



MEMORIAL VILLAGES WATER AUTHORITY

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2016 DRINKING WATER QUALITY REPORT

(Consumer Confidence Report)

January 1, 2016 to December 31, 2016

Public Water Supply I.D. TX1010148

The United States Environmental Protection Agency (EPA) requires most drinking water suppliers in the country to provide a water quality report to their customers. This annual report concerns the quality of water provided by Memorial Villages Water Authority to the residents of Hedwig, Hunters Creek and Piney Point Villages. Questions concerning this report should be directed to our General Manager, Mr. Mike Montgomery, by calling 713-465-8318.

OUR DRINKING WATER MEETS OR EXCEEDS ALL FEDERAL (EPA) DRINKING WATER REQUIREMENTS.

In order to ensure that tap water is safe to drink, the Environmental Protection Agency (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. We hope this report helps you become more knowledgeable about what's in the water you drink. **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 water poses a health risk.** More information about contaminants and potential health effects, call EPA's Safe Drinking Water Hotline (1-800-426-4791). The following pages list many of the federally regulated/monitored constituents that have been found in your drinking water. The E.P.A. requires water systems to test up to 97 contaminants. **Secondary Constituents:** 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 EPA. These constituents are not necessarily causes for health concerns. Secondary constituents are not required to be reported in this document but they may greatly affect the appearance and taste of your water. For more information on taste, odor or color, contact the Water Authority at 713-465-8318.

SPECIAL NOTICE

You may be more vulnerable than the general population to certain microbial contaminants, such as *Cryptosporidium*, in drinking water. **INFANTS**, some **ELDERLY** or **IMMUNO-COMPROMISED PERSONS** such as those undergoing **CHEMOTHERAPY** for cancer; those who have undergone **ORGAN TRANSPLANTS**; those who are undergoing treatment with certain **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 healthcare providers. Additional guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* & other microbial contaminants are available from the Safe Drinking Water Hotline at: 1-800-426-4791.

WHERE DOES YOUR DRINKING WATER COME FROM?

In 2016, the Water Authority provided 37.45% of its treated drinking water from its 5 water wells which draw water from the Evangeline aquifer. This type of water source is commonly referred to as **groundwater**. The other 62.55% of our drinking water came from the City of Houston (COH) in the form of **surface water** from Lake Houston. **Surface water** comes from rivers, lakes, streams, ponds, reservoirs, and springs. 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, please contact Mr. Montgomery at 713-465-8318. Further details about sources and source-water assessments are available in Drinking Water Watch at the following URL: <http://dww.tceq.texas.gov/DWW>.

SOURCES OF DRINKING WATER

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 pick up substances resulting from the presence of animals or from human activity. For further details about sources of water, go to: <http://gis3.tceq.state.tx.us/swav//Controller/index.jsp?wtrsrc=>

Contaminants that may be present in source water:

- **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 byproducts 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.

WHAT YOU NEED TO KNOW TO BETTER UNDERSTAND WHAT IS IN YOUR WATER

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

Maximum Contaminant Level (MCL): The highest permissible level of a contaminant that is allowed in drinking water. MCL's are set as close to the MCLG's 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. MCLG's 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.

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 contamination.

Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow. **Action Level Goal (ALG)** The level of a contaminant in drinking water below which there is no known or expected risk to health. ALG's allow for a margin of safety.

Avg: Regulatory compliance with some MCL's are based on running average of monthly samples. **pCi/l** = Pico curies per liter (a measure of radioactivity); **NTU** = Nephelometric Turbidity Units; **ppm** = parts per million or milligrams per liter (mg/l); **ppb** = parts per billion, or micrograms per liter (ug/l); **ppt** = parts per trillion, or nanograms per liter; **ppq** = parts per quadrillion, or picograms per liter; **MFL** = million fibers per liter (a measure of asbestos); **ND** = Not Detected; **NA** = Not Applicable. **SCL** = Secondary Contaminant Level.

TABLE I = Information on the **groundwater** supplied by the Water Authority as part of its drinking water supply.

