



# **BIG PLAINS WATER SPECIAL SERVICE DISTRICT CULINARY WATER MASTER PLAN**

**July 2023**

PREPARED BY:

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# **BIG PLAINS WATER SPECIAL SERVICE DISTRICT CULINARY WATER MASTER PLAN**

**July 2023**

**INCLUDES:**

**FIVE POINT SYSTEM ANALYSIS  
RECOMMENDED SYSTEM IMPROVEMENTS  
SYSTEM FINANCING PLAN  
IMPACT FEE FACILITIES PLAN  
IMPACT FEE ANALYSIS**

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## I. INTRODUCTION

### A. PREFACE

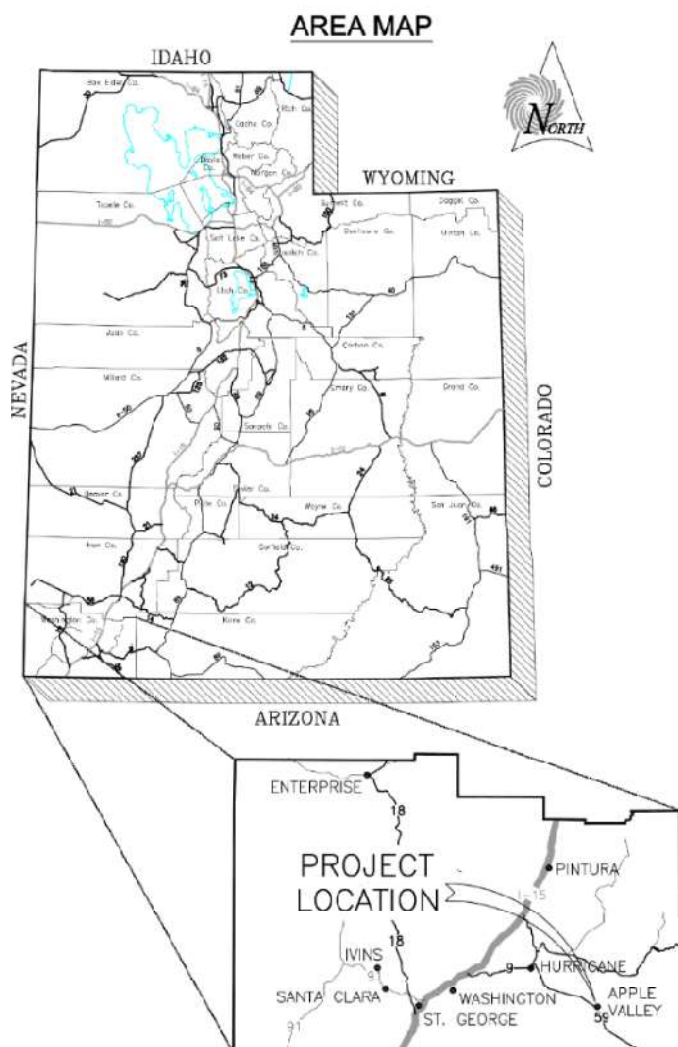
*Big Plains Water Special Service District (BPWSSD) has entered into an agreement with Sunrise Engineering, Inc. to prepare this Culinary Water Master Plan. The plan will provide board members with the information they need to make important decisions relating to water infrastructure as the District continues to grow and develop over the next 20 years. This plan will provide information regarding the existing culinary water infrastructure, analyze these facilities for adequacy, and make recommendations in order to meet projected demands.*

### B. INTRODUCTION

This Culinary Water Master Plan has been prepared for BPWSSD, located in Washington County, Utah in the town of Apple Valley. The BPWSSD consists of three water systems: Apple Valley, Cedar Point, and Cannan Springs. The District is a political subdivision and operates as an independent special district under Utah law. An area map showing the location of BPWSSD has been included as Figure I.B-1.

BPWSSD is anticipating additional growth and development in the future. This plan is intended to help the district evaluate their ability to meet the increasing demands placed on the system by development, and to identify and correct existing deficiencies in the culinary water system.

**Figure I.B-1: Area Map**



The water system has been analyzed according to the Utah Division of Drinking Water regulations and includes a 5-point review of the Apple Valley, Cannan Springs, and Cedar Point systems consisting of water rights, water source capacity, water storage capacity, water treatment, and water distribution.

As part of the plan, Sunrise Engineering has recommended several improvements to the culinary water system and has developed a sample financing plan as a possible means to fund the recommended improvements.

The existing water rates and impact fees have also been analyzed as a possible means of supporting the recommended system improvements. The recommended water rates and impact fees are fair and reasonable and will allow BPWSSD to continue to maintain the level of service that is required of a public water system for the present time and over the planning period

## II. SYSTEM USERS' ANALYSIS

### A. PROJECTED GROWTH RATE

An important element in the development of a Culinary Water Master Plan is the projection of the population growth rate. This projection gives the planner an idea of the future demands on the culinary water system throughout the planning period.

Projecting future growth can be subjective but should be grounded in historical trends and current information as much as possible. BPWSSD is only accounting for Apple Valley, and we have census data for Apple Valley. After meeting with Apple Valley officials, it was decided that a rate increase of 5% will be used in this analysis. The future growth can be projected using the following compound interest formula:

$$F = P(1+i)^N$$

F = Future Population

i = Projected Growth Rate

P = Present Population

N = Years

Table II.A-1 shown on the following page summarizes the projected population and number of equivalent residential units (ERUs) throughout the 20-year planning periods. This was done using the compound interest formula for Apple Valley, Cedar Point, and Cannan Springs Individually and then added them together to get a total estimated ERU's that can be used in the impact fees and financial calculations. It is important to understand that projected growth rate figures are not the cornerstone of this Master Plan. If the maximum number of system connections is reached earlier or later than projected, then future improvements to support such growth may either come earlier or later. Impact Fees should not be significantly affected if the actual rate of growth varies from the rate used in the plan.

**Table II.A-1 Projected Growth Rate**

Apple Valley					Cannan Springs					Cedar Point				
Year	Est. Growth Rate	Residential ERU's	Total ERU's (Res+Com+Other)	Estimated Population	Year	Est. Growth Rate	Residential ERU's	Total ERU's (Res+Com+Other)	Estimated Population	Year	Est. Growth Rate	Residential ERU's	Total ERU's (Res+Com+Other)	Estimated Population
2023	5.00%	264	345	613	2023	5.00%	13	13	58	2023	5.00%	149	157	278
2024	5.00%	277	362	644	2024	5.00%	32	32	61	2024	5.00%	156	165	292
2025	5.00%	291	380	676	2025	5.00%	52	52	64	2025	5.00%	164	173	306
2026	5.00%	306	399	710	2026	5.00%	55	55	67	2026	5.00%	172	182	322
2027	5.00%	321	419	745	2027	5.00%	58	58	70	2027	5.00%	181	191	338
2028	5.00%	337	440	782	2028	5.00%	60	60	74	2028	5.00%	190	201	355
2029	5.00%	354	462	821	2029	5.00%	64	64	78	2029	5.00%	200	211	373
2030	5.00%	371	485	863	2030	5.00%	67	67	82	2030	5.00%	210	221	391
2031	5.00%	390	509	906	2031	5.00%	70	70	86	2031	5.00%	220	232	411
2032	5.00%	410	535	951	2032	5.00%	74	74	90	2032	5.00%	231	244	431
2033	5.00%	430	562	999	2033	5.00%	77	77	94	2033	5.00%	243	256	453
2034	5.00%	452	590	1048	2034	5.00%	81	81	99	2034	5.00%	255	269	475
2035	5.00%	474	619	1101	2035	5.00%	85	85	104	2035	5.00%	268	282	499
2036	5.00%	498	650	1156	2036	5.00%	89	89	109	2036	5.00%	281	297	524
2037	5.00%	523	683	1214	2037	5.00%	94	94	115	2037	5.00%	295	311	550
2038	5.00%	549	717	1274	2038	5.00%	99	99	121	2038	5.00%	310	327	578
2039	5.00%	576	753	1338	2039	5.00%	103	103	127	2039	5.00%	325	343	607
2040	5.00%	605	790	1405	2040	5.00%	109	109	133	2040	5.00%	342	360	637
2041	5.00%	635	830	1475	2041	5.00%	114	114	140	2041	5.00%	359	378	669
2042	5.00%	667	871	1549	2042	5.00%	120	120	147	2042	5.00%	377	397	702
2043	5.00%	700	915	1626	2043	5.00%	126	126	154	2043	5.00%	395	417	738

**B. LENGTH OF PLANNING PERIOD**

This Culinary Water Master Plan uses a 20-year planning period beginning in the year 2023 and running through year 2043. Water rights will be evaluated for a 40 year time period. These planning periods are consistent with standard practice and will allow an adequate evaluation of the system for potential infrastructure improvements or other needs. It is assumed that by 2043 with a 5.0% growth rate, Apple Valley will reach approximately 915 ERU's, Cannan Springs approximately 126 ERU's (this includes an expected development that will be adding 37 connections in the next couple years), and Cedar Point approximately 417 ERU's which in total is 1,458 ERU's for all three systems.

**C. HISTORICAL WATER USAGE**

Culinary water usage data was also provided by BPWSSD for analysis. We were given monthly water meter usage data from 2015 to 2022 for Apple Valley and Cedar Point and from 2018 to 2022 for Cannan Springs. The data has been tabulated and analyzed to determine usage trends for BPWSSD including the average usage per connection. The results of this analysis have been summarized in Table II.D-1 through Table II.D-3.



**Table II C-1: Apple Valley Average Culinary Water Usage**

Year	Average Usage Per Connection		
	Yearly (gal)	Monthly (gal)	Daily (gal)
2015	133,320	11,110	365
2016	120,014	10,001	329
2017	107,360	8,947	294
2018	103,020	8,585	282
2019	104,959	8,747	288
2020	110,380	9,198	302
2021	152,705	12,725	418
2022	107,589	8,966	295
8 Yr Ave=	117,418	9,785	<b>322</b>
5 Yr Ave=	115,731	9,644	<b>317</b>
3 Yr Ave=	123,558	10,296	<b>339</b>

**Table II C-2: Cannan Springs Average Culinary Water Usage**

Year	Average Usage Per Connection		
	Yearly (gal)	Monthly (gal)	Daily (gal)
2018	272,694	22,724	747
2019	314,049	26,171	860
2020	333,348	27,779	913
2021	281,609	23,467	772
2022	229,601	19,133	629
5 Yr Ave=	286,260	23,855	<b>784</b>
3 Yr Ave=	281,519	23,460	<b>771</b>

**Table II C-3: Cedar Point Average Culinary Water Usage**

Year	Average Usage Per Connection		
	Yearly (gal)	Monthly (gal)	Daily (gal)
2015	207,283	17,274	568
2016	157,536	13,128	432
2017	146,062	12,172	400
2018	138,673	11,556	380
2019	140,949	11,746	386
2020	312,318	26,027	856
2021	287,502	23,958	788
2022	141,752	11,813	388
8 Yr Ave=	191,509	15,959	<b>525</b>
5 Yr Ave=	204,239	17,020	<b>560</b>
3 Yr Ave=	247,191	20,599	<b>677</b>

Average usage for 3 year, 5 year, and 8 year timeframes were calculated as shown in the previous tables. The 3 year average usage per connection is 339 gallons per day (gpd) for Apple Valley, 771 gpd for Cannan Springs, and 677 gpd for Cedar Point. This

value is an average based on the number of active connections from 2020-2022 and will be referenced throughout this plan.

It should be noted that BPWSSD does not have a secondary water irrigation system for outside watering. Because of this, customers use the culinary water system for outdoor use. The usage numbers presented in this plan represent all uses of the culinary system, including outdoor usage.

Water usage also varies significantly throughout the year. During winter months, water usage typically goes down as outside watering becomes unnecessary. Peak water usage generally corresponds to summer months, when outdoor watering is at its peak.

To further understand BPWSSD usage patterns, the total annual and monthly water usage over the years 2019-2022 have been averaged and compared. Table II.D-4 through II.D-6 below presents the variation in usage throughout the year.

**Table II.D-4: Apple Valley Seasonal Water Usage**

Monthly % of Usage		
Month	% of Annual	% of Average
Jan	3.6%	43.3%
Feb	3.9%	46.9%
Mar	4.9%	59.3%
Apr	6.7%	80.0%
May	9.7%	116.3%
Jun	12.1%	145.1%
Jul	14.1%	169.2%
Aug	16.2%	194.5%
Sep	8.5%	101.9%
Oct	10.3%	123.7%
Nov	5.6%	66.8%
Dec	4.4%	53.0%

**Table II.D-5: Cannan Springs Seasonal Water Usage**

Monthly % of Usage		
Month	% of Annual	% of Average
Jan	4.0%	48.0%
Feb	3.7%	44.5%
Mar	5.3%	63.8%
Apr	7.0%	84.1%
May	9.3%	112.0%
Jun	15.7%	188.7%
Jul	15.4%	184.7%
Aug	13.1%	157.3%
Sep	9.0%	108.6%
Oct	6.7%	79.9%
Nov	6.0%	71.5%
Dec	4.7%	56.9%

**Table II.D-6: Cedar Point Seasonal Water Usage**

Monthly % of Usage		
Month	% of Annual	% of Average
Jan	4.0%	48.3%
Feb	2.7%	31.9%
Mar	8.9%	106.9%
Apr	4.5%	54.4%
May	7.5%	89.7%
Jun	8.1%	97.6%
Jul	14.4%	172.3%
Aug	13.7%	164.0%
Sep	12.0%	144.1%
Oct	10.9%	131.1%
Nov	7.0%	83.9%
Dec	6.3%	75.7%

Based on the usage data provided, the period of lowest water usage runs from December through March with approximately 4.7% of the total annual usage occurring in each of these months on average. The period of highest usage runs from June through September for all three areas. For Apple Valley, the month of August represents the month with the peak water usage, with 16.2% of the total annual usage with the usage also being 1.95 times the overall average usage through the year. For Cannan Springs, the month of June

represents the month with the peak water usage, with 15.7% of the total annual usage with the usage also being 1.89 times the overall average usage through the year. For Cedar Point the month of July represents the month with the peak water usage, with 14.4% of the total annual usage with the usage also being 1.72 times the overall average usage through the year. Peak Day Demand is typically shown as double the average day demand; however, since BPWSSD experiences higher usage in the summer months due to outdoor watering a slightly higher peak day was used. The peak demand for this report will be 2 times the average day demand resulting in a peak day demand of 677 gpd for Apple Valley, 1,543 gpd for Cannan Springs, and 1,354 gpd for Cedar Point.

### III. WATER RIGHTS ANALYSIS

#### A. EXISTING WATER RIGHT

The State has written guidelines specific to 40-year Water Right Plans. These plans when prepared are based on historical growth or planned growth, and current and future water right inventory. The plan projects current water right required and future water right required based on current state methods. The plan may predict a water right surplus.

Sunrise completed a detailed water rights inventory report for BPWSSD based on information recorded by the Utah Division of Water Rights. This report has been included in this plan as Appendix C. It includes a full water rights review, map exhibits, and recommended actions to protect the water rights listed in the report.

The existing water rights owned by BPWSSD are listed in Table III.A-1 below. The water rights are listed according to number, flow rates in gpm and cfs, and duty in ac-ft.

**Table III.A-1: BPWSSD Culinary Water Rights**

Culinary Water Rights		Flow		
W.R. #	Source	gpm	cfs	AcFt.
81-1799	Underground Wells	0.62	0.001	1.00
81-3169	Underground Wells	125.53	0.370	202.50
81-3200	Underground Wells	38.74	0.370	62.50
81-3641	Canaan Mountain Spring & Spring Areas	112.00	0.250	36.85
81-4619	Canaan Springs	58.00	0.130	8.15
81-2171	Underground Wells	100.08	0.223	25.20
81-4600	Underground Wells	57.65	0.128	93.00
81-4614	Underground Wells	36.27	0.081	58.50
81-5318	Underground	0.62	0.001	1.00
81-5559	Underground	4.04	0.009	5.00
81-5560	Underground	26.03	0.058	22.00
81-5561	Underground	4.13	0.009	3.50
81-5562	Underground	4.34	0.010	7.00
81-5567	Surface	13.78	0.031	1.00
81-5568	Underground	2.24	0.005	1.00
81-5513	Underground	42.77	0.095	69.00
<b>Total Water Rights</b>		<b>626.8</b>	<b>1.8</b>	<b>597.2</b>

Considering the available water rights shown in the table above, BPWSSD has access to 597.2 ac-ft of water rights. All water rights are held in a bank, allowing all sources to draw from rights owned by BPWSSD.

## **B. EXISTING REQUIRED WATER RIGHT**

The State of Utah Public Administrative Rules for Public Drinking Water Systems, R309-510, states that a community should have adequate water right to supply each culinary ERU with 400 gallons per day for indoor water use, plus an amount for outdoor use as dictated by irrigated acreage and a consumptive use value obtained from the State guidelines. If adequate data exists, the provider is allowed to substitute historical usage data instead. Apple Valley's historical average usage of 298 gpd per ERU, Cannan Spring's historical average usage of 771 gpd per ERU, and Cedar Point's historical average usage of 677 gpd per ERU will be used in this plan.

By multiplying the average water usage per ERU in the BPWSSD by the number of existing ERUs, the current required amount of water rights can be determined as shown in Table III.B-1.

**Table III.B-1: BPWSSD Current Required Water Right**

<b>Apple Valley</b>						
345 ERUs X	$\frac{339 \text{ gpd X}}{\text{ERU}}$	$\frac{1 \text{ day X}}{24 \text{ hr}}$	$\frac{1 \text{ hr}}{60 \text{ min.}}$	=	81	gpm
345 ERUs X	$\frac{339 \text{ gpd X}}{\text{ERU}}$	$\frac{365 \text{ day X}}{1 \text{ yr}}$	$\frac{1 \text{ Acft.}}{325,829 \text{ gal}}$	=	131	Ac-Ft
<b>Cannan Springs</b>						
13 ERUs X	$\frac{771 \text{ gpd X}}{\text{ERU}}$	$\frac{1 \text{ day X}}{24 \text{ hr}}$	$\frac{1 \text{ hr}}{60 \text{ min.}}$	=	7	gpm
13 ERUs X	$\frac{771 \text{ gpd X}}{\text{ERU}}$	$\frac{365 \text{ day X}}{1 \text{ yr}}$	$\frac{1 \text{ Acft.}}{325,829 \text{ gal}}$	=	11	Ac-Ft
<b>Cedar Point</b>						
157 ERUs X	$\frac{677 \text{ gpd X}}{\text{ERU}}$	$\frac{1 \text{ day X}}{24 \text{ hr}}$	$\frac{1 \text{ hr}}{60 \text{ min.}}$	=	74	gpm
157 ERUs X	$\frac{677 \text{ gpd X}}{\text{ERU}}$	$\frac{365 \text{ day X}}{1 \text{ yr}}$	$\frac{1 \text{ Acft.}}{325,829 \text{ gal}}$	=	119	Ac-Ft
					<b>Existing Water Right</b>	<b>597 Ac-Ft 627 gpm</b>
					<b>Total Required Water Right</b>	<b>261 Ac-Ft 162 gpm</b>
					<b>Existing Culinary System Water Right Surplus</b>	<b>336 Ac-Ft 465 gpm</b>

The existing water right surplus or deficit is determined by subtracting the current required water right demand in each area from the total available water right which yields a surplus of 336 Ac-ft.

### C. PROJECTED REQUIRED WATER RIGHT

The projected amount of required water rights at the end of the 20-year planning period can also be calculated by substituting the projected number of ERUs into the calculation for the current number of ERUs as shown in Table III.C-1 through Table III.C-3.

