

# 2023 Drinking Water Quality Report

## We're here to answer your questions.

For water quality questions, contact the Board –  
Deputy Director Brad Perron or Executive Director  
Alan Taubert at (978) 922-2600

For water distribution questions in your city, contact –  
Beverly Water Department: (978) 921-6000, ext. 2358  
Salem Water Department: (978) 745-9595, ext. 5673



Providing drinking water for over 110 years to nearly 90K residents

Salem and Beverly Water Supply Board:  
PWS ID 3030001  
Salem Water Department:  
PWS ID 3258000  
Beverly Water Department:  
PWS ID 3030000



Distributed June 2024

To Our Customers,

The year 2023 was another exciting and challenging year for the Salem and Beverly Water Supply Board (the Board). Great progress was made with the new, multiphased, 20-year capital sustainability and best management practices programs. Our laboratory got a new roof, we modernized our maintenance operations and laboratory spaces, and we completed the contract documents for the next sustainability construction project named Contract 2022-1 Facilities Upgrades. This facility upgrades project is planned to commence construction in 2024, and the scope of work involves improvements to our water filtration plant and reservoir facilities. These efforts are being undertaken to prepare the Board for the generations to follow to ensure the Board succeeds in its mission to deliver our customers with a high-quality, reliable, and resilient water supply. This sustainability program will require careful and strategic planning along with significant public support and funding. It is our vision to be a world-class water utility driven by teamwork and operational excellence.

This report describes the Board's raw water sources, drinking water treatment process, and water quality performance data for the year 2023. As part of our ongoing commitment to increase public communication, awareness, and transparency, this report includes information beyond the minimum requirements related to your drinking water for the protection and sustainability of this most precious and valuable resource.

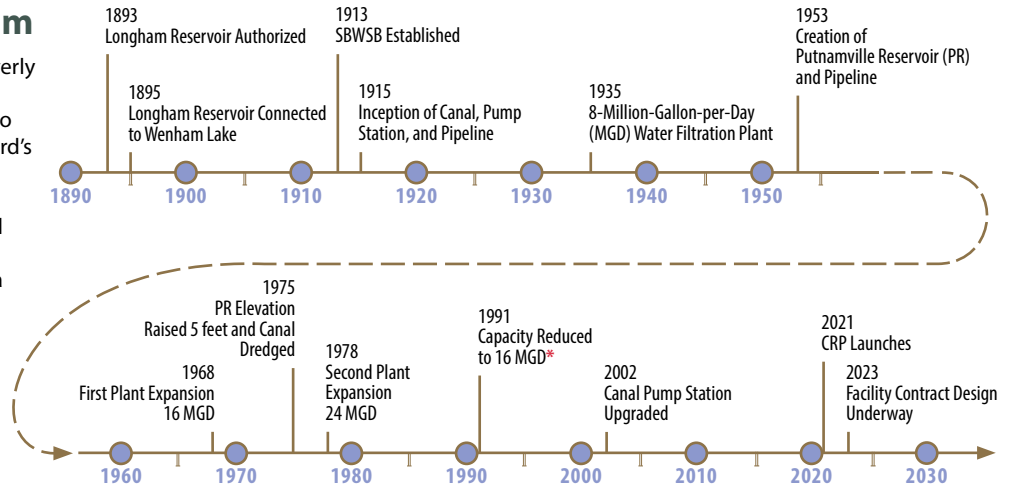
It has been a great pleasure, once again, to serve you all in 2023 and we look forward to a productive and successful 2024.

Sincerely,

**Alan F. Taubert, Jr., P.E., C.E.M., Executive Director  
Salem and Beverly Water Supply Board**

# Sustainability Program

The rich history of the Salem and Beverly Water Supply Board (SBWSB or the Board), from the turn of the century to the present day, underscores the Board's mission to deliver a high-quality, reliable, and resilient water supply to our customers. In 2021, our Capital Renewal Program (CRP) launched a multiphase, long-term plan to build a sustainable resource of drinking water for the communities of Salem and Beverly. Our current projects will build the foundation for our 20-year Capital Sustainability Master Plan (CSMP).



## How Is Your Water Purified?

The source waters of the Board's reservoir system undergo extensive treatment at the water treatment plant on the shores of Wenham Lake Reservoir in Beverly before drinking water is delivered to your home or business. The water is treated to exceed all state and federal drinking water standards established by the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP). The plant removes naturally occurring impurities from the source water as required by federal regulations and good public health practices.

**1 Source Water:** Raw water for the water treatment plant is drawn from Wenham Lake Reservoir.

**2 and 3 Pretreatment:** The first step in the treatment process combines preoxidation with potassium permanganate, adsorption with carbon and coagulation with alum and polymer, followed by gravity settling to remove manganese, natural color, taste and odor, and sediment and particles.

