



## 2021 Annual Drinking Water Report for Lorna Water District

Federal regulations require Lorna Domestic Water to provide for our customers a yearly report of our drinking water quality. We're very pleased to provide you with this year's Annual Water Quality Report for data collected in 2021. We want to keep you informed about the excellent water we have delivered to you over the past year. Our goal is and always has been, to provide to you a safe and dependable supply of drinking water. Our water source comes from the City of Portland, which primarily gets its water from the Bull Run Reservoir. The City of Portland's Water Quality Report continue after Lorna Water District's report. We are pleased to report that our drinking water is safe and meets federal and state requirements.

We want our valued customers to be informed about their water utility. Hiland Water owns or operates over 50 water system in Oregon, including Lorna Water District. Questions about billing or customer service can be addressed by the friendly staff in the office or on site. The Hiland Water office is open from 9 am to 4 pm, Monday through Friday. You can reach Hiland Water by phone (503-554-8333), email ([info@hilandwater.com](mailto:info@hilandwater.com)), or on their website ([www.hilandwater.com](http://www.hilandwater.com)). Please feel free to contact Hiland Water with any questions.

Lorna Water District routinely monitors for microbiological constituents in your drinking water and for disinfection by-products, according to federal and state laws. Lorna Water District and the City of Portland completed lead and copper testing together. In addition to the testing done by the City of Portland, Lorna Water District completed additional testing. The results are below. The report from the City of Portland is found on the following pages. The test results demonstrate the high quality of the water we purchase from the City of Portland. All drinking water, including bottled drinking water, may be reasonably expected to contain at least small amounts of some constituents. It's important to remember that the presence of these constituents does not necessarily pose a health risk. The residual of disinfection by-products was well below the Maximum Contaminate Level (MCL) of 80 parts per billion (ppb). On the basis of our own testing no contaminated water from Portland was introduced into our distribution system.

### Lorna Domestic Water Test Results for 2021

Variable	Amount Detected		MCL	MCLG	Possible Source of Contamination
	Minimum	Maximum			
Microbiological Contaminants					
Total Coliform Bacteria	N/D	N/D	0	0	Naturally present in the environment
Fecal Coliform and E.coli	N/D	N/D	0	0	Human and animal fecal waste
Contaminant	MCL	MCLG	Maximum Detected (Average)	Violation Yes/No	Source of Contamination
TTHM	80 ppb	0	26.3	No	By-product of drinking water chlorination
HAA5	60 ppb	0	17.8	No	By-product of drinking water chlorination

Lorna Domestic Water had no violations in 2021.

*The Water Quality Report from the City of Portland is on the following pages.*



# Portland Water Bureau’s 2022 Drinking Water Quality Report

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## Portland’s drinking water sources

**The Bull Run Watershed**, Portland’s protected surface water supply, is in the Mount Hood National Forest, 26 miles from Portland. The Portland Water Bureau and the US Forest Service carefully manage the watershed to sustain and supply clean drinking water. In a typical year, the watershed receives an astounding 135 inches of precipitation (rain and snow), which flows into the Bull Run River and then into two reservoirs that store nearly 10 billion gallons of drinking water.

Source water assessments are completed to identify contaminants of concern for drinking water. For the Bull Run, the only contaminants of concern are naturally occurring microorganisms, such as *Giardia*, *Cryptosporidium*, fecal coliform bacteria, and total coliform bacteria. The Portland Water Bureau regularly tests Bull Run water for these microorganisms that live in virtually all freshwater ecosystems.

The Portland Water Bureau treats water to control organisms that could make people sick but does not currently treat for *Cryptosporidium*. Portland is installing filtration to remove *Cryptosporidium* and other contaminants from drinking water by 2027.



# Portland Water Bureau 2022 Drinking Water Quality Report

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Portland's source water assessment is available at [portland.gov/water/resources/source-water-assessment](https://portland.gov/water/resources/source-water-assessment) or by calling 503-823-7525.

