2018 City of Burlington

2018 ANNUAL DRINKING WATER QUALITY REPORT

CITY OF BURLINGTON, NC - Public Water System ID# 02-01-010

The City of Burlington is pleased to present you with the twentieth annual water quality report, also known as the Consumer Confidence Report (CCR). This report provides our customers with a snapshot of the previous year's water quality. This report includes details about where your water comes from, what it contains, and how it compares to standards set by regulatory agencies. During the calendar year 2018, The City of Burlington delivered an average of 11.3 million gallons of water per day through more than 440 miles of water lines. The peak day was on Tuesday, January 2 when over 16.6 million gallons of water was pumped into the distribution system. Our goal is to provide our citizens with an uninterrupted supply of safe and high quality drinking water. We want you to understand the efforts we make to improve the water treatment process and protect our water resources. We are committed to ensuring the quality of your water and to providing you with this information.

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. These minerals are carried with the water as "contaminants". The water may pick up other contaminants, resulting from plants, animal or human activities. The City provides treatment designed to remove many of the contaminants, especially any harmful ones. However, some trace amounts of contaminants may remain after treatment. *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 at (800) 426-4791***.

SOURCES OF DRINKING WATER

The City of Burlington utilizes two (2) surface water supply sources. Lake Mackintosh is located in Southwest Alamance County and Southeast Guilford County. It supplies the J.D. Mackintosh, Jr. Water Treatment Plant (JDMWTP) located in Southwest Alamance County. Stoney Creek Reservoir is located near the Hopedale community. It supplies the Ed Thomas Water Treatment Plant (ETWTP) located in downtown Burlington.

A **source water assessment** has been prepared by the North Carolina Department of Environment and Natural Resources. Source Water Assessments were performed on Stoney Creek Reservoir and Lake Mackintosh and were updated in September 2017. These assessments indicate that Stoney Creek Reservoir has a susceptibility rating of "Moderate" and Lake Mackintosh has a susceptibility rating of "Higher". You can find more information about the NCSWAP program online at http://www.ncwater.org/?page=600&Action=Swap_Search

DEFINITIONS & ABBREVIATIONS

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

MCLG **MAXIMUM CONTAMINANT LEVEL GOAL:** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

MCL **MAXIMUM CONTAMINANT LEVEL:** The highest level of a contaminant allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

ug/L **MICROGRAM PER LITER :** 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.

mg/L **MILLIGRAM PER LITER:** A measure of mass per unit volume to express the concentration of a solution, also referred to as "parts per million" – often abbreviated as ppm.

ng/L **NANOGRAM PER LITER :** 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.

MFL **MILLION FIBERS PER LITER:** A measure of the amount of asbestos per unit volume.

pCi/L **PICOCURIES PER LITER:** A measure of radioactive intensity per unit volume.

SMCL **SECONDARY MAXIMUM CONTAMINANT LEVEL:** The highest concentration of a contaminant based on apparent quality such as color, odor, or taste, but does not imply any known health effects.

TT **TREATMENT TECHNIQUE:** A required process intended to reduce the level of a contaminant in drinking water.

ND **NOT DETECTED:** This term is used when the concentration of a substance is too low to be detected by standard lab tests.

NA **NOT APPLICABLE:** Information does not apply to this parameter.

Just How Much Is One Part Per Billion?

The concentrations of substances measured in drinking water are usually expressed as parts per million (ppm), parts per billions (ppb) or even parts per trillion (ppt). It is often difficult to grasp just how large a million, a billion or a trillion really is. We have included some examples to provide perspective on how large numbers like 1 million, 1 billion and 1 trillion are. Here are a few examples…

If something is measured as 1 Part Per Million (ppm or mg/L)	If something is measured as 1 Part Per Billion (ppb or ug/L)
1 ppm is the same as 1 second compared to 11½ days	1 ppb is the same as 1 second compared to 31¾ years
1 ppm is the same as 1 penny compared to $10,000	1 ppb is the same as 1 penny compared to ***TEN MILLION*** dollars
1 ppm is the same as 1 inch compared to 15 miles	1 ppb is the same as 1 inch compared to 3 trips from Burlington to Los Angeles, CA and back to Burlington

1 part per trillion (ppt or ng/L) is the same as 1 inch compared to 31 trips from the earth to the moon and back!

