

Clackamas River Water **2022 Drinking Water Quality Report**

Based on data from 2021

*Our drinking water exceeded all state
drinking water standards in 2021.*

Clackamas River Water (CRW) delivers reliable, safe, and healthy tap water to you, our customers. In this report you will find:

- **Where your water comes from**
- **How your water is treated**
- **Steps we take to protect water quality**
- **How we test your water, and**
- **The outcomes of our water quality testing efforts in 2021**

Clackamas (North) Service Area, Public Water System ID #4100187
Clairmont (South) Service Area, Public Water System ID #4100594

Table of Contents

About Us	2
Protecting Our Source	3
About Water Contaminants	4
Vulnerable Populations	4
How your water is treated	5
Drinking Water Monitoring	5
What is Backflow?.....	6
Monitoring for Contaminants	6
Indicator Bacteria	6
Algae Toxins	8
Lead in Drinking Water	9
Cryptosporidium & Giardia	9
Definitions.....	10
Service Area Map	10
Water Quality Results	11
Notes on Contaminants	12
Frequently Asked Questions	12
Contacts and Resources	12



The CRW treatment plant has been in operation since 1964.

About Us

CRW has 39 dedicated employees and provides drinking water to about 50,000 people directly. In addition we sell water wholesale that serves another 30,000 people. We move water to our customers through 265 miles of pipeline. Pipelines connect our 15 reservoirs and 13 pump stations to about 12,000 service connections.

CRW's water treatment plant (WTP) has been in operation more than 55 years. Through thoughtful management, our WTP, pipelines and related components are continually monitored for leakage and maintained to high industry standards. When water infrastructure is replaced, it is with careful planning for reliable materials, resiliency after disasters, and with an eye toward our role as stewards of public funds.

Public oversight is provided through our elected Board of Commissioners. Board meetings happen on the second Thursday of each month at 6:00pm. In-person meetings are held at our administrative offices at **16770 SE 82nd Drive**. If meetings have an online attendance option, a link will be posted on our website, **www.crwater.com** and included in the meeting's agenda. The public is encouraged to attend.

Our Mission:

Provide high quality, safe drinking water to our customers at rates consistent with responsible planning for the health of our district.

Our Guiding Values:

- *Water Quality*
- *Customer Service*
- *Financial Accountability*
- *Responsible Stewardship*

Protecting Our Drinking Water Source, The Clackamas River

The Clackamas River is designated federally as a “wild and scenic” river and has 47 miles of protected waterway. The river’s watershed, in total, is about 950 square miles. In the watershed there is a mixture of forests, mountain meadows, farmland, neighborhoods, and some light industrial areas.

CRW is committed to ensuring the continued exceptional quality of the river as a drinking water source. Active monitoring of the watershed occurs in partnership with our drinking water coalition, the Clackamas River Water Providers (CRWP).

These partners represent the drinking water providers serving about 300,000 residents in Clackamas and Washington Counties. These residents rely on the Clackamas for their drinking water, hydro-electric power, and many outdoor activities.

In 2019, Oregon’s Department of Environmental Quality (OR-DEQ) updated the source water assessment of the Clackamas River. A source water assessment identifies potential contamination sources in a watershed.

You can read it at:

