

2018 Water Conservation Plan

November 2018

Prepared for:

**Twin Creeks
Special Service District**

Prepared by:



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INTRODUCTION

Water conservation has different meanings to different people. People who have adopted a conservation ethic are likely to support a wide range of water conservation practices aimed at reducing water use. Others not so inclined often associate water conservation with inconvenience, deprivation, and dry yards. From Twin Creeks Special Service District's perspective, water conservation means increasing the efficiency of water use in order to sustain and optimize future water supplies to its customers. It does not mean dry flower beds and brown lawns, but rather a wise use of water to ensure that it is not needlessly wasted. With this in mind, Twin Creek SSD has adopted water conservation as a key element in its long-term master plan to serve its customers.

Attitudes toward water supplies are changing. Water is no longer seen as an endless supply, but as a valuable commodity that needs to be managed carefully. With this shift in attitude, conservation is becoming a larger part of water suppliers' plans to meet future water needs. Many water suppliers throughout the country have adopted conservation programs. Benefits experienced as a result of these programs include:

- Using existing water supplies more efficiently.
- Maximizing utilization of existing water conveyance, treatment and distribution facilities
- Delaying or deferring expensive construction of capital improvement projects
- Reducing the need for additional water supplies.

Officials at the State of Utah Department of Water Resources recognize the potential of conservation programs to extend current water supplies. They have established a statewide conservation goal of reducing per capita water use from levels measured in 2000 by 25 percent by the year 2025.

Twin Creeks SSD recognizes the potential benefits of conservation efforts, which ultimately will reduce costs to individual customers. Since sustained additional water conservation will be an important component in Twin Creeks SSD's plans for future water use, this report will evaluate current conservation efforts within the District and will discuss additional measures that will allow Twin Creeks to conserve water.

HISTORY AND CURRENT POPULATION

Established in 1994, Twin Creeks Special Service District was developed to provide sewer and water service to Lake Creek Estates, Big Pole Estates, and Lake Creek Farms. The service district is located in Wasatch County just east of Heber City (Figure 1). TCSSD has seen substantial growth over the last 12 years, increasing from approximately 385 Equivalent Residential Units (ERU) in 2000 to 1,073 ERU in 2018, with much more room for growth remaining in the district. The historic and projected ERUs with an associated population estimate in Twin Creeks SSD and Red Ledges Development is identified in Table 1. Projections shown in the table have been taken from those developed for the District's 2012 Water Master Plan developed by Bowen Collins & Associates (BC&A).

Table 1
Historic and Projected Twin Creeks SSD and Red Ledges Equivalent Residential Units

