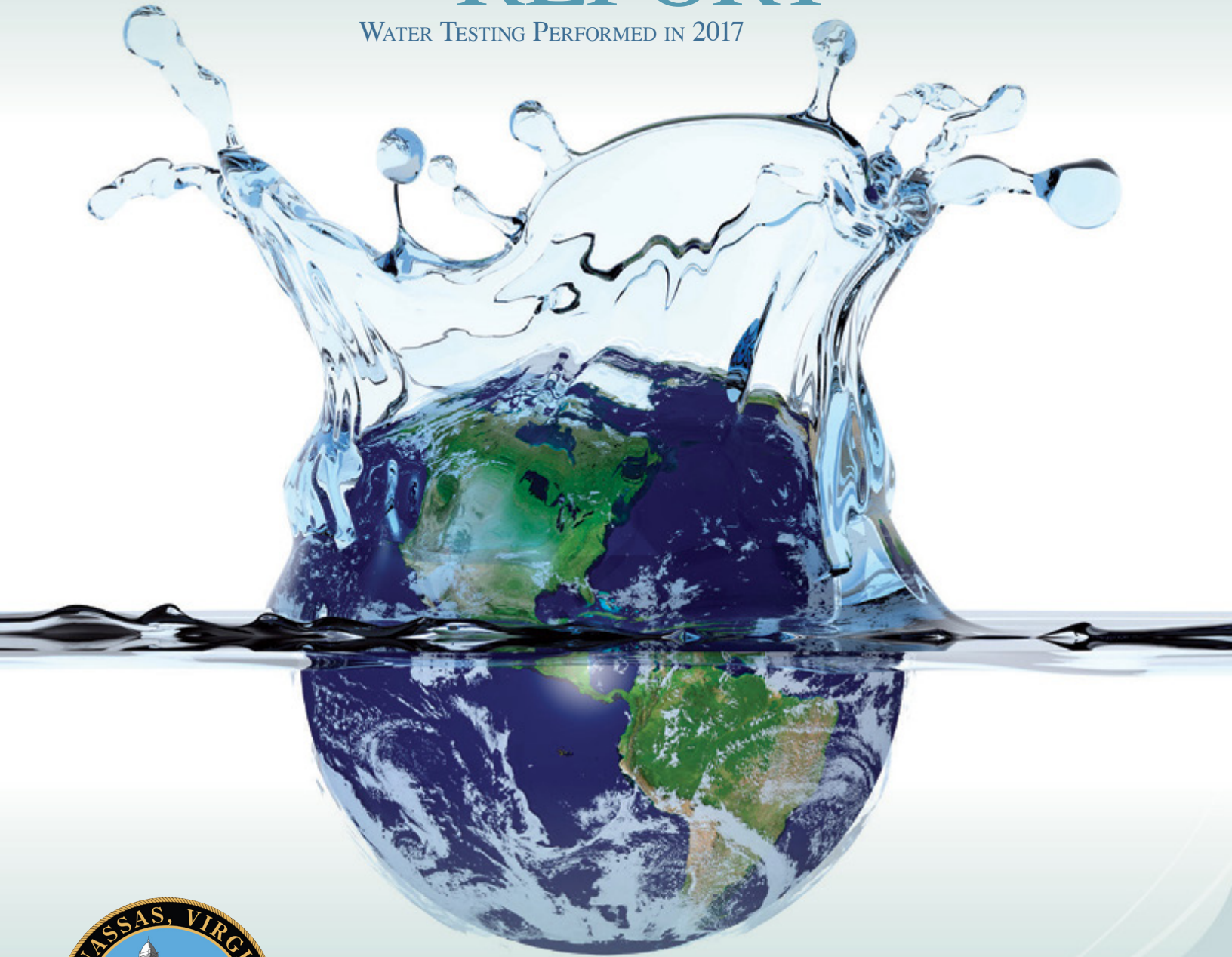


ANNUAL WATER QUALITY REPORT

WATER TESTING PERFORMED IN 2017



Presented By
City of Manassas

Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.

PWS ID#: 6685100

Quality First

Once again we are pleased to present our annual water quality report. As in years past, we are committed to delivering the best-quality drinking water possible. To that end, we remain vigilant in meeting the challenges of new regulations, source water protection, water conservation, and community outreach and education while continuing to serve the needs of all of our water users. Thank you for allowing us the opportunity to serve you and your family.

