SPRINGVILLE CITY

PRESSURIZED IRRIGATION MASTER PLAN AND CAPITAL FACILITY PLAN

February 2026

HANSEN ALLEN & LUCE INC
ENGINEERS

SPRINGVILLE CITY

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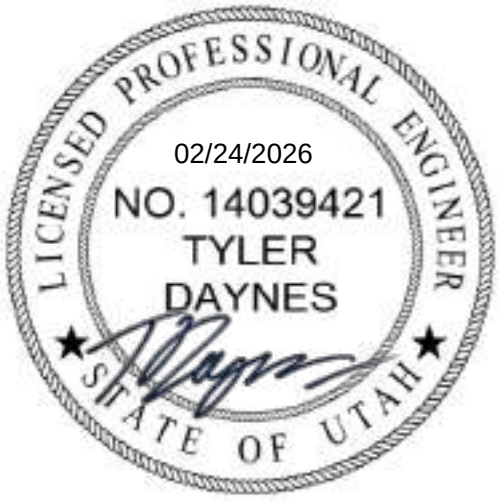
(HAL Project No.: 260.61.100)



Tyler Daynes, P.E.
Project Engineer

Recommended By: _____

Katie Gibson Jacobsen, P.E., Project Manager

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS AND UNITS

ac	acre [area]
ac-ft	acre-foot (1 ac-ft = 325,851 gal) [volume]
CIP	Capital Improvement Plan
CFP	Capital Facilities Plan
CUWCD	Central Utah Water Conservancy District
CWP	Central Water Project
DW	Drinking Water
EPA	U.S. Environmental Protection Agency
ERC	Equivalent Residential Connection
ft	foot [length]
ft/s	feet per second [velocity]
gal	gallon [volume]
gpd	gallons per day [flow rate]
gpm	gallons per minute [flow rate]
HAL	Hansen, Allen & Luce, Inc.
hp	horsepower [power]
hr	hour [time]
IFA	Impact Fee Analysis
IFFP	Impact Fee Facilities Plan
in	inch [length]
irr-ac	irrigated acre(s)
kW	kilowatt [power]
kWh	kilowatt hour [energy]
MG	million gallons [volume]
mi	mile [length]
PI	Pressurized Irrigation
PRV	Pressure Reducing Valve
psi	pounds per square inch [pressure]
s	second [time]
SCADA	Supervisory Control And Data Acquisition
SUVMWA	South Utah Valley Municipal Water Association
ULS	Utah Lake Drainage Basin Water Delivery System
yr	year [time]

CHAPTER 1 INTRODUCTION

PURPOSE AND SCOPE

The purpose of this master plan is to provide direction to the City of Springville regarding decisions that will be made to provide an adequate pressurized irrigation (PI) water system for its customers at the most reasonable cost. Recommendations are based on demand data, growth projections, and standard engineering practices. The planning horizon for the master plan is approximately 2070. Buildout occurs beyond 2070 and refers to the time period when all parcels are developed within the annexation declaration boundary according to the current General Plan.

The master plan is a study of the City's PI water system and customer water use. The following topics are addressed herein: growth projections, source requirements, storage requirements, and distribution system requirements. Operational parameters for the City's PI water system were reviewed and optimized based on stability, ease of use, and cost. Based on this study, needed capital improvements have been identified and conceptual-level cost estimates for the recommended improvements have been provided. This master plan includes a Capital Facility Plan (CFP) to identify the PI facilities that are required to meet the demands placed on the system by future development for the 10-year and 20-year planning period.

The results of the study are limited by the accuracy of growth projections, data provided by the City, and other assumptions used in preparing the study. It is expected that the City will review and update this master plan every 5–10 years as new information about development, system performance, or water use becomes available. This master plan updates the previous plan completed by the City of Springville and adopted in August 2020.

BACKGROUND

Springville was originally settled in 1850 and had an estimated population of 36,500 in 2024 (provided by the City). It is located in central Utah County and has an area of 14.4 square miles. As a result of its location along the I-15 corridor and in the rapidly growing Provo-Orem metropolitan area, Springville has experienced rapid growth and is expected to grow into the future. Growth rates were determined based on future population estimates produced by Mountainland Association of Governments (MAG) and average annual growth rates produced by Kem C. Gardner. See population estimates in Figure 1-1. In 2011, Springville obtained nine million dollars of federal funding to build its PI system to service residents and businesses west of the railroad. The PI system was available to customers beginning in approximately 2014.

The City provides water service via a drinking water system and a PI system. While the drinking water system is available throughout the City, the PI system only serves the central-western portion of the City, approximately west of 400 West (see Figure 1-2). Areas of the City without access to the PI system use drinking water for outdoor water use. There are also some customers located within the PI system service area that have not connected to the PI system yet. These customers are considered to be borrowing capacity in the drinking water system. The drinking water system is addressed in a separate master plan.

In 2020, the City prepared a Capital Facilities Plan, with an Impact Fee Facilities Plan (IFFP) and Impact Fee Analysis (IFA) following and updated in 2024 for its PI water system. This master plan will provide the bases for updating those studies and provide a basic full system layout design to guide new development.

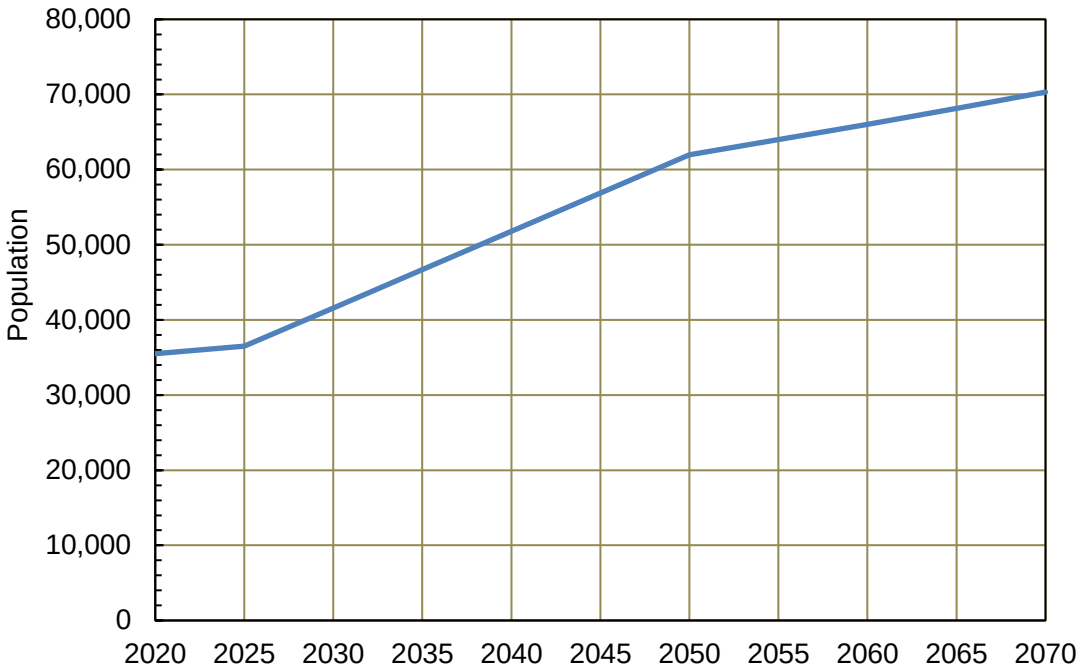


Figure 1-1: Springville Projected Population

The system is serviced by Bartholomew Pond, which is supplied by canyon water from Hobble Creek/Highline Canal, the North and South Springs, and the Mapleton Springville Lateral Canal Pipeline. The existing PI water system includes a 36-inch transmission pipeline running approximately 3 miles from the PI sources and pond, followed by a 30-inch pipeline that extends another half mile. The existing distribution system contains approximately 41 miles of active pipe ("wet") with diameters ranging from 4 to 36 inches. An additional 21 miles of pipe are currently disconnected ("dry") from the PI system. The current PI system has one pressure zone and there are no plans for future pressure zones. The City recognizes that its continued growth necessitates proactively planning additional PI water facilities to maintain the current level of service for outdoor water use.

MASTER PLANNING METHODOLOGY

Pressurized irrigation water systems consist of water sources, storage facilities, distribution pipes, pump stations, and other components. Design and operation of the individual components must be coordinated so that they operate efficiently under a range of demands and conditions. The system must be capable of responding to daily variations in demand.

Identifying present and future water system needs is essential in the management and planning of a water system. For this study, existing water demands are based on billing data and the level of service established by the City. Future water demands were predicted using this level of service, current zoning and densities provided by the City, and estimated future population growth. Computer models of the City's PI water system were prepared to simulate the performance of facilities under existing and future conditions. System improvement recommendations were prepared from the analysis and are presented in this report.

The report addresses water sources, storage, distribution, minimum pressures, hydraulic modeling, capital improvements, and other topics pertinent to Springville's PI water system.

LEVEL OF SERVICE (LOS)

To propose a level of service for the PI water system, HAL analyzed production and billing data provided by Springville City for the previous three years. Once water production and demand patterns were well understood, HAL and the City met to discuss an appropriate level of service considering the water use data, variability and uncertainty within this data, standard engineering practices, and anticipated future conservation. The City ultimately selected a level of service which is below current usage, but which is sufficient for landscape irrigation including losses and inefficiencies. The City anticipates that water use will decrease as it continues to promote conservation. A summary of the level of service selected by the City is included in Table 1-1.

Table 1-1
System Level of Service

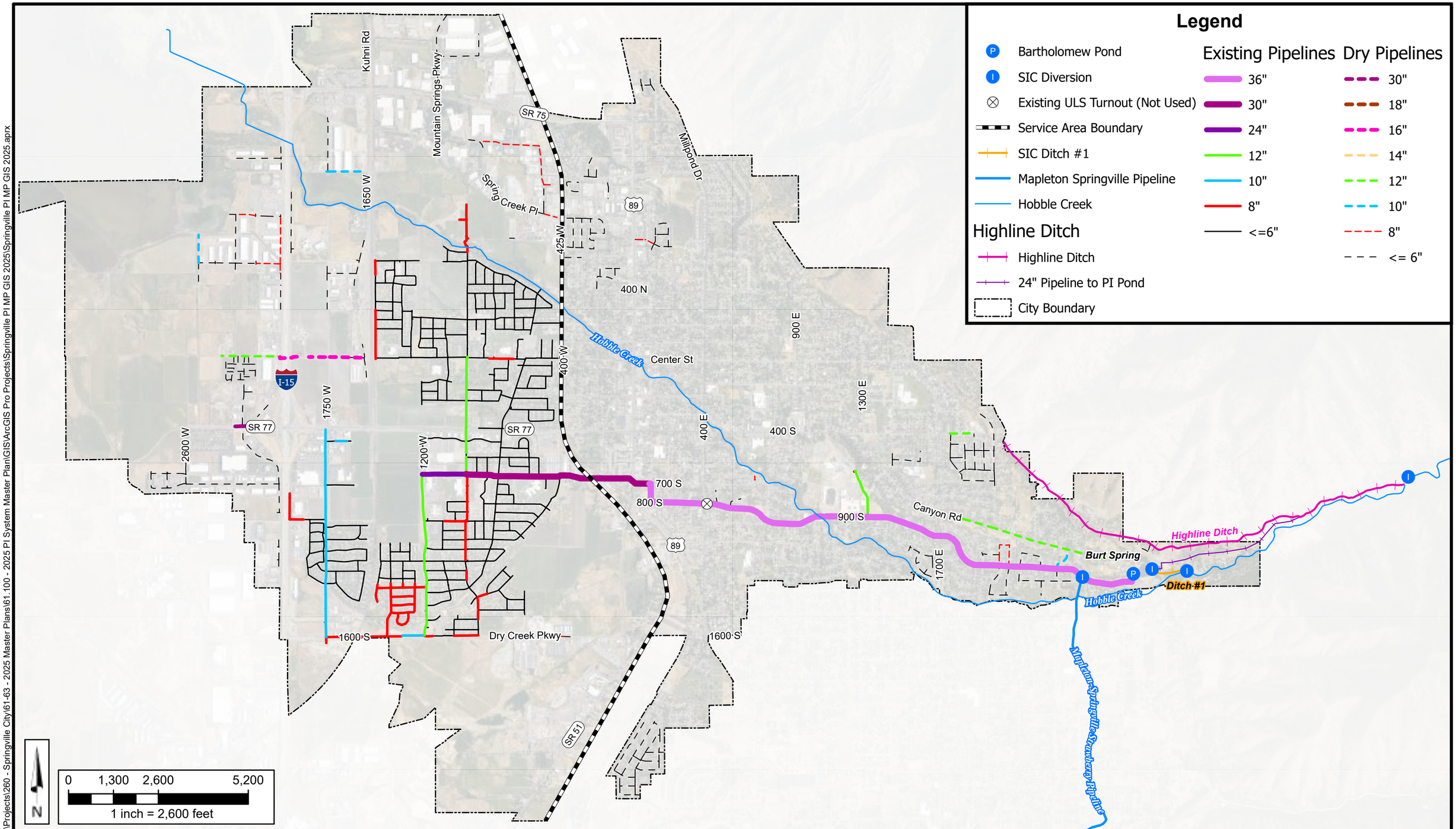
Criteria	Level of Service Per Irrigated Acre
Average Yearly Demand	4.0 ac-ft
Peak Day Demand	8.5 gpm
Peak Instantaneous Demand	17.0 gpm
Storage	6,120 gal

DESIGN AND PERFORMANCE CRITERIA

Summaries of the key design criteria and demand requirements for the PI water system are included in Table 1-2. The design criteria were used in evaluating system performance and recommending future improvements. Criteria development is described in later chapters.

Table 1-2
Key System Design Criteria

	Criteria	Existing Requirements	Estimated Requirements		
			10-year	20-year	Planning Horizon (2070)
Acreage Irrigated by PI System	Existing and Planned Irrigated acreage	362	788	1,093	1,331
Source					
Peak Day Demand	Level of Service	3,077 gpm	6,698 gpm	9,291 gpm	11,314 gpm
Average Yearly Demand	Level of Service	1,448 acre-ft	3,152 ac-ft	4,371 ac-ft	5,324 ac-ft
Storage	Level of Service	6.8 ac-ft	14.8 ac-ft	20.5 ac-ft	25.0 ac-ft
Distribution					
Peak Instantaneous	2.0 × Pk Day demand	6,154 gpm	13,396 gpm	18,581 gpm	22,627 gpm
Max. Operating Pressure	Level of Service	125 psi	125 psi	125 psi	125 psi
Min. Operating Pressure	Level of Service	50 psi	50 psi	50 psi	50 psi



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EXISTING SYSTEM

FIGURE
1-2

CHAPTER 2 IRRIGATED ACREAGE

EXISTING IRRIGATED ACREAGE

Outdoor water demands are based on actual usage on irrigated acreage (irr-ac). The existing irrigated acreage was determined using customer billing data, the City's level of service, and PI system SCADA records. The irrigated acreage presented in this report for the existing system then refers not to actual areas, rather a calculated value based on actual usage from customers, similar to equivalent residential connections (ERC) which are commonly used for drinking water systems. The estimated irrigated acreage for the existing PI system is 362 acres.

Currently, there are customers within the existing PI system service area that are not connected to the system and use drinking water for outdoor watering. These customers may be near available "wet" pipelines but never connected to the system, or may be unable to connect to the system as they are located near "dry" pipelines or areas without any PI pipelines at all. It is estimated that these connections account for approximately 257 irrigated acres. This estimate was produced by analyzing differences between summer and winter billing data for these customers. After discussions with the City, it was determined that customers within the existing service area with wet pipelines, plus the customers west of I-15 with dry pipelines, would be connected to the system within 10 years. Customers within the industrial park near the Nestle facility north of the existing service area are anticipated to be connected to the system within 20 years.

FUTURE IRRIGATED ACREAGE

Growth projections for the PI system were estimated based on an irrigation factor. This factor represents the portion of land that is irrigated on a parcel. Irrigated factors were assigned to General Plan designations. Irrigated factors were estimated by using aerial imagery from the National Agricultural Imagery Program (NAIP) and billing data. The irrigation factors used for the PI system growth projections are presented in Table 2-1. The irrigation factors presented in this table account for road areas which may take up around 20% of any land use designations. Figure 2-1 shows a map of the land classifications used in this study.

Table 2-1
Irrigation Factors by Land Classification

Land Classification	Irrigation Factor
Agriculture (Placeholder for Future Development)	30%
Commercial	15%
Industrial Manufacturing	10%
Low Density Residential	37%
Medium Density Residential	40%
Medium High Density Residential	34%
Medium Low Density Residential	38%
Mixed Use	39%

Additionally, the average irrigated area for various lot sizes were determined based on several factors including City code, aerial imagery, and historical PI usage. These irrigated areas are presented in Table 2-2.

Table 2-2
Irrigated Acreage by Lot Size

Minimum Lot Size (ft^2)	Maximum Lot Size (ft^2)	Irrigated Area		Annual Volume (Acre-ft)
		(ft^2)	(acre)	
0	2,000	1,000	0.03	0.09
2,000	3,999	1,100	0.03	0.10
4,000	5,999	2,500	0.06	0.23
6,000	7,999	3,600	0.09	0.33
8,000	10,889	4,400	0.11	0.40
10,990	21,779	6,300	0.15	0.58
≥ 21,780		14,900	0.35	1.37

Future irrigated acreage was calculated by starting with the existing irrigated acreage and adding the area of additional land that is expected to be irrigated by the PI system in 10 years, 20 years, and the planning horizon (2070).

The acreage irrigated by the PI system in 2024 was calculated to be 362 acres. Based on the irrigation factors shown in Table 2-1, the total 2070 irrigated acreage was calculated to be 1,331 acres. This total includes the customers which are currently within the service area but are not connected to the PI system.

Many customers are located within the service area of the PI system but are not currently connected to it for outdoor watering. These customers may have been "grandfathered" into the PI system and never connected or are unable to connect to the system due to infrastructure requirements. These customers may be near "dry" or "wet" pipelines. These customers account for approximately 257 irrigated acres of outdoor demand. The City has a goal to connect all these potential customers to the PI system within the next 20 years. To represent this goal, 173 irrigated acres were added to the 10-year projection to represent the customers near "wet" pipelines and the customers near "dry" pipelines west of I-15. The remaining 84 irrigated acres associated with the industrial park near the Nestle facility were added to the 20-year projection. Table 2-3 shows the total growth projections, including these potential customers, for each scenario.

Table 2-3
Projected Irrigated Acres

Scenario	Projected Irrigated Acres	Potential Existing Customers*	Total Irrigated Acres
Existing	362		362
10-year	615	173	788
20-year	836	257	1,093
Planning Horizon	1,074	257	1,331

* The value in this column represents the total amount of additional customers added to the growth projections. The values in this column are not additive.

To improve water conservation, it is recommended that all customers that can connect to the pressurized irrigation are connected and all customers be billed for use with an allocation-based tiered rate structure to conserve water and meet the City's selected level of service.

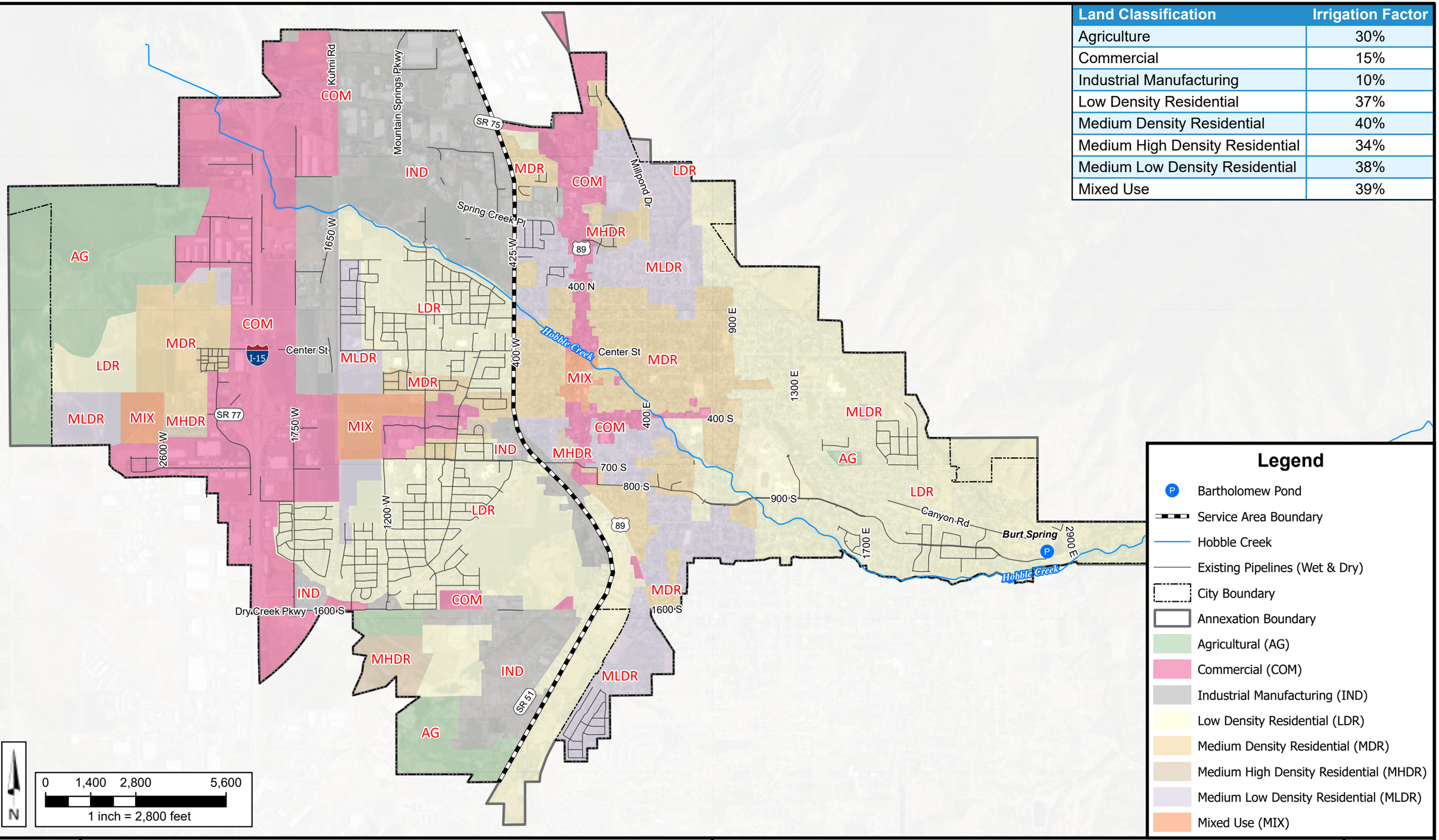
GROWTH PROJECTIONS

The development of impact fees requires growth projections over the next ten years. In addition to impact fee projects, this report will also highlight anticipated projects required in the next 10 to 20 years in the Capital Facilities Plan section of this report. Growth projections for the City were made as part of the City's strategic, general, and master planning efforts by HAL.

Growth of the PI system was determined by establishing the areas that would be irrigated by the PI system for the existing, 10 year, 20 year, and planning horizon (2070) time frames. The acreage that could be served by the PI system if customers connected today and the acreage that is adjacent to dry PI pipes was not added to the existing irrigated acreage, rather to the 10-year and 20-year projections as discussed previously. The projected irrigated acreages for scenario can be found in Table 1-2.

The City's General Plan land use classifications were used to determine densities and allocate demands across the City. As these classifications were prepared in 2011, updates to these classifications were made by HAL based on community plans for large developments, city zoning, and nearby development. The land classifications used in this study are shown on Figure 2-1.

Land Classification	Irrigation Factor
Agriculture	30%
Commercial	15%
Industrial Manufacturing	10%
Low Density Residential	37%
Medium Density Residential	40%
Medium High Density Residential	34%
Medium Low Density Residential	38%
Mixed Use	39%



Legend

- Bartholomew Pond
- Service Area Boundary
- Hobble Creek
- Existing Pipelines (Wet & Dry)
- City Boundary
- Annexation Boundary
- Agricultural (AG)
- Commercial (COM)
- Industrial Manufacturing (IND)
- Low Density Residential (LDR)
- Medium Density Residential (MDR)
- Medium High Density Residential (MHDR)
- Medium Low Density Residential (MLDR)
- Mixed Use (MIX)

N

0 1,400 2,800 5,600

1 inch = 2,800 feet

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FUTURE GROWTH PROJECTIONS

FIGURE
2-1

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CHAPTER 3 WATER SOURCES

Water sources need to be available to supply the PI system with enough water for the entire irrigation season and supply the PI system with enough water to meet demand on the day of greatest water use (peak day demand). The PI water source requirements are based on existing and future irrigated acres and the City's level of service.

EXISTING PI SOURCES

The Springville City PI system is supplied by Hobble Creek through the Highline Ditch and Springville Irrigation Ditch #1 (see Figure 1-2). The PI system is also supplied by water from Strawberry Reservoir (Strawberry water) through the Mapleton-Springville Lateral Canal Pipeline (see Figure 1-2). Burt Springs can supply water to the PI system when not being used in the drinking water system, but for this study it is considered a drinking water source only and is not included in any source water calculations.

