



# ANNUAL WATER QUALITY REPORT



Portland  
Water  
District

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# *It's simple, everyone needs water. Getting it to you, not so simple.*

It takes a vast network of resources – from our protected water source to nearly 1,000 miles of pipe—to deliver water to your tap. In addition, we employ dual disinfection processes and constantly monitor water quality to ensure safe, clean water is available to you. An added challenge is aging infrastructure. Roughly 20% of Greater Portland’s water distribution system is over 80 years old—which demands increasing investments every year to ensure fresh, clean water keeps flowing from the tap.

In this water quality report, you will find a wealth of information on the complex system that churns 24 hours a day, 7 days a week, to ensure the water is there when you turn on the tap.



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## *Water Drop Find Contest*

You will find a hidden water drop within this annual water quality report, like this one . For a chance to win one of two framed photos of Sebago Lake (pictured here), find the hidden water drop and tell us where it is. Enter by June 12. The winner will be announced on our Facebook page the following week. Good luck.

You must live in the Portland Water District’s service area to win. PWD employees are not eligible to participate in the drawing. Only one entry per person. Prizes must be picked up at the District’s corporate office in Portland, Maine.

# WATER SAFETY & ADVICE

## *Ask the Water Expert*

Inquiries about discolored or dirty water are some of the most common customer calls we receive, and for good reason. It's disconcerting when you turn on the tap expecting clear water and instead see water that is discolored or dirty. Customers often wonder why this happens, what they can do, and most of all, if the water is still safe to use. Read on for answers to these and other questions about dirty water.

***Why does my water look dirty?*** Dirty or discolored water is often due to a disruption in the water main. When water flows through the pipes faster than normal, natural sediment at the bottom of the pipe can get stirred up. This can happen as a result of a water main break, higher water flow due to firefighting, or even a street sweeper using a hydrant to fill up its tanks. Sometimes PWD turns valves or flushes water mains and this can stir up the sediment as well.

***My hot water is dirty but the cold water still looks fine. What does that mean?*** Sometimes the culprit is your hot water heater. If the problem is in the hot water only, it's probably a sign that the hot water heater needs to be flushed or drained, or maybe even replaced. You can contact your plumber to evaluate your hot water heater.

***Is my water still safe to drink?*** The sediment that is stirred up is inert, so it is not harmful and your water is still safe to drink.

***What can I do?*** Normally, discolored water will clear up on its own. If it doesn't, we recommend that you flush the pipes in your house after the main disruption event is over. This will clear out any remaining sediment or discolored water. One good way to do this is to fill and drain your bathtub once or twice. If you're still having problems with dirty water, or if you have dirty water that persists for several days or goes away and then returns, please give us a call. We can help diagnose and solve the problem.



# THE SOURCE

*Where does your water come from?*



Your drinking water comes from Sebago Lake, Maine's deepest and second largest lake. By almost any measure, the quality of water in Sebago Lake is among the highest of any lake in Maine. It is so clean, in fact, it is exempt from filtration requirements.

## The lake is so clean for three main reasons:

- 1 It is naturally deep and cold, and the soil around the lake doesn't easily erode;
- 2 People have cared for it so well for more than a century and continue to do so; and
- 3 The land around the lake – known as the watershed – is mostly covered with forest. Forested land naturally cleans the water as it makes its way to the lake.

Keeping the lake clean is the best way to ensure clean, safe drinking water for decades to come.



## Moderate Risk of Contamination

Although Sebago Lake is very clean today, human activities on and around the lake can pose a risk to water quality.

The Maine Drinking Water Program has evaluated all public water supplies as part of their Source Water Assessment Program (SWAP). The assessments reviewed geology, hydrology, land uses, water testing information, and the extent of land ownership or protection by local ordinance to see how likely drinking water sources are to being contaminated by human activities. Their report on Sebago Lake concludes that the lake is at **moderate risk** of contamination.

The most significant risks to the long-term protection of Sebago Lake, according to state officials, are boating and ice fishing in Lower Bay and shoreland development. For more information about the SWAP, please contact the DWP at 287-2070.

## Lowering Risk of Contamination

Because the lake is used by so many for various reasons, our efforts to decrease the risk of contamination involve multiple approaches. Our protection program involves: water quality monitoring, security, inspections, direct actions, education, land acquisition, and land preservation.

Keeping the land surrounding the lake forested is key to protecting the water quality of the lake since forests naturally clean water. To help make this happen the Board of Trustees approved an initiative in 2013 to help local land trusts and willing landowners conserve forested land. The District contributes up to 25% of the cost of these transactions since our customers directly benefit with cleaner water. When a willing landowner and land trust apply for financial support, we evaluate the property to determine its value to the overall protection of the lake and choose a level of support accordingly.

