



2016 Annual Drinking Water Quality Report



A Superior Rated Water System



PWS ID: TX1780003

Dear Water Customers,

The Corpus Christi Utilities Department is pleased to present its 2016 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 that 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 I to be blended at the treatment plant.



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, 2016 to December 31, 2016, our system lost an estimated 2,070,194,004 gallons of water, which is 9.6%. If you have any questions about the water loss audit, please call 361-826-1234.

A Look Inside the Utilities Department

When you turn your faucet on, it is simple to see what your utility bill buys. What is not so simple to see is what it takes for that water to get there. There are 1,600 miles of pipeline hidden below the ground in the water distribution system. There are facilities that draw our water from its sources. There is the O. N. Stevens Water Treatment Plant where the raw water is treated and tested. There are scientists, engineers, and maintenance crews working around the clock to make sure the water is there when you need it, and that the water is high quality. Your water payments are helping to build a better tomorrow by supporting needed improvements that keep the water flowing for all of us today and in the future. This is all for mere pennies a gallon.

Did you know that a City customer service representative is available to help you at any time? The City of Corpus Christi call center can be reached at 361-826-CITY (2489).

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 conservation begins with each of us. Visit our website for conservation tips and information at <http://www.cctexas.com/government/water/conservation/index>.

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.

Este informe incluye información importante sobre el agua potable. Si tiene preguntas o comentarios sobre éste informe en español, favor de llamar al 361-826-1800 para hablar con una persona bilingüe en español o visite www.cctexas.com/government/water.

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. 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.

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.

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.

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.

2016 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 required water systems to test for up to 97 contaminants.

INORGANIC CONTAMINANTS

Year	Constituent (Unit of Measure)	Average	Range	MCL	MCLG	Likely Source of Contaminant
2016	Barium (ppm)	0.11	NA	2	2	Discharge of drilling waste, erosion of natural deposits
2016	Fluoride (ppm)	0.60	NA	4	4	Erosion of natural deposits, water additive
2016	Nitrate (ppm)	0.34	NA	10	10	Runoff from fertilizer use, erosion of natural deposits
2016	Cyanide (total) (ppb)	175	110 – 270	NA	NA	Discharge from plastic and fertilizer factories

DISINFECTION BY-PRODUCTS

Year	Constituent (Unit of Measure)	Highest Yearly Average	Range	MCL	MCLG	Likely Source of Contaminant
2016	Total Trihalomethanes (ppb)	64.4	29.1 – 63.3	80	NA	By-product of drinking water disinfection
2016	Total Haloacetic Acids (ppb)	34	15.2 – 29.6	60	NA	By-product of drinking water disinfection

The locational running annual average is a health concern at levels above the MCL. Some people who drink water containing THMs 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	Removal Ratio (TT)	MCLG	Likely Source of Contaminant
2016	Source Water (ppm)	6.91	6.50 – 7.43	NA	NA	Naturally present in the environment
2016	Plant 1 (ppm)	4.75	4.49 – 4.99	NA	NA	Naturally present in the environment
2016	Plant 2 (ppm)	4.90	4.58 – 5.25	NA	NA	Naturally present in the environment
2016	Plant 1 Removal Ratio (% removal*)	1.18	0.81 – 1.44	≥1.0	NA	Naturally present in the environment
2016	Plant 2 Removal Ratio (% removal*)	1.12	0.91 – 1.27	≥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. By-products of disinfection include trihalomethanes (THM) and haloacetic acids (HAAS) 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.

ORGANIC CONTAMINANTS

Year	Constituent (Unit of Measure)	Average	MCL	MCLG	Likely Source of Contaminant
2016	Atrazine (ppb)	<0.1	3.0	3.0	Runoff from herbicide use on row crops

MAXIMUM RESIDUAL DISINFECTION LEVEL

Year	Constituent (Unit of Measure)	Average	Range	MCL	MCLG	Likely Source of Contaminant
2016	Chloramines (ppm)	2.37	1.35 – 2.91	4.0	4.0	Disinfectant used to control microbes
2016	Chlorine (ppm)	1.51	1.07 – 1.88	4.0	4.0	Alternate disinfectant used to control microbes

UNREGULATED CONTAMINANTS

Year	Constituent (Unit of Measure)	Average	Range	MCL	MCLG	Likely Source of Contaminant
2016	Bromodichloromethane (ppb)	16.1	8.1 – 21.8	NA	NA	By-product of drinking water disinfection
2016	Dibromochloromethane (ppb)	13.4	2.4 – 20.5	NA	NA	By-product of drinking water disinfection
2016	Chloroform (ppb)	9.4	6.4 – 13.2	NA	NA	By-product of drinking water disinfection
2016	Bromoform (ppb)	6.9	1.4 – 16.4	NA	NA	By-product 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
2016	Plant 1 (NTU)	0.27	100	≤ 0.3	1.0	Soil runoff
2016	Plant 2 (NTU)	0.34	100	≤ 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	Highest Monthly % of Positive Samples	Unit Of Measurement	MCLG	Likely Source of Contaminant
2016	<i>Cryptosporidium</i>	0	Total (0o) cysts/L	0	Naturally present in 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	Highest Monthly % of Positive Samples	Unit Of Measurement	MCL	Likely Source of Contaminant
2016	Total Coliform Bacteria	1.0	Presence	**	Naturally present in environment

**Presence of coliform bacteria in 5% or more of the monthly samples.

Total Coliform bacteria occur naturally in the environment and are used as an indicator for other, potentially harmful, bacteria that could also be present.

