ANNUAL WATER QUALITY REPORT

Reporting Year 2022

Presented By

Henrico County Public Utilities

PWS ID#: VA4087125

Our Mission Continues

We are once again pleased to present our annual water quality report covering all testing performed between January 1 and December 31, 2022. Over the years, we have dedicated ourselves to producing drinking water that meets all state and federal standards. We continually strive to adopt new methods for delivering the best-quality drinking water to you. As new challenges to drinking water safety emerge, we remain vigilant in meeting the goals of source water protection, water conservation, and community education while continuing to serve the needs of all our water users. Please remember that we are always available should you ever have any questions or concerns about your water.

Where Does My Water Come From?

During the past fiscal year (July 1, 2021, to June 30, 2022), Henrico County customers received an average of 24 million gallons of water per day from the County's water treatment facility and 11 million gallons per day from the City of Richmond's water treatment facility. The source for both facilities is surface water drawn from the James River. The County's water treatment facility began operations in April 2004 and can produce up to 80 million gallons per day to meet the County's future drinking water needs. The facility has multiple sources of electric power and emergency generators to ensure our ability to provide drinking water during local power outages.

Cryptosporidium

Cryptosporidium is a microscopic parasite that can cause cryptosporidiosis, a type of gastrointestinal illness, in humans. In April 2017, Henrico County completed 24 months of monitoring of the untreated water in the James River for *Cryptosporidium* to determine if the level of treatment provided at the Henrico water treatment facility is adequate for the concentration of *Cryptosporidium* detected in the river. The average concentration detected in the river water was 0.033 oocyst per liter. If the average concentration exceeds 0.075 oocyst per liter, additional treatment will be required.

Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised 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. The U.S. EPA/CDC (Centers for Disease Control and Prevention) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline at (800) 426-4791 or http://water.epa.gov/drink/hotline.

Water Main Flushing

Distribution mains (pipes) convey water to homes, businesses, and hydrants in your neighborhood. The water entering distribution mains is of very high quality; however, water quality can deteriorate in areas of the distribution mains over time. Water main flushing is the process of cleaning the interior of water distribution mains by sending a rapid flow of water through the mains.

Flushing maintains water quality in several ways. For example, flushing removes sediments like iron and manganese. Although iron and manganese do not pose health concerns, they can affect the taste, clarity, and color of the water. Additionally, sediments can shield microorganisms from the disinfecting power of chlorine, contributing to the growth of microorganisms within distribution mains. Flushing helps remove stale water and ensures the presence of fresh water with sufficient dissolved oxygen and disinfectant levels and an acceptable taste and smell.

During flushing operations in your neighborhood, some short-term deterioration of water quality, though uncommon, is possible. You should avoid tap water for household uses at that time. If you do use the tap, allow your cold water to run for a few minutes at full velocity before use and avoid using hot water to prevent sediment accumulation in your hot water tank. Please contact us if you have any questions or if you would like more information on our water main flushing schedule.

Community Participation

Regular meetings of the Henrico Board of Supervisors are typically held on the second and fourth Tuesday of every month in the boardroom, Administration Building, Government Center, 4301 East Parham Road. The board meeting schedule and agenda can be found at https://henrico.us/supervisors/. Each board agenda has a public comment period.

QUESTIONS? If you have any questions about this report or your drinking water quality, please call our Water Quality Engineer at (804) 727-8700. You can view this report on our website at https://henrico.us/public-data/water-quality-report-2022.

Substances That Could Be in Water

To ensure that tap water is safe to drink, the U.S. EPA prescribes regulations limiting the amount of certain contaminants in water provided by public water systems. U.S. Food and Drug Administration regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of these contaminants does not necessarily indicate that the water poses a health risk.

The sources of drinking water (both tap water 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, in some cases radioactive material, and substances resulting from the presence of animals or from human activity. Substances 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.

For more information about contaminants and potential health effects, call the U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791.

