We are once again pleased to present to you our annual water quality report. This edition covers all testing completed through December 31, 2019. The Water Services Department is dedicated to producing drinking water that meets or exceeds all state and federal drinking water standards. We continually strive to adopt new and better methods for delivering the best quality drinking water to you. As new challenges to drinking water safety emerge, we remain vigilant in meeting the challenges of source water protection, water conservation, and community education while continuing to serve the needs of all our water users. Please share your thoughts with us about the information in this report, as well informed customers are our best allies.

**How can I learn more?** If you want to learn more about this report, or have questions relating to your drinking water provided by St. George, please call Scott Taylor, Water Services Director or Kerry Benson at (435) 627-4800.


**Where does my water come from?** Our water sources are from both groundwater and surface water sources. Our multiple spring and groundwater sources draw from consolidated rock aquifers of the Navajo Sandstone and Kayenta Formation, which lie within the Virgin River basin. We purchase our surface water from the Washington County Water Conservancy District. Their surface water is drawn from the Virgin River, stored at Quail Lake and Sand Hollow Reservoirs and treated at the Quail Creek Water Treatment Plant before transmission to our City boundaries and distribution to our customers. With some exceptions, all water customers within the City receive a mixture of water from groundwater and surface water sources during some of the year. Customers located along State Highway 18 as far north as the Ledges Subdivision are served exclusively by groundwater from our Tolman-Ledges wells.

**Water Conservation Tip** - Repair a dripping faucet and you can save 15 to 20 gallons per day or 6,000 gallons of water each year.

**Source Protection**: Drinking Water Source Protection Plans (DWSPPs) for the City of St. George are available for your review. They contain information about source protection zones, potential contamination sources, and management strategies to protect drinking water that originates from City-owned groundwater wells and springs. Most of our groundwater sources are located in remote and protected areas and have a low level of susceptibility to potential contamination sources. We have also developed management strategies to further protect our sources from contamination. Our plans are available for review on the City’s web site at [www.sgcity.org/utilities/waterdepartment](http://www.sgcity.org/utilities/waterdepartment) or during normal business hours from the St. George Water Department office located at 811 East Red Hills Parkway. Please contact us if you have questions or concerns about our source protection plan.

The WCWCD maintains the Watershed Protection Plans for the portion of the Virgin River basin from which they draw, store and treat surface water. Additional information on their source protection plans can be obtained by calling (435) 673-3617.

**Water Conservation Tip** - Check toilets for leaks by putting a few drops of food coloring in the rear tank. Check the bowl after a few minutes to see if the color appears. If it does, you can easily repair the leak and save up to 30,000 gallons of water per year.

**Water Hardness**: Most of the water sources in Southern Utah are said to be "hard" and that’s because they contain high amounts of non-toxic calcium or magnesium minerals. Hard water does not dissolve soap readily, so making lather for washing and cleaning is difficult. Many customers use treatment devices, such as water softeners, to remove the calcium and magnesium from tap water to produce soft water for household use. Customers with water softeners may find that softener settings between 13 to 22 grains per gallon will provide the most effective treatment.

**Water Conservation Tip** - Use your water meter to detect hidden leaks. Check the meter reading, and then turn off all water faucets and water using appliances. Check the meter again after 15 minutes of no water use. If the reading changed, you have a leak that needs to be repaired.

**Spanish (Español)**
Este informe contiene información muy importante sobre la calidad de su agua potable. Por favor lea este informe o comuníquese con alguien que pueda traducir la información.
The City of St. George routinely monitors for contaminants in our drinking water in accordance with Federal and State law. Some contaminants are sampled less frequently because they do not change frequently. Unless otherwise noted, the following table lists all of the drinking water contaminants that we detected in our water through analytical monitoring during the 2019 calendar year, or during the last sample event. You may find terms and abbreviations in the table below that you may not be familiar with. We have provided definitions on the facing page.