For planning purposes, the City has requested that the analysis consider the lowest flows on record as the reliable supply to plan for low water years. The flows from City owned PI sources presented in Table 3-1 represent water available in a low flow year. Minor water sources that cannot be relied on in a low flow year such as Bartholomew Pond Springs are not included in Table 3-1. It is important to note that source capacity requires both the physical water and the water rights to be able to provide water to the system. Water rights are discussed in Chapter 6.

Table 3-1
Existing Pressurized Irrigation System Water Sources

Source	Flow Capacity (gpm)*	Flow Capacity (cfs)	Annual Capacity (ac-ft)*
Hobble Creek/ Highline Ditch	2,245	5	500
Springville Irrigation Ditch #1	0**	0**	5,000
Mapleton-Springville Strawberry Pipeline	5,835***	13***	1,600
Total	**8,080**	**18**	**7,100**

* Denotes physical facility capacity. See Chapter 6 for water rights capacity.
** Ditch #1 provides an important supply of water, but is typically dry by the time peak day demand occurs. As such, its peak day capacity was assumed to be 0.
***Turnout capacity to Springville City/SIC is 35 cfs.

EXISTING SOURCE REQUIREMENTS

Existing Peak Day Demand

Peak day demand is the water demand on the day of the year with the highest water use. It is used to determine required source capacity under existing and future conditions. Since the drinking water system provides water for indoor use, only outdoor demand is allocated to the PI system. Outdoor peak day demand was calculated based on a level of service of 8.5 gpm/irr-ac.

Under existing conditions, the City serves 362 irr-ac, requiring 3,077 gpm peak day demand. There are approximately 257 irr-ac of additional demand that could be added to the PI system from customers which are located within the service area but are not connected to the PI system. The City has expressed a desire to connect all these potential connections to the PI system within 10 to 20 years. The total peak day demand of these additional customers is approximately 2,185 gpm. Table 3-2 compares the available source capacity with the peak day demand of the existing system without the additional 257 irr-ac of additional demand from potential drinking water customers.

Table 3-2
Existing PI Peak Day Water Demand and Source Capacity

Parameter	Peak Day (gpm)
Demand	3,077
Capacity*	8,080
Surplus	**5,003**

* Denotes physical facility capacity.
See Chapter 6 for water rights capacity.

Existing Average Yearly Demand

Average yearly demand is the volume of water used during an entire year, and is used to ensure the sources have enough annual volume to meet demand under existing and future conditions. Since the drinking water system provides water for indoor use, only outdoor demand in the PI system service area is allocated to the PI system. Average yearly demand was determined based on irrigated acreage and a level of service of 4.0 ac-ft/irr-ac.

Based on the existing irrigated acreage of 362, the average yearly demand is 1,448 ac-ft. The 257 irr-ac of potential customers equates to an average yearly demand of 1,028 ac-ft. Table 3-3 compares the capacity of the existing sources with the demand of the existing system. The 257 irr-ac of potential customers are not included in the demand shown in Table 3-3.

Table 3-3
Existing PI Average Yearly Water Demand and Source Capacity

Parameter	Average Yearly (ac-ft)
Demand	1,448
Capacity*	7,100
Surplus	**5,652**

* Denotes physical facility capacity.
See Chapter 6 for water rights capacity.

FUTURE SOURCE REQUIREMENTS

As with existing PI source requirements, future PI source requirements were evaluated on two criteria. First, sufficient water source capacity is needed to meet peak day flow. Second, the PI sources must also be capable of supplying the average yearly demand.

Future Peak Day Demand

Following the methodology described for existing conditions and the City's selected level of service, projected irrigated acres and peak day demand was projected for 10 years, 20 years, and for the planning horizon (2070). Table 3-4 compares the future PI peak day demands with the existing peak day source capacity.

Table 3-4
Future PI Peak Day Water Demand and Source Capacity

Time	Projected Irrigated Acres	Peak Day Demand (gpm)	Peak Day Capacity* (gpm)	Surplus/ Deficit (gpm)
10-years	788	6,698	8,080	1,385
20-years	1,093**	9,291	8,080	**-1,211**
2070	1,331**	11,314	8,080	**-3,234**

* Denotes physical facility capacity. See Chapter 6 for water rights capacity.
** These projections include irrigated acres from the "potential customers." Refer to Table 2-3 for details on projected irrigated acres.

Table 3-4 indicates that the City will not have sufficient source capacity for the peak day demand for the 20-year timeframe. The source capacity listed in Table 3-4 does not include the additional capacity that will be brought into the system by piping the Highline Canal. This project is currently underway and is expected to bring up to 1,300 gpm of additional peak day capacity once complete. This project will provide sufficient source water for the PI system through the next 20 years. Additionally, flow from the Mapleton-Strawberry Pipeline could be increased; however, the City would not be able to utilize the full capacity of the pipeline due to capacity limitations in the 36-inch pipeline in 900 South.

Future Average Yearly Demand

Following the methodology described for existing conditions and the City's selected level of service, irrigated acres and average yearly demand was projected for 10 years, 20 years, and for the planning horizon. Table 3-5 compares the future PI average yearly water demands with the average yearly source capacity.

Table 3-5
Future PI Average Yearly Water Demand and Source Capacity

Time	Projected Irrigated Acres	Average Yearly Demand (ac-ft)	Average Yearly Capacity* (ac-ft)	Surplus (ac-ft)
10-years	788	3,152	7,100	3,948
20-years	1,093**	4,372	7,100	2,728
2070	1,331**	5,324	7,100	1,776

* Denotes physical facility capacity. See Chapter 6 for water rights capacity.
** These projections include irrigated acres from the "potential customers." Refer to Table 2-3 for details on projected irrigated acres.

As shown in Table 3-5, the existing PI sources will have excess annual capacity through 2070, unlike the peak day capacity. Rather than developing additional sources, the City may desire to implement water conservation measures to encourage outdoor water conservation from residents. Measures such as allocation-based tiered water rates, restricting outdoor watering times, or requiring water-efficient landscaping for new developments may help improve water conservation. Doing so may reduce the peak day demand for the PI system which could delay or remove the requirement to develop additional PI sources to meet the anticipated peak day demand.

The City's Water Conservation Plan, adopted in 2022, explores some "Best Management Practices" the City can implement to improve water conservation (Hansen, Allen & Luce, 2022). This report was written for the drinking water system, however, many of the recommendations may be applicable for the PI system. A copy of the Water Conservation Plan is provided in Appendix D.

FUTURE SOURCE RECOMMENDATIONS

As indicated in Table 3-5, the City has a surplus of average yearly PI source capacity through 2070 if all sources continue to remain available and to produce as they have in the past. The existing peak day source capacity, however, is insufficient to meet future demands within 20 years. Additional capacity will be introduced once the Highline Canal has been piped. The City will also be obligated to utilize water from the Utah Lake Drainage Basin Water Delivery System of the Bonneville Unit of the Central Utah Project (ULS) within the next 10 years. This water could also be utilized to bolster existing sources.

Possible changes in water rights, transfer of water rights to the drinking water system, climate change, or other unforeseen circumstances could also make it necessary to plan for additional water sources for the PI system much earlier than 2070. It is recommended that the City promote conservation, potentially with an allocation-based tiered rate structure. The following is a list of potential water sources for the PI system. Proposed locations are shown on Figure 3-1. Any locations shown on Figure 3-1 are approximate and can be adjusted to avoid difficult routes and accommodate development.

The Dry Creek Pump Stations are included in the capital improvement plan due to limitations in the transmission capacity of the PI system. The additional sources listed below may also be considered and pursued as resources allow, surrounding land develops, and the projects make sense.

- ULS Water – Springville City is obligated to purchase 5,448 of ULS water through a petition agreement between Central Utah Water Conservancy District (CUWCD) and South Utah Valley Municipal Water Association (SUVMWA). This is the amount remaining after the 3,500 ac-ft given back to fund the construction of the pressurized irrigation system, see Appendix E for details.

  The City could look into the possibility of allowing another SUVMWA city to have a portion or all of Springville City's ULS Water allotment. More detail on the ULS water is discussed in Chapter 6. The source capacity equates to a flow rate of at least 6,000 gpm. A proposed location for a turnout to connect the PI system to ULS water is shown on Figure 3-1.

- Piping the Highline Ditch – Piping the Highline Ditch will allow more efficient conveyance of Hobble Creek water to the PI system, especially in the high runoff season in the spring. This would also allow the City to save Strawberry water for use later in the irrigation season. No pumping would be required. Source capacity could be increased by as much

as 1,300 gpm. However, the possibility of moving Hobble Creek water rights up to Bartholomew Springs to use in the drinking water system should be pursued first. This project is currently underway.

- Dry Creek Pump Stations (East and West) – Hobble Creek, Strawberry, underground drains, Fulmer Springs, Big Hollow Irrigation, Wash Creek, and Roundy Spring can all be diverted from Dry Creek. Also, a land owner in the Dry Creek area has a water right to use a portion of Spanish Fork City's wastewater effluent which is discharged into Dry Creek. Source capacity could be increased by 2,000 gpm or more. Two locations are proposed for future pump stations, the East and West Dry Creek Pump Stations, as shown on Figure 3-1. Construction of each facility will be dependent on the development of nearby property. These facilities are both included in the capital improvements plan in Chapter 7.

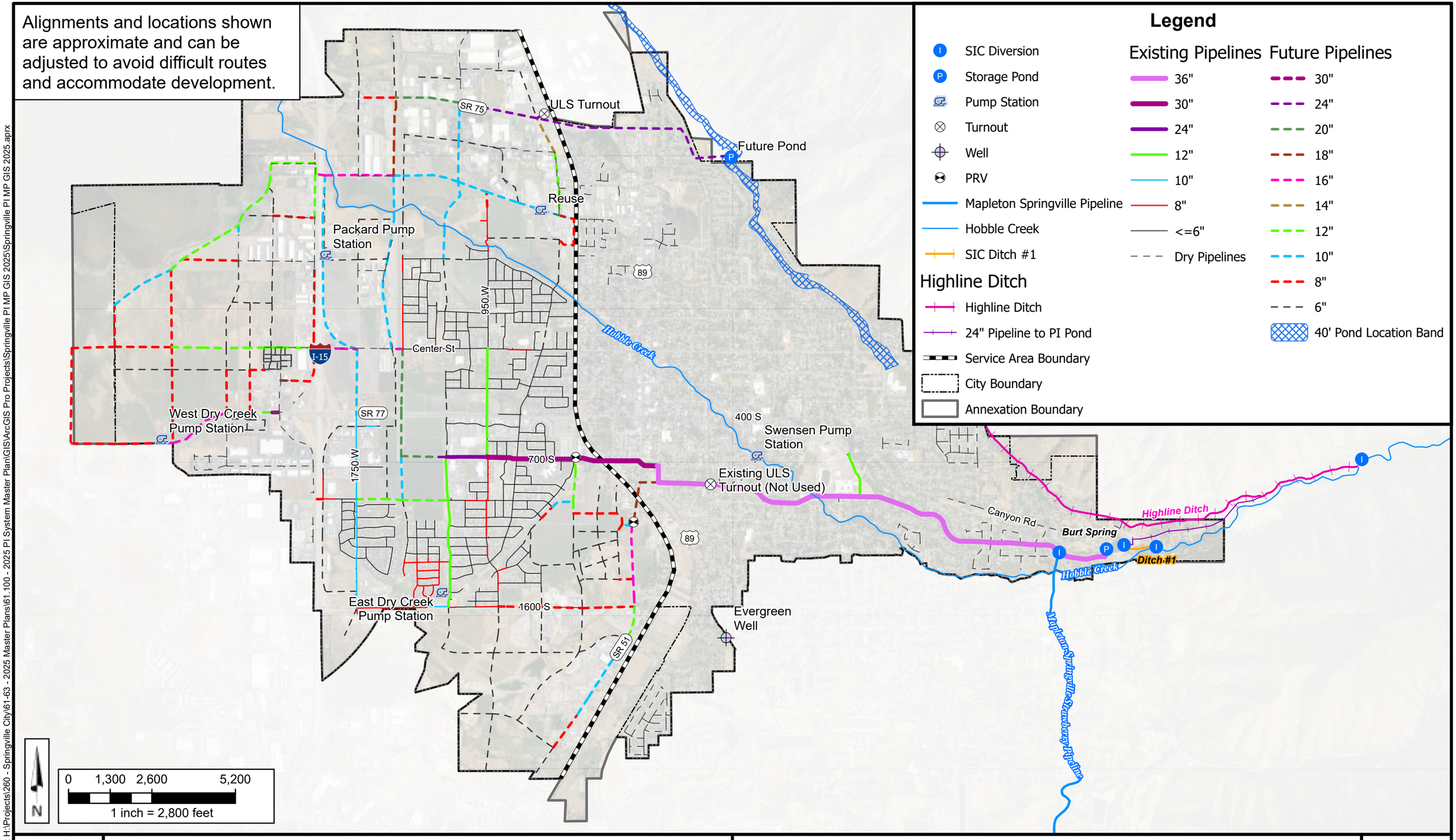
- Swenson Pump Station – Hobble Creek, Strawberry, Highline, Wheeler Springs can be pumped into the PI system at this location. Source capacity could be increased by as much as 3,000 gpm.

- Packard Pump Station – Coffman Springs, Wood Springs, Hobble Creek, and underground drains can be pumped into the PI system at this location. Source capacity could be increased by as much as 900 gpm.

- Reuse of Effluent – The City does not deplete all of its water rights because the City returns excess water to Hobble Creek through the effluent of the wastewater treatment plant. Using the excess water the City has the right to use may be a costly and complicated process. The water would need to be pumped into the PI system adding additional ongoing cost. Developing other new sources of water first is recommended.

- Evergreen Well – The Evergreen Well is equipped for use on the drinking water system but is not currently used. The City has expressed desire to equip this well for use on the PI system. Doing so would require the construction of an 8-12 inch transmission line from the well to future pipelines west of State Street. Upgrades to the existing pump and motor may also be necessary to equip the well for use in the PI system. The current capacity of the Evergreen Well is approximately 350 gpm. Upgrades to the well pump and motor may allow the well to produce more water, though further study would be required to make the determination.

Alignments and locations shown are approximate and can be adjusted to avoid difficult routes and accommodate development.



Legend

- SIC Diversion
- Storage Pond
- Pump Station
- Turnout
- Well
- PRV
- Mapleton Springville Pipeline
- Hobble Creek
- SIC Ditch #1

Highline Ditch

- Highline Ditch
- 24" Pipeline to PI Pond
- Service Area Boundary
- City Boundary
- Annexation Boundary

Existing Pipelines

- 36"
- 30"
- 24"
- 12"
- 10"
- 8"
- <=6"
- Dry Pipelines

Future Pipelines

- 30"
- 24"
- 20"
- 18"
- 16"
- 14"
- 12"
- 10"
- 8"
- 6"
- 40' Pond Location Band

HANSEN ALLEN & LUCE INC ENGINEERS

SPRINGVILLE CITY
PRESSURIZED IRRIGATION SYSTEM MASTER PLAN

FUTURE SYSTEM

FIGURE 3-1

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CHAPTER 4 WATER STORAGE

EXISTING WATER STORAGE

The purpose of water storage within the PI water system is to provide equalization for when peak demand exceeds the source supply and to provide operational redundancy. The City's existing PI water system includes one irrigation pond (Bartholomew Pond) with a total capacity of 30 ac-ft. The location of Bartholomew Pond is shown on Figure 1-2. The City is interested in maintaining a minimum water depth of six feet to reduce the vegetation and improve water quality. Based on the design plans and stage-storage curve provided by the City, the available water storage with a water depth of six feet is 19.4 acre-feet. See Table 4-1.

Table 4-1
Existing Storage Capacity

Pond	Capacity (ac-ft)
Bartholomew Pond – total	30.3
Bartholomew Pond – 6 feet depth	19.4

EXISTING WATER STORAGE REQUIREMENTS

Existing equalization storage requirements were based on irrigated acreage and the level of service of 6,120 gallons per irr-ac. Therefore, under existing conditions, with an existing irrigated acreage of 362 acres, the required storage is 6.8 ac-ft. Table 4-2 compares the available storage with the required storage for the existing system.

Table 4-2
Existing Storage Requirements

Irrigated Acreage	Storage Requirement (ac-ft)	Existing Capacity (ac-ft)	Surplus (ac-ft)
362.0	6.8	19.4	12.6

FUTURE WATER STORAGE REQUIREMENTS

Table 4-3 compares the 10-year, 20-year, and planning horizon (2070) storage requirements based on irrigated acreage projections with the available storage of the pond with a six-foot minimum water depth.

Table 4-3
Future Storage Requirements

Time	Irrigated Acreage	Storage Requirement (ac-ft)	Existing Capacity (ac-ft)	Deficiency (-) or Surplus (+) (ac-ft)
10-Years	788	14.8	19.4	+4.6
20-Years	1,093*	20.5	19.4	**-1.2**
2070	1,331*	25.0	19.4	**-5.6**

* These projections include irrigated acres from the "potential customers." Refer to Table 2-3 for details on projected irrigated acres.

As shown in Table 4-3, beginning in 20 years, the storage requirement for the PI system will exceed the available capacity of Bartholomew Pond with a six-foot minimum depth. If the City were to allow the storage level of the pond to drop to 3 feet of water depth, the available storage of the pond would be 25.4 ac-ft and would meet the requirements for the planning horizon (2070) of this study.

Additionally, a secondary overflow structure is constructed one foot higher than the primary overflow structure. This structure is not currently utilized by system operators. Raising the maximum pond level to utilize the secondary overflow structure would bring an additional 3.5 ac-ft of storage capacity to the pond, bringing the total storage capacity up to 22.8 ac-ft while keeping the same minimum water depth of 6 feet. Lastly, a minimum water depth of 5 feet, coupled with the secondary overflow structure, provides a total storage volume of 25 ac-ft, which meets the requirements for the planning horizon for this study. Operational constraints may still require an additional pond.

WATER STORAGE RECOMMENDATIONS

Based on the growth projections, level of service, pond stage-storage curve, and maximum pond drawdown assumptions, almost enough storage is already available to maintain the desired six foot minimum pond depth in 20 years. Increasing the daily pond level fluctuations by one foot would increase the available volume to 21.5 ac-ft, which would meet the 20-year storage requirements. Another one foot of drawdown would likely not affect recreation at the pond even during peak PI system usage hours.

Another alternative to increasing the capacity of the Bartholomew Pond is to utilize the existing secondary overflow structure. This structure is currently constructed one foot higher than the existing primary overflow structure. This additional foot of storage provides an additional 3.5 ac-ft of storage capacity, which increases the total storage capacity of the pond to 22.8 ac-ft while maintaining the six-foot minimum water depth. Increasing the maximum water depth by one foot will provide enough storage to meet the 20-year storage requirements.

An option beyond 20 years would be to construct a second storage pond in the northern end of the City. Installing PRVs to reduce the high pressure in the system would also allow this second pond to be constructed at a lower elevation than Bartholomew Pond, approximately 4725 to 4730 feet. A proposed location for this second pond is shown on Figure 3-1. This pond would not only reduce the storage requirement of Bartholomew Pond, but it would also allow system operators to more efficiently store ULS water from the proposed connection shown on Figure 3-1.

No storage projects are included in the capital improvement plan in this master plan because no additional storage is projected to be needed within the next 20 years if the City allows Bartholomew pond to maintain a five-foot water depth or utilizes the secondary overflow structure.

CHAPTER 5 WATER DISTRIBUTION

PEAK WATER DISTRIBUTION SYSTEM DEMANDS

Springville's PI water distribution system consists of all pipelines, valves, fittings, and other appurtenances used to convey water from sources and storage to water users. The existing water system contains approximately 41 miles of wet pipelines (in use) with diameters of 4 to 36 inches with approximately 21 miles of dry pipelines disconnected to the system. The PI system has one pressure zone (see Figure 1-2). Figure 5-1 shows the distribution of wet pipeline sizes throughout the PI system.

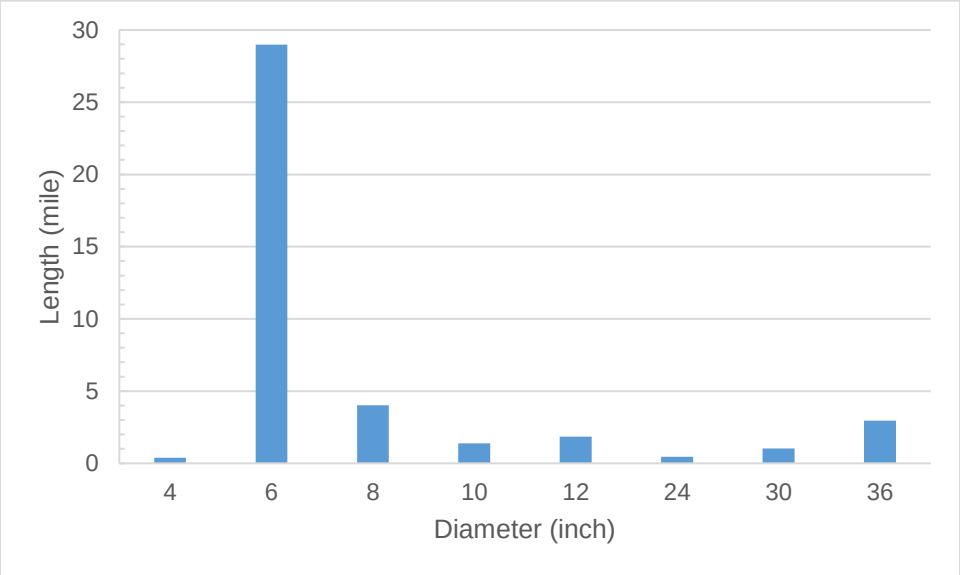

Figure 5-1: Existing Pipeline Diameters

Existing Peak Instantaneous Demand

Peak instantaneous demand was calculated based on irrigated acreage and the level of service defined by analysis of usage data. The selected level of service was 17.0 gpm per irrigated acre; therefore, the total peak instantaneous is 6,148 gpm under existing conditions. This does not include the 257 acres currently irrigated by the drinking water system.

Future Peak Instantaneous Demand

Future peak instantaneous demand in 2070 was calculated based on the same level of service as defined for existing conditions. The total future irrigated acreage estimated at 2070 is 1,331 acres. Therefore, the future peak instantaneous demand was calculated as 22,626 gpm.

HYDRAULIC MODEL

Development

A computer model of the City's PI water distribution system was developed to analyze the performance of the existing and future distribution system and to prepare solutions for existing facilities not meeting the distribution system requirements. The model was developed with the software InfoWater Pro, published by Autodesk. InfoWater Pro simulates the hydraulic behavior

of pipe networks as an ArcGIS Pro extension. Sources, pipes, tanks, valves, controls, and other data used to develop the model were obtained from GIS data of the city's PI water system and other updated information supplied by the City.

HAL developed models for each development phase discussed in this report (10-year, 20-year, 2070) plus an existing system model and a buildout model. The first phase of modeling was a model representing the existing system (existing model). This model was used to calibrate the model and identify if any deficiencies were present in the existing system. The second phase of modeling included all future scenario models (10-year, 20-year, 2070, and buildout) which represent future conditions and the improvements necessary to accommodate growth (future models).

Model Components

The two basic elements of the model are pipes and nodes. A pipe is described by its inside diameter, length, minor friction loss factors, and a roughness value associated with friction head losses. A pipe can contain elbows, bends, valves, pumps, and other operational elements. Nodes are the endpoints of a pipe and can be categorized as junction nodes or boundary nodes. A junction node is a point where two or more pipes meet, where a change in pipe diameter occurs, or where flow is added (source) or removed (demand). A boundary node is a point where the hydraulic grade is known (a reservoir, tank, or PRV). Other components include tanks, reservoirs, pumps, valves, and controls.

The model is not an exact replica of the actual system. Pipeline locations used in the model are approximate and not every pipeline may be included in the model, although efforts were made to make the model as complete and accurate as possible. Moreover, it is not necessary to include all the distribution system pipes in the model to accurately simulate its performance.

Pipe Network

The pipe network layout originated from GIS data provided by the City. HAL verified its accuracy by reviewing maps and drawings provided by the City, as well as a model prepared for the previous master plan. Elevation information was obtained from AGRC 0.5 Meter 2013-2014 LiDAR Data. Hazen-Williams roughness coefficients for pipes in this model ranged from 130 - 150, which are typical for common pipe materials in PI systems.

Water Demands

Water demands were allocated in the model based on billing data and billing address. The peak day demand was determined for each billing address, and then the billing addresses were geocoded to link the demands to a physical location. The geocoded demands were then assigned to the closest model node. Future demand was assigned to nodes in the future model which best represented the location of anticipated development.

The pattern of water demand over a 24 hour period is called the diurnal curve or daily demand curve. HAL developed a diurnal curve for peak day conditions using SCADA data and a peak factor of 2.3 (the ratio of peak instantaneous demand to peak day average demand). The diurnal curve used in this study is presented in Figure 5-2. The diurnal curve was input into the model to simulate changes in the water system throughout the day.

