



CHAPTER 6

WATER USE & PRESERVATION

- South Ogden City Water Profile
- Water Use
- Water Conservation Plan
- Regional Collaboration Goals & Practices



IMAGE 6.1 - THE SOUTH OGDEN WATER TANKS BEING PAINTED



Caption: The South Ogden water tanks being painted as viewed from Harrison Boulevard on Wednesday, October 10, 2012. Credit: Dennis Montgomery/Special to the Standard-Examiner.

INTRODUCTION

Utah is among the fastest growing and driest states in the nation. By 2065 the population is expected to double, increasing demand for and stretching finite water resources even further. The drought has been at or near historic levels – though as of 2023, conditions may be improving.

Water conservation is an issue that touches everyone, and ensuring we continue to have enough water for the future is a major concern for local and state leaders, water providers, and the public. The use and preservation of water resources has emerged as a major concern on the state level. S.B. 110: Water as Part of General Plan, a law that was adopted in 2022, requires municipalities and counties to amend their general plan to address how land use planning impacts water use. Water use and preservation also emerged as key concerns of local residents who recently participated in a Citywide community survey, further highlighting the importance of the topic.

As a community nearing build-out, South Ogden City’s water use challenges have less to do with population growth and more to do with satisfying anticipated demands, delivering required emergency flows to all areas within the City, maintaining and improving the current distribution system, and achieving the City’s water conservation goals.¹ This chapter describes water system basics and the City’s current and future water use. It also outlines existing and proposed water planning goals and strategies and recommends additional goals and policies that will reduce water demands as part of current and future developments.

¹ South Ogden City. (2019, January). Culinary Water Capital Facilities Plan and Impact Fee Analysis.



SOUTH OGDEN CITY WATER PROFILE

WATER SYSTEM BASICS

By law, water in Utah belongs to the public and the right to divert water and decide how it is used is determined by the state. Each year, more than five million acre-feet of water is diverted from Utah’s natural water systems and delivered to agricultural, residential, commercial, institutional, and industrial customers. Of that, an estimated 82% goes to agricultural uses with the remaining amount distributed to other uses through water delivery systems.²

A community water delivery system typically consists of one or more water sources, storage facilities, and a distribution system within a service area. In order to operate efficiently and effectively, each system component must be planned and designed to operate under the wide range of demands placed on the system by users. Responding to daily and seasonal variations in demand and providing sufficient capacity for fire protection and other emergency situations are critical system requirements. **Map 6.1** shows the intricate web of water sources, waterlines, valves, and meters that form South Ogden City’s Existing Culinary Water System.³

WHERE DOES THE CITY GET ITS WATER FROM?

A water right is permission from the state to divert and beneficially use a certain amount of water. South Ogden City has water rights to surface water from Burch Creek, Strong Canyon and Waterfall Canyon, and wholesale water purchases from Weber Basin Water Conservancy District (WBWCD). In an emergency situation, an inactive well located in Washington Terrace is also available. Through a long-term contract, WBWCD treats the water and delivers it in exchange for water from the City’s surface water sources.

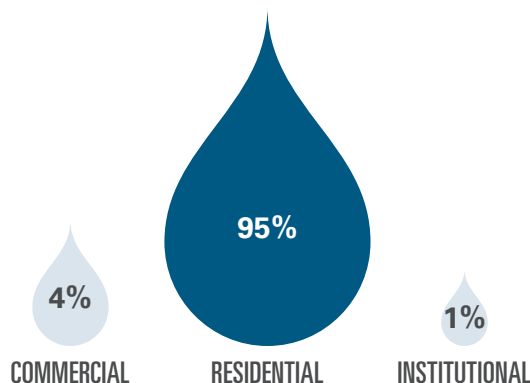
2 Prepared 60 Securing Utah’s Economic Future. (2018). Understanding Utah’s Water Municipal Manual 1st Edition. Retrieved on 12/15/2022 from <http://prepare60.com/>.

