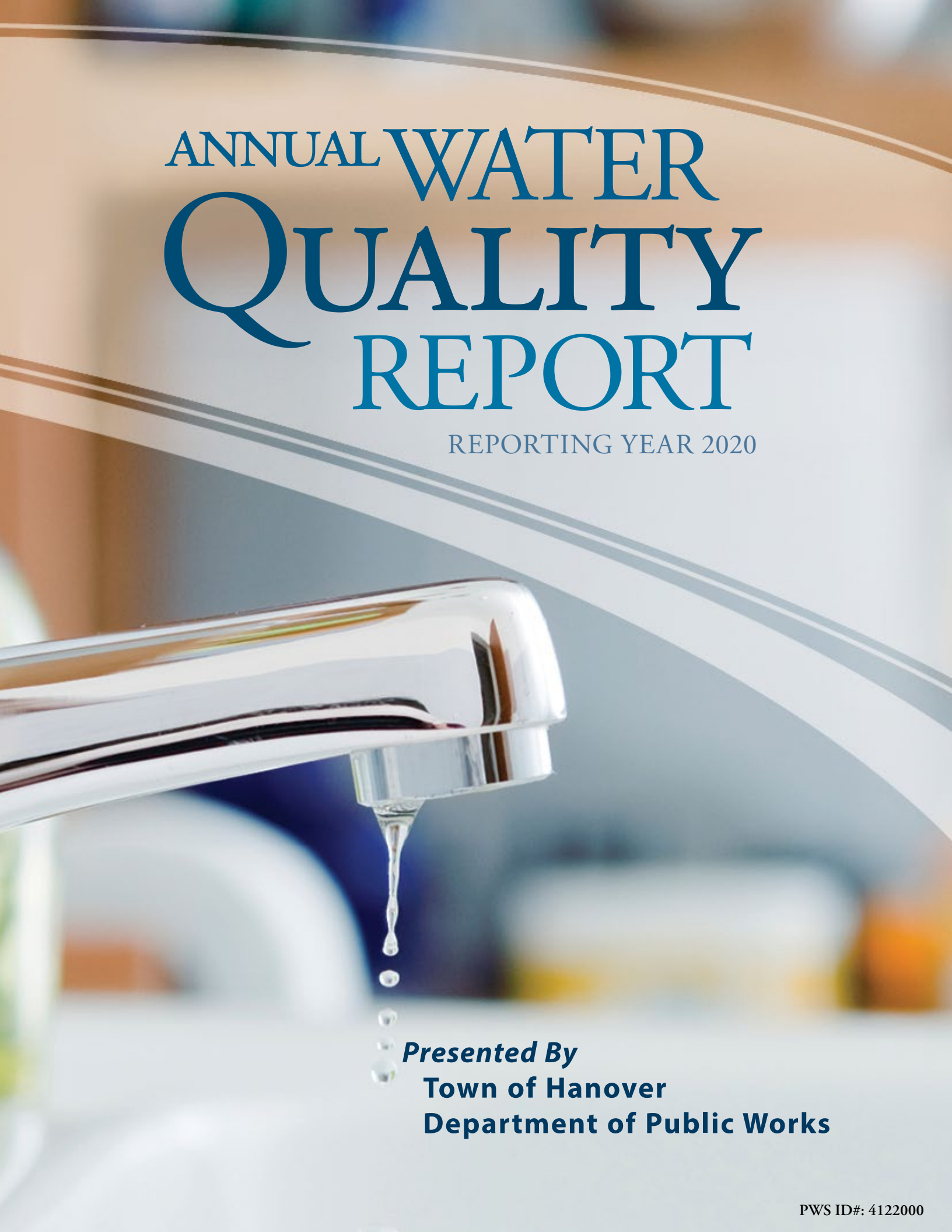


ANNUAL WATER QUALITY REPORT

REPORTING YEAR 2020

Presented By

Town of Hanover
Department of Public Works

PWS ID#: 4122000

Quality First

Once again, we are pleased to present our annual water quality report covering all testing performed between January 1 and December 31, 2020. 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.

Safeguard Your Drinking Water

Protection of drinking water is everyone's responsibility. You can help protect your community's drinking water source in several ways:

- Eliminate excess use of lawn and garden fertilizers and pesticides – They contain hazardous chemicals that can reach your drinking water source.
- Pick up after your pets.
- If you have your own septic system, properly maintain your system to reduce leaching to water sources.
- Dispose of chemicals properly; take used motor oil to a recycling center.
- Volunteer in your community. Find a watershed or wellhead protection organization in your community and volunteer to help. If there are no active groups, consider starting one. Use the U.S. EPA's Adopt Your Watershed to locate groups in your community.
- Organize a storm drain stenciling project with others in your neighborhood. Stencil a message next to the street drain reminding people "Dump No Waste – Drains to River" or "Protect Your Water". Produce and distribute a flyer for households to remind residents that storm drains dump directly into your local water body.

