

# City of Baltimore Annual Water Quality Report

Baltimore City Department of Public Works



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## Eighth Annual Water Quality Report

This is the eighth edition of Baltimore City's Annual Water Quality Report that we are pleased to make available to our customers. This report for our Water System (PWSID#: 0300002) contains information regarding the quality of the water you drink, as well as educational and important public health notices and contacts. The information in this Drinking Water Quality Report, covering the year 2005, is being provided to you in addition to other notices that may be required by law.

Questions about this report and requests for additional copies should be directed to one of the City's Water Quality Laboratories (Ashburton - 410-396-0150 or Montebello - 410-396-6040).

We also wish to take this opportunity to inform you that tours of the treatment plants are again being offered; however, some restrictions may continue to be observed based on ongoing facility security requirements.

This report, along with more information about water quality, system history and common water quality concerns can be accessed through the Baltimore City Department of Public Works' Web Site at:

<http://www.baltimorecity.gov/government/dpw/water.html>

## NEW FEDERAL WATER QUALITY REGULATIONS WILL REQUIRE CHANGES TO FINISHED WATER STORAGE RESERVOIRS

### Available Options are to Cover, Replace or Provide Additional Treatment

On January 5, 2006, the Environmental Protection Agency (EPA) published the Long Term 2 Enhanced Surface Water Treatment Rule. In addition to other measures, this regulation requires that water systems that maintain uncovered finished water storage reservoirs must either cover them, replace them with storage tanks or provide additional and substantial treatment as the water leaves these storage facilities. This requirement will have far reaching ramifications for Baltimore's Water System.

Many years ago, when water engineers began to establish the system we enjoy and benefit from today, there was an accepted belief that re-chlorination of stored finished water in an open reservoir was sufficient to ensure that the water would be free of harmful bacteria

and other microorganisms that could adversely affect health. This remains true for most potential biological contaminants; however, the industry now recognizes the possibility — though remote, that chlorine resistant microorganisms such as cryptosporidium (see page 3 of this report) could enter the system through open reservoir locations.

Even before this regulatory requirement, the Baltimore System had been proactive in addressing this issue. Covers for several moderately-sized reservoirs have either been installed or are in the process of being studied or designed. However, there are system storage reservoirs that are so large in size and capacity that covers would be impractical.

The City of Baltimore will closely explore available options to meet this unfunded

federal mandate while also considering interrelated water quality regulations, system security, future regulatory compliance and of course public concerns.



One of the larger finished water reservoirs in Baltimore's Water System that will have to be covered, replaced or have significant additional treatment before water is discharged for system use.

## WHERE YOUR MONEY IS GOING

### The Baltimore City Water System 6-Year Capital Program

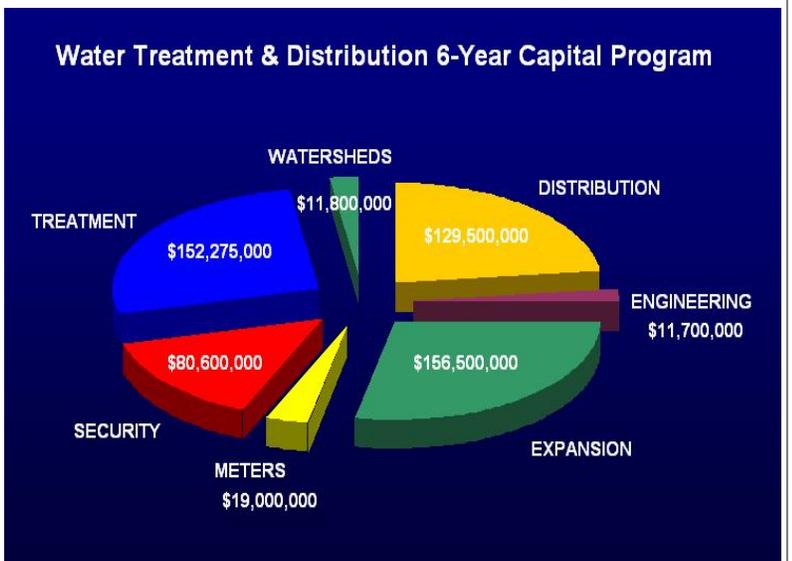
The Department of Public Works' Bureau of Water & Wastewater estimates it will spend approximately \$560,000,000 over the next six years to rehabilitate and update your water system. These improvements range from minor road repairs at the watersheds to a new \$130,000,000 water treatment facility at Fullerton.

