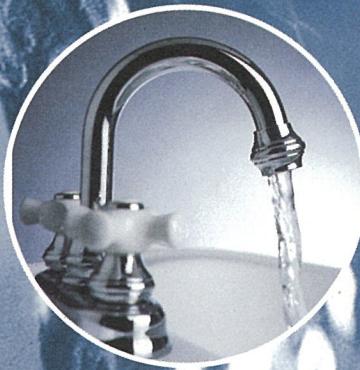


# 2004 Water Quality Report



City of Roanoke & Roanoke County

# Introduction

## Water Quality

This year, in the spirit of regional cooperation, the city of Roanoke and Roanoke County have developed a joint water quality report. This report contains information about where your water comes from, what it contains and how it compares to the standards set by regulatory agencies. The utility departments of both Roanoke County and the city of Roanoke vigilantly safeguard your water supplies, and are proud to report that in 2003, they were in full compliance with all state and federal monitoring and reporting requirements without a single violation.

## The Western Virginia Water Authority

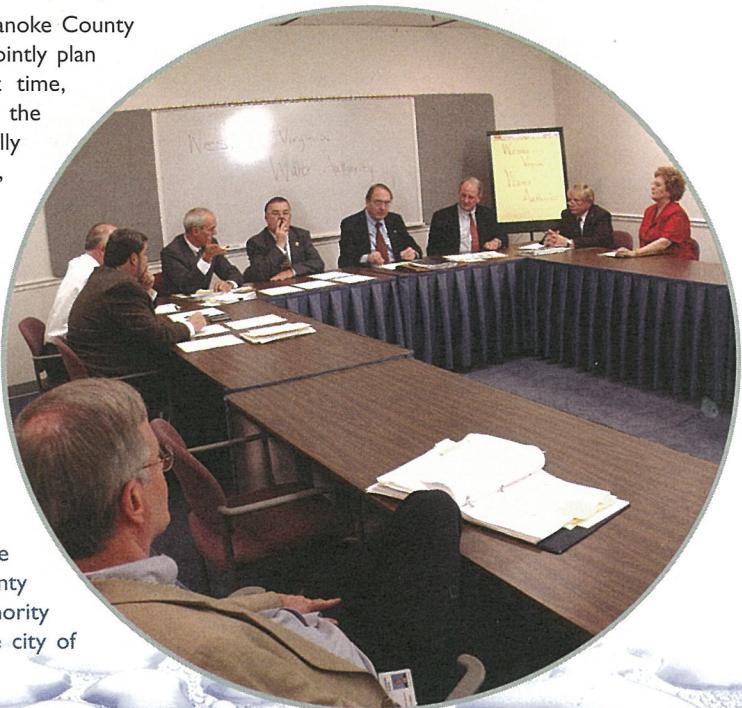
On July 1, 2004, the water and wastewater operations of Roanoke County and the city of Roanoke will officially consolidate as the Western Virginia Water Authority, an incorporated public body independent of local government. Thereafter, the Authority will serve county and city water and sewer customers. In anticipation of the new Authority, city water and sewer bills have been redesigned to streamline integration of the city and county billing operations. In the fall of 2004, water and sewer billing for city residents will be monthly instead of quarterly. The Authority will be contracting with a bank to process payments. After July 1, 2004, payments should be mailed to: Western Virginia Water Authority, P.O. Box 17381, Baltimore, MD 21297-1381. New payment envelopes will be provided. After July 1, 2004, water and sewer bills may also be paid at the Authority's Utility Billing Office in the city's Noel C. Taylor Municipal Building, 215 Church Avenue, Room 252, or at the Authority's Utility Billing Office in the County Administration Building, 5204 Bernard Drive, Suite 300. For complete and up-to-the-minute billing information after July 1, 2004, visit the Authority's Website at [www.westernvawater.org](http://www.westernvawater.org) or call 540-853-2456.

## Background on the Western Virginia Water Authority

In February 2003, the Roanoke City Council and the Roanoke County Board of Supervisors voted to authorize their staffs to jointly plan a regional water and wastewater authority. Since that time, employees from both jurisdictions have been creating the Authority structure. In early 2004, both jurisdictions formally approved the formation of the Authority and on March 2, 2004, the Commonwealth of Virginia bestowed the state Articles of Incorporation to the Authority.

Recent droughts, the cost of developing new sources of supply and the cost of wastewater treatment convinced city and county officials that a truly regional approach to these challenges was needed. The Western Virginia Water Authority is positioned to meet such challenges, and will provide a secure water supply and wastewater service with reasonable rates and excellent service to both localities.

In late 2003, seven individuals were selected to serve on the Authority board by the governing bodies of Roanoke County and the city of Roanoke. Pictured here are several Authority board members and staff from Roanoke County and the city of Roanoke at an Authority board meeting.



