

2018 DRINKING WATER QUALITY REPORT

LYNNFIELD CENTER WATER DISTRICT, LYNNFIELD, MASSACHUSETTS

PWS ID# 3164000

Compliance with Safety and Health Standards

The Lynnfield Center Water District's (the District's) water meets and exceeds all state and federal standards. We test our water regularly through a certified laboratory. During 2018, we collected more than 1,200 water samples in the system that were then tested for

compliance with state and federal health standards. State and federal regulators routinely monitor our compliance and testing protocols to assure that we deliver safe drinking water to our customers.

Important Drinking Water Information

All sources of drinking water (both tap water and bottled water) including rivers, lakes, streams, ponds, reservoirs, springs, and wells contain some naturally occurring contaminants or substances. 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.

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 the water poses a health risk.

More information about contaminants and potential health affects can be obtained by calling the Environmental Protection Agency's (EPA's) Safe Drinking Water Hotline (1-800-426-4791). In order to ensure that tap water is safe to drink, the Massachusetts Department of Environmental Protection (DEP) 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. This report provides you with information about the contaminants found naturally in your

drinking water, the levels at which they were found, and the likely source of each contaminant.

Contaminants that may be present in source water include:

- *Microbial contaminants*, such as viruses and bacteria, may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.
- *Inorganic contaminants*, such as salts and metals, can be naturally-occurring or result from urban stormwater runoff, industrial, or domestic wastewater discharges, oil and gas production, mining and farming.
- *Pesticides and herbicides* may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- *Organic chemical contaminants* include synthetic and volatile organic chemicals that are by-products of industrial processes and petroleum production and can also come from gas stations, urban stormwater runoff and septic systems.
- *Radioactive contaminants* can be naturally-occurring or be the result of oil and gas production and mining activities.

Cross Connection Control Program

A cross connection is a connection between a drinking water pipe and a polluted source. The pollution can come from your own home. For instance, you're going to spray fertilizer on your lawn. You hook up your hose to the sprayer that contains the fertilizer. If the water pressure drops (say because of the fire hydrant use in the town) when the hose is connected to the fertilizer, the fertilizer may be sucked back into the drinking water pipes through the hose. Using an attachment on your hose called a backflow prevention device can prevent this problem.

The Lynnfield Center Water District recommends the installation of backflow prevention devices, such as low cost hose bib vacuum breaker, for all inside and outside hose connections. You can purchase that at a hardware store or plumbing supply store. This is a great way for you to help protect the water in your home as well as the drinking water system in your town!

Private Wells and Cross Connection Control

Many residents in Lynnfield own their own private well used for irrigation in addition to receiving drinking water from the District. If a residence is connected to both private well and the District's public water supply, the piping carrying the private well and public water cannot be connected anywhere. Otherwise an illegal cross connection is created, through which private well water may be siphoned into the public water mains. Therefore, residences served by private wells must physically disconnect from the public water system, or the pipes carrying private well and public water must be kept completely separate by means of an air gap. The physical separation between the private well and the public water supply, referred to as an air gap, must be at least twice the diameter of the water supply outlet, but never less than 1 inch.

2018 Drinking Water Report

This report describes the Lynnfield Center Water District's drinking water sources and treated water quality for calendar year 2018, and programs that protect the high quality of our water supply.

This publication is mandated by the federal public-right-to-know regulation requiring

community water suppliers to provide specific treated water quality information annually to their customers.

This report includes additional information beyond the minimum federal requirements in order to respond to typical questions our customers ask about the District's water system.



Published by the:

Lynnfield Center Water District
83 Phillips Rd., Lynnfield, MA 01940

2018 Water Quality Data

Listed below are 24 substances detected in the Lynnfield Center Water District's drinking water during 2018 (unless noted otherwise). The District also does additional testing well beyond what is required by federal and state regulations. Not listed are more than 100 other substances for which we tested that were not detected during 2018, including comprehensive testing for pesticides and herbicides.

