

2004 Water Quality Report

Report's Purpose

The Littleton Water Department (LWD) is pleased to present this annual report on the quality of our water for the 2004 calendar year. As the stewards of the town's drinking water, we are proud to relate that it is of the highest quality, meeting and exceeding all primary drinking water standards set forth by the US Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MADEP). While this report satisfies a state requirement for reporting water quality data, it also gives us an opportunity to share with you important information on the sources of our water supply, treatment techniques, conservation measures and protection activities.

Source Water Assessment Program

The Source Water Assessment Program (SWAP) was developed by MADEP to help communities identify potential contamination sources that may compromise the source water quality. LWD has delineated the wellhead protection areas for each of the four wells that include identifying the location of potential contaminant sources within each well's watershed. The town map indicates the location of the wells, the aquifer areas and the watershed areas that recharge the wells.

The Town of Littleton and LWD have integrated land-use planning, stormwater management, environmental audits, and groundwater monitoring into an aggressive and comprehensive aquifer and watershed protection program that has been used as a model for other communities nationwide. Begun in 1981, much of the success of the program is due to a cooperative relationship between community planners and industrial and commercial developments. Currently, more than 100 groundwater-monitoring wells are sampled annually throughout the community by LWD. All compliance monitoring costs are borne by the property owners. Through communication, monitoring and public awareness, the program has become a proactive tool in protecting the groundwater resources of the community.

Residents can assist in protecting the groundwater by practicing good septic system maintenance, such as pumping out their septic tank every two years, and not using the septic system to dispose of solvents and paints. Limiting the use of pesticides, herbicides and fertilizers on the lawns will also help. Utilizing Littleton's hazardous waste collection day will help reduce the potential improper disposal of hazardous materials.



Water Sources

The Town of Littleton's drinking water comes from four wells that penetrate the shallow sand and gravel aquifer deposits located within the Beaver Brook and Bennett's Brook watersheds. The sand and gravel aquifers act as huge underground reservoirs that are continually replenished by rainfall and snowmelt.

LWD's four groundwater production wells yield over two and one-half million gallons per day of drinking water. After the water is pumped from the ground, it enters the distribution system that consists of over 42 miles of water main and three standpipes (water towers). The standpipes, located on Newtown Hill, Cedar Road, and Oak Hill, can store over four million gallons of water. This storage capacity helps maintain system-wide water pressure while at the same time providing sufficient amounts of water during periods of high water demand (i.e., fire protection). Water personnel not only service and maintain the existing distribution system, but also provide assistance required for system growth and development.

Drinking Water Treatment

In May 1998, the Spectacle Pond water treatment plant began operation to remove iron and manganese from the water supply well located near the pond. Excessive iron and manganese can cause aesthetic problems such as staining on laundry and bathroom fixtures, but are not a health concern. The application of ozone to the water causes the iron and manganese to form solid precipitates that are then removed by the treatment plant's fine-pore filters (ultrafiltration).

Potassium hydroxide is added to all of the Town of Littleton's drinking water sources prior to entering the distribution system. It is added at very low concentrations to increase the pH of the water and reduce its natural corrosivity. Corrosive water is undesirable because it can cause service leaks, stain plumbing fixtures, and even degrade the drinking water quality by leaching copper or lead out of private service lines and home plumbing. LWD does not add fluoride to its drinking water.



System Improvements

In 2004 crews concentrated on maintenance of the system. At the request of the residents, water main was installed on upper Crane Road. The installation was paid for by the residents through the betterment process.

Once a year, the water department carries out its water main flushing program to help reduce the adverse impacts caused by manganese buildup in the distribution system. The town-wide flushing program was initiated in October and took approximately three weeks to complete. The dates and locations of the flushing schedule were posted weekly in the local newspaper. We also posted daily updates on our website, www.lclwd.com, and our after-hours information line (978-486-3104, ext 460). We are committed to making the necessary enhancements to provide you with clean, safe water.



The water department continues to manage income generated from cell towers installed on town-owned property. In 2004, a total of \$245,226.76 was collected and distributed to the Conservation Commission, Clean Lakes Committee and Water Department. The Conservation Commission received \$142,949.28 which goes toward preserving open space in Littleton. The Clean Lakes Committee received \$63,811.64 to further their protection and clean-up of the lakes and ponds in town. The Water Department received \$38,465.84. We are pleased to be a part of a program that brings additional revenue to the town for the protection of our natural resources.