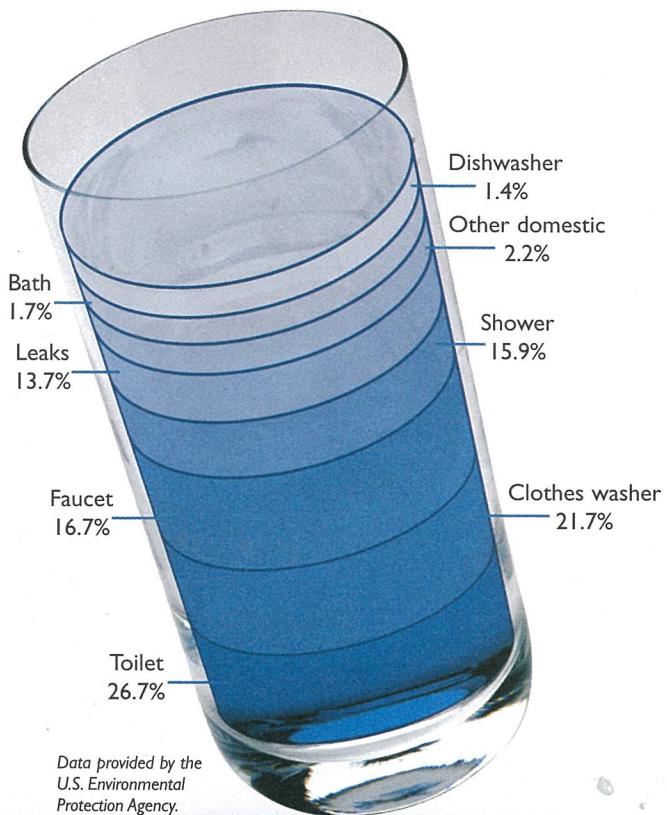
# Every Drop *Still* Counts

The amount of water in the earth's water cycle hasn't changed in billions of years—we are using the same water today that dinosaurs used. The way we use water, however, and the rate at which we use it, has changed. Using water efficiently helps protect our water supplies, especially during periods of drought. It is always important to conserve water, and it should never be wasted any time we use it. Conserving water also cuts water and sewer bills and reduces water-heating costs. In addition, using water wisely helps the city and county reduce costs and energy used to treat and pump both drinking water and wastewater.