When reviewing this table, please recognize that all sources of drinking water are subject to potential contamination by constituents that are naturally occurring or man-made. Those constituents can be microbes, organic or inorganic chemicals, or radioactive materials. All 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 the water poses a health risk. To ensure that tap water is safe to drink, EPA prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. Please note that all contaminants listed in this table were found to be present in concentrations below the maximum contaminant levels established by EPA. The EPA has determined that your water IS SAFE at these levels.

More information about contaminants and potential health effects may be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline at 1-800-426-4791.

**CITY OF ST. GEORGE – 2019 WATER QUALITY DATA**

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>City of St. George Groundwater Sources</th>
<th>Washington County Water Conservancy District Sources</th>
<th>Unit of Measure</th>
<th>MCLG (EPA Goal)</th>
<th>MCL (EPA Limit)</th>
<th>Likely Source of Contamination</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Microbiological Contaminants</strong></td>
<td>(Sampled Throughout the Distribution System &amp; Includes City of St. George Groundwater Sources &amp; Washington County Conservancy District Sources)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Coliform Bacteria</td>
<td>N</td>
<td>1 positive sample count 2019 NA NA NA NA 0</td>
<td>Presence of total coliform bacteria in 5% of monthly samples</td>
<td>Naturally present in the environment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Coli</td>
<td>N</td>
<td>0 positive sample counts 2019 NA NA NA NA 0</td>
<td>If routine &amp; repeat samples are total coliform positive, and one is also E. coli positive</td>
<td>Human and animal fecal waste</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turbidity, Ground Water</td>
<td>N</td>
<td>0 – 1.3 2015 NA 1 2018 NTU 0 5.0</td>
<td></td>
<td>Naturally present in the environment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turbidity, Surface Water</td>
<td>N</td>
<td>NA NA 0.1 0.7 2019 NTU NE TT</td>
<td></td>
<td>Naturally present in the environment</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Inorganic Contaminants</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antimony</td>
<td>N</td>
<td>NA ND-1.2 2018 NA NA NA NA ppb 6 6</td>
<td></td>
<td></td>
<td></td>
<td>Erosion of natural deposits</td>
</tr>
<tr>
<td>Arsenic</td>
<td>N</td>
<td>RAA = 8.98 Range = ND-13 2019 RAA = 3 Range = 0-10 2019 ppb 0</td>
<td></td>
<td>RAA = 10</td>
<td></td>
<td>Erosion of natural deposits</td>
</tr>
<tr>
<td>Barium</td>
<td>N</td>
<td>0.011 – 0.27 2018 0.1 0.2 2019 ppm 2 2</td>
<td></td>
<td></td>
<td></td>
<td>Erosion of natural deposits</td>
</tr>
<tr>
<td>Chromium</td>
<td>N</td>
<td>ND - 2.4 2018 NA NA NA NA ppb 100 100</td>
<td></td>
<td></td>
<td></td>
<td>Erosion of natural deposits</td>
</tr>
<tr>
<td>Cyanide</td>
<td>N</td>
<td>ND - 8.7 2018 NA NA NA NA ppb 200 200</td>
<td></td>
<td></td>
<td></td>
<td>Erosion of natural deposits</td>
</tr>
<tr>
<td>Fluoride</td>
<td>N</td>
<td>0.1 – 2.30 2018 0.2 0.3 2019 ppm 4 4</td>
<td></td>
<td></td>
<td></td>
<td>Erosion of natural deposits</td>
</tr>
<tr>
<td>Nickel</td>
<td>N</td>
<td>ND – 3.2 2018 NA NA NA NA ppb 100 100</td>
<td></td>
<td></td>
<td></td>
<td>Runoff from fertilizer use; leaching from septic tanks, sewage, erosion of natural deposits</td>
</tr>
<tr>
<td>Nitrate</td>
<td>N</td>
<td>0.11 – 0.87 2019 0.2 2.4 2019 ppm 10 10</td>
<td></td>
<td></td>
<td></td>
<td>Runoff from fertilizer use; leaching from septic tanks, sewage, erosion of natural deposits</td>
</tr>
<tr>
<td>Selenium</td>
<td>N</td>
<td>ND - 0.87 2018 1.5 3 2019 ppm 50 50</td>
<td></td>
<td></td>
<td></td>
<td>Erosion of natural deposits</td>
</tr>
<tr>
<td>Sodium</td>
<td>N</td>
<td>8.1 – 169 2018 52 53 2019 ppm 500 NE</td>
<td></td>
<td></td>
<td></td>
<td>Erosion of natural deposits</td>
</tr>
<tr>
<td>Sulfate</td>
<td>N</td>
<td>22 – 446 2018 203 169 2019 ppm NE 500*</td>
<td></td>
<td></td>
<td></td>
<td>Erosion of natural deposits</td>
</tr>
<tr>
<td>Total Dissolved Solids</td>
<td>N</td>
<td>92 – 903 2018 332 480 2019 ppm NE 1000*</td>
<td></td>
<td></td>
<td></td>
<td>Erosion of natural deposits</td>
</tr>
</tbody>
</table>