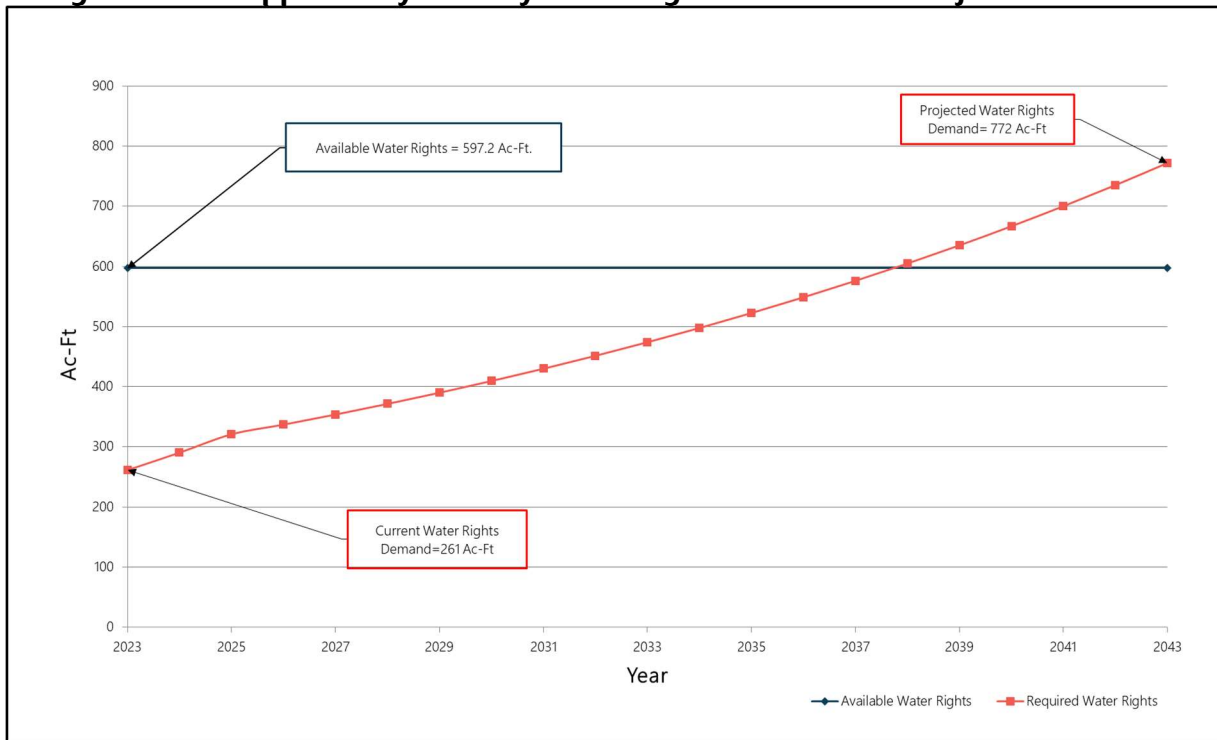
**Table III.C-1: BPWSSD 20-Year Required Water Right**

<b>Apple Valley</b>						
915 ERUs X	$\frac{339 \text{ gpd X}}{\text{ERU}}$	$\frac{1 \text{ day X}}{24 \text{ hr}}$	$\frac{1 \text{ hr}}{60 \text{ min.}}$	=	215	gpm
915 ERUs X	$\frac{339 \text{ gpd X}}{\text{ERU}}$	$\frac{365 \text{ day X}}{1 \text{ yr}}$	$\frac{1 \text{ Acft.}}{325,829 \text{ gal}}$	=	347	Ac-Ft
<b>Cannan Springs</b>						
126 ERUs X	$\frac{771 \text{ gpd X}}{\text{ERU}}$	$\frac{1 \text{ day X}}{24 \text{ hr}}$	$\frac{1 \text{ hr}}{60 \text{ min.}}$	=	67	gpm
126 ERUs X	$\frac{771 \text{ gpd X}}{\text{ERU}}$	$\frac{365 \text{ day X}}{1 \text{ yr}}$	$\frac{1 \text{ Acft.}}{325,829 \text{ gal}}$	=	109	Ac-Ft
<b>Cedar Point</b>						
417 ERUs X	$\frac{677 \text{ gpd X}}{\text{ERU}}$	$\frac{1 \text{ day X}}{24 \text{ hr}}$	$\frac{1 \text{ hr}}{60 \text{ min.}}$	=	196	gpm
417 ERUs X	$\frac{677 \text{ gpd X}}{\text{ERU}}$	$\frac{365 \text{ day X}}{1 \text{ yr}}$	$\frac{1 \text{ Acft.}}{325,829 \text{ gal}}$	=	317	Ac-Ft
			<b>Existing Water Right</b>		<b>597</b>	<b>Ac-Ft 627 gpm</b>
			<b>Total Required Water Right</b>		<b>772</b>	<b>Ac-Ft 479 gpm</b>
			<b>Existing Culinary System Water Right Surplus</b>		<b>-175</b>	<b>Ac-Ft 148 gpm</b>

The projected water right surplus or deficit is determined by subtracting the projected required water right from the total available water right. The 20-year projection results in a deficit of 175 ac-ft. Figure III.C-1 shows the projected culinary water right demands vs. BPWSSD’s existing available water right resources throughout the planning period.



Figure III.C-1: Apple Valley Culinary Water Right Resources vs. Projected Demand



**D. RECOMMENDED WATER RIGHT IMPROVEMENTS**

Water rights have continued to be a growing concern in Southern Utah. Analysis shows that BPWSSD does not have sufficient water rights for the anticipated growth over the 20-year planning period. New developments should either deed additional municipal water rights to BPWSSD for subdivision approval or pay an equivalent fee to the district to utilize the water rights. This will allow the district to maintain needed water rights. It is recommended that developers provide an additional 1 ac-ft of water right for each ERU a developer brings to the system.

**IV. WATER SOURCE CAPACITY ANALYSIS**

**A. EXISTING WATER SOURCE CAPACITY**

To analyze source capacity, all available culinary water sources must first be identified. These sources are listed in the tables below along with flow values provided by the District. The total flow is 565 gpm for Apple Valley, 97 gpm for Cannan Springs, and 123 gpm for Cedar Point as shown in Table IV. A-1 through Table IV.A-3 below.

**Table IV.A-1: Apple Valley SSD Culinary Water Source Capacity**

Apple Valley Sources	Total Flow	
Wells	CFS	gpm
Well #1	0.8	380
Well #2	0.4	185
Source Total =	1.3	565

**Table IV.A-2: Cannan Springs SSD Culinary Water Source Capacity**

Cannan Springs Sources	Total Flow	
Wells	CFS	gpm
Upper Spring	0.1	58
Lower Sping	0.1	39
Source Total =	0.2	97

**Table IV.A-3: Cedar Point SSD Culinary Water Source Capacity**

Cedar Point Sources	Total Flow	
Wells	CFS	gpm
Well #59	0.1	60
Jessop Well	0.1	30
Cooke Well	0.1	33
Source Total =	0.3	123

**B. EXISTING REQUIRED WATER SOURCE CAPACITY**

The State of Utah Public Administrative Rules for Public Drinking Water Systems, R309-510, states that a water system should have an adequate water source capacity to supply peak day demand. This is implied to be two and a half the amount of average day demand. Multiplying the historical usage by 2 results in a peak day demand of

## SECTION IV – WATER SOURCE CAPACITY ANALYSIS

597 gpd/ERU for Apple Valley, 1,543 gpd/ERU for Cannan Springs, and 1,354 gpd/ERU for Cedar Point.

By multiplying the peak day culinary water usage per ERU by the number of existing ERUs, the existing required culinary water source capacity was determined. This calculation is shown below in Table IV.B-1 through Table.B-3.

**Table IV.B-1: Apple Valley Current Required Culinary Water Source Capacity**

<b>Required Indoor/Outdoor Source - Historic Usage</b>						
345	ERUs X	<u>677 gpd X</u>	<u>1 day X</u>	<u>1 hr</u>	=	162 gpm
		ERU	24 hr	60 min.		
<b>Total Available Source Capacity</b>						565 gpm
<b>Existing Culinary System Source Capacity Surplus</b>						403 gpm

**Table IV.B-2: Cannan Springs Current Required Culinary Water Source Capacity**

<b>Required Indoor/Outdoor Source - Historic Usage</b>						
13	ERUs X	<u>1,543 gpd X</u>	<u>1 day X</u>	<u>1 hr</u>	=	14 gpm
		ERU	24 hr	60 min.		
<b>Total Available Source Capacity</b>						97 gpm
<b>Existing Culinary System Source Capacity Surplus</b>						83 gpm

**Table IV.B-3: Cedar Point Current Required Culinary Water Source Capacity**

<b>Required Indoor/Outdoor Source - Historic Usage</b>						
157	ERUs X	<u>1,354 gpd X</u>	<u>1 day X</u>	<u>1 hr</u>	=	148 gpm
		ERU	24 hr	60 min.		
<b>Total Available Source Capacity</b>						123 gpm
<b>Existing Culinary System Source Capacity Deficit</b>						-25 gpm

The existing source capacity surplus or deficit is determined by subtracting the existing required source capacity from the total available source capacity which yields a surplus of 403 gpm for Apple Valley, a surplus of 83 gpm for Cannan Springs, and a deficit of 25 gpm for Cedar Point.

### C. PROJECTED REQUIRED WATER SOURCE CAPACITY

Projected required water source capacity at the end of the planning period is determined from the same information and calculations explained in Part B, except the projected number of culinary water ERUs is substituted into the calculations for the current number of ERUs as shown in Table IV.C-1 Table IV.C-3.

## SECTION IV – WATER SOURCE CAPACITY ANALYSIS

**Table IV.C-1: Apple Valley Projected 20-Year Required Culinary Water Source Capacity**

Required Indoor/Outdoor Source - Historic Usage						
915	ERUs X	$\frac{677 \text{ gpd}}{\text{ERU}}$	$\times$	$\frac{1 \text{ day}}{24 \text{ hr}}$	$\times$	$\frac{1 \text{ hr}}{60 \text{ min.}}$
						= 430 gpm
<b>Total Available Source Capacity</b>						565 gpm
<b>Projected Culinary System Source Capacity <u>Surplus</u></b>						<b>135 gpm</b>

**Table IV.C-2: Cannan Springs Projected 20-Year Required Culinary Water Source Capacity**

Required Indoor/Outdoor Source - Historic Usage						
126	ERUs X	$\frac{1,543 \text{ gpd}}{\text{ERU}}$	$\times$	$\frac{1 \text{ day}}{24 \text{ hr}}$	$\times$	$\frac{1 \text{ hr}}{60 \text{ min.}}$
						= 135 gpm
<b>Total Available Source Capacity</b>						97 gpm
<b>Projected Culinary System Source Capacity <u>Deficit</u></b>						<b>-38 gpm</b>

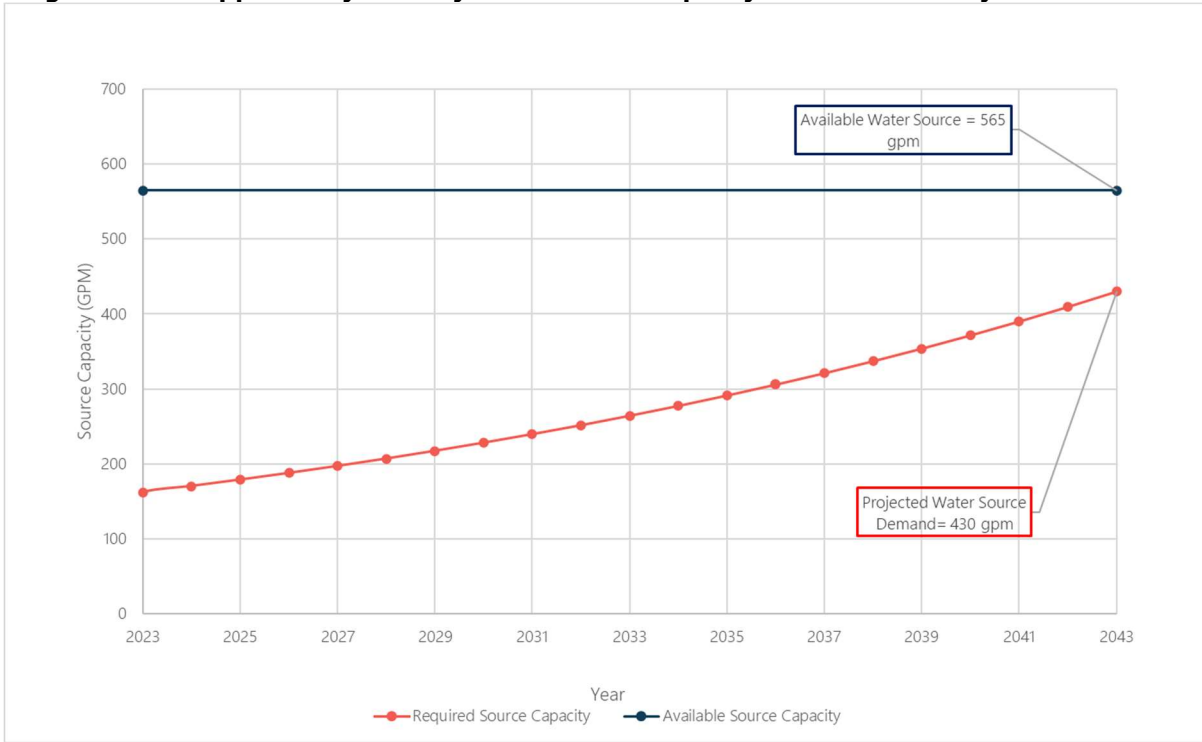
**Table IV.C-3: Cedar Point Projected 20-Year Required Culinary Water Source Capacity**

Required Indoor/Outdoor Source - Historic Usage						
417	ERUs X	$\frac{1,354 \text{ gpd}}{\text{ERU}}$	$\times$	$\frac{1 \text{ day}}{24 \text{ hr}}$	$\times$	$\frac{1 \text{ hr}}{60 \text{ min.}}$
						= 392 gpm
<b>Total Available Source Capacity</b>						123 gpm
<b>Projected Culinary System Source Capacity <u>Deficit</u></b>						<b>-269 gpm</b>

The projected source capacity surplus or deficit is determined by subtracting the projected required source capacity from the total available source capacity, which yields a projected surplus of 135 gpm for Apple Valley, a projected deficit of 38 gpm for Cannan Springs, and a projected deficit 269 gpm for Cedar Point at the end of the 20-year planning period. Figure IV.C-1 through Figure IV.C-3 shows the projected culinary water source capacity demands vs. BPWSSD’s existing available source capacity resources throughout the planning period.

## SECTION IV – WATER SOURCE CAPACITY ANALYSIS

**Figure IV.C-1: Apple Valley Culinary Water Source Capacity Resources vs. Projected Demands**



**Figure IV.C-2: Cannan Springs Culinary Water Source Capacity Resources vs. Projected Demands**

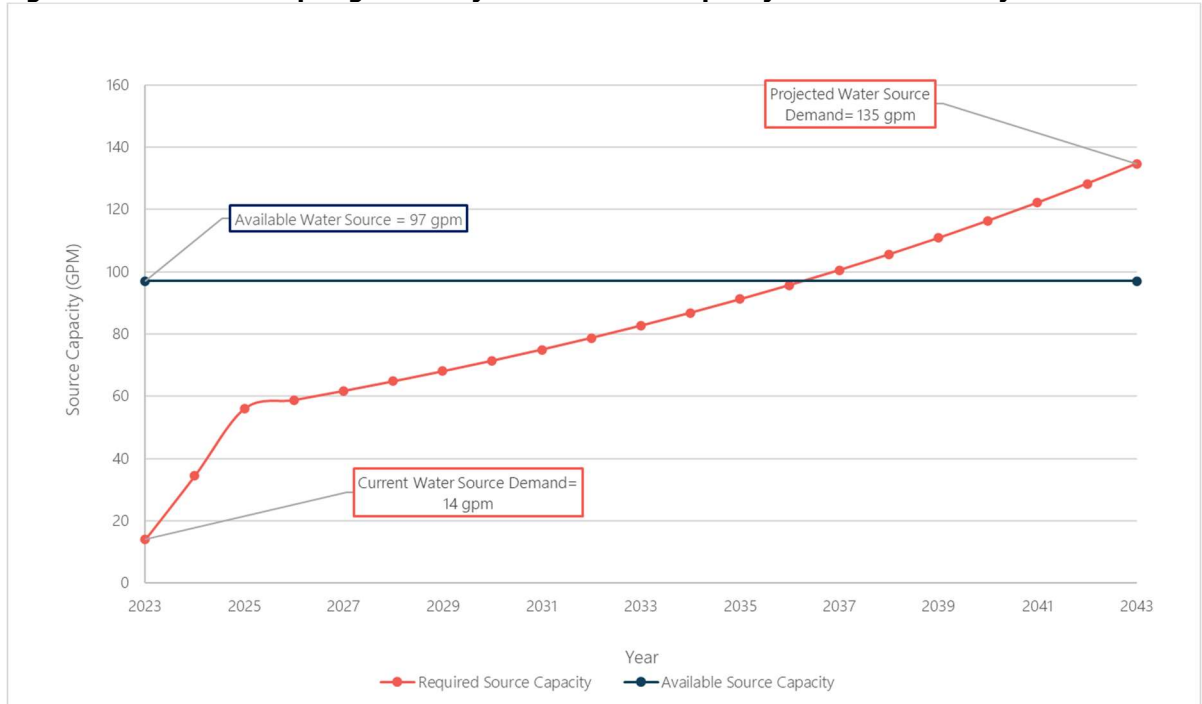
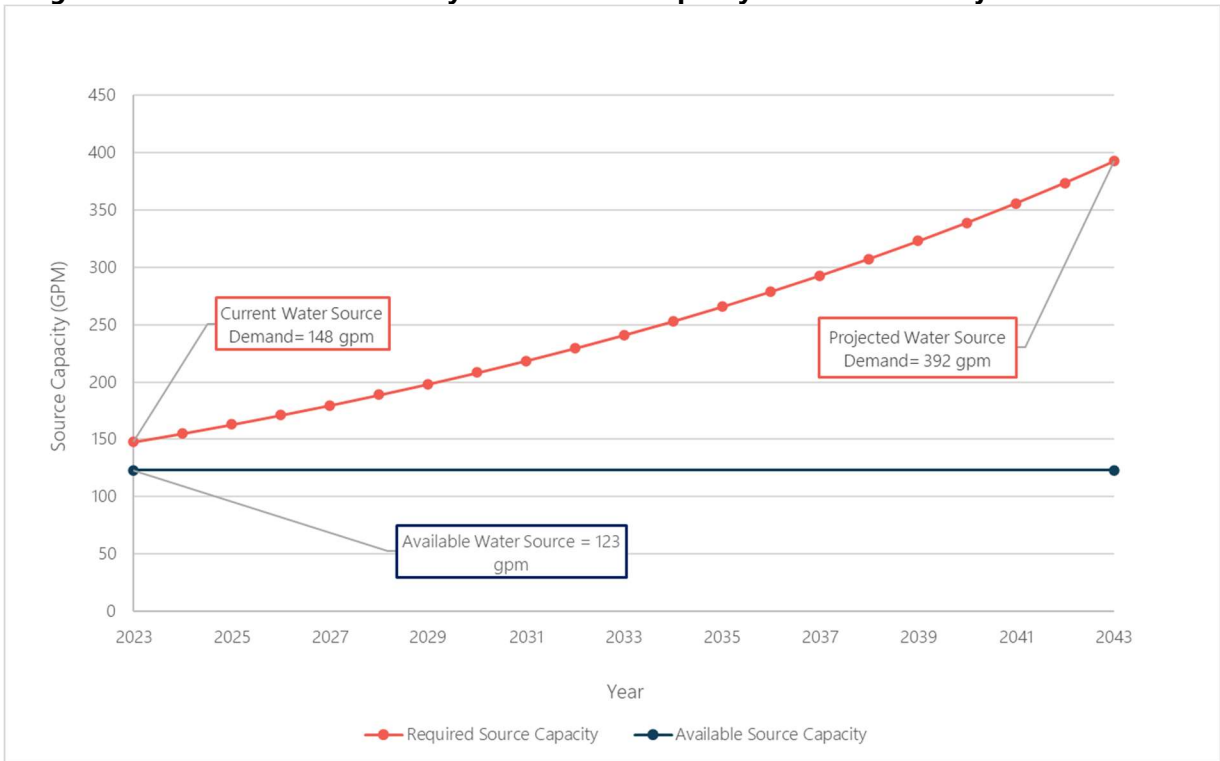


Figure IV.C-3: Cedar Point Culinary Water Source Capacity Resources vs. Projected Demands



**D. RECOMMENDED WATER SOURCE CAPACITY IMPROVEMENTS**

Because of the insufficient amount of water source in the projected future, it is recommended that a new well be constructed in Cedar Point and Cannan Springs to cover the deficits shown above along with equipping the Rock Well in Cedar Point which will give approximately another 100 gpm resulting in an existing surplus of 75 gpm rather than a deficit of 25 gpm.

V. WATER STORAGE CAPACITY ANALYSIS

A. EXISTING WATER STORAGE CAPACITY

To analyze storage capacity, all available culinary water storage must first be identified. The existing storage facilities for Apple Valley consist of two tanks (both 220,000 gal.), two tanks for Cannan Springs (100,000 gal and 50,000 gal), and 1 tank for Cedar Point (1,000,000 gal.). The total storage is shown in Table V.A-1 through Table V.A-3 below.

**Table V.A-1: Apple Valley Culinary Water Storage Capacity**

Existing Storage Capacity:	
Apple Valley Tank 1	220,000 gal.
Apple Valley Tank 2	220,000 gal.
<b>Total Existing Storage Capacity</b>	<b>440,000 gal.</b>

**Table V.A-2: Cannan Springs Culinary Water Storage Capacity**

Existing Storage Capacity:	
Cannan Springs Tank 1	100,000 gal.
Cannan Springs Tank 2	50,000 gal.
<b>Total Existing Storage Capacity</b>	<b>150,000 gal.</b>

**Table V.A-3: Cedar Point Culinary Water Storage Capacity**

Existing Storage Capacity:	
Cedar Point Tank	1,000,000 gal.
<b>Total Existing Storage Capacity</b>	<b>1,000,000 gal.</b>

B. EXISTING REQUIRED WATER STORAGE CAPACITY

Water storage capacity requirements are found in the State of Utah Administrative Rules for Public Drinking Water Systems, R309-510. These regulations require storage for a community’s culinary water system to meet one full day’s use requirement for all water connections, plus the required fire flows for a minimum of one hour.

Storage requirements for fire protection vary slightly from community to community. In general, fire flow requirements are set by the local Fire Chief or are based on building size and type of construction. The Statewide minimum fire flow is 1,000 gpm.

## SECTION V – WATER STORAGE CAPACITY ANALYSIS

This is also the minimum fire flow required for BPWSSD. Based on this information, the current required storage capacity is calculated as shown in Table V.B-1 through Table V.B-3.