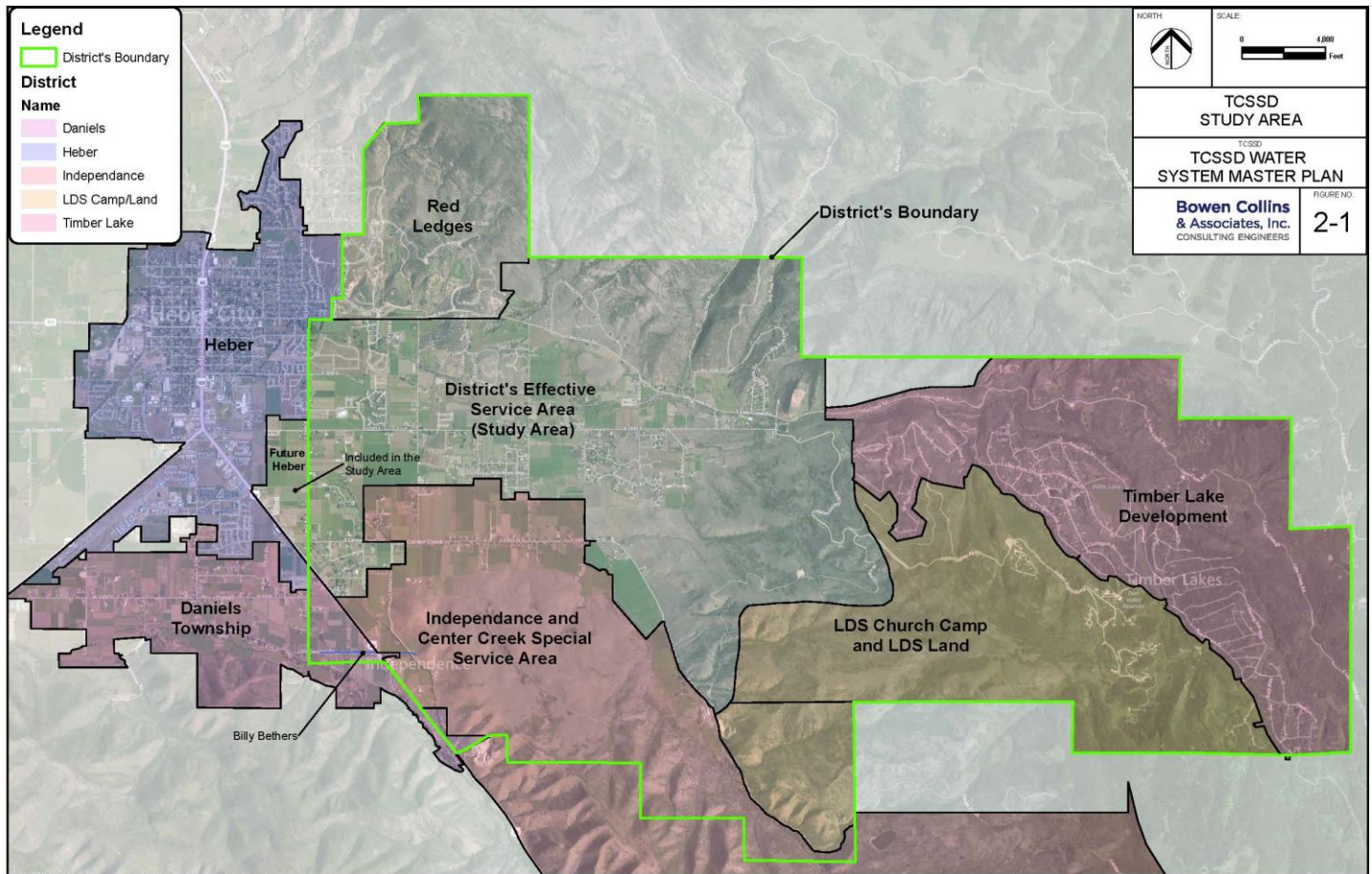
Year	TCSSD Equivalent Residential Units	TCSSD Approximate Total Population*	Red Ledges Equivalent Residential Units	Red Ledges Approximate Total Population*
2000	385	1,348	0	0
2011	508	1,778	0	0
2018	803	2,810.5	270	945
2020	927	3,244.5	383	1,341
2030	2,333	8,166	698	2,443
2040	3,698	12,943	933	3,266
2050	4,793	16,776	1,128	3,948
2060	5,782	20,237	1,200	4,200
2070	6,438	22,533	1,200	4,200
2080	6,928	24,248	1,200	4,200

*Assumed 3.5 people per house (value on record for 2010 census for Heber City)

SERVICE AREA

The District’s official statutory boundary is shown in Figure 1 below and includes the Red Ledges development. However, the District’s service area excludes the LDS Church Camp and Land, Timber Lake Development and Independence and Center Creek Special Service Area. These excluded areas are not currently planned to be served by TCCSD water systems, but rather by separate existing or proposed systems.

Figure 1
Twin Creeks SSD Service Area



EXISTING WATER USERS

Twin Creek SSD currently has 1,048 metered water service connections (1,073 ERUs), primarily providing indoor culinary water service to residential customers most of the District as well as irrigation service to Red Ledges, a connection for an elementary school, and a connection for a junior high school. Based on historical data from the year 2011, average daily demand per ERU was 258 gallons, which equates to approximately 74 gallons per capita per day (gpcd) based on average household size of 3.5 from Heber City 2010 census.

It should be noted that, prior to the development of the Red Ledges subdivision (starting around 2010), almost all of the water deliveries to customers in the Twin Creeks culinary water system was for indoor use. The majority of water for outdoor use was delivered by Lake Creek Irrigation Company (LCIC). With the addition of the Red Ledges development, some water in the District is starting to be used for outdoor purposes. Red Ledges does not have a pressure irrigation system and uses culinary water for irrigation.

Thus, when considering historic water use, it is useful to compare conservation trends from 2000 through about 2012 independently from trends in later years. During this period, demand and system impact from Red Ledges were relatively minimal. After 2012, the addition of irrigation demands associated with Red Ledges makes direct comparison of per capita water use less helpful in understanding conservation trends.