3 South Ogden City. (2019, January). Culinary Water Capital Facilities Plan and Impact Fee Analysis.

DRINKING WATER

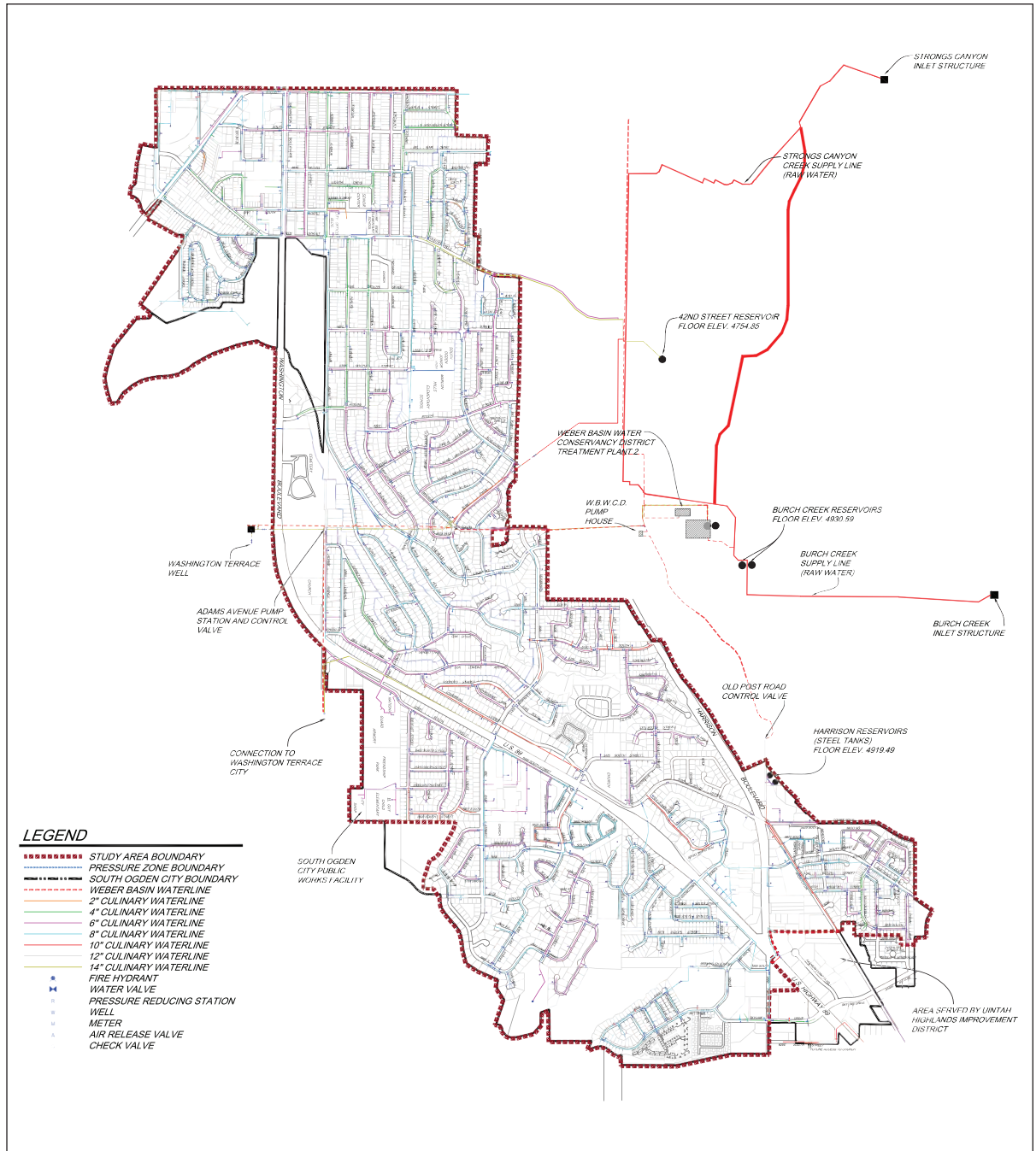
Water is primarily delivered to cities through a culinary water system (drinking water) and a secondary water system (irrigation water). All of South Ogden City’s culinary water supply is delivered through metered connections to WBWCD which supplies approximately 17,800 people with drinking water. Of the 5,291 total service connections, 5,036 (95%) are residential, 232 (4%) are commercial, and 23 (1%) are institutional (**Figure 6.1**).

FIGURE 6.1 - BREAKDOWN OF CULINARY WATER SERVICE CONNECTIONS





MAP 6.1 - SOUTH OGDEN EXISTING CULINARY WATER SYSTEM



IRRIGATION WATER

South Ogden City is served by two physically and operationally independent secondary water (irrigation) systems: Weber Basin Water Conservancy District (WBWCD) and the South Ogden Conservation District which is an entity of Pineview Water. These two providers supply secondary water for outside irrigation to nearly all residential, commercial, and institutional connections in the City.