Improving security at our water facilities remains a high priority, with over \$80,000,000 in projected spending during the subject time period for reservoir improvements and other enhancements.

Changing regulatory mandates continue to drive the need for improvements at our existing treatment facilities, with an extensive filter renovation planned for the Montebello Water Treatment Complex

that should begin soon after the current renovations to the Ashburton Water Treatment Plant are completed.

These changes will result in a safer, more efficient water supply that will meet tomorrow's challenges.



## BALTIMORE CITY WATER QUALITY REPORT FOR 2005

During the year 2005, the City performed approximately 150,000 water quality analyses...



Coliform bacteria indicate the potential presence of disease-causing organisms

Turbidity measurements are a way to describe the level of "cloudiness" of the water

Lead and Copper Testing was last required in 2003. That evaluation involved 51 "tier 1" or high risks homes.

During the year 2005, the City performed approximately 150,000 water quality analyses as part of a continuous effort to assure the water you drink meets or exceeds regulatory standards. The water is analyzed for over 90 different drinking water contaminants. A summary of the finished water quality results is provided below. The data represents the most recent testing done in accordance with the requirements of EPA's Water Testing Regulations and were the only regulated substances found in your drinking water.

### TERMS AND ABBREVIATIONS – What They Mean in Plain English

Term / Abbreviation	Definition	What it Means
PPM	Parts per million	1 ppm is the same as one drop in 10 gallons of water.
PPB	Parts per billion	1 ppb is the same as one drop in 10,000 gallons of water.
HLD	Highest Level Detected	Same
MCL	Maximum Contaminant Level	The highest level of a contaminant allowed by health regulations established by the Environmental Protection Agency.
MCLG	Maximum Contaminant Level Goal	Health related goals. The MCL is set as close to this "goal" as possible but with consideration to achievability and cost.
NTU	Nephelometric Turbidity Units	Units of measurement used to report the level of turbidity or "cloudiness" in the water.
AL	Action Level	If the "Action Level" for a particular contaminant is exceeded, a response that may include additional treatment steps and / or public education may have to be initiated by the water system.
TT	Treatment Technique	A "Treatment Technique" is a required process that is intended to reduce the amount of a specific contaminant in drinking water.
pCi/L	picoCuries per Liter	A measure of the level of radioactivity in the water.
TURBIDITY	Relates to a condition where suspended particles are present in the water.	Turbidity measurements are a way to describe the level of "cloudiness" of the water.
TOTAL / FECAL COLIFORMS	Indicator Bacteria	Type of bacteriological tests routinely used to determine if contamination has occurred in a drinking water system.
MRDL	Maximum Residual Disinfectant Level	Disinfectant level beyond which some people may experience irritating effects. Based on running annual average of monthly averages of distribution system samples computed quarterly.

### MICROBIOLOGICAL CONTAMINANTS

SUBSTANCE	MCLG	MCL	ASHBURTON PLANT	MONTEBELLO PLANT	MAJOR SOURCES
TOTAL COLIFORMS	0	The presence of coliform bacteria in more than 5% of monthly samples will exceed the MCL.	Highest monthly percentage of positive samples: 0%	Highest monthly percentage of positive samples: 0%	Naturally present in the environment.
FECAL COLIFORMS and E. COLI	0	A routine sample and a repeat sample are total coliform positive, and one is also fecal coliform or E. Coli positive.	Highest monthly percentage of positive samples: 0%	Highest monthly percentage of positive samples: 0%	Human and animal fecal waste.

### TURBIDITY

SUBSTANCE	MCLG	MCL	ASHBURTON PLANT	MONTEBELLO PLANTS	MAJOR SOURCES
TURBIDITY <sup>1</sup>	None	Treatment	HLD	HLD	Soil run-off.
		Filtration	0.19 NTU	0.21 NTU	
			LOWEST %	LOWEST %	
			100	100	

1. Turbidity cannot exceed 1 NTU and must be less than or equal to 0.3 NTU in at least 95% of measurements taken each month. Lowest % is the lowest percentage of monthly filtered water turbidity samples less than 0.3 NTU.