Using a peaking factor of 2.3 provided very good calibration for the existing system models but created extreme pressure swings and maximum velocities in future system models. The 2.3 peaking factor accurately simulates the existing conditions. High water use occurs

around 5 am across the PI system when many residents turn on automated sprinkler systems. Existing model calibration reports are provided in Appendix A.

After evaluating previous planning documents, the City's accepted level of service, and discussing with the City, a responsible peaking factor of 2.0 was recommended for use with future modeling. This lower peaking factor represents a "spreading out" of water demand across the system to reduce the demand incurred on the system at 5 am. The City has also previously adopted a 2.0 peaking factor as the level of service for the PI system. Both the 2.0 and 2.3 peaking factor demand patterns are provided in Figure 5-2 for comparison.

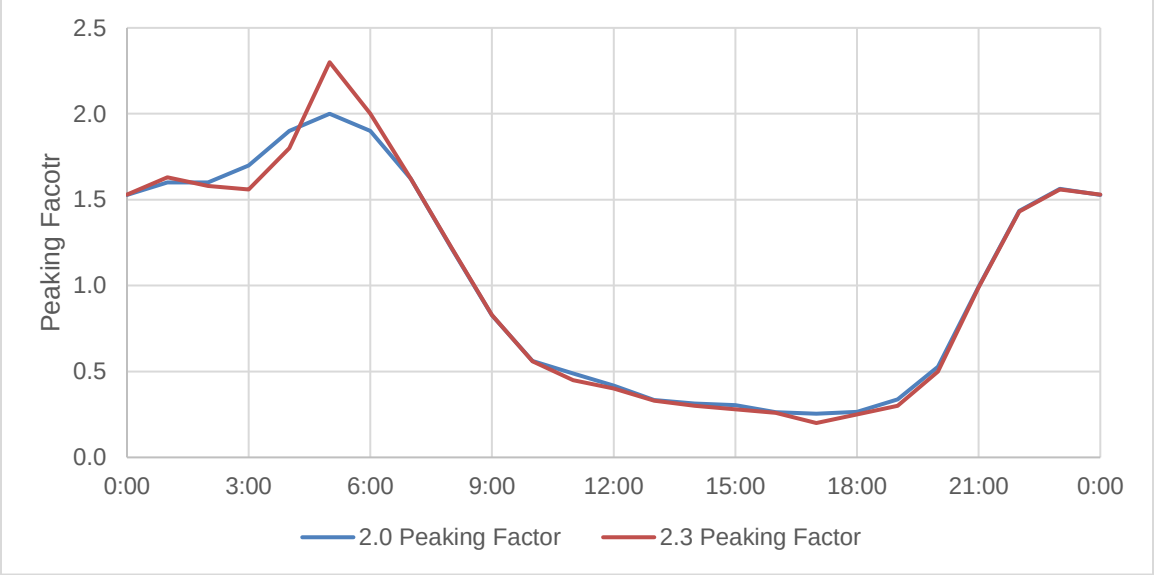

Figure 5-2: Springville PI Diurnal Curve

Water Sources and Storage Pond

The existing sources include water provided by Springville's existing shares in Springville Irrigation Company. The main two diversion locations include the "City Diversion" which is located on Hobble Creek a short distance above the existing debris basin and the Mapleton Springville Lateral Canal Pipeline which connects to the 36" main pipeline out of the pond. The pond location, elevation, and volume are represented in the model. The extended-period models predicts water levels in the pond as they fill from sources and as they empty to meet demand in the system.

ANALYSIS METHODOLOGY

HAL used extended-period models to analyze the performance of the water system with current and projected future demands. An extended-period model represents system behavior over a period of time: pond filling and draining, pressures fluctuating, and flows shifting in response to demands. The models were used to analyze flow conditions, controls, operation, and performance. Recommendations for existing and future conditions were checked with the extended-period models to confirm adequacy.

Two extreme operating conditions analyzed with the model were high pressure conditions and peak instantaneous demand conditions. Peak day plus fire flow conditions were not analyzed because water for fire flow will come from the drinking water system. Each of these conditions is

a worst-case situation so the performance of the distribution system may be analyzed for compliance with City requirements. Each operating condition is discussed in more detail below.

High Pressure Conditions

Low flow conditions are usually the worst case for high pressures in a PI system. Before the evening irrigation begins, storage is typically nearly full, and movement of water through the system is minimal. Similar conditions may also occur early and late in the irrigation season and on rainy days. Under these conditions, the system approaches a static condition where water pressures are dictated only by elevation differences and pressure-regulating devices. This high-pressure condition was simulated with the model to analyze the system's existing and future conformance to pressure requirements.

Peak Instantaneous Demand Conditions

Peak instantaneous demand conditions are the worst-case for low pressures in a PI system. The PI system reaches peak instantaneous demand conditions when irrigation is the highest, such as hot summer days or holidays. For PI systems, peak instantaneous demand typically occurs around 4 to 6 am, when residents turn on automatic sprinkler systems. The high demand causes high velocities and increased losses in the distribution pipes, resulting in reduced pressure.

WATER DISTRIBUTION RECOMMENDATIONS

The existing model calibration indicates that the PI system experiences high peak demands around 5 am. When applying this high demand pattern to future models, the PI system experienced pressure swings greater than 30 to 40 psi. Implementing water conservation measures such as allocation-based tiered water rates or restricting outdoor watering times can help to "smooth out" the high peak demands experienced at 5 am and improve system performance. Additional recommendations from the 2022 Water Conservation Plan may also be effective at reducing high peak demands. A copy of the 2022 Water Conservation Plan is included in Appendix D.

It is recommended that the City install a PRV on the existing 30-inch pipeline in 700 South to control high pressure conditions. A second PRV on the proposed 18-inch pipeline in 800 South is also recommended. Installing these PRVs will reduce the high-pressure conditions experienced during low flow periods while maintaining adequate pressures during peak instantaneous demand conditions.

All existing distribution pipelines are sufficient to meet the existing level of service. It is recommended that sufficiently sized pipelines continue to be installed as development continues. Recommended pipeline projects anticipated in the next 20 years are detailed in the capital facility plan in Chapter 7. Pipeline projects anticipated beyond 20 years are displayed in Figure 3-1. Recommended pipes are intended to accomplish the following objectives:

- Provide transmission capacity to developing areas west of I-15
- Connect areas to the system which currently rely on drinking water to meet irrigation demands
- Provide acceptable service pressures and pressure swings
- Reserve sufficient capacity for future demands

CHAPTER 6 WATER RIGHTS

EXISTING WATER RIGHTS

Springville City currently owns water rights for use in the PI system. Some water rights are owned directly by the City and the remaining water rights are Springville Irrigation Company Shares owned by the City. Table 6-1 is a summary of the water rights used in the PI system delivered to Bartholomew Pond by the PI system sources list in Table 3-1.

Table 6-1: Existing Water Rights Used in the PI System

Water Right	Flow* (gpm)	Volume* (ac-ft)	PI Source
Strawberry Water Shares (Springville Irrigation Company)	3,000	1,970	Mapleton-Springville Strawberry Pipeline
Springville Irrigation Company Shares (Non-Strawberry Water)	645	855	Springville Irrigation Ditch #1
51-6025	627	490	Hobble Creek/ Highline Ditch
51-6219	145	103	Hobble Creek/ Highline Ditch
TOTAL	**4,417**	**3,418**	

* Flow and volume for each water right is estimated based on the State of Utah water right database and City records.

Springville City has a total of 3,418 ac-ft of water rights available for use in PI water system. Compared to the existing level of service water requirement of 1,448 ac-ft, the City currently owns a surplus of 1,970 ac-ft of water rights currently available for use in the PI water system (see Table 6-2).

Table 6-2
Existing PI Average Yearly Water Demand and Water Right Capacity

Parameter	Average Yearly (ac-ft)
Demand	1,448
Capacity	3,418
Surplus	1,970

FUTURE WATER RIGHTS

By 2070, the City will require a minimum of 5,324 ac-ft of water rights to meet requirements for the PI water system. Compared to the existing water rights available in the PI system, the City currently is short 1,906 ac-ft (see Table 6-3). Buildout requirements for the City will be higher than the predicted 2070 requirements. Similar to other components of the PI water system, water rights

should have redundancy. Typically, some water rights cannot be used as planned or do not yield the allowed flow, and the City will need to acquire more than the minimum rights calculated in order to have the usable flow and volume required.

Table 6-3
Future PI Average Yearly Water Demand and Water Right Capacity

Time	Irrigated Acreage	Average Yearly Demand (ac-ft)	Average Yearly Capacity (ac-ft)	Surplus (ac-ft)
10-years	788	3,152	3,418	266
20-years	1,093	4,372	3,418	**-954**
2070	1,331	5,324	3,418	**-1,906**

Water rights are independent of physical source capacity in this study. For example, the Mapleton-Springville Strawberry Pipeline has a physical capacity of more than 6,000 gpm, but the City currently does not own enough water rights to supply the PI system at this rate throughout irrigation season. Other water rights and Springville Irrigation Company shares the City owns are used for irrigation in small independent City-owned irrigation systems not connected to the PI system or are not currently used by the City. These water rights are summarized in Table 6-4. It is recommended that the City file change applications to change the use of these water rights to municipal use for better protection and ease of management of the water rights. It is recommended that the City file a change application to add a point of diversion on the Plat A water right (51-5224) at the City Dam to use the water in the PI system.

Table 6-4
Potential Water Rights for Use in the PI System

Water Right	Flow (gpm)	Volume (ac-ft)	Current Use	Water Source
51-5328	450	724	Hobble Creek Golf Course	Jurd Springs
Springville Irrigation Shares	245	195	Jolly's Park, Kelly Park, and Hobble Creek Golf Course	Hobble Creek
51-5224	1,571	2,000	Plat A Irrigation System	Hobble Creek
51-5230	25	20	Irrigation at Westroc	Roundy Springs
51-7463 (a24494)	50	37	Industrial Park	Little Spring Creek
Total	**2,341**	**2,976**		

* Flow and volume for each water right is estimated based on the State of Utah water right database and City records.

ULS AND SUVMWA WATER

The City is obligated to purchase 5,448 ac-ft of ULS water through a petition agreement between CUWCD and SUVMWA, see Appendix E for details. It is recommended that the City plan for how the ULS water will be used.

There is important information in the contract between SUVMWA and CUWCD for delivery of ULS water that the City should consider about the proper timing, cost, payment, and potential options

to avoid the purchase of the ULS water. It is recommended that the City start discussions with the Department of Interior, CUWCD and SUVMWA immediately to fully understand the contract and negotiate potential options so the City can make informed and timely decisions for the ULS water. The City could consider discussing the possibility of purchasing a portion of the water, purchasing an increasing portion of the water over time, or allowing another SUVMWA city to have a portion or all of Springville City's ULS Water allotment.

The ULS water would be the most expensive water in the City's entire portfolio currently estimated at around $350 per acre-foot per year for 50 years. This would be a yearly cost of $1.9 Million and a total cost of $95.3 Million. After 50 years the City would pay operation and maintenance costs for the water, currently estimated at about $40 an acre-foot in today's dollars. If the full cost of the ULS water is delayed for up to 10 years, the annual payment will be higher at the end of the deferral because the amortization period will be shorter. For example, if the annual cost for the 5,448 ac-ft allotment without deferment is $1.9 Million based on a 50-year period, it will be near $2.4 Million for a 10-year deferment based on a 40-year period. However, there is no interest assessed for delaying and the total cost remains the same.

It is important to note that there are conservation requirements in the contract that the City will be immediately subject to when the City starts to take ULS water. If the conservation requirements are not met, the City will be surcharged 5%. The City should confirm conservation documentation to be ready to prove the required reductions of 12.5% by 2020 and 25% by 2050. It is also important to note that no debt can be used to pay for the ULS water and none of the return flows of the ULS water may be claimed or used.

The feasibility of a drinking water treatment plant in Salem supplied by ULS water is being studied by CUWCD. It is recommended that the City participate and provide input in the study.

Springville also owns 95 ac-ft of East Jordan Canal water through the City's approximate 23.7 percentage of SUVMWA. It is recommended that the City sell the SUVMWA East Jordan Canal water right.

WATER RIGHT RECOMMENDATIONS

In summary, although the City has sufficient water rights to meet existing demands in the PI system, several actions with regards to PI water rights are recommended to ensure future demands have sufficient water rights. They include:

- Work with the Utah Division of Water Rights to aid in a decision being finalized in the water right adjudication.
- File change applications for all water rights based on shares to municipal use.
- File a change application to add a point of diversion on the Plat A water right (51-5224) at the City Dam to use the water in the PI system.
- Sell the City's SUVMWA portion of an East Jordan Canal water right.
- Start discussions with the Department of Interior, CUWCD, and SUVMWA to understand the contract between the SUVMWA and CUWCD for delivery of ULS water. The City should plan for the best options for meeting the obligation and using the water.

CHAPTER 7 CAPITAL FACILITY PLAN

GENERAL

The purpose of this section is to identify the PI facilities that are required to meet the demands placed on the system by future development for the 10-year planning period (impact fee) and the 20-year planning period (capital facility plan). Proposed facility capacities were sized to adequately meet the planning horizon growth projections and were compared to current master planned facilities. A detailed design analysis will be required before construction of the facilities to ensure that the location and sizing is appropriate for the actual growth that has taken place since this CFP was developed.

METHODOLOGY

Future water demands were based on the growth projections converted into irrigated acreage projections as discussed in Chapter 2. The 20-year growth projection was used to identify the capital projects listed in this chapter. While capital projects are selected for the 20-year growth projection, the facilities were sized to service future growth projections through the planning horizon. A hydraulic model was developed for the purpose of assessing the system operation and capacity with future demands added to the system. This model was used to identify problem areas in the system and to identify the most efficient way to make improvements.

MASTER PLANNING

Throughout the master planning process, the three main components of the PI system (source, storage, and distribution) were analyzed to determine the system's ability to meet existing demands and also the anticipated future demands. Each of the system deficiencies identified in the master planning process and described previously in this report were presented in an alternatives workshop with City staff. Possible alternatives for future growth and facilities were discussed. After the workshop, HAL studied the feasibility of the alternatives and developed conceptual level cost estimates.

One important method of paying for system improvements is through impact fees. Impact fees are collected from new development and should only be used to pay for system improvements related to new development. For this reason, it is important to identify which projects are related to resolving existing deficiencies, and which projects are related to providing anticipated future capacity for new development.

PRECISION OF COST ESTIMATES

When considering cost estimates, there are several levels or degrees of precision, depending on the purpose of the estimate and the percentage of detailed design that has been completed. The following levels of precision are typical:

Type of Estimate	Precision
Master Planning	-50% to +100%
Preliminary Design	-30% to +30%
Final Design or Bid	-10% to +10%

For example, at the master planning level (or conceptual or feasibility design level), if a project is estimated to cost $1,000,000, then the precision or reliability of the cost estimate would typically be expected to range between approximately $500,000 and $2,000,000. While this may seem

very imprecise, the purpose of master planning is to develop general sizing, location, cost, and scheduling information on a number of individual projects that may be designed and constructed over a period of many years. Master planning also typically includes the selection of common design criteria to help ensure uniformity and compatibility among future individual projects. Details such as the exact capacity of individual projects, the level of redundancy, the location of facilities, the alignment and depth of pipelines, the extent of utility conflicts, the cost of land and easements, the construction methodology, the types of equipment and material to be used, the time of construction, interest and inflation rates, permitting requirements, etc., are typically developed during the more detailed levels of design.

At the preliminary design level, some of the aforementioned information will have been developed. Major design decisions such as the size of facilities, selection of facility sites, pipeline alignments and depths, and the selection of the types of equipment and material to be used during construction will typically have been made. At this level of design, the precision of the cost estimate for a $1,000,000 project would typically be expected to range between approximately $700,000 and $1,300,000.

After the project has been completely designed and is ready to bid, all design plans and technical specifications will have been completed and nearly all of the significant details about the project should be known. At this level of design, the precision of the cost estimate for the same $1,000,000 project would typically be expected to range between approximately $900,000 and $1,100,000.

SYSTEM IMPROVEMENT PROJECTS

As discussed in previous chapters, source, storage and distribution system capacity expansion will be needed to meet the demands of future growth. Project descriptions for PI system improvements are presented in Chapters 3, 4 and 5 with the location of each project shown on Figure 3-1. Each recommendation includes a conceptual cost estimate for construction and year needed.

Unit costs for the construction cost estimates are based on conceptual level engineering. Sources used to estimate construction costs include:

1. “Means Heavy Construction Cost Data, 2025”
2. Price quotes from equipment suppliers
3. Recent construction bids for similar work

All costs are presented in 2025 dollars. Recent price and economic trends indicate that future costs are difficult to predict with certainty. Engineering cost estimates provided in this study should be regarded as conceptual level for use as a planning guide. Only during final design can a definitive and more accurate estimate be provided for each project.

The recommended system improvement projects for the next 20 years through 2045 are summarized in Tables 7-1 and 7-2 and shown on Figure 7-1. A cost estimate calculation for each recommended project is provided in Appendix B The estimated cost for the recommended system capital improvement projects for the next 10 years is **$17,243,000**. In the 10-20 year planning window, there is another **$33,634,000** in estimated cost for capital improvement projects.

Alignments and locations shown are approximate and can be adjusted to avoid difficult routes and accommodate development.

Portions of 10-2 and 10-3 have already been constructed by LGI.

Legend

- SIC Diversion
- Bartholomew Pond
- Pump Station
- PRV
- Existing Pipelines (Wet & Dry)
- Mapleton Springville Pipeline
- Hobble Creek
- SIC Ditch #1

Highline Ditch

- Highline Ditch
- 24" Pipeline to PI Pond
- City Boundary
- Service Area Boundary

10-Year Pipelines	20-Year Pipelines
24"	24"
20"	20"
18"	16"
16"	14"
12"	12"
10"	10"
8"	8"
6"	

West Dry Creek Pump Station
East Dry Creek Pump Station
Center St
400 S
1600 S
1750 W
SR 75
SR 77
SR 51
I-15
89
Hobble Creek
Canyon Rd
Burt Spring
Ditch #1
Highline Ditch
Mapleton Springville Mainline Pipeline

0 1,300 2,600 5,200
1 inch = 2,600 feet

N

HANSEN ALLEN & LUCE INC ENGINEERS

SPRINGVILLE CITY
PRESSURIZED IRRIGATION SYSTEM MASTER PLAN

CAPITAL FACILITIES PLAN

FIGURE 7-1

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Table 7-1
Recommended 0-10 Year Transmission Projects

Project ID*	Recommendation	Impact Fee Eligible Cost	% Impact Fee Eligible	Total Cost Estimate
10-1	20-inch diameter pipe in 1500 W - from Center St to 700 S - and 24-inch diameter pipe east of 700 S	$4,370,000	100%	$4,370,000
10-2**	16-inch diameter pipe in Center Street - from 1200 W to 1500 W	$2,271,000	100%	$2,271,000
10-3**	12-inch diameter pipe Center Street – West of 2000 W. This cost is for the remaining portion of pipeline not constructed by LGI	$280,000	25%	$1,120,000
	This cost is for the impact fee eligible cost of upsizing the 1,160 LF of pipe that has already been constructed by LGI.	$73,000	100%	$73,000
10-4	10-inch diameter pipe in 1750 W - from Center St to 400 S	$230,000	15%	$1,460,000
10-5	18-inch diameter pipe in State St (near 1000 S) and PRV to 18" pipe	$3,470,000	100%	$3,470,000
10-6	16-inch diameter pipe in State St	$1,440,000	100%	$1,440,000
10-7	8-inch diameter pipe in 1600 S - from State St to 950 W	$1,890,000	100%	$1,890,000
10-8	8-inch, 10-inch, and 12-inch diameter pipes across Dry Creek area	$210,000	13%	$1,560,000
10-9	10-inch diameter pipe in 1700 W - from 700 S to 900 S	$80,000	14%	$530,000
10-10	12-inch diameter pipe in 900 S - from 1750 W to 1700 W	$230,000	25%	$880,000
10-11	8-inch diameter pipe in 2000 W - from about 500 N to Sweetwater Dr and 6-inch diameter pipe in 500 N - from 2400 W to 2250 West	$1,560,000	100%	$1,560,000
10-12	12-inch diameter pipe in 2000 W - from 1000 N to 800 N	$570,000	100%	$570,000
10-13	8-inch diameter pipe in 900 S under I-15 and 6-inch diameter pipe in 2200 West under 400 South	$990,000	100%	$990,000
10-14	8-inch diameter pipe off 2250 W	$50,000	7%	$640,000
10-15	10-inch diameter pipe across 700 S road to connect 30" pipe to 6" pipe and a PRV to 30" pipe near 400 W 700 S	$550,000	100%	$550,000
10-16	12-inch diameter pipe in 400 S - from 2400 W to 2600 W	$180,000	24%	$710,000
10-17	8-inch diameter pipe in 2600 W to connect to 400 S pipeline	$40,000	6%	$580,000
	Total	**$18,484,000**	**75%**	**$24,664,000**

* See Figure 7-1
** Projects 10-2 and 10-3 are currently under construction by developers. Cost information was provided by the City and is included in Appendix B.

Table 7-2
Recommended 10-20 Year Transmission Projects

Project ID*	Recommendation	Impact Fee Eligible Cost	% Impact Fee Eligible	Total Cost Estimate
20-1	12-inch diameter pipe in 900 S - from 1700 W to 1200 W	$190,000	24%	$760,000
20-2	12-inch diameter pipe in 400 W - from 700 S to about 900 S	$220,000	26%	$850,000
20-3	16-inch diameter pipe in 400 S - from West Dry Creek PS to 100 W	$1,210,000	100%	$1,210,000
20-4	10-inch diameter pipe parallel to I-15 - from 1000 N to Center St	$360,000	14%	$2,500,000
20-5	10-inch diameter pipe in 1650 W - from to 1000 N to Center St	$340,000	14%	$2,380,000
20-6	10-inch diameter pipe in Spring Creek Rd - from 950 W to 400 W and 16-inch diameter pipe in 1000 N - from I-15 to 950 W	$2,300,000	36%	$6,320,000
20-7	8-inch, 20-inch, and 24-inch diameter pipes in State Route 75 - from 1750 W to ULS Turnout	$4,120,000	100%	$4,120,000
20-8	12-inch diameter pipe in 450 W St - from 1200 N to Spring Creek Rd and 14-inch diameter pipe in 450 W - from ULS Turnout to 1200 N	$1,810,000	100%	$1,810,000
20-9	10-inch diameter pipe in Mtn Springs Pkwy - from State Route 75 to 1000 N/Spring Creek Rd	$1,060,000	100%	$1,060,000
20-10	8-inch diameter pipe in 950 W - from Spring Creek Rd to about 900 N	$20,000	5%	$270,000
20-11	8-inch diameter pipe parallel to Spring Canyon Way (to connect to 10" pipe proposed in Project 10-8)	$20,000	7%	$180,000
20-12	East Dry Creek PS and Holding Pond along Dry Creek and near 1200 W	$8,060,000	100%	$8,060,000
20-13	West Dry Creek PS and Holding Pond along Dry Creek and near 4000 South	$8,060,000	100%	$8,060,000
	Total	**$27,770,000**	**74%**	**$37,580,000**