In 2010, BWCD began installing water meters on secondary connections in an effort to eliminate waste, inform homeowners on their outdoor water use, and educate them about how much is actually needed for their landscape.⁴ Water conservation goals, information, resources, programs, and strategies can be found on the respective websites of both water providers.

WATER USE

People use water for their homes and workplaces, manufacturing, and recreation. Gallons per capita per day (GPCD) is a standard measurement for water use among water professionals.⁵ GPCD, which includes residential water use, commercial water use, institutional water use, and system losses, is calculated by dividing total annual water use by the resident population. Water supply and use numbers are often reported in Acre Feet Per Year (ACFT).

PRESENT REQUIREMENTS

The City's present water requirements were estimated using records from master meters located at water sources. According to the *South Ogden Water Conservation Plan 2022*, the daily readings history is not yet sufficient to provide a reliable measurement for peak day demand, therefore, peak day use was estimated based upon monthly totals.⁶ Monthly records show an expected seasonal water use pattern that reflects the fact that most of the outside irrigation is supplied by a secondary water system. Maximum seasonal demand still occurs in the summer months, but the peak summer water usage is much lower than it would be without a secondary water system (**Figure 6.2**).

The average annual growth rate in GPCD between 2016 and 2021 was 5% with a 1% decrease occurring between 2018 and 2019, and a 17% increase occurring between 2019 and 2020. The outlying 17% increase is likely a result of the unique circumstances surrounding the COVID-19 pandemic and the implementation of stay-at-home orders and remote work. The result of these societal changes resulted in more people being in their homes for more hours each day, cooking, washing dishes, flushing toilets, and showering, which resulted in the substantial increase in residential water use (**Figure 6.3**).⁷

4 South Ogden City. (2022, July). South Ogden City Water Conservation Plan.

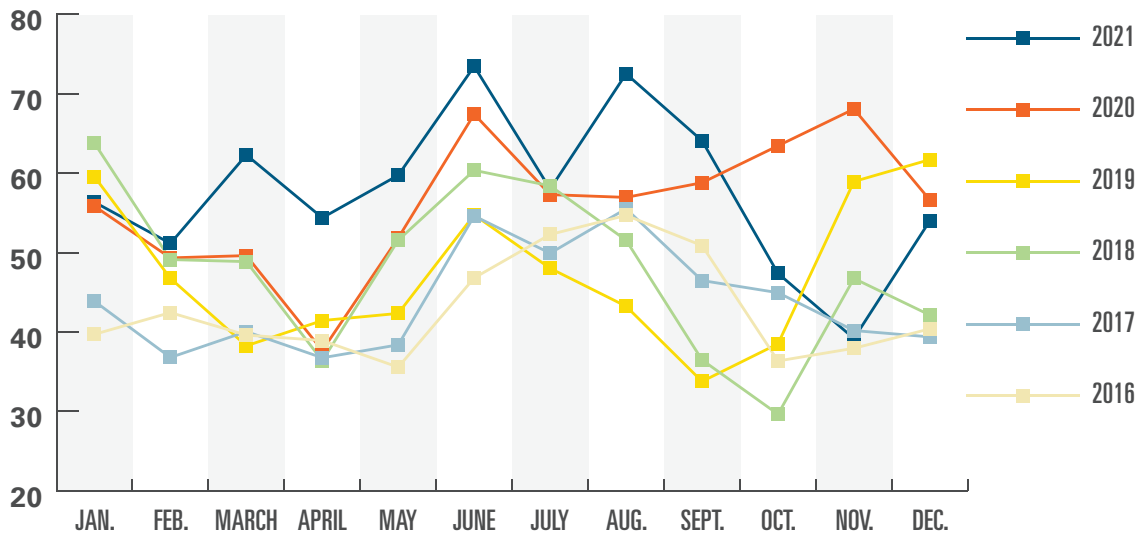
5 Utah Department of Natural Resources. About GPCD Population Estimates. Retrieved on 12/08/2022 from: <https://dwre-utahdnr.opendata.arcgis.com/pages/population-data>

6 Weber Basin Water Conservancy District. Retrieved on 12/15/2020 from: <https://weberbasin.com/Conservation/About>

7 Irwin NB, McCoy SJ, McDonough IK. Water in the time of corona(virus): The effect of stay-at-home orders on water demand in the desert. *J Environ Econ Manage*. 2021 Sep;109:102491. doi: 10.1016/j.jeem.2021.102491. Epub 2021 Jun 18. PMID: 34176994; PMCID: PMC8220444.

