City of Raleigh 2023 Consumer Confidence Report

System ID: 03-92-010

Your Water is Our Passion

We are proud to provide the 2023 Consumer Confidence Report, which is a summary of last year's drinking water quality. Included are details about your sources of water, what it contains, and how it compares to standards set by regulatory agencies. Our goal is to provide you with a safe and dependable supply of drinking water. We do this by investing in our infrastructure, integrating new technology into our processes and complying with industry programs that go above and beyond regulatory requirements.

Everyday we provide critical drinking water services to approximately 640,000 residents and help support over $120 billion in economic activity in Raleigh. This service requires the operation and maintenance of 2 water treatment plants, 27 elevated water storage tanks, ~2,600 miles of water line, ~70,000 water valves and over 21,000 fire hydrants. Here are a few highlights from 2023:

- Treated approximately 18.9 billion gallons of water
- Upgraded flocculation and sedimentation basins at the EM Johnson Water Treatment Plant
- Replaced approximately 3.2 miles of water lines
- Constructed a new Drinking Water Compliance Laboratory
- Awarded "Best Tasting Water" in North Carolina at the One Water Conference for the second straight year.

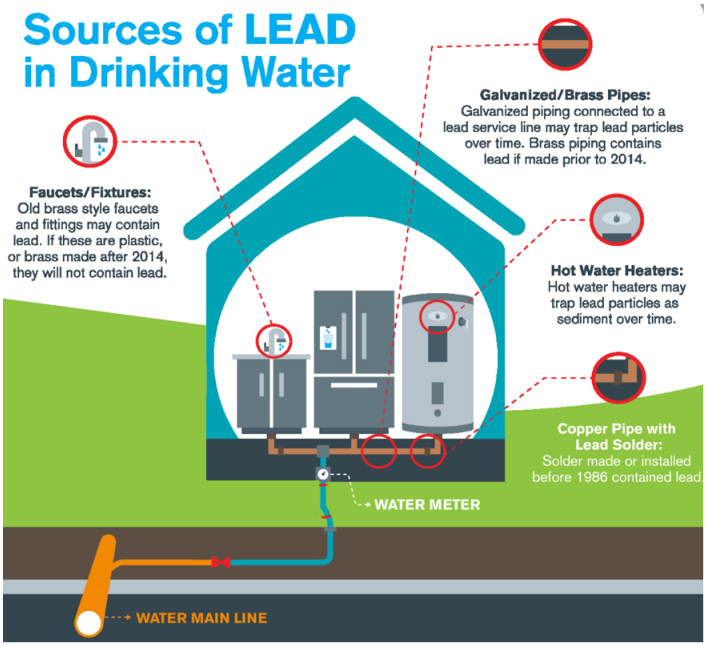
We remain committed to ensuring the high quality of your drinking water and to providing you with this information. If you would like to learn more about this report or request a paper copy, please contact:

Edward Buchan at edward.buchan@raleighnc.gov or (919) 996-3471.

Get The Lead Out!

The Lead and Copper Rule (LCR) is the National Primary Drinking Water Regulation first promulgated in 1991 that requires actions by public water systems to reduce levels of lead and copper in drinking water. On January 15, 2021, the EPA promulgated the Lead and Copper Rule Revisions (LCRR), and the deadline for water systems to comply with these revised requirements is October 16, 2024. On December 6, 2023, EPA published the proposed Lead and Copper Rule Improvements (LCRI) that, when final, will significantly reduce exposure to lead through drinking water. The LCRI proposal builds on the LCRR and the original LCR. The EPA plans to finalize the LCRI prior to the LCRR compliance date of October 16, 2024. More information about these changes can be found here:

https://www.epa.gov/ground-water-and-drinking-water/revised-lead-and-copper-rule



Your residence is connected to the public water distribution system through a small diameter pipe called a service line. In some older systems throughout the US these service lines contained a high level of lead and could represent a source of lead in drinking water. To date, Raleigh Water has never found a lead service line and given the age of our system we do not expect to find any. However, in exceedingly rare cases, the connection between the public system and a service line (called a "gooseneck") can be made from lead. If a service line is galvanized iron, lead from a gooseneck could adhere to the inside of pipe and potentially be released into a residence. Therefore, to ensure compliance with LCRR, Raleigh Water has been using field verifications and machine learning tools to identify galvanized service lines and replace them.