Substance	Highest Detected Levels	Range of Detected Levels	Highest Level Allowed (MCL)	Ideal Goal (MCLG)	Source of Contamination
Regulated at the Water Supply Wells					
Barium	0.05 ppm	0.02 – 0.05 ppm	2 ppm	2 ppm	Discharge of drilling wastes, discharge from metal refineries, erosion of natural deposits
Chromium ¹	3.6 ppb	ND – 3.6 ppb	100 ppb	100 ppb	Discharge from pulp mills, erosion of natural deposits
Fluoride ²	0.6 ppm	0.1 – 0.6 ppm	4 ppm	4 ppm	Erosion of natural deposits; Water additive which promotes strong teeth
Gross Alpha ³	3.2 pCi/L	2.0 – 3.2 pCi/L	15 pCi/L	0 pCi/L	Erosion of natural deposits
Nitrate as Nitrogen	5.2 ppm	0.12 – 5.2 ppm	10 ppm	10 ppm	Runoff from fertilizer use; Leaching from septic systems; Erosion of natural deposits
Perchlorate	0.45 ppb	ND – 0.45 ppb	2 ppb	ND	Rocket propellants, fireworks, munitions, flares, blasting agents
Radium (226 & 228 combined) ³	0.2 pCi/L	0.0 – 0.2 pCi/L	5 pCi/L	0 pCi/L	Erosion of natural deposits
Bromodichloromethane	1.5 ppb	ND – 1.5 ppb	not regulated	not regulated	By-product of drinking water chlorination
Bromoform	0.9 ppb	ND – 0.9 ppb	not regulated	not regulated	By-product of drinking water chlorination
Chlorodibromomethane	1.5 ppb	ND – 1.5 ppb	not regulated	not regulated	By-product of drinking water chlorination
Chloroform	1 ppb	ND – 1 ppb	not regulated	not regulated	By-product of drinking water chlorination
Disinfectants and Disinfection By-Products					
Free, Total or Combined Chlorine ⁴	0.41 ppm	0.04 – 1.00 ppm	4 ppm (MRDL)	4 ppm (MRDLG)	Water additive used to control microbes
Total Trihalomethanes ⁴	26.1 ppb	18.4 – 33.7 ppb	80 ppb	NA	By-product of drinking water chlorination
Haloacetic Acids ⁴	7.1 ppb	5.8 – 8.5 ppb	60 ppb	NA	By-product of drinking water chlorination
Substance	Average Detected Levels	Range of Detected Levels	SMCL	Ideal Goal (MCLG)	Noticeable Aesthetic Effects Above the SMCL
Secondary Contaminants					
Aluminum	4.5 ppb	ND – 5 ppb	200 ppb	not regulated	Colored water
Chloride	78.3 ppm	40.5 – 116 ppm	250 ppm	not regulated	Salty taste
Copper	0.25 ppm	0.19 – 0.32 ppm	1 ppm	not regulated	Metallic taste; blue-green staining
Iron	11.5 ppb	ND – 19 ppb	300 ppb	not regulated	Taste and deposition on plumbing mixtures
Manganese ^{5, 6}	5 ppb	ND – 7 ppb	50 ppb	not regulated	Staining of laundry, metallic taste, odor and/or black-brown color
Odor	1 Ton	1 Ton	3 Ton	not regulated	Rotten-egg, musty or chemical smell
Sulfate	25.3 ppm	19.8 – 30.7 ppm	250 ppm	not regulated	Salty taste
Total Dissolved Solids (TDS)	281 ppm	204 – 358 ppm	500 ppm	not regulated	Metallic taste
Zinc	0.009 ppm	ND – 0.014 ppm	5 ppm	not regulated	Hardness; deposits; colored water; staining; salty taste
Substance	Highest Detected Levels ¹⁰	Range and Number of Sites Above Action Level (AL)	Action Level (AL)	Ideal Goal (MCLG)	Source of Contamination
Regulated at the Customer's Tap					
Lead	4 ppb	ND – 7 ppb 0 result > AL	15 ppb	0 ppb	Corrosion of household plumbing systems, erosion of natural deposits
Copper ¹¹	0.97 ppm	0.069 – 1.5 ppm 1 result > AL	1.3 ppm	1.3 ppm	Corrosion of household plumbing systems, erosion of natural deposits, leaching from wood preservatives
Regulated in the Groundwater Source Water					
Fecal Indicator	Result	Range	MCL	MCLG	Violation (Y/N)
E.coli (in groundwater source) ¹²	1 positive sample	ND – 1	0	0	No