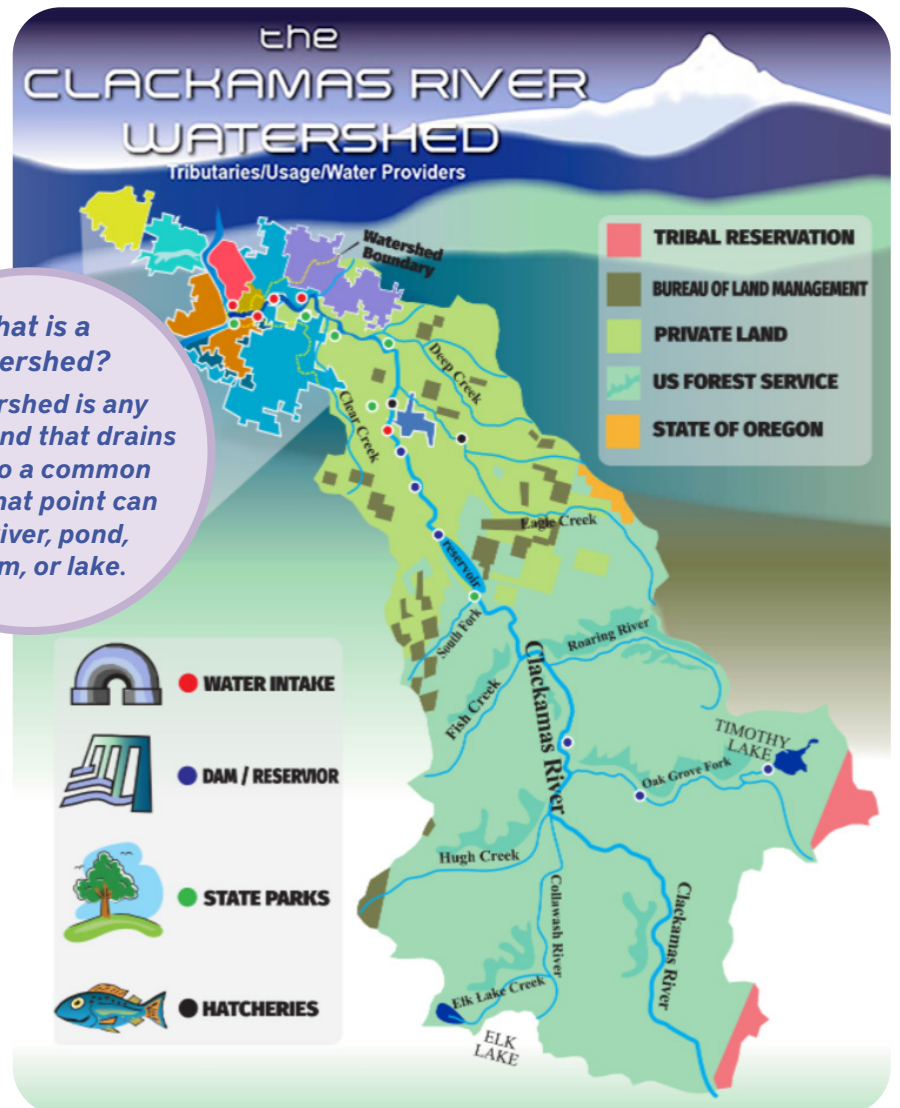
bit.ly/SWaterAssess

From the study, the CRWP developed strategies to support the immediate and long-term health of the River. **Our combined efforts to identify, prevent, and reduce harm to the ecosystem helps ensure that the river supports drinking water needs into the future.**

To read more about the CRWP, explore this map in an interactive way, learn about water conservation, read the Drinking Water Protection Plan, and so much more, visit:

www.clackamasproviders.org

The Clackamas River is the primary source of drinking water for CRW.
The river starts at about 4900 feet of elevation in the Mt. Hood National Forest and heads downstream to eventually meet the Willamette River.



Water Contaminants in Source Water

All sources of drinking water, surface and ground water, regardless of if its bottled or from the tap, has moved through the ground or over surfaces where it breaks down naturally occurring minerals. It can also pick up substances due to human or animal activity nearby. These are called contaminants.

These are 6 different types of contaminants that can be present in source water:

Microbial: Viruses and/or bacteria that may come from sewage treatment plants, septic systems, agricultural livestock, pet waste, and wildlife

Inorganic: salts or metals that can be naturally occurring from the environment or as a result of storm runoff, industrial or domestic wastewater, oil and gas production, mining, or farming.

Pesticides/Herbicides: chemicals used to grow and protect crops and plants which can come from a variety of sources such as storm runoff, residential, or business use.

Organic Chemicals: by-products of industrial processes, petroleum production. Can come from gas stations, urban stormwater runoff, or septic systems.

Radioactive: Naturally occurring or can be the result of oil and gas production or mining activities.

Algal Toxins: Under certain conditions, such as in warm water containing an abundance of nutrients, naturally occurring blue-green algae can sometimes form harmful algal blooms (HABs) in lakes and rivers. Some of these blooms are capable of producing toxins known as cyanotoxins that can harm humans and animals.

The US EPA sets rules and regulations to ensure that tap water is safe to drink. The rules set limits to the amount of certain contaminants that can be in water produced by public water systems, like CRW. The Oregon Health Authority (OHA) is the agency that ensures the US EPA drinking water rules are followed in addition to Oregon-specific regulations.

All drinking water, including bottled water, may be reasonably expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk.