TOTAL WATER DELIVERIES

Culinary water supplied to customers in the District comes from two sources, the Twin Creeks Water Treatment Plant (WTP) and wholesale water purchased from Jordanelle Special Service District (JSSD). The available flow data from the WTP over the past 9 years is shown in Table 2 below. These values reflect the total quantity of water supplied to customers within the District.

**Table 2
TCSSD Water Production Volumes**

Month	2009 (MG)	2010 (MG)	2011 (MG)	2013 (MG)	2014 (MG)	2015 (MG)	2016 (MG)	2017 (MG)	2018 (MG)
TCSSD Water Treatment Plant Production									
January	3.5	2.7	4.3	3.6	3.7	4.6	5.2	5.1	5.9
February	3.1	2.5	3.2	3.6	3	4.0	4.8	4.2	5.7
March	3.6	3.2	3.5	3.3	4.1	4.7	5.1	5.2	5.9
April	3.3	3.1	3.0	3.7	5.2	5.7	7.0	4.7	6.3
May	4.0	3.7	4.0	5.1	6.2	6.6	7.4	6.4	5.9
June	4.0	3.9	4.8	5.3	8.1	7.0	7.5	6.0	7.5
July	3.6	4.2	5.2	6.2	8.0	8.0	7.0	7.2	6.1
August	4.5	3.4	4.9	6.0		7.7	5.9	6.5	6.7
September	4.6	3.4	4.2	4.5		8.8	4.9	5.9	5.7
October	3.8	2.9	3.7	4.1		5.9	4.9	5.8	NA
November	2.0	3.3	3.3	2.8		5.2	4.3	5.5	NA
December	4.2	4.7	4.0*	3.7		5.2	4.4	5.4	NA
Average	3.6	3.4	4.0	4.3	NA	6.1	5.7	5.7	6.2
Subtotal	43.7	41.0	48.1*	51.9	NA	74.0	69.0	68.5	56.1
JSSD Wholesale Water Purchases									
Annual Purchase							13.0	19.26	25.5
Total TCSSD Water Production									
Total	43.7	41.0	48.1	51.9	NA	74.0	82.00	87.80	81.60

*Estimated value (No data available for December 2011)

**No data is available for the year 2012

EXISTING WATER SUPPLY

Twin Creeks currently retains ownership of water shares totaling 3,424 acre-feet per year. Most of the water shares have been assigned to a water right within the District. Of this volume of water, 1,348.7 acre-feet is available for consumptive use, with the other portion used for return flows to

the drainage system and losses in the treatment process. Supply to Twin Creeks is currently limited by the capacity of the Water Treatment Plant, which can treat up to 347 gpm. Running at full capacity for the entire year, this will produce 560 acre-feet per year. A future plant expansion is planned that will increase its capacity by 694 gpm and allow the full yield of the District's water shares to be treated.

The District also has a contract for wholesale water with JSSD for 900 acre-ft per year. In addition to the WTP and the wholesale water contract, the District expects to receive additional water from potential future wells in the area. Table 3 summarizes the yield and capacity of both existing and future District water supplies.

**Table 3
Summary of Existing and Future Water Supplies
Source Water Rights Annual Yield Peak Capacity**

Source	Water Rights	Annual Yield	Peak Capacity
Lake Creek	1348.7 acre-ft Consumptive	Existing – 558 acre-ft Full Plant Expansion* – 1,348.7 acre-ft	Existing – 346 gpm Full Plant Expansion – 694 gpm
Big Pole	Based on 3424.122 acre-ft of irrigation rights x 0.45 consumptive yield (less 192.15 acre-ft for future well)	*Limited by Water Rights. Actual production limitation = 1,677 acre-ft	Water from Big Pole limited to 350 gpm. Lake Creek is not currently metered but is expected to be at least double the peak flow of Big Pole.
Wolf Creek Ranches Wells*	178 acre-ft Based on existing rights of 315 acre-ft less 1.67 acre-ft/lot for 82 WCR lots. Additional rights could be transferred to the wells.	267 acre-ft Based on annual yield of wells (404 acre-ft) less 1.67 acre-ft/lot for 82 WCR lots. Annual yield of wells based on 50 percent of max production.	330 gpm Based on existing well capacity of 500 gpm less 2.07 gpm/lot for 82 WCR lots. Additional rights could be transferred to the wells.
Future Well*	192.15 acre-ft Based on Water Right 55-8222.	192.15 acre-ft Limited by water right. Actual potential yield (based on 50 percent of max production) is 202 acre-ft.	250 gpm Assumed minimum design capacity of future well.
JSSD Wholesale Contract	900 acre-ft per contract.	900 acre-ft per contract.	545.3 gpm per contract.
Total Projected	2,618.85 acre-ft	2,707.85 acre-ft	1,819.3 gpm

*Future potential water sources

*Note that an updated audit of water rights and firm yields is currently underway. Values shown in this table is from the 2015 study.

