

THE CITY OF SALEM 2005 WATER QUALITY REPORT

Prepared by:
City of Salem
Water Department
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The City of Salem wants its customers to know that Salem drinking water is safe to drink. This water quality report will answer your questions about the source of Salem water, the treatment process that produces Salem water and information about substances detected in Salem water.

The City of Salem is proud to report that drinking water treated by the City of Salem Water Department met all federal and state standards for drinking water during 2005. This report to consumers covers the calendar year from January to December 2005. Annual reports such as this one are provided by the City each year.

To learn even more about your water after reviewing this report, contact the City of Salem Water Department at 540-375-3029 or visit the City's web site at www.ci.salem.va.us.

HOW IS SALEM'S WATER TREATED FOR DRINKING PURPOSES?

While the treatment process varies slightly at different water plants in different localities, the basic steps are similar. As raw water enters the plant, a coagulant, DELPAC [Polyaluminum chloride] is added, causing small particles to adhere to one another, making them heavy enough to settle out of the water in a sedimentation basin. The settled water is filtered through a rapid sand filter to remove remaining fine particles. Chlorine is added to kill harmful bacteria and viruses, and powdered activated carbon is added to reduce tastes and odors sometimes present in the raw water. As recommended by the American Dental Association fluoride is added to aid in the prevention of tooth decay. The treated water proceeds through a series of pressure controls and storage facilities before being delivered to your home.



WHERE DOES SALEM'S WATER COME FROM?

The City of Salem's water source is the Roanoke River and ground water from three wells. In emergency situations we purchase or exchange water with the Western Virginia Water Authority.

The Virginia Department of Health has recently completed a source water assessment for our waterworks system. This assessment provides information on possible sources of contamination to our source water. As determined by the source water assessment, the possibility of contamination to our water source, the Roanoke River, is high. This is due to the fact that our water is surface water that is exposed to an inconsistent array of contaminants at varying concentrations due to changing hydrologic, hydraulic and atmospheric conditions with land use activities of concern in the assessment area. To view a copy of this assessment, please contact the City of Salem Water Department office at 540-375-3029.



Please remember that we need your help in the protection of these valuable water resources.

ABOUT OUR SYSTEM

The City of Salem has a new ten million gallon per day (MGD) plant. This new facility is a Class I facility serving a population of approximately 25,000 customers.

WHO CAN I CONTACT?

If you have any questions about this report please contact Harold Weikle - Water Production Manager, Steve Nichols - Chief Filter Plant Operator, Marcus Potts - Chemist, or Frank Young - Environmental Compliance Inspector at the City of Salem Water Department office at 540-375-3029. We want our valued customers to be informed about their water utility. If you want to learn more, please attend any of the regularly scheduled City Council meetings. They are held on the second and fourth Monday of each month in council chambers.

WHAT AFFECTS WATER QUALITY?

The sources of drinking water (both tap 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.

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

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

Pesticides and herbicides: may come from a variety of sources such as agriculture urban storm water runoff, and residential uses.

