

2022 Annual Drinking Water Quality Report

Western Carolina University Water Treatment Plant

We are pleased to present to you this year's Annual Drinking Water Quality Report. This report is a snapshot of last year's water quality. Included are details about the source of water, what it contains, and how it compares to standards set by regulatory agencies. Our constant goal is to provide you with a safe and dependable supply of drinking water. We are committed to ensuring the quality of your water and to providing you with this information. We are proud to report that our drinking water met all federal and state standards for drinking water during 2022. This report is updated yearly. **If you have any questions about this report or concerning your water, please contact Kristy Maddy at 828-227-7441 or by email at kmaddy@wcu.edu.**

What EPA Wants You to Know

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 (1-800-426-4791).

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).

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 storm water 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 storm water 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 storm water runoff, and septic systems; and radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.

To ensure that tap water is safe to drink, EPA prescribes regulations which limit the amounts of certain contaminants in water provided by public water systems. FDA regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. For information about the Safe Drinking Water Act, including current regulations and basic drinking water information, visit the EPA website at <https://www.epa.gov/sdwa>.

Source Water

The water that is used by this system is surface water which comes from a pool formed by the dam on the Tuckasegee River in Cullowhee. https://en.wikipedia.org/wiki/Tuckasegee_River

Help Protect Your Source Water

Protection of drinking water should be everyone's responsibility. You can help protect your community's drinking water source in several ways: do not litter, dispose of chemicals properly, minimize the use of fertilizers and pesticides especially where runoff may occur, take used motor oil to a recycling center and volunteer in your community to participate in group efforts to protect your source.

Source Water Assessment Program

The North Carolina Department of Environmental Quality (DEQ), Public Water Supply (PWS) Section, Source Water Assessment Program (SWAP) conducted assessments for all drinking water sources across North Carolina. The purpose of the assessments was 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 the source for the Western Carolina University Water Treatment Plant 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:

Susceptibility of Sources to Potential Contaminant Sources (PCSs)

<i>Source Name</i>	<i>Susceptibility Rating</i>	<i>SWAP Report Date</i>
<i>Tuckasegee River</i>	<i>Higher</i>	<i>September 2021</i>

It is important to understand that a susceptibility rating of “higher” does not imply poor water quality, only the system’s potential to become contaminated by PCSs in the assessment area.

The complete SWAP Assessment report for the WCU Water Treatment Plant may be viewed on the Web at:

<https://www.ncwater.org/?page=600> by entering **0150116** or **Western Carolina Univ WTP** in the search criteria box. Note that because SWAP results and reports are periodically updated by the PWS Section, the results available on this web site may differ from the results that were available at the time this CCR was prepared. If you are unable to access your SWAP report on the web, you may mail a written request for a printed copy to: Source Water Assessment Program – Report Request, 1634 Mail Service Center, Raleigh, NC 27699-1634, or email requests to swap@ncdenr.gov. Please indicate your system name, number, and provide your name, mailing address and phone number.

Water Quality

We routinely monitor for over 150 contaminants in your drinking water per Federal and State Laws. We monitor the drinking water for contaminants such as those listed below:

