# 2017 ANNUAL DRINKING WATER QUALITY REPORT

## A SUPERIOR RATED WATER SYSTEM

PWS ID: TX1780003

Este reporte incluye informacion importante sobre el agua para tomar.
Para asistencia en español, favor de llamar al telefono 361-826-1800.

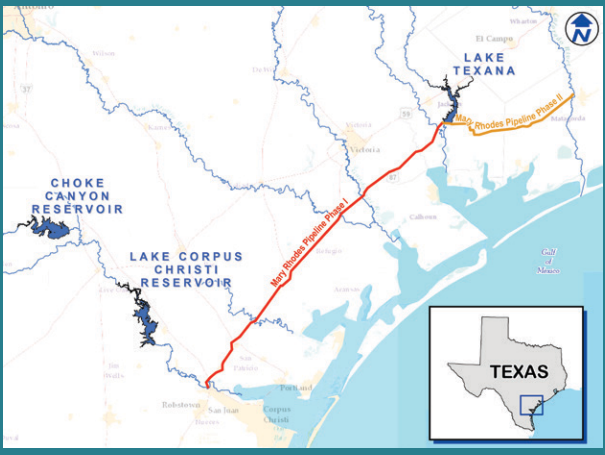
# DEAR WATER CUSTOMERS,

The Corpus Christi Utilities Department is pleased to present its 2017 Annual Water Quality Report in accordance with the United States Environmental Protection Agency (EPA) National Primary Drinking Water Regulations, 40 CFR Part 141 Subpart O, which requires all drinking water suppliers to provide the public with an annual statement describing the water supply and the quality of its water.

Highly trained professionals take steps to perform extensive water quality monitoring and testing so our water supply meets or exceeds all federal and state drinking water requirements. We are mindful of our responsibility to provide you with a safe product at all times.

Corpus Christi's surface water is supplied through a network of three reservoirs, including Choke Canyon and Lake Corpus Christi which are located in the Nueces River Basin. The Nueces River transports water from the two reservoirs where it is pumped to the O. N. Stevens Water Treatment Plant.

The Mary Rhodes Pipeline Phase II pulls water from the Lower Colorado River into Lake Texana. The water from Lake Texana is then transported through the Mary Rhodes Pipeline Phase 1 to be blended at the treatment plant.




# WANT TO KNOW MORE ABOUT YOUR WATER?

For more information on the quality of your drinking water, visit our website at **www.cctexas.com/departments/water-department**. Here you can find information on water quality data, water rates and the status of water quality projects.

Or call our Water Quality Hotline at **361-826-1234** to speak with someone.

## KNOW MORE ABOUT THE SOURCE OF YOUR DRINKING WATER

The City's water is obtained from a combination of water sources. The Atascosa River and the Nueces River supply water to Lake Corpus Christi, while the Frio River supplies water to the Choke Canyon Reservoir. Water from the Lower Colorado River is transported through the Mary Rhodes Phase II Pipeline to Lake Texana, which is then transported through the 101 mile-long Mary Rhodes Phase I Pipeline to the O. N. Stevens Water Treatment Plant.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and aquifers. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and picks up substances resulting from the presence of animals or from human/industrial activity. Contaminants that may be present in a water source before treatment include: microbes, inorganic contaminants, pesticides, radioactive contaminants and organic chemical contaminants.

A Source Water Susceptibility Assessment of our drinking water sources is available on the Texas Drinking Water Watch website. To view, please visit **http://dww2.tceq.texas.gov/DWW/**. The report describes the susceptibility and types of constituents that may come in contact with our water supply source based on human activities and natural conditions.

## WATER LOSS

In the water loss audit submitted to the Texas Water Development Board for the time period of January 1, 2017 to December 31, 2017, our system lost an estimated 1,968,883,749 gallons of water, which is 8.65%. If you have any questions about the water loss audit, please call **361-826-1234**.