**The Columbia South Shore Well Field**, Portland's protected groundwater supply, provides drinking water from 25 active wells located in three different aquifers. The well field is between Portland International Airport and Blue Lake Park. Portland uses the well field for two purposes: to supplement the Bull Run supply in the summer, and to temporarily replace the Bull Run supply during turbidity events, maintenance activities, and emergencies.

The Columbia South Shore Well Field is beneath homes and businesses with a variety of potential contaminant sources. The deep aquifers that are the primary sources of water supply have natural geologic protection from pollutants present at the land surface. Portland, Gresham, and Fairview work together to protect the well field. The cities' Groundwater Protection Programs work with residents and businesses in the well field to ensure that pollutants from this urban area do not impact the groundwater source.

To learn more about groundwater protection and find upcoming groundwater education events, visit [portland.gov/water/groundwater](https://portland.gov/water/groundwater).

The Clackamas River Water District, City of Gresham, City of Lake Oswego, City of Milwaukie, Rockwood Water People's Utility District, Sunrise Water Authority, and Tualatin Valley Water District provide drinking water to some Portland customers who live near service area boundaries. Customers who receive water from these providers will receive detailed water quality reports about these sources in addition to this report.

**Get email updates when we make changes to our source water or treatment. Sign up at [portland.gov/water/notification](https://portland.gov/water/notification).**

## Frequently asked questions about water quality

### What test results will I find in this report?

The Portland Water Bureau monitors drinking water for over 200 regulated and unregulated contaminants. This report lists all of the regulated contaminants the bureau detected in drinking water in 2021. **If a known, health-related contaminant is not listed in this report, the Portland Water Bureau did not detect it in drinking water.**

### How is Portland's drinking water treated?

Currently, Portland's drinking water treatment is a three-step process: **1) Chlorine** disinfects against organisms, such as bacteria and viruses, that could otherwise make people sick. **2) Ammonia** stabilizes chlorine to form a longer-lasting disinfectant. **3) Sodium carbonate and carbon dioxide** replaced sodium hydroxide in 2022 to further reduce the corrosion of metals such as lead. Portland's treatment is changing in the coming decade.

## Is Portland's water safe from viruses such as the COVID-19 virus?

Yes, your water is safe from viruses and safe to drink. Portland controls microorganisms, including viruses, with chlorine.

## Is Portland's water filtered?

No. Neither of Portland's sources is filtered. In response to a series of low-level detections of *Cryptosporidium* in Bull Run water in 2017, Portland is installing a filtration plant to treat for *Cryptosporidium*. Bull Run water will be filtered by 2027.

## Does the Portland Water Bureau add fluoride to the water?

No. Fluoride naturally occurs in Portland's water at very low levels. You may want to ask your dentist or doctor about supplemental fluoride for preventing tooth decay. This is especially important for young children.

## Is Portland's water soft or hard?

Bull Run water—Portland's main water supply—is very soft. It typically has a total hardness of 3–8 parts per million (ppm), or ¼ to ½ a grain of hardness per gallon. Portland's groundwater supply is moderately hard: about 80 ppm, or about 5 grains per gallon.

## What is the pH of Portland's water?

The pH of Portland's drinking water typically ranges between 7.8 and 8.5.

## How can I get my water tested?

For free lead-in-water testing, contact the LeadLine at [leadline.org](https://leadline.org) or 503-988-4000. For other testing, you can pay a private, accredited laboratory to test your tap water. For information about accredited labs, contact the Oregon Health Authority at [ORELAP.Info@state.or.us](mailto:ORELAP.Info@state.or.us) or 503-693-4100.

## What causes temporarily discolored water?

Sediment and organic material from the Bull Run Watershed settle at the bottom of water mains. These can sometimes be stirred up during hydrant use or a main break. They can also be seen in the fall as a harmless tea-colored tint. Discolored water can also be caused by older pipes in buildings that add rust to the water. Find out more at [portland.gov/water/discoloredwater](https://portland.gov/water/discoloredwater).

