

2016 DRINKING WATER QUALITY REPORT

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***CONSUMER CONFIDENCE REPORT***

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**WATER SOURCE**

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Currently, the Brockton system obtains its drinking water from Silver Lake and the Brockton Reservoir. Silver Lake is the primary supply (89.01% of total) and is located approximately 15 miles southeast of the center of Brockton. Over 50% of the watersheds are either owned by the City of Brockton or in conservation protection. The remainder of the acreage is largely low-density residential development. Water from the lake is treated at the Silver Lake Water Treatment Plant (SL WTP) and is transmitted through two 24-inch diameter mains to the City's Pumping station. After the pumping station, the water travels through one 36-inch diameter and two 24-inch diameter transmission mains to the Brockton service system. The Brockton Reservoir is a supplemental supply (4.68 % of total) to Silver Lake and is blended into the system at Woodland Avenue. This reservoir was placed in service when the Woodland Avenue WTP became operational in 1994. The Brockton service area and water sources are shown on the map on the front cover. Brockton may also purchase supplemental water from the Aquaria Water Treatment Plant in Dighton, Mass. which treats water from the Taunton River and is connected to the Brockton water system on Pearl St at the West Bridgewater line. Brockton did purchase water from Aquaria in 2016 (6.31% of total).

Silver Lake can be supplemented by Furnace Pond in Pembroke and Monponsett Pond in Halifax and are diverted by gravity to Silver Lake. These sources are subject to certain seasonal operating restrictions. The safe yield of the Silver Lake system is 9.4 million gallons per day (mgd). The safe yield of the Brockton Reservoir is 0.81 mgd.

Emergency sources include the Hubbard Avenue well, located in the southern part of Brockton. The Hubbard Avenue well has not been active since 1985 due to fear of drawing nearby contaminated groundwater toward the well.

Over the last twenty years the City has replaced 18,387 miles of undersized mains and 16,692 miles of large 100 year old mains for a total of 33.60 miles of pipe, which has reduced water lost in the system while adding over 199 new fire hydrants to these streets. This year the City replaced Torrey St. for over a mile of older pipes replaced. The City has a regular leak detection program that regularly inspects the 303 miles of water mains in Brockton. This has maintained the systems annual water consumption at 10.779 million gallons per day in 2016.

**SOURCE WATER ASSESSMENT PROGRAM**

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The Brockton water system was evaluated in April 2003 by the Department of Environmental Protection (DEP) and has remained relatively unchanged since then. This evaluation is called a Source Water Assessment Program (SWAP). The SWAP found that the watersheds for the Brockton Water System are primarily a mix of underdeveloped forest (42% for Silver Lake 38% for Brockton Reservoir), residential development (23% and 14%). Agriculture, industry (18% for Brockton Reservoir) commercial uses and protected open space. The Hubbard Avenue Well which is only used in an emergency has an Interim Wellhead Protection Area (IWPA) that contains predominantly residential (35%), commercial (21% and industrial (8%) uses, with some forest. In the SWAP the Brockton Water System was commended for taking an active role in implementing source protection measures. The SWAP is available for review and questions at the Brockton Water Commission Office. Brian Creedon, the Water Systems Manager, is available to answer any questions and is available for educational programs on further inquires on the Brockton Water System. Further information on the SWAP is available at [www.state.ma.us/dep](http://www.state.ma.us/dep).

**Substances found in tap water**

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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 mineral, and in some cases, radioactive material. It can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include:

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 stormwater 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 agricultural, urban stormwater runoff, and residential uses.

Organic chemical contaminants -including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.

Radioactive contaminants -which can be naturally occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (EPA) prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration (FDA) regulations

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**Public Water System ID 40444000-01S&02S**

establish limits for contaminants in bottled water that must provide the same protection for public health. All 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 can be obtained by calling the EPA Safe Drinking Water Hotline at 800-426-4791.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, persons with HIV/AIDS or other immune system disorders, some elderly, and some infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care 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 at 800-426-4791.

