

# Drinking Water Quality Report 2006



City of Houston  
Department of  
Public Works &  
Engineering

## City of Houston Department of Public Works and Engineering DRINKING WATER QUALITY REPORT 2006

### *Houston's Water is rated Superior!*

This report contains information about your drinking water and the treatment and monitoring performed to serve the highest possible quality of water to you.

You can be assured that **Superior Drinking Water** is being provided to you and approximately 2.7 million other customers in the Greater Houston Metropolitan Area. **In 2006, Houston drinking water met and exceeded all Federal and State standards for safe drinking water.** The City of Houston has maintained a **five-year record of providing safe and reliable drinking water of Superior Quality.** There were no water quality violations for treated water or the water distribution system for 2006. In addition, the city participated voluntarily in the **Partnership for Safe Drinking Water** to produce water of a quality better than most other water providers in the nation. This report contains information about the presence of contaminants in your drinking water. The presence of these contaminants does not indicate that the water poses a health risk, as all drinking water may reasonably be expected to contain at least small amounts of contaminants.



### **City of Houston Sources of Drinking Water**

Sources of drinking 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 materials, and can pick up substances resulting from the presence of animal or human activity.

The total production from all sources averaged 392 million gallons per day (MGD) in 2006. There is enough water in our distribution system at any given time to fill the Astrodome 2 ½ times. The City currently draws 71% of its treated drinking water from its major surface water treatment plants. Surface water

comes from the San Jacinto River through Lake Conroe and Lake Houston, and the Trinity River, through Lake Livingston. The remaining 29% comes from groundwater wells. These are deep wells with average depths greater than 750 feet, producing water from the Evangeline and Chicot Aquifers, and are not vulnerable to surface contamination. For information please call one of our professional customer service staff at 713-837-0473.

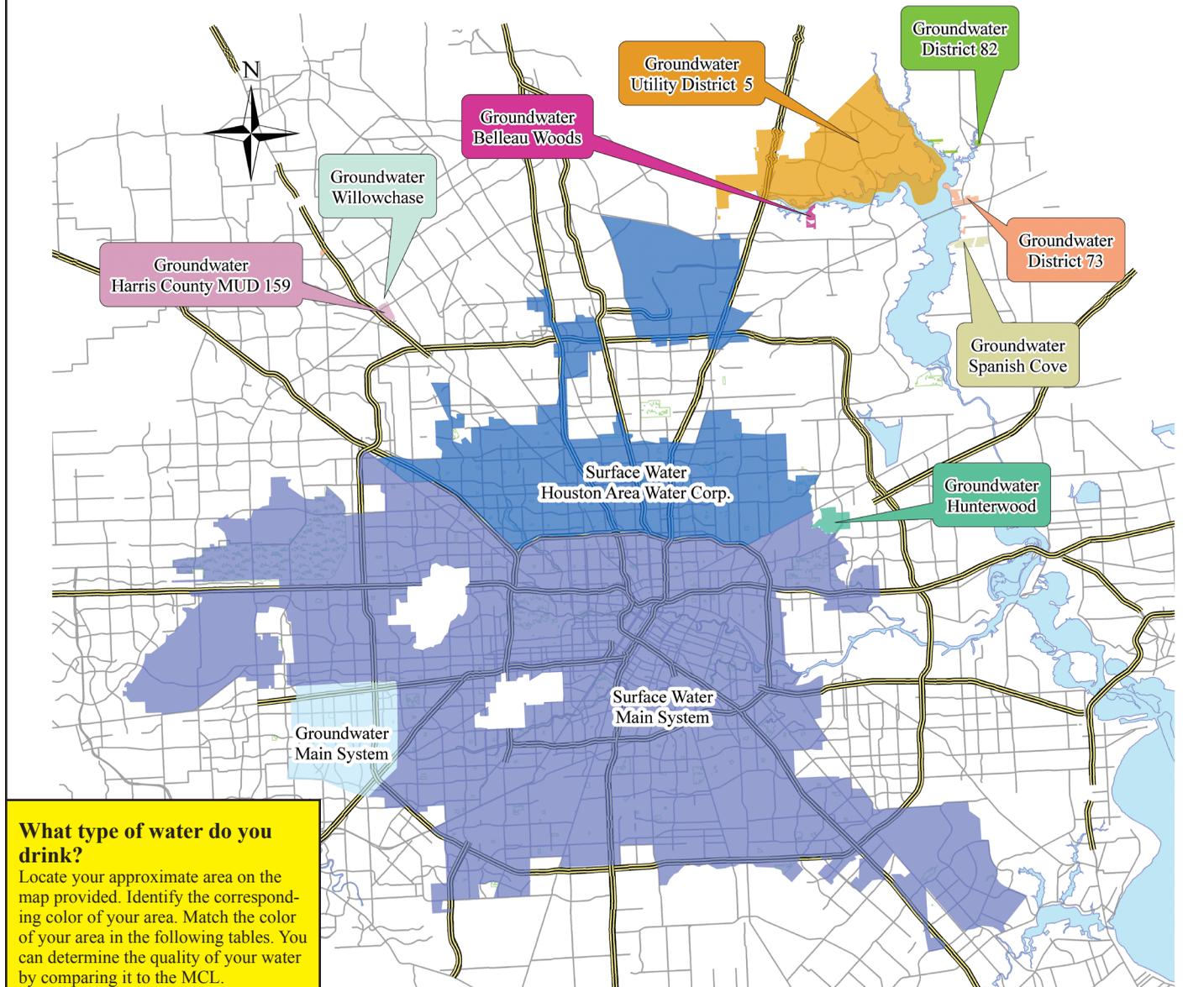
Visit our web site:

