

What's Happening in Flint's Water System and How is MWRA Different

The news has been full of coverage of the problems with drinking water in Flint, Michigan. The current situation in Flint has developed due to a sudden, unacknowledged increase in lead levels at the tap, inaction and stonewalling by local and state health and water officials, and the resulting increase in lead exposures and loss of public confidence. Contributing to that loss of confidence was also the discolored and foul smelling and tasting water, high levels of bacteria, levels of disinfection byproducts above national standards and, most recently, reports of increased levels of legionnaire's disease in the community.

What happened in Flint was wrong, and tragic, and based on the news coverage MWRA customers may have questions about the safety of their water.

The Lead Issue

Lead in drinking water typically comes from having lead bearing materials in contact with water. These can include a lead service line (the pipe connecting the home to the water main in the street), leaded solder and some brass fixtures. If the water is corrosive and is left in contact with lead bearing material, lead can leach out.

- MWRA's water does not contain lead, and the MWRA and community pipes carrying that water are made of concrete, iron or steel and do not add lead to the water.
- MWRA water is treated to reduce its corrosivity.

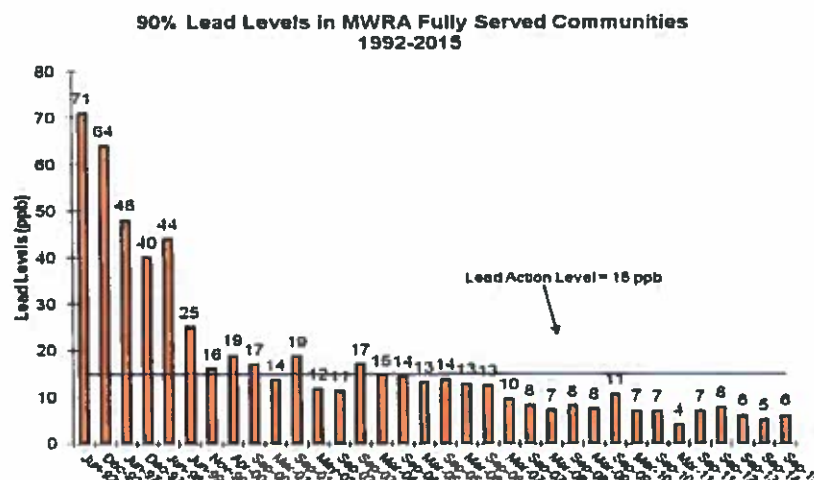
The increase in lead levels in water in Flint was due to a change in source and treatment – from a long standing use of Detroit's water – to use of Flint's back up supply (the Flint River) and treatment plant.

- MWRA uses its well-protected, stable sources: the Wachusett and Quabbin reservoirs.
- MWRA has been extremely thorough each time treatment changes have occurred to review how the changes might affect lead corrosion, including bench and pilot scale testing, consultation with a panel of the national experts in lead corrosion, and careful review of the data when the new treatment was put on-line.
- Massachusetts Department of Environmental Protection and EPA have always been actively involved in reviewing and approving any change in MWRA treatment.

Flint did not install corrosion control treatment when they made the switch to Flint River water.

- MWRA installed corrosion control treatment in 1996, using one of the two successful techniques, and is meticulous in operating it stably. MWRA's well-trained, licensed operators carefully adjust the pH and alkalinity of the water to make it non-corrosive, continuously monitoring the results. Water is adjusted from its natural, slightly acidic, and corrosive raw pH level of between 6.5 and 7 to a non-corrosive 9.3 to 9.5, and stabilized with the addition of alkalinity with sodium carbonate.

The data shows MWRA's success – a better than 90 percent reduction in lead levels in high risk homes:



EPA requires that at least 90 percent of samples be below the lead Action Level of 15 parts per billion (ppb). In 2015, 97.7 percent of MWRA samples were below the Action Level.

