2018 Annual *Water Quality Report*

Drinking Water Quality Data Compiled Before December, 2017

CITY OF Salem
AT YOUR SERVICE
Public Works Department

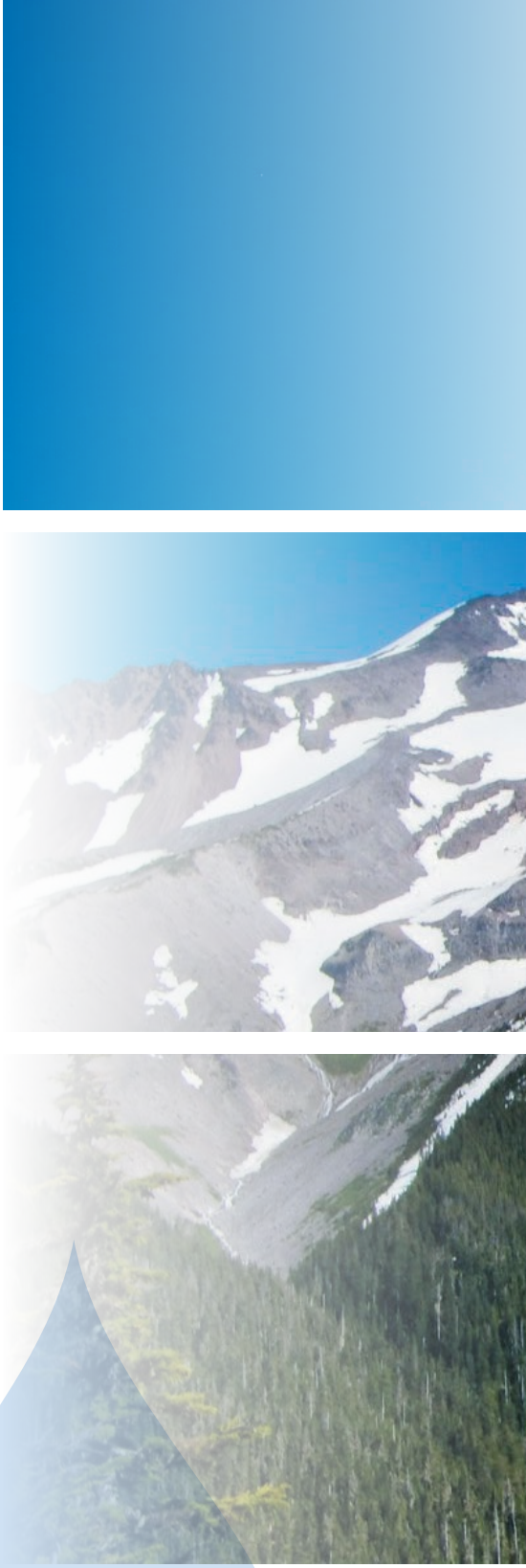
To our valued customers,

I am pleased to present the 2018 Annual Water Quality Report to you. The report contains important information about your drinking water, including where it comes from, how it is treated, and what, if any, contaminants it may contain. While many components of the report are mandated by the Environmental Protection Agency (EPA), the City of Salem prides itself in providing a more comprehensive report that is accessible to all our customers.

In 2017, City of Salem drinking water met or surpassed every public health requirement—more than 120 drinking water standards—set by the Oregon Health Authority and the EPA.

Water is the most valuable natural resource in the world today, and the City of Salem is fortunate to have an extremely high-quality, reliable, and abundant source. It's easy to take this precious resource for granted until you learn about the troubles other areas of the United States and the world are experiencing with their water supply. We often forget about the treatment process, hundreds of miles of water mains, pump stations, reservoirs, and dedicated staff it takes to deliver water to the average residential customer for less than a penny a gallon.

As always, the City of Salem strives to deliver high-quality water to your tap, as well as provide prompt service to our valued customers. For more information about Salem's drinking water, please visit **www.cityofsalem.net**.



