2022 Annual Drinking Water Quality Report
CITY OF KANNAPOLIS
NC ID # 01-80-065

We are pleased to present 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(s) 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 to protect our water resources. We are committed to ensuring the quality of your water. **If you have any questions about this report or concerning your water, please contact Alex Anderson at (704) 920-4252. We want our valued customers to be informed about their water utility. Kannapolis City Council welcomes public comments at their meetings held on the second and fourth Mondays of each month at 6:30 p.m. at the Kannapolis City Hall, 401 Laureate Way. For more information, contact the City Clerk at (704) 920-4300.**

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. The City of Kannapolis is responsible for providing high quality drinking water but cannot control the variety of materials used in your 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 number 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

Kannapolis is in the 10.6 square mile Irish Buffalo Creek Watershed, which is part of the Rocky River sub-basin of the major Yadkin River Basin. The City of Kannapolis' drinking water comes primarily from Kannapolis Lake, a 289-acre reservoir that stretches from Pump Station Road to Cannon Farm Road. The lake has a 1.35 billion gallon holding capacity. We have two supplemental raw water sources, Lake Don T. Howell in Cabarrus County and Second Creek in Rowan County that can supply Kannapolis Lake when necessary. Water is also obtained through system interconnections from the City of Concord and the City of Salisbury. The average daily demand for water in Kannapolis is 4-million gallons per day. To learn more about our watershed, go to the U.S. EPA's Surf Your Watershed web site at www.epa.gov/surf .

Source Water Assessment Program (SWAP) Results

The North Carolina Department of Environment and Natural Resources (DENR), 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 Kannapolis 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
Kannapolis Lake	Moderate	September 9, 2020
Second Creek/Back Creek	Moderate	September 9, 2020
Lake Don T. Howell	Moderate	September 9, 2020
Lake Fisher	Higher	September 9, 2020
Lake Concord	Moderate	September 9, 2020
Yadkin River	Moderate	September 9, 2020
Tuckertown Reservoir	Higher	September 9, 2020
Narrows Reservoir/Badin Lake	Moderate	September 9, 2020

The complete SWAP Assessment report for The City of Kannapolis 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.

The City of Kannapolis and the adjacent communities have adopted a regional approach in utilizing water resources. Kannapolis has interconnections with Concord, Salisbury, and Landis. Kannapolis purchased approximately 0.3 million gallons per day from Concord for usage in the Shiloh Church Road (NC ID #20-13-022) section of the City of Kannapolis. Kannapolis has not purchased water from the City of Salisbury for the year (NC ID #01-80-010). Kannapolis and Concord (NC ID #01-13-010) are interconnected in several adjacent community areas to supply water to each other when necessary. The City of Kannapolis supplied approximately 0.3 million gallons per day to the Town of Landis. Distribution system water receiving data is included in sampling results below. Please refer to the following websites for additional water quality information: www.concordnc.gov/water quality report; http://www.albemarlenc.gov/departments/public-utilities quality report. This report also includes Shiloh Church Rd SD (NC ID # 20-13-022)

To continue meeting future demands for high quality drinking water, an interbasin transfer has been obtained from the State of North Carolina that will allow the City of Kannapolis to obtain raw or finished water, or a combination from the Catawba and Yadkin Rivers.

In partnership with Concord and Albemarle, Kannapolis is now connected to the Albemarle water system through the Concord system. A 30-inch water line runs nearly 16 miles connecting Albemarle to Kannapolis through Concord. Over the past decade Albemarle has been impacted by the loss of numerous industrial customers to their water system. As a result, Albemarle now has excess treated water capacity and desires new customers to make up for industrial usage losses. This is a primary example of the regional approach in utilizing water resources. Since April 2016, we have purchased 0.8 million gallons per day of Yadkin IBT water.

Help Protect Your Source Water

Protection of drinking water is everyone's responsibility. You can help protect your community's drinking water sources in several ways: (examples: 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, etc.). Please remember that what goes down a storm drain ends up in our lakes, rivers, and creeks.

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 table below lists all the drinking water contaminants that we detected in the last round of sampling for the 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, 2022.** 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.

Violations that Your Water System Received for the Report Year

None

Unregulated Contaminants

Unregulated contaminants are those for which EPA has not established drinking water standards. 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.

