Massachusetts Water Resources Authority
2018 Drinking Water Test Results

Your Drinking Water

Where To Go For Further Information
Massachusetts Water Resources Authority (MWRA)  www.mwra.com  617-242-5323
Massachusetts Dept. of Environmental Protection  www.mass.gov/dep  617-292-3500
Massachusetts Dept. of Public Health (DPH)  www.mass.gov/dph  617-624-6000
Department of Conservation and Recreation  www.mass.gov/dcr/watersupply  617-626-1250
US Centers for Disease Control & Prevention (CDC)  www.cdc.gov  800-232-4636
Source Water Assessment and Protection Reports  www.mwra.com/sourcewater.html  617-242-5323

Public Meetings
MWRA Board of Directors  www.mwra.com/boardofdirectors.html  617-788-1117
MWRA Advisory Board  www.mwraadvisoryboard.com  617-788-2050
Water Supply Citizens Advisory Committee  www.mwra.com/wscac.html  413-213-0454

For A Larger Print Version, Call 617-242-5323.

This report is required under the Federal Safe Drinking Water Act.  MWRA PWS ID# 6000000
Dear Customer,

I am pleased to share with you the annual results of our water quality testing. Each year, MWRA takes hundreds of thousands of tests to ensure your water is safe and of the highest quality. In 2018, we again met every federal and state drinking water standard.

Lead in drinking water is an important issue and we continue to make progress on reducing the risk by treating the water to make it less corrosive, and working with our member communities to identify and remove lead service lines. More information can be found on pages 4 and 5 of this report.

Your water system is well protected – from the source reservoirs to the treatment plants to the storage tanks – and real-time water quality monitoring allows us to check the water every step of the way. We also have emergency plans for all of our facilities so we can quickly respond to any issue any time of day or night.

Our emergency planning also includes redundancy for every part of the water system. We are currently working on two large pipeline projects to the north and south that will allow us to re-route the water in the event of a break so that your service will not be interrupted. Also, we have begun the initial design phase for two new water tunnels that will allow us to make repairs to the existing system. You will be hearing more about this in the coming years as the project gets underway.

I hope you will take a few moments to read through this important report and learn more about your water system. We have great confidence in the water we deliver to your home and we want you to share that confidence. Please contact us if you have any questions about this report or any of MWRA’s programs.

Sincerely,

Frederick A. Laskey
Executive Director

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For more information on MWRA and its Board of Directors, visit www.mwra.com.
Why Your Water Tastes Great – High Quality Source Water

Your water comes from the Quabbin Reservoir, about 65 miles west of Boston, and the Wachusett Reservoir, about 35 miles west of Boston. Water from the Ware River can also add to the supply at times. These pristine reservoirs supply wholesale water to local water departments in 51 communities. The two reservoirs combined supplied about 200 million gallons a day of high-quality water to consumers in 2018.

The Quabbin and Wachusett watersheds are naturally protected with over 85% of the watersheds covered in forest and wetlands. To ensure safety, the streams and reservoirs are tested often and patrolled daily by the Department of Conservation and Recreation (DCR).

Rain and snow falling on the watersheds - protected land around the reservoirs - turn into streams that flow to the reservoirs. This water comes in contact with soil, rock, plants and other material as it follows its natural path to the reservoirs. While this process helps to clean the water, it can also dissolve and carry very small amounts of material, including radioactive material, into the reservoir. Minerals from soil and rock do not typically cause problems in the water. But water can also transport contaminants from human and animal activity. These can include bacteria and pathogens - some of which can cause illness. The test data in this report show that these contaminants are not a problem in your reservoirs’ watersheds.

The Department of Environmental Protection (DEP) has prepared a Source Water Assessment Program report for the Quabbin and Wachusett Reservoirs.

The DEP report commends DCR and MWRA on the existing source water protection plans and states that our “watershed protection programs are very successful and greatly reduce the actual risk of contamination.” MWRA follows the report recommendations to maintain the pristine watershed areas.

Testing Your Water – Every Step Of The Way

Test results show few contaminants are found in the reservoir water. The few that are found are in very small amounts that are well below EPA’s standards.