**Table V.B-1: Apple Valley Current Required Culinary Water Storage Capacity**

	<u>339 gpd</u>	X	345	ERUs	=	116,712	gpd
	ERU						
Fire Demand	1,000 gpm	X	60	min	X	1	hr
			1	hr	=	60,000	gpd.
						<b>Emergency Supply: 25% of required storage</b>	44,178 gpd
						<b>Total Existing Required Storage</b>	220,890 gpd
						<b>Total Existing Storage Capacity</b>	440,000 gpd
						<b>Existing Storage Capacity Surplus</b>	<b>219,110 gpd</b>

**Table V.B-2: Cannan Springs Current Required Culinary Water Storage Capacity**

	<u>771 gpd</u>	X	13	ERUs	=	10,027	gpd
	ERU						
Fire Demand	1,000 gpm	X	60	min	X	1	hr
			1	hr	=	60,000	gpd.
						<b>Emergency Supply: 25% of required storage</b>	17,507 gpd
						<b>Total Existing Required Storage</b>	87,533 gpd
						<b>Total Existing Storage Capacity</b>	150,000 gpd
						<b>Existing Storage Capacity Surplus</b>	<b>62,467 gpd</b>

**Table V.B-3: Cedar Point Current Required Culinary Water Storage Capacity**

	<u>677 gpd</u>	X	157	ERUs	=	106,506	gpd
	ERU						
Fire Demand	1,000 gpm	X	60	min	X	1	hr
			1	hr	=	60,000	gpd.
						<b>Emergency Supply: 25% of required storage</b>	41,627 gpd
						<b>Total Existing Required Storage</b>	208,133 gpd
						<b>Total Existing Storage Capacity</b>	1,000,000 gpd
						<b>Existing Storage Capacity Surplus</b>	<b>791,867 gpd</b>

The existing water storage capacity surplus or deficit is determined by subtracting the current required water storage capacity gallons from the total available water storage capacity gallons, which yields an existing surplus of 219,110 gpd for Apple Valley, a



surplus of 62,467 gpd for Cannan Springs, and a surplus of 791,867 gpd for Cedar Point.

**C. PROJECTED REQUIRED WATER STORAGE CAPACITY**

The projected required culinary water storage capacity at the end of the planning period is determined from the same factors explained previously, but the projected number of ERUs is inserted into the calculations as shown in Table V.C-1 through Table V.C-3.

**Table V.C-1: Apple Valley Projected 20-Year Required Culinary Water Storage Capacity**

	339 gpd		X	915	ERUs	=	309,671 gpd
	ERU						
Fire Flow	1,000 gpm	X	60 min	X	1 hr	=	60,000 gpd
	1 hr						
	<b>Emergency Supply: 25% of required storage</b>						92,418 gpd
	<b>Total Required Storage</b>						462,089 gpd
	<b>Total Existing Storage Capacity</b>						440,000 gpd
	<b>Future Storage Capacity Deficit</b>						<b>(22,089) gpd</b>

**Table V.C-2: Cannan Springs Projected 20-Year Required Culinary Water Storage Capacity**

	771 gpd		X	126	ERUs	=	97,000 gpd
	ERU						
Fire Flow	1,000 gpm	X	60 min	X	1 hr	=	60,000 gpd
	1 hr						
	<b>Emergency Supply: 25% of required storage</b>						39,250 gpd
	<b>Total Required Storage</b>						196,250 gpd
	<b>Total Existing Storage Capacity</b>						150,000 gpd
	<b>Future Storage Capacity Surplus</b>						<b>(46,250) gpd</b>

**Table V.C-3: Cedar Point Projected 20-Year Required Culinary Water Storage Capacity**

	677 gpd		X	417	ERUs	=	282,593 gpd
	ERU						
Fire Flow	1,000 gpm	X	60 min	X	1 hr	=	60,000 gpd
	1 hr						
Emergency Supply	<b>Emergency Supply: 25% of required storage</b>						85,648 gpd
	<b>Total Required Storage</b>						428,241 gpd
	<b>Total Existing Storage Capacity</b>						1,000,000 gpd
	<b>Future Storage Capacity Surplus</b>						<b>571,759 gpd</b>

The projected water storage capacity surplus or deficit is determined by subtracting the projected required water storage capacity from the total available water storage capacity, which yields a projected deficit of 22,089 gpd for Apple Valley, a deficit of 46,250 gpd for Cannan Springs, and a surplus of 571,759 gpd for Cedar Point at the end of the planning period.

Figure V.C-1 through Figure V.C-3 shows the projected culinary water storage capacity demands vs. BPWSSD’s existing available storage capacity resources throughout the planning period.

**Figure V.C-1: Apple Valley Water Storage Capacity vs. Projected Demands**

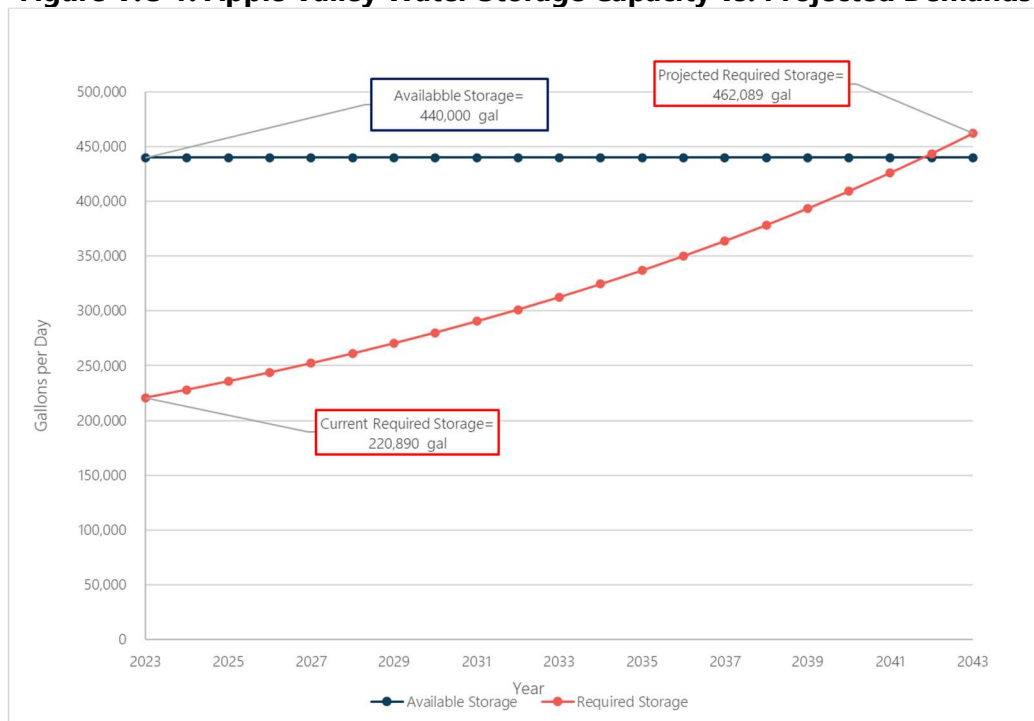


Figure V.C-2: Cannan Springs Water Storage Capacity vs. Projected Demands

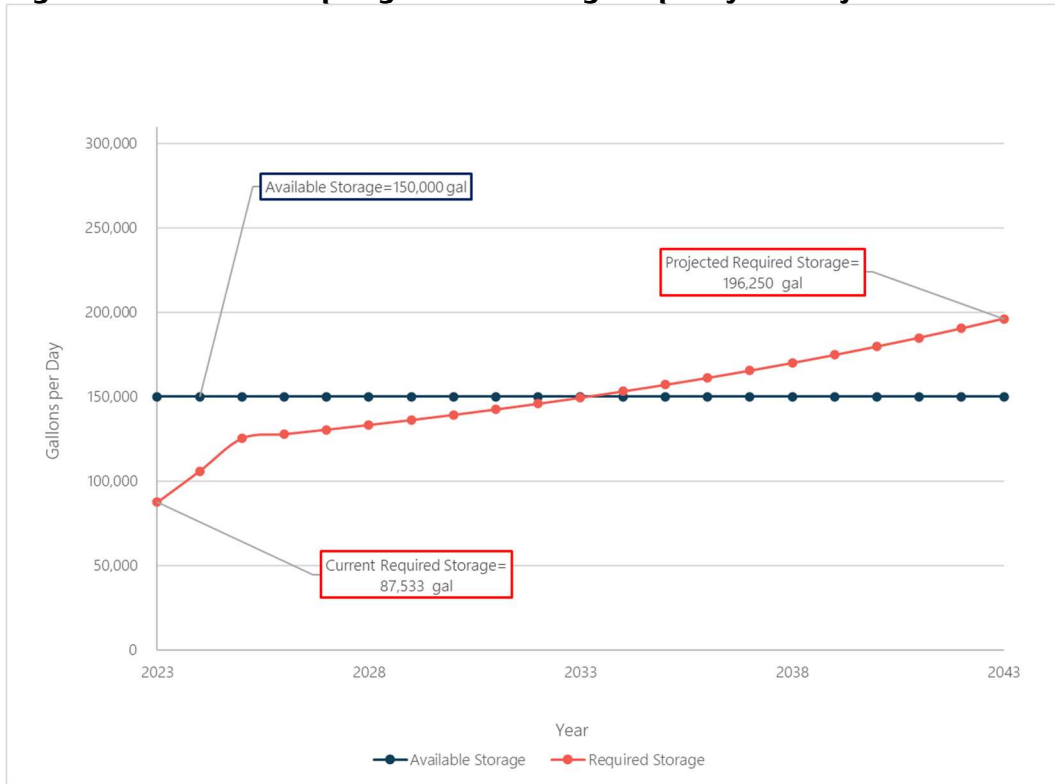
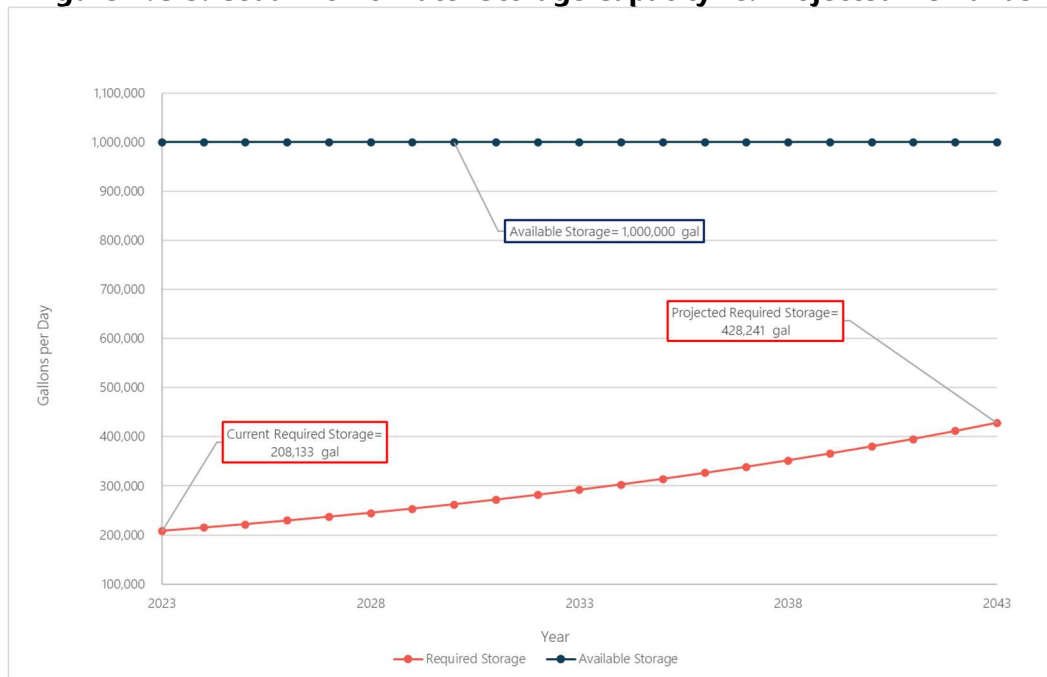


Figure V.C-3: Cedar Point Water Storage Capacity vs. Projected Demands



### D. EXISTING ELEVATION CONSTRAINTS

In order to supply adequate pressure throughout the system in Apple Valley, a new 1,000,000-gallon tank being used to help supply adequate pressures throughout the system should be placed at an elevation of about 4,970 ft which may be obtainable on the hills just north of where the current tanks are located.

Cannan Springs and Cedar Point do not currently have tank elevation constraints.

### E. RECOMMENDED WATER STORAGE CAPACITY IMPROVEMENTS

Projected storage requirements will need to be evaluated as subdivisions are approved and constructed. It is anticipated that the majority of growth in Cedar Point will be within the service limits of the existing tank, thus no improvements for this area have been recommended.

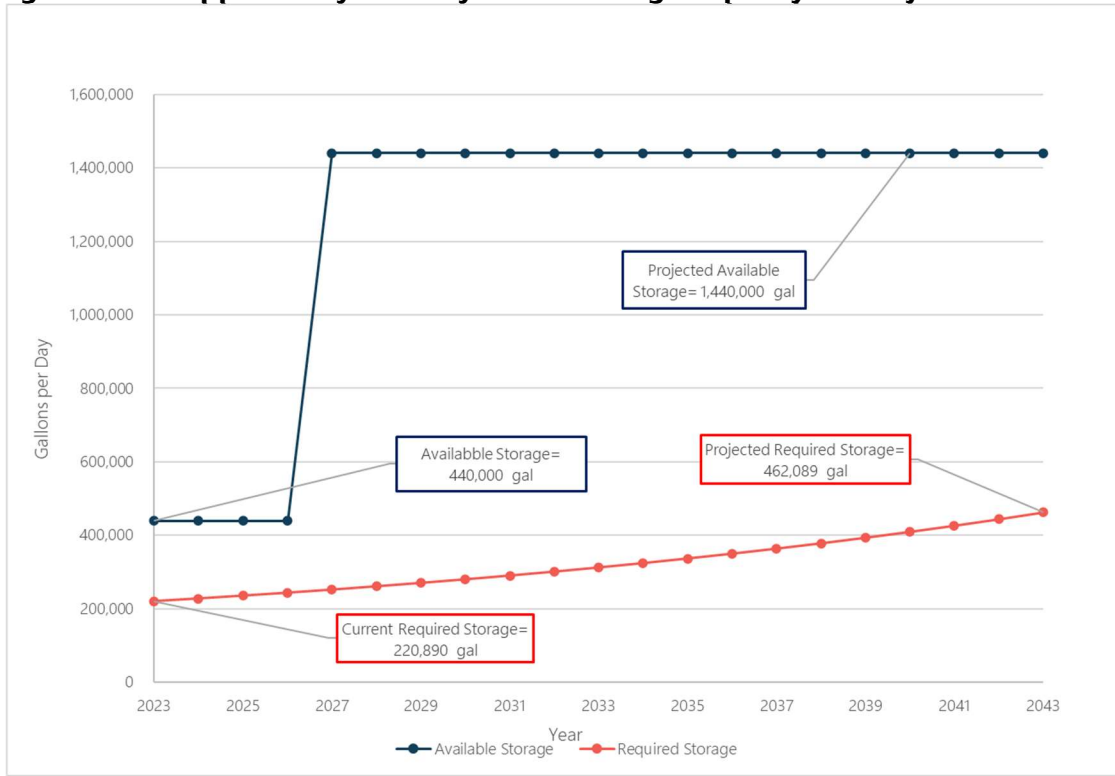
However, due to the projected deficit of about 46,250 gpd in Cannan Springs, it is recommended that Cannan Springs increases their storage with a 100,000-gallon tank.

Apple Valley is currently projected to have a storage deficit for the planning period and the tanks are at a lower elevation so an additional tank at higher elevation will be needed to help Apple Valley be within the state pressure requirements. A new 1,000,000-gallon tank is recommended to help with pressure and storage requirements throughout the system and support the growth and construction of future communities.

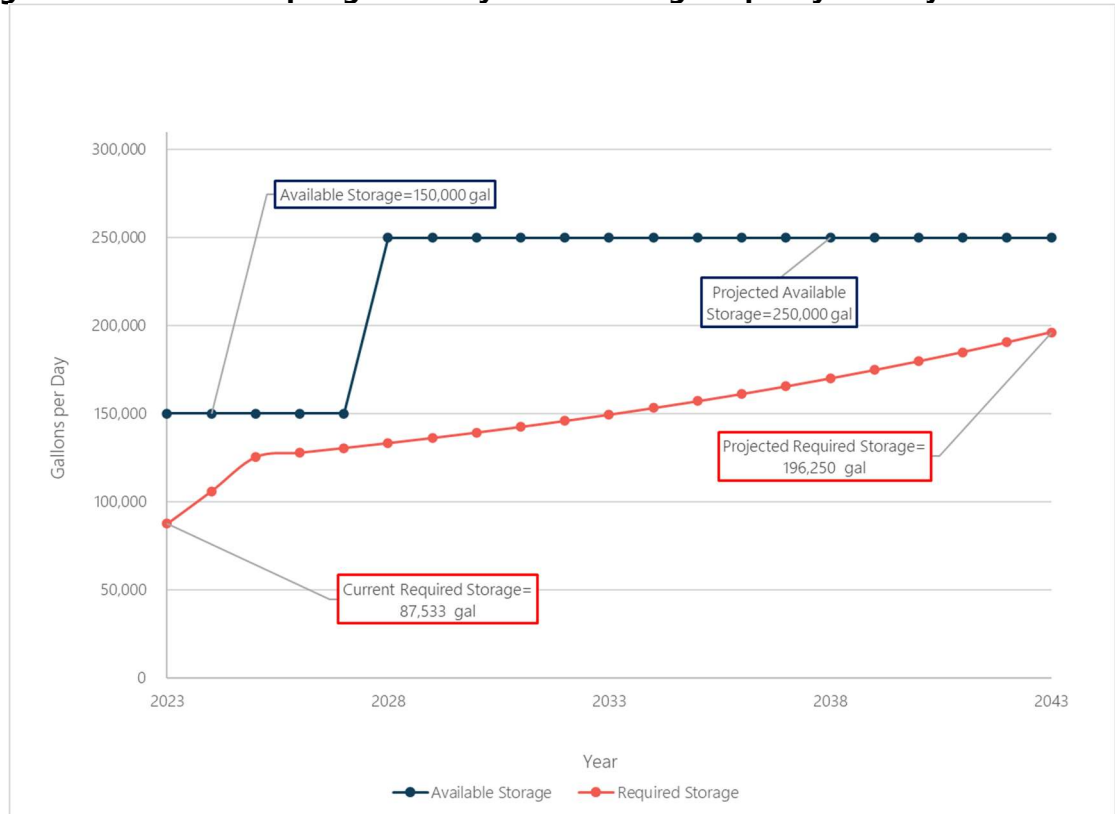
Figure V.E-1 and Figure V.E-2 below shows the projected water storage capacity demands vs. BPWSSD's available storage capacity throughout the planning period for Apple Valley and Cannan Springs with these recommendations. Should the local fire authority change the fire flow requirements for the district, sizing for the Cannan Springs tank may need to be increased.

## SECTION V – WATER STORAGE CAPACITY ANALYSIS

**Figure V.E-1: Apple Valley Culinary Water Storage Capacity vs. Projected Demands**



**Figure V.E-2: Cannan Springs Culinary Water Storage Capacity vs. Projected Demands**



## VI. WATER TREATMENT REQUIREMENTS

### A. GENERAL REQUIREMENTS

BPWSSD does not currently treat water. As growth occurs it may become necessary to treat water. As new growth occurs and additional sources are put online, the distribution system should be improved so all sources tie directly into storage before source water enters the distribution system.

The State of Utah Public Drinking Water Regulations R309, in accordance with the National Safe Drinking Water Act, have adopted “primary” regulations for the protection of public health and “secondary” regulations related to taste and aesthetics. Applicable “primary” standards and treatment techniques must be met by all public drinking water systems. “Secondary” standards are optional standards which are meant to help water suppliers avoid consumer complaints.

VII. WATER DISTRIBUTION SYSTEM ANALYSIS

A. EXISTING DISTRIBUTION SYSTEM ANALYSIS

The State of Utah Administrative Rules for Public Drinking Water Systems, R309-510, require distribution systems to be sized to supply peak instantaneous flows, while maintaining a minimum system pressure of 30 psi. The rule also requires that distribution systems are able to supply peak day flows plus fire flows for a minimum of 1 hour, while maintaining a minimum system pressure of 20 psi. The system also needs to provide peak day flows while maintaining a minimum system pressure of 40 psi. As a general guideline, it is recommended that the system be able to provide a minimum static pressure of 50 psi at every point in the distribution system.

The indoor peak instantaneous demand equation (see Table VII.A-1 through Table VII.A-3) is found in the State of Utah Public Administrative Rules for Drinking Water Systems, R309-510. This rule also provides a flow requirement of 2.83 gpm per irrigated acre for use in determining the outdoor peak instantaneous demand. By taking a representative sample of homes/yards in BPWSSD and averaging the area of irrigated landscaping, an average area of 0.03 irrigated acres per ERU was determined and used to estimate the outdoor peak instantaneous demand. The number of outdoor ERUs represents the estimated number of existing ERUs because there is no secondary irrigation system.

