



2016 Annual

Water Quality Report

Hopewell District
PWSID: VA3670800



Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.

This report contains important information about your drinking water. If you do not understand it, please have someone translate it for you.

A Message from the Virginia American Water President



To Our Valued Customer:

Virginia American Water is proud to be your local water service provider, and I am pleased to share with you good news about the quality of your drinking water. Each year, we provide you with our Annual Water Quality Report – and like so many years prior -- we continue to supply water that meets or surpasses all state and federal water quality regulations.

This is no small task. Quite a lot goes into bringing that water to your home. The miles of pipeline hidden below the ground. The facilities that draw water from the source. The plant where it's treated and tested. Our treatment plant operators, water quality experts, engineers, and maintenance crews working around the clock to make sure that water is always there when you need it. Delivering high-quality, reliable water service to your tap around the clock also requires significant investment in our water infrastructure to upgrade aging facilities. In 2016 alone, we invested \$16.1 million in water system improvements statewide.

We do this because we believe we're delivering more than just water service. We deliver a key resource for public health, fire protection, the economy and overall quality of life. Our job is to ensure that quality water keeps flowing not only today, but well into the future. It's part of our commitment to you and the communities we serve.

We hope you agree, it's worth every penny and worth learning more about. Please, take the time to review this report. It provides details about the source and quality of your drinking water using the data from water quality testing conducted for your local water system from January through December 2016.

Thanks for allowing us to serve you.

Sincerely,

Barry Suits, P.E.



WE CARE ABOUT WATER. IT'S WHAT WE DO.®

Information on the Internet

Virginia American Water, a subsidiary of American Water (NYSE: AWK), is the largest investor-owned water utility in the state, providing high-quality and reliable water services to approximately 320,000 people.

With a history dating back to 1886, American Water is the largest and most geographically diverse U.S. publicly-traded water and wastewater utility company. The company employs more than 6,700 dedicated professionals who provide regulated and market-based drinking water, wastewater and other related services to an estimated 15 million people in 47 states and Ontario, Canada. More information can be found by visiting www.amwater.com.

The U.S. EPA Office of Water (www.epa.gov/safewater) and the Center for Disease Control and Prevention (www.cdc.gov) web sites provide a substantial amount of information on many issues relating to water resources, water conservation and public health. Also, the Virginia Department of Health and the Virginia Department of Environmental Quality have web sites that provide complete and current information on water issues in Virginia. These web sites are located at (www.vdh.virginia.gov) and (www.deq.state.va.us). All these web sites have numerous links that will direct you to other professional organizations, public education and public health topics related to water.

What Is a Water Quality Report?

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. Food and Drug Administration regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

To comply with Virginia Department of Health and U.S. Environmental Protection Agency (EPA) regulations, Virginia American Water issues a report annually describing the quality of your drinking water. The purpose of this report is to provide you an overview of last year's (2016) drinking water quality. It includes details about where your water comes from and what it contains. We hope the report will raise your understanding of drinking water issues and awareness of the need to protect your drinking water sources.

Share This Report

Landlords, businesses, schools, hospitals and other groups are encouraged to share this important water quality information with water users at their location who are not billed customers of Virginia American Water and therefore do not receive this report directly.

Where Does My Water Come From?

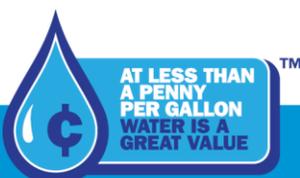
Virginia American Water, Hopewell District customers enjoy an abundant water supply from two major surface waters in Virginia. The water is withdrawn from the Appomattox River, at the confluence with the James River. The combined drainage area of these two watersheds is approximately 9,000 squares miles, where the rivers meet at Hopewell. To learn more about our watershed on the Internet, go to U.S. EPA's Search Your Watershed at www.epa.gov/safewater.

What Is a Source Water Assessment?

The Source Water Assessment Program is a result of the 1996 amendments to the Federal Safe Drinking Water Act (SDWA). Those amendments require all states to establish a program to assess the vulnerability of public water systems to potential contamination.

The first step of a Source Water Protection Program is the preparation of a source water assessment report. This report was prepared by the Virginia Department of Health and became available in the year 2002. The following paragraph describes the source water assessment.

