



County of Brunswick Water Quality Report–2017

IMPORTANT PHONE NUMBERS

BILLING QUESTIONS
(910) 253-2655 Option #3

WATER EMERGENCIES
8:00 a.m. to 4:30 p.m.
(910) 253-2657

AFTER HOURS
4:30 p.m. to 8:00 a.m.
Northwest WTP
(910) 371-3490
211 WTP
(910) 454-0512
Alternate
(910) 755-7921

EPA SAFE DRINKING WATER HOTLINE
1-800-426-4791

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And LEAD Information
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FROM THE DIRECTOR

The Brunswick County Public Utilities Department would like to let you know that we are here to serve you 24 hours a day. If you plan to dig, then call 811 or log on to www.NC811.org to request utility locates. If you have billing questions, call Customer Service at 910-253-2655 Option #3. If you have water quality concerns or questions about the function of your meter, please contact our office at (910) 253-2657; we will be glad to work with you to solve any water issues. If you have questions about your backflow device or need it inspected, we can help – please call (910) 253-2683.

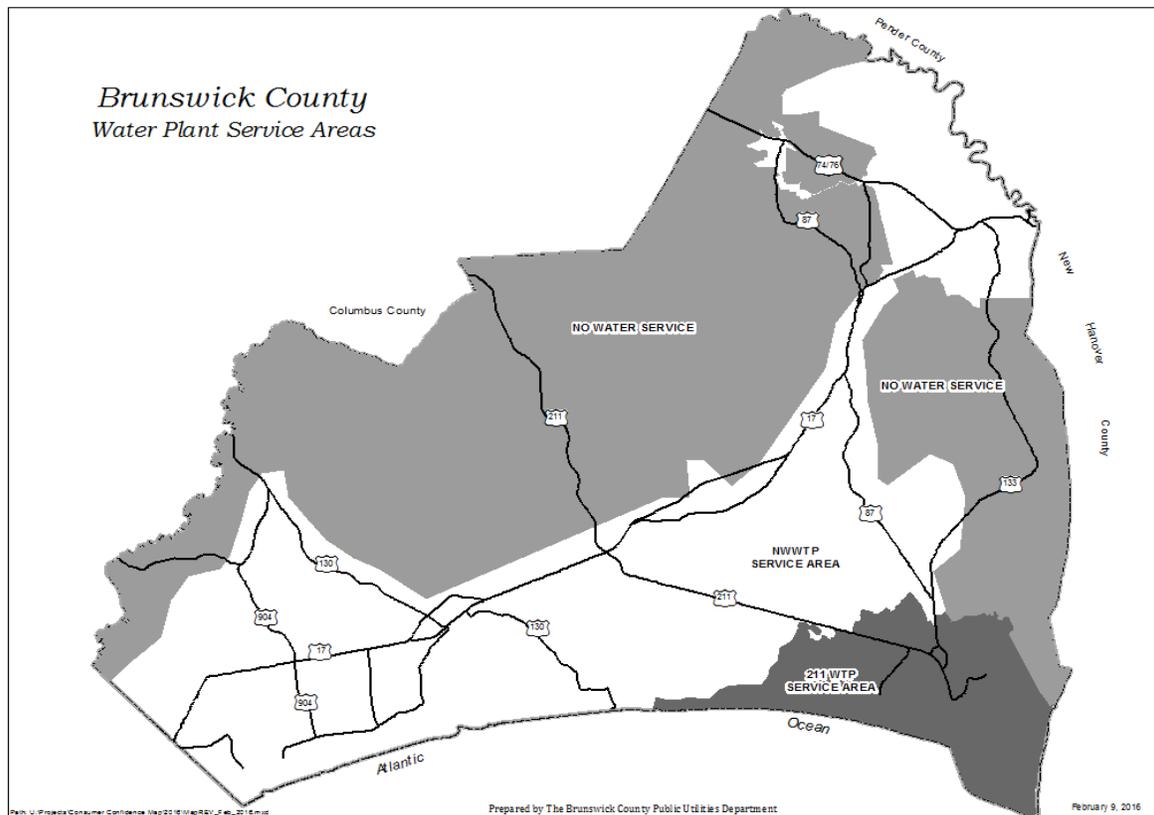
Interesting Facts:

Total Brunswick County Water System Capacity: 30 MGD

The Greatest One Day System Demand of the Year for 2017 was 24.43 million gallons (MGD) on July 7, 2017.

