

Richmond's Drinking Water From Past to Present

More than 300 years ago, Richmond's drinking water came from numerous springs and from an open stream flowing from the Capitol across Main Street. Richmond's Water Treatment Plant was built on the banks of the James River in 1924. Over the years the plant has been upgraded and enlarged to meet growing demand.

Today, Richmond's Department of Public Utilities' (DPU) water plant can produce up to 132 million gallons per day (MGD). In 2010, DPU treated an average of 59 MGD of water and distributed it to more than 60,000 residential, commercial and industrial customers in the metro Richmond area. DPU also provides water to Henrico, Chesterfield, Hanover, Goochland and Powhatan counties through wholesale contracts.

DPU has invested millions of dollars to ensure it will meet or exceed federal regulations and meet increasing regional demands for reliable, high-quality drinking water. Water utility employees perform numerous water tests every day and maintain more than 1,200 miles of water lines so that when you turn on the tap, your family will receive clean and safe water.

Inside the Water Quality Report

This brochure is a snapshot of Richmond's 2010 drinking water quality. Included is information about the water source, what it contains and how it compares with standards mandated by the U.S. Environmental Protection Agency (EPA) and the Virginia Department of Health. This report is being sent to you to comply with the 1996 Safe Drinking Water Act. Landlords, businesses and other property owners are encouraged to share this drinking water quality report with tenants.

For free additional copies or more information about your water and this report, call the city of Richmond Department of Public Utilities at 646-5224.

For information about public participation opportunities, watch our website at www.richmondgov.com/PublicUtilities/index.aspx and our blog at www.cordpu.blogspot.com for meeting announcements.

Why We Report on Water Quality

The 1996 Safe Drinking Water Act requires water utilities to provide consumers with a yearly report on the **source and quality** of the water they drink. You may also find this information posted on our Internet website at www.richmondgov.com/DPU.

The state allows us to monitor for some substances less than once per year because the concentrations of these substances do not change frequently.

The Virginia Department of Health conducted a source water assessment of our system during 2002. The Richmond Water Treatment Plant was determined to be of high susceptibility to contamination, using criteria developed by the state in its EPA-approved Source Water Assessment Program. The assessment report consists of maps showing the source water assessment area, an inventory of known land use activities of concern, and documentation of any known contamination within the last five years from the date of assessment. This report is available by contacting the Department of Public Utilities at 646-8938.



Water from the James River goes to the Water Treatment Plant.



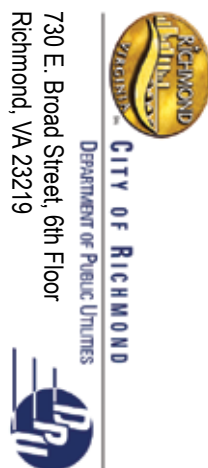
Settling basins remove large and medium particles. Filtration removes small to minute particles, and aeration and disinfection improves taste and kills bacteria. Chemicals are added to buffer water and provide dental protection.



Water leaves the treatment plant through a distribution system of pipes that carries water into homes.



Mayor Dwight C. Jones *Building a Better Richmond*



Dedicated to Drinking Water Quality

The city of Richmond Department of Public Utilities is a member of the American Water Works Association, the Water Research Foundation, and the Association of Metropolitan Water Agencies. These organizations are dedicated to furthering knowledge and research on safe drinking water.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some substances. The presence of substances does not necessarily indicate that the water poses a health risk.

More information about substances and potential health effects may be obtained by calling the Environmental Protection Agency's (EPA) Safe Drinking Water Hotline at 1-800-426-4791.

Health Information

Some people may be more vulnerable to substances in drinking water than the general population. Immuno-compromised people – such as those with cancer who are undergoing chemotherapy, those who have undergone organ transplants, those with HIV/AIDS or other immune system disorders, and some elderly people and infants – can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC (Centers for Disease Control) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial substances are available from the Safe Drinking Water Hotline at 1-800-426-4791.

For More Information

Contact the City of Richmond Department of Public Utilities at 646-5224 for additional copies of this report. For more information about Richmond's water quality, call Audrey Brubeck at 646-8938 or visit us on the Web at www.RichmondGov.com/DPU.

For more general information about drinking water, visit the U.S. Environmental Protection Agency's website at www.epa.gov/safewater, 1-800-426-4791.

