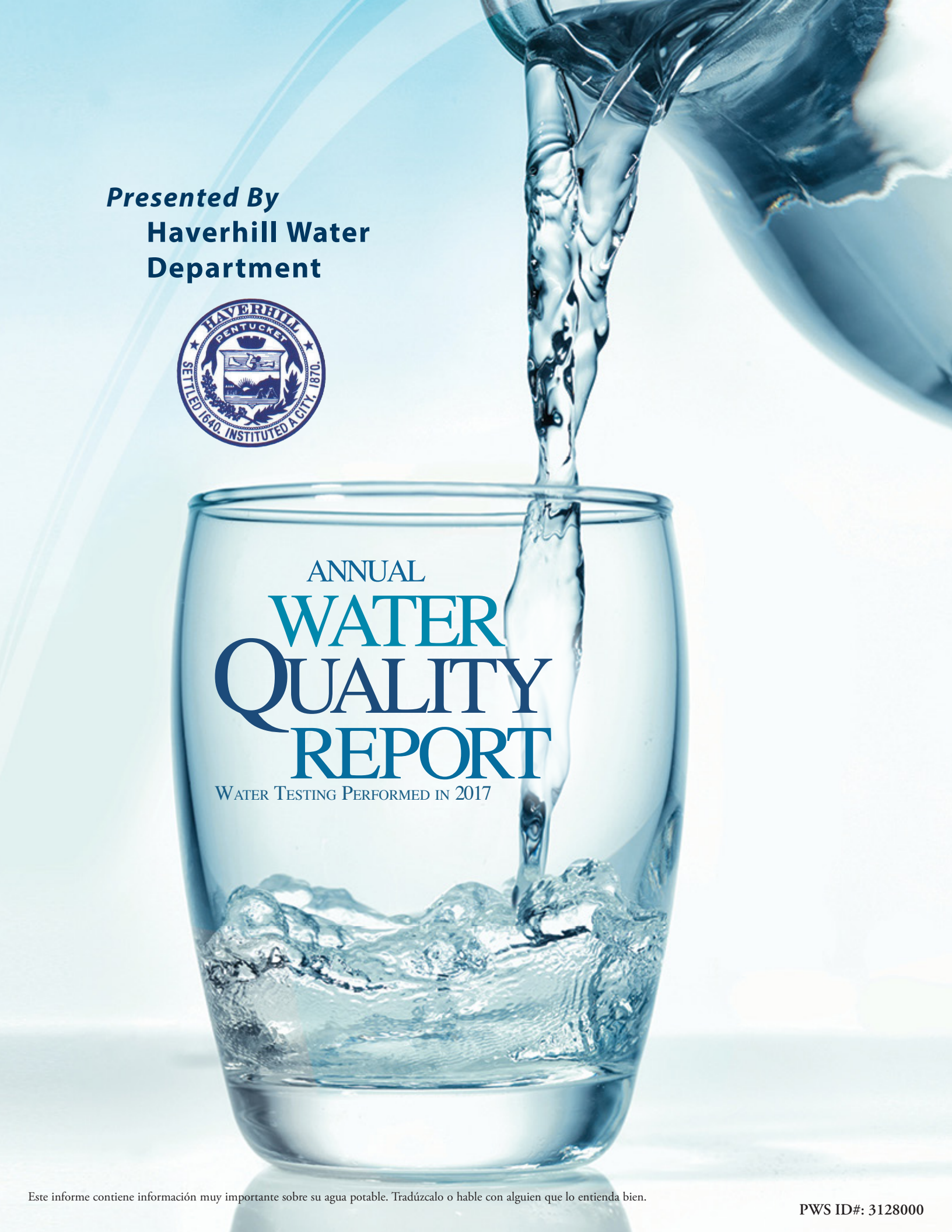

Presented By

Haverhill Water Department

ANNUAL WATER QUALITY REPORT

WATER TESTING PERFORMED IN 2017

Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.

PWS ID#: 3128000

Quality First

Once again, we are pleased to present our annual water quality report. As in years past, we are 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 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.

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.

Our Water Sources

Our drinking water comes from combined water sources, all of which are surface water. Surface water means that all our water comes from aboveground supplies, in our case, lakes and man-made reservoirs. Water is pumped from Millvale Reservoir and Crystal Lake into Kenoza Lake, as needed, where the water treatment plant is located. Water from Round Pond and Winnekenni Basin overflows into Kenoza Lake and are part of our drinking water system.

Important Contact Information

Backflow/Cross Connections . . . . . (978) 374-2375

Water Billing . . . . . (978) 374-2370

Water Maintenance . . . . . (978) 374-2368

Water Meters . . . . . (978) 373-8487

Water Treatment . . . . . (978) 374-2385

Source Water Assessment

A Source Water Assessment Plan (SWAP) is available at the water treatment plant. This plan is an assessment of the delineated area around our listed sources through which contaminants, if present, could migrate and reach our source water. It also includes an inventory of potential sources of contamination within the delineated area and a determination of the water supply's susceptibility to contamination by the identified potential sources.