> "We remain vigilant in delivering the best-quality drinking water"

Conversion to Chloramines

To address elevated levels of total trihalomethanes (TTHMs) in the system, we converted the disinfection process at our three water treatment plants from chlorine to chloramines starting on May 13, 2020. Being less reactive with the natural organic matter found in our source water, chloramines produce lower levels of TTHMs than would be produced by chlorine. Since this conversion, we have seen a substantial drop in TTHM levels at our four MADEP-approved sample locations, with the latest samples collected in December 2020 averaging 38 ppb, well below the maximum contaminant level (MCL) of 80 ppb.

Unfortunately, our conversion to chloramines occurred after our first quarter TTHM sample was collected in March of 2020. That sample set had one location above the MCL, and as a result, we must report a violation in the drinking water standard for TTHMs in this year's report. However, moving forward, we are confident that the continued use of chloramines will maintain TTHM levels below the 80 ppb MCL.

ACO Update

Since 2018, our system has been operating under an Administrative Consent Order with MADEP for exceeding our authorized average annual withdrawal of 1.38 million gallons per day (MGD) and for unaccounted-for water levels in excess of 15%. As part of this ACO, we were directed by MADEP to implement additional restrictions on Non-Essential Outdoor Water Use (primarily focusing on lawn irrigation); to increase our leak detection and meter calibration efforts from annual to biannual; to evaluate our large customer meters (those larger than 2"); to continue with our residential meter replacement program (approaching 60% completion); to conduct an annual audit of our billing records; and to implement improved record-keeping procedures.

We are pleased to report that as a result of these actions and your actions as consumers by conserving water, we have seen a reduction in our average day withdrawal to below 1.38 MGD for the past two years. In addition, through improved record keeping, we have reduced our unaccounted-for water from 27% in 2018 to 9% and 5% in 2019 and 2020, respectively.

Information on the Internet

The U.S. EPA (https://goo.gl/TFAMKc) and the Centers for Disease Control and Prevention (www.cdc.gov) Web sites provide a substantial amount of information on many issues relating to water resources, water conservation and public health. Also, the DEP has a Web site (http://bit.ly/2HY4gfO) that provides complete and current information on water issues in Massachusetts, including valuable information about our watershed.

Substances That Could Be in Water

To ensure that tap water is safe to drink, the Department of Environmental Protection (MADEP) 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 that 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 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.

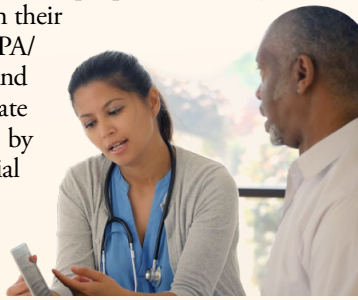
Source Water Assessment

A Source Water Assessment Plan (SWAP) is available at our office. 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.

Hanover's wells are located in aquifers with high vulnerability to contamination due to the absence of hydrogeologic barriers (e.g., clay) that can prevent contaminant migration. As a result, Hanover's sources are considered highly susceptible to contamination from a variety of sources such as petroleum products, industrial solvents, fertilizers, and microbial contaminants. Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area and does not imply poor water quality.

Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as those with cancer undergoing chemotherapy, those 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.



QUESTIONS? For more information about this report, or for any questions relating to your drinking water, please call Neal Merritt, Deputy Superintendent of Public Works (Water Operations), at (781) 826-3189.

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 we 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 at (800) 426-4791 or at www.epa.gov/safewater/lead.

Where Does My Water Come From?

The Town of Hanover's water supply comes from nine groundwater sources. Pond Street Wells #1, #2, and #3 are located north of the Pond Street Water Treatment Plant (WTP) at 40 Pond Street. Beal Wells #1 and #2 are located east of the Beal WTP at Riverside Drive. Broadway Wells #1 and #2 are located adjacent to the Broadway WTP at 507 Broadway. Hanover Wells #1 and #2 are located to the rear of 139 Hanover Street.

What type of container is best for storing water?
Consumer Reports has consistently advised that glass or BPA-free plastics such as polyethylene are the safest choices. To be on the safe side, don't use any container with markings on the recycle symbol showing "7 PC"(that's code for BPA). You could also consider using stainless steel or aluminum with BPA-free liners.

