

FACT SHEET



CHLORINE

In response to concerns regarding water quality issues, the City of Longview asked a team of water quality experts to review our drinking water and determine whether some of the components of Longview's drinking water might have health impacts. This fact sheet was prepared by the City of Longview with help from Confluence Engineering Group to address questions commonly asked by City of Longview customers.

What is chlorine?

Chlorine is the most common oxidant and disinfectant used to treat drinking water. It is widely used as a disinfectant and bleach by residential, commercial and industrial users. Chlorination techniques for disinfecting drinking water began in the late 1800's. It was first used in the United States in 1908 to prevent outbreaks of waterborne disease caused by harmful microorganisms and bacteria such as typhoid, cholera, dysentery, hepatitis, *E.coli*, *Giardia*, *Salmonella* and *Legionella*.

How is chlorine measured?

Chlorine is easy to measure using portable test kits with color indicators. The color is compared to a standard color chart to determine concentration. The City uses a pocket colorimeter analyzer for a digital test result. There are three types of chlorine:

- Free Chlorine
- Combined Chlorine
- Total Chlorine

Free Chlorine is unused chlorine left in the water and "available" after all reactions have taken place. Combined Chlorine is chlorine that has typically reacted with ammonia to form chloramines. Total Chlorine is the sum of Free Chlorine and Combined Chlorine.

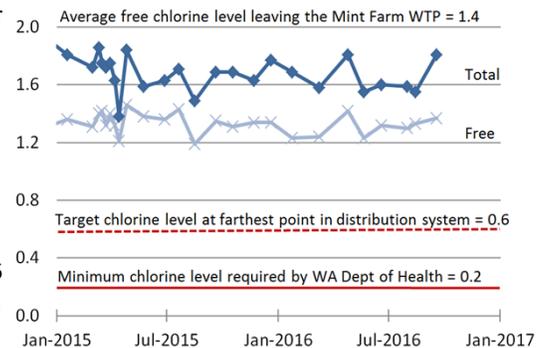
What is one part per million?

One part per million (ppm) is equal to:

- One drop in 10 gallons
- One ounce in 32 tons
- One milligram in one liter (mg/L)

How much chlorine is in Longview's drinking water?

The amount of chlorine in your water depends on where you live. When it leaves the Mint Farm Water Treatment Plant, the water has about 1.4 ppm of free chlorine. Our goal is to maintain at least 0.6 ppm everywhere in the system. Most people have between 0.6 and 1.0 ppm of free chlorine in their water.



What does the EPA say about chlorine in drinking water?

Health professionals consider chlorination one of the most important advances in public health. Under the Safe Drinking Water Act, the City is required to inactivate 99.99% of viruses using disinfection. However, to limit the formation of disinfection byproducts (DBPs), no more than 4 ppm of chlorine can be added to the water. The City's chlorine and DBP levels are far below EPA limits.

Chlorine is one of the most commonly manufactured chemicals in the United States. Not only is it used in drinking water, swimming pools, hot tubs and household cleaners to kill bacteria, it is also used in the manufacture of paper, cloth, toys, cake flour, food packaging, plastics, PVC, rubber, solvents and pesticides. Exposure to chlorine gas or ingesting household bleach can be deadly and there is no antidote. But low levels of chlorine in drinking water are considered safe and necessary. Exposure from drinking or eating food prepared with chlorinated drinking water, bathing or brushing teeth is extremely low. Chlorine dissipates with heat (in your hot water heater) and with time (as water sits inside household plumbing) so chlorine levels at your tap tend to be even lower than they are in the distribution system.

Should I be worried about how much water I drink?



The World Health Organization set the guideline for Total Daily Intake of free chlorine in drinking water with no observed adverse effects at 150 ug/kg of body weight. An adult weighing 130 pounds would have to drink thirty eight 8-oz. glasses of water a day to ingest that amount.

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What can I do about chlorine?

Chlorine does not pose a health risk at the levels found in our drinking water. However, objectionable taste and odor can be nuisance for some customers. Here are some things you can do to remove or neutralize chlorine in your water:

- Use a pitcher to let water sit overnight
- Boil water for 15 minutes
- Use a carbon or charcoal filter
- Add vitamin C tablets to bath water
- Use Campden tablets (home brewers)

Could I be allergic to chlorine?

Chlorine is not a common allergen but it is an irritant. Chlorine sensitivity is most often related to elevated chlorine levels in a swimming pool or hot tub which is not properly balanced or has recently been "shocked". Common symptoms include eye irritation, dry or itchy skin, rashes, bumps and redness which may take a few hours or days to go away. Depending on exposure, some swimmers may experience a runny nose, cough, sneezing or asthma related symptoms. Limit exposure by rinsing off after swimming or using lotions or sprays formulated to protect your skin.

Should I dechlorinate my water?

Chlorine should be removed from water used for dialysis, aquariums and home brewing beer. Combined chlorine (chloramines) can interfere with dialysis, affect aquatic life and may give home brewed beer a medicinal taste.

What happens when chlorine enters the body?

Chlorine exists in the body as sodium chloride or common salt. Chloride is found in barley, wheat, and other grains, green leafy vegetables, and fruits like melon and pineapple. Chloride is essential for distribution of carbon dioxide, maintenance of osmotic pressure in body tissue, the manufacture of glandular hormone secretions, regulating the alkali-acid balance in the blood, and the proper balance of fluid and electrolytes. It prevents the building of excessive fat and auto-intoxication, and works with potassium to produce hydrochloric acid in the stomach for digesting proteins. Deficiency can occur when sodium chloride is restricted during the active phase of edema or hypertension. Excessive loss of salt from the body can result in heat cramps, and may also lead to loss of hair and teeth, impaired digestion of foods and derangement of fluid levels in the body.

What health effects can be caused by exposure to chlorine?

The duration, strength and route of exposure are important to understand health effects. Short term, high level exposure is usually accidental whereas long term, low level exposure is common. Inhaling chlorine gas attacks soft tissues and mucus membranes (eyes, nose, throat) and causes fluid to build in the lungs, leading to respiratory failure and death. Symptoms of swallowing concentrated chlorine can range from mild stomach irritation to damage or perforation of the esophagus and stomach. Chlorine used to disinfect drinking water can form undesirable byproducts but available evidence does not prove any adverse health affect in humans who drink water containing byproducts at levels below EPA limits. The International Programme on Chemical Safety strongly cautions: *The health risks from these byproducts at the levels at which they occur in drinking water are extremely small in comparison with the risks associated with inadequate disinfection. Thus, it is important that disinfection not be compromised in an attempt to control such byproducts.*

Never mix bleach with ammonia, acid or household cleaners!



When household bleach is mixed with ammonia, toxic chloramine gas is produced. Ammonia can be found in glass cleaner, paint and urine (litter box, diaper pail, toilets). When household bleach is mixed with acids, toxic chlorine gas is produced. Acid can be found in vinegar, dishwasher detergents, drain cleaners, rust removal products and masonry cleaners. Bleach can also react with some oven cleaners, hydrogen peroxide and insecticides.

Where can I get more information?

EPA has a searchable website for Frequently Asked Questions about water quality at <https://safewater.zendesk.com/hc/en-us>

References

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