For more information about contaminants and potential health effects call the EPA's **Safe Drinking Water Hotline at 800-426-4791** or visit www.epa.gov/safewater. For bottled water, the US Food and Drug Administration (FDA) sets limits for that product and it must provide the same protections for public health as publicly supplied tap water.

Vulnerable Populations and Water Contaminants

In our community there are persons who are more vulnerable to contaminants in the drinking water than the general population.

Examples include:

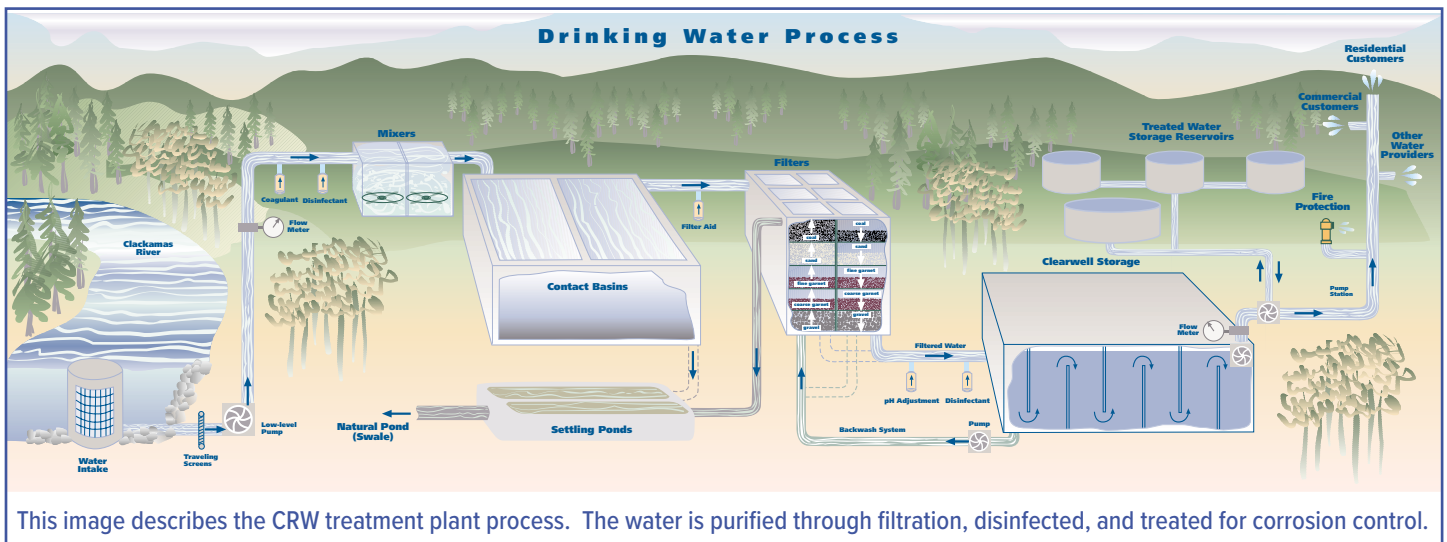
- Patients receiving chemotherapy
- Organ Transplant Recipients
- People Living with HIV/AIDS
- People with immune disorders
- Some elderly persons
- Infants

Customers with concerns about the risk of health impacts from drinking water contaminants should get advice from their healthcare provider. EPA/CDC guidelines on ways to reduce the risk of infection by *Cryptosporidium* and other microbial contaminants are accessible from the **Safe Drinking Water Hotline at 800-426-4791**

How your water is treated

CRW has two service areas the North (Clackamas) and South (Clairmont), as detailed on the map on page 10. Customers in the North Service Area receive water that is treated by Clackamas River Water's water treatment plant. Customers in the South Service Area receive water that is treated by South Fork Water Board's treatment plant but is serviced by Clackamas River Water. Both treatment plants draw water from the Clackamas River. Water is treated through a similar process at both plants. The process involves three basic steps:

- 1) **Filtration:** This removes a wide range of contaminants, such as particles and micro-organisms from the water.
- 2) **Disinfection with chlorine:** The smallest amount of chlorine is added that will maintain disinfection to the farthest reaches of the distribution system.
- 3) **Corrosion control:** The final chemistry of the water is adjusted to minimize corrosion in home plumbing that could lead to lead exposure. This is accomplished by slightly adjusting pH, alkalinity, or both.



BEFORE THERE'S AN EMERGENCY



Get ready.
Get water.