How much emergency water should I keep?
Typically, 1 gallon per person per day is recommended. For a family of four, that would be 12 gallons for 3 days. Humans can survive without food for 1 month, but can only survive 1 week without water.

How long can I store drinking water?
The disinfectant in drinking water will eventually dissipate, even in a closed container. If that container housed bacteria prior to filling up with the tap water, the bacteria may continue to grow once the disinfectant has dissipated. Some experts believe that water could be stored up to six months before needing to be replaced. Refrigeration will help slow the bacterial growth.

How many community water systems are there in the U.S.?
About 53,000 public water systems across the United States process 34 billion gallons of water per day for home and commercial use. Eighty-five percent of the population is served by these systems.

Which household activity wastes the most water?
Most people would say the majority of water use comes from showering or washing dishes; however, toilet flushing is by far the largest single use of water in a home (accounting for 40% of total water use). Toilets use about 4–6 gallons per flush, so consider an ultra-low-flow (ULF) toilet, which requires only 1.5 gallons.

Test Results

Our water is monitored for many different kinds of substances on a very strict sampling schedule. Also, the water we deliver must meet specific health standards. Here, we show only those substances that were detected in our water. (A complete list of all our analytical results is available upon request.) Remember that detecting a substance does not 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 often 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
Chloramines[1] (ppm)	2020	[4]	[4]	3.55	0.01–3.55	No	Water additive used to control microbes
Chlorine (ppm)	2020	[4]	[4]	1.45	0.00–2.34	No	Water additive used to control microbes
Combined Radium (pCi/L)	2015	5	0	1.90	NA	No	Erosion of natural deposits
Haloacetic Acids [HAAs] (ppb)	2020	60	NA	31	3–33	No	By-product of drinking water disinfection
Nitrate (ppm)	2020	10	10	1.92	ND–1.92	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Nitrite (ppm)	2020	1	1	0.21	ND–0.21	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Perchlorate (ppb)	2020	2	NA	0.28	0.13–0.28	No	Inorganic chemicals used as oxidizers in solid propellants for rockets, missiles, fireworks, and explosives
TTHMs [Total Trihalomethanes][2] (ppb)	2020	80	NA	84	13–63	Yes	By-product of drinking water disinfection
Tetrachloroethylene (ppb)	2020	5	0	1.2	ND–1.2	No	Discharge from factories, dry cleaners, and asbestos-cement-lined pipes
Total Coliform Bacteria (Positive samples)	2020	TT	NA	1	NA	No	Naturally present in the environment

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 %ILE)	SITES ABOVE AL/TOTAL SITES	VIOLATION	TYPICAL SOURCE
Copper (ppm)	2020	1.3	1.3	0.61	0/120	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppb)	2020	15	0	4	1/120	No	Lead services lines; Corrosion of household plumbing systems including fittings and fixtures; Erosion of natural deposits

SECONDARY SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	SMCL	MCLG	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Manganese[3] (ppb)	2020	50	NA	92	ND–92	No	Leaching from natural deposits

UNREGULATED SUBSTANCES [4]

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
1,2,3-Trichloropropane (ppb)	2020	0.7	NA	Discharge from use in paint and varnish removers
Bromodichloromethane (ppb)	2020	10.8	1.2–20.4	By-product of drinking water disinfection
Bromoform (ppb)	2020	2.3	0.7–7.5	By-product of drinking water disinfection
Chlorodibromomethane (ppb)	2020	6.7	0.6–14.1	By-product of drinking water disinfection
Chloroform (ppb)	2020	15.4	1.5–26.7	By-product of drinking water disinfection
Sodium (ppm)	2019	62.7	NA	Discharge from the use and improper storage of sodium-containing de-icing compounds

[1] Dichloramine detects ranged from 0.00 to 0.40 mg/L in 2020.

[2] Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their livers, kidneys, or central nervous systems, and may have an increased risk of getting cancer.

[3] Manganese is a naturally occurring mineral found in rocks, soil, groundwater, and surface water. Manganese is necessary for proper nutrition and is part of a healthy diet, but it can have undesirable effects on certain sensitive populations at elevated concentrations. U.S. EPA and MADEP have established public health advisory levels for manganese to protect against concerns of potential neurological effects.

[4] Unregulated contaminants are those for which the U.S. EPA has not established drinking water standards. The purpose of monitoring unregulated contaminants is to assist the EPA in determining their occurrence in drinking water and whether future regulation is warranted.

Definitions

90th %ile: 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 that, if exceeded, triggers treatment or other requirements that a water system must follow.

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.

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): These standards are developed to protect aesthetic qualities of drinking water and are not health based.

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