This report assesses activities on our watershed and identifies potential pollution hazards. These potential hazards, if handled properly, would not pose a threat to our water supplies. These hazards fall in the following categories: fertilizer storage, livestock operations, manure storage/spreading, nurseries, pesticide storage/use, auto repair and body shops, bus and truck terminals, cemeteries, golf courses, junk/salvage yards, nursing homes, repair shops, sand and gravel mining/washing, fuel oil storage, lawn care/gardening, septic systems, aquatic wildlife, combined sewer overflows, composting facilities, fishing/boating, land application of sewage sludge, school, colleges/universities, snow dump, stormwater drains/retention basins, and underground storage tanks. One or all of these hazards can be found on all of Haverhill's water sources. A water department employee checks these areas weekly to identify any violations.

If you would like to view this report, please contact the water treatment plant at (978) 374-2385.

QUESTIONS?

For more information about this report, or for any questions relating to your drinking water, please call Mary D'Aoust, Water Treatment Plant Chemist, at (978) 374-2385.

This report can also be found online at https://goo.gl/fLhYJi

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) prescribes 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 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 agriculture, 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 which may also come from gas stations, urban stormwater runoff, and septic systems;

> "Water treatment is a complex, time-consuming process."

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.

Water Conservation Tips

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 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.

Treatment Train Description

The water treatment plant is a conventional filtration plant, which includes coagulation, flocculation, and sedimentation. The pretreated water then goes through a two-stage filtration process before it is fluoridated then disinfected with sodium hypochlorite before it is pumped into the distribution system. The fluoride is added to prevent tooth decay and cavities. Last year, the water treatment plant processed 2.3 billion gallons of water.

The distribution system is made up of three storage tanks with a capacity of 17 million gallons, 11 pumping stations, and approximately 300 miles of water main.

Information on the Internet

The U.S. EPA (https://goo.gl/TFAMKc) and the Centers for Disease Control and Prevention (www.cdc.gov) websites provide a substantial amount of information on many issues relating to water resources, water conservation, and public health. Also, the DEP has a website (https://goo.gl/fg45jY) that provides complete and current information on water issues in Massachusetts, including valuable information about our watershed.

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.

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 (backpressure). 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 (backsiphonage).

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.

The Benefits of Fluoridation

Fluoride is a naturally occurring element in many water supplies in trace amounts. In our system, the fluoride level is adjusted to an optimal level averaging 0.7 part per million (ppm) to improve oral health in children. At this level, it is safe, odorless, colorless, and tasteless.

Tip Top Tap

The most common signs that your faucet or sink is affecting the quality of your drinking water are discolored water, sink or faucet stains, a buildup of particles, unusual odors or tastes, and a reduced flow of water. The solutions to these problems may be in your hands.

Kitchen Sink and Drain

Hand washing, soap scum buildup, and the handling of raw meats and vegetables can contaminate your sink. Clogged drains can lead to unclean sinks and backed up water in which bacteria (i.e., pink and black-colored slime growth) can grow and contaminate the sink area and faucet, causing a rotten egg odor. Disinfect and clean the sink and drain area regularly. Also, flush regularly with hot water.

Faucets, Screens, and Aerators

Chemicals and bacteria can splash and accumulate on the faucet screen and aerator, which are located on the tip of faucets, and can collect particles like sediment and minerals resulting in a decreased flow from the faucet. Clean and disinfect the aerators or screens on a regular basis.

Check with your plumber if you find particles in the faucet screen because they could be pieces of plastic from the hot water heater dip tube. Faucet gaskets can break down and cause black, oily slime. If you find this slime, replace the faucet gasket with a higher-quality product. White scaling or hard deposits on faucets and shower heads may be caused by hard water or water with high levels of calcium carbonate. Clean these fixtures with vinegar or use water softening to reduce the calcium carbonate levels for the hot water system.

Water Filtration/Treatment Devices

A smell of rotten eggs can be a sign of bacteria on the filters or in the treatment system. The system can also become clogged over time so regular filter replacement is important. (Remember to replace your refrigerator filter!)

System Improvements

In 2017, the Haverhill Water Department broke ground on a 3-year construction project to update and renovate its water treatment plant. New and duplicated processes will ensure that Haverhill's water quality will continue to meet and exceed Safe Drinking Water Act standards for generations to come. The renovations will include adding filters and another disinfection contact chamber, updating and adding clarifiers, updating the electrical service, and replacing the emergency generator. These renovations will ensure the water department will continue to supply the highest water quality as Haverhill's water system expands. You can find more information on the project at http://www.haverhillma.gov/departments/public_works_department/water_wastewater/kenoza_lake_wtp_improvements.php.