## How should property managers maintain water quality in large buildings?

Managers of large buildings should implement a water management program to protect their water quality and address the risk of *Legionella* growth. This is especially important during the pandemic and as buildings reopen. Find more at [portland.gov/water/WQBuilding](https://portland.gov/water/WQBuilding).

## What the EPA says can be found in drinking water

Across the United States, the sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

In order to ensure that tap water is safe to drink, the Environmental Protection Agency (EPA) has regulations that limit the amount of certain contaminants in water provided by public water systems and require monitoring for these contaminants. Food and Drug Administration regulations establish limits for contaminants in bottled water, which must provide the same protection for public health.

Contaminants in drinking water sources may include **microbial contaminants**, such as viruses, bacteria, and protozoa from wildlife; **inorganic contaminants**, such as naturally-occurring salts and metals; **pesticides and herbicides**, which may come from farming, urban stormwater runoff, or home and business use; **organic chemical contaminants**, such as byproducts from industrial processes or the result of chlorine combining with naturally occurring organic matter; and **radioactive contaminants**, such as naturally occurring radon.

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

## Contaminants detected in 2021

Regulated contaminant	Detected in Portland's water		EPA standard		Sources of contaminant	
	Minimum	Maximum	MCL or TT	MCLG		
Untreated source water						
Turbidity (NTU)	0.18	2.81	5	N/A	Erosion of natural deposits	
Fecal coliform bacteria (% >20 colonies/100 mL in 6 months)	Not detected	0%	10%	N/A	Animal wastes	
<i>Giardia</i> (#/L)	Not detected	0.08	TT	N/A	Animal wastes	
Treated drinking water						
Metals and nutrients at the entry points						
Arsenic (ppb)	<0.50	1.02	10	0	Found in natural deposits	
Barium (ppm)	0.00081	0.01030	2	2	Found in natural deposits	
Cyanide (ppm)	<0.005	0.014	0.2	0.2	Naturally made by algae and plants	
Fluoride (ppm)	<0.025	0.160	4	4	Found in natural deposits	
Lead (ppb)	<0.05	0.15	15	0	Found in natural deposits	
Nitrate (as Nitrogen) (ppm)	0.012	0.30	10	10	Found in natural aquifer deposits, animal wastes	
Microbial contaminants in the distribution system						
Total coliform bacteria (% positive per month)	Not detected	Not detected	TT	N/A	Found throughout the environment	
Disinfection residual and byproducts in the distribution system						
Total chlorine residual (ppm)	Running annual average	0.31	1.64	4 [MRDL]	4 [MRDLG]	Chlorine used to disinfect water
	Range of single results at all sites	0.31	1.64	N/A	N/A	
Haloacetic acids (ppb)	Running annual average at any one site	17.8	17.8	60	N/A	Byproduct of drinking water disinfection
	Range of single results at all sites	17.8	17.8	N/A	N/A	
Total trihalomethanes (ppb)	Running annual average at any one site	26.3	26.3	80	N/A	Byproduct of drinking water disinfection
	Range of single results at all sites	26.3	26.3	N/A	N/A	

Unregulated contaminant	Detected in Portland's water			Sources of contaminant
	Minimum	Average	Maximum	
Treated drinking water				
Radon (pCi/L)	<50	186	372	Found in natural deposits
Sodium (ppm)	3.0	6.5	15	
Manganese (ppm)	0.0019	0.0152	0.0319	

Find additional results at: [portland.gov/water/TestResults](http://portland.gov/water/TestResults)

## Definitions

### **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 benefits of the use of disinfectants to control microbial contaminants.

### **N/A: not applicable**

Some contaminants do not have a health-based level or goal defined by the EPA.

### **NTU: nephelometric turbidity unit**

A unit for measuring the turbidity, or cloudiness, of a water sample.