Substances Expected to be in Drinking Water

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (800-426-4791).

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. Further information on any of the contaminants, including detection levels, can be found in the Water Quality Data table in this report:



Microbial Contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

Organic Chemical Contaminants, including synthetic and volatile organic compounds, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.

Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.

Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

Inorganic contaminants, such as salts and metals, which can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, and farming.



Perchlorate Results Negative

Perchlorate is both a naturally occurring and man-made chemical. Most of the perchlorate manufactured in the United States is used as the primary ingredient of solid rocket propellant and explosives. Neighboring communities have found traces of perchlorate in their water; LWD sampled twice in 2004 at all of our well sites and the results were all negative. There was no perchlorate found in Littleton's water supplies.

Radon in Water

Radon is a radioactive gas that you cannot see, taste, or smell. It is found throughout the U.S. Radon can move up through the ground and into a home through cracks and holes in the foundation. Radon can build up to high levels in all types of homes. Radon can also get into indoor air when released from tap water from showering, washing dishes, and other household activities. Compared to radon entering the home through soil, radon entering the home through tap water will be (in most cases) a small source of radon in indoor air. Radon was detected in the water supply during the 1999 sampling period. The highest level detected was 1,900 picocuries per liter of air (pCi/l), which is well below the advisory limit of 10,000 pCi/l.

Radon is a known human carcinogen. Breathing air containing elevated radon levels can lead to lung cancer. Drinking water containing radon may also cause increased risk of stomach cancer. If you are concerned about radon in your home, test the air in your home. Testing is inexpensive and easy. Fix your home if the level of radon in your air is 4 pCi/l or higher. There are simple ways to fix a radon problem that aren't too costly. For additional information call the DPH at 413-586-7525 or call EPA's Radon Hotline, 800-SOS-RADON.



Drinking Water Quality Standards

In order to ensure that tap water is safe to drink, the MADEP and EPA prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration (FDA) and the Massachusetts Department of Public Health (DPH) regulations establish limits for contaminants in bottled water that must provide the same protection for public health.

Primary drinking water standards have been established by the EPA to insure the protection of human health. These standards relate to regulated chemicals (natural and man-made) commonly identified within drinking water recharge areas. LWD routinely monitors the four municipal drinking water wells, as well as sample locations within the distribution system, to evaluate the water quality of the entire distribution system. We are pleased to report that the drinking water within our system currently meets or exceeds all established primary drinking water standards. Secondary drinking water standards have been set for those chemicals that manifest themselves as nuisance or aesthetic water quality problems.

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

Sampling Schedule

The MADEP requires LWD to sample the four production wells yearly for volatile organic compounds, iron, manganese and nitrate. The MADEP has reduced the monitoring requirements for asbestos, inorganics, synthetic organic compounds (pesticides & herbicides), nitrite, radionuclides, lead and copper. The sampling frequency for these compounds is reduced because the water sources are not at risk of contamination by these substances.

All MADEP sampling parameters, with the exception of asbestos, inorganics, nitrite, radionuclides, lead and copper, were required to be sampled in 2004. Asbestos and inorganics were last sampled for in 2002 and were found to meet all applicable EPA and MADEP standards. Nitrite, radionuclides, lead and copper were last sampled for in 2003 and the results met all applicable EPA and MADEP standards.

Important Definitions

Action Level (AL) - The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

HAA4 - Haloacetic acids (mono-, di-, and trichloroacetic acid, and mono- and di-bromoacetic acid)

Massachusetts Office of Research and Standards Guideline (ORSG) - This is the concentration of a chemical in drinking water, at or below which, adverse health effects are unlikely to occur after chronic (lifetime) exposure. If exceeded, it serves as an indicator of the potential need for further action.

Maximum Contaminant Level (MCL) - 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.

Maximum Contaminant Level Goal (MCLG) - 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.

Maximum Residual Disinfection Level (MRDL) - 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 contaminant (ex. chlorine, chloramines, chlorine dioxide).

Maximum Residual Disinfection Level Goal (MRDLG) - 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 disinfectant to control microbial contaminants.

