

## The City of Tulsa – Chloramine Conversion Web Copy

### Chloramine Navigation Links:

- Home
- About Chloramine
- Health Info
- Water Treatment Process
- Media
- Chloramine FAQ
- Glossary
- Contact Us
- Links

### ***Home***

In June 2010, the City of Tulsa and the Tulsa Metropolitan Utility Authority announced plans to begin using chloramine as a secondary water disinfectant in Tulsa's water supply by the end of 2011. The City will continue to use chlorine as the system's primary disinfectant.

Why is Tulsa making this change? Switching to secondary chloramine disinfection will help Tulsa meet the EPA's stricter water safety rule (the [Stage 2 Disinfection Byproducts Rule](#)), which goes into effect in 2012 and provides higher standards for drinking water. By making this change, the City of Tulsa will be able to provide longer-lasting protection and water that meets drinking water standards to every part of the city.

Here are a few quick facts about chloramine:

#### *Chloramine Quick Facts*

- Chloramine, like chlorine, is a disinfectant [commonly used to treat drinking water](#).
- Chloramine is formed by adding trace amounts of ammonia to chlorine in water.
- Chloramine has been used as a reliable disinfectant to treat water in cities across the United States since 1917 -- [more than 90 years](#).
- The [EPA has determined](#) that chloramine is more stable than chlorine. Chloramine is effective for controlling bacterial growth in city water systems.

### **About Chloramine**

Chloramines are [disinfectants added to the water for public health protection](#). Chloramines are most commonly formed when ammonia is added to chlorine to treat drinking water. Chloramines provide long-lasting protection, as chloramines are more stable than free chlorine.

There are [different types of chloramines](#), including monochloramines, dichloramines, trichloramines and organic chloramines. Monochloramine is the most common form used to disinfect drinking water and is the form that will be used in Tulsa's water distribution system.

The [Environmental Protection Agency \(EPA\) approves the use of chloramines](#) as a disinfectant in drinking water. The maximum concentration of chloramine allowed in drinking water is 4 ppm (mg/l).

### **Chloramine History and Usage**

Chloramine has a long history of effective use in city water treatment systems. Here are a few facts:

- Chloramine has been used as a disinfectant in water systems since 1917 – [more than 90 years](#) (chlorine has been in use since 1908).
- Chloramine is currently used by approximately [29% of community water systems](#). Due to the upcoming implementation of the EPA's stricter D/DBP2 standards in 2012, it's projected that a large number of other cities will be making similar conversions to meet the new standards and that [approximately 55% of U.S. surface water systems will be using chloramine](#) as a disinfectant.
- The [EPA has determined that chloramine is more stable than chlorine](#) in the distribution system.
- Chloramine is effective for controlling bacterial growth.
- Chloramine forms lower levels of regulated disinfection byproducts.
- Increased chloramine use in distribution systems is being driven by new and more stringent EPA regulations.

### **Health Info**

Chloramine has a long, proven record as a safe and effective disinfection method for treating drinking water.

According to the EPA, chloraminated water is [safe for all everyday uses](#), including drinking, bathing and cooking. It has been used safely in the U.S., Canada and Great Britain for more than 90 years. Other nearby cities such as Oklahoma City, Sand Springs, Lawton, Norman, Denver, Dallas and Fort Worth have used chloramine for decades to treat their water.

In addition, the [EPA recognizes chloramine as a safe disinfectant](#) and an effective way to reduce the formation of disinfection byproducts (DBPs), which have been linked to certain forms of cancer.

### **Kidney Dialysis Patients**

Chloramine, like chlorine, must be removed from the water before it can be used in kidney dialysis machines.

Kidney dialysis patients should contact their physician or local kidney dialysis center for guidance on modifications to dialysis machines and procedures. Medical centers that perform dialysis are responsible for purifying the water that enters the dialysis machines.

Kidney dialysis patients can still bath, drink and cook with chloraminated water. The digestive process neutralizes the chloramines before they reach the bloodstream. It's only when water interacts directly in the blood stream, as in dialysis, that chloramines must be removed.

