



PREPARED FOR:

PREPARED BY:



TIMBER LAKES WATER SSD



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& ASSOCIATES



TIMBER LAKES WATER
SPECIAL SERVICE DISTRICT

AUGUST 2023

WATER CONSERVATION PLAN

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ABBREVIATIONS

AMI	Advanced Metering Infrastructure
CUWCD	Central Utah Water Conservancy District
DWRi	Division of Water Rights
GPCD	Gallons per Capita per Day
TLWSSD	Timber Lakes Water Special Service District

UNIT CONVERSIONS

GALLONS = ACRE FEET × 325,850
 ACRE-FEET = GALLONS ÷ 325,850
 MILLION GALLONS = ACRE-FEET ÷ 3.069
 ACRE-FEET = MILLION GALLONS × 3.069
 GPCD = GALLONS ÷ DAYS OF USAGE ÷ POPULATION

INTRODUCTION

Attitudes toward water supplies are changing. Water is no longer seen as a boundless resource, but as a valuable commodity that needs to be managed carefully. Therefore, 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 of these programs include:

- Using existing water supplies more efficiently
- Maximization of existing water conveyance, treatment, and distribution facilities
- Deferring or eliminating the expense of construction or capital improvement projects
- Reducing the need for additional water supplies

Timber Lakes Water Special Service District (TLWSSD or District) recognizes the benefits of conservation programs. The District sees that per capita use will be at higher levels without emphasis and a clear plan on conservation. It also recognizes that there are still many benefits of further conservation efforts. Since sustained water conservation efforts will be an important component in the District's plans for future water use, this report will evaluate the District's current conservation program and will discuss additional measures that will allow further conservation of water.