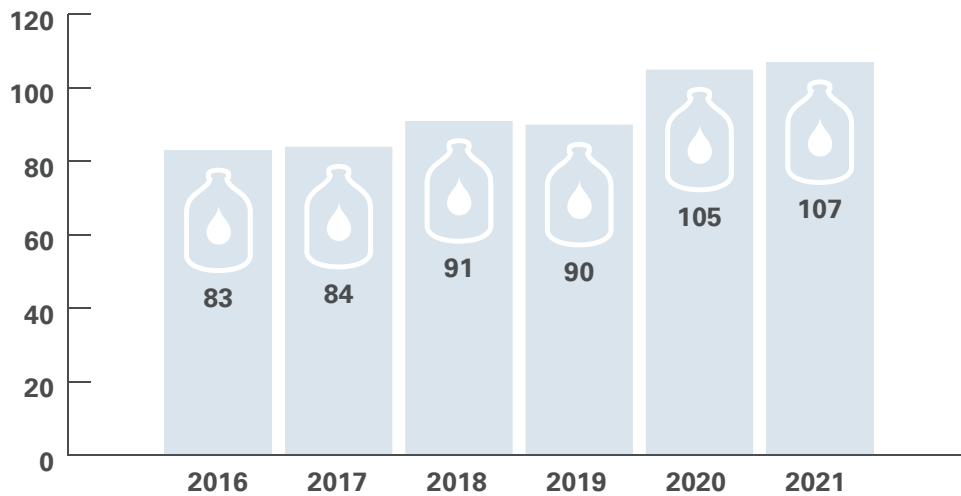


FIGURE 6.2 - MONTHLY WATER DEMAND IN MILLIONS OF GALLONS



Water sources, storage, and distribution systems must be adequate to meet varying demand for water which fluctuates not only with the time of year, but also with the time of day. For residential communities, daily water demand typically peaks in the morning between 7 and 11am and again in the evening between 5 and 9pm with the highest demand generally occurring on hot summer evenings.

FIGURE 6.3 - YEARLY WATER DEMAND (GPCD²)



The average annual growth rate in GPCD between 2016 and 2021 was 5% with a 1% decrease occurring between 2018 and 2019, and a 17% increase occurring between 2019 and 2020.



OUTDOOR WATER USE & SUSTAINABLE LANDSCAPING

In Utah, outdoor residential water use is the largest single category of municipal water use, averaging 45% of statewide municipal use. Of our culinary water use, approximately 65% is applied, often inefficiently, to landscapes.⁸ For this reason, many communities are focused on promoting water-efficient landscaping — including South Ogden City. This is best reflected in the current landscape regulations in South Ogden, which were developed and recently updated to “protect the community’s environmental, economic, recreational, and aesthetic resources by promoting efficient use of water in the community’s landscapes, to reduce water waste, and to establish a structure for the designing, installing and maintaining of water efficient landscapes throughout the City.”⁹

The landscape design standards outlined in the South Ogden City code are structured around principles of sustainable landscaping and while single-family and twin home sites are not required to adhere to these standards, water efficient landscapes are encouraged. Educational brochures regarding a variety of water-related topics can also be found on the City’s website.

PRINCIPLES OF SUSTAINABLE LANDSCAPING:¹⁰



1. START WITH A PLAN

For a landscape design to be water-conserving, it needs to use water efficiently. The planning stage is the optimal time to decide which water efficiency strategies will be used.



2. PRACTICAL TURF-AREAS REDUCE OVER-IRRIGATION

Water-efficient landscaping does not require the elimination of all turfgrass. In fact, turfgrass can be a practical and beneficial component of a water-wise landscape if best practices are followed. The use of turfgrass becomes problematic when it is over-irrigated, used in areas that are challenging to irrigate such as steep slopes or odd-shaped and narrow spaces, and when it is placed in areas where it isn’t useful.

8 “Principles of Water Wise Landscaping.” Utah State University Extension Center for Water-Efficient Landscaping. Retrieved September 20, 2022, from <https://extension.usu.edu/cwel/principles>

9 South Ogden City, UT, City Code Title 10 Chapter 23 (2022) .

10 “Principles of Water Wise Landscaping.” Utah State University Extension Center for Water-Efficient Landscaping. Retrieved September 20, 2022, from <https://extension.usu.edu/cwel/principles>



3. SOIL PREPARATION IS THE FOUNDATION OF A QUALITY LANDSCAPE

Soil is the most basic component of a quality landscape and will have an impact on the growth rate, health, and appearance of plants.