Respectfully,

Dwayne Barnes
Utility Operations Manager
City of Salem Public Works Department

503-588-6211

Precipitation that falls in the
mountains
supplies most of our fresh water

H_2O

Water is the
most valuable
natural resource
in the world today

City of Salem Continues with Electronic Delivery of Annual Water Quality Report

With previous year's successes, the City of Salem continues to provide the Annual Water Quality Report via electronic delivery as a favorable streamline conversion. Electronic delivery provides faster access and reduction in costs affiliated with printing and mailing. For this reason, the report has been made available on the City's website. However, if you prefer, hard copies are available at the Salem Civic Center, or you can request one by calling (503) 588-6333.

An average American uses
176 gallons
of water every day

Important Information Regarding Drinking Water

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 acquired by calling the U.S. Environmental Protection Agency (EPA) Safe Drinking Water Hotline at **1-800-426-4791**. You can also submit questions on the EPA Safe Drinking Water Act Hotline webpage.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (**800-426-4791**).

EPA and Centers for Disease Control 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 **1-800-426-4791**.

¿Español?

Este documento contiene información sobre el agua potable y el origen. Si usted desea recibir una copia de este documento en español, por favor llame al **503-588-6323** y pida una copia del reporte de calidad de agua o visite nuestra página electrónica **www.cityofsalem.net/water**.

This document contains information about your potable water and its source. If you would like to receive a copy of this document in Spanish, please call **503-588-6323** and ask for a water quality report or visit our website at **www.cityofsalem.net/water**.

Please Share!

If you are a manager or owner of a business or multifamily dwelling, please share this report with your employees or residents. If you would like additional copies, please call the Water Quality Hotline at **503-588-6323**.

What the EPA Wants You to Know about Contaminants in Source Water

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and groundwater 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 contaminants resulting from the presence of animals or human activity. Contaminants that may be present in any source water include:

Sediments and turbidity, including loose dirt, topsoil, minerals, sand, and silt from roads and highways, excessive removal of vegetation from grazing animals, forest practices, and farming practices.

Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

Pesticides and herbicides, which may come from a variety of sources such as agriculture, road maintenance, individual homes and businesses, and urban stormwater runoff.

Organic chemical contaminants, including synthetic and volatile chemicals, which are by-products of industrial processes, petroleum processes, wood processes and mills, gas and fueling stations, and auto and mechanical shops.

Inorganic contaminants, such as salts and metals, which can occur naturally in the geology, or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or agriculture.

Radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.

In order to ensure that the drinking water from your tap is safe, the EPA has regulations that limit the amount of certain contaminants in water provided by public water systems. This requires monitoring for these contaminants.

Understanding Salem's Source Water Assessment

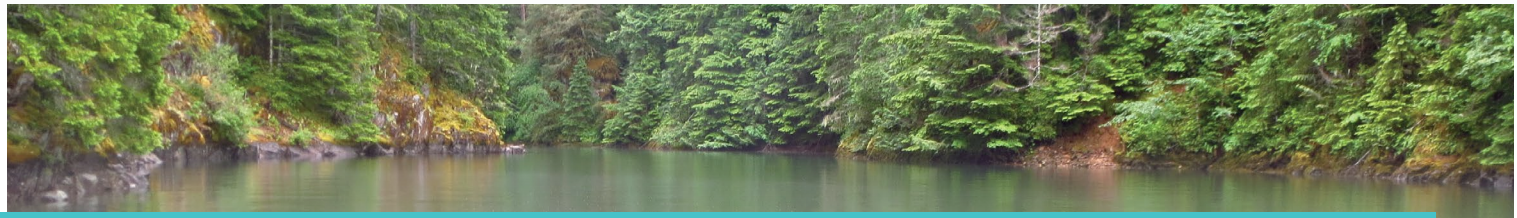
THE CITY OF SALEM'S SOURCE WATER ASSESSMENT was completed in 2003 with assistance from the Oregon Department of Environmental Quality. It provides an inventory of potential contaminant sources that could pose a risk to the water quality of the North Santiam River, which is Salem's primary drinking water source. As required by the Federal Safe Drinking Water Act, the assessment also identifies sensitive areas where the water supply may be more vulnerable to impact by these potential contaminant sources. These sensitive areas include those close to bodies of water, and areas where runoff and erosion potentials are highest.