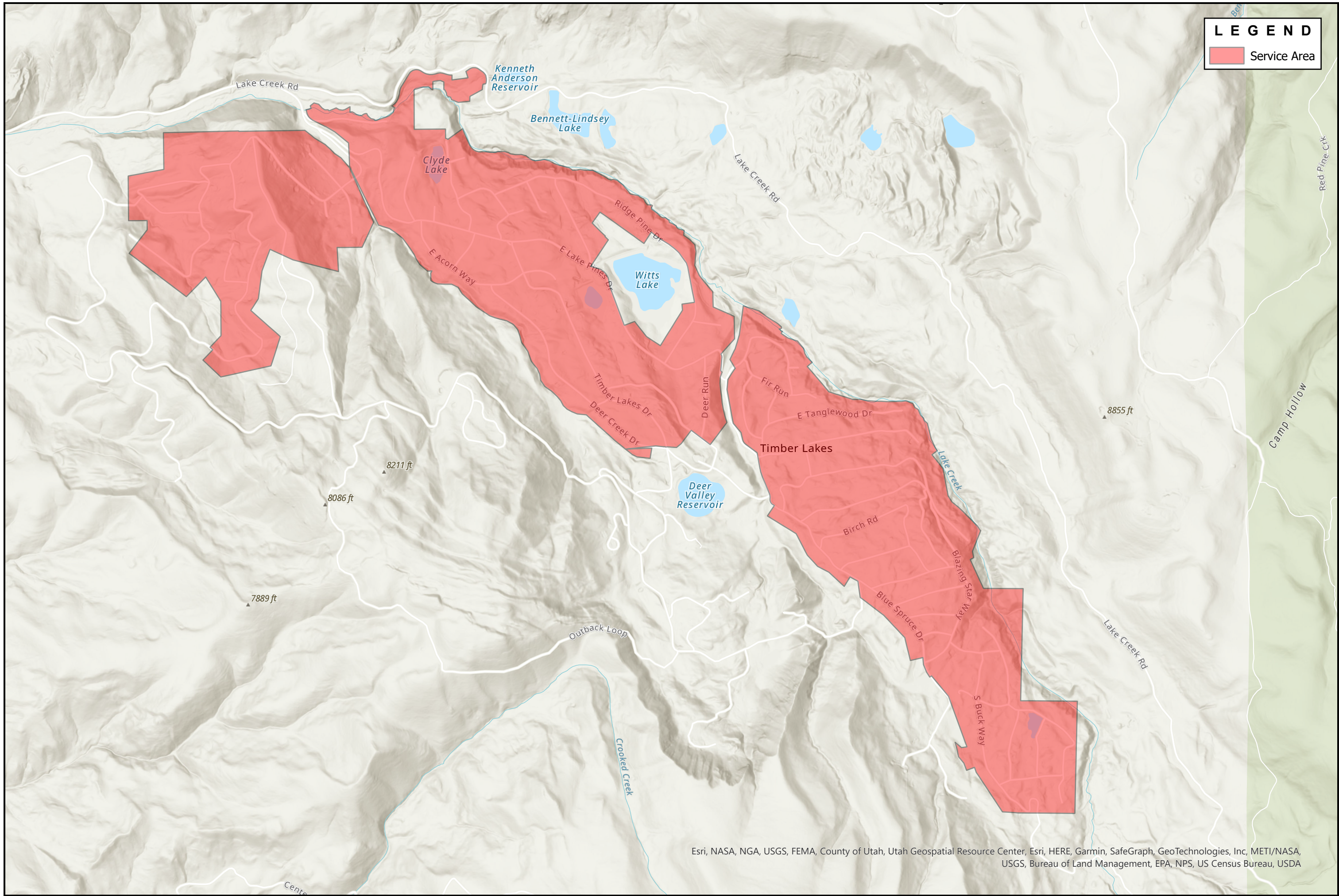
SYSTEM PROFILE

Timber Lakes Water Special Service District Water System Service Area

Timber Lakes Water Special Service District is located in the northern part of Wasatch County and has roughly 965 residential connections. TLWSSD has a culinary water system with no outdoor water use and no future plans to implement a secondary water system.

TLWSSD serves the Timber Lakes Development community, a gated residential community with no commercial or industrial areas. It was originally considered a mountain cabin community with seasonal occupancy. Since then, services have expanded for winter access and now many of the homes are occupied year-round.

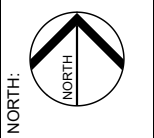
The existing TLWSSD system service area is shown in Figure 1. The system serves TLWSSD's legal boundaries, being bounded to the west by Twin Creeks Special Service District and Lake Creek Irrigation Company.



LEGEND

Service Area

SCALE:
1 in = 2,000 ft



SERVICE AREA

WATER CONSERVATION PLAN



FIGURE NO.
1

Esri, NASA, NGA, USGS, FEMA, County of Utah, Utah Geospatial Resource Center, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA

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System Connections

The Timber Lakes water system includes residential connections only. About 35% of the current connections are full-time residents and 65% are part-time residents. To help evaluate and quantify the amount of water that can reasonably be conserved in TLWSSD, an analysis of current water use patterns has been performed. Usage for the year 2022 is shown in Table 1.

**Table 1
2022 Water Usage**

Customer Type	Connections	Percent of Connections	Annual Water Sales (acre-ft)	Percent of Total Water Use
Residential Full-time	337	35%	49.75	82%
Residential Part-time	625	65%	11.29	18%
Commercial	0	0%	0.00	0%
Institutional	0	0%	0.00	0%
Industrial	0	0%	0.00	0%
Unmetered	0	0%	0.00	0%
TOTAL	962	100%	61.04	100%

