

ANNUAL WATER QUALITY REPORT

WATER TESTING PERFORMED IN 2015



Presented By
Haverhill Water Department

Dear Valued Customer:

Once again I am happy to introduce our annual water quality report to you. This report covers testing that the Water Department performed between January 1 and December 31, 2015. Every year, the Water Department delivers this report to the customers to convey vital information regarding their drinking water.

We are dedicated to providing Haverhill's residents with the highest quality water that meets and exceeds all regulatory standards, and also to ensure the most reliable service. I encourage you to read this report to learn more about how our drinking water is treated and is distributed to your homes.

You can contact my office at (978) 374-2300 with any questions or, if you have specific questions regarding this report, please call Mary D'Aoust at (978) 374-2385.

You can also find a copy of the report on the following Web site: <http://bit.ly/haverhill2015ccr>

Sincerely,

James Fiorentini
Mayor

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 Process

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 and 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, 10 pumping stations, and approximately 300 miles of water main.

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;

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.

Our Water Sources

Our drinking water comes from a combined water source, all of which are surface water. Water is pumped from Millvale Reservoir and Crystal Lake into Kenoza Lake, where the Water Treatment Plant is located. Round Pond and Winnekenni Basin overflow into Kenoza Lake.

A Year in Review

The Haverhill Water Department has continued its phased plan of improvements at the water treatment plant that began in 2006. The design for an updated water treatment plant and upgrades to major distribution mains has been completed.

The Haverhill Water Department's program of meter replacement continued through 2015. To ensure that the City's major consumers have accurate readings of the amount of water used, the department has begun to replace the large water meters that have been in use for more than 10 years. Along with the older meters, any water meter that has failed to operate properly is also being replaced with radio read meters. The newer meters will result in more accurate meter readings and eventually eliminate the need for estimated bills. All work is being completed by water department staff with identification and clearly labeled vehicles. If you would like to verify authenticity, you may contact the Water Department's Meter Division at (978) 373-8487.

In a continuing effort to improve water quality and flows throughout the city, the Department flushed approximately 28 miles of water mains in the Riverside area of the City. In connection with the flushing, malfunctioning water valves and hydrants have been repaired. Riverside was the third section of Haverhill to be systematically flushed. We will continue to flush one section of the City at a time until the entire city has been flushed.

The Maintenance Division contracted Miles Leak Detection to conduct a survey of the entire distribution system of approximately 300 miles of water mains. The survey found 26 leaks that were previously undetected. The repair of these leaks saved up to 75.3 million gallons/year. This process will be repeated again in 2017. In addition, there were 40 major water main breaks and service leaks that were repaired in 2015.

To help us reach out to you with needed information, the Haverhill Water Department would like to direct you to the City's Web site at <http://ci.haverhill.ma.us> and ask that you sign up for Blackboard Connect. For emailed water/wastewater billing updates, please sign up for Constant Contact on the Water Billing page on the City's Web site at http://www.cityofhaverhill.org/departments/public_works_department/water_wastewater/billing_office/index.php.

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, 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.

Community Involvement

Through the efforts with the Firefighter's Museum, a project to paint, clear, and maintain the areas around your neighborhood fire hydrants was started. Paint, tools, and details of the program are available through the Firefighter's Museum on Kenoza Street.

The Haverhill Water Department would like all residents to be mindful of their water use and conserve when possible. Low-flow shower heads, faucet aerators, and water conservation kits are available to all water customers at the Water/Wastewater Billing Office in City Hall.

Please help us better serve you by reporting any leaks or if you see anyone other than water or fire department opening or drawing off a fire hydrant at (978) 374-2368 or use the free Mobile Citizen by MaintStar app for your smartphone.



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.

About our Violation

During the spring of 2015, we did not monitor for the presence of nitrates in the public drinking water system. Upon being notified of this violation by the Massachusetts Department of Environmental Protection, we immediately sampled and analyzed our water for nitrates. Results of the analysis have been received and properly recorded as required by state and federal law and are located in the table of results in this report. We do not believe that missing this monitoring requirement had any impact on public health and safety. We have already taken the steps to ensure that adequate monitoring and reporting will be performed in the future so that this oversight will not be repeated.