[www.publicworks.cityofhouston.gov/utilities/waterprod.htm](http://www.publicworks.cityofhouston.gov/utilities/waterprod.htm)

### ***Public Utilities Mission Statement***

***To be the Nation's Leading Public Utility, Champion for the Environment, Providing Reliable Service of Exceptional Quality to the Most Satisfied Customers in the Nation.***

# City of Houston Drinking Water Service Areas



The City of Houston uses chloramines for the disinfection of its drinking water. This protects public health by controlling central exposure to waterborne organisms known to cause infectious diseases in humans, while at the same time lowering regulated disinfection by-products. For certain sensitive uses such as kidney dialysis, chlorinated water must be treated before use.

DISINFECTION BY-PRODUCTS AND DISINFECTANTS*							
	MCL	MCLG	Average of all sampling points		Range of detected levels		Source of Constituent
			MAIN SYSTEM	HOUSTON AREA WATER CORP.	MAIN SYSTEM	HOUSTON AREA WATER CORP.	
<b>HALOACETIC ACIDS - HAAS (ppb)</b>	60 as Running Annual Average (RAA) of quarterly samples in distribution system	N / A	13.4	9.9	< 6.0 - 90.7	6.3 - 15.7	By-product of drinking water disinfection
<b>TOTAL TRIHALOMETHANES - TTHMS (ppb)</b>	80 as Running Annual Average (RAA) of quarterly samples in distribution system	N / A	15.9	11.2	< 8.0 - 69.3	< 8.0 - 19.1	By-product of drinking water disinfection
<b>CHLORAMINES/FREE CHLORINE (ppm)</b>	MRDL = 4 as Running Annual Average (RAA) of daily distribution system samples	MRDLG = 4	Free Chlorine = 1.4 Chloramine = 2.5	Free Chlorine = 1.4 Chloramine = 2.5	0.2 - 3.9	0.2 - 3.9	Disinfectant used to control microbes

During 2006, the City of Houston collected more than 600,000 laboratory samples for containments in its source water, treated water and distribution system.