Contaminants in Drinking Water

The City continues to monitor activities that may impact its drinking water source, within the North Santiam River Watershed.

The City works together with federal and state agencies, as well as groups, nonprofits, and individuals to reduce these impacts to the drinking water source. City employees collect water samples and monitor the water quality at various sites within Salem city limits, and in the watershed, to assure safe and high quality water be provided to its customers.

Salem's Source Water Assessment is available on the City's website at **www.cityofsalem.net/water**. The report is also available by calling the Water Quality Hotline at **503-588-6323**, or by emailing a request to **water@cityofsalem.net**.



Salem's Sources for Drinking Water

FOR MORE THAN 80 YEARS, the City of Salem has been getting its drinking water supply from the North Santiam River. This high quality river source flows over 90 miles from the high ridges near Mt. Jefferson, through Detroit Reservoir, and down to the Mid-Willamette Valley where it meets with the Willamette River just upriver of Salem. The North Santiam Watershed is an area of about 760 square miles! It provides clean and pristine river water for many canyon communities along its route. Due to the rivers high quality water, it is suitable for a more natural filtering process called Slow Sand Filtration, at the Geren Island Water Treatment Facility located near Stayton. The City of Salem has been using this process since the 1930s, while making improvements to the facility and processes over time. Following the slow sand filtration process, the water is further disinfected by adding a regulated amount of sodium hypochlorite (liquid chlorine), fluorosilicic acid (liquid fluoride) for fluoridation, and sodium carbonate (soda ash) which adjusts the pH and minimizes the corrosion of lead and copper from household plumbing. From the treatment facility, the water is transported to Salem, distributed throughout the City and stored within the 17 reservoir systems located around the City.

Additionally, the City utilizes an Aquifer Storage and Recovery (ASR) system, located underground in south Salem, to store and recover finished water. During the winter months, when flows in the river are high and there is a low demand for water by customers, treated drinking water is injected into the ASR system. The water is stored in a naturally existing groundwater aquifer located 350 feet below Woodmansee Park. During the summer months, when the river is flowing low and customer water demand is high, water is pumped back to the surface and recovered from the ASR system. The recovered water is treated with calcium hypochlorite (chlorine) for disinfection and then conveyed to the distribution system, serving the south Salem water customers.

Where Does Salem's Water Come From?

The supply of Salem's water begins with a raindrop or snowflake that falls on the west side of the Cascade Range, near Mt. Jefferson and Three Fingered Jack. As that drop melts and moves downhill, it flows over land and through soil into the North Santiam River. It is stored briefly in Detroit Reservoir until it is released through the dams and flows towards other canyon communities and City of Salem. For more information about the North Santiam Watershed, visit the City's website to take a virtual watershed tour.

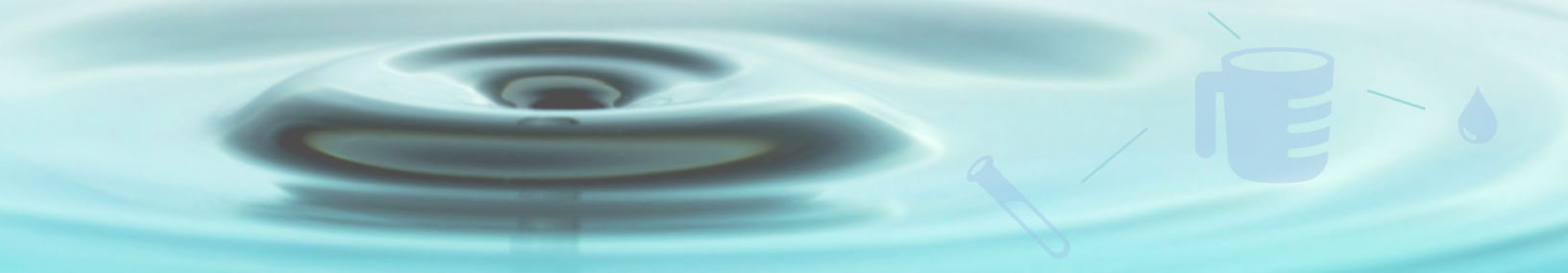
Salem's Water System *serves a population of 192,800 daily from the North Santiam River*

What Is in Salem's Drinking Water?