While system-wide results have shown remarkable reductions, MWRA continues to stress that elevated lead levels in any home deserve attention. Each of the 450 homes sampled receives its own data, along with educational material on steps to take to reduce any risk in the home. All unexpectedly elevated sample results are immediately investigated by MWRA or community staff.

In Flint, initial reports of poor water quality (taste and odor) were ignored. When data suggesting lead levels in water and children's blood were elevated in Flint, they were initially dismissed by local and state officials.

- MWRA tracks customer complaints on a daily, weekly and monthly basis, recognizing that our customers' perceptions of water quality may be the first indication of a problem – we take complaints very seriously and attempt to understand, categorize and investigate each one.
- Every local water department is contacted weekly to check on complaints, and community staff typically contact MWRA immediately with any serious issues.
- MWRA has built its decision making on treatment and water quality through strong collaboration with local and state health officials. Regular communication assures that both health and water officials take any change in water quality or health indicators seriously.

Data on water quality in Flint was not made public, forcing citizens to gather their own data, and reducing public confidence.

- MWRA believes in transparency. We track and publish water quality data on our web site, and have a water quality hot-line with a public health professional to respond to inquiries. www.mwra.com/watertesting/watertests.htm and 617-242-LEAD.
- Every lead sample result collected since 1992 is published on MWRA's web site, along with easily understood summary level charts.
- When the General Accountability Office reviewed public outreach efforts on lead in 2005, they touted MWRA's efforts as a national example of clear and effective communication.

Almost half the homes in Flint have lead services.

- MWRA communities have been diligent in working to eliminate lead services. They report that only about 5 percent of the 430,000 connections have lead. Lead service lines were typically installed up until just after WWII.
- MWRA's zero-interest loan program allows communities complete flexibility in funding replacement of lead services on both public and private property.
- Boston Water and Sewer Commission's lead service line database and web map (every lead service line is mapped on an accessible and easy to use map), and their incentive program for private lead service line replacement are a national models (BWSC funds the first \$1,000 and lends the rest over 24 months at no interest). <http://www.bwsc.org/COMMUNITY/lead/leadmaps.asp>

MWRA's expert staff keep abreast of changes in the state-of-the-art in treatment and public health research, are engaged with national associations in researching ways to better manage lead, and are national leaders on this issue. Community staff can contact MWRA staff for technical assistance on any aspect of lead and drinking water quality.

Other Water Quality Issues

In addition to the lead issues, drinking water in Flint was affected by high levels of bacteria, levels of disinfection byproducts above national standards and, most recently, reports of increased levels of legionnaire's disease in the community.

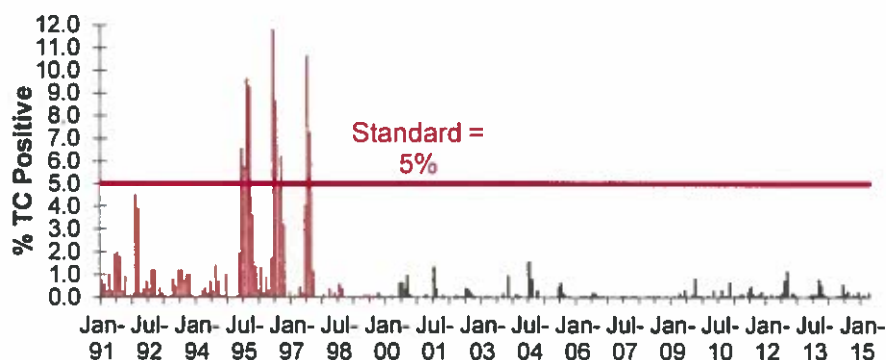
One reason for MWRA's customers to have confidence on our drinking water is its consistent good taste. In 2014, at the national drinking water professional's conference in Boston (with 14 thousand attendees) Boston and MWRA water captured both first and second place in the taste test. Blind testing by local food and wine experts has reached similar results – MWRA has great tasting water.

- Customers provide an important early warning system for problems.
- Our customers are used to the consistent good taste, and can contact MWRA and local water departments if they notice changes in appearance or taste.
- When we receive a complaint for off-tasting or discolored water, MWRA staff take it seriously, and investigate to see if there is a local or home plumbing issue to be resolved.