Virginia Department of Health (Drinking Water)
www.vdh.state.va.us/dw/index.asp

Consumer Confidence Report on Drinking Water Quality 2010



Definitions

- **AL** – *Action Level*: The concentration of a substance which, when exceeded, triggers treatment or other requirements.
- **MCL** – *Maximum Contaminant Level*: The highest level allowed by regulation. MCLs are set as close to the MCLGs (see below) as feasible using the best treatment technology.
- **MCLG** – *Maximum Contaminant Level Goal*: The level of contaminant below which there is no known or suspected health risk.
- **NTU** – *Nephelometric Turbidity Unit*: A measure of turbidity, water cloudiness.
- **ND** – Not detected.
- **pCi/L** – *Picocuries per liter*: A measure of radioactivity
- **ppb** – parts per billion or micrograms per liter (µg/L)
- **ppm** – parts per million or milligrams per liter (mg/L)
- **su** – standard units. Used in pH measurements.
- **TT** – *Treatment Technique*: Process intended to reduce the level of a substance in drinking water.
- **Source water** – Untreated water
- **Finished Water** – Treated water
- **Regulated Substances** are regulated by the EPA and their concentration cannot be above the MCL.
- **Unregulated Substances** are not regulated by the EPA, but they must be monitored so information about their presence in drinking water can be used to develop limits.



Our Water Source

The source of our water is the James River.

Lead

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Richmond 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 15-30 seconds or until it becomes cold or reaches a steady temperature before using water for cooking or drinking.

If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing materials, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline at <http://www.epa.gov/safewater/lead>.

Substances Expected To Be In Drinking Water

As water travels over land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material. Water can pick up substances resulting from the presence of animals or human activity. Substances that may be present in source water include:

- ◆ Microbial substances such as viruses and bacteria, which may come from domestic animals, wildlife, septic systems, livestock and sewage treatment plants.
 - ◆ Inorganic substances 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 chemicals, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and can come from gas stations, urban stormwater runoff and septic systems.
 - ◆ Radioactive substances, which can be naturally occurring or be the result of oil and gas production and mining activities.
- Water treatment significantly reduces the level of these substances in drinking water. In order to ensure that tap water is safe to drink, Environmental Protection Agency (EPA) regulations limit the amount of certain substances in water provided by public water systems. Food and Drug Administration regulations establish limits for substances in bottled water, which must provide the same protection for public health.

Cryptosporidium

The Water Treatment Plant's source water was analyzed for the presence of Cryptosporidium from January 2004 until December 2005. Of the 24 source water samples tested, only three analyzed had (Indirect) ImmunoFlourescence Assay (IFA) counts, which may be considered viable (infectious). The average count for the 24 source water samples analyzed was 2.9 counts / 100 L. This value is less than EPA's future action level of 7.5 counts / 100 L.

Method 1623 Cryptosporidium and Giardia in Water by Filtration/IMS/FA April 2001. USEPA, Washington D.C. EPA-821-R-01-025

Water Quality Information

We are proud to report that during 2010, we were in 100 percent compliance with all federal and state Safe Drinking Water Act MCLs. Last year, the Department of Public Utilities (DPU) conducted 94 different tests on more than 55,000 water samples. The tables here list the results for substances that were analyzed in our drinking water in 2010. Unless otherwise noted, the data presented in this table is from testing performed from January 1 through December 31, 2010.

The state allows DPU to monitor for some substances less than once per year because the concentrations of those substances do not change frequently.

The city of Richmond monitors the James River continuously throughout the year for various substances and will continue to monitor our source water to enhance the water treatment process and to ensure the highest quality finished water is provided to our customers.

To enhance existing water protection efforts, DPU has partnered with Virginia Commonwealth University's Center for Environmental Studies to design and implement a state-of-the-art monitoring system. DPU is among the first water utilities in the nation to use this cutting-edge technology for the purpose of screening for naturally and intentionally introduced biological, chemical and radiological substances.

Microbial Contaminants

Substance	Likely Source	Richmond's Samples Indicating Bacteria Presence	Richmond's Highest Monthly % of Positive Samples	MCL	MCLG	Sample Date	Meets EPA Standards
Total Coliform	Naturally present in the environment	3	2.3% ¹	5% of all samples per month	0	April 2010	<input checked="" type="checkbox"/>
Fecal coliform & Escherichia coliform	Human and animal fecal waste	0 ²	0%	A routine sample & repeat sample are total coliform positive; one is fecal or E. coli positive	0	2010	<input checked="" type="checkbox"/>

¹Total Coliform – Highest monthly percentage of positive total coliform samples for 2010

²Fecal Coliform – Highest total number of positive samples per month in 2010

The EPA has implemented the Stage 2 Disinfectants and Disinfection Byproduct Rule (Stage 2 DBPR) and the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR). The Stage 2 DBP Rule provides increased protection against health effects associated with disinfection byproducts (DBPs). The LT2ESWTR further protects health against Cryptosporidium and other microbial pathogens that may be present in drinking water.