Table 1 indicates that approximately 35 percent of the meters in TLWSSD are residential full-time connections, and full-time connections account for 82 percent of the total water use.

All of the future connections are expected to be residential in this area so the dominance of residential connections will continue. Hence, residential water use represents the largest single—and virtually only—area for potential conservation.

Current Rates

Table 2, found on the following page, shows the District’s current culinary water rate structure.

The District recently completed a Culinary Water Rate Study that was adopted in 2023 and the rates in this table are the result of that study.

**Table 2
TLWSSD Water Rates**

	2023	2024	2025	2026	2027
Monthly Base Rate					
Base System Maintenance Fee*	\$34.80	\$37.24	\$39.47	\$41.05	\$42.69
Water Delivery O&M Fee	\$27.69	\$29.35	\$30.52	\$31.44	\$32.38
Capital Fee Bond 2004	\$3.50	\$3.50	\$0	\$0	\$0
Assessment Bond 2011	\$31.11	\$31.11	\$31.11	\$31.11	\$31.11
Revenue Bond	\$2.95	\$2.95	\$2.95	\$2.95	\$2.95
Volumetric Tier Definitions					
Tier 1	0-6,000 gal	0-6,000 gal	0-6,000 gal	0-6,000 gal	0-6,000 gal
Tier 2	6,000-12,000 gal	6,000-12,000 gal	6,000-12,000 gal	6,000-12,000 gal	6,000-12,000 gal
Tier 3	12,000-30,000 gal	12,000-30,000 gal	12,000-30,000 gal	12,000-30,000 gal	12,000-30,000 gal
Tier 4	30,000-50,000 gal	30,000-50,000 gal	30,000-50,000 gal	30,000-50,000 gal	30,000-50,000 gal
Tier 5	50,000-80,000 gal	50,000-80,000 gal	50,000-80,000 gal	50,000-80,000 gal	50,000-80,000 gal
Tier 6	>80,000 gal	>80,000 gal	>80,000 gal	>80,000 gal	>80,000 gal
Volumetric Charges					
Tier 1	\$6.00	\$6.36	\$6.61	\$6.81	\$7.02
Tier 2	\$8.00	\$8.48	\$8.82	\$9.08	\$9.36
Tier 3	\$10.00	\$10.60	\$11.02	\$11.35	\$11.70
Tier 4	\$15.00	\$15.90	\$16.54	\$17.03	\$17.54
Tier 5	\$25.00	\$26.50	\$27.56	\$28.39	\$29.24
Tier 6	\$32.00	\$33.92	\$35.28	\$36.34	\$37.43

*Combined lots will also be charged 50% of the Base System Maintenance Fee for each additional lot.

