STEPHANIE RAWLINGS-BLAKE
MAYOR

City of Baltimore
Annual Water Quality Report
Baltimore City Department of Public Works

BALTIMORE CITY DPW
DEPARTMENT OF PUBLIC WORKS
DAVID E. SCOTT, P.E.
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Reporting Period: January 1, 2009 to December 31, 2009

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311

The Bureau of Water and Wastewater strives to provide the best possible customer service. You can help us by using the 311 system. If you have a water, sewer or storm drain issue which requires our assistance, please call 311. Examples are: no water in my house, broken water main or leak, sewage flowing in a stream, storm drain filled with trash.

By using 311, Baltimore is able to provide you with a tracking number which is directly tied to your service request. By using 311, we can make sure your request is processed, tracked, completed and evaluated for customer satisfaction.

You can also use 311 on-line: https://baltimore.customerservicerequest.org/web_intake_balt/Controller.

If you have a question you would like answered which is not a request for service you can send it to Water@baltimorecity.gov. Examples are: When is fishing season at Loch Raven? How is my drinking water processed? What are those big domes at Back River? You can also go to www.baltimorecity.gov for answers.

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Rebuilding an Aging Water Treatment System

There is no doubt about it, Baltimore's water system has been around a long time, yet it still is one of the best in the country. What keeps it that way its continuous renewal and investment, and that investment needs to accelerate if we are to be a world-class provider of water to our customers.

Baltimore's water supply originates on three rivers. Two reservoirs are located on the Gunpowder River at the Loch Raven Dam (completed in 1915) and the Prettyboy Dam (completed in 1932). A third is on the North Branch Patapsco River at the Liberty Dam (completed in 1956). All three of these dams receive constant attention and upgrades as necessary. The Loch Raven Dam was doubled in mass during a major renovation project which was completed in 2005. Prettyboy Dam is currently undergoing substantial reconstruction to strengthen it and to realign the gatehouse on the structure.

The Susquehanna River is the third source of raw water for our customers in the Baltimore region. Water is withdrawn as needed from the Conowingo intake using the Deer Creek Pumping Station. Although primarily used during drought, this source is expected to play a key role in providing water for our growing metropolitan area.

Water from these rivers is processed at our treatment plants. In 2009, the City produced, on average, 229 million gallons of water per day (MGD) to sufficiently supply our 1.8 million consumers in the City of Baltimore and the metropolitan area. The City's three water treatment plants: Montebello Filtration Plant I (1915), Montebello Filtration Plant II (1928) and the Ashburton Filtration Plant (1956) operate around-the-clock to provide the highest quality product.

Although these facilities have long histories, they have received major upgrades over the decades; the most recent having been completed in 2009 at Ashburton. This five-year reconstruction project of the Ashburton Filtration Plant and the wash-water lake has made it a 21st century facility that complies with present and anticipated Environmental Protection Agency (EPA) drinking water standards.

Montebello I is in the midst of revitalization which began with the Lake Montebello dredging and landscaping project completed in 2007. A new chlorination facility will soon be built on the campus and plans are underway to construct a pumping station to draw water from Lake Montebello for processing and use as drinking water. Additional improvements will follow based on the Ashburton model.

In 2006, the Environmental Protection Agency (EPA) published the Long Term 2 Enhanced Surface Water Treatment Rule. Among other things this regulation requires that water systems must enclose or provide post treatment at open finished water storage reservoirs. Baltimore City is working with Baltimore County to comply with this new regulation, and we have already completed construction of the covered reservoirs at Pikesville and Mays Chapel; the Towson Reservoir project is in the construction phase.

The City has also started construction on a four-year project to cover the finished water reservoir at Montebello Plant II, located on the west side of Hillen Road. A proposal to cover and landscape the Guilford Reservoir is in the design phase. Druid Lake and Lake Ashburton are too large to cover, so post-treatment will be utilized. This will most-likely involve the use of ultra-violet light to neutralize any possible pathogens in water leaving these reservoirs.

Once the water is treated and stored, it must be distributed to our customers. Our distribution system, which serves an area of approximately 234 square miles, consists of a network of mains varying in size from three inches to nine feet in diameter. The majority of these mains are cast iron, but some of the larger ones, that is, 24 inches in diameter and up, are made of steel or reinforced concrete. More than 3,100 miles of mains are in service.