Substance	Average Detected Levels	Range of Detected Levels
Unregulated Contaminants⁷		
Alkalinity	97 ppm	95 – 98 ppm
Calcium	33.6 ppm	23.2 – 43.9 ppm
Hardness	158 ppm	144 – 171 ppm
Magnesium	18 ppm	15 – 21 ppm
Nickel ^{1, 8}	5 ppb	3 – 9 ppb
Potassium	11.5 ppm	8.4 – 14.6 ppm
Sodium ⁹	40.5 ppm	12.6 – 107.1 ppm

Definitions:

Maximum Contaminant Level (MCL) – The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLG's as feasible using the best available 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. MCLG's allow for a margin of safety.

Maximum Residual Disinfectant 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 contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG) – The level of a drinking water disinfectant below which there is no known expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

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

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

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.

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

Key to Abbreviations:

NA – Not applicable **ND** – Not detected
ppm (Part Per Million) – One part per million is the equivalent of \$1 in \$1,000,000.
ppb (Part Per Billion) – One part per billion is the equivalent of \$1 in \$1,000,000,000.

pCi/L – Picouries per liter is a measure of the radioactivity in water. A picocurie is 10⁻¹² curies and is the quantity of radioactive material producing 2.22 nuclear transformations per minute.

Ton – Threshold odor number < Less than ± Plus or minus, denoting a range

Footnotes:

¹ Results from most recent testing in 2015.

² EPA's MCL for fluoride is 4 ppm. However, our state has set a lower SMCL, 2 ppm, to better protect human health.

³ Results from most recent testing in 2014.

⁴ Highest levels are based on annual average data. The ranges represent the individual results of all samples collected in 2018.

⁵ The SMCL for manganese is 50 ppb. EPA has established a lifetime health advisory (HA) of 300 ppb and a SMCL of 50 ppb for manganese to protect against concerns of potential neurological effects, and a 1-day and 10-day HA of 1,000 ppb for acute exposure.

⁶ Results shown are from MassDEP required sampling only. In 2018, the District elected to collect additional manganese samples at residential locations in response to reports of discolored water. For information regarding the additional manganese sampling, please visit the District's website: <https://lcwd.us> or call the office at: (781) 334-3901.

Unregulated contaminants are those for which there are no established drinking water standards. The purpose of unregulated contaminant monitoring is to assist regulatory agencies in determining their occurrence in drinking water and whether future regulation is warranted.

⁸ The ORSG for nickel is 100 ppb (there is no applicable SMCL for nickel). Some people who drink water containing nickel at high concentrations for many years could experience effects on the lung, stomach, blood, liver, kidneys, immune system, reproduction, and development.

⁹ The ORSG for sodium is 20 ppm (there is no applicable SMCL for sodium). Sodium sensitive individuals, such as those experiencing hypertension, kidney failure, or congestive heart failure, should be aware of the sodium levels where exposures are being carefully controlled.

¹⁰ Based on 90th percentile, as required by regulations. Results based on 20 MADEP approved sample sites.

¹¹ Copper is listed twice in this table, the first represents results found at an approved sample location. The second represents the results of 20 samples taken at the customer's tap, at locations approved by MassDEP.

¹² On July 23, 2018 we sampled raw (untreated) water at the Main Street Well for E. coli. On July 24, 2018 we were notified that the Main Street Well tested positive for E. coli. We immediately turned off the Main Street Well and took 5 additional samples that were all free from E. coli. We will continue to monitor the situation through weekly raw water bacteria samples. Water from the Main Street Well is disinfected with chlorine to kill viruses and bacteria, including E. coli. All distribution system samples were free from E. coli.

Health Effects: Fecal coliform and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some elderly, and people with severely compromised immune systems.

Lynnfield Center Water District's Source Water Assessment Program

Where does my water come from?

The Lynnfield Center Water District (LCWD) obtains its drinking water from four groundwater wellfields, as shown on the map below. The Glen Drive wellfield contains four bedrock wells. The Main Street wellfield contains a single gravel packed well. There are two wellfields in the Phillips Road area: a tubular wellfield with 60 wells, and a bedrock wellfield with five wells.