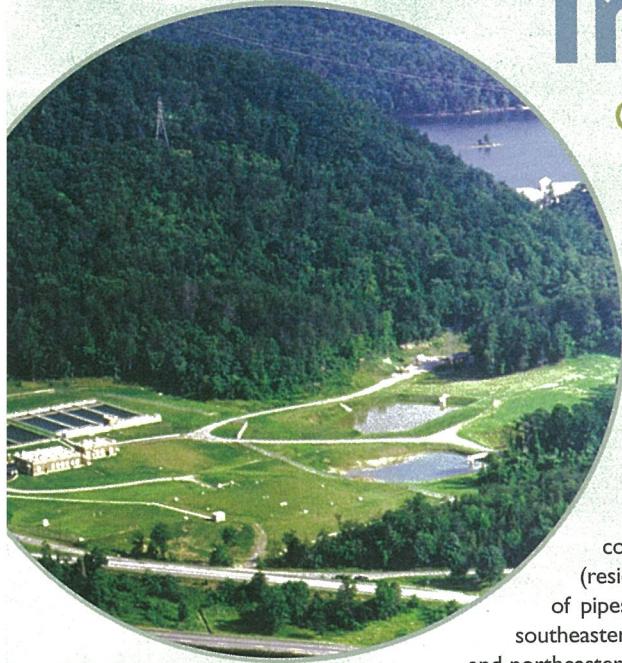
## The Best Ways to Save

- **Use water wisely outdoors.** Outdoor water use can account for almost 40% of home water use. Watering a lawn with a sprinkler can use 75 gallons in 10 minutes; washing a car with the hose running for 15 minutes can use 112 gallons! Reducing lawn areas wherever possible saves water and reduces the amount of lawn herbicides and fertilizers that can run off with rain and pollute waterways. Consider landscaping with drought-tolerant trees, shrubs, grasses, groundcovers and other perennials. Retain soil moisture by mulching plantings well, and use a rain gauge to measure rainfall and irrigation. Water plants only when they need it. Use mosquito-proof rain barrels or buckets to capture rainwater. Use buckets for car washing, instead of a hose. Commercial car washes use water efficiently and many recycle water. Use a broom, not a hose, to clean sidewalks and driveways.
- **Toilets.** Toilet flushing accounts for more than a quarter of indoor water use. If possible, replace old toilets. Toilets made before 1992 use between 5 and 7 gallons per flush. By installing 1.6-gallon flush toilets, a family of four can save 14,000 to 25,000 gallons of water per year. If replacing toilets is not possible, place a water-displacement bag in toilet tanks to reduce the amount of water needed to flush. For all toilets, flush only when necessary; never use toilets as wastebaskets.
- **Clothes washers.** Consider replacing old clothes washers with water- and energy-efficient front-loading machines, which can use up to half as much water as older washers. Visit the U.S. Department of Energy's Web site ([www.energy.gov](http://www.energy.gov)) for information on energy- and water-efficient appliances. For all washing machines, wash only full loads and select the appropriate water level or load size.
- **Leaks.** Leaky toilets, pipes, hoses and faucets can account for almost 14% of home water use, and this water isn't even used! Fix leaks immediately; to check for silent toilet tank leaks, place a few drops of food coloring in the tank and check for color in the bowl. If color appears in the bowl, the toilet is leaking.

## How much water do we use indoors?



# City of Roanoke Water Sources & Drinking Water Treatment



## Carvins Cove Natural Reserve

The city of Roanoke owns a 12,672-acre watershed near Hollins University in Botetourt County, which drains into Carvins Cove Reservoir. In addition to receiving water from the watershed, the reservoir is fed from two underground tunnels that carry overflow from Tinker and Catawba Creeks. This surface water source covers 630 acres and stores 6.5 billion gallons of water at full pond. Carvins Cove Water Filtration Plant has the capacity to treat 28 million gallons of water from the reservoir every day. The filtration process takes place in a series of basins. Water is first aerated to remove unwanted dissolved gases and to oxidize dissolved metals, which reduces any unpleasant tastes and odors. Flash mixing of chemicals is the next step, where alum is added to coagulate suspended particles. Water then flows into settling basins where the particles clump together, become heavy and settle to the bottom of the basins. The water is next filtered through gravel, sand and carbon, and disinfected with chlorine. Fluoride is added to promote strong teeth, and orthophosphate is added to control corrosion in pipes. Treated water is distributed to more than 137,000 water customers (residences and businesses) through six booster pump stations, six storage tanks and 688 miles of pipes. All of the northeastern and northwestern parts of the city, and the majority of the southeastern part of the city, to Reserve Avenue, are served by Carvins Cove. Portions of northern and northeastern Roanoke County are also served by Carvins Cove.

Carvins Cove Natural Reserve also offers outdoor recreation opportunities, including boating, fishing, hiking and nature viewing. For more information, call the Natural Reserve at 563-9170.

## Crystal Spring

Crystal Spring flows at the base of Mill Mountain in the southern part of the city. This groundwater source provides an average flow of 3.5 million gallons of water a day, which is filtered in the Crystal Spring Filtration Plant, completed in the fall of 2002. The plant's microfiltration system filters out all particles larger than 0.2 micron. One micron is one thousandth of a millimeter. Filtered water is treated with chlorine and fluoride and pumped to water customers from Crystal Spring Pumping Station. Crystal Spring serves the southwestern part of the city and part of southern Roanoke County. With the capacity to filter five million gallons of water a day, Crystal Spring Filtration Plant is the largest microfiltration plant in Virginia.



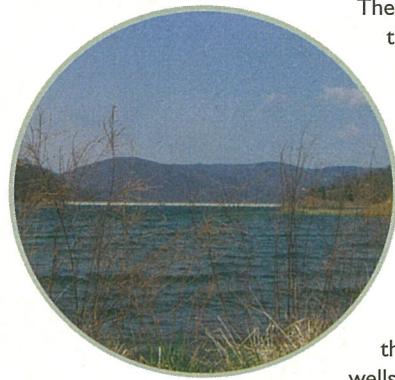
## Falling Creek Reservoir

Falling Creek Reservoir is a surface water source located in Bedford County east of Vinton. It covers 21 acres and stores 85 million gallons of water at full pond. It is fed by Beaver Reservoir, which covers 69 acres and stores 435 million gallons of water at full pond. The treatment process of this water source is similar to that of Carvins Cove Filtration Plant; treatment capacity is 1.5 million gallons a day. Falling Creek serves King Street northeast to Route 60 and along Route 24 to 13th Street.

## Muse Spring Well

Muse Spring Well is used as a temporary, emergency water source. It is in southeastern Roanoke and can supply up to 1 million gallons of water per day. Water is pumped and disinfected with chlorine and is mixed with water from Carvins Cove in the southeastern part of the city.

# Roanoke County Water Sources & Drinking Water Treatment



The Roanoke County water system comprises seven separate source areas, which include surface water from the Spring Hollow Reservoir, ground water, water traded with the city of Roanoke and water purchased from the city of Salem.