## A REMINDER TO CONSERVE WATER

Most of us take for granted that we will always have enough water. Unfortunately, our area often experiences long periods of drought. We encourage residents to continue to conserve water as we strive to provide the highest water quality in Texas. Conservation is saving tomorrow's water today and it begins with each of us. Visit our web site for conservation tips and information at **http://www.cctexas.com/conservation**.

## GET A FREE GIFT JUST FOR ATTENDING!

The City of Corpus Christi Utilities Department will hold a meeting to discuss the contents of the 2017 Annual Water Quality Report. Attendees will receive a free gift. The meeting will be held on July 9, 2018 at 6 p.m., at the Water Utilities building located at 2726 Holly Road, Corpus Christi, Texas. Please join us as we share our challenges and our accomplishments. We want to provide our community with the best drinking water.

## IMPORTANT HEALTH INFORMATION

You may be more vulnerable than the general population to certain microbial contaminants, such as *Cryptosporidium*, in drinking water. Infants, some elderly, or immunocompromised persons such as those undergoing chemotherapy for cancer; those who have undergone organ transplants; those who are undergoing treatment with steroids; and people with HIV/AIDS or other immune system disorders can be particularly at risk from infections. You should seek advice about drinking water from your physician or health care provider. Additional guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* are available from the Safe Drinking Water Hotline at **800-426-4791**.

### *CRYPTOSPORIDIUM* MONITORING

The City monitors for *Cryptosporidium*, a microbial parasite that may be commonly found in surface water. *Cryptosporidium* may come from animal and human feces in the watershed. The result of our monitoring indicated that there may be *Cryptosporidium* in the raw water and/or treated finished water. Although treatment by filtration removes *Cryptosporidium*, it cannot guarantee 100 percent removal. The testing method used cannot determine if the organisms are alive and capable of causing cryptosporidiosis, an abdominal infection with nausea, diarrhea and abdominal cramps that may occur after ingestion of contaminated water.

### ALL DRINKING WATER MAY CONTAIN CONTAMINANTS

When drinking water meets federal standards, there may not be any health based benefits to purchasing bottled water or point of use devices. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline at **800-426-4791**.

## HOME PLUMBING PIPES MAY IMPACT YOUR EXPOSURE TO LEAD

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. This water supply is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to two minutes before using water for drinking or cooking.

We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not our drinking water meets health standards. During July 1–December 31, 2017, we did not complete all monitoring or testing at a laboratory accredited for total dissolved solids (TDS) and hardness, and therefore cannot be sure of the quality of your drinking water during that time. All monitoring was completed in the required timeframe, however, the laboratory used to analyze TDS and hardness samples was accredited for non-potable rather than potable water in these methods. The City of Corpus Christi's public water system continually uses the data collected to monitor for corrosivity to ensure the system is meeting all regulations. This problem has been corrected by using an alternative laboratory with proper accreditation.

If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline at **800-426-4791** or at **http://www.epa.gov/safewater/lead**.

## DEFINITIONS OF THE DRINKING WATER QUALITY REPORT TABLE

**Action Level (AL)** – The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

**Average (Avg)** – Regulatory compliance with some MCLs are based on running annual average of monthly samples.

**Level 1 Assessment** – A Level 1 assessment is a study of the water system to identify potential problems and determine (if possible) why total coliform bacteria were found.

**Level 2 Assessment** – A level 2 assessment is a very detailed study of the water system to identify potential problems and determine (if possible) why an *Escherichia coli* (*E. coli*) maximum contaminant level (MCL) violation had occurred and/or why total coliform bacteria were found on multiple occasions.

**Maximum Contaminant Level (MCL)** – The highest level of a contaminant allowed in drinking water. MCLs are set as close to the MCLG as feasible using the best available treatment technology.

**Maximum Contaminant Level Goal (MCLG)** – The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

**Maximum Residual Disinfectant Level (MRDL)** – The highest level of disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants. The limit is the running annual average.

**Maximum Residual Disinfectant Level Goal (MRDLG)** – The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

**Minimum Reporting Level (MRL)** – The smallest measured concentration of a substance that can be reliably measured by using a given analytical method.

