Salem and Beverly Water Supply Board

2019 WATER QUALITY REPORT

Public Water Supply ID #3030001

This report describes the Salem and Beverly Water Supply Board's (the Board's) drinking water sources and treated water quality for 2019.

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 customers.

This report includes additional information beyond the minimum federal requirements as part of our ongoing commitment to increase public awareness of your drinking water and protection of this valuable resource.

For More Information

...about contaminants and potential health effects contact the EPA's Safe Drinking Water Hotline
800-426-4791
visit www.epa.gov/safewater

...about the Salem and Beverly Water Supply Board (PWS ID #3030001) and your water quality, please call Peter Smyrnios, Superintendent, at 978-922-2600.

The Board meets at the Water Filtration Plant at 50 Arlington Avenue in Beverly. The Board usually meets on Thursday after the first Monday of the month, but call to confirm a meeting is scheduled. Notices of meetings are posted in the Beverly and Salem City Halls.

...about your water distribution system, please contact the appropriate department in your city:

Salem Water Department
(PWS ID #3258000)
phone: 978-745-9595 x5673

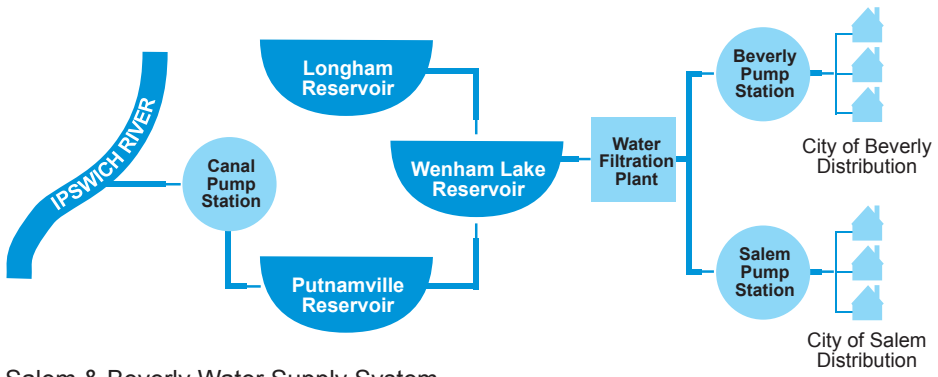
Beverly Water Department
(PWS ID #3030000)
phone: 978-921-6000 x2358

Sources of Your Drinking Water

Salem and Beverly use approximately 3.5 billion gallons of drinking water per year. This water is drawn from the Ipswich River and three reservoirs: Wenham Lake Reservoir, Putnamville Reservoir and Longham Reservoir.

Beverly's water mains have interconnections with Salem, Wenham, Danvers and Manchester. Salem's water mains have interconnections with Beverly, Marblehead and Peabody.

The Board recognizes the practical and ecological importance of storing high winter and spring flows of the Ipswich River for use in summer when river flows are naturally low. During winter and spring, water is pumped from the Ipswich River to Putnamville Reservoir and/or Wenham Lake Reservoir for storage and use in summer. Water is not pumped from the river during summer. Similarly, Longham Reservoir augments Wenham Lake Reservoir.



Salem & Beverly Water Supply System

Nonpoint Source Pollution

The US Environmental Protection Agency (EPA) Phase II Stormwater regulations require all communities with populations under 100,000 to implement control measures aimed at reducing water pollution caused by stormwater runoff. Stormwater runoff is a major component of nonpoint source (NPS) pollution. Approximately 40 percent of America's surveyed lakes, rivers, and estuaries fail to meet standards for safe fishing or swimming.

According to the EPA, NPS pollution constitutes the nation's largest source of water quality problems. NPS pollution occurs when runoff (rainwater or snowmelt) moves over the land picking up sediments and contaminants and then deposits them into lakes, rivers and coastal waters. Overland flow picks up pollutants from driveways, crops, industrial sites, or malfunctioning septic systems before discharging into the river or storm drain.

NPS pollution can lead to beach closures, fish kills, habitat destruction, and unsafe drinking water. Unlike point sources (e.g., discharge pipes from facilities), nonpoint sources are diffuse, which makes them difficult to trace and control.

Everyone contributes to NPS pollution in one way or another. Land use such as agriculture, forestry, construction, and septic systems are all potential sources of nonpoint contaminants.