* See Figure 7-1

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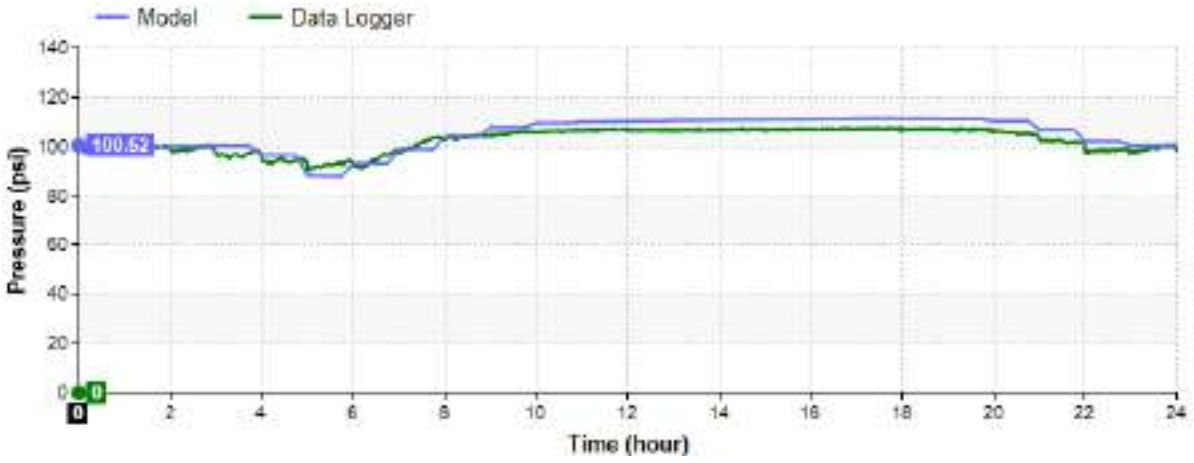
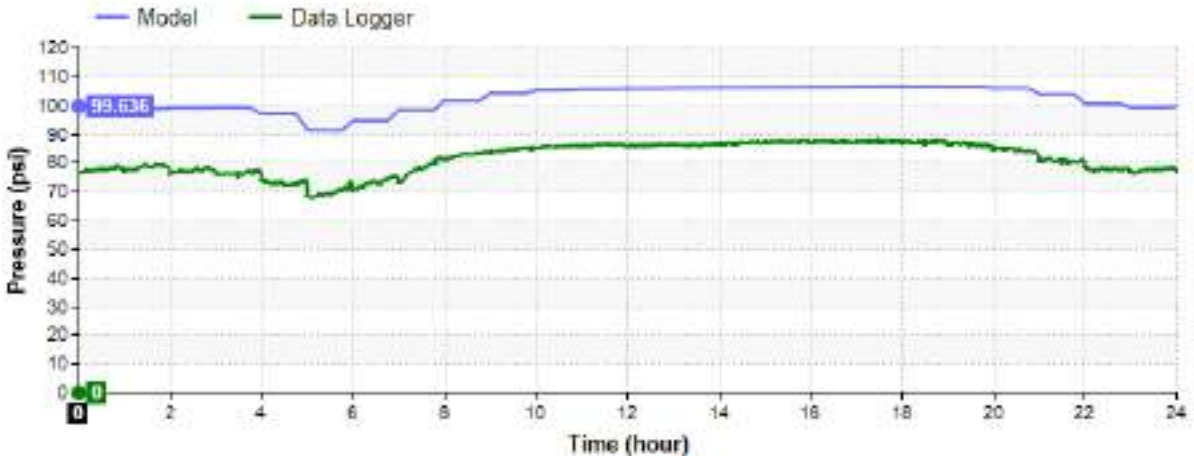
APPENDIX A

Model Calibration Reports

878 W 175 S



722 W 1375 S



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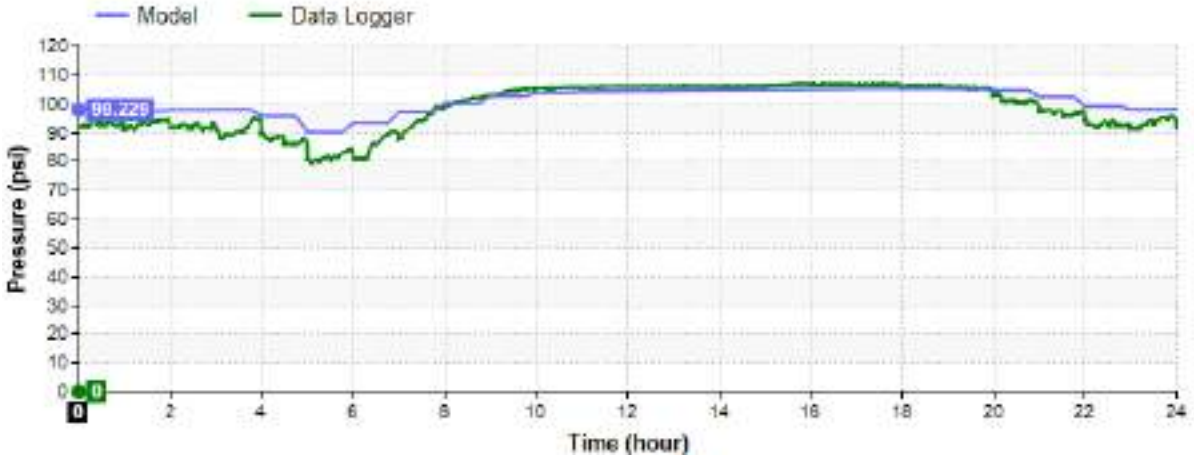

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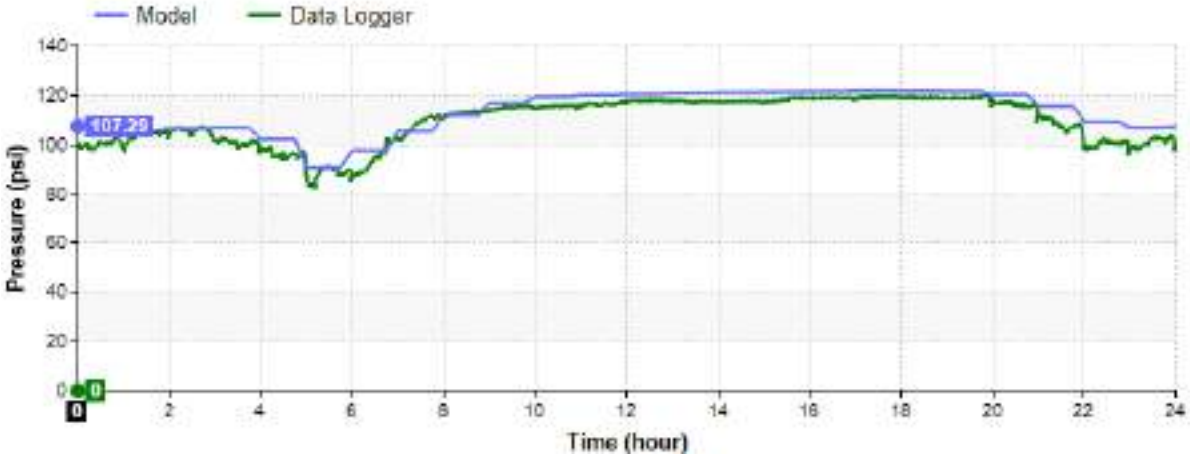
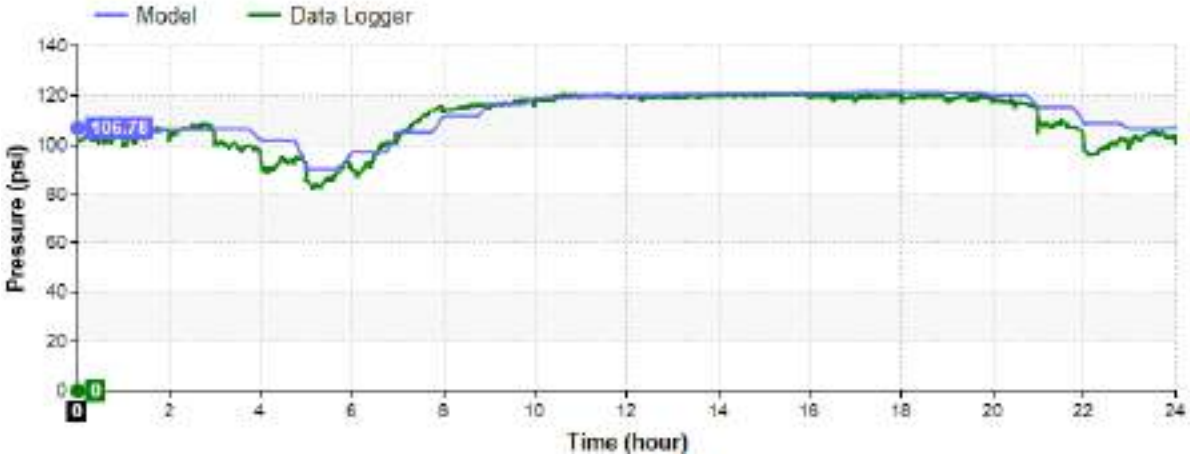
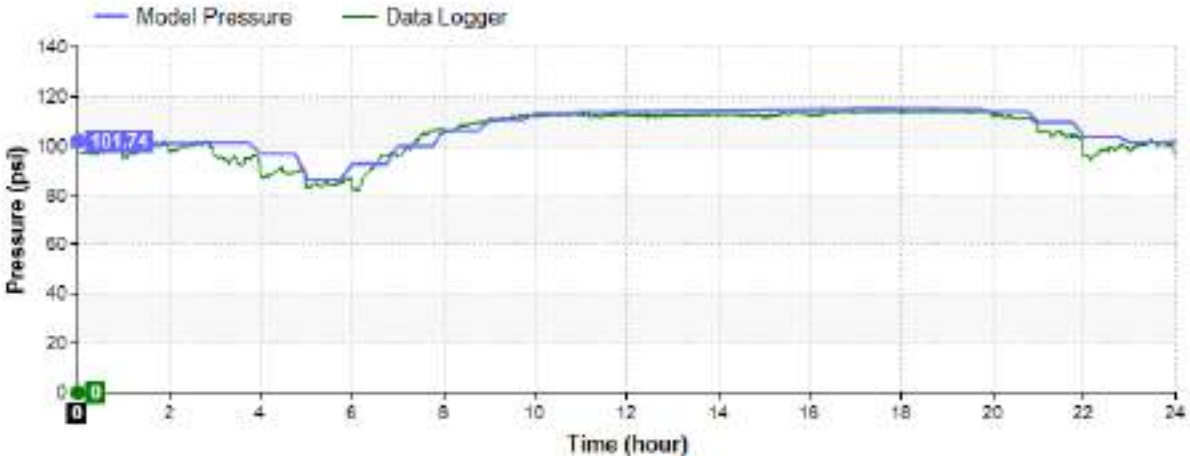


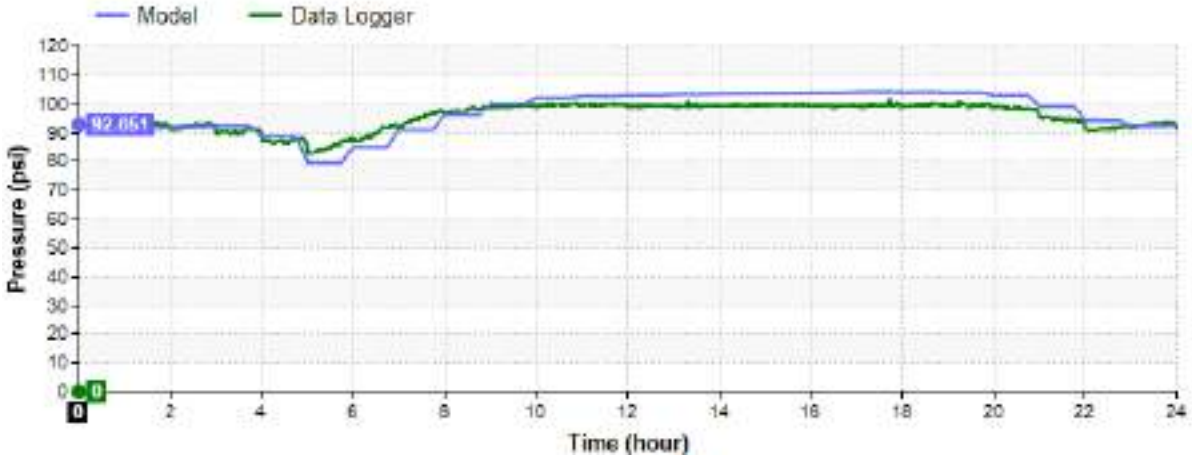
350 N 750 W



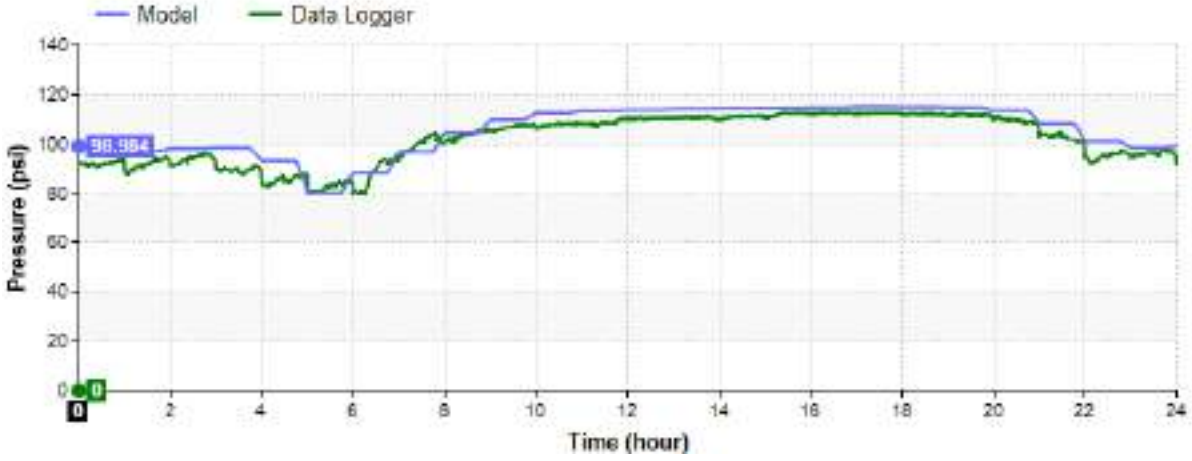
1168 W Center



543 W 200 S



556 N 950 W



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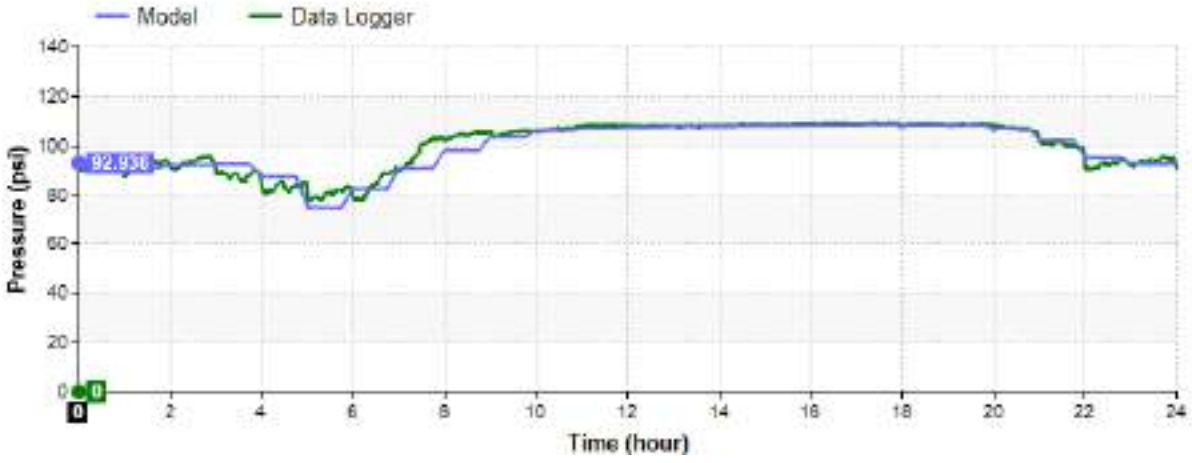

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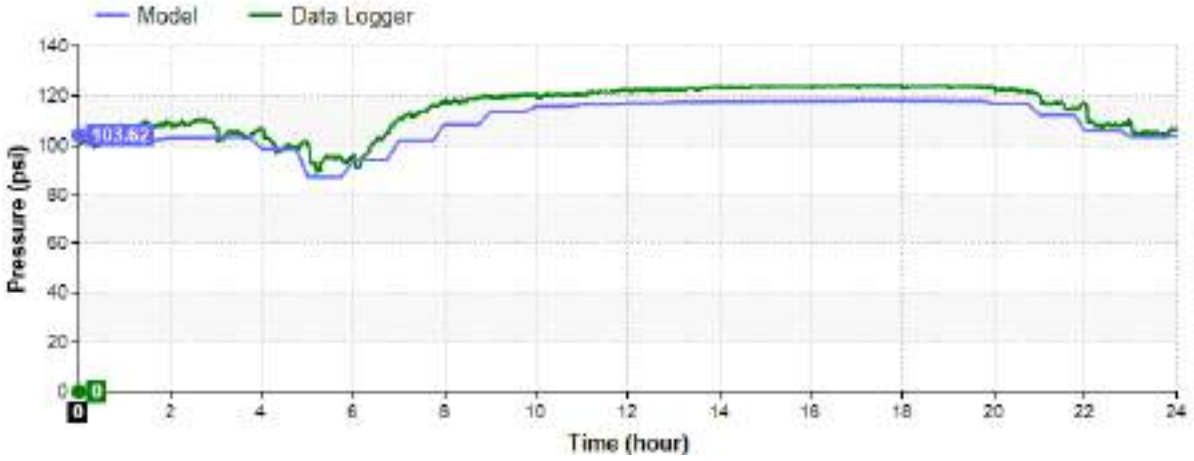

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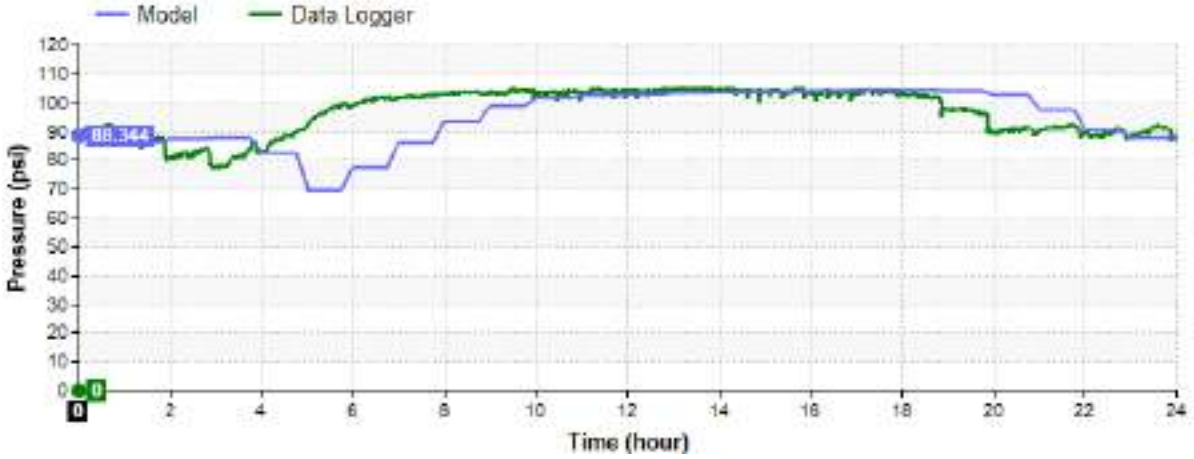
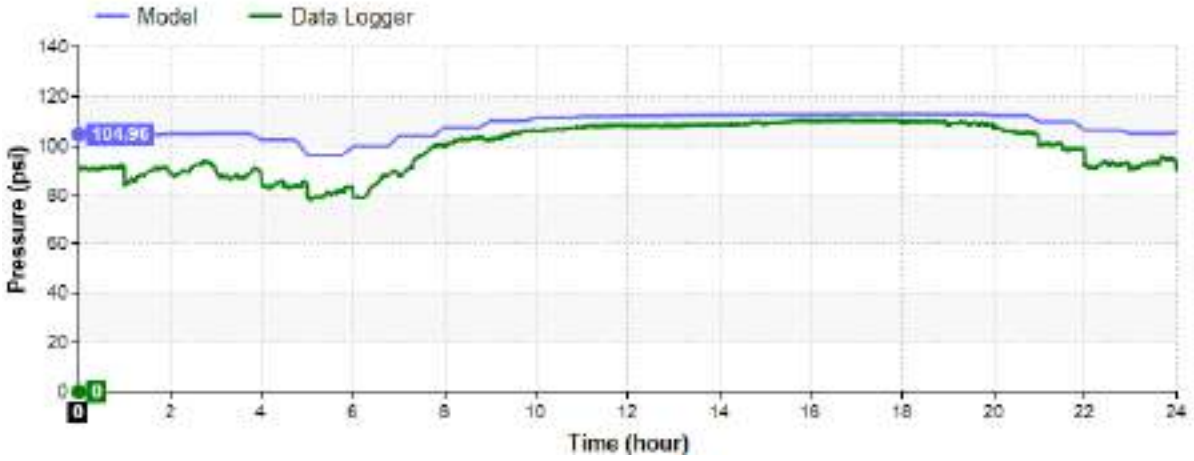


1418 S Avalon



APPENDIX B

Cost Estimate Calculations

Springville City Pressurized Irrigation Water Master Plan - Capital Facility Plan Project Cost Estimates
Springville City
by Hansen, Allen & Luce, Inc.

AACE Class: 5

Project 10-2 and 10-3 have been or are currently under construction. The costs shown for these projects reflect the bid or reimbursement agreement amounts provided by the City.
10-2: Bid document - Lakeside-Landing Offsite PI Improvements by Landmark Excavating
10-3: Reimbursement agreement - Center Street pressurized irrigation water system improvements