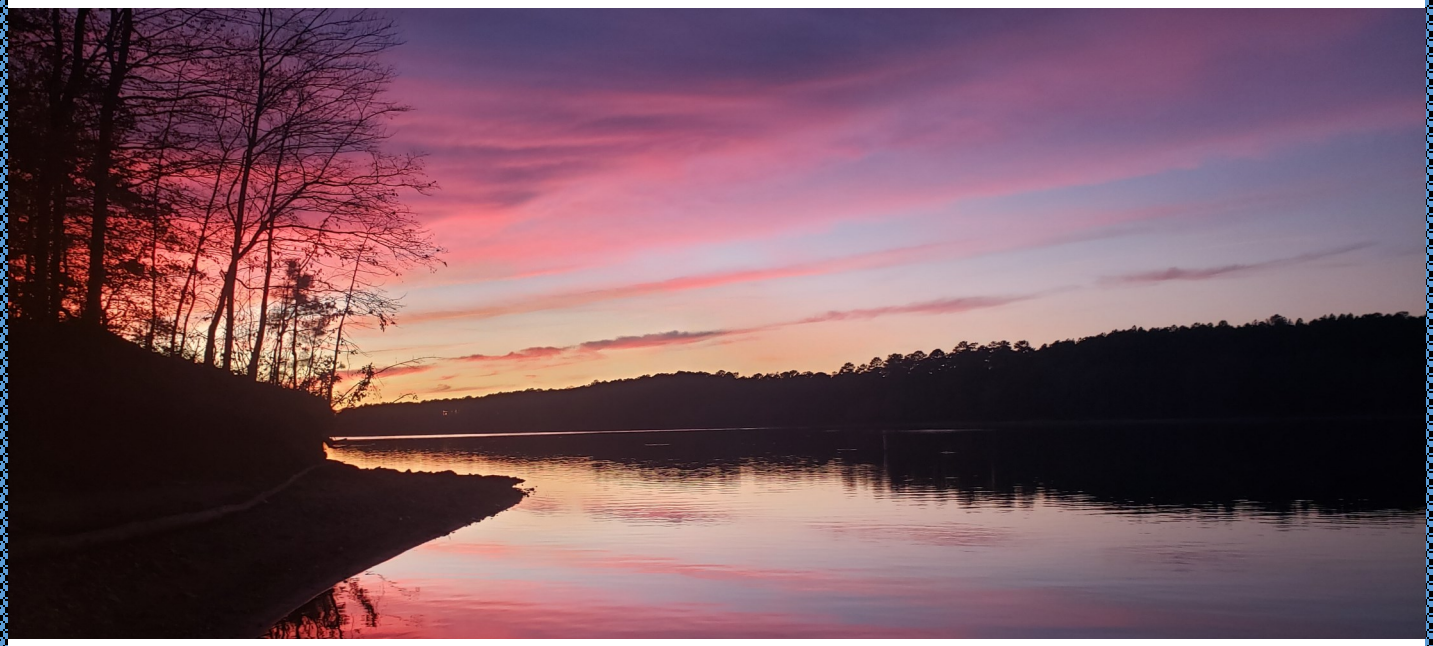
Raleigh Water maintains an active program to minimize the risk of lead exposure through its drinking water supply. Operations staff carefully monitor and adjust pH levels of water to a specific range that reduces the corrosive nature of the water, and a corrosion inhibitor is added in our water treatment process to create and maintain a protective film in pipes that reduces the release of metals, such as lead, from household plumbing. The US EPA Lead and Copper Rule compliance is based on the 90th percentile of samples collected during each monitoring period from homes built in the target period between 1982 and 1985 or homes served by lead service lines. Our water distribution system is below the action level for lead and below the maximum contaminant level (MCL) for copper and is in full compliance with the Lead and Copper Rule.

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. Raleigh 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 2 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. Raleigh Water customers may request a free kit to test for lead in their drinking water, by calling: 919-996-4H20 (4420) or by email: watersamples@raleighnc.gov

For Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead.