TABLE II = Information on the **surface water** supplied by Houston to the Water Authority as part of its drinking water supply.

**TABLE I - Memorial Villages Water Authority's Public Water Supply System — I.D. No. 1010146
2016* CONTAMINANTS DETECTED IN YOUR DRINKING WATER**

REGULATED CONTAMINANTS								
Year/ Range	Constituent	Highest Level	Range of Levels	MCLG	MCL	Unit of Measure	Source of Constituent	
3/14/16	Arsenic	<0.0020	0.0020—0.0020	0	10	ppm	Erosion of natural deposits; Runoff from orchards And from glass and electronics production wastes.	
3/14/16	Barium	0.0788	0.0782—0.0788	2	2	ppm	Erosion of natural deposits; Discharge of drilling wastes and metal refineries.	
3/14/16	Beryllium	Levels lower than the detect level	0—0	4	4	ppb	Discharge from metal refineries & coal-burning factories; discharge from electrical, aerospace & defense.	
3/14/16	Cadmium	Levels lower than the detect level	0—0	5	5	ppb	Corrosion of galvanized pipes; Erosion of natural deposits; Discharge from metal refineries; runoff from waste batteries.	
3/14/16	Chromium	Levels lower than the detect level	0—0	100	100	ppb	Discharge from steel & pulp mills; Erosion of natural deposits.	
2/07/14	Fluoride	0.57	0.31—0.57	4	4	ppm	Erosion of natural deposits; Water additive which promotes strong teeth. Discharge from fertilizer & aluminum factories.	
3/22/16	Nitrate as (N)	1.29	0.81—1.29	10	10	ppm	Erosion of natural deposits. Runoff from fertilizer use; leaching from septic tanks & sewage.	
2016	Cyanide	60	0—60	200	200	ppb	Discharge from plastic and fertilizer factories. Discharge from steel/metal factories.	
3/14/16	Selenium	<0.0030	0—0	50	50	ppb	Discharge from petroleum and metal refineries; erosion of natural deposits discharge from mines.	
3/14/16	Thallium	<0.00040	0—0	0.5	2	ppb	Discharge from electronics, glass & leaching from ore-processing sites; Drug factories.	
3/14/16	Mercury	<0.00040	0—0	2	2	ppb	Erosion of natural deposits; Discharge from re- fineries & factories; runoff from landfills/croplands.	
Synthetic Organic Contaminants:								
01/20/16	Atrazine	<0.1	1—1	3	3	ppb	Runoff from herbicides used on row crops.	
01/20/16	Simazine	0.11	0—0.11	4	4	ppb	Herbicide runoff.	
RADIOACTIVE CONTAMINATES*								
		Highest Level Detected	Range of Levels	MCLG	MCL	Unit of Measure		
2005-09	Uranium	0.6	0—0.6	0	30	ppb	Erosion of natural deposits.	
01/13/11	Combined Radium (226 & 228)	1	1—1	0	5	pCi/L	Erosion of natural deposits.	
2005-09	Gross alpha	Levels lower than the detect level	0—0	0	15	pCi/L	Erosion of natural deposits.	
01/13/11	Gross beta emitters	5.4	0—5.4	0	50	pCi/L	Decay of natural & manmade deposits.	
Maximum Residual Disinfectant Level —No violation associated with disinfectant residuals.								
Year	Disinfectant	Average Level	Min Level	Max Level	MRDL	MRDLG	Units	Source of Disinfectant
2016	Chloramine	1.0	0.16	3.60	4.0	4.0	ppm	Disinfectant used to control microbes.
Disinfection By-Products		Highest	Range of	MCLG	Unit of			
Year	Constituent	Level	Level	Level	MCL	Measure	Source of Constituent	
2016	Total Haloacetic Acids	39	0.00—83.1	No Goal	60	ppb	Byproduct of drinking water disinfection.	
2016	Total Trihalomethanes	46	0.00—103	No Goal	80	ppb	Byproduct of drinking water disinfection.	
Turbidity: 2009—Highest Sample = 0.40 Lowest Monthly % Meeting Limits=99% Turbidity Limit=0.3 NTU—Comes from soil runoff.								
Total Coliform: MCLG=0; No positive monthly samples. MCL=2 or more/month: NO VIOLATION Naturally present in the environment.								
E. Coli or Fecal Coliform: Total No. of Positive E. Coli or Fecal coliform Samples = ZERO (-0-) NO VIOLATION.								
UNREGULATED INITIAL DISTRIBUTION SYSTEM EVALUATION FOR DISINFECTION BYPRODUCTS: WAIVED OR NOT YET SAMPLED								
* The MCL for beta particles is 4/mrem/year. EPA considers 50 pCi/L to be the level of concern for beta particles.								