Stored drinking water is one of the most important supplies needed in a disaster. If a major earthquake hits it could take two weeks before help arrives. Water service could also be interrupted due to major power outages, fires or accidents, or even major harmful algae blooms. To learn more about storing emergency water, visit www.regionalh2o.org/emergency-preparedness

Protecting Water from Contamination After Treatment

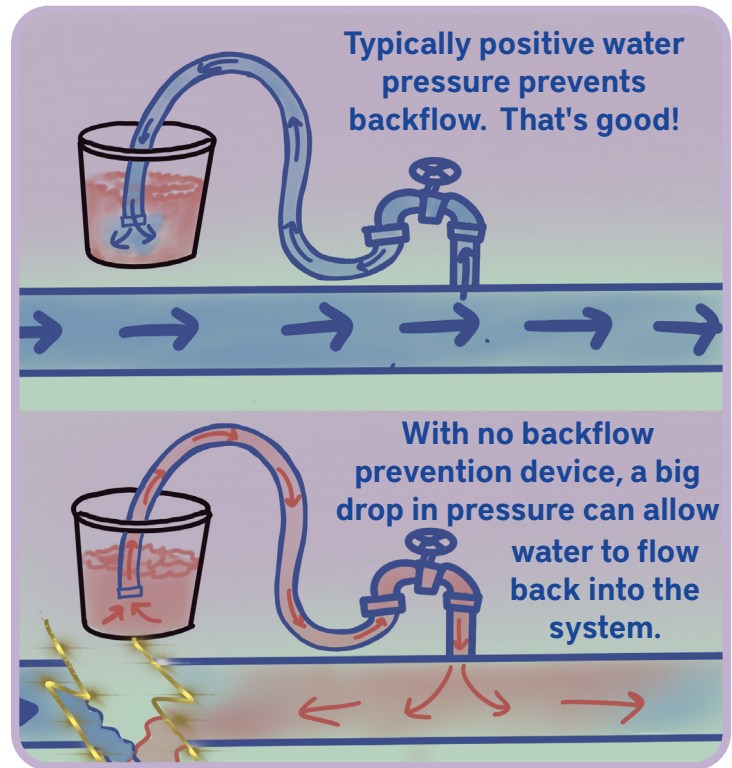
What is Backflow?

Water systems operate under positive pressure, which causes water to flow out of (not into) the system. This prevents contamination.

On rare occasions a sudden loss or drop in pressure (such as during a main break) can allow “backflow”, when contaminated water flows into the system through an undetected leak, an open faucet, or other plumbing connection. Examples of open plumbing connections include a hose in a bucket of liquid or an irrigation system not fitted with an appropriate backflow prevention device.

Backflow can also occur due to a cross connection between a pump or pressure vessel connected to potable plumbing.

CRW takes steps to prevent and closely monitor backflow threats to water quality.



Backflow Prevention

Leak Detection

In addition to proactively replacing aging pipes, CRW has a leak detection program that identifies and fixes leaks to safeguard water quality. Leaks are found with:

- Listening Equipment
- Visual Inspection for wet soils
- Water Loss Analysis

Backflow Prevention / Cross-Connection Program

Anyone with underground irrigation systems is required by law to install and maintain appropriate backflow equipment on their water meter. CRW:

- Helps educate our customers & provide information.
- Provides a list of certified backflow device inspectors.
- Tracks whether yearly maintenance has been performed.

See crwater.com/backflow to learn about doing your part to safeguard water quality in your community from backflow.

Flushing Program

Regularly flushing pipes by intentionally running water quickly through them is an essential tool we use for maintaining water quality. Flushing our distribution pipes:

- Keeps water fresh.
- Clears fine debris that can cause discoloration when disturbed.
- Helps maintain pipe integrity which prevents line breaks & the opportunity for backflow to occur

Monitoring for Backflow

Indicator Bacteria

It would be impossible to test water for every substance that could be introduced by backflow. Instead we test for indicator bacteria. Indicator bacteria are not harmful themselves, but are easy to test for and are reliable indicators of water contamination. We test for them throughout the system on a regular basis. See the next page for more details about monitoring for indicator bacteria.

Chlorine Residual

Chlorine residual is also regularly monitored throughout the system. Chlorine is the disinfectant we depend on to keep the water free of pathogens. We check to make sure there is just enough to do the job. A mysterious drop in chlorine can also be an indicator of a bacterial source or other contamination.