Your Drinking Water Sources

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. In Raleigh's case, our source water comes Falls Lake, located in northern Wake County, and Lake Benson which is located in Garner, NC. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases and can pick up contaminants resulting from the presence of animals or from human activity. Contaminants that may be present in source water include microbial contaminants, inorganic contaminants, pesticides and herbicides, organic chemical contaminants and radiological contaminants.



Source Water Assessment

The North Carolina Department of Environmental Quality, Public Water Supply (PWS) Section, Source Water Assessment Program (SWAP) conducts assessments for all drinking water sources across North Carolina. The purpose of the assessments is to determine the susceptibility of each drinking water source (well or surface water intake) to Potential Contaminant Sources (PCSs). The results of the assessment are available in SWAP Assessment Reports that include maps, background Information and a relative susceptibility rating of Higher, Moderate or Lower.

The relative susceptibility rating of each source for Raleigh Water was determined by combining the contaminant rating (number and location of PCSs within the assessment area) and the inherent vulnerability rating (i.e., characteristics or existing conditions of the well or watershed and its delineated assessment area). The assessment findings are summarized in the table below:

Source Name	Susceptibility Rating
Falls Lake	Higher
Lake Benson	Higher

To help reduce potential impacts of upstream contaminant sources, Raleigh Water established a Watershed Protection Program, which to date has helped permanently protected over 11,000 acres and 120 miles of streams in our drinking watersheds. More information about this program is available at this webpage:

https://www.upstreammatters.org/

Raleigh Water also partners with the Center for Applied Ecology at NC State University to provide real time water quality data at Falls Lake to help detect potential water quality issues. More information is available at this webpage:

https://caae.cals.ncsu.edu/water-quality-data/

Confidence in Your Drinking Water:

Laboratory staff from Raleigh Water's Treatment Plant Division perform an extensive level of testing to ensure the safety of your drinking water. Our drinking water laboratories are certified and approved by the State of North Carolina and the USEPA to perform drinking water quality analyses. In 2023, staff chemists, microbiologist and technicians at the drinking water laboratory collected, tested and analyzed Raleigh's drinking water between 6,000 and 7,000 times per month for many substances such as trace metals, petroleum products, pesticides and bacteria. During 2023, the City of Raleigh was in full compliance with all state and national Drinking Water Regulations. The following data represents results for both the EM Johnson and Dempsey E. Benton water treatment plants.

EM Johnson Treatment Plant

Contaminant (units)	Sample Date	Your Water	Range Low High	Secondary MCL
Sodium (ppm)	1/3/2023	29.9	N/A	N/A
Sulfate (ppm)	1/3/2023	32.7	N/A	250
pH, SU	2023	8.40	8.40 - 8.40	6.5 to 8.5
Alkalinity (ppm)	2023	31.1	26.3 - 40.0	N/A
Hardness (ppm)	2023	27.8	24.3 - 30.1	N/A

TURBIDITY*

Contaminant (units)	Treatment Technique (TT) Violation Y/N	Your Water	Treatment Technique (TT) Violation if:	Likely Source of Contamination
Turbidity (NTU) - Highest single turbidity measurement	N	0.10	Turbidity > 1 NTU	Soil runoff
Turbidity (NTU) - Lowest monthly percentage (%) of samples meeting turbidity limits	N	100%	Less than 95% of monthly turbidity measurements are ≤ 0.3 NTU	

*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. The Turbidity rule requires that 95% or more of the monthly samples must be less than or equal to 0.3 NTU.

EM Johnson Treatment Plant (cont)

INORGANIC CONTAMINANTS

Contaminant (units)	Sample Date	MCL Violation Y/N	Your Water	Range Low High	MCLG	MCL	Likely Source of Contamination
Fluoride (ppm)	1/3/2023	N	0.70	N/A	4	4	Erosion of natural deposits; water additive which protects dental health; discharge from fertilizer and aluminum factories

LEAD AND COPPER CONTAMINANTS

Contaminant (units)	Sample Date	Your Water	# of sites found above the	MCLG	MCL	Likely Source of Contamination
Copper (ppm) (90th percentile)	2023	0.05	0	1.3	AL = 1.3	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Lead (ppb) (90th percentile)	2023	<3	0	0	AL = 15	Corrosion of household plumbing systems, erosion of natural deposits