Regulated Substances

Substance	Likely Source	Richmond's Results	Richmond's Range	MCL	MCLG	Sample Date	Meets EPA Standards
Fluoride (ppm)	Added to promote dental health	0.8		4	4	Jan. 10	<input checked="" type="checkbox"/>
Nitrate (ppm)	Fertilizer runoff, septic tank leakage, sewage, erosion of natural deposits	0.54		10		Jan. 10	<input checked="" type="checkbox"/>
Total organic carbon removal ratio ³	Naturally present in source water	1.4	1.0 – 1.9	TT, removal ratio>1.0		2010	<input checked="" type="checkbox"/>
Alpha Emitters (pCi/L)	Erosion of natural deposits	0.2	0.1 – 0.3 ⁴	15	0	2005	<input checked="" type="checkbox"/>
Combined Radium	Erosion of natural deposits	0.4	0 – 0.6 ⁴	5	0	2005	<input checked="" type="checkbox"/>
TTHMs (ppb)	Byproduct of drinking water chlorination	22	11 – 30 ⁵	80		2010	<input checked="" type="checkbox"/>
Total trihalomethanes	Byproduct of drinking water chlorination	26	13 – 38 ⁵	60		2010	<input checked="" type="checkbox"/>
HAA5 (ppb) Haloacetic Acids	Byproduct of drinking water chlorination						<input checked="" type="checkbox"/>
Barium	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits	0.03 mg/L		2 mg/L		Jan. 10	<input checked="" type="checkbox"/>

³TOC Removal Ratio – Amount detected is the lowest of the annual rolling average of the four quarterly calculations made in 2010; range is the minimum and maximum of all samples used to calculate average

⁴Radioactive Contaminants – Analyzed for four quarters in 2005

⁵TTHMs and HAA5s – Maximum annual rolling average of four quarterly calculations made in 2010; range is the minimum of all samples used to calculate averages

Disinfectant

Substance	Likely Source	Richmond's Results	Richmond's Range	MCL	MCLG	Sample Date	Meets EPA Standards
Chloramines (ppm) ⁶	Disinfection	3.6	1.2 – 4.7	4	4	2010	<input checked="" type="checkbox"/>

⁶Chloramines – Amount detected is the maximum of the annual rolling average; range is the minimum and maximum of all samples used to calculate average

Turbidity

Substance	Likely Source	Richmond's Results	Richmond's Range	MCL	MCLG	Sample Date	Meets EPA Standards
Turbidity (NTU)	Soil runoff	0.18, 100% ⁷	N/A	TT, 1.0 NTU, Max <0.3 (95% of the time)		2010	<input checked="" type="checkbox"/>

⁷Turbidity – Highest single measurement and the lowest monthly percentage of samples meeting monthly turbidity limits

Lead and Copper

Substance	Likely Source	Richmond's Results	Richmond's Range	MCL	MCLG	Sample Date	Meets EPA Standards
Copper (ppm)	Corrosion of household plumbing; leaching from wood preservatives	0.07	No results exceeded action level ⁸	Action Level = 1.3	1.3	2010	<input checked="" type="checkbox"/>
Lead (ppb)	Corrosion of household plumbing; erosion of natural deposits	3	No results exceeded action level ⁸	Action Level = 15	0	2010	<input checked="" type="checkbox"/>

⁸Lead and Copper – 90th percentile of the most recent round of sampling; number of sites exceeding action level

Unregulated Monitored Substances

Substance	Likely Source	Richmond's Result	MCL	Sample Date	Unit
Aluminum	Erosion of natural deposits; addition of water treatment substances	<0.05		2010	ppm
Manganese	Naturally present in the environment	<0.01		2010	ppm
Nickel	Corrosion of household plumbing	<0.01		2010	ppm
Sodium	Naturally present in the environment; addition of water treatment substances	11.6	*	2010	ppm
Sulfate	Naturally present in the environment; addition of water treatment substances	28.7		2010	ppm

*For low or no salt diets, a limit of 20 ppm is suggested

Other Information

Substance	Richmond's Result	EPA's Suggested Limit	Sample Date	Unit
Alkalinity	42.0		2010	ppm
Chloride	11.1	250	2010	ppm
Hardness	62		2010	ppm
pH (acidity)	6.4	6.5 – 8.5	2010	su
Silica	9.8		2010	ppm
Total Dissolved Solids	124	500	2010	ppm