## The Spring Hollow Water System

The water source for this system comes from the Roanoke River and is pumped into the Spring Hollow Reservoir, a 3.2-billion gallon side stream storage reservoir. Water is withdrawn from the reservoir for treatment at the Spring Hollow Water Treatment Facility. Treatment includes clarification, filtration, chlorine disinfection and fluoridation. Spring Hollow Water Treatment Facility currently has the capacity to treat 15 million gallons of water a day and can be expanded to 30 million gallons a day. Treated water is stored in a 2-million gallon storage tank then pumped through the north and south transmission lines to the distribution system. The current usage averages 7.19 million gallons a day. During the drought, standby wells were used to supplement source water. This system supplies water to Hidden Valley, Oak Grove, Penn Forest, Hunting Hills, Clearbrook, Castle Rock, Canterbury Park, Bridlewood, Brookwood, Woodbridge, Big Hill, Campbell Hills, Twine Hollow, Little Brushy Mountain, Cherokee Hills, Glenvar East, North Beverly Heights, Wooded Acres, Berwick Heights, Georgetown Park, Mount Vernon Heights, North Lakes, Montclair, The Woodlands, Starmount and Hanging Rock subdivisions and adjacent areas.

## Traded Water

Water is traded with the city of Roanoke and blended with Spring Hollow water to supply certain areas of Roanoke County. Carvins Cove supplies water to the North County areas of Boxley Hills, the Hollins community, Ardmore, Shadwell and adjacent areas. Crystal Spring supplies the southern Roanoke County areas of Hampden Hills and Brookfield.

## East County System

This system supplies the LaBellevue subdivision, Hunt Ridge, Botetourt East, Glade Creek, The Orchards and adjacent areas. The source is Labellevue well number 7, and the Carvins Cove source. Chlorine is used to disinfect the water prior to distribution. During emergencies, standby wells and the connection to the town of Vinton are used to supplement source water.

## Salem Source

Water is purchased through contract from the city of Salem's downtown and Glenvar filtration plants to supply Andrew Lewis Place, Robin Hood Park and the Roanoke County area along West Main Street, east of the Glenvar Treatment Plant.

## The Martin Creek System

Nine wells supply this groundwater source, which is disinfected with chlorine prior to distribution. Water is distributed throughout the community by two storage tanks and distribution piping consisting of 8-inch, 6-inch and 4-inch pipe. The total source/pump capacity is equal to 76,000 gallons per day. Current usage is approximately 32,637 gallons per day. This system supplies water to the Forest Edge and Carriage Hills areas.

## The Delaney Court System

One well supplies this groundwater source, which is disinfected with chlorine prior to distribution. Water is distributed throughout the community by a storage tank, a booster pump station and distribution piping consisting of 2-inch pipe. The total source/pump capacity is equal to 43,200 gallons per day. Current usage is approximately 8,218 gallons per day. This system supplies water to the Delaney Court subdivision.

## The Suncrest Heights System

The source is groundwater obtained from one well. Chlorine is used to disinfect the water prior to distribution. Water is distributed throughout the community by a storage tank and distribution piping consisting of 6-inch, 4-inch and 2-inch pipe. The total source/pump capacity is equal to 43,200 gallons per day. Current usage is approximately 5,066 gallons per day. This system supplies water to the Suncrest Heights subdivision.



Above right: Spring Hollow Water Treatment Plant

## Customer Service Areas

Several water sources serve different parts of the city and the county, as shown on this map. Refer to pages 4 and 5 for complete information about these water sources.

CRAIG CO.

ROANOKE CO.

CRAIG CO.