DISINFECTION BYPRODUCT PRECURSORS CONTAMINANTS

Contaminant (units)	TT Violation Y/N	Your Water (RAA Removal Ratio)	Range Monthly Removal Ratio Low-High	MCLG	TT	Compliance Method (Step 1 or ACC#)	Likely Source of Contamination
Total Organic Carbon (removal ratio) (TOC) - TREATED	N	1.37	1.21 - 1.55	N/A	TT	Step 1	Naturally present in the environment

DISINFECTANT RESIDUALS SUMMARY

Disinfectant	Year Sampled	MRDL Violation Y/N	Your Water (highest RAA)	Range Low High	MRDLG	MRDL	Likely Source of Contamination
Chlorine (ppm)	2023	N	2.17	0.00 - 3.51	4	4	Water additive used to control microbes
Chloramines (ppm)	2023	N	2.97	0.18- 3.97	4	4	Water additive used to control microbes

EM Johnson Treatment Plant (cont)

STAGE 2 DISINFECTION BYPRODUCT COMPLIANCE

Monitoring	Year Sampled	MCL Violation Y/N	Your Water (highest	Range Low High	MCLG	MCL	Typical Source
TTHM (ppb)	2023	N	39.1 (highest LRAA at Site B12)	8.60 - 57.4	NA	80	Byproduct of drinking water disinfection
HAA5 (ppb)	2023	N	31.8 (highest LRAA at Site B11)	6.59 – 45.3	NA	60	Byproduct of drinking water disinfection

What You Need to Know About Your Drinking Water:

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 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, and wildlife; inorganic contaminants, 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 chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems; and radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.

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 (800-426-4791).

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 can 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 Safe Drinking Water Hotline (800-426-4791).

Dempsey Benton Treatment Plant

TURBIDITY*

Contaminant (units)	Treatment Technique (TT) Violation Y/N	Your Water	Treatment Technique (TT) Violation if:	Like Source of Contamination
Turbidity (NTU) - Highest single turbidity	N	0.09	Turbidity > 1 NTU	Soil runoff
Turbidity (NTU) - Lowest monthly percentage (%) of samples meeting turbidity	N	100%	Less than 95% of monthly turbidity measurements are ≤ 0.3 NTU	

*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. The Turbidity rule requires that 95% or more of the monthly samples must be less than or equal to 0.3 NTU.

INORGANIC CONTAMINANTS

Contaminant (units)	Sample Date	MCL Violation Y/N	Your Water	Range Low High	MCLG	MCL	Like Source of Contamination
Fluoride (ppm)	1/3/2023	N	0.66	N/A	4	4	Erosion of natural deposits; water additive which protects dental health; discharge from fertilizer

DISINFECTION BYPRODUCT PRECURSORS CONTAMINANTS

Contaminant (units)	TT Violation Y/N	Your Water (RAA Removal Ratio)	Range Monthly Removal Ratio	MCLG	TT	Compliance Method (Step 1 or ACC#)	Likely Source of Contamination
Total Organic Carbon (removal ratio)	N	1.35	1.42 - 1.64	N/A	TT	Step 1	Naturally present in the environment

SYNTHETIC ORGANIC CHEMICAL (SOC) Contaminants Including Pesticides and Herbicides

Contaminant (units)	Sample Date	MCL Violation Y/N	Your Water	Range Low High	MCLG	MCL	Like Source of Contamination
Simazine (ppb)	2023	N	0.12	N/A	4	4	Herbicide runoff

WATER CHARACTERISTICS CONTAMINANTS

Contaminant (units)	Sample Date	Your Water	Range Low High	Secondary MCL
Sodium (ppm)	1/3/2023	21.8	NA	N/A
Sulfate (ppm)	1/3/2023	37.2	N/A	250
pH, SU	2023	8.37	8.32 - 8.42	6.5 to 8.5
Alkalinity, ppm	2023	30.5	25.3 - 38.6	N/A
Hardness, ppm	2023	24.7	20.3 - 29.2	N/A

Glossary of Terms

ACTION LEVEL (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

CHLORAMINATION: the process of adding ammonia to drinking water which already has chlorine added as a disinfectant. The ammonia combines with the existing chlorine which is called free chlorine to create chloramines.