ND - not detected above laboratory method detection limits.

N/A - Not Applicable.

PCE - Tetrachloroethylene

pCi/l - picocuries per liter. A unit of radiation.

ppm - parts per million, or milligrams per liter (mg/l)

ppb - parts per billion, or micrograms per liter (µg/l)

Secondary Maximum Contaminant Level (SMCL) - These standards are developed to protect the aesthetic qualities of drinking water and are not health based.

TTHMs - Trihalomethanes (chloroform bromodichloromethane, dibromochloromethane and bromoform)

2,4-D - 2,4-Dichlorophenoxyacetic acid

90th Percentile - Out of every 10 homes sampled, 9 were at or below this level.

Water Quality Data

The following table provides information about substances that have been detected in Littleton's water system during the 2004 calendar year. These data are the same data used to comply with the EPA and MADEP monitoring and testing requirements. The MADEP requires LWD to monitor for certain substances less than once a year. In these cases, the most recent sample data are included, along with the year the sample was collected. Unless otherwise noted, only detected substances are included in the table.

Regulated Contaminants

Substance (units)	Sample Date	MCLG/MRDLG	MCL/MRDL	Highest Detected/Annual Average	Range Detected	Violation	Possible Source(s) of Contamination
Alpha emitters (pCi/L)	2003	0	15	2.3 ± 1.2	0.4-2.3	No	Erosion of natural deposits.
Barium (ppm)	2002	2	2	0.04	0.01-0.04	No	Discharge of drilling wastes; erosion of natural deposits.
Fluoride (ppm)	2001	4	4	0.18	0.10-0.18	No	Erosion of natural deposits.
Nitrates (ppm)	2004	10	10	0.93	0.44-0.93	No	Fertilizer use; leaching from septic tanks; sewage.
PCE (ppb)	1999	0	5	0.6	ND-0.6	No	Discharge from factories and dry cleaners.
TTHMs (ppb)	2004	0	80	1.21	0.62-1.8	No	By-product of drinking water chlorination.
HAA5 (ppb)	2004	N/A	60	2.37	1.8-2.8	No	By-product of drinking water disinfection.
2,4-D (ppm)	2004	70	70	0.27	ND-0.27	No	Herbicide runoff.
Picloram (ppm)	2004	500	500	0.87	ND-0.87	No	Herbicide runoff.

Unregulated Contaminants

Substance (units)	Sample Date	SMCL	ORSG	Highest Detected	Range Detected	Violation	Possible Source(s) of Contamination
Iron (ppb)	2004	300	--	180	20-180	No*	Erosion of natural deposits.
Manganese (ppb)	2004	50	--	100	ND-100	Yes*	Erosion of natural deposits.
MTBE (ppb)	1999	20-40	70	0.6	ND-0.6	No	Leaking underground storage tanks or gasoline spill.
Sodium (ppm)	2004	--	20	41.4	36.6-41.4	Yes**	Erosion of natural deposits; road salt.
Sulfate (ppm)	2004	250	--	15.3	6.3-15.3	No	Erosion of natural deposits.

Lead & Copper (Tap water was collected in 2003 for lead and copper analysis from 20 homes in service area.)

Substance (units)	Sample Date	MCLG	MCL/AL	No. of Sites Sampled	90th Percentile	Sites above AL	Possible Source(s) of Contamination
Copper (ppm)	2003	1.3	1.3	20	1.1	1	Corrosion of household plumbing, see statement below.
Lead (ppb)	2003	0	15	20	0.005	1	Corrosion of household plumbing.

Bacteria Sampling

	Sample Date	MCLG	MCL	Highest No. Positive in Routine Monthly Samples	Violation	Possible Source(s) of Contamination
Total Coliform	2004	0	>1 /month	1	No	Naturally present in the environment. See E.coli narrative in text.
Fecal Coliform or E.coli	2004	0	***	0	No	Human or animal fecal waste. See E.coli narrative in text.

Important Notes

-- = No applicable standard.

* = Elevated concentrations can cause aesthetic problems such as staining on laundry and bathroom fixtures, but are not a health concern.

** = Sodium levels fluctuate seasonally and are the result of road salting activities. If you are concerned about your daily intake of sodium, please contact your physician.