**Table VII.A-1: Apple Valley Current Required Distribution Demands**

<b>Indoor Peak Instantaneous Demand:</b>				
Q=	10.8 X N <sup>.64</sup>		N=	Number of ERU's
Q=	10.8 X 345 <sup>.64</sup>		=	454 gpm
<b>Outdoor Peak Instantaneous Demand: Q = N X Irr. Acre/ERU X gpm/Irr. Acre</b>				
Q=	345 ERU X	$\frac{0.03 \text{ acre}}{\text{ERU}}$	X	$\frac{2.83 \text{ gpm}}{\text{irr. acre}}$
			=	29 gpm
<b>Current Peak Instantaneous Demand</b>				<b>= 484 gpm</b>
<b>Peak Day Demand &amp; Fire Flow</b>				
All ERUs				
345 ERUs X	$\frac{677 \text{ gpd}}{\text{ERU}}$	$\frac{1 \text{ day}}{24 \text{ hr}}$	$\frac{1 \text{ hr}}{60 \text{ min.}}$	= 162 gpm
			<b>Fire Flow</b>	= 1,000 gpm
<b>Current Peak Day Demand + Fire Flow</b>				<b>= 1,162 gpm</b>

**Table VII.A-2: Cannan Springs Current Required Distribution Demands**

<b>Indoor Peak Instantaneous Demand:</b>				
Q=	10.8 X N <sup>.64</sup>	N=	Number of ERU's	
Q=	10.8 X 13 <sup>.64</sup>			= 56 gpm
<b>Outdoor Peak Instantaneous Demand: Q = N X Irr. Acre/ERU X gpm/Irr. Acre</b>				
Q=	13 ERU X	0.03 acre X	2.8340278 gpm	= 1 gpm
		ERU	irr. acre	
<b>Current Peak Instantaneous Demand</b>				<b>= 57 gpm</b>
<b>Peak Day Demand &amp; Fire Flow</b>				
All ERUs				
13 ERUs X	1,543 gpd X	1 day	1 hr	= 14 gpm
	ERU	24 hr	60 min.	
<b>Fire Flow</b>				<b>= 1,000 gpm</b>
<b>Current Peak Day Demand + Fire Flow</b>				<b>= 1,014 gpm</b>

**Table VII.A-3: Cedar Point Current Required Distribution Demands**

<b>Indoor Peak Instantaneous Demand:</b>				
Q=	10.8 X N <sup>.64</sup>	N=	Number of ERU's	
Q=	10.8 X 157 <sup>.64</sup>			= 275 gpm
<b>Outdoor Peak Instantaneous Demand: Q = N X Irr. Acre/ERU X gpm/Irr. Acre</b>				
Q=	157 ERU X	0.03 acre X	2.83 gpm	= 13 gpm
		ERU	irr. acre	
<b>Current Peak Instantaneous Demand</b>				<b>= 288 gpm</b>
<b>Peak Day Demand &amp; Fire Flow</b>				
All ERUs				
157 ERUs X	1,354 gpd X	1 day	1 hr	= 148 gpm
	ERU	24 hr	60 min.	
<b>Fire Flow</b>				<b>= 1,000 gpm</b>
<b>Current Peak Day Demand + Fire Flow</b>				<b>= 1,148 gpm</b>

As previously discussed, the peak day demand is 2 times the average amount of historical usage. The State regulation for fire flow requires a minimum of 1,000 gpm if no recommendation has been provided by the local fire authority. State regulations require all fire hydrants to be served from 8-inch diameter or larger pipelines unless it can be proven through the use of modeling that 6-inch lines are sufficient.

The existing BPWSSD culinary water distribution system has been modeled for these demands using the computer program Infowater by Innovyze®. The main network of the distribution system is providing good service to the majority of connections.



However, there are a few locations where required pressures and flows are not able to be met. Improvements have been recommended to negate the existing deficiencies. These can be seen in Figures VII.C-1 through VII.C-3.

**B. PROJECTED DISTRIBUTION SYSTEM ANALYSIS**

The projected distribution system analysis is performed using the same assumptions as in the existing system analysis, except that the projected number of ERUs are inserted into the calculations. The projected peak instantaneous demand and peak day demand plus fire flow are calculated in Table VII.B-1 through Table VII.B-3. Exhibits of the current system can also be seen below in Figures VII.B-1 through VII.B-3

**Table VII.B-1: Apple Valley Projected 20-Year Required Distribution Demands**

<b>Indoor Peak Instantaneous Demand:</b>				
Q=	10.8 X N <sup>.64</sup>		N= Number of ERU's	
Q=	10.8 X 915 <sup>.64</sup>			= 849 gpm
<b>Outdoor Peak Instantaneous Demand: Q = N X Irr. Acre/ERU X gpm/Irr. Acre</b>				
Q=	915 ERU X	$\frac{0.03 \text{ acre}}{\text{conn.}}$	$\times \frac{2.83 \text{ gpm}}{\text{irr. acre}}$	= 78 gpm
<b>Projected Peak Instantaneous Demand</b>				<b>= 926 gpm</b>
<b>Peak Day Demand &amp; Fire Flow</b>				
All ERUs				
915 ERUs X	$\frac{677 \text{ gpd X}}{\text{ERU}}$	$\frac{1 \text{ day}}{24 \text{ hr}}$	$\frac{1 \text{ hr}}{60 \text{ min.}}$	= 430 gpm
				<b>Fire Flow = 1,000 gpm</b>
<b>Projected Peak Day Demand + Fire Flow</b>				<b>= 1,430 gpm</b>

**Table VII.B-2: Cannan Springs Projected 20-Year Required Distribution Demands**

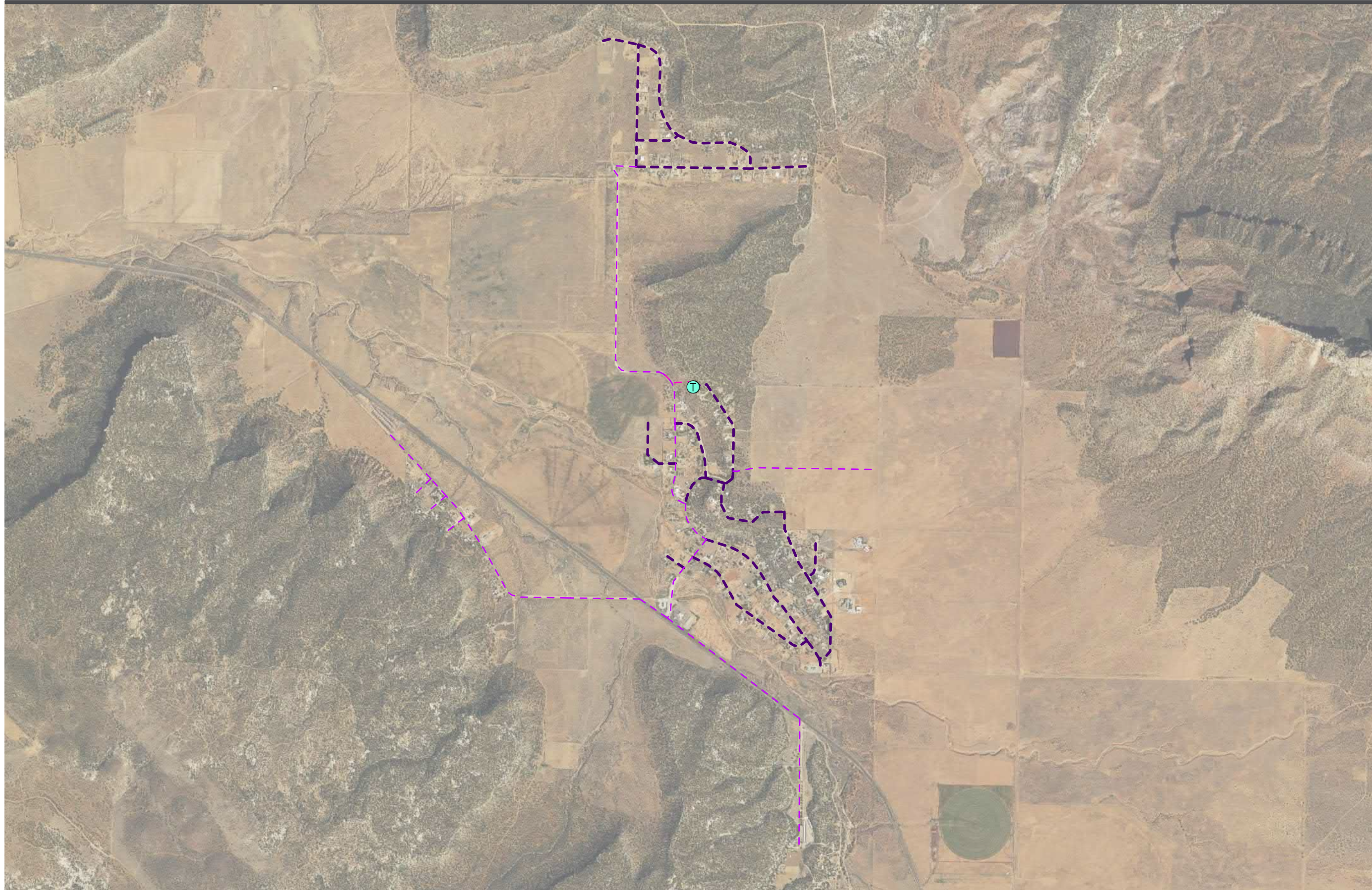
<b>Indoor Peak Instantaneous Demand:</b>				
Q=	10.8 X N <sup>.64</sup>		N= Number of ERU's	
Q=	10.8 X 126 <sup>.64</sup>	=		238 gpm
<b>Outdoor Peak Instantaneous Demand: Q = N X Irr. Acre/ERU X gpm/Irr. Acre</b>				
Q=	126 ERU X	$\frac{0.03 \text{ acre}}{\text{conn.}}$ X	$\frac{2.8340278 \text{ gpm}}{\text{irr. acre}}$	= 11 gpm
<b>Projected Peak Instantaneous Demand</b>				<b>= 249 gpm</b>
<b>Peak Day Demand &amp; Fire Flow</b>				
All ERUs				
126 ERUs X	$\frac{1,543 \text{ gpd X}}{\text{ERU}}$	$\frac{1 \text{ day}}{24 \text{ hr}}$	$\frac{1 \text{ hr}}{60 \text{ min.}}$	= 135 gpm
				<b>Fire Flow = 1,000 gpm</b>
<b>Projected Peak Day Demand + Fire Flow</b>				<b>= 1,135 gpm</b>

**Table VII.B-3: Cedar Point Projected 20-Year Required Distribution Demands**

<b>Indoor Peak Instantaneous Demand:</b>				
Q=	10.8 X N <sup>.64</sup>		N= Number of ERU's	
Q=	10.8 X 417 <sup>.64</sup>	=		513 gpm
<b>Outdoor Peak Instantaneous Demand: Q = N X Irr. Acre/ERU X gpm/Irr. Acre</b>				
Q=	417 ERU X	$\frac{0.03 \text{ acre}}{\text{conn.}}$ X	$\frac{2.8340278 \text{ gpm}}{\text{irr. acre}}$	= 35 gpm
<b>Projected Peak Instantaneous Demand</b>				<b>= 549 gpm</b>
<b>Peak Day Demand &amp; Fire Flow</b>				
All ERUs				
417 ERUs X	$\frac{1,354 \text{ gpd X}}{\text{ERU}}$	$\frac{1 \text{ day}}{24 \text{ hr}}$	$\frac{1 \text{ hr}}{60 \text{ min.}}$	= 392 gpm
				<b>Fire Flow = 1,000 gpm</b>
<b>Projected Peak Day Demand + Fire Flow</b>				<b>= 1,392 gpm</b>



# APPLE VALLEY



## MAP LEGEND



0 875 1750





1 In = 1,750 Feet

 Water Tank

Existing Water Mains

 8"

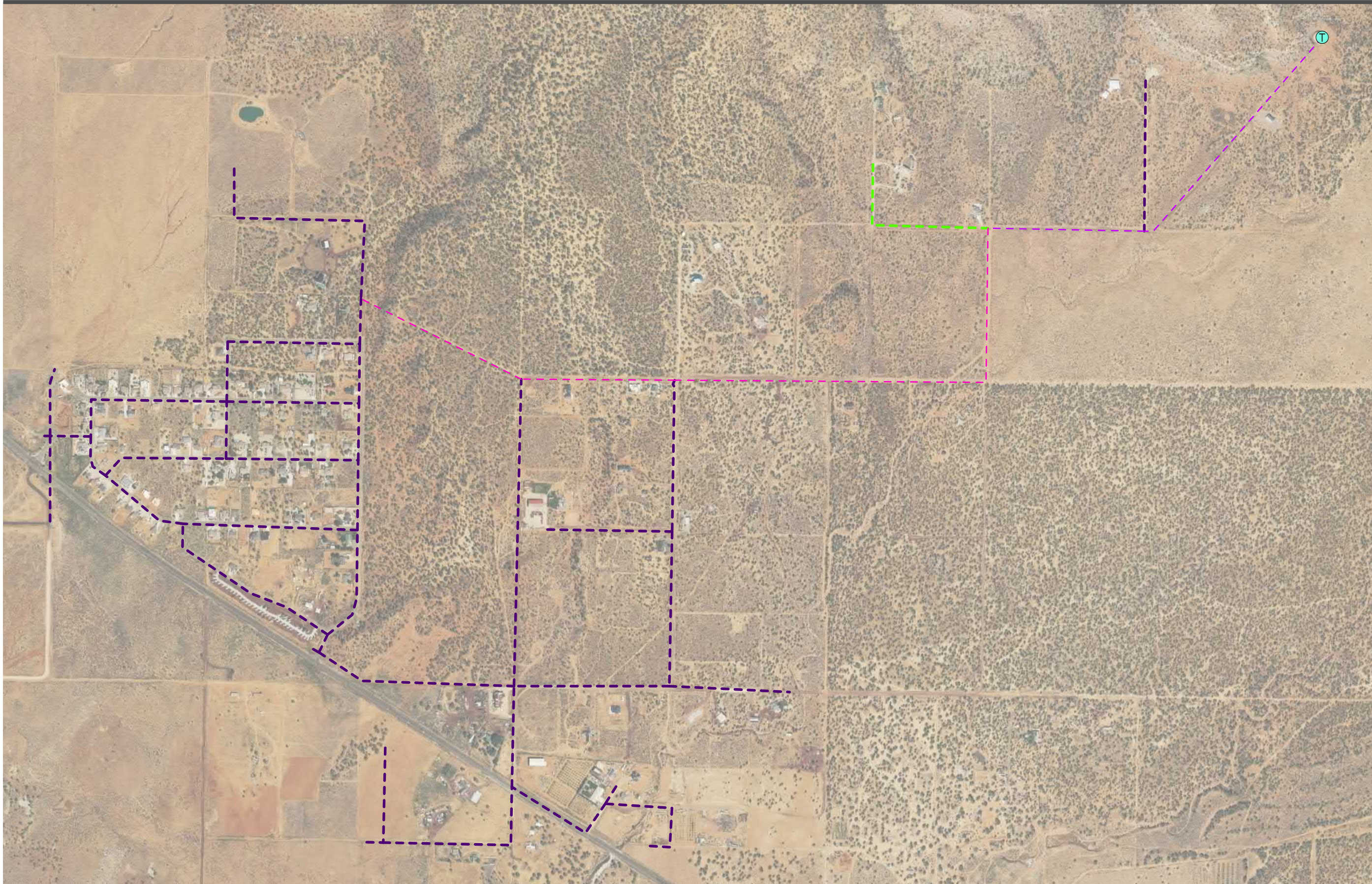
 10"

 12"





# CEDAR POINT




## MAP LEGEND



0 400 800



1 In = 800 Feet


 Water Tank

Existing Water Mains

 6"

 8"

 10"

 12"

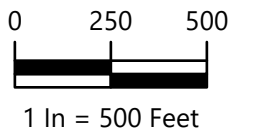






# CANNAN SPRINGS



## MAP LEGEND



-  Water Tank
- Existing Water Mains
-  8"





A final model incorporating all of the recommended distribution system improvements has also been created. This system was modeled using the projected 2043 system demands. With these modifications, the system will be able to meet projected peak day demands with a 1,000-gpm fire flow.

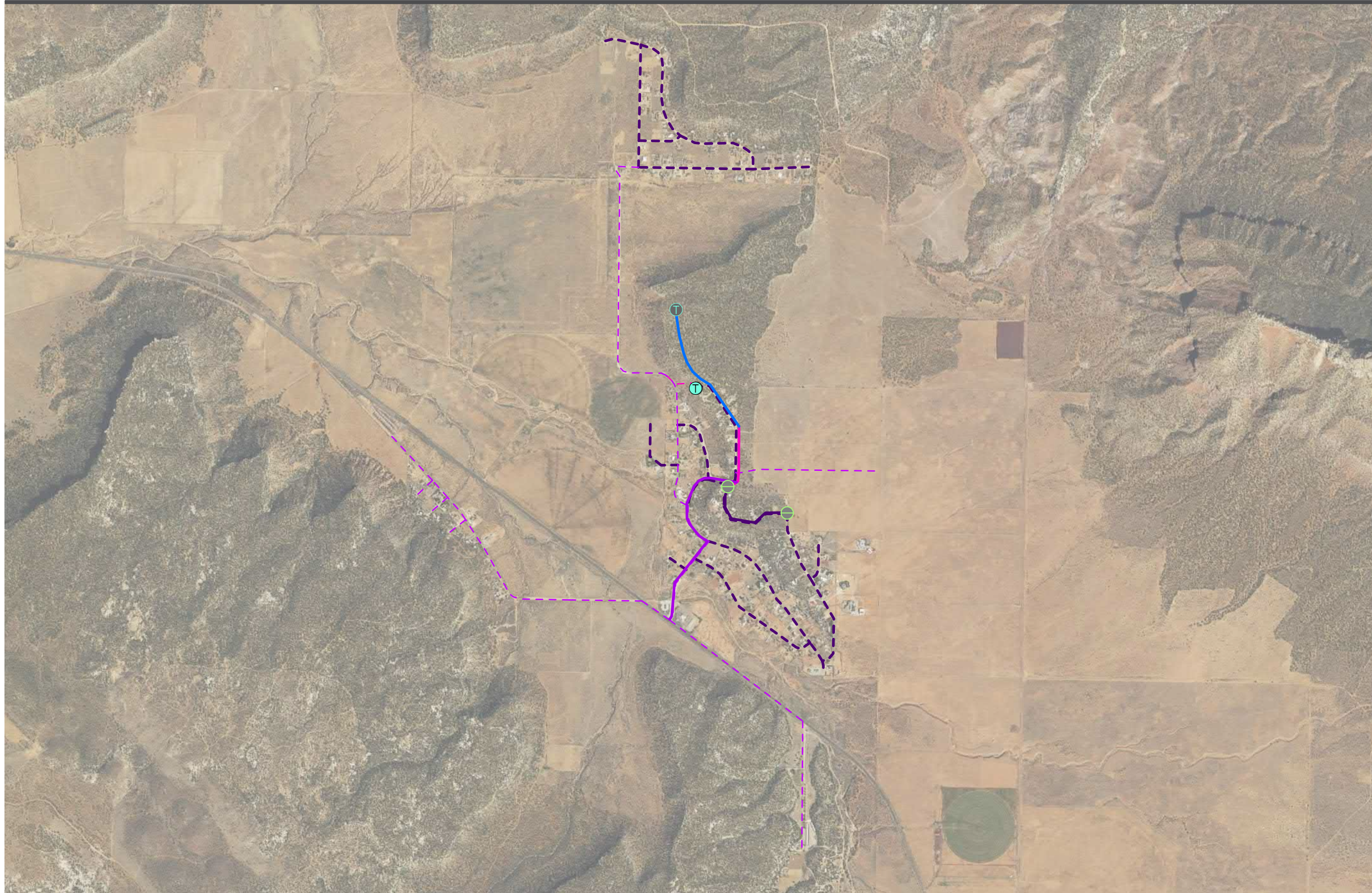
The projected peak instantaneous demands (while maintaining a minimum pressure of 30 psi) and the projected peak day demands (while maintaining a minimum pressure of 40 psi) are able to be met throughout the entire system. Details of this analysis have also been provided in Appendix B.

### C. RECOMMENDED DISTRIBUTION SYSTEM IMPROVEMENTS

In an effort to meet the State requirements with the current and future demands the following distribution system improvements are recommended. The recommendations are shown in the exhibits below.