CRYPTOSPORIDIUM: Cryptosporidium is a microorganism that can cause intestinal illness. Raleigh Water voluntarily tests for Cryptosporidium and DID NOT detect Cryptosporidium in its drinking water in 2021.

HALOACETIC ACIDS (HAAS): A group of chemicals known as disinfection byproducts. These form when a disinfectant reacts with naturally occurring organic and inorganic matter in the water.

MAXIMUM RESIDUAL DISINFECTION LEVEL GOAL (MRDLG): The "Level" (MRDLG) 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.

MAXIMUM RESIDUAL DISINFECTION LEVEL (MRDL): The "Highest Level" (MRDL) of a disinfectant allowed in drinking water. There is clear evidence that addition of a disinfectant is necessary for control of microbial contaminants.

MAXIMUM CONTAMINANT LEVEL (MCL): The "Maximum Allowed" (MCL) is 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.

MAXIMUM CONTAMINANT LEVEL GOAL (MCLG): The "Goal" (MCLG) is 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.

Extra Note: MCLs are set at very stringent levels. To understand the possible health effects described for many regulated constituents, a person would have to drink 2 liters of water every day at the MCL level for a lifetime to have a one-in-a-million chance of having the described health effect.

MTBE: Raleigh Water also tested for Methyl tert-butyl ether (MTBE) and found it to be below the detection limit of 5 ppb for MTBE. At this time no limit for MTBE has been established, however the EPA is considering a limit of 30 ppb.

NOT-APPLICABLE (N/A): Information not applicable/not required for that particular water system or for that particular Rule.

NEPHELOMETRIC TURBIDITY UNIT (NTU): Nephelometric turbidity unit is a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

PARTS PER MILLION (PPM) OR MILLIGRAMS PER LITER (MG/L): One part per million corresponds to one minute in two years or a single penny in $10,000.

PARTS PER BILLION (PPB) OR MICROGRAMS PER LITER: One part per billion corresponds to one minute in 2,000 years, or a single penny in $10,000,000.

PICOCURIES PER LITER (PCI/L): Picocuries per liter is a measure of the radioactivity in water.

RADON: Radon is a radioactive gas that you can't see, taste, or smell. It is found naturally occurring throughout the U.S. EPA expects to issue a Radon Rule, which will set a standard for Radon in drinking water. Raleigh Water tested for Radon in its finished water and found it to be <100 pCi/L. There is no current MCL for Radon. However, the EPA is considering a MCL of 300 pCi/L.

TOTAL TRIHALOMETHANES (TTHMS): A group of chemicals known as disinfection byproducts. These form when a disinfectant reacts with naturally occurring organic and inorganic matter in the water.

TREATMENT TECHNIQUE (TT): A treatment technique is a required process intended to reduce the presence of a contaminant in drinking water.

Per-and Polyfluorinated Substances (PFAS)

PFAS are synthetic chemicals that have been manufactured and used by a broad range of industries since the 1940s. PFAS are used in many applications because of their unique physical properties such as resistance to high and low temperatures, resistance to degradation, and nonstick characteristics. They are commonly used in products like food packaging, dental floss, carpeting, water proof clothing and cookware. PFAS have been detected worldwide in the air, soil, and water.

Due to their widespread use and persistence in the environment, most people in the United States have been exposed to PFAS. There is now evidence that continued exposure above specific levels to certain PFAS may cause adverse health effects. In response, the EPA established Maximum Contaminant Levels (MCLs) for six PFAS including perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), perfluorononanoic acid (PFNA), hexafluoropropylene oxide dimer acid (HFPO-DA, commonly known as GenX Chemicals), perfluorohexane sulfonic acid (PFHxS), and perfluorobutane sulfonic acid (PFBS). The MCLs for PFOA and PFOS at 4 parts per trillion (ppt), which is the level that can be reliably measured. The rule also places limits on any mixture containing one or more of PFNA, PFHxS, PFBS, and/or GenX Chemicals. For these PFAS, water systems use a hazard index calculation to determine if the combined levels of these PFAS pose a potential risk (calculation should be below "1.0"). Concentrations of these compounds in Raleigh's drinking water have usually ranged from non-detectable to 4 ppt (PFOA) and non-detectable to 5.5 ppt (PFOS) and from non-detectable to 3.5 ppt (PFBS). The hazard index calculation for Raleigh's drinking water is 0.0017

In response, Raleigh Water has adjusted our treatment processes in order to reliably meet the proposed regulations and we are evaluating additional treatment technologies which may be integrated into our facilities in the future.