**4 Filtration:** The water passes through sand and anthracite media to remove organic compounds. Filtration also acts as a "polishing step" to remove additional particles, color, and bacteria.

**5 Disinfection:** Sodium hypochlorite is used to provide disinfection of the filtered water to kill bacteria and viruses and maintain a protective residual throughout the distribution system.

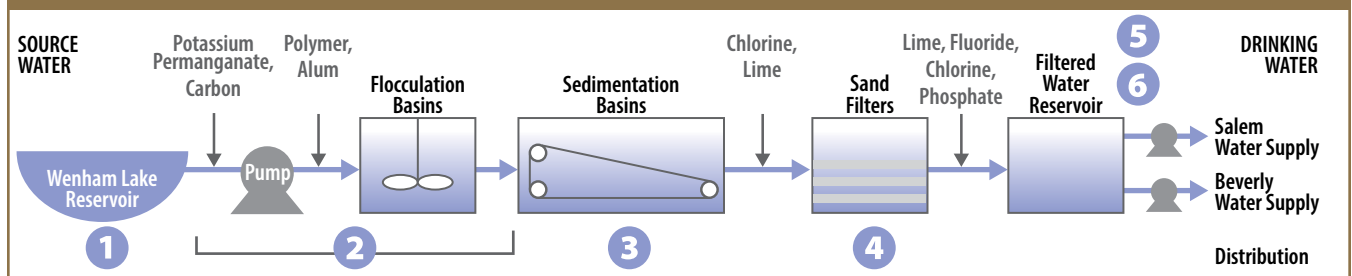
**6 Post treatment:** Fluoride is added to prevent tooth decay/cavities. To maintain corrosion control in the distribution pipes, the Board adjusts the pH and uses a phosphate additive that is designed to optimize corrosion control throughout the distribution system and minimize dissolved lead in the pipes and household plumbing. To ensure the highest quality water, the Board continuously monitors the effectiveness of the treatment process and makes necessary adjustments to the treatment to maintain water quality.

\*To comply with the DEP 1991 revision to Turbidity Standards



PHOTO COURTESY OF GOOD THINGS FOR YOU

### The Board's Source Water and Process Flow Diagram





## Where Does Your Water Come From?

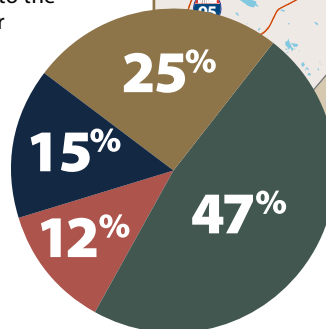
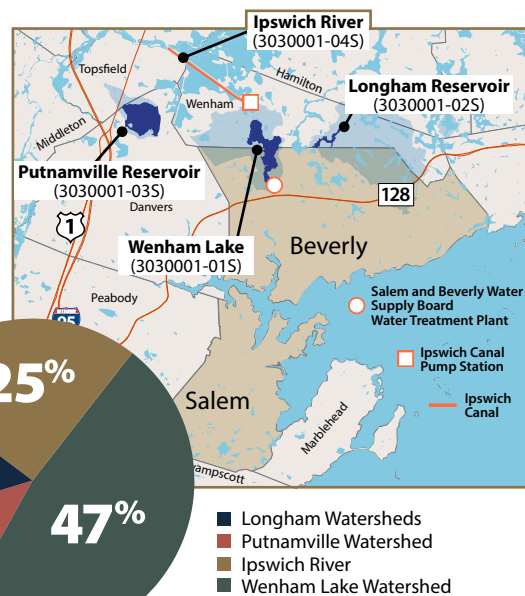
The Board provides potable water to the cities of Salem and Beverly for drinking, sanitation, and fire protection. The Board maintains the source waters, treats the water at the Arlington Avenue water treatment plant located in North Beverly, and delivers water to the individual Salem and Beverly pumping stations. These pumping stations deliver drinking water to your home in pipes owned and maintained by each city water department.

Salem and Beverly use over 3 billion gallons of drinking water each year. This water is drawn from the Ipswich River and three reservoirs: Wenham Lake, Putnamville, and Longham Reservoirs.

Beverly's water mains have interconnections with Salem, Wenham, Danvers, and Manchester-by-the-Sea. Salem's water mains

have interconnections with Beverly, Marblehead, and Peabody.

The Board recognizes the importance of storing high winter and spring flows of the Ipswich River for use in summer when river flows are naturally low. Between December 1 and May 31, when there is excess water in the river, water is pumped to the Putnamville Reservoir and/or Wenham Lake Reservoir for storage and use during summer and fall each year. Water is not pumped from the Ipswich River from June 1 through November 30. Similarly, Longham Reservoir augments Wenham Lake Reservoir.