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 or the Haverhill Water Department's Backflow/Cross Connection division at (978) 374-2375.

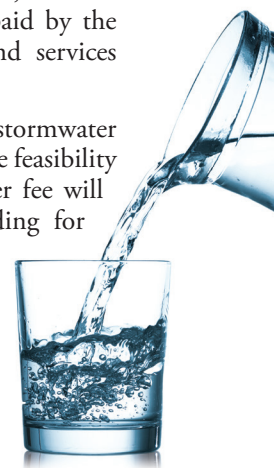
Lead in Home Plumbing

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.

Stormwater Utility

Pollution and flooding from stormwater runoff has become an increasing concern for the country. Stormwater runoff can transport pollutants into our waterways and cause flooding. Due to these impacts, stormwater has come under more scrutiny and regulation by the state and federal governments. Currently in Haverhill, stormwater costs are paid for by the wastewater ratepayers. However, there is no relationship between wastewater fees paid by the ratepayers and stormwater compliance and services received.

As the challenges and costs to comply with stormwater regulations increase, the City is exploring the feasibility of a stormwater fee. A separate stormwater fee will provide a more equitable source of funding for Haverhill's stormwater program instead of placing the burden on the wastewater ratepayers. In addition to stormwater regulatory compliance, the stormwater fee will go toward maintenance, stormwater infrastructure improvements, water quality of our waterways and sources, and reducing of flooding in Haverhill.



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.

Sampling Results

During the past year, we have taken hundreds of water samples to determine the presence of any radioactive, biological, inorganic, volatile organic or synthetic organic contaminants. The table below shows only those contaminants that were detected in the water.

The state requires us to monitor 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)	2015	2	2	0.009	NA	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Chlorine (ppm)	2015	[4]	[4]	1.52	1.12–1.75	No	Water additive used to control microbes
Combined Radium (pCi/L)	2014	5	0	0.54	NA	No	Erosion of natural deposits
Fluoride (ppm)	2015	4	4	0.6	0.08–1.4	No	Water additive that promotes strong teeth
Haloacetic Acids [HAA] (ppb)	2015	60	NA	18.9	4.8–28.6	No	By-product of drinking water disinfection
Nitrate (ppm)	2015	10	10	0.09	NA	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Perchlorate (ppb)	2015	2	NA	0.05	NA	No	Inorganic chemicals used as oxidizers in solid propellants for rockets, missiles, fireworks, and explosives.
TTHMs [Total Trihalomethanes] (ppb)	2015	80	NA	54.6	35.0–78.6	No	By-product of drinking water disinfection
Total Organic Carbon (ppm)	2015	TT	NA	1.84	1.56–2.17	No	Naturally present in the environment
Turbidity ¹ (NTU)	2015	TT	NA	0.118	0.044–0.118	No	Soil runoff
Turbidity (Lowest monthly percent of samples meeting limit)	2015	TT = 95% of samples < or = 0.3 NTU	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)	2014	1.3	1.3	0.04	0/32	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppb)	2014	15	0	7.0	0/32	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
Aluminum (ppb)	2015	200	NA	50	NA	No	Erosion of natural deposits; Residual from some surface water treatment processes
Chloride (ppm)	2015	250	NA	66	NA	No	Runoff/leaching from natural deposits
Manganese (ppb)	2015	50	NA	7	NA	No	Leaching from natural deposits
Odor (TON)	2015	3	NA	2	NA	No	Naturally occurring organic materials
pH (Units)	2015	6.5-8.5	NA	7.19	NA	No	Naturally occurring
Sulfate (ppm)	2015	250	NA	27	NA	No	Runoff/leaching from natural deposits; Industrial wastes
Total Dissolved Solids [TDS] (ppm)	2015	500	NA	220	NA	No	Runoff/leaching from natural deposits

¹Turbidity 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.

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 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

ND (Not detected): Indicates that the substance was not found by laboratory analysis.

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.

TON (Threshold Odor Number): A measure of odor in water.

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