*Although the EPA has not established an MCL, for sulfite and TDS, the Utah Division of Water Quality requires a sulfite concentration of less than 500 ppm and a total dissolved solids concentration of less than 1,000 ppm unless the water system has no other water sources available. In no case is the Sulfite concentration to exceed 1,000 ppm or the total dissolved solids concentration to exceed 2,000 ppm.

**Copper & Lead** – Sampled at 31 residences throughout the distribution system.

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>Unit of Measure</th>
<th>MCL (EPA Limit)</th>
<th>Likely Source of Contamination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>ppm</td>
<td>1.3</td>
<td>Corrosion of household plumbing systems, erosion of natural deposits</td>
</tr>
<tr>
<td>Lead</td>
<td>ppm</td>
<td>0</td>
<td>Corrosion of household plumbing systems, erosion of natural deposits</td>
</tr>
</tbody>
</table>

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 associated with service lines and home plumbing. St. George City is responsible for providing high quality drinking water, but cannot control the materials used in household plumbing components. If you have not been using water in your home for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using your 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: [www.epa.gov/ground-water-and-drinking-water/basic-information-about-lead-drinking-water](http://www.epa.gov/ground-water-and-drinking-water/basic-information-about-lead-drinking-water)
Disinfectants & Disinfection Byproducts – City of St. George Distribution System - There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Chlorine (as Cl₂) N 0.06 – 1.20 2019 NA NA NA ppm 4.0 4.0 Water additive used to control microbes
Haloacetic Acids [HAA5] N ND – 25 2019 NA NA NA ppb 0 60 Byproduct of drinking water disinfection
Total Trihalomethanes [THM] N ND – 67.8 2019 NA NA NA ppb 0 80 Byproduct of drinking water disinfection

Organic Contaminants
Carbon, Total Organic N ND – 1.62 2015 1.9 NA 2019 ppm NE TT Naturally present in the environment

Synthetic Organic Contaminants Including Pesticides and Herbicides
Di (2-ethylhexyl) phthalate N ND – 2.2 2019 NA NA NA ppb 0 6 Runoff from of rubber and chemical processes
Lindane N ND – 0.013 2019 NA NA NA ppb 0.20 0.20 Runoff / leaching from insecticides

Radioactive Contaminants
Alpha Emitters N 0 – 7.6 2018 1 5 2016 pCi/L 0 15 Erosion of natural deposits
Combined Radium 226/228 N 0.4 – 1.8 2018 NA NA NA pCi/L 0 5 Erosion of natural deposits
Beta Emitters N 3 – 21 2016 3 5 2019 pCi/L 0 50 Decay of natural & man-made deposits
Radon 222 N 0 – 0.71 2018 NA NA NA pCi/L 0 - Erosion of natural deposits
Radon 228 N 0.02 – 1.5 2018 0.5 0.5 2018 pCi/L 0 5 Erosion of natural deposits
Uranium N 0.33 – 2.7 2016 NA NA NA pCi/L 0 20.1 Erosion of natural deposits

Significant Deficiency – Physical Facilities
M020 – Unprotected cross connection present in the distribution system – Unapproved Individual home pressure booster pumps – Determined 11/01/2018
The City of St. George is working with the Utah Division of Drinking Water to add additional backflow devices to the homes with booster pumps.

