



PORTLAND WATER BUREAU

2016 Drinking Water Quality Report





From the Commissioner and the Director

We are pleased to present you with the Portland Water Bureau's 2016 Water Quality Report.

As the largest water provider in Oregon, the Water Bureau is committed to delivering clean, safe and reliable drinking water to you, your family and nearly one million people.

In Portland, we are blessed with a natural advantage. Since 1895, the Bull Run Watershed has been our primary source of drinking water — capable of storing almost 10 billion gallons of water. We also have another high-quality water source in the Columbia South Shore Well Field, which helps us during the summer months or turbidity events.

Public health continues to be our highest priority. Throughout our system, the bureau's hardworking professionals regularly monitor water quality, testing for more than 200 possible contaminants. And to ensure that our pristine water moves reliably from "forest to faucet," we are improving the system that carries it. That includes investing in resilience, so we can continue to deliver water after "the Big One."

We strive to deliver quality services at a fair price. Our goal is to preserve our precious resources, while preparing for future challenges. It is a team effort, and we are honored to lead the dedicated professionals who work for the bureau.



Nia Fin

Nick Fish, Commissioner-In-Charge



Michael Stuhr

Michael Stuhr, P.E., Director

Questions? We're Here to Help

You have a range of options for contacting the Portland Water Bureau on topics from programs and projects to issues with your account and information about public meetings.

Central Information Line

8 a.m. - 5 p.m., Monday - Friday
503-823-7404

For general information about projects, programs and public meetings.

You can also learn more on our website:

www.portlandoregon.gov/water

Water Line

8:30 a.m. - 4:30 p.m., Monday - Friday
503-823-7525

WBWaterLine@portlandoregon.gov

For questions regarding water quality or water pressure.

Emergency Line

24 hours, 7 days a week
503-823-4874

For water system emergencies.

Customer Service

8 a.m. - 5 p.m., Monday - Friday
503-823-7770

PWBCustomerService@portlandoregon.gov

For questions or information about your account.

For Additional Information

Oregon Health Authority

Drinking Water Services: 971-673-0405

[http://public.health.oregon.gov/
HealthyEnvironments/DrinkingWater](http://public.health.oregon.gov/HealthyEnvironments/DrinkingWater)

Portland Water Bureau's Water System ID: 4100657

Look for us on Facebook and Twitter:

 www.facebook.com/portlandwaterbureau

 [@portlandwater](https://twitter.com/portlandwater)

Frequently Asked Questions About Water Quality

How does Portland test our drinking water?

The Portland Water Bureau monitors for over 200 regulated and unregulated contaminants in drinking water. All monitoring data in this report are from 2015.

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 our drinking water treated?

The first step in the treatment process for Portland's drinking water is disinfection using chlorine. Next, ammonia is added to form chloramines which ensure that disinfection remains adequate throughout the distribution system.

Finally, sodium hydroxide is added to increase the pH of the water to reduce corrosion of plumbing systems. This treatment helps control lead and copper levels at customers' taps, should these metals be present in commercial and household plumbing systems.

Is our water treated by filtration?

No. Neither the groundwater nor the Bull Run source water is filtered. Groundwater is not required to be filtered and the Bull Run source meets the filtration avoidance criteria of the Surface Water Treatment Rule. The State of Oregon approved Portland's compliance with these criteria in 1992. Portland continues to meet these criteria on an ongoing basis.

Does Portland add fluoride to our drinking water?

No. The Portland Water Bureau does not add fluoride to the water. Fluoride is a naturally occurring trace element in surface and groundwater. You may want to consult with your dentist about fluoride treatment to help prevent tooth decay, especially for young children.

Is Portland's water soft or hard?

Portland's water is very soft. The hardness of Bull Run water is typically 3-8 parts per million (ppm), or approximately ¼ to ½ a grain of hardness per gallon. For periods of time Portland may supplement the Bull Run supply with groundwater. Portland's groundwater hardness is approximately 80 ppm (about 5 grains per gallon), which is considered moderately hard.

What is the pH of Portland's water?

The pH of Portland's drinking water typically ranges between 7.5 and 8.5.

How can I get my water tested?

Contact the LeadLine at www.leadline.org or 503-988-4000 for information about free lead-in-water testing. For more extensive testing, private laboratories can test your tap water for a fee. Not all labs are accredited to test for all contaminants. For information about accredited labs, call the Oregon Health Authority, Oregon Environmental Laboratory Accreditation Program at **503-693-4122**.



The Portland Water Bureau collects and analyzes more than 11,000 samples each year.

Information from the EPA About Drinking Water Contaminants

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 Environmental Protection Agency's Safe Drinking Water Hotline at **800-426-4791** or at www.epa.gov/safewater.

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.

Contaminants in drinking water sources may include:

Microbial contaminants, such as viruses and bacteria, which may come from wildlife or septic systems.

Inorganic contaminants, such as salts and metals, which can occur naturally or result from urban stormwater runoff, industrial or domestic wastewater discharges or farming.

