

2001 Annual Water Quality Report

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2001 Water Quality Report

The Roanoke City Water Division is pleased to provide this water quality report to our customers. The Water Division is committed to providing the highest quality of drinking water, and this report includes information about where your water comes from, what it contains and how it compares to the standards set by regulatory agencies. The Water Division vigilantly safeguards the water supply and is proud to report that it was in full compliance with all monitoring and reporting requirements without a single violation.

For questions about the quality of our drinking water or this report, call the Roanoke City Water Division at 853-2596.

Health and General Information

As water travels over the land's surface or through the ground, it dissolves naturally occurring minerals and radioactive material, and can be polluted by animals or human activity.

Contaminants that might be expected in untreated water include biological contaminants, such as viruses and bacteria; inorganic contaminants, such as salts and metals; pesticides and herbicides; organic chemicals from industrial or petroleum use, and radioactive materials.

Turbidity as a contaminant has no health effects, however, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches. The percentage of samples meeting the turbidity limits specified (see chart) was 100% for the City water supply.

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 the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the U. S. Environmental Protection Agency's Safe Drinking Water Hotline at 800-426-4791. Information is also available through the Virginia Department of Health, VDH, at (540) 463-7136 and the Roanoke City Environmental Health Department at (540) 857-7663.

Special Information Available

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 persons and infants - can be particularly at risk from infections. These people should seek advice about drinking water from their healthcare providers, the Environmental Protection Agency, and the Centers for Disease Control. Guidelines to reduce the risk of infection by *Cryptosporidium* are available from the EPA's Safe Drinking Water Hotline at 800-426-4791.

Sources and Treatment of Your Drinking Water

Carvins Cove Reservoir, a surface water source located near Hollins University, covers 630 acres and stores 6.5 billion gallons of water at full pond. The dam is 80 feet high and was constructed in 1927. Treatment at the plant includes aeration, flash mixing, coagulation, flocculation, sedimentation and filtration. After filtration, water is treated with chlorine for disinfection, fluoride for promoting strong teeth, and orthophosphate for corrosion control. Water is distributed throughout the community by six booster pump stations, six storage tanks, and pipes. Treatment capacity is 28 million gallons a day.

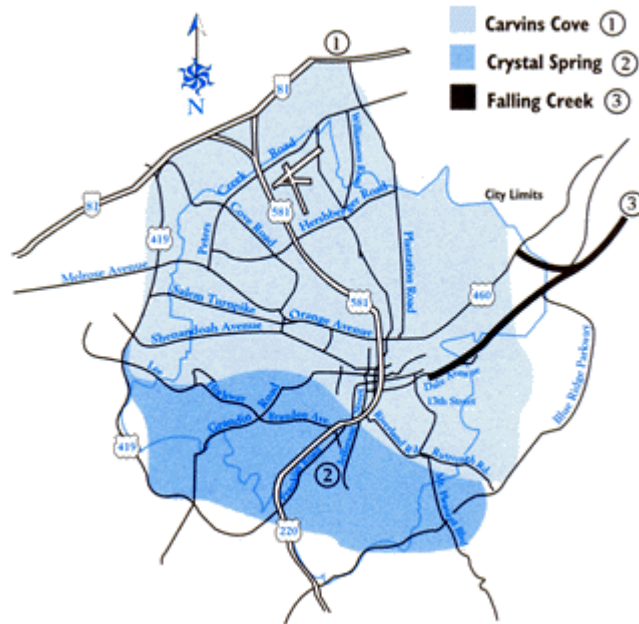
Falling Creek Reservoir, a surface water source located in Bedford County east of Vinton, covers 21 acres and stores 85 million gallons of water at full pond. It is fed by Beaver Reservoir that covers 69 acres and stores 435 million gallons of water at full pond. The dam at Falling Creek is 40 feet high and was constructed in 1897. The treatment process is similar to Carvins Cove, and water is distributed to the community by one storage tank and pipes. Treatment capacity is 1.5 million gallons a day.