MAIN WATER SYSTEM*									
<i>(Most City of Houston customers receive their drinking water from the Main System.)</i>									
CONTAMINANT (units)	MCLG	MCL	SURFACE WATER		GROUND WATER		HOUSTON AREA WATER CORP. (Surface)		SOURCES OF CONTAMINANTS
			Avg	Max	Avg	Max	Avg	Max	
Alpha Emitters (pCi/L)	0	15****	3.9 (2005)	10.8 (2005)	6.5 (2005)	20.7 (2005)	< 2.0 (2005)	< 2.0 (2005)	Erosion of natural deposits
Arsenic (ppb)	0	10	4.1	4.1	3.1	4.3	< 2.0	< 2.0	Erosion of natural deposits
Atrazine (ppb)	3	3	0.21	0.23	< 0.20 (2005)	< 0.20 (2005)	0.46	0.77	Runoff from herbicide used on row crops; commonly found in surface water at low levels
Barium (ppm)	2	2	0.0839 (2005)	0.2010 (2005)	0.1933	0.2370	0.063	0.063	Discharge of drilling wastes; erosion of natural deposits
Benzene (ppb)	0	5	< 0.5 (2005)	< 0.5 (2005)	< 0.5 (2005)	0.6 (2005)	ND	ND	Discharge from factories; leaching from gas storage tanks and landfills
Beta/Photon Emitters (pCi/L)	0	50***	5.6 (2005)	16.2 (2005)	4.9 (2005)	12.8 (2005)	< 4.0 (2005)	< 4.0 (2005)	Decay of natural or man made deposits
Copper (ppm)	1.3	90% below AL = 1.3	90% below 0.1920 at customer tap - none exceeded AL (2005) **		90% below 0.1920 at customer tap - none exceeded AL (2005)**		ND		Erosion of natural deposits; corrosion of household plumbing
Ethylbenzene (ppb)	700	700	< 0.5	< 0.5	< 0.5	1.7	< 0.5	< 0.5	Discharge from petroleum refineries
Fluoride (ppm)	4.0	4.0	0.53	0.90	0.18	0.20	0.70	0.70	Water additive which promotes strong teeth; erosion of natural deposits
Lead (ppb)	0	90% below AL = 15	90% below 4.2 at customer tap - none exceeded AL (2005)**		90% below 4.2 at customer tap - none exceeded AL (2005)**		ND		Erosion of natural deposits; corrosion of household plumbing
Nitrate (ppm), as N	10	10	0.25	0.50	0.09	0.43	0.60	0.60	Runoff from fertilizer use; erosion of natural deposits
Nitrite (ppm), as N	1	1	< 0.01 (2005)	< 0.01 (2005)	< 0.01	< 0.01	0.45 (2005)	0.45 (2005)	Runoff from fertilizer use; erosion of natural deposits
Selenium (ppb)	50	50	< 3.0 (2005)	5.9 (2005)	< 3.0	4.9	< 3.0	< 3.0	Erosion of natural deposits
Toluene (ppm)	1	1	< 0.0005	< 0.0005	< 0.0005	0.0013	< 0.0005	< 0.0005	Discharge from petroleum factories
Combined Radium (pCi/L)	0	5	< 1.0 (2005)	3.8 (2005)	< 1.0 (2005)	2.7 (2005)	< 1.0 (2005)	< 1.0 (2005)	Erosion of natural deposits
Combined Uranium (ppb)	0	30	17.1 (2005)	17.1 (2005)	12.2 (2005)	13.1 (2005)	ND (2005)	ND (2005)	Erosion of natural deposits
Total Xylenes (ppm)	10	10	< 0.0015	< 0.0015	0.0016	0.0126	< 0.0015	< 0.0015	Discharge from petroleum factories; discharge from chemical factories

### Terminology

**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 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 (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 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 (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.

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

### Measurement Definitions

**Nephelometric Turbidity Unit (NTU):** Turbidity is a measure of how clear the water looks.

**N/A:** Not Applicable

**ND:** Not Detected

**pCi/L:** picocuries per liter (a measure of radioactivity)

**ppm:** 1 part per million = 1 mg/L = 1 milligram per liter

**ppb:** 1 part per billion = 1 ug/L = 1 microgram per liter

**1 ppm = 1000 ppb**

\* Calendar Year 2006 data unless otherwise specified.

\*\* Includes groundwater and surface water sites.

\*\*\* EPA considers 50 picocuries per liter to be the level of concern for beta particles.

\*\*\*\* MCL compliance is based on annual average of samples.