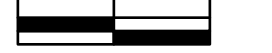
# APPLE VALLEY



## MAP LEGEND



0 875 1750



1 In = 1,750 Feet


 Water Tank


Existing Water Mains

 8"

 10"

 12"

 Water Tank Improvements


 Water Control Valves Improvements

Water Mains Improvements

 8"

 10"

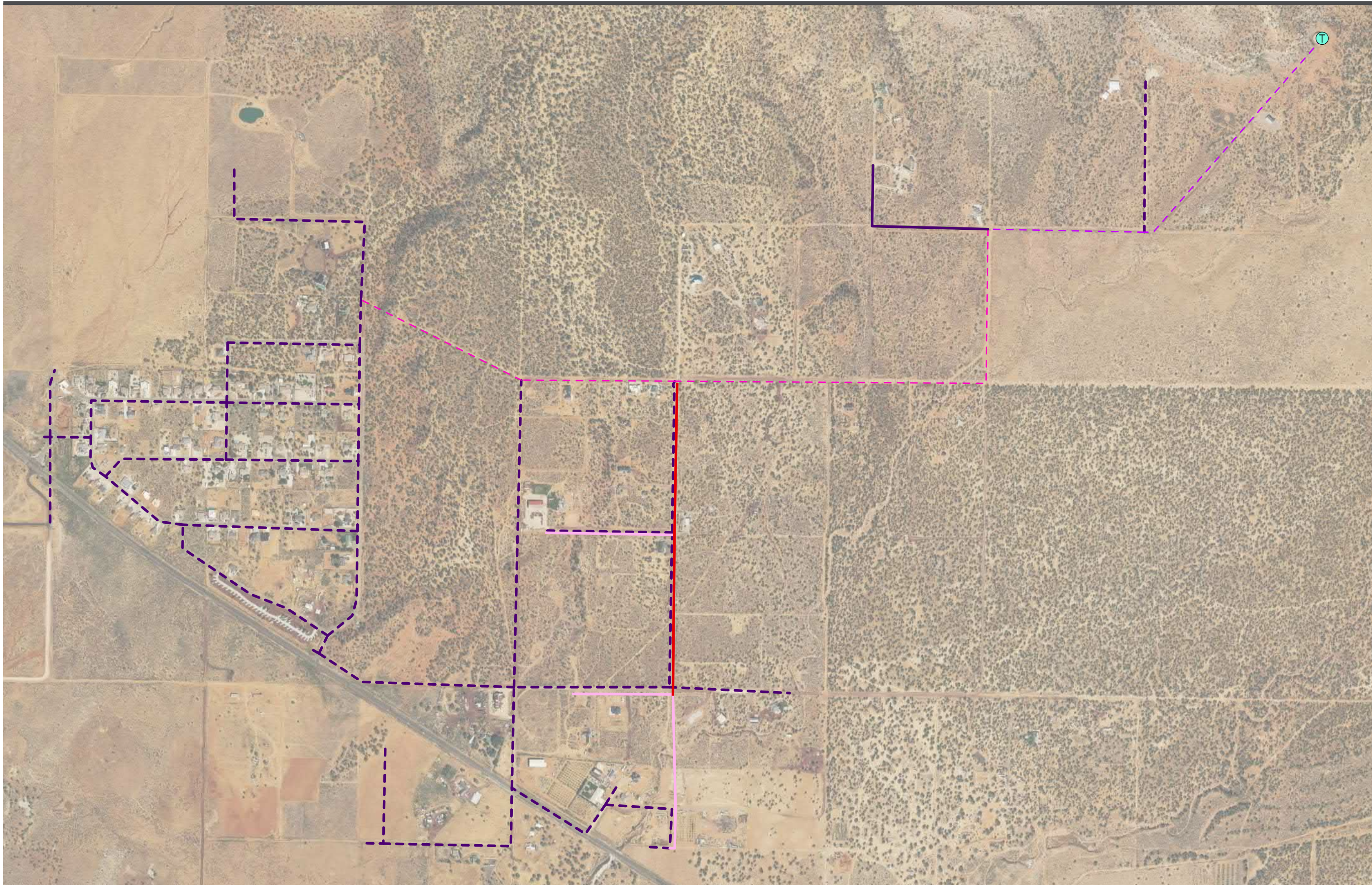
 12"

 16"

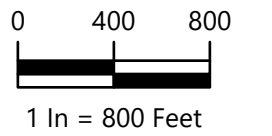





# CEDAR POINT



## MAP LEGEND




 Water Tank

Existing Water Mains


 6"

 8"

 10"

 12"

Water Mains Improvements

 3"

 4"

 8"

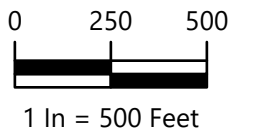





# CANNAN SPRINGS



## MAP LEGEND




 Water Tank

Existing Water Mains

 8"

Water Mains Improvements

 3"

 10"





**VIII. SUMMARY OF RECOMMENDED SYSTEM IMPROVEMENTS**

**A. RECOMMENDED SYSTEM IMPROVEMENTS**

Based on the findings from Sections III - VII, showing immediate system needs as well as requirements for growth projected over the next 20 years, it is recommended that BPWSSD proceed with a construction project to implement improvements as required to bring the system into conformance with State rules. Table VIII.A-1 through Table VIII.A-3 summarizes the recommended improvements.

**Table VIII.A-1: Apple Valley Recommended System Improvements**

ANALYSIS	RECOMMENDED IMPROVEMENTS
1. Water Rights	No Improvements
2. Water Source Capacity	No Improvements
3. Water Storage Capacity	New High elevation 1,000,000 Gallon Tank Routine Tank Inspection Scada to All Tanks/Wells in all Systems
4. Distribution System	New Line to connect high elevation Tank will be tied back into the existing system using two PRVs. To do this will require approximately 2,523 ft of 16" pipe, 3,680 ft of 12" pipe, 1,250 ft of 10" pipe, and 1,800 ft of 8" pipe.  Connect all three systems together with roughly 23,865 ft of pipe from Apple Valley to Cedar Point and roughly 23,180 ft of pipe from Cedar Point to Cannan Springs  Additional Fire Hydrants

**Table VIII.A-2: Cedar Point Recommended System Improvements**

ANALYSIS	RECOMMENDED IMPROVEMENTS
1. Water Rights	No improvements
2. Water Source Capacity	New Well
3. Water Storage Capacity	Routine Tank Inspection.
4. Distribution System	Upgrade 6" line to 8" line (1,496 ft)  Source Transmission Line 3" & 4" Line project (3,825 ft)

**Table VIII.A-3: Cannan Springs Recommended System Improvements**

ANALYSIS	RECOMMENDED IMPROVEMENTS
1. Water Rights	Water Right Plan
2. Water Source Capacity	New Well
3. Water Storage Capacity	New 100,000 Gallon Tank Routine Tank Inspection.
4. Distribution System	Replace the first 2,730' of 8" line coming from the tank toward the town with 10" line

**B. PRELIMINARY ENGINEER’S OPINION OF PROBABLE COST**

An Engineer’s Opinion of Probable Cost (EOPC) for the recommended water system improvements has been provided in Appendix D.

The EOPC includes all anticipated construction costs, contingency budgets, and all other normal project costs such as survey, administration, engineering, legal services, fiscal costs, rights-of-way, etc.

**C. PROPOSED FINANCING PLAN**

Table VIII.C-1 outlines a sample financing scenario for the recommended improvements. The financing scenario includes funding under the assumption that projects begin in fiscal year 2024 with the self-participation of \$50,000 being paid up front and new debt services beginning the following year in 2024. It has been assumed that a grant for approximately 30% of the project cost will be received for this analysis. After the District knows the actual value of the grant received this proposed financing plan may need to be reevaluated.

**SECTION VIII – SUMMARY OF RECOMMENDED SYSTEM IMPROVEMENTS**

TABLE VIII.C-1			
BIG PLAINS SSD WATER			
FY 2024 PROPOSED FINANCING PLAN			
<b>TOTAL PROJECT COST</b>			<b>\$ 11,120,600</b>
<b>Proposed Funding:</b>	<b>Rate</b>	<b>Term in Yrs.</b>	<b>Principal</b>
Self Participation			\$ 50,000
New Grant			\$ 3,320,000
New Loan	2.50%	30	\$ 7,750,600
<b>TOTAL PROJECT FUNDING:</b>			<b>\$ 11,120,600</b>
<b>FY 2024 EXPENSES</b>			
<b>EXPENSES: (First Year of New Debt Serv. Pmt.)</b>			
clerical contractor labor			\$3,537
town interlocal agreement costs			\$152
water salaries and wages			\$50,039
water benefits			\$28,982
admin salaries and wages			\$8,383
admin benefits			\$4,537
public postings			\$566
travel/fuel			\$896
training			\$334
books/subscriptions/memberships			\$1,076
admin supplies and expenses			\$5,885
postage			\$490
bank servc charges			\$1,062
professional service			\$23,327
accounting & audit fees			\$6,801
water testing			\$6,420
legal fees			\$4,499
system maintenance and repairs			\$11,304
system equipment			\$6,168
well maintenance and repairs			\$1,725
tank maintenance and repairs			\$2,599
equipment costs other than fuel			\$3,443
equipment fuel			\$2,513
utilities			\$13,931
telephone and internet			\$249
insurance			\$5,178
depreciation expense			\$142,813
interest expense			\$97,607
	<b>Subtotal Expenses:</b>		<b>\$434,517</b>
<b>EXISTING DEBT SERVICE</b>			\$229,540
	<b>Subtotal Existing Annual Debt Service:</b>		<b>\$229,540</b>
<b>NEW DEBT SERVICE</b>			
New Project Loan			\$370,305
	<b>Subtotal New Annual Debt Service:</b>		<b>\$370,305</b>
Renewal and Replacement Fund (10% of Annual Expenses)			\$43,452
	<b>GRAND TOTAL EXPENSES:</b>		<b>\$1,077,814</b>
<b>ANNUAL INCOME</b>	<u>New Conn.</u>	<u>Fee</u>	
*New Impact Fee	44	\$ 21,541	\$ 953,232
Impact Fee for Loan Repayment			\$ 513,272
Total Number Of ERUs			559
Average Monthly Water User Rate/ERU (with no other income)			\$95.04
<b>OTHER INCOME</b>			
Connection Fees			\$64,758
Water Standby Fees			\$42,411
Other Operating Income			\$32,172
Sundry Revenue			\$324
Interest Income			\$2,124
Total			\$141,789
Average Monthly Water User Rate/ERU			<b>\$73.91</b>
	<b>TOTAL ANNUAL INCOME:</b>		<b>\$1,591,086</b>

**IX. WATER RATE ANALYSIS**

**A. GENERAL**

Generally, water rates are a combination of base rates and overage rates wherein a base amount of water is provided for the base rate charge. The base rate is charged to all connections in the system whether or not water is used and should cover all operation and maintenance costs of the system. Overage rates are normally set to encourage water conservation but should always cover all variable costs of the system. BPWSSD has established the following as their current service fee rate structure:

**Table IX.A-1: Big Plains Existing Culinary Water Rates**

Big Plains SSD Existing Residential Water Rate Structure		
Total Base Rate		\$49.00 per Conn./Month
Includes		0 Gallons
Overage Steps		
Cost Per 1,000 Gal.	Low Gallons	High Gallons
\$1.50	1	5,000
\$1.75	5,001	12,000
\$2.00	12,001	25,000
\$2.25	25,001	35,000
\$2.50	35,001	45,000
\$2.75	45,001	& UP
Example of Water User's Bill Based on Usage		
Usage	Amount	
(Gallons)	Existing Rates	
0	\$	49.00
5,000	\$	56.50
12,000	\$	68.75
25,000	\$	94.75
35,000	\$	117.25
90,000	\$	266.00

**B. AVERAGE RATE DETERMINATION FOR FY2024**

Table VIII.C-1 shows the values used to determine the average water rate per ERU which should be divided among all system customers. The table uses data for the year of the new debt service (2024) and uses the existing and new debt service as part of the equation.

Annual revenues must be sufficient to cover the expenses incurred by the construction, maintenance, and administration of the water system. These expenses could include items such as debt service, personnel services, operation & maintenance, insurance, and other supplies & expenses. It is strongly recommended that the District maintain

a funded depreciation account or a replacement fund to provide the money necessary for replacement and repair of water department facilities and pipelines. The loan for the proposed project may require a fund where at least 10% of the expenses, including debt service, be set aside for this purpose.

Based on the calculations shown in Table VIII.C-1 the average water rate per residential connection (1 ERU) for any newly adopted rate structure for the year 2024 would need to be approximately \$73.91. It should be noted that this assumes that the system has grown to a total of 559 ERUs Between Apple Valley, Cannan Springs, and Cedar Point and that the district has chosen to pursue construction of the proposed improvements. It is estimated that this rate would allow BPWSSD to pay the debt and operations costs associated with the culinary water system. The existing average monthly user rate revenue per ERU was calculated to be \$61.62 and determined to be insufficient to meet the \$73.91 per ERU that was calculated. A rate increase of \$12.29 is estimated to be needed to cover the anticipated expenses; however, rates should be looked at annually as expenses increase in a typical year.

### C. BASE AND OVERAGE RATE DETERMINATION

This study includes separating the average user rate into base and overage rates and investigates possible rate structures that would promote conservation and work hand-in-hand with drought management policies. It is generally recommended that the base rate should cover the operation and maintenance (O&M) expenses of the system. Variable costs are covered by the overage rates. This rate scenario simply identifies base and overage rates that should satisfy the revenue requirements based on estimated O&M expenses and on projected water usage. BPWSSD is able to set the rate structure to any amount it deems to be fair. However, the rates should be such that the system remains financially viable. BPWSSD may decide to lower the base rate and increase variable costs in order to promote further conservation.

BPWSSD should have a rate schedule that will result in revenues that will provide the necessary culinary water system improvements as recommended in this Plan and maintain the current level of O&M. The base and overage rates should be examined each year to ensure that enough revenue is being generated to cover the expenses.

It is important to note that if BPWSSD does not experience any future growth which in turn will generate no revenue from impact fees, there will be a fixed base rate of about \$142 per connection that would be required in order to support the implementation of the recommended improvements in the Plan.

#### D. POSSIBLE RATE STRUCTURE

Tables IX.D-1, IX.D-2, and IX.D-3 illustrate possible rate structures based on the base and overage rates suggested in Section C. The overage rate structure is stepped to promote conservation by charging a higher amount for excessive water usage. The tables also include some examples of water bills based on the proposed rate structure and show bills based on existing rates for comparison. An amount is shown for the average monthly water use of approximately 14,043 gallons per month which is based on taking the weighted average of the daily usage per ERU for all three areas. This being 339 gpd for Apple Valley, 771 gpd for Cannan Springs, and 677 gpd for Cedar Point multiplied by the average numbers of ERC's. The weighted average comes out to be 453 gpd which is then used to get the monthly usage of 14,043 gallons. The way to confirm that the average rate produced will cover annual expenses is to implement the structure and evaluate the results after a full year of use.

Calculations based on the District's financial data show that the proposed rate structures should provide an average rate revenue sufficient to sustain the system. It is recommended that, if in a given year there are excess funds generated by the existing rate, these funds be saved in an interest-bearing Renewal and Replacement account for expenditures on future projects.

This plan can be tailored to include guidelines for adding new customers on a temporary basis to provide beneficial use of the surplus water. The intent of the process is to protect the surplus water right until BPWSSD needs the water based on BPWSSD additional growth. This action may produce an additional income stream which could possibly be used to reduce the user rate.

Adding the mentioned "new customers" will require legal counsel to set up the New Customer Agreement/s which will protect BPWSSD through the process.



## SECTION IX - WATER RATE ANALYSIS

<b>TABLE IX.D-1</b>			<b>TABLE IX.D-2</b>		
<b>Big Plains SSD</b>			<b>Big Plains SSD</b>		
<b>Possible Residential Water Rate Structure (Option 1)</b>			<b>Possible Residential Water Rate Structure (Option 2)</b>		
Total Base Rate		\$49.00 per Conn./Month	Total Base Rate		\$60.00 per Conn./Month
Includes		0 Gallons	Includes		0 Gallons
Overage Steps			Overage Steps		
Cost Per 1,000 Gal.	Low Gallons	High Gallons	Cost Per 1,000 Gal.	Low Gallons	High Gallons
\$2.30	1	5,000	\$1.30	1	5,000
\$2.55	5,001	12,000	\$1.50	5,001	12,000
\$2.80	12,001	25,000	\$1.70	12,001	25,000
\$3.05	25,001	35,000	\$1.90	25,001	35,000
\$3.30	35,001	45,000	\$2.10	35,001	45,000
\$3.55	45,001	& UP	\$2.30	45,001	& UP
Example of Water User's Bill Based on Usage			Example of Water User's Bill Based on Usage		
Usage	Amount		Usage	Amount	
(Gallons)	Existing Rates	Proposed Rates	(Gallons)	Existing Rates	Proposed Rates
0	\$ 49.00	\$ 49.00	0	\$ 49.00	\$ 60.00
5,000	\$ 56.50	\$ 60.50	5,000	\$ 56.50	\$ 66.50
12,000	\$ 68.75	\$ 78.35	12,000	\$ 68.75	\$ 77.00
14,000	\$ 72.75	\$ 83.95	14,000	\$ 72.75	\$ 80.40
25,000	\$ 94.75	\$ 114.75	25,000	\$ 94.75	\$ 99.10
35,000	\$ 117.25	\$ 145.25	35,000	\$ 117.25	\$ 118.10
90,000	\$ 266.00	\$ 338.00	90,000	\$ 266.00	\$ 242.60

<b>TABLE IX.D-3</b>		
<b>Big Plains SSD</b>		
<b>Possible Residential Water Rate Structure (Option 3)</b>		
Total Base Rate		\$70.00 per Conn./Month
Includes		0 Gallons
Overage Steps		
Cost Per 1,000 Gal.	Low Gallons	High Gallons
\$0.50	1	5,000
\$0.60	5,001	12,000
\$0.70	12,001	25,000
\$0.95	25,001	35,000
\$1.20	35,001	45,000
\$1.45	45,001	& UP
Example of Water User's Bill Based on Usage		
Usage	Amount	
(Gallons)	Existing Rates	Proposed Rates
0	\$ 49.00	\$ 70.00
5,000	\$ 56.50	\$ 72.50
12,000	\$ 68.75	\$ 76.70
14,000	\$ 72.75	\$ 78.10
25,000	\$ 94.75	\$ 85.80
35,000	\$ 117.25	\$ 95.30
90,000	\$ 266.00	\$ 172.55

## E. SUMMARY

Based on the District's financial data and the information presented in this Plan, the existing average monthly user rate revenue per ERU of \$61.62 has been determined to be insufficient to meet the \$73.91 per ERU that is needed per the Financing Plan. A rate increase of \$12.29 is estimated to be needed to cover the anticipated expenses. Rate structure option 1 left the base rate the same as the current base rate of \$49. Options 2 and 3 show what the overage rates would look like by increasing base rate of \$60 and \$70. Water rates and fees should be reviewed by BPWSSD periodically to ensure that they keep up with inflation rates and increased costs in system maintenance. The Cash Flow Projection included in Appendix E does not assume a yearly rate increase.

BPWSSD does not have to adopt the amounts shown in the rate analysis. However, the rates suggested are calculated to be enough to ensure that the water fund remains viable while paying for the existing debt service and the projected debt based on the recommendations in this plan. The existing debt is projected to be paid off by FY 2054, in which case the rate structure may want to be reconsidered.

## X. IMPACT FEES

### A. IMPACT FEE

This report constitutes a capital fee facilities plan to determine the public facilities requirement to serve development resulting from new development activity. An impact fee that is charged by a community may be used to pay for capital costs and the debt service associated with surplus capacity built into the system provided actual costs can be documented. The surplus capacity in the water system can be assessed to growth, and for this reason, impact fees can pay for that portion of the debt service associated with the system surplus capacity. The impact fee should also be used to pay for the cost of improvements to the system that are required to support new growth as new connections are added to the system. It is recommended that an impact fee be charged on all new connections at the time of plat approval to help with the necessary capital improvements that BPWSSD will be taking on. It should be noted that the connection fees may not be combined into the impact fee. The State of Utah has mandated that connection fees may only be charged for the actual costs of the connection into the water system.

### B. CALCULATION

The total cost that is eligible for the impact fee assessment is equal to the existing debt service from previous water improvements projects that can be attributed to new growth plus the portion of any planned water improvements project that will be constructed to accommodate new growth. The combined total cost that is due to new growth is divided by the projected number of new ERUs that will be added to the system within the service area. The impact fee calculation can be found in Table X.B-1.

All recommended projects are required to improve the system regardless of growth. However, most of the recommendations benefit new growth as well and therefore are partially impact fee eligible. It was determined that the impact fee eligibility of all the proposed improvement projects would be equal to 82% leaving a total of \$11,385,726 that is impact fee eligible. A breakdown of all the different projects and the amounts that are impact fee eligible can be seen below in Table X.B-1. The storage improvements, water right plan, and water source for Cannan Springs along with the

water source for Cedar Point and the project to connect all three systems were all deemed to be 100% impact fee eligible because they would be required to maintain the current level of service during future growth. The distribution system improvements for Cannan Springs was deemed 0% impact fee eligible because it is only required to for the existing pipelines and future development does not impact the projects. The storage improvements for Apple valley are 96% impact fee eligible and the distribution system improvements for Apple Valley and Cedar Point are 34% and 77% impact fee eligible, respectively.

