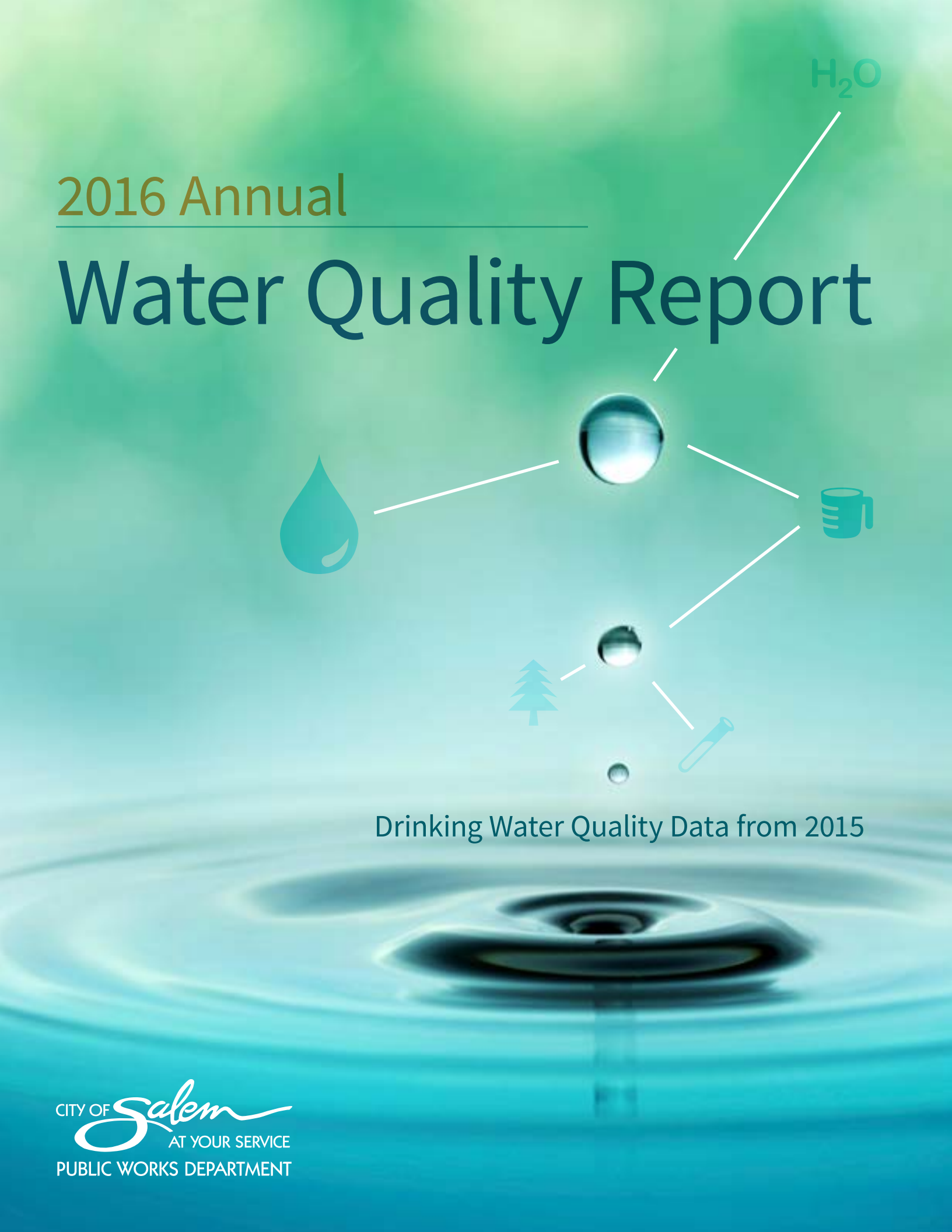


2016 Annual Water Quality Report

Drinking Water Quality Data from 2015

CITY OF Salem
AT YOUR SERVICE
PUBLIC WORKS DEPARTMENT

To our valued customers,

I am pleased to present the 2016 Annual Water Quality Report to you. This 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 this 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.

I am pleased to report that in 2015, 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 is 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 to provide prompt service to our valued customers. For more information about Salem's drinking water, please visit **www.cityofsalem.net/water**.

