

City of St. George Water Conservation Plan Update

January 2008



Water System Overview

The City of St. George serves a population estimated at 83,364 as of December 31, 2007. There are 20,638 connections in the water system. This includes M&I meters as well as meters for irrigation and reuse water customers. There is not a means for the different types of meters to be identified with the current software used. Water meters are read and billed monthly. Meters are now read with automatic meter reading (AMR) technology. About three years ago the Department evaluated the accuracy of the oldest meters. Approximately 50 meters were randomly chosen to be replaced and readings compared pre and post replacement. It was determined that meter replacement was not necessary at this time as the water delivered through the new meters was consistent with historical water use.

Total water delivered for the year ending December 2007 was 9,464,503,236 gallons. This reflects all water used in the City including reuse and irrigation quality water as well as water used by industrial and commercial customers. Water use by class breaks downs as follows:

Account Type	Number of Accts	Gallons delivered
Commercial	1,650	1,565,266,379
Industrial	264	514,575,880
Residential	18,724	7,384,660,977

Determining per capita usage can be a difficult calculation as there are many ways to calculate it. For instance Tucson Arizona calculates per capita water used based on meters serving individual single family residents but includes in the population count all residents including those living in multifamily housing, duplexes etcetera. Excluded in their calculation is the amount of water used for commercial and industrial purposes as well as water used in multifamily units.

Within the State there is a great difference in how the per capita water usage calculation is made. Many communities have extensive secondary water systems that deliver unmetered amounts of water, so their per capita use does not include water used for irrigation. There are communities that support significant amount of "snow birds" or part-time residents that use water year round particularly in the hot summer months, but are not included in population estimates. The City of St. George is one of those communities, with approximately 6,500 second homes. Statistically there are 2.9 people per home in the county. If the population count were to include second homes, the population served

increases to 102,214. Similar to other communities in the State, the City population estimates do not include the number of students attending colleges and universities. The City provides water to Dixie State College which includes a student population from areas outside the City, also not included in population estimates.

Per capita water use for all residential water use, including second homes without adjusting the population estimate is approximately 243 gallons per person per day (GPCPD). If the population estimate were to be adjusted to include a residential count for second home owners, water use drops to 198 GPCPD.

The current potable water sources include the following:

- 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.
- 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).

The City also has a Reuse Plant that treats effluent from the Waste Water Treatment Plant bringing it up to irrigation quality standard. Reuse water is supplied to Sunbrook golf course Southgate golf course, Sun River golf course, Bloomington Country Club and Entrada golf course. It is also used for construction water at the Atkinville Exchange (I 15 project). Extension of the reuse pipeline is in the planning stages to make this water available to more large irrigators.

Current irrigation sources of water include the following:

- Shares in several privately owned irrigation companies
- Seven irrigation quality wells

Projected Water Needs

The City of St. George currently has approximately 20,000 acre feet of developed M&I water. Additionally, there is another 10,000 acre feet available through the Sand Hollow/Quail Creek water source managed by the WCWCD. There are also approximately 5,000 acre feet of water that can be

developed in the future. With this water the City can meet water needs for a population of approximately 125,000.

Current projections indicate the build out for the City will be a population of about 174,000, reached in the year 2035 assuming a three percent growth rate. However, that amount could be higher if density was increased.

The City is supporting the WCWCD Lake Powell Pipeline project. This project will provide the county an with an additional 70,000 acre feet of water which will meet the demand into the 2050.

The above projections assume no additional progress with respect to conservation efforts. However, the City's conservation effort has been very successful with City residents responding to the efficiency message. The year 2002 is used as a baseline as the emphasis on improving water efficiency and conservation became more focused in the year 2003. According to the records of water sales for ¾" meters from 2002 to 2007, per capita usage has dropped. Single family homes are the customers served primarily with ¾" meters. This does not include all residents as multifamily units (apartments) as well as some Planned Unit Developments are metered with larger meters, but it is a good indication of the residential water use. In the year 2002 the average monthly water use for these customers was 23,891 gallons. In the year 2007 the average monthly water use was 18,685 gallons, a drop of approximately 27%. The City is determined to continue the progress towards improving water efficiency as outlined in the next section of the updated plan.

Current Conservation Efforts

Current conservation efforts are varied. The City works closely with the WCWCD with respect to many water issues, including conservation. Some of the conservation programs are funded and operated by the City, some in partnership with the WCWCD.

The first step in conservation has been education. Unless customers understand how they use water, they cannot make efforts to improve the efficiency in water use. The education aspect is many faceted. It includes presentations made to students at many grade levels. Presentations are made by the Conservation Coordinator to First, second and third grade classes as requested by teachers.