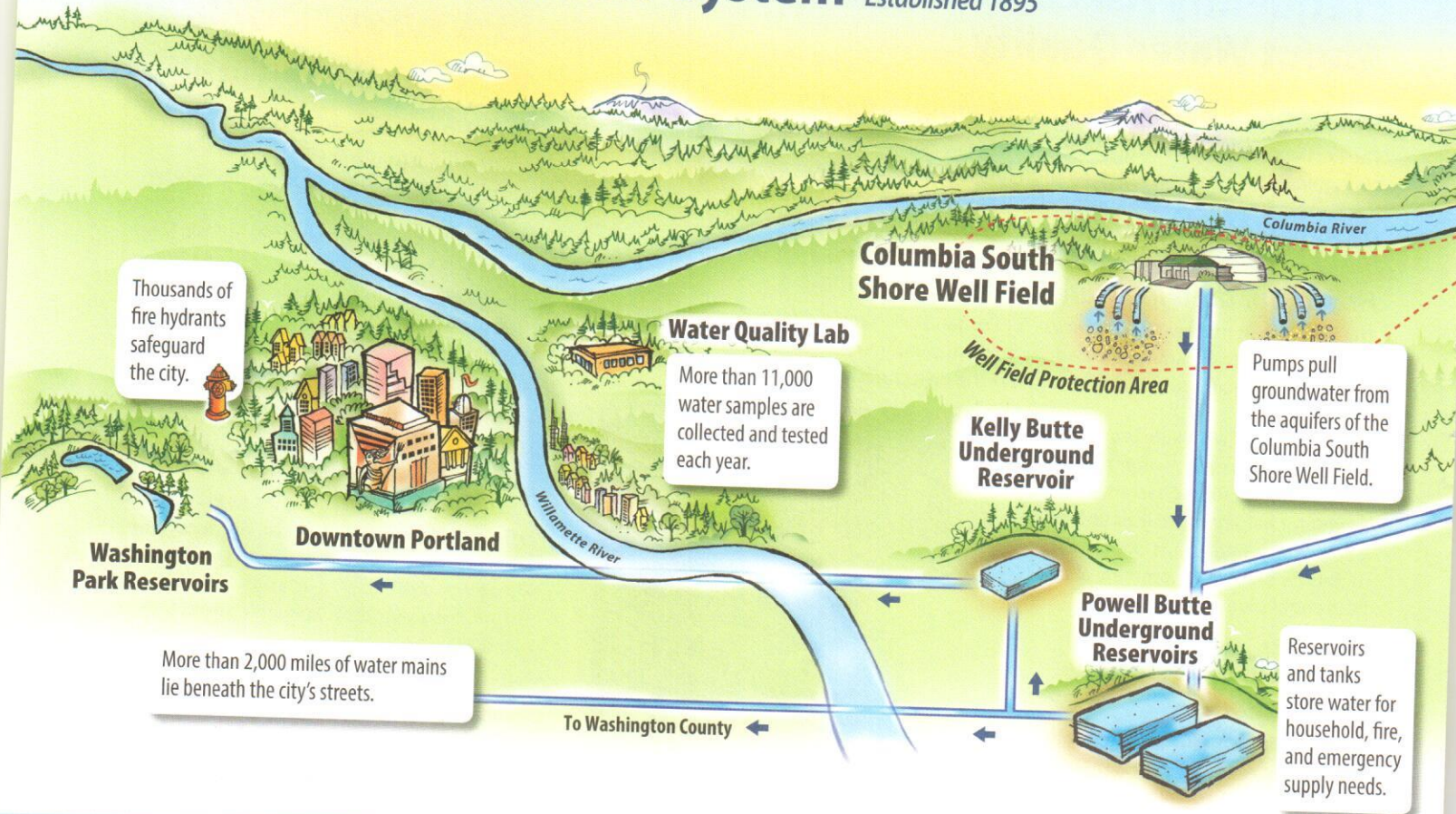
Pesticides and herbicides, which may come from a variety of sources such as farming, urban stormwater runoff and home or business use.

Organic chemical contaminants, including synthetic and volatile organic chemicals, which are byproducts of industrial processes, and can also come from gas stations, urban stormwater runoff and septic systems.

Radioactive contaminants, which can occur naturally.

In order to ensure that tap water is safe to drink, the 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.

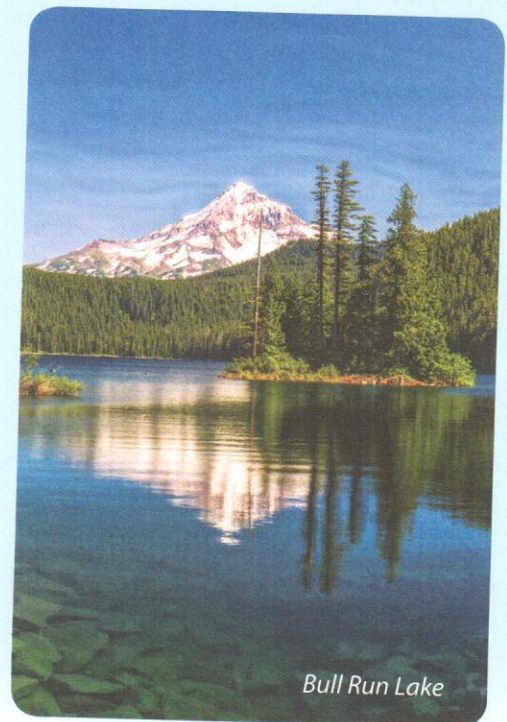
Portland's Water System Established 1895