2017 Water Quality Data

from Geren Island Treatment Facility, Distribution System, and Salem Water Customers

TEST	DATE TESTED	UNIT	MCLG (MRDLG)	MCL (MRDL)	DETECTED LEVEL	LOWEST RANGE	HIGHEST RANGE	VIOLATION	MAJOR SOURCES
Inorganic									
Fluoride[1]	2017	ppm	4	4	Average: 0.63	0.50	0.79	NO	Erosion of natural deposits; water additive—promotes strong teeth
Copper	2017	ppm	1.3	AL = 1.3	0.036	One sample collected		NO	Corrosion of household plumbing systems
Nitrate[2]	2016	ppm	10	10	0.10	One sample collected		NO	Runoff from fertilizer use; leaching from septic tanks; erosion of natural deposits
Nitrate-Nitrite[2]	2016	ppm	10	10	0.10	One sample collected		NO	Runoff from fertilizer use; leaching from septic tanks; erosion of natural deposits
Barium[2]	2016	ppm	2	2	0.002	One sample collected		NO	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Copper[2]	2016	ppm	1.3	AL = 1.3	90th Percentile: 0.342 Homes exceeding: 0	< 0.03	0.56	NO	Corrosion of household plumbing systems
Lead[2]	2016	ppb	0	AL = 15	90th Percentile: 5.9 Homes exceeding: 2	< 1.0	23	NO	Corrosion of household plumbing systems
Microbiological									
Turbidity	2017	NTU	N/A	TT	100% of samples meet turbidity standards Average: 0.13	0.05	0.38	NO	Erosion and soil runoff
Total coliform	2017	No units	N/A	TT	1,458 samples collected	None	3 positive of 120 samples or 2.5%	NO	Naturally present in the environment
E. coli bacteria	2017	No units	0	Routine and repeat samples are total coliform-positive and either *E. coli*-positive or the water supplier fails to collect repeat samples following *E. coli*-positive routine sample or system fails to analyze total coliform-positive repeat sample for *E. coli*	*E. coli* bacteria were not detected	None	None	NO	Human and animal fecal waste
Disinfection By-Products, By-Product Precursors, and Disinfectant Residual									
Haloacetic acids	2017	ppb	0	60	Locational Running Annual Average: 33	17	41	NO	By-product of drinking water disinfection
Total Trihalomethanes	2017	ppb	0	80	Locational Running Annual Average: 38	23	47	NO	By-product of drinking water disinfection
Haloacetic acids	2017	ppb	0	60	Entry Point: 12	One sample collected		NO	By-product of drinking water disinfection
Total Trihalomethanes	2017	ppb	0	80	Entry Point: 7.6	One sample collected		NO	By-product of drinking water disinfection
Total Organic Carbon	2017	ppm	N/A	TT	Raw Water Annual Average: 1.23	1.0	1.6	NO	Naturally present in the environment
Chlorine Residual	2017	ppm	4.0	4.0	Entry Point Average: 1.23	0.97	1.67	NO	Remaining chlorine from disinfection process
Organic Constituents									
2, 4-D	2017	ppb	70	70	0.11	ND	0.11	NO	Runoff from herbicide used on row crops
Unregulated Constituents									
Sodium	2017	ppm		20[2]	5.9			NO	Erosion of natural deposits