4. PROPER PLANT SELECTION AND PLACEMENT SAVES WATER

Selecting the right plant for the right place is critical to creating a water-efficient landscape. Proper placement provides shade, privacy, beauty, efficiency, and can even decrease yard maintenance.



5. RETAIN MOISTURE WITH MULCH

Mulch covers the soil and prevents crusting, compaction, and moisture loss. Mulching around trees, shrubs, and flower beds can result in a ten-fold reduction in evaporative water loss from soil.



6. EFFICIENT IRRIGATION IS CRITICAL FOR CONSERVING WATER

Grouping plants with similar water needs (hydrozoning) is the first step in developing an efficient irrigation plan. Once plants are properly zoned, develop an irrigation schedule that will apply the appropriate amount of water based on the unique needs of each zone.



7. PROPER LANDSCAPE MAINTENANCE KEEPS PLANTS HEALTHY AND HELPS TO CONSERVE WATER

Landscape maintenance is one of the most important components of a beautiful and lasting landscape. The main activities required to maintain a water-wise landscape are irrigation and irrigation system maintenance, weed control, fertilization, pruning, and pest and disease control.



FUTURE REQUIREMENTS

Future water requirements in South Ogden City's are calculated assuming water use patterns and per capita water use both remain relatively constant. Accordingly to this measurement, the total yearly demand in 2032 conditions is projected to be approximately 2,010 acre-feet, which can be met over the next decade with continued wholesale purchases and the current exchange agreement through BWCD.

Since the City is estimated to be more than 90% fully developed at present, South Ogden City should consider land-use policies and practices that best complement established local water conservation goals and built-out status.¹ Quality land use policies and practices informed by variables such as lot size, development density, landscape composition, and irrigation efficiency will greatly influence future water requirements and consumption rates.

HOW DOES THE PUBLIC FEEL ABOUT WATER USE?

A public survey that was conducted as part of the 2022/2023 general plan update process found that 97% of respondents are at least somewhat concerned about water use and preservation, with 54% being very concerned. When asked to choose conservation strategies they find favorable, the public selected incentivizing water-conserving landscapes, planting water-conserving trees, and converting underutilized lawn areas in South Ogden public parks to water conserving landscapes. 52% of respondents indicated they were interested in installing a water-conserving landscape at home (**Appendix A**).

WATER CONSERVATION PLAN

In 1998 the Utah Legislature passed the Water Conservation Act, which was amended again in 2022, requiring water agencies with more than 500 culinary water connections to submit water conservation plans to the Utah Division of Water Resources and update the plans every five years. The purpose of a water conservation plan is to provide information regarding existing and proposed water conservation measures that will help conserve water in the state so that adequate supplies of water are available for future needs. Water conservation plans include water use reduction goals as well as implementation strategies. The following is a description of local and regional conservation measures and goals from South Ogden City's current plan.

LOCAL EFFORTS

Examples of measures that encourage water conservation at the municipal-level include education, incentives for appliance and landscape retrofits, secondary water meters, smart irrigation timers, water rates and pricing, fines and penalties for excessive water use, and restrictions to water only on specific days.

¹ Jennie C. Nolon Blanchard, Integrating Water Efficiency into Land Use Planning in the Interior West: A Guidebook for Local Planners. Prepared by Land Use Law Center for Western Resource Advocates. (2018)



SOUTH OGDEN CITY'S CURRENT WATER CONSERVATION MEASURES INCLUDE:

- 1. Public Education:** Several times a year water conservation articles are included in the City's monthly newsletter. South Ogden City will also include information about rebates offered by Weber Basin Water Conservancy District for water saving products.
- 2. Water rates based upon metered water use at service connections:** South Ogden City's water rates are structured to generate sufficient income and to discourage water waste by charging for the amount of water used. While the effectiveness of the South Ogden City rate structure as a water conservation measure is unknown, literature suggests that comparable water rates are somewhat effective in reducing peak period demand associated with outside watering but have limited impact on indoor water use.
- 3. Water meter replacement program:** South Ogden City has recently completed a program of upgrading all meters to radio read meters, which has reduced overall meter reading costs. The City will continue evaluating metering data for potential water conservation opportunities and will check meters if accuracy problems are suspected.
- 4. Pipeline replacements:** Aging waterlines with repeated leaks are identified and scheduled for replacement.
- 5. Leak detection and repair for reservoirs, pipelines, and service connections:** Timely identification and repair of water leaks and other issues reduces water loss.