SUPPLY INFORMATION

The District meets system demand by three groups of springs:

- Cove Springs (2 springs)
- Lone Pine Springs (6 springs)
- Lookout Mountain Spring

Figure 2 shows TLWSSD production data reported to the Division of Water Rights (DWRi) website for 2020 through 2022. While this represents the District’s best understanding of water source production, it should be noted that there are some needed improvements to give the District the ability to fully meter its source production from its springs. Thus, the accuracy of production data will be improved in the future after the planned 2024 metering projects are completed. It is our understanding that the data in Figure 2 is the total production of the springs and not the amount of water that entered the District’s system.

The District’s existing springs have not been deficient in meeting demands, but the meters that are being designed will better quantify the production from the springs and indicate if the District will need to develop more springs to meet future demands.

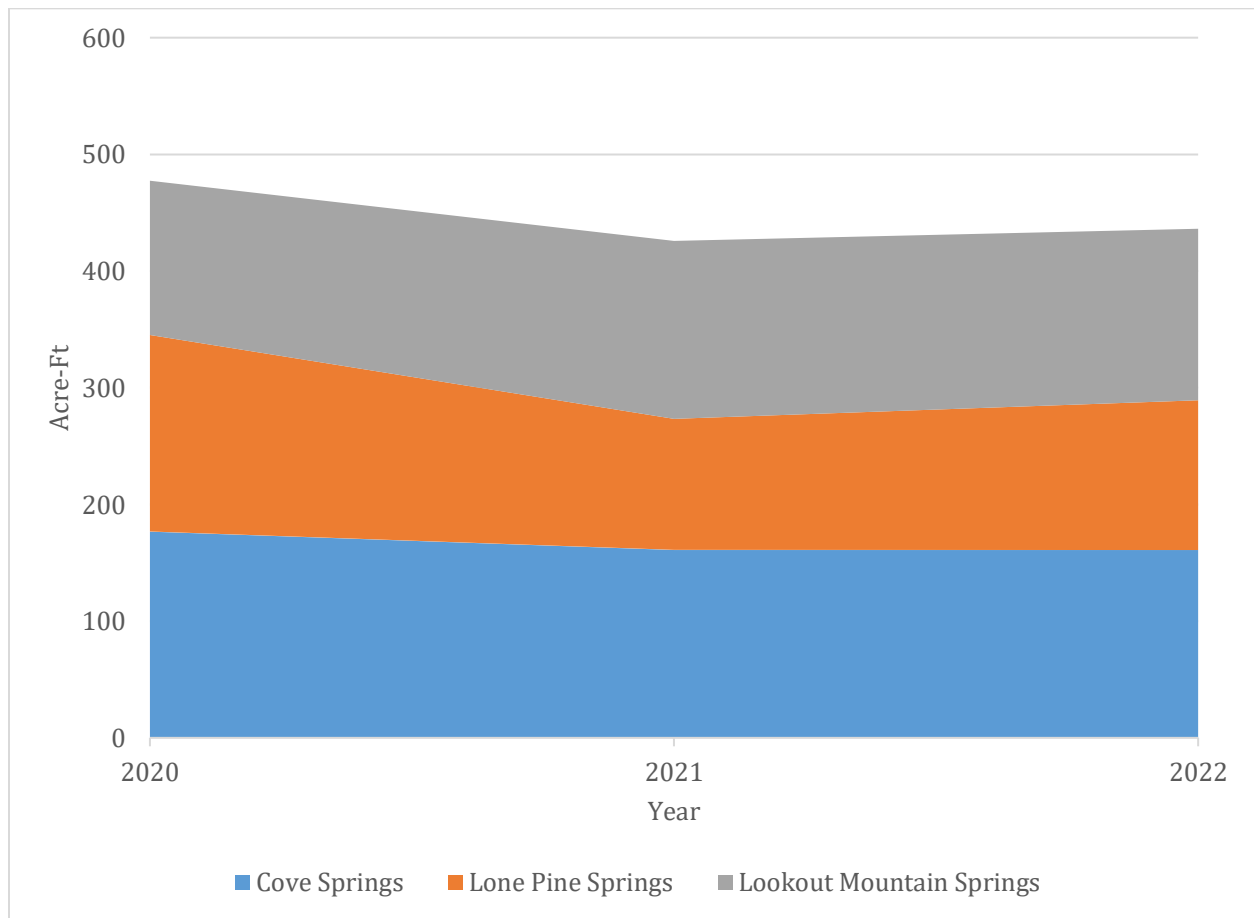


Figure 2 TLWSSD Source Summary

WATER MEASUREMENT

Currently, all water connections within TLWSSD are metered and read on a monthly basis using a drive by meter reading system. The District has thought about transitioning to an automated metering infrastructure (AMI) system. AMI systems automate collection of meter data around the District and can actively measure use, identify leaks, and educate customers on use. AMI systems provide an online portal for each customer through which water use on a monthly (or even hourly) basis can be viewed and interacted with. Installation required the construction of central towers to collect the data. Generally, AMI technology can help encourage water conservation by helping customers proactively monitor water use.

WATER SALES AND SYSTEM LOSS

Historic Water Use

Historic water use from 2020 to 2022 is summarized in Table 3 below. Table 3 includes water sales (metered use out of the system) for the culinary system. Per capita water use has also been calculated.

Data for this table comes from the water sales records which were provided by the District. An average occupancy per connection in Wasatch County is approximated to be 3.1 persons per household per the latest 2020 census data. However, after reviewing historic water sales data with the District, it was discussed that the full-time residents in Timber Lakes are generally comprised of older couples and less than a dozen full-time children (as evidenced by the school bussing needs in the community). From this observation and with the absence of direct population data for Timber Lakes, the full-time persons per connection in the District is approximated to be 2.4 instead of the county average of 3.1. The State requires the per capita water use in this table to be calculated using full-time population only, which means the part-time population in the District has been excluded.

**Table 3
Historic Per Capita Water Culinary Sales**

Year	TLWSSD Full-time Population	Historic Water Sales (acre-ft)	Per Capita Water Use (gpcd)
2020	773	70.61	82
2021	791	60.6	68
2022	812	61.0	67

System Losses

TLWSSD does not currently have the metering infrastructure to accurately estimate system losses due to the spring overflow and system intake not being metered accurately. The District is currently in the design process to install meters that will quantify the overflow from the springs and the amount of water that enters the system from the springs.

Current Per Capita Sales Water Use

Per capita indoor water use for the year 2022 from the District’s sales data is summarized in Table 4. This per capita water use of 67 gpcd is based on full-time population only, but TLWSSD is currently 65% part-time residents. If the part-time population is considered, the per capita water use is 55 gpcd.

**Table 4
Current Per Capita Water Use (Sales)**

User Type	Indoor Use (gpcd)
Residential Full-Time Only	67
Residential Full-Time and Part-Time	55

CONSERVATION GOAL WITH MILESTONES

The State of Utah recently adopted regional conservation goals that focus on regions primarily matching dominant river drainages. The District aims to meet the State of Utah’s conservation targets (Utah’s Regional M&I Conservation Goals, November 2019). The adopted goals establish 2015 as the baseline year for setting conservation targets. Table 5 below shows target per capita indoor use goals for Wasatch County, which is the county in which TLWSSD is located. With the adoption of this Conservation Plan, the District has selected to adopt the state conservation goals as its own. Table 5 and Figure 3 show the District conservation goals.

**Table 5
Conservation Goal with Milestones Through 2065 (Sales)**

Year	State Conservation Goal (Indoor Use Component)	TLWSSD Per Capita Conservation Goal – Full-Time Population Only (gpcd)	TLWSSD Per Capita Conservation Goal – Considering All Occupancy (gpcd)
2015	0%	72.0	58.6
2030	14.1%	61.8	50.3
2040	18.7%	58.5	47.6
2065	22.3%	55.9	45.5