CRW's Monitoring Program for Contaminants

Water quality monitoring is a critical function of a water utility and a passion here at Clackamas River Water. CRW regularly tests above and beyond what is required by the Oregon Health Authority. Each year, our staff collects over 1,000 samples of our drinking water to ensure that the water provided continues to be clean and safe to drink.

Our water is tested for over 100 EPA-regulated and other unregulated contaminants. Most substances we test for are not detected in the drinking water. If a contaminant that we are required to test for was detected in 2021 then it will be in the table on page 11. If a contaminant is tested for less than once per year, the most recent results are included where noted.



On-site Accredited Laboratory

All tests for regulated contaminants must be performed by an accredited laboratory. For two types of contaminants (indicator bacteria and cyanotoxins) CRW has invested in having an on-site accredited laboratory. Our laboratory had been accredited to analyze coliform bacteria since 1989 – more than 30 years! **By having an on-site laboratory we can get results faster and on a more flexible schedule when time is critical to our customers.**

CRW Monitoring for Indicator Bacteria

With one test we can look for organisms that indicate (1) any contamination, and (2) contamination more likely to cause waterborne illness. These organisms are total coliforms and *E.coli*.

Total coliforms are a group of bacteria that is widespread in nature. If we find them in drinking water, it is an indication of contamination of the drinking water from an outside source. If we confirm their presence, steps are taken to identify the source and correct the issue.

E.coli is a specific coliform bacteria that indicates contamination from fecal material either from humans or other warm-blooded animals. This type of contamination is more likely to contain viruses or bacteria that can cause human illness. If *E.coli* were ever confirmed in the water, customers would be instructed to boil their water until the source has been identified, the issue corrected, and tests had confirmed the water is safe.

We sample for coliforms regularly throughout our system at rates higher than required.

Using one test that looks for both total coliforms and E.coli is a fast and cost effective to monitor water for contamination and protect the health of our customers.

Thanks to our on-site accredited laboratory we can assure our customers that the water is safe to drink as soon as possible when we have a main break or loss in pressure that results in a boil water notice. We also analyze samples for neighboring water districts to help offset laboratory costs.

No total coliforms or E. coli were detected in our water in 2021.

You can rest assured we will continue to be vigilant above and beyond what is required to protect your safety, with pride!

CRW Testing for Algae Blooms and Algal Toxins

Harmful algal blooms (HABs) occur when specific types of algae begin to grow rapidly due to favorable growth conditions like warm water and an abundance of nutrients. Sometimes blooms of specific types of algae, commonly called blue-green algae, can produce toxic compounds known as cyanotoxins. Cyanotoxins can attack either the liver or the nervous systems, and can at times make it through the water treatment process. This is what happened in Salem, Oregon in 2018 resulting in a prolonged “Do not drink” water advisory.



An algae bloom in Timothy Lake during summer 2020

CRW became the first water provider in the nation to be accredited to analyze water for all four major cyanotoxins that threaten water safety.

Historically, algal toxins have not been detected in treated water in our watershed. We have observed blooms of blue-green algae with the potential to produce toxins in reservoirs upstream, and there have been a few low-level detections from time to time in those reservoirs and even once in the mainstream of the Clackamas River.

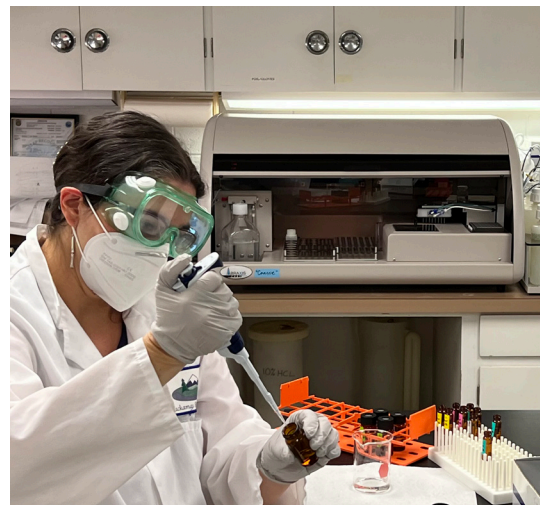


Images of blue-green algae analyzed in our lab.

Clackamas River Water takes this threat seriously, and developed an algae monitoring program even prior to the 2018 event in Salem. We use a technology called a FlowCam that allows us to capture an image of each particle within a small volume of water. This allows us to monitor populations of algae species as they change and also see if the cells are robust looking or showing signs of decay. This is an advanced warning system as we can see problem species begin to increase.