ISOLATED GROUNDWATER SYSTEMS*									
CONTAMINANT (units)	MCLG	MCL	BELLEAU WOODS	SPANISH COVE	DISTRICT 82		HARRIS COUNTY MUD 159		SOURCES OF CONTAMINANTS
					Avg	Max	Avg	Max	
Alpha Emitters (pCi/L)	0	15	ND ('05)	ND ('05)	2.9 ('01)	3.2 ('01)	6.2 ('03)	6.2 ('03)	Erosion of natural deposits
Arsenic (ppb)	0	10	< 2.0 ('05)	2.9 ('05)	< 2.0 ('05)	< 2.0 ('05)	2.2 ('03)	2.2 ('03)	Erosion of natural deposits
Barium (ppm)	2	2	0.292 ('01)	0.3350 ('05)	0.139 ('04)	0.139 ('04)	0.257 ('03)	0.257 ('03)	Discharge of drilling wastes; erosion of natural deposits
Beta/Photon Emitters (pCi/L)	0	50***	< 4.0 ('05)	5.8 ('01)	< 4.0 ('05)	< 4.0 ('05)	< 4.0 ('05)	< 4.0 ('05)	Decay of natural or man made deposits
Copper (ppm)	1.3	90% below AL = 1.3	90% below 0.081 at customer tap-none exceeded AL ('99)	90% below 0.002 at customer tap-none exceeded AL ('03)	90% below 0.043 at customer tap-none exceeded AL ('00)		90% below 0.257 at customer tap-none exceeded AL ('99)		Erosion of natural deposits; corrosion of household plumbing
Ethylbenzene (ppb)	700	700	< 0.5 ('05)	< 0.5 ('05)	< 0.5 ('05)	< 0.5 ('05)	< 0.5 ('05)	< 0.5 ('05)	Discharge from petroleum refineries
Fluoride (ppm)	4.0	4.0	ND ('05)	0.1 ('05)	ND ('05)	ND ('05)	ND	ND	Water additive which promotes strong teeth; erosion of natural deposits
Lead (ppb)	0	90% below AL = 15	90% below 2.1 at customer tap-none exceeded AL ('99)	90% below 1.0 at customer tap-none exceeded AL ('03)	90% below 1.4 at customer tap-none exceeded AL ('00)		90% below 3.8 at customer tap-none exceeded AL ('99)		Erosion of natural deposits; corrosion of household plumbing
Nitrate (ppm), as N	10	10	< 0.01 ('05)	< 0.01 ('05)	0.17 ('05)	0.17 ('05)	0.21	0.22	Runoff from fertilizer use; erosion of natural deposits
Selenium (ppb)	50	50	< 3.0 ('05)	< 3.0 ('05)	< 3.0 ('05)	< 3.0 ('05)	3.9 ('03)	3.9 ('03)	Erosion of natural deposits
Total Trihalomethanes (TTHMs) (ppb)	N/A	Running Annual Avg=80	7.9 ('05)	< 8.0 ('05)	4.6 ('05)	9.2 ('05)	< 8.0 ('05)	< 8.0 ('05)	By-product of drinking water disinfection
Toluene (ppm)	1	1	< 0.0005 ('05)	< 0.0005 ('05)	< 0.0005 ('05)	< 0.0005 ('05)	< 0.0005 ('05)	< 0.0005 ('05)	Discharge from petroleum factories
Combined Radium (pCi/L)	0	5	< 1.0 ('05)	< 1.0 ('05)	< 1.0 ('04)	< 1.0 ('04)	0.4 ('03)	0.4 ('03)	Erosion of natural deposits
Total Xylenes (ppm)	10	10	< 0.0015 ('05)	< 0.0015 ('05)	< 0.0015 ('05)	< 0.0015 ('05)	< 0.0015 ('05)	< 0.0015 ('05)	Discharge from petroleum factories; discharge from chemical factories

Over 6000 bacteriological samples are collected every month from the City's distribution system.

MICROBIOLOGICAL AND PHYSICAL QUALITY*					
CONTAMINANT (units)	MCLG	MCL	MAIN SYSTEM	UTILITY DISTRICT 5	SOURCES OF CONTAMINANTS
Total Coliforms	0	5% of monthly samples tested positive	1.1% Highest percentage of monthly samples	1.0% Highest percentage of monthly samples	Naturally present in the environment
E. Coli	0	0	0	0	Human and animal fecal waste
Viruses, Giardia, Legionella	0	TT	ND	ND	Naturally present in the environment
Turbidity (clarity) (NTU) Main System - Surface Water	N/A	95% of samples tested each month less than or equal to 0.3	0.05 Average Range = 0.00 - 0.55 98.9% was the Lowest monthly percentage of samples meeting the limit	N/A	Soil runoff

### Is Giardia or Cryptosporidium in our water supply?

*Cryptosporidium* and *Giardia* are waterborne pathogenic organisms. Both are naturally present in the intestines of most mammals including humans, and are passed into the environment through urban runoff or sewage disposal system failure. The diseases caused by *Cryptosporidium* or *Giardia* can lead to symptoms such as diarrhea, abdominal discomfort, fever, weight loss, malabsorption, or anemia. Although not life threatening to healthy adults, *Cryptosporidium* and *Giardia* can be fatal to infants, the elderly, pregnant women, and immunocompromised persons.

Neither *Giardia* nor *Cryptosporidium* is found in deep wells such as the City's, which are protected from surface water contamination. We routinely monitor our source water entering and treated water leaving our filtration plants for these two organisms. To date, we have detected no confirmed occurrences of either organism in any of our drinking water.