**Most Probable Number (MPN)**

**Nephelometric Turbidity Units (NTU)** – A measure of turbidity in water.

**Not Applicable (NA)**

**Parts per Billion (ppb)** – One part per billion is equal to one packet of artificial sweetener sprinkled into 250,000 gallons of iced tea.

**Parts per Million (ppm)** – One part per million is equal to one packet of artificial sweetener sprinkled into 250 gallons of iced tea.

**Picocuries per Liter (pCi/L)** – A measure of radioactivity.

**Treatment Technique (TT)** – A required process intended to reduce the level of a contaminant in drinking water.

**Turbidity** – A measure of clarity of drinking water.

# 2017 DRINKING WATER QUALITY REPORT

Our drinking water is regulated by the Texas Commission on Environmental Quality (TCEQ). The information that follows lists all of the federally regulated or monitored contaminants which have been found in our drinking water. The U.S. EPA requires water systems to test for up to 97 contaminants.

## INORGANIC CONTAMINANTS

| Year | Constituent (Unit of Measure) | Highest Average | Highest Single Measurement | Range | MCL | MCLG | Likely Source of Contaminant |
|---|---|---|---|---|---|---|---|
| 2017 | Arsenic (ppb) | 2.2 | 2.2 | 0.0 – 2.2 | 10 | NA | Erosion of natural deposits; runoff from orchards; runoff from glass and electronics production wastes |
| 2017 | Barium (ppm) | 0.10 | 0.10 | 0.09 – 0.10 | 2 | 2 | Discharge of drilling waste; discharge from metal refineries; erosion of natural deposits |
| 2017 | Chlorite (ppm) | 0.71 | 0.74 | 0.0037 – 0.74 | 1 | 0.80 | Byproduct of drinking water disinfection |
| 2017 | Cyanide (total) (ppb) | 140 | 140 | 0 – 140 | 200 | 200 | Discharge from plastic and fertilizer factories; discharge from steel/metal factories |
| 2017 | Fluoride (ppm) | 0.57 | 0.57 | 0.54 – 0.57 | 4 | 4 | Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories |
| 2017 | Nitrate (ppm) | 0.44 | 0.59 | 0.23 – 0.59 | 10 | 10 | Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits |
| 2017 | Selenium (ppb) | 3.9 | 3.9 | 3.4 – 3.9 | 50 | 50 | Discharge from petroleum and metal refineries, erosion of natural deposits, discharge from mines |
| 2017 | Total Chromium (ppb) | <10 | <10 | NA | 100 | 100 | Discharge from steel and pulp mills; erosion of natural deposits |

## ORGANIC CONTAMINANTS

| Year | Constituent (Unit of Measure) | Highest Average | Highest Single Measurement | Range | MCL | MCLG | Likely Source of Contaminant |
|---|---|---|---|---|---|---|---|
| 2017 | Atrazine (ppb) | 0.15 | 0.33 | 0 – 0.33 | 3.0 | 3.0 | Runoff from herbicide used on row crops |

## SYNTHETIC ORGANIC CONTAMINANTS

| Year | Constituent (Unit of Measure) | Highest Average | Range | MCL | MCLG | Likely Source of Contaminant |
|---|---|---|---|---|---|---|
| 2017 | Di(2-Ethylhexyl) Phthalate (ppb) | 2.0 | 0 – 2.0 | 6.0 | 0 | Discharge from rubber chemical factories |
| 2017 | Metolachlor (ppb) | 0.42 | 0.14 – 0.56 | NA | NA | Runoff from herbicide use |

## DISINFECTION BYPRODUCTS

| Year | Constituent (Unit of Measure) | Highest Yearly Average | Range | MCL | MCLG | Likely Source of Contaminant |
|---|---|---|---|---|---|---|
| 2017 | Total Trihalomethanes (ppb) | 50.3 | 23.0 – 68.9 | 80 | NA | Byproduct of drinking water disinfection |
| 2017 | Total Haloacetic Acids (ppb) | 25.6 | 15.1 – 34.5 | 60 | NA | Byproduct of drinking water disinfection |

The locational running annual average is a health concern at levels above the the MCL. Some people who drink water containing TTHMs in excess of the MCL over many years may experience problems with their liver, kidney, or central nervous systems, and may have an increased risk of getting cancer.