## **ppm: parts per million**

Water providers use ppm to describe a small amount of a substance within the water. In terms of time, one part per million is about 32 seconds out of one year.

## **ppb: parts per billion**

Water providers use ppb to describe a very small amount of a substance within the water. In terms of time, one part per billion is about 3 seconds out of 100 years.

## **pCi/L: picocuries per liter**

Picocurie is a measurement of radioactivity.

## **TT: treatment technique**

A required process intended to reduce the level of a contaminant in drinking water.

## **About these contaminants**

### **Arsenic, barium, fluoride, lead, and manganese**

These metals are elements found in the earth's crust. They can dissolve into water that is in contact with natural deposits. At the levels found in Portland's drinking water, these are unlikely to lead to negative health effects.

### **Cyanide**

Cyanide is produced by certain bacteria, fungi, algae, and plants. It is rarely detected in Portland's water. At the levels found in Portland's drinking water, cyanide is unlikely to contribute to adverse health effects.

### **Fecal coliform bacteria**

To comply with the filtration avoidance criteria of the Surface Water Treatment Rule, water is tested for fecal coliform bacteria before disinfectant is added. The presence of fecal coliform bacteria in source water indicates that water may be contaminated with animal wastes. This is reported in percent of samples with more than 20 colonies in 100 milliliters of water during any six-month period. The Portland Water Bureau uses chlorine to control these bacteria.

## Giardia

Wildlife in the watershed may be hosts to *Giardia*, a microorganism that can cause gastrointestinal illness. The treatment technique is to remove 99.9 percent of *Giardia* cysts. The Portland Water Bureau uses chlorine to control *Giardia*.

## Haloacetic acids and total trihalomethanes

Disinfection byproducts form when chlorine interacts with naturally occurring organic material in the water. High levels of disinfection byproducts can cause health problems in people. Portland adds ammonia to form a more stable disinfectant, which helps minimize disinfection byproducts.

## Nitrate (as Nitrogen)

Nitrate, measured as nitrogen, can lead to bacterial and algal growth in the water. At levels that exceed the standard, nitrate can contribute to health problems. At the levels found in Portland's drinking water, nitrate is unlikely to lead to negative health effects.

## Radon

Radon is a naturally occurring radioactive gas that cannot be seen, tasted, or smelled. Radon can be detected at very low levels in the Bull Run water supply and at varying levels in Portland's groundwater supply. Based on the historical levels of radon in groundwater combined with the limited amount of groundwater used, people in Portland are unlikely to have negative health effects from radon in water. Find more information about radon from the EPA at [epa.gov/radon](https://www.epa.gov/radon).

## Sodium

There is currently no drinking water standard for sodium. At the levels found in drinking water, it is unlikely to lead to negative health effects.

## Total chlorine residual

Total chlorine residual is a measure of free chlorine and combined chlorine and ammonia in the water distribution system. Chlorine residual is a low level of chlorine remaining in the water and is meant to maintain disinfection through the entire distribution system.

## Total coliform bacteria

Coliforms are bacteria that are naturally present in the environment. Coliform bacteria usually do not make people sick. They are used as an indicator that other potentially harmful bacteria may be present. If more than 5 percent of samples in a month are positive for total coliforms, an investigation must be conducted to identify and correct any possible causes. The Portland Water Bureau uses chlorine to control these bacteria.

### Turbidity

Turbidity is the cloudiness of a water sample. In Portland's system, increased turbidity usually comes from large storms, which suspend organic material in Bull Run water. Increased turbidity can interfere with disinfection and provide an environment for microorganisms to grow. Since the Portland Water Bureau does not yet filter Bull Run water, the treatment technique is that turbidity cannot exceed 5 NTU more than two times in 12 months. When turbidity rises in the Bull Run source, Portland switches to its Columbia South Shore Well Field source.