Respectfully,

Dwayne Barnes
Water Services 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 Moves to Electronic Delivery of Annual Water Quality Report

The City of Salem is constantly exploring new ways to provide its customers with the best customer service while keeping costs low. After a thorough review of our process, the City has decided to switch to an electronic delivery for this year's Annual Water Quality Report. This change will streamline the delivery of the report and will reduce costs for printing and mailing. The report is available on the City's website at **www.cityofsalem.net/water**. If you would like a hard copy, you may pick one up at the Salem Civic Center or 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 obtained by calling the U.S. Environmental Protection Agency (EPA) Safe Drinking Water Hotline at **1-800-426-4791**.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers.

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 informacion importante sobre su agua potable. 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 pagina electronica **www.cityofsalem.net/water**.

This document contains information about your potable water. 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 Waters

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 human activity. Contaminants that may be present in source water include:

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

Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.

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

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

In order to ensure tap water is safe to drink, the EPA establishes regulations that limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations set limits for contaminants in bottled water that must provide the same protection of public health.

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 water quality of the North Santiam River. The assessment, as required by the Federal Safe Drinking Water Act, also identifies sensitive areas where potential contaminant sources may have a greater potential to impact the water supply.

Results of the assessment reveal that potential contaminant sources include sediments/turbidity, microbiological agents, and nutrients. Potential sources of these contaminants include highways,

leaking septic systems, grazing animals, forest practices, above-ground and below-ground storage tanks, wood processing and milling, junk yards, and auto and mechanical shops. The City continues to monitor activities within the North Santiam River Watershed that may impact its drinking water source.

Salem's Source Water Assessment is available on the City of Salem 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**.

Snow and rain on Mt. Jefferson feed the North Santiam River Watershed

A boat for collecting algae samples navigates Heater Creek near Detroit Lake

Salem's Sources for Drinking Water

FOR MORE THAN 75 YEARS, the City of Salem has been getting its drinking water supply from the North Santiam River, which flows from the foothills of the Cascade Range and provides high-quality river water suitable for slow sand filtration at the Geren Island Water Treatment Facility. Following slow sand filtration, the water is further treated with sodium hypochlorite (liquid chlorine) for disinfection, fluorosilicic acid (liquid fluoride) for fluoridation, and sodium carbonate (soda ash) to minimize the corrosion of lead and copper from household plumbing.

Additionally, the City utilizes an Aquifer Storage and Recovery (ASR) system, located in south Salem. In the winter months, during peak river flows and low customer water demand, treated drinking water is injected into the ASR system. The water is stored in a naturally existing aquifer located 350 feet below Woodmansee Park. During the summer months, when low river flows and high customer water demand exist, water is recovered from the ASR system. The recovered water is treated with calcium hypochlorite (chlorine) for disinfection and conveyed to the distribution system serving south Salem water customers.

Where Does Salem's Water Come From?

Salem's Water System *serves a population of 189,000 daily from the North Santiam River Watershed*

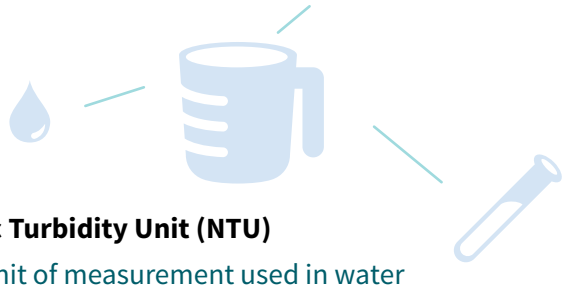
What Is in Salem's Drinking Water?

