



Water Disinfection

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Disinfection is a water treatment process that provides an additional barrier against waterborne diseases. The City of Corpus Christi uses chloramines (a combination of chlorine and ammonia) to disinfect its water supply.

Federal and State regulations require the existence of disinfectant not only in the water leaving the water treatment plant, but also in drinking water samples collected across the distribution system.

The City performs many actions to ensure adequate disinfectant levels are maintained in the distribution system, including monitoring, hydrant flushing to reduce water age, and periodic free chlorine conversions. These preventative actions, as well as the distribution system challenges we face, are common throughout the state of Texas and across the USA.

What is water disinfection? 3

How is Corpus Christi's water disinfected? 4

What are the advantages and disadvantages of chloramines? 5

Why must we maintain disinfectant in drinking water throughout the system? 6

What is the significance of low disinfection levels in water systems? 6

What can cause low disinfection levels in water systems? 6

What is nitrification? 7

What are the steps are the City taking to combat low disinfection levels in the system? 7

What is free chlorine conversion? 8

What is flushing? 9

What is Water Disinfection?

Disinfection is a critical part of the water treatment process and is necessary to protect consumers from the risk of illnesses caused by certain disease-causing bacteria.

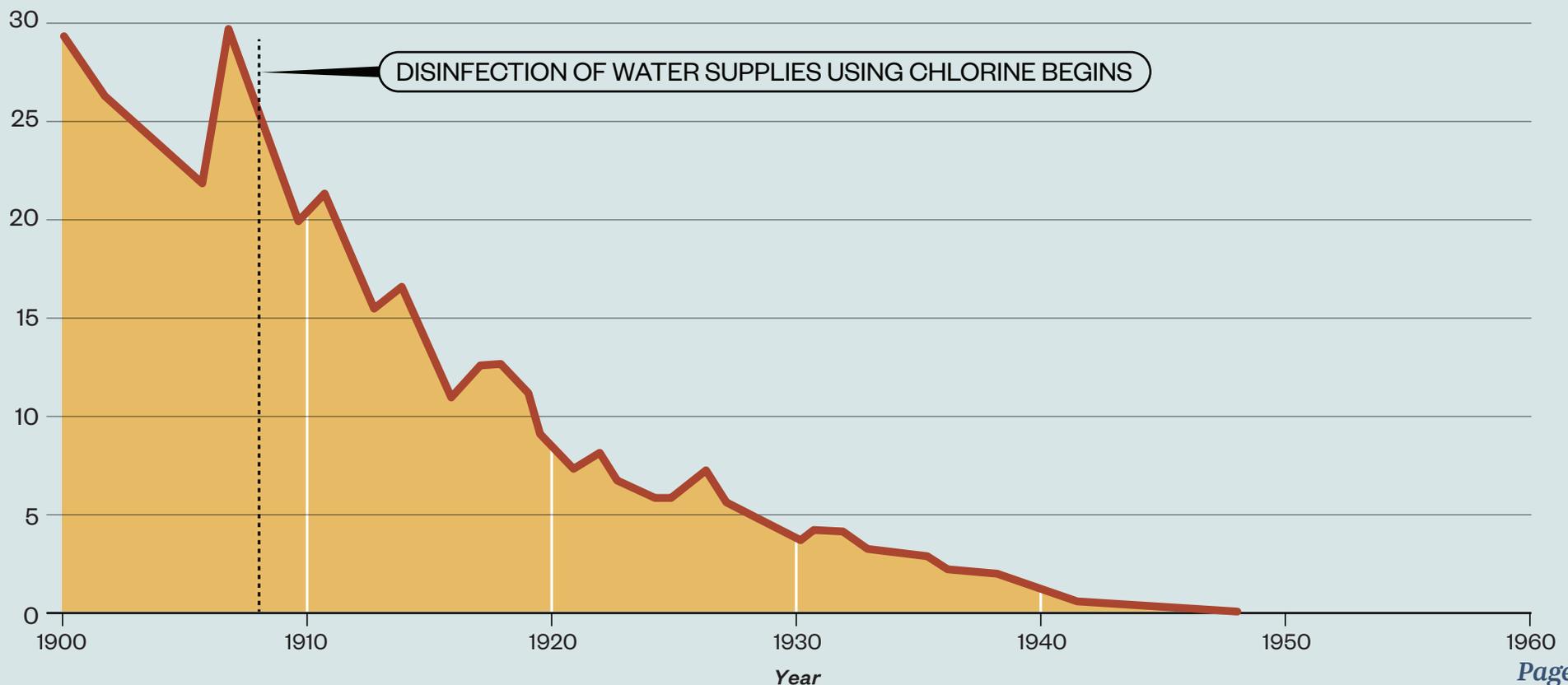
Disinfectants, when added to water, are able to inactivate or kill these bacteria. When such disease-causing bacteria are not inactivated or