"The Virginia Department of Health conducted a Source Water Assessment of the Appomattox and James Rivers in 2001. The rivers were determined to be of high susceptibility to contamination using the criteria developed by the state in its approved Source Water Assessment Program. The assessment report consists of maps showing the Source Water Assessment area, an inventory of known Land Use Activities and Potential Sources of Contamination of Concern, Best Management Practices Utilized at Land Use Activity Sites in Zone 1, documentation of any known contamination within the last five years, Susceptibility Explanation Chart, and Definitions of Key Terms. The report is available by contacting your waterworks system owner at the telephone number or address included in the CCR."



Water Quality: What You Can Do

Everyone can play a role in improving the health of the source water and the Chesapeake Bay watershed:

- Avoid overuse of pesticides, herbicides and fertilizers, which contribute to the growth of algae that can cause taste and odor in drinking water.
- Clean up after your pet so the rain won't wash pet waste into the watershed through storm sewers.
- Dispose of pharmaceutical and personal care products in the trash, not down the toilet.
- Properly dispose of chemicals, paints and hazardous waste products so they don't enter the watershed through storm sewers.
- If you have a boat, keep it clean to avoid bringing algae, dirty water or contaminants into your marina.
- Support regulations and other efforts to reduce nutrients in the watershed.

DRINKING WATER NOTICE

Lead Education Statement

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. Virginia American Water 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 two minutes before using the 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 exposure is available from the Safe Drinking Water Hotline (800) 426-4791 or at <http://www.epa.gov/safewater/lead>.

Special Health Information

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 may 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 microbial contaminants are available from the EPA's Safe Drinking Water Hotline (800) 426-4791.

Other Drinking Water Constituents You May Be Interested In Are As Follows:

The sodium concentration in the sample collected from the plant effluent was 24.1 ppm. This concentration exceeds the recommended maximum contaminant level guidance of 20ppm for persons on a "strict" sodium intake diet.

Water Information Sources

Virginia American Water:
www.amwater.com/vaaw

Virginia Department of Health:
www.vdh.virginia.gov

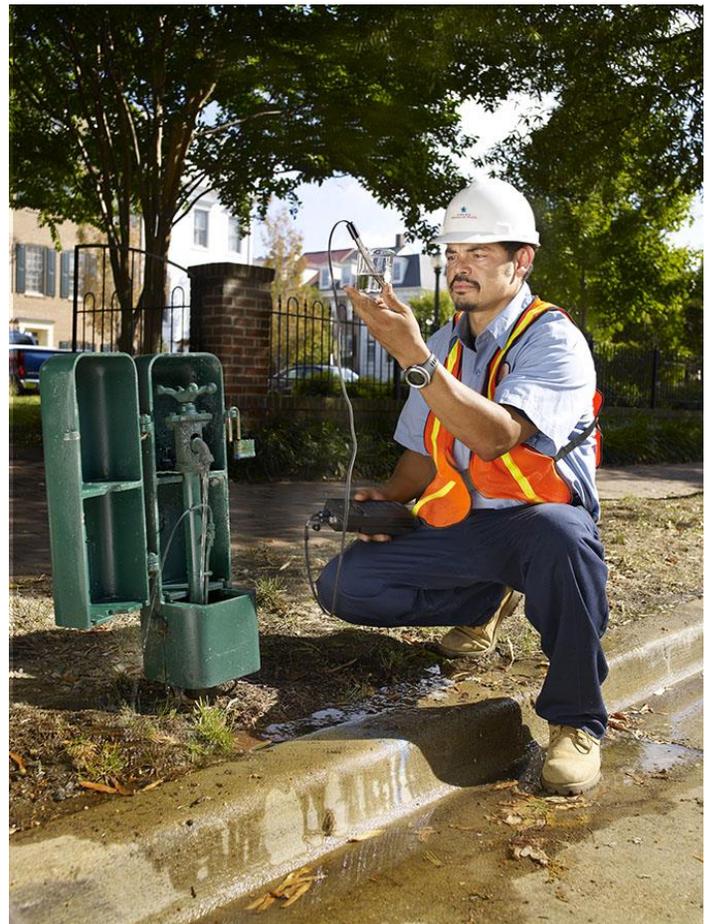
United States Environmental Protection Agency
www.epa.gov/safewater

Safe Drinking Water Hotline: (800) 426-4791

Centers for Disease Control and Prevention:
www.cdc.gov

American Water Works Association:
www.awwa.org

National Library of Medicine/National Institute of Health:
www.nlm.nih.gov/medlineplus



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Substances Expected to be in 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's Safe Drinking Water Hotline (800) 426-4791.