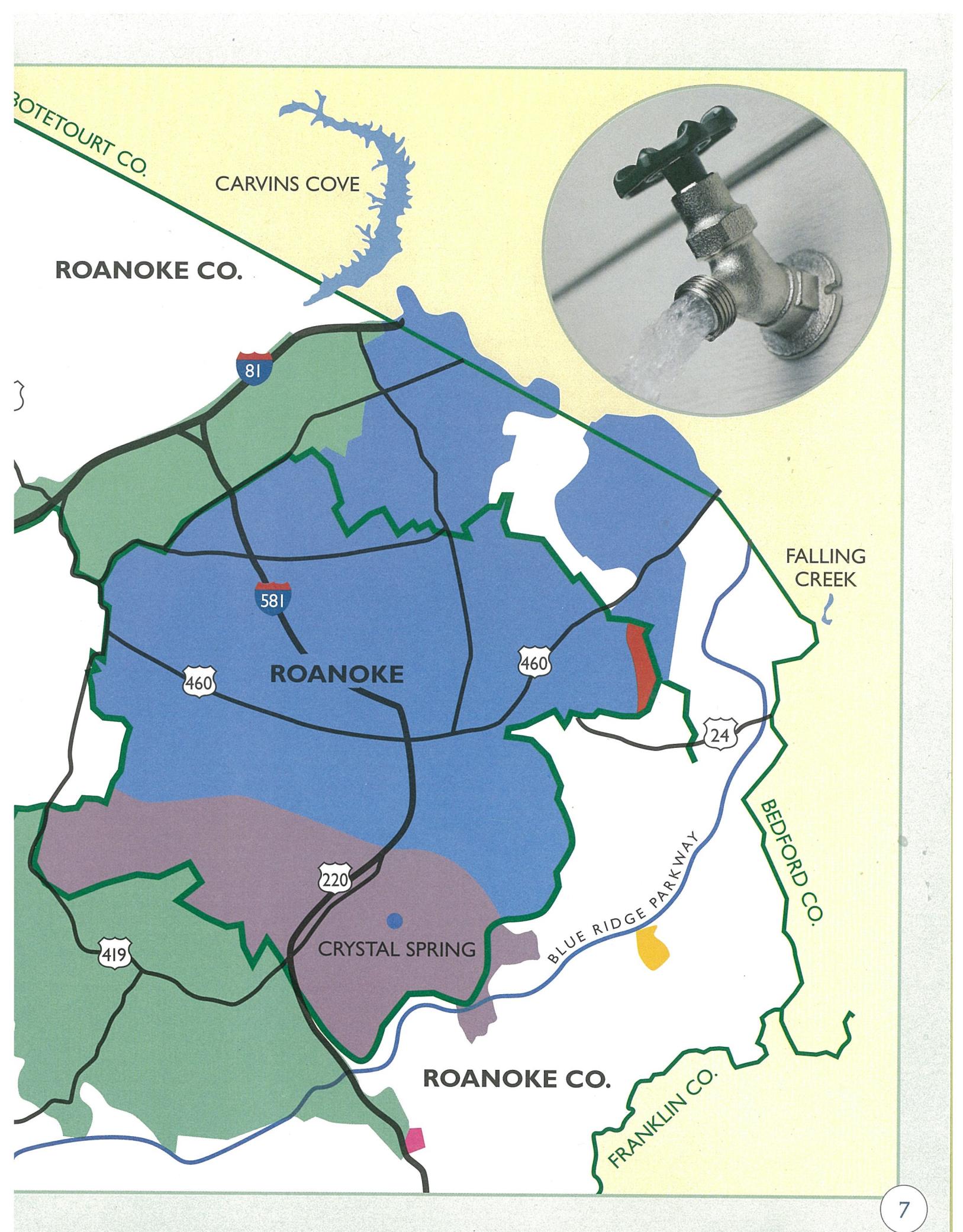
- SPRING HOLLOW
- MARTIN CREEK
- SUNCREST HEIGHTS
- DELANEY COURT
- CARVINS COVE
- SALEM SOURCE
- CRYSTAL SPRING
- FALLING CREEK



SPRING HOLLOW

ROANOKE CO.





# Water Quality & Health

As water travels over the land's surface or through the ground, it dissolves naturally occurring minerals and can be polluted by animals and human activity. Contaminants in source water may come from septic systems, discharges from domestic or industrial wastewater treatment facilities, agricultural and farming activities, urban stormwater runoff, residual uses and many other activities. Water from surface sources is treated to make it suitable for consumption while groundwater may or may not require treatment.

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 Environmental Protection Agency's Safe Drinking Water Hotline at 1-800-426-4791.