In addition to the wellfields, the District operates two storage tanks, one at Knoll Road and one at Wing Road. The distribution system consists of approximately 48 miles of water mains ranging in size from 2- to 16-inch diameter.

How are these sources protected?

The DEP has prepared a Source Water Assessment Program (SWAP) Report for the water supply sources serving the LCWD. The SWAP report notes the key issues of: residential land uses and activities; presence of oil or hazardous material contamination sites; and comprehensive wellhead protection planning in the water supply protection areas. The report commends the LCWD on its existing source protection measures, which include: posting "Public Drinking Water" signs; regular inspections of protection areas;

prohibition of non-water-supply related activities within the protection area; development of an "Emergency Response Plan" to deal with spills or other emergencies; and regular inspections of commercial and industrial activities by the Board of Health.

tilization at golf courses, residential pesticide use/over-application, above ground storage tanks, water treatment sludge lagoons, improper residential fuel oil storage and malfunctioning septic systems. Sources of high threats in the Phillips Road and Main Street recharge

What can be done to improve protection?

The Lynnfield Center Water District implements and monitors, as applicable, the above recommendations on an ongoing basis.

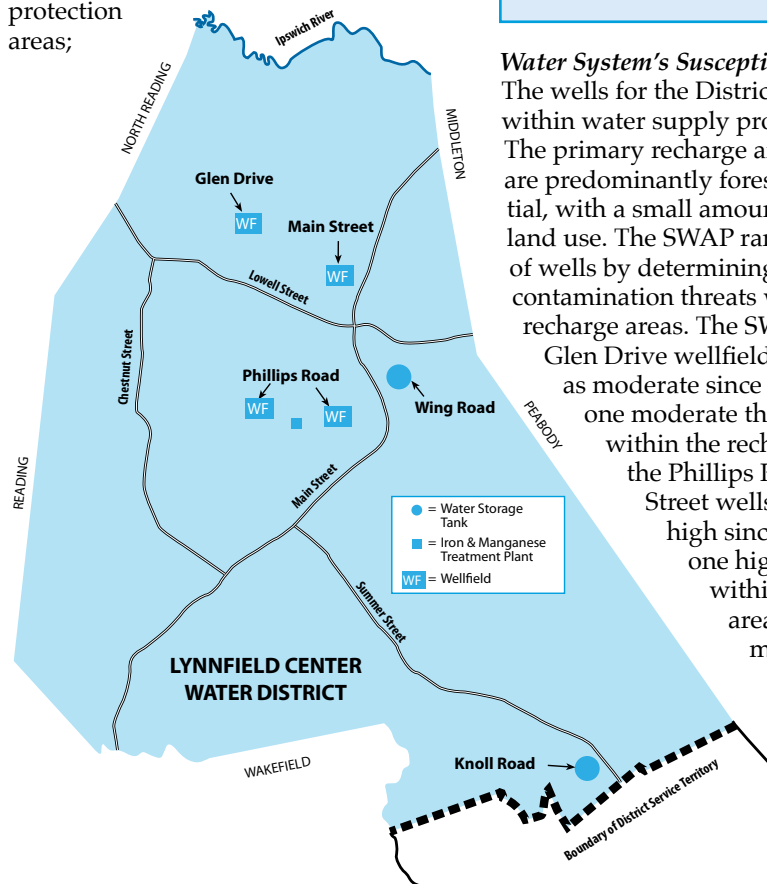
Residents can help protect sources by:

- Practicing good septic system maintenance.
- Supporting water supply protection initiatives at Town meetings.
- Taking hazardous household chemicals to hazardous materials collection days.
- Contacting the water department or Board of Health to volunteer for monitoring or education outreach to schools.
- Limiting pesticide and fertilizer use.

The SWAP report recommends:

- Educating residents on proper disposal of hazardous materials.

- Providing residents with information on environmentally friendly household products.
- Educating residents on septic system care.
- Educating residents on environmentally sound lawn care.
- Providing residents with educational materials on proper storage of liquid petroleum products in above ground storage tanks.
- Monitoring progress on ongoing remedial action conducted for known oil or hazardous material contamination sites.
- Developing a land acquisition plan.
- Coordinating efforts with local officials in North Reading and Peabody to compare existing controls.
- Developing and implementing an Inspection Program for facilities that generate, use, store, or dispose of hazardous / toxic materials.



