

# Annual Drinking Water Quality Report

## TX1540001 City Of Brady Water System

This Annual Water Quality Report is for the period of January 1 to December 31, 2017. This report is intended to provide you with important information about your drinking water and the efforts made by the water system to provide safe drinking water.

If you would like the opportunity to participate in decisions that may affect the quality of our water, you may attend a regularly scheduled City Council meeting on the first and third Tuesday of each month. Check the City's website or call City Hall (325-597-2152) for the meeting place.

For more information regarding this report contact:

Name: Gary Jacobson, Superintendent of Water

Phone: 325-597-2244, extension 204

Este reporte incluye información importante sobre el agua para tomar. Para asistencia en español, favor de llamar al telefono (325) 597-2152.

## Sources of Drinking Water

### General background information

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. 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 can pickup substances resulting from the presence of animals or from human activity.

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 water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline at (800) 426-4791.

Contaminants that may be present in source water include:

- Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.
- Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.
- Radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. FDA regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

Contaminants may be found in drinking water that may cause taste, color, or odor problems. These types of problems are not necessarily causes for health concerns. For more information on taste, odor, or color of drinking water, please contact the system's business office.

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; persons 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 providers. Additional guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* are available from the Safe Drinking Water Hotline (800-426-4791).

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. We are responsible for providing high quality drinking water, but we 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 2 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 or at <http://www.epa.gov/safewater/lead>.

## Specific information about the City of Brady water sources

The City of Brady Water System obtains its water solely from groundwater wells into the Hickory Aquifer, which is located in deep formations below Brady and the surrounding lands. We are not at this time obtaining any water from surface sources, such as lakes, creeks, or rivers. The City expects to significantly upgrade its water system within the next two or three years, as a part of the TCEQ and EPA required radium reduction project. The City surface water plant was removed from service in 2013 and will remain inactive for the time required to restore equipment and procedures and to obtain regulatory approval as a part of the planned upgrade of the City's entire water system. The City does not expect the surface water plant to be available until 2019 at the earliest. After the upgrade is complete, the City expects to use whichever source (Hickory Aquifer groundwater or Brady Lake surface water) can produce high-quality drinking water at the lowest cost.

The TCEQ completed an assessment of your source water and results indicate that some of your sources are susceptible to certain contaminants. The sampling requirements for your water system are based on this susceptibility and previous sample data. Any detections of these contaminants may be found in this Consumer Confidence Report. For more information on source water assessments and protection efforts at our system, contact Gary Jacobson, Superintendent of Water, at 325-597-2244, extension 204.

## Information about Maximum Contaminant Level (MCL) violations

### ***Combined Radium -226 & Radium -228***

The TCEQ has notified the City that the drinking water being supplied to customers has exceeded the Maximum Contaminant Level (MCL) for combined radium (-226 & -228). The U.S. Environmental Protection Agency (U.S. EPA) has established the MCL for combined radium (-226 & -228) at 5 pico curies per liter (pCi/L), based on a running annual average (RRA), and has determined that it is a health concern at levels above the MCL. The specific results of sampling for combined radium 226 and/or -228 are disclosed below in the Regulated Contaminants table.

***This is not an emergency.*** However, some people who drink water-containing radium -226 and/or -228 in excess of the MCL over many years may have an increased risk of getting cancer. *You do not need to use an alternative water supply.* However, if you have health concerns, you may want to talk to your doctor to get more information about how this may affect you.

***We are working to correct the problem: The City expects to apply for and receive funding from the Texas Water Development Board in 2018 and to begin construction in 2019.*** The City of Brady has engaged professional engineering services in which probable technical solutions have been derived to reduce combined radium 226 and/or -228 in the drinking water. The engineering plans and specifications for water treatment, transmission, storage, and distribution are complete or almost so. Necessary easements have been acquired.