Turbidity (or cloudiness of the water) is one measure of overall water quality. All water must be below 5 NTU (Nephelometric Turbidity Units) and water can only be above 1 NTU if it does not interfere with effective disinfection. Typical levels at the Wachusett Reservoir are 0.34 NTU. In 2018, turbidity was always below EPA’s 5 NTU standard. It was also below the stricter Massachusetts standard of 1 NTU 99.99% of the time, with the highest level 2.9 NTU.

MWRA also tests reservoir water for pathogens such as fecal coliform, bacteria and the parasites Cryptosporidium and Giardia that can enter the water from animal or human waste. All test results were well within state and federal testing and treatment standards. For more information, please visit www.mwra.com/ucmr/2018.html.

Test Results – After Treatment

EPA and state regulations require many water quality tests after treatment to check the water you are drinking. MWRA conducts hundreds of thousands of tests per year on over 120 contaminants (a complete list is available on www.mwra.com). Details about 2018 test results are in the table below. The bottom line is the water quality is excellent.

<table>
<thead>
<tr>
<th>Compound</th>
<th>Units</th>
<th>(MCL) Highest Level Allowed</th>
<th>(We Found) Detected Level-Average</th>
<th>Range Of Detentions</th>
<th>(MCLG) Ideal Goal</th>
<th>Violation</th>
<th>How It Gets In The Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barium</td>
<td>ppm</td>
<td>2</td>
<td>0.01</td>
<td>0.01-0.011</td>
<td>2</td>
<td>No</td>
<td>Common mineral in nature</td>
</tr>
<tr>
<td>Mono-Chloramine</td>
<td>ppm</td>
<td>4-MRDL</td>
<td>2.08</td>
<td>0.3-3</td>
<td>4-MRDLG</td>
<td>No</td>
<td>Water disinfectant</td>
</tr>
<tr>
<td>Fluoride</td>
<td>ppm</td>
<td>4</td>
<td>0.70</td>
<td>0.31-0.78</td>
<td>4</td>
<td>No</td>
<td>Additive for dental health</td>
</tr>
<tr>
<td>Nitrate^</td>
<td>ppm</td>
<td>10</td>
<td>0.09</td>
<td>0.05-0.09</td>
<td>10</td>
<td>No</td>
<td>Atmospheric deposition</td>
</tr>
<tr>
<td>Nitrite^</td>
<td>ppm</td>
<td>1</td>
<td>0.006</td>
<td>ND-0.006</td>
<td>1</td>
<td>No</td>
<td>Byproduct of water disinfection</td>
</tr>
<tr>
<td>Total Trihalomethanes</td>
<td>ppb</td>
<td>80</td>
<td>16.4</td>
<td>7.13-21.0</td>
<td>ns</td>
<td>No</td>
<td>Byproduct of water disinfection</td>
</tr>
<tr>
<td>Haloacetic Acids-5</td>
<td>ppb</td>
<td>60</td>
<td>16.7</td>
<td>3.5-22.3</td>
<td>3.5</td>
<td>No</td>
<td>Byproduct of water disinfection</td>
</tr>
<tr>
<td>Total Coliform</td>
<td>%</td>
<td>5%</td>
<td>1.4% (Sept)</td>
<td>ND-1.4%</td>
<td>0</td>
<td>No</td>
<td>Naturally present in environment</td>
</tr>
<tr>
<td>Combined Radium*</td>
<td>pCi/L</td>
<td>5</td>
<td>1.76</td>
<td>ND-1.76</td>
<td>0</td>
<td>No</td>
<td>Erosion of natural mineral deposits</td>
</tr>
</tbody>
</table>

KEY: MCL=Maximum Contaminant Level. The highest level of a contaminant allowed in water. MCLs are set as close to the MCLGs as feasible using the best available technology. MCLG=Maximum Contaminant Level Goal. The level of contaminant in drinking water below which there is no known or expected risk to health. MRDL=Maximum Residual Disinfectant Level. 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. MRDLG=Maximum Residual Disinfectant Level Goal. The level of a drinking water disinfectant below which there is no known or expected health risk. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contamination. ppm=parts per million. ppb=parts per billion. ns=non standard. ND=non detect. ^=As required by DEP, the maximum result is reported for nitrate and nitrite, not the average. pCi/L=Picocuries/Liter. *Result from 2014.
**Why Your Water Tastes Great – Water Treatment**

The MWRA has invested in state-of-the-art treatment to make sure your water is clean, fresh, and tastes great. Part of the reason that the water tastes so good is MWRA’s advanced treatment at the John J. Carroll Water Treatment Plant in Marlborough. Since 2005, your water has been treated with ozone - produced by pure oxygen. Ozone ensures strong protection against microbes and viruses, improves water clarity and makes the water taste better. In 2014, we also started using ultraviolet (UV) disinfection, further improving the quality of water. UV light is essentially a more potent form of the natural disinfection from sunlight and ensures that any pathogens potentially in our reservoirs are rendered harmless.