### **Health Concerns by Select Advocacy Groups**

The EPA states that water disinfected with chloramine that meets regulatory standards [has no known or anticipated adverse health effects](#), including [skin problems](#), [breathing problems](#), [digestive problems](#) or [cancers](#).

Because a handful of concerns have been raised over the years by consumer advocacy groups regarding the health effects of chloramine consumption, the City of Tulsa wants to address these issues as openly as possible. In general:

- No current information exists in medical literature linking chloramine in drinking or bathing water to health concerns raised.
- There is the possibility that individuals have specific sensitivities to various chemicals in the environment; there is no evidence that health effects occur on the population level as a result of chlorine or chloramines.

### **Addressing Skin Irritation Concerns:**

- The prevalence of dermatitis (skin irritation) in the general population is 12%. Skin problems may be caused by multiple factors, including: soaps, detergent, environmental conditions and bacteria growing in hot water heaters when temperature is too low. Monochloramine, the form of chloramine that will be used as a disinfectant in Tulsa's water distribution system, has not been shown to be a cause or contribute to reported skin problems.
- The Centers for Disease Control (CDC)'s [investigation of reports of monochloramine-related skin problems](#) associated with drinking water use was unable to draw any conclusions about monochloramine and health effects.
- Concerns expressed by individuals may be based on misinterpretation of chemistry and anecdotal health data available on the Internet for concentrated chemicals.

### **Addressing Inhalation Concerns:**

- Monochloramine is highly soluble and loss to evaporation is minimal, based on literature and primary research of third-party municipalities.
- Swimming pools tend to have a higher load of ammonia from urine and sweat. Chlorine and trichloramine are [potential irritants in improperly operated pools, especially indoor pools](#).
- Concerns expressed by individuals may be based on misinterpretation of chemistry and anecdotal health data available on the internet for concentrated chemicals and for swimming facilities.

As with any health issue, people with specific health concerns should discuss these with their doctors. Physicians may contact the City of Tulsa's Public Works Department or the Tulsa City-County Health Department to discuss any public health concerns.

As always, the City of Tulsa will closely monitor its ongoing water treatment process and will continue to monitor ongoing research regarding the use of chloramines.

## Water Treatment Process

Tulsa's water treatment process has earned the reputation for providing some of the highest-quality water in the country. For a complete overview of the process the City of Tulsa's Public Works Department goes through every day to provide quality water to your home and work, and for more information on how chloramine will be used in the treatment process, please visit <http://www.cityoftulsa.org/city-services/water/treatment-process.aspx>.

## Media

Media can direct any questions about the City of Tulsa's upcoming chloramine conversion to Waller & Company Public Relations, (918) 587-1909. Feel free to contact:

- Barrett Waller, [barrett@wallerpr.com](mailto:barrett@wallerpr.com)
- Jordan Guthmann, [jordan@wallerpr.com](mailto:jordan@wallerpr.com)
- Liz Kubik, [liz@wallerpr.com](mailto:liz@wallerpr.com)

## Frequently Asked Questions – Chloramines

- **Why Disinfect Drinking Water?**
- **General Chloramine Information**
- **Use of Chloramine in Water Systems**
- **Chloramine Safety**
- **Chloramine Removal**

### Why Disinfect Drinking Water?

**Q: Why do cities disinfect drinking water?**

**A:** Without some type of disinfectant in drinking water, disease-causing organisms may exist and cause widespread health issues for a community.

### General Chloramine Information

**Q: What are chloramines?**

**A:** [Chloramines are disinfectants added to the water for public health protection](#). Chloramines are most commonly formed when ammonia is added to chlorine to treat drinking water. Chloramines provide long-lasting protection as they do not break down quickly in water pipes.

**Q: Are there different kinds of chloramines?**

**A:** Yes, there are [different types of chloramines](#), including monochloramines, dichloramines, trichloramines and organic chloramines. Monochloramine is the most common form used to disinfect drinking water, and it is the form that will be used in Tulsa's water distribution system.