Conserving forested land helps keep the water in Sebago Lake clean—directly impacting the quality of water delivered to customers. If lake water quality were to decline significantly, the District would have to add additional treatment to meet drinking water standards. The cost of this would be much greater than the cost of maintaining forested land through conservation.



*An investment of nearly a half a million dollars by the Portland Water District since 2013 has protected 2397 acres of land valued at over \$4 million dollars.*

# ENSURING WATER QUALITY



## Water Purification and Disinfection

Meeting your expectations for high quality water is our first priority. We know your water is safe because we regularly monitor and test it. Our water quality experts performed over 15,000 analyses last year. Many inorganic, synthetic organic and volatile organic chemicals, and disinfection by-products are routinely monitored for and not detected.

- Primary disinfection: ozone and ultraviolet light
- Secondary disinfection: chloramine
- Filtration: None, PWD holds a waiver from filtration due to the purity of Sebago Lake.
- pH adjustment: sodium hydroxide
- Corrosion control: zinc orthophosphate
- Dental health additive: fluoride (hydrofluorosilicic acid)

In 2014, your water met or surpassed every state and federal requirement. Water samples are tested by state-certified testing laboratories including the Portland Water District laboratory which is certified by the Maine Department of Health and Human Services.



## Aging Infrastructure

With nearly 1,000 miles of pipe serving our 11 communities, we are focused on getting safe, clean, great tasting water to you when and where you need it. That takes forward thinking and investment.

### *The Problem*

It is a problem water utilities face nationwide - the aging of buried infrastructure. Because much of the water system was built in the late 19th and early 20th century, those pipes have reached the end of their useful life. Twenty percent of Greater Portland's water system is over 80 years old.

### *The Solution*

To avoid increases in water service disruptions and water quality issues, the Portland Water District has slowly increased its investments in water main replacement, from \$2.5 million in 2011 to \$6.5 million in 2015. Over the last 5 years, the Portland Water District has invested \$22 million in water main replacements while striving to keep water rates affordable.

### *Water Main Replacement Program*

The age of the pipe isn't the only thing that contributes to water main failures. The Portland Water District has a comprehensive water main replacement program that considers age, type of material, and leak history. Planning also takes into consideration water quality issues, local impacts, and efficiencies realized through the integration with other infrastructure projects.

### *Success*

Our investments are working! Water main leaks have been reduced since 1985. In fact, in 2014, we had roughly 9 main breaks per 100 miles of pipe compared to the national standard of 25-30 breaks per 100 miles of pipe.

## Distribution System: Just the size of it

Miles of pipe: 1000

Materials: Mostly Cast Iron and Ductile Iron

Age of Pipe: 1870 – 2014

Leak Frequency: 9 breaks per 100 miles of pipe, compared to the national standard of 25-30 breaks per 100 miles of pipe a year

On the surface,  
it couldn't be easier.



Underneath, not so much.



# WATER QUALITY ANALYSIS



## Detected Regulated Substances

Substance	Violation	Ideal Goal MCLG	Highest Level Allowed MCL	Amount Detected in 2014 (unless otherwise noted)	Source
<b>Microbiological</b>					
Total coliform bacteria <sup>1</sup>	No	0% of monthly samples	No more than 5% of monthly samples	Highest % detected: 0.76% in November Monthly Range: 0.0%-0.76%	Naturally present in environment
<b>Inorganic Chemicals</b>					
Barium (mg/L)	No	2	2	0.003	Erosion of natural deposits
Copper (mg/L) <sup>2</sup>	No	1.3	AL = 1.3	0.45	Corrosion of household plumbing systems; erosion of natural deposits
Lead (µg/L) <sup>3</sup>	No	0	AL = 15	5	Corrosion of household plumbing systems
Fluoride (mg/L)	No	4	4	Average: 0.70 Range: 0.51 - 0.93	Water additive which promotes strong teeth; erosion of natural deposits
Chloramine (mg/L)	No	MRDLG=4	MRDL=4	Average: 2.02 Range: 0.20 - 2.37	A water additive used to control microbes
Turbidity (NTU)	No	None	5	Average: 0.23 Range: 0.14 - 0.68	Soil runoff
<b>Organic Compounds</b>					
Total Haloacetic Acids, HAA (µg/L)	No	0	60	LRAA: < 8.0 Range: < 8.0 - 11	By-product of drinking water chlorination

### Footnotes:

<sup>1</sup> Annual detection - 1 in 1910 samples ; monthly detection - November 1 in 132 samples or 0.76%

<sup>2</sup> None of the 50 homes tested in 2014 exceeded the action level for copper.

<sup>3</sup> 1 of the 50 homes tested in 2014 exceeded the action level for lead.