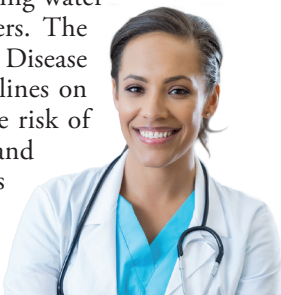
We encourage you to share your thoughts with us on the information contained in this report. After all, well-informed customers are our best allies.

Community Participation

You are invited to participate in our Utility Commission meetings and voice your concerns about your drinking water. The Utility Commission meets on the second Thursday of each month, beginning at 5:30 p.m. in the large conference room at the City of Manassas Public Works Building, 8500 Public Works Drive, Manassas, VA 20110. If you would like to attend or have any questions, please contact the Utilities Department at (703) 257-8351.

Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as those with cancer undergoing chemotherapy, those who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants may be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The U.S. EPA/CDC (Centers for Disease Control and Prevention) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline at (800) 426-4791 or <http://water.epa.gov/drink/hotline>.



Substances That Could Be in Water

To ensure that tap water is safe to drink, the U.S. EPA prescribes regulations limiting the amount of certain contaminants in water provided by public water systems. U.S. Food and Drug Administration regulations establish limits for contaminants in bottled water that must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of these contaminants does not necessarily indicate that the water poses a health risk.

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, in some cases, radioactive material, and substances resulting from the presence of animals or from human activity. Substances 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, or wildlife;

Inorganic Contaminants, such as salts and metals, which can be naturally occurring or may 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 may also come from gas stations, urban stormwater runoff, and septic systems;

Radioactive Contaminants, which can be naturally occurring or may be the result of oil and gas production and mining activities.

For more information about contaminants and potential health effects, call the U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791.



Lead in Home Plumbing

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. We are responsible for providing high-quality drinking water, but we 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 www.epa.gov/lead.

Where Does My Water Come From?

The City of Manassas is fortunate because we have two reliable water supply sources for our customers. The primary source is the City of Manassas Water Treatment Plant, which draws water from Lake Manassas, an impoundment on Broad Run in Western Prince William County. The watershed for Lake Manassas covers approximately 74.5 square miles, with the reservoir covering over 880 acres.

The second source of water, if needed during peak consumption periods or emergencies, is water supplied from the Prince William County Service Authority (PWCSA). The water supplied to us from PWCSA is treated at Fairfax Water's Northern Treatment Facility, the James J. Corbalis Plant, which withdraws water from the Potomac River. To learn more about our watershed on the Internet, go to U.S. EPA's Search Your Watershed at www.epa.gov/surf.

Water Treatment Process

The City of Manassas Water Treatment Plant's state-licensed operators use multiple processes to remove microbial, organic, inorganic, and particulate contaminants from our source waters during water treatment. Water treatment is the process of producing pure, clean, high-quality drinking water from the source water. First, raw water from Lake Manassas enters the water treatment plant, where pre-filtration chemicals are added. These pre-filtration chemicals cause the particles contained in raw water to adhere to one another, making them heavy enough to settle out in the settling basins and be removed. After settling, water is filtered through layers of anthracite, gravel, and silicate sand. As smaller suspended particles are filtered out, clear water emerges. After filtration, chlorine is added as a disinfectant to protect against any bacteria that may still be present. Chlorination is needed to deter the growth of bacteria while the water is flowing through the pipes and into your home. We carefully monitor the amount of chlorine, adding the lowest quantity necessary to protect the safety of your water without compromising taste. Following chlorination, ammonia is added to stabilize the chlorine, pH is adjusted, orthophosphate is added to prevent corrosion, and fluoride is added to prevent tooth decay. After the treatment process, the water is pumped to the water distribution system via underground piping to customers in the City of Manassas, Manassas Park, and Prince William County.

The City of Manassas Water Plant is proud to have won the Silver Award for Water Treatment Plant Performance for Excellence in Filtration and Clarification for 2017.

Recognition of Our Water Plant

The City of Manassas Water Plant is proud to have won the Silver Award for Water Treatment Plant Performance for Excellence in Filtration and Clarification for 2017 from the Virginia Department of Health - Office of Drinking Water. The Water Plant also received the Water Fluoridation Quality award from the Centers for Disease Control and Prevention, Division of Oral Health.

