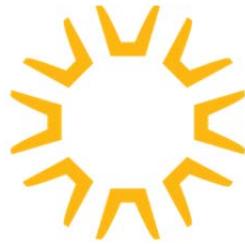


City of St. George Water Conservation Plan Update

2018



St. George

THE BRIGHTER SIDE

Contents

Water System Overview	3
Current Water Use	3
Existing Water Sources	4
Projected Water Needs.....	5
Current Conservation Efforts	7
System Improvements	11
Conservation Goals	11
Pricing Structure	12
Water Conservation Policies/Ordinances	13
Water Conservation Staff.....	15
Conclusion	15

Water System Overview

The City of St. George serves a population of approximately 85,000 based on projected 2016 Census data. There are approximately 26,750 connections in the water system; comprised of residential, commercial, industrial, and institutional water users. These water connections include both culinary water and secondary irrigation users. All culinary and secondary irrigation water meters are read and billed on a monthly basis, utilizing automatic meter reading (AMR) technology.

Current Water Use

The latest water use data for the 2017 calendar year shows that the City of St. George delivered 24,205 acre-feet of culinary water to its customers. The amount of water used per person, or the “per capita” water use, is calculated by dividing the total amount of water delivered to our customers, by the total population of the City of St. George. The total amount of water delivered includes both culinary water and secondary irrigation water sources.

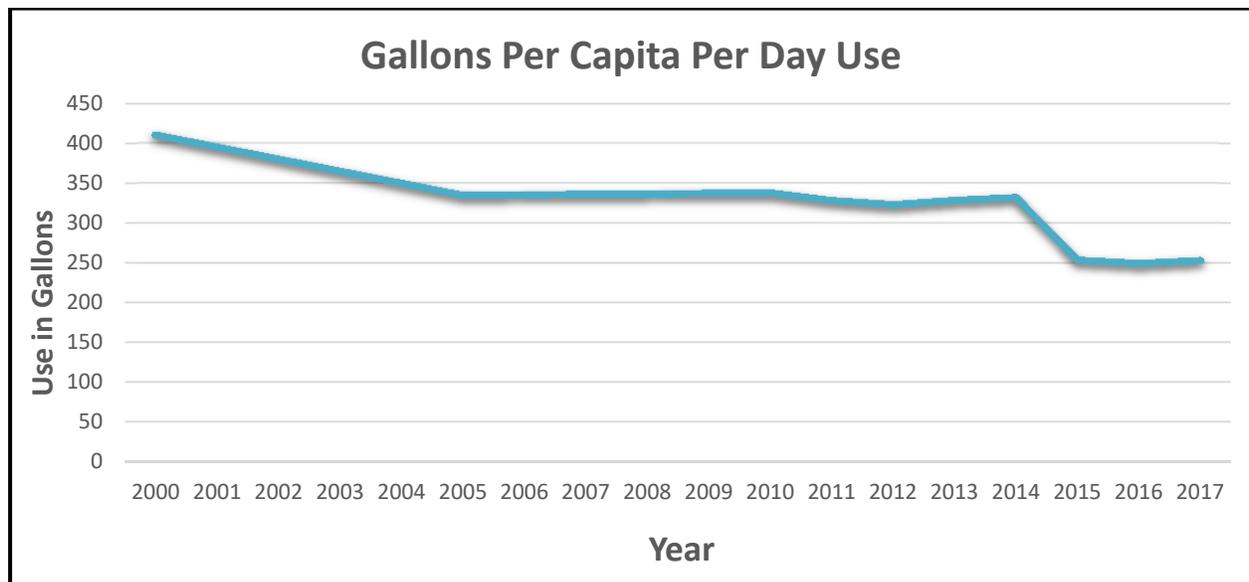
In considering the per capita water use, it is important to note that approximately 6,300 of the dwelling units in the City of St. George, or 23% of the metered connections, are non-primary residences, based on information from Washington County tax records. While these homes use a considerable amount of water, the population associated with these homes is not considered in the per capita water use calculations. In addition to the non-primary dwelling units, the student population at Dixie State University (DSU) is not included in the per capita water use calculations, as the students are not included in the population identified in the latest Census data. The current enrollment at DSU is approximately 9,700 students.