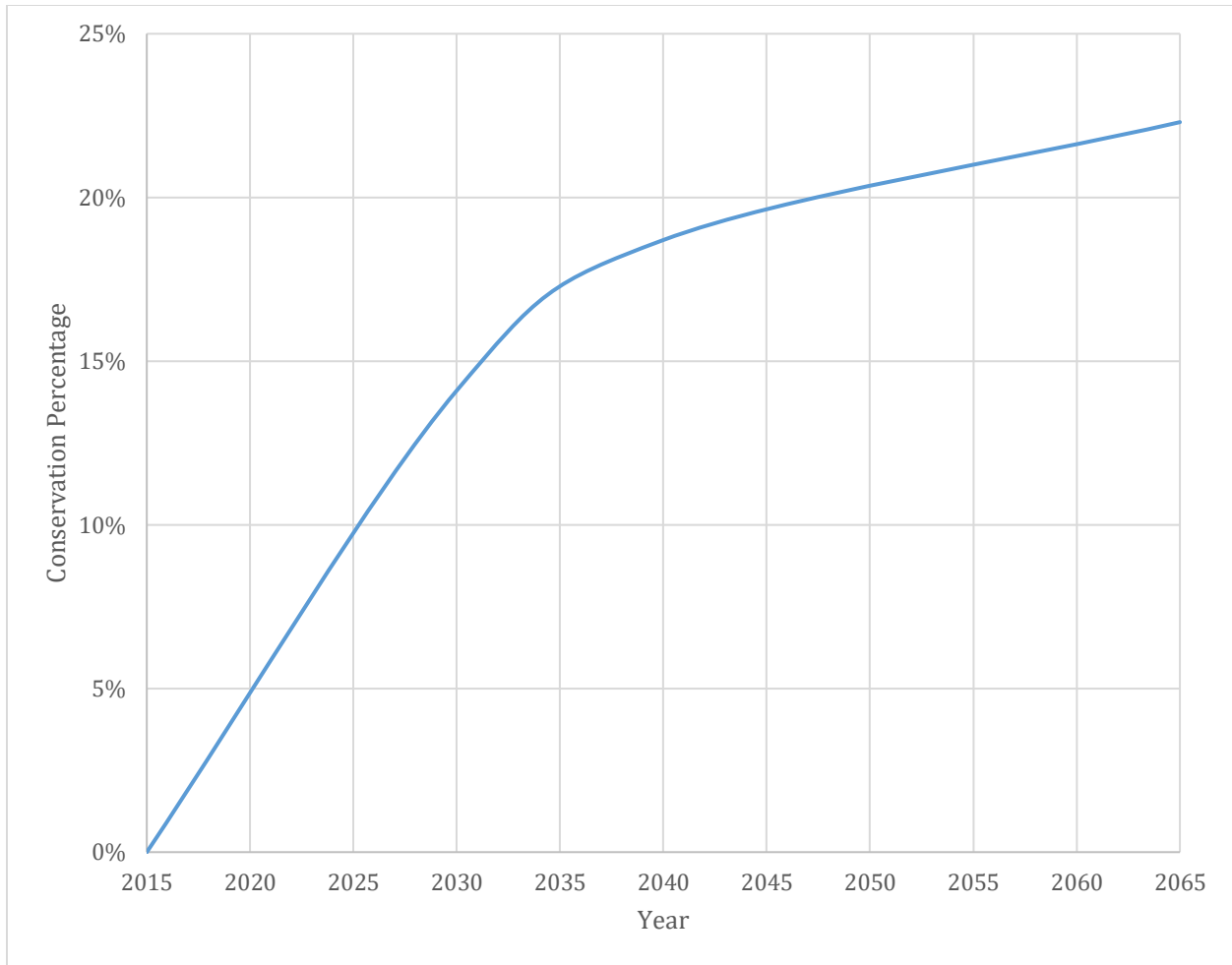


Figure 3 Conservation Curve

Measuring Savings from Conservation

To track how well the District is doing in achieving its conservation goal in the future, the District will continue to annually estimate per capita water demands based on yearly metered sales data and an updated population estimate as a function of new system connections.

EFFECT OF CONSERVATION ON FUTURE WATER SUPPLY AND DEMAND

The historic and projected full-time population for the TLWSSD water service area are shown in Table 6. Population changes in the future are expected to be driven by growth and by shifts in occupancy as time goes on. Since the ratio of full-time residents to part-time residents in the District at buildout is unknown¹, two projections have been provided in the table. The low estimate assumes that 35% of the total residents at buildout are full-time residents. The high estimate assumes that 60% of the total residents at buildout are full-time residents.

¹ In TLWSSD the trend over the past couple of decades is that the prevalence of full-time occupancy in the District is increasing. That trend is expected to continue, but the magnitude of homes which will convert to full-time occupancy in the future is unknown.