PROJECTED WATER SUPPLY AND DEMAND

As noted previously, per capita water demands for TCSSD in 2011 were approximately 74 gallons per day. Per capita water demand for Red Ledges in 2015 were 191.3 gallons per day. The State water conservation goal is to reduce per capita water usage by 25 percent by the year 2025, measured from the year 2000. Because of a lack of reliable water use data for TCSSD in the year 2000, and because the per capita demand in 2011 is already substantially lower than State Standards, an assumption has been made that the District has been on par with the conservation goal of 1% water use reduction per year through 2011. Estimates of per capita water use in the years prior to 2011 have been extrapolated based on this assumption with continued conservation in accordance with the State goal.

Table 4 and presents the per capita water demand goals for the District with the Red Ledges Development. Tables 5 and 6 show projected population for TCSSD (Table 5) and Red Ledges (Table 6) and the corresponding required supply with and without conservation through 2060. Conservation efforts can potentially delay or eliminate the need for additional water supply acquisition in the future, which results in savings for both the District and for customers.

**Table 4
Twin Creek SSD and Red Ledges per Capita Demand Reduction Goal Through 2025**

Year	TCSSD Per Capita Demand w/ Conservation (gpcd)	Red Ledges Per Capita Demand w/ Conservation Red Ledges (gpcd)	Total per Capita Weighted Average (gpcd)
2000	83.7	-	83.7
2005	79.5	-	79.5
2010	75.3	-	75.3
2015	71.1	191.3	93.5
2020	67.0	181.7	93.3
2025	62.8	172.2	87.2

Table 5
TCSSD Projected Demand With & Without Conservation
(Excludes Red Ledges)

Year	Approximate Total Population	Annual Demand without Conservation (acre-ft)	Annual Demand with Conservation (acre-ft)	Estimated Annual Water Savings Through Conservation (acre-ft)	Estimated New Supply Development Which Can Be Delayed Through Conservation* (acre-ft)
2000	1,348	126.4	126.3	0	0
2005	1,509	141.5	134.4	7.1	0
2011	1,778	166.7	150.0	16.7	0
2018	2,811	263.5	216.0	47.5	0
2020	3,245	304.2	243.5	60.7	0
2025	5,558	521.1	391.0	130.1	0
2030	8,166	765.6	574.4	191.2	0
2035	10,503	984.8	738.9	245.9	0
2040	12,943	1213.5	910.5	303.0	0
2045	15,183	1423.5	1068.0	355.4	74.8
2050	16,776	1572.8	1180.1	392.7	224.1
2055	19,012	1782.5	1337.4	445.1	433.8
2060	20,237	1897.3	1423.6	473.8	548.6

*Beyond the District's current estimated supply of 1,348.7 acre-ft.