killed in drinking water, consumption or usage can result in illness.

Disinfection of water supplies has been commonplace since the early 1900s and has significantly reduced the occurrences of water-borne disease.

Change in Typhoid Fever Fatalities Before and After Disinfection of Water Supplies Began in the USA

Death rate for Typhoid Fever (per 100,000 population)

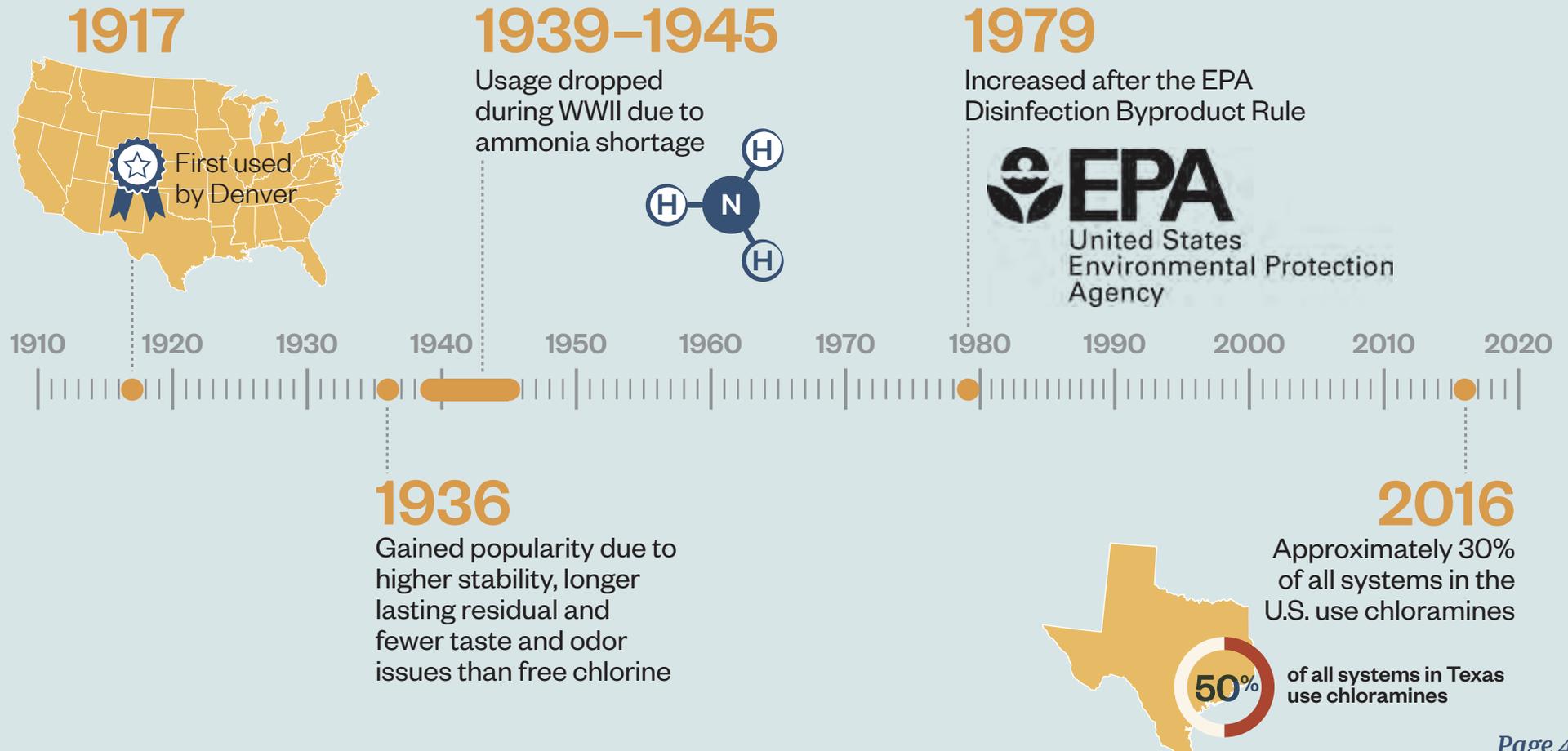


How is Corpus Christi's water disinfected?

During normal operating conditions, the City of Corpus Christi uses chloramines (a combination of chlorine and ammonia) to disinfect its water supply. With our raw water supply, chloramination has proven to be the most cost effective disinfection strategy.

Chloramines have been safely and successfully used by water utilities for more than 90 years. Today, more than one in three Americans use drinking water treated with chloramines. Approximately 50% of water utilities in Texas use chloramines to disinfect their water supply.

History of Chloramines



What are advantages and disadvantages of Chloramines?

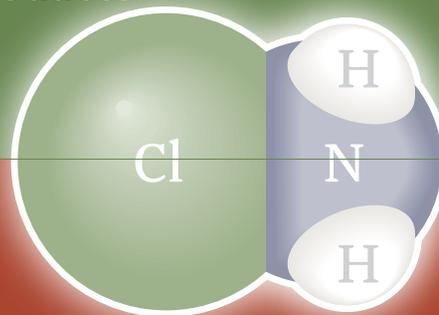
ADVANTAGES

✓ Longer lasting disinfection capability

✓ Reduced production of regulated disinfection byproducts

✓ Less odor than chlorine treatment

✓ Better control of Legionella in building plumbing systems



✗ Risk of nitrification – loss of disinfectant residual

✗ Dialysis facilities must remove chloramine prior to use in equipment

DISADVANTAGES

Why must we maintain disinfectant in drinking water throughout the system?

Ensuring that an optimum disinfectant level is maintained in the distribution system can help neutralize or kill disease-causing bacteria that may be present in the distribution system. This helps provide an additional barrier against the potential occurrence of waterborne diseases and ensures the delivery of safe drinking water to the consumer.

What is the significance of low disinfectant levels?