### **Use of Chloramine in Tulsa's Water System**

**Q: Why is Tulsa switching from chlorine to chloramine for its secondary disinfectant?**

**A:** New Environmental Protection Agency (EPA) [regulations are going into effect in 2012](#) that require water utilities to control levels of regulated disinfection byproducts (DBPs). DBPs are chemical compounds that are formed when chlorine mixes with small quantities of natural organics in the water. Chloramine produces lower concentrations of regulated DBPs than chlorine because chloramine is less reactive with natural organic matter.

The City of Tulsa currently uses chlorine to disinfect drinking water. The addition of trace amounts of ammonia to chloramine in the City's water distribution system will improve water quality and ensure the City continues to comply with the EPA's increasingly stringent regulations on drinking water.

**Q: When will the change occur in Tulsa?**

**A:** The 18-month conversion to chloramine is expected to be completed by fall 2011. Announced in June 2010, the conversion project began immediately with engineering studies conducted by CH2M Hill, an international engineering firm with offices in Tulsa.

**Q: What can I expect to notice with the change?**

**A:** Chloramination is expected to improve the taste and smell of Tulsa's water. You may, however, notice an unfamiliar odor or taste for a few days when the change from chlorine to chloramine first occurs.

**Q: Are other cities around the country also switching from a chlorine disinfectant to a chloramine disinfectant?**

**A:** Many water utilities have already switched from chlorine to chloramine and have reported [increases in customer satisfaction with the water's taste and odor](#).

### **Chloramine Safety**

**Q: Are chloramines safe?**

**A:** Yes, chloraminated water is safe for bathing, drinking, cooking and all everyday uses. Chloramines have been used safely in the U.S., Canada and Great Britain for more than 90 years. Other nearby cities such as Oklahoma City, Sand Springs, Lawton, Norman, Denver, Dallas and Fort Worth have been using chloramine as part of their water treatment process for decades.

**Q: What stances does the federal Environmental Protection Agency take on chloramine?**

**A:** The EPA recognizes chloramines as a safe disinfectant and an effective way to reduce DBP formation. In addition, the EPA states that water disinfected with chloramine that meets regulatory standards [has no known or anticipated adverse health effects](#), including [skin problems](#), [breathing problems](#), [digestive problems](#) or [cancers](#).

**Q: Are there any groups who must take special precautions with water containing chloramines?**

**A:** Yes. Kidney dialysis patients must remove chloramine from the water they use for [dialysis treatment](#). Fish owners also must remove the chloramines from the water used for their fish in aquariums and ponds.

**Q: What special precautions do kidney dialysis patients have to take?**

**A:** Chloramine, like chlorine, must be removed from the water before it can be used in kidney dialysis machines. Chloramines can be removed by adding ascorbic acid to the water or using a granular-activated carbon treatment.

Kidney dialysis patients should contact their physician or local kidney dialysis center for guidance on modifications to dialysis machines and procedures. Medical centers that perform dialysis are responsible for purifying the water that enters the dialysis machines.

Kidney dialysis patients can still bath, drink and cook with chloraminated water. The digestive process neutralizes the chloramines before they reach the bloodstream. It's only when water interacts directly in the blood stream, as in dialysis, that chloramines must be removed.

**Q: What does the change in water disinfection mean for fish and fish owners?**

**A:** Chloramine, like chlorine, [must be removed from the water before it is added to aquariums or fish ponds](#), including fish and lobster tanks in restaurants and stores. The ammonia in chloramine is toxic to fish and other aquatic life as it enters the bloodstream directly through the gills.

The water can be purified for fish and other aquatic life by adding specific agents to remove chloramines and ammonia or using a high grade of granular-activated carbon to remove chloramines. Leaving water to sit is not a reliable method for removing chloramines from the water.

Pet owners should visit local pet stores and pet suppliers for dechloramination products and instructions. Water conditioners specifically designed for removing chloramines are commercially available.