**IMPORTANT DEFINITIONS**

**Maximum Contaminant Level (MCL)** – the highest level of a contaminant that is allowed in drinking water.

**Maximum Contaminant Level Goal (MCLG)** – the level of a contaminant in drinking water below which there is no known or expected risk to health.

**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 expected risk to health.

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

**Action Level (AL)** – The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

**90th Percentile:** – Out of 10 homes, 9 were at or below this level.

**Secondary** – Secondary Drinking Water Standards are unenforceable federal guidelines regarding taste, odor, color, and certain other non-aesthetic effects of drinking water.

**ppm** – one part per million or milligram per liter

**ppb** – one part per billion or microgram per liter

**NR** – not regulated

**ND** –not detected

**N/A** – not applicable

**WATER QUALITY TESTING RESULTS**

The Brockton Water Treatment Plant continuously monitors for forty standard water processing tests including turbidity, pH, alkalinity, hardness, iron, manganese and color. The Brockton distribution system had over 2,300 microbial tests for coliform (over 192/month) and had no positive results (all absent of coliform). The water at both the Silver Lake and the Woodland Avenue Treatment facilities are tested for both Pesticides and herbicides and Organic chemical contaminants (see Substances Found in Tap Water above) with zero detectable contaminants.

The following table includes those of the 84 regulated contaminants that were tested in 2016 and are reported by DEP.

**REGULATED CONTAMINANTS**

Calendar Year 2016

CONTAMINANT (UNITS)	HIGHEST VALUE	RANGE DETECTED	AVERAGE DETECT	MCL	MCLG	VIOLATION (YES/NO)	POSSIBLE SOURCE OF CONTAMINATION
Turbidity (NTU)	0.28	0.04-0.28	0.049	TT=5.0 NTU	N/A	No	Soil runoff
Nitrate (ppm)	0.28	0.14-0.28	0.147	10	10	No	Runoff from fertilizer use; leaching from septic tanks, sewage; Erosion of natural deposits
HAA5 (Haloacetic Acids (ppb) LRAA	24.8	10.3-24.8	18.3	60	N/A	No	By-product of drinking water chlorination
TTHMs (Total trihalomethanes (ppb) LRAA	68.5	24-122.9	52.63	80.0	N/A	No	By-product of drinking water chlorination
Manganese (ppb)	.046	ND-0.046	.0058	.05	N/A	No	Erosion of natural deposits

**INORGANIC CONTAMINANT REPORT**

CONTAMINANT (units)	HIGHEST VALUE	RANGE DETECTED	AVERAGE DETECT	MCL	MCGL	VIOLATION (YES/NO)	POSSIBLE SOURCE OF CONTAMINATION
Barium(ppm)	0.044	.014-.044	.015	2	N/A	No	Erosion of natural deposits
Sodium (ppm)	68.80	19.50-68.80	21.81	N/A	NR	No	By-product of drinking water process

**Lead and Copper testing for the City of Brockton is required every 3 year and will be tested for again this fall at 30 approved sampling sites (residences) and at 2 schools or daycare sites. The School**

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Department in conjunction with the State of Massachusetts has just completed a testing of all City schools. The result of the Water Department's last testing follows:

**LEAD AND COPPER from 2014**

CONTAMINANT (UNITS)	ACTION LEVEL (AL)	MCLG	90 <sup>TH</sup> PERCENT LEVEL	# OF SITES TESTED	# OF SITES ABOVE AL	VIOLATION (YES/NO)	POSSIBLE SOURCE OF CONTAMINATION
Lead (ppb)	15	15	.002	34	0	NO	Sampled corrosion of household plumbing systems
Copper (ppm)	1.3	1.3	.09	34	0	NO	Sampled corrosion of household plumbing systems

**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 from the street and home plumbing. The City of Brockton Water Division is responsible for high quality drinking water, but 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 water for 30 seconds to 2 minutes, or until the water gets colder, before using water to drink or cook. 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 or at <http://www.epa.gov/safewater/lead>.

Turbidity is a measure of the cloudiness of the water. We monitor it because it is a good indicator of the effectiveness of our filtration system.