***The City expects to return to compliance on or about the year 2020.***

## **Gross Alpha Excluding Radon And Uranium**

The TCEQ has notified the City water system that the drinking water being supplied to customers had exceeded the Maximum Contaminant Level (MCL) for gross alpha excluding radon and uranium. The U.S. Environmental Protection Agency (U.S. EPA) has established the MCL for gross alpha excluding radon and uranium at 15 pico curies per liter (pCi/L) based on a running annual average (RAA), and has determined that it is a health concern at levels above the MCL. The specific results of sampling for gross alpha excluding radon and uranium are disclosed below in the Regulated Contaminants table.

***This is not an emergency.*** Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have increased risk of getting cancer. *You do not need an alternate water supply.* However, if you have health concerns, you may want to talk to your doctor to get more information about how this may affect you.

***We are working to correct the problem: The City expects to apply for funding from the Texas Water Development Board in 2018 and to begin construction in 2019.*** The City of Brady has engaged professional engineering services in which probable technical solutions have been derived to reduce gross alpha excluding radon and uranium in the drinking water. The engineering plans and specifications for water treatment, transmission, storage, and distribution are complete or almost so. Necessary easements have been acquired.

***The City expects to return to compliance on or about the year 2020.***

## **About Radiochemicals and Drinking Water**

### **How do these chemicals affect health?**

Even at the highest levels found naturally in groundwater in Texas, radiochemicals do not pose an immediate risk to the health of anyone who drinks the water. People who drink this water every day for a lifetime might have an increased risk of kidney damage or cancer.

### **How can we understand the level of risk?**

The US Environmental Protection Agency (EPA) studied the health risks and the costs associated with reducing them — that is, at what point do the costs of further reducing the risk outweigh the expected benefits? In this analysis, the EPA used an estimate generally considered to be conservative — the point at which the risk was no more than an additional 2 cases among 10,000 individuals.

In the EPA's analysis, that level of risk is reached by people who drink 2 liters — about a half a gallon — of water every day for 70 years at any one of these levels of radiochemicals in drinking water:

- For radium, 5 picocuries per liter (combining both isotopes, radium-226 and radium-228).
- For the gross alpha standard, 15 picocuries per liter.

These levels are called the maximum contaminant levels, or MCLs, for the respective contaminant. Each PWS is required to ensure that the water it distributes does not regularly exceed these MCLs.

## **About Iron and Drinking Water**

From time to time, City customers experience issues with discolored water. The discoloration is almost always a result of naturally occurring iron in the water. The City regularly tests the level of iron in the water. The level of iron is safe and in compliance with EPA and TCEQ guidelines.

Nonetheless, the iron may cause discoloration of showers, toilets, and swimming pools, and may cause your laundry to come out less bright. The City expects that the upgrade to the water system related to the radium reduction project will significantly solve the problem. If in the meantime you would like to address the issue, several retail products are available, such as additives and filters.

## Information about Source Water Assessments

A Source Water Susceptibility Assessment for your drinking water source(s) is currently being updated by the Texas Commission on Environmental Quality. This information describes the susceptibility and types of constituents that may come into contact with your drinking water source based on human activities and natural conditions. The information contained in the assessment allows us to focus source water protection strategies.

For more information about your sources of water, please refer to the Source Water Assessment Viewer available at the following URL: <http://www.tceq.texas.gov/gis/swaview>

Further details about sources and source-water assessments are available in Drinking Water Watch at the following URL: <http://dww2.tceq.texas.gov/DWW/>

Source Water Name	Type of Water	Report Status	Location
<a href="#">Well 2 - MAINT YARD</a>	Ground Water	Active	<a href="#">900 W 1st St</a>
<a href="#">Well 3 - OAK ST</a>	Ground Water	Active	<a href="#">200 S Oak St</a>
<a href="#">Well 4 - WHITE ST</a>	Ground Water	Active	<a href="#">907 W White St</a>
<a href="#">Well 5 - W CHINA ST</a>	Ground Water	Active	<a href="#">411 W China St</a>
<a href="#">Well 6 - GST (COLORADO ST / LAKE RD)</a>	Ground Water	Active	<a href="#">398 Fife Rd</a>
<a href="#">Well 7 - SOUTH AVE</a>	Ground Water	Active	<a href="#">300 South Ave</a>
<a href="#">Well 8 - GST (COLORADO ST / LAKE RD)</a>	Ground Water	Active	<a href="#">398 Fife Rd</a>

# Water Quality Test Results

## Definitions

The following tables contain certain abbreviations, scientific terms, and measures, some of which may require explanation.