City of BURLINGTON Water Resources

Chloramines

In July of 2011, the City of Burlington made the transition from FREE CHLORINE as a secondary disinfectant to a combined form of chlorine called CHLORAMINES. This was a highly publicized event. This change resulted in better maintained chlorine residual in the city's distribution system, fewer taste and odor complaints and lower Dinisfection By-Product (DBP) formation. There is a difference in the regulatory requirements for Chloramine versus Free Chlorine. The minimum allowable concentration of **free chlorine** is 0.2 mg/L. The minimum allowable concentration for **chloramines** is 1.0 mg/L. The maximum residual disinfectant level for both free chlorine and chloramine is 4.0 mg/L.

The City of Burlington uses free chlorine as a primary disinfectant (at the plant) and chloramines as a secondary disinfectant (in the distribution system) to control microbial growth.

Inorganic Compounds

The USEPA has set standards for a number of inorganic chemicals that can affect our health. Inorganic contaminants in source water such as salts and metals, can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

Parameter	MCLG	Federal MCL	JDMWTP	ETWTP	Range	Major Sources in Drinking Water
Fluoride #	4	4	0.60	0.70	0.60 – 0.70	Added to water to promote strong teeth
Free Chlorine* (mg/L)	NA	NA	Free chorine concentration did not exceed MRDL of 4.0 mg/L			Water additive used to control microbes
Chloramine (mg/L)	NA	NA	Chloramine concentration did not exceed MRDL of 4.0 mg/L			Water additive used to control microbes

* Chlorine is used as a disinfectant in drinking water. The minimum acceptable free chlorine residual is 0.2 mg/L. The maximum allowable chlorine residual has been set at 4.0 mg/L. Chlorine is measured at several points in the treatment process. **The residuals reported in this table are Point-of-Entry samples – where the water is pumped into the distribution system**. The chlorine residual in the City of Burlington distribution system will fluctuate depending on the season of the year, location in the system, time of day or even which water plant is in operation at any given time.
# - Fluoride analysis are conducted every 4 hours for process control purposes. The fluoride analysis reported in this Water Quality Report are certified results from a samples collected on 03/05/2018.

Organic Compounds

There are a number of organic compounds that are of potential concern in drinking water. This group includes Volatile Organic Compounds (VOC's), which vaporize easily, and Synthetic Organic Compounds (SOC's), which are manmade, such as some pesticides and herbicides. *These contaminants may come from sources like agriculture, urban stormwater runoff, residential uses, industrial processes and petroleum production, gas stations, and septic systems.* Trihalomethanes and Haloacetic acids are disinfection byproducts that are formed when organic compounds that are in water react with chlorine used to disinfect drinking water. These disinfection by-products are made up of several components. None of the individual components of these disinfection byproducts are regulated. However, the sum of these components is regulated and is included in the table below.

On April 1, 2012, The City of Burlington became subject to what are commonly referred to as the Stage 2 Disinfection Byproduct Rules, or the Stage 2 DBP rules. ***Under the new Stage 2 DBP rule***, compliance with the rule is calculated by averaging the four quarterly results for ***each*** of the 8 different sample locations. If the 4-quarter average for any of the 8 sample locations exceeds the compliance limit for any of the Disinfection By-Products, the entire water system is considered out of compliance with the Stage 2 DBP rule and a public notification must be sent to customers.

Parameter	MCLG	Federal MCL	Burlington Water System	Major Sources in Drinking Water	Health Effects
Total Trihalomethanes (ug/L) 4-Quarter Average	NA	80	39.5	By-product of drinking water chlorination	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.
Range for 2018 (ug/L)			15 - 65	This is the range (lowest and highest) of all compliance values for TTHM samples reported in 2018	
Total Haloacetic acids (ug/L) 4-Quarter Average	NA	60	41.3	By-product of drinking water chlorination	Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer
Range for 2018 (ug/L)			27 - 59	This is the range (lowest and highest) of all compliance values for HAA samples reported in 2018	

All sample locations were in compliance with the Stage 2 DBP rules in 2018.

Pesticides & Synthetic Organic Compounds

These contaminants may come from sources like agriculture, urban stormwater runoff, residential uses, industrial processes and petroleum production, gas stations, and septic systems.

The City of Burlington is required to test for Pesticides and Synthetic Organic Compounds at both water treatment plants every three years. The last test for these compounds was conducted in April and July of 2016. **There were No Synthetic Organic Chemicals or Pesticides detected** in samples analyzed during the most recent round of testing. **The next round of testing will be conducted in 2019.**

Lead & Copper

USEPA requires that the City perform household testing in accordance with the 1994 Lead and Copper Rule. According to that rule, 90% of the samples taken from locations in Burlington identified as "high risk" must have less than 15 parts per billion (ppb or ug/L) of lead and less than 1,300 parts per billion (ppb or ug/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. Testing in 2018 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 50 ppb, both well below the regulatory limits. Lead and copper samples are collected by the homeowner and analyzed by a certified laboratory. Samples are collected after the water has 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. **The next scheduled round of Lead and Copper sampling will occur between June 1 and September 30, 2021**.