ISOLATED GROUNDWATER SYSTEMS*										
CONTAMINANT (units)	MCLG	MCL	UTILITY DISTRICT 5		HUNTERWOOD	WILLOWCHASE		DISTRICT 73		SOURCES OF CONTAMINANTS
			Avg	Max		Avg	Max	Avg	Max	
Alpha Emitters (pCi/L)	0	15	2.9 ('05)	5.0 ('05)	ND ('05)	4.3 ('02)	8.6 ('02)	5.2 ('02)	6.2 ('02)	Erosion of natural deposits
Arsenic (ppb)	0	10	< 2.0 ('05)	< 2.0 ('05)	7.4 ('03)	2.2 ('03)	2.2 ('03)	< 2.0 ('05)	< 2.0 ('05)	Erosion of natural deposits
Barium (ppm)	2	2	0.252 ('05)	0.252 ('05)	0.276 ('03)	0.246 ('02)	0.246 ('02)	0.276 ('05)	0.309 ('05)	Discharge of drilling wastes; erosion of natural deposits
Beta/Photon Emitters (pCi/L)	0	50***	< 4.0 ('05)	7.1 ('05)	2.5 ('03)	< 4.0 (2000 - 02)	4.3 (2000 - 02)	4.6 ('02)	4.7 ('02)	Decay of natural or man made deposits
Copper (ppm)	1.3	90% below AL = 1.3	90% below 0.2440 at customer tap-none exceeded AL ('05)		90% below 0.15 at customer tap-none exceeded AL ('00)	90% below 0.1620 at customer tap-none exceeded AL ('05)		90% below 0.1190 at customer tap-none exceeded AL ('99)		Erosion of natural deposits; corrosion of household plumbing
Ethylbenzene (ppb)	700	700	1.2 ('05)	7.2 ('05)	< 0.5 ('05)	< 0.5 ('05)	< 0.5 ('05)	0.8 ('05)	1.5 ('05)	Discharge from petroleum refineries
Fluoride (ppm)	4.0	4.0	0.3 ('05)	0.3 ('05)	0.5 ('00)	0.1 ('05)	0.1 ('05)	0.1 ('05)	0.1 ('05)	Water additive which promotes strong teeth; erosion of natural deposits
Lead (ppb)	0	90% below AL = 15	90% below 2.2 at customer tap-none exceeded AL ('05)		90% below 4.0 at customer tap-one exceeded AL ('00)	90% below 3.2 at customer tap-none exceeded AL ('05)		90% below 2.2 at customer tap-one exceeded AL ('99)		Erosion of natural deposits; corrosion of household plumbing
Nitrate (ppm), as N	10	10	< 0.01 ('05)	< 0.01 ('05)	< 0.01 ('05)	0.19	0.19	0.02 ('05)	5.7 ('05)	Runoff from fertilizer use; erosion of natural deposits
Selenium (ppb)	50	50	< 3.0 ('05)	< 3.0 ('05)	< 3.0 ('05)	3.8 ('02)	3.8 ('02)	< 3.0 ('05)	5.7 ('05)	Erosion of natural deposits
Total Trihalomethanes (TTHMs) (ppb)	N/A	Running Annual Avg=80	1.3 ('05)	12.8 ('05)	< 8.0 ('05)	2.4 ('05)	2.4 ('05)	< 8.0 ('05)	< 8.0 ('05)	By-product of drinking water disinfection
Toluene (ppm)	1	1	0.0011 ('05)	0.0063 ('05)	< 0.0005 ('05)	< 0.0005 ('05)	< 0.0005 ('05)	< 0.0005 ('05)	< 0.0005 ('05)	Discharge from petroleum factories
Combined Radium (pCi/L)	0	5	1.0 ('05)	1.1 ('05)	< 1.0 ('05)	0.4 ('02)	0.4 ('02)	0.6 ('02)	0.7 ('02)	Erosion of natural deposits
Total Xylenes (ppm)	10	10	0.0028	0.0028	< 0.0015 ('05)	< 0.0015 ('05)	< 0.0015 ('05)	0.0040 ('05)	0.0079 ('05)	Discharge from petroleum factories; discharge from chemical factories