In addition, fluoride is added to promote dental health and the water chemistry is adjusted to reduce corrosion of home plumbing. Last, we add mono-chloramine, a mild and long-lasting disinfectant combining chlorine and ammonia to protect the water as it travels through miles of pipelines to your home.

**Emergency Preparedness**

To confidently deliver the high-quality water you expect, MWRA must be prepared for all situations. MWRA and DCR staff are out in the watersheds every day walking the land, monitoring activities and protecting the source. Whether managing wildlife, rerouting road runoff away from the reservoir or regulating development activity, DCR’s biologists, engineers and planners are at work keeping the source water pristine.

MWRA continuously monitors water quality within the reservoir with monitoring buoys and underwater sampling stations at multiple locations with the ability to sample at multiple depths. If there were an accident in the reservoir, a pipeline, or in one of our communities, we are ready to respond with mobile disinfection units and pumps, a mobile laboratory and staff who have been trained and participate in drills.

Modern water systems rely on computers and specialized control systems to operate efficiently. We have invested in cyber security systems to prevent disruption, and have backup operation centers in case our regular control center is non-operational or inaccessible.

Redundant pipelines and tunnels also allow inspection and maintenance of key facilities while ensuring uninterrupted service. We have just completed the Wachusett Aqueduct Pumping Station in Marlborough, which now provides a second way to get water to the treatment plant.

We are also nearing completion of projects to provide redundant pipelines to the north and south of Boston. Design is underway to repair and improve the Weston Aqueduct Supply Main #3 in Weston, Waltham, Belmont, Arlington and Medford. Planning for two new tunnels north and south of Boston that will provide redundancy is now well underway.

**On-going Pipeline Rehabilitation**

MWRA continues to rehabilitate and replace pipelines throughout the distribution system to improve both reliability and water quality. MWRA also provides zero-interest loans to customer communities for local pipeline projects. In 2018, $43 million was loaned to communities for 25 projects for the replacement of older, unlined pipes with new cement-lined ductile iron water pipes or rehabilitation with cleaning and new cement lining.

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**Sodium Facts**

Sodium in water contributes only a small fraction of a person’s overall sodium intake (less than 5%). MWRA tests for sodium monthly and the highest level found was 41.6 mg/L (about 8 mg per 8 oz. glass). This would be considered VERY LOW SODIUM by the Food and Drug Administration.
**Lead In Tap Water Continues To Be In The News**

and you may have some concerns about the safety of your tap water. MWRA’s water system has been below the Lead Action Level for over a decade. Of nearly 2,300 samples taken in the last 5 years, 98% were below this 15 ppb level.

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**What You Need To Know About Lead In Tap Water**

MWRA water is lead-free when it leaves the reservoirs. MWRA and local pipes that carry the water to your community are made mostly of iron and steel and do not add lead to the water. However, lead can get into tap water through pipes in your home, your service line if it is made of lead, lead solder used in plumbing, and some brass fixtures. Corrosion or wearing away of lead-based materials can add lead to tap water, especially if water sits for a long time in the pipes before it is used.

In 1996, MWRA began adding sodium carbonate and carbon dioxide to adjust the water’s pH and buffering capacity. This change has made the water less corrosive, thereby reducing the leaching of lead into drinking water. Lead levels found in sample tests of tap water have dropped by about 90 percent since this treatment change.

MWRA’s water system has been below the Lead Action Level for over a decade. Of the nearly 2,300 samples taken in the last 5 years, 98% were below the 15 ppb level.