Unregulated Contaminant Monitoring Rule (UCMR4)

This program is EPA's screening survey and assessment monitoring of 30 unregulated contaminants using specialized analytical method technologies not as commonly used by drinking water laboratories. This program is for data gathering and future assessment options.

Analysis was performed during the 2019 calendar year.

Contaminant	Results
2-Propen-1-ol (Allyl alcohol)	0.32 ug/L
2-Methoxyethanol	2.3 ug/L
alpha-BHC	35.1 ug/L
Bromo chloroacetic Acid	16.5 ug/L
Butylated Hydroxy anisole	31.8 ug/L
Chlorodibromoacetic Acid	3.2 ug/L
Chlorpyrifos	13.1 ug/L
Dichloroacetic Acid	32.2 ug/L
Dimethipin	5.0 ug/L
Ethoprop	17.1 ug/L
Germanium	1.3 ug/L
HAA9 Group	52.4 ug/L
Haloacetic Acids (Total)	3.9 ug/L
Merphos-Oxone	1760 ug/L
Monobromoacetic Acid	1.8 ug/L
Profenofos	3.1 ug/L
Trichloroacetic Acid	3390 ug/L
Bromide	30.8 ug/L
Manganese	23.3 ug/L

If you have questions about this assessment monitoring please call the U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791 or http://water.epa.gov/drink/hotline

Important Drinking Water 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.

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.

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 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.

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 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.

Microbiological Contaminants in the Distribution System - For systems that collect ***40 or more*** 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	5% of monthly samples are positive	Naturally present in the environment
Fecal Coliform or *E. coli* (presence or absence)	N	0	0	0 (Note: The MCL is exceeded if a routine sample and repeat sample are total coliform positive, and one is also fecal coliform or *E. coli* positive)	Human and animal fecal waste

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 Low High	MCLG	MCL	Likely Source of Contamination
TTHM (ppb)	2022				N/A	80	By-product of drinking water disinfection
B01		N	**45.1**	**23.2 - 70.2**			
B02		N	**43.1**	**21.1 - 64.4**			
B03		N	**39.0**	**19.0 - 55.4**			
B04		N	**49.0**	**27.0 - 72.4**			
HAA5 (ppb)	2022				N/A	60	By-product of drinking water disinfection
B01		N	**34.4**	**21.8 - 43.7**			
B02		N	**32.9**	**20.8 - 42.3**			
B03		N	**33.8**	**21.5 - 46.7**			
B04		N	**36.0**	**19.0 - 57.1**			

Disinfection Byproduct Combination	Year Sampled	MCL Violation Y/N	Your Water (Highest LRAA)	Range Low-High	MCLG	MCL	Likely Source of Contamination
TTHM (ppb)	2022	N	49.0	33.4 - 49.0	N/A	80	By-product of drinking water disinfection
HAA5 (ppb)	2022	N	36.0	27.4 - 36.0	N/A	60	By-product of drinking water disinfection

For TTHM: ***Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.***

For HAA5: ***Some people who drink water containing halo acetic acids in excess of the MCL over many years may have an increased risk of getting cancer.***

Chlorine

Contaminant (units)	Year Sampled	MRDL Violation Y/N	Average	Range	MRDLG	MRDL	Likely Source of Contamination
Chlorine (ppm)	2022	N	0.85 mg/L	0.27 - 1.99	4	4.0	Water additive used to control microbes

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	0.079	Turbidity > 1 NTU	Soil runoff
Turbidity (NTU) – Lowest to Highest	N	0.023	Turbidity > 1 NTU	
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.

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	1.14	0.89 - 1.32	N/A	TT	Naturally present in the environment	STEP 1

STEP 1 - Required % TOC Removals			
Source Water TOC (mg/L)	**Source Water Alkalinity (mg/L as $CaCO_3$)**		
	0 - 60	**>60-120**	**>120**
> 2.0 - 4.0	35.0	25.0	15.0
> 4.0 - 8.0	45.0	35.0	25.0
> 8.0	50.0	40.0	30.0