## Mineral Content and Secondary Standard

Substance	Maine Recommended Limit	Result	Likely Source
Chloride(mg/L)	250	10	Natural mineral, road salt
Color(PCU)	15	<10	Natural characteristic
Hardness (mg/L as CaCO <sub>3</sub> )	150	<10	Natural mineral
Iron(mg/L)	0.3	<0.01	Natural mineral
Manganese(mg/L)	0.05	<0.03	Natural mineral
Sodium(mg/L)	100	5.6	Natural mineral, road salt
Sulfate(mg/L)	250	5.4	Naturally occurring
Magnesium(mg/L)	50	0.5	Natural mineral
Calcium(mg/L)	500	2.6	Natural mineral
Zinc(mg/L)	5	0.10	Natural mineral, corrosion control additive

## Detected Unregulated Substances Ongoing Research For New Regulations

Substance	Violation	Health Advisory, µg/L	Range of Results (Detected in year noted)	Source
Nitrosamine–NDEA N-nitrosodiethylamine, µg/L (2010)	No	No EPA health data	Average: 0.0533 Range: 0.0066 - 0.1	By-product of drinking water chloramination
Chlorate, µg/L (2013)	No	No EPA health data	Average: 90 Range: 64 - 140	Agricultural defoliant or desiccant; used in the production of chlorine dioxide
Chromium, Total, µg/L (2013)	No	No EPA health data	Average: 0.29 Range: 0.27 - 0.31	Erosion of natural deposits
Hexavalent Chro- mium, Dissolved, µg/L (2013)	No	No EPA health data	Average: 0.057 Range: 0.037 - 0.110	Naturally occurring element; used in making steel and other alloys
Strontium, µg/L (2013)	No	No EPA health data	Average: 21 Range: 20 - 23	Erosion of natural deposits

Unregulated Substances are those that don't yet have a drinking water standard set by the USEPA. The purpose of monitoring for these contaminants is to help EPA decide whether or not they should have a standard.

As part of this 2013 monitoring, the Portland Water District tested for several additional unregulated contaminants, all without detection. This included hormones such as testosterone and estradiol that are produced in the human body and used in pharmaceuticals.

# DEFINITIONS

**MCL:** Maximum Contaminant Level. The highest level of a contaminant that is allowed in drinking water.

**MCLG:** Maximum Contaminant Level Goal. The level of a contaminant in drinking water below which there is no known or expected risk to health.

**MRDL:** Maximum Residual Disinfectant Level. The highest level of a disinfectant allowed in drinking water.

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

**LRAA:** Locational Running Annual Average. An annual average calculated at each monitoring site.

**Variations and Exemptions:** State permission not to meet MCL or a treatment technique under certain conditions.

**AL = Action Level:** The concentration of a contaminant that, if exceeded, triggers treatment or other requirements that a water system must follow. Action Levels for Lead and Copper are measured at the tap of “high risk” homes. Ninety percent of tests must be equal to or below the Action Level.

**ppb:** one part per billion.

**ppm:** one part per million.

**mg/L:** milligrams per liter, or parts per million.

**µg/L:** micrograms per liter, or parts per billion

**Turbidity:** The measurement of cloudiness or suspended colloidal matter (silt). As you can see from the table, all of the samples taken of our water system were well below 5 NTUs.

**NTU:** Nephelometric Turbidity Units

## Notes:

**Fluoride:** Fluoride levels must be maintained between 0.5 to 1.2 ppm. The optimum level is 0.7 ppm.

**Lead/Copper:** Action levels (AL) are measured at consumer’s tap. 90% of the tests must be equal to or below the action level. 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. Portland 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 or at: <http://www.epa.gov/safewater/lead>

**TTHM/HAA5:** Total Trihalomethanes and Haloacetic Acids (TTHM and HAA5) are formed as a by-product of drinking water chlorination. This chemical reaction occurs when chlorine combines with naturally occurring organic matter in water. Compliance is based on locational running annual average.

## About the Regulations

The federal Safe Drinking Water Act directs the state, along with the EPA, to establish and enforce drinking water standards. The standards set limits on certain biological, radioactive, organic and inorganic substances sometimes found in drinking water. Two types of standards have been established. Primary drinking water standards set achievable levels of drinking water quality to protect your health. Secondary drinking water standards provide guidelines regarding the taste, odor, color, and other aesthetic aspects of your drinking water, which do not present a health risk.

## Health Advisories

Drinking water, including bottled water, may reasonably be expected to contain impurities or contaminants. However, these contaminants do not necessarily indicate that water poses a health risk. Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife. 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, or farming. Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses. Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production and can also come from gas stations, urban runoff, and septic systems. Radioactive Contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised people such as individuals with cancer undergoing chemotherapy, people 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. Guidelines, jointly developed by the EPA and the CDC, on the appropriate means to lessen the risk of infection by *Cryptosporidium*, are available from the Safe Drinking Water Hotline or web site.

