

Introduction

We are pleased to present to you this year's Annual Drinking Water Quality Report which is a snapshot of last year's water quality. Included are details about your sources 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. We are committed to ensuring the quality of your water and to providing you with this information because informed customers are our best allies. **If you have any questions concerning your water or this report, please contact Seth Brown at (910) 937-7520.** We want our valued customers to be informed about their water utility. If you want to learn more, you may attend a Board of Director's meeting. The Board of Director's meeting schedule can be found at www.onwasa.com along with other useful information.

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. ONWASA 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 storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming; pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses; organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems; and radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.

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 water that is used by this system is groundwater. ONWASA has 14 wells located throughout the county, which draw from the Black Creek Aquifer. The water provided by the treatment plants in Hubert and Dixon draw water from 22 wells in the Castle Hayne Aquifer.

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 ONWASA 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:

| Source Name | Susceptibility Rating | SWAP Report Date |
|-------------|-----------------------|------------------|
| Well 1 | Lower | July 2016 |
| R2 | Lower | July 2016 |
| Dixon 1 | Lower | July 2016 |
| Hubert 1 | Moderate | July 2016 |

The complete SWAP Assessment report for ONWASA may be viewed on the Web at: www.ncwater.org/pws/swap. 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. ONWASA maintains a Wellhead Plan adopted in 2002 to help protect our drinking water source. Customers can view this plan on our web site at www.onwasa.com. You can help protect your community’s drinking water source(s) 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.). ONWASA is also involved in the community and is available to speak to civil groups, schools, boy/girl scouts, and others to educate our consumers on Source Water Protection.

Violations that ONWASA Received in 2016

ONWASA is pleased to announce during 2016, no violations were received.

Important Drinking Water Definitions

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

Parts per trillion (ppt) or Nanograms per liter (nanograms/L) - One part per trillion corresponds to one minute in 2,000,000 years, or a single penny in \$10,000,000,000.

Parts per quadrillion (ppq) or Picograms per liter (picograms/L) - One part per quadrillion corresponds to one minute in 2,000,000,000 years or one penny in \$10,000,000,000,000.

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.

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 ONWASA sampled 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, 2016.** 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.

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.

2016 Analytical Results for Regulated Substances

Microbiological Group

| Substance | Violation Y/N | Your Water | MCLG | MCL | Likely Source |
|----------------------------|---------------|------------|------|---|---------------------------------------|
| Total Coliform Bacteria | N | 0.17% | 0 | 5% of monthly samples are positive. | Naturally present in the environment. |
| Fecal Coliform and E. Coli | N | 0 | 0 | A routine sample and repeat sample are total coliform positive, and one is also fecal coliform or E. coli | Human and animal fecal waste. |

What the chart means: ONWASA samples 100 sites per month throughout the service area for bacteriological contaminants. Two of the 1,200 routine samples tested positive for Total Coliform Contamination. The repeat of this site tested negative. Total Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful bacteria may be present. None of the bacteriological samples were positive for fecal contamination. ONWASA draws these samples from sampling stations in the distribution system which allows us to sample in strategic areas. Although ONWASA does not sample at each individual resident all areas of the system are represented in the sampling plan. ONWASA received no violation because 5% of the samples did not test positive for both Total and Fecal Bacteria.

Inorganic Group

| Substance | Sample Date | Your Water in mg/l | No. of sites found above the AL | MCLG in mg/l | AL (mg/l) | Likely Source |
|-----------|---------------|--------------------|---------------------------------|--------------|-----------|---|
| Lead | July-Dec 2016 | <0.003 | 0 | 0 | AL=0.015 | Corrosion of household plumbing systems: erosion of natural deposits. |
| Copper | July-Dec 2016 | <0.261 | 0 | 1.3 | AL=1.3 | Corrosion of household plumbing systems: erosion of natural deposits. |

What the chart means: Sampling results are from the 2016 compliance period. **Your Water** results represent the 5th highest level detected of the total amount of samples and is the number used to determine if ONWASA is in compliance.

2016 Analytical Results continued

Inorganic Group

| Substance | Sample Date | MCL Violation | Your Water in mg/l | Range | | SMCL in mg/l | MCL in mg/l | Likely Source |
|-----------------|-------------|---------------|--------------------|--------|-------|--------------|-------------|--|
| | | | | Low | High | | | |
| Fluoride (Mg/L) | 11/23/2015 | N/A | 3.5 | 0.56 | 3.5 | 2.00 | 4.00 | Erosion of natural deposits/water additive which promotes strong teeth/discharge from fertilizer and aluminum factories. |
| Chromium (ppb) | 11/23/2015 | N/A | 0.020 | <0.020 | 0.020 | N/A | 0.10 | Discharge from steel and pulp mills; erosion of natural deposits |

Notice to the Public for Exceedance of Secondary MCL for Fluoride. What the chart means: Sampling results are from the 2015 compliance period. ONWASA was not required to sample for Fluoride and Chromium in 2016. The next routine sampling event will occur in 2017. This is an alert about your drinking water and a cosmetic dental problem that might affect children under nine years of age. At low levels, fluoride can help prevent cavities, but children drinking water containing more than 2 milligrams per liter (mg/l) of fluoride may develop cosmetic discoloration of their permanent teeth (dental fluorosis). The drinking water provided by your community water system [ONWASA] has a fluoride concentration of 3.5 mg/l.

