



## BALTIMORE CITY WATER QUALITY REPORT FOR 2004

*During the year 2004, 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 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.*

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### 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	0.18 NTU	0.37 NTU	
			LOWEST %	LOWEST %	
			100	99.9	

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.

*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.*

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

SUBSTANCE	ACTION LEVEL	90TH PERCENTILE	SAMPLE RESULTS GREATER THAN ACTION LEVEL
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	2.46 ppm	1.76 - 2.46 ppm	2.75 ppm	1.38 - 2.75 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	0.27 - 1.32 ppm	0.91 ppm	1.70 ppm	0.07 - 1.70 ppm	0.91 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	0.59 ppm (Based on 4,936 distribution system samples collected in 2004).	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	69 ppb	20 - 69 ppb	41 ppb	81 ppb	20 - 81 ppb	46 ppb	By-product of drinking water chlorination.
HAA(5)	N/A <sup>1</sup>	60 ppb	92 ppb	9 - 92 ppb	44 ppb	83 ppb	2 - 83 ppb	41 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

**SYNTHETIC ORGANIC CONTAMINANTS**

SUBSTANCE	MCLG	MCL	ASHBURTON PLANT		MONTEBELLO PLANTS		MAJOR SOURCES		
			HLD	RANGE	HLD	RANGE			
DI(2-ETHYLHEXYL) PHTHALATE			0 ppb	6 ppb	0.61 ppb	<0.5 - 0.61 ppb	0.81 ppb	<0.5 - 0.81 ppb	Discharge from rubber and chemical factories.
DI (2-ETHYLHEXYL) ADIPATE			400 ppb	400 ppb	N/A	N/A	0.69 ppb	<0.5 - 0.69 ppb	Discharge from chemical factories.

**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

**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 organ-

ism 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 Cryptosporidium using the services of environmental laboratories employing the latest available and approved analytical methods. Analyses for cryptosporidium performed in the year 2004 on water samples obtained from each of the City's raw water sources (see pages 1 &

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 bacteria 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.

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 ob-

### Source Water Assessment

Continued from Page 1.

hazardous materials. The majority of the population living within the watershed is served by the metropolitan sewer system and their wastewater is piped outside of the reservoir watershed. The sewage infrastructure system represents a potential source of contamination due to blockages, pump failures or other disruption in service. The municipal wastewater plants from the Towns of Hampstead and Manchester discharge treated effluent into tributaries feeding Loch Raven and Prettyboy Reservoirs, respectively. State issued discharge permits for these plants have strict phosphorus limits. Stormwater runoff originating in developed areas transports sediment via stream bank erosion, and conveys road salts, pathogens and nutrients to the reservoirs. Runoff from agricultural areas include sediment, pathogens and nutrients. The report identi-

fies several areas of failing septic systems that need correcting. Road crossings over Loch Raven Reservoir proper and interstate crossings over tributaries just upstream of the reservoir are key areas of potential concerns for spills.

The Report's susceptibility analysis indicates that phosphorus is the primary concern to Loch Raven and Prettyboy Reservoirs. Sediment, sodium, disinfection byproduct precursors and pathogenic protozoans are also contaminants of concern.

Several recommendations are included in the report. They include: strengthening the Reservoir Management Agreement; expanding the local partnerships and reducing phosphorus loadings.

#### Liberty Reservoir

Liberty Reservoir is located on the North Branch of the Patapsco River on the boundary between Baltimore and Carroll Counties. The reservoir collects water from a 163.8 square mile water-

shed that includes eastern Carroll County and western Baltimore County. The storage capacity of this reservoir is approximately 36.8 billion gallons. Water from Liberty Reservoir is delivered to the Ashburton Water Treatment Plant via a 12.5 mile long 10' diameter tunnel.

Potential sources of contamination include point and non-point sources, including industrial sites, highways, a railroad, a petroleum product pipeline, agriculture and septic tanks in rural portions of the watershed. An increasing trend for total dissolved solids, chlorides, and conductivity in the tributaries indicates that human activities, such as development, are having an increasing effect on reservoir water quality. Liberty Reservoir is susceptible to protozoa, viruses and coliforms, as are all surface water sources. However, sampling data suggests that Liberty Reservoir, as well as the Loch Raven and Prettyboy Reservoirs, may pose a much lower risk from pathogenic organisms than most source

waters drawing directly from rivers or streams.