Following that 2018 event CRW bought state-of-the-art equipment and became the first municipal water provider in the nation to be accredited to analyze raw and treated water for all four of the major cyanotoxins that threaten water safety. Currently two of those toxins are regulated by the State of Oregon. At any sign of a bloom we begin testing for all four toxins.

In addition to analyzing our own samples with maximum speed and flexibility, we also provide FlowCam analysis and toxin testing for Portland General Electric as they monitor the upstream reservoirs in our watershed. This gives us the fastest information we can get about algae and what toxins may be present upstream of our intakes.



Our source water being tested for cyanotoxins the same day the sample was collected.

CRW Testing for Lead in Drinking Water

Higher levels of lead in drinking water can cause serious health problems, especially for pregnant women and young children. The main sources of lead contamination in drinking water are the pipes and parts in a home plumbing system. This includes lead solder used to join metal pipes or plumbing fixtures. Homes built prior to 1986 are more likely to contain lead plumbing components, since installing them became outlawed at that time.

CRW is responsible for providing safe, healthy drinking water, but cannot control the variety of materials used in plumbing components. While we optimize our water chemistry to prevent corrosion and monitor the results, you may wish to have your plumbing and/or water tested for lead.

The most simple and effective way to reduce lead exposure in a home with lead plumbing is to let the water run for between 30 seconds and two minutes before using it for consumption, especially if the water has sat unused for several hours. This brings fresh water into the house that has not been sitting in

The main sources of lead contamination in drinking water are the pipes and parts in home plumbing systems built prior to 1986.

contact with the plumbing. To learn about lead in drinking water, testing methods, and more steps you can take to reduce your exposures, contact the ***Safe Drinking Water Hotline at 800-426-4791*** or visit ***epa.gov/safewater***.

Routinely, 30 to 60 homes that do contain lead plumbing components are monitored in CRW's service areas. These houses 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. When more than 10 percent of these homes exceed the lead action level of 15 parts per billion, the Lead and Copper Rule has been exceeded.

- **Two rounds of testing were performed in the North Service Area in 2021 (60 & 63 homes tested each round) and *none of the homes exceeded the action level for lead and copper.***
- **The most recent round of testing conducted by Clackamas River Water in the South Service Area was in 2019. *Zero out of 35 homes exceeded the action level for lead and copper.***

CRW Testing for Cryptosporidium & Giardia

Cryptosporidium & Giardia are microscopic organisms that may cause gastrointestinal disease in some people. CRW's filtration process is designed as required to remove them from the raw water. Because of the potential health effects, CRW chooses to test both raw and treated water for Cryptosporidium & Giardia.

CRW tests administered in 2021 did not detect these organisms in finished drinking water.



The Clackamas River, miles upstream from our intakes.

Definitions

Action Level (AL): The concentration of a contaminant that, if exceeded, triggers treatment or other requirements that a water system must follow.

Haloacetic Acids: By-products of the treatment process that are formed when the disinfectant chlorine combines with organic matter in the source water. Since chlorine is important for disinfection, HAAs will be present, but they are monitored very closely by water utilities.