The sources of drinking water (both tap water and bottled water) includes 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.

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, or wildlife.

Inorganic Contaminants, such as salts and metals, which can be naturally occurring or may 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 may also come from gas stations, urban stormwater runoff, and septic systems.

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

Cryptosporidium

Cryptosporidium is a microbial pathogen found in surface water throughout the U.S. Although filtration removes Cryptosporidium, the most commonly used filtration methods cannot guarantee 100 percent removal. Our monitoring indicates the presence of these organisms in our source water. Current test methods do not allow us to determine if the organisms are dead or if they are capable of causing disease. Ingestion of Cryptosporidium may cause cryptosporidiosis, an abdominal infection. Symptoms of infection include nausea, diarrhea, and abdominal cramps. Most healthy individuals can overcome the disease within a few weeks. However, immuno-compromised people, infants and small children, and the elderly are at greater risk of developing life-threatening illness. We encourage immuno-compromised individuals to consult their doctor regarding appropriate precautions to take to avoid infection. Cryptosporidium must be ingested to cause disease, and it may be spread through means other than drinking water

Opportunities for Public Participation

Virginia American Water does not schedule regular meetings for public participation in decisions that affect drinking water quality. However when public participation is required, meetings would be announced in the local newspaper and information would be posted on our website (www.amwater.com/vaaw).



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How to Read the Data Tables

Virginia American Water conducts extensive monitoring. The results of our monitoring are reported in the accompanying tables. While most monitoring was conducted in 2016, certain substances are only monitored once every three to nine years because the levels do not change frequently. For help with interpreting this table, see the “Table Definitions” section.

Starting with a **Substance**, read across. **Year Sampled** is usually in 2016 but may be a prior year. **MCL** shows the highest level of substance (contaminant) allowed. **MCLG** is the goal level for that substance (this may be lower than what is allowed). **Average Amount Detected** represents the measured amount (less is better). **Range** tells the highest and lowest amounts measured. A **Yes** under **Compliance Achieved** means the amount of the substance met government requirements. **Typical Source** tells where the substance usually originates. Table Definitions and Abbreviations

- **Action Level (AL):** The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
- **MCL (Maximum Contaminant Level):** 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.
- **MCLG (Maximum Contaminant Level Goal):** 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.
- **MRDL (Maximum Residual Disinfectant Level):** The highest level of disinfectant routinely allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
- **MRDLG (Maximum Residual Disinfectant Level Goal):** The level of 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.
- **NA:** Not applicable
- **ND:** Not detected
- **NTU – Nephelometric Turbidity Units:** Measurement of the clarity, or turbidity, of water. Turbidity in excess of 5 NTU is just noticeable to the average person.
- **pCi/L (picocuries per liter):** Measurement of the natural rate of disintegration of radioactive contaminants in water (also beta particles).
- **ppm (parts per million):** One part substance per million parts water, or milligrams per liter. 1 ppm = 1 minute in 2 years or 1 penny in \$10,000.
- **ppb (parts per billion):** One part substance per billion parts water, or micrograms per liter. 1 ppb = 1 minute in 2,000 years or 1 penny in \$10,000,000.
- **TT (Treatment Technique):** A required process intended to reduce the level of a contaminant in drinking water.

Why does my water sometimes have a chlorine taste and odor?

Periodically, you may notice the taste and odor of chlorine in your water. Virginia American Water uses free chlorine instead of the less noticeable combined chlorine (chloramines) as a disinfectant during distribution system flushing. Free chlorine provides the best method of disinfection, during the water main flushing program done each year, to maintain a high level of water quality. Keeping an open container of drinking water in the refrigerator allows the chlorine to dissipate, which usually improves the taste of the water. Change the water in your refrigerated container weekly.