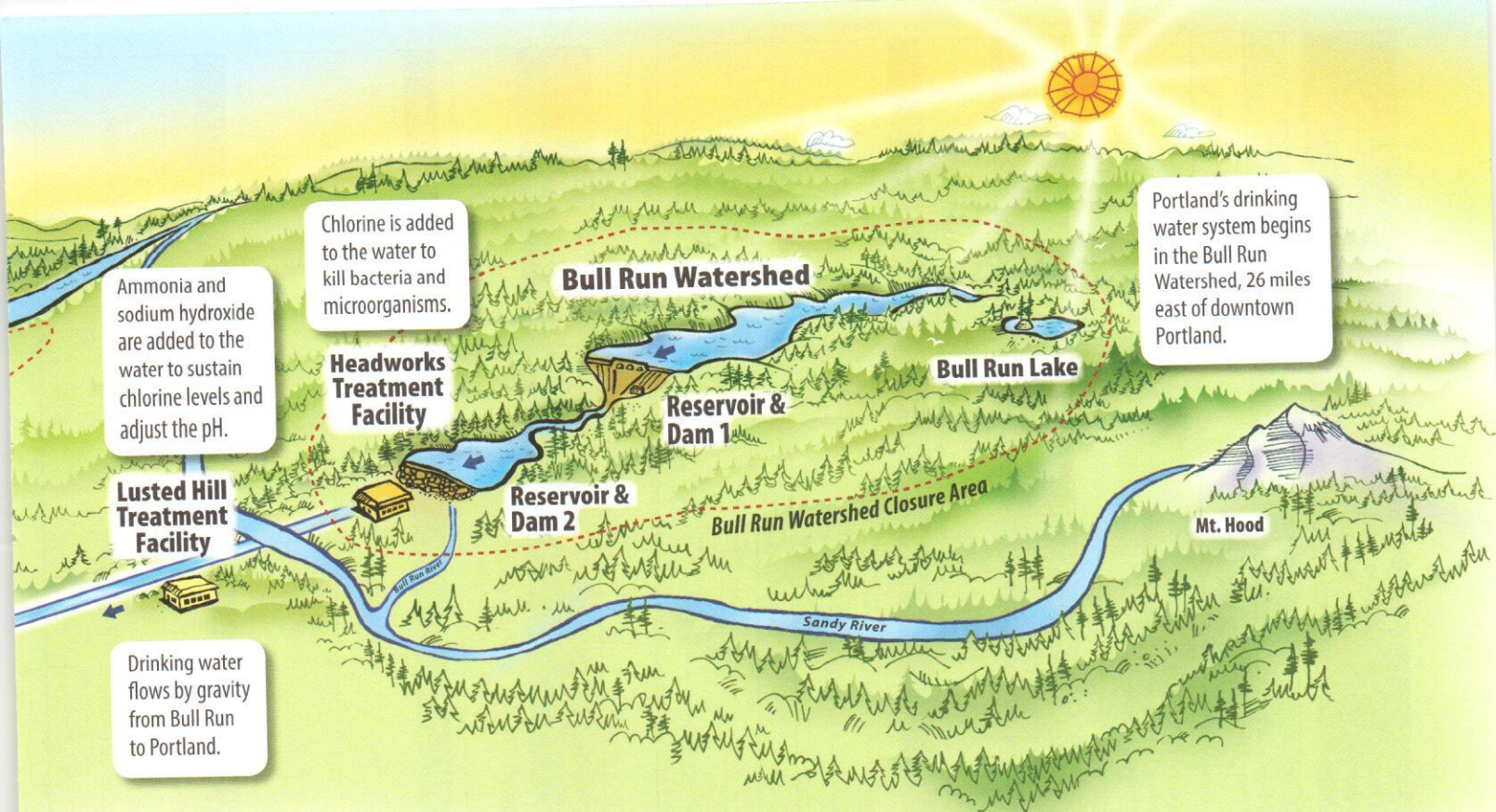
The Bull Run Watershed

is Portland's primary drinking water source, a protected surface water supply located in the Mt. Hood National Forest 26 miles from Portland. The watershed covers 102 square miles and typically receives around 135 inches of precipitation per year mostly as rain, but also includes snow at higher elevations during the winter. This precipitation flows to the Bull Run River and its tributaries. The river drains into two reservoirs, where nearly 10 billion gallons are stored for use year-round, particularly during the dry summer months. Bull Run Lake provides additional supply storage but is only occasionally needed. Current regulations, and the availability of the Columbia South Shore Well Field, allow Portland to meet federal drinking water standards without filtering the high-quality Bull Run water supply. Federal, state and local laws restrict public entry and no recreational, residential or commercial uses are allowed. The watershed is carefully managed to sustain and supply clean drinking water to a quarter of Oregon's population.

In 2003, the Portland Water Bureau completed a Source Water Assessment for the Bull Run water supply to comply with the 1996 Safe Drinking Water Act Amendments. The only contaminants of concern for the Bull Run water supply are naturally occurring microbial contaminants such as *Giardia*, *Cryptosporidium*, fecal coliform bacteria and total coliform bacteria. These organisms are found in virtually all freshwater ecosystems and may be present in the Bull Run water supply at very low levels. The Bull Run water supply complies with all applicable state and federal regulations for source water, including the 1989 Surface Water Treatment Rule filtration-avoidance criteria. The Portland Water Bureau is also operating under a variance for the treatment requirements for *Cryptosporidium*; see page 9 for more information. The Source Water Assessment Report is available at www.portlandoregon.gov/water/sourcewaterassessment and by calling 503-823-7525.