Find Your Service Area

Brunswick County operates two water treatment plants; the 24 million gallon per day Northwest WTP that treats raw water from the Cape Fear River and the 6 million gallon per day groundwater 211 WTP. The three data tables on pages 3, 4, & 5 provide water quality data for the two water treatment plants and the distribution system. Customers in the area of HWY 211 near the towns of St. James, Southport, and Oak Island primarily receive water from the 211 WTP or blended water. All other customers receive water from the Northwest WTP.



Sources of Drinking Water

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and can pick up substances resulting from the presence of animals or from human activity. Contaminants are anything in the water other than the water molecule. Contaminants that may be present in source water include *microbial contaminants*, such as viruses and bacteria, which may come from wildlife, sewage treatment plants, septic systems, and agricultural livestock operations; *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 typically come from agricultural operations; and *chemicals*, which are often by-products of industrial processes.

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.

The NC Source Water Assessment Program (SWAP)

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 Brunswick County 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 as of October 2017 are summarized in the table below.

Susceptibility of Sources to Potential Contaminant Sources (PCSs)

Source Name	Susceptibility Rating
CAPE FEAR RIVER	Moderate
WELL # 1, 2, 15, 16, 17, 18, & 19	Lower
WELL # 3, 5, 6A, 8, 11, 12, & 12A	Moderate

The complete SWAP Assessment Report for the Brunswick County Water System may be viewed on the Web by typing the following address into your browser: https://www.ncwater.org/files/swap/SWAP_Reports/0410045_9_8_2017_17_22.pdf To obtain a printed copy of this 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 systems’ potential to become contaminated by PCSs in the assessment area.

211 Water Treatment Plant



certification; Jacob Stephens for receiving his A-Well certification; and to Wilbur William’s retirement, he served the citizens of Brunswick County for more than 35 years!

The 211 Water Treatment Plant has fourteen (14) different groundwater wells that are tapped into the Castle Hayne Aquifer approximately 175 ft. below the ground’s surface. They use a lime softening process to remove excess calcium from the water. Construction was recently finished on a new one million gallon clearwell and sludge storage basins. Facility staff continue to provide quality water service to the areas of Southport, Oak Island, and St. James Plantation. Congratulations to Jeffrey Coward for receiving his B-Well





Brunswick County Water Quality Report 2017 Continued:

Northwest Water Treatment Plant

The Northwest WTP takes water from the Cape Fear River above Lock and Dam #1. This year Brunswick County Public Utilities contracted with CDM Smith to provide water treatment recommendations for the treatment of per and poly-fluoroalkyl substances (PFAS). As part of their study, CDM Smith installed a miniature (pilot) Reverse Osmosis (RO) System at the Northwest WTP to evaluate its effectiveness on PFAS like GENX. More detailed information



about the RO pilot study, water quality results, and steps we are taking to secure our water future can be found on the Brunswick County website <<http://www.brunswickcountync.gov/genx/>>.

Congratulations to Thaddeus Hill for his promotion to WTP Superintendent; Thaddeus previously served as Chief Operator for 10 years.

Water Quality Results for 2017

Terms & abbreviations used in the tables below:

- **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.
- **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.
- **Action Level (AL):** the concentration of a contaminant which, when exceeded, triggers treatment or other requirements which a water system must follow.
- **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. **N/A:** not applicable, **ntu:** nephelometric turbidity unit (cloudiness), **ppm-mg/L:** parts per million or milligrams per liter, **ppb-ug/L:** parts per billion or micrograms per liter, **ppt-ng/L:** is equal to parts per trillion, **pCi/l:** Pico-curies per liter (a measure of radiation), **MGD:** million gallons a day

Distribution System Analysis

Questions and Comments: Contact Mickey Thompson, Water Distribution Superintendent, 910-253-2404 or mickey.thompson@brunswickcountync.gov