## TOTAL ORGANIC CARBON

| Year | Constituent (Unit of Measure) | Average | Range | TT | MCLG | Likely Source of Contaminant |
|---|---|---|---|---|---|---|
| 2017 | Source Water (ppm) | 6.9 | 6.25 – 7.70 | NA | NA | Naturally present in the environment |
| 2017 | Plant 1 (ppm) | 4.8 | 4.44 – 5.40 | NA | NA | Naturally present in the environment |
| 2017 | Plant 2 (ppm) | 4.5 | 4.22 – 4.98 | NA | NA | Naturally present in the environment |
| 2017 | Plant 1 Removal Ratio (% removal*) | 1.2 | 0.72 – 1.43 | ≥1.0 | NA | Naturally present in the environment |
| 2017 | Plant 2 Removal Ratio (% removal*) | 1.3 | 0.97 – 1.55 | ≥1.0 | NA | Naturally present in the environment |

Total Organic Carbon (TOC) has no health effects. The disinfectant can combine with TOC to form disinfection by-products. Disinfection is necessary to ensure that water does not have unacceptable levels of pathogens. Byproducts of disinfection include trihalomethanes (THM) and haloacetic acids (HAA5) which are reported elsewhere in this report. *Removal ratio is the percent of TOC removed by the treatment process divided by the percent of TOC required by TCEQ to be removed.

## MAXIMUM RESIDUAL DISINFECTANT LEVEL

| Year | Constituent (Unit of Measure) | Highest Average | Highest Single Measurement | Range | MRDL | MRDLG | Likely Source of Contaminant |
|---|---|---|---|---|---|---|---|
| 2017 | Chloramines (ppm) | 2.9 | NA | 2.17 – 3.35 | 4.0 | 4.0 | Disinfectant used to control microbes |
| 2017 | Chlorine (ppm) | 2.2 | NA | 2.18 – 2.22 | 4.0 | 4.0 | Alternate disinfectant used to control microbes |
| 2017 | Chlorine Dioxide (ppb) | 290 | 560 | 20 – 560 | 800 | 800 | Water additive used to control microbes |

## UNREGULATED CONTAMINANTS

| Year | Constituent (Unit of Measure) | Highest Average | Range | MCL | MCLG | Likely Source of Contaminant |
|---|---|---|---|---|---|---|
| 2017 | Bromodichloromethane (ppb) | 14.5 | 6.9 – 49 | NA | NA | Byproduct of drinking water disinfection |
| 2017 | Bromoform (ppb) | 6.3 | 1.7 – 15.2 | NA | NA | Byproduct of drinking water disinfection |
| 2017 | Chloroform (ppb) | 8.1 | 2.8 – 52 | NA | NA | Byproduct of drinking water disinfection |
| 2017 | Dibromochloromethane (ppb) | 13.1 | 6.1 – 39 | NA | NA | Byproduct of drinking water disinfection |

Unregulated contaminants are those for which EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist EPA in determining the occurrence of unregulated contaminants in drinking water and whether future regulation is warranted.

## TURBIDITY

| Year | Constituent (Unit of Measure) | Highest Single Measurement | Lowest % of Samples Meeting Limits | Entry Point Limit (TT) | Single Measurement Limit (TT) | Likely Source of Contaminant |
|---|---|---|---|---|---|---|
| 2017 | Plant 1 (NTU) | 0.36 | 99.5 | ≤0.3 | 1.0 | Soil runoff |
| 2017 | Plant 2 (NTU) | 0.94 | 99.5 | ≤0.3 | 1.0 | Soil runoff |

Turbidity has no health effects; however, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.