2017 Water Quality Data
from Aquifer Storage and Recovery Wells

TEST	DATE TESTED	UNIT	MCLG (MRDLG)	MCL (MRDL)	DETECTED LEVEL	LOWEST RANGE	HIGHEST RANGE	VIOLATION	MAJOR SOURCES
Inorganic									
Barium	2017	ppm	2	2	0.0022	One sample collected		NO	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Fluoride	2017	ppm	4	4	0.50	One sample collected		NO	Erosion of natural deposits; water additive—promotes strong teeth
Radioactive Constituents									
Combined Radium[2]	2014	pCi/L	0	5	1.01	One sample collected		NO	Erosion of natural deposits
Disinfection By-Products, By-Product Precursors, and Disinfectant Residual									
Haloacetic acids	2017	ppb	0	60	Average: ND	ND	ND	NO	By-product of drinking water disinfection
Total Trihalomethanes	2017	ppb	0	80	Average: 17.3	3.5	47	NO	By-product of drinking water disinfection
Total Organic Carbon	2017	ppm	N/A	TT	0.89	One sample collected		NO	Naturally present in the environment
Organic Constituents									
Hexachlorocyclopentadiene	2017	ppb	0	50	0.061	One sample collected		NO	Discharge from chemical factories
Unregulated Constituents									
Sodium	2017	ppm		20[3]	6.8	One sample collected		NO	Erosion of natural deposits

[1] The City of Salem was conducting maintenance on the flouridation equipment from August 15, 2016–December 9, 2016.
[2] The City of Salem is required to report any detected contaminant within the last five years.
[3] EPA advisory level only.

Units of Measurement

Parts per Million (ppm)
One part per million is equal to one cup of food coloring in an Olympic size swimming pool (130,000 gallons)

Parts per Billion (ppb)
One part per billion is equal to one drop of food coloring in an Olympic size swimming pool (130,000 gallons)

Nephelometric Turbidity Unit (NTU)
The standard unit of measurement used in water analysis to measure turbidity in water samples.

Picocuries per Liter (pCi/L)
One part per billion of a curie per liter of water, used to measure radiation at very low levels.

Definitions

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

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

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

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 contamination.

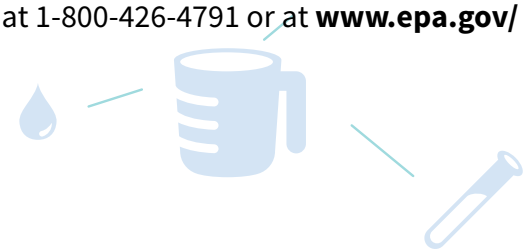
City Scheduled to Conduct Lead and Copper Sampling in 2019

THE CITY OF SALEM WILL CONDUCT LEAD AND COPPER SAMPLING again during the summer of 2019. The City is currently on reduced monitoring, which required sampling every three years. In 2016, the City of Salem conducted lead and copper sampling as mandated by the Lead and Copper Rule (LCR). From June 1, 2016 through September 30, 2016, 89 water samples were collected from Tier 1 homes and analyzed for lead and copper. Of the 89 samples, only two samples exceeded the Action Level (AL) for lead and none of the samples exceeded the AL for copper.

The Oregon Health Authority requires that the City collect and analyze a minimum of 50 water samples from Tier 1 homes. Assessments made in the 1990s identified 147 Tier 1 homes in Salem that met the qualifications for ongoing lead and copper sampling. Tier 1 homes, built between 1983 and 1985, are considered most at risk because of lead or lead-based plumbing components used during construction.

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is mostly from materials and components in service lines and home plumbing. The City of Salem is responsible for providing high-quality drinking water, but cannot control the variety of materials used in plumbing components.

When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize your exposure is available from the Safe Drinking Water Hotline at 1-800-426-4791 or at **www.epa.gov/safewater/lead**.



Free Lead Testing for Salem Water Customers

The City of Salem offers free lead testing to its water customers. If you are concerned about the levels of lead in your home and would like to request a free test, please call the Water Quality Hotline at **503-588-6323**.