In 2009, there were 1,125 water main breaks. Many of these were quite dramatic, disruptive and damaging. These included ones on E. Madison St., E. Lombard St., Argonne Dr., and also in Halethorpe and Dundalk. In March 2010, a break on a 36-inch main in NW Baltimore County disrupted water service to homes, schools and businesses for several days.

In the vast majority of cases these breaks are related to the simple fact that our mains have outlived their service life. They are old, patched and fragile.

To avert future main breaks there are planned capital expenditures of approximately one-half billion dollars to maintain, rebuild and improve the distribution system over the next six years. Even with a massive influx of capital, a disruption in water service is always a possibility. Natural or man-made events could at any time make the tap go dry. **Remember: always keep on hand a three-day supply of water for each member of your household.**

Baltimore City, through planning, engineering and construction, is meeting the anticipated water needs of future generations. The legacy of those whose vision gave us such an outstanding utility will be continued by this generation.

BALTIMORE CITY WATER QUALITY REPORT FOR 2009

In the year 2009, 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 as defined.
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 PLANTS	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: 0.80%*	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: 0.53%*	Human and animal fecal waste.

* Met MDE regulations - All repeat samples were negative.

TURBIDITY

SUBSTANCE	MCLG	MCL	ASHBURTON PLANT		MONTEBELLO PLANTS		MAJOR SOURCES
TURBIDITY[1]	None	Treatment Technique (TT)	HLD	LOWEST %	HLD	LOWEST %	Soil run-off.
		Filtration	0.06 NTU	100	0.27 NTU	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.

ARSENIC RESULTS

SUBSTANCE	MCL	ASHBURTON PLANT	MONTEBELLO PLANTS	MAJOR SOURCES
ARSENIC	0.010 ppm	<0.002 ppm	<0.002ppm	Erosion of natural deposits.

LEAD AND COPPER TESTING

Lead and copper testing was last required by regulatory standards in 2009. During that year, the testing involved 53 "tier 1" or high risks homes. To determine compliance, the 53 test results were arranged from the lowest value to the highest. The 90th percentile value is identified by: 53 x 0.9 = 47.7. Therefore, the 48th value, arranged from lowest to highest, must be below the "action level" for lead and copper. Our system met this compliance standard. Testing will be required again in 2012.

LEAD AND COPPER TESTING RESULTS (2009)

SUBSTANCE	ACTION LEVEL	90TH PERCENTILE	SAMPLE RESULTS GREATER THAN ACTION LEVEL
LEAD	15 ppb	7.6 ppb	2
COPPER	1,300 ppb	357 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	0.04 ppm	0.03 - 0.04 ppm	Discharge of drilling wastes & metal refineries; erosion of natural deposits.
NITRATE (AS NITROGEN)	10 ppm	10 ppm	2.23 ppm	1.31-2.23 ppm	2.46 ppm	1.40 - 2.46 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	0.66 - 1.32 ppm	0.90 ppm	1.66 ppm	<0.20 - 1.66 ppm	0.93 ppm	Water additive that promotes strong teeth.

CHLORINE

SUBSTANCE	MRDLG	MRDL	RUNNING ANNUAL AVG. OF MONTHLY SAMPLES COMPUTED QUARTERLY	MAJOR SOURCE
CHLORINE	4 ppm	4 ppm	0.50 ppm (Based on 4,668 distribution system samples collected in 2009)	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 CHEMICALS

SUBSTANCE	MCLG	MCL	ASHBURTON PLANT			MONTEBELLO PLANTS			MAJOR SOURCES
			HLD	RANGE	*AVERAGE	HLD	RANGE	*AVERAGE	
TOTAL THM'S	N/A[1]	80 ppb	112 ppb	13 - 112 ppb	46 ppb	141 ppb	14-141 ppb	46 ppb	By-product of drinking water chlorination.
HAA(5)	N/A[1]	60 ppb	68 ppb	<0.5-68 ppb	37 ppb	73 ppb	2-73 ppb	32 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.

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 fecal matter.

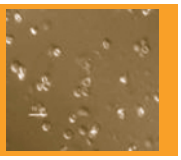
The City monitors its raw water sources for the presence of Cryptosporidium using the services of environmental laboratories employing the latest available and approved analytical methods.