Low disinfectant levels in water distribution systems could indicate that the disinfection barrier may not be adequate to maintain control of waterborne diseases throughout the system.

The disinfectant present in the distribution system also controls biofilm growth. Biofilms are thin microbiological films that coat pipes in every water system. Biofilms typically are not a health concern, but they can cause taste, odor, or color changes in drinking water.

What can cause low disinfectant levels?

Low disinfectant levels in distribution systems can be caused by one or more of the following factors:

- Nitrification (see page 7)
- Distance water travels in the distribution system over time
- Old pipes in the system
- Hot weather/ higher temperatures
- Excessive rainfall/reduced water usage
- Breaks in water lines

What is nitrification?

Nitrification is a microbiological process that negatively affects drinking water quality by reducing disinfection levels in distribution systems. Nitrification is a challenge in all systems that use chloramines, but it can be successfully managed through the implementation of a Nitrification Action Plan.

What steps is the City taking to prevent low disinfection levels in the system?

- Monitoring water quality at 98 sites in the distribution system
- Reducing the amount of time it takes water to travel in the distribution system
- Tank cleaning
- Hydrant flushing
- Increasing disinfectant at water treatment plant
- Booster Chloramination: Adding additional chloramines at storage tanks in the distribution system
- Installing chlorine dioxide system to augment the primary disinfectant system (chloramines)
- Implementing the City's Nitrification Action Plan with the primary goal of reducing the potential for nitrification in the water distribution system and lowering the risk of low disinfectant levels in system.
- Improving chemical feed control at the water treatment plant to ensure a stable and longer lasting disinfectant is developed.