### LEAD AND COPPER TESTING

Lead and copper testing was last required by regulatory standards in 2003. During that year, the testing involved 51 "tier 1" or high risks homes. To determine compliance, the 51 test results were arranged from the lowest value to the highest. The 90th percentile value is identified by : 51 x 0.9 = 45.9. Therefore, the 46th value, arranged from lowest to highest, must be below the "action level" for lead and copper. Our system met this compliance standard.

**LEAD AND COPPER TESTING RESULTS (2003)**

SUBSTANCE	ACTION	90TH PERCENTILE	SAMPLE RESULTS GREATER THAN ACTION
LEAD	15 ppb	10 ppb	4
COPPER	1,300 ppb	283 ppb	0

*To minimize your exposure to lead and copper, if the tap has not been used for several hours, it is recommended that you flush your tap for at least 30 seconds before using water for drinking or cooking and don't consume hot water from the tap. To conserve water, consider keeping a container of drinking water in your refrigerator.*

**INORGANIC CONTAMINANTS**

SUBSTANCE	MCLG	MCL	ASHBURTON PLANT		MONTEBELLO PLANTS		MAJOR SOURCES
			HLD	RANGE	HLD	RANGE	
BARIUM	2 ppm	2 ppm	<0.02 ppm	<0.02 ppm	0.03 ppm	0.02 - 0.03 ppm	Discharge of drilling wastes & metal refineries; erosion of natural deposits.
NITRATE (AS NITROGEN)	10 ppm	10 ppm	2.21 ppm	1.49 - 2.21 ppm	2.32 ppm	1.37 - 2.32 ppm	Run-off from fertilizer use; leaching from septic tanks; erosion of natural deposits.

**FLUORIDE**

SUBSTANCE	MCLG	MCL	ASHBURTON PLANT			MONTEBELLO PLANTS			MAJOR SOURCES
			HLD	RANGE	AVERAGE	HLD	RANGE	AVERAGE	
FLUORIDE	4 ppm	4 ppm	1.32 ppm	0.11 - 1.32 ppm	0.99 ppm	1.84 ppm	0.00 - 1.84 ppm	0.98 ppm	Water additive that promotes strong teeth; erosion of natural deposits.

**CHLORINE**

SUBSTANCE	MRDLG	MRDL	RUNNING ANNUAL AVG. OF MONTHLY SAMPLES COMPUTED QUARTERLY	SOURCE
CHLORINE	4 ppm	4 ppm	0.49 ppm (Based on 4,923 distribution system samples collected in 2005).	Water treatment additive to disinfect supply.

**RADIOACTIVE CONTAMINANTS**

SUBSTANCE	MCLG	MCL	ASHBURTON PLANT	MONTEBELLO PLANTS	MAJOR SOURCES
BETA PHOTON EMITTERS	0 mrem/yr	50 pCi/L*	3+/-2 pCi/L	3+/-2 pCi/L	Erosion of natural deposits.
ALPHA EMITTERS	0 pCi/L	15 pCi/L	<1 pCi/L	1+/-1 pCi/L	Erosion of natural deposits.

\*The MCL for Beta Photon Emitters is 4 millirems per year (a measure of radiation absorbed by the body). The EPA considers 50 pCi/l to be a level of concern for this contaminant.

**VOLATILE ORGANIC CONTAMINANTS**

SUBSTANCE	MCLG	MCL	ASHBURTON PLANT			MONTEBELLO PLANTS			MAJOR SOURCES
			HLD	RANGE	*AVERAGE	HLD	RANGE	*AVERAGE	
TOTAL THM'S	N/A <sup>1</sup>	80 ppb	99 ppb	4 - 99 ppb	44 ppb	103 ppb	19-103 ppb	48 ppb	By-product of drinking water chlorination.
HAA(5)	N/A <sup>1</sup>	60 ppb	112 ppb	<0.5-112 ppb	40 ppb	95 ppb	<0.5-95 ppb	39 ppb	By-product of drinking water chlorination.