Water is our most valuable natural resource. Join the Salem and Beverly Water Supply Board's conservation efforts to sustain our local water supplies. Look inside to learn more!

En Espanol: El informe contiene informacione importante sobre la calidad del agua en su cominidad. Traduzco o hable con alguien que lo entienda bien.

En Francais: La rapport contient des infomations concernant la qulaite de l'eau de votra communaute. Faites-le traduire, ou parlez-en a un ami que le comprend bien.

Salem and Beverly Water Supply Board
50 Arlington Avenue
Beverly, MA 01915

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...Nonpoint

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Household contributors include improperly disposed pet waste, lawn fertilizer, paints, and motor oil. Automobiles, factories, and wood stoves emit airborne contaminants that return to the earth in the form of rain or snow. The amount of these contaminants that reach water sources is increased by impermeable surfaces, such as roofs and pavements, which keep the soils from naturally filtering stormwater.

The Cities of Salem and Beverly have implemented Stormwater Management Plans (SWMP) designed to reduce stormwater runoff pollution and protect your source and surface waters. Public education and participation are required control measures for the SWMP.

Massachusetts Source Water Assessment & Protection Program

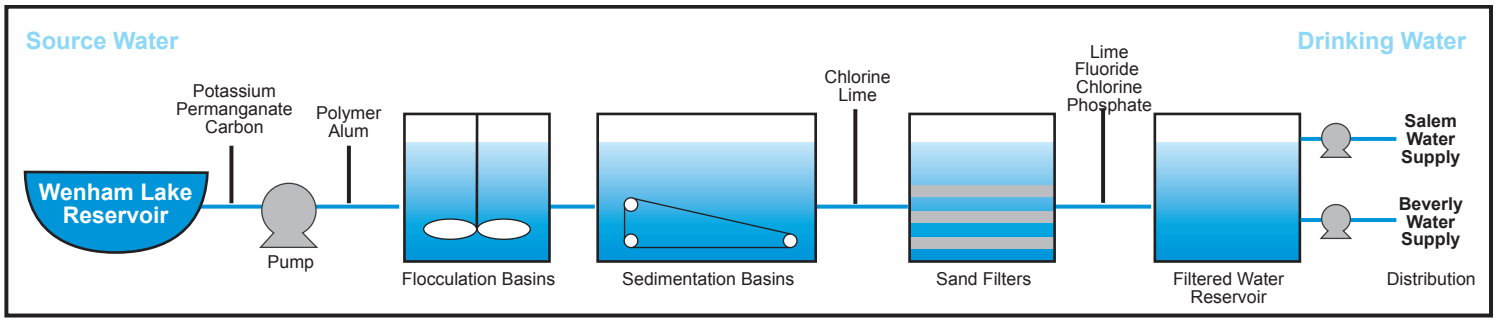
The Source Water Assessment and Protection (SWAP) Program assesses the susceptibility of public water supplies to contamination due to land uses and activities within the recharge area of Salem and Beverly's water supply. The water supply for these cities consists of surface water from Wenham Lake (Source ID #3030001-01S), Longham Reservoir (Source ID #3030001-02S), Putnamville Reservoir (Source ID #3030001-03S) and the Ipswich River (Source ID #3030001-04S).

A susceptibility ranking of high was assigned to this system using the information collected during the assessment by the Massachusetts Department of Environmental Protection (MassDEP). A high ranking is given to any water supply that has at least one high threat within the water supply protection area. Since there are 17 potential high threat land uses within the protection area, the Salem and Beverly water supply must be assigned a high susceptibility ranking. The potential contaminant sources within the protection area are: manure storage or spreading, pesticide storage or use, airports, body shops, gas stations, service stations/auto repair shops, bus and truck terminals, dry cleaners, photo processors, repair shops (engine, appliance, etc.), hazardous materials storage, machine/metalworking shops, hazardous waste facilities, large quantity hazardous waste generators, landfills and dumps, military facilities (past and present), former NIKE sites, and underground storage tanks. This ranking does not imply that the cities have poor water quality or will have poor water quality in the future. It only draws attention to various activities within the watershed that may be potential sources of contamination.

The SWAP then assesses what the water supplier is doing to prevent contamination and recommends other measures that can be taken to further protect the sources. Some source protection measures Salem and Beverly have already implemented include reviewing the development of plans in the City of Beverly and the Town of Wenham, conducting stream monitoring throughout the watersheds, and managing geese on Wenham Lake.