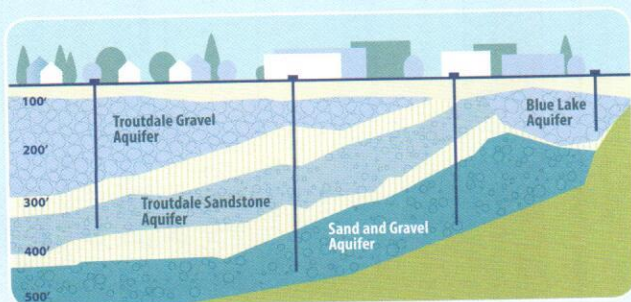
Bull Run Lake



Portland's drinking water system delivers water from two high-quality sources – the Bull Run Watershed and the Columbia South Shore Well Field – to almost one million people in Portland and surrounding communities.

The Columbia South Shore Well Field provides high-quality drinking water from groundwater production wells located in three different aquifers: the Blue Lake Aquifer, the Troutdale Sandstone Aquifer and the Sand and Gravel Aquifer. It is the second largest water source in Oregon, with about half of the daily capacity of Portland's Bull Run Watershed. In 2015, the well field was used to supplement the Bull Run supply during routine maintenance and as additional supply during the long, dry summer. A total of 5.8 billion gallons, or 15% of the total water provided to customers, came from the well field in 2015.

Portland installed its first wells in the Columbia South Shore Well Field in the early 1980s, and the most recent update of the state-certified Columbia South Shore Well Field Protection Program occurred in 2008. Through this program, the cities of Portland, Gresham and Fairview regulate businesses in the groundwater protection area to prevent hazardous material spills from seeping into the ground. Public events such as Aquifer Adventure, Cycle the Well Field and Groundwater 101 educate local residents on how to help protect groundwater. To obtain a copy of Portland's Well Field Protection Program certification, read more about the program, find upcoming events and learn how to help protect groundwater, visit the Portland Water Bureau's groundwater website at www.portlandoregon.gov/water/groundwater or call **503-823-7473**.



There are 26 active wells capable of pumping water from three aquifers on the south shore of the Columbia River in Portland, Gresham and Fairview. The well field serves as a backup water supply during turbidity events, emergencies and when the bureau needs additional summer supply. The well field can produce up to 95 million gallons of water per day.

The Clackamas River Water District, City of Gresham, City of Lake Oswego, 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 also receive detailed water quality reports about these sources in addition to this report.

Contaminants Detected in 2015

Regulated Contaminant	Minimum Detected	Maximum Detected	Maximum Contaminant Level (MCL), Treatment Technique or Maximum Residual Disinfectant Level (MRDL)	Maximum Contaminant Level Goal (MCLG) or Maximum Residual Disinfectant Level Goal (MRDLG)	Sources of Contaminant
Untreated Source Water from the Bull Run Watershed					
Turbidity	0.20 NTU	2.99 NTU	Cannot exceed 5 NTU more than 2 times in 12 months	Not Applicable	Erosion of natural deposits
Fecal Coliform Bacteria	Not detected	100% of samples had 20 or fewer bacterial colonies per 100 milliliters of water (1 sample had 16 bacterial colonies per 100 milliliters)	At least 90% of samples measured during the previous six months must have 20 or fewer bacterial colonies per 100 milliliters of water	Not Applicable	Animal wastes

Treated Drinking Water from Bull Run Watershed and Columbia South Shore Well Field Entry Points to the Distribution System

NUTRIENTS					
Nitrate-Nitrogen	0.02 parts per million	0.22 parts per million	10 parts per million	10 parts per million	Found in natural aquifer deposits; animal wastes
METALS AND MINERALS					
Arsenic	<0.50 parts per billion	0.87 parts per billion	10 parts per billion	0 parts per billion	Found in natural deposits
Barium	0.00081 parts per million	0.00684 parts per million	2 parts per million	2 parts per million	
Chromium (total) ¹	<0.5 parts per billion	0.2 parts per billion	100 parts per billion	100 parts per billion	
Copper	<0.00050 parts per million	0.00116 parts per million	Not Applicable	1.3 parts per million	
Fluoride	<0.025 parts per million	0.15 parts per million	4 parts per million	4 parts per million	
Lead	<0.05 parts per billion	0.25 parts per billion	Not Applicable	0 parts per billion	

¹ During the year, tests with varying method reporting limits (MRLs) were used to analyze chromium. The sample with a result of <0.5 ppb was analyzed by a test with a less sensitive MRL and is why the minimum appears to be greater than the maximum.

Treated Drinking Water from Points throughout the Distribution System of Reservoirs, Tanks and Mains

MICROBIOLOGICAL CONTAMINANTS					
Total Coliform Bacteria	Not Detected	0.74% of samples in January (2 out of 269) had detectable coliform bacteria	5% of monthly samples with detectable coliform bacteria	0 samples with detectable coliform bacteria	Found throughout the environment
DISINFECTANT RESIDUAL					
Total Chlorine Residual Running Annual Average	1.86 parts per million	1.95 parts per million	4 parts per million	4 parts per million	Chlorine is used to disinfect water
Total Chlorine Residual at Any One Site	0.37 parts per million	2.79 parts per million	Not Applicable	Not Applicable	
DISINFECTION BYPRODUCTS					
Haloacetic Acids					
Running Annual Average at Any One Site	0.85 parts per billion	39.2 parts per billion	60 parts per billion	Not Applicable	Byproduct of drinking water disinfection
Single Result at Any One Site	<2.0 parts per billion	76.7 parts per billion	Not Applicable	Not Applicable	