The total amount of culinary water delivered to city customers in the year 2017 was 24,205 acre-feet or 7,887,233,863 gallons. This amount of culinary water divided by the 2017 population estimate of 85,000 results in a per capita use of 254 gallons per capita per day (GPPD). The overall per capita water use has declined over the last 17 years. The per capita water use calculated in 2000 was 410 GPPD. Overall there has been a 38% decrease in per capita use from the 2000.

As stated above, the 2017 per capita use of 254 GPPD includes all water delivered to customers in all classes; residential, commercial, industrial, and institutional. The City of St. George serves two industrial parks, numerous businesses associated with the hospitality industry, a hospital that serves the

surrounding area as well as a university. Much of the water included in the per capita calculation is used by people that live outside the city and are not included in the population census data. In addition, water used for tourism, healthcare, education and special events are included in the overall per capita use, but not included in the population data.

The per capita water use for residential water use only is significantly less than the overall per capita water use. Using only the residential water uses divided by the total population the residential per capita water use calculates to be 190 GPPD. This residential per capita water use does not take into account the water use by non-primary homes in the city, which as stated earlier is approximately 6,300 residential connections. The graph below tracks the per capita use since the year 2000.



Existing Water Sources

The culinary water used by the City of St. George comes from a variety of water sources, including surface water, ground water, and natural spring sources. These sources include:

- Eleven wells in the Gunlock Well Field
- Three wells in the Ledges Well Field
- Two wells in the Millcreek Well Field
- Five wells in the Snow Canyon Well Field are jointly owned by the cities of St. George, Ivins and Santa Clara. The City of St. George's portion is 64% of the facility.
- One well in City Creek
- Mountain Springs
- West City Springs

- Water purchased from the Washington County Water Conservancy District (WCWCD) and treated at the Quail Creek Water Treatment Plant (QCWTP).

In addition to the culinary water sources, the city also has various secondary irrigation water sources. Secondary irrigation water is water that does not meet current culinary water quality standards and is generally used for outdoor landscape irrigation. These secondary irrigation sources include:

- Shares in several privately owned irrigation companies
- Several irrigation wells
- Treated effluent from the regional Waste Water Treatment Plant