CRYPTOSPORIDIUM RESULTS

Liberty: 0.0 Oocyst/Liter

Loch Raven: 0.00 Oocyst/Liter

Susquehanna River: 0.1 Oocyst/Liter



Microscopic view of Cryptosporidium oocysts

SECONDARY CONTAMINANTS

Sodium levels in the water supply are often of concern to consumers who contact our facilities. Sodium naturally occurs in raw waters but the concentration can be increased due to the influence of run-off from road surfaces treated with rock salt during snow and ice removal efforts. During the year 2009, the average sodium concentrations measured in the finished water from the Ashburton and Montebello Water Treatment Plants were 14.7 ppm and 17.0 ppm respectively and are considered low.

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In order to run Baltimore in an efficient manner, the 311 system was established. Circumventing the system means that your request gets lost and may never be addressed.

Baltimore County residents who receive water bills from Baltimore City: please call 410-396-5352 with your water customer service requests and inquiries.

All Baltimore City water customers can call 410-396-5398 for billing inquiries.

Twelfth Annual Water Quality Report

This is the twelfth edition of Baltimore City's Annual Water Quality Report that the Department of Public Works is pleased to make available to Baltimore's 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 2009, is being provided to you in addition to other notices that may be required by law.

Questions about this report, questions about drinking water quality, or information on source water assessments 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 are pleased 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: www.baltimorecity.gov

Protecting and Preserving Our Watersheds

Baltimore uses surface water from rainfall and snowmelt as the source of its water. This water, approximately 75 billion gallons of storage volume at maximum capacity, is collected and stored in the City owned and operated watersheds: Liberty, Loch Raven and Prettyboy.

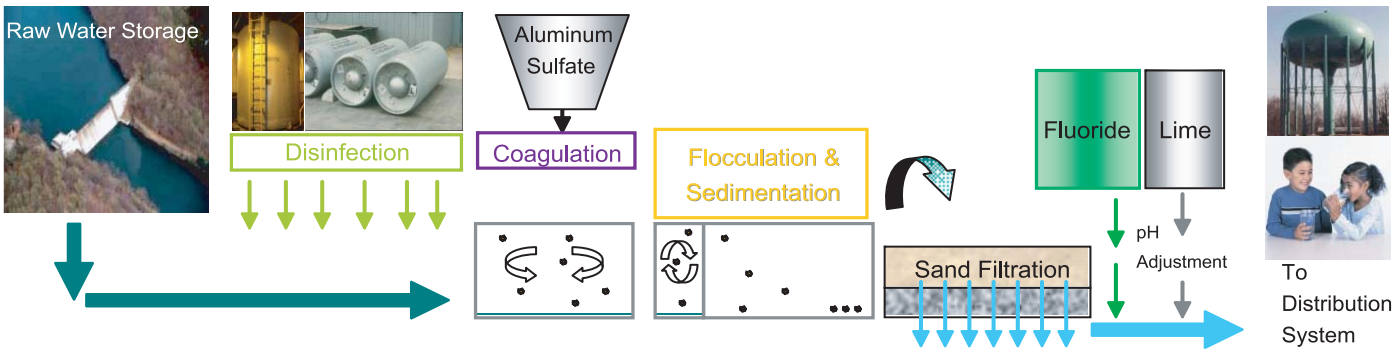
These reservoir lands were established for the sole purpose of protecting our drinking water supply. The forests and other vegetation remove nutrients and prevent erosion and runoff. Protecting these lands is a full-time job for our team of Watershed Rangers, biologists and maintenance personnel.

There are many challenges we are facing in preserving these watershed lands. Invasive plant and animal species are continuously a threat to a healthy ecosystem. Population growth over the last century has meant the loss of green space for outdoor activities, leaving the reservoirs as primary attractions for recreation. While the reservoirs are open for biking, hiking, boating and fishing, various restrictions are in place to protect our drinking water. Swimming is strictly prohibited. Reservoir grounds are closed from sunset to sunrise.

In 2010, new signs and new trail blazes will be installed. These will help you better understand the importance of these lands and how you can protect them. They will also let you know the reservoir rules so that you can help us protect and preserve these Baltimore treasures.

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...



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, live-stock, and wildlife*
- *Salts and metals that can be naturally-occurring or result from storm water runoff, wastewater discharges, and farming*
- *Organic chemicals that are by-products of industrial processes and petroleum production, agriculture, gas stations, storm water runoff, 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 water poses 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).

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 cutting, or climbing facility fencing, loitering, 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.