Scenario	Project ID	Item Type	Location/Description	Diameter	Quantity	Rounded Quantity	Unit	Unit Cost	Base Cost	Contingency (20%)	Engineering (10%)	Project Total Cost	Project Total Cost *Rounded*	Impact Fee Eligible Cost	Impact Fee Eligible Cost *Rounded*	% Impact Fee Eligible
PI Project 10-1																
10-Year	10-1	Pipe	20-inch diameter pipe	20	4507	4510	LF	$ 440	$ 1,984,400	$ 396,880	$ 198,440	$ 2,579,720	$ 2,580,000	$ 2,579,720	$ 2,580,000	100%
10-Year	10-1	Pipe	24-inch diameter pipe	24	241	250	LF	$ 510	$ 127,500	$ 25,500	$ 12,750	$ 165,750	$ 166,000	$ 165,750	$ 166,000	100%
10-Year	10-1	Bore-20	Bore 20-inch diameter pipe across SR77/400 S (180')	20	180	180	LF	$ 4,800	$ 864,000	$ 172,800	$ 86,400	$ 1,123,200	$ 1,124,000	$ 1,123,200	$ 1,124,000	100%
10-Year	10-1	Bore-20	Bore 20-inch diameter pipe across (2) canals (40')	20	80	80	LF	$ 4,800	$ 384,000	$ 76,800	$ 38,400	$ 499,200	$ 500,000	$ 499,200	$ 500,000	100%
												PI Project 10-1 Total	**$ 4,370,000**	**10-1 Total**	**$ 4,370,000**	**100%**
PI Project 10-2 ***(Lakeside Offsite PI, under construction)***									**Bid Cost**	**Contingency (10%)**	**Engineering (5%)**	**Total**	**Rounded**			
10-Year	10-2	Pipe	16-inch along Center St from 1500 W to 2000 W	16	(-)	(-)	(-)	(-)	$ 1,973,978	$ 197,398	$ 98,699	$ 2,270,075	$ 2,271,000	$ 2,271,000	$ 2,271,000	100%
												PI Project 10-2 Total	**$ 2,271,000**	**10-2 Total**	**$ 2,271,000**	**100%**
PI Project 10-3 ***(LGI Center Street Offsite PI, West of I-15, portion constructed)***												**Total**	**Rounded**			
10-Year	10-3	Pipe	12-inch along Center St (constructed)	12	1160	1160	LF	(-)	(-)	(-)	(-)	$ 72,945	$ 73,000	$ 72,945	$ 73,000	100%
												PI Project 10-3 Subtotal	**$ 73,000**	**10-3 Subtotal**	**$ 73,000**	**100%**
10-Year	10-3	Pipe	12-inch diameter pipe	12	1916	1920	LF	$ 320	$ 614,400	$ 122,880	$ 61,440	$ 798,720	$ 799,000	$ 174,720	$ 175,000	22%
10-Year	10-3	Bore-12	Bore 12-inch diameter pipe across (2) canals (40')	12	80	80	LF	$ 3,000	$ 240,000	$ 48,000	$ 24,000	$ 312,000	$ 312,000	$ 104,000	$ 104,000	33%
												PI Project 10-3 Subtotal	**$ 1,120,000**	**10-3 Subtotal**	**$ 280,000**	**25%**
PI Project 10-4												**PI Project 10-3 Total**	**$ 1,193,000**		**$ 353,000**	
10-Year	10-4	Pipe	10-inch diameter pipe	10	2049	2050	LF	$ 290	$ 594,500	$ 118,900	$ 59,450	$ 772,850	$ 773,000	$ 106,600	$ 107,000	14%
10-Year	10-4	Bore-10	Bore 10-inch diameter pipe across SR77 (180')	10	180	180	LF	$ 2,400	$ 432,000	$ 86,400	$ 43,200	$ 561,600	$ 562,000	$ 93,600	$ 94,000	17%
10-Year	10-4	Bore-10	Bore 10-inch diameter pipe across canal (40')	10	40	40	LF	$ 2,400	$ 96,000	$ 19,200	$ 9,600	$ 124,800	$ 125,000	$ 20,800	$ 21,000	17%
												PI Project 10-4 Total	**$ 1,460,000**	**10-4 Total**	**$ 230,000**	**15%**
PI Project 10-5																
10-Year	10-5	Pipe	18-inch diameter pipe	18	1971	1980	LF	$ 400	$ 792,000	$ 158,400	$ 79,200	$ 1,029,600	$ 1,030,000	$ 1,029,600	$ 1,030,000	100%
10-Year	10-5	PRV-18	PRV to 18" pipe on 1000 S State St.	18	1	1	Each	$ 400,000	$ 400,000	$ 80,000	$ 40,000	$ 520,000	$ 520,000	$ 520,000	$ 520,000	100%
10-Year	10-5	Bore-18	Bore 18-inch diameter pipe across US 89 (300')	18	300	300	LF	$ 4,200	$ 1,260,000	$ 252,000	$ 126,000	$ 1,638,000	$ 1,638,000	$ 1,638,000	$ 1,638,000	100%
10-Year	10-5	Bore-18	Bore 18-inch diameter pipe across railroad (50')	18	50	50	LF	$ 4,200	$ 210,000	$ 42,000	$ 21,000	$ 273,000	$ 273,000	$ 273,000	$ 273,000	100%
												PI Project 10-5 Total	**$ 3,470,000**	**10-5 Total**	**$ 3,470,000**	**100%**
PI Project 10-6																
10-Year	10-6	Pipe	16-inch diameter pipe	16	2516	2520	LF	$ 370	$ 932,400	$ 186,480	$ 93,240	$ 1,212,120	$ 1,213,000	$ 1,212,120	$ 1,213,000	100%
10-Year	10-6	Bore-16	Bore 16-inch diameter pipe across Dry Creek (40')	16	40	40	LF	$ 4,200	$ 168,000	$ 33,600	$ 16,800	$ 218,400	$ 219,000	$ 218,400	$ 219,000	100%
												PI Project 10-6 Total	**$ 1,440,000**	**10-6 Total**	**$ 1,440,000**	**100%**
PI Project 10-7																
10-Year	10-7	Pipe	8-inch diameter pipe	8	4245	4250	LF	$ 270	$ 1,147,500	$ 229,500	$ 114,750	$ 1,491,750	$ 1,492,000	$ 1,491,750	$ 1,492,000	100%
10-Year	10-7	Bore-8	Bore 8-inch diameter pipe across SR51 (150')	8	150	150	LF	$ 2,000	$ 300,000	$ 60,000	$ 30,000	$ 390,000	$ 390,000	$ 390,000	$ 390,000	100%
												PI Project 10-7 Total	**$ 1,890,000**	**10-7 Total**	**$ 1,890,000**	**100%**
PI Project 10-8																
10-Year	10-8	Pipe	8-inch diameter pipe	8	2464	2470	LF	$ 270	$ 666,900	$ 133,380	$ 66,690	$ 866,970	$ 867,000	$ 64,220	$ 65,000	7%
10-Year	10-8	Pipe	10-inch diameter pipe	10	1006	1010	LF	$ 290	$ 292,900	$ 58,580	$ 29,290	$ 380,770	$ 381,000	$ 52,520	$ 53,000	14%
10-Year	10-8	Pipe	12-inch diameter pipe	12	361	370	LF	$ 320	$ 118,400	$ 23,680	$ 11,840	$ 153,920	$ 154,000	$ 33,670	$ 34,000	22%
10-Year	10-8	Bore-12	Bore 12-inch diameter pipe across canal (40')		40	40	LF	$ 3,000	$ 120,000	$ 24,000	$ 12,000	$ 156,000	$ 156,000	$ 52,000	$ 52,000	33%
												PI Project 10-8 Total	**$ 1,560,000**	**10-8 Total**	**$ 210,000**	**13%**
PI Project 10-9																
10-Year	10-9	Pipe	10-inch diameter pipe	10	1375	1380	LF	$ 290	$ 400,200	$ 80,040	$ 40,020	$ 520,260	$ 521,000	$ 71,760	$ 72,000	14%
												PI Project 10-9 Total	**$ 530,000**	**10-9 Total**	**$ 80,000**	**14%**
PI Project 10-10																
10-Year	10-10	Pipe	12-inch diameter pipe	12	1435	1440	LF	$ 320	$ 460,800	$ 92,160	$ 46,080	$ 599,040	$ 600,000	$ 131,040	$ 132,000	22%
10-Year	10-10	Bore-12	Bore 12-inch diameter pipe across railroad (70')		70	70	LF	$ 3,000	$ 210,000	$ 42,000	$ 21,000	$ 273,000	$ 273,000	$ 91,000	$ 91,000	33%
												PI Project 10-10 Total	**$ 880,000**	**10-10 Total**	**$ 230,000**	**25%**
PI Project 10-11																
10-Year	10-11	Pipe	8-inch diameter pipe	8	4403	4410	LF	$ 270	$ 1,190,700	$ 238,140	$ 119,070	$ 1,547,910	$ 1,548,000	$ 1,547,910	$ 1,548,000	100%
10-Year	10-11	Bore-8	Bore 8-inch diameter pipe across canal structure (20')		1	1	LF	$ 2,000	$ 2,000	$ 400	$ 200	$ 2,600	$ 3,000	$ 2,600	$ 3,000	100%
												PI Project 10-11 Total	**$ 1,560,000**	**10-11 Total**	**$ 1,560,000**	**100%**
PI Project 10-12																
10-Year	10-12	Pipe	12-inch diameter pipe	12	1365	1370	LF	$ 320	$ 438,400	$ 87,680	$ 43,840	$ 569,920	$ 570,000	$ 569,920	$ 570,000	100%
												PI Project 10-12 Total	**$ 570,000**	**10-12 Total**	**$ 570,000**	**100%**
PI Project 10-13																
10-Year	10-13	Pipe	8-inch diameter pipe	8	502	510	LF	$ 270	$ 137,700	$ 27,540	$ 13,770	$ 179,010	$ 180,000	$ 179,010	$ 180,000	100%
10-Year	10-13	Pipe	6-inch diameter pipe	6	73	80	LF	$ 250	$ 20,000	$ 4,000	$ 2,000	$ 26,000	$ 26,000	$ 26,000	$ 26,000	100%
10-Year	10-13	Bore-8	Bore 8-inch diameter pipe across I-15 (300')		300	300	LF	$ 2,000	$ 600,000	$ 120,000	$ 60,000	$ 780,000	$ 780,000	$ 780,000	$ 780,000	100%
												PI Project 10-13 Total	**$ 990,000**	**10-13 Total**	**$ 990,000**	**100%**
PI Project 10-14																
10-Year	10-14	Pipe	8-inch diameter pipe	8	1793	1800	Each	$ 270	$ 486,000	$ 97,200	$ 48,600	$ 631,800	$ 632,000	$ 46,800	$ 47,000	7%
												PI Project 10-14 Total	**$ 640,000**	**10-14 Total**	**$ 50,000**	**7%**
PI Project 10-15																
10-Year	10-15	Pipe	10-inch diameter pipe	10	62	70	LF	$ 290	$ 20,300	$ 4,060	$ 2,030	$ 26,390	$ 27,000	$ 26,390	$ 27,000	100%
10-Year	10-15	PRV-30	PRV to 30" pipe on 400 W 700 S	30	1	1	Each	$ 400,000	$ 400,000	$ 80,000	$ 40,000	$ 520,000	$ 520,000	$ 520,000	$ 520,000	100%
												PI Project 10-15 Total	**$ 550,000**	**10-15 Total**	**$ 550,000**	**100%**
PI Project 10-16																
10-Year	10-16	Pipe	12-inch diameter pipe	12	1323	1330	LF	$ 320	$ 425,600	$ 85,120	$ 42,560	$ 553,280	$ 554,000	$ 121,030	$ 122,000	22%
10-Year	10-16	Bore-12	Bore 12-inch diameter pipe across canal (40')	12	40	40	LF	$ 3,000	$ 120,000	$ 24,000	$ 12,000	$ 156,000	$ 156,000	$ 52,000	$ 52,000	33%
												PI Project 10-16 Total	**$ 710,000**	**10-16 Total**	**$ 180,000**	**24%**
PI Project 10-17																
10-Year	10-17	Pipe	8-inch diameter pipe	8	1327	1330	LF	$ 270	$ 359,100	$ 71,820	$ 35,910	$ 466,830	$ 467,000	$ 34,580	$ 35,000	7%
10-Year	10-17	Bore-8	Bore 8-inch diameter pipe across canal (40')	8	40	40	LF	$ 2,000	$ 80,000	$ 16,000	$ 8,000	$ 104,000	$ 104,000	$ -	$ -	0%
												PI Project 10-17 Total	**$ 580,000**	**10-17 Total**	**$ 40,000**	**6%**

Springville City Pressurized Irrigation Water Master Plan - Capital Facility Plan Project Cost Estimates
Springville City
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AACE Class: 5

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10-2: Bid document - Lakeside-Landing Offsite PI Improvements by Landmark Excavating
10-3: Reimbursement agreement - Center Street pressurized irrigation water system improvements

Scenario	Project ID	Item Type	Location/Description	Diameter	Quantity	Rounded Quantity	Unit	Unit Cost	Base Cost	Contingency (20%)	Engineering (10%)	Project Total Cost	Project Total Cost *Rounded*	Impact Fee Eligible Cost	Impact Fee Eligible Cost *Rounded*	% Impact Fee Eligible
PI Project 20-1																
20-Year	20-1	Pipe	12-inch diameter pipe	12	1428	1430	LF	$ 320	$ 457,600	$ 91,520	$ 45,760	$ 594,880	$ 595,000	$ 130,130	$ 131,000	22%
20-Year	20-1	Bore-12	Bore 12-inch diameter pipe across canal structure (40')	12	40	40	LF	$ 3,000	$ 120,000	$ 24,000	$ 12,000	$ 156,000	$ 156,000	$ 52,000	$ 52,000	33%
												PI Project 20-1 Total	**$ 760,000**	**20-1 Total**	**$ 190,000**	**24%**
PI Project 20-2																
20-Year	20-2	Pipe	12-inch diameter pipe	12	1367	1370	LF	$ 320	$ 438,400	$ 87,680	$ 43,840	$ 569,920	$ 570,000	$ 124,670	$ 125,000	22%
20-Year	20-2	Bore-12	Bore 12-inch diameter pipe across railroad (70')	12	70	70	LF	$ 3,000	$ 210,000	$ 42,000	$ 21,000	$ 273,000	$ 273,000	$ 91,000	$ 91,000	33%
												PI Project 20-2 Total	**$ 850,000**	**20-2 Total**	**$ 220,000**	**26%**
PI Project 20-3																
20-Year	20-3	Pipe	16-inch diameter pipe	16	2265	2270	LF	$ 370	$ 839,900	$ 167,980	$ 83,990	$ 1,091,870	$ 1,092,000	$ 1,091,870	$ 1,092,000	100%
20-Year	20-3	UDOT	UDOT ROW (SR 77)		1	1	LS	10% project	$ 83,990	$ 16,798	$ 8,399	$ 109,187	$ 110,000	$ 109,187	$ 110,000	100%
												PI Project 20-3 Total	**$ 1,210,000**	**20-3 Total**	**$ 1,210,000**	**100%**
PI Project 20-4																
20-Year	20-4	Pipe	10-inch diameter pipe	10	5958	5960	LF	$ 290	$ 1,728,400	$ 345,680	$ 172,840	$ 2,246,920	$ 2,247,000	$ 309,920	$ 310,000	14%
20-Year	20-4	Bore-10	Bore 10-inch diameter pipe across canal (80')	10	80	80	LF	$ 2,400	$ 192,000	$ 38,400	$ 19,200	$ 249,600	$ 250,000	$ 41,600	$ 42,000	17%
												PI Project 20-4 Total	**$ 2,500,000**	**20-4 Total**	**$ 360,000**	**14%**
PI Project 20-5																
20-Year	20-5	Pipe	10-inch diameter pipe	10	5464	5470	LF	$ 290	$ 1,586,300	$ 317,260	$ 158,630	$ 2,062,190	$ 2,063,000	$ 284,440	$ 285,000	14%
20-Year	20-5	Bore-10	Bore 10-inch diameter pipe across Hobble Creek (100')	10	100	100	LF	$ 2,400	$ 240,000	$ 48,000	$ 24,000	$ 312,000	$ 312,000	$ 52,000	$ 52,000	17%
												PI Project 20-5 Total	**$ 2,380,000**	**20-5 Total**	**$ 340,000**	**14%**
PI Project 20-6																
20-Year	20-6	Pipe	10-inch diameter pipe	10	5355	5360	LF	$ 290	$ 1,554,400	$ 310,880	$ 155,440	$ 2,020,720	$ 2,021,000	$ 278,720	$ 279,000	14%
20-Year	20-6	Pipe	16-inch diameter pipe	16	2442	2450	LF	$ 370	$ 906,500	$ 181,300	$ 90,650	$ 1,178,450	$ 1,179,000	$ 382,200	$ 383,000	32%
20-Year	20-6	Bore-16	Bore 16-inch diameter pipe across railroad (170')	16	170	170	LF	$ 4,200	$ 714,000	$ 142,800	$ 71,400	$ 928,200	$ 929,000	$ 486,200	$ 487,000	52%
20-Year	20-6	Bore-16	Bore 16-inch diameter pipe across Hobble Creek (100')	16	100	100	LF	$ 4,200	$ 420,000	$ 84,000	$ 42,000	$ 546,000	$ 546,000	$ 286,000	$ 286,000	52%
20-Year	20-6	Bore-16	Bore 16-inch diameter pipe under I-15 (300')	16	300	300	LF	$ 4,200	$ 1,260,000	$ 252,000	$ 126,000	$ 1,638,000	$ 1,638,000	$ 858,000	$ 858,000	52%
												PI Project 20-6 Total	**$ 6,320,000**	**20-6 Total**	**$ 2,300,000**	**36%**
PI Project 20-7																
20-Year	20-7	Pipe	8-inch diameter pipe	8	1160	1160	LF	$ 270	$ 313,200	$ 62,640	$ 31,320	$ 407,160	$ 408,000	$ 407,160	$ 408,000	100%
20-Year	20-7	Pipe	20-inch diameter pipe	20	2010	2010	LF	$ 440	$ 884,400	$ 176,880	$ 88,440	$ 1,149,720	$ 1,150,000	$ 1,149,720	$ 1,150,000	100%
20-Year	20-7	Pipe	24-inch diameter pipe	24	2448	2450	LF	$ 510	$ 1,249,500	$ 249,900	$ 124,950	$ 1,624,350	$ 1,625,000	$ 1,624,350	$ 1,625,000	100%
20-Year	20-7	Bore-20	Bore 20-inch diameter pipe across railroad (150')	20	150	150	LF	$ 4,800	$ 720,000	$ 144,000	$ 72,000	$ 936,000	$ 936,000	$ 936,000	$ 936,000	100%
												PI Project 20-7 Total	**$ 4,120,000**	**20-7 Total**	**$ 4,120,000**	**100%**
PI Project 20-8																
20-Year	20-8	Pipe	12-inch diameter pipe	12	1955	1960	LF	$ 320	$ 627,200	$ 125,440	$ 62,720	$ 815,360	$ 816,000	$ 815,360	$ 816,000	100%
20-Year	20-8	Pipe	14-inch diameter pipe	14	1213	1220	LF	$ 330	$ 402,600	$ 80,520	$ 40,260	$ 523,380	$ 524,000	$ 523,380	$ 524,000	100%
20-Year	20-8	Bore-14	Bore 14-inch diameter pipe across SR75 (100')	14	100	100	LF	$ 3,600	$ 360,000	$ 72,000	$ 36,000	$ 468,000	$ 468,000	$ 468,000	$ 468,000	100%
												PI Project 20-8 Total	**$ 1,810,000**	**20-8 Total**	**$ 1,810,000**	**100%**
PI Project 20-9																
20-Year	20-9	Pipe	10-inch diameter pipe	10	2468	2470	LF	$ 290	$ 716,300	$ 143,260	$ 71,630	$ 931,190	$ 932,000	$ 931,190	$ 932,000	100%
20-Year	20-9	Bore-10	Bore 10-inch diameter pipe across canal (40')	10	40	40	LF	$ 2,400	$ 96,000	$ 19,200	$ 9,600	$ 124,800	$ 125,000	$ 124,800	$ 125,000	100%
												PI Project 20-9 Total	**$ 1,060,000**	**20-9 Total**	**$ 1,060,000**	**100%**
PI Project 20-10																
20-Year	20-10	Pipe	8-inch diameter pipe	8	460	460	LF	$ 270	$ 124,200	$ 24,840	$ 12,420	$ 161,460	$ 162,000	$ 11,960	$ 12,000	7%
20-Year	20-10	Bore-8	Bore 8-inch diameter pipe across canal (40')	8	40	40	LF	$ 2,000	$ 80,000	$ 16,000	$ 8,000	$ 104,000	$ 104,000	$ -	$ -	0%
												PI Project 20-10 Total	**$ 270,000**	**20-10 Total**	**$ 20,000**	**5%**
PI Project 20-11																
20-Year	20-11	Pipe	8-inch diameter pipe	8	489	490	LF	$ 270	$ 132,300	$ 26,460	$ 13,230	$ 171,990	$ 172,000	$ 12,740	$ 13,000	7%
												PI Project 20-11 Total	**$ 180,000**	**20-11 Total**	**$ 20,000**	**7%**
PI Project 20-12																
20-Year	20-12	PS	East Dry Creek PS		1	1	Each	$ 5,000,000	$ 5,000,000	$ 1,000,000	$ 500,000	$ 6,500,000	$ 6,500,000	$ 6,500,000	$ 6,500,000	100%
20-Year	20-12	Pond	East Dry Creek Holding Pond		3	3	ac-ft	$ 400,000	$ 1,200,000	$ 240,000	$ 120,000	$ 1,560,000	$ 1,560,000	$ 1,560,000	$ 1,560,000	100%
												PI Project 20-12 Total	**$ 8,060,000**	**20-12 Total**	**$ 8,060,000**	**100%**
PI Project 20-13																
20-Year	20-13	PS	West Dry Creek PS		1	1	Each	$ 5,000,000	$ 5,000,000	$ 1,000,000	$ 500,000	$ 6,500,000	$ 6,500,000	$ 6,500,000	$ 6,500,000	100%
20-Year	20-13	Pond	West Dry Creek Holding Pond		3	3	ac-ft	$ 400,000	$ 1,200,000	$ 240,000	$ 120,000	$ 1,560,000	$ 1,560,000	$ 1,560,000	$ 1,560,000	100%
												PI Project 20-13 Total	**$ 8,060,000**	**20-13 Total**	**$ 8,060,000**	**100%**

	Total		Impact Fee Eligible	
10-Year	**$ 24,664,000**	**10-Year**	**$ 18,484,000**	**75%**
20-Year	**$ 37,580,000**	**20-Year**	**$ 27,770,000**	**74%**

APPENDIX C

Water Right Summary

Springville City Water Rights DRAFT

Status[1]	Water Right #	Change or Exchange #	Change Priority Date	Type[2, 3]	Proof Due Date	Base Priority	Segregated From	Group #	Use[4]	Period of Use	Owner	Address[5]	Flow (cfs)	Reference Flow[6]	Quantity (AF)	Reference Quantity[6]	Quantity Used for Reuse Permit (AF)	Depletion (AF)	Reference Depletion Value[7] (AF)	Perecent Depletion from Diversion (%)	Percent Return to Utah Lake (%)	Volume Return to Utah Lake (AF)	Prior Source	Source	Points of Diversion	Source #	Source Common Name	Irrigation Company	Number of Shares	Quantity based on Shares (AF)	Action Needed[8]	Notes
Well Water Rights (Municipal)																																
CERT	51-1024			APPL		1925							1.980		1433.52			1433.52	APPL 1925	100%	0.00	0.00	underground stream		(1) N 1400 feet W 485 feet from SE corner, Sec 29 T 7S R 3E SLBM (2) N 675 feet E 1452 feet from SW corner, Sec 34 T 7S R 3E SLBM (3) N 1105 feet E 392 feet from W4 corner, Sec 34 T 7S R 3E SLBM (4) N 666 feet E 83 feet from W4 corner, Sec 2 T 8S R 3E SLBM (5) N 957 feet W 3964 feet from E4 corner, Sec 3 T 8S R 3E SLBM (6) N 122 feet W 397 feet from E4 corner, Sec 4 T 8S R 3E SLBM (7) N 1350 feet W 825 feet from E4 corner, Sec 9 T 8S R 3E SLBM	28851 (WS007) 428960 (WS005) 428961 (WS004) 31850 (WS012) 23334 (WS008) 433148 (WS006) 23335 (WS011)	Industrial Park Well-Treatment Plant Well(inactive) 400 South 900 East Well 200 North 800 East Well Canyon Road Well 900 South 1000 East Well 1000 South Well Evergreen Well						
	51-1025	a28367(2003) certificated(2018)	2003	APPL	Certificated	1925	None	636971	M	01/01-12/31	Springville City Corporation	City	0.144	CERT (2018)	104.26	CERT (2018)	2377.760	104.26	APPL 1925	100%	0.00	0.00	underground stream	Wells							
	51-1088			APPL		1950							0.390		282.36			47.06	PROOF 1954	17%	0.83	235.30	well								
	51-6970			APPL		1925							0.770		557.62			557.62	Calculated from use	100%	0.00	0.00	wells?								
CERT	51-2530	a29656(2004) certificated 2019	2004	UGWC	Certificated	1900	None	636971	M	01/01-12/31	Springville City	City	6.02	Proof(2022)	8.28	CERT (2019)	144.280	76.03	OSE(2005)	53%	47%	68.25	well	Wells	(1) N 1400 feet W 485 feet from SE corner, Sec 29 T 7S R 3E SLBM (2) N 675 feet E 1452 feet from SW corner, Sec 34 T 7S R 3E SLBM	28851 (WS007) 428960 (WS005)	Industrial Park Well-Treatment Plant Well(inactive)					
	51-3679			DEC		1851					Springville City				136.00								Roundy Springs								
CERT	51-2780	a28366(2003) certificated 2018	1992	DIL	Certificated	1874	None	636971	M	01/01-12/31	Springville City	City	3.00	CERT (2018)	439.03	CERT (2018)	439.03	240.37	OSE(2003)	55%	45%	198.66	springs	Wells	(1) N 1400 feet W 485 feet from SE corner, Sec 29 T 7S R 3E SLBM (2) N 675 feet E 1452 feet from SW corner, Sec 34 T 7S R 3E SLBM (3) N 1105 feet E 392 feet from W4 corner, Sec 34 T 7S R 3E SLBM (4) N 666 feet E 83 feet from W4 corner, Sec 2 T 8S R 3E SLBM (5) N 957 feet W 3964 feet from E4 corner, Sec 3 T 8S R 3E SLBM (6) N 122 feet W 397 feet from E4 corner, Sec 4 T 8S R 3E SLBM (7) N 1350 feet W 825 feet from E4 corner, Sec 9 T 8S R 3E SLBM	28851 (WS007) 428960 (WS005) 428961 (WS004) 31850 (WS012) 23334 (WS008) 433148 (WS006) 23335 (WS011)	Industrial Park Well-Treatment Plant Well(inactive) 400 South 900 East Well 200 North 800 East Well Canyon Road Well 900 South 1000 East Well 1000 South Well Evergreen Well	N/A	N/A	N/A		Change Application a28366 changed quantity from 462.38 to 439.03.
APP	51-1111	a26443	2002	APPL	4/30/2027	1944		227309	M	01/01-12/31	Springville City Corporation East Jordan Irrigation Co.	City	0.441	OSE(2002)	16.00	OSE(2002)	102.900	8.48	OSE(2002)	53%	47%	7.52	spring	wells	(1) N 1400 feet W 485 feet from SE corner, Sec 29 T 7S R 3E SLBM (2) N 675 feet E 1452 feet from SW corner, Sec 34 T 7S R 3E SLBM (3) N 1105 feet E 392 feet from W4 corner, Sec 34 T 7S R 3E SLBM (4) N 957 feet W 3964 feet from E4 corner, Sec 3 T 8S R 3E SLBM (5) N 1350 feet W 825 feet from E4 corner, Sec 9 T 8S R 3E SLBM	28851 (WS007) 428960 (WS005) 428961 (WS004) 23334 (WS008) 23335 (WS011)	Industrial Park Well-Treatment Plant Well(inactive) 400 South 900 East Well 200 North 800 East Well 1000 South Well Evergreen Well	East Jordan Irrigation Company	10.00	48.40		
	51-6666			APPL		1944	51-1104								36.00			19.71		55%	45%	16.3	well								
	51-6990			APPL		1935	51-1035								2.50			1.88		75%	25%	0.6	well								
	51-7242			SHAR		1998	None								48.40			20.52		42%	58%	27.9	river								
APP	51-1455	a42209(2016)	2016	APPL	3/31/2031	1960	None	636971	M	01/01-12/31	Springville Municipal Corporation	City	11.000	OSE(2017)	7963.65	Calculated from Flow	7963.650	7963.65	Municipal in APPL (1960)	100%	0.00	0.00	wells	wells	(1) N 1400 feet W 485 feet from SE corner, Sec 29 T 7S R 3E SLBM (2) N 675 feet E 1452 feet from SW corner, Sec 34 T 7S R 3E SLBM (3) N 1105 feet E 392 feet from W4 corner, Sec 34 T 7S R 3E SLBM	28851 (WS007) 428960 (WS005) 428961 (WS004)	Industrial Park Well-Treatment Plant Well(inactive) 400 South 900 East Well	N/A	N/A	N/A	Check POD Descriptions	Proof Filed 3/18/2022
	51-1486			APPL																												
	51-1493			APPL																												
APP	51-5450	a40919	2015	DIL PD	12/4/2023 File Now	1861	None	227551	M	01/01-12/31	Springville City	City	2.97	OSE	13.80	OSE	13.796	7.84	OSE(2015)	0.57	0.43	5.96	Little Spring Creek	wells	(1) N 1400 feet W 485 feet from SE corner, Sec 29 T 7S R 3E SLBM (2) N 661 feet E 1462 feet from SW corner, Sec 34 T 7S R 3E SLBM (3) N 1076 feet E 369 feet from W4 corner, Sec 34 T 7S R 3E SLBM (4) N 666 feet E 83 feet from W4 corner, Sec 2 T 8S R 3E SLBM (5) N 957 feet W 3964 feet from E4 corner, Sec 3 T 8S R 3E SLBM (6) N 122 feet W 397 feet from E4 corner, Sec 4 T 8S R 3E SLBM (7) N 1350 feet W 825 feet from E4 corner, Sec 9 T 8S R 3E SLBM	28851 (WS007) 428960 (WS005) 428961 (WS004) 31850 (WS012) 23334 (WS008) 433148 (WS006) 23335 (WS011)	Industrial Park Well-Treatment Plant Well(inactive) 400 South 900 East Well 200 North 800 East Well Canyon Road Well 900 South 1000 East Well 1000 South Well Evergreen Well	N/A	N/A	N/A	Check POD Descriptions	Proof Filed 3/18/2020 - Proof Returned 10/5/2023 but Extension will be accepted if filed by 12/4/2023.
APP	51-8641	a40920	2015	DIL	2/28/2030	1861	51-5454	N/A	M	01/01-12/31	Springville City	City	N/A	N/A	33.36	OSE(2016)	33.360	17.55	OSE(2016)	52.61%	47.39%	15.81	creek	wells	(1) N 1400 feet W 485 feet from SE corner, Sec 29 T 7S R 3E SLBM (2) N 661 feet E 1462 feet from SW corner, Sec 34 T 7S R 3E SLBM (3) N 1076 feet E 369 feet from W4 corner, Sec 34 T 7S R 3E SLBM (4) N 666 feet E 83 feet from W4 corner, Sec 2 T 8S R 3E SLBM (5) N 957 feet W 3964 feet from E4 corner, Sec 3 T 8S R 3E SLBM (6) N 122 feet W 397 feet from E4 corner, Sec 4 T 8S R 3E SLBM (7) N 1350 feet W 825 feet from E4 corner, Sec 9 T 8S R 3E SLBM	28851 (WS007) 428960 (WS005) 428961 (WS004) 31850 (WS012) 23334 (WS008) 433148 (WS006) 23335 (WS011)	Industrial Park Well-Treatment Plant Well(inactive) 400 South 900 East Well 200 North 800 East Well Canyon Road Well 900 South 1000 East Well 1000 South Well Evergreen Well	N/A	N/A	N/A		
APP	51-8793	a43986	2018	SHAR	10/31/2032	2018	None	N/A	M	01/01-12/31	Springville City Corporation	City	N/A	N/A	15.00	OSE(2018)	15.000	11.28	OSE(2018)	75.20%	24.80%	3.72	creek	wells	(1) N 1400 feet W 485 feet from SE corner, Sec 29 T 7S R 3E SLBM (2) N 675 feet E 1452 feet from SW corner, Sec 34 T 7S R 3E SLBM (3) N 1105 feet E 392 feet from W4 corner, Sec 34 T 7S R 3E SLBM (4) N 666 feet E 83 feet from W4 corner, Sec 2 T 8S R 3E SLBM (5) N 957 feet W 3964 feet from E4 corner, Sec 3 T 8S R 3E SLBM (6) N 122 feet W 397 feet from E4 corner, Sec 4 T 8S R 3E SLBM (7) N 1350 feet W 825 feet from E4 corner, Sec 9 T 8S R 3E SLBM (8) N 1125 ft E 1425 ft from SW corner, Sec 34 T 7S R 3E SLBM	28851 (WS007) 428960 (WS005) 428961 (WS004) 31850 (WS012) 23334 (WS008) 433148 (WS006) 23335 (WS011) 440770	Industrial Park Well-Treatment Plant Well(inactive) 400 South 900 East Well 200 North 800 East Well Canyon Road Well 900 South 1000 East Well 1000 South Well Evergreen Well New Well	Wash Creek Irrigation Company	5.00	15.00		
Subtotal																	11,089.78	10,509.76		94.77%											10953.516
												SubTotal:					**2,961.07**														
																	11027.620														