ADDITIONAL WATER CONSERVATION MEASURES

Additional water conservation measures that could be implemented by South Ogden City include:

- 1. Additional Public Education:** The City can expand its public education efforts to provide a more comprehensive program that encourages efficient watering of lawns and gardens, landscaping with drought-resistant plants, use of low-flow plumbing fixtures, and other water-saving practices. Public education about efficient outside irrigation may help reduce culinary water used for irrigation even with secondary water systems providing service to nearly all of South Ogden City.
- 2. Water Conservation Committee:** A water conservation committee consisting of community leaders, City staff, and residents could assist with the public education program, identify water use concerns, and recommend water conservation measures.
- 3. Additional Metering at City Facilities:** Metering water use at City parks and facilities may help identify potential water use concerns and opportunities for water conservation.
- 4. Analysis of Metered Use Individual Connections:** When sufficient data is available, water use metered at service connections can be analyzed and compared to water use metered at the water sources. Analysis of metered use at individual connections can help determine if water loss is occurring through non-metered connections, faulty meters, or undetected leaks. This analysis can also help homeowners understand and evaluate their own water use for water-saving opportunities.



10 YEAR CONSERVATION GOAL

South Ogden City’s water conservation goal amount for the next ten years was established based upon the reduction of outdoor use by 20% and indoor use by five-percent. It is anticipated that this goal can be achieved by continuing existing water conservation measures and additional public education efforts. Ultimately, the goal should be to reduce future water use while maintaining a financially viable water delivery system.

REGIONAL COLLABORATION, GOALS, & PRACTICES

Local water suppliers have the best information regarding their own systems, challenges, and opportunities. Since water exists and flows freely across political boundaries, joint planning efforts between local, regional, and state entities is also important. South Ogden City can work with other suppliers and other entities to establish policies and partnerships that allow for a comprehensive regional approach to water-supply management that will promote water-use efficiency programs, ensure that plans provide for adequate water supplies and maximize water conservation and reuse, and communicate with the public the importance of water conservation as it relates to quality of life.¹

Utah’s Regional M&I Water Conservation Goals Report² presents a suite of regional goals and practices for residential, commercial, institutional, and industrial water use. The report’s purpose is not to provide a detailed water conservation plan for all regions in the state, but to guide the state’s water industry in planning future infrastructure, policies, and programs consistent with Utah’s semiarid climate and growing demand for water. Local water suppliers, communities, and businesses are encouraged to adapt and refine these recommendations, as well as implement others, in their own water conservation efforts and in pursuit of the regional goals.

REGIONAL EFFORTS

The Utah Regional Municipal and Industrial (M&I) Water Conservation Goals Report proposes nine water conservation regions including a timeline and projected GPCD reductions for each. South Ogden City falls within the Weber River Region, which has a goal to reduce GPCD by 20% by 2030, 26% by 2040, and by 30% by 2065 (**Table 6.1**).

When considering all regional efforts together, the resulting water use for the entire state is projected to be 202 GPCD by 2030 (a 16% reduction from 2015), 188 GPCD by 2040 (a 22% reduction from 2015), and 179 GPCD by 2065 (a 26% reduction from 2015). Meeting the initial 2030 goal will save nearly 165,000 acre-feet of water annually across the state (**Map 6.2** and **Table 6.1**).

1 Integrating Water Efficiency into Land Use Planning

2 Utah Division of Water Resources. (2019, November). Utah’s Regional M&I Water Conservation Goals. Retrieved December 8, 2022, from <https://conservewater.utah.gov/regional-water-conservation-goals/>.