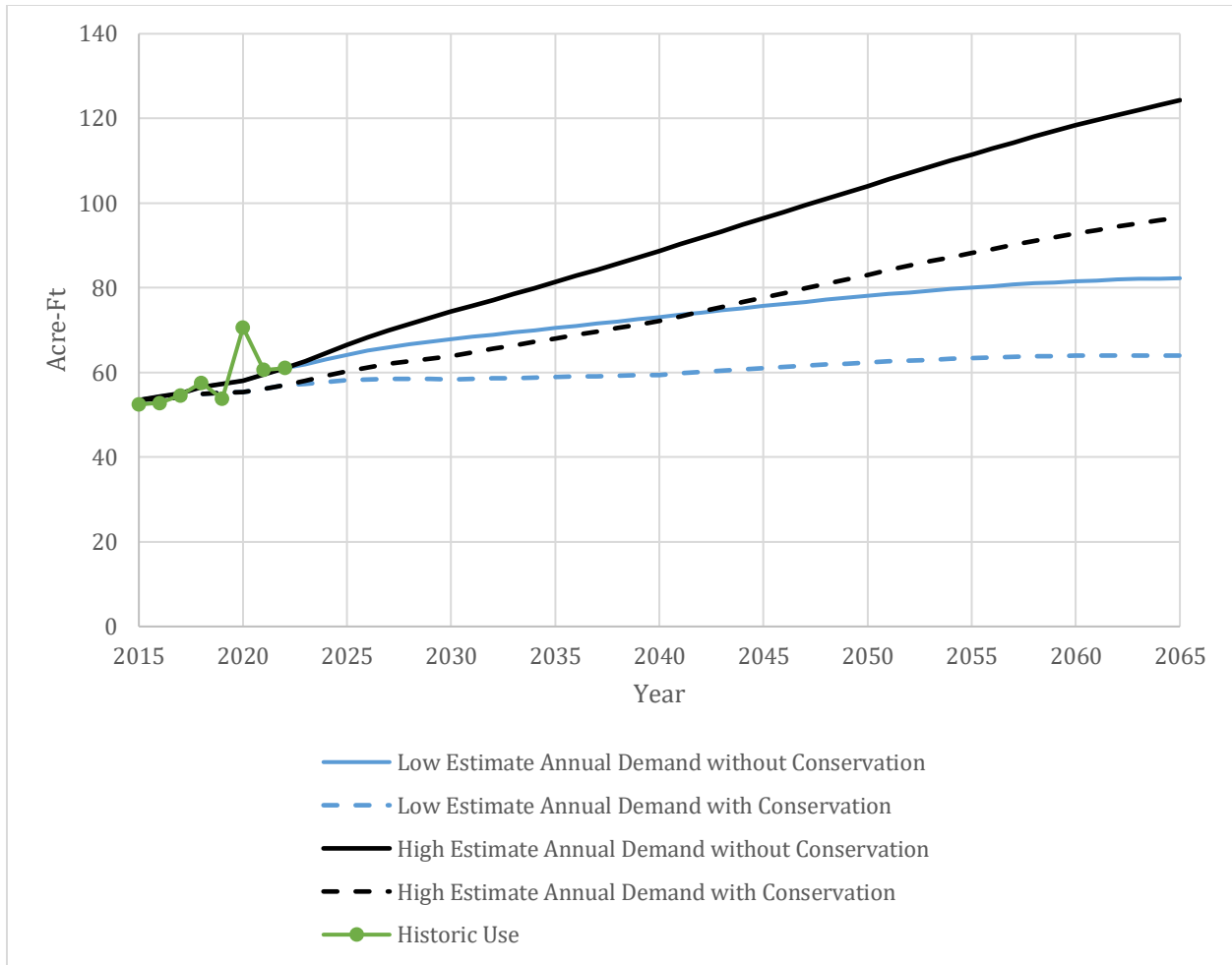
**Table 6
TLWSSD Projected Population**

Year	Estimated Full-Time Population - Low Estimate	Estimated Full-Time Population - High Estimate
2020	950	950
2021	972	972
2022	997	997
2023	1,012	1,023
2025	1,049	1,087
2030	1,109	1,214
2040	1,194	1,450
2050	1,276	1,699
2060	1,332	1,933

Based on these growth estimates, Table 7 and Figure 4 show both the projected annual water production requirement (demand) for the District with conservation and the projected annual production requirement if no conservation occurs.

**Table 7
Projected Annual Culinary Water Production Requirements**

Year	Projected Production Requirements without Conservation - Low Estimate (acre-ft)	Projected Production Requirements At Proposed Conservation Goal - Low Estimate (acre-ft)	Projected Production Requirements without Conservation - High Estimate (acre-ft)	Projected Production Requirements At Proposed Conservation Goal - High Estimate (acre-ft)
2020	58	55	58	55
2021	60	56	60	56
2022	61	57	61	57
2023	62	57	63	58
2025	64	58	66	60
2030	68	58	74	64
2035	70	59	81	68
2040	73	59	89	72
2045	76	61	96	78
2050	78	62	104	83
2055	80	63	111	88
2060	82	64	118	93
2065	82	64	124	97



Note: “Low” and “High” represent the anticipated prevalence of full-time occupancy in TLWSSD. Low is associated with current levels of full-time occupancy (approximately 35%) and High is associated with the currently anticipated maximum full-time occupancy level with in the next 40-50 years (approximately 65%).