Spring Water Rights (Municipal)

DEC	51-5328	N/A	N/A	DIL PD	Decreed	1903	None				Springville Municipal Corporation	City	1.00	PD(1986)	723.97	Calculated from Flow	0.0000	0.00					spring	spring	(1) S 2590 feet E 198 feet from W4 corner, Sec 33 T 7S R 4E SLBM	Secondary System	Jurd Springs	N/A	N/A	N/A		Producton data reported shows from 2018 to 2022, use of 75 to 113 acre-feet. Not included for reuse (doesn't return to their treatment plant)
DEC	51-5329	N/A	N/A	DIL PD	Decreed	1890	None				Springville Municipal Corporation	City	5.50	PD(1986)	3981.820	Calculated from Flow	3981.8200	3981.82	Assumed from Original Municipal Use	100%	0.00	0.00	spring	spring	(1) S 800 feet E 840 feet from W4 corner, Sec 1 T 8S R 3E SLBM	WS003	Burt Springs	N/A	N/A	N/A		Producton data reported shows from 2018 to 2022, use of 1,017 to 1,969 acre-feet. Should reuse diversion be cut back based on reported use? **Diligence Claim(1981)** - Claimed to have been a municipal source prior to 1903.
DEC	51-5330	N/A	N/A	UGWC PD	Decreed	1890	None	231296 231297 231377 631867 631893 631909 631910 631911 631912 636652	M I S	01/01-12/31 04/01-10/31 01/01-12/31	Springville Municipal Corporation	City	0.40	PD(1986)	289.587	Calculated from Flow	289.5870	289.59	Assumed from Original Municipal Use	100%	0.00	0.00	spring	spring	(1) S 969 feet E 295 feet from N4 corner, Sec 2 T 8S R 3E SLBM	WS009	Konold Spring	N/A	N/A	N/A		
DEC	51-6027	N/A	N/A	DIL PD	Decreed	1851	None				Springville Municipal Corporation	City	5.50	PD(1986)	3981.820	Calculated from Flow	3981.8200	3981.82	Assumed from Original Municipal Use	100%	0.00	0.00	spring	spring	(1) N 1459 feet E 1530 feet from S4 corner, Sec 35 T 7S R 3E SLBM (2) N 1495 feet E 1032 feet from S4 corner, Sec 35 T 7S R 3E SLBM	WS002	Spring Creek Canyon Springs	N/A	N/A	N/A		Producton data reported shows from 2018 to 2022, use of 1,076 to 2,377 acre-feet. Should reuse diversion be cut back based on reported use?
DEC	51-5520	N/A	N/A	SHAR PD	Decreed	1851	None				Springville City Corporation Springville Irrigation Company	City	4.00	PD(1986)	1068.000	Calculated from Shares	1068.000	534.00	Based off Irrigation use	50%	534.00	0.00	spring	spring	(1) N 1546 feet E 207 feet from S4 cor Sec 08 T7S R4E SL or (1) N 1504 feet W 2321 feet from SE corner, Sec 8 T 7S R 4E SLBM	WS001	Lower Bartholomew Spring	Springville Irrigation Company (SIC)	267	1068.00		Quantity - Calculated from 1986 PD statement that the right has a total irrigated acreage for all claims of 35.69 acres. A flow of 4 cfs is 2,895.87 acre-feet per year. This is the only consumptive City water right for this spring. Production data reported shows from 2018 to 2022, use of 1,027 to 1,064 acre-feet. To be consisten with Springville Irrigation Company (SIC) - depletion is assumed to be 50%
Subtotal																	9,321.23	8,787.23		94%	534.00										
												Subtotal					**20,348.85**														

River Water Rights (Municipal and/or Decreed)

APP	51-7463	a45344	2019	DIL	3/31/2030	1861	51-4541	232966	M	01/01-12/31	Springville City	City	N/A	N/A	37.20	OSE	0.00	0.00		#DIV/0!			creek	creek	(1) N 1024 feet W 3766 feet from SE corner, Sec 20 T 7S R 3E SLBM	None Assigned	Little Spring Creek Industrial Pump Station (Stouffers)	N/A	N/A	N/A		**Springville City a24494(2000)** Filed to be used in City's secondary system but system not built (withdrawn) **Springville City a45344(2019)** municipal. POD where stream can be used as municipal irrigation. **Removed from reuse application based on City's input**
DEC	51-5224	N/A	N/A	PD	Decreed	1851	None	231296 231297 231377 631867 631893 631909 631910 631911 631912	M I S	01/01-12/31 04/01-10/31 01/01-12/31	Springville Municipal Corporation	City	8.00	PD(1986)?	5,791.74	Calculated from Flow	5,791.74	5,791.74		100%			creek	creek	(1) S 2590 feet E 198 feet from W4 corner, Sec 33 T 7S R 4E SLBM		Hobble Creek	N/A	N/A	N/A		
DEC	51-6025	N/A	N/A	WUC PD	Decreed	1851	None	231705 631859 631864 631912	I S	04/01-10/31 01/01-12/31	Springville Municipal Corporation	City	6.50	PD(1986)	490.12	PD(1986)	490.12	490.12		100%			creek	creek	(1) S 800 feet E 3150 feet from NW corner, Sec 6 T 8S R 4E SLBM		Hobble Creek (through Highline Canal)	N/A	N/A	N/A		**Deliverd through Highline Canal**
Subtotal																	6,281.86	6,281.86													
												Subtotal																			
Total Approved																	**26,692.86**	**25,578.85**													
																	18564.157														

Perfected Water Rights: 580.01

City Water Rights Not Approved for Municipal Use

Pending APP	51-8792	a44541	2019	SHAR	N/A	1890-1934	None	724481	I	4/01-10/31	Springville City Corporation Wood Springs Irrigation Company	City Wood Springs	N/A	N/A	233.784	Share Statement (2018)	233.784	116.89					well drain	well drain	(1) N 28 feet W 5025 feet from E4 corner, Sec 32 T 7S R 3E SLBM (2) S 670 feet W 1370 feet from E4 corner, Sec 32 T 7S R 3E SLBM (3) S 570 feet W 1350 feet from E4 corner, Sec 32 T 7S R 3E SLBM (4) S 793 feet W 2635 feet from E4 corner, Sec 32 T 7S R 3E SLBM (5) S 33 feet W 2403 feet from E4 corner, Sec 32 T 7S R 3E SLBM	(1) 3421		Wood Springs Irrigation Company	64.94	108.19	Share Value was updated	2/20/2025 - Regional Office (Jacob Wright) said there were no notes on why these applications were deferred. He recommended sending a letter from the City asking that the application be reactivated. It appears however that the hang-up is changing them to municipal status for

Pending APP	51-8366	a35086	2008	SHAR	N/A	1890-1934	None	631934	I	4/01-10/31	Springville City Corporation Wood Springs Irrigation Company	City Wood Springs	N/A	N/A	252.000	Share Statement (2008)	252.000	126.00					drain	drain	(1) S 670 feet W 1370 feet from E4 corner, Sec 32 T 7S R 3E SLBM			Wood Springs Irrigation Company	63	104.958	Request to Activate	drinking water use. Applications have been approved recently but are irrigation rights that state the strawberry portion will not be used for domestic use.
Pending APP	51-8791	a43637	2018	SHAR	N/A	1861	None	724480	I	4/01-10/31	Springville City Corporation Mill Pond Irrigation Company	City Mill Pond Irrigation	N/A	N/A	387.855	Share Statement (2018)	387.855	193.93					springs creek	springs creek	(1) S 3030 feet E 20 feet from N4 corner, Sec 28 T 7S R 3E SLBM (2) S 150 feet W 1320 feet from NE corner, Sec 32 T 7S R 3E SLBM (3) S 860 feet W 1050 feet from E4 corner, Sec 30 T 7S R 3E SLBM (4) N 790 feet W 480 feet from SE corner, Sec 29 T 7S R 3E SLBM		(1) Mill Pond (2) Hobble Creek (3) Mill Pond Irrigation Well (4) Mendenahl Spring	Mill Pond Irrigation Company	99.45	396.8055	Check Share Value	12/04/2008 - Change Application filed on 89.63 12/14/2011 - Mill Pond Irrigation Company - States 89.63 shares, 391.68 AF, 39.17 AF carrier losses, and 352.51 AF available to transfer out of the system. 4.37 AF, 10% losses, 3.933 AF 04/26/2012 - 06/29/2020 - OSE, PD 535.28 acres irrigation and 504.21 shares, Company stated 3.99 AF per share. 6/2011 Franson Civil Engineers states 1660 AF delivery. DWRi concludes 3.304 AF per share, 0.826 acre/share, depletion 1.863 AF per share. Approved 89.63 shares for 266.5238 AF and 166.98 AF. 7/20/2020 - Request for Reconsideration granted to the City on 7/22/2020 In light of the critical nature of the share calculations, the City respectfully requests that you grant this Request for Reconsideration and revert the Change Applications to unapproved status in order to give the City and the irrigation companies the necessary time to research the key information, provide the Division with the requested information and documentation, and to review the share calculations with the **Division. J. Craig Smith and Jeffry R. Gittins.**
Pending APP	51-8639	a40922	2015	SHAR	N/A	1890-1934	None	637325	I	4/01-10/31	Springville City Corporation Springville Irrigation Company	City Springville Irrigation	N/A	N/A	259.400	Share Statement (2015)	259.400	129.70					creek spring well	creek spring well	All SIC diversions, etc			Springville Irrigation Company (SIC)	64.85	259.4	Not listed on Company Page	
Pending APP Objection in PD	51-8368	a35091	2008	SHAR WUC	N/A	1890-1934	None	231366	I	4/01-10/31	Springville City Corporation Springville Irrigation Company	City	N/A	N/A	1236.080	Share Statement (2008)	1236.080	618.04					creek	creek	(1) N 1770 feet E 1860 feet from SW corner, Sec 1 T 8S R 3E SLBM (2) N 1048 feet W 1368 feet from SE corner, Sec 2 T 8S R 3E SLBM (3) N 964 feet E 715 feet from SW corner, Sec 2 T 8S R 3E SLBM (4) S 582 feet E 53 feet from NW corner, Sec 3 T 8S R 3E SLBM (5) S 800 feet E 3150 feet from NW corner, Sec 6 T 8S R 4E SLBM		Hobble Creek: #1 Diversion Island Dam Diversion Sage Creek Diversion Swenson Dam Diversion City Dam Diversion	Springville Irrigation Company (SIC)	309.02	1236.08	Objection in PD	
Pending APP	51-8790	a44540	2019	SHAR	N/A	1890-1934	None	724479	I	4/01-10/31	Springville City Corporation Springville Irrigation Company	City	N/A	N/A	3660.000	Share Statement (2018)	3660.000	1830.00					creek spring well	creek spring well	See SIC points of diversion		Hobble Creek Dry Creek Left Fork Hobble Creek Burt Springs Well	Springville Irrigation Company (SIC)	915	3660		
Pending APP	51-8367	a35088	2008	SHAR	N/A	1861	None	230402	I S	4/01-10/31 01/01-12/31	Springville City Corporation Coffman Springs Irrigation Company	City Coffman Springs	N/A	N/A	46.560	Share Statement (2008)	46.560	23.28					spring	spring	(1) S 1220 feet W 670 feet from N4 corner, Sec 32 T 7S R 3E SLBM		Coffman Springs	Springville Irrigation Company (SIC)	11.64	26.72544	Check Share Value	
None	51-8794	N/A	N/A	SHAR	N/A	1851-1953	None	724483	I	4/01-10/31	Springville City Corporation Mapleton Irrigation Company	City Mapleton Irrigation	N/A	N/A	0.380	Share Statement (2018)	0.380	0.19					creeks springs	creeks springs	See MIC points of diversion		Hobble Creek Maple Canyon Creek Fullmer Spring Red Pine Spring Grindstone Spring	Mapleton Irrigation Company (MIC)	0.38	0.38		Not Included in total amount for reuse (include for pending amount)
Pending APP	51-1322	a28531(pending)	2003	APPL	N/A	1955	None	227541-227544 227546-227560	I S	4/01-10/31 01/01-12/31	Springville Municipal Corporation	City	4.57	CERT (1969)	Unevaluated Sole Supply	CERT (1969)	909.710	454.86					drain	wells	(1) S 592 feet W 135 feet from NE corner, Sec 32 T 7S R 3E SLBM	Drain	Abandoned Sewer Drain	N/A	N/A	N/A	File Declaration of Beneficial Use Process Change Application	Not included in total amount for reuse (include for pending amount) Beneficial Use Groups have multiple other owners and no sole supply of this right.
WUC	51-5453	none	N/A	DIL	N/A	1861	None	227546	I S	4/01-10/31 01/01-12/31	Springville City	City	2.97	PD(1986)	Unevaluated Sole Supply	N/A	0.000	0.00							(1) N 250 feet E 2365 feet from SW corner, Sec 28 T 7S R 3E SLBM (2) S 300 feet W 800 feet from NE corner, Sec 33 T 7S R 3E SLBM	Creek	Little Spring Creek	N/A	N/A	N/A	File Declaration of Beneficial Use Change Application to municipal	Not included for reuse. **ROC(2020) -** To Springville City Beneficial Use Groups have multiple other owners and no sole supply of this right. Supplemental Use to 51-1322 and 51-2778 (owned by Corp of Presiding Bishop) Groups total 18.86 acre-feet
Pending Totals												**SubTotal:**					**6,985.77**	**3,492.88**			**50%**												

APPENDIX D

2022 Water Conservation Plan

CITY COUNCIL OF SPRINGVILLE CITY

RESOLUTION NUMBER: #2022-52

SHORT TITLE: A RESOLUTION BY THE SPRINGVILLE CITY COUNCIL ADOPTING THE SPRINGVILLE CITY WATER CONSERVATION PLAN 2022.

PASSAGE BY THE CITY COUNCIL
ROLL CALL

NAME	MOTION	SECOND	FOR	AGAINST	OTHER
Liz Crandall		✓	✓		
Craig Jensen			✓		
Chris Sorensen			✓		
Jason Miller	✓		✓		
Mike Snelson			✓		
	TOTALS		5	—	—

This resolution was passed by the City Council of Springville City, Utah, on the 20th day of December 2022; on a roll call vote as described above.

Approved and signed by me this 20th day of December 2022.

CORPORATE SEAL SPRINGVILLE, UTAH

Matt Packard, Mayor

ATTEST:

Kim Crane, City Recorder

RESOLUTION #2022-52

A RESOLUTION BY THE SPRINGVILLE CITY COUNCIL ADOPTING THE SPRINGVILLE CITY WATER CONSERVATION PLAN 2022.

WHEREAS, Springville City recognizes the need to conserve water within *Springville City*; and

WHEREAS, Springville City has participated in the creation of a water conservation plan, hereby known as the Springville City Water Conservation Plan 2022 in accordance with State Code 73-10-32; and

WHEREAS, the Springville City Water Conservation Plan 2022 identifies water conservation goals and actions to reduce water on property in Springville City as required by State law; and

WHEREAS, adoption by Springville City demonstrates their commitment to conserve water and achieve the goals outlined in the Springville City Water Conservation Plan 2022; and

WHEREAS, after providing the 14-day public notice as required by Utah State law, the Springville City Council held a public hearing and found that the Springville City Water Conservation Plan 2022 meets the requirements of Utah State law and is in the best interests of Springville City's water conservation efforts moving forward.

NOW THEREFORE, BE IT RESOLVED BY THE SPRINGVILLE CITY COUNCIL:

SECTION 1. Springville City approves and adopts the Springville City Water Conservation Plan 2022 and directs public works to submit to the Division of Drinking Water, with Utah State.

SECTION 2. This resolution shall be effective on the date it is adopted.

CORPORATE SEAL
SPRINGVILLE, UTAH

Passed this 20th day of December, 2022

Matt Packard, Mayor
Springville City

Attest:

Kim Crane, City Recorder

EXHIBIT A

Springville City Water Conservation Plan 2022

SPRINGVILLE CITY

2022 WATER CONSERVATION PLAN UPDATE

(HAL Project No.: 260.58.100

December 2022

SPRINGVILLE CITY

2022 WATER CONSERVATION PLAN UPDATE

(HAL Project No.: 260.58.100)

Lance Nielsen, P.E.
Principal, Project Engineer

HANSEN ALLEN & LUCE inc
ENGINEERS

December 2022

ACKNOWLEDGEMENTS

Successful completion of this water conservation plan update was made possible by the cooperation and assistance of many individuals, including the Mayor of Springville, City Council members, and City Staff as shown below. We sincerely appreciate the cooperation and assistance provided by these individuals.

Springville City

Mayor
Matt Packard

City Council
Liz Crandall
Craig Jensen
Jason Miller
Chris Sorensen
Michael Snelson

Public Works Department
Brad Stapley, Public Works Director

Water Department Staff
Shawn Barker, Water Supervisor

TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

CHAPTER 1 – INTRODUCTION

PURPOSE

The purpose of this plan is to assess the water conservation alternatives available to Springville, Utah (the City), to set reasonable and achievable goals to conserve water, and to identify the methods and measures which the City will take to reach these goals. This plan will serve as a guide to maintaining the same level of service to Springville's residents into the future.

This plan addresses future water needs and the City's ability to meet these needs. The City may choose the presented alternatives that best suit their interests, while attaining the selected goals. Once the conservation measures are implemented, the water system will be monitored to ensure that the methods are effective in improving water conservation.

BACKGROUND

Historically, the City has consistently met its primary goal of meeting the water demands for its residents. Engineering, master planning, and good civic leadership have been the keys for keeping the City on track. This plan will serve as a guide to maintaining the same level of service to Springville Residents into the future.

The City of Springville recognizes the need for proactive planning to meet the water needs of its residents. The Utah State Legislature has passed legislation requiring public water suppliers to prepare and periodically update a Water Conservation Plan. This report is an update to the 2016 Water Conservation Plan for the City. Included in this document are descriptions of the drinking water and pressurized irrigation (PI) systems, summaries of water consumption rates, assessments of water conservation alternatives, goals for water conservation, and details for existing and proposed conservation measures for the City.

CHAPTER 2 – EXISTING WATER SYSTEMS

SYSTEM PROFILES

The City is located in southern Utah County, on the eastern side of Utah Lake. The City boundaries include approximately 15 square miles, with an additional annexation area of approximately 17 square miles planned for future acquisition. The City also services some residents in Hobble Creek Canyon, which is outside the City limits.

M&I Water Connections

The City owns and operates both a public drinking water system and a public pressurized irrigation system servicing 9,666 and 1,591 connections respectively (Utah Division of Water Rights, 2022). The City began service for the pressurized irrigation system in 2019 and is actively pursuing growth of the system. A summary of the drinking water system connections for 2005 to 2021 is included in Table 2-1 below.

Table 2-1: Drinking Water Connections

Year	Connection Distribution					Total Connections
	Residential	Commercial	Industrial	Institutional	Other	
2005	93.59%	4.96%	0.48%	0.86%	0.11%	**7,240**
2006	93.43%	5.09%	0.46%	0.90%	0.12%	**7,334**
2007	93.53%	5.04%	0.40%	0.90%	0.13%	**7,664**
2008	93.31%	5.19%	0.39%	0.98%	0.14%	**7,770**
2009	92.48%	5.16%	0.38%	0.99%	0.99%	**7,964**
2010	92.48%	5.16%	0.37%	0.98%	1.01%	**8,084**
2011	92.39%	5.23%	0.33%	1.02%	1.03%	**8,159**
2012	92.22%	5.23%	0.33%	1.16%	1.05%	**8,177**
2013	91.82%	5.42%	0.01%	1.70%	1.05%	**8,471**
2014	92.12%	5.59%	0.09%	1.78%	0.41%	**8,531**
2015	90.76%	5.97%	0.09%	3.18%	-	**8,765**
2016	92.08%	5.84%	0.09%	1.99%	-	**8,685**
2017	93.83%	4.01%	0.09%	2.06%	-	**8,673**
2018	92.43%	5.48%	0.09%	2.00%	-	**8,983**
2019	92.75%	4.91%	0.56%	1.78%	-	**9,099**
2020	92.74%	4.93%	0.62%	1.70%	-	**9,344**
2021	92.76%	4.98%	0.60%	1.67%	-	**9,666**

Source: Utah Division of Water Rights

As shown in Table 2-1, most of the drinking water system connections are residential; while not shown in any table or figure, this is also the case for the pressurized irrigation system. The “other” category of service connections in Table 2-1 includes stock, wholesale, miscellaneous, and unmetered connections. The City has made efforts to install meters on unmetered connections,

and as of 2016, no unmetered connections have been reported to the Division of Water Rights. Water meters are read monthly, March through October, and are replaced on an as-needed basis.

