

ANNUAL WATER QUALITY REPORT

WATER TESTING
PERFORMED
IN 2014



Presented By
City of Keene

There When You Need Us

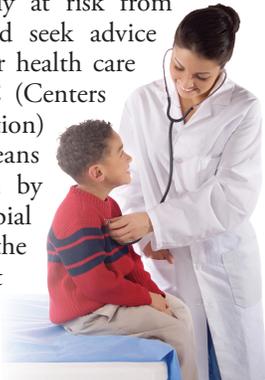
The City of Keene is proud to present its annual water quality report covering all testing performed between January 1 and December 31, 2014. Most notably, last year marked the 40th anniversary of the Safe Drinking Water Act (SDWA). This rule was created to protect public health by regulating the nation's drinking water supply. The Public Works Operations, Laboratory, Maintenance, and Water/ Sewer divisions have dedicated themselves to producing and delivering high-quality drinking water that meets all state and federal standards. As new challenges to drinking water safety emerge, the City remains vigilant in meeting the goals of source water protection, water conservation, and community education while continuing to serve the needs of all users.

Community Participation

The City Council's Municipal Services, Facilities, and Infrastructure committee is designated to address water related issues. This committee has regular meetings at 6:00 p.m. on the 2nd and 4th Wednesdays of each month in the City Council Chambers at City Hall. If you wish to speak with them about an issue concerning your drinking water, contact the City of Keene Clerk's office at (603) 352-0133.

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>.



Substances That Could Be in Water

To ensure that tap water is safe to drink, the U.S. EPA prescribes regulations limiting the amount of certain contaminants in water provided by public water systems. U.S. Food and Drug Administration 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, in some cases, radioactive material, and 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.

For more information about contaminants and potential health effects, call the U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791.

Where Does My Water Come From?

The City of Keene delivers both surface and groundwater to its customers. The majority of the water comes from the surface water reservoirs located in the town of Roxbury and some from four gravel-packed wells located in Keene on Court and West Streets. Water from the reservoir flows to the Water Treatment Facility (WTF) where it is filtered, disinfected, and made less acidic before it enters the distribution system. Well water is pumped from the Court Street and West Street aquifers. It is not filtered, but it is disinfected and the pH is adjusted before it is distributed to your home. Although your water comes from more than one source, it all goes into the same distribution system, so you may receive different blends of water on different days.

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 as 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!)

Source Water Assessment

In October 2002, the NH Department of Environmental Services prepared Source Water Assessment Reports for our source water, assessing the sources' vulnerability to contamination. The results of the assessments are as follows:

Babbidge Reservoir received zero high susceptibility ratings, one medium susceptibility ratings, and eleven low susceptibility ratings.

The Court Street Well Field received two high susceptibility ratings, five medium susceptibility ratings, and five low susceptibility ratings.

The West Street well site received six high susceptibility ratings, three medium susceptibility ratings, and three low susceptibility ratings.

The complete Assessment Report is available for review at the Keene Public Works Department. For more information, contact Donna Hanscom, Assistant Public Works Director, at 352-6550 or visit NH Department of Environmental Services Drinking Water Source Water Assessment Program Eeb site at <http://des.nh.gov/organization/divisions/water/dwgb/dwspp/dwsap.htm>.

QUESTIONS?

The City encourages and welcomes participation and feedback from the public. Come see how the Water Treatment Facility works. City staff invites individuals, groups, schools, and college classes to schedule a tour of the facility.

For more information about this report, to schedule a tour, or for any questions relating to your drinking water, please contact Aaron Costa, Operations Manager, at (603) 357-9836 Ext. 6507 or acosta@ci.keene.nh.us, or Benjamin Crowder, Water Treatment Facility Manager, at (603) 357-8483 or bcrowder@ci.keene.nh.us.

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. The City is 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 or at www.epa.gov/safewater/lead.

Testing For *Cryptosporidium*

Cryptosporidium is a microbial parasite found in surface waters throughout the U.S. Very low concentrations were detected in samples collected from the City's untreated surface water source in 2008 & 2009. Although filtration removes *Cryptosporidium*, the most commonly used filtration methods cannot guarantee 100 percent removal. Current test methods cannot determine if the organisms are dead or if they are capable of causing disease. Symptoms of infection include nausea, diarrhea, and abdominal cramps. Most healthy individuals can overcome the disease within a few weeks. However, immunocompromised people are at greater risk of developing life-threatening illness. Immunocompromised individuals are encouraged to consult their doctors regarding appropriate precautions to take to avoid infection. *Cryptosporidium* must be ingested to cause disease, and it may be spread through means other than drinking water.

New TOC Analyzer Helps City Enhance Coagulation

In March of 2015, the City installed a new total organic carbon (TOC) online analyzer at the Water Treatment Facility. The new analyzer continuously monitors naturally occurring dissolved organic matter concentrations of the untreated water source as well as the concentration of the filtered, treated water. The new analyzer is a valuable tool for enhancing coagulation. Enhanced coagulation is a water treatment technique designed to target turbidity (cloudiness of the water) and dissolved organics. It is important to remove as much organic matter as possible before disinfection because chlorine reacts with organics, causing potentially harmful disinfection by-products (DBPs). The new analyzer, which replaced an older, obsolete model, was funded through the City's capital improvement program.