Tap vs. Bottled

Thanks in part to aggressive marketing, the bottled water industry has successfully convinced us all that water purchased in bottles is a healthier alternative to tap water. However, according to a four-year study conducted by the Natural Resources Defense Council, bottled water is not necessarily cleaner or safer than most tap water. In fact, about 25 percent of bottled water is actually just bottled tap water (40 percent, according to government estimates).

The Food and Drug Administration is responsible for regulating bottled water, but these rules allow for less rigorous testing and purity standards than those required by the U.S. EPA for community tap water. For instance, the high mineral content of some bottled waters makes them unsuitable for babies and young children. Furthermore, the FDA completely exempts bottled water that's packaged and sold within the same state, which accounts for about 70 percent of all bottled water sold in the United States.

People spend 10,000 times more per gallon for bottled water than they typically do for tap water. If you get your recommended eight glasses a day from bottled water, you could spend up to \$1,400 annually. The same amount of tap water would cost about 49 cents. Even if you installed a filter device on your tap, your annual expenditure would be far less than what you'd pay for bottled water.

For a detailed discussion on the NRDC study results, check out their Web site at <https://goo.gl/Jxb6xG>.

QUESTIONS?

For more information about this report, or for any questions relating to your drinking water, please call Ivy Ozmon, Water Department Compliance Officer, at (703) 257-8342.

Testing for *Cryptosporidium*

Cryptosporidium is a microbial parasite naturally found in surface water throughout the U.S. Although filtration removes *Cryptosporidium*, the most commonly used filtration methods cannot guarantee 100 percent removal. Monitoring of source water indicates the presence of these organisms. Current test methods do not allow us to determine if the organisms are dead or if they are capable of causing disease.

Symptoms of infection include nausea, diarrhea, and abdominal cramps. Most healthy individuals can overcome the disease within a few weeks. However, immunocompromised people are at greater risk of developing life-threatening illness. We encourage immunocompromised individuals to consult their doctors 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.

In April 2015 the City of Manassas began additional monitoring for compliance under the U.S. EPA's Long-Term 2 Enhanced Surface Water treatment rule (LT2ESWTR), round 2. The EPA has developed this rule to provide increased source water protection against microbial pathogens such as *Cryptosporidium*.

Under the LT2ESWTR round 2, the average *Cryptosporidium* concentration determines if additional treatment measures are needed. A *Cryptosporidium* concentration of 0.075 oocysts/Liter triggers additional water treatment measures. *Cryptosporidium* concentrations in the City of Manassas' source waters are well below this threshold. 2017 results: The Lake Manassas average *Cryptosporidium* concentration was 0.034 (oocysts/Liter).



BY THE NUMBERS

The number of gallons of water produced daily by public water systems in the U.S.

34
BILLION

1
MILLION

The number of miles of drinking water distribution mains in the U.S.

The amount of money spent annually on maintaining the public water infrastructure in the U.S.

135
BILLION

300
MILLION

The number of Americans who receive water from a public water system.

The age in years of the world's oldest water, found in a mine at a depth of nearly two miles.

2
BILLION

151
THOUSAND

The number of active public water systems in the U.S.

The number of highly trained and licensed water professionals serving in the U.S.

199
THOUSAND

Source Water Assessment

Under provisions of the Safe Drinking Water Act, states are required to develop comprehensive Source Water Assessment Programs to identify the watersheds that supply public tap water, provide an inventory of contaminants present in the watershed, and assess susceptibility to contamination in the watershed. The Virginia Department of Health (VDH) conducted a Source Water Assessment of the Lake Manassas Reservoir in 2002 and found it to be of high susceptibility to contamination using the criteria developed by the state in its approved Source Water Assessment Program. The VDH assessment report consists of maps showing the source water assessment area, an inventory of known land use activities of concern in Prince William County, and documentation of any known contamination within the five-year study period. The report is available by contacting Ivy Ozmon, Water Department Compliance Officer, at (703) 257-8342. Another source water assessment will be conducted in the near future.

Test Results

Our water is monitored for many different kinds of substances on a very strict sampling schedule. The information in the data tables shows only those substances that were detected between January 1 and December 31, 2017. Remember that detecting a substance does not necessarily mean the water is unsafe to drink; our goal is to keep all detects below their respective maximum allowed levels. The state recommends monitoring for certain substances less often than once per year because the concentrations of these substances do not change frequently. In these cases, the most recent sample data are included, along with the year in which the sample was taken.