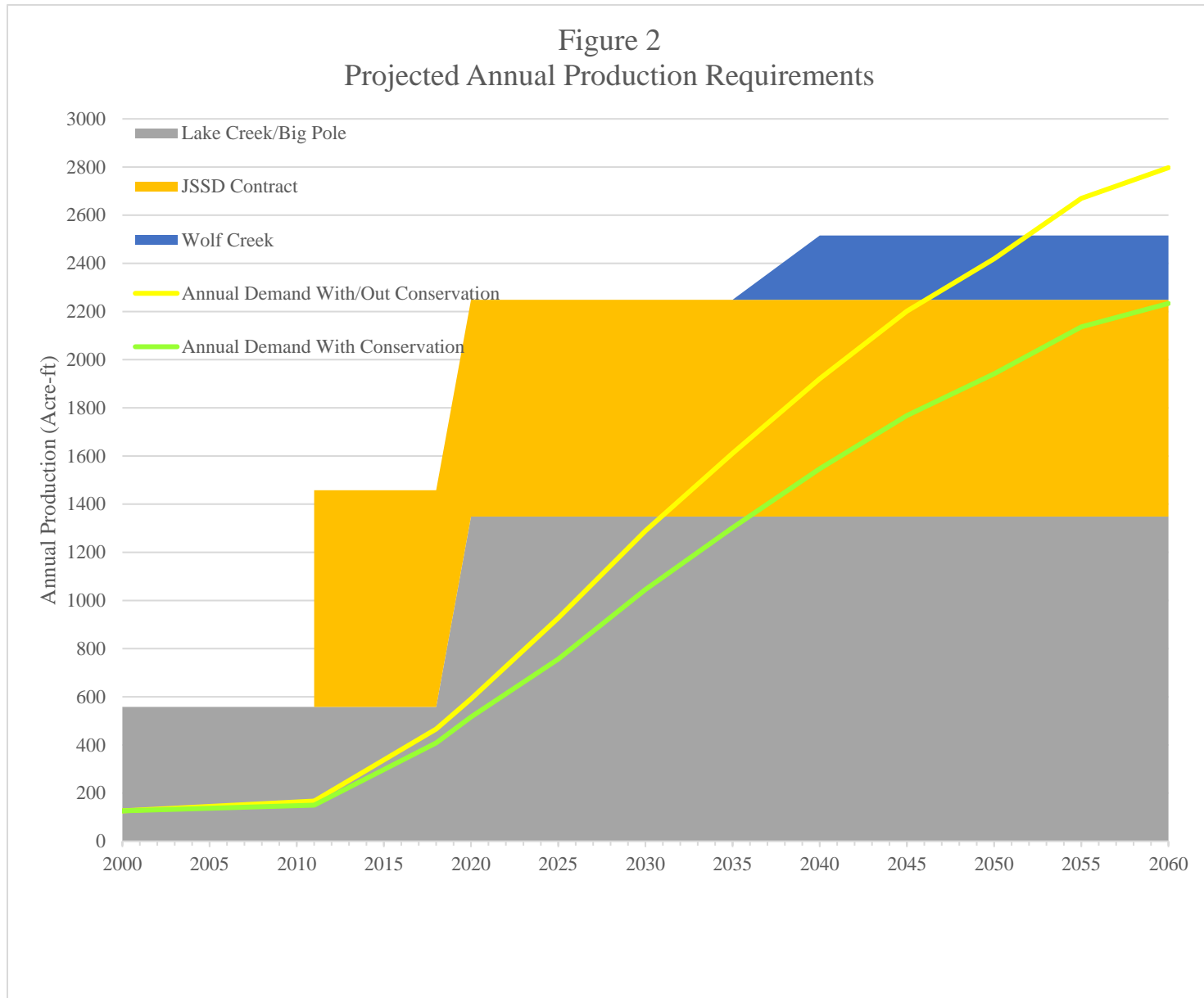
**Table 6
Red Ledges Projected Demand With & Without Conservation**

Year	Approximate Total Population	Annual Demand without Conservation (acre-ft)	Annual Demand with Conservation (acre-ft)	Estimated Annual Water Savings Through Conservation (acre-ft)	Estimated New Supply Development Which Can Be Delayed Through Conservation* (acre-ft)
2000	-	-	-	-	-
2005	-	-	-	-	-
2011	-	-	-	-	-
2018	945	202.5	192.4	10.1	0.0
2020	1,341	287.2	272.9	14.4	0.0
2025	1897	406.5	365.8	40.6	0.0
2030	2,443	523.5	471.1	52.3	0.0
2035	2922.5	626.2	563.6	62.6	0.0
2040	3,301	707.2	636.5	70.7	0.0
2045	3629.5	777.7	700.0	77.8	0.0
2050	3,948	846.0	761.4	84.6	0.0
2055	4140.5	887.2	798.5	88.7	0.0
2060	4,200	900.0	810.0	90.0	0.0

*Beyond the Red Ledges’s current estimated supply of 900.0 acre-ft.