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### Lead & Copper Results - September 2018

<table>
<thead>
<tr>
<th></th>
<th>Range</th>
<th>90% Value</th>
<th>(Target) Action Level</th>
<th>(Ideal Goal) MCLG</th>
<th>#Homes Above AL/ #HomesTested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead (ppb)</td>
<td>0-601</td>
<td>9.7</td>
<td>15</td>
<td>0</td>
<td>20/458</td>
</tr>
<tr>
<td>Copper (ppm)</td>
<td>0-1.52</td>
<td>0.122</td>
<td>1.3</td>
<td>1.3</td>
<td>1/455</td>
</tr>
</tbody>
</table>

KEY: AL—Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow. Definition of MCLG available on page 3.

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### 90% Lead Levels In MWRA System Of Fully Served Communities (ppb)

![Graph showing 90% lead levels](image)

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**MWRA Meets Lead Standard In 2018**

Under EPA rules, each year MWRA and your local water department must test tap water in a sample of homes that are likely to have high lead levels. These are usually homes with lead service lines or lead solder. The EPA rule requires that 9 out of 10, or 90%, of the sampled homes must have lead levels below the Action Level of 15 parts per billion (ppb).

So far, MWRA has distributed over $10 million to nine communities. To find out more, please read your community letter or contact your local water department.

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**Important Information From EPA About Lead**

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 and home plumbing. MWRA is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. If your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. 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 at 1-800-426-4791 or [www.epa.gov/safewater/lead](http://www.epa.gov/safewater/lead).
Did You Know?
Most cases of lead poisoning are from contact with peeling lead paint and lead paint dust. But drinking water exposed to lead can increase a person’s total lead exposure. This is particularly a concern for infants or pregnant women.

What Do I Do If I Have A Lead Service Line?
What Is A Lead Service Line?
What Is The Concern?
A service line is the pipe that connects your house to the water main in the street. Some service lines that run from older homes (constructed before 1940) are made from lead. Many of these older service lines have been replaced, but some remain. These service lines are the main source of lead in tap water in homes that have them. Therefore, removing lead service lines is a priority to reduce the potential for lead exposure, particularly if a pregnant woman or child lives at your home.

How Do I Replace My Lead Service Line?
If you have a lead service line, you should consider replacing it. Many communities have programs to help with the replacement cost. Removing the whole lead service line is important. It is the only way to ensure that your service line will not be adding lead to your water. Partial replacements - which leave some lead behind - do not lower lead levels and in many cases, can actually increase lead levels.

MWRA Program To Replace Lead Service Lines
To help communities in removing lead service lines, MWRA and its Advisory Board approved a program to make available $100 million in zero-interest loans to its member communities to fully replace lead service lines. Under the program, each community can develop its own program, tailored to their local circumstances. So far, MWRA has distributed over $10 million to nine communities. To find out more, please read your community letter or contact your local water department.

How Do I Get My Home’s Tap Water Tested For Lead?
There is a list of labs and sampling instructions available on the lead testing page at www.mwra.com or you can call MWRA at 617-242-5323. Also, some communities have testing available for residents. Please contact your local water department for more information.

Lead Testing In Schools
Starting in 2016, MWRA, in coordination with DEP, provided no-cost lab analysis and technical assistance for schools and day care centers across all of MWRA’s water communities. Almost all of MWRA communities have already participated in the program, and sampling is ongoing. Nearly 34,000 tests have been completed from over 430 schools across 44 communities. Most of the results are available on the DEP website – www.mass.gov/dep (search for lead in schools). Some results may also be available through your local community website, DPW or school department.

MWRA Meets Lead Standard In 2018
Under EPA rules, each year MWRA and your local water utility must report to the EPA the results of their service line sampling. For the past 14 years, MWRA has met the EPA’s zero lead standard. In 2018, MWRA met the standard. How Do I Tell if I have a lead service line?
- You can identify a lead service line by carefully scratching it with a key.
- Have it replaced with a new copper service line.

For more information on lead service lines go to www.mwra.com.