There were no Cryptosporidium cells found in any testing of the City of Brockton water system raw water sources during 2016 and 2017. The City does not add Fluoride to the water.

There was no detection of arsenic, antimony, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium, or thallium in our testing.

Brockton water is monitored continuously and has a hardness of 20 to 40 ppm, and is considered soft. This is important as less detergent is needed when using washing machines or dishwashers.

**Activated Charcoal Filtration with coagulation, flocculation and sedimentation:**

Small particles and organisms such as sediment, algae and bacteria can cause water to take on unpleasant odors or taste, and can sometimes make it unhealthy to drink. To remove this material, it is necessary to chemically treat the water and then pass it through an activated charcoal filter.

The process begins with alum being added to the water at an established rate. This prompts the small particles to coagulate, or stick together and form particles of increasing size. Heavier particles sink to the bottom of large settling basins while the cleaner water flows onto filter beds. Filters are comprised of several layers, which trap the small particles that did not settle out previously. Finally the activated charcoal removes organic particles left in the water. Each day these filters are cleaned by a backwash process. The water is then chlorinated to prevent any bacterial contamination.

The Commonwealth of Massachusetts, Department of Environmental Protection approves all chemicals used for coagulation for water treatment. Chemicals also have to meet performance standards established by the American Water Works Association.

**The City of Brockton is proud to present AquaHawk which allows its citizen the ability to view their water usage and set up alerts if the amount of water or dollar amount is exceeded. It can be found on the City Web Page at [www.brockton.ma.us](http://www.brockton.ma.us) on the front page.**

**\*\*\* You need to have your account number in order to register, which can be found on you water bill\*\*\***

**Water Use Restrictions (Water Bans) can be found on the City Web Page and also must be followed by properties with irrigation meters.**

The Brockton Water Commission meets at 39 Montauk Rd. every month, the schedule and agenda can be found on the City Web Site [www.brockton.ma.us](http://www.brockton.ma.us)

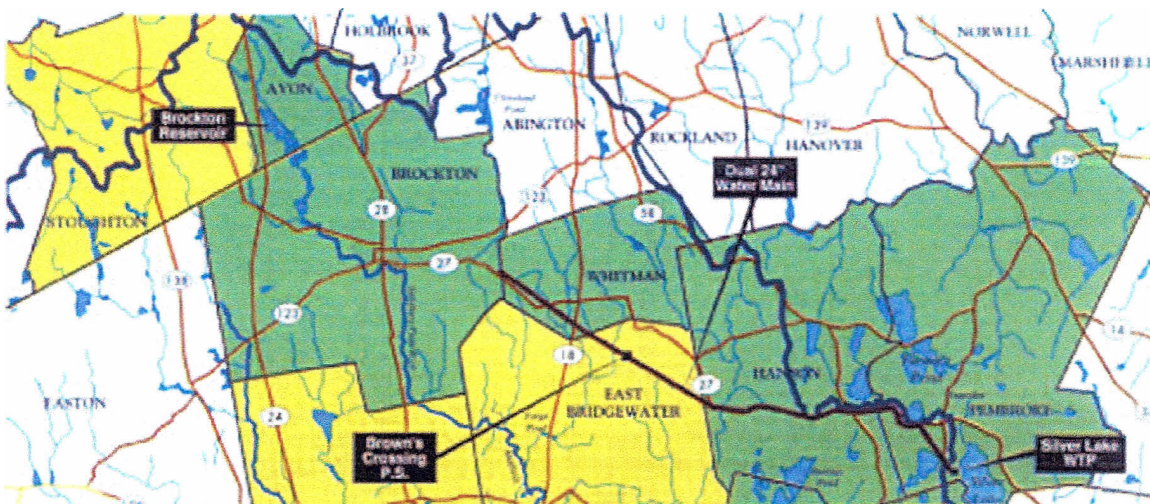
Copies of this report may be obtained and test results can be reviewed at the Water Commission's office.

Brockton Water Commission  
39 Montauk Road  
Brockton, MA 02301

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## CITY OF BROCKTON



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