Figure 4 Annual Demand (Sales) Projections with and without Conservation

As can be seen in Table 7 and Figure 4, approximately 18 to 27 acre-ft per year can be conserved at buildout if TLWSSD is able to reach their conservation targets. Timber Lake’s best chances of reaching conservation targets are to directly pursue the recommended conservation practices described in the section below. As conservation continues within the District and demand per capita decreases, the amount of spring development in the future will decrease.

Figure 5 shows the comparison of estimated available supply to the projected required production². The figure shows that current estimated available supply will be able to meet the projected required production through buildout. It should be noted that the supply shown in the figure is estimated to be what the springs can produce and not what actually enters the system.

² Production requirements assume 10% system loss for purposes of comparison in this study. After the 2024 metering projects are complete, the District will have the data necessary to truly understand source production and source capacity. Actual system loss will also then be quantifiable.

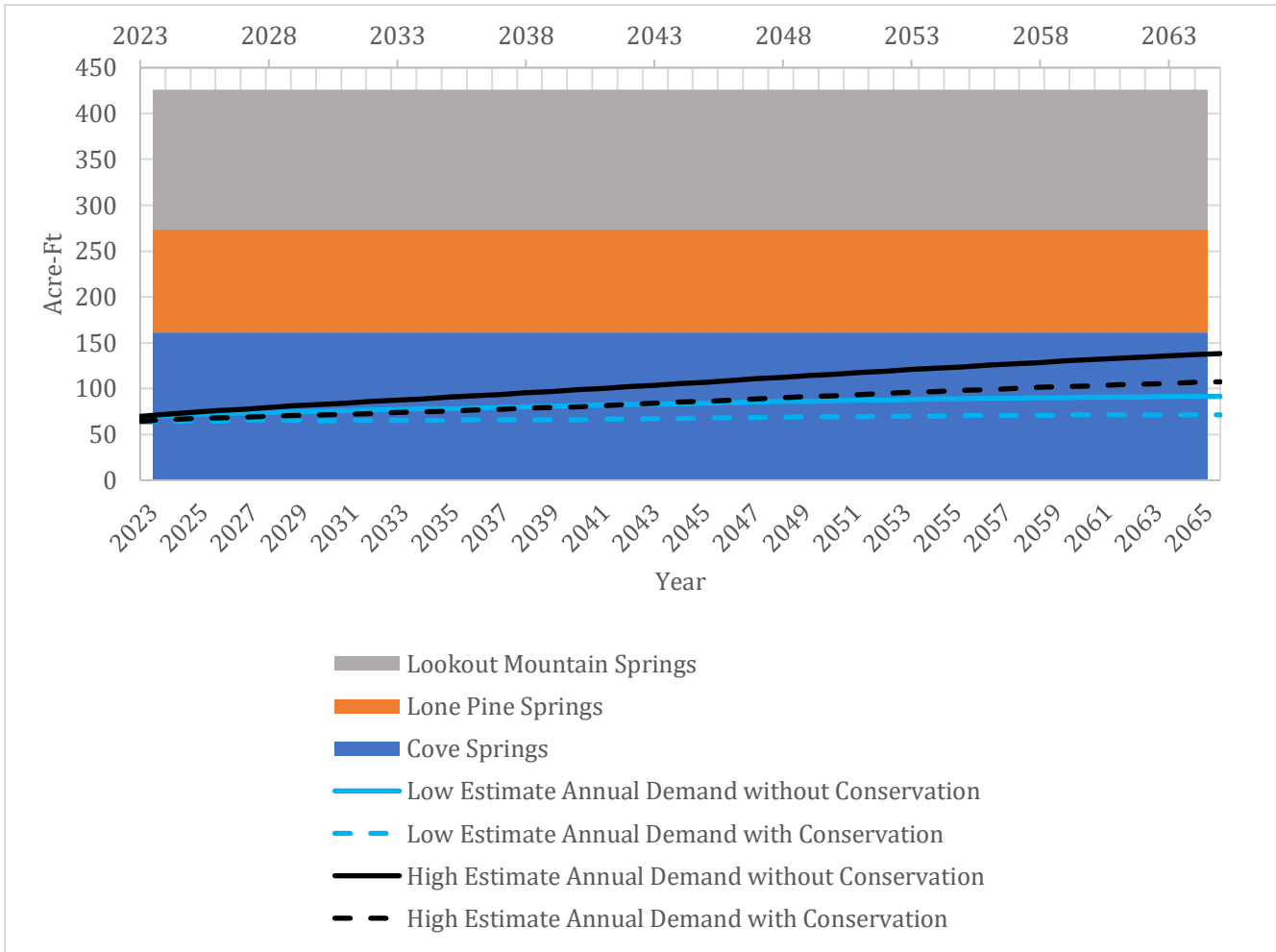


Figure 5 Supply Versus Demand (Production)