Source Water Assessment

The Safe Drinking Water Act mandated that the Virginia Department of Health (VDH) perform source water assessments for all public water sources. The assessment reports consist 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 the assessment. The VDH assessed our system in 2002 and determined that the source water, the James River, was highly susceptible to contamination. As a result, both Richmond's and Henrico's water treatment facilities have systems that remove harmful contaminants from source water to ensure that high-quality drinking water is supplied to you. Information about the source water assessment is available from our water quality engineer at (804) 727-8700.

Lead in Home Plumbing

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. We are responsible for providing high-quality drinking water, but we 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 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 at (800) 426-4791 or at www.epa.gov/safewater/lead.

Test Results

Our water is monitored for many different kinds of substances on a very strict sampling schedule, and the water we deliver must meet specific health standards. Here, we only show those substances that were detected in our water (a complete list of all our analytical results is available upon request). Remember that detecting a substance does not mean the water is unsafe to drink; our goal is to keep all detects below their respective maximum allowed levels.

The state recommends monitoring 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.

We participated in the 4th stage of the U.S. EPA's Unregulated Contaminant Monitoring Rule (UCMR4) program by performing additional tests on our drinking water. UCMR4 sampling benefits the environment and public health by providing the U.S. EPA with data on the occurrence of contaminants suspected to be in drinking water in order to determine if U.S. EPA needs to introduce new regulatory standards to improve drinking water quality. Unregulated contaminant monitoring data are available to the public so please feel free to contact us if you are interested in obtaining that information. If you would like more information on the U.S. EPA's Unregulated Contaminants Monitoring Rule, please call the Safe Drinking Water Hotline at (800) 426-4791.

REGULATED SUBSTANCES

				Henrico County Public Utilities		Richmond City Public Utilities			
SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Barium (ppm)	2022	2	2	0.033	NA	0.028	NA	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Chloramines (ppm)	2022	[4]	[4]	3.2[1]	ND–4.5	3.9	2.2–5.0	No	Water additive used to control microbes
Combined Radium (pCi/L)	2017	5	0	ND	NA	ND[2]	NA	No	Erosion of natural deposits
Fluoride (ppm)	2022	4	4	0.78	NA	0.81	0.35–0.81	No	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories
Gross Beta Particles (pCi/L)	2017	50	0	3.7	NA	2[2]	NA	No	Erosion of natural deposits
Haloacetic Acids [HAAs]–Stage 2 (ppb)	2022	60	NA	26.55	2.01–30.4	23	2.4–30	No	By-product of drinking water disinfection
Nitrate (ppm)	2022	10	10	0.30	NA	0.26	NA	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Total Coliform Bacteria[3] (% positive samples)	2022	5	0	0.65	NA	4.17	NA	No	Naturally occurring
Total Organic Carbon (removal ratio)	2022	TT	NA	2.0[4]	1.6–2.7	1.0	0.6–2.0	No	Naturally present in the environment
TTHMs [total trihalomethanes]–Stage 2 (ppb)	2022	80	NA	37.75	0.6–52.7	28	17–38	No	By-product of drinking water disinfection
Turbidity[5] (NTU)	2022	TT	NA	0.46	NA	0.29	NA	No	Soil runoff
Turbidity (lowest monthly percent of samples meeting limit)	2022	TT = 95% of samples meet the limit	NA	100	NA	100	NA	No	Soil runoff

Tap water samples were collected for lead and copper analyses from sample sites throughout the community

				Henrico County Public Utilities		Richmond City Public Utilities			
SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AL	MCLG	AMOUNT DETECTED (90TH %ILE)	SITES ABOVE AL/TOTAL SITES	AMOUNT DETECTED (90TH %ILE)	SITES ABOVE AL/TOTAL SITES	VIOLATION	TYPICAL SOURCE
Copper (ppm)	2021	1.3	1.3	0.019	0/55	0.063[6]	0/50[6]	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppb)	2021	15	0	<1	0/55	3.7[6]	0/50[6]	No	Lead service lines; Corrosion of household plumbing systems, including fittings and fixtures; Erosion of natural deposits