LEAD AND COPPER	Action Level (AL)	MCLG	Brunswick County Amount Detected	# of Samples above the AL	Exceedence of the Action Level? Y/N	
Copper 90th percentile 6/1/17 - 8/31/17	13 ppm	13 ppm	0.120 ppm	1	N	Corrosion of Household Plumbing
Lead 90th percentile 6/1/17 - 8/31/17	0.05 ppm	0 ppm	≤0.003 ppm	0	N	Corrosion of Household Plumbing
ORGANIC CHEMICALS	EPA's MCL	EPA's MCLG	Brunswick County Amount Detected	Range Low High	Violation Y/N	
Total Trihalomethanes Stage 2	LLRA 80 ppb	N/A	Highest LLRA 34.3 ppb	16 47	N	By-product of Disinfection
Total Haloacetic Acids Stage 2	LLRA 60 ppb	N/A	Highest LLRA 18.8 ppb	12 24	N	By-product of Disinfection
REGULATED INORGANIC CHEMICALS	EPA's MCL	EPA's MCLG	Brunswick County Amount Detected	Range Low High	Violation Y/N	
Chlorite	10 ppm	0.8 ppm	Average 0.43 ppm	0.33 0.55	N	By-product of Disinfection
Nitrate	10 ppm	10 ppm	1.27 ppm	N/A	N	By-product of Disinfection
PESTICIDES, VOLATILE, & SYNTHETIC ORGANIC CHEMICALS	There Were No Regulated Pesticides, Volatile or Synthetic Organic Chemicals Detected in the Distribution System (Beyond those listed above) for the 2017 Sample Period					



Brunswick County Water Quality Report 2017 Continued:

Northwest Water Treatment Plant Analysis						
Listed below are the results of water quality sampling performed from January 1, 2017, to December 31, 2017.						
Questions and Comments: Contact Glenn Walker, Water Resources Manager, 910-371-3490 or glenn.walker@brunswickcountync.gov						
REGULATED ORGANIC CHEMICALS	EPA's MCL	EPA's MCLG	Brunswick County Amount Detected	Range Low High	Violation Y/N	Source of Contaminant
Turbidity	Treatment Technique Limit of 10 ntu	N/A	Average 0.039 ntu	% of samples ≤ 0.3 ntu	N	Soil Runoff
			Maximum 0.267 ntu	100.0%		
Raw Water TOC	Treatment Technique Minimum 45% Removal Efficiency	N/A	Average 6.482 ppm	2.9 8.1	N	Naturally Present in the Environment
Finish Water TOC		N/A	Average 2.718 ppm	2.0 3.1		
Total Organic Carbon (TOC)		N/A	Removal Efficiency Average 55.1%	3% - 65%		
pH	6.8 - 8.5	N/A	7.03	6.9 - 7.1	N	By-P Product of Caustic Addition
REGULATED INORGANIC CHEMICALS	EPA's MCL	EPA's MCLG	Brunswick County Amount Detected	Range Low High	Violation Y/N	Source of Contaminant
Chlorite	10 ppm	0.8 ppm	Average 0.59 ppm	0.40 0.80	N	By-Product of Disinfection
Chlorine Dioxide	0.8 ppm	0.8 ppm	Average 0.13 ppm	0.05 0.28	N	Water Additive Used to Control Microbes
Fluoride	4 ppm	4 ppm	Average 0.77 ppm	0.0 0.93	N	Water Additive which Promotes Strong Teeth
Orthophosphate	17 ppm	N/A	Average 173 ppm	162 199	N	Water Additive Used to Control Corrosion
Total Chlorine	4 ppm	4 ppm	Average Minimum 2.59 ppm	11 3.0	N	Water Additive Used to Control Microbes
Monochloramine Disinfectant Residual	4 ppm	4 ppm	2.57 ppm	102 2.86	N	Water Additive Used to Control Microbes
UNREGULATED SUBSTANCES	EPA's MCL	EPA's MCLG	Brunswick County Amount Detected	Range Low High	Violation Y/N	Source of Contaminant
1,4 Dioxane	Non Regulated	N/A	Average 185 ppb	13 2.4	N	Purifying Agent in Pharmaceuticals and By-Product of PET Plastic Production
Hardness	Non Regulated	N/A	Average 29.7 ppm	27 32	N	Part of the Treatment Process, Erosion of Natural Deposits
Iron	Non Regulated	N/A	Average 0.048 ppm	0.02 0.10	N	Part of the Treatment Process, Erosion of Natural Deposits
Manganese	Non Regulated	N/A	0.04 ppm	0.01 0.13	N	Part of the Treatment Process, Erosion of Natural Deposits
Free Ammonia	Non Regulated	N/A	0.063 ppm	0.02 0.08	N	Water Additive Used to Control Microbes
Sodium	Non Regulated	N/A	26 ppm	N/A	N	Part of the Treatment Process, Erosion of Natural Deposits
Sulfate	Non Regulated	N/A	16.3 ppm	N/A	N	Part of the Treatment Process, Erosion of Natural Deposits
CRYPTOSPORIDIUM - Cape Fear River 2017		N/A	0.0 oocyst	0.0 0.0	N	Naturally Present in the Environment
UNREGULATED PFAS SUBSTANCES	EPA's MCL	EPA's MCLG	Brunswick County Amount Detected	Range Low High	Violation Y/N	Source of Contaminant
perfluorohexanoic acid (PFHxA)	Non Regulated	N/A	23.245 ppt	8 39	N	By-Product of Chemical Manufacturer
perfluoro-2-propoxypropanoic acid (GenX)	Non Regulated	N/A	39.492 ppt	13 193	N	By-Product of Chemical Manufacturer
perfluoroheptanoic acid (PFHpA)	Non Regulated	N/A	18.681 ppt	6 33	N	By-Product of Chemical Manufacturer
perfluorohexanesulfonic acid (PFHxS)	Non Regulated	N/A	3.777 ppt	0 6	N	By-Product of Chemical Manufacturer
perfluorooctanoic acid (PFOA)	Non Regulated	N/A	8.952 ppt	4 17	N	By-Product of Chemical Manufacturer
perfluorononanoic acid (PFNA)	Non Regulated	N/A	1.479 ppt	0 4	N	By-Product of Chemical Manufacturer
perfluorooctanesulfonic acid (PFOS)	Non Regulated	N/A	6.459 ppt	2 11	N	By-Product of Chemical Manufacturer
perfluorodecanoic acid (PFDA)	Non Regulated	N/A	0.989 ppt	0 2	N	By-Product of Chemical Manufacturer