## *CRYPTOSPORIDIUM* MONITORING

| Year | Constituent (Unit of Measure) | Highest Monthly % of Positive Samples | Unit of Measurement | MCLG | Likely Source of Contaminant |
|---|---|---|---|---|---|
| 2017 | *Cryptosporidium* | 0 | Total (Oo)cycts/L | 0 | Naturally present in the environment |

*Cryptosporidium* is of great concern in public water systems that treat surface water for drinking water sources. Resistant to disinfectants, *Cryptosporidium* can cause gastrointestinal illness in individuals who consume contaminated water. The Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) is required by Congress in order to increase protection from microbial contaminants such as *Cryptosporidium*. Under this rule, water systems must conduct monthly *Cryptosporidium* sampling over a two year span. The City of Corpus Christi began sampling in April 2015.

## MICROBIOLOGICAL CONTAMINANTS

| Year | Constituent (Unit of Measure) | Highest Monthly % of Positive Samples | Unit of Measurement | MCL | Likely Source of Contaminant |
|---|---|---|---|---|---|
| 2017 | Total Coliform Bacteria | 1.0 | Presence | ** | Naturally present in the environment |

Total coliform bacteria occur naturally in the environment and are used as an indicator for other, potentially harmful, bacteria that could also be present. **Presence of coliform bacteria in 5% or more of the monthly samples.

| Year | Constituent (Unit of Measure) | Total Number of Positive Samples | Unit of Measurement | MCL | Likely Source of Contaminant |
|---|---|---|---|---|---|
| 2017 | Fecal Coliform and *E. coli* | 0 | Presence | *** | Human and animal fecal waste |

Fecal coliform bacteria, in particular *E. coli,* are members of the coliform bacteria group originating in the intestinal tract of warm-blooded animals and are passed into the environment through feces. The presence of fecal coliform bacteria (*E. coli*) in drinking water may indicate recent contamination of the drinking water with fecal material. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, and other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems. ***A routine sample and a repeat sample are total coliform positive, and one is also fecal coliform or *E. coli* positive.

## LEAD AND COPPER MONITORING RULE

| Year | Constituent (Unit of Measure) | 90th Percentile | Number of Sites Exceeding AL | Action Level | Likely Source of Contaminant |
|---|---|---|---|---|---|
| 2017 | Lead (ppb) | 2.9 | 0 | 15.0 | Corrosion of household plumbing systems, erosion of natural deposits |
| 2017 | Copper (ppm) | 0.067 | 0 | 1.3 | Corrosion of household plumbing systems, erosion of natural deposits |

## RADIOACTIVE CONTAMINANTS

| Year | Constituent (Unit of Measure) | Highest Average | Range | MCL | MCLG | Likely Source of Contaminant |
|---|---|---|---|---|---|---|
| 2017 | Combined Uranium (ppb) | <1.0 | NA | 30.0 | 0 | Erosion of natural deposits |
| 2017 | Gross Alpha, excluding Radon and Uranium (pCi/L) | <3.0 | NA | 15.0 | 0 | Erosion of natural deposits |
| 2017 | Gross Alpha, including Radon and Uranium (pCi/L) | <3.0 | NA | 15.0 | 0 | Erosion of natural deposits |
| 2017 | Gross Beta Particle Activity (pCi/L) | 8.1 | 6.6 – 8.1 | 50.0 | 0 | Naturally occurring, byproduct of oil/gas production and mining |
| 2017 | Radium-228 (pCi/L) | <1.0 | NA | 5.0 | 0 | Erosion of natural deposits |

## UNREGULATED CONTAMINANT MONITORING RULE 3 (UCMR3)

| Year | Screening Survey List (Unit of Measure) | Average | Range | MRL |
|---|---|---|---|---|
| 2014 | Chlorate (ppb) | 124 | 20 – 210 | 20 |
| 2014 | Chromium-Hexavalent (ppb) | 0.05 | 0.03 – 0.08 | 0.03 |
| 2014 | Molybdenum (ppb) | 1.2 | 1.2 – 1.3 | 1 |
| 2014 | Strontium (ppb) | 339 | 280 – 390 | 0.3 |
| 2014 | Vanadium (ppb) | 6.3 | 5.5 – 7.0 | 0.2 |