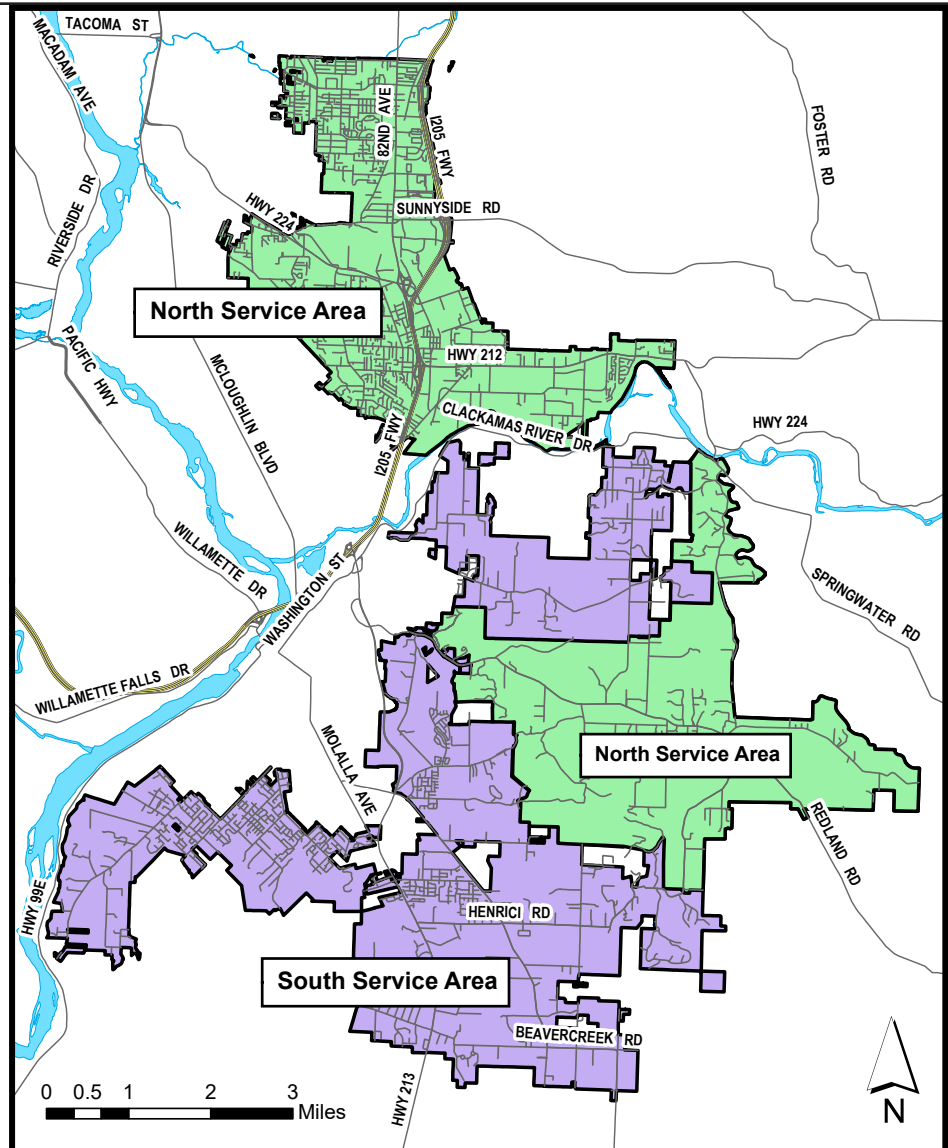
Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible, using the best available treatment technology.

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. The addition of a disinfectant is necessary to control 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): A measure of particles in water.



Clackamas River Water (CRW) Service Areas

Parts Per Million (ppm) or Milligrams per Liter (mg/L): A measure of the concentration of a substance in a given volume of water. One part per million corresponds to one penny in \$10,000.

Parts Per Billion (ppb) or Micrograms Per Liter (ug/L): An even finer measure of concentration. One part per billion corresponds to one penny in \$10,000,000.

Total Trihalomethanes: By-products of the treatment process that form when the disinfectant chlorine combines with organic matter in the source water. Since chlorine is important for disinfection, TTHMs will be present, but they are monitored very closely by water utilities.

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

90th Percentile: The result which 90% of the results were below when put in order from lowest to highest.

Water Quality Results for 2021



Clackamas River Water

Regulated Limits		North Service Area ^a			South Service Area ^a			Typical Source
MCL [MRDL] (AL) {TT}	MCLG [MRDLG]	Minimum	Max Detected	Meets Standard?	Min	Max Detected	Meets Standard?	

Treated Drinking Water at Treatment Plant

Turbidity

% of monthly samples below 0.3 NTU	{>95%}	N/A	100%	100%	Yes ✓	100%	100%	Yes ✓	1
Single measurement (NTU)	1.0	N/A	0.02	0.22	Yes ✓	0.03	0.07	Yes ✓	1

Treated Drinking Water at the Entry Point to the Distribution System

Barium (ppm)	2	2	NA	0.004	Yes ✓	0.003	0.005	Yes ✓	2, 6
Nitrate (ppm)	10	10	NA	0.3	Yes ✓	0.1	0.3	Yes ✓	2, 7, 8

Treated Drinking Water from Points throughout the Distribution System

Disinfection Residual

Total Coliform (% positive per month)	TT	0	0%	0%	Yes ✓	0%	0%	Yes ✓	3
Chlorine Individual measurements (ppm)	N/A	N/A	0.04	1.16	Yes ✓	0.05	1.11	Yes ✓	4
Chlorine Monthly Average (ppm)	N/A	N/A	0.54	0.73	Yes ✓	0.35	0.68	Yes ✓	4
Chlorine Annual Rolling Average (ppm)	[4]	[4]	0.64	0.66	Yes ✓	0.55	0.58	Yes ✓	4