1. Not applicable because there are individual MCLG's for individual THM's and HAA(5)'s. \*The averages listed are running annual averages. Compliance is based on these values.



*Chlorine's reaction with decomposing vegetation - such as leaves can result in by-product formation*

**Important Health Information**

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised people such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly citizens and infants can be particularly at risk from infections. These people should seek advice about drinking water from their healthcare providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

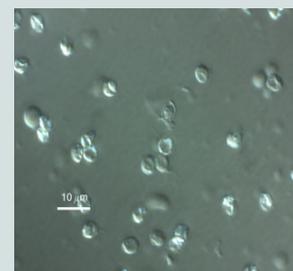
**Cryptosporidium** (crip-toe-spor-ID-ee-um) is a protozoan, a single-celled parasite that can invade and reside in the intestines of animals and people. This organism is found in some surface water (lakes, reservoirs, rivers, etc.) and also groundwater under the influence of surface water. Infection of healthy individuals by this organism can cause

a gastrointestinal illness referred to as cryptosporidiosis (crip-toe-spor-id-ee-o-sis), which may produce symptoms including diarrhea, headache, abdominal cramps, nausea, vomiting and low-grade fever. The symptoms usually last one to two weeks. For immunocompromised people, however, the infection can continue and last for several

months. Because there are no effective medical treatments, prolonged infection can be fatal for severely immunocompromised individuals. Human transmission routes include ingestion of contaminated food or drinking water or through direct contact with contaminated fecal matter. The City monitors its raw water sources for the presence of Cryptosporid-

ium using the services of environmental laboratories employing the latest available and approved analytical methods. Analyses for cryptosporidium performed in the year 2005 on water samples obtained from each of the City's raw water sources (see page 4 of this report) showed an average of <0.075 cryptosporidium oocyst / Liter.

*Microscopic view of Cryptosporidium oocysts*



Consumers should be aware that drinking water, including bottled water, might reasonably be expected to contain at least small amounts of some contaminants...

## How Can Impurities Get in the Water Supply?

As water travels over the surface of the land, it dissolves naturally-occurring minerals and can pick up substances resulting from the presence of animals or from human activity. Contaminants may include: viruses and bacte-

ria that may come from sewage treatment plants, septic systems, livestock and wildlife; salts and metals that can be naturally-occurring or result from storm water run-off, wastewater discharges, and farming; organic chemicals that are by-products of industrial processes and petroleum production, agriculture, gas stations, storm water run-off and septic systems and radioactive contaminants, which

can be naturally-occurring.

In order to assure that tap water is safe to drink, the Environmental Protection Agency (EPA) sets regulations that limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration (FDA) regulations set limits for contaminants in bottled water that must provide the same protection for public health.

Consumers should be aware that drinking water, including bottled water, might reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that these waters pose a health risk. More information about contaminants and potential health effects can be obtained by calling the **Environmental Protection Agency's Safe Drinking Water Hotline (800-426-4791)**.

## What are the Sources of Baltimore's Water Supply?

Baltimore uses surface water from rainfall and snow melt as the source of its water. This water, approximately 75 billion gallons of available storage volume at maximum capacity, is collected and stored in the City-owned and operated areas of the watersheds.

Liberty Reservoir supplies raw water to the Ashburton Water Treatment Plant and is located on the North Branch Patapsco River.



Liberty Reservoir Dam

Loch Raven Reservoir supplies water to the Montebello Filtration Plants [1 and 2] and is located in Baltimore County on the Gunpowder Falls.



Newly Improved Loch Raven Dam

Prettyboy Reservoir is located approximately six miles south of the Maryland and Pennsylvania State line and is within the drainage area of the Loch Raven Reservoir.

Water is released from the Prettyboy Reservoir into the Gunpowder Falls, which then drains into Loch Raven Reservoir.