Dental fluorosis, in its moderate or severe forms, may result in a brown staining and/or pitting of the permanent teeth. This problem occurs only in developing teeth, before they erupt from the gums. Children under nine should be provided with alternative sources of drinking water or water that has been treated to remove the fluoride to avoid the possibility of staining and pitting of their permanent teeth. You may also want to contact your dentist about proper use by young children of fluoride-containing products. Older children and adults may safely drink the water.

Fluoride is naturally occurring in all of ONWASA's water sources with the exception of the Dixon and Hubert Water Treatment Plants where it is added for dental benefits. This addition is well below the Secondary Maximum Contaminant Level (SMCL) of 2.00 mg/l. **Your Water** results represent the highest level detected of all the source water samples. All other Inorganics results, to include Antimony, Arsenic, Barium, Beryllium, Cadmium, Cyanide, Mercury, Nickel, Selenium, Sulfate, and Thallium, were below the detection limit.

Other Water Characteristics or Secondary Inorganic Group

| | | | | | | | | |
|-----------|------------|----|-------|--------|-------|--------------------------|----|--------------------------------------|
| Iron | 11/25/2015 | NA | 4.32 | <0.060 | 4.32 | 0.3 | NA | Erosion of natural deposits |
| Manganese | 11/25/2015 | NA | 0.085 | <0.010 | 0.085 | 0.05 | NA | Erosion of natural deposits |
| Sodium | 11/23/2015 | NA | 218 | 64.6 | 218.0 | N/A | NA | Erosion of natural deposits |
| Chloride | 1/10/2015 | NA | 81.4 | 4.9 | 81.4 | 250 | NA | Erosion of natural deposits |
| pH | 11/23/2015 | NA | 9.01 | 8.65 | 9.01 | 6.50 units to 8.50 units | NA | Natural dissolved gases and minerals |

2016 Analytical Results for Regulated Substances

Secondary Inorganics continued

What the chart means: Sampling results are from the 2015 compliance period. ONWASA was not required to sample for Inorganics 2016. The next routine sampling event will occur in 2017. Secondary Inorganics are naturally occurring elements in the water supply that are regulated for aesthetic purposes rather than the health affects. The results in the table above are for compliance purposes but ONWASA samples daily for iron, manganese and fluoride to insure water quality. **Your Water** results represent the highest level detected of all the source water samples.

Disinfectant By-Products

| DBP Type / Location | TTHM Range Detected in mg/l | HAA5 Range Detected in mg/l | Average TTHM in mg/l | Average HAA5 in mg/l | MCL in MG/L | Likely Source |
|--------------------------|-----------------------------|-----------------------------|----------------------|----------------------|--------------------------------|--|
| 104 Manchester Lane | 0.043-0.057 | 0.027-0.043 | 0.049 | 0.031 | TTHM 0.080 HAA5 0.060 | Total Trihalomethanes (TTHM) and Total Haloacetic Acids (HAA5) By-product of drinking water chlorination. |
| 23395 Hwy. 50 | 0.063-0.092 | 0.034-0.057 | 0.077 | 0.044 | TTHM 0.080 HAA5 0.060 | Total Trihalomethanes (TTHM) and Total Haloacetic Acids (HAA5) By-product of drinking water chlorination. |
| 900 Broadway | 0.059-0.087 | 0.027-0.053 | 0.078 | 0.038 | TTHM 0.080 HAA5 0.060 | Total Trihalomethanes (TTHM) and Total Haloacetic Acids (HAA5) By-product of drinking water chlorination. |
| 1012 Barkley Ct. | 0.024-0.033 | 0.010-0.018 | 0.042 | 0.017 | TTHM 0.080 HAA5 0.060 | Total Trihalomethanes (TTHM) and Total Haloacetic Acids (HAA5) By-product of drinking water chlorination. |
| 7561 New Bern Hwy. | 0.039-0.067 | 0.012-0.026 | 0.05 | 0.019 | TTHM 0.080 HAA5 0.060 | Total Trihalomethanes (TTHM) and Total Haloacetic Acids (HAA5) By-product of drinking water chlorination. |
| 2900 White Oak River Rd. | 0.042-0.059 | 0.020-0.027 | 0.053 | 0.024 | TTHM 0.080 HAA5 0.060 | Total Trihalomethanes (TTHM) and Total Haloacetic Acids (HAA5) By-product of drinking water chlorination. |