What CAN I DO to reduce my exposure to lead in drinking water?
- Be careful of places you may find lead in or near your home. Paint, soil, dust and some pottery may contain lead.
- Let the water run before using it: fresh water is better than stale! To save water, fill a pitcher with fresh water and place in the refrigerator for future use.
- Any time water has gone unused for more than 6 hours, run each faucet used for drinking or cooking until after the water becomes cold.
- Never use hot water from the faucet for drinking or cooking, especially when making baby formula or other food for infants.
- Check your plumbing fixtures to see if they are lead-free. Read the labels closely.
- Remove loose lead solder and debris. Every few months remove the aerator from each faucet in your home and flush the pipes for 3-5 minutes.
- Call the Department of Public Health at 800-532-9571 or EPA at 800-424-LEAD for health information.
Tests In Community Pipes
MWRA and local water departments test 300 to 500 water samples each week for total coliform bacteria. Total coliform bacteria can come from the intestines of warm-blooded animals, or can be found in soil, plants, or other places. Most of the time, they are not harmful. However, their presence could signal that harmful bacteria from fecal waste may be there as well. If total coliform is detected in more than 5% of samples in a month, the water system is required to investigate the possible source and fix any identified problems. If a water sample does test positive, we run more specific tests for E.coli, which is a bacteria found in human and animal fecal waste and may cause illness. If your community found any total coliform or E.coli, it will be listed within the community letter on page 7.

Drinking Water And People With Weakened Immune Systems
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, people with HIV/AIDS or other immune system disorders, some elderly, and 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 EPA’s Safe Drinking Water Hotline (1-800-426-4791).

Contaminants In Bottled Water And Tap Water
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’s Safe Drinking Water Hotline (1-800-426-4791) or MWRA. In order to ensure that tap water is safe to drink, the Massachusetts DEP and EPA prescribe regulations which limit the amount of certain contaminants in water provided by public water systems. U.S. Food and Drug Administration (FDA) and the Massachusetts Department of Public Health regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

Research For New Regulations
MWRA has been working with EPA and other researchers to define new national drinking water standards by testing for unregulated contaminants. To read more about these regulations, and to see a listing of what was found in MWRA water, please visit www.mwra.com/UCMR/2018.

Cross Connection Information
Massachusetts DEP recommends the installation of backflow prevention devices for inside and outside hose connections to help protect the water in your home as well as the drinking water system in your town. For more information on cross connections, please call 617-242-5325 or visit mwra.com/crosscon.

Watershed Protection keeps the water supply clean and safe while providing open space. All of the trees and protected land in the Quabbin, Wachusett and Ware River watersheds act as a natural filter, and it is one of the reasons MWRA water has been rated as the best in the country. Since 1985, almost $150 million has been invested in land protection.
Dear Customer:

This report contains an annual update on the quality of drinking water supplied to you by the Boston Water and Sewer Commission (BWSC), in partnership with the Massachusetts Water Resources Authority (MWRA). Inside this report, there is detailed information on the MWRA’s system, and how the water delivered to Boston exceeds both federal and state quality standards.

In 2018, BWSC received a Public Water Systems Award from the Massachusetts Department of Environmental Protection (MassDEP) that acknowledged not only our drinking water excellence but also gave BWSC top marks (in the Consecutive System category) for our consistency in achieving excellence.

To assure quality and regulatory compliance, BWSC maintains a comprehensive program to consistently sample your tap water. BWSC and MWRA test over 240 samples each month for total coliform, and EPA requires that no more than 5% of samples may be positive. In 2018, two samples during the year tested positive with the highest result of 0.4% in September. BWSC test results continued to meet or exceed Federal and State regulations.

In conformance with the EPA’s Lead and Copper Rule, BWSC tests water quality each year and the Boston lead sampling results have remained below the EPA Lead Action Level of 15 parts per billion (ppb). In 2018, the test results were 12.7 ppb at the 90th percentile. BWSC is proactive with the replacement of lead service lines, thereby improving overall water quality.

With the health and safety of Boston residents as a priority for Mayor Martin J. Walsh, BWSC continues to offer financial assistance of up to $2,000 to homeowners for replacement of their private lead service line. In addition, in 2017 BWSC received honors for Systems Taking Action to Reduce Lead (Star L award). The Star L award acknowledges BWSC’s collaboration with Boston Public Schools and their efforts within the community to protect children from the dangers of lead. For more information on lead, contact BWSC’s Lead Hotline at (617) 989-7888 or visit BWSC’s website at www.bwsc.org.

Any questions regarding information in this report may be directed to BWSC’s Communications and Community Services Department at (617) 989-7000.

Sincerely,

[Signature]

Henry F. Vitale, CPA
Executive Director/ Treasurer