Water System's Susceptibility

The wells for the District are located within water supply protection areas. The primary recharge areas for the wells are predominantly forested and residential, with a small amount of recreational land use. The SWAP ranks susceptibility of wells by determining the presence of contamination threats within the well recharge areas. The SWAP ranks the Glen Drive wellfield susceptibility as moderate since there is at least one moderate threat land use within the recharge area, and the Phillips Road and Main Street wells susceptibility as high since there is at least one high threat land use within the recharge area. Sources of moderate threats in the Glen Drive recharge area include potential contamination sources such as over-fer-

area include potential contamination sources such as improper fluid and fuel handling at gas stations and improper handling of underground storage tanks.

Where can I see the SWAP Report?

The complete SWAP report is available at the LCWD and online at www.mass.gov/files/documents/2016/08/ou/3164000.pdf

For more information, call the District at 781-334-3901.

Vulnerability

Some people may be more vulnerable to contaminants in drinking water than the general population. 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 advise about drinking water from their health care provider. EPA/Center for Disease Control guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline 1-800-426-4791.

Information About Manganese

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 can have undesirable effects on certain sensitive populations at elevated concentrations. The United States Environmental Protection Agency (EPA) and MassDEP have set an aesthetics-based Secondary Maximum Contaminant Level (SMCL) for manganese of 50 ug/L (microgram per liter), or 50 parts per billion. In addition, MassDEP's Office of Research and Standards (ORS) has set a drinking water guideline for manganese (ORSG), which closely follows the EPA public health advisory for manganese. Drinking water may naturally have manganese and, when concentrations

are greater than 50 ppb, the water may be discolored and taste bad. Over a lifetime, the EPA recommends that people drink water with manganese levels less than 300 ppb and over the short term, EPA recommends that people limit their consumption of water with levels over 1000 ppb, primarily due to concerns about possible neurological effects. Children younger than one year old should not be given water with manganese concentrations over 300 ppb, nor should formula for infants be made with that water for more than a total of ten days throughout the year. The ORSG differs from the EPA's health advisory because it expands the age group to which a lower manganese concentration applies from children less than six months of age to children up to one year of age

to address concerns about children's susceptibility to manganese toxicity. See EPA Drinking Water Health Advisory for manganese at: epa.gov/sites/production/files/2014-09/documents/support_cc1_magnese_dwreport_0.pdf and MassDEP Office of Research and Standards (ORS) for manganese mass.gov/eea/agencies/massdep/water/drinking/lead-and-other-contaminants-in-drinking-water.html

The District is performing hydrant flushing to lower manganese levels. There are also ongoing studies being performed to consider alternate water sources that would help lower manganese levels. Please see the District's website for additional information regarding flushing and ongoing studies.

Water Use Restrictions

As of May 31, 2019, the District has elevated the water use restriction to two days per week, Tuesday and Saturday, beginning 8 PM and ending 6 AM, due to Water Management Act Permit conditions, effective until further notice. Please visit the LCWD website for updates.

Important Health Information

Nitrate: Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant, you should ask for advice from your health care provider.

Note that nitrate results above 5 ppm were sampled from a single source (Main Street), which the district will continue to monitor.

Lead: 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. Lynnfield Center Water District is 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 at 800-426-4791 or at epa.gov/ground-water-and-drinking-water/basic-information-about-lead-drinking-water

Copper: 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.

How the District Treats Your Water

Sodium hypochlorite (chlorine) is added in the treatment process and as a disinfectant to kill any germs that may be in the water and to ensure that the water in the distribution system remains safe to drink.

Fluoride is added to the water to reduce the incidence of dental cavities, particularly in children. Note that in calendar year 2016, fluoride addition was temporarily taken offline, and was re-introduced in 2018, following replacement of equipment.

Potassium hydroxide (KOH) is mixed uniformly through the water to adjust pH and provide control corrosion of lead and copper from household plumbing fixtures.

Customer Views Welcome

If you are interested in learning more about Lynnfield Center Water District's water supply system, water quality and other related information please contact the District by calling 781-334-3901. The District's Board of Water Commissioners typically meet on the 2nd and 4th Monday of the month at the District's offices.

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