- **Asbestos** – includes testing for Chrysotile, Amphibole and Total Asbestos.
- **Total Coliform Bacteria** – includes testing for Total Coliform bacteria and Fecal/*E.coli* bacteria. Testing for Fecal/*E.coli* bacteria is required if total coliform is present in the sample.
- **Disinfectant Residuals** – tested on site with the collection of each compliance bacteriological sample, at the same time and site and is monitored weekly throughout the distribution system.
- **Haloacetic Acids** – includes testing for Monochloroacetic Acid, Dichloroacetic Acid, Trichloroacetic Acid, Monobromoacetic Acid, Dibromoacetic Acid (all combined=Total Haloacetic Acids).
- **Inorganic chemicals** – includes testing for Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cyanide, Fluoride, Iron, Manganese, Mercury, Nickel, pH, Selenium, Sodium, Sulfate, and Thallium.
- **Lead and Copper** – monitored by collecting the required number of samples in the distribution system and getting each of the samples tested for both lead and copper.
- **Nitrate/ (NI) Nitrite** – includes testing for nitrate and/or nitrite.
- **Radionuclides** -includes testing for Gross Alpha, Combined Uranium, Combined Radium 226 & 228.
- **Synthetic Organic Chemicals/Pesticides** –includes testing for 2,4-D, 2,4,5-TP (Silvex), Alachlor, Atrazine, Benzo(a)pyrene, Carbofuran, Chlordane, Dalapon, Di(2-ethylhexyl)adipate, Di(2-ethylhexyl)phthalate, Dibromochloropropane (DBCP), Dinoseb, Endrin, Ethylene dibromide (EDB), Heptachlor, Heptachlor Epoxide, Hexachlorobenzene, Hexachlorocyclopentadiene, Lindane, Methoxychlor, Oxamyl(vydate), PCBs, Pentachlorophenol, Picloram, Simazine, Toxaphene.
- **Total Organic Carbon** – samples taken at the Raw Water-Source Tap to be tested for Alkalinity and Total Organic Carbon (TOC). Samples taken at the Combined Filter Water Tap for treated water to be tested for TOC. Source water samples and treated water samples must be collected on the same day.

- **Total Trihalomethanes** – includes testing for Chloroform, Bromoform, Bromodichloromethane, and Chlorodibromomethane (all combined=Total Trihalomethanes).
- **Volatile Organic Chemicals** –includes testing for 1,2,4-Trichlorobenzene, Cis-1,2-Dichloroethylene, Xylenes (Total), Dichloromethane, o-Dichlorobenzene, p-Dichlorobenzene, Vinyl Chloride, 1,1, -Dichloroethylene, Trans-1,2, -Dichloroethylene, 1,2-Dichloroethane, 1,1,1-Trichloroethane, Carbon Tetrachloride, 1,2-Dichloropropane, Trichloroethylene, 1,1,2-Trichloroethane, Tetrachloroethylene, Chlorobenzene, Benzene, Toluene, Ethylbenzene, and Styrene.
- **Water Quality Parameters** - includes Orthophosphate (as PO₄), pH, Alkalinity and Water Temperature testing.

Important Drinking Water Definitions:

In the tables in this report, there will be terms and abbreviations you might not be familiar with. To help you better understand these terms, see the drinking water definitions below.

- ***Not-Applicable (N/A)*** – Information not applicable/not required for that water system or for that rule.
- ***Non-Detects (ND)*** - Laboratory analysis indicates that the contaminant is not present at the level of detection set for the particular methodology used.
- ***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 (ug/L)*** - One part per billion corresponds to one minute in 2,000 years, or a single penny in \$10,000,000.
- ***Nephelometric Turbidity Unit (NTU)*** - Nephelometric turbidity unit is a measure of the clarity of water. Turbidity more than 5 NTU is just noticeable to the average person.
- ***Action Level (AL)*** - The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
- ***Treatment Technique (TT)*** - A required process intended to reduce the level of a contaminant in drinking water.
- ***Maximum Residual Disinfection Level (MRDL)*** – 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.
- ***Maximum Residual Disinfection Level Goal (MRDLG)*** – 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.
- ***Locational Running Annual Average (LRAA)*** – The average of sample analytical results for samples taken at a particular monitoring location during the previous four calendar quarters under the Stage 2 Disinfectants and Disinfection Byproducts Rule.
- ***Running Annual Average (RAA)*** – The average of sample analytical results for samples taken during the previous four calendar quarters.
- ***Maximum Contaminant Level (MCL)*** - 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 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.

