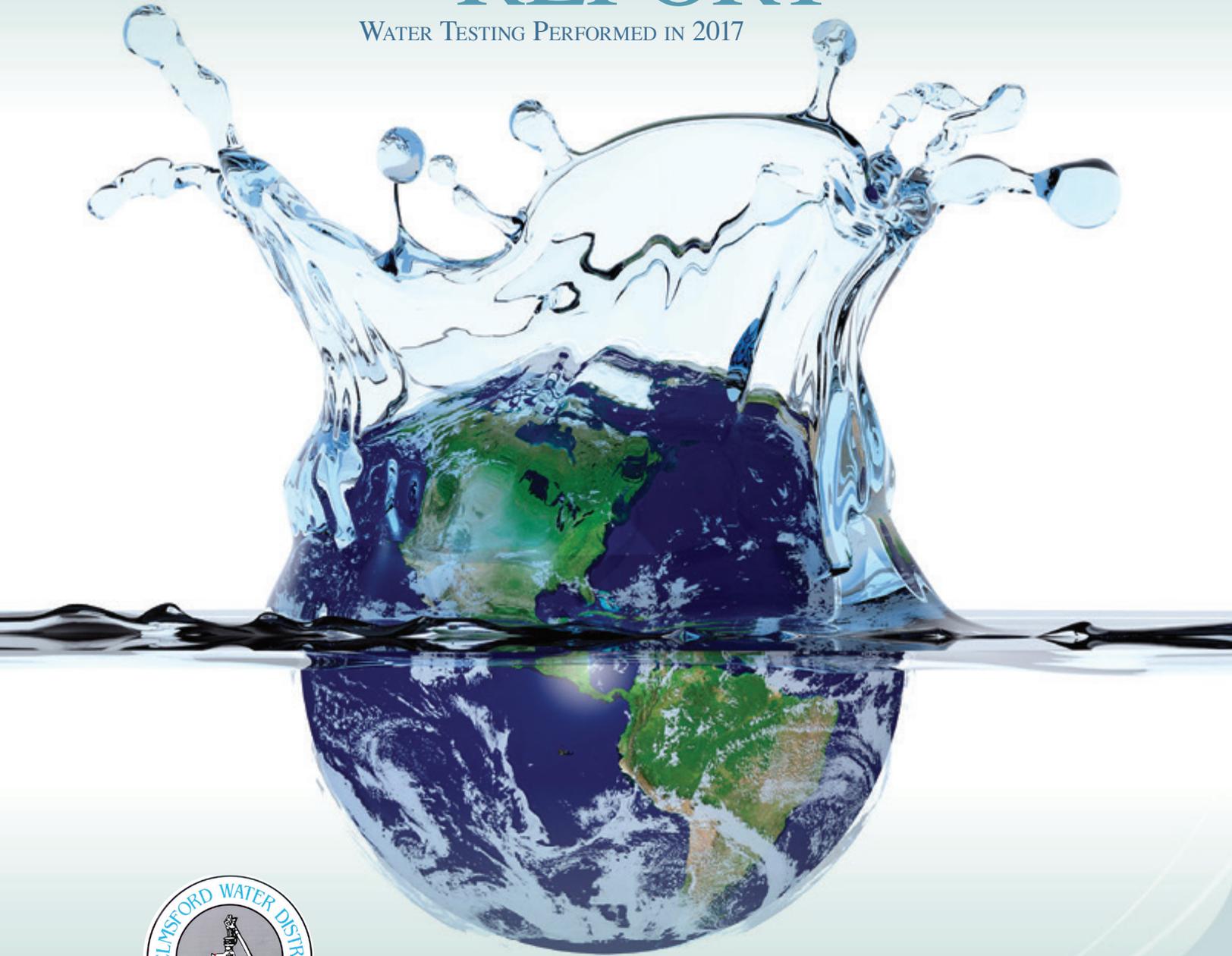


# ANNUAL WATER QUALITY REPORT

WATER TESTING PERFORMED IN 2017



***Presented By***  
**Chelmsford Water District**

## Quality First

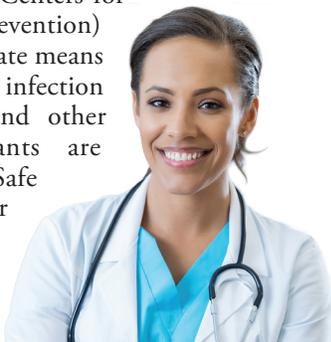
Once again we are pleased to present our annual water quality report covering the period between January 1 and December 31, 2017. As in years past, we continue to be committed to delivering the best-quality drinking water possible. To that end, we remain vigilant in meeting the challenges of new regulations, source water protection, water conservation, and community outreach and education while continuing to serve the needs of all of our water users. Thank you for allowing us the opportunity to serve you and your family.

We encourage you to share your thoughts with us on the information contained in this report. After all, well-informed customers are our best allies.

For more information about this report, or if there are any questions relating to your drinking water, please contact us at (978) 256-2381 or visit our website at [www.chelmsfordwater.com](http://www.chelmsfordwater.com).

## Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised 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 may be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The U.S. EPA/CDC (Centers for Disease Control and Prevention) 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 or <http://water.epa.gov/drink/hotline>.



Water treatment is a complex, time-consuming process.

## Substances That Could Be in Water

To ensure that tap water is safe to drink, the Department of Environmental Protection (DEP) and the U.S. Environmental Protection Agency (U.S. EPA) prescribe regulations limiting the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration (FDA) and Massachusetts Department of Public Health (DPH) regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of these contaminants does not necessarily indicate that the water poses a health risk.

The 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 minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Substances 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, or wildlife;

Inorganic Contaminants, such as salts and metals, which can be naturally occurring or may result from urban storm-water 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 agriculture, urban storm-water runoff, and residential uses;

Organic Chemical Contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and which may also come from gas stations, urban storm-water runoff, and septic systems;

Radioactive Contaminants, which can be naturally occurring or may be the result of oil and gas production and mining activities.

More information about contaminants and potential health effects can be obtained by calling the U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791.