2016 Analytical Results continued

Disinfectant By-Products continued

What the chart means: Disinfection By-Products are substances that can form when water is chlorinated for disinfection purposes. In 2016 ONWASA sampled 6 sites every quarter and the ranges of detection are reported above. The maximum level reported for Total Trihalomethanes was above the MCL for that substance at 2 out of the 6 sample stations in the system. Because the average for the 4 quarters at that stations was not above the MCL there was no violation. ONWASA takes every precaution to minimize the levels of Disinfection By-Products in the distribution system. ONWASA has placed automatic flushing devices at strategic points in the distribution system, such as White Oak River Road, to pull fresh water into the outer ends of the system where Trihalomethanes are most likely to occur. We also perform daily chlorine monitoring to maintain levels sufficient for disinfection and to minimize creation of Disinfection By-Products. State mandates chlorine levels be maintained between 4.00 mg/l to 0.20 mg/l and ONWASA's average for the system is 1.01 mg/l. Through a regular flushing program and extra monitoring, ONWASA has lowered the TTHM levels below the MCL.

Other Constituents

2016 sampling for Nitrates in all 16 water sources detected levels less than the reportable levels of less than 1.0 mg/l.

| Volatile Organic Chemicals | Sample Date | MCL Violation Y/N | Your Water | Range Low High | MCL in MG/L | Likely Source |
|----------------------------|-------------|-------------------|------------|----------------|-------------|--|
| Carbon Tetrachloride (ppb) | 11/18/2015 | N | 0.0005 | <0.0005 | 0.005 | Discharge for chemical plants and other industrial factories |

ONWASA was not required to sample for Volatile Organic Chemicals (VOC) in 2016. The next routine sampling event will occur in 2017. 2015 sampling for 21 Volatile Organic Chemicals (VOC) found levels lower than the reportable level for all but 1 water source. These are commonly referred to as No Detection. VOCs are usually found as chlorinated solvents and fuel components. They include: 1,2,4-Trichlorobenzene, Cis-1,2-Dichloroethylene, Xylenes, Dichloromethane, o-Dichlorobenzene, p-Dichlorobenzene, Vinyl chloride, 1,1-Dichloroethylene, Trans-1,2-Dichloroethylene, 1,2-Dichloroethane, 1,1,1-Trichloroethane, Carbon tetrachloride, 1,2-Dichloropropane, Trichloroethylene, 1,1,2-Trichloroethane, Tetrachloroethylene, Chlorobenzene, Benzene, Toluene, Ethylbenzene, Styrene.

ONWASA was not required to sample for Radiologicals in 2016. The next routine sampling event will occur in 2017. 2015 sampling for Radiologicals found no detects for Gross Alpha, Uranium, Radium 226 and Radium 228 at 15 of the source water sites. Reportable levels for Gross Alpha 4.4pCi/L, Uranium 1.0 pCi/L, Gross Bete were detected at 1 of ONWASA's source water wells. The Allowable Limits are 15pCi/L, 5pCi/L and 8.6 PCI/L respectively. Radiologicals are caused by the erosion of natural deposits.

ONWASA was not required to sample for UCMR in 2016. 2015 sampling for 12 Unregulated Contaminant Monitoring (UCMR) at 5 water sources resulted in No Detection for VOC's, 1,4-Dioxane, Solid Phase Extraction 522, Prefluorinated Chemicals, Solid Phase Extraction 537, Hormones 539, Solid Phase Extraction 539, Chromium, Cobalt, Molybdenum. Chlorate, Hexavalent Chromium, Strontium and Vanadium were 250 ug/l, 0.14 ug/l, 120 ug/l, and 0.22 ug/l respectively.

ONWASA was not required to sample for Pesticides & Synthetic Organic Chemicals (SOC) in 2016. The next routine sampling event will occur in 2017. The 2015 sampling for 26 Pesticides & Synthetic Organic Chemicals (SOC) found levels lower than the reportable levels for all 16 water sources. These are commonly referred to as No Detection. SOC's are found as herbicides, pesticides and defoliants. They include: Endrin, Lindane, Methoxychlor, Toxaphene, Dalapon, Di(2-ethylhexyl)phthalate, Oxamyl(vydate), Simazine, Di-(2-ethylhexyl)phthalate, Picloram, Diinoseb, Atrazine, Carbofuran, Hexachlorocyclopentadiene, Alachlor, Heptachlor, Heptachlor epoxide, 2,4-D, 2,4,5-TP(Silvex), Hexachlorobenzene, Benzo(a)pyrene, Pentachlorophenol, PCBs (as decachlorobiphenol), 1,2-Dibromo-3-chloropropane(DBCP), Ethylene, Dibromide(EDB), Chlordane.

2016 WATER QUALITY REPORT



Onslow Water and Sewer Authority
228 Georgetown Road
Jacksonville, North Carolina 28540
(910) 455-0722
WWW.ONWASA.COM