More information is available on our webpage: https://raleighnc.gov/water-and-sewer/perfluorinated-chemicals-data-and-information

2023 PFAS Results

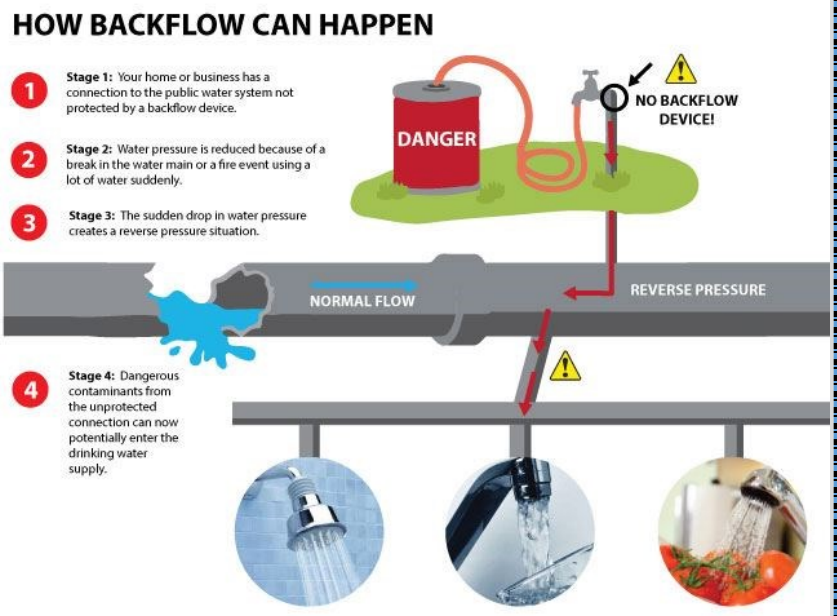
units: **Parts per Trillion**

		1/19/2023				4/18/2023				7/26/2023			
		EMJWTP		DEBWTP		EMJWTP		DEBWTP		EMJWTP		DEBWTP	
Perfluorinated Compounds Contaminant	**EPA MRL**	**Finished**	**Raw**	**Finished**	**Raw**	**Finished**	**Raw**	**Finished**	**Raw**	**Finished**	**Raw**	**Finished**	**Raw**
GenX	5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0				
Perfluorobutanesulfonic acid (PFBS)	3.0	3.1	3.4	<3.0	<3.0	<4.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Perfluorooctanesulfonic acid (PFOS)	4.0	<4.0	5.7	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	4.7	4 .7	<4.0	<4.0
Perfluorooctanoic acid (PFOA)	4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0

NEED TO KNOW INFORMATION

Backflow Prevention Devices

Backflow prevention devices protect the potable water supply by allowing water in only one direction to prevent potential backsiphonage of pollutants or contaminants from entering the public water supply. All commercial connections including domestic, fire and lawn irrigation are required to have a backflow device installed and tested annually. Every residential irrigation system is required to have a backflow assembly installed and tested every three years. If you have a backflow prevention device, please help us protect the public water system and make sure it is working properly.



If you would like to know more about backflow prevention, please call: (**919) 996-2747**
Or visit our backflow webpage: https://raleighnc.gov/backflow-frequently-asked-questions

Capital Infrastructure Projects for the Capital City

Raleigh Water is dedicated to providing safe and reliable water services to our customers 24/7/365. This is why we also invest our capital funds into replacing, upgrading and repairing our critical water infrastructure. To find out more about our Capital Projects, please visit our project page to see how we are improving our infrastructure for not only today, but for the future a well:

https://raleighnc.gov/water-and-sewer/raleigh-water-capital-improvement-program

See or Experience a Water Problem?

Please call Raleigh to report an unusual taste or odor with your tap water, a water main break or sanitary sewer backup or overflow. To report a main break or sewer backup/overflow, please call **(919) 996-3245**. Thank you for your help!

Raleigh Water