Crystal Spring, a natural flowing spring at the base of Mill Mountain, provides an average flow of 3.5 to 4.0 million gallons as a water supply source for the southwest section of the city. As a result of recent changes in the regulations that govern the use of groundwater, Crystal Spring was determined to be under the influence of surface water and has to be filtered. The city stopped using this source on May 1, 2000 and currently is designing a membrane filtration plant to filter the water. The filtered water will again be treated with chlorine and fluoride. This process will ensure a safe and reliable drinking water supply. The design of the filter plant is underway and the estimated date of completion is May 2002. Currently, the water supply for the Crystal Spring service area is from Carvins Cove with supplemental water being mixed from Roanoke County's Spring Hollow.

Water is also purchased from Roanoke County, Salem and Town of Vinton in the event of shortages or emergencies such as the drought of

1999. This water is mixed with Carvins Cove and Crystal Spring sources throughout the city service areas.

Customer service areas served by the different water sources are shown on the map below. Your water source depends on where you live. All of NE, NW, and the majority of SE to Reserve Avenue are served by Carvins Cove. Crystal Spring serves the SW section, and Falling Creek serves King Street NE to Rte 460 and along Rte 24 to 13th St. If you have a question on the source of your water, please call 853-2596 or 853-2595.



Customer Service Areas

Source Water Assessments

The City of Roanoke will complete this year, a source water assessment of Crystal Spring, Falling Creek and Carvins Cove water supplies. The assessment is a requirement of the Virginia Department of Health's (VDH) Source Water Assessment Program (SWAP) in accordance with the 1996 Amendments of the Safe Drinking Water Act. Upon completion of the study, information will be available in the Water Division Administration Office, on this web site, and by contacting the Virginia Department of Health, VDH at (540) 463-7136.

Cryptosporidium and Giardia

Cryptosporidium and Giardia are microscopic organisms that can result in diarrhea, fever and other gastrointestinal systems when ingested. The organisms come from animal and human wastes, and are eliminated by an effective treatment combination including filtration, sedimentation and disinfection. Roanoke City has tested for Cryptosporidium and Giardia in all three source waters and has never detected either organism.

Lead and Copper

Roanoke water met all of the U. S. Environmental Protection Agency's new Action Level standards in the first round of testing for lead and copper in 1992. The regulations state that 90 percent of samples taken from drinking water taps in 100 "high risk" homes with lead services, pipes or lead solder in copper pipes must be below 0.015 parts per million for lead and 1.3 ppm for copper. Sampling has been conducted in accordance with the regulations since and results have been well below the Action Levels.

When it leaves our treatment plants, our water is virtually free of lead and copper. A building's plumbing can contain elements susceptible to corrosion and leach into tap water. If you are unsure whether your pipes contain lead or copper, run the tap water until it changes temperature to assure that the building's plumbing has been flushed. Lead's suspected health effects in adults include high blood pressure, hearing problems, and kidney and nervous system disorders. In infants and children, lead can interfere with formation of red blood cells, cause low birth weight, delay physical and mental development, and is a probable cancer risk. Copper is a nutritionally essential element, but at high levels, copper can cause gastrointestinal difficulties such as nausea and diarrhea. Business and residential owners with lead or copper plumbing may have tests conducted by independent laboratories.

Customer Views Welcome

If you are interested in learning more about the Water Department and water treatment, opportunities are available. Tours of the treatment plant for school, civic or other interested groups are available by request. Questions about water quality, comments or other interests should be directed to the Water Division Office by calling 853-2596 or 853-2595, or by writing to 541 Luck Avenue, S.W., Suite 118, Roanoke, VA 24016.

2000 Water Quality Data

Regulated Substances									
Substance	Units	Ideal Goals (EPA's MCLG)	Highest Level Allowed (EPA's MCL)	Highest Level Detected at Source			(Range)/ Average	Spring Hollow (Range)/ Average	Source of Substance
				Carvin's Cove	Falling Creek	Crystal Spring ***			
Chlorine*	ppm		4-MDRL	1.7*	1.5*	1.1*	(0.7-2.3)/1.2	(0.9-1.3)/1.1	Required disinfectant added during treatment process to eliminate bacteria