Unit of Measure Descriptions
µg/L Micrograms per Liter – The number of micrograms of a substance in one liter of water. Also known as one part per billion (ppb), or 1 part contaminant in 1,000,000,000 parts water.
mg/L Milligrams per Liter – The number of milligrams of a substance in one liter of water. Also known as one part per million (ppm), or 1 part contaminant in 1,000,000 parts water.
ppb Parts per Billion - The number of parts of a substance in one billion parts of water. Also known as micrograms per liter (µg/L).
ppm Parts Per Million - The number of parts of a substance in one million parts of water. Also known as milligrams per liter (mg/L).
pCi/L Picocuries per Liter – A measure of the radioactivity in a liter of water.
NTU Nephelometric Turbidity Unit - Turbidity is a measure of the cloudiness of the water. Turbidity is monitored it because it is a good indicator of the effectiveness of the filtration system at the Quail Creek Water Treatment Plant (QCWTP). Turbidity in excess of 5 NTU is just noticeable to the average person.
positive samples The number of positive samples taken this year.
% positive samples/month The percentage of monthly samples that were positive.
NA Not Applicable
ND Not Detected – The contaminant was not detected in the water sample during laboratory analysis.
NE None Established – MCL or MCLG has not been established for particular contaminant.
ND/Low – High For water systems like St. George with multiple water sources, the Utah Division of Drinking Water allows the option of listing the test results of the constituents in one table, instead of multiple tables. To accomplish this, the lowest and highest values detected in the multiple sources are recorded in the same space in the report table. As noted above, most customers receive a mixture of water from the City’s groundwater wells and springs and surface water purchased from the WCWCD that is treated at QCWTP. The ranges for these analytical values are included in the column as indicated.
NR Not Required – Monitoring not required, but recommended.
RAA Running Annual Average – Highest running annual average of four consecutive quarters when sampling occurs quarterly.
W Waiver - Because certain chemicals are not present near some drinking water sources, water systems are sometimes issued waivers that exempt them from having to sample for those chemicals not present, these waivers are also associated with Drinking Water Source Protection Plans.

Definitions of Important Drinking Water Terms & Acronyms
AL Action Level - The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
Last Sample Date Date - Because of required sampling time frames e.g. yearly, 3 years, 6 years and 9 years, sampling dates may seem out-dated.
MCLG Maximum Contaminant Level Goal - The “Goal” (MCLG) is 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 (MCL) - The “Maximum Allowed” (MCL) is 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.
TT Treatment Technique - A treatment technique is a required process intended to reduce the level of a contaminant in drinking water.
AL Action Level - The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
Variances & Exceptions Variances or Exceptions - State or EPA permission not to meet an MCL or a treatment technique under certain conditions.
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.
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.
MNR Monitored Not Regulated
MPL Maximum Permissible Level – State assigned

Substances That Could Be in Water: Sources of drinking water (both bottled and tap) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or though the ground, it can dissolve naturally occurring materials, and can pick up a wide variety of substances:
- **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 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 which may also come from urban stormwater runoff, gas stations and septic systems.
- **Radioactive Contaminants**, which can be naturally occurring or may be the result of oil and gas production and mining activities.

More information about contaminants and potential health effects can be obtained by calling the U.S. EPA’s Safe Drinking Water Hotline at (800) 426-4791, or their web site at: [www.epa.gov/ground-water-and-drinking-water/safe-drinking-water-information](http://www.epa.gov/ground-water-and-drinking-water/safe-drinking-water-information)

**Water Conservation Tip** – Irrigate during the evening, night or early morning hours to reduce water lost to evaporation.
**Arsenic:** Some water sources in our system have arsenic concentrations that exceed the EPA standard (10 ppb); however all water delivered to customers this year met the standard. The City meets the MCL by combining sources to blend water so that the EPA’s standard for arsenic is met. Our blending treatment proposals were approved by the Utah Division of Drinking Water & detailed performance testing concluded in 2011. The City was able to demonstrate that our blending treatment process can meet the arsenic MCL for our affected sources.