MWRA and our customer communities test the water we provide hundreds of thousands of times each year. Depending on the parameter, the water may be monitored continuously, or tested multiple times per day or tested in various locations throughout the system daily, weekly, monthly or annually. Results are used by MWRA and community staff to assure that source water, treatment and the distribution system are operating properly, and to detect and resolve any issues.

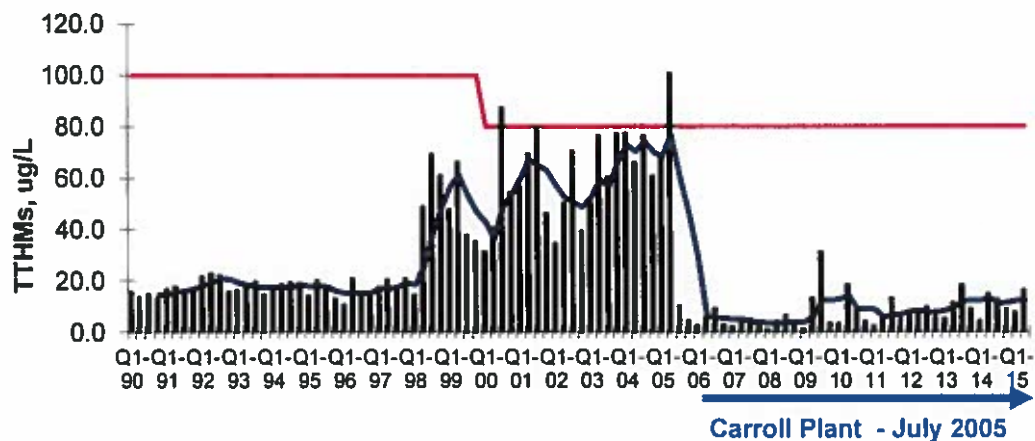
- MWRA water quality data is made available to operating staff continuously. Daily, weekly, and monthly data are used by management to assure that all national and internal benchmarks are being met.
- Water quality data is provided to regulators as it is analyzed, and in monthly reports.
- Water quality is posted on the MWRA web site, and monthly reports are e-mailed (or mailed) to local elected, water and health officials in every MWRA community as well as interested members of the public. www.mwra.com/watertesting/watertests.htm and 617-242-LEAD

MWRA and our customer communities collect about 2000 bacteria samples from throughout the regional system each month, testing them for an indicator bacteria (total coliform) and *E. coli*. After investments in improved treatment from the mid 1990s to present, levels of the indicator total coliform have been very low and *E. coli* almost non-existent (and when detected usually a local issue).



If any community detects total coliform bacteria (or any other water quality problem) in their system, MWRA's expert staff are immediately available to assist them in determining what the issue is, how it can be quickly resolved, and to help in communicating with local officials and the public.

Disinfectants such as chlorine are used to kill harmful bacteria, viruses, and other pathogens in the water, but if used inappropriately can result in potentially harmful levels of carcinogenic disinfection byproducts. Too little disinfection, and the water may be unsafe due to pathogens, but too much or the wrong disinfectant, and the byproducts levels will be above safety standards. MWRA temporarily boosted chlorine levels in the late 1990s to meet more stringent federal rules while designing and constructing the Carroll Water Treatment Plant, resulting in higher total coliform levels, but switched to using ozone in 2005 because it is both more powerful and less likely to create harmful byproducts. With the addition of ozone in 2005 and ultraviolet light disinfection in 2014, disinfection is more potent and disinfectant byproducts levels dropped substantially to well below EPA standards.



MWRA's high quality well-protected sources, state-of-the-art treatment, on-going investments in the piping network, an effective collaborative working relationship with the cities and towns we serve, constant attention to water quality, and transparency with all our customers provide the foundation for continued delivery of great tasting and safe drinking water to our two and a half million customers.