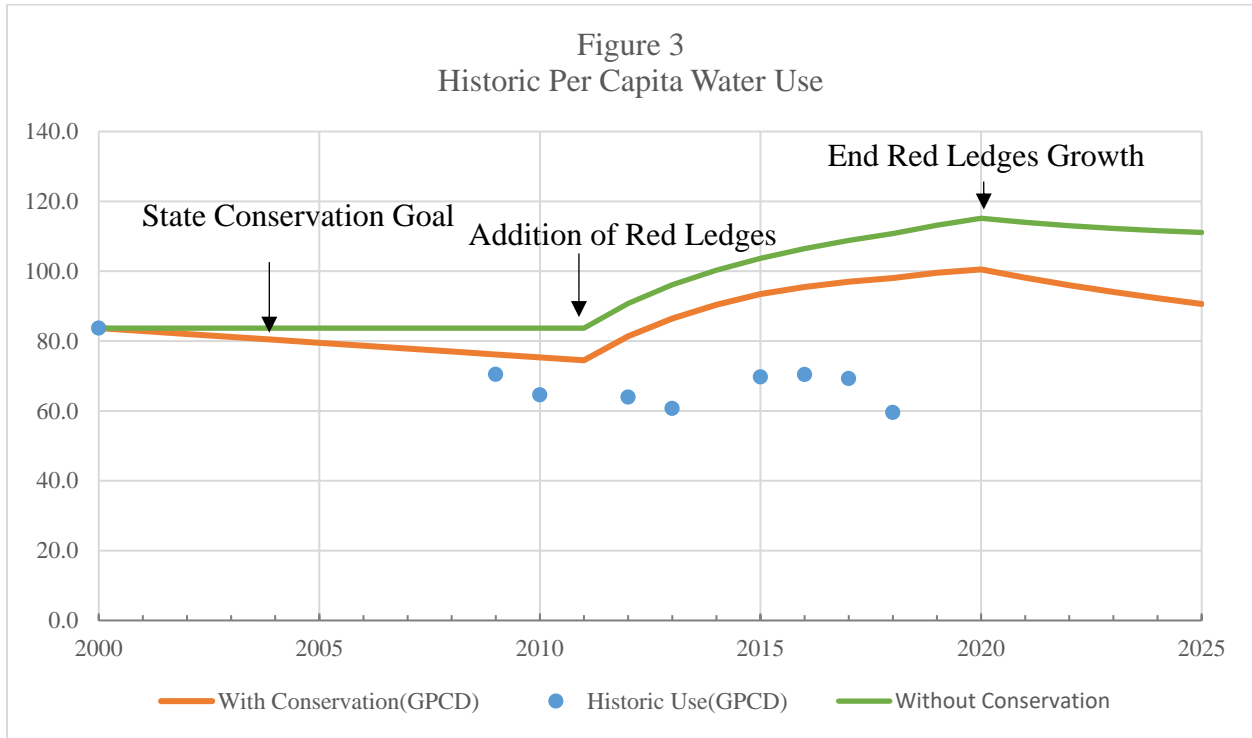
The combined information from Tables 5 and 6 is represented below in Figure 2, which shows that if Twin Creek is able to achieve and maintain the conservation goal set by the State by 2025, they will have sufficient source capacity through the year 2060. However, if conservation goals are not met, the District may find themselves needing additional source capacity well before 2060. Conservation efforts will have a similar effect on WTP capacity. By reducing water use, the District can delay and reduce the magnitude of expensive treatment plant expansion projects. Figure 2 illustrates the benefit of water conservation in the District. With conservation, the District will potentially avoid the need to acquire the additional source capacity from Wolf Creek Ranches or an additional underground well.

Figure 2
Projected Annual Production Requirements



MEASURING SAVINGS FROM CONSERVATION

Figure 3 shows historic per capita water use of TCSSD and Red Ledges Development to date. To track how well TCSSD is achieving its conservation goal, the District will, on an annual basis, estimate per capita water demands based on yearly production data from the WTP and an updated population estimate as a function of new system connections.



WATER METERING AND PRICING

To encourage conservation, TCSSD has implemented an increasing block water rate structure as shown in Table 6. All Block 1 water is currently included in the monthly base rate allowance (the first 12,000 gallons of water used per connection). However, the price of this water is about 33% less than Block 2 water above 12,000 gallons per month. At more than \$15.00 per thousand gallons, the charge for Block 2 water is very aggressive when compared to other water rates in Utah and provides a significant incentive for conservation.