Total Trihalomethanes			
Running Annual Average at Any One Site	20.8 parts per billion	32.7 parts per billion	80 parts per billion
Single Result at Any One Site	12.1 parts per billion	41.3 parts per billion	Not Applicable

Regulated Contaminant	90 th Percentile Value	Number of Sites Exceeding the Action Level	Lead and Copper Rule Exceedance	Maximum Contaminant Level Goal (MCLG)	Source of Contaminant
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Lead and Copper Sampling at High-Risk Residential Water Taps					
Lead	14 parts per billion	9.7% of samples (11 out of 114) exceeded the lead action level of 15 parts per billion	More than 10% of the homes tested have lead levels greater than 15 parts per billion	0 parts per billion	Corrosion of household and commercial building plumbing systems
Copper	0.34 parts per million	0% of samples (0 out of 114) exceeded the copper action level of 1.3 parts per million	More than 10% of the homes tested have copper levels greater than 1.3 parts per million	1.3 parts per million	

Unregulated Contaminant	Minimum Detected	Average Detected	Maximum Detected	Source of Contaminant
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Treated Drinking Water from Bull Run Watershed and Columbia South Shore Well Field Entry Points to the Distribution System				
Radon	<16 picocuries per liter	202 picocuries per liter	370 picocuries per liter	Found in natural deposits
Sodium	3.35 parts per million	6.55 parts per million	15.5 parts per million	

See *Notes on Contaminants* on page 7 for more information.

Definitions

Action Level

The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

Maximum Contaminant Level (MCL)

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.

Maximum Contaminant Level Goal (MCLG)

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.

Maximum Residual Disinfectant Level (MRDL)

The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG)

The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Nephelometric Turbidity Units (NTU)

The unit of measurement of turbidity or cloudiness in water as measured by the amount of light passing through a sample.

Part Per Million (ppm)

One part per million corresponds to one penny in \$10,000 or approximately one minute in two years. One part per million is equal to 1,000 parts per billion.

Part Per Billion (ppb)

One part per billion corresponds to one penny in \$10,000,000 or approximately one minute in 2,000 years.

Picocuries Per Liter

Picocurie is a measurement of radioactivity. One picocurie is one trillion times smaller than one curie.

Treatment Technique

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

Notes on Contaminants

Arsenic, Barium, Chromium (total), Copper, Fluoride and Lead

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, they are unlikely to contribute to adverse health effects. Copper and lead are regulated at customers' taps. For more information see *Reducing Exposure to Lead* on page 8.

Disinfection Byproducts

During disinfection, certain byproducts form as a result of chemical reactions between chlorine and naturally occurring organic matter in the water. These byproducts can have negative health effects. Trihalomethanes and haloacetic acids are regulated disinfection byproducts that have been detected in Portland's water. Adding ammonia to chlorine results in a more stable disinfectant and helps to minimize the formation of disinfection byproducts.

Fecal Coliform Bacteria

The presence of fecal coliform bacteria in source water indicates that water may be contaminated with animal wastes. The Portland Water Bureau uses chlorine to kill these bacteria.

Nitrate - Nitrogen

Nitrate, measured as nitrogen, can support microbial growth (bacteria and algae). Nitrate levels exceeding the standards can contribute to health problems. At the levels found in Portland's drinking water, nitrate is unlikely to contribute to adverse health effects.

Radon

Radon is a naturally occurring radioactive gas that cannot be seen, tasted or smelled. Radon was detected at very low levels in the Bull Run

water supply. It was also detected 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, radon is unlikely to contribute to adverse health effects. For information about radon, call the EPA's Radon Hotline (800-SOS-RADON) or www.epa.gov/radon.

Sodium

There is currently no drinking water standard for sodium. Sodium is an essential nutrient. At the levels found in drinking water, it is unlikely to contribute to adverse health effects.

Total Chlorine Residual

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

Total Coliform Bacteria

Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other potentially-harmful bacteria may be present. The Portland Water Bureau uses chlorine to kill these bacteria.

Turbidity

Turbidity is a measure of the water's clarity. Increased turbidity is typically caused by large storms that suspend organic material in our source water. This can interfere with disinfection and provide an environment for microbial growth. When turbidity rises, the Portland Water Bureau can shut down the Bull Run system and serve water from the Columbia South Shore Well Field.

Unregulated Contaminant Monitoring Rule

Every five years, as required by the EPA, the Portland Water Bureau gathers information about the presence of certain unregulated substances in drinking water. The EPA uses the results of this testing, along with the potential health risks of the substances, to determine if regulations are needed. In 2014, the Portland Water Bureau tested for 21 unregulated substances, and detected five in our source water and distribution system. Those results can be found in the 2015 Water Quality Report posted on our website. In June 2015, an additional round of testing was conducted in the Columbia South Shore Well Field, detecting the same five substances. The results are reported below.

Detections in 2015

Substance	Minimum Detected	Average Detected	Maximum Detected	Likely Source
Treated Drinking Water from the Columbia South Shore Well Field Entry Point to the Distribution System				
Chlorate	0.1 parts per million	0.1 parts per million	0.1 parts per million	Byproduct of drinking water disinfection
Chromium (total)	0.2 parts per billion	0.2 parts per billion	0.2 parts per billion	
Chromium-6	0.089 parts per billion	0.089 parts per billion	0.089 parts per billion	Found in natural deposits
Strontium	0.068 parts per million	0.068 parts per million	0.068 parts per million	
Vanadium	2.2 parts per billion	2.2 parts per billion	2.2 parts per billion	

Chlorate

Chlorate, a byproduct of the drinking water disinfection process, can form when sodium hypochlorite is used as a disinfectant. At the levels found in Portland's water, chlorate is unlikely to contribute to adverse health effects.