- Classroom presentations to elementary schools and 9th grade science classes.
- Participation in the annual Water Fair, hosted by the WCWCD for all 4th grade classes in the county. Many issues are covered at the Water Fair including conservation, waste water treatment, culinary water treatment, source water protection and more.
- Financial and in kind support for the WCWCD Demonstration Gardens at Tonquint Park
- Monthly Garden workshop – cooperative effort with the WCWCD
- Monthly Green Build Seminars – cooperative effort with SUHBA
- Material distributed through the utility office and in booths at various community events
- Conservation tips, brochures, links available through the City’s web page
- Conservation Calendar

In addition, programs 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.
 - In 2006 – 80 residents in St. George participated in the program
 - In 2007 – 130 residents participated
- Ultra Low Flow Toilet Replacement Rebate – this program has ended and resulted in a water savings of about 1,000 gallons per month per customer. 445 toilets were replaced. The funding for these two programs is listed below:
 - \$25,000 from Bureau of Reclamation as a grant
 - \$ 3,000 in funding from WCWCD as part of the matching funds
 - \$26,252 in Water Services Department funding
- Water Efficient Appliance Rebate program – this program is in operation although I expect funds to be depleted in about 6 months. This program is offered to residential customers as well as multifamily complexes with common laundry areas and commercial Laundromats. To date approximately \$33,300 has been spent on this program, funding is listed below:
 - \$25,000 from Bureau of Reclamation as a grant
 - 5,000 in funding from WCWCD as part of the matching funds
 - 20,000 in Water Services Department funding
- Planned Landscape/Irrigation efficient install/rehab incentives – this grant application was submitted in Dec. of 2007. I have received verbal notice of grant award, but cannot consider it a formal acceptance until notice of award has been received in writing. I anticipate providing a \$500 per customer incentive to be applied towards a professional irrigation design/drought tolerant plant material. The funding for this program is listed below:
 - \$25,000 from Bureau of Reclamation as a grant
 - \$ 5,000 in funding from WCWCD as part of the matching funds
 - \$20,000 in Water Services Department funding
- Rebate for installation of SMART Irrigation Controllers (controllers that use either weather data or a soil moisture probe to control the irrigation system). This is a WCWCD funded and administered program, which St. George residents are eligible to participate in.

The City of St. George has led the conservation effort by example. In 2004 the landscape at City Hall was rehabilitated. Formerly the south facing area in front of City Hall was 100% turf. The area is steeply sloped, making irrigation and maintenance difficult. Additionally, there was turf planted in narrow areas around the parking lots. The landscape rehabilitation removed most of the turf, leaving a few small flat areas which with trees planted around them and benches, providing places for the public to sit and enjoy the area. The remainder of the area was planted with low water use plants and some rocks and paving stones. As the landscape has matured it has continued to display effectively the use of color and texture to create an aesthetically pleasing and water efficient landscape.

Additionally the Parks Department has been transitioning to the use of more automated sprinkler systems with computer monitoring. This has allowed staff to locate and turn off misaligned or broken sprinklers more quickly, resulting in less waste of water. The irrigation controllers are also tied to weather stations so that the large City facilities irrigation is completed based on weather data.

Along with improving the efficiency of irrigation, large facilities such as The Canyons Softball Complex, City golf courses, parks and cemeteries use irrigation quality water or combination of irrigation/reuse quality water. This has reduced the demand on the potable water system.

The City has applied for and been awarded a grant from the Bureau of Reclamation to upgrade the Supervisory Control and Data Acquisition System (SCADA). This project involves the upgrade of the SCADA system to allow for equipment and software to be installed at each tank to monitor tank levels and allow for remote control of wells. The project allows for increased interaction between the tanks and well to prevent tank overflow and decrease occurrences of problems related to SCADA system operation's miscommunication. It is a means to manage the water resources more effectively. It estimated that the upgrade will reduce system spills by over 8 million gallons of water per year.

Conservation Goals

Future goals 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.

Continued partnership with the WCWCD will assist the City in continuing to lower per capita water use. It is anticipated that per capita water use can continue to be lower by 1.5% to 2% per year.

Water use is measured through the meters on a monthly basis. This is the basis of measuring water savings.

Pricing Structure

The City has a tiered water rate structure that charges more per 1,000 gallons with increased water use. The standard rates are listed below.