## Important Information from EPA & MassDEP about Sources of Drinking Water and Drinking Water Contaminants

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.

### 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 byproducts 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 the result of oil and gas production and mining activities.

To ensure tap water is safe to drink, MassDEP and EPA prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The FDA and the Massachusetts Department of Public Health 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 contamination. The presence of contaminants does not necessarily indicate that water poses a health risk.

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 advice 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 available from the **Safe Drinking Water Hotline: 800-426-4791**.

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 it 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 800-426-4791** or at [epa.gov/safewater/lead](http://epa.gov/safewater/lead).

## Massachusetts Source Water Assessment and Protection Program

The Source Water Assessment and Protection (SWAP) Program assesses the susceptibility of public water supplies to contamination from 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).

MassDEP assigned a susceptibility rating of "high" to this system using the information collected during their assessment. A high ranking is given to any water supply that has at least one high threat within the water supply protection area. Because 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 (e.g., engine, appliance), hazardous materials storage, machine/metalworking shops, hazardous waste facilities, large quantity hazardous waste generators, landfills and dumps, military facilities (past and present), 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 the Board have already implemented include reviewing the development of plans in the City of Beverly and the Towns of Wenham and Topsfield,

conducting stream monitoring throughout the watersheds, and managing geese on Wenham Lake.



For more information, the complete SWAP report is available at the Board and online:

[mass.gov/doc/salem-beverly-water-supply-bd-swap-report/download](https://www.mass.gov/doc/salem-beverly-water-supply-bd-swap-report/download)

You can also call the Board at **(978) 922-2600**.

## Nonpoint Source Pollution

The 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. 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 depositing 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. The Board provides robust watershed protection (including limiting access to the public) to control NPS pollution and the source of drinking water for their customers.

Household contributors to NPS pollution 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. Involving the public through education and participation are required control measures for the SWMP.

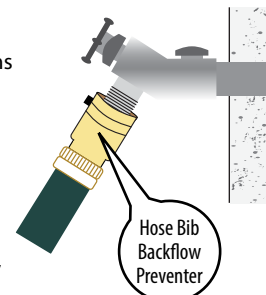
## Protect Your Drinking Water at Home!

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, to spray fertilizer on your lawn, you hook your hose up to the sprayer that contains the fertilizer. If the water pressure drops (for example, because of fire hydrant use in the city) when the hose is connected to the fertilizer, the fertilizer may be sucked back into the drinking water pipes through the hose. Over half of cross-connection incidents involve unprotected garden hoses.

For additional information on cross connections and the status of our program, please contact your city's Water Department:

**Salem:**  
**(978) 745-9595,**  
**ext. 5673**

**Beverly: (978) 921-6000, ext. 2358**





REGULATED COMPOUNDS					
Compound	Highest Level Found	Range of Detections (low–high)	Highest Level Allowed (MCL or MRDL)	Ideal Goal (MCLG or MRDLG)	Possible Source
Barium	0.03 ppm	Single Sample	2 ppm	2 ppm	Erosion of natural deposits
Chlorine	0.68 ppm <sup>[1]</sup>	0.01 – 1.83 ppm <sup>[2]</sup>	4 ppm	4 ppm	Water disinfectant
Copper <sup>[3]</sup>	Both: 0.16 ppm Salem: 0.16 ppm Beverly: 0.15 ppm	0.019 – 0.27 ppm 0.019 – 0.22 ppm 0.021 – 0.27 ppm	AL = 1.3 ppm	0 ppm	Corrosion of household plumbing systems
Fluoride <sup>[4]</sup>	0.79 ppm	0.1 – 0.79 ppm	4 ppm <sup>[5]</sup>	4 ppm	Added to water to promote strong teeth
Lead <sup>[3]</sup>	Both: 1.7 ppb Salem: 1.5 ppb Beverly: 1.8 ppb	ND – 3.4 ppb ND – 3.4 ppb ND – 2.7 ppb	AL = 15 ppb	0 ppb	Corrosion of household plumbing systems
Nitrate as Nitrogen	0.06 ppm	Single Sample	10 ppm	10 ppm	Naturally present in the environment
PFAS6 <sup>[5]</sup>	5 ppt	ND – 5 ppt	20 ppt	–	‡ Discharges and emissions from industrial and manufacturing sources associated with the production or use of these PFAS, including production of moisture- and oil-resistant coatings on fabrics and other materials. Additional sources include the use and disposal of products containing these PFAS, such as firefighting foams.
Total Haloacetic Acids	41 ppb <sup>[1]</sup>	13 – 51 ppb <sup>[2]</sup>	60 ppb <sup>[6]</sup>	0 ppb	Byproduct of water disinfection
Total Trihalomethanes	68 ppb <sup>[1]</sup>	19 – 109 ppb <sup>[2]</sup>	80 ppb <sup>[6]</sup>	0 ppb	Byproduct of water disinfection
Turbidity <sup>[7]</sup>	0.29 NTU	0.04 – 0.29 NTU	TT = 0.3 NTU	N/A	Suspended matter from soil runoff
SECONDARY/GUIDELINE CONTAMINANTS					
Compound	Highest Level Found	Range of Detections (low–high)	Highest Guidance Level (SMCL or ORSG)	Ideal Goal (MCLG or MRDLG)	Possible Source
Chloroform	29 ppb	Single Sample	70 ppb	–	Byproduct of water disinfection
Sodium <sup>[8]</sup>	55 ppm	Single Sample	20 ppm	–	Discharge from the use and improper storage of sodium-containing de-icing compounds or in water-softening agents.
UNREGULATED CONTAMINANTS	Compound	Average	Range of Detections (low–high)		Possible Source
	PFHxA	3.0 ppt	2.4 – 3.3 ppt		Refer to ‡ above
	PFBS	0.5 ppt	ND – 2.1 ppt		Refer to ‡ above