## How Is My Water Treated and Purified?

The Crooked Spring Treatment Plant went online in the Spring of 2007. Nine of the District's wells are processed through this plant, including the four gravel-packed wells from the wellfield at the Meadowbrook #3 pumping station, which went online in November of 2007. The raw water goes through an aeration tower, removing any potential volatile organic compounds, and then the water goes through a greensand filtration system, removing high levels of iron and manganese before the water enters the distribution system. This plant recycles the backwash discharged water to a lagoon, which then re-enters the earth and becomes part of the aquifer.

Raw water is drawn from the other nine wells in the eastern area of the district and is sent through the greensand filtration system at the Riverneck Road Treatment Plant to remove elevated levels of iron and manganese from these wells. The filtration process also incorporates an aeration tower to remove low levels of volatile organic compounds from the raw water. The backwash water generated from the treatment process is stored in an on-site, 100,000-gallon underground storage facility. The facility has the capability of pumping all of the backwash water to the nearby public sewer, or recycling the water to the treatment plant.

The Smith Street Treatment Plant and Wells, after being unused since 1999, was reopened in the fall of 2012 with DEP approval. The District refurbished the wells and retrofitted the treatment system. The raw water enters the Smith Street Treatment Plant which is serviced by an aeration and membrane filtration system to remove iron and manganese. This plant and wells allow for system relief during times of withdrawal stress and emergency back up for both the Crooked Spring and Riverneck Road Treatment Plants.

All of Chelmsford Water District's water is processed and treated through state of the art treatment.

Faced with deteriorating water quality and increasing peak demands for water during daytime hours, the Board of Water Commissioners has made and kept the commitment to our customers to provide treatment for all the districts wells.

## Source Water Assessment

The Source Water Assessment and Protection (SWAP) program assesses the susceptibility of public water supplies to potential contamination due to land uses and activity within the recharge areas. Established under the federal Safe Drinking Water Act, the program requires every state to inventory land uses within the recharge areas of all public water supply sources, to assess the susceptibility of drinking water sources to contamination from these land uses, and to publicize the results to provide support for improved protection.