Parameter	MCLG	Action Level	Max	Average result from Tier 1 sites in Burlington		Major Sources in Drinking Water
				Average	90th Percentile	
Lead (ug/L)	0	15	33.0	<3	<3	Corrosion of household plumbing systems; Erosion of natural deposits.
Copper (ug/L)	1,300	1,300	483	<50	73	Corrosion of household plumbing systems; Erosion of natural deposits.

Microbiological

Microbial contaminants in the source water, such as viruses and bacteria, may come from sewage treatment plants, septic systems, agricultural livestock and wildlife. The physical processes and disinfection chemicals used during the treatment process effectively eliminate harmful organisms that may be in the untreated water. Microbiological testing is performed daily to assure the absence of these organisms and to monitor the efficiency of these treatment techniques. Total and Fecal Coliform tests are performed on samples taken from the treatment plants, homes and businesses throughout the city.

Parameter	MCLG	Federal MCL	Burlington Water System Average	JDMWTP	ETWTP	Major sources in Drinking Water
Total Coliform* (see note)	0	<5.0 % of samples	0.5%	NA	NA	Naturally present in the environment
Fecal Coliform (e. coli)	0	0	0.0%	NA	NA	Human and animal fecal waste
Average Turbidity (NTU)**	NA	TT	NA	0.04	0.06	Soil runoff
Maximum Turbidity**	NA	TT	NA	0.09	0.26	Soil runoff

100% of finished water samples tested for turbidity in 2018 were below 0.3 NTU.

*Total coliform samples are samples that are taken from homes and businesses in the distribution system. There were 735 samples collected in 2018. Five (5) of these samples tested positive for total coliform. Follow-up samples for these locations indicated a localized issue with the outdoor spigots that were causing the samples to test positive. The problems were resolved and all subsequent samples showed no coliform bacteria present. To help provide some perspective on these results, consider that the safe drinking water standards would permit up to 36 of the 725 samples to be positive for total coliform without exceeding the limit considered safe as set by the EPA

100% of samples were below the limit. 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. **Turbidity itself has no health effects. However, turbidity can interfere with the disinfection process and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.

Radiological Contaminants

Radioactive contaminants in source water may be naturally occurring or may be the result of oil and gas production and mining activities. The table is based on samples collected in 2016.

Parameter	Last Test	MCLG	Federal MCL	Burlington Water System	Major Sources in Drinking Water
Gross Alpha (pCi/L)	2017	0	15	ND	Erosion of natural deposits
Uranium (pC/L)	2017	0	20.1	ND	Erosion of natural deposits
Combined Radium (pC/L)	2017	0	<1.0	N/A	Erosion of natural deposits

Secondary Standards

Secondary standards are non-enforceable standards that assure that your water meets standards of appearance, odor, and taste. These aesthetic contaminants normally do not affect the safety of your water.

Parameter	SMCL	JDMWTP	ETWTP	System Range	Major sources in drinking water
Iron (ug/L)*	300	ND	ND	ND	Naturally occurring
Manganese (ug/L)*	50	ND	14	ND	Naturally occurring

*Data reported for Iron and Manganese was taken from 3rd party analysis of inorganic chemicals conducted on 03/05/2018. Iron and manganese are tested regularly for process control.

Cryptosporidium sp.

Cryptosporidium sp. Is a microscopic organism that, when ingested, can cause diarrhea, fever and other gastrointestinal symptoms. The organism occurs naturally in surface waters (lakes and streams) and comes from animal wastes. Cryptosporidium sp. is eliminated by an effective treatment combination of coagulation, sedimentation, filtration and disinfection. Both of the City's water supply reservoirs underwent a 2-year sampling program to evaluate the water supplies for this organism. The City of Burlington completed monthly sampling at both reservoirs for 2 months in 2017 (This sampling program began in 2015 and consisted of a total of 24 samples. Each sample was sent to a certified lab for analysis.

Sampling results from January 1, 2017 through December 31, 2017 (2 samples at each reservoir) are listed below.