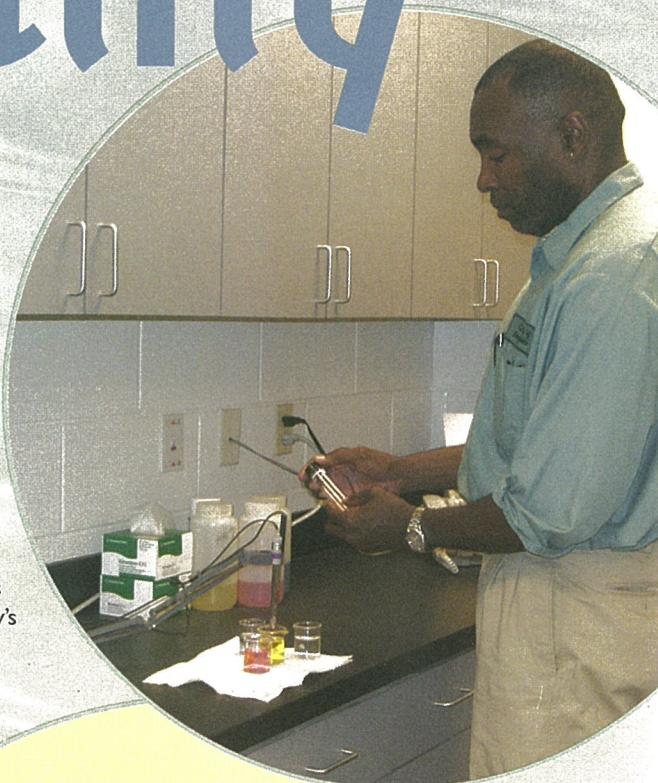
Turbidity, or the amount of suspended particles in water, does not always present health risks. Turbidity can, however, interfere with disinfection and provide a medium for microbial growth. Turbidity may also indicate the presence of disease-causing organisms. These organisms can include bacteria, viruses and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches. Therefore, the U.S. Environmental Protection Agency and the Virginia Department of Health—our water quality regulators—set limits for turbidity. The percentage of water samples meeting turbidity limits in 2003 for compliance was 100 percent for both the county and city water supply (see table on pages 10 and 11).

Through the water treatment process, contaminants are filtered from the city's and county's water supply to safe levels, and turbidity levels are reduced well below legal limits. Constant testing ensures that the treated water supply remains safe. Some people may be more vulnerable to trace contaminants in drinking water than the general population. People whose immune systems have been compromised, such as cancer patients undergoing chemotherapy, people who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, and some older adults and infants, can be particularly at risk from infections. These people should seek advice about drinking water from their healthcare providers. Environmental Protection Agency/Centers for Disease Control guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Environmental Protection Agency Safe Drinking Water Hotline (1-800-426-4791). The following are other resources for drinking water safety information:

Virginia Department of Health: 540-463-7136

Roanoke Environmental Health Department: 540-857-7663

Centers for Disease Control and Prevention: 1-800-311-3435, 404-639-3311 or 404-639-3312 (TTY)



## Source Water Assessments

The city of Roanoke has completed 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. Based on the land use activities and potential sources of contamination in the assessment areas, the source water assessments determined that the city's water sources are susceptible to contamination. This designation does not mean that the source water has been impacted or that it will be impacted. It does mean if there is a release of pollutants in the assessment area, the source water could be impacted. For more information, contact the city of Roanoke's Department of Utilities at 853-1449. The VDH completed a source water assessment of Roanoke County's main water source, the Roanoke River. This source water assessment determined that the Roanoke River may be susceptible to contamination because it is surface water exposed to a wide array of contaminants at varying concentrations. Also, changing hydrologic, hydraulic and atmospheric conditions promote migration of contaminants from land use activities of concern into the Roanoke River. The assessment also determined that Roanoke County's wells might be susceptible to contamination because they are located in areas that promote migration of contaminants from land use activities of concern. More specific information may be obtained by contacting the Roanoke County Utility Department at 387-6104.

# 2003 Water Quality Data

The table on pages 10 and 11 summarizes water-testing results from 2003 for both regulated and unregulated substances. All regulated substances must be tested annually, except for lead and copper, which must be tested every three years, and radiologicals, which must be tested every four years. This 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 lab equipment.

## Cryptosporidium and Giardia

The bacteria *Cryptosporidium* and *Giardia* are microscopic organisms that can cause fever, diarrhea and other gastrointestinal symptoms when ingested. The organisms come from animal and human wastes, and are eliminated through water filtration and disinfection. Even though the presence of these organisms is not regulated by the state or federal government, the city and county have tested for *Cryptosporidium* and *Giardia* in all of their water sources and have never detected either organism.

## Lead and Copper

In 1992, the U.S. Environmental Protection Agency created new standards for acceptable levels of lead and copper in drinking water. Every year since 1992, the city's and county's water have met these standards. The regulations state that 90 percent of samples taken from drinking water taps in 100 homes considered to be at high risk for lead, due to lead services, pipes or lead solder in copper pipes, must be below 15 parts per billion (ppb) for lead and 1.3 ppm for copper. Sampling has been conducted in accordance with the regulations since 1992 and results have been well below the standards.

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.

When water leaves the county's or the city's treatment facilities, it is virtually free of lead and copper. Once the water enters a building, however, the building's plumbing can contain lead, copper or other elements that can leach into tap water. If the safety of a building's plumbing is questionable, run tap water until it changes temperature to assure that the plumbing has been flushed. Business and residential owners with lead or copper plumbing may have tests conducted by independent laboratories.