*** = Compliance with the Fecal Coliform/E.coli MCL is determined upon additional repeat sampling.

Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.

Special Health Information

Some people may be more vulnerable to contaminants in drinking water than the general public. Immuno-compromised 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 can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).



Stormwater Management Techniques

A number of years ago, the Town of Littleton received a state grant to revitalize Long Lake; among the measures being implemented with the funding are bioretention cells and rain gardens in the neighborhoods surrounding the Lake. These kinds of stormwater management tools are becoming increasingly popular in communities looking to treat stormwater before it is discharged into storm drains and makes its way to our lakes and streams.



Photo courtesy of the Low Impact Development Center

The rain gardens are designed to collect stormwater runoff from roofs and impervious surfaces and allow it to recharge into the ground. These gardens filter out the harmful nutrients that would typically be flushed directly into the Lake. Perennial plants are planted in the garden and thrive off the nutrients left behind. Rain gardens have an additional benefit in reducing the need for large amounts of turf; they create a pleasing landscape that does not require additional watering that a lawn would need.

A wetlands park at the end of Beach Road and Lake Drive was constructed with a boardwalk to provide public access. Porous pavers were installed to allow the stormwater to infiltrate the ground, reducing runoff and increasing recharge into the ground. It has become a natural habitat for birds and other species. A kiosk is being constructed that will provide information on the project and other important environmental issues.

For those interested in learning more about the concepts described, please visit the Low Impact Development Center's website at www.lowimpactdevelopment.org.

Conservation Measures

Above normal rainfall during the months of July and August prevented the department from having to institute mandatory water restrictions during the summer of 2004. However, it is always important to continue to look for ways to use water wisely and to practice basic conservation measures to avoid stressing the water system.

The single greatest contributing factor to increased water usage is excessive lawn watering, primarily via sprinkler systems. Water from lawn sprinklers and garden hoses alone can often account for about 50 percent of the water used by individual consumers during the months of July and August. It is important to note that one inch of water per week is all that is necessary for proper lawn maintenance. For customers with automatic sprinklers, that translates to approximately 15 minutes per zone.

As new home construction continues, we must redouble our efforts to promote more naturally wooded lots, smaller lawns and drought-resistant landscaping. We must remain cognizant of the fact that our water is not an unlimited resource and we must continue to use it wisely both indoors and outdoors. The use of water conservation measures may reduce the likelihood of water restrictions during future periods of peak demand.

Water-Saving Tips

- Install moisture sensors on sprinklers systems. Do not water during the hottest part of the day; water once or twice per week in the very early morning before sunrise.
- Run your dishwasher only when full. Automatic dishwashers consume the most water in the kitchen, about 12 to 17 gallons per load. Select dishwashing cycles that use the least number of washes and rinses.
- Run your washing machine only when full. Washing machines use 30 to 60 gallons per load. Don't run half loads. For smaller loads, adjust the water-setting level carefully or wait until you have enough laundry for a full load.
- Turn off the faucet while you brush your teeth or shave. You can save four to ten gallons of water a day.
- Install low-flow showerheads and faucet aerators. Low-flow showerheads can save 20-40 gallons of water during one 10-minute shower. A low-flow aerator can reduce faucet flow by 25%.



- Check for and fix any leaks in outdoor hoses, pipes, faucets, and connections. Outdoor leaks are often not as visible as leaks inside the home. But they can waste just as much water.



- Don't leave your garden hose unattended. A garden hose can pour out more than 600 gallons of water in just a few hours.

Water Quality Report 2004



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Additional Information:

This is LWD's sixth annual Consumer Confidence Report (CCR). For additional information or a complete breakdown of the analyses conducted at wells and distribution locations, please contact Gregory Woods, Environmental Analyst, or Savas Danos, General Manager, at (978) 486-3104, between the hours of 7:00 AM and 4:00 PM, M-F. In addition, you can view the 2004 CCR and other information at our web site www.lelwd.com, or e-mail questions to cssupport@lelwd.com. Our information line is accessible after 4:00 PM at (978) 486-3104, extension 460.

You are welcome to join the monthly Board of Water Commissioners meetings on Wednesday evenings at 7:00 PM. Meeting notices are posted at the Town Hall and at the Light and Water Administration Building, located at 39 Ayer Road.