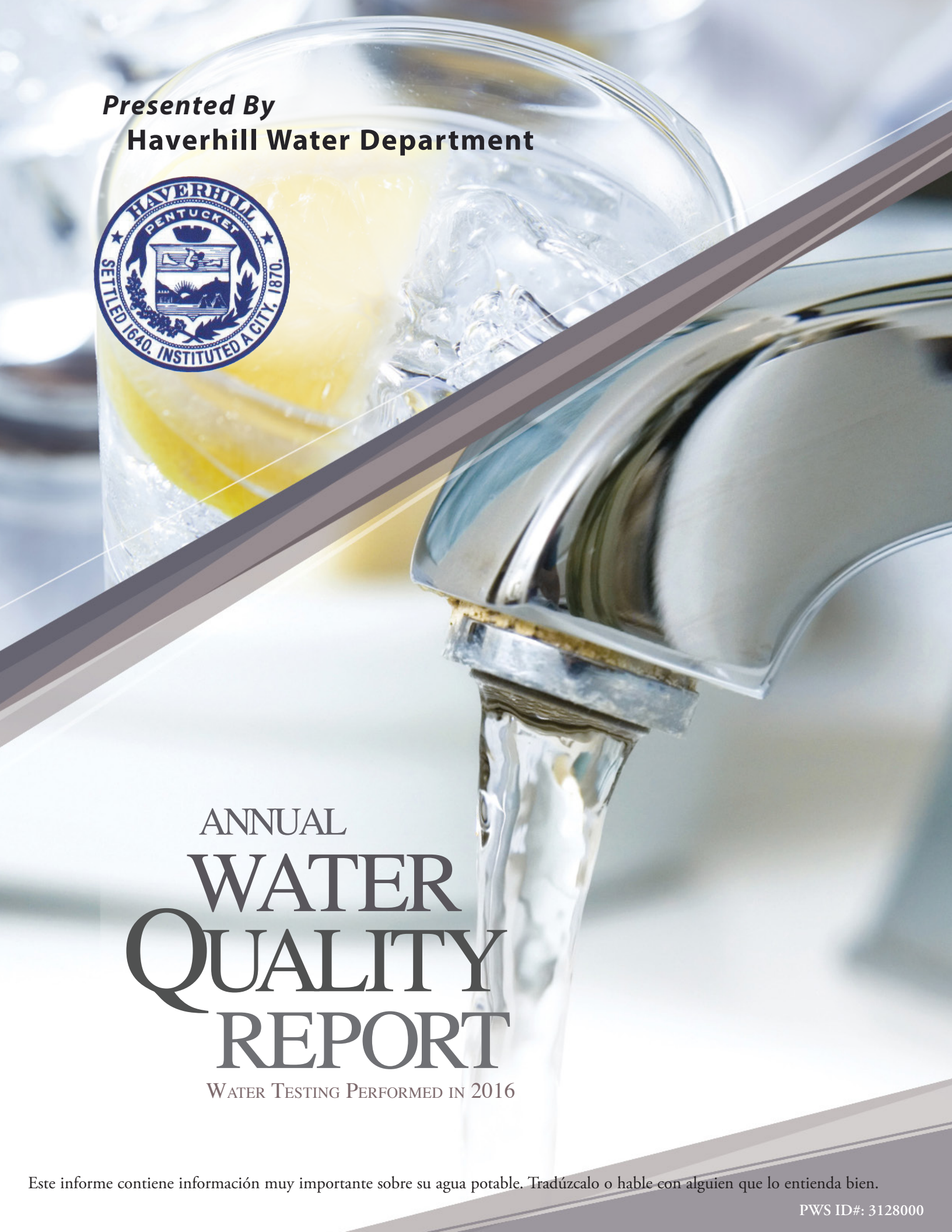


Presented By

Haverhill Water Department

ANNUAL WATER QUALITY REPORT

Water Testing Performed in 2016

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

PWS ID#: 3128000

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, 2016. Every year, the Water Department delivers this report to you, the customer, to convey vital information regarding your drinking water.

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

As you know, the Water Department asked customers to voluntarily conserve water last year due to drought conditions. I would like to personally thank you for your efforts. Even though our reservoirs are full at this time due to the recent, above-average precipitation, I encourage you to continue to use water wisely.

Please read this report to learn more about how your water is treated and how it reaches 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 website: https://goo.gl/0puAQx.