Chromium (total) and Chromium-6

Chromium is a naturally occurring element found in the environment and in drinking water in two main forms: trivalent chromium (chromium-3) and hexavalent chromium (chromium-6). Total chromium (combined chromium-3 and -6) is currently regulated by the EPA at a maximum contaminant level of 100 parts per billion. At the very low levels detected in Portland's drinking water, chromium is unlikely to contribute to adverse health effects.

Strontium and Vanadium

These are metals found in the earth's crust which can dissolve into water that is in contact with natural deposits. At the levels found in Portland's water, strontium and vanadium are unlikely to contribute to adverse health effects.

Reducing Exposure to Lead

Lead is commonly found in a variety of places throughout our environment. While lead is rarely found in our source waters and there are no known lead service lines in the water system, lead can be found in some homes. 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. Lead in household plumbing can dissolve into drinking water when water sits in those pipes for several hours, such as overnight or after returning from work or school.



If present, lead at elevated levels 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 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. 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 can request a free lead-in-water test from the LeadLine. Information on lead in drinking water, testing methods and steps you can take to minimize exposure is available from the **LeadLine, 503-988-4000, www.leadline.org** or the **Safe Drinking Water Hotline, (800) 426-4791, www.epa.gov/safewater/lead**.

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 and pottery.

Protecting Public Health

The Portland Water Bureau's Lead Hazard Reduction program is a comprehensive approach to reduce exposure to lead. Through this program the Portland Water Bureau provides:

Corrosion Control Treatment. Reduces corrosion of lead in plumbing by increasing the pH of the water. This pH adjustment has reduced lead in tap water by more than half.

Lead in Water Testing. Provides free lead in water testing to everyone, but targets testing the water in households most at-risk from lead in water. These are homes built between 1970 and 1985 with pregnant women or children ages six or younger in the home.

Education, Outreach and Testing. Funds agencies and organizations that provide education, outreach and testing on all sources of lead.

Home Lead Hazard Reduction. Supports the Portland Lead Hazard Control Program to provide grants to minimize lead paint hazards in homes.

Water Testing

Twice each year the Portland Water Bureau and regional water providers in the Bull Run service area monitor for lead and copper in tap water from a sample group of more than 100 homes. These are homes where the plumbing is known to contain lead solder, and represent a worst-case scenario for lead in water. Samples are collected after the water has been standing in the household plumbing for more than 6 hours. A Lead and Copper Rule exceedance for lead occurs when more than 10 percent of these homes exceed the lead action level of 15 parts per billion. In the most recent round of testing, less than 10 percent of homes exceeded the lead action level.

LEADLINE

If you are concerned that your home tap water may have lead, contact the LeadLine for a free lead-in-water test kit and to learn ways to reduce your exposure to all sources of lead. **Call the LeadLine at 503-988-4000 or visit www.leadline.org.**

Easy steps to reduce possible exposure to lead from household plumbing

- **Run your water to flush the lead out.** If the water has not been used for several hours, run each tap for 30 seconds to 2 minutes or until it becomes colder before drinking or cooking. This flushes water which may contain lead from the pipes.
- **Use cold, fresh water for cooking and preparing baby formula.** Do not cook with or drink water from the hot water tap; lead dissolves more easily into hot water. Do not use water from the hot water tap to make baby formula.
- **Do not boil water to remove lead.** Boiling water will not reduce lead.
- **Test your child for lead.** Ask your physician or call the LeadLine to find out how to have your child tested for lead. A blood lead level test is the only way to know if your child is being exposed to lead.
- **Test your water for lead.** Contact the LeadLine at www.leadline.org or **503-988-4000** to find out how to get a FREE lead-in-water test.
- **Consider using a filter.** Check whether it reduces lead - not all filters do. Be sure to maintain and replace a filter device in accordance with the manufacturer's instructions to protect water quality. Contact NSF International at **800-NSF-8010** or www.nsf.org for information on performance standards for water filters.
- **Regularly clean your faucet aerator.** Particles containing lead from solder or household plumbing can become trapped in your faucet aerator. Regular cleaning every few months will remove these particles and reduce your exposure to lead.
- **Consider buying low-lead fixtures.** As of January 2014, all pipes, fittings and fixtures are required to contain less than 0.25% lead. When buying new fixtures, consumers should seek out those with the lowest lead content.

- **Free lead-in-water testing**
- **Free childhood blood lead testing**
- **Free lead reduction services**

Bull Run Treatment Variance

The Portland Water Bureau is the only system in the United States to have received a variance to the treatment requirements for *Cryptosporidium* based on the high quality of its raw water and therefore does not provide treatment for *Cryptosporidium*. In March 2012, the Oregon Health Authority (OHA) issued the Portland Water Bureau a variance from the state and federal drinking water rules requiring the treatment of raw water from the Bull Run Watershed for the parasite *Cryptosporidium*. A variance is state permission not to meet an MCL or a treatment technique under certain conditions. A state may grant a variance if a water system demonstrates that the required treatment is not necessary to protect public health because of the nature of the water system's raw water source. OHA issued Portland Water Bureau the treatment variance for *Cryptosporidium* based on substantial data and analyses presented in the *LT2 Treatment Variance Request* for the Bull Run drinking water source.

