

2021 Annual Drinking Water Quality Report



Water System Number: NC02-01-015

The City of Graham is 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 your 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 want you to understand the efforts we make to continually improve the water treatment process and protect our water resources. Our staff is committed to ensuring the quality of your water. **If you have any questions about this report or concerning your water, please contact the Graham-Mebane Water Plant at 336-578-3264. We want our valued customers to be informed about their water utility.**

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 (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).

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. City of Graham 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. 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>.

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.

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. FDA regulations establish limits for contaminants in bottled water, which must provide the same protection for public health.

When You Turn on Your Tap, Consider the Source



The source water treated by the City of Graham is surface water from the Graham-Mebane Lake which is located at 3218 Bason Road, Mebane, NC 27302.

Source Water Assessment Program (SWAP) Results

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 each source for The City of Graham 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)

Source Name	Susceptibility Rating	SWAP Report Date
Graham-Mebane Lake	Lower	September 9, 2020

The complete SWAP Assessment report for City of Graham may be viewed on the Web at: <https://www.ncwater.org/?page=600> 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. If you have any questions about the SWAP report please contact the Source Water Assessment staff by phone at 919-707-9098.

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.

Help Protect Your Source Water

Protection of drinking water is everyone’s responsibility. You can help protect your community’s drinking water source(s) in several ways: dispose of chemicals properly, take used motor oil to a recycling center, volunteer in your community to participate in group efforts to protect your source water.

No Violations Were Received for Your Water System for 2021

The City of Graham is required to monitor your drinking water for specific contaminants on a regular basis to ensure drinking water is meeting the health standards. During 2021, or during any compliance period that ended in 2021, The City of Graham had no violations of drinking water quality standards.

Important Drinking Water Abbreviations & Definitions:

Not-Applicable (N/A) – Information not applicable/not required for that particular water system or for that particular rule.

Non-Detects (ND) - Laboratory analysis indicates that the contaminant is not present at the level of detection set for the particular methodology used.

Milligrams per liter (mg/L) – A measure of mass per unit volume to express concentration of a solution, also referred to as “parts per million” – often abbreviated as ppm. One part per million corresponds to one minute in two years or a single penny in \$10,000.

Micrograms per liter (ug/L) – A measure of mass per unit volume to express the concentration of a solution, also referred to as “parts per billion” – often abbreviated as ppb. One part per billion corresponds to one minute in 2,000 years, or a single penny in \$10,000,000.

Nanograms per liter (nanograms/L) – A measure of mass per unit volume to express the concentration of a solution, also referred to as “parts per trillion” – often abbreviated as ppt. One part per trillion corresponds to one minute in 2,000,000 years, or a single penny in \$10,000,000,000.

Picocuries per liter (pCi/L) - Picocuries per liter is a measure of the radioactivity in water.

Million Fibers per Liter (MFL) - Million fibers per liter is a measure of the presence of asbestos fibers that are longer than 10 micrometers.

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.

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.

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

We routinely monitor for over 150 contaminants in your drinking water according to Federal and State laws. The tables below list all the drinking water contaminants that we detected in the last round of sampling for each particular contaminant group. The presence of contaminants does not necessarily indicate that water poses a health risk. **Unless otherwise noted, the data presented in this table is from testing done January 1 through December 31, 2021.** The EPA and the 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. Some of the data, though representative of the water quality, is more than one-year-old.

REVISED TOTAL COLIFORM RULE:

Microbiological Contaminants in the Distribution System

For systems that collect **less than 40** samples per month

Contaminant (units)	MCL Violation Y/N	Your Water	MCLG	MCL	Likely Source of Contamination
Total Coliform Bacteria (presence or absence)	N	0	0	TT*	Naturally present in the environment
<i>E. coli</i> (presence or absence)	N	0	0	Routine and repeat samples are total coliform-positive and either is <i>E. coli</i> -positive or system fails to take repeat samples following <i>E. coli</i> -positive routine sample or system fails to analyze total coliform-positive repeat sample for <i>E. coli</i> <u>Note:</u> If either an original routine sample and/or its repeat samples(s) are <i>E. coli</i> positive, a Tier 1 violation exists.	Human and animal fecal waste

* If a system collecting fewer than 40 samples per month has two or more positive samples in one month, an assessment is required.

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	0.18 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. Turbidity is measured at multiple locations throughout the treatment process. The turbidity above represents Combined Filter Effluent (CFE) turbidity. To meet current turbidity requirements, water must be less than 0.3 turbidity units 95% of the time and never allowed to exceed 1.0 turbidity units in the Combined Filter Effluent (CFE). The 2021 average turbidity for our Combined Filter Effluent was 0.08 NTU.