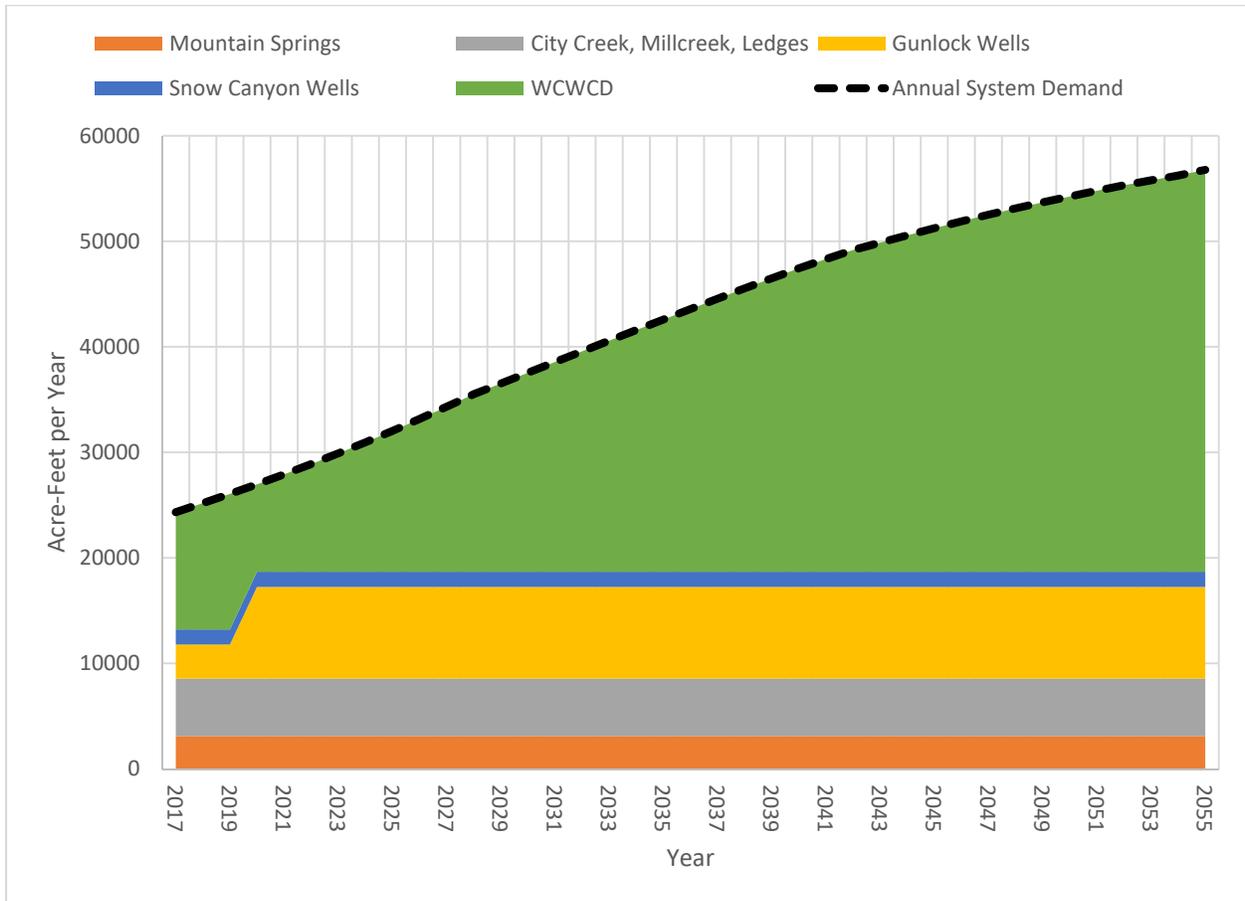
The city owns and operates a Wastewater Reuse Plant. The Wastewater Reuse Plant is an additional treatment process in the St. George Water Reclamation Facility that treats effluent from the wastewater treatment plant, bringing water quality up to irrigation quality standard. Water produced from the reuse treatment plant is discharged into the secondary irrigation transmission system and is used to supply irrigation water to various golf courses, parks, cemeteries, and schools. The service area of the secondary irrigation system continues to expand and made available to large irrigation users.

Projected Water Needs

Currently, approximately 65% of the water used within the City of St. George is purchased from the Washington County Water Conservancy District (WCWCD). This amount of water represents approximately 19,000 acre-feet. The majority of this water is surface water from the Virgin River that is treated at the Quail Creek Water Treatment Plant to meet potable water standards. Additionally, the city produces from its groundwater and springs an additional 10,000 acre feet of water for potable use.

In 2006, the City of St. George joined the Washington County Water Conservancy District (WCWCD) and several surrounding communities in the Regional Water Pooling Agreement. Since that time, the city has not actively pursued any new water sources. The Regional Water Pooling Agreement stipulates that securing additional water sources is the responsibility of the WCWCD. As such, the city is not pursuing additional water resources. However, the city does own various water resources that are not fully developed.

With the existing water sources that the city has developed or has the ability to develop, and the development of WCWCD resources, there is adequate supply to meet the needs of a growing community over the next several years.



The city supports the WCWCD in their efforts of securing additional water resources to meet the growing demand for water in Washington County. The WCWCD is currently working on several projects that will help meet this demand. The largest source of water that the WCWCD is currently working to secure is water that would be delivered by the Lake Powell Pipeline project. This project will provide the county with an additional 82,000 acre feet of water.

The above water demand projections assume that there is no additional progress with respect to water conservation efforts. However, the city’s ongoing conservation effort is successful with customers responding to the efficiency message.

One of the signs of water conservation success within the city is the results of the H2Oath challenge operated by the Division of Water Resources. The city won the challenge in 2017 which resulted in a \$5,000 grant from the Division of Water Resources which was used to extend the funding for the WaterSense Toilet Rebate program.

Current Conservation Efforts

Current and future water conservation efforts by the City of St. George are varied. The city works closely with the WCWCD with respect to many water issues, including water conservation. The city supports the WCWCD's water conservation efforts and works closely to implement their water conservation plan.