## Water Discoloration

Changes in water pressure in water systems can occasionally cause drinking water to be discolored. The discoloration is caused by sediments in pipes mixing with clear water. The sediments occur naturally from the oxidation of iron in pipes. While discolored water is ordinarily safe to drink, it is best to flush any discolored water from pipes by turning on all cold-water faucets in your home or business. Avoid turning on hot-water faucets so the discolored water is not drawn into water heaters.

One cause of water pressure change is from the use or flushing of fire hydrants. Fire-EMS Department and Utilities employees occasionally flush hydrants to ensure that they are working properly and to flush sediments out of pipes.

Water pressure can also change in the event of water main breaks. If you notice evidence of a water main break or a leaking fire hydrant, call 853-2000 in the city or 387-6104 in the county. (After July 1, 2004, call 853-5700 in the city or the county.)

## Definitions:

### Action Level (AL):

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

### HAA5s:

Halogenated acids.

### 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.

### MDRL:

Maximum disinfection residual level.

### mg/l:

Milligrams per liter (for example, one minute in two years).

### MPN:

Most probable number.

### NTUs:

Nephelometric Turbidity Units; a measure of turbidity.

### pCi/l:

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

### ppm:

One part per million (for example, one minute in two years).

### ppb:

One part per billion (for example, one minute in 2,000 years).

### THMs:

Trihalomethanes.

### Treatment Technique:

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

### µg/l:

Micrograms per liter (for example, one minute in 2,000 years).

### µmhos/cm:

Micromhos per centimeter; a measure of conductivity.

## Regulated Substances

Substance	Units	Ideal Goals (EPA's MCLG)	Highest Level Allowed (EPA's MCL)	(Range) / Average			
				Carvins Cove	Falling Creek	Crystal Spring	City of Salem
Barium	ppm	2	2	<.2	<.2	<.2	
Chlorate	ppm		1				
Chlorine	ppm		4-MDRL	(0.9-1.3)/1.0	(0.9-1.2)/1.1	(0.9-1.1)/1.0	(0.08-3.04)/1.38
Chloride	ppm		250	6.96	6.28	7.68	(13.33-14.67)/14.01
Chlorite	ppm		1				
Fluoride	ppm	4	4	(0.9-1.1)/1.0	(0.8-1.0)/0.9	(0.1-0.9)/0.4	(0.26-2.29)/0.9
Iron	ppm		0.3	(<0.01-0.01)/<0.01	(<0.01-0.01)/<0.01	<0.01	
Total Nitrate and Nitrite (as N)	ppm	10	10	<0.05	<0.05	<0.05	(0.42-0.49)/0.46
Manganese	ppm		0.05	(0.01-0.02)/0.02	(<0.01-0.01)/0.01	(0.01-0.02)/0.01	
Zinc	ppm		5	<0.2	<0.2	<0.2	
Color	color units		15	<1	(<1-1)/<1	<1	
Corrosivity		Non Corrosive	<10 highly aggressive >12 non aggressive	11.49	8.307	11.52	
THMS	ppb	0 µg/l	80	(28-82)/44	(35-84)/62	(1-13)/7	(11-54)/28
HAA5s	ppb	0 µg/l	60	(22-36)/29	(18-49)/36	(0.5-5)/2	(7-89)/46
pH	pH units		6.5-8.5	(7.8-7.9)/7.9	(7.8-8.2)/8.0	(7.6-7.9)/7.8	(6.4-8.3)/7.6
Total Dissolved Solids	ppm		500	121	49	145	(198-201)/199.5
Sulfate	ppm		250	24.64	5.14	<5	(26.58-54.55)/40.57
Sulfide	ppm			<.03	<.03	<.03	
Turbidity	NTU	N/A	0.5	(0.03-0.13)/0.05	(0.04-0.11)/0.06	(0.02-0.05)/0.03	(0.03-0.19)/0.04
Total Coliform Bacteria	MPN/100ml or present/absent	0	Presence of coliform bacteria in >5% of monthly samples	0	0	0	0
Fecal Coliform Bacteria	MPN/100ml or present/absent	0	A routine and a repeat sample are total coliform positive, and one is also fecal coliform or E. coli positive	0	1*	0	0

### Most recent monitoring period

Gross Alpha	pCi/l	0	15	1.8	0.1	1.1
Gross Beta	pCi/l	0	50	2.9	1.3	1.8
Radium 226/228	pCi/l	0	5	0.0	0.1	1.5

### Lead and Copper

Lead	ppb	0 µg/l	AL=15	0 samples exceeded AL		0 samples exceeded AL
				0 samples exceeded AL	0 samples exceeded AL	
Copper	ppm	1.3 mg/l	AL=1.3	0 samples exceeded AL	0 samples exceeded AL	0 samples exceeded AL