Unregulated Contaminant Monitoring

Definition: Unregulated contaminants are those for which the U.S. Environmental Protection Agency has not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist the EPA in determining the occurrence of unregulated contaminants in drinking water and whether regulation is warranted.

The list of unregulated contaminants applicable for monitoring during 2013-2016 under the unregulated contaminants monitoring rule 3 is located on EPA’s website at: [http:// water.epa.gov/lawsregs/rulesregs/sdwa/ucmr/ucmr3/index.cfm](http://water.epa.gov/lawsregs/rulesregs/sdwa/ucmr/ucmr3/index.cfm)

Water Quality Statement

For your information, we have compiled a list in the table, showing what substances were detected in your drinking water during 2016. We feel it is important that you know exactly what was detected and how much of the substance was present in the water. For information concerning our results, please contact Water Quality Supervisor, Kelly Ryan, at (804) 446-9822.



Your Drinking Water Quality

Regulated Substances (Measured on the Water Leaving the Treatment Facility)

Substance (units)	Year Sampled ¹	MCL	MCLG	Average Amount Detected	Range Low-High	Compliance Achieved	Typical Source	
Beta/photon emitters (pCi/L) ²	2015	50	0	3.4	NA	Yes	Decay of natural and man-made deposits	
Fluoride (ppm)	2016	4	4	0.64	NA	Yes	Discharge from fertilizer and aluminum factories; Erosion of natural deposits; Additive to promote strong teeth	
Nitrate (ppm)	2016	10	10	0.15	NA	Yes	Run off from fertilizer use; Leaching from septic tanks/sewer; Erosion of natural deposits	
Radium 228 (pCi/L)	2015	5	0	3.9	NA	Yes	Erosion of natural deposits	
Total Organic Carbon (removal ratio) ³	2016	TT	NA	1.33	1.25 - 2.08	Yes	Naturally present in the environment (removal ratio should be > 1.00)	
Substance (units)	Year Sampled	MCL		MCLG	Highest Reading	Readings < 0.3 NTU	Compliance Achieved	Typical Source
Turbidity (NTU) ⁴	2016	TT (<1 NTU)		NA	0.307	NA	Yes	Soil runoff
		TT (95% of readings ≤ 0.3 on a monthly basis)			NA	99.97%		

Regulated Substances (from the Distribution System)

Substance (units)	Year Sampled	MCL	MCLG	Average Amount Detected	Range Low-High	Compliance Achieved	Typical Source
Total Chlorine (ppm) ⁵	2016	MRDL=4	MRDLG=4	2.3	0.5 - 3.4	Yes	Additive used to control microbes
Haloacetic Acids (HAAs) (ppb) ^{6 & 7}	2016	60	NA	22.9	4.8 - 28.4	Yes	By-product of drinking water disinfection
TTHMs (Total Trihalomethanes) (ppb) ^{6 & 7}	2016	80	NA	66.4	35.6 - 63.4	Yes	By-product of drinking water disinfection

Unregulated Substances (Measured on the Water Leaving the Treatment Facility)

Substance (units)	Year Sampled	Results	Range Low-High	Typical Source
Calcium (ppm)	2016	15	NA	Naturally occurring
Chloride (ppm)	2016	17.9	NA	Naturally occurring
Magnesium (ppm)	2016	4	NA	Naturally occurring
Ortho-Phosphate (ppm)	2016	0.65	NA	Naturally occurring and water treatment additive
Sodium (ppm)	2016	24.1	NA	Naturally occurring and water treatment additive
Sulfate (ppm)	2016	32.6	NA	Naturally occurring
Cryptosporidium (oocyst/L) ⁸	2016	0.727	ND - 0.727	Naturally occurring pathogen found in surface water
Zinc (ppm)	2016	0.242	NA	Naturally occurring and water treatment additive
Total Chlorine (ppm) ⁹	2016	3.78	1.68 - 3.78	Additive used to control microbes

Unregulated Substances (From the Distribution System)