Alternative Compliance Criteria (ACC)	
ACC 1	Source Water TOC < 2.0 mg/L
ACC 2	Treated Water TOC < 2.0 mg/L
ACC 3	Source Water SUVA ≤ 2.0 L/mg-m
ACC 4	Finished Water SUVA ≤ 2.0 L/mg-m
ACC 5	Treated Water Alkalinity < 60 mg/L **(for softening systems only)**
ACC 6	TTHM **&** HAA5 RAAs **≤** 1/2 MCL **&** uses only chlorine
ACC 7	Source TOC RAA **<** 4.0 mg/L **and** Source Alkalinity RAA **>** 60 mg/L **and** TTHM **&** HAA5 RAAs **≤** 1/2 MCL

Inorganic Contaminants

Contaminant (units)	MCL Violation Y/N	Sample Date	Your Water	MCLG	MCL	Likely Source of Contamination
Fluoride (ppm)	N	4-6-2022	0.80	4	4	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories

Lead and Copper Contaminants

Contaminant (units)	Sample Date	Your Water	# of sites found above the AL	MCLG	AL	Likely Source of Contamination
Copper (ppm) (90^{th} percentile)	July 2021	0.24	0	1.3	AL=1.3	Corrosion of household plumbing systems; erosion of natural deposits
Lead (ppb) (90^{th} percentile)	July 2021	ND	0	0	AL=15	Corrosion of household plumbing systems, erosion of natural deposits

***31 samples collected for the City of Kannapolis in 2021.**

Asbestos Contaminant

Contaminant (units)	MCL Violation Y/N	Sample Date	Your Water	MCLG	MCL	Likely Source of Contamination
Total Asbestos (MFL)	N	2-12-20	ND	7	7	Decay of asbestos cement water mains; erosion of natural deposits

Synthetic Organic Chemicals (SOC) – Including Pesticides & Herbicides

Contaminant (units)	Sample Date	Your Water	MCL	Violation Y/N	Likely Source of Contamination
2,4-D (ppb)	1-5-2022	ND	70	N	Runoff from herbicide used on row crops
2,4-D (ppb)	4-6-2022	0.45	70	N	Runoff from herbicide used on row crops
2,4-D (ppb)	7-6-2022	ND	70	N	Runoff from herbicide used on row crops
2,4-D (ppb) Range	2022	ND - 0.45	70	N	Runoff from herbicide used on row crops

Miscellaneous Contaminants

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 Characteristic Contaminants

Contaminant (units)	Sample Date	Your Water	Range Low/High	SMCL
Iron (ppm)	4-6-2022	ND	N/A	0.3 mg/L
Manganese (ppm)	4-6-2022	ND	N/A	0.05 mg/L
Sodium (ppm)	4-6-2022	15.83	N/A	N/A
Sulfate (ppm)	4-6-2022	25.2	N/A	250 mg/L
pH	continuous	7.1	6.6 – 7.4	6.5 to 8.5

City of Kannapolis - Long Term 2 Enhanced Surface Water Treatment Rule (LT2) data:

To comply with the LT2 rule, the City of Kannapolis began collecting samples from its raw water sources in October 2016, for analysis of cryptosporidium and E. coli. This sampling was for 24 months. Samples were collected once a month from each raw water source. 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, immune-compromised people, infants and small children, and the elderly are at greater risk of developing life-threatening illness. We encourage immune-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. Giardia lamblia is a single-celled protozoan parasite that lives in the intestine of infected humans or animals. It is found on surfaces or in soil, food, or water that has been contaminated with the feces from infected humans or animals. Giardia lamblia can cause symptoms such as nausea, cramps, diarrhea, and associated headaches. Below are the results that were obtained in 2018.

Cryptosporidium: Cryptosporidium was detected in four raw water sample out of 36 raw water samples; with one detection at Coddle Creek, at a level of 0.3 oocysts/L and three at Second Creek, at 0.095, 0.098, and 0.098 oocysts/L respectively.