Effective
7/1/2007

CONSERVATION SCHEDULE

3/4" Meter

5-10	0.71
10-15	0.82
15-20	0.91
20-25	1.01
25-30	1.11
30-35	1.21
35-40	1.50
40-45	2.00
Over 45,000	2.43

1" Meter

Flat fee	\$
(10,000)	37.00
10-20	1.00
20-30	1.14
30-40	1.24
40-50	1.35
50-60	1.47
60-70	1.59
70-105	1.96
Over 105,000	2.43

REGULAR SCHEDULE

3/4" Meter

5-10	0.71
10-15	0.82
15-20	0.91
20-25	1.01
25-30	1.11
30-35	1.21
35-40	1.31
40-45	1.41
Over 45,000	1.51

1" Meter

Flat fee (5,000)	\$	35.55
5-10		0.71
10-15		0.82
15-20		0.91
20-25		1.01
25-30		1.11
30-35		1.21
35-40		1.31
40-45		1.41
OVER 45,000		1.51

CONSERVATION SCHEDULE**1 1/2" Meter**

Flat fee	\$
(20,000)	74.00
20-40	1.00
40-60	1.14
60-80	1.24
80-100	1.35
100-120	1.47
120-140	1.59
140-180	1.96
Over 180,000	2.43

2" Meter

Flat fee	\$
(40,000)	148.00
40-80	1.00
80-120	1.15
120-160	1.25
160-200	1.36
200-240	1.47
240-280	1.59
280-360	1.96
Over 360,000	2.43

3" Meter

Flat fee (80,000)	\$268.50
80-130	1.00
130-180	1.20
180-230	1.35
230-300	1.46
300-400	1.56
400-560	1.71
560-720	1.96
Over 720,000	2.43

REGULAR SCHEDULE**1 1/2" Meter**

Flat fee (5,000)	\$ 45.07
5-10	0.71
10-15	0.82
15-20	0.91
20-25	1.01
25-30	1.11
30-35	1.21
35-40	1.31
40-45	1.41
OVER 45,000	1.51

2" Meter

Flat fee (5,000)	\$ 67.93
5-10	0.71
10-15	0.82
15-20	0.91
20-25	1.01
25-30	1.11
30-35	1.21
35-40	1.31
40-45	1.41
OVER 45,000	1.51

3" Meter

Flat fee (5,000)	\$192.78
5-10	0.71
10-15	0.82
15-20	0.91
20-25	1.01
25-30	1.11
30-35	1.21
35-40	1.31
40-45	1.41
Over 45,000	1.51

CONSERVATION SCHEDULE**REGULAR SCHEDULE****4" Meter**

Flat fee
(160,000) \$572.00

160-220 1.00
220-300 1.20
300-400 1.35
400-580 1.46
580-740 1.56
740-1,120 1.71
1,120-1,440 1.96
Over 1,440,000 2.43

4" Meter

Flat fee
(5,000) \$ 439.48

5-10 0.71
10-15 0.82
15-20 0.91
20-25 1.01
25-30 1.11
30-35 1.21
35-40 1.31
40-45 1.41
Over 45,000 1.51

6" Meter

Flat fee (320,000) \$1,184.00

320-400 1.00
400-560 1.20
560-720 1.35
720-1,040 1.46
1,040-1,540 1.56
1,540-2,240 1.71
2,240-2,920 1.96
Over 2,920,000 2.43

6" Meter

Flat fee
(5,000) \$762.74

5-10 0.71
10-15 0.82
15-20 0.91
20-25 1.01
25-30 1.11
30-35 1.21
35-40 1.31
40-45 1.41
Over 45,000 1.51

BILLING DATES DURING WHICH CONSERVATION RATE IS EFFECTIVE:

<u>Cycle #1</u>	<u>Cycle #2</u>
4/15	4/30
5/15	5/31
6/15	6/30
7/15	7/31
8/15	8/31
9/15	9/30

Water Conservation Policies/Ordinances

The City has adopted a Culinary Water Shortage/Drought Management plan. It is a four stage plan and can be implemented to address a water shortage due to a short term supply issue or in response to drought conditions. Generally, the City Council, based on recommendation from Water Services Department staff enacts Stage One 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.

Irrigation water use is not addressed in the management plan for several reasons.

- System storage is limited so there is not enough water to allow all customers to irrigate during the night hours.
- Some of the irrigation water is provided through shares the City owns in various irrigation companies. These companies determine watering schedules.

The City is currently in the process of adopting a Landscape Ordinance. It will be presented to the Planning Commission in February of 2008. Once it receives approval from the Planning Commission, it will be presented to the City Council for adoption.

Water Conservation Coordinator

The City has had a fulltime Conservation Coordinator since 2003. 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.

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.