MAP 6.2 - WATER CONSERVATION REGIONS

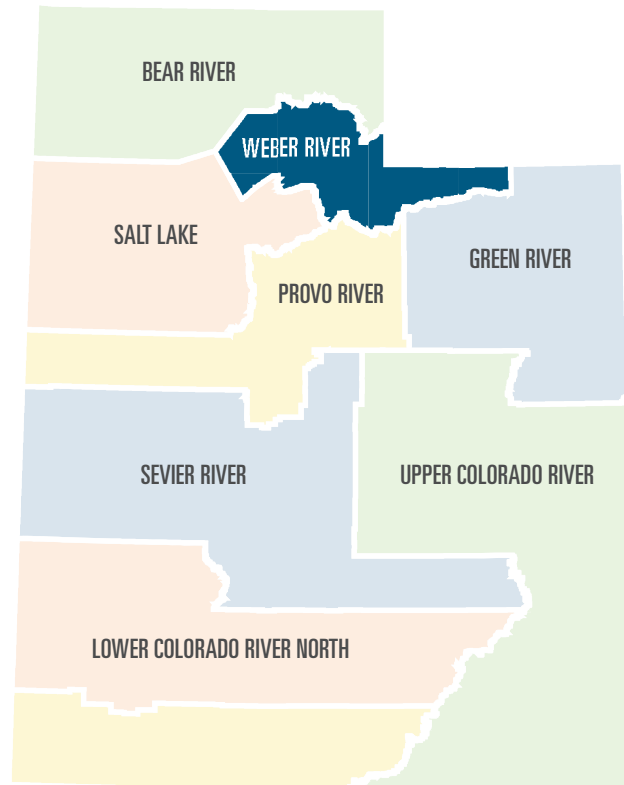


TABLE 6.1 - REGIONAL WATER CONSERVATION GOALS & PROJECTIONS

REGION	BASELINE GPCD				REDUCTION FROM BASELINE		
	2015	2030	2040	2065	2030	2040	2065
Bear River	304	249	232	219	18%	24%	28%
Green River	284	234	225	225	18%	21%	21%
Lower Colorado River North	284	231	216	205	19%	24%	28%
Lower Colorado River South	305	262	247	237	14%	19%	22%
Provo River	222	179	162	152	20%	27%	32%
Salt Lake	210	187	178	169	11%	15%	19%
Sevier River	400	321	301	302	20%	25%	25%
Upper Colorado River	333	267	251	248	20%	25%	25%
Weber River	250	200	184	175	20%	26%	30%
Statewide	240	202	188	179	16%	22%	26%



RECOMMENDED REGIONAL PRACTICES

In addition to regional water conservation goals, the Regional M&I Water Conservation Goals Report also recommends a variety of water conservation practices. Some of these South Ogden has already adopted and others should be considered for future implementation or partnering efforts.

GENERAL PRACTICES

- **Water conservation education:** Continued emphasis and funding of education and outreach must be fundamental components of any water conservation plan, and these efforts must evolve and innovate to be more effective than in the past.
- **Conservation pricing:** While most Utahns have a desire to save water, efforts to do so will be limited unless financial incentives exist to help motivate action. It is recommended that water suppliers examine and update their existing water rate structures to identify ways of encouraging continued conservation.

INDOOR PRACTICES

- **Fixture and appliance conversion or new installation:** Conversion of toilets, faucets, and shower heads to high efficiency options has been shown to be one of the most cost-effective conservation practices available. In addition to reducing water volume with each use, new fixtures also reduce leakage.
- **Indoor Leak repair and changing indoor water use habits:** To achieve long-term water conservation, all regions will need to make at least some progress in reducing indoor leaks and changing indoor water use habits.

OUTDOOR

- **Improved irrigation efficiency:** While significant improvement has been made in irrigation efficiency over the last few decades, additional potential still exists. Examples include secondary meters, controllers that increase efficiency by adjusting irrigation schedules based on weather and landscaping needs, and drip irrigation systems.
- **Water-wise landscaping:** Efficient use of water in community landscapes reduces water waste and enhances the community's environmental, economic, recreational, and aesthetic resources (see principles of sustainable landscaping on pages 127-128).
- **Lot size and density:** It is recommended that water suppliers work with entities regulating development to implement guidelines that encourage and respond to market demand for smaller lot sizes.



GOALS, POLICIES & IMPLEMENTATION MEASURES

GOAL 1: Establish a clear and realistic vision for existing and future water resources, rights, and systems in South Ogden.

- **Policy 1.1:** Protect and conserve the South Ogden culinary drinking water system to meet future needs.
 - **Implementation Measure 1.1.1:** Ensure access to the culinary water system is available for anticipated growth and development in the City.
- **Policy 1.2:** Protect and conserve the South Ogden irrigation water to meet future needs.
 - **Implementation Measure 1.2.1:** Support South Ogden’s secondary water providers in installing water meters on secondary connections to eliminate waste and inform homeowners on how much water they use for outdoor irrigation.
 - **Implementation Measure 1.2.2:** Educate the public on how much water is needed for their landscapes.
- **Policy 1.3:** Maintain strong relationships with water providers to ensure future water needs are met.
 - **Implementation Measure 1.3.1:** Coordinate and discuss changes and needs with water providers on a regular basis.