### Unregulated Substances

Orthophosphate	ppm	unregulated		(1.0-1.2)/1.1	(0.06-1.3)/1.1	
Conductivity	µmhos/cm	unregulated		(129-259)/196	(57-80)/69	(193-306)/263
Silica	ppm	unregulated		5.0	16.9	10.2
Sodium	ppm	No limits designated		10.1	8.41	<5

### Other parameters (Not regulated)

Alkalinity	ppm	unregulated		(42-105)/74	(20-24)/22	(130-135)/133	(10-170)/122
Hardness	ppm	unregulated		(43-122)/82	(11-14)/12	(131-140)/137	(78-342)/169

Figures with a range were derived from running annual averages. Both jurisdictions constantly monitor their water supplies 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 maximum contaminant level. The city of Roanoke and Roanoke County have tested for volatile organics (VOCs), pesticides, synthetic organic compounds (SOCs) and total organic carbons (TOCs), all of which met with current state and federal standards for drinking water.

Spring Hollow	Martin Creek	Delaney Court	Suncrest Heights	Source of Substance
.02			0.05	Naturally present in the environment; discharge of drilling waste or mineral refineries
(1-1.5)/1	(0.2-0.8)/0.6	0.6	0.4	By-product of drinking water chlorine dioxide
(4.5-41.3)/12	(11.7-32.8)/22.2	5.86	20.7	Required disinfectant added during treatment process to eliminate bacteria
.07				Naturally occurring in the environment
(0.9-1.2)/1.0	(0.31-1.67)/0.8	0.5		Erosion of natural deposits; water additive to promote strong teeth; discharge from aluminum and fertilizer factories
			0.0002	Naturally occurring in the environment
.43	(0-0.72)/0.2	1.95	1.07	Run-off from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
	(0-0.13)/0.1			Naturally occurring in the environment
	(<0.20-0.45)/0.3		0.01	Naturally occurring in the environment
0			0	Physical property of water
12	(0.3-10.92)/9.3	11.47	11.96	Physical property that occurs when water reacts with metal
(13-51)/30				By-product of drinking water chlorination
(6-28)/15				By-product of drinking water chlorination
(7.3-8)/7.5	(6.1-7.9)/6.4	7.5	7.6	Acidity or basicity of water
89	(213-330)/281	148	176	Physical property of water
20.7	(17.2-58.8)/27.9		5.76	Naturally present in the environment
			1.9	Naturally present in the environment
(0.04-0.08)/.05	(0-1.24)/0.6	0.09	1.6	Soil run-off
0	0	0	0	Naturally present in the environment
0	0	0	0	Human and animal waste
0.8	(0-2.9)/0.4	0	1.7	Erosion of natural deposits
3.1	(0.2-4.2)/2.3	1	3.1	Decay of natural and man-made deposits
0.4	.01		0.4	Erosion of natural deposits
0 samples exceeded AL	Natural/industrial deposits, plumbing solder, brass alloy in faucets			
0 samples exceeded AL	Natural/industrial deposits, plumbing, wood preservatives			
	(0.002)/0	0.07		Corrosion inhibitor added during treatment process
(300-309)/300	(346-538)/466	230	416	Physical property of water
5.86	(20.8-29.4)/24	35.1		Naturally present in the environment
(4.52-14.1)/9.57	(12.3-34.6)/177	8.63	12.9	Naturally occurring in the environment
(121-136)/122	(20-201)/200	111	150	Measurement of naturally occurring carbonates
(148-166)/150	(128-230)/159	100	152	Measurement of naturally occurring hardness metals

The city of Roanoke's Muse Spring Well is used as an emergency, temporary water source. Radiologicals, nitrate/nitrite and regulated VOC's were tested and met all current state and federal standards for drinking water. Complete data are available from the city of Roanoke Department of Utilities.

\*This result was isolated at one site and was suspected to be due to a contaminated fixture or sampling error. Water quality was not compromised.

# Citizen input is welcome!



City residents with questions or comments about their water supply, treatment or quality may call the city at 853-1449 or write to City of Roanoke, Water Division, 2012 S. Jefferson Street, Suite 100, Roanoke, VA 24014. Roanoke County residents may call 387-6104 or write to Roanoke County, 1206 Kessler Mill Road, Salem, VA 24153.

To report a water main break or leaking fire hydrant, call 853-2000 in the city or 387-6104 in the county. (After July 1, 2004, call 853-5700 in the city or county.)

Tours of Carvins Cove Filtration Plant, Crystal Spring Filtration Plant or Spring Hollow Treatment Plant are available upon request for school, civic, neighborhood or other groups. For tour information, please call 853-1315.

Staff members from the city of Roanoke and Roanoke County also are available to give presentations to groups about water supply, treatment and quality.



Upper right photo: Crystal Spring Filtration Plant

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