<b>TABLE X.B-1</b>				
<b>BIG PLAINS SSD</b>				
<b>IMPACT FEE ANALYSIS</b>				
<b>CULINARY WATER MASTER PLAN</b>				
				6/5/23
<b>EXISTING DEBT SERVICE</b>				
	<b>Remaining Debt</b>	<b>% Eligible</b>		<b>Eligible</b>
Debt Service-Principle-2013 Water Bond	\$ 1,690,000.00	52%	\$	879,645
Debt Service-Principle-2014A Water Bond	\$ 2,089,653.86	52%	\$	1,087,665
Debt Service-Principle-2014B Water Bond	\$ 268,136.48	52%	\$	139,565
Debt Service-Principle-well 59	\$ 60,000.00	52%	\$	31,230
Debt Service-Principle-Canaan Springs	\$ 295,000.00	52%	\$	153,548
Total debt service			\$	<b>2,291,652</b>
<b>PROPOSED IMPROVEMENT PROJECTS</b>				
<b>Project</b>	<b>Year</b>	<b>Total Cost</b>	<b>%IFE</b>	<b>Impact Fee Eligible</b>
Water Storage Capacity Improvements - Apple Valley	2024	\$ 2,161,000	96%	\$ 2,074,560
Water Storage Capacity Improvements - Cannan Springs	2024	\$ 585,400	100%	\$ 585,400
Water Right Plan - Cannan Springs	2024	\$ 11,500	100%	\$ 11,500
Water Source - Cannan Springs	2024	\$ 573,300	100%	\$ 573,300
Water Source - Cedar Point	2024	\$ 573,300	100%	\$ 573,300
Distribution System Improvements - Apple Valley	2024	\$ 1,967,500	34%	\$ 664,013
Distribution System Improvements - Cannan Springs	2024	\$ 499,400	0%	\$ -
Distribution System Improvements - Cedar Point	2024	\$ 604,200	77%	\$ 467,000
Connecting Apple Valley, Cannan Springs, Cedar Point Distribution Sytem	2024	\$ 4,145,000	100%	\$ 4,145,000
<i>Proposed Improvements total:</i>		\$ 11,120,600	82%	<b>\$ 9,094,073</b>
Impact Fee Eligible Cost for Projects				<b>\$ 11,385,726</b>
No. of ERUs (2024)				559
Future ERUs (2039)				1,199
No. of New ERU's Due to Growth				640
Maximum Eligible Impact Fee Amount = Total Eligible Cost / New ERU's				<b>\$ 17,788 /ERU</b>

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Table X.B-1 shows that the maximum impact fee that BPWSSD may assess each new ERU is \$17,788. BPWSSD is free to charge less than the maximum if it decides to do so but should ensure that collected impact fees are sufficient to cover future culinary water system impacts due to growth. This is based on an assumed project construction timeline of 15 years.

The city is also free to charge impact fees based on meter size if they choose to do so. The maximum fee for each meter size is determined by the increase in cross sectional area in relation to the average residential meter size of 3/4". Table X.B-2 below shows the maximum fee with this calculation up to a 3" meter size.

**Table X.B-2: Big Plains Maximum Impact Fees**

Meter Size	X-Sectional Area (in <sup>2</sup> )	% Area Increase	Maximum Non-Residential Impact Fee per Unit
3/4"	0.44	0%	\$ 17,788.00
1"	0.79	78%	\$ 31,623.11
1 1/2"	1.77	300%	\$ 71,152.00
2"	3.14	611%	\$ 126,492.44
3"	7.07	1500%	\$ 284,608.00

It is important to note that these impact fees are for the improvements suggested in Section VII and do not provide for the district to design and build anything beyond the proposed projects.

All new additions to the system will need to be considered in the impact fee calculations. Otherwise the developer should be required to make the improvements.

**C. IMPACT FEE CERTIFICATION**

The Impact Fee Certification is included as Appendix F.

#### D. IMPACT FEE RELATED ITEMS

There are a few items related to Impact Fees that BPWSSD staff should keep in mind when planning for, collecting, and expending Impact Fees.

Generally, it is a good idea to update this plan at least every five years, or more frequently if occasion arises.

District board members should be made aware that, in conformance with Utah Code 11-36a-602, Impact Fees can generally only be expended for a system improvement that is identified in the Impact Fee Facilities Plan and that is for the specific public facility type for which the fee was collected (i.e. transportation impact fees cannot be used for water or sewer projects). Also, Impact Fees in Utah must be expended or encumbered for a permissible use within six years of their receipt unless 11-36a-602(2)(b) applies.

BPWSSD board members should also ensure that proper accounting of the Impact Fees occurs (track each fee in and out). See Utah Code 11-36a-601.



# **APPENDIX A**

## **FIVE POINT ANALYSIS**

## Water Rights:

Apple Valley Current & Projected Required Water Right (2023-2043):				
Year	Number of ERUs	Avg. Usage (gpd/conn.)	Existing Water Rights	Water Rights Required (Ac-ft)
2022	295	338.5	597.2	112
2023	345	338.5	597.2	131
2024	362	338.5	597.2	137
2025	380	338.5	597.2	144
2026	399	338.5	597.2	151
2027	419	338.5	597.2	159
2028	440	338.5	597.2	167
2029	462	338.5	597.2	175
2030	485	338.5	597.2	184
2031	509	338.5	597.2	193
2032	535	338.5	597.2	203
2033	562	338.5	597.2	213
2034	590	338.5	597.2	224
2035	619	338.5	597.2	235
2036	650	338.5	597.2	247
2037	683	338.5	597.2	259
2038	717	338.5	597.2	272
2039	753	338.5	597.2	285
2040	790	338.5	597.2	300
2041	830	338.5	597.2	315
2042	871	338.5	597.2	330
2043	915	338.5	597.2	347



**Cannan Springs Current & Projected Required Water Right (2023-2043):**

Year	Number of ERUs	Avg. Usage (gpd/conn.)	Existing Water Rights	Water Rights Required (Ac-ft)
2022	13	771.3	597.2	11
2023	13	771.3	597.2	11
2024	32	771.3	597.2	28
2025	52	771.3	597.2	45
2026	55	771.3	597.2	47
2027	58	771.3	597.2	50
2028	60	771.3	597.2	52
2029	64	771.3	597.2	55
2030	67	771.3	597.2	58
2031	70	771.3	597.2	61
2032	74	771.3	597.2	64
2033	77	771.3	597.2	67
2034	81	771.3	597.2	70
2035	85	771.3	597.2	74
2036	89	771.3	597.2	77
2037	94	771.3	597.2	81
2038	99	771.3	597.2	85
2039	103	771.3	597.2	89
2040	109	771.3	597.2	94
2041	114	771.3	597.2	99
2042	120	771.3	597.2	103
2043	126	771.3	597.2	109

**Cedar Point Current & Projected Required Water Right (2023-2043):**

Year	Number of ERUs	Existing Water Rights	Avg. Usage (gpd/conn.)	Water Rights Required (Ac-ft)
2022	132	597.2	677.2	100
2023	157	597.2	677.2	119
2024	165	597.2	677.2	125
2025	173	597.2	677.2	132
2026	182	597.2	677.2	138
2027	191	597.2	677.2	145
2028	201	597.2	677.2	152
2029	211	597.2	677.2	160
2030	221	597.2	677.2	168
2031	232	597.2	677.2	176
2032	244	597.2	677.2	185
2033	256	597.2	677.2	194
2034	269	597.2	677.2	204
2035	282	597.2	677.2	214
2036	297	597.2	677.2	225
2037	311	597.2	677.2	236
2038	327	597.2	677.2	248
2039	343	597.2	677.2	260
2040	360	597.2	677.2	273
2041	378	597.2	677.2	287
2042	397	597.2	677.2	301
2043	417	597.2	677.2	317

## Source Capacity:

Apple Valley Current & Projected Required Source Capacity (2023-2043):					
Year	Number of ERUs	Peak Day Usage (gpd/conn.)	Existing Source Capacity	Source Capacity Required (gpm)	Surplus Source Capacity (gpm)
2022	295	677	565	139	426
2023	345	677	565	162	403
2024	362	677	565	170	395
2025	380	677	565	179	386
2026	399	677	565	188	377
2027	419	677	565	197	368
2028	440	677	565	207	358
2029	462	677	565	217	348
2030	485	677	565	228	337
2031	509	677	565	239	326
2032	535	677	565	251	314
2033	562	677	565	264	301
2034	590	677	565	277	288
2035	619	677	565	291	274
2036	650	677	565	306	259
2037	683	677	565	321	244
2038	717	677	565	337	228
2039	753	677	565	354	211
2040	790	677	565	372	193
2041	830	677	565	390	175
2042	871	677	565	410	155
2043	915	677	565	430	135

**Cannan Springs Current & Projected Required Source Capacity (2023-2043):**

Year	Number of ERUs	Peak Day Usage (gpd/conn.)	Existing Source Capacity	Source Capacity Required (gpm)	Surplus Source Capacity (gpm)
2022	13	1543	97	14	83
2023	13	1543	97	14	83
2024	32	1543	97	34	63
2025	52	1543	97	56	41
2026	55	1543	97	59	38
2027	58	1543	97	62	35
2028	60	1543	97	65	32
2029	64	1543	97	68	29
2030	67	1543	97	71	26
2031	70	1543	97	75	22
2032	74	1543	97	79	18
2033	77	1543	97	83	14
2034	81	1543	97	87	10
2035	85	1543	97	91	6
2036	89	1543	97	96	1
2037	94	1543	97	101	-4
2038	99	1543	97	106	-9
2039	103	1543	97	111	-14
2040	109	1543	97	116	-19
2041	114	1543	97	122	-25
2042	120	1543	97	128	-31
2043	126	1543	97	135	-38

**Cedar Point Current & Projected Required Source Capacity (2023-2043):**

Year	Number of ERUs	Percent Reduction in Usage per ERU	Peak Day Usage (gpd/conn.)	Source Capacity Required (gpm)
2022	132	0	1,354	124
2023	157	0	1,354	148
2024	165	0	1,354	155
2025	173	0	1,354	163
2026	182	0	1,354	171
2027	191	0	1,354	180
2028	201	0	1,354	189
2029	211	0	1,354	198
2030	221	0	1,354	208
2031	232	0	1,354	219
2032	244	0	1,354	229
2033	256	0	1,354	241
2034	269	0	1,354	253
2035	282	0	1,354	266
2036	297	0	1,354	279
2037	311	0	1,354	293
2038	327	0	1,354	308
2039	343	0	1,354	323
2040	360	0	1,354	339
2041	378	0	1,354	356
2042	397	0	1,354	374
2043	417	0	1,354	392

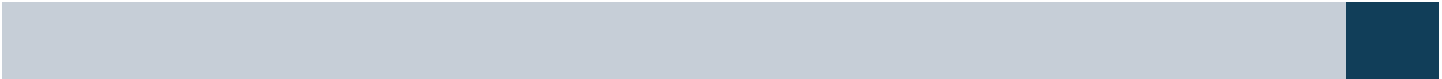
## Storage Capacity:

Apple Valley Storage Capacity Analysis						
Year	Number of ERUs	Storage Required	Fire Flow Stg Rqd	Emergency Supply	Existing Stg Capacity	Total Stg Rqd
2015	287	97,154	60,000	39,288	440,000	196,442
2016	237	80,228	60,000	35,057	440,000	175,285
2017	255	86,418	60,000	36,604	440,000	183,022
2018	251	84,883	60,000	36,221	440,000	181,104
2019	264	89,284	60,000	37,321	440,000	186,604
2020	264	89,284	60,000	37,321	440,000	186,604
2021	264	89,284	60,000	37,321	440,000	186,604
2022	295	99,838	60,000	39,960	440,000	199,798
2023	345	116,712	60,000	44,178	440,000	220,890
2024	362	122,548	60,000	45,637	440,000	228,184
2025	380	128,675	60,000	47,169	440,000	235,844
2026	399	135,109	60,000	48,777	440,000	243,886
2027	419	141,864	60,000	50,466	1,440,000	252,330
2028	440	148,957	60,000	52,239	1,440,000	261,197
2029	462	156,405	60,000	54,101	1,440,000	270,506
2030	485	164,225	60,000	56,056	1,440,000	280,282
2031	509	172,437	60,000	58,109	1,440,000	290,546
2032	535	181,059	60,000	60,265	1,440,000	301,323
2033	562	190,111	60,000	62,528	1,440,000	312,639
2034	590	199,617	60,000	64,904	1,440,000	324,521
2035	619	209,598	60,000	67,399	1,440,000	336,997
2036	650	220,078	60,000	70,019	1,440,000	350,097
2037	683	231,082	60,000	72,770	1,440,000	363,852
2038	717	242,636	60,000	75,659	1,440,000	378,295
2039	753	254,768	60,000	78,692	1,440,000	393,459
2040	790	267,506	60,000	81,876	1,440,000	409,382
2041	830	280,881	60,000	85,220	1,440,000	426,101
2042	871	294,925	60,000	88,731	1,440,000	443,657
2043	915	309,671	60,000	92,418	1,440,000	462,089

Cannan Springs Storage Capacity Analysis						
Year	Number of ERUs	Storage Required	Fire Flow Stg Rqd	Emergency Supply (25%)	Existing Stg Capacity	Total Stg Rqd
2018	13	10,027	60,000	17,507	150,000	87,533
2019	13	10,027	60,000	17,507	150,000	87,533
2020	13	10,027	60,000	17,507	150,000	87,533
2021	13	10,027	60,000	17,507	150,000	87,533
2022	13	10,027	60,000	17,507	150,000	87,533
2023	13	10,027	60,000	17,507	150,000	87,533
2024	32	24,797	60,000	21,199	150,000	105,996
2025	52	40,305	60,000	25,076	150,000	125,382
2026	55	42,321	60,000	25,580	150,000	127,901
2027	58	44,437	60,000	26,109	150,000	130,546
2028	60	46,659	60,000	26,665	150,000	133,323
2029	64	48,992	60,000	27,248	150,000	136,239
2030	67	51,441	60,000	27,860	150,000	139,301
2031	70	54,013	60,000	28,503	150,000	142,516
2032	74	56,714	60,000	29,178	150,000	145,892
2033	77	59,550	60,000	29,887	150,000	149,437
2034	81	62,527	60,000	30,632	150,000	153,159
2035	85	65,653	60,000	31,413	150,000	157,067
2036	89	68,936	60,000	32,234	150,000	161,170
2037	94	72,383	60,000	33,096	150,000	165,479
2038	99	76,002	60,000	34,000	150,000	170,002
2039	103	79,802	60,000	34,951	150,000	174,753
2040	109	83,792	60,000	35,948	150,000	179,740
2041	114	87,982	60,000	36,995	150,000	184,977
2042	120	92,381	60,000	38,095	150,000	190,476
2043	126	97,000	60,000	39,250	150,000	196,250

Cedar Point Storage Capacity Analysis						
Year	Number of ERUs	Storage Required	Fire Flow Stg Rqd	Emergency Supply	Existing Stg Capacity	Total Stg Rqd
2015	47	31,830	60,000	22,958	1,000,000	114,788
2016	63	42,666	60,000	25,666	1,000,000	128,332
2017	79	53,831	60,000	28,458	1,000,000	142,289
2018	91	61,958	60,000	30,490	1,000,000	152,448
2019	95	64,251	60,000	31,063	1,000,000	155,314
2020	102	68,992	60,000	32,248	1,000,000	161,240
2021	119	80,505	60,000	35,126	1,000,000	175,631
2022	132	89,309	60,000	37,327	1,000,000	186,636
2023	157	106,506	60,000	41,627	1,000,000	208,133
2024	165	111,832	60,000	42,958	1,000,000	214,790
2025	173	117,423	60,000	44,356	1,000,000	221,779
2026	182	123,294	60,000	45,824	1,000,000	229,118
2027	191	129,459	60,000	47,365	1,000,000	236,824
2028	201	135,932	60,000	48,983	1,000,000	244,915
2029	211	142,729	60,000	50,682	1,000,000	253,411
2030	221	149,865	60,000	52,466	1,000,000	262,331
2031	232	157,358	60,000	54,340	1,000,000	271,698
2032	244	165,226	60,000	56,307	1,000,000	281,533
2033	256	173,488	60,000	58,372	1,000,000	291,860
2034	269	182,162	60,000	60,540	1,000,000	302,702
2035	282	191,270	60,000	62,818	1,000,000	314,088
2036	297	200,834	60,000	65,208	1,000,000	326,042
2037	311	210,875	60,000	67,719	1,000,000	338,594
2038	327	221,419	60,000	70,355	1,000,000	351,774
2039	343	232,490	60,000	73,122	1,000,000	365,612
2040	360	244,114	60,000	76,029	1,000,000	380,143
2041	378	256,320	60,000	79,080	1,000,000	395,400
2042	397	269,136	60,000	82,284	1,000,000	411,420
2043	417	282,593	60,000	85,648	1,000,000	428,241





**APPENDIX B**

**INFOWATER® ANALYSIS**

## Existing Peak Day Demand with Fireflow

		ID	Static Demand (gpm)	Static Pressure (psi)	Static Head (ft)	Fire-Flow Demand (gpm)	Residual Pressure (psi)	Hydrant Available Flow (gpm)	Hydrant Pressure at Available Flow (psi)
1	<input type="checkbox"/>	J1	0.00	34.36	5,721.05	1,000.00	-35,140,536.00	90.00	20.00
2	<input type="checkbox"/>	J100	4.07	53.90	4,936.09	1,000.00	49.42	2,731.29	20.00
3	<input type="checkbox"/>	J102	4.07	56.80	4,936.09	1,000.00	46.93	1,994.54	20.00
4	<input type="checkbox"/>	J104	4.07	77.08	4,935.90	1,000.00	74.74	5,682.16	20.00
5	<input type="checkbox"/>	J106	4.07	77.94	4,935.90	1,000.00	75.28	5,386.48	20.00
6	<input type="checkbox"/>	J111	2.79	49.59	5,197.91	1,000.00	36.55	1,571.14	20.00
7	<input type="checkbox"/>	J110	4.07	61.83	4,935.94	1,000.00	57.63	3,450.54	20.00
8	<input type="checkbox"/>	J112	4.07	60.64	4,935.96	1,000.00	55.83	3,126.52	20.00
9	<input type="checkbox"/>	J114	4.07	59.77	4,935.96	1,000.00	53.19	2,635.90	20.00
10	<input type="checkbox"/>	J116	4.07	74.91	4,935.89	1,000.00	71.04	4,334.59	20.00
11	<input type="checkbox"/>	J118	4.07	77.51	4,935.88	1,000.00	72.91	4,055.49	20.00
12	<input type="checkbox"/>	J12	2.79	75.69	5,197.91	1,000.00	72.79	5,306.12	20.00
13	<input type="checkbox"/>	J120	4.07	85.52	4,935.87	1,000.00	73.89	2,608.90	20.00
14	<input type="checkbox"/>	J122	4.07	61.48	4,935.89	1,000.00	54.19	2,624.85	20.00
15	<input type="checkbox"/>	J124	4.07	43.71	4,935.89	1,000.00	33.85	1,628.31	20.00
16	<input type="checkbox"/>	J126	4.07	79.05	4,935.90	1,000.00	72.76	3,419.87	20.00
17	<input type="checkbox"/>	J128	4.07	52.66	4,935.79	1,000.00	34.11	1,367.74	20.00
18	<input type="checkbox"/>	J13	2.79	77.11	5,197.86	1,000.00	72.50	4,162.78	20.00
19	<input type="checkbox"/>	J130	4.07	7.38	4,935.74	1,000.00	7.22	3.73	7.38
20	<input type="checkbox"/>	J132	6.94	45.74	4,936.31	1,000.00	44.16	4,397.68	20.00
21	<input type="checkbox"/>	J134	6.94	59.74	4,977.57	1,000.00	51.43	2,777.56	20.00
22	<input type="checkbox"/>	J136	4.07	54.57	4,936.21	1,000.00	54.34	3,870.15	20.00
23	<input type="checkbox"/>	J138	4.07	76.21	4,935.89	1,000.00	64.86	2,395.35	20.00
24	<input type="checkbox"/>	J140	4.07	79.13	4,935.87	1,000.00	69.84	2,801.31	20.00
25	<input type="checkbox"/>	J142	4.07	82.24	4,935.87	1,000.00	72.35	2,781.60	20.00
26	<input type="checkbox"/>	J144	4.07	82.22	4,935.87	1,000.00	71.86	2,708.97	20.00
27	<input type="checkbox"/>	J146	4.07	71.65	4,935.87	1,000.00	60.89	2,392.20	20.00
28	<input type="checkbox"/>	J148	4.07	73.27	4,935.87	1,000.00	62.85	2,479.08	20.00
29	<input type="checkbox"/>	J15	2.79	69.39	5,197.86	1,000.00	52.88	1,830.39	20.00
30	<input type="checkbox"/>	J150	4.07	68.85	4,935.87	1,000.00	59.12	2,457.66	20.00
31	<input type="checkbox"/>	J154	4.07	34.01	4,978.68	1,000.00	32.81	4,647.44	20.00
32	<input type="checkbox"/>	J156	4.07	49.60	4,978.56	1,000.00	47.97	6,386.31	20.00
33	<input type="checkbox"/>	J158	4.07	63.62	4,977.57	1,000.00	58.20	4,116.86	20.00
34	<input type="checkbox"/>	J160	4.07	31.18	4,936.06	1,000.00	28.52	2,200.76	20.00
35	<input type="checkbox"/>	J164	4.07	65.10	4,977.11	1,000.00	57.82	3,574.33	20.00
36	<input type="checkbox"/>	J166	4.07	48.90	4,977.11	1,000.00	38.28	1,922.67	20.00