## SECONDARY AND OTHER CONSTITUENTS – NOT ASSOCIATED WITH ADVERSE HEALTH EFFECTS

Many constituents, such as calcium, sodium, or irons, which are often found in drinking water, can cause taste, color and odor problems. The taste and odor constituents are called secondary constituents and are regulated by the State of Texas, not the USEPA. These constituents are not causes for health concern. Therefore, secondaries are not required to be reported in this document, but they may greatly affect the appearance and taste of your water.

| Year | Constituent (Unit of Measure) | Highest Average | Range | MCL | Likely Source of Contaminant |
|---|---|---|---|---|---|
| 2017 | Aluminum (ppm) | 0.17 | 0.14 – 0.17 | 0.2 | Abundant naturally occurring element |
| 2017 | Bicarbonate (ppm) | 155 | 146 – 155 | NA | Corrosion of carbonate rocks such as limestone |
| 2017 | Calcium (ppm) | 53.2 | 49 – 53.2 | NA | Abundant naturally occurring element |
| 2017 | Chloride (ppm) | 94 | 91 – 94 | 300 | Abundant naturally occurring element, used in water purification |
| 2017 | Hardness as $CaCO_3$ (ppm) | 162 | 150 – 162 | NA | Naturally occurring calcium and magnesium |
| 2017 | Magnesium (ppm) | 7.11 | 6.73 – 7.11 | NA | Abundant naturally occurring element |
| 2017 | Manganese (ppm) | 0.0025 | NA | 0.05 | Abundant naturally occurring element |
| 2017 | Nickel (ppm) | 0.0019 | 0.0015 – 0.0019 | NA | Erosion of natural deposits |
| 2017 | Potassium (ppm) | 8.45 | 8.40 – 8.45 | NA | Abundant naturally occurring element |
| 2017 | Sodium (ppm) | 66 | 62.5 – 66 | NA | Erosion of natural deposits, oil field byproduct |
| 2017 | Sulfate (ppm) | 62 | 52 – 62 | 300 | Naturally occurring, oil field by-product |
| 2017 | Total Alkalinity (ppm) | 133 | 120 – 152 | NA | Naturally occurring soluble mineral salts |
| 2017 | Total Dissolved Solids (ppm) | 393 | 379 – 393 | 1,000 | Total dissolved mineral constituents in water |

# CITY OF CORPUS CHRISTI
# WATER QUALITY PROJECTS
## Improving the Quality of Our Drinking Water

The City of Corpus Christi Utilities Department has made great strides in improving drinking water quality. Many Capital Improvement Projects (CIP) have been completed or are in progress to optimize overall water treatment and distribution:

### SOURCE WATER
- **Solids Management** – Minimize impact on water quality, improve operational flexibility
- **Nueces River Pump Station Improvements** – Increase reliability of water delivery, reduce operational cost

### TREATMENT
- **Chlorine Dioxide System** – Improve control of nitrification, reduce chlorine demand, reduce disinfection by-product (DBP) formation
- **Chlorine System Improvements** – Increase reliability, improve safety of operations, optimize system improvements
- **Chemical Feed Improvements** – Update equipment, improve chemical mixing, optimize system performance
- **Pilot Plant** – Evaluate changing water quality, test alternative treatment strategies, optimize system performance

### DISTRIBUTION SYSTEM
- **Updated Nitrification Action Plan (NAP)** – Revise action levels, refine monitoring plan
- **Tank Mixing and Operation** – Increase tank turnover, reduce water age, improve chlorine residual stability

Did you know a City customer service representative is available to help you? The City of Corpus Christi call center can be reached at **361-826-CITY (2489)**, Monday through Friday, from 7 a.m. to 7 p.m.

Please share this information with all other people who drink this water, especially those who may not have received this notice directly (i.e., people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.


CORPUS CHRISTI UTILITIES DEPARTMENT
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**www.cctexas.com/departments/water-department**