Giardia: Giardia was detected in 12 out of 36 raw water samples (results shown are reported as cysts/L):

Raw water source	Average result	Range of results
Kannapolis Lake	0.010	ND – 0.095
Coddle Creek	0.960	ND – 4.47
Second Creek	0.370	ND – 1.04

E. coli: The following averages and ranges were obtained from analyses of the following City of Kannapolis raw water sources (results shown are reported as E coli. per 100 mL of sample):

Raw water source	Average result	Range of results
Kannapolis Lake	1.44	ND – 5
Coddle Creek	342.22	25 – 1374
Second Creek	49.33	30 – 1058

Other Water Sources and Their Characteristics

Shiloh Church Road (NC ID # 20-13-022)

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	1 positive sample / month* Note: If either an original routine sample and/or its repeat samples(s) are fecal coliform or *E. coli* positive, a Tier 1 violation exists.	Naturally present in the environment
Fecal Coliform or *E. coli* (presence or absence)	N	0	0	0	Human and animal fecal waste

Disinfectants and Disinfection Byproducts Contaminants

Contaminant (units)	MCL Violation Y/N	Your Water RAA (Highest)	Range Low High	MCLG	MCL	Likely Source of Contamination
TTHM (ppb) [Total Trihalomethanes]	N	53.6	27.2 - 92.9	N/A	80	By-product of drinking water disinfection
HAA5 (ppb) [Total Haloacetic Acids]	N	29.4	16.8 - 52.8	N/A	60	By-product of drinking water disinfection

For TTHM: ***Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.***

For HAA5: ***Some people who drink water containing halo acetic acids in excess of the MCL over many years may have an increased risk of getting cancer.***

Chlorine

Contaminant (units)	Year Sampled	MRDL Violation Y/N	Average	Range	MRDLG	MRDL	Likely Source of Contamination
Chlorine (ppm)	2022	N	0.74	0.28 – 1.41	4	4.0	Water additive used to control microbes

Lead and Copper

Contaminant (units)	MCLG	Action Level	Violation	Your Water	Likely Source of Contamination
Lead, ug/l (90^{th} percentile)	0	15 ug/l	NO	ND	Corrosion of household plumbing systems; erosion of natural deposits.
Copper, mg/l (90^{th} percentile)	1.3	1.3	NO	0	

11 Samples were collected in July 2020. In one sample, copper was detected at 0.152 mg/l. All other samples were no detect.

Asbestos Contaminant

Contaminant (units)	MCL Violation Y/N	Sample Date	Your Water	MCLG	MCL	Likely Source of Contamination
Total Asbestos (MFL)	N	2-12-20	ND	7	7	Decay of asbestos cement water mains; erosion of natural deposits

City of Concord (NC ID 01-13-010)

Microbiological Contaminants in the Distribution System - For systems that collect ***40 or more*** samples per month

Contaminant (units)	MCL Violation Y/N	Concord Water	MCLG	MCL	Likely Source of Contamination
Total Coliform Bacteria (presence or absence)	N	2%	0	5% of monthly samples are positive	Naturally present in the environment
Fecal Coliform or *E. coli* (presence or absence)	N	0	0	0 (Note: The MCL is exceeded if a routine sample and repeat sample are total coliform positive, and one is also fecal coliform or *E. coli* positive)	Human and animal fecal waste

Disinfectants and Disinfection Byproducts Contaminants

Contaminant (units)	MCL Violation Y/N	Concord Water Highest RAA	Range Low High	MCLG	MCL	Likely Source of Contamination
TTHM (ppb) [Total Trihalomethanes]	N	55.7	15.4 – 76.6	N/A	80	By-product of drinking water disinfection
HAA5 (ppb) [Total Haloacetic Acids]	N	46.4	17.1 – 63.4	N/A	60	By-product of drinking water disinfection

For TTHM: ***Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.***

For HAA5: ***Some people who drink water containing halo acetic acids in excess of the MCL over many years may have an increased risk of getting cancer.***

Chlorine

Contaminant (units)	Year Sampled	MRDL Violation Y/N	Average	Range	MRDLG	MRDL	Likely Source of Contamination
Chlorine (ppm)	2022	N	1.05	0.21 – 2.00	4	4.0	Water additive used to control microbes

Turbidity

Contaminant (units)	Treatment Technique (TT) Violation Y/N	Concord Water	Treatment Technique (TT) Violation if:	Likely Source of Contamination
Turbidity (NTU) - Highest single turbidity measurement	N	0.29	Turbidity > 1 NTU	Soil runoff
Turbidity (NTU) – Coddle Creek WTP Range Highest to Lowest	N	0.04 – 0.29	Turbidity > 1 NTU	
Turbidity (NTU) – Hillgrove WTP Range Highest to Lowest	N	0.04 – 0.28	Turbidity > 1 NTU	
Turbidity (NTU) - Lowest monthly percentage (%) of samples meeting turbidity limits	N	Coddle Creek - 100% Hillgrove – 100%	Less than 95% of monthly turbidity measurements are $\leq$ 0.3 NTU	