The city will continue to offer various water conservation programs. Funding and operations of these water conservation programs will be a combination of city and joint partnering with the WCWCD. Both the city and the WCWCD will continue to pursue water conservation funding from other sources, including the Bureau of Reclamation.

The State of Utah has also started offering water conservation programs which the city has advertised using social media resources. Through the website, utahwatersavers.com, customers can take advantage of rebate programs; currently the program for Smart Irrigation Controllers is open to residents of St. George.

The City of St. George will continue to focus primarily on water conservation education. The city believes that customers who better understand how they use water are better able to implement efficiency in water use. The city will continue its water conservation education efforts with the following:

- Classroom presentations to K-12 students
- Material distributed through the utility office and in booths at various community events
- Conservation tips, brochures, links available through the city's web page and the department's Facebook page.
- The department also has a social media presence on Facebook and Twitter. Facebook posts and Tweets advertise upcoming workshops; remind citizens when it's time adjust sprinkler clocks to match the seasons and/or the weather, promote general conservation messages.
- Periodic articles in the local newspaper and local publications regarding conservation efforts and promotions.
- Messaging on utility bills to promote conservation and available programs

- WaterSense promotional partner, making customers aware of water saving devices and programs that are labeled through this EPA program.
- Support and assist in advertising programs offered by the WCWCD
- Participate in the annual Water Fair offered to all 4th grade students in the county. Many issues are covered at the Water Fair including conservation, waste water treatment, culinary water treatment, source water protection and more.
- Celebration of Water Week annually with events such as a Garden Fair and Mayor's Water Walk and scavenger hunts.
- Financial and in kind support for the WCWCD Demonstration Gardens at Tonquint Park and the development of the Red Hills Desert Garden.
- Monthly Garden workshops

Another effort to promote water efficiency involves the cars driven by the Data Collection Specialists (meter reading). The new meter reading car incorporates graphics to promote water conservation. The vehicle was driven in the local Dixie Round-Up Parade, has been posted on Facebook, and is spotted driving throughout the city to collect meter readings.





In addition to the efforts made by the city, the city supports and promotes WCWCD educational and rebate programs that are offered to assist customers in reducing their per capita use.

- Free residential lawn water audits – which includes more education material provided to the customer as well as a suggested irrigation schedule to work with their irrigation system design, landscape and soil type. The following is the number of residents in St. George that participated in the program.
- Residential Landscape Efficiency Upgrades – Customers are provided rebates for replacing sprinkler spray zones with high efficiency spray heads, micro drip system or capping a zone, installing Smart Irrigation controllers
- Multi-Family High Efficiency washer rebate program
- Commercial Equipment for CII customers that are air-cooled rather than water cooled and WaterSense labeled plumbing fixtures and pre-rinse spray valves.

The city and the WCWCD have been successful with various water conservation rebate programs. Below is a list of the number of residential and commercial customers that have participated in WCWCD programs over the last five years.

Year	Residential	Commercial
2013	109	7
2014	151	6
2015	69	4
2016	56	2
2017	111	3

City Rebate Programs:

The city has offered rebates for replacement of older high flow toilets since 2007. With the creation of the EPA's WaterSense program, rebates are offered for retrofits with WaterSense labeled models. WaterSense labeled models use 1.28 gallons per flush (gpf) or less and are shown to flush an adequate amount of waste on the first flush. Grant funding from the EPA's WaterSense program for toilet rebates is no longer available. However, the city will continue to budget funds annually for this program as it continues to result in water savings. The following is a summary of the EPA WaterSense Rebate Program.

- 2013-2015
 - \$37,500 Bureau of Reclamation grant
 - \$ 34,557 Water Services Department funding
 - \$4,000 WCWCD funding
 - 1,009 toilets replaced
 - Estimated water savings 525,000 gallons per year
- 2015 – June 30 2018
 - \$37,500 Bureau of Reclamation grant
 - 35,688 City of St. George funding – need to update with current amount
 - \$4,000 WCWCD funding
 - \$5,000 State of Utah H²O grant
 - Replaced 1,138 toilets
 - Water Savings estimated at 1.1 million gallons annually
- July 1, 2018 – June 30, 2019
 - \$50,000 City of St. George Funding

Water use is measured through the meters on a monthly basis. Estimated water savings is determined based on water use during the winter months one year prior to one year post installation from a random sample of program participants.