The meter division installed 595 new radio units in 2017. Radio read units help with more dependable, accurate, and efficient meter reading that reduces the need for estimated bills. So, if you receive an estimated bill, please call us at (978) 373-8487. Since we may be out in the field, please leave a message and we will return your call as soon as possible.

During the summer and fall of 2017, the distribution division began a multiphase project to create a more dependable and more efficient system for the transmission of water from the water treatment plant on Kenoza Lake to the 10-million gallon storage tank on Gale Hill. The following work was completed in 2017:

- Added 270 feet of new 36-inch water main with new valves to the 36-inch main feed from the treatment to the 20-inch water main at Kenoza Ave. and Humphrey St. This eliminated some flow restriction to make distribution more efficient.
- Replaced 290 feet of 20-inch water main installed in 1892 and replaced old valves at Humphrey St. This provides more reliable valves for directing water flow and eliminated some very old fittings, like the one that failed on October 10th.
- Cleaned and cement lined 1,800 feet of the 1892 20-inch water main and replaced the valves and fittings to extend its life for another 100 years.
- Connected the water mains that feed water to the northeast part of Haverhill to both the 36-inch and 20-inch transmission mains. Now, we can feed that area of the city from either transmission main.

The City contracted Miles Leak Detection to survey its approximately 300 miles of water distribution pipes for leaks in the fall of 2017. One large leak and some smaller leaks on services and fire hydrants were found. The potential for loss of water through these leaks is estimated to be 94,320 gallons per day. The majority of these leaks have been repaired.

Sign up for NIXLE on the city's webpage, http://ci.haverhill.ma.us/, to receive notifications of any water projects or repairs that may affect you.

UCMR3 Sampling

We participated in the 3rd stage of the U.S. 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, to determine if the EPA needs to introduce new regulatory standards to improve drinking water quality. Contact us for more information on this program.

Due to results from UCMR3, Haverhill began monthly monitoring of chlorate in our drinking water. A health reference level of 210 parts per billion (ppb) was set as a benchmark to analyze the testing data and set possible new regulations. Chlorate ions enter drinking water through chemical reactions with treated water and the disinfection chemical sodium hypochlorite. The range of 12 results for 2017 was 27.6 - 210 parts per billion (ppb) with the yearly average of 108.2 ppb. Haverhill has instituted and updated best management practices to reduce the formation of chlorate by storing less sodium hypochlorite on site and reducing the storage tanks' exposure to light.

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.

REGULATED SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Alpha Emitters (pCi/L)	2014	15	0	-0.21	NA	No	Erosion of natural deposits
Barium (ppm)	2017	2	2	0.010	NA	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Chlorine (ppm)	2017	[4]	[4]	1.45	1.06–1.89	No	Water additive used to control microbes
Combined Radium (pCi/L)	2014	5	0	0.54	NA	No	Erosion of natural deposits
Fluoride (ppm)	2017	4	4	0.59	0.27–0.93	No	Water additive that promotes strong teeth
Haloacetic Acids [HAA] (ppb)	2017	60	NA	18.5	6.5–27.7	No	By-product of drinking water disinfection
Nitrate (ppm)	2017	10	10	0.10	NA	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Perchlorate (ppb)	2017	2	NA	0.10	NA	No	Inorganic chemicals used as oxidizers in solid propellants for rockets, missiles, fireworks, and explosives
TTHMs [Total Trihalomethanes] (ppb)	2017	80	NA	51.2	28.9–72.0	No	By-product of drinking water disinfection
Total Organic Carbon (ppm)	2017	TT	NA	2.8	1.74–2.8	No	Naturally present in the environment
Turbidity[1] (NTU)	2017	TT	NA	0.22	0.04–0.22	No	Soil runoff
Turbidity (Lowest monthly percent of samples meeting limit)	2017	TT = 95% of samples meet the limit	NA	100	NA	No	Soil runoff

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	0.07	0/32	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppb)	2017	15	0	3.0	1/32	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	55	NA	No	Runoff/leaching from natural deposits
pH (Units)	2017	6.5-8.5	NA	7.1	NA	No	Naturally occurring
Sulfate (ppm)	2017	250	NA	13	NA	No	Runoff/leaching from natural deposits; Industrial wastes
Total Dissolved Solids [TDS] (ppm)	2017	500	NA	180	NA	No	Runoff/leaching from natural deposits
Zinc (ppm)	2017	5	NA	0.86	NA	No	Runoff/leaching from natural deposits; Industrial wastes

[1] Turbidity is a measure of the cloudiness of the water. It is monitored because it is a good indicator of the effectiveness of the filtration system.

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

NTU (Nephelometric Turbidity Units): Measurement of the clarity, or turbidity, of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

pCi/L (picocuries per liter): A measure of radioactivity.

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.

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