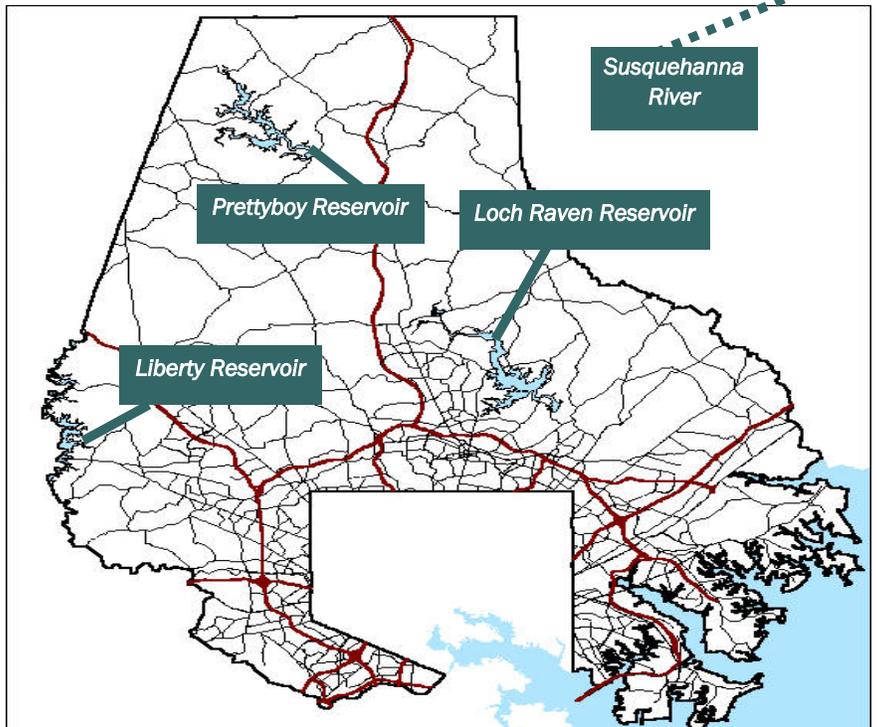
The City also maintains raw supply intake facilities and an associated pumping station on the Susquehanna River. These facilities were last used extensively in 2002 because of the severe drought in the north-



Susquehanna River

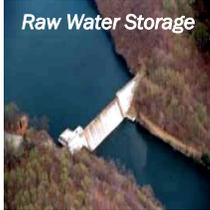
eastern part of the country. Fortunately, since that time, precipitation has been so favorable that the storage reservoirs have been at or above their maximum capacity

with water often overflowing the dams.

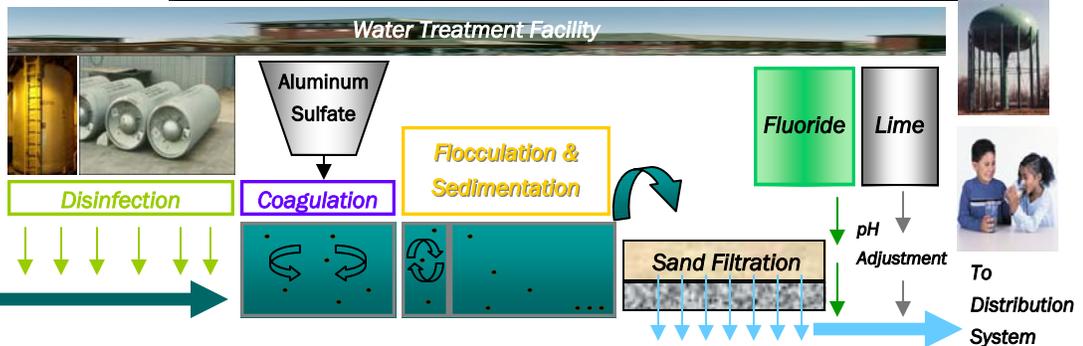


## Baltimore's Water Treatment Process

When the water reaches the filtration plants, sufficient chlorine is added to kill many of the microorganisms that could otherwise potentially cause illness...



Raw Water Storage



## You Can Help with Water System Security

Water system security continues to be an enormously important issue. If you notice suspicious activities in or around local water utilities such as persons videotaping or photographing facilities, equipment or structures, please call 410-396-6762.

ing; tampering with equipment or other similar activities, please contact your local law enforcement agency immediately by dialing 911. For other suspicious activities that may appear non-threatening such as persons videotaping or photographing facilities, equipment or structures, please call 410-396-6762.