Northwest WTP has monitored for Cryptosporidium (a protozoan) monthly and has **not** detected oocysts (egg-like structure) in the Cape Fear River raw water supply for 2017. Cryptosporidium is a microbial parasite which is found in surface water throughout the U.S. Although Cryptosporidium can be removed by filtration, the most commonly used filtration methods cannot guarantee 100 percent removal. The Northwest WTP takes precautions to kill and remove Cryptosporidium oocysts by using Chlorine Dioxide as a pre-oxidant disinfectant in our raw water supply line and then again applying Chlorine Dioxide just before and after filtration.



Brunswick County Water Quality Report 2017 Continued:

HWY 211 Groundwater Treatment Plant Analysis

Questions and Comments: Contact Jeremy Sexton, Water Treatment Plant Superintendent, 910-454-0512 or jeremy.sexton@brunswickcountync.gov

UNREGULATED SUBSTANCES	EPA's MCL	EPA's MCLG	Brunswick County Amount Detected	Range		Violation Y/N	Source of Contaminant
				Low	High		
Turbidity	Non Regulated	N/A	Average 0.90 ntu	0.04	2.9	N	Part of the Treatment Process, Erosion of Natural Deposits
pH	Non Regulated	N/A	-----	6.5	8.4	N	Part of the Treatment Process
CO2	Non Regulated	N/A	7.4 ppm	4	14	N	Part of the Treatment Process
Alkalinity	Non Regulated	N/A	35 ppm	16	195	N	Part of the Treatment Process, Erosion of Natural Deposits
Hardness	Non Regulated	N/A	121 ppm	71	236	N	Part of the Treatment Process, Erosion of Natural Deposits
Iron	Non Regulated	N/A	0.09 ppm	0	0.8	N	Part of the Treatment Process, Erosion of Natural Deposits
Chloride	Non Regulated	N/A	21 ppm	2	24	N	Part of the Treatment Process, Erosion of Natural Deposits
Free Ammonia	Non Regulated	N/A	0 ppm	0	0.14	N	Water Additive Used to Control Microbes
REGULATED INORGANIC CHEMICALS	EPA's MCL	EPA's MCLG	Brunswick County Amount Detected	Range Low	Range High	Violation Y/N	Source of Contaminant
Fluoride	4 ppm	4 ppm	0.68 ppm	0.1	1.0	N	Water Additive Used to Promote Strong Teeth
Orthophosphate	17 ppm	N/A	14 ppm	0.1	2.9	N	Water Additive Used to Control Corrosion
Total Chlorine	4 ppm	4 ppm	2.54 ppm	1.2	3.8	N	Water Additive Used to Control Microbes
Monochloramine	4 ppm	4 ppm	2.49 ppm	1.0	3.7	N	Water Additive Used to Control Microbes