## More Information

The Portland Water District Board of Trustees generally meet every second and fourth Monday of the month. The public is welcome to attend meetings.

### Portland Water District

207.761.8310

(Monday through Friday between 8:00 a.m. and 4:30 p.m.)

225 Douglass Street | PO Box 3553 | Portland, Maine 04102

[www.pwd.org](http://www.pwd.org) | [Customerservice@pwd.org](mailto:Customerservice@pwd.org)  

### Environmental Protection Agency

800.426.4791 | [www.epa.gov/safewater/](http://www.epa.gov/safewater/)

### National Centers for Disease Control

404.639.3311 | [www.cdc.gov](http://www.cdc.gov)

### American Water Works Association

303.794.7711 | [www.awwa.org](http://www.awwa.org)

### Maine Drinking Water Program

207.287.2070 | [www.maine.gov](http://www.maine.gov)



## SUPPLEMENTAL INFORMATION

Because the Steep Falls water system is separate from the Greater Portland water system, some components of the Water Quality Report do not apply to your system. Those sections have been modified and provided below.

### Your Source of Water and Ensuring Water Quality

The Steep Falls well system (Standish) supplies approximately 300 people. Treatment includes the addition of liquid sodium hypochlorite for disinfection, sodium hydroxide for pH adjustment and corrosion control, aeration for radon removal, and fluoride (sodium fluoride).

The state Drinking Water Program waived the requirement to sample for pesticide, herbicide, carbamate and PCB in the Steep Falls water system through 2016. The waiver was granted based on past water test results and the land uses in the proximity of the wells. Other testing for inorganic and volatile organic compounds continues at the required frequency.

### Detected Regulated Substances

Substance	Violation	Ideal Goal MCLG	Highest Level Allowed MCL	Amount Detected in 2014 (unless otherwise noted)	Source
<b>Radionuclides</b>					
Gross Alpha (pCi/L) 2012	No	0	15	7.6 ± 4.6	Erosion of natural deposits
Radium, Combined (pCi/L) 2012	No	0	5	1.2	Erosion of natural deposits
Radium-226 (pCi/L) 2012	No	0	5	0.4 ± 0.17	Erosion of natural deposits
Radium-228 (pCi/L)	No	0	5	0.8 ± 0.5	Erosion of natural deposits
Radon (pCi/L)	No	4000	4000	1040	Erosion of natural deposits
<b>Organic Compounds</b>					
Total Trihalomethanes (µg/L) 2013	No	0	80	6.30	By-product of chlorination
<b>Inorganic Compounds</b>					
Barium (mg/L)	No	2	2	0.007	Erosion of natural deposits; discharge of drilling waste and metal refineries
Chromium (µg/L)	No	100	100	1	Erosion of natural deposits; discharge from steel and pulp mills
Uranium (µg/L)	No	0	30	4	Erosion of natural deposits
Chlorine (mg/L)	No	MRDL=4	MRDL=4	1.00 0.58 - 1.44	A water additive used to control microbes
Fluoride (mg/L)	No	4	4	0.72 0.64 - 0.78	Water additive which promotes strong teeth. Erosion of natural deposits
Copper (mg/L) <sup>1</sup> 2012	No	AL=1.3	AL=1.3	0.06	Corrosion of household plumbing systems
Nitrate - Nitrogen (mg/L)	No	10	10	1.1	Fertilizer runoff; leaching septic tanks; erosion of natural deposits

<sup>1</sup>None of the 5 homes tested in 2012 exceeded the action limit for copper.

**Definitions:** Look to page 9 for definitions. pCi/L: picocuries per liter (a measure of radioactivity)

**Notes:** Gross Alpha: Action level over 5 pCi/L requires testing for Radium 226 and 228. Action level over 15 pCi/L requires testing for Uranium. Compliance is based on Gross Alpha results minus Uranium results = Net Gross Alpha.

**Radon:** The State of Maine adopted a Maximum Exposure Guideline (MEG) for Radon in drinking water at 4000 pCi/L, effective 1/1/07. If Radon exceeds the MEG in water, treatment is recommended. It is also advisable to test indoor air for Radon. Radon at a level of 1040 pCi/L was detected in Steep Falls' well water after aeration treatment. Radon is found in the soil and bedrock formations and is a water soluble, gaseous by-product of uranium. Most radon is released to the air moments after turning on the tap. Only about 1-2 percent of radon in the air comes from drinking water. Inhalation of radon increases the risk of lung cancer over the course of your lifetime. If you'd like more information about radon, please contact us or the State Drinking Water Program and request a radon fact sheet. 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 advice from your health provider.