2015 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	2015	ppm	4	4	Average: 0.66	< 0.50	0.77	NO	Erosion of natural deposits; water additive—promotes strong teeth
Nitrate*	2014	ppm	10	10	0.08	One sample collected		NO	Runoff from fertilizer use; leaching from septic tanks; erosion of natural deposits
Nitrate-Nitrite*	2014	ppm	10	10	0.08	One sample collected		NO	Runoff from fertilizer use; leaching from septic tanks; erosion of natural deposits
Barium*	2014	ppm	2	2	0.0017	One sample collected		NO	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Copper*	2013	ppm	1.3	AL = 1.3	90th Percentile: 0.372 Homes exceeding: 0	< 0.03	0.676	NO	Corrosion of household plumbing systems
Lead*	2013	ppb	0	AL = 15	90th Percentile: 4.4 Homes exceeding: 1	< 1.0	29	NO	Corrosion of household plumbing systems
Microbiological									
Turbidity	2015	NTU	N/A	TT	100% of samples meet turbidity standards Average: 0.11	0.04	0.38	NO	Erosion and soil runoff
Total coliform	2015	No units	0	Presence of coliform bacteria in > 5% of monthly samples	1,522 samples collected; no coliform bacteria were present in any samples	None	None	NO	Naturally present in the environment
Fecal coliform or *E. coli* bacteria	2015	No units	0	Presence of coliform bacteria in > 5% of monthly samples	Fecal coliform or *E. coli* bacteria were not detected	None	None	NO	Human or animal fecal waste
Disinfection By-Products, By-Product Precursors, and Disinfectant Residual									
Haloacetic acids	2015	ppb	0	60	Locational Running Annual Average: 36	22	46	NO	By-product of drinking water disinfection
Total Trihalomethanes	2015	ppb	0	80	Locational Running Annual Average: 38	25	49	NO	By-product of drinking water disinfection
Total Organic Carbon	2015	ppm	N/A	TT	Raw Water Annual Average: 0.99	0.88	1.10	NO	Naturally present in the environment
Chlorine Residual	2015	ppm	4.0	4.0	Entry Point Average: 1.22	0.36	1.61	NO	Remaining chlorine from disinfection process
Radioactive Constituents									
Combined Radium*	2011	pCi/L	0	5	0.26	One sample collected		NO	Erosion of natural deposits
Unregulated Constituents									
Sodium	2015	ppm	N/A	20†	4.4	One sample collected		NO	Erosion of natural deposits

* The City of Salem is required to report any detected contaminant within the last five years.
† 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.

2015 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	2015	ppm	2	2	0.0024	One sample collected		NO	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Fluoride	2015	ppm	4	4	0.59	One sample collected		NO	Erosion of natural deposits; water additive—promotes strong teeth
Chromium*	2010	ppb	100	100	1.0	One sample collected		NO	From steel and pulp mills; erosion of natural deposits
Lead*	2010	ppb	0	15	0.8	One sample collected		NO	Corrosion of household plumbing systems; erosion of natural deposits
Organic									
Hexachlorocyclo-pentadiene*	2010	ppb	50	50	0.08	ND	0.08	NO	Discharge from chemical factories
Di(2-ethylhexyl)phthalate*	2009	ppb	0	6	0.7	One sample collected		NO	Discharge from rubber and chemical factories
Radioactive Constituents									
Combined Radium*	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	2015	ppb	0	60	22	One sample collected		NO	By-product of drinking water disinfection
Total Trihalomethanes	2015	ppb	0	80	66	One sample collected		NO	By-product of drinking water disinfection
Total Organic Carbon	2015	ppm	N/A	TT	0.79	One sample collected		NO	Naturally present in the environment
Unregulated Constituents									
Sodium	2015	ppm	N/A	20†	5.24	One sample collected		NO	Erosion of natural deposits

* The City of Salem is required to report any detected contaminant within the last five years.
† EPA advisory level only.

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 Remains on Reduced Monitoring for Lead and Copper Sampling

THE CITY OF SALEM IS PAYING CLOSE ATTENTION to what unfolded in Flint, Michigan, and our thoughts are with all those who are struggling without access to safe and reliable water in their homes. In North America, no one should have to question the safety of water at the tap. Lead does not come from the treatment plants and water mains; it comes from plumbing found inside the home, such as lead piping or lead solder at pipe joints.

In our community, we do not have lead service lines remaining in our system. The City of Salem is committed to ensuring that the water that is delivered to your home is safe to drink. To that end, the City will conduct another round of lead and copper sampling this summer. As mandated by the Lead and Copper Rule, Oregon Health Authority requires the City of Salem to collect and analyze 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. Homes built between 1983 and 1985 were identified as Tier 1 homes; these are considered to be most at risk because of lead or lead-based plumbing components used during construction.

In 2013, samples were collected from 91 of the 147 Tier 1 homes identified, and only one home exceeded the action level for lead. Therefore, the City of Salem continues to be on a reduced monitoring plan, which requires collection and analyses of a minimum of 50 samples from Tier 1 homes every three years.

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 U.S., 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 U.S. 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 2015 did not detect Cryptosporidium in untreated North Santiam River source water.

Ways to Get Involved!