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#__)
Hillgrove WTP Removal Ratio	N	1.13	1.06 – 1.57	N/A	TT	Naturally present in the environment	STEP 1
Coddle Creek WTP Removal Ratio	N	1.44	1.10 – 1.71	N/A	TT	Naturally present in the environment	STEP 1

Inorganic Contaminants

Contaminant (units)	MCL Violation Y/N	Hillgrove WTP	Coddle Creek WTP	MCLG	MCL	Likely Source of Contamination
Fluoride (ppm)	N	0.935	0.84	4	4	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories

Lead and Copper Contaminants

Contaminant (units)	Sample Date	Concord Water	# of sites found above the AL	MCLG	AL	Likely Source of Contamination
Copper (ppm) (90^{th} percentile)	2022	0.119	0	1.3	AL=1.3	Corrosion of household plumbing systems; erosion of natural deposits
Lead (ppb) (90^{th} percentile)	2022	< 3	0	0	AL=15	Corrosion of household plumbing systems, erosion of natural deposits

Concord collected 53 samples for lead and copper in 2022

Unregulated Substances

Contaminant (units)	Sample Date	Hillgrove WTP	Coddle Creek WTP	Range Low/High	SMCL
Sodium (ppm)	2021	18	13	N/A	N/A
Sulfate (ppm)	2021	20	23	N/A	250 mg/L

City of Concord 2020 Substances Detected - continued:

Long Term 2 Enhanced Surface Water Treatment Rule (LT2) data:

Cryptosporidium in Drinking Water:

To comply with the LT2 rule, the City of Concord began collecting samples for cryptosporidium and E. coli in October 2015. The City of Albemarle collected cryptosporidium samples in 2016. The City of Kannapolis began collecting samples in October 2016. Samples were collected monthly from each raw water source. Here are the results that were obtained:

Cryptosporidium: The following averages and ranges were obtained from the following City of Concord raw water sources (results shown are reported in oocysts/L):

Raw water source	Average result	Range of results
Lake Don T. Howell	ND	ND
Lake Fisher	0.007	ND – 0.087
Lake Concord	0.09	ND – 0.100

E. coli: The following averages and ranges were obtained from analyses of the following City of Concord raw water sources (results shown are reported as MPN, colonies/100 mL of sample):

Raw water source	Average result	Range of results
Lake Don T. Howell	2.6	<1 – 13.2
Lake Fisher	9.0	<1 – 33.1

City of Concord Unregulated Contaminants

Unregulated contaminants are those for which EPA has not established drinking water standards. 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.

Other Unregulated Substances Detected: UCMR4, collected 2019-2020

Contaminant	Sample Location	Result (Highest)	Range
Bromide (ppb)	Raw water	31.4	12.8-31.4
Total Organic Carbon (ppm)	Raw water	4.9	3.4-4.9
Bromochloroacetic Acid (ppb)	Distribution System	6.7	ND-6.7
Bromodichloroacetic Acid (ppb)	Distribution System	4.4	ND-4.4
Chlorodibromoacetic Acid (ppb)	Distribution System	1.1	0.31-1.1
Dibromoacetic Acid (ppb)	Distribution System	0.70	0.28-0.70
Dichloroacetic Acid (ppb)	Distribution System	57.5	22.3-57.5
HAA9 Group (ppb)	Distribution System	87.1	50.1-87.1
Total Brominated HAAs (ppb)	Distribution System	13.3	ND-13.3
Haloacetic Acids (Total) (ppb)	Distribution System	77.8	43.6-77.8
Monobromoacetic Acid (ppb)	Distribution System	0.50	ND-0.50
Monochloroacetic Acid (ppb)	Distribution System	4.0	ND-4.0
Trichloroacetic Acid (ppb)	Distribution System	31.7	16.8-31.7
Manganese (ppb)	Entry point to the Distribution System	22.3	0.34-22.3
n-Butanol (ppb)	Entry point to the Distribution System	0.69	ND-0.69

City of Albemarle (NC ID 01-84-010)