Other Results

Turbidity is a measure of water's clarity. High turbidity (muddy water) results from suspended soil and organic matter in water. This can increase the risk of contamination by interfering with the drinking water treatment process. All of the City's turbidity samples were below required levels.

Radon is a naturally-occurring radioactive gas found throughout the United States, more often in groundwater than surface water. Radon levels taken from Salem's Aquifer Storage and Recovery (ASR) wells are consistent with levels typically found in Salem area groundwater.

Cryptosporidium is a harmful microbial pathogen found in surface water throughout the United States. Cryptosporidium may cause cryptosporidiosis, an abdominal infection. Cryptosporidium must be ingested to cause disease and may be spread through means other than drinking water. Monitoring in 2017 did not detect Cryptosporidium in untreated water from North Santiam River, which is Salem's primary source of drinking water.

Ways to Get Involved!

Salem City Council

Salem City Council is the policy-making body for Salem's water system. The meetings are held to allow Council to conduct business, make decisions in a public forum, and formulate policy. These meetings also provide an opportunity for you to give input on issues and policies under consideration by the City. The Council meets on the 2nd and 4th Mondays of each month at 6 p.m. (in December, the first and second Monday at 6 p.m.). The meetings are open to the public and are held in the City Council Chambers in Room 240 of the Vern Miller Civic Center at 555 Liberty Street SE, Salem, Oregon. Feel free to call at 503-588-6091, or visit **www.cityofsalem.net** for more information.

North Santiam Watershed Council

The North Santiam Watershed Council (NWSC) is a 501(c)(3) nonprofit made up of local volunteers who act together to provide opportunities for stakeholders to cooperate in promoting, improving and sustaining the health and economy of the North Santiam River Watershed, and its communities. The Council hosts events such as restoration project tours, tree plantings, and river clean-ups during the year. Each year, the NWSC receives a grant from the City to help with operational costs, and collaborates with the City and Marion County in hosting an annual North Santiam Basin Summit. Watershed Council meetings are open to the public and are held every second Thursday of each month (except December) at 6 p.m. at the Stayton Community Center at 400 West Virginia Street, Stayton, Oregon. Call 503-930-8202 or visit **www.northsantiam.org** for more information or to inquire about donations.

Water Conservation

fact: **A leaky faucet that drips at the rate of one drip per second can waste more than 2,000 gallons per year. That's the amount of water needed to take more than 120 showers!**

Ways to Conserve Water: Tips and Resources

During the summer, a high demand of water comes at a period when water resources are already stressed due to hotter temperatures, and drier conditions. Below are some ways one can help conserve water.

City Offers Free Conservation Kits to Salem Water Customers

Retrofitting existing fixtures can help reduce the amount of water you use every day and will help save money on your utility bill, and well as leave more water in the river for wildlife and fish. The City offers free indoor and outdoor water conservation kits to its water customers. To request a free water conservation kit, please call the Water Quality Hotline at 503-588-6323, or email us at **water@cityofsalem.net**.

Conservation at Home

On average, one person uses over 100 gallons of water per day. Each water customer in the City of Salem can help conserve water by changing daily practices at home, or work. Simple changes include:

- Turn off the tap while brushing your teeth, washing your hands or cleaning the dishes.
- Fix leaky toilets, pipes and faucets. One drip per a second can add up to a lot in a day.
- Look for WaterSense logos at your local home improvement stores.
- Landscape with plants, shrubs and trees that are suitable for this climate. Drought-tolerant plants tend to be easier to maintain and require less water during warm weather.
- Remember *one inch per week* when watering your lawn and gardens!

There are many local resources, like Marion Soil & Conservation District (SWCD), OSU Master Gardeners and the Natural Resources Conservation Services (NRCS), that host events such as Native Plant Sale, and workshops. Both the NRCS, and SWCD have grants and technical assistance for conservation projects.

One Inch per Week Program

Did you know that as much as 50 percent of water used outdoors is wasted from inefficient watering methods and irrigation systems?