WATER CONSERVATION PRACTICES

The following sections document both existing and proposed water conservation practices in the District. To organize the information, each section groups conservation practices by the following major conservation categories:

- Conservation Public Awareness Practices
- Education and Training Practices
- Rebates, Incentives, and Rewards
- Ordinances and Standards
- Water Pricing
- Improvements to Physical System

Current Conservation Practices

TLWSSD has been working in recent years on its conservation practices and will continue to do so. TLWSSD's current conservation practices are listed below (organized by conservation category):

Conservation Public Awareness Practices:

- **Universal Water Meters** – All residential connections to the District's water system are metered.
- **Enhanced Consumer Confidence Report** - As part of its annual Consumer Confidence Report sent to all customers, the District includes materials encouraging water conservation habits.

Ordinances & Standards:

- **Outdoor Irrigation Not Allowed** – The Timber Lakes HOA does not allow any customers to use culinary water for outdoor irrigation. This ordinance saves a significant amount of water.

Water Pricing:

- **Increasing Water Block Schedule** – TLWSSD currently structures its Water Rate schedule that customers that have higher water usage pay more for water.

New Conservation Practices Planned for Implementation

There are several new conservation practices that the District will implement in the next five years. The following sections describe each conservation practice and Table 8 summarizes the implementation schedule, estimated costs, and measurement of progress for each practice.

Conservation Public Awareness Practices:

- **Update Conservation Plan** – This document creates the TLWSSD conservation plan of conservation goals and practices to be adopted by the TLWSSD Board. TLWSSD will update regularly to capture new data, reflect additional growth, and check in on conservation practices/goals.

Education & Training Practices:

- **Assign TLWSSD Staff Member Conservation Tasks** – Assign a TLWSSD staff member to act as a Water Conservation Education Coordinator that ensures that the public/stakeholder education and engagement for water conservation as identified in this plan are sent out (mailers) and kept up to date (website).

Rebates, Incentives & Rewards:

- **Educate Consumers on CUWCD Rebates** – Central Utah Water Conservancy District (CUWCD) offers rebate programs that residents in Wasatch County can participate in.
 - **Toilet Replacement** – Receive up to \$100 when you replace your old toilet with a WaterSense labeled toilet! Toilets use more water than any other indoor fixture. Because toilets manufactured before 1994 use more gallons of water per flush, replacing them is an easy way to conserve water. The District will promote this rebate on its website.

Water Pricing:

- **Evaluate Water Use and Current Water Rate Structure** – The District will continue to evaluate water use and the current water rate structure. Within the next 5 years, the District will complete an update to the rate study to identify potential modifications to its current rates structure that encourage reductions in excessive water use and further incentivize conservation. Results of the review will be presented to the TLWSSD board for consideration.

Improvements to Physical System:

- **Overflow and Source Metering Project** – The District is currently designing overflow meters for the existing springs and meters to measure flow into the system. This allows the district to better collect data, as well as have this data readily available to District personnel.
- **Research AMR to AMI Project** – The District will look into converting their metering system to an AMI system. This would allow the district to better collect data, as well as have this data readily available to the consumers.
- **Complete an AWWA Water Audit** – This program helps water suppliers quantify system water loss and associated revenue losses. This will be the natural progression of the District’s existing internal auditing after all the necessary metering is completed and all data are consolidated. The District will participate in at least one water audit by 2025.

**Table 8
Implementation, Schedule, Estimated Cost, and Measurement of Progress**

New Conservation Practices	Implementation Timeline	Estimated Cost	Measurement of Progress
Update Water Conservation Plan	Complete by 2028	\$10,000	Completion of report
Assign TLWSSD Staff Member Conservation Tasks	Complete by 2025	Varies	Complete the associated tasks (See New Conservation Practices)
Educate Consumers on CUWCD Rebates	Begin in 2023	Varies	Educate TLWSSD consumers on the rebate programs available to them
Evaluate Water Use and Current Water Rate Structure	Complete in 2026	\$20,000	Completion of report with associated recommendations
Overflow and Source Metering Project	Complete in 2025	\$1,500,000	Completion of project
Research AMR to AMI Project	Complete in 2024	Varies	Bring secondary system online including the development of an increasing block rate structure.
Complete an AWWA Water Audit	Complete by 2025	\$15,000	Completed audit score and record

WATER CONSERVATION COORDINATOR

With the adoption of this Conservation Plan, the District will designate a Water Conservation Coordinator. See new conservation practices.

WATER CONSERVATION PLAN AUTHOR(S)

This plan was prepared by Bowen Collins & Associates at the Draper office:

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