COLIFORM BACTERIA are used as indicators of microbial contamination of drinking water because testing for them is easy. While not disease-causing organisms themselves, they are often found in association with other microbes that are capable of causing disease. Coliform bacteria are more hardy than many disease-causing organisms; therefore, their absence from water is a good indication that the water is microbiologically safe for human consumption. **TURBIDITY**—has no health effects. However, it can interfere with disinfection & provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms including bacteria, viruses & parasites that can cause nausea, diarrhea & associated headaches.

**TABLE I — CONTINUED - Memorial Villages Water Authority's Public Water Supply System — I.D. No. 1010146
2016* CONTAMINANTS DETECTED IN YOUR DRINKING WATER**

Secondary and Other Regulated Constituents (No associated adverse health effects)							
Year	Constituent	Average Level	Minimum Level	Maximum Level	Secondary Limit	Unit of Measure	Source of Constituent
3/14/16	Aluminum	0.020	0.020	0.020	.05	ppm	Abundant—naturally occurring Element.
3/14/16	Bicarbonate	146.66	106	183	N/A	ppm	Corrosion of carbonate rocks
3/14/16	Calcium	33.5	33.5	42.1	N/A	ppm	Abundant—naturally occurring element.
3/14/16	Copper	0.0023	0.0023	0.023	1	ppm	Corrosion of household plumbing systems; erosion of natural deposits leaching from wood preservatives.
3/14/16	Hardness as CaCO ₃	99.4	99.4	99.4	N/A	ppm	Naturally occurring calcium & magnesium.
3/14/16	Iron	0.096	0.096	0.096	0.3	ppm	Erosion of natural deposits; iron or steel water delivery.
3/14/16	Magnesium	3.83	3.83	3.83	N/A	ppm	Abundant naturally occurring element.
3/14/16	Manganese	0.0077	0.0077	0.0077	.05	ppm	Abundant naturally occurring element.
3/14/16	Nickel	0.0023	0.0023	0.0023	N/A	ppm	Erosion of natural deposits.
3/14/16	Potassium	4.71	4.71	4.71	N/A	ppm	Naturally occurring in nature.
3/14/16	pH	7.77	7.3	8.2	> 7	units	Measure of waters corrosivity.
3/14/16	Sodium	54.2	54.2	54.2	N/A	ppm	Erosion of natural deposits; byproduct of oil field activity.
3/14/16	Sulfate	39.67	32	49	300	ppm	Naturally occurring; common industrial byproduct; byproduct of oil field activity.
3/14/16	Total Alkalinity as CaCO ₃	120.33	87	150	N/A	ppm	Naturally occurring in mineral salts.
3/14/16	Total Dissolved Solids	269.66	242	293	1000	ppm	Total dissolved mineral constituents in water.

LEAD and COPPER

Year	Constituent	90th Percentile	No. of Sites Exceeding AL	Action Level	Unit of Measure	Source of Constituent
2016	Copper	0.1364	0	1.3	ppm	Corrosion of household plumbing systems; Erosion of natural deposits.
2016	Lead	7.1	1	15	ppb	Corrosion of household plumbing system; Erosion of natural deposits; Leaching from wood preservatives.

MCLG—Copper = 1.3 MCLG—Lead = 0 No Levels Above MCL
 Lead and Copper Rule: Violation began December 30, 2013 and ended upon delivery of lead and copper results in 2014. We failed to provide the results of the lead tap water monitoring to the consumers at the location water was tested within 30 days of getting the results.