As a result of the treatment variance, the following are among the state-mandated conditions that must be met in order to maintain the variance:

Watershed Protection: The Portland Water Bureau must maintain or strengthen all existing legal and operational protections for the Bull Run Watershed, monitor the watershed on a routine basis in an effort to eliminate unauthorized entry, maintain strict controls for sanitary facilities, implement field inspections and monitor tributaries and wildlife scat in the watershed.

Raw Water Intake Monitoring: The Portland Water Bureau must conduct regular ongoing monitoring for *Cryptosporidium* where raw water first enters the drinking water system at least two days each week. If *Cryptosporidium* is detected in any one sample, the Portland Water Bureau must begin a much more intensive monitoring program to demonstrate whether the *Cryptosporidium* concentration is less than 0.075 oocysts per 1,000 liters of water. Additional detections of *Cryptosporidium* during this period of monitoring could result in OHA revoking the variance.

Reporting and Notification: The Portland Water Bureau must report the results of watershed and raw water monitoring to OHA. Any detections of *Cryptosporidium* must be reported to OHA within 24 hours. The Portland Water Bureau must notify the public through its website and issue a press release in the event of a *Cryptosporidium* detection at the raw water intake. The results of watershed field inspections and tributary and wildlife scat monitoring must be reported to OHA annually. The Portland Water Bureau must also notify OHA of any circumstances that may impact the conditions of the variance.

The treatment variance is valid for a period of 10 years from the date it was issued. OHA may revoke the variance if the conditions of the variance are not met.

2015 Results of *Cryptosporidium* Monitoring at the Raw Water Intake

Number of Samples	Total Volume	Detections
226	5,664.1	None

In 2015, there were no detections of *Cryptosporidium* during Raw Water Intake Monitoring. The most recent monthly intake reports can be found at www.portlandoregon.gov/water/BRTVIntakeReports.

The most recent annual *Bull Run Treatment Variance Watershed Report* summarizes the results of watershed field inspections and monitoring of tributaries and wildlife scat for Water Year 2015 (October 1, 2014 - September 30, 2015) and can be found at www.portlandoregon.gov/water/2015BRTVReport.

Additional information on Portland Water Bureau's treatment variance can be found at www.portlandoregon.gov/water/treatmentvariance.

Special Notice for Immuno-Compromised Persons

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 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**.

A Reliable Water Supply, Now and in the Future

Portland's robust and resilient water system meets the supply needs of Portland Water Bureau customers.

Many will remember the low snowpack in the winter of 2014-15 and the long, hot and dry summer and fall of 2015. Portland's primary water supply in the Bull Run Watershed relies on mostly rain-fed reservoirs, and is less vulnerable to the effect of warming temperatures on snow. Portland's secondary groundwater supply also increases the water system's resilience when needed.

The Portland Water Bureau is actively working to understand and develop a long-term plan for the impacts of climate change on our drinking water system. The Northwest's climate future is expected to include hotter, drier summers and warmer, wetter winters with heavier rainstorms, and more rain and less snow falling at higher elevations. Winters with low snow accumulation and warmer than

average temperatures will therefore become increasingly more likely over the next few decades.

Building for a major earthquake is another way the Portland Water Bureau plans for a reliable water supply. The major focus of the Portland Water Bureau for the last several decades has been to ensure that the water supply facilities can withstand seismic forces and be functional after an earthquake. Newly constructed reservoirs at Kelly Butte and Powell Butte and the future seismically reinforced underground reservoirs at Washington Park were all designed to meet modern seismic standards.

We know you rely on water every time you open your tap. Thanks to careful planning and a robust and resilient water system, the Portland Water Bureau will meet the supply needs of our customers, now and in the future.

We are preparing. Are you?

1

Sign up to get Public Alerts.

More information: www.PublicAlerts.org

PublicAlerts

2

Get a kit, make a plan, and be informed.

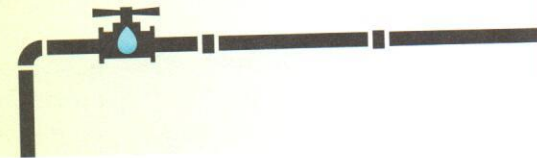
More information: www.portlandoregon.gov/pbem/plan



3

Know how to shut off your water.

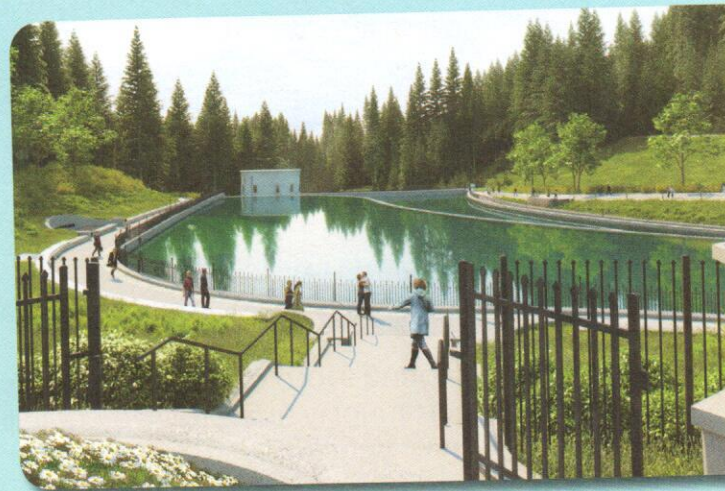
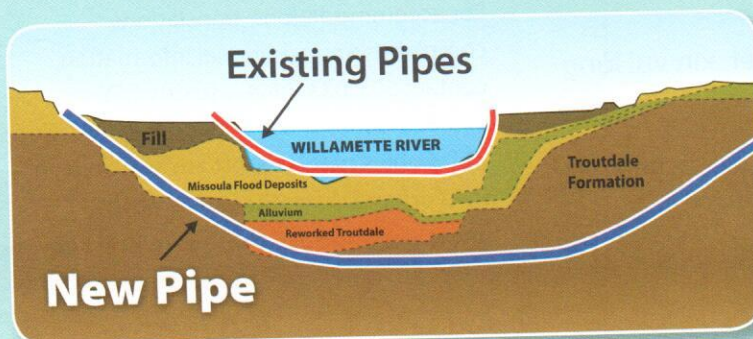
More information: www.regionalh2o.org/how-shut-your-water-emergency