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 at http://water.epa.gov/drink/hotline.

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 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.

Our Water Sources

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

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 parts per million (ppm) to improve oral health in children. At this level, it is safe, odorless, colorless, and tasteless.

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, schools/colleges/universities, snow dump, storm-water 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.

Year in Review

Due to drought conditions and our request for voluntary water conservation, the City's flushing program was postponed until 2017 or until water levels are adequate.

The construction funding of the improvements to the Water Treatment Plant was approved in 2016 by City Council. Methuen Construction of Plaistow, NH, has been awarded the contract and is scheduled to begin in April 2017. The rehabilitation project will improve the plant's filtering capacity, improve disinfection systems, and provide increase redundancy in treatment plant processes. Construction will be completed in the spring of 2020.

The Haverhill Water Department is in the midst of a project to develop an additional water supply to meet the growing demands of our city. Many options have been explored, and we are moving forward with final exploratory work at a site along the Merrimack River. This new source will be a high-yield collector well that will withdraw water from the aquifer running through the sand and gravel deposits along the Merrimack River.

The Water Department asked Haverhill residents to voluntarily conserve water due to the 2016 drought. The voluntary efforts of our customers reduced our daily water demand and allowed us to make it into the recovery season without instituting mandatory water restrictions. We thank you for all of your efforts.

The Meter Department continues to replace older meters with radio-read meters to improve accuracy and efficiency of meter readings and to reduce estimated bills. All work is completed by the water department staff with identification and clearly labeled vehicles. If you are unsure about any employee, you can verify their identity by calling the Water Department Meter division at 978-373-8487. A large meter replacement program will begin in 2017.

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.

What's a Cross-connection?

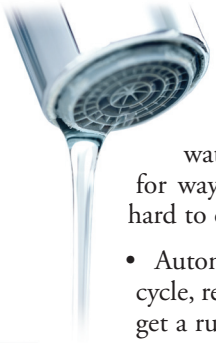
Cross-connections that contaminate drinking water distribution lines are a major concern. A cross-connection is formed at any point where a drinking water line connects to equipment (boilers), systems containing chemicals (air conditioning systems, fire sprinkler systems, irrigation systems) or water 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.

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.



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

Test Results

Our water is monitored for many different kinds of contaminants on a very strict sampling schedule. The information below represents only those substances that were detected; 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)	2016	2	2	0.009	NA	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Chlorine (ppm)	2016	[4]	[4]	1.24	0.64–2.06	No	Water additive used to control microbes
Combined Radium (pCi/L)	2014	5	0	0.54	NA	No	Erosion of natural deposits
Fluoride (ppm)	2016	4	4	0.7	0.25–1.07	No	Water additive which promotes strong teeth
Haloacetic Acids [HAA] (ppb)	2016	60	NA	21.2	3.6–28.8	No	By-product of drinking water disinfection
Nitrate (ppm)	2016	10	10	0.04	NA	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Perchlorate (ppb)	2016	2	NA	0.15	NA	No	Inorganic chemical used as oxidizers in solid propellants for rockets, missiles, fireworks, and explosives
TTHMs [Total Trihalomethanes] (ppb)	2016	80	NA	59.6	10.4–76.4	No	By-product of drinking water disinfection
Total Organic Carbon (ppm)	2016	TT	NA	1.42	0.32–2.18	No	Naturally present in the environment
Turbidity[1] (NTU)	2016	TT	NA	0.28	0.02–0.28	No	Soil runoff
Turbidity (lowest monthly percent of samples meeting limit)	2016	TT = 95% of samples meet the limit	NA	100	NA	No	Soil runoff

Tap Water Samples 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)	2016	200	NA	20	NA	No	Erosion of natural deposits; Residual from some surface water treatment processes
Chloride (ppm)	2016	250	NA	61	NA	No	Runoff/leaching from natural deposits
Odor (TON)	2016	3	NA	2	NA	No	Naturally occurring organic materials
pH (Units)	2016	6.5–8.5	NA	7.71	NA	No	Naturally occurring
Sulfate (ppm)	2016	250	NA	24	NA	No	Runoff/leaching from natural deposits; Industrial wastes
Total Dissolved Solids [TDS] (ppm)	2016	500	NA	188	NA	No	Runoff/leaching from natural deposits
Zinc (ppm)	2016	5	NA	0.79	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.

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.

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).

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

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.