Dear ACSA Customer:

Each and every day we work hard to provide you with safe, dependable, high-quality drinking water, and each day a number of water quality tests are conducted to assure that you continue to receive this high-quality water. Your drinking water again met or exceeded all regulatory requirements in 2018.

The Albemarle County Service Authority (ACSA) and Rivanna Water and Sewer Authority (RWSA), in partnership with the Virginia Department of Health (VDH), work cooperatively to ensure that you receive a safe and reliable supply of drinking water. The RWSA collects, stores and treats the water, while the ACSA purchases the treated water and delivers it to you through our distribution system.

The ACSA is committed to providing you, the customer, with this information since informed customers are indeed our best allies. We hope you find this report easy to read and understand. We encourage you to contact us and tell us what you think of the report; your suggestions on how to improve it are always welcomed. If you wish to receive a “hard copy” of the report, please contact Tim Brown at 977-4511, ext. 119, or at tbrown@serviceauthority.org.

For the Spanish-speaking members of our community: Este informe contiene información muy importante. Traduzcalo o hable con un amigo quien lo entienda bien.

Thank you,

Gary B. O’Connell
Executive Director
Albemarle County Service Authority

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Our Customer Service Representatives are available Monday-Friday from 8am to 5pm to assist you in person, via email, or on the phone. Information is also available on our website at www.serviceauthority.org.

168 Spotnap Road
Charlottesville, VA 22911
(434)977-4511
custserv@serviceauthority.org
Your Water Supply and Treatment

The RWSA operates three water treatment plants (WTP) to provide water to the City of Charlottesville and the urban “ring” served by the ACSA. The plants, with their source of water indicated in parentheses, are as follows:

• South Rivanna WTP (South Rivanna Reservoir)
• Observatory WTP (Ragged Mountain & Sugar Hollow Reservoirs)
• North Rivanna WTP (North Fork Rivanna River)

All are surface water supplies, replenished by precipitation, stream flow, overland runoff, and groundwater flow. All supplies have a low mineral content, are quite “soft” (low in hardness, or scale), and there is little of the iron or manganese that is commonly found with the groundwater of this area.

Each plant employs both physical and chemical treatment processes before releasing water into the distribution system. Sodium hypochlorite is used at all three plants to disinfect the treated water. Fluoride is added at each plant to promote good dental health. The plant that provides water to your tap may vary from time to time depending on demand, the level of storage in the system, and your location.

Significant upgrades to all three treatment plants were completed in the spring of 2018 related to the Stage 2 Disinfection Byproducts Rule.

An advanced treatment process that employs granular activated carbon (GAC) was installed to result in higher quality water. In particular, the concentration of disinfection byproducts (TTHMs and HAAs; see discussion of contaminants) has been significantly reduced, and you will see the full effect of this improvement in next year’s report.

In addition to lowering these chemical compounds, GAC should improve certain taste and odor issues as well.

Water Treatment for Corrosion Control

It is standard practice that a phosphate chemical be added to drinking water supplies during treatment in order to reduce corrosion of the metal pipes in the distribution system and in customer plumbing. The chemical forms a protective layer on the inside of the pipes, reducing corrosion, and thus reducing the possibility of mainly lead and copper entering the water.

For over 30 years, the RWSA has used a polyphosphate product for corrosion control, and it has been very effective in keeping lead and copper out of customer water supplies. However, the RWSA has been evaluating a new, blended orthophosphate product to optimize distribution system lead and copper corrosion control.

Pending the outcome of continued studies, implementation of this new product may occur in late 2019.
**Water Quality Standards**

The information in this report has been collected and reported in accordance with the drinking water standards established by the USEPA and the VDH. The RWSA conducts extensive testing of the source water (reservoirs; river) and the treated water before it ever leaves the plants and enters the ACSA distribution system. Samples within the distribution system are collected weekly, monthly, and quarterly for further testing. In addition to the data contained inside this report, other testing includes such parameters as the “heavy” metals, volatile organic compounds, and pesticides in the treated water. They are not listed here since none of these parameters was detected. More specific information may be obtained by contacting Tim Brown at 977-4511, ext. 119, or at tbrown@serviceauthority.org.

As water travels over the surface of land, or through the ground, it dissolves naturally-occurring minerals, and in some cases radioactive material, as well as substances resulting from the presence of animals, and human activities. In other words, all surface water supplies are exposed to a wide array of “contaminants” at varying concentrations.