Inorganic Contaminants

Contaminant (units)	Sample Date	MCL Violation Y/N	Your Water	Range Low High	MCLG	MCL	Likely Source of Contamination
Fluoride (ppm)	7/14/21	N	0.76	N/A	4	4	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories

The respective concentration of fluoride reported above is the result of a single sample collected on 7/14/21. However, fluoride analysis is conducted every day for process control at the treatment plant. The average fluoride concentration for 2021 was 0.74 mg/L.

There are a number of organic chemicals that are of potential concern in drinking water. This group includes Volatile Organic Chemicals (VOCs) which vaporize easily. It also includes Synthetic Organic Chemicals (SOCs) which are manmade and include substances such as pesticides and herbicides. These organic chemicals may come from various sources like agriculture, urban storm runoff, residential uses, industrial processes and petroleum production, gas stations and septic systems.

Volatile Organic Chemical (VOC) Contaminants

City of Graham is required to test for 21 Volatile Organic Chemicals every year. Volatile Organic Chemicals were analyzed in February of 2021 and there were no detections found for any of the 21 VOCs.

Synthetic Organic Chemical (SOC) Contaminants Including Pesticides and Herbicides

Contaminant (units)	Sample Date	MCL Violation Y/N	Your Water	Range Low High	MCLG	MCL	Likely Source of Contamination
Atrazine (ppb)	5/19/20	N	0.1	N/A	3	3	Runoff from herbicide used on row crops
Simazine (ppb)	1/25/21	N	0.18	N/A	4	4	Herbicide runoff

City of Graham is required to test for 26 Pesticides and Synthetic Organic Chemicals in 2 consecutive quarters every three years. Testing was done for these in January, April and May of 2020. There were 24 SOCs that were not detected. City of Graham is required to test for Simazine on an annual basis.

Lead and Copper Contaminants

The US EPA requires that the City of Graham perform household testing in accordance with the 1994 Lead and Copper Rule. According to that rule, 90% of the samples taken from locations in Graham identified as “high risk” must have less than 15 parts per billion (ppb or ug/L) of lead and less than 1.3 parts per million (ppm or mg/L) of copper. These sample locations are classified as “high risk” because they were constructed using copper pipe and lead solder as components in the plumbing system. New building codes and regulations no longer permit houses to be built using these components. Lead and copper samples were collected by the homeowner and analyzed by a certified laboratory. Samples were collected after the water had been left undisturbed in the household plumbing for an extended period of time. This is intended to collect a water sample that represents the “worst case” for lead and copper. Testing in 2019 indicated that the average concentration of lead in these “high risk” homes was less than 3 ppb and the average concentration of copper was less than 0.050 ppm, well below the regulatory limits. Data presented in the table below is from the most recent monitoring event. The City of Graham is required to monitor for lead and copper every three years. The next monitoring period will occur in 2022.

Contaminant (units)	Sample Date	Your Water	Number of sites found above the AL	MCLG	AL	Likely Source of Contamination
Copper (ppm) (90 th percentile)	7/19/19	<0.050	0	1.3	AL=1.3	Corrosion of household plumbing systems; erosion of natural deposits
Lead (ppb) (90 th percentile)	7/17/19	3	0	0	AL=15	Corrosion of household plumbing systems; erosion of natural deposits

Radiological Contaminants

Radiological contaminants in source water may be naturally occurring or may be the result of oil and gas production and mining activities. Data presented in the table below is from the most recent monitoring event. The City of Graham is required to monitor for radiological contaminants every 9 years.

Contaminant (units)	Sample Date	MCL Violation Y/N	Your Water	Range Low High	MCLG	MCL	Likely Source of Contamination
Beta/photon emitters (pCi/L)	1/25/17	N	2.8	N/A	0	50 *	Decay of natural and man-made deposits
Combined radium (pCi/L)	1/25/17	N	1.31	N/A	0	5	Erosion of natural deposits

* Note: The MCL for beta/photon emitters is 4 mrem/year. EPA considers 50 pCi/L to be the level of concern for beta particles.

Total Organic Carbon (TOC)

Contaminant (units)	TT Violation Y/N	Your Water (RAA Removal Ratio)	Range Monthly Removal Ratio Low - High	MCLG	TT	Likely Source of Contamination	Compliance Method (Step 1 or ACC#_)
Total Organic Carbon (removal ratio) (TOC)- TREATED	N	1.43	1.24 – 1.66	N/A	TT	Naturally present in the environment	Step 1

For 2021 the average raw water TOC was 5.73 mg/L and the average finished water TOC was 2.02 mg/L. The average TOC removal rate was 64.75% with removal rates ranging from 55.99% to 70.99% during 2021.