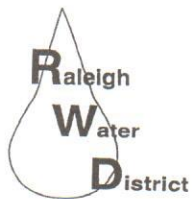
Resilience in Action

Two current Portland Water Bureau projects will ensure that water keeps flowing to and within Portland's west side in the event of a catastrophic earthquake.

The **Willamette River Crossing (WRX) project** will construct a seismically hardened transmission main under the Willamette River. The six transmission mains that currently cross the river are a critical part of providing water to customers on the west side. However, the oldest river crossing is more than 110 years old and none are seismically hardened, which means the water mains are not restrained so they may move and break during an earthquake. The new pipeline will be large enough to provide the average daily need to west side customers.



The Washington Park Reservoir Improvements Project entails building a new, seismically reinforced below-ground reservoir. The reservoir will be engineered to withstand ongoing landslide encroachment and effects of earthquakes. When complete, the new underground reservoir will supply water to Portland's west side, including all downtown businesses and residents, the Oregon Zoo, more than 60 parks, six hospitals and 20 Portland public schools.



RALEIGH WATER DISTRICT

5010 SW Scholls Ferry Road
Portland, Oregon 97225
503-292-4894

ON THE COVER

Experience Bull Run

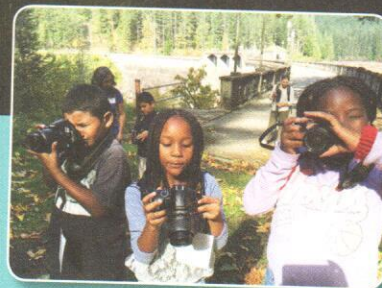
A STUDENT ART PROJECT

The Portland Water Bureau guides hundreds of students and adults through the Bull Run Watershed each year. On Bull Run tours, visitors learn about water science, forest ecology and engineering. Many visitors say they feel a special and visceral connection to their water after visiting.

In Fall 2015, fourth-grade students from Boise-Eliot/Humboldt School accepted a special mission from the Portland Water Bureau: to experience their city's protected watershed and bring back a sense of what it feels like to be there.

The Water Bureau and teachers from Boise-Eliot/Humboldt designed a special tour for the fourth-graders. The goal? To capture their impressions using all five senses. Students took a silent walk through the forest, recorded sound from inside a dam, practiced photo yoga and even tasted an oxalis plant. And from these impressions, students created art.

To learn more about this project, and Bull Run tours in general, please visit www.portlandoregon.gov/water/education.



Para obtener una copia de este informe en español, por favor llame al siguiente número o visite el sitio Web que aparece abajo:

Для получения копии этого отчета на русском языке позвоните по указанному ниже номеру телефона или зайдите на указанный ниже вебсайт:

Để có được một bản sao của báo cáo này bằng Tiếng Việt, xin vui lòng gọi số điện thoại hoặc truy cập vào trang web dưới đây:

要索取这份报告的中文复本, 请拨打下列电话号码或访问下列网站

www.portlandoregon.gov/water/wqreport

(503) 823-7770

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ADDENDUM

WATER QUALITY REPORT 2016

Raleigh Water District participates in the joint monitoring program with the City of Portland. This joint monitoring program allows the District to use samples from Portland's system, to meet most of the monitoring requirements.

The following tables list the additional sampling that the District performed within our own system in 2015.

Regulated Contaminants					
Distribution System	Minimum Detected	Maximum Detected	MRDL	MRDLG	Source of Contaminant
Chlorine Residual	0.15 ppm	2.5 ppm	4 ppm	4 ppm	Chloramines are used to disinfect water.
Total Coliform Bacteria Raleigh Water District Distribution System	0 samples in MONTH (0 out of 5) had detectable coliform bacteria	0 samples in MONTH (0 out of 5) had detectable coliform bacteria	<u>MCL</u> Must not detect coliform bacteria in more than 1 sample in any month	<u>MCLG</u> N/A	Found throughout the environment
<u>Disinfection Byproducts</u> Total Trihalomethanes Running Annual Average of all sites. Single result at any one site.	16.85 ppb 27.0 ppb	16.85 ppb 40.4 ppb	<u>MCL</u> 80 ppb	<u>MCLG</u> Not Applicable	Byproduct of drinking water disinfection
<u>Haloacetic Acids</u> Running Annual Average of all sites. Single Result at any one site	12.98 ppb 17.6 ppb	12.98 ppb 34.3 ppb	<u>MCL</u> 60ppb	Not Applicable	Byproduct of drinking water disinfection

If you have any questions or comments about this report, please call Raleigh Water District at **503-292-4894**.