Some people who drink water containing arsenic that is in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased cancer risk. It is important to note that EPA's arsenic MCL balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. EPA continues to research the health effects of chronic exposure to low levels of arsenic (see table for arsenic levels).

Point-of-use treatment devices (i.e., reverse osmosis or distillation) can be effective in removing arsenic. However, their effectiveness varies, they can be expensive, and they must be properly maintained. Customers who choose to install water treatment devices are advised to monitor system performance with routine testing and ensure the system is maintained as recommended by the manufacturer.

**Health Info on Microbiological Contaminants:** Some people may be more vulnerable to microbiological 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 microbiological contaminants are available from the EPA’s Safe Drinking Water Hotline (800-426-4791).

**In Home Filtration Systems:** Customers are advised to exercise caution with whole-house filtration systems that remove the chlorine used by our water utility for water disinfection.

By unknowingly removing the residual chlorine concentration in your home piping network, you could allow microbes to multiply. These microbes may cause illnesses, especially for immunocompromised family members. These types of filters are best limited to point of use such as the kitchen faucet.

**Fluoride:** The fluoride present in our drinking water is from natural deposits. St. George City does not add fluoride to our water (see table for fluoride concentrations).

**Answer to Common Concern:** Growths in bathrooms or pet bowls that are pink or black in color come from various types of mold in the air – not your tap water. Wash those surfaces frequently and keep fresh water in pet bowls.

**Lead:** 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 cannot control the variety of materials used in plumbing components. All customers can minimize their potential for exposure to lead by flushing faucets for 30 seconds to 2 minutes before using the water for drinking or cooking. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available at www.epa.gov/safewater/lead.

The age of your home is an indicator of what type of plumbing materials you may have. Homes built through the early 1900s commonly used lead pipes for plumbing. Until the 1940s, lead piping was often used for the service lines connecting meters to the water mains. In the 1950s, copper or galvanized piping replaced lead piping in many homes. Until the mid-1980s, copper piping was installed with solder and fluxes containing lead. If your home fits any of these categories, your plumbing may contain lead that can leach into your drinking water, especially when it has not been used for several hours (see table for lead levels).

**Free Lead & Copper Testing:** The City conducts lead and copper testing every 3 years at 30 homes. Our next scheduled sampling will be conducted in summer 2021. First priority for this program is single-family homes constructed from 1983-1988 with lead piping or copper piping with lead solder. If your home meets this criteria and you are interested in participating in lead and copper testing please contact Kerry Benson at (435) 627-4656 or kerry.benson@stgcity.org.

**Cross-connections:** Cross-connections to drinking water system lines are a major concern. A cross-connection is formed at any point where a drinking water line connects to equipment containing chemicals, or water sources of questionable quality. Examples are boilers, air conditioning systems, fire sprinkler systems, irrigation systems, etc. Whenever equipment pressure rises above the pressure in the drinking water system line, contamination can occur. Backpressure from the equipment allows contamination to pass into the drinking water line. Contamination by backsiphonage occurs when the pressure in the drinking water line drops below that in the equipment. This can happen under normal operating scenarios when demand is heavy, or when a main breaks. Backsiphonage draws contaminants out of the equipment & into the drinking water line.

Customers can help protect water supplies from cross-connections by watching for potential cross-connections and installing & maintaining proper backflow prevention assemblies. Exterior water faucets tend to be the most common sources of cross-connection contamination. All exterior faucets should be equipped with hose bib vacuum breakers to provide backsiphonage protection. Garden hoses attached to chemical sprayers, submerged in a swimming pool, etc., can allow contaminants to be backsiphoned into the City’s distribution system. Commercial operators should ensure that chemical tanks are fitted with air gap devices.

**Swimming pools, spas and ponds** – Swimming pools, spas, fishponds and decorative pools are all sites particularly susceptible to cross connection and backflow issues. The water make up line for these facilities must always be constructed with an adequate air gap or fitted with an approved backflow prevention device.

The mission of the City of St. George, Water Services Department is to provide our community with clean, healthy, and reliable drinking water at a reasonable price. We hope that this information brings you a better understanding of how we are meeting this vital objective.