Location	Samples Collected	Total oocysts detected	Average Concentration	Concentration Requiring Additional Treatment
Stoney Creek Reservoir	2 (20 Liters)	0 oocyst	0.000 / Liter	0.075 oocysts / Liter
Mackintosh Reservoir	2 (20 Liters)	0 oocysts	0.000 / Liter	0.075 oocycts / Liter

Some people may be more vulnerable to contaminants in drinking water than the general population. People whose immune systems have been compromised – such as people 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 for infections. These people should seek the advice about drinking water from their healthcare providers. Environmental Protection Agency and the Center for Disease Control guidelines on appropriate means to lessen the risk of infection by Cryptosporidium sp. and other microbiological contaminants are available from the Safe Drinking Water Act Hotline at (800) 426-4791.

Other Physical and Chemical Information

The following information is derived from routine analyses and is included for your information. These parameters are not regulated under the Safe Drinking Water Act and may vary widely between systems. Unless otherwise noted (*), all results in this table are system averages that were reported on monthly operation reports.

Parameter	JDMWTP	ETWTP	Parameter	JDMWTP	ETWTP
Alkalinity, mg/L as $CaCO_3$	33.4	27.8	Sodium (mg/l)*	24.6*	22.6*
Carbon Dioxide	2.8	3.9	Sulfate (mg/L)*	32.0*	33.0*
Orthophosphorus, ug/L (minimum required: 500)	811	791	Hardness (mg/L)	32.1	29.4
PH, standard units	7.82*	7.72*	Hardness (Grains/Gal)	1.9	1.7

*Data reported was taken from 3rd party analysis of inorganic chemicals conducted on 03/05/2018.

Unregulated Contaminant Monitoring Rule Sampling (UCMR4)

The UCMR requires water systems to collect and analyze water samples for 28 chemicals and 2 viruses that are **currently not regulated**. The results of these samples help to guide EPA in setting future drinking water regulations. The results of the most recent UCMR4 data are included in the table below. This table only includes data for UCMR4 parameters that were ***detected***. The UCMR4 list was developed by EPA and includes compounds for potential regulation to determine their relative occurrence around the country.

The data in the table below is the latest round of sampling conducted in 2018.

UCMR4 parameter	JD Mackintosh WTP		Ed Thomas WTP		Distribution System	
	average	range	average	range	average	range
Managanese, ug/L	16.8	2.22 – 49.8	17.3	7.7 – 35.5	NA	NA
Quinoline, ug/L	ND	ND	23.7	20.2 – 27.0	NA	NA
Source Water Manganese, ppb	6,428	5,530 – 7,950	7,525	6,320 – 8,720	NA	NA
Source Water Bromide, ppb	20.9	20 – 21.8	ND	ND	NA	NA
Haloacetic Acids-9	NA	NA	NA	NA	44.8	28.8 – 55.9

Individuals may obtain the analytical results and health information for all UCMR4 data by contacting the City of Burlington Water Resources Department at (336) 222-5133.
For more information on the UCMR4, please visit the EPA website at: https://www.epa.gov/sites/production/files/2018-10/documents/ucmr4-data-summary.pdf

For more information

If you would like more information about the City of Burlington's Water Resources or this report, the following contacts may be able to assist you: The Director of Water Resources can be reached at (336) 222-5130, the Water and Sewer Field Operations Manager at (336) 222-5140, the City Engineer at (336) 222-5050, the Chief Chemist or the Assistant Water Resources Director of Operations at (336) 222-5133. The Burlington City Council meets on the first and third Tuesday of each month. You may also log on to EPA's website at http://www.epa.gov/ccr.

PLEASE NOTE: *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)***.

Violations — There were zero (0) violations of drinking water quality standards in 2018.

The City of Burlington is required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not our drinking water meets health standards. ***The City of Burlington had no violations in 2018***.

A **"Monitoring Violation"** means that water was not tested within the appropriate timeframe. A **"Reporting Violation"** means that the samples were analyzed, but the results were either not reported or reported incorrectly.

SPECIAL NOTICE REGARDING LEAD AND COPPER

The following special notice is provided solely for the information of our water customers.

There has been no indication that any City of Burlington water sample has shown elevated levels of lead or copper. However, regulations require that we provide certain information to our customers regarding the health effects of lead and copper.

LEAD & COPPER - If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. If lead is found in drinking water, it is almost always a result of the materials and components associated with the service lines and household plumbing. The City of Burlington 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 it tends to accumulate minute quantities of contaminants present in your household plumbing. 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. The City of Burlington Water Resources Department would be happy to assist you with this. 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/lead

Health Effects Language

LEAD – Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water (*water containing lead in excess of the action level*) over many years could develop kidney problems or high blood pressure.

COPPER – Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.