### What Is My Systems Ranking?

A susceptibility ranking of "high" was assigned to this system using the information collected during the assessment by the Massachusetts Department of Environmental Protection (DEP).

### Where Can I See the SWAP Report?

The complete SWAP report is available at the Chelmsford Water District, at the Chelmsford Board of Health, and online at [www.mass.gov/eea/docs/dep/water/drinking/swap/nero/3056000.pdf](http://www.mass.gov/eea/docs/dep/water/drinking/swap/nero/3056000.pdf). For more information, call Superintendent Delaney at (978) 256-2931.

## Where Does My Water Come From?

The Chelmsford Water District customers are fortunate because we enjoy an abundant water supply from 20 sources. The Chelmsford Water District draws water from the Merrimack and Concord river basins. Our reservoirs hold one of the states largest capacities, 15.3 million gallons of water. Combined, our facilities provide roughly 1 billion gallons of clean drinking water each year. The Riverneck Road Treatment Plant was placed in service at the end of 2004 and treats 3 million gallons of water per day. The Crooked Spring Treatment Plant was placed in service in the spring of 2007 and treats 4 million gallons a day. The Smith Street Treatment Plant was refurbished and put back into services in the fall of 2012. To learn more about our watershed, visit the U.S. EPA website at [www.epa.gov/surf](http://www.epa.gov/surf).

## Community Participation

You are invited to participate in our public forum and voice your concerns about your drinking water. We meet the second Wednesday of each month, beginning at 4 p.m. at the Chelmsford Water District, 20 Watershed Lane, Chelmsford, MA

## Ground Water Sampling

On the following dates: April 5th, June 7th, August 2nd, August 3rd, September 7th and November 8th, the District was informed that at least one of our routine samples of our untreated source water samples that were collected on April 4th, June 6th, August 1st, August 2nd, September 6th, and November 7th were positive for fecal contamination (*E. coli*). With the knowledge that the District's untreated source water is vulnerable to this type of contamination, and because of the enacting of the Ground Water Rule (GWR), the Chelmsford Water District has ensured that its treated water through disinfection practices is and remains safe by being 4-log certified by state agencies as of February 24, 2010. The District maintains this certification on a day-to-day basis and reports this status to the state monthly. Because the District is in compliance with the GWR with respect to this certification, no other steps were or are required. The reporting of these positive results is for informational purposes only and is a regulatory requirement. At no time was the public's health at risk.

Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches or other symptoms. They may pose a special health risk for infants, young children, some of the elderly and people with severely compromised immune systems.

## Water Conservation

You can play a role in conserving water and saving yourself money in the process by becoming conscious of the amount of water your household is using and by looking for ways to use less whenever you can. It is not hard to conserve water. Here are a few tips:

- Automatic dishwashers use 15 gallons for every cycle, regardless of how many dishes are loaded. So, get a run for your money and load it to capacity.
- Turn off the tap when brushing your teeth.
- Check every faucet in your home for leaks. Just a slow drip can waste 15 to 20 gallons a day. Fix it and you can save almost 6,000 gallons per year.
- Check your toilets for leaks by putting a few drops of food coloring in the tank. Watch for a few minutes to see if the color shows up in the bowl. It is not uncommon to lose up to 100 gallons a day from an invisible toilet leak. Fix it and you can save more than 30,000 gallons a year.

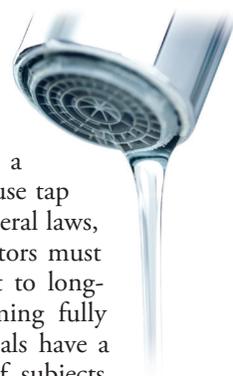
- Use your water meter to detect hidden leaks. Simply turn off all taps and water using appliances.

Then check the meter after 15 minutes. If it moved, you have a leak.