In 2019, the City began reporting service for customers within the pressurized irrigation system to the Division of Water Rights. The pressurized irrigation system currently only serves the newer developments on the west side of the City. Since the PI service began, the City has expanded it rapidly, with the total number of connections growing from 894 in 2019 to 1,399 in 2021 (Utah Division of Water Rights, 2022). Figure 2-1 shows a chart of the total service connections for both the drinking water system and pressurized irrigation system from 2005 to 2021.

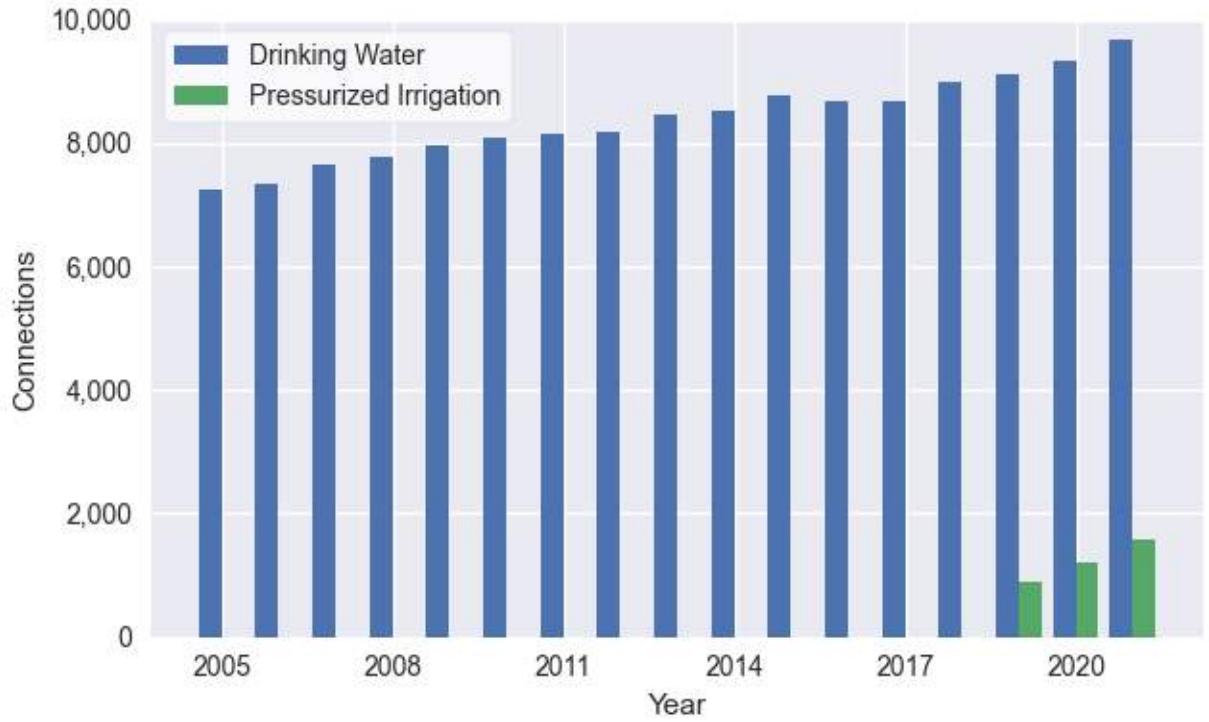
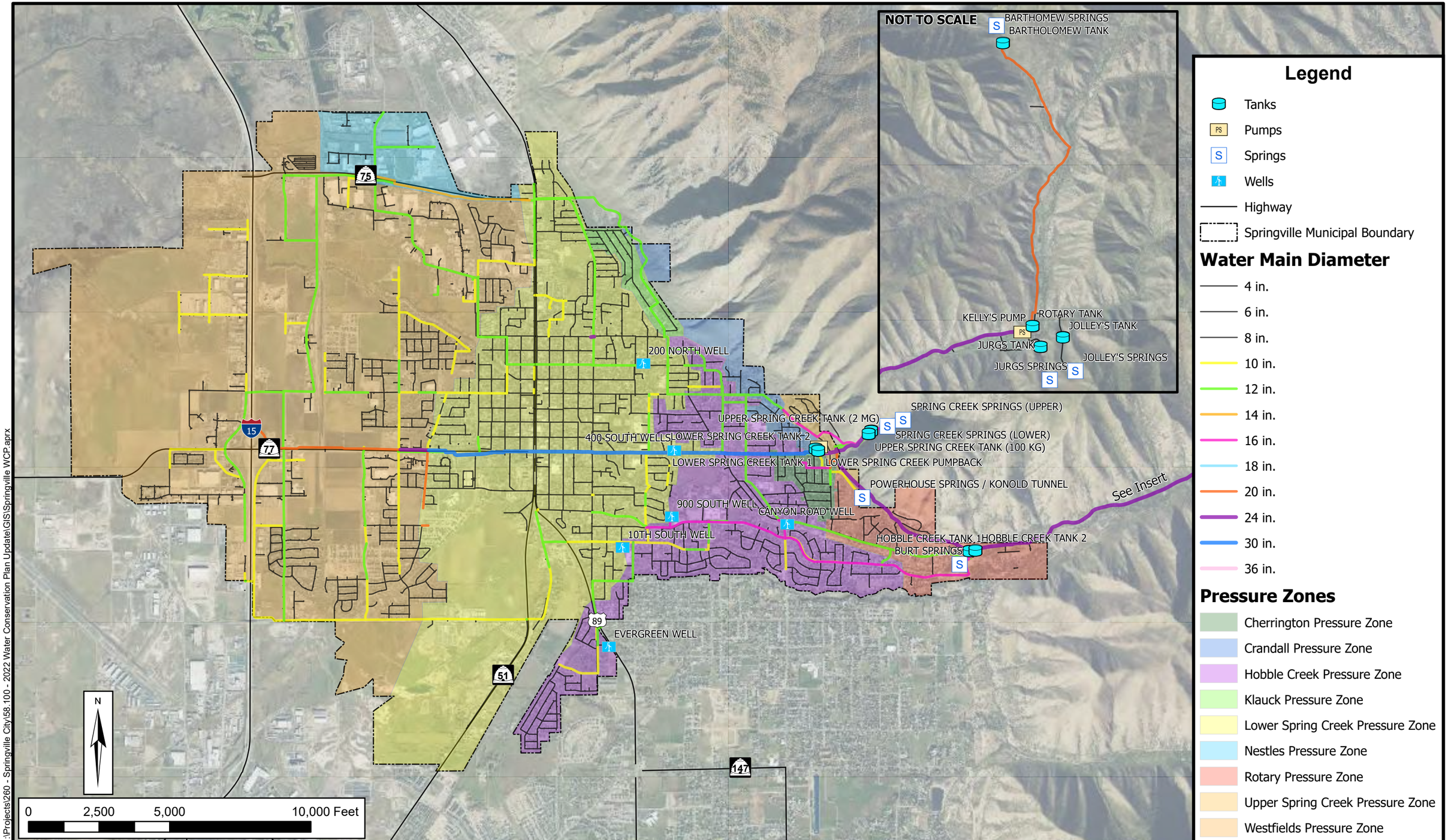


Figure 2-1: Total Service Connections

INVENTORY OF WATER RESOURCES

The drinking water system consists of nine main pressure zones and services the residents of Springville City and a small number of the residents in Hobble Creek Canyon. There is a total of seven wells and four springs which supply water for the drinking water system. The City uses eight storage tanks for drinking water storage. Figure 2-2 shows a map of the drinking water system.

The pressurized irrigation system primarily uses Hobble Creek, Burt Springs, and Strawberry Reservoir as water sources, with a small amount of water source coming from Jurd Spring (a.k.a. Jurg Spring), which flows into the middle reach of Hobble Creek. The Industrial Park Well (an artesian well) flows into little Spring Creek. The water from the Industrial Park Well is subsequently drawn from Little Spring Creek to service an industrial customer's outdoor irrigation. Figure 2-3 shows a map of the pressurized irrigation system.



Date: 10/26/2022
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HANSEN ALLEN & LUCE INC ENGINEERS

SPRINGVILLE
2022 WATER CONSERVATION PLAN UPDATE

DRINKING WATER SYSTEM

FIGURE
2-2

INDUSTRIAL PARK WELL

Hobble Creek

Jurd (Jurg) Spring

Highline Ditch

Burt Spring

Strawberry

Hobble Creek

Ditch #1

Mapleton-Springville Strawberry Pipeline

75

77

15

89

51

147

N

0 2,500 5,000 10,000 Feet

Legend

- Wells
- PI Pond
- S.I.C. Diversion
- East Edge of PI Zone
- Highway
- Hobble Creek
- Mapleton-Springville Pipeline
- Springville Municipal Boundary

Highline Ditch

- Main Ditch
- 24" Pipeline to PI Pond

Springville Irrigation Company

- S.I.C. Ditch #1

PI Main Diameter

- <=6 in.
- 8 in.
- 10 in.
- 12 in.
- 14 in.
- 16 in.
- 18 in.
- 24 in.
- 30 in.
- 36 in.

Date: 10/26/2022
Document Path: H:\Projects\260 - Springville City\58.100 - 2022 Water Conservation Plan Update\GIS\Springville WCP.aprx

HANSEN ALLEN & LUCE inc ENGINEERS

SPRINGVILLE
2022 WATER CONSERVATION PLAN UPDATE

PRESSURIZED IRRIGATION SYSTEM

FIGURE
2-3

WATER RIGHTS

The 2020 Drinking Water Master Plan identifies the water rights currently held by the City and potential water rights the City could acquire in the future. The City currently has a total of 15,831 acre-feet of water rights available for use in the drinking water system. Table 2-2 below is from the 2020 Drinking Water Master Plan and summarizes the drinking water rights currently owned by the City (Hansen, Allen & Luce, Inc. 2020). It should be noted that some of these water rights are used in the pressurized irrigation system as it uses a small amount of water from Jurd Spring and the Industrial Park Well.

Table 2-2: Culinary Water Rights

Water Right(s)	Flow (gpm)	Volume (Acre-feet)	Source
51-111 (a26443) Includes 51-6666, 51-6990, 51-7242	198	103	City Wells
51-1455 (a28365) Includes 51-1486, 51-1493	4,937	7,964*	City Wells
51-2530 (a29656) Includes 51-3679	2,703	144	City Wells
51-2780 (a28366)	1,346	439	City Wells
51-5450 (a40919)	1,333	14	City Wells
51-6970 (a28367) Includes 51-1024, 51-1025, 51-1088	1,472	1,746	City Wells
51-8641	35	33	City Wells
51-8793 (a43986)	9	14	City Wells
51-5329	1,300	2,069**	Burt Springs
51-5330	180	290*	Konold Springs
51-5520	662	1,068#	Bartholomew Springs
51-6027	1,200	1,947##	Spring Creek Canyon Springs
Total	**15,375**	**15,831**	

Source: 2020 Drinking Water Master Plan

* Potential volume if sources are able to produce designated flow rate year-round. Actual volume may be limited by either source capacity (i.e., a spring may not be able to produce the designated flow rate year-round) or by demand.

** W.U.C. indicates that 8 cfs is diverted 24 hours for 5 days out of each 8-1/3 days from April 1 to October 31. This would equal 128.45 days with an estimated volume of 2,038.24 ac-ft.

Springville Irrigation Company water right used by Springville City based on City ownership of 267 shares. Each share equals 4 ac-ft resulting in an annual volume of 1,068 ac-ft.

10-year average yield of the spring from 1999 – 2009

Springville City, in conjunction with Springville Irrigation Company, own water rights for use in the pressurized irrigation system. There is a total of 3,097 acre-feet of water rights available for use in the pressurized irrigation system according to the 2020 Pressurized Irrigation Water Master Plan. Table 2-3 is taken from the 2020 Pressurized Irrigation Water Master Plan and shows a

summary of the water rights used in the pressurized irrigation system (Hansen, Allen & Luce Inc., 2020).

Table 2-3: PI Water Rights

Water Right	Flow (gpm)	Volume (Acre-feet)	Source
Strawberry Water Shares (Springville Irrigation Company)	3,000	1,970	Springville/Mapleton Strawberry Pipeline
Springville Irrigation Company Shares (Non-Strawberry Water)	645	513	Springville Irrigation Ditch #1
51-6025	627	499	Hobble Creek/ Highline Ditch
51-6219	145	115	Hobble Creek/ Highline Ditch
Total	**4,417**	**3,097**	

Source: 2020 Pressurized Irrigation Water Master Plan

* Flow and volume for each water right is estimated based on the Division of Water Rights database and City records.

RELIABLE WATER SUPPLY

The City's annual reliable water supply is comprised of the combined volume of the drinking water and pressurized irrigation system water rights. In addition to the current water supply, additional water will become available to the City when the Utah Lake Drainage Basin Water Delivery System of the Bonneville Unit of the Central Utah Project (ULS) is complete. This additional water will be used in the pressurized irrigation system.

ULS Pipeline

Through a petition agreement between the Central Utah Water Conservancy District (CUWCD) and the South Utah Valley Municipal Water Association (SUVMWA), the City is obligated to purchase 4,945 acre-feet of ULS water. The pipeline to Springville is complete, with pipelines to the remaining SUVMWA cities finishing as early as 2025. When the remaining SUVMWA pipelines are completed, the City will be obligated to start purchasing water from the ULS pipeline. The 2020 Pressurized Irrigation Master Plan has more details regarding use of the ULS pipeline water (Hansen, Allen & Luce, 2020). Table 2-4 shows the reliable water supply for the City with the additional ULS water.

Table 2-4: Reliable Water Supply

System	Annual Capacity (Acre-feet)
Drinking Water System	15,831
Pressurized Irrigation System	3,097
Total	**18,928**
ULS Water	4,945
Total with ULS Water	**23,873**

HISTORICAL SUPPLY

The City uses seven wells and four springs to supply drinking water to the drinking water system. Over time, the production of well water has increased while the production of spring water has decreased. Prior to 2015, a majority of the water supplied to drinking water system was through springs. Currently, the majority of the water supplied to the drinking water system is from wells. Table 2-5 summarizes the historical water supply for the drinking water system.

Table 2-5: Historical Drinking Water Supply

Year	Water Supplied (Acre-feet)		Total
	Springs	Wells	
2005	8,142.93	2,136.61	**10,279.54**
2006	14,714.38	1,500.62	**16,215.00**
2007	6,719.66	5,895.96	**12,615.62**
2008	5,054.43	4,696.21	**9,750.64**
2009	4,786.38	1,899.80	**6,686.18**
2010	3,448.20	3,193.15	**6,641.35**
2011	5,269.03	1,905.68	**7,174.71**
2012	4,823.95	5,080.97	**9,904.92**
2013	4,344.91	5,746.27	**10,091.18**
2014	5,251.69	3,755.31	**9,007.00**
2015	3,484.88	4,818.24	**8,303.12**
2016	3,219.00	5,207.47	**8,426.47**
2017	3,338.00	3,906.00	**7,244.00**
2018	2,801.00	4,818.63	**7,619.63**
2019	3,278.86	3,218.00	**6,496.86**
2020	2,868.64	6,195.78	**9,064.42**
2021	2,578.00	6,020.73	**8,598.73**

Source: Utah Division of Water Rights

The majority of the water supplied to the pressurized irrigation system comes from Hobble Creek, Burt Springs, and Strawberry Reservoir, with some additional supply from Jurd Spring and the Industrial Park Well. Since the pressurized irrigation system is new, historical data for the system is limited to 2016. The water for the pressurized irrigation system is stored in the Bartholomew Pond which has a capacity of 32 acre-feet. Table 2-6 shows the historical water supply for the pressurized irrigation system.

Table 2-6: Historical PI Water Supply

Year	Water Supplied (Acre-feet)			Total
	Surface Water	Industrial Park Well*	Jurd Spring	
2016	1,120.94	0.00	0.00	**1,120.94**
2017	1,634.88	0.00	0.00	**1,634.88**
2018	1,902.87	0.00	0.00	**1,902.87**

Year	Water Supplied (Acre-feet)			Total
	Surface Water	Industrial Park Well*	Jurd Spring	
2019	1,647.38	0.00	0.00	**1,647.38**
2020	2,327.11	8.04	112.89	**2,448.04**
2021	2,328.31	8.04	82.75	**2,419.10**

Source: Utah Division of Water Rights

* The Utah Division of Water Rights refers to this well as the Treatment Plant Well

CHAPTER 3 – WATER USE

PER CAPITA WATER USE

A useful way of measuring water usage is in gallons per capita per day (gpcd). This expression is calculated by dividing annual water use by the service area population. Expressing water use in this manner gives an estimate for the average amount of water used by an individual on a daily basis. Since the City operates both a drinking water system and a pressurized irrigation system, the per-capita usage was calculated for both systems. The Division of Water Rights stores annual use data on their database. Per-capita usage rates were calculated for both systems from 2005 to 2021 (data for the pressurized irrigation system is only available from 2019 since service started that year). The combined per-capita usage rates from 2005 to 2021, along with the regional conservation goals are shown in Figure 3-1.

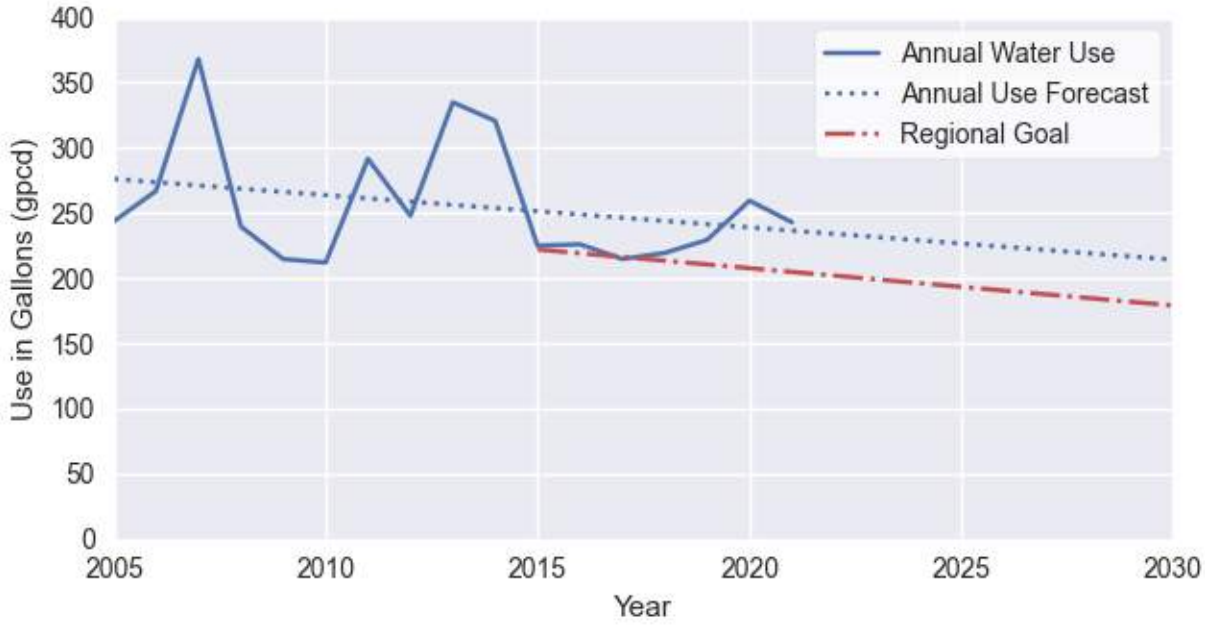

Figure 3-1: Historical Per-Capita Water Use

FUTURE WATER NEEDS

The City, much like the rest of Utah County, is expected to grow substantially over the next several years. The population in 2021 was 36,565 (Utah Division of Water Rights, 2022). The Drinking Water Master Plan projected that the population would reach approximately 45,000 by 2030 and 62,000 by 2060 (Hansen, Allen & Luce, 2020).

The 5-year average water use for 2016 to 2021 is 233.14 gallons per capita per day. This value was used to project the water demand for the City by multiplying it with the population projections from the Drinking Water Master Plan. Figure 3-2 compares the annual and projected water use from 2005 to 2060 with the reliable water supply (discussed in Chapter 2) and the efficient water use for the Provo River region. The efficient water use was calculated with the reduction goals included in Utah's Regional M&I Water Conservation Goals. This report establishes the Provo

River regional goals of 179 gpcd water use by 2030 and 162 gpcd by 2040 (HAL & BCA, 2019). These goals are discussed further in Chapter 5.

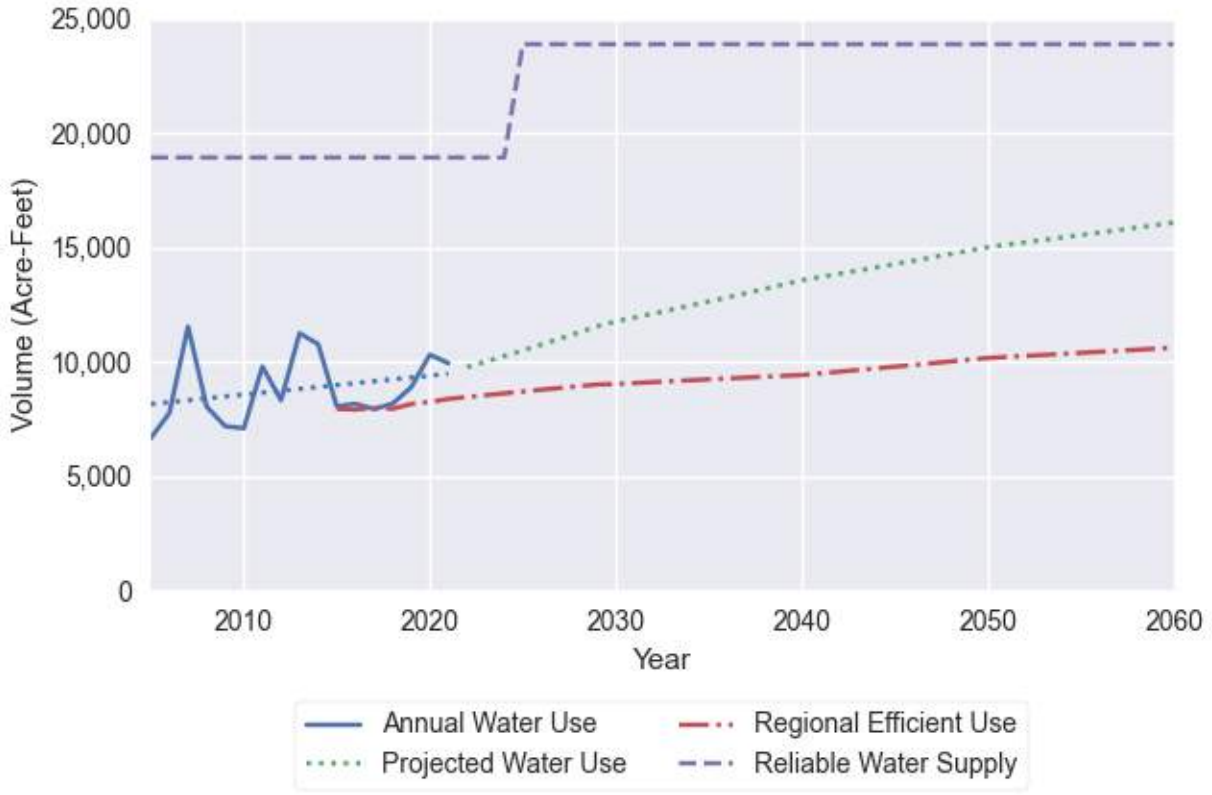

Figure 3-2: Water Use Projections

The regional efficient use as shown in Figure 3-2 was calculated by applying the Provo River regional conservation goals to the population projection for the City. The Provo River regional goals for 2015, 2030, and 2040 are 222, 179, and 162 gpcd, respectively. The raw data for the calculations shown in Figure 3-2 is included in Appendix A.

Although the per-capita water use rate for the City is trending downward, as shown in Figure 3-1, the annual water use volume has been steadily increasing since 2005. This is expected as the population of Springville has been growing rapidly. Figure 3-2 shows a diverging trend for the projected water use and regional efficient water use projection. The City should aim to have these curves converge so that future water use can meet the regional efficient water use goals.

Figure 3-2 also shows that the projected water use is not expected to exceed the City's reliable water supply. In the off-chance that demand does exceed water supply, the City has identified ways to acquire additional water rights in both the 2020 Drinking Water Master Plan and the Pressurized Irrigation Master Plan.

CHAPTER 4 – WATER & REVENUE LOSS CONTROL

WATER LOSS

Every water system experiences some type of water loss. Water is often lost through pipe leaks or breaks, hydrant flushing, construction water, waste pumping, and unmetered connections. According to a study done by the EPA, public water systems lose an average of 16%, and some Utah systems are known to lose 30% or more of their water (EPA, 2017). Water loss is not only a loss of a valuable resource, it also may lead to revenue and energy loss. Preventing and mitigating water loss should be a high priority for public water systems.

The Division of Water Rights reports estimated water loss on their database for public water suppliers. The reported data for the City's drinking water system shows that the estimated water loss has reduced since 2005. The City has made considerable efforts to reduce water loss by upgrading infrastructure and installing water meters on unmetered connections. Unfortunately, since the pressurized irrigation system is new, estimated water loss records are not available at this time. These records will become available as the City installs more water meters for the pressurized irrigation system. Table 4-1 and Figure 4-1 show the comparison of drinking water used with the amount produced from 2005 to 2021.