If you would like more information, the complete SWAP report is available at the Salem and Beverly Supply Board and online at http:/www.mass.gov/eea/docs/dep/water/drinking/swap/nero/3030001.pdf. You can also call the Salem and Beverly Water Supply Board at 978-922-2600.

Water Treatment and Distribution



Water from the Ipswich River and the 3 reservoirs is processed by a water filtration plant, operated 24 hours per day, 7 days per week by the Board. The plant removes naturally occurring impurities from the source water, as required by federal regulations and good public health practices, and delivers the water to pumping stations owned by the cities of Salem and Beverly. These pumping stations deliver drinking water to your home in pipes owned and maintained by each city water department.

Before water enters the filtered water reservoir that precedes the pumping stations, it is fluoridated. Fluoride is added to prevent tooth decay/cavities.

To maintain corrosion control in the distribution pipes, the Board utilizes a phosphate additive that is designed to optimize corrosion control throughout the distribution system and minimize dissolved lead in the pipes and household plumbing.

Treated Water Quality Data for 2019

Listed below are 24 contaminants detected in Salem's and Beverly's drinking water in 2019. We tested for more than 100 other contaminants in 2019, but they were not detected in your water.

Samples Collected from the Water Filtration Plant (After Treatment)

Substance	Units	Highest Result Detected	Range of Detection	Highest Level Allowed (MCL)	Ideal Goal (MCLG)	Violation (Y/N)	Sources of Contaminant
Microbiological							
Total Organic Carbon (TOC)(1)	ppm	2.76	1.70 - 2.76	TT	NR	N	Naturally present in the environment
Turbidity (2)	NTU	0.28	0.08 - 0.28	TT = 0.3	NR	N	Soil runoff
Inorganic Chemicals							
Barium	ppm	0.026	Single Sample	2	2	N	Discharge of drilling wastes, metal refineries, erosion of natural deposits
Fluoride (3)	ppm	0.71	Single Sample	4	4	N	Water additive which promotes strong teeth, erosion of natural deposits
Nitrate	ppm	0.19	0.05 - 0.19	10	10	N	Runoff from fertilizer use, leaching from septic tanks, sewage, erosion of natural deposits
Sodium (4)	ppm	49.6	Single Sample	NR	NR	N	Natural sources, runoff from use of salt on roadways, by-product of treatment process
Radionuclides							
Gross Alpha (5)	pCi/L	0.86	Single Sample	15	0	N	Erosion of natural deposits
Radium (6) (226 & 228 combined)	pCi/L	0.60	Single Sample	5	0	N	Erosion of natural deposits

Unregulated Contaminants

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.

	Units	Highest Result Detected	Range of Detection	SMCL	Sources of Contaminant
Manganese (7)	ppb	7	Single Sample	NR	Erosion of natural deposits
Trihalomethanes					
Chloroform	ppb	45.0	13.0 - 45.0		By-product of chlorination
Bromodichloromethane	ppb	16.7	7.52 - 16.7		By-product of chlorination
Dibromochloromethane	ppb	4.07	2.0 - 4.07		By-product of chlorination
Secondary Contaminants					
Aluminum	ppb	24	Single Sample	200	Byproduct of treatment process
Calcium	ppm	21.4	Single Sample	NR	Naturally present in environment
Chloride	ppm	89.8	Single Sample	250	Runoff from road de-icing, use of inorganic fertilizers, landfill leachates, septic tank effluents, animal feeds, industrial effluents
Copper	ppm	0.03	Single Sample	1	Naturally occuring organic material
Magnesium	ppm	4.36	Single Sample	NR	Naturally present in environment
Odor	T.O.N.	66.7	Single Sample	3	Erosion of natural deposits; leaching from wood preservatives
pH	S.U.	6.94	Single Sample	6.5 - 8.5	Runoff and leaching from natural deposits; seawater influence
Potassium	ppm	1.83	Single Sample	NR	Naturally present in environment
Sulfate	ppm	25.3	Single Sample	250	Naturally present in environment
Total Dissolved Solids	ppm	222	Single Sample	500	Erosion of natural deposits