Chloride	ppm		250	8.0	<5	5.2	(0-8.0)/4.4	9.1	Natural occurring in the environment
Flouride*	ppm	4	4	1.4*	0.95*	1.1*	(0.37-2.03)/.91	(0.9-1.1)/0.9	Erosion of natural deposits; water additive which promotes strong teeth; discharge from aluminum and fertilizer factories
Iron*	ppm		0.3	0.02*	<0.01*	<0.01*	(0-0.03)/<0.01	No data	Naturally occurring in the environment
Total Nitrate & Nitrite (as N)	ppm	10	10	0.57	<0.05	<0.05	(0-0.57)/0.19	0.68	Run-off from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Manganese*	ppm		0.05	0.02	<0.01	<0.01	(0-0.2)/<0.01	No data	Naturally occurring in the environment
Zinc	ppm		5	<0.2	<0.2	<0.2		No data	Naturally occurring in the environment
Color*	color units		15	3*	<1*	<1*	(0-3)/1	<5	Physical property of water
Corrosivity		Non Corrosive	<10 Highly >12 Non	Moderately aggressive	Highly aggressive	Moderately aggressive		Moderately aggressive	Physical property that occurs when water reacts with metal
THM'S	ppb	0	100	80	93	***	(47-93)/66.4	18	By-product of drinking water chlorination
pH*	pH units		6.5-8.5	8.0*	8.0*	7.9*	(6.7-8.5)/7.8	(7.4-7.9)/7.7	Acidity or basicity of water
Total Dissolved Solids	ppm		500	128	39	134	(39-134)/100	168	Physical property of water
Sulfate	ppm		250	20	<5	55	(0-20)/8.3	20.2	Naturally occurring in the environment
Turbidity*	NTU	N/A	0.5	0.08*	0.09*	0.1*	(0.07-0.21)/.08	(0.02-0.13)/.08	Soil run-off
Total Coliforms	MPN/100 mL	0	Presence of	0	0	0	0	0	Naturally present in

			coliform bacteria in >5% of monthly samples						the environment
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	0	Human and animal waste
Gross Alpha	pCi/L	0	15	0.4	0.5	0	(0-0.5)/0.3	0.3	Erosion of natural deposits
Gross Beta	pCi/L	0	50	2.0	2.2	1	(1.0-2.2)/1.7	2	Decay of natural and man-made deposits
Unregulated Substances									
Ortho-Phosphate*	ppm	unregulated		1.1*	1.38*	0*	(47-2.1)/1.1	No data	Corrosion inhibitor added during treatment process
Conductivity*	umhos/cm	unregulated		243*	69.4*	234*	(43.5-275)/173	308	Physical property of water
Sodium	ppm	No Limits Designated		7.07*	7.73	<5	(0-7.73)/4.9	No data	Naturally occurring in the environment
HAA5									
Lead and Copper									
Lead	ppb	0 mg/L	AL=15	0 samples exceeded AL for the City			(0-0.006)	5 (0 samples exceeded AL)	Natural/ industrial deposits, plumbing solder, brass alloy in faucets
Copper	ppm	1.3 mg/L	AL=1.3	0 samples exceeded AL for the City			(0-0.21)	0.3 (0 samples exceeded AL)	Natural/ industrial deposits, plumbing, wood preservatives
Other Parameters (Not Regulated)									
Alkalinity*	ppm	unregulated		139*	27*	137*	(14-164)/85	(114-130)/120	Measurement of naturally occurring carbonated
Hardness*	ppm	unregulated		119*	15*	140*	(8-156)/85	(140-150)/148	Measurement of naturally

									occurring hardness metals
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* Figures were derived from running annual averages.

*** Crystal Springs was taken out of service May 2000 and remains offline.

We constantly monitor the water supply for various contaminants to meet all regulatory requirements. The table lists only those contaminants that had some level of detection. Many other contaminants have been analyzed but were not present or were below the detection limits of the lab equipment.

The City has tested for Volatile Organics (VOC's), pesticides and synthetic organic compounds (SOC's) (1997) with none detected.

Definitions:

Maximum Contaminant Level (MCL)

The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLG 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.

ppm

One part per million (Ex. One minute in 2 years)

ppb

One part per billion (Ex. One minute in 2,000 years)

mg/L

Milligrams per liter (Ex. One minute in 2 years)

Action Level

The concentration of a contaminant that triggers treatment or other requirement that a water system must follow.

pCi/L

Picocuries per liter is a measure of the radioactivity of water.

Treatment Technique

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

MDRL
Maximum disinfection residual level.