Fixtures With Green Stains

A green or blue-green stain on kitchen or bathroom fixtures is caused by tiny amounts of copper that dissolve in your home's copper plumbing system when the water sits unused overnight. Copper staining may be the result of a leaky faucet or a faulty toilet flush valve, so be sure your plumbing is in good working order. Copper stains may also be caused by overly hot tap water. Generally speaking, you should maintain your water temperature at a maximum of 120 degrees Fahrenheit. You should consult the owner's manual for your heater or check with your plumber to determine your current heat setting. Lowering your water temperature will reduce the staining problem and save you money on your energy bill. Also keep in mind that a tap that is used often throughout the day usually will not produce copper stains, so if you flush the tap for a minute or so before using the water for cooking or drinking, copper levels will be reduced.

UCMR3 Sampling

The City participated in the U.S. EPA's Unregulated Contaminant Monitoring Regulation (UCMR3) program. UCMR3 benefits the environment and public health by providing the EPA with data on the occurrence of contaminants suspected to be in drinking water. This information is used by the EPA to help determine if new regulatory standards to improve drinking water quality are needed. Any UCMR3 detections are shown in the data tables in this report. Contact Mary Ley, Laboratory Supervisor, at (603) 357-9836 Ext. 6502 for more information on this program.



Sampling Results

During the past year, staff collected hundreds of water samples in order to determine the presence of any radioactive, biological, inorganic, volatile organic, or synthetic organic contaminants. The tables below show only those contaminants that were detected in the water. The state requires the City to monitor 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
Chlorine (ppm)	2014	[4]	[4]	0.88	0.09–1.69	No	Water additive used to control microbes
Haloacetic Acids [HAAs]–Stage 2 (ppb)	2014	60	NA	38.3	7.0–72.4	No	By-product of drinking water disinfection
Nitrate (ppm)	2014	10	10	1.43	<0.10–1.8	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
TTHMs [Total Trihalomethanes]–Stage 2 (ppb)	2014	80	NA	40.4	21.6–65.1	No	By-product of drinking water disinfection
Total Organic Carbon (ppm)	2014	TT	NA	1.42	0.80–1.89	No	Naturally present in the environment
Turbidity ¹ (NTU)	2014	TT	NA	0.16	0.03–0.69	No	Soil runoff
Turbidity (Lowest monthly percent of samples meeting limit)	2014	TT=95% of samples <0.3 NTU	NA	99.6	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)	2013	1.3	1.3	0.42	0/51	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppb)	2013	15	0	1.6	0/51	No	Corrosion of household plumbing systems; Erosion of natural deposits

SECONDARY SUBSTANCES

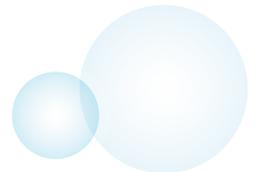
SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	SMCL	MCLG	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Chloride (ppm)	2014	250	NA	44.3	40–48	No	Runoff/leaching from natural deposits
Copper (ppm)	2014	1.0	NA	0.12	NA	No	Corrosion of household plumbing systems; Erosion of natural deposits
Iron (ppb)	2014	300	NA	60	48–85	No	Leaching from natural deposits; Industrial wastes
Manganese (ppb)	2014	50	NA	38	NA	No	Leaching from natural deposits
pH (Units)	2014	6.5–8.5	NA	7.6 (Mode)	5.8–9.3	No	Naturally occurring
Sulfate (ppm)	2014	250	NA	13.4	8.6–16.0	No	Runoff/leaching from natural deposits; Industrial wastes

OTHER SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Chlorate ² (ppb)	2014	NA	NA	115	56–190	No	By-product of drinking water disinfection
Chromium ² (ppb)	2014	100	NA	0.31	0.2–0.43	No	Naturally occurring metallic element
Hexavalent Chromium ² (ppb)	2014	100	NA	0.10	0.05–0.23	No	Naturally occurring in environment from erosion of chromium deposits; produced by industrial processes
Sodium (ppm)	2014	NA	NA	43	24–54	No	Naturally occurring
Strontium ² (ppm)	2014	1.5	NA	0.0565	0.0089–0.12	No	Naturally occurring metal
Vanadium ² (ppb)	2014	NA	NA	0.34	0.21–0.46	No	Naturally occurring metal

¹ Turbidity is a measure of the cloudiness of the water. It is monitored by surface water systems because it is a good indicator of water quality and thus helps measure the effectiveness of the treatment process. High turbidity can hinder the effectiveness of disinfectants.

² This substance was sampled for as part of the UCMR3 program.



Definitions

AL (Action Level): The concentration of a contaminant which, 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

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.

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).

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