Disinfection Byproducts

Total Trihalomethanes

Running Annual Average at any one site (ppb)	80	N/A	24.2	41.6	Yes ✓	43.7	55.5	Yes ✓	5
Single result at any one site (ppb)	N/A	N/A	22	60.2	Yes ✓	37.5	61.3	Yes ✓	5

Haloacetic Acids

Running Annual Average at any one site (ppb)	60	N/A	18.6	29.9	Yes ✓	27.8	37.5	Yes ✓	5
Single result at any one site (ppb)	N/A	N/A	8.6	33.4	Yes ✓	22.3	37.9	Yes ✓	5

Regulated at the Consumer Tap

Copper 90th percentile ^b (ppm)	(1.3)	1.3	0.08	0.09	Yes ✓	N/A	0.03 ^c	Yes ✓	9
Copper Result at any one site (ppm)	N/A	1.3	ND	0.15	Yes ✓	ND ^c	0.09 ^c	Yes ✓	9
Lead 90th percentile ^b (ppb)	(15)	0	3	5	Yes ✓	N/A	4 ^c	Yes ✓	9
Lead Result at any one site (ppb)	N/A	0	ND	10	Yes ✓	ND ^c	6 ^c	Yes ✓	9

Unregulated Contaminants

Sodium	N/A	N/A	N/A	5.6	Yes ✓	11.3	13.4	Yes ✓	2, 10
--------	-----	-----	-----	-----	-------	------	------	-------	-------

Table Key (See also Definitions on Pg. 10, Notes on Contaminants on Pg. 12)

N/A = Not applicable

ND = Not detected

> = greater than

a: See service area map on pg. 11

b: See definition of 90th percentile

c: This data is from the last testing in 2019

Typical Sources

1: Soil runoff

2: Erosion of natural deposits

3: Found naturally throughout the environment

4: Added for disinfection to control microbes

5: By-product of drinking water disinfection

6: Discharge of drilling wastes or metal refineries

7: Runoff from fertilizer use

8: Leaching from septic tanks/ sewage

9: Corrosion of household plumbing

10: Soda Ash used in water treatment

Notes on Contaminants

Barium This metal is an element found in the earth's crust. It can dissolve into water that is in contact with natural deposits. At the levels found in CRW's drinking water, it is unlikely to contribute to adverse health effects.

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 if consumed at high levels over time. Trihalomethanes and haloacetic acids are regulated disinfection byproducts that have been detected in CRW's water. Removing organic matter in the filtration process and regularly flushing the distribution system helps to minimize the formation of disinfection byproducts.

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

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.

Chlorine Residual Chlorine residual is a measure of free chlorine and combined chlorine CRW's distribution system. Chlorine residual is a low level of chlorine that remains in the 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. They are used as an indicator that other potentially-harmful bacteria may be present. CRW uses chlorine to control these bacteria.

Turbidity is a measure of the water's clarity. Increased turbidity is typically caused by large storms that suspend organic material in the Clackamas River source water. This can interfere with disinfection and provide an environment for microbial growth. CRW's filtration process is effective at controlling turbidity.

Commonly Asked Questions

Do you add fluoride to the water?

CRW does not add fluoride to the water. Occasionally trace amounts of naturally occurring fluoride have been detected.

Is our water hard or soft?

Since our water comes from a river instead of a well, our water is soft. There is some seasonal variation. During the summer months when rain and snowmelt are scarce, there is a greater groundwater influence on the river flow. This means in the summer our water is still soft, but is slightly less so.

What is the pH of the water?

The water entering the system has a pH of about 7.6. It can increase as it travels through the system, and is typically measured there between 7.6 and 9.0.

Resources & Contacts

Questions concerning this report or requests for more information should be directed to Tracy Triplett at ttriplett@crwater.com

You may request a paper copy online at crwater.com or by calling **503-722-9220**

The Environmental Protection Agency Safe Water Drinking Hotline is **800-426-4791** or epa.gov/safewater

Information regarding watershed protection can be found at the Clackamas River Water Providers website clackamasproviders.org

For information regarding emergency preparedness and water conservation, visit the Regional Water Providers Consortium website regionalh20.org