By giving your lawn only what it needs, in most cases only **one inch per week**, you will improve the durability of grass, reduce the need for chemical amendments like fertilizers, and decrease

lawn-mowing frequency. This will also improve local stream habitats for fish and wildlife, and improve water quality. Here are tips to improve your landscape:

- Raise your lawn mower blade height to three inches. Longer grass blades retain more moisture, and help keep weeds to a minimum.
- Water deeply and infrequently to provide deep and strong root systems. Generally, no more than **one inch per week**.

For a free rain gauge, call the Water Quality Hotline at 503-588-6323, or email water@cityofsalem.net.

- Water early in the morning or late in the evening, when temperatures are cool and the sun is low.
- Use mulch around vegetated areas to help retain moisture.
- Learn about how much fertilizer your lawn or garden needs. Adding too much fertilizer may encourage weed and algae growth, or wash into nearby streams. Using the right amount will help you save on costs, as well. Learn more by inquiring with your local agriculture and gardening agencies.

Detroit Dam and Lake Downstream Passage Project

THE ARMY CORPS OF ENGINEERS (CORPS) is conducting an environmental review to aid in developing a project to provide downstream juvenile fish passage for the Chinook salmon and steelhead, and for temperature control at Detroit Dam. The City of Salem is closely monitoring the Corps review and actions for this proposed large-scale project.

The City prepared detailed comments addressing all concerns as part of the Environmental Impact Statement (EIS) Public Scoping process at the end of 2017. The Corps projects developing a range of alternatives that meet the plan's purpose using public comments, and technical information during 2018. Any impact to water quality and water quantity could have drastic effects on Salem's ability to produce reliable, high-quality drinking water to Salem's customers. The City will continue to work hard with other stakeholders, and will closely monitor the project as it progresses.

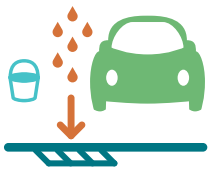
Salem Families Benefit from Low-Income Assistance Program

THE LOW-INCOME UTILITY ASSISTANCE PROGRAM is dedicated to helping individuals and families facing short-term financial difficulties to pay their City of Salem utility bills. Eligible households may apply for assistance by contacting local service agencies to apply for aid. The program is possible due to generous voluntary, tax-deductible donations used exclusively for low-income utility assistance.

In 2017, $15,111 was distributed to 156 families and individuals who would have otherwise faced possible water service disruption. If you would like to learn more about donating to the low-income utility assistance program, or if you are in need of assistance to pay your City of Salem utility bill, please visit **www.cityofsalem.net** or contact Customer Services Utility Billing at 503-588-6099 for more information.

$15,111 assisted
156
local families and individuals

Salem has...



Over 15,000 storm drains discharging runoff to...

90 miles of streams and the Willamette River...

3 water utilities: drinking water, stormwater, and wastewater....

that combine to form 1 water.

Water is a precious resource.

Please visit **bit.ly/pledgetoprotectstreams** and take the action pledge to protect it.

Want to Learn More?

US EPA

Safe Drinking Water Hotline

1-800-426-4791

www.epa.gov

Oregon Health Authority

Drinking Water Program

971-673-0405

http://public.health.oregon.gov/HealthyEnvironments/DrinkingWater

(Salem's ID# 00731)

City of Salem Public Works Department

City of Salem Website

www.cityofsalem.net

Water Quality Hotline

503-588-6323

water@cityofsalem.net

Water Conservation Hotline

503-588-6323

water@cityofsalem.net

Water Outreach and Education Program

To arrange a classroom presentation, field trip, or community service project, call 503-588-6211

THE FEDERAL SAFE DRINKING WATER ACT requires this annual water quality report be made available to every customer to provide information regarding the quality of the community's drinking water. If you would like to receive a printed copy of this report, please call **503-588-6333**. If you have any questions or comments, please email **water@cityofsalem.net** or call the Water Quality Hotline at **503-588-6323**.

CITY OF Salem AT YOUR SERVICE

Public Works Department

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SALEM OR 97302-1200

PWS – OR4100731