundwater, the use of chloramines for this purpose has several advantages, including a reduction in the formation of disinfection by-products (DBPs) and a longer lasting disinfection residual. Because a blend of surface water and the current groundwater supply is being blended, groundwater must also be disinfected with chloramines rather than chlorine to avoid chemical conflicts and the potential for taste and odor problems.

The use of both chlorine and chloramines is regulated by the EPA and the Texas Commission on Environmental Quality (TCEQ). ***Chloraminated water is safe for bathing, drinking, cooking and all normal tasks we have for water every day.***

There are two situations, however, where special care must be taken: kidney dialysis treatments and tropical fish aquariums. In both cases, the water comes into direct contact with the blood -- in dialysis through a permeable membrane, and in fish through their gills.The chloramines in the water would therefore be toxic in these situtions. Removing the chloramines can be accomplished by introducing an additive (for fish)or by use of a granular activated carbon filter/treatment (for fish and dialysis).

There are no other restrictions for kidney patients -- drinking, bathing, cooking -- when using chloraminated water are fine. A problem only occurs during dialysis when the water has the potential to come into direct contact with the blood supply. This situation is well known, regularly addressed, and accommodated by professional dialysis providers.

Drinking water supplies in this country are highly regulated, at all levels of government. In addition, each year, the EPA requires water utilities to provide their customers with detailed information about the quality of their drinking water, as well as the amounts of any contaminants found in the district's source water. The report -- known as the **Consumer Confidence Report** -- is sent to water customers each summer. This oversight and regulation, the diligence of the water managers, and advances in science and technology all provide reassurance that our drinking water meets the highest possible quality standards. This will continue be true as we accomplish the conversion to surface water.

Q What are chloramines? *

A. Chloramines are disinfectants used to treat drinking water. Chloramines are most commonly formed when ammonia is added prior to chlorine to treat drinking water. The most typical purpose of chloramines is to protect water quality as it moves through pipes. Chloramines provide long-lasting protection as they do not break down quickly in water pipes. Compared with chlorine disinfection, chloramines reduce the formation of disinfection by-products.

***Q Does the Environmental Protection Agency regulates the safe use of chloramines* in drinking water.**

A. Yes. EPA requires water utilities to meet strict health standards when using chloramines to treat water. EPA chloramines regulations are based on the average concentration of chloramines found in a water system over time. EPA regulates certain chemicals formed when chloramines react with natural organic matter in water.

Q. How did EPA evaluate the safety of *monochloramine* for use as a drinking water disinfectant?

A. Just as they regulate by-products of chlorine use, EPA evaluates monochloramine (the dominant chloramine) primarily through an analysis of human health and animal data. Research reviewed in EPA's safety analysis is contained in EPA's Drinking Water Criteria Document for Chloramines. The criteria for monochloramine provides a complete summary of health and other data considered in establishing a monochloramine standard. EPA periodically updates the monochloramine "criteria document".

EPA's monochloramine standard is set at a level where no human health effects are expected to occur. EPA reviews and considers new research results as they become available.

EPA's standard for monochloramine takes data gaps and uncertainty into account by building safety factors into the regulatory standard.

EPA also reviews historical data in its evaluation of monochloramine. Monochloramine has been in use as a drinking water disinfectant for over 90 years. Decades of use in the US, Canada, and Great Britain shows that monochloramine is an effective secondary drinking water disinfectant. Houston, Denver, Philadelphia, and other large cities have used monochloramine as part of their water treatment process for years.

Chloramine Facts:

- Chloramines are a combination of chlorine and a small amount of ammonia. The primary type of Chloramines use in our systems is monochloramine (NH_2CL), in a ratio of 5 parts chlorine to one part ammonia-nitrogen.
- Chloramines are preferred over chlorine for their ability to persist in the distribution system; their lack of taste and odor; and for their safety. This method of water disinfection has been used in this country since 1917. The EPA estimates that more than half of the nation's large water systems currently use chloramines.
- The amount of chloramines in our drinking water will be extremely small: no more than four (4) parts per million.
- About the only thing you might notice about chloraminated water is that it may have less of a chlorine taste or smell.
- Chloramines will not change the pH of the water; it will remain as it was before the conversion.
- Swimming pools will still need to have chlorine added to control algae and growth of bacteria.
- Chlorine dissipates quickly when water sits for a few days, but chloramines are more persistent and they may take weeks to disappear. For aquarium or pond concerns, check with a pet store for appropriate agents or filters that will remedy the problem.

* Source: US EPA -- Chloramines Q&A