## Count on Us

Delivering high-quality drinking water to our customers involves far more than just pushing water through pipes. Water treatment is a complex, time-consuming process. Because tap water is highly regulated by state and federal laws, water treatment plant and system operators must be licensed and are required to commit to long-term, on-the-job training before becoming fully qualified. Our licensed water professionals have a basic understanding of a wide range of subjects, including mathematics, biology, chemistry, and physics. Some of the tasks they complete on a regular basis include:



- Operating and maintaining equipment to purify and clarify water;
- Monitoring and inspecting machinery, meters, gauges, and operating conditions;
- Conducting tests and inspections on water and evaluating the results;
- Maintaining optimal water chemistry;
- Applying data to formulas that determine treatment requirements, flow levels, and concentration levels;
- Documenting and reporting test results and system operations to regulatory agencies; and
- Serving our community through customer support, education, and outreach.

So, the next time you turn on your faucet, think of the skilled professionals who stand behind each drop.

## Lead in Home Plumbing

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. We are responsible for providing 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 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 or at [www.epa.gov/lead](http://www.epa.gov/lead).

## Water Main Flushing

Distribution mains (pipes) convey water to homes, businesses, and hydrants in your neighborhood. The water entering distribution mains is of very high quality; however, water quality can deteriorate in areas of the distribution mains over time. Water main flushing is the process of cleaning the interior of water distribution mains by sending a rapid flow of water through the mains.

Flushing maintains water quality in several ways. For example, flushing removes sediments like iron and manganese. Although iron and manganese do not pose health concerns, they can affect the taste, clarity, and color of the water. Additionally, sediments can shield microorganisms from the disinfecting power of chlorine, contributing to the growth of microorganisms within distribution mains. Flushing helps remove stale water and ensures the presence of fresh water with sufficient dissolved oxygen, disinfectant levels, and an acceptable taste and smell.

During flushing operations in your neighborhood, some short-term deterioration of water quality, though uncommon, is possible. You should avoid tap water for household uses at that time. If you do use the tap, allow your cold water to run for a few minutes at full velocity before use, and avoid using hot water to prevent sediment accumulation in your hot water tank.

Please contact us if you have any questions or if you would like more information on our water main flushing schedule.

## What's a Cross-connection?

Cross-connections that contaminate drinking water distribution lines are a major concern. A cross-connection is formed at any point where a drinking water line connects to equipment (boilers), systems containing chemicals (air conditioning systems, fire sprinkler systems, irrigation systems) or water sources of questionable quality. Cross-connection contamination can occur when the pressure in the equipment or system is greater than the pressure inside the drinking water line (back-pressure). Contamination can also occur when the pressure in the drinking water line drops due to fairly routine occurrences (main breaks, heavy water demand), causing contaminants to be sucked out from the equipment and into the drinking water line (back-siphonage).

Outside water taps and garden hoses tend to be the most common sources of cross-connection contamination at home. The garden hose creates a hazard when submerged in a swimming pool or when attached to a chemical sprayer for weed killing. Garden hoses that are left lying on the ground may be contaminated by fertilizers, cesspools, or garden chemicals. Improperly installed valves in your toilet could also be a source of cross-connection contamination.

Community water supplies are continuously jeopardized by cross-connections unless appropriate valves, known as backflow-prevention devices, are installed and maintained. We have surveyed industrial, commercial, and institutional facilities in the service area to make sure that potential cross-connections are identified and eliminated or protected by a backflow preventer. We also inspect and test backflow preventers to make sure that they provide maximum protection.

For more information on backflow prevention, contact the Safe Drinking Water Hotline at (800) 426-4791.



## Test Results

Our water is monitored for many different kinds of substances on a very strict sampling schedule. The information in the data tables shows only those substances that were detected between January 1 and December 31, 2017. Remember that detecting a substance does not necessarily mean the water is unsafe to drink; our goal is to keep all detects below their respective maximum allowed levels. The State recommends monitoring for certain substances less than once per year because the concentrations of these substances do not change frequently. In these cases, the most recent sample data are included, along with the year in which the sample was taken.

We participated in the 3rd stage of the EPA's Unregulated Contaminant Monitoring Rule (UCMR3) program by performing additional tests on our drinking water. UCMR3 benefits the environment and public health by providing the EPA with data on the occurrence of contaminants suspected to be in drinking water, in order to determine if EPA needs to introduce new regulatory standards to improve drinking water quality. Contact us for more information on this program.