## Existing Peak Day Demand with Fireflow

		ID	Static Demand (gpm)	Static Pressure (psi)	Static Head (ft)	Fire-Flow Demand (gpm)	Residual Pressure (psi)	Hydrant Available Flow (gpm)	Hydrant Pressure at Available Flow (psi)
37	<input type="checkbox"/>	J168	4.07	72.29	4,977.10	1,000.00	50.67	1,665.81	20.00
38	<input type="checkbox"/>	J170	4.07	64.69	4,977.31	1,000.00	58.24	3,797.12	20.00
39	<input type="checkbox"/>	J172	0.00	84.20	4,977.31	1,000.00	52.73	1,491.39	20.00
40	<input type="checkbox"/>	J174	0.00	78.56	4,977.31	1,000.00	40.93	1,280.03	20.00
41	<input type="checkbox"/>	J176	0.00	85.50	4,977.31	1,000.00	50.08	1,409.61	20.00
42	<input type="checkbox"/>	J178	0.00	87.66	4,977.31	1,000.00	61.10	1,693.10	20.00
43	<input type="checkbox"/>	J182	0.00	92.75	4,977.31	1,000.00	82.26	3,334.61	20.00
44	<input type="checkbox"/>	J184	0.00	86.98	5,040.74	1,000.00	24.22	1,036.34	20.00
45	<input type="checkbox"/>	J186	0.00	84.38	5,040.74	1,000.00	21.09	1,009.40	20.00
46	<input type="checkbox"/>	J188	0.00	72.25	5,040.74	1,000.00	10.28	910.55	20.00
47	<input type="checkbox"/>	J190	0.00	75.71	5,040.74	1,000.00	17.17	973.12	20.00
48	<input type="checkbox"/>	J2	0.00	165.77	5,721.05	1,000.00	-35,140,460.00	90.00	20.00
49	<input type="checkbox"/>	J22	2.79	83.75	5,197.57	1,000.00	66.88	2,142.53	20.00
50	<input type="checkbox"/>	J24	2.79	105.84	5,197.53	1,000.00	84.22	2,187.35	20.00
51	<input type="checkbox"/>	J25	2.79	116.72	5,197.53	1,000.00	86.58	1,924.03	20.00
52	<input type="checkbox"/>	J26	2.79	127.24	5,197.51	1,000.00	104.31	2,395.51	20.00
53	<input type="checkbox"/>	J27	2.79	126.99	5,197.51	1,000.00	95.96	2,003.15	20.00
54	<input type="checkbox"/>	J28	2.79	89.74	5,197.52	1,000.00	70.36	2,082.35	20.00
55	<input type="checkbox"/>	J29	2.79	143.20	5,197.49	1,000.00	121.32	2,666.59	20.00
56	<input type="checkbox"/>	J3	5.19	61.96	5,040.75	1,000.00	18.31	983.66	20.00
57	<input type="checkbox"/>	J30	2.79	147.97	5,197.48	1,000.00	119.09	2,314.89	20.00
58	<input type="checkbox"/>	J31	2.79	143.32	5,197.48	1,000.00	106.13	1,958.93	20.00
59	<input type="checkbox"/>	J32	2.79	141.63	5,197.48	1,000.00	103.09	1,904.25	20.00
60	<input type="checkbox"/>	J34	2.79	143.65	5,197.48	1,000.00	98.01	1,744.75	20.00
61	<input type="checkbox"/>	J35	2.79	164.54	5,197.48	1,000.00	123.03	2,008.01	20.00
62	<input type="checkbox"/>	J36	2.79	164.90	5,197.48	1,000.00	122.27	1,980.45	20.00
63	<input type="checkbox"/>	J37	2.79	157.06	5,197.48	1,000.00	109.17	1,797.30	20.00
64	<input type="checkbox"/>	J38	2.79	150.52	5,197.48	1,000.00	126.58	2,613.31	20.00
65	<input type="checkbox"/>	J39	2.79	152.56	5,197.48	1,000.00	127.91	2,590.33	20.00
66	<input type="checkbox"/>	J4	5.19	66.56	5,040.74	1,000.00	18.92	992.65	20.00
67	<input type="checkbox"/>	J40	2.79	146.66	5,197.48	1,000.00	122.77	2,573.78	20.00
68	<input type="checkbox"/>	J41	2.79	136.70	5,197.48	1,000.00	112.60	2,447.36	20.00
69	<input type="checkbox"/>	J42	2.79	128.03	5,197.48	1,000.00	104.21	2,360.61	20.00
70	<input type="checkbox"/>	J43	2.79	119.37	5,197.48	1,000.00	95.88	2,271.37	20.00
71	<input type="checkbox"/>	J44	2.79	109.31	5,197.49	1,000.00	86.54	2,179.23	20.00
72	<input type="checkbox"/>	J45	2.79	103.83	5,197.50	1,000.00	82.11	2,161.21	20.00

## Existing Peak Day Demand with Fireflow

		ID	Static Demand (gpm)	Static Pressure (psi)	Static Head (ft)	Fire-Flow Demand (gpm)	Residual Pressure (psi)	Hydrant Available Flow (gpm)	Hydrant Pressure at Available Flow (psi)
73	<input type="checkbox"/>	J46	2.79	111.94	5,197.50	1,000.00	72.86	1,615.34	20.00
74	<input type="checkbox"/>	J47	2.79	141.94	5,197.48	1,000.00	117.39	2,480.15	20.00
75	<input type="checkbox"/>	J48	2.79	144.50	5,197.48	1,000.00	119.89	2,506.38	20.00
76	<input type="checkbox"/>	J49	2.79	143.20	5,197.48	1,000.00	117.73	2,441.81	20.00
77	<input type="checkbox"/>	J5	5.19	66.45	5,040.74	1,000.00	15.84	959.12	20.00
78	<input type="checkbox"/>	J50	2.79	132.41	5,197.48	1,000.00	108.21	2,391.08	20.00
79	<input type="checkbox"/>	J51	2.79	127.17	5,197.48	1,000.00	103.37	2,351.78	20.00
80	<input type="checkbox"/>	J52	2.79	121.43	5,197.48	1,000.00	96.84	2,235.60	20.00
81	<input type="checkbox"/>	J53	2.79	145.49	5,197.48	1,000.00	117.23	2,320.69	20.00
82	<input type="checkbox"/>	J54	2.79	150.56	5,197.48	1,000.00	116.46	2,124.86	20.00
83	<input type="checkbox"/>	J55	2.79	140.17	5,197.48	1,000.00	107.37	2,075.92	20.00
84	<input type="checkbox"/>	J6	5.19	80.64	5,040.74	1,000.00	20.67	1,011.33	20.00
85	<input type="checkbox"/>	J60	2.79	145.55	5,197.48	1,000.00	116.91	2,302.98	20.00
86	<input type="checkbox"/>	J62	4.07	55.85	4,935.79	1,000.00	35.90	1,382.17	20.00
87	<input type="checkbox"/>	J64	4.07	77.20	4,935.79	1,000.00	70.57	3,288.80	20.00
88	<input type="checkbox"/>	J66	4.07	74.44	4,935.79	1,000.00	65.40	2,692.85	20.00
89	<input type="checkbox"/>	J72	4.07	59.36	4,935.79	1,000.00	49.11	2,102.90	20.00
90	<input type="checkbox"/>	J74	4.07	64.04	4,935.79	1,000.00	52.22	2,064.84	20.00
91	<input type="checkbox"/>	J76	4.07	53.17	4,935.79	1,000.00	39.92	1,660.89	20.00
92	<input type="checkbox"/>	J78	4.07	57.48	4,935.81	1,000.00	56.53	7,661.64	20.00
93	<input type="checkbox"/>	J80	4.07	15.43	4,935.81	1,000.00	14.12	4.51	15.43
94	<input type="checkbox"/>	J82	4.07	71.36	4,935.88	1,000.00	70.28	8,069.79	20.00
95	<input type="checkbox"/>	J84	4.07	78.94	4,935.89	1,000.00	77.63	7,788.68	20.00
96	<input type="checkbox"/>	J86	4.07	82.66	4,935.89	1,000.00	78.88	4,638.51	20.00
97	<input type="checkbox"/>	J88	4.07	46.94	4,936.36	1,000.00	45.93	5,173.09	20.00
98	<input type="checkbox"/>	J90	4.07	47.47	4,936.42	1,000.00	47.27	6,684.85	20.00
99	<input type="checkbox"/>	J92	4.07	69.06	4,936.11	1,000.00	67.94	7,085.47	20.00
100	<input type="checkbox"/>	J94	4.07	31.25	4,936.36	1,000.00	29.61	2,609.87	20.00
101	<input type="checkbox"/>	J96	4.07	79.57	4,935.91	1,000.00	78.14	7,409.16	20.00
102	<input type="checkbox"/>	J98	4.07	76.04	4,935.91	1,000.00	74.05	6,092.86	20.00
103	<input type="checkbox"/>	NEWSUBDIV	0.00	92.00	4,977.31	1,000.00	76.78	2,573.13	20.00
104	<input type="checkbox"/>	W5	4.07	78.81	4,935.88	1,000.00	72.64	3,503.47	20.00
105	<input type="checkbox"/>	W6	4.07	79.08	4,935.88	1,000.00	72.98	3,534.54	20.00

Future Peak Day Demand with Fireflow

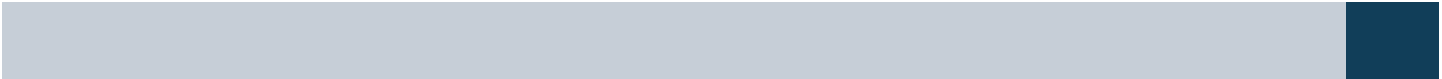
	ID	Static Demand (gpm)	Static Pressure (psi)	Static Head (ft)	Fire-Flow Demand (gpm)	Residual Pressure (psi)	Hydrant Available Flow (gpm)	Hydrant Pressure at Available Flow (psi)
1	J1	0.00	34.36	5,721.03	1,000.00	-35,333,612.00	85.00	20.00
2	J100	9.42	53.79	4,935.84	1,000.00	46.44	2,440.19	20.00
3	J102	9.42	56.69	4,935.84	1,000.00	43.89	1,832.53	20.00
4	J104	9.42	76.96	4,935.61	1,000.00	73.94	5,198.82	20.00
5	J106	9.42	77.81	4,935.59	1,000.00	74.43	4,944.56	20.00
6	J11	8.05	49.36	5,197.39	1,000.00	35.42	1,531.07	20.00
7	J110	9.42	61.70	4,935.65	1,000.00	56.29	3,153.49	20.00
8	J112	9.42	60.52	4,935.67	1,000.00	54.15	2,859.87	20.00
9	J114	9.42	59.65	4,935.67	1,000.00	51.49	2,442.52	20.00
10	J116	9.42	74.76	4,935.54	1,000.00	70.04	4,001.58	20.00
11	J118	9.42	77.35	4,935.52	1,000.00	71.83	3,766.53	20.00
12	J12	8.05	75.47	5,197.39	1,000.00	71.76	5,116.76	20.00
13	J120	9.42	85.33	4,935.43	1,000.00	72.42	2,497.41	20.00
14	J122	9.42	61.33	4,935.53	1,000.00	53.12	2,476.31	20.00
15	J124	9.42	43.56	4,935.53	1,000.00	32.76	1,556.50	20.00
16	J126	9.42	78.92	4,935.59	1,000.00	71.87	3,239.80	20.00
17	J128	9.42	52.56	4,935.56	1,000.00	33.18	1,345.92	20.00
18	J13	8.05	76.76	5,197.07	1,000.00	70.89	3,977.34	20.00
19	J130	9.42	7.35	4,935.68	1,000.00	7.19	9.08	7.35
20	J132	9.42	45.72	4,936.26	1,000.00	43.92	3,866.14	20.00
21	J134	9.42	51.27	4,958.03	1,000.00	40.51	2,049.67	20.00
22	J136	9.42	54.50	4,936.06	1,000.00	49.39	3,261.27	20.00
23	J138	9.42	76.12	4,935.67	1,000.00	64.30	2,345.77	20.00
24	J140	9.42	78.94	4,935.44	1,000.00	68.42	2,657.91	20.00
25	J142	9.42	82.05	4,935.44	1,000.00	70.90	2,645.97	20.00
26	J144	9.42	82.03	4,935.43	1,000.00	70.40	2,580.86	20.00
27	J146	9.42	71.47	4,935.43	1,000.00	59.42	2,278.72	20.00
28	J148	9.42	73.08	4,935.44	1,000.00	61.39	2,359.41	20.00
29	J15	8.05	69.05	5,197.07	1,000.00	51.16	1,781.41	20.00
30	J150	9.42	68.66	4,935.44	1,000.00	57.70	2,331.63	20.00
31	J154	9.42	32.11	4,974.31	1,000.00	29.50	3,765.53	20.00
32	J156	9.42	47.03	4,972.65	1,000.00	43.50	5,122.23	20.00
33	J158	9.42	55.15	4,958.03	1,000.00	47.30	2,859.27	20.00
34	J160	9.42	31.15	4,935.99	1,000.00	28.46	2,131.72	20.00
35	J164	9.42	54.08	4,951.67	1,000.00	46.50	2,346.06	20.00
36	J166	1,009.42	34.42	4,943.68	1,000.00	18.19	1,884.65	20.00

Future Peak Day Demand with Fireflow

		ID	Static Demand (gpm)	Static Pressure (psi)	Static Head (ft)	Fire-Flow Demand (gpm)	Residual Pressure (psi)	Hydrant Available Flow (gpm)	Hydrant Pressure at Available Flow (psi)
37	<input type="checkbox"/>	J168	9.42	57.80	4,943.67	1,000.00	30.48	1,217.89	20.00
38	<input type="checkbox"/>	J170	9.42	54.63	4,954.09	1,000.00	46.97	2,541.25	20.00
39	<input type="checkbox"/>	J172	44.30	73.06	4,951.62	1,000.00	32.61	1,232.67	20.00
40	<input type="checkbox"/>	J174	44.30	67.41	4,951.57	1,000.00	20.30	1,048.74	20.00
41	<input type="checkbox"/>	J176	44.30	74.39	4,951.68	1,000.00	30.05	1,183.85	20.00
42	<input type="checkbox"/>	J178	44.30	76.58	4,951.74	1,000.00	41.81	1,398.41	20.00
43	<input type="checkbox"/>	J182	9.42	82.42	4,953.48	1,000.00	69.10	2,578.69	20.00
44	<input type="checkbox"/>	J184	0.00	85.09	5,036.37	1,000.00	8.78	908.11	20.00
45	<input type="checkbox"/>	J186	0.00	82.49	5,036.37	1,000.00	5.67	882.31	20.00
46	<input type="checkbox"/>	J188	0.00	70.36	5,036.38	1,000.00	-5.12	780.88	20.00
47	<input type="checkbox"/>	J190	0.00	73.83	5,036.38	1,000.00	1.79	836.49	20.00
48	<input type="checkbox"/>	J2	0.00	165.76	5,721.02	1,000.00	-35,333,536.00	85.00	20.00
49	<input type="checkbox"/>	J22	8.05	82.63	5,194.98	1,000.00	61.38	1,969.55	20.00
50	<input type="checkbox"/>	J24	8.05	104.63	5,194.74	1,000.00	78.20	2,042.78	20.00
51	<input type="checkbox"/>	J25	8.05	115.51	5,194.74	1,000.00	80.48	1,822.01	20.00
52	<input type="checkbox"/>	J26	8.05	125.96	5,194.57	1,000.00	98.00	2,252.71	20.00
53	<input type="checkbox"/>	J27	8.05	125.72	5,194.57	1,000.00	89.57	1,899.21	20.00
54	<input type="checkbox"/>	J28	8.05	88.50	5,194.67	1,000.00	64.18	1,913.61	20.00
55	<input type="checkbox"/>	J29	8.05	141.89	5,194.47	1,000.00	114.76	2,509.04	20.00
56	<input type="checkbox"/>	J3	45.49	60.20	5,036.69	1,000.00	4.68	862.76	20.00
57	<input type="checkbox"/>	J30	8.05	146.62	5,194.39	1,000.00	112.05	2,189.23	20.00
58	<input type="checkbox"/>	J31	8.05	141.97	5,194.37	1,000.00	98.86	1,859.79	20.00
59	<input type="checkbox"/>	J32	8.05	140.28	5,194.37	1,000.00	95.80	1,808.68	20.00
60	<input type="checkbox"/>	J34	8.05	142.30	5,194.37	1,000.00	90.65	1,664.34	20.00
61	<input type="checkbox"/>	J35	8.05	163.19	5,194.36	1,000.00	115.63	1,918.51	20.00
62	<input type="checkbox"/>	J36	8.05	163.55	5,194.36	1,000.00	114.86	1,893.35	20.00
63	<input type="checkbox"/>	J37	8.05	155.71	5,194.36	1,000.00	101.71	1,719.86	20.00
64	<input type="checkbox"/>	J38	8.05	149.18	5,194.38	1,000.00	119.74	2,463.72	20.00
65	<input type="checkbox"/>	J39	8.05	151.22	5,194.38	1,000.00	121.06	2,445.37	20.00
66	<input type="checkbox"/>	J4	45.49	64.71	5,036.46	1,000.00	4.37	875.09	20.00
67	<input type="checkbox"/>	J40	8.05	145.32	5,194.37	1,000.00	115.91	2,423.28	20.00
68	<input type="checkbox"/>	J41	8.05	135.35	5,194.37	1,000.00	105.72	2,297.52	20.00
69	<input type="checkbox"/>	J42	8.05	126.68	5,194.38	1,000.00	97.33	2,208.94	20.00
70	<input type="checkbox"/>	J43	8.05	118.02	5,194.39	1,000.00	89.03	2,118.25	20.00
71	<input type="checkbox"/>	J44	8.05	107.98	5,194.43	1,000.00	79.78	2,022.87	20.00
72	<input type="checkbox"/>	J45	8.05	102.54	5,194.52	1,000.00	75.54	2,001.88	20.00

Future Peak Day Demand with Fireflow

		ID	Static Demand (gpm)	Static Pressure (psi)	Static Head (ft)	Fire-Flow Demand (gpm)	Residual Pressure (psi)	Hydrant Available Flow (gpm)	Hydrant Pressure at Available Flow (psi)
73	<input type="checkbox"/>	J46	8.05	110.64	5,194.51	1,000.00	66.12	1,528.86	20.00
74	<input type="checkbox"/>	J47	8.05	140.59	5,194.37	1,000.00	110.48	2,332.76	20.00
75	<input type="checkbox"/>	J48	8.05	143.15	5,194.36	1,000.00	112.93	2,358.22	20.00
76	<input type="checkbox"/>	J49	8.05	141.84	5,194.36	1,000.00	110.72	2,298.04	20.00
77	<input type="checkbox"/>	J5	45.49	64.58	5,036.44	1,000.00	1.07	848.19	20.00
78	<input type="checkbox"/>	J50	8.05	131.07	5,194.37	1,000.00	101.31	2,241.43	20.00
79	<input type="checkbox"/>	J51	8.05	125.82	5,194.38	1,000.00	96.48	2,199.56	20.00
80	<input type="checkbox"/>	J52	8.05	120.09	5,194.39	1,000.00	89.99	2,089.84	20.00
81	<input type="checkbox"/>	J53	8.05	144.13	5,194.35	1,000.00	110.12	2,190.24	20.00
82	<input type="checkbox"/>	J54	8.05	149.20	5,194.34	1,000.00	109.29	2,017.86	20.00
83	<input type="checkbox"/>	J55	8.05	138.81	5,194.34	1,000.00	100.22	1,964.38	20.00
84	<input type="checkbox"/>	J6	45.49	78.75	5,036.37	1,000.00	5.19	917.26	20.00
85	<input type="checkbox"/>	J60	8.05	144.19	5,194.35	1,000.00	109.80	2,174.38	20.00
86	<input type="checkbox"/>	J62	9.42	55.76	4,935.56	1,000.00	34.99	1,362.89	20.00
87	<input type="checkbox"/>	J64	9.42	77.11	4,935.59	1,000.00	69.91	3,207.48	20.00
88	<input type="checkbox"/>	J66	9.42	74.34	4,935.57	1,000.00	64.61	2,636.21	20.00
89	<input type="checkbox"/>	J72	9.42	59.26	4,935.57	1,000.00	48.29	2,058.32	20.00
90	<input type="checkbox"/>	J74	9.42	63.94	4,935.57	1,000.00	51.39	2,026.87	20.00
91	<input type="checkbox"/>	J76	9.42	53.07	4,935.56	1,000.00	39.05	1,627.56	20.00
92	<input type="checkbox"/>	J78	9.42	57.42	4,935.67	1,000.00	56.25	7,057.37	20.00
93	<input type="checkbox"/>	J80	9.42	15.41	4,935.74	1,000.00	14.08	8.94	15.41
94	<input type="checkbox"/>	J82	9.42	71.28	4,935.68	1,000.00	69.92	7,377.34	20.00
95	<input type="checkbox"/>	J84	9.42	78.84	4,935.68	1,000.00	77.19	7,137.00	20.00
96	<input type="checkbox"/>	J86	9.42	82.56	4,935.68	1,000.00	78.39	4,391.18	20.00
97	<input type="checkbox"/>	J88	9.42	46.93	4,936.32	1,000.00	45.59	4,416.99	20.00
98	<input type="checkbox"/>	J90	9.42	47.46	4,936.39	1,000.00	46.73	5,389.48	20.00
99	<input type="checkbox"/>	J92	9.42	68.99	4,935.96	1,000.00	67.57	6,337.77	20.00
100	<input type="checkbox"/>	J94	9.42	31.22	4,936.30	1,000.00	28.22	2,046.95	20.00
101	<input type="checkbox"/>	J96	9.42	79.47	4,935.68	1,000.00	77.62	6,759.67	20.00
102	<input type="checkbox"/>	J98	9.42	75.92	4,935.63	1,000.00	73.33	5,555.26	20.00
103	<input type="checkbox"/>	NEWSUBDIV	44.30	81.38	4,952.81	1,000.00	61.50	2,039.39	20.00
104	<input type="checkbox"/>	W5	9.42	78.64	4,935.49	1,000.00	71.43	3,283.73	20.00
105	<input type="checkbox"/>	W6	9.42	78.91	4,935.49	1,000.00	71.78	3,311.59	20.00



**APPENDIX C**

**WATER RIGHTS INVENTORY**



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Hurricane, UT 84737  
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Jeannette Barney, Esq.\*†  
Travis Dunsmoor, Esq.◊  
\*Licensed in Utah †Licensed in Arizona  
◊Licensed In Nevada

March 30, 2023

To: Andy McGinnis, Board Chairman

From: Jeannette Barney

RE: Water Rights Audit for Big Plains Water Special Service District (“BPWSSD”)

I have researched the Washington County Recorder’s records on their website and BPWSSD’s water rights ownership listed in the Utah Division of Water Rights website (“DWR”) and have determined that BPWSSD owns 528.194 acre-feet of water rights. I reviewed the Big Plains Apple Valley Culinary Master Plan Draft 1.24.23 (“Master Plan”) and the BPWSSD Water rights excel spreadsheet as a starting point for BPWSSD’s water rights ownership. Below are modified versions of Tables III.A-1, III.A-2 and III.A-3, and additional tables to demonstrate how I arrived at BPWSSD’s water rights ownership.