REGULATED SUBSTANCES

| SUBSTANCE (UNIT OF MEASURE) | YEAR SAMPLED | MCL [MRDL] | MCLG [MRDLG] | AMOUNT DETECTED | RANGE LOW-HIGH | VIOLATION | TYPICAL SOURCE |
|---|--------------|------------------------------------|--------------|-----------------|----------------|-----------|---|
| Chlorine (ppm) | 2017 | [4] | [4] | 3.2 | 0.3–3.9 | No | Water additive used to control microbes |
| Fluoride (ppm) | 2017 | 4 | 4 | 0.70 | 0.59–0.79 | No | Water additive that promotes strong teeth |
| Haloacetic Acids [HAAs] (ppb) | 2017 | 60 | NA | 31 | 13–43 | No | By-product of drinking water disinfection |
| TTHMs [Total Trihalomethanes] (ppb) | 2017 | 80 | NA | 45 | 20–67 | No | By-product of drinking water disinfection |
| Total Organic Carbon (ppm) | 2017 | TT | NA | 1.35 | 1.16–1.54 | No | Naturally present in the environment |
| Turbidity (NTU) | 2017 | TT | NA | 0.099 | 0.041–0.099 | No | Soil runoff |
| Turbidity (Lowest monthly percent of samples meeting limit) | 2017 | TT = 95% of samples meet the limit | NA | 100 | NA | No | Soil runoff |

Tap water samples were collected for lead and copper analyses from sample sites throughout the community.

| SUBSTANCE (UNIT OF MEASURE) | YEAR SAMPLED | AL | MCLG | AMOUNT DETECTED (90TH%TILE) | SITES ABOVE AL/TOTAL SITES | VIOLATION | TYPICAL SOURCE |
|-----------------------------|--------------|-----|------|-----------------------------|----------------------------|-----------|---|
| Copper ¹ (ppm) | 2015 | 1.3 | 1.3 | 0.123 | 0/30 | No | Corrosion of household plumbing systems |
| Lead ¹ (ppb) | 2015 | 15 | 0 | 0.51 | 0/30 | No | Corrosion of household plumbing systems |

OTHER SUBSTANCES

| SUBSTANCE (UNIT OF MEASURE) | YEAR SAMPLED | AMOUNT DETECTED | RANGE LOW-HIGH | TYPICAL SOURCE |
|-----------------------------|--------------|-----------------|----------------|---|
| Alkalinity (ppm) | 2017 | 46 | NA | A measure of the capacity of water to neutralize acids |
| Conductivity (µS/cm) | 2017 | 206 | NA | Conductivity or specific conductance is a measure of the water's ability to conduct an electric current. Conductivity is related to the number of ions in the water. Water with higher conductivity contains more ions |
| Total Hardness (ppm) | 2017 | 45 | NA | Total Hardness is a measure of the amount of calcium and magnesium in the water. Hard water can cause mineral buildup in plumbing. Hardness contributes to the effectiveness of soaps and detergents. The City of Manassas' water is in the slightly hard range |

¹Lead and copper results are based on testing completed in 2015. The next round of testing will be performed in 2018.

Definitions

AL (Action Level): The concentration of a contaminant that, if exceeded, triggers treatment or other requirements that a water system must follow.

µS/cm (microsiemens per centimeter): A unit expressing the amount of electrical conductivity of a solution.

LRAA (Locational Running Annual Average): The average of sample analytical results for samples taken at a particular monitoring location during the previous four calendar quarters. Amount Detected values for TTHMs and HAAs are reported as the highest LRAAs.

MCL (Maximum Contaminant Level): 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.

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.

MRDL (Maximum Residual Disinfectant Level): 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.

MRDLG (Maximum Residual Disinfectant Level Goal): 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.

NA: Not applicable

NTU (Nephelometric Turbidity Units): Measurement of the clarity, or turbidity, of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

ppb (parts per billion): One part substance per billion parts water (or micrograms per liter).

ppm (parts per million): One part substance per million parts water (or milligrams per liter).

TT (Treatment Technique): A required process intended to reduce the level of a contaminant in drinking water.