## Reducing exposure to lead

### Sources of lead in Portland

The Portland Water Bureau cares about the health of the families in our community and is committed to helping you. If present, lead at elevated levels can cause serious health problems, especially for pregnant people and young children. Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drinking this water over many years could develop kidney problems or high blood pressure.

Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The Portland Water Bureau is responsible for providing high-quality drinking water, but cannot control the variety of materials used in plumbing components in homes or buildings. Lead is rarely found in Portland's source waters and there are no known lead service lines in the water system. In Portland, lead enters drinking water from the corrosion (wearing away) of household plumbing materials containing lead. These materials include lead-based solder used to join copper pipe — commonly used in homes built or plumbed between 1970 and 1985 — and brass components and faucets installed before 2014.

In Portland, the most common sources of lead exposure are lead-based paint, household dust, soil, and plumbing materials. Lead is also found in other household objects such as toys, cosmetics, pottery, and antique furniture.

### What you can do

When your water has been sitting for several hours, such as overnight or while you are away at work or school, 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 can request a free lead-in-water test from the **LeadLine** ([leadline.org](https://www.leadline.org) or **503-988-4000**). Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from EPA's Safe Drinking Water Hotline: 800-426-4791 or [epa.gov/safewater/lead](https://www.epa.gov/safewater/lead).

**Additional steps to reduce exposure to lead from plumbing**

- Run your water to flush the lead out.
- Use cold, fresh water for cooking, drinking, and preparing baby formula
- Do not boil water to remove lead.
- Test your child for lead.
- Test your water for lead.
- Consider using a filter certified to remove lead
- Clean your faucet aerators every few months.
- Consider replacing pre-2014 faucets or fixtures.

More information to keep your family safe from lead: [leadline.org](http://leadline.org) or **503-988-4000**.

**Lead and copper testing results from homes with higher risk of lead in water**

The Portland Water Bureau offers free lead-in-water tests to anyone in the service area. Twice each year, the Portland Water Bureau also collects water samples from a group of over 100 homes that have lead solder and are more likely to have higher levels of lead in water. Testing results from Fall 2021 showed that more than 10 percent of these homes had elevated levels of lead. Because these results exceeded the action level for lead, the Portland Water Bureau informed customers about the lead results and brought improved corrosion treatment online to reduce lead levels at the tap.

Regulated contaminant	Detected in residential water taps		EPA standard		Sources of contaminant
	Fall 2021 results <sup>1</sup>	Homes exceeding action level <sup>2</sup>	Action level <sup>2</sup>	MCLG <sup>3</sup>	
Lead (ppb) <sup>3</sup>	21.0	14 out of 104 (13.5%)	15	0	Corrosion of household and commercial building plumbing systems
Copper (ppm) <sup>3</sup>	0.238	0 out of 104 (0%)	1.3	1.3	

<sup>1</sup> 90<sup>th</sup> Percentile: 90 percent of the sample results were less than the values shown.

<sup>2</sup> Action Level definition: The concentration of a contaminant which, if exceeded, triggers treatment or requirements of which a water system must follow.

<sup>3</sup> See page 6 for definitions.

## Bull Run Treatment Projects: Improved Corrosion Control Treatment

### Improved treatment started this spring

In April 2022, Portland began implementing our improved corrosion control treatment to reduce the levels of lead in drinking water for everyone. The new treatment system, built at our existing Lusted Hill treatment facility, adds two naturally occurring substances, sodium carbonate (soda ash) and carbon dioxide, to our drinking water. These adjust the alkalinity to 25 mg/L and will increase the pH to at least 8.5. We are proud to bring this improved treatment online and better support the health of our community.

### How we got here

After detecting elevated levels of lead in higher risk homes 2013, we looked for additional ways to reduce lead that can enter the water from home or building plumbing. We determined that improving our drinking water treatment is the most effective way to reduce lead levels. In 2016, we agreed with the Oregon Health Authority to install improved treatment and began construction in 2020. We found elevated levels of lead in these higher risk homes again in fall 2021, highlighting the need for improved treatment to protect public health. The improved corrosion control treatment facility began treating our drinking water in April 2022.