GOAL 2: Adopt Water Use Targets that meet local needs while reducing unnecessary consumption of water resources.

- **Policy 2.1:** Promote sustainable water use and sustainable landscaping principles and methods
 - **Implementation Measure 2.1.1:** Continue to adopt land-use policies and practices that best complement established local water conservation efforts.
 - **Implementation Measure 2.1.2:** Continue to implement and improve established landscape codes and design standards with a goal of reducing water use.
 - **Implementation Measure 2.1.3:** Consider requiring single-family and similar uses to apply measurable water-conservation targets.
 - **Implementation Measure 2.1.4:** Develop additional educational brochures regarding a variety of water-related topics.



GOAL 3: Support Concepts and ideas Contained in the South Ogden Water Conservation Plan (2022).

- **Policy 3.1:** Review and update the South Ogden City Water Conservation Plan (2022) on a regular basis.
- **Policy 3.2:** Implement Water Conservation Measures that encourage water conservation.
 - **Implementation Measure 3.2.1:** In partnership with secondary water providers, expand public education efforts to provide a more comprehensive program that encourages efficient watering of lawns and gardens, landscaping with drought-resistant plants, use of low-flow plumbing fixtures, and other water-saving practices.
 - **Implementation Measure 3.2.2:** Consider providing incentives for appliance and landscape retrofits, secondary water meters, smart irrigation timers, water rates and pricing, fines and penalties for excessive water use, and restrictions to water only on specific days.
 - **Implementation Measure 3.2.3:** Continue to disseminate educational materials to the community, including information about rebates and incentives.
 - **Implementation Measure 3.2.4:** Work closely with water providers to ensure water rates are an effective tool for reducing indoor and outdoor water use.
 - **Implementation Measure 3.2.5:** Continue established efforts to install and upgrade meters to further water conservation efforts in the future.
 - **Implementation Measure 3.2.6:** Replace and upgrade leaky and aging waterlines as part of a scheduled process.
 - **Implementation Measure 3.2.7:** Establish a system for the timely identification and repair of water leaks.
 - **Implementation Measure 3.2.8:** Establish a Water Conservation Committee consisting of community leaders, City staff, and residents to assist with public education programs, identify water use concerns, and recommend water conservation measures.
 - **Implementation Measure 3.2.9:** Metering water use at City parks and facilities to help identify potential water use concerns and opportunities for water conservation.
 - **Implementation Measure 3.2.10:** Analyze and compare metered water use at individual connections to help determine if water loss is occurring through non-metered connections, faulty meters, or undetected leaks. This analysis can also help homeowners understand and evaluate their own water use for water-saving opportunities.



- **Policy 3.3:** Meet existing conservation goals and targets.
 - **Implementation Measure 3.3.1:** Maintain the ten-year South Ogden water conservation goal through 2032 to reduce future water use while maintaining a financially viable water delivery system. This includes reducing outdoor use by 20% and indoor use by five-percent.
 - **Implementation Measure 3.3.2:** Support meeting these targets by maintaining existing water conservation measures and introducing additional public education efforts.

GOAL 4: Support Collaborative Regional Water Use and Preservation Practices

- **Policy 4.1:** Implement the concepts and practices for residential, commercial, institutional, and industrial water use contained in the Utah Regional Municipal and Industrial (M&I) Water Conservation Goals Report.
 - Implementation Measure 4.1.1: Emphasize and fund education related to the M&I report.
 - Implementation Measure 4.1.2: Ensure the (M&I) Water Conservation Goals Report evolves and innovate to promote better effectiveness.
 - Implementation Measure 4.1.3: Support ongoing review and improvements to local water rate structures to identify ways of encouraging continued conservation.
 - Implementation Measure 4.1.4: Consider programs to convert toilets, faucets, and shower heads to high efficiency.
 - Implementation Measure 4.1.5: Implement improved secondary meter systems for city-owned facilities that increase efficiency by adjusting irrigation schedules based on weather, landscaping needs, and drip irrigation systems.
 - Implementation Measure 4.1.6: Update and enhance established codes and guidelines to ensure the use of water in landscapes reflects state-of-the art methods.
 - Implementation Measure 4.4.7: Create guidelines that encourage and respond to market demand for smaller lot sizes.