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

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

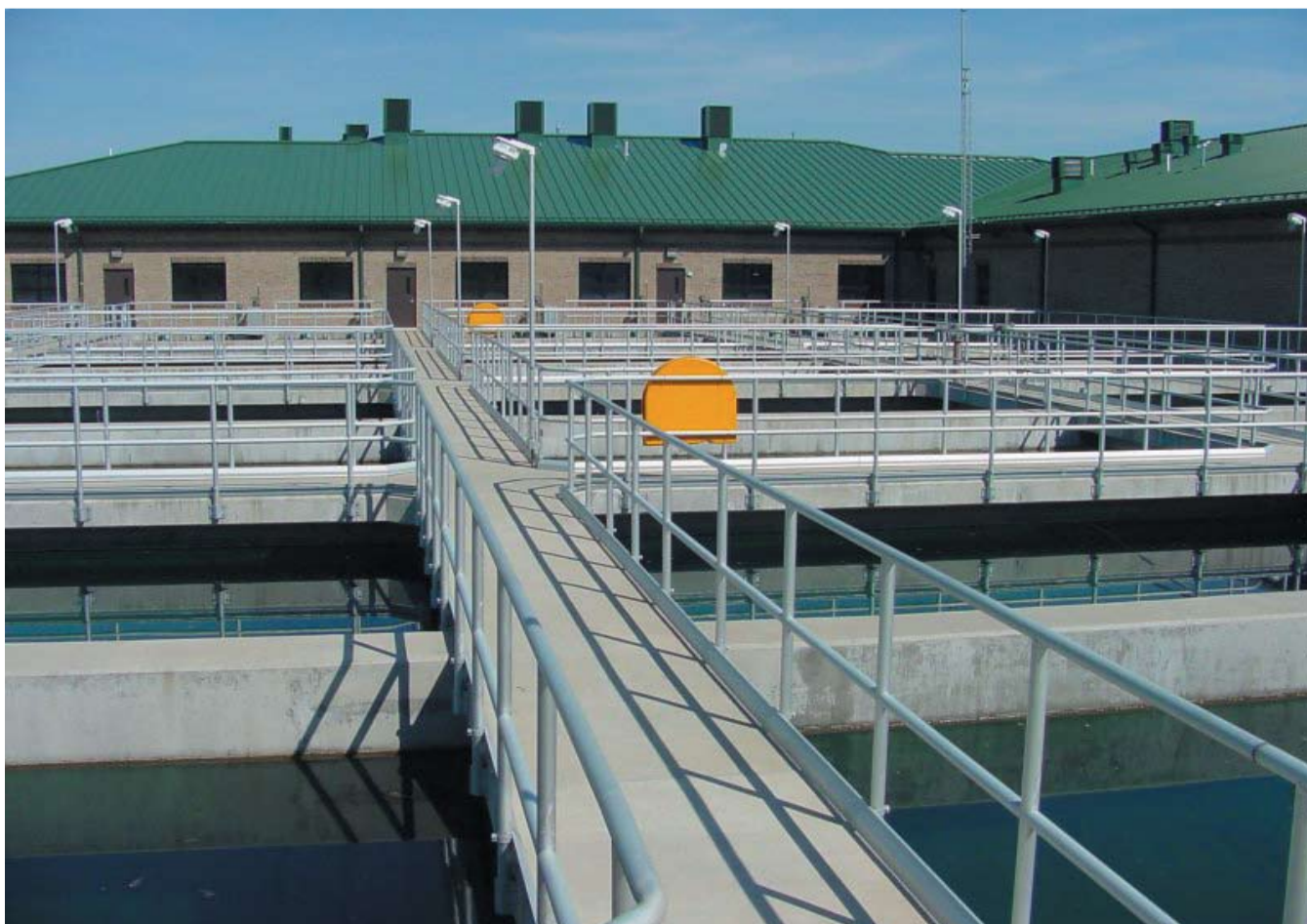


ABOUT OUR PERSONNEL

Your facility is staffed by operators licensed by the Commonwealth of Virginia. Licenses are obtained through a combination of experience, education and training. Training is on-going with operators attending seminars and hands-on trials of new processes. Licenses are classified into six groups by the Commonwealth of Virginia, with a Class I license being the highest level. A Class I license requires two and a half to ten years of experience depending on education. The Salem Water Department has: 13 - Class I operators, 4 - Class II operators, and 1 - Class III operators.

WHAT'S NEW

Construction on the new 10 MGD Water Treatment plant on Tidewater Street has been completed. Three wells have been developed on site to supplement water taken from the Roanoke River which can be blended with river water or treated separately. Pre-settling basins will assist in treatment of river water during periods of heavy rain. There are two one million gallon storage tanks on site and a state of the art disinfection system. A Supervisory Control and Data Acquisition (SCADA) will aid the operators in control of the water plant and the entire distribution system. In the event that a loss of power should occur, an emergency generator capable of supplying the entire facility with temporary power has been installed.