### Progress in reducing lead levels at the tap

Our team has been working to ramp up improved treatment to full operation. We are making treatment changes in steps to allow our drinking water system to adjust to the changes in water chemistry. Throughout these changes, the treatment team is collecting water samples from around the city to track how the improved treatment is affecting lead levels. These results are helping us monitor the changes to the system and determine the correct treatment to reduce lead levels as much as possible.

## Monitoring for *Cryptosporidium*

*Cryptosporidium* is a potentially disease-causing microorganism that lives in virtually all freshwater ecosystems. Drinking water treatment for *Cryptosporidium* is required by state and federal regulations. For five years, the Oregon Health Authority (OHA) did not require the Portland Water Bureau to treat for *Cryptosporidium* based on data showing that *Cryptosporidium* was rarely found in the Bull Run Watershed. Since 2017, test results have shown low-level detections of *Cryptosporidium* primarily during the rainy season. As a result, OHA determined that treatment is now necessary.

The Portland Water Bureau does not currently treat for *Cryptosporidium*, but is required to do so under drinking water regulations. Portland is working to install filtration by 2027 under a compliance schedule with OHA. In the meantime, the Portland Water Bureau is implementing interim measures such as watershed protection and additional monitoring to protect public

health. Consultation with public health officials continues to conclude that the general public does not need to take any additional precautions.

Exposure to *Cryptosporidium* can cause cryptosporidiosis, a serious illness. Symptoms can include diarrhea, vomiting, fever, and stomach pain. People with healthy immune systems recover without medical treatment. According to the Centers for Disease Control and Prevention (CDC), people with severely weakened immune systems are at risk for more serious disease. Symptoms may be more severe and could lead to serious life-threatening illness. Examples of people with weakened immune systems include those with AIDS, those with inherited diseases that affect the immune system, and cancer and transplant patients who are taking certain immunosuppressive drugs.

The Environmental Protection Agency has estimated that a small percentage of the population could experience gastrointestinal illness from *Cryptosporidium* and advises that customers who are immunocompromised and receive their drinking water from the Bull Run Watershed consult with their health care professional about the safety of drinking the tap water.

**2020 Results of *Cryptosporidium* monitoring at the raw water intake**

Number of samples		Concentration detected (oocysts/L)	
Total tested	Positive for <i>Cryptosporidium</i>	Minimum	Maximum
200	33	Not detected	0.12

More information: [portland.gov/water/crypto](http://portland.gov/water/crypto)

**Special notice for immunocompromised persons**

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised 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 people, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. Environmental Protection Agency (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 at **800-426-4791**.

**Bull Run Treatment Projects: Filtration treatment by 2027**

**Project achieves important halfway milestone**

Since 2017, a team of Portland Water Bureau and consultant engineers have been working to plan for and design the new water filtration facility. In 2020, the project team submitted two

years of testing data confirming the best way to filter our water and they achieved a significant milestone this past year when they received OHA's approval to design the filtration plant using that filtration method.

## Testing drinking water treatment options

The project team relied on science to help make sure the filtration process at the full-scale facility is designed for our unique Bull Run water. To do this, they used a mini-filtration facility to test how different treatment options work through seasonal changes to our water. The testing ensures that treatment at the future water filtration facility will meet our public health goals, including removing *Cryptosporidium* from our drinking water.

## What's next

The project is now at its halfway point and on track to begin delivering filtered Bull Run water in 2027. The final design of the filtration facility will be complete by the end of 2022 and construction is anticipated to begin in 2023.

Our new water filtration treatment process:

- The Bull Run Watershed will remain highly protected.
- Filtration will remove *Cryptosporidium* and other potential contaminants.
- Disinfection will control microorganisms.
- Corrosion control treatment will continue to lower lead levels at the tap.

**More information:** [portland.gov/BullRunTreatment](https://portland.gov/BullRunTreatment)