Samples Collected from the Distribution System

Substance	Area	Units	90th Percentile	Range of Detection	Action Level	# of Samples Exceeding Action Level	Ideal Goals (MCLG)	Sources of Contaminant
Copper (8)	Salem	ppm	0.1868	0.0238 - 0.7489	1.3	0	1.3	Corrosion of household plumbing system, erosion of natural deposits, leaching from wood preservations
	Beverly	ppm	0.0891	0.0135 - 0.1232	1.3	0	1.3	
	Both	ppm	0.1252	0.0135 - 0.7489	1.3	0	1.3	
Lead (8)	Salem	ppb	2.7	ND - 4.8	15	0	0	Corrosion of household plumbing systems, erosion of natural deposits
	Beverly	ppb	3.7	ND - 26.2	15	2	0	
	Both	ppb	3.3	ND - 26.2	15	2	0	

Substance	Units	Average or Highest Running Annual Average Detected	Range of Detection	Highest Level Allowed (MCL)	Ideal Goal (MCLG)	Violation (Y/N)	Sources of Contaminant
Disinfection Contaminants							
Haloacetic Acids (HAA)	ppb	30.7 (10)	ND - 55.5 (11)	60 (12)	NR	N	By-product of drinking water chlorination
Total Trihalomethanes (TTHM) (9)	ppb	59.5 (10)	29.4 - 81.4 (11)	80 (12)	NR	N	By-product of drinking water chlorination
Chlorine (total)	ppm	1.53	0.85 - 2.90	4 (MRDL)	4 (MRDLG)	N	Water additive used to control microbes

Substance	Units	Highest % Positive in a Month	Total # Positive	Highest Level Allowed (MCL)	Ideal Goal (MCLG)	Violation (Y/N)	Sources of Contaminant
Microbiological							
Total Coliform Bacteria	-	0.00%	0 in 1,427 Samples	TT	N/A	N	Naturally present in the environment

Unregulated Contaminant Monitoring Rule (UCMR-4) (13)

Contaminant	Units	Average Results	Range of Detection	Sources of Contaminant
Bromochloroacetic Acid (14)	ppb	4.53	ND - 7.1	By-product of drinking water chlorination
Bromodichloroacetic Acid (14)	ppb	6.29	ND - 8.6	By-product of drinking water chlorination
Chlorodibromoacetic Acid (14)	ppb	0.99	ND - 1.5	By-product of drinking water chlorination
Monobromoacetic Acid (14)	ppb	0.24	ND - 1.1	By-product of drinking water chlorination
Dibromoacetic Acid (14)	ppb	0.52	ND - 1.2	By-product of drinking water chlorination
Dichloroacetic Acid (14)	ppb	10.64	0.35 - 18	By-product of drinking water chlorination
Monochloroacetic Acid (14)	ppb	0.56	ND - 2.9	By-product of drinking water chlorination
Trichloroacetic Acid (14)	ppb	16.49	ND - 25	By-product of drinking water chlorination

Contaminant	Units	Highest Results	Range of Detection	Sources of Contaminant
Total Organic Carbon (TOC) (15)	ppb	5600	4500 - 5600	Haloacetic Acid Indicator
Bromide (15)	ppb	61	ND - 61	Haloacetic Acid Indicator
Manganese (16)	ppb	45	ND-45	Erosion of natural deposits

Notes:

1. Finished water TOC compliance is determined in accordance with the requirements of 310 CMR 22.07E(6)(e)4a. TOC levels for 2019 were in compliance with applicable criteria.
2. Turbidity is a measure of the cloudiness of the water. Turbidity is monitored because it is a good indicator of water quality and the effectiveness of filtration. 95% of monthly samples of filtered water leaving the treatment plant must be <0.3 NTU and no samples can exceed 1 NTU. In 2019, all samples were <0.3 NTU.
3. Fluoride also has an SMCL of 2.0 ppm.
4. The MassDEP Office of Research and Standards has set a guideline concentration of 20 ppm for sodium. Sodium-sensitive individuals, such as those experiencing hypertension, kidney failure, or congestive heart disease, should be aware of the sodium levels if exposures are being carefully controlled.
5. Gross alpha testing was performed in 2014 (The next sampling is due in 2023).
6. Because past monitoring results for radium have been extremely low, the Board is now on a reduced monitoring interval. Radium testing was performed in 2014.
7. US EPA has established a lifetime health advisory (HA) value of 300 ppb for manganese to pretect against concerns of potential neurological effects, and a one-day and 10-day HA of 1000 ppb for acute exposure.
8. See lead and copper compliance monitoring sections below for details on lead and copper sampling.
9. 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. They may have a greater statistical risk of getting cancer.
10. Highest level detected is based on the locational running annual average (LRAA).
11. The range of detection is based on the samples collected quarterly at each sampling site and is not an average.
12. The highest level allowed (MCL) for total trihalomethanes and haloacetic acids is based on the locational running annual average (LRAA) of four quarterly samples.
13. Unregulated contaminant monitoring rule (UCMR-4) was performed in 2018.
14. Samples were collected from the distribution system.
15. Samples were collected at source water influent locations representing untreated water entering the water treatment plant.
16. Samples were collected from the water filtration plant after treatment in 2018 as part of the UCMR-4.