System Improvements

The city received a Community Development Block Grant (CBDG) in 2017 to replace failing cast iron water lines that date to the 1950's. The central area of the city is currently being upgraded from cast iron to PVC distribution lines. The city will continue to focus on this area of the community to upgrade failing and leaking water lines.

Over the last several years the city has continued to improve the automated/computerized controls of the system. Actions such as installing SCADA controls on wells, tanks, pump stations, control valves to improve water and energy efficiencies. These actions have reduced water loss due to tank overflows and increased overall efficiency of pumping systems.

While not specifically a system improvement, the use of Automated Meter Infrastructure (AMI) has the potential to aid in conservation efforts. Currently the city is conducting an AMI pilot study to determine the feasibility of moving to this technology for meter reading and data collection. The system being tested provides leak detection notifications when meters show a constant flow over a specific length of time such as 24 or 48 hours. Reports will be available to gather this data so that customers can be notified before a billing cycle has gone by and they have a large water bill due to a leak.

Conservation Goals

Future water conservation goals for the City of St. George will continue along the lines of the existing programs. The city will continue the education efforts as well continue to look for effective rebate and incentive programs to offer its customers.

Most rebate programs have been funded with grant funding which helps stretch the conservation funds. However, with some of the changes in grant funding such as the elimination of toilet rebate funding through the EPA, rebate programs offered directly through the city are very limited. The WCWCD continues to offer rebate programs which the city promotes to its customers. The State of Utah has also started offering rebates for WaterSense labeled irrigation controllers through the utahwatersavers.com website. Rebate programs through both these organizations will continue to be marketed by the city.

The Water Services Department will allocate \$50,000 annually for conservation program funding and continue to look for grants that will extend that funding. The water conservation goal for the City of St. George is to decrease the per capita water use by an additional 10% by the year 2025.

Pricing Structure

The city has a tiered water rate structure that charges more per 1,000 gallons with increased water use. The current water rates are listed below. From April through September the conservation rate schedule applies. For the rest of the year, the non-conservation rate applies.

General Water Service Rate

Monthly Base Charge Conservation Rate		Non Conservation Rate
Meter Size	Monthly Charge	Monthly Charge
5/8 X 3/4" & 3/4"	\$24.72	\$24.72
1"	\$52.03	\$50.28
1-1/2"	\$96.80	\$61.80
2"	\$186.34	\$89.45
3"	\$332.15	\$240.53
4"	\$699.38	\$539.03
6"	\$1439.90	\$930.17

Consumptive Use Blocks ¾" meter Conservation Rate		Non Conservation Rate
Water Use Per Month	Costs Per 1,000 Gallons Used	Costs Per 1,000 Gallons Used
0-5,000	Included in base charge	Included in base charge
5,000-10,000	\$1.18	\$1.18
10,000-15,000	\$1.30	\$1.30
15,000-20,000	\$1.40	\$1.40
20,000-25,000	\$1.51	\$1.51
25,000-30,000	\$1.62	\$1.62
30,000-35,000	\$1.73	\$1.73
35,000-40,000	\$2.05	\$1.84
40,000-45,000	\$2.60	\$1.95
45,000 and above	\$3.07	\$2.06

Consumptive Use Blocks 1" – 6" meter Conservation Rate		Non Conservation Rate
Water Use Per Month	Costs Per 1,000 Gallons Used	Costs Per 1,000 Gallons Used
0-10,000	Included in base charge	Included in base charge
10,000-20,000	\$1.50	\$1.30
20,000-30,000	\$1.65	\$1.40
30,000-40,000	\$1.76	\$1.51
40,000-50,000	\$1.89	\$1.62
50,000-30,000	\$2.02	\$1.73
60,000-70,000	\$2.15	\$1.84
70,000-105,000	\$2.56	\$1.95
105,000 and above	\$3.07	\$2.06

Water Conservation Policies/Ordinances

The city has adopted a Culinary Water Shortage/Drought Management plan. The Culinary Water Shortage/ Drought Management Plan is a four stage plan that can be implemented to address a water shortage due to a short term supply issue or in response to drought conditions.