LEAD in Drinking Water: 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 it 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 at (1-800-426-4791) or by logging on to EPA's web site at: <http://www.epa.gov/safewater/lead>.

**PUBLIC PARTICIPATION OPPORTUNITIES
FOR
MEMORIAL VILLAGES WATER AUTHORITY**

BOARD MEETINGS: 1ST Tuesday of each Month
 LOCATION: 8955 Gaylord Drive, Houston, 77024
 TIME: 7:00 p.m.
 FOR INFORMATION CALL: 713-465-8318
VISIT OUR WEB SITE AT: WWW.MVWA.ORG

ARSENIC: While your drinking water meets EPA's standard for arsenic, it does contain low levels of arsenic. EPA's standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. EPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.

NITRATE: Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than 6 months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant, ask for advice from your health care provider.

Violations Table: Haloacetic Acids (HAA5): Violation Type - MCL, LRAA. Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer. Water samples showed that the amount of this contaminant in our drinking water, beginning 4/1/2016 and ending 6/30/2016, was above its standard (called a maximum contaminant level and abbreviated MCL). Lead and Copper Rule: Violation Type - Lead Consumer Notice. The Lead & Copper Rule protects public health by minimizing lead & copper levels in drinking water, primarily by reducing water corrosivity. Lead & copper enter drinking water mainly from corrosion of lead & copper containing plumbing materials. MVWA failed to provide the results of lead tap water monitoring to the consumers at the location water was tested. These results were supposed to be provided no later than 30 days after learning the results. The violation began 12/30/2013 and ended 10/18/2016 once the consumers had been notified. Public Notification Rule: Violation Type - Public Notice Rule Linked to Violation. The Public Notification Rule helps to ensure that consumers will always know if there is a problem with their drinking water. These notices immediately alert consumers if there is a serious problem with their drinking water (e.g., a boil water emergency). We failed to adequately notify you, our drinking water consumers, about a violation of the drinking water regulations beginning 5/31/2016 and ending in 2016. Total Trihalomethanes (TTHM) - Violation Type—MCL, LRAA. Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer. Water samples showed that the amount of this contaminant in our drinking water, beginning 4/1/2016 and ending 6/30/2016, was above its standard (called a maximum contaminant level and abbreviated MCL).

DISINFECTANTS IN DRINKING WATER

The drinking water provided to you contains **Chloramines** as a disinfectant which provides protection from waterborne diseases but can cause problems to persons dependent on dialysis. You are encouraged to discuss this with your health care provider. Chloraminated water may also be toxic to fish. For more information about the use of chloramines contact the Water Authority at 713-465-8318.

For 2016:

Disinfectant used: Chloramines (chlorine + ammonia)
 Quaterly average levels: Jan. - Mar. 1.07 mg/L
 Apr. - June 0.79 mg/L
 July - Sept. 0.97 mg/L
 Oct. - Dec. 1.19 mg/L
 Lowest single sample result: 0.16 mg/L
 Highest single sample result: 3.60 mg/L
 Annual average of all samples: 1.00 mg/L
 Maximum Residual Disinfectant Level (MRDL): 4.0 mg/L*
 Maximum Residual Disinfectant Level Goal (MRDLG): 4.0 mg/L*

*Measured as chlorine as an annual average

Unregulated Contaminants

Unregulated contaminants are those for which the 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 & whether future regulations are warranted.

Chromium in Drinking Water

The current federal drinking water standard for total chromium is 0.1 mg/L or 100 ppb. Chromium-6 and Chromium-3 are covered under the total chromium standard. The level of Total Chromium in your drinking water measured <0.0100 mg/L or what is consider lower than the detectable level. If your water supply measures ever exceeds the federal standard for Total Chromium, consumers will be notified. For more information call us at 713-465-8318.