Lead and 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 doctor.

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 Board 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 drinking 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 http://www.epa.gov/safewater/lead.

Lead and Copper Compliance Monitoring

There is no lead in the water that enters the distribution system. Lead enters the drinking water through the corrosion of household plumbing. Lead in tap water is controlled by adding corrosion inhibiting chemicals to the water supply during the treatment process.

Since the Board began implementing a new blended phosphate corrosion control treatment in 2004, frequent monitoring of lead and copper levels has been continuing in the distribution system. This monitoring examines the progress of the corrosion control treatment process and will continue. These are optimized in accordance with the Lead and Copper Rule. The Board is on a 3-year monitoring schedule. The most recent round of monitoring was completed in 2017; the results can be found in the table on the previous page and described in the paragraph above.

Important Health Information

Some people may be more vulnerable to contaminants in drinking water than people in the general population. Immuno-compromised persons such as those with cancer undergoing chemotherapy, persons who have undergone organ transplants, those with HIV/AIDS or other immune system disorders, elderly persons, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/Centers for Disease Control and Prevention (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are also available from the EPA's Safe Drinking Water Hotline at 800-426-4791.

Definitions

Action Level (AL) – The concentration of a contaminant which if exceeded triggers a 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 (chlorine, chloramines, chlorine dioxide) 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 highest level of a disinfectant (chlorine, chloramines, chlorine dioxide) below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfection to control microbial contaminants.

mrem/yr (millirems per year) – a measure of radiation absorbed by the body.

NR (Not Regulated) – 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.

NTU (Nephelometric Turbidity Units) – A measure of the suspended material in water.

RAA (Running Annual Average) - Average of four consecutive quarters of data.

pCi/L (picoCuries/liter) – A measure of the radioactivity in water.

ppb – Parts per billion, or micrograms per liter (µg/L). One ppb is equivalent to $1 in $1,000,000,000.

ppm – Parts per million, or milligrams per liter (mg/L). One ppm is equivalent to $1 in $1,000,000.

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

SU - Standard Unit

TON - Threshold Odor Number

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

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

N/A - Not applicable.

ND – Not detected.

Substances Found in Drinking Water

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. It can also pick up substances resulting from the presence of animals or from human activity.

Contaminants 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, domestic animal waste, and wildlife.

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

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 can also come from gas stations, urban stormwater runoff and septic systems.

Inorganic contaminants, such as salt 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.

In order to ensure that tap water is safe to drink, the MassDEP and USEPA prescribe regulations that limit the amount of certain contaminants in the 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. All drinking water, including bottled water, may reasonably be expected to contain detectable amounts of some contaminants. Detecting the presence of contaminants does not necessarily indicate that the 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 at 800-426-4791.

Compliance with Health and Safety Standards

The Board is committed to providing drinking water that meets or surpasses all primary and secondary health and safety standards. State and federal regulators routinely monitor our compliance and testing protocols to ensure that we deliver safe drinking water to customers. Laboratory staff at our water filtration plant conduct more than 38,000 water-quality tests on your drinking water every year.

What Can You Do To Conserve Water?

While the Salem Beverly Water Supply System has adequate capacity to endure a drought, the Board has many suggestions to help you save our resources by conserving water.

Conserve Indoors!

- Swap out old appliances for low water use, energy efficient models
- Run only full loads of dishes and laundry
- Fix leaking plumbing immediately

Conserve Outdoors!

- Use outdoor water wisely: water early in the morning, use drip irrigation, and limit lawn irrigation to one inch/ once a week
- Create a drought friendly garden: mulch bedding plants to reduce evaporation, use drought resistant plants
- Set mower 3 inches high to encourage deep root growth