FREQUENTLY ASKED QUESTIONS

What is the pH of the water from The City of Salem Water Department?

The pH of our water after treatment ranges from 6.8 to 8.3 standard units; the average pH is 7.6 units.

Is Salem's water soft or hard?

Salem's water is moderately hard. It ranges from 6 to 14 grains per gallon (106 to 252 parts per million) with an average of 11 grains per gallon (192 parts per million).

Why does the water sometimes look rusty?

Rusting galvanized pipe in plumbing systems is the typical cause of discolored water. Iron causes the discoloration; it is not a health risk. If the cold water is discolored, it will clear after running a bit. If the hot water is rusty, the water heater may need flushing. If you flush it, please follow the manufacturer's directions.

Does Salem add fluoride to the water?

Yes, we do add fluoride to the water. Fluoride is added to aid in the prevention of tooth decay. Fluoride analyses on fluoride levels are done every four hours.

What can I do about chlorine odors?

Chlorine odors may be more noticeable during the summer. Chlorine kills organisms that may cause disease. If you remove the chlorine, be sure to refrigerate the water to limit bacterial regrowth.

- * Fill a pitcher and let it stand in the refrigerator overnight. (This is the best way.)
- * Fill a glass or jar with water and let it stand in sunlight for 30 minutes.
- * Pour water between containers about 10 times.
- * Heat the water to about 100 degrees Fahrenheit

Why do the taste and odor of my water sometimes differ?

Water naturally varies in taste and odor at different times of the year. Taste and odor problems can come from new or old pipelines, plumbing fixtures, or changes in water quality. Customers may notice changes during severe winter storms; when river water levels are low; or during hot weather conditions.

Why would my water have a milky appearance?

Water becomes saturated with air due to temperature changes in the water giving it a milky look. To be sure that this is the problem collect a glass of water and set it out. The air should rise to the top, therefore clearing from the bottom up. Flushing your water lines may help this situation some, but it will disappear over time with the temperature change.

DEFINITIONS

Non-Detects (ND) – laboratory analysis indicates that the constituent is not present.

Parts per million (ppm) or milligrams per liter (mg/l) – one part per million corresponds to one minute in two years or a single penny in \$10,000.

Parts per billion (ppb) or micrograms per liter – one part per billion corresponds to one minute in 2,000 years, or a single penny in \$10,000,000.

Parts per trillion (ppt) or nanograms per liter (nanograms/l) – one part per trillion corresponds to one minute in 2,000,000 years, or a single penny in \$10,000,000,000.

Parts per quadrillion (ppq) or picograms per liter (picograms/l) – one part per quadrillion corresponds to one minute in 2,000,000,000 or one penny in \$10,000,000,000,000.

Picocuries per liter (pCi/L) – picocuries per liter is a measure of the radioactivity in water.

Nephelometric Turbidity Unit (NTU) – nephelometric turbidity unit is a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

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

Maximum Contaminant Level – the "Maximum Allowed" (MCL) is 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 – The "Goal" (MCLG) is 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.

IS IT SAFE TO DRINK?



Yes, we are pleased to report that your drinking water is safe and consistently meets federal and state requirements. The City of Salem Water Department routinely monitors drinking water according to federal and state laws. The following table shows the results of our monitoring for the period of January 1 to December 31, 2005. All drinking water, including bottled water, may reasonably be expected to contain at least a small amount of some constituents. It's important to remember that the presence of contaminants does not necessarily indicate that the water poses a health risk. More information about potential health effects can be obtained by calling the Environmental Protection Agency's (EPA) Safe Drinking Water Hotline at 1-800-426-4791.