Liberty recommendations include: strengthening the Watershed Agreement between Baltimore City, Baltimore County and Carroll County; Instituting protective low density zoning in the watershed; expanding [an already extensive] water quality sampling program; and [augmenting] phosphorus control.

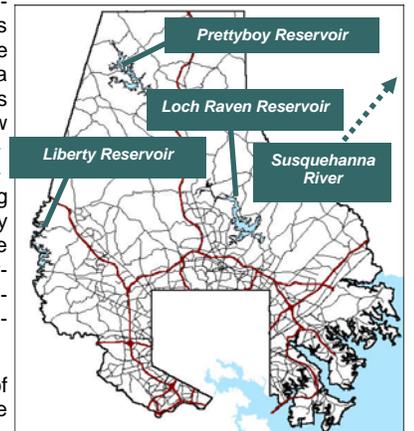
#### Susquehanna River

The City treats water received from the Susquehanna River, typically during periods of drought. The Susquehanna River Basin spans three states (New York, Pennsylvania, and Maryland), draining approximately 27,500 square miles, or 43 percent of the Chesapeake Bay's drainage area.

Contaminants of concern to the

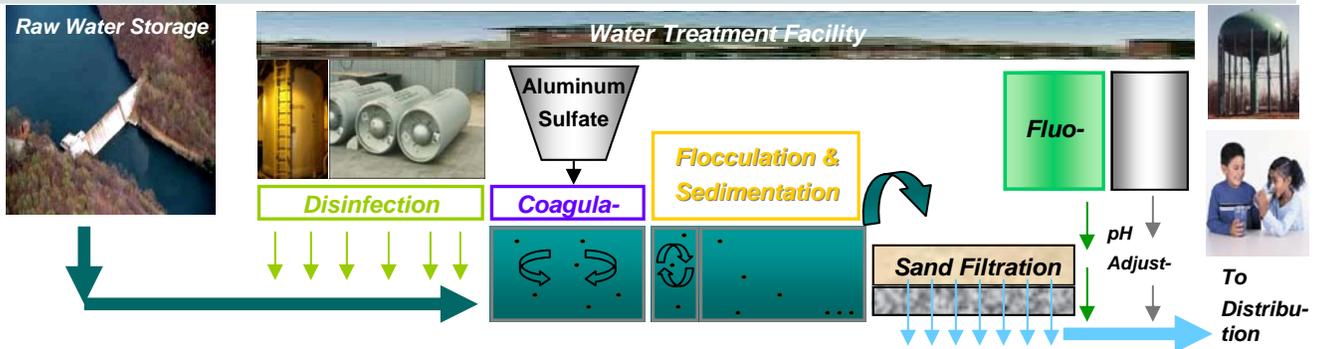
water supply include turbidity, sediment, microbials, disinfection byproducts, inorganic compounds, organic compounds, and radionuclides. The sources for these contaminants are largely associated with agricultural land use within the Lower Susquehanna Subbasin, and

Reports in their entirety are available at the Enoch Pratt Free Library, or can be made available to you by contacting the Bureau of Water and Wastewater in the City Department of Public Works, or the MDE Water Supply Program.



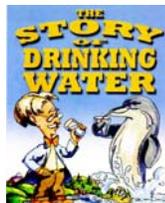
### Baltimore's Water Treatment Process

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



### Free Publication Offer

"The Story of Drinking Water" Available for Students attending Grades 2 - 6



This colorful 16 page booklet published by the American Water Works Association (AWWA) has been a great favorite of elementary school aged students who have visited our water treatment facilities over the past 25 years. It contains information about the water cycle, water sources, drinking water treatment, water conservation and the importance of water to human survival. For a free



Born into a world where you have water on demand? Learn more about this important public works service... Come visit! Baltimore Public Works Museum Pier7 Inner Harbor Tuesday-Sunday 10am to 4pm