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/A	N/A	N/A	1 positive sample / month* Note: If either an original routine sample and/or its repeat samples(s) are fecal coliform or *E. coli* positive, a Tier 1 violation exists.	Naturally present in the environment
Fecal Coliform or *E. coli* (presence or absence)	N	A	0	0	Human and animal fecal waste

Nitrate/Nitrite Contaminants

Contaminant (units)	Sample Date	MCL Violation Y/N	Albemarle Water	Range Low High	MCLG	MCL	Likely Source of Contamination
Nitrate (as Nitrogen) (ppm)	8-8-22	N	ND	N/A	10	10	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits.
Nitrite (as Nitrogen) (ppm)	8-8-22	N	ND	N/A	1	1	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits.

Turbidity

Contaminant (units)	Treatment Technique (TT) Violation Y/N	Albemarle Water	Treatment Technique (TT) Violation if:	Likely Source of Contamination
Turbidity (NTU) - Highest single turbidity measurement	N	0.10 NTU	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	

Inorganic Contaminants

Contaminant (units)	Sample Date	MCL Violation Y/N	Albemarle Water	Range	MCLG	MCL	Likely Source of Contamination
Antimony (ppb)	9/8/22	N	ND	N/A	6	6	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder
Arsenic (ppb)	9/8/22	N	ND	N/A	0	10	Erosion of natural deposits; runoff from orchards; runoff from glass and electronics production wastes
Barium (ppm)	9/8/22	N	ND	N/A	2	2	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Beryllium (ppb)	9/8/22	N	ND	N/A	4	4	Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries
Cadmium (ppb)	9/8/22	N	ND	N/A	5	5	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints
Chromium (ppb)	9/8/22	N	ND	N/A	100	100	Discharge from steel and pulp mills; erosion of natural deposits
Cyanide (ppb)	9/8/22	N	ND	N/A	200	200	Discharge from steel/metal factories; discharge from plastic and fertilizer factories
Fluoride (ppm)	9/8/22	N	.54	.46-.61	4	4	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories
Mercury (inorganic) (ppb)	9/8/22	N	.001	ND to 1ppb	2	2	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills; runoff from cropland
Selenium (ppb)	9/8/22	N	ND	N/A	50	50	Discharge from petroleum and metal refineries; erosion of natural deposits; discharge from mines

Asbestos Contaminant

Contaminant (units)	Sample Date	MCL Violation Y/N	Albemarle Water	Range Low High	MCLG	MCL	Likely Source of Contamination
Total Asbestos (MFL)	11/27/12	N	ND	N/A	7	7	Decay of asbestos cement water mains; erosion of natural deposits

Synthetic Organic Chemicals (SOC) – Including Pesticides & Herbicides

Contaminant (units)	Sample Date	Albemarle Water	Range	MCLG	MCL	Violation	Likely Source of Contamination
2,4-D (ppb)	10/13/22	N	ND	N/A	70	70	Runoff from herbicide used on row crops
2,4,5-TP (Silvex) (ppb)	10/13/22	N	ND	N/A	50	50	Residue of banned herbicide
Alachlor (ppb)	10/13/22	N	ND	N/A	0	2	Runoff from herbicide used on row crops
Atrazine (ppb)	10/13/22	N	.12	0 to .12	3	3	Runoff from herbicide used on row crops
Benzo(a)pyrene (PAH) (ppt)	10/13/22	N	ND	N/A	0	200	Leaching from linings of water storage tanks and distribution lines
Carbofuran (ppb)	10/13/22	N	ND	N/A	40	40	Leaching of soil fumigant used on rice and alfalfa
Chlordane (ppb)	10/13/22	N	ND	N/A	0	2	Residue of banned termiticide
Dalapon (ppb)	10/13/22	N	ND	N/A	200	200	Runoff from herbicide used on rights of way
Di(2-ethylhexyl) adipate (ppb)	10/13/22	N	ND	N/A	400	400	Discharge from chemical factories
Di(2-ethylhexyl) phthalate (ppb)	10/13/22	N	ND	N/A	0	6	Discharge from rubber and chemical factories
DBCP [Dibromochloropropane] (ppt)	10/13/22	N	ND	N/A	0	200	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards
Dinoseb (ppb)	10/13/22	N	ND	N/A	7	7	Runoff from herbicide used on soybeans and vegetables
Endrin (ppb)	10/13/22	N	ND	N/A	2	2	Residue of banned insecticide
EDB [Ethylene dibromide] (ppt)	10/13/22	N	ND	N/A	0	50	Discharge from petroleum refineries
Heptachlor (ppt)	10/13/22	N	ND	N/A	0	400	Residue of banned pesticide
Heptachlor epoxide (ppt)	10/13/22	N	ND	N/A	0	200	Breakdown of heptachlor
Hexachlorobenzene (ppb)	10/13/22	N	ND	N/A	0	1	Discharge from metal refineries and agricultural chemical factories
Hexachlorocyclo-pentadiene (ppb)	10/13/22	N	.38	N/A	50	50	Discharge from chemical factories
Lindane (ppt)	10/13/22	N	ND	N/A	200	200	Runoff/leaching from insecticide used on cattle, lumber, gardens
Methoxychlor (ppb)	10/13/22	N	ND	N/A	40	40	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock

Oxamyl [Vydate] (ppb)	10/13/22	N	ND	N/A	200	200	Runoff/leaching from insecticide used on apples, potatoes and tomatoes
PCBs [Polychlorinated biphenyls] (ppt)	10/13/22	N	ND	N/A	0	500	Runoff from landfills; discharge of waste chemicals
Pentachlorophenol (ppb)	10/13/22	N	ND	N/A	0	1	Discharge from wood preserving factories
Picloram (ppb)	10/13/22	N	ND	N/A	500	500	Herbicide runoff
Simazine (ppb)	10/13/22	N	ND	N/A	4	4	Herbicide runoff
Toxaphene (ppb)	10/13/22	N	ND	N/A	0	3	Runoff/leaching from insecticide used on cotton and cattle

Volatile Organic Chemical (VOC) Contaminants

Contaminant (units)	Sample Date	Albemarle Water	Range	MCLG	MCL	Violation	Likely Source of Contamination
Benzene (ppb)	3/2/22	N	ND	N/A	0	5	Discharge from factories; leaching from gas storage tanks and landfills
Carbon tetrachloride (ppb)	3/2/22	N	ND	N/A	0	5	Discharge from chemical plants and other industrial activities
Chlorobenzene (ppb)	3/2/22	N	ND	N/A	100	100	Discharge from chemical and agricultural chemical factories
o-Dichlorobenzene (ppb)	3/2/22	N	ND	N/A	600	600	Discharge from industrial chemical factories
p-Dichlorobenzene (ppb)	3/2/22	N	ND	N/A	75	75	Discharge from industrial chemical factories
1,2 – Dichloroethane (ppb)	3/2/22	N	ND	N/A	0	5	Discharge from industrial chemical factories
1,1 – Dichloroethylene (ppb)	3/2/22	N	ND	N/A	7	7	Discharge from industrial chemical factories
cis-1,2-Dichloroethylene (ppb)	3/2/22	N	ND	N/A	70	70	Discharge from industrial chemical factories
trans-1,2-Dichloroethylene (ppb)	3/2/22	N	ND	N/A	100	100	Discharge from industrial chemical factories
Dichloromethane (ppb)	3/2/22	N	ND	N/A	0	5	Discharge from pharmaceutical and chemical factories
1,2-Dichloropropane (ppb)	3/2/22	N	ND	N/A	0	5	Discharge from industrial chemical factories
Ethylbenzene (ppb)	3/2/22	N	ND	N/A	700	700	Discharge from petroleum refineries
Styrene (ppb)	3/2/22	N	ND	N/A	100	100	Discharge from rubber and plastic factories; leaching from landfills

Tetrachloroethylene (ppb)	3/2/22	N	ND	N/A	0	5	Discharge from factories and dry cleaners
1,2,4 – Trichlorobenzene (ppb)	3/2/22	N	ND	N/A	70	70	Discharge from textile-finishing factories
1,1,1 – Trichloroethane (ppb)	3/2/22	N	ND	N/A	200	200	Discharge from metal degreasing sites and other factories
1,1,2 – Trichloroethane (ppb)	3/2/22	N	ND	N/A	3	5	Discharge from industrial chemical factories
Trichloroethylene (ppb)	3/2/22	N	ND	N/A	0	5	Discharge from metal degreasing sites and other factories
Toluene (ppm)	3/2/22	N	ND	N/A	1	1	Discharge from petroleum factories
Vinyl Chloride (ppb)	3/2/22	N	ND	N/A	0	2	Leaching from PVC piping; discharge from plastics factories
Xylenes (Total) (ppm)	3/2/22	N	ND	N/A	10	10	Discharge from petroleum factories; discharge from chemical factories