## Notes

- <sup>[1]</sup> Highest level detected is based on a running monthly or quarterly average of samples.
- <sup>[2]</sup> Highest value in range is based on individual samples, rather than averages.
- <sup>[3]</sup> The Action Level (AL) and the highest level found are based on the 90th percentile of the samples. The range represents all individual samples.
- <sup>[4]</sup> Fluoride also has an SMCL of 2.0 ppm.
- <sup>[5]</sup> PFAS6 are comprised of six compounds: perfluorooctane sulfonic acid (PFOS), perfluorooctanoic acid (PFOA), perfluorohexane sulfonic acid (PFHxS), perfluorononanoic acid (PFNA), perfluoroheptanoic acid (PFHpA), and perfluorodecanoic acid (PFDA).
- <sup>[6]</sup> Highest level allowed (MCL) for this substance is based on the average of four quarterly samples.
- <sup>[7]</sup> All samples met the TT requirement.
- <sup>[8]</sup> 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.

## Terms and Abbreviations

- 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 level of disinfectants required to control microbial contaminants.
- N/A: Not Available** – An ideal goal has not been established by EPA or MassDEP for this compound.
- ND:** Not Detected

- NTU: Nephelometric Turbidity Unit** – A measure of the turbidity (or clarity) of water. We monitor it because it is a good indicator of the effectiveness of our filtration system.
- Massachusetts Office of Research and Standards Guideline (ORSG):** Guidance values developed by MassDEP ORS in absence of any other federal standards or guidance.
- ppb: Parts per Billion or Micrograms per Liter** – (µg/L). One part per billion is the equivalent of \$1 in \$1,000,000,000.
- ppm: Parts per Million or Milligrams per Liter** – (mg/L). One part per million is the equivalent of \$1 in \$1,000,000.
- ppt: Parts per Trillion or Nanograms per Liter** – (ng/L). One part per trillion is the equivalent of \$1 in \$1,000,000,000,000.
- SMCL: Secondary Maximum Contaminant Level** – Concentration limit for a contaminant that may have aesthetic effects such as taste, odor, or staining.
- TT: Treatment Technique** – A required process intended to reduce the level of a contaminant in drinking water. Turbidity is a measure of treatment performance and is regulated as a treatment technique. A total of 95% of our turbidity readings each month must be below 0.3 NTU.
- 90th Percentile:** Nine out of every 10 homes were at or below this level.





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

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## ECRWSS POSTAL PATRON

**DID YOU KNOW?**

The average U.S. household uses more water outdoors than for showering and washing clothes combined?

### Water Conservation

As summer approaches, Americans will use more water for landscaping purposes – **nearly 8 billion gallons of water each day!** A simple walk through your backyard can help you save water using the EPA's WaterSense *Find it, Flag it, Fix it* methodology found here: [epa.gov/sites/default/files/2020-04/documents/ws-outdoor-landscaping-find-it-flag-it-audit-checklist.pdf](http://epa.gov/sites/default/files/2020-04/documents/ws-outdoor-landscaping-find-it-flag-it-audit-checklist.pdf)

**Hey Kids!** How much do you know about water use?  
 Check out the pictures below and take a guess – **which one uses more water?**  
 Circle your choice and find the answer key at the bottom of this page.

### The Salem and Beverly Water Supply Board's Mission:

*To deliver a high-quality, reliable, and resilient water supply to our customers.*

This report contains very important information about your drinking water. Please translate it or speak with someone who understands it.

Este informe contiene información importante acerca de su agua potable.

Haga que alguien lo traduzca para usted, o hable con alguien que lo entienda.

Answers: 1.) A 2.) B 3.) B