**Q: If chloramines are harmful to kidney dialysis patients and fish, why are they not harmful to me?**

**A:** Chloramines are harmful only when they enter the bloodstream directly, as in the kidney dialysis process. Monochloramines are broken down by the saliva and further neutralized by stomach acid. They leave the body through human waste quickly and cause no adverse health effects.

## **Chloramine Removal**

**Q. How can I remove chloramines from my tap water?**

**A:** Unlike chlorine, chloramine can't be removed from drinking water by boiling water, allowing water to sit at room temperature over an extended period of time or by using reverse osmosis filters. However, there are commercial products available that remove chloramine from drinking water. Please contact a local carrier of home water filters for information on chloramine-removing filters.

**Q. I already have a water filter stalled at my home, is it effective in removing chloramines?**

**A.** Some modern household treatments and filters may remove chloramine. To verify whether your current treatment or filter removes chloramine, please refer to your original filter packaging or contact a local provider of home water filters.

- [Full EPA FAQ on Chloramine](#)

## Glossary

**µg/L** – microgram per liter  
**AOC** – assimilable organic carbon  
**AWWA** – American Water Works Association  
**CDC** – Centers for Disease Control and Prevention  
**DBP** – disinfection byproducts  
**D/DBPR** – Disinfectants/Disinfection Byproducts Rule  
**EPA** – Environmental Protection Agency  
**FDA** – Food and Drug Administration  
**GAC** – granular activated carbon  
**HAAs** – haloacetic acids  
**HPC** – heterotrophic plate count  
**ICR** – Information Collection Rule  
**IRIS** – Integrated Risk Information System  
**LCR** – Lead and Copper Rule  
**MCL** – maximum contaminant level  
**mg/L** – milligrams per liter  
**MIC** – microbial influenced corrosion  
**MRDL** – maximum residual disinfectant level  
**MSDS** – Material Safety Data Sheet  
**MWDSC** – Metropolitan Water District of Southern California  
**NDMAN** – nitrosodimethylamine  
**ng/L** – nanograms per liter  
**NOM** – natural organic matter  
**NSF** – NSF International  
**OSHA** – Occupational Safety and Health Administration  
**POUD** – point-of-use devices  
**PVC** – polyvinyl chloride  
**RO** – reverse osmosis  
**SDWA** – Safe Drinking Water Act  
**SWTR** – Surface Water Treatment Rule  
**TCR** – Total Coliform Rule  
**THMs** – trihalomethanes  
**TMUA** – Tulsa Metropolitan Utility Authority  
**TOC** – total organic carbon  
**TOX** – Total Organic Halides  
**USEPA** – U.S. Environmental Protection Agency  
**UV** – ultraviolet  
**WHO** – World Health Organization  
**WIC** – Women, Infants & Children  
**WQD** – Water Quality Division

## Contact Us

For questions about chloramine or the City of Tulsa's upcoming chloramine conversion process, please see the information below:

**Name:** City of Tulsa

**Mailing address:**

City Hall at One Technology Center  
Communications Dept., Suite 560  
Tulsa, OK 74103

**Phone:** 918-596-2412 (Joan Arthur, City of Tulsa Public Works chloramine conversion project leader) or 918-596-2100 (Mayor's Action Center)

**Email:** [JArthur@cityoftulsa.org](mailto:JArthur@cityoftulsa.org)

For general questions regarding the Tulsa water supply, please contact one of the following:

- To report Leaks or Outages – (918) 596-9488
- For Utility Billing or a new connection – (918) 596-9511
- To arrange for a speaker to talk about Tulsa Water at your next club or organization meeting (918) 596-9847

## Links

- [California Conference of Local Health Officers Chloramine Letter](#)
- [Full EPA FAQ on Chloramine](#)
- [Home Water Treatment Devices – National Sanitation Foundation Consumer Information](#)
- [Letter from Jeffrey K. Griffiths, MD MPH&TM of Tufts University to the San Francisco Public Utilities Commission, Water Quality Division](#)
- [Opflow, November 2010 Issue – “Survey Says?”](#)
- [Vermont Department of Health](#)