**Table 7
TCSSD Current Rate Structure**

Monthly Base Rate (\$/month)

Meter Size	2013	2014	2015	2016	2017	2018
<i>Water – Reservation Fee</i>						
NA	\$25.00	\$25.00	\$25.00	\$25.00	\$25.00	\$25.00
<i>All Other Metered Connections (inches)</i>						
1" and Smaller	\$43.48	\$49.15	\$55.07	\$61.10	\$63.22	\$65.34
1 1/2"	\$83.89	\$95.11	\$106.87	\$118.75	\$122.89	\$127.01
2"	\$132.38	\$150.27	\$169.05	\$187.92	\$194.48	\$201.01
3"	\$245.53	\$278.95	\$314.12	\$349.34	\$361.54	\$373.66

Volume Rates (\$/kgal)

	2013	2014	2015	2016	2017	2018
Typical Overage	\$15.00	\$15.00	\$15.00	\$15.26	\$15.40	\$15.57
Modified Overage for Special Rate Schedules ¹	\$2.81	\$3.24	\$3.68	\$4.12	\$4.26	\$4.41

¹ Cost of water between 12,000 gallons and revised break point for 36,000 and 72,000 gallon customers. Above revised break point, typical overage applies.

Due to the fact that Twin Creeks SSD was formed fairly recently, the majority of the water system infrastructure, including meters, is relatively new. Because of this, the District has not yet established a replacement schedule for its meters. In the future it is expected that the District will replace meters per recommendations from the manufacturer.

CURRENT CONSERVATION MEASURES

Twin Creeks is a relatively young water service district, but has already implemented a few important water conservation measures:

- **Universal Metering** – The District has embraced the concept of universal metering for its water system, providing a flow meter at each service connection.
- **Increasing block rate structure** – Twin Creeks’ current rate structure is tiered so that the highest volume users pay more per 1,000 gallons. The goal is to encourage users to be conscious of water use on a daily basis.
- **Water Conservation Plan** – Developing a Water Conservation Plan will guide the conservation effort in years to come and will help establish the policies adopted by the water agency authority.

At this point, the District has not implemented any public education programs regarding water conservation. However, the low per capita water use in Twin Creeks SSD indicates that the District’s customers are conscious of their water use. Along with the conservation measures

already in effect, there are additional efforts the District will implement in order to raise awareness about the wise use of the limited resource that is water.

PROPOSED CONSERVATION MEASURES

Potential conservation measures are discussed in detail in the sections that follow. Because of the inter-related nature of conservation measures, the amount of the water that will be saved by each individual program cannot be calculated with any degree of accuracy. However, the combined effect of these several programs will be closely monitored by the District relative to its conservation goals. As necessary, conservation measures will be added or modified to improve performance. As required by the Division of Water Resources, Twin Creeks SSD has chosen Doug Scow, a full time employee on the District's administrative team, to serve as water conservation coordinator.

WaterSense Program – The “WaterSense” partnership program developed by the Environmental Protection Agency provides free access to media materials, public service announcements, factsheets, brochures, and bill stuffers with water-efficiency messages. The District is investigating becoming a WaterSense partner to obtain relevant information on and encourage conservation.

Expanded Secondary Meter Program – While all water to the secondary system serving the District is provided by Lake Creek Irrigation Company, some of the customers have their distribution system serviced by Twin Creeks SSD and are billed by Twin Creeks SSD. For those customers that fall in this category, the District has a plan in place to install secondary water meters on 100 percent of its connections in the next 3 years. This will allow the District to implement a 4 tier increasing block structure for secondary water use by these customers.

Meter Testing/Replacement Program – A meter testing and replacement program will improve the accuracy of meter reads, providing better data for billing purposes as well as identifying potential leaks in the system. As previously mentioned, the TCSSD water system is relatively new and meter replacement to date has been limited. However, the District's meter replacement program will become increasingly important in the future as meters begin to reach the end of their design life. The District's most recent rate study budget includes \$ 300,000 for rehabilitation and replacement that can be used for this purpose.

District Services Booths – The District will occasionally provide a booth at key functions to help citizens learn more about the services offered by the District. This will provide an opportunity to teach the citizens about water conservation. Booths will be set up with water conservation information, information about the current water supply situation, and other activities that teach about water conservation.

Consumer Confidence Report - As part of its annual Consumer Confidence Report, the District will include a section discussing tips to develop better water conservation habits. This will act as a simple reminder to the water system customers.

Expanded Web-Based Information – For many people, the Internet is now the primary source of information. The District will update its website to include a summary of its water conservation goals, water conservation tips, and the benefits of actively conserving water.

Advanced Metering Infrastructure – The District’s new AMI system will provide significant improvements for identifying leak and education consumers about water use.

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