The presence of contaminants, however, does not necessarily indicate that water poses a health risk, and even bottled water may reasonably be expected to contain at least minimal amounts of some contaminants. More information about contaminants and potential health effects can be obtained by calling the [EPA Safe Drinking Water Hotline](http://800-426-4791), or by visiting their website ([www.epa.gov/safewater](http://www.epa.gov/safewater)). See also the discussion of *Cryptosporidium* contained in this report.

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**Internal Issues of Mold**

The most common “water quality” complaint that we have received from our residential customers over the past several years, particularly in the Urban Area and Crozet, is the occasional appearance of a black growth in the toilets, on the aerator screens at the end of faucets, in shower heads, or on other surfaces that stay moist.

This is a harmless form of mold, and the water is safe to drink. The mold is not coming into your home through our water pipes. Rather, airborne spores that get into your home result in this growth, and there is not enough chlorine disinfectant in the water to prevent it from occurring. The spores come from our hardwood forests, from construction sites, and from mulch piles. In particular, we have seen a very clear link between mold and mulch supplies for several years.

Testing in 2018 identified the mold as very common types. More information, including tips on control, can be obtained by visiting our website at [http://www.serviceauthority.org/watersupplyfaq.html](http://www.serviceauthority.org/watersupplyfaq.html).
**Cryptosporidium**

*Cryptosporidium* is a microbial pathogen found in surface waters throughout the U.S. Ingestion of *Cryptosporidium* may cause cryptosporidiosis, an abdominal infection characterized by nausea, diarrhea, and abdominal cramps. Most healthy individuals can overcome the disease within a few weeks, but immuno-compromised people are at risk of developing a potentially life-threatening illness.

In 2017, one raw water sample from the North Fork Rivanna River showed 0.09 organisms per liter. *Cryptosporidium* was absent from all other raw water samples serving the other two treatment plants.

Although filtration removes the pathogen, the most commonly used filtration methods cannot guarantee 100% removal. The RWSA makes every effort to optimize the filtration process at all of the WTPs to ensure the greatest degree of *Cryptosporidium* removal. Based on the results of these studies, our water supplies have been placed in the lowest risk category for exposure to *Cryptosporidium*.

**Fluoride**

The naturally-occurring fluoride content of our source waters (reservoirs and streams) is quite low. Therefore, fluoride is added to your water at the treatment plants to promote good dental health. Fluoridation of drinking water was first introduced in the U.S. in the 1940s, and the Centers for Disease Control and Prevention has named it one of the ten great public health achievements of the 20th century.

In 2011, the U.S. Department of Health and Human Services (HHS), jointly with the U.S Environmental Protection Agency (EPA), recommended that the level of fluoride added to drinking water be reduced from a range of 0.7-1.2 ppm to 0.7 ppm. The RWSA put this change into effect at all treatment plants immediately.

The main reason for this proposed action is that Americans have access to more sources of fluoride than they did decades ago. In addition to the fluoride added to many public water supplies, it is found in toothpastes and mouth rinses, and is routinely applied to children’s teeth by dental professionals.

HHS officially decreased the recommended level of fluoride in drinking water to 0.7 ppm in 2015. The range of fluoride added to your water in 2018 was 0.44-0.84 ppm.

**Lead in Drinking Water**

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 internal plumbing. RWSA and the ACSA are responsible for providing high quality drinking water; it is non-corrosive, has a corrosion inhibitor added to the water to coat the pipes, and is delivered to you in pipes that are free of lead.

However, we cannot control the variety of materials used in the plumbing components of houses and businesses. 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. The periodic lead and copper testing at select, high-risk households last occurred in the summer of 2016 (see the data chart). **Only a trace amount of lead was found in one (1) of 30 samples.** 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: www.epa.gov/safewater/lead.

**What if I am immuno-compromised?**

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 healthcare providers.

USEPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from EPA’s Safe Drinking Water Hotline (800-426-4791) or by visiting their website (www.epa.gov/safewater).
# Microbiological Organisms; Related Measurements

<table>
<thead>
<tr>
<th>Component</th>
<th>MCL</th>
<th>MCLG</th>
<th>&quot;ACS A WATER&quot; Result</th>
<th>Range of Detections</th>
<th>Violation?</th>
<th>Typical Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Coliform Bacteria</td>
<td>0</td>
<td>Presence of coliform in 5% of samples per month</td>
<td>1 per month [May, June, Sept]</td>
<td>n/a</td>
<td>0-1 per month</td>
<td>No²</td>
</tr>
<tr>
<td>Fecal Coliform Bacteria (as E. coli)</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turbidity (maximum single value)</td>
<td>n/a</td>
<td>1</td>
<td>0.25 NTU</td>
<td>n/a</td>
<td>n/a</td>
<td>No</td>
</tr>
<tr>
<td>Turbidity (% of monthly samples below 0.3 NTU)</td>
<td>n/a</td>
<td>95%³</td>
<td>100%</td>
<td>n/a</td>
<td>100%</td>
<td>No</td>
</tr>
</tbody>
</table>

# Radioactive Compounds

<table>
<thead>
<tr>
<th>Component</th>
<th>MCL</th>
<th>MCLG</th>
<th>&quot;ACS A WATER&quot; Result</th>
<th>Range of Detections</th>
<th>Violation?</th>
<th>Typical Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combined Radium⁴</td>
<td>0 pCi/l</td>
<td>5 pCi/l</td>
<td>0.7 pCi/l</td>
<td>n/a</td>
<td>&lt;0.5-0.7 pCi/l</td>
<td>No</td>
</tr>
<tr>
<td>Gross Alpha ⁵</td>
<td>0 pCi/l</td>
<td>15 pCi/l</td>
<td>&lt;0.38 pCi/l</td>
<td>n/a</td>
<td>&lt;0.3-0.38 pCi/l</td>
<td>No</td>
</tr>
<tr>
<td>Gross Beta ⁵,⁶</td>
<td>0 pCi/l</td>
<td>50 pCi/l</td>
<td>1.7 pCi/l</td>
<td>n/a</td>
<td>1.1-1.7 pCi/l</td>
<td>No</td>
</tr>
</tbody>
</table>

# Inorganic Compounds

<table>
<thead>
<tr>
<th>Component</th>
<th>MCL</th>
<th>MCLG</th>
<th>&quot;ACS A WATER&quot; Result</th>
<th>Range of Detections</th>
<th>Violation?</th>
<th>Typical Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead ⁶</td>
<td>0 ppb</td>
<td>15 ppb (AL)</td>
<td>&lt;2.00 ppb⁷</td>
<td>0</td>
<td>&lt;2.00-3.34 ppb</td>
<td>No</td>
</tr>
<tr>
<td>Copper ⁸</td>
<td>1.3 ppm</td>
<td>1.3 ppm (AL)</td>
<td>0.065 ppm⁹</td>
<td>0</td>
<td>&lt;0.020-0.097</td>
<td>No</td>
</tr>
<tr>
<td>Barium</td>
<td>2 ppm</td>
<td>2 ppm</td>
<td>0.020 ppm</td>
<td>n/a</td>
<td>&lt;0.010-0.020</td>
<td>No</td>
</tr>
<tr>
<td>Fluoride</td>
<td>4 ppm</td>
<td>4 ppm</td>
<td>0.80 ppm</td>
<td>n/a</td>
<td>0.44-0.84 ppm</td>
<td>No</td>
</tr>
<tr>
<td>Nitrates</td>
<td>10 ppm</td>
<td>10 ppm</td>
<td>0.49 ppm</td>
<td>n/a</td>
<td>0.09-0.49 ppm</td>
<td>No</td>
</tr>
</tbody>
</table>

# Disinfectant & Disinfection By-product Contaminants

<table>
<thead>
<tr>
<th>Component</th>
<th>MCL</th>
<th>MCLG</th>
<th>&quot;ACS A WATER&quot; Result</th>
<th>Range of Detections</th>
<th>Violation?</th>
<th>Typical Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free Residual Chlorine</td>
<td>MRDL=4 ppm</td>
<td>MRDLG=4 ppm</td>
<td>1.04 ppm¹⁰</td>
<td>n/a</td>
<td>&lt;0.02-2.15 ppm</td>
<td>No</td>
</tr>
<tr>
<td>Total Trihalomethanes (TTHMs)</td>
<td>n/a</td>
<td>80 ppb</td>
<td>49 ppb¹¹</td>
<td>n/a</td>
<td>2.55 ppb</td>
<td>No</td>
</tr>
<tr>
<td>Haloacetic Acids (HAAs)</td>
<td>n/a</td>
<td>60 ppb</td>
<td>38 ppb¹²</td>
<td>n/a</td>
<td>&lt;1.43 ppb</td>
<td>No</td>
</tr>
</tbody>
</table>