Salem City Council

Salem City Council is the policy-making body for the water system and meets on the second and fourth Mondays of each month at 6:30 p.m. The meetings are open to the public and are held in the **City Council Chambers, Room 240, Vern Miller Civic Center, 555 Liberty Street SE, Salem, Oregon**. Call **503-588-6091** or visit **www.cityofsalem.net** for more information.

North Santiam Watershed Council

North Santiam Watershed Council's mission is to promote and sustain the health of the North Santiam Watershed. The meetings are open to the public and are held September through June at **284 E Water Street, Stayton, Oregon,** on the second Thursday of each month at 6 p.m. Call **503-930-8202** for more information.

By the Numbers

42.56
million gallons
peak daily water usage
August 19, 2015

18.55
million gallons
minimum daily water usage
April 25, 2015

9.675
billion gallons
total water produced
by the City of Salem in 2015

Water Conservation

Conservation Starts at Home

Each water customer can help by conserving water at their home or business. Fix leaky toilets and faucets—better yet, consider installing new, water efficient faucets and appliances. Landscape with plants, shrubs, and trees that are suitable for our climate and don't require excess water during the summer months when water demand is at its highest.

To learn more about the ideas listed above or water conservation in general, visit the EPA *Water Sense* website at **www.epa.gov/WaterSense**.

One Inch Per Week

Your lawn only needs approximately one inch of water per week to stay healthy and green. Do you know how much water you apply every week? Request a free *One Inch Per Week* lawn watering gauge to find out. Call the Water Quality Hotline at **503-588-6323** or email **water@cityofsalem.net**.

City Offers Free Conservation Kits to Water Customers

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

Salem Families Benefit from Low-Income Assistance Program

THE LOW-INCOME UTILITY ASSISTANCE PROGRAM, sponsored by the City of Salem, is dedicated to helping individuals and families facing financial difficulties to pay their water, wastewater, and stormwater bills. The program is possible due to generous utility customers making voluntary, tax-deductible donations used exclusively for low-income assistance.

In 2015, a total of **$11,954.55** was distributed to **141** families and individuals who would have otherwise faced possible water service disruption. Currently the donation amounts received are not enough to keep up with the low-income requests for distribution.

If you would like to donate to the Low-Income Utility Assistance Program or if you are in need of low-income assistance for your utility bill, please visit our website at **www.cityofsalem.net** or contact Customer Services Utility Billing at **503-588-6099** for more information.

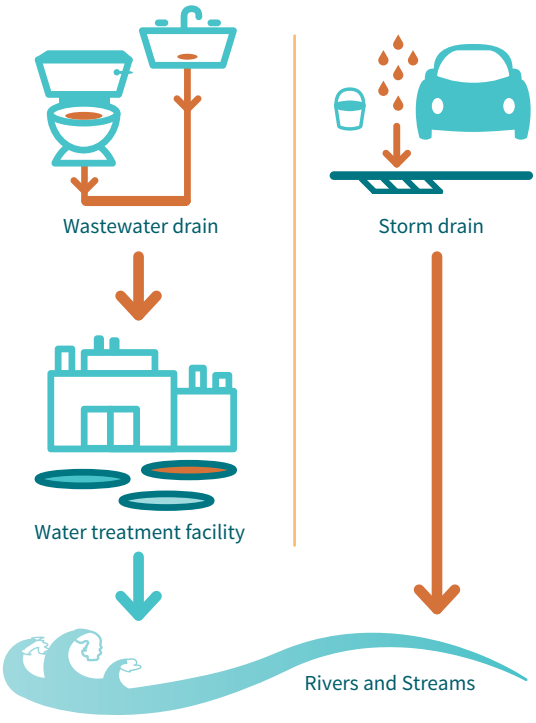
$11,954.55
was given to
141
low-income
families

Help Keep Water Clean

In Salem, we enjoy clean water. You can help to keep our water supply clean by keeping pollution out of storm drains.

When you flush a toilet or drain your bathtub, the wastewater is pumped through the sewer system to a treatment facility. There the water is cleaned before it is returned to the river. But storm drains carry rain water directly to creeks and rivers, without being cleaned.

So to keep icky things like car wash soap, oil, and grime out of streams, wash your car on grass or gravel, where the runoff will soak into the ground instead of going into the storm drain. Or take your car to a commercial car wash company that recycles and cleans the wash water.



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
1410 20TH STREET SE BLDG 2
SALEM OR 97302-1200

PWS – OR4100731