2005 ANALYSIS RESULTS								
Substance	Units	Ideal Goals (EPA'S MCLG)	Highest Level Allowed (EPA'S MCL)	Plant I Level Detected		Plant II Level Detected		Source of Substance
				Range	Average of all results	Range	Average of all results	
REGULATED SUBSTANCES								
Fecal Coliforms	MPN / 100 ml	0	A routine and a repeat sample are total coliform positive, and one is also fecal coliform or E. coli positive	0	0	0	0	Human and animal waste
Chlorine	ppm	-	4-MDRL	0.72-2.22	1.6	0.63-1.94	1.38	Required disinfectant added during treatment process to eliminate bacteria
Chloride	ppm	-	250	N/A	14.3	N/A	15	Naturally occurring in the environment
Fluoride	ppm	4	4	0.14-1.25	0.87	0.77-1.15	0.95	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from aluminum and fertilizer factories
Nitrate (as nitrogen)	ppm	10	10	N/A	0.49	N/A	0.46	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Total Dissolved Solids	ppm	-	500	N/A	256	N/A	219	Physical property of water
Sulfate	ppm	-	250	N/A	44.2	N/A	31.9	Naturally occurring in the environment
Total Coliforms	MPN / 100 ml	0	Presence of coliform bacteria in >5% of monthly samples	0	0	0	0	Naturally present in the environment
THM'S	ppm	0	0.08	0.0157-0.0737	0.0352	0.0139-0.0967	0.0329	By-Product of drinking water chlorination
HAA5's	ppm	0	0.06	0.0153-0.0954	0.0444	0.0067-0.1150	0.041	By-Product of drinking water chlorination
pH	pH units	-	6.5 – 8.4	6.7-8.1	7.6	6.4-7.4	6.9	Acidity or basicity of water
UNREGULATED SUBSTANCES								
Conductivity	umhos / cm	Unregulated		N/A	483	N/A	422	Physical property of water
Sodium	ppm	No Limits Designated		N/A	5.6	N/A	5	Naturally occurring in the environment
OTHER PARAMETERS (NOT REGULATED)								
Alkalinity	ppm	unregulated		88-200	143	72-172	123	Measurement of naturally occurring carbonates
Hardness	ppm	unregulated		22-240	189	106-204	169	Measurement of naturally occurring hardness metals
TURBIDITY								
Substance	Units	Ideal Goals (EPA'S MCLG)	Highest Level Allowed (EPA'S MCL)	Plant I Level Detected		Plant II Level Detected		Source of Substance
				Lowest monthly % <0.3 NTU	Highest Level Detect	Lowest monthly % <0.3 NTU	Highest Level Detect	
Turbidity	NTU	N/A	0.3	100%	0.411	100%	0.14	Soil Run-off
LEAD AND COPPER								
Substance	Units	Ideal Goals (EPA'S MCLG)	Highest Level Allowed (EPA'S MCL)	Level Detected		Number of samples exceeding the Action Level	Source of Substance	
				Range	90th Percentile Level			
Lead	ppb	0 ppb	Action Level = 15	<0.005 – 0.008	0.006	0 samples exceeded the AL for the City	Corrosion of household plumbing systems; erosion of natural deposits	
Copper	ppm	1.3 ppm	Action Level = 1.3	<0.100 – 0.599	0.287	0 samples exceeded the AL for the City	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives	

As you can see by the table, our system had no violations. We're proud that your drinking water meets or exceeds all Federal and State requirements. We have learned through our monitoring and testing that some contaminants have been detected. The EPA has determined that your water IS SAFE at these levels.

WHAT DOES THIS MEAN?



In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. (MCL's are set by the U.S. Environmental Protection Agency. In developing the standards EPA assumes that the average adult drinks 2 liters of water each day throughout a 70-year life span. EPA generally sets MCL's at levels that will result in no adverse health effects for some contaminants or a one-in-ten-thousand to one-in-a-million change of having the described health effect for other contaminants.) Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water which must provide the same public health protection. This table lists only those contaminants that had some level of detection. Many other contaminants have been analyzed for but were not present or were below the detection limits of the lab equipment. Most of the results in the table are from testing done in 2005. However, the state allows us to monitor for some contaminants less than once per year because the concentrations of the contaminants do not change frequently. Some of our data, though accurate, is more than one year old.

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 microbiological contaminants are available from the Safe Drinking Water Hotline (800-426-4791).