# Secondary Standards—Aesthetic Factors

<table>
<thead>
<tr>
<th>Component</th>
<th>MCL</th>
<th>MCLG</th>
<th>&quot;ACS A WATER&quot; Result</th>
<th>Range of Detections</th>
<th>Violation?</th>
<th>Typical Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloride</td>
<td>n/a</td>
<td>250 ppm</td>
<td>7.7-13.7 ppm</td>
<td>n/a</td>
<td>-</td>
<td>No</td>
</tr>
<tr>
<td>Iron</td>
<td>n/a</td>
<td>0.3 ppm</td>
<td>&lt;0.05 ppm</td>
<td>n/a</td>
<td>-</td>
<td>No</td>
</tr>
<tr>
<td>Manganese</td>
<td>n/a</td>
<td>0.05 ppm</td>
<td>&lt;0.01 ppm</td>
<td>n/a</td>
<td>-</td>
<td>No</td>
</tr>
<tr>
<td>pH</td>
<td>n/a</td>
<td>6.5-8.5</td>
<td>7.5-7.6 (monthly avg)</td>
<td>n/a</td>
<td>-</td>
<td>No</td>
</tr>
<tr>
<td>Sulfate</td>
<td>n/a</td>
<td>250 ppm</td>
<td>&lt;0.3-39.5 ppm</td>
<td>n/a</td>
<td>-</td>
<td>No</td>
</tr>
<tr>
<td>Total Dissolved Solids</td>
<td>n/a</td>
<td>500 ppm</td>
<td>65-135 ppm</td>
<td>n/a</td>
<td>-</td>
<td>No</td>
</tr>
</tbody>
</table>

# Other Parameters of Interest

<table>
<thead>
<tr>
<th>Component</th>
<th>MCL</th>
<th>MCLG</th>
<th>&quot;ACS A WATER&quot; Result</th>
<th>Range of Detections</th>
<th>Violation?</th>
<th>Typical Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkalinity</td>
<td>n/a</td>
<td>n/a</td>
<td>17-55 ppm (monthly averages)</td>
<td>n/a</td>
<td>-</td>
<td>n/a</td>
</tr>
<tr>
<td>Conductivity</td>
<td>n/a</td>
<td>n/a</td>
<td>96-217 micromhos/cm</td>
<td>n/a</td>
<td>-</td>
<td>n/a</td>
</tr>
<tr>
<td>Hardness</td>
<td>n/a</td>
<td>n/a</td>
<td>16-41 ppm</td>
<td>n/a</td>
<td>-</td>
<td>n/a</td>
</tr>
<tr>
<td>Sodium</td>
<td>n/a</td>
<td>n/a</td>
<td>6.8-37.3 ppm</td>
<td>n/a</td>
<td>-</td>
<td>n/a</td>
</tr>
</tbody>
</table>

¹Unit of Measurement for total and fecal coliform bacteria is the presence or absence of bacteria in a 100 ml sample.

²Of 960 samples collected in 2018, three (3) samples indicated the presence of total coliform bacteria. None of these samples indicated the presence of fecal coliform bacteria.

³Fecal coliform MCL: A routine sample and a repeat sample are total coliform positive, and at least one is also fecal coliform positive.

⁴No sample indicated a positive result for fecal coliform bacteria.

⁵The MCL for turbidity is for no single measurement to exceed 1 NTU, and for 95% of all measurements to be below 0.3 NTU.

⁶Last sampled at all three treatment plants in 2017. ⁷EPA considers 50 pCi/l to be the level of concern for beta particles.

⁸Sampled in July, 2016 from select, high-risk residences. To be sampled again summer, 2019.

⁹The value reported is the 90th percentile of all data (30 samples) collected. ¹⁰The value reported is the highest quarterly, system-wide average.