Table 4-1: Historical Drinking Water Loss

Year	Total Retail Use (Acre-feet)	Total From Sources (Acre-feet)	Estimated Water Loss
2005	6,682.35	12,274.54	**45.56%**
2006	7,774.74	18,162.25	**57.19%**
2007	11,545.60	14,455.42	**20.13%**
2008	8,052.75	11,317.17	**28.84%**
2009	7,196.46	8,802.04	**18.24%**
2010	7,107.06	8,403.86	**15.43%**
2011	9,800.03	9,829.24	**0.3%**
2012	8,330.18	11,896.04	**29.98%**
2013	11,253.91	11,285.67	**0.28%**
2014	10,776.99	10,563.13	**-2.02%**
2015	8,059.70	9,798.88	**17.75%**
2016	8,172.75	10,075.47	**18.88%**
2017	7,946.76	9,438.00	**15.8%**
2018	8,179.66	9,576.63	**14.59%**
2019	8,052.00	8,873.86	**8.92%**
2020	9,167.81	11,150.42	**17.5%**
2021	8,189.53	9,368.00	**12.33%**

Source: Utah Division of Water Rights

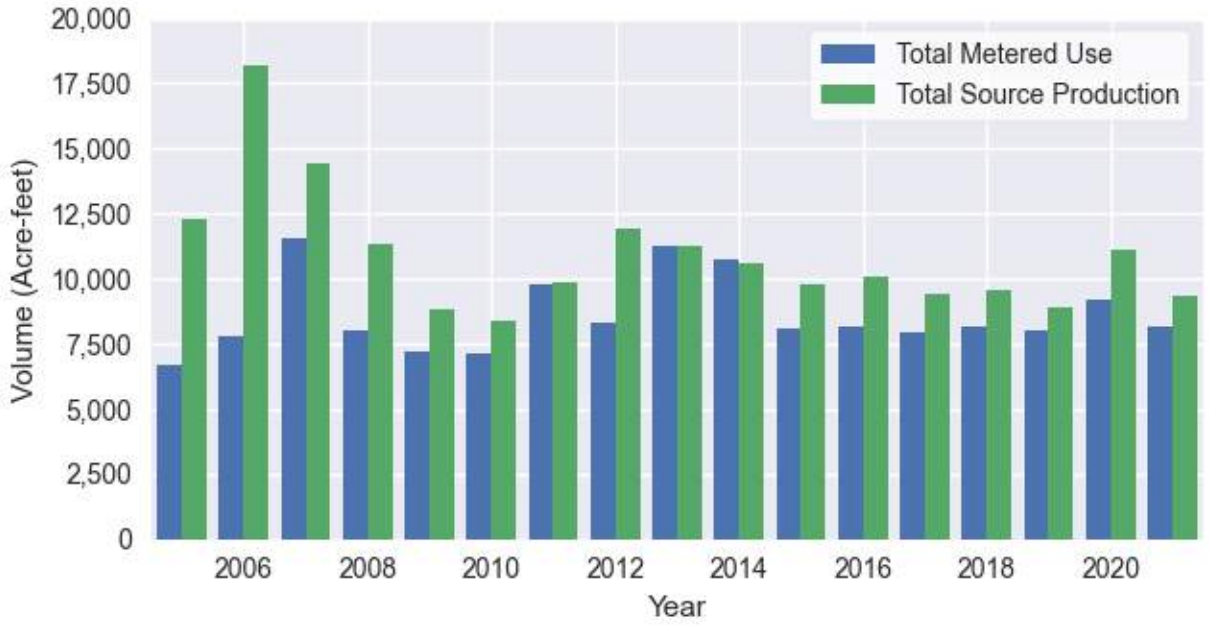

Figure 4-1: Historical Drinking Water Production & Use

BILLING RATES

To promote water conservation, the City has enforced tiered water rates for customers for both the drinking water system and the pressurized irrigation system. The City encourages customers to utilize the pressurized irrigation system, if they are able to, by slightly increasing drinking water rates and offering lower irrigation water rates for those customers. Tables 4-2 and 4-3 show the City's current water rates. Residential water meters are read in the months of March through October. All other months are billed at the minimum fee of $16.32 per month, with an additional fee of $1.21 for each 1,000 gallons used above 5,000 gallons.

Table 4-2: Drinking Water Rates

Fee		Description
If PI is Not Used	**If PI is Used**	
$16.32	$16.32	Minimum monthly fee.
$1.00	$1.13	For each 1,000 gallons or portion thereof between 5,001 and 12,000 gallons.
$1.32	$1.49	For each 1,000 gallons or portion thereof between 12,001 and 20,000 gallons.
$1.64	$1.85	For each 1,000 gallons or portion thereof between 20,001 and 40,000 gallons.
$1.95	$2.20	For each 1,000 gallons or portion thereof between 40,001 and 60,000 gallons.
$2.22	$2.50	For each 1,000 gallons or portion thereof between 60,001 and 100,000 gallons.
$3.01	$3.39	For each 1,000 gallons or portion thereof between 100,001 and 150,000 gallons

Fee		Description
If PI is Not Used	If PI is Used	
$3.43	$3.87	For each 1,000 gallons or portion thereof between 150,001 and 200,000 gallons
$4.22	$4.76	For each 1,000 gallons or portion above 200,000 gallons.

Source: Springville 2022-2023 Comprehensive Fee Schedule

Table 4-3: Pressurized Irrigation Rates

Fee	Description
No Charge	For the first 5,000 gallons
$0.91	For each 1,000 gallons or portion thereof between 5,001 and 20,000 gallons.
$1.43	For each 1,000 gallons or portion thereof between 20,001 and 60,000 gallons.
$1.90	For each 1,000 gallons or portion thereof between 60,001 and 100,000 gallons.
$2.38	For each 1,000 gallons or portion thereof between 100,001 and 150,000 gallons.
$2.85	For each 1,000 gallons or portion thereof between 150,001 and 200,000 gallons.
$3.80	For each 1,000 gallons or portion above 200,000 gallons.

Source: Springville 2022-2023 Comprehensive Fee Schedule

CHAPTER 5 – CONSERVATION GOALS & PRACTICES

The City is aware of the need for water conservation and is committed to improve water conservation efforts. City staff are aware of the water conservation goals and work to together to achieve them. The Public Works Director is responsible for overseeing water conservation efforts.

Brad Stapley
Public Works Director
801-489-2711

IDENTIFIED PROBLEMS

The following issues were identified in the 2016 Water Conservation Plan. These issues are still priorities for the City.

- "The City is seeing a change in demographics as their agricultural areas turn into residential subdivisions. This change emphasizes the need to inform all residents, but especially new residents, about indoor conservation practices. Residents lack information and understanding of landscaping water requirements and efficient water-use habits and practices.
- Along with indoor use, residential outdoor use is also a large concern. It is well documented that water used to irrigate turf grass drives summer water use to its peak during the summer months. Much of the City's clean culinary water is [not used efficiently] through over watering. Most residents' irrigation practices are based on convenience rather than plant needs.
- Springville City has many aging water lines that are contributing to the water losses seen in the City" (Springville City, 2016).

WATER CONSERVATION GOALS

Provo River Regional Goals

Utah's Regional M&I Water Conservation Goals establishes water conservation goals for the major river basins, referred to as regions, in the state. Since the Provo River Region is highly populated, it has some of the strongest conservation goals compared to the other regions. By 2030 the water conservation goal for the Provo River Region is 179 gpcd, which is a 20% reduction from the 2015 goal of 222 gpcd (HAL & BCA, 2019). Table 5-1 summarizes the regional conservation goals and the percentage reduction from the 2015 goal.

Table 5-1: Provo River Region Conservation Goals

Year	Conservation Goal (gpcd)	Reduction from 2015 Baseline
2015	222 (Baseline)	N/A
2030	179	20%
2040	162	27%
2065	152	32%

Source: *Utah's Regional M&I Water Conservation Goals*

Springville City Water Conservation Goals

The City has set a goal to continue current water conservation trends until 2030. Following the Annual Use Forecast series in Figure 3-1, the forecasted water use rate in 2030 is 214 gpcd which is a 4.89% reduction from the 2015 rate of 225 gpcd. This forecast is based on data provided by the Division of Water Rights. The City should periodically monitor water use rates to ensure that this water conservation goal is met. The City plans to reevaluate the 2030 and future goals in subsequent updates to this water conservation plan.

Table 5-2: Springville City Conservation Goals

Year	Conservation Goal (gpcd)	Reduction from 2015 Baseline
2015	225 (Baseline)	N/A
2030	214	4.89%

In addition to the water conservation goals listed in Table 5-2, the City has continued the following conservation goals from the 2016 Water Conservation Plan:

- "Continue to support the current conservation measures that have brought the City success in reducing the water used…
- Inform residents of water conservation practices for indoor and outdoor use.
- Conserve culinary water by using secondary water for irrigation per the City's master plans.
- Continue the City's existing aging water meter replacement program" (Springville City, 2016).

BEST MANAGEMENT PRACTICES

Best Management Practices (BMPs) are the practices adopted by public water suppliers and water conservation districts to conserve water use within their respective service areas.

Existing Best Management Practices

In previous water conservation plans, the City has implemented aggressive water conservation measures that have proven to be successful. The following BMPs have already been implemented by the City in previous water conservation plans:

- "Promoting the 'Slow the Flow Program' sponsored by the State, which includes educational brochures, free water audits and checks, and free water wise landscaping seminars…
- Requiring low flow indoor fixtures as required in the plumbing code on all new construction.
- Using, evaluating, and periodically refining the water rates structure that charges users using a tiered rate structure which both promotes water conservation and continues to keep the water system viable.
- Replacing galvanized steel water service lines with copper and polyethylene pipe.
- Performing leak-detection testing for all water lines prior to new overlays of asphalt.

- Performing annual leakage surveys to identify unsurfacing leaks on main pipelines and services, especially in older areas of the water system.
- Replacing water meters with new, more efficient meters.
- Implementing a pressurized irrigation (secondary water) system with metered services in the developing western portion of the community" (Springville City, 2016).
- Meter replacement program for aging water meters.

Since the 2016 Water Conservation Plan, the City has also implemented the following BMPs:

- Continue and expand leak detection efforts by hiring a leak detection company.
- Offer opportunities for residents to submit complaints about water waste.
- Receive a weekly water waste report from the Utah Division of Water Resources.
- Continue installing water meters for the pressurized irrigation system

Proposed Best Management Practice

The BMPs implemented in previous water conservation plans have helped the City achieve previous water conservation goals. The City will need to implement additional BMPs to meet the water conservation goal discussed previously. The following BMPs are proposed for the City to adopt, any combination of these BMPs can be adopted as the City sees fit. Additional BMPs which the City may also consider are included in Appendix B.

- Enact a time-of-day watering ordinance
- Enact a water-efficient landscape ordinance for new commercial developments

The City encourages residents to limit outdoor watering between 10 am and 6 pm; however, city ordinances do not currently restrict water use. Enacting a city ordinance that prohibits outdoor irrigation times during summer months would further enable the City to enforce water conservation for residents and commercial developments.

In addition to a time-of-day watering ordinance, the City may enact an ordinance which requires water-efficient landscaping for new commercial developments. While it is true that most of the water use is residential, reducing water use in all categories is critical for meeting water conservation goals. By requiring commercial developments to use water-efficient landscaping, the City may be able to reduce water use for commercial connections.

Table 5-2 shows a summary of all BMPs that the City has and can implement to reach their water conservation goals.

Table 5-2: Best Management Practices

Best Management Practice	Description
Existing BMPs	
Promote the "Slow the Flow Program"	Promote the "Slow the Flow Program" sponsored by the state to residents. Encourage them to take advantage of the opportunities the program provides.
Require Low Flow Indoor Fixtures	Require low flow indoor fixtures on all new construction in city code.

Best Management Practice	Description
Tiered Water Rate Structure	Continue to use and periodically refine the tiered water rates for both water systems.
Replace Galvanized Steel Lines	Continue replacing galvanized steel water service lines with copper and polyethylene pipe, as necessary.
Leak Testing	Continue to test for leaks in all water lines before overlaying asphalt.
Annual Leak Surveys	Perform annual leak surveys to test for unsurfacing leaks, especially in older parts of the water system.
Meter & Pipe Replacement Program	Continue to replace aging meters and pipelines throughout the drinking water system. Install more efficient water meters when replacing old meters which do not meet American Water Works Association Standards.
Pressurized Irrigation System	Continue to expand the pressurized irrigation system according to city master plans.
Professional Leak Detection	Continue to hire a leak detection company to expand leak detection efforts.
Water Waste Complaints	Encourage residents to notify the City of water waste. Respond to the complaints when possible.
Weekly Water Waste Report	Receive the weekly water waste report from the Division of Water Resources. Act on any recommendations or issues raised in the reports.
Pressurized Irrigation Meters	Continue installing efficient water meters in the pressurized irrigation system as the system expands.
Proposed BMPs	
Enact a Time-of-Day Watering Ordinance	Enact a city ordinance which restricts outdoor irrigation from 10 am to 6 pm during summer months.
Enact a Water-Efficient Landscape Ordinance	Enact a city ordinance which requires new commercial developments to use water-efficient landscaping.
Additional Water Conservation Measures	Consider implementing other conservation measures included in Appendix B.

CHAPTER 6 – IMPLEMENTATION PLAN

This Water Conservation Plan renews the existing water conservation measures for at least the next five years. Existing and proposed water conservation measures will be implemented according to Table 6-1. Additional conservation measures the city may choose to adopt are included in Appendix B.

Table 6-1: Implementation Plan

Conservation Measure	Implementation Plan
Existing Conservation Measures	
Promote the "Slow the Flow Program"	Continue promoting the "Slow the Flow Program" to city residents. • Print and deliver fliers during periods of high use. • Advertise classes and events on social media, city websites, and by email.
Require Low Flow Indoor Fixtures	Require low flow indoor fixtures in the pluming code on all new construction and developments. Require the following fixtures be fitted with low flow variants: • Shower heads • Sink faucets • Toilets
Tiered Water Rate Structure	Continue using and updating the tiered water rate structure for both the drinking water and pressurized irrigation systems. • Consider water conservation goals during annual review of water rates.
Leak Testing	Continue testing for leaks in all water lines before overlaying asphalt. • Perform annual leak surveys. • Continue hiring a professional leak detection company.
Meter & Pipe Replacement Program	Continue replacing galvanized steel lines with copper and polyethylene pipe. • Continue replacing aging meters and pipelines throughout the drinking water system. • Install efficient water meters when replacing old meters which do not meet City standards.
Pressurized Irrigation System	Expand the pressurized irrigation system by implementing master plan projects.
Water Waste Complaints	Continue providing means for residents to submit complaints about wasted water throughout the City. • Follow up with complaints to ensure that responsible parties are held accountable. • Consider imposing fines for repeated counts of wasted water.
Weekly Water Waste Report	Continue to review weekly water waste reports from the Division of Water Resources.

Conservation Measure	Implementation Plan
Pressurized Irrigation Meters	Continue to install efficient water meters throughout the pressurized irrigation system as it expands. • Replace existing meters on an as-needed basis.
Proposed Conservation Measures	
Time-of-Day Watering Ordinance	• Enact a city ordinance which restricts outdoor watering from 10 am to 6 pm during summer months. • Consider imposing fines for repeat violators.
Water-Efficient Landscape Ordinance	Enact a city ordinance which requires new commercial developments to use water-efficient landscaping. Examples include: • Providing a Pressurized Irrigation connection for eligible developments • Using native, low-water plants • Using drip irrigation • Xeriscaping when appropriate
Additional Water Conservation Measures	Consider implementing other conservation measures included in Appendix B.

REFERENCES

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APPENDIX A

WATER USE PROJECTIONS

Year	Population	(Acre-feet) DW Use	(Acre-feet) PI Use	(Acre-feet) Total Use	(GPCD) Per-Capita	(GPCD) 5-Year Avg.	(Acre-feet, using 2021 5-year average) Projected Use	(GPCD) Regional Goal	(Acre-feet) Efficient Use	(Acre-feet) Water Supply
2005	24,500	6,682.35		6,682.35	243.49					18,928
2006	26,000	7,774.74		7,774.74	266.96					18,928
2007	28,000	11,545.60		11,545.60	368.12					18,928
2008	30,000	8,052.75		8,052.75	239.63					18,928
2009	29,930	7,196.46		7,196.46	214.65	266.57				18,928
2010	29,930	7,107.06		7,107.06	211.99	260.27				18,928
2011	30,000	9,800.03		9,800.03	291.63	265.20				18,928
2012	30,000	8,330.18		8,330.18	247.89	241.16				18,928
2013	30,000	11,253.91		11,253.91	334.89	260.21				18,928
2014	30,000	10,776.99		10,776.99	320.70	281.42				18,928
2015	31,982	8,059.70		8,059.70	224.98	284.02		222	7,952	18,928
2016	32,286	8,172.75		8,172.75	225.99	270.89		219	7,924	18,928
2017	33,044	7,946.76		7,946.76	214.70	264.25		216	8,004	18,928
2018	33,294	8,179.66		8,179.66	219.33	241.14		213	7,957	18,928
2019	34,632	8,052.00	845.54	8,897.54	229.36	222.87		211	8,166	18,928
2020	35,504	9,167.81	1,150.09	10,317.90	259.44	229.76		208	8,258	18,928
2021	36,565	8,189.53	1,757.85	9,947.38	242.87	233.14		205	8,387	18,928
2022	37,448						9,778.17	202	8,469	18,928
2023	38,353						10,014.43	199	8,551	18,928
2024	39,280						10,256.40	196	8,631	18,928
2025	40,229						10,504.22	193	8,711	23,873
2026	41,201						10,758.02	190	8,789	23,873
2027	42,197						11,017.96	188	8,866	23,873
2028	43,216						11,284.18	185	8,941	23,873
2029	44,260						11,556.83	182	9,015	23,873
2030	45,078						11,770.31	179	9,037	23,873
2031	45,724						11,938.99	177	9,079	23,873
2032	46,379						12,110.08	176	9,121	23,873
2033	47,044						12,283.63	174	9,162	23,873
2034	47,718						12,459.67	172	9,203	23,873
2035	48,402						12,638.23	171	9,243	23,873
2036	49,096						12,819.34	169	9,282	23,873
2037	49,799						13,003.05	167	9,320	23,873
2038	50,513						13,189.40	165	9,357	23,873
2039	51,237						13,378.41	164	9,394	23,873
2040	51,971						13,570.14	162	9,429	23,873
2041	52,499						13,708.03	162	9,502	23,873
2042	53,033						13,847.32	161	9,574	23,873
2043	53,571						13,988.02	161	9,648	23,873
2044	54,116						14,130.16	160	9,722	23,873
2045	54,666						14,273.74	160	9,796	23,873
2046	55,221						14,418.78	160	9,871	23,873
2047	55,782						14,565.29	159	9,946	23,873
2048	56,349						14,713.29	159	10,022	23,873
2049	56,922						14,862.79	158	10,098	23,873
2050	57,500						15,013.82	158	10,175	23,873
2051	57,897						15,117.58	158	10,219	23,873
2052	58,298						15,222.07	157	10,264	23,873
2053	58,700						15,327.27	157	10,309	23,873
2054	59,106						15,433.21	156	10,353	23,873
2055	59,515						15,539.87	156	10,398	23,873
2056	59,926						15,647.28	156	10,443	23,873
2057	60,340						15,755.42	155	10,488	23,873
2058	60,757						15,864.32	155	10,534	23,873
2059	61,177						15,973.96	154	10,579	23,873
2060	61,600						16,084.37	154	10,625	23,873

APPENDIX B

ADDITIONAL WATER CONSERVATION MEASURES

Conservation Best Management Practices (BMP's)

Water Conservation Coordinator, Committee or Team
Hire or designate a Water Conservation Coordinator.
Create a committee/team/board with a chair that includes a combination of the following participants; Water Conservation Coordinator, Public Works Director, City Council Member, and/or applicable local advocacy group member to help research, coordinate, create and implement public information campaign(s), water conservation programs and incentives.
Water Conservation Plan (WCP)
Develop a WCP. More information at www.conservewater.utah.gov/wcp.html.
Provide contact information, system profile, water use history and detail specific ongoing and new conservation programs.
Public Awareness & Public Outreach
Develop or utilize existing messaging from Slow The Flow, Water Resources, CWEL and WaterSense.
Display educational materials & resources on agency website(s), social media & bills.
Offer agency materials and resources to community partners for distribution.
Hold or collaborate events, programs and/or presentations.
Education & Training
Provide adult efficient water use education and training. Or, direct them to available local training(s) such as Localscapes.
Provide or support youth education programs for elementary school students.
Provide or recommend a waterwise demonstration garden.
Educate customers about new water-saving technology. Example: weather based smart controllers.
Provide new homeowner water-efficient landscape information.
Participate and promote large efficient landscape training and programs: https://www.qwelutah.com/training/
Create and/or distribute "how to videos". Example: switching to drip.
Rebates | Incentives |Rewards
Offer or collaborate on rebates for high efficiency appliances, fixtures, irrigation smart controllers, drip irrigation, nozzles, shut off hose valves, and landscape conversions.
Promote rebates offered in your service area

Conservation Best Management Practices (BMP's)

Public Involvement
Offer or collaborate on residential water audit programs.
Offer or collaborate on landscape consultation programs.
Offer residential water budgeting programs.
Offer indoor and outdoor retrofit kits.
Perform outdoor high water use inquiries and resolution techniques.
Address water waste complaints
Identify structures built before 1992 and organize low efficiency fixture replacements.
Ordinances & Standards
Adopt a time-of-day watering ordinance. Example: no watering between 10-6pm and alternating watering days
Adopt an ordinance requiring a water-efficient landscaping in all new residential developments.
Review existing plumbing codes and revise them as necessary to ensure water-conserving measures in all new construction.
Adopt an ordinance requiring water-efficient landscaping in all new commercial development.
Change business license requirements to require water reuse and recycling in new facilities.
Mandate retrofit upon resale.
Water Pricing
Utah SB28 requires water rates to rise for higher tiers of consumption
Charge for secondary water based on individual use.
High water use notification.
Physical System
Install & maintain efficient irrigation, utilize water-wise landscaping & smart controller technology at agency facilities.
Perform agency water system audit and implement a leak detection program
Meter all connections (UT SCR 1), repair and replacement program, read meters on a regular basis.
Consider water reuse.

APPENDIX C

SPRINGVILLE CITY COUNCIL ADOPTION
OF CONSERVATION PLAN

Utah Department of Natural Resources
Division of Water Resources

Certification of Adoption

We hereby certify that the attached Water Conservation Plan has been established and adopted by the Springville City Council on December 20, 2022

Matt Packard, Mayor

Attest:

Kim Crane, City Recorder

APPENDIX E

CUP Allotment

SOUTH UTAH VALLEY MUNICIPAL WATER ASSOCIATION
CUP 1590 AC-FT ALLOTMENT
AND JORDAN CANAL WATER

CITY	% 1998	CUP(1,590) ALLOTMENT	JORDAN CANAL	% 2003	CUP (30,000) ALLOTMENT	GIVEN BACK APR 2003*	GIVEN BACK FEB 2004*	GIVEN BACK JUNE 2007	GIVEN BACK MAY 2010	GIVEN BACK AUGUST 2013	TOTAL GIVEN BACK	REMAINDER CUP (30,000) ALLOTMENT	**TOTAL**	CITY
Springville	31.66%	503.39	126.64	28.15%	8,445			500		3,000	3,500	4,945	**5,575**	Springville
Mapleton	6.67%	106.05	26.68	8.01%	2,403			500	1,000		1,500	903	**1,036**	Mapleton
Spanish Fork	28.33%	450.45	113.32	27.90%	8,370	1,000					1,000	7,370	**7,934**	Spanish Fork
Salem	5%	79.50	20.00	6.03%	1,809			1,000			1,000	809	**909**	Salem
Woodland Hills	1.25%	19.88	5.00	1.30%	390						0	390	**415**	Woodland Hills
Elk Ridge	1.25%	19.88	5.00	2.53%	759						0	759	**784**	Elk Ridge
Payson	18.34%	291.61	73.36	17.53%	5,259		500				500	4,759	**5,124**	Payson
Santaquin	5%	79.50	20.00	6.03%	1,809			1,000			1,000	809	**909**	Santaquin
Goshen	1.25%	19.88	5.00	1.32%	396						0	396	**421**	Goshen
Genola	1.25%	19.88	5.00	1.20%	360						0	360	**385**	Genola
TOTAL	**100.00%**	**1,590.00**	**400.00**	**100.00%**	**30,000**	**1,000**	**500**	**3,000**	**1,000**	**3,000**	**8,500**	**21,500**	**23,490**	**TOTAL**

* This water was technically given back from the CUP 1,590 Allotment. However, because the individual entities didn't have the water to give back, SUVMWA handled the exchange at the time. For ease of calculation, it has been counted against the 30,000 AF allotment.