Year	Constituent	Total Number of Positive Samples	Unit Of Measurement	MCL	Likely Source of Contaminant
2016	Fecal Coliform and <i>E. coli</i>	0	Presence	***	Human and animal fecal waste

*** A routine sample and a repeat sample are total coliform positive, and one is also fecal coliform or *E. coli* positive.

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.

LEAD AND COPPER MONITORING RULE

Year	Constituent (Unit of Measure)	90th Percentile	Number of Sites Exceeding Action Level	Action Level	Likely Source of Contaminant
2016	Lead (ppb)	1.7	0	15.0	Corrosion of household plumbing systems, erosion of natural deposits
2016	Copper (ppm)	0.058	0	1.3	Corrosion of household plumbing systems, erosion of natural deposits

UNREGULATED CONTAMINANT MONITORING RULE 3 (UCMR3)

Year	Constituent (Unit of Measure)	Average	Range	MRL (Minimum Reporting Level)	
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	
2014	Chromium-Hexavalent (ppb)	0.05	0.03 – 0.08	0.03	
2014	Chlorate (ppb)	124	20 – 210	20	

SECONDARY AND OTHER CONSTITUENTS – Not Associated with Adverse Health Effects

Many constituents, such as calcium, sodium, or iron, 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)	Average	Range	MCL	Likely Source of Contaminant
2016	Aluminum (ppm)	0.029	NA	0.2	Abundant naturally occurring element
2016	Bicarbonate (ppm)	133	NA	NA	Corrosion of carbonate rocks such as limestone
2016	Calcium (ppm)	59.7	NA	NA	Abundant naturally occurring element
2016	Chloride (ppm)	131	NA	300	Abundant naturally occurring element, used in water purification
2016	Hardness as CaCO ₃ (ppm)	184	NA	NA	Naturally occurring calcium and magnesium
2016	Magnesium (ppm)	8.51	NA	NA	Abundant naturally occurring element
2016	Manganese (ppm)	0.0193	NA	0.05	Abundant naturally occurring element
2016	Nickel (ppm)	0.0015	NA	NA	Erosion of natural deposits
2016	Potassium (ppm)	8.28	NA	NA	Abundant naturally occurring element
2016	Sodium (ppm)	74.5	NA	NA	Erosion of natural deposits, oil field by-product
2016	Sulfate (ppm)	65	NA	300	Naturally occurring, oil field by-product
2016	Total Alkalinity (ppm)	141	109 – 173	NA	Naturally occurring soluble mineral salts
2016	Total Dissolved Solids (ppm)	443	NA	1,000	Total dissolved mineral constituents in water

City of Corpus Christi Dead End Main Flushing Program

Balancing Water Conservation and Water Quality

Have you ever seen City employees near an open fire hydrant and wondered what they were doing? What you are seeing is our Dead-end Main (DEM) flushing program, required by the Texas Commission on Environmental Quality (TCEQ). A DEM is a water line that extends from the main distribution system without reconnecting back, resulting in water with no flow. This water can sit and age, potentially leading to increased bacterial activity with the decrease of water quality. In order to prevent this from occurring, City employees will manually flush hydrants or install mechanical flushers on these hydrants to bring fresh water into the area.

There are approximately 1,900 DEMs in our system and the City is required to flush each one monthly. We recognize the importance of water conservation and have looked into ways to reuse this water. The City of Corpus Christi's Water Quality Assurance Water Reuse Program was started in 2013 and now waters almost 300 lawns with the water flushed from our DEM flushing program.

In addition to water conservation, we are always seeking ways to reduce the number of DEMs in our water system. Every month, Utilities Department employees meet to discuss strategies and plans to eliminate DEMs from the system.

Want to Know More About Your Water?

For more information on the quality of your drinking water, visit our website at <http://www.cctexas.com/government/water/index> and click on "General Info" on the lower left hand side of the page. Check out our "Guide to Common Water Quality Concerns" informational link in the menu on the left side of the webpage.

Or call our water quality hotline at **361-826-1234** to speak with someone.

Get a FREE Gift Just for Attending

The City of Corpus Christi Utilities Department (CCUD) will hold a meeting to discuss the contents of the 2016 Annual Drinking Water Quality Report. Attendees will receive a free gift. The meeting will be held on July 17, 2017 at 6:00 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.

Corpus Christi Utilities Department

2726 Holly Road, Corpus Christi, TX 78415

<http://www.cctexas.com/government/water/index>