STAGE 1:

- A Stage 1 shortage shall be declared when the Water Services Department Staff and the City Manager determine that a 5% - 10% reduction in culinary water is required.
- Compliance shall consist of voluntary implementation of water conservation methods including, without limitation, reduced irrigation as well as turning off non-recirculating water features.

STAGE 2:

- A Stage 2 shortage shall be declared when Water Services Department Staff and the City Manager determine that a 15% - 20% reduction in culinary water is required.
- Compliance methods include mandatory methods as well as continued encouragement of voluntary measures specified in Stage 1.
- Mandatory conservation methods include daytime outdoor water prohibition.
- Large irrigators that use culinary water shall reduce irrigation by 25% of baseline year use.
- The use of water for cleaning streets, driveways or other paved areas is prohibited except to alleviate immediate fire or sanitation hazards.
- Delay planting new grass/sod or other new landscaping.

STAGE 3:

- A Stage 3 shortage shall be declared when Water Services Department Staff and the City Manager determine that a 25% - 30% reduction in culinary water is required.
- Compliance methods include mandatory methods specified in Stage 3 and Stage 2 as well as continued encouragement of voluntary measures specified in Stage 1.
- Use of fire hydrants for purposes other than fire protection is prohibited.
- Water use for non-essential uses shall not be permitted, such as non-commercial washing of automobiles and trucks.
- Culinary water will not be used to irrigate city parks, golf courses or schools.
- Filling of non-public swimming pools is prohibited.

STAGE 4:

- A Stage 4 shortage shall be declared when Water Services Department Staff and the City Manager determine that a 40% - 60% reduction in culinary water is required.
- Stage 4 compliance methods include mandatory methods specified in Stage 2 and 3 as well as continued encouragement of voluntary measures specified in Stage 1.
- It is expected that Stage 4 would be implemented for short term issues such as a natural disaster. In stage 4 water for basic health and sanitary needs would be provided, but other uses would be restricted until the issue is resolved.

Generally, the City Council, based on recommendation from Water Services Department staff, enacts Stage One of the plan at the beginning of the summer season. As well as entering into Stage One the Council generally prohibits day time watering. Irrigation done with culinary water can only be completed between 8:00 pm and 8:00 am.

An advantage of using the plan versus an ordinance to implement time of day watering mandates is that it provides an opportunity to advertise the day time watering policy of the city on an annual basis. Because the news media picks up on the council agenda item dealing with entering into Stage One of the plan an opportunity to refresh the idea of water efficiency and conservation in the minds of our customers is created. It also gives the council an opportunity to support the conservation message promoted by staff.

Large irrigators using irrigation quality water which includes reuse water supplied by the city are not subject to the day time watering restriction due to the production and storage capacity limitations on the irrigation system. However, the city believes it is a better use of water to allow those irrigators to water as the resource is available rather than switch them over to using drinking water for irrigation. The WCWCD continues to look for sites to build a reservoir for irrigation water. If one is approved, the city will be able to produce reuse water year round as there will be a place to store the water.

Some of the irrigation water is provided through shares in various irrigation companies. These privately held companies determine watering schedules.

The city has adopted a Landscape Standard. While not adopted specifically as a conservation measure, it addresses some issues such as prohibiting turf on slopes of 30% or greater and encouraging use of plant material adaptive to this climate. It also requires a water audit within 30 days of installation of the landscape, this should help customers understand how much water their landscape will need by providing a suggested irrigation schedule both for during and after the establishment of the landscape.

Water Conservation Staff

Conservation efforts are managed by the Energy and Water Customer Service Manager.

It is a shared position with the Energy Services Department. The responsibilities of this position include, but are not limited to, community outreach and education and implementation of conservation strategies that result in a reduction of water and energy use. The city and the WCWCD continue work together to promote water efficiency and education efforts within the community.

Conclusion

The City of St. George has been successful in dropping per capita water use as well as using technology to improve the efficiency with which city facilities use water. Residents and businesses have responded favorably to the water wise/conservation message. The city plans to continue with the conservation effort, moving in the direction of improving the wise water use ethic that has begun.