Water Quality Data Tables of Detected Contaminants

The tables below list only the drinking water contaminants that we detected in the last round of sampling for each contaminant group. All the contaminant levels were below the MCL's. The presence of contaminants does not necessarily indicate that the water poses a health risk.

The EPA and State allow us to monitor for certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. **Unless otherwise noted, the data presented in these tables is from testing done January 1 through December 31, 2022.**

Turbidity

Contaminant (units)	Treatment Technique (TT) Violation Y/N	Your Water	MCLG	Treatment Technique (TT) Violation if:	Likely Source of Contamination
Turbidity (NTU) - Highest single turbidity measurement	N	0.154 NTU	N/A	Turbidity > 1 NTU	Soil runoff
Turbidity (NTU) - Lowest monthly percentage (%) of samples meeting turbidity limits	N	100 %	N/A	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 (Nephelometric Turbidity Unit). **The average turbidity during 2022 was 0.029 NTU.**

Lead and Copper Contaminants

Contaminant (units)	Sample Date	Your Water (90 th Percentile)	Number of sites found above the AL	MCLG	AL	Likely Source of Contamination
Copper (ppm) (90 th percentile)	8-9-22	0.173 ppm	0	1.3	AL=1.3	Corrosion of household plumbing systems; erosion of natural deposits
Lead (ppb) (90 th percentile)	8-9-22	<3 ppb	0	0	AL=15	Corrosion of household plumbing systems; erosion of natural deposits

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. WCU WTP is responsible for providing high quality drinking water but cannot always 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 or a water fountain 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 additional testing. 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>.

Total Organic Carbon (TOC)

Contaminant (units)	TT Violation Y/N	Your Water (Lowest RAA)	Range Monthly Removal Ratio Low - High	MCLG	Treatment Technique (TT) violation if:	Likely Source of Contamination
Total Organic Carbon (TOC) Removal Ratio (no units)	N	<1 ppm	100 % removed in each quarter 1.1 to 1.7 ppm removed	N/A	If Removal Ratio RAA >1.00 and alternative compliance criteria was not met	Naturally present in the environment

During each quarter of 2022, **compliance with the TOC rule was met** by the Running Annual Average of each TOC removal ratio being below 1.0 ppm and the alternative compliance criteria 2 of treated water being below 2.0 ppm.

Disinfectant Residuals Summary

	Year Sampled	MRDL Violation Y/N	Your Water (Highest RAA)	Range		MRDLG	MRDL	Likely Source of Contamination
				Low	High			
Chlorine (ppm) (Distribution System)	2022	N	0.72 ppm	0.49	1.02	4	4	Water additive used to control microbes

Stage 2 Disinfection Byproduct Compliance (Based upon Locational Running Annual Average (LRAA))

Disinfection Byproduct	Year Sampled	MCL Violation Y/N	Your Water (Highest LRAA)	Range		MCLG	MCL	Likely Source of Contamination
				Low	High			
TTHM (ppb)	2022	N				N/A	80	Byproduct of drinking water disinfection
NCCAT B01			35 ppb	20	46			
Killian B02			28 ppb	18	37			
HAA5 (ppb)	2022	N				N/A	60	Byproduct of drinking water disinfection
NCCAT B01			32 ppb	22	38			
Killian B02			30 ppb	21	32			

The PWS Section requires monitoring for other misc. contaminants, some for which the EPA has set national secondary drinking water standards (SMCLs) because they may cause cosmetic effects or aesthetic effects (such as taste, odor, and/or color) in drinking water. The contaminants with SMCLs normally do not have any health effects and normally do not affect the safety of your water.

Other Miscellaneous Water Characteristics Contaminants

Contaminant (units)	Sample Date	Your Water	Range		SMCL
			Low	High	
Sodium (ppm)	2-7-22	24.4 ppm		N/A	N/A
Sulfate (ppm)	2-7-22	23 ppm		N/A	250 mg/L or ppm
pH	2-7-22	7.5	6.9	7.5	6.5 to 8.5