Term	Definition
Avg	Regulatory compliance with some MCLs are based on running annual average of monthly samples.
Maximum Contaminant Level or MCL	The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
Maximum Contaminant Level Goal or 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 or MRDL	The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
Maximum residual disinfectant level goal or 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.
MFL	million fibers per liter (a measure of asbestos)
na	not applicable.
NTU	nephelometric turbidity units (a measure of turbidity)
pCi/L	picocuries per liter (a measure of radioactivity)
ppb	micrograms per liter or parts per billion - or one ounce in 7,350,000 gallons of water.
ppm	milligrams per liter or parts per million - or one ounce in 7,350 gallons of water.
ppt	parts per trillion, or nanograms per liter (ng/L)
ppq	parts per quadrillion, or picograms per liter (pg/L)
Action Level Goal (ALG)	The level of a contaminant in drinking water below which there is no known or expected risk to health. ALGs allow for a margin of safety.
Action Level	The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
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 have been found in our water system.
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 E. coli MCL violation has occurred and/or why total coliform bacteria have been found in our water system on multiple occasions.
Treatment Technique or TT	A required process intended to reduce the level of a contaminant in drinking water.

## 2017 Regulated Contaminants Detected

### Lead and Copper

Lead and Copper	Date Sampled	MCLG	Action Level (AL)	90th Percentile	# Sites Over AL	Units	Violation	Likely Source of Contamination
Copper	11/19/2015	1.3	1.3	0.62	0	ppm	None	Erosion of natural deposits; Leaching from wood preservatives; Corrosion of household plumbing systems.
Lead	11/19/2015	0	15	2.88	0	ppb	None	Corrosion of household plumbing systems; Erosion of natural deposits.

### Regulated Contaminants

Disinfectants and Disinfection By-Products	Year	Highest Level Detected	Range of Levels Detected	MCLG	MCL	Units	Violation?	Likely Source of Contamination
Haloacetic Acids (HAA5)*	2017	3	0 - 3.2	No goal for the total	60	ppb	N	By-product of drinking water disinfection.
<i>*The value in the Highest Level or Average Detected column is the highest average of all HAA5 sample results collected at a location over a year.</i>								
Total Trihalomethanes (TTHM)*	2017	9	0 - 9.2	No goal for the total	80	ppb	N	By-product of drinking water disinfection.
<i>*The value in the Highest Level or Average Detected column is the highest average of all HAA5 sample results collected at a location over a year.</i>								
Inorganic Contaminants	Year	Highest Level Detected	Range of Levels Detected	MCLG	MCL	Units	Violation?	Likely Source of Contamination
Groundwater-only systems, including the City of Brady, are required to sample for the presence of certain inorganic contaminants every three years.								
Arsenic	01/25/2016	2.4	0 - 2.4	0	10	ppb	None	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes.
Barium	01/25/2016	0.0452	0.0273 - 0.0452	2	2	ppm	None	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits.
Fluoride	02/11/2015	0.9	0.69 - 0.9	4	4	ppm	None	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories.
Nitrate [measured as Nitrogen]	2017	0.03	0 - 0.03	10	10	ppm	N	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.
Selenium	01/25/2016	5	0 - 5	50	50	ppb	None	Discharge from petroleum and metal refineries; Erosion of natural deposits; Discharge from mines.

Radioactive Contaminants	Year	Highest Level Detected	Range of Levels Detected	MCLG	MCL	Units	Violation?	Likely Source of Contamination
Beta/photon emitters	2017	69.5	15.8 - 69.5	0	4	mrem/yr	N	Decay of natural and man-made deposits.
Combined Radium 226/228	2017	47	11.82 - 52	0	5	pCi/L	Y	Erosion of natural deposits.
Gross alpha excluding radon and uranium	2017	42	16.8 - 58.3	0	15	pCi/L	Y	Erosion of natural deposits.
Volatile Organic Contaminants	Year	Highest Level Detected	Range of Levels Detected	MCLG	MCL	Units	Violation?	Likely Source of Contamination
Ethylbenzene	2017	0.5	0 - 0.5	700	700	ppb	N	Discharge from petroleum refineries.
Xylenes	2017	0.0007	0 - 0.0007	10	10	ppm	N	Discharge from petroleum factories; Discharge from chemical factories.