TABLE II - City of Houston: Surface Water supplied to Memorial Villages Water Authority

Houston Entry Points 101 - East Water Plant III

Houston's Main System I.D. No. 1010013

2016* CONTAMINANTS DETECTED IN YOUR DRINKING WATER; NONE WERE ABOVE THE MCL

Regulated Contaminates

Year	Constituent	Detected Level	Unit of Measure	MCL	MCLG	Source of Constituent
9/20/16	Arsenic	<0.002	ppm	10*	0	Erosion of natural deposits; Runoff from orchards and from glass and electronic production waste. production waste.
<i>(*New arsenic values were effective January 23, 2006. In the event of a violation, you will be notified)</i>						
9/20/16	Atrazine	0.21	ug/L	3	3	Runoff from herbicide used on row crops.
9/20/16	Barium	0.0563	ppm	2	2	Erosion of natural deposits; Discharge of drilling wastes and metal refineries.
9/20/16	Fluoride	0.53	ppm	4	4	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories.
9/20/16	Nitrate as (N)	0.16	ppm	10	10	Erosion of natural deposits; Runoff from fertilizer use; Leaching from septic tanks and sewage.
2014	Simazine	ND	ug/L	4	4	Runoff from herbicide used on row crops.
9/20/16	Cyanide	<0.01	mg/L	200	200	Discharge from plastic and fertilizer factories. Discharge from steel/metal factories.

RADIOACTIVE CONTAMINATES

2/24/11	Combined Radium (226 & 228)	<1.0	pCi/l			Erosion of natural deposits.
2/24/11	Alpha Emitters	<2.0	pCi/l			Erosion of natural deposits.
2/24/11	Beta Emitters	4.6	pCi/l			Erosion of natural deposits.

SECONDARY and OTHER UNREGULATED CONSTITUENTS

Year/Range	Constituent	Detected Level	Unit of Measure	SCL	Source of Constituent
2016	Aluminum	<0.2	ppm	50 to 200	Naturally occurring element.
2016	Bicarbonate	129	ppm		Corrosion of carbonate rocks such as limestone.
2016	Calcium	50.1	ppm		Naturally occurring element.
2016	Chloride	26	ppm	250	Erosion of natural deposits; Discharge of drilling
2016	Hardness-CaCO ₃	141	ppm		Naturally occurring calcium & magnesium.
2016	Alkalinity-CaCO ₃	106	ppm		Naturally occurring soluble mineral salts.
2016	Sulfate	34	ppm	250	Naturally occurring; common industrial byproduct
2016	Iron	<0.010	ppm	300	Erosion of natural deposits
2016	Manganese	0.0043	ppb	50	Abundant occurring natural element.
2016	Nickel	0.0023	ppm		Erosion of natural deposits.
2016	Magnesium	3.86	ppm		Abundant occurring natural element.
2016	Sodium	16.7	ppm		Erosion of natural deposits. Byproduct of oil fields.
2016	Total Dissolved Solids	212	ppm	500	Total dissolved mineral constituents in water.
2016	pH	7.6	units	6.5—8.5	Measure of waters corrosivity.
2016	Potassium	4.23	ml/L		Naturally occurring in nature.

UN-REGULATED DISINFECTION BY-PRODUCT

Year	Constituent	Result	MCLG	Unit of Measure	Source of Constituent
2015	Chloroform	22	0	ppb	Byproduct of drinking water disinfection.
2015	Bromodichloromethane	11	0	ppb	Byproduct of drinking water disinfection.
2015	Dibromochloromethane	1.9	60	ppb	Byproduct of drinking water disinfection.
2015	Bromoform	ND	0	ppb	Byproduct of drinking water disinfection.

Turbidity: Year	Avg.	Min.	Max.	Unit of Measure	Lowest Monthly % of samples Meeting Limits	Turbidity Limits	Source of Constituent
2016	0.10	0.06	0.74	NTU	95%	0.3	Soil Runoff

Additional information concerning the City of Houston's Water Quality may be obtained by calling the Water Authority at 713-465-8318 or the Water Production Branch of the Department of Public Works, City of Houston at 713-842-4001.

*Or latest information available.