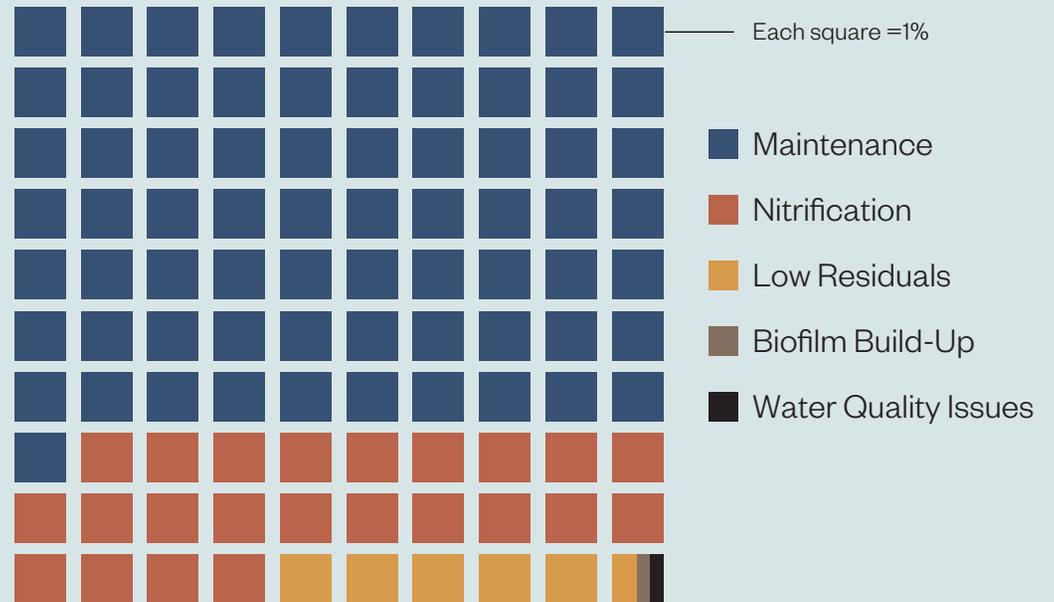
What is free chlorine conversion?

A free chlorine conversion is a temporary replacement of chloramine disinfection with chlorine to reduce nitrification in the distribution system.

While the process does not pose immediate health risks to consumers, the length of free chlorine conversions is minimized to protect the public against any long-term health risks.

In 2015 there were 629 and in 2016 there were 582 free chlorine conversions in the state of Texas.

Reasons for Free Chlorine Conversions in Texas (2016)



What is flushing?

Flushing is the action of opening hydrants to release water from pipes in a particular area. Flushing helps remove older water from the distribution system and can remove settled particles and biofilm by flushing water at high speeds. Flushing helps reduce color, particles, or taste issues in your water.





Is our water safe for consumption?

Yes. The City of Corpus Christi Staff takes a number of proactive steps and performs regular monitoring, testing, maintenance, and upgrades to the water system. The City also invests in Improvement Programs to plan and provide for the needs of Corpus Christi's growing population.

In spite of such proactive measures, occasional, often unavoidable, water quality challenges may occur because of system age, wet weather events, changing regulatory requirements, or contamination from third parties. The priority of the Corpus Christi Staff is to safeguard human health. While water

challenges have occurred in Corpus Christi, none have resulted in an outbreak of waterborne diseases. In the event of a potential risk, our city's staff takes immediate action to contain and resolve the risk, while notifying the public to take appropriate precautions.

Due to the continued efforts of our city staff, the City of Corpus Christi's drinking water is in compliance with Federal and State regulatory requirements for safe drinking water according to Environmental Protection Agency (EPA) and the Texas Commission on Environmental Quality (TCEQ) standards.