UNREGULATED SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	Henrico County Public Utilities AMOUNT DETECTED	Henrico County Public Utilities RANGE LOW-HIGH	Richmond City Public Utilities AMOUNT DETECTED	Richmond City Public Utilities RANGE LOW-HIGH	TYPICAL SOURCE
Manganese (ppb)	2022	ND	NA	ND	NA	Leaching from natural deposits
Sodium[7] (ppm)	2022	21.8	NA	12.6	NA	Naturally present in the environment; Water treatment

UNREGULATED CONTAMINANT MONITORING RULE – PART 4 (UCMR4)

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	Henrico County Public Utilities AMOUNT DETECTED	Henrico County Public Utilities RANGE LOW-HIGH	Richmond City Public Utilities AMOUNT DETECTED	Richmond City Public Utilities RANGE LOW-HIGH	TYPICAL SOURCE
Bromochloroacetic Acid (ppb)	2020	1.33	ND–2.05	1.7	0.9–3.3	By-product of drinking water disinfection
Bromodichloroacetic Acid (ppb)	2020	1.05	ND–2.51	2.6	1.0–5.6	By-product of drinking water disinfection
Chlorodibromoacetic Acid (ppb)	2020	ND	ND–0.47	0.4	0.3–0.6	By-product of drinking water disinfection
Dichloroacetic Acid (ppb)	2020	11.58	1.08–18.2	13.3	3.3–23.4	By-product of drinking water disinfection
Monochloroacetic Acid (ppb)	2020	ND	ND–2.15	ND	NA	By-product of drinking water disinfection
Trichloroacetic Acid (ppb)	2020	7.41	ND–12.7	9.6	4.0–16.0	By-product of drinking water disinfection

[1] Amount detected is the maximum of the running annual average. Range is the minimum and maximum of all 2022 samples used to calculate the average.
[2] Sampled in 2018.
[3] We sample for coliforms each month, and the positive samples for Henrico County occurred in January, April, July, and October. The highest number of positive samples during any given month was 1, and the percentage of the total monthly samples this number represents is 0.65. The positive samples for the City of Richmond occurred in February, May, June, July, September, and October, and the highest number of positive samples during any given month was 5. The percentage of the total monthly samples this number represents is 4.17.
[4] Amount detected is the lowest running annual average removal ratio: the lowest ratio of percentage of TOC actually removed to percentage of TOC required to be removed. A value of greater than 1 indicates that the water system is in compliance with TOC removal requirements. A value of less than 1 indicates a violation of the TOC removal requirements.
[5] Turbidity is a measure of the cloudiness of the water. It is monitored because it is a good indicator of the effectiveness of the filtration system.
[6] Sampled in 2022.
[7] The maximum suggested for consumers on low-sodium diets is 20 ppm.

Water Treatment Process

The treatment process consists of a series of steps. First, raw (untreated) water is pumped from the river to the Water Treatment Facility. After it enters the facility, a coagulant is added, and the water then goes to a rapid mixing basin, followed by a flocculation basin. These two steps cause particles (called floc) to adhere to one another, making them heavy enough to settle to the bottom of the sedimentation basins, where the sediments are removed.

The water then undergoes intermediate ozonation, which is used for primary disinfection. Next, the water goes through deep-bed granular activated carbon (GAC) filters. The GAC filters are used for removing turbidity, tastes, odors, and any biodegradable organics or ozonation by-products remaining in the water. Chloramines (as a secondary disinfectant) and fluoride (to promote strong teeth) are added to the filtered water. We also add a corrosion inhibitor to prevent the leaching of harmful metals from materials and components associated with service lines and home plumbing. Finally, the finished water is pumped into the distribution system, which delivers it to your home or business.

Definitions

90th %ile: The levels reported for lead and copper represent the 90th percentile of the total number of sites tested. The 90th percentile is equal to or greater than 90% of our lead and copper detections.

AL (Action Level): 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 a disinfectant 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 a 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 contaminants.

NA: Not applicable.

ND (Not detected): Indicates that the substance was not found by laboratory analysis.

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): A measure of radioactivity.

ppb (parts per billion): One part substance per billion parts water (or micrograms per liter).

ppm (parts per million): One part substance per million parts water (or milligrams per liter).

removal ratio: A ratio between the percentage of a substance actually removed to the percentage of the substance required to be removed.

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