Lead and Copper Contaminants

Contaminant (units)	Sample Date	Albemarle Water	# of sites found above the AL	MCLG	AL	Likely Source of Contamination
Copper (ppm) (90^{th} percentile)	7/20	0.196	0	1.3	AL=1.3	Corrosion of household plumbing systems; erosion of natural deposits
Lead (ppb) (90^{th} percentile)	7/20	ND	0	0	AL=15	Corrosion of household plumbing systems, erosion of natural deposits

Radiological Contaminants

Contaminant (units)	Sample Date	MCL Violation Y/N	Albemarle Water	Range Low High	MCLG	MCL	Likely Source of Contamination
Alpha emitters (pCi/L)	1/13/22	N	ND	N/A	0	15	Erosion of natural deposits
Beta/photon emitters pCi/L	1/13/22	N	ND	N/A	0	50*	
Combined radium (pCi/L)	1/13/22	N	ND	N/A	0	5	Erosion of natural deposits
Uranium (pCi/L)	1/13/22	N	ND	N/A	0	20.1	Erosion of natural deposits

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	1.29	.92 – 1.57	N/A	TT	Naturally present in the environment	ACC #2

Chlorine

Contaminant (units)	Year Sampled	MRDL Violation Y/N	Highest RAA	Range	MRDLG	MRDL	Likely Source of Contamination
Chlorine (ppm)	2022	N	.93	.20 – 1.54	4	4.0	Water additive used to control microbes

Disinfectants and Disinfection Byproducts Contaminants

Disinfection Byproduct	Year Sampled	MCL Violation Y/N	Your Water (Highest LRAA)	Range Low High	MCLG	MCL	Likely Source of Contamination
TTHM (ppb)	2022				N/A	80	By-product of drinking water disinfection
B01		N	**38**	**20 - 57**			
B02		N	**34**	**20 - 49**			
B03		N	**39**	**19 – 50**			
B04		N	**34**	**21 – 49**			
HAA5 (ppb)	2022				N/A	60	By-product of drinking water disinfection
B01		N	**33**	**28 – 42**			
B02		N	**32**	**27 – 49**			
B03		N	**39**	**31 – 56**			
B04		N	**34**	**26 - 43**			

For TTHM: ***Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.***

For HAA5: ***Some people who drink water containing halo acetic acids in excess of the MCL over many years may have an increased risk of getting cancer.***

Miscellaneous Contaminants

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 Characteristic Contaminants

Contaminant (units)	Sample Date	Albemarle Water	Range Low/High	SMCL
Iron (ppm)	9/8/22	ND	N/A	0.3 mg/L
Manganese (ppm)	9/8/22	ND	N/A	0.05 mg/L
Nickel (ppm)	9/8/22	ND	N/A	N/A
Sodium (ppm)	9/8/22	15.59	14.35 to 16.83	N/A
Sulfate (ppm)	9/8/22	19.1	16.9 to 21.3	250 mg/L
pH	9/8/22	7.4	7.3 to 7.4	6.5 to 8.5
Asbestos	12/22/22	ND	N/A	0.2 MFL

Unregulated Contaminants

Unregulated contaminants are those for which EPA has not established drinking water standards. 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.

Contaminant (units)	Sample Date	Your Water (average)	Range Low High
Bromochloroacetic acid (ppb)	4/15/20	2.68	2.48 - 3.02
Bromodichloroacetic acid (ppb)	4/15/20	2.10	1.08 - 3.32
Chlorodibromoacetic acid (ppb)	4/15/20	.355	.323 - .372
Dichloroacetic acid (ppb)	4/15/20	18.15	12.4 - 23.3
Trichloroacetic acid (ppb)	4/15/20	21.55	17.1 - 25.4
Manganese (ppb)	4/15/20	1.21	.869 - 1.55
Total Organic Carbon (ppb)	4/15/20	2615	2450 - 2690