Substance (units)	Year Sampled	Results	Range Low-High	Typical Source
Bromochloro-acetic acid (ppb)	2016	3.8	1.0 - 3.8	By-product of drinking water disinfection
Bromide (ppm)	2016	0.02	ND - 0.02	By-product of drinking water disinfection
Bromodichloromethane (ppb)	2016	11.1	6.0 - 11.1	By-product of drinking water disinfection
Chlorodibromomethane (ppb)	2016	3.9	0.9 - 3.9	By-product of drinking water disinfection
Chloroform (ppb)	2016	55.9	23 - 55.9	By-product of drinking water disinfection
Monobromo-acetic acid (ppb)	2016	2.4	1.0 - 2.4	By-product of drinking water disinfection
Dichloroacetic acid (ppb)	2016	10.8	3.4 - 10.8	By-product of drinking water disinfection
Trichloroacetic acid (ppb)	2016	17.1	1.4 - 17.1	By-product of drinking water disinfection

Unregulated Substances (From the Distribution System and Treatment facility) UCMR 3

Substance (units)	Year Sampled	Results	Range Low-High	Typical Source
1,4 Dioxane (ppb)	2014	0.15	ND - 0.15	Stabilizer and solvent; component of cosmetics, shampoos and detergents
Hexavalent Chromium (ppb)	2014	0.10	0.09 - 0.10	Discharge from steel and pulp mills
Strontium (ppb)	2014	47.3	46.9 - 47.3	Soil Runoff
Vanadium (ppb)	2014	0.4	0.3 - 0.4	Discharge from power plants; erosion of natural deposits



Regulated Tap Water Samples: Lead and Copper Results (From the Distribution System)

Substance (units)	Year Sampled	Action Level	MCLG	Results	Number of Samples	90th Percentile	Number of Samples Above Action Level	Typical Source
Copper (ppm)	2016	1.3	1.3	0.026-0.190	30	0.085	0	Corrosion of household plumbing
Lead (ppb)	2016	15	0	ND	30	<1	0	Corrosion of household plumbing

¹ Year Sampled: The state requires us to monitor for certain substances less than once per year because the concentrations of these substances do not change frequently. In these cases, the most recent sample data are included, along with the year in which the sample was taken.

² Beta/Photon emitters: The MCL for Beta/photon emitters is written as 4 mrem/year. EPA considers 50 pCi/L as the level of concern for beta-emitters.

³ Total Organic Carbon: The value reported under "Average Amount Detected" is the lowest quarterly running annual average ratio between the percentage of TOC actually removed and the TOC required to be removed. A value of greater than or equal to 1.0 indicates that the water system is in compliance with TOC removal requirements. TOC is covered by a treatment technique (TT).

⁴ Turbidity: Turbidity is a measure of the cloudiness of the water. We monitor it because it is a good indicator of the effectiveness of our filtration system. During the reporting year, a minimum of 99.97% of all samples taken to measure turbidity met water quality standards of less than 0.3 NTU.

⁵ Total Chlorine (Distribution System): In addition to chloramines, free chlorine was used as a disinfectant during part of the year. These data show values for both chlorine and chloramines.

⁶ Average amount detected is the highest locational running average of the 4 Stage 2 locations

⁷ The range is determined using all data Stage 2 locations.

⁸ Cryptosporidium is conducted on water entering the facility from the Appomattox River

⁹ Total Chlorine (Plant effluent): In addition to chloramines, free chlorine was used as a disinfectant during part of the year. These data show daily values for both chlorine and chloramines.

There's a lot more to your water bill than just water.

When you turn on the tap, it's easy to see what your water bill buys. What's not as easy to see is what it takes to bring that water to your home. The miles of pipeline hidden below the ground. The facilities that draw water from the source. The plant where it's treated and tested. The scientists, engineers, and maintenance crews working around the clock to make sure that water is always there when you need it. Your water payments are helping to build a better tomorrow by supporting needed improvements that will keep water flowing for all of us—today and well into the future. All for less than a penny a gallon.

 **AT LESS THAN A PENNY PER GALLON WATER IS A GREAT VALUE™**

WE CARE ABOUT WATER. IT'S WHAT WE DO. FIND OUT WHY YOU SHOULD, TOO, at amwater.com.

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