### REGULATED SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Barium (ppm)	2015	2	2	0.038	0.008–0.038	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Haloacetic Acids [HAA] (ppb)	2017	60	NA	16	0–19.0	No	By-product of drinking water disinfection
Hexachlorocyclopentadiene (ppb)	2016	50	50	0.29	0–0.29	No	Discharge from chemical factories
Nitrate (ppm)	2017	10	10	1.00	0–1.0	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
TTHMs [Total Trihalomethanes] <sup>1</sup> (ppb)	2017	80	NA	68	14–83	No	By-product of drinking water disinfection

Tap water samples were collected for lead and copper analyses from sample sites throughout the community

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AL	MCLG	AMOUNT DETECTED (90TH% TILE)	SITES ABOVE AL/ TOTAL SITES	VIOLATION	TYPICAL SOURCE
Copper (ppm)	2017	1.3	1.3	0.390	0/30	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppb)	2017	15	0	4	0/30	No	Corrosion of household plumbing systems; Erosion of natural deposits

### SECONDARY SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	SMCL	MCLG	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Chloride (ppm)	2017	250	NA	188	100–188	No	Runoff/leaching from natural deposits
Iron (ppb)	2017	300	NA	0.5	0–0.5	No	Leaching from natural deposits; Industrial wastes
Manganese (ppb)	2017	50	NA	5.9	0–5.9	No	Leaching from natural deposits

### UNREGULATED SUBSTANCES<sup>2</sup>

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
Bromodichloromethane (ppb)	2017	24.4	4.4–24.4	Chlorination by-product
Bromoform (ppb)	2017	3.3	0–3.3	Chlorination by-product
Chloroform (ppb)	2017	47.7	6.3–47.7	Chlorination by-product
Dibromomethane (ppb)	2017	11.2	3.1–11.2	Chlorination By-product
Nickel (ppm)	2015	0.008	0.001–0.008	A natural element of the earth's crust; therefore, small amounts are found in food, water, soil, and air
Sodium (ppm)	2017	85.2	75.6–85.2	Naturally occurring

## UNREGULATED CONTAMINANT MONITORING RULE - PART 3 (UCMR3) <sup>2</sup>

<b>1,4 Dioxane</b> (ppb)	2015	0.09	0–0.09	Cyclic aliphatic ether; used as a solvent or solvent stabilizer in manufacture and processing of paper, cotton, textile products, automotive coolant, cosmetics, and shampoos
<b>Chlorate</b> (ppb)	2015	320	35–320	Agricultural defoliant or desiccant; disinfection by-product
<b>Chromium</b> (ppm)	2015	0.20	0–0.20	Discharge from steel and pulp mills; Erosion of natural deposits
<b>Hexavalent Chromium</b> (ppb)	2015	0.15	0–0.15	Naturally occurring element; used in making steel and other alloys; chromium-3 or -6 forms are used for chrome plating, dyes and pigments, leather tanning, and wood preservation
<b>Strontium</b> (ppb)	2015	200	140–200	Naturally occurring element; historically, commercial use of strontium has been in the faceplate glass of cathode-ray-tube televisions to block X-ray emissions

<sup>1</sup> Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.

<sup>2</sup> Unregulated contaminants are those for which the U.S. EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist U.S. EPA in determining their occurrence in drinking water and whether future regulation is warranted.

## Definitions

**90th Percentile:** Out of every 10 homes sampled, 9 were at or below this level. This number is compared to the Action Level to determine lead and copper compliance.

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

**LRAA (Locational Running Annual Average):** The average of sample analytical results for samples taken at a particular monitoring location during the previous four calendar quarters. Amount Detected values for TTHMs and HAAs are reported as the highest LRAAs.

**MCL (Maximum Contaminant Level):** The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

**MCLG (Maximum Contaminant Level Goal):** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

**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 risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

**NA:** Not applicable.

**ppb (parts per billion):** One part substance per billion parts water (or micrograms per liter).

**ppm (parts per million):** One part substance per million parts water (or milligrams per liter).

**SMCL (Secondary Maximum Contaminant Level):** SMCLs are established to regulate the aesthetics of drinking water like appearance, taste and odor.