¹¹TTHM and HAA results are averaged over four quarters at each sampling location to determine compliance with the MCL. Range of detections are from 2018, but “Result” includes 2017 and 2018.
- **Maximum Contaminant Level Goal (MCLG):** the level of a contaminant in drinking water below which there is no known or expected health risk. 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 possible using the best available treatment technology.
- **Maximum Residual Disinfectant Level (MRDL):** The highest level of a disinfectant allowed in drinking water. The addition of a disinfectant is necessary for control of microbial contaminants.
- **Maximum Residual Disinfectant Level Goal (MRDLG):** The level of a drinking water disinfectant below which there is no known or expected risk to health.
- **ppb:** parts per billion, or micrograms per liter (µg/l). One part substance per billion parts of solution.
- **ppm:** parts per million, or milligrams per liter (mg/l). One part substance per million parts of solution.
- **pCi/l:** picocuries per liter. This is a measure of radioactivity.
- **Nephelometric Turbidity Unit (NTU):** 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 actions by the water provider. This term is typically limited to discussions of lead and copper concentrations.
- **n/a:** not applicable.
- **<:** less than.

### What do all these numbers mean?

Of great importance, this information shows that your drinking water **met and exceeded all regulatory requirements during 2018.** We are fortunate to have reliable sources for your drinking water needs and well-operated treatment facilities. Additional information is provided below that will give you more detail on each potentially harmful contaminant or compound detected in your drinking water.

### What are the potential health risks associated with these contaminants?

- **Total and Fecal Coliform Bacteria.** Coliforms are a large group of bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, bacteria may be present. Fecal coliform bacteria, and *E. coli,* in particular, indicate a likely contamination from human or animal wastes. These microorganisms can result in short-term effects such as nausea, headache, cramps and diarrhea, and they pose a special health risk for infants, young children, the aged, and those with severely compromised immune systems.

- **Turbidity** is a measure of the clarity of water. On its own, elevated turbidity has no health effects. However, turbid water can interfere with disinfection and may provide a medium for microbial growth. Elevated turbidity may also indicate the presence of disease-causing organisms, including bacteria, viruses or parasites that can cause such symptoms as nausea, headache, cramps and diarrhea.

- **Combined Radium, Gross Alpha and Gross Beta.** These are naturally-occurring forms of radiation, resulting from certain minerals that are radioactive. When these minerals are eroded into the source water, radiation in the water may result. Some people who drink water containing radium, or alpha or beta emitters, over many years may have an increased risk of getting cancer.

- **Lead and Copper.** The USEPA Lead and Copper Rule mandates a household testing program for these metals, and the values reported in the chart above are from samples that were collected from select households. Infants and children who drink water containing lead in excess of the Action Level could experience delays in physical or mental development. Children could show deficits in attention span and learning abilities. Adults who drink this water over many years could possibly develop kidney problems or high blood pressure. **See the box for additional information on lead.** Copper is an essential nutrient, but some who drink water containing copper in excess of the Action Level could experience gastrointestinal distress in a relatively short period of time. Some who drink this water over many years could develop kidney or liver damage. Individuals with Wilson’s disease should consult their doctor.

- **Barium** is a metal that is naturally-occurring in rock and the soil. Some people who drink water containing barium in excess of the MCL over many years may experience an increase in their blood pressure.

- **Fluoride** is an element added at the water treatment plants to promote strong teeth. Some people who drink water containing fluoride in excess of the MCL over many years could develop bone disease, with pain and tenderness of the bones. Children who drink water containing fluoride in excess of the MCL may develop mottled teeth. **See the box for additional information on fluoride.**

- **Nitrate** is a form of nitrogen found primarily in fertilizers, sewage, and runoff from natural deposits. Infants below the age of six months who drink water containing nitrate in excess of the MCL could develop “blue baby syndrome” in which there is a bluish coloration of the skin and shortness of breath. The infant can become seriously ill and, if untreated, may die.

- **Chlorine** is added at the treatment plant to inactivate disease-causing microbes. Some people who use water containing chlorine in excess of the MRDL could experience irritation of the eyes, nose and skin. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.

- **Trihalomethanes and Haloacetic Acids** are compounds formed by the interaction of chlorine with naturally-occurring organic matter, and they are sometimes referred to as disinfection by-products. Chlorine is added at the treatment plant to inactivate disease-causing microbes, and organic matter is naturally present from leaves and decaying plants in the reservoirs and streams. Some people who drink water containing these compounds in excess of the MCL over many years may experience problems with their liver, kidneys or central nervous system, and may have an increased risk of getting cancer.