### Total Organic Carbon

The percentage of Total Organic Carbon (TOC) removal was measured each month and the system met all TOC removal requirements set, unless a TOC violation is noted in the violations section.

### Disinfectant Residual

Disinfectant is necessary to control microbial contaminants and is required by law. The City of Brady uses chlorine gas (CL2) as the primary disinfectant of the water. The City purchases chlorine gas from DPC Industries in Abilene.

The presence of chlorine residual in drinking water indicates that a sufficient amount of chlorine was added initially to the water to inactivate the bacteria and some viruses and that the water is protected from recontamination during storage.

The Maximum Residual Disinfectant Level (MRDL) is the highest level of disinfectant allowed in drinking water. The Maximum Residual Disinfectant Level Goal (MRDLG) is the level of disinfectant below which there is no known or expected health risk. MRDLGs do not reflect the benefits of disinfectant to control microbial contaminants. Both the MRDL and MRDLG are based on monthly averages. Occasionally exceeding 4 ppm chlorine residual is not a violation.

The City currently has an informal practice of measuring chlorine residuals at more locations and more frequently than required by law. The levels of chlorine residual measured in the City water during 2017 may be summarized as follows:

Disinfectant Residual	Year	Average Level	Range of Levels Detected	MRDL	MRDLG	Units	Violation?	Source in Drinking Water
Chlorine gas (CL2)	2017	1.25	0.21 - 2.60	4	4	ppm	N	Water additive used to control microbes.

### Violations Table

<b>Combined Radium 226/228</b>
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Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer.			
Violation Type	Violation Begin	Violation End	Violation Explanation
MCL, AVERAGE	01/01/2017	03/31/2017	Water samples showed that the amount of this contaminant in our drinking water was above its standard (called a maximum contaminant level and abbreviated MCL) for the period indicated.
MCL, AVERAGE	04/01/2017	06/30/2017	Water samples showed that the amount of this contaminant in our drinking water was above its standard (called a maximum contaminant level and abbreviated MCL) for the period indicated.
MCL, AVERAGE	07/01/2017	09/30/2017	Water samples showed that the amount of this contaminant in our drinking water was above its standard (called a maximum contaminant level and abbreviated MCL) for the period indicated.
MCL, AVERAGE	10/01/2017	12/31/2017	Water samples showed that the amount of this contaminant in our drinking water was above its standard (called a maximum contaminant level and abbreviated MCL) for the period indicated.

<b>Gross alpha excluding radon and uranium</b>			
Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.			
Violation Type	Violation Begin	Violation End	Violation Explanation
MCL, AVERAGE	01/01/2017	03/31/2017	Water samples showed that the amount of this contaminant in our drinking water was above its standard (called a maximum contaminant level and abbreviated MCL) for the period indicated.
MCL, AVERAGE	04/01/2017	06/30/2017	Water samples showed that the amount of this contaminant in our drinking water was above its standard (called a maximum contaminant level and abbreviated MCL) for the period indicated.
MCL, AVERAGE	07/01/2017	09/30/2017	Water samples showed that the amount of this contaminant in our drinking water was above its standard (called a maximum contaminant level and abbreviated MCL) for the period indicated.
MCL, AVERAGE	10/01/2017	12/31/2017	Water samples showed that the amount of this contaminant in our drinking water was above its standard (called a maximum contaminant level and abbreviated MCL) for the period indicated.

## Public Water Systems Served by the City of Brady

The City serves one other public water system: Lakeland Services (TCEQ Number TX1540007).

### Lakeland Services

Lakeland Services purchases substantially all of its water from the City of Brady. Lakeland Services has approximately 28 service connections and serves a population of approximately 58.