NOTICE TO THE PUBLIC -TIER III

We are 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. In August 2017, we did not complete all monitoring for TOC (Total Organic Carbon) and therefore cannot be sure of the quality of our drinking water during that time.

Total Organic Carbon is monitored every 30 minutes in our own laboratory; however, a sample was not submitted to a State certified laboratory as required.

Staff is now being more diligent to ensure samples are being submitted to a certified laboratory approved by the NC Public Water Supply Section.

There is nothing that you need to do at this time. All sample results before and after the missed sample were reported to be in compliance with State treatment technique standards. The water system returned to compliance on September 1, 2017, and has no reason to believe the water quality was ever out of compliance. New staff and calendar reviews should help remove sampling irregularities.

(TOC) - Total Organic Carbon - includes testing for Alkalinity, Dissolved Organic Carbon (DOC), Total Organic Carbon (TOC) and Ultraviolet Absorption 254 (UV254). Source water samples must be tested for both TOC and Alkalinity. Treated water samples must be tested for TOC.

Source water samples and treated water samples must be collected on the same day.

For more information on this PN please contact: Glenn Walker, Water Resources Manager at glenn.walker@brunswickcountync.gov, 910-371-3490, or P. O. Box 249 Bolivia, NC 28422

Did You Know?

The EPA and Brunswick County Want You to Know About Potential Household Lead Contamination

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. Brunswick County Public Utilities 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 (800-426-4791) or at <http://www.epa.gov/safewater/lead>.



Brunswick County Water Quality Report 2017 Continued:

- **How Does Brunswick County prevent and monitor for lead in our drinking water?**
 - We don't use lead service lines between the distribution pipes and our water meters.
 - We have an active corrosion control and prevention plan that requires us to feed a corrosion inhibitor (orthophosphate) and to monitor the residual daily at the water plants and weekly in the distribution system.
 - Brunswick County building codes have required plumbing materials to be low or free of lead since 1987.
 - We monitor for lead and copper in homes that were built before 1987 and may be at higher risk for exposure due to susceptible plumbing materials (copper pipe with lead solder joints) at least every three years.

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.

Immunocompromised 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 microbiological contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

Water Quality in the Home

Remove and flush faucet aerators regularly. This helps to keep debris such as pipe solder and sediment from clogging aerator screens, as well as provide the best quality water possible.

What about Home Filtration Systems? Brunswick County Public Utilities does not recommend whole house filtration systems because these systems tend to remove the disinfection properties of the water and may waste a significant amount of water. The removal of disinfection chemicals in turn will allow bacteria to grow in your household plumbing. If you must use a filtration system purchase one that goes "under the counter", attaches to the kitchen faucet, or is a part of your refrigerator. This allows the disinfected water to remain in the plumbing, preventing bacterial growth.

Ways You Can Conserve Water!

Brunswick County Public Utilities asks that you use water wisely. By following the recommendations outlined below, you may be able to reduce the amount of water you use.

- **IRRIGATE DURING OFF PEAK HOURS**
Peak demand for water is between 5:00 a.m. to 10:00 a.m. and 4:00 p.m. to 7:00 p.m. If irrigation is necessary, irrigate during off peak times. This will help to ensure proper water pressure for more efficient irrigating.
- **REDUCE IRRIGATION FREQUENCY**
For established lawns, daily irrigation is not required. Irrigate only when there is no moisture in the root zone.
- **WHEN PURCHASING NEW OR REPLACEMENT APPLIANCES AND FAUCETS**
Look for the Energy Star compliant symbol and the EPA's Water Sense symbol. These ensure the appliances are both energy and water efficient.