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 the EPA in determining the occurrence of unregulated contaminants in drinking water and whether future regulation is warranted.													
CONTAMINANT (units)	MAIN SYSTEM (Surface)		MAIN SYSTEM (Ground)		HOUSTON AREA WATER CORP. (Surface)		BELLEAU WOODS (2005)	SPANISH COVE (2005)	HARRIS COUNTY MUD 159 (2005)	UTILITY DISTRICT 5	WILLOWCHASE (2005)	DISTRICT 73 (2005)	
	Avg	Max	Avg	Max	Avg	Max						Avg	Max
Chloroform (ppb)	36.9	48.0	2.1	6.1	4.0	8.0	0.8	< 0.5	< 0.5	3.3	< 0.5	1.8	3.5
Bromodichloromethane (ppb)	10.9	14.0	6.0	31.0	1.1	1.7	1.5	< 0.5	< 0.5	12.0	< 0.5	3.4	6.8
Dibromochloromethane (ppb)	1.3	2.0	4.9	20.0	< 0.5	< 0.5	2.0	< 0.5	< 0.5	29.0	< 0.5	2.6	5.2
Bromoform (ppb)	< 0.5	< 0.5	2.8	6.3	< 0.5	< 0.5	1.3	< 0.5	< 0.5	26.0	< 0.5	< 0.5	< 0.5
4-methyl-2-pentanone (MIBK) (ppb)	ND	ND	2.8	22.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene (ppb)	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acetone (ppb)	< 10	< 10	< 10	< 10	< 10	< 10	30.0	< 10	< 10	< 10	< 10	< 10	< 10
2-Hexanone (ppb)	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

## Drinking Water and Your Health



### Notice from the EPA

All drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. Contaminants may be found in drinking water that may cause taste, color, or odor problems. Presence of contaminants does not necessarily indicate that the water poses a health risk. In order to ensure that tap water is safe to drink, the EPA and the TCEQ enforce regulations that limit the amount of certain contaminants in water provided by public water systems. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline 1-800-426-4791.

### Health-Related Notices

Special Notice for the Elderly, Infants, Cancer Patients, People with Weakened Immune Systems

You may be more vulnerable to certain microbial contaminants in drinking water than the general population. Infants, some elderly or immunocompromised persons such as those who have undergone 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 microbial contaminants are available from:

**Safe Drinking Water Hotline 1-800-426-4791 or City of Houston Department of Health and Human Services/Bureau of Epidemiology 713-794-9181.**

If other people, such as tenants, receive water from you, it is important that you provide this notice to them by posting it in a prominent location or by hand or mail delivery.

Please feel free to copy this report. Visit our web site:

[www.publicworks.cityofhouston.gov/utilities/waterprod.htm](http://www.publicworks.cityofhouston.gov/utilities/waterprod.htm)

## *H<sub>2</sub>Ouston Drinking Water Operations Delivers!*

### Quality

We work hard to bring you one of the highest quality drinking water in the nation! Houston's drinking water is rated "**Superior**" by TCEQ, meaning we have exceeded its expectations of a water utility. This includes not only bringing you great tasting water but taking extra efforts to protect our water sources.

The City of Houston actively participates with the **American Water Works Association (AWWA)** and other agencies that research water quality issues. Such research helps us optimize and improve our drinking water operations.

The City also participates in programs such as the **Partnership for Safe Drinking Water**. This program ensures that preventative measures are being optimized at our treatment plants to increase performance and protection against microbiological contamination in the Houston drinking water supply.

### Reliability

The City of Houston's Waterworks has been in place since the early 1900's, ensuring dependable water service to over 2,700,000 customers. This includes operating three water purification complexes and maintaining over 7,000 miles of water pipelines.

Recently, the City's of Houston's water purification plants have been nationally recognized among the most elite water plants in the nation. The East Water Purification Plant recently won the **2006 Five-Year Directors Award** for achieving excellence in water purification maintenance. This award is given to utilities' which meet or exceed water quality standards established by the **Partnership for Safe Drinking Water**.

### Service

The City of Houston operates a non-emergency help line-**311**. Customers can dial this number to notify us of any problems they may be experiencing and a water quality investigator will be dispatched within twenty-four hours to respond to and resolve the problem. In addition, Houston Drinking Water Operations operates a 24-hour control center to remotely monitor system conditions at all its facilities. This control center assists with responding to system problems before they affect the customers.



### En Español

Este informe contiene información muy importante sobre de su agua que bebe. Tradúzcalo, ó hable con alguien que lo entienda. Para mas información por favor llame Línea de Ayuda de Houston marcando 311.