Disinfectant Residuals Summary

	Year Sampled	MRDL Violation Y/N	Your Water (highest RAA)	Range Low High	MRDLG	MRDL	Likely Source of Contamination
Chlorine (ppm)	2021	N	1.84	0.24 – 3.2	4	4.0	Water additive used to control microbes
Chloramines (ppm)	2021	N	2.37	0.4 – 3.4	4	4.0	Water additive used to control microbes

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

Trihalomethanes (TTHM) and Haloacetic acids (HAA5) are disinfection byproducts that are formed when organic compounds that are in water react with chlorine used to disinfect the drinking water.

Disinfection Byproduct	Year Sampled	MCL Violation Y/N	Your Water (highest LRAA)	Range Low - High	MCLG	MCL	Likely Source of Contamination
TTHM (ppb)							
B01	2021	N	35	27.9 – 37.5	N/A	80	Byproduct of drinking water disinfection
B02	2021	N	32	26.4 – 36.5	N/A	80	Byproduct of drinking water disinfection
B03	2021	N	29	20.8 – 32.0	N/A	80	Byproduct of drinking water disinfection
B04	2021	N	32	21.9 – 38.5	N/A	80	Byproduct of drinking water disinfection
HAA5 (ppb)							
B01	2021	N	28	17.8 – 27.2	N/A	60	Byproduct of drinking water disinfection
B02	2021	N	23	14.3 – 26.4	N/A	60	Byproduct of drinking water disinfection
B03	2021	N	20	13.6 – 21.5	N/A	60	Byproduct of drinking water disinfection
B04	2021	N	23	15.9 – 26.7	N/A	60	Byproduct of drinking water disinfection

Cryptosporidium sp.

Cryptosporidium sp. is a microscopic organism that, when ingested, may cause diarrhea, fever and other gastrointestinal symptoms. The organism occurs naturally in surface waters and comes from animal wastes. Cryptosporidium sp. is eliminated by an effective treatment combination of coagulation, sedimentation, filtration and disinfection. The Graham-Mebane Lake, your source water, underwent a 2-year sampling program which was completed in 2018. The average concentration of the sampling event was 0.008 oocysts/L.

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	
Iron (ppm)	7/14/21	0.088	N/A		0.3 mg/L
Manganese (ppm)	7/14/21	0.013	N/A		0.05 mg/L
Sodium (ppm)	7/14/21	33.9	N/A		N/A
pH	7/14/21	7.7	N/A		6.5 to 8.5

The Unregulated Contaminant Monitoring Rule 4 (UCMR4) required water systems to collect and analyze water samples for 20 chemicals and 10 cyanotoxins for which the EPA has not established drinking water standards, therefore are not regulated. The purpose of unregulated contaminant monitoring is to assist EPA in determining the occurrence of unregulated contaminants in drinking water and whether future regulations are warranted. The table below only includes data for the UCMR4 parameters that were detected.

Unregulated Contaminants

UCMR4 Parameter	Year Tested	Source Water- Graham-Mebane Lake		Graham-Mebane WTP		Distribution System	
		Average	Range	Average	Range	Average	Range
Manganese, ug/L	2020	N/A	N/A	11.62	3.66 – 27.6	N/A	N/A
Bromide, ug/L	2020	21.9	21.1 – 22.6	N/A	N/A	N/A	N/A
Total Organic Carbon (TOC) ug/L	2020	6,870	6,090 – 7,870	N/A	N/A	N/A	N/A
Haloacetic Acids- 9, ug/L	2020	N/A	N/A	N/A	N/A	28.63	21.82 – 41.02

The Graham-Mebane Treatment Plant is staffed by professional, trained and certified water facility operators. We take pride in our profession and our staff is committed to providing a safe and dependable supply of water for our citizens. Please let us know if you have any questions or concerns regarding the City of Graham’s water supply.

The City Council of Graham is the authority that determines infrastructure funding and the council members, under advisement of the City’s management staff, make other decisions that affect the water supply and the quality of the drinking water. The City of Graham City Council meets on the second Tuesday of every month at 6:00 p.m. in the City of Graham Municipal Building located at 201 South Main Street in Graham.

The current city council members are:

Jennifer Talley, Mayor

Ricky Hall, Mayor Pro Tem



Bobby Chin

Joey Parsons

Bonnie Whitaker