W.R. #	Source	gpm	cfs	AcFt.	Changes	Total AcFT	Explanation
81-1799	Underground Wells	0.62	0.0014	1		1	
81-2740	Underground Wells	0.62	0.0014	1	-1	0	Segregated:a30637
81-3011	Underground Wells	82.19	0.1831	132.58	-132.58	0	QC to CPWC # 20190000149 Jan 2, 2019
81-3106(1)	Underground Wells	13.64	0.0304	22	-22	0	Segreated: A40599b
81-3106(2)	Underground Wells	18.61	0.0415	30.02	-30.02	0	QC to CPWC # 20190000149 Jan 2, 2019
81-3169	Underground Wells	125.53	0.37	202.5		202.5	
81-3200	Underground Wells	38.74	0.37	62.5		62.5	
81-4014	Underground Wells	96.09	0.2141	155	-155	0	QC to CPWC # 20190000149 Jan 2, 2019
81-4599	Underground Wells	160.56	0.3578	259	-259	0	QC to CPWC # 20190000149 Jan 2, 2019
81-4600	Underground Wells	122.74	0.2735	198	-198	0	QC to CPWC # 20190000149 Jan 2, 2019
81-4676	Underground Wells	29.76	0.0663	48	-48	0	QC to CPWC # 20190000149 Jan 2, 2019
Total Water Rights		689.1	1.5	1,111.60	-845.6	266	

The quitclaim deed transferring water rights from BPWSSD to Cedar Point Water Company (“CPWC”) and the segregation histories that are identified in Table III.A-1 are attached to this memorandum as Exhibit 1.

W.R. #	Source	gpm	cfs	AcFt.	Changes	Total AcFT	Explanation
81-4014	AV Water Rights	692	1.54	1,116.60	-1,116.60	0	WR #81-4014 has 131 AcFt, owned by Apple Valley Develop. Trust,
Total Water Rights		692.2	1.54	1,116.60	-1,116.60	0	Cedar Point Water Company owns water rights but the amounts in AcFt do not correspond with this amount

Water Right #81-4014 is 131 AcFt of water and is owned by Apple Valley Development Trust. BPWSSD conveyed its rights in WR# 81-4014 in 2019 with the Quitclaim deed referenced in Exhibit 1. I researched water rights owned by Cedar Point Water Company and water rights on the DWR with a source of Apple Valley or Cedar Point but was unable to find water rights owned by BPWSSD supporting the AcFt amount from Table III.A-2.

W.R. #	Source	gpm	cfs	AcFt.	Changes	Total AcFT	Explanation
81-3641	Canaan Mountain Sp	112	0.25	8.15 *		36.85	*Water rights ACFt reversed in Master Plan vs. amounts shown on deeds and Water Rights
81-4619	Canaan Springs	58	0.13	36.85 *		8.15	Division website
Total Water Rights		170.5	0.38	45		45	

As noted in Table III.A-3, the total AcFt of water is correct, however, the AcFt amounts of the water rights were reversed. Listed in the Total AcFt column is the correct water right AcFt amount.

Table A-4 shows the water rights BPWSSD owns that were not listed in the Master Plan or that were reacquired with a different AcFt amount.

81-1526	surface			1	-1	0	QC 20180044608
81-1798	underground well			5	-5	0	QC 20130020225
81-2171	underground well			25.196		25.196	QC 20200032179, dated 12 June, 2020
81-3106(1)	irrigation			21.548	-21.548	0	**Aff. 20210022860, 3-23-2021, 21.548 AF
81-3106(1)	domestic			0.45	-0.45	0	**Aff. 20210022860, 3-23-2021, 0.45 AF
81-3106(3)	irrigation			3.5	-3.5	0	QC 20200047627, 8-27-2020-corrected below
81-3433	underground well			7	-7	0	QC 20220024399 (Corrected to 81-5514)
81-4600	underground well			93		93	QC 20220024399
81-4614	underground well			58.5		58.5	QC 20200032178, dated June 12, 2020.
81-4988	underground well			2	-2	0	QC20220046536, -1 QC20220011098, -1 seg
81-5512	irrigation			3.5	-3.5	0	QC 20220038943, correcting QC 20200047627
81-5514	underground well			7	-7	0	QC 20220038944, correcting QC 20220024399
New Water Rights owned by BPWSSD that were segregated from BPWSSD recorded water rights.							
81-5318	underground			1		1	Segregated from 81-2740 (A39405)
81-5559	underground		0.009	5		5	Segregated from 81-1798 (A38149a)
81-5560	underground		0.058	21.998		21.998	Segregated from 81-3106(1) (A40599b) see **
81-5561	underground		0.0092	3.5		3.5	Segregated From: 81-5512 (A40599b)
81-5562	underground			7		7	Segregated from 81-5514 (A43996a)
81-5567	surface		0.0307	1		1	Segregated from 81-1526 (D3161)
81-5568	underground		0.005	1		1	Segregated from 81-4988 (A41023a)
Total Water rights not listed in Master Plan:				268.192	-50.998	217.194	
Total Water Rights Owned by BPWSSD						528.194	

The additional segregations from the recorded water rights are documented in Exhibit 2. Please note that the segregated portion of WR #81-3106 was the subject of the affidavit listed in Table A-4 and therefore is listed in that table as well as Table III.A-1. However, the AcFt amount is only counted with the segregated water right #81-5560.

# **EXHIBIT 1**

Quit Claim Deed Page 1 of 8  
Russell Shirts Washington County Recorder  
01/02/2019 04:52:52 PM Fee \$29.00 By  
RUESCH & REEVE, PLLC

When Recorded, Mail To:  
Cedar Point Water Company, Inc.  
253 W. 1480 S., Hurricane UT 84737

**QUIT CLAIM DEED  
(Water)**

BIG PLAINS WATER AND SEWER SPECIAL SERVICE DISTRICT, A UTAH SPECIAL SERVICE DISTRICT, GRANTEE, of Apple Valley, Washington County, Utah, GRANTOR, hereby conveys to hereby conveys to CEDAR POINT WATER COMPANY, INC., A UTAH CORPORATION, GRANTEE, of Washington County, Utah for the sum of \$10.00 and other good and valuable consideration the water rights located in Washington County, Utah, described on Exhibit A attached hereto and referenced in the Water Rights Addendum to Water Deeds attached hereto as Exhibit B.

WITNESS, the hands of said grantor, this 2 day of January, 2019.

BIG PLAINS WATER AND SEWER SPECIAL SERVICE DISTRICT,  
A UTAH SPECIAL SERVICE DISTRICT

[Signature]  
HAROLD MERRITT

ITS: Chairman

ATTEST:

BY [Signature]  
NAME: Janna M. McEwen  
ITS: Clerk

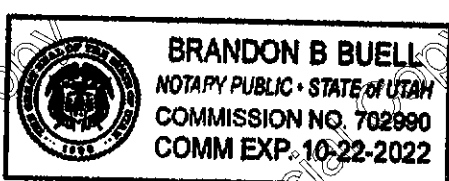
STATE OF UTAH )

) ss.

COUNTY OF WASHINGTON )

On this 2 day of January, 2019, before me personally appeared HAROLD MERRITT, personally known to or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn (or affirmed), did say that he is the Chairman of BIG PLAINS WATER AND SEWER SPECIAL SERVICE DISTRICT, A UTAH SPECIAL SERVICE DISTRICT and that the foregoing document was signed by him on behalf of that entity and the document was the act of the entity for its stated purpose.

Seal:

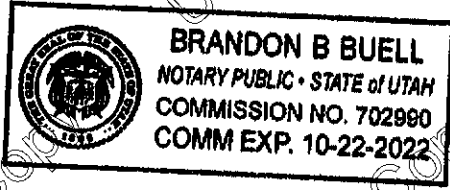


[Signature]  
NOTARY PUBLIC

ACKNOWLEDGEMENT

State of Utah )  
 : ss.  
County of Washington )

On this 2nd day of January, 2019, personally appeared before me JAUNA MCGINNIS, signer of the within and foregoing document, who duly acknowledged before me that she executed the same.



*Brandon B Buell*  
\_\_\_\_\_  
Notary Public

EXHIBIT A

<u>Water Right #</u>	<u>App #</u>	<u>Quantity (acre feet)</u>	<u>Cert. #</u>	<u>Priority Date</u>
81-4014	A39405	155	10502	5/28/1969
81-3105	A40599b	30.02 (of 52.02)	12054	4/22/1971
81-4599	A43996	259		8/5/1974
81-3011	A43996a	132.58	12955	8/15/1974
81-4600	A43996a	198	12955	8/15/1974
81-4676	A43996a	48	12955	8/15/1974
<b>Total:</b>		<b>822.60 acre feet</b>		

**EXHIBIT B**

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**WATER RIGHTS ADDENDUM TO WATER DEEDS**

Grantor: BIG PLAINS WATER AND SEWER SPECIAL SERVICE DISTRICT

Grantee: Cedar Point Water Company, Inc., a Utah corporation

Water Right No(s): 81-3011; 81-3106; 81-4014; 81-4599; 81-4600; 81-4676

In connection with the foregoing water rights conveyance, Grantor hereby assigns to Grantee all water rights listed which are not yet capable by law of being conveyed by deed (e.g., pending or unapproved water rights) and all applications pertaining to the water rights listed (e.g., all change applications, extension applications, non-use applications, etc.). Grantor also makes the following declarations and disclosures:

**SECTION 1 - TYPE OF DEED** Check one box only - Must match language in the deed

- The foregoing deed is a warranty deed. (Grantor is making all standard warranties.)
- The foregoing deed is a special warranty deed. (Grantor is only warranting that Grantor has not previously conveyed title to others, i.e., a warranty of title as to all claiming by or through Grantor.)
- The foregoing deed is a quit claim deed. (Grantor is making no warranties.)
- The language in the foregoing deed is controlling as to the type of deed and associated warranties, if any. (County Recorder should forward a copy of this form to the Utah Division of Water Rights if any box above is checked)

**SECTION 2 - APPURTENANT WATER RIGHTS** Check one box only

- All of Grantor's water rights approved for use on the following described parcel(s) are being conveyed.
- In addition to any specifically identified rights, all other water rights owned by Grantor and approved for use on the following described parcel(s) are being conveyed.
- No water rights other than those specifically identified by water right number are being conveyed.

**SECTION 3 - WATER RIGHTS CONVEYED IN WHOLE OR IN PART** Check all applicable boxes

- 100% of the following water rights described in the deed are being conveyed. Water Right Nos. 81-3011; 81-4014; 81-4599; 81-4600; 81-4676
- Only the portion indicated of the following water rights described in the deed are being conveyed.
  - 30.02 acre-feet from Water Right No. 81-3106 for:      families;      acres of irrigated land; stock water for      Equivalent Livestock Units; and/or for the following other uses:
  - acre-feet from Water Right No.      for:      families;      acres of irrigated land; stock water for      Equivalent Livestock Units; and/or for the following other uses:
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- The language in the foregoing deed is controlling as to quantity, if any.

**SECTION 4 - OTHER DISCLOSURES** Check all applicable boxes

- Grantor is endorsing and delivering to Grantee stock certificates for      shares of stock in the following water company;
- Other water related disclosures:

*The undersigned acknowledge sole responsibility for the information contained herein even though they may have been assisted by employees of the Utah Division of Water Rights, real estate professionals, or other professionals, except to the extent that title insurance or a legal opinion concerning such information is obtained.*

Grantor's Signature: *Arnell Stewart*

Grantee's Acknowledgment of Receipt:     

Grantee's Mailing Address: 253 W. 1480 S., Hurricane UT 84737

**NOTE: GRANTEE MUST KEEP A CURRENT ADDRESS ON FILE WITH THE UTAH DIVISION OF WATER RIGHTS**



## NOTES TO WATER RIGHTS ADDENDUM TO WATER DEEDS

Please read the following notes carefully in order to avoid problems and the possible loss of the water rights being conveyed in connection with this transaction.

**The mere purchase of a water right does not guarantee: (1) that the water right is in good standing with the Utah Division of Water Rights; (2) that the owner has clear title to the water right; (3) that the Division will recognize the ownership change; or (4) that the Division will approve any proposed changes or extensions regarding the water right. You are encouraged to conduct proper "due diligence" research into any water right before purchasing it.**

### Section

1-4 Once this Water Rights Addendum has been recorded at the County Recorder's Office, **Grantee must prepare a "Report of Water Right Conveyance" or "ROC"** (available from the Utah Division of Water Rights) and file it with the Utah Division of Water Rights in order to: (1) have the Division's records updated with **current ownership and address information**; (2) file any application on these water rights; and (3) receive notifications concerning deadlines and other essential information pertaining to these rights. **Failure to do so PROMPTLY may result in the loss of these water rights.** Help with reviewing the water rights and completing the ROC can be obtained from the Utah Division of Water Rights and/or water professionals, such as attorneys, engineers, surveyors, and title professionals with experience in water rights and water law.

1 There are three general types of deeds – warranty deeds, special warranty deeds, and quit claim deeds – which can be used to convey water rights. The primary difference between them is the type of warranty being given, which has a dramatic effect on the rights and responsibilities of both the Grantor and the Grantee. If you are unsure about the type of deed that you should use or accept, you should obtain legal advice on this issue.

2 Water rights owned by the Grantor and used on Grantor's Parcel may be "appurtenant" to Grantor's Parcel. Not all appurtenant water rights have been assigned a water right number because not all water rights are "of record." If either of the first two boxes in Section 2 are checked, this conveyance includes all appurtenant water rights, whether or not they are listed by water right number or are of record. Grantee should investigate each water right listed and determine if there are any water rights that are not of record. If there are water rights not of record, Grantee should seriously consider making them of record by filing the appropriate forms with the Utah Division of Water Rights.

3 A Water right can be conveyed in whole (100% of the right is conveyed) or in part (only a portion of the right is conveyed). If the whole right is conveyed, you do not need to describe the beneficial uses associated with the right. If only a part is being conveyed, you need to describe exactly what beneficial uses are being conveyed. This is usually expressed in terms of acre-feet and generally consists of: (1) the number of families for domestic (indoor culinary) uses (generally quantified as 0.45 acre-feet per family for a year-round residence and 0.25 acre-feet per family for a seasonal residence); (2) the number of acres irrigated (this involves issues of "irrigation duty" [the number of acre-feet of water allowed per acre of irrigated land] and "sole supply/supplemental supply" [the amount of water allocated to each water right when more than one right is being used on the same land or for the same livestock]; and (3) the number of livestock being watered (expressed in terms of equivalent livestock units or "ELUs" which are quantified at the rate of 0.028 acre-feet per ELU for full-year use). Any other uses being conveyed should be similarly described. Help with evaluating, quantifying, and/or describing the uses can be obtained from the Utah Division of Water Rights and/or water professionals.

4 Shares of stock in water companies (including irrigation, canal, and ditch companies) are generally not transferred by deed. Each company has procedures for transferring ownership. The company should be contacted to ascertain the appropriate procedures to follow. The most common procedure is for the Grantor to endorse and deliver the stock certificate to the Grantee, who then presents that certificate to company for issuance of a new certificate in the Grantee's name. If another procedure is to be followed, that should be noted on the "Other water related disclosures" line in Section 4 of this form. Each company also defines how much water is associated with a particular share and what fees and assessments are charged. The Grantee should contact the company about all such issues.

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The Utah Division of Water Rights (often referred to as the State Engineer's Office) is located at  
1594 W. North Temple, Suite 220, PO Box 146300, Salt Lake City, Utah 84114-6300  
Telephone: 801-533-7240 Web Address: [www.waterrights.utah.gov](http://www.waterrights.utah.gov)

DocuSign Envelope ID: 3D5F8C57-2B3F-4689-B22E-92E32E3B6210

**WATER RIGHTS ADDENDUM TO WATER DEEDS**

Grantor: BIG PLAINS WATER AND SEWER SPECIAL SERVICE DISTRICT

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Water Right No(s): 81-3011; 81-3106; 81-4014; 81-4599; 81-4600; 81-4676

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*The undersigned acknowledge sole responsibility for the information contained herein even though they may have been assisted by employees of the Utah Division of Water Rights, real estate professionals, or other professionals, except to the extent that title insurance or a legal opinion concerning such information is obtained.*

Grantor's Signature: \_\_\_\_\_

Grantee's Acknowledgment of Receipt: Jenny Erva

1/2/2019 | 4:30 PM MST

Grantee's Mailing Address: 253 W. 1400 S., P.O. Box 205, Big Water, UT 84737

**NOTE: GRANTEE MUST KEEP A CURRENT ADDRESS ON FILE WITH THE UTAH DIVISION OF WATER RIGHTS**

DocuSign Envelope ID: 3D5F8C57-2B3F-4689-B22E-92E32E386210

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Telephone: 801-538-7240 Web Address: [www.waterrights.utah.gov](http://www.waterrights.utah.gov)**

# STATEMENT OF WATER RIGHT SEGREGATION STATE OF UTAH

For the purpose of informing the State Engineer of the separation of a portion of a water right, this statement is hereby made, pursuant to the requirements of Section 73-3-27, Utah Code Annotated, and based upon the following showing of facts.

<b>WATER RIGHT No.:</b> 81-5318	<b>APPLICATION/CLAIM #:</b> A39405																																																																								
<b>PRIORITY DATE:</b> May 28, 1969	<b>SEGREGATION FILING DATE:</b> February 07, 2020																																																																								
<b>WATER RIGHT SEPARATED FROM:</b> 81-2740(A39405) <span style="float: right; font-size: small;">(This document was created on February 7, 2020 by KCHRISTE.)</span>																																																																									
<b>PARENT RIGHT TYPE:</b> Application To Appropriate																																																																									
<b>PARENT RIGHT STATUS:</b> Certified																																																																									
<b>1. OWNER INFORMATION:</b>																																																																									
<b>Name:</b> Big Plains Water and Sewer Special Service District <b>Address:</b> 1777 North Meadowlark Drive Apple Valley UT 84737																																																																									
<b>2. QUANTITY, SOURCE, AND LOCATION OF WATER:</b>																																																																									
<b>Quantity of Water:</b> 1 acft																																																																									
<b>Source:</b> Underground Water Well	<b>County:</b> Washington																																																																								
<b>Common Description:</b> 12 miles East of Hurricane																																																																									
<b>POINTS OF DIVERSION -- UNDERGROUND:</b>																																																																									
[1] N 486 feet E 1133 feet from the SW corner, Section 19 T 42S R 11W SLB&M																																																																									
Well Diameter: 12 inches																																																																									
[2] N 957 feet E 1692 feet from the SW corner, Section 19 T 42S R 11W SLB&M																																																																									
Well Diameter: 16 inches																																																																									
<b>3. WATER USE INFORMATION:</b>																																																																									
<b>Water Rights Appurtenant to the following use(s):</b> 81-2740,5318																																																																									
IRRIGATION: from Mar 01 to Nov 30 IRRIGATING: 0.2000 acre of the Group Total of 0.4000 acres.																																																																									
<b>PLACE OF USE:</b> (which includes all or part of the following legal subdivisions:)																																																																									
<table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th style="width: 10%;"></th> <th colspan="4">Northwest Quarter</th> <th colspan="4">Northeast Quarter</th> <th colspan="4">Southwest Quarter</th> <th colspan="4">Southeast Quarter</th> <th style="width: 10%;">Section</th> </tr> <tr> <th>BS TOWN RANG SC</th> <th>NW</th><th>NE</th><th>SW</th><th>SE</th> <th>NW</th><th>NE</th><th>SW</th><th>SE</th> <th>NW</th><th>NE</th><th>SW</th><th>SE</th> <th>NW</th><th>NE</th><th>SW</th><th>SE</th> <th>Totals</th> </tr> </thead> <tbody> <tr> <td>SL 42S 11W 19</td> <td></td><td></td><td></td><td>*</td> <td></td><td></td><td>X</td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td>*X</td> <td></td><td>0.0000</td> </tr> <tr> <td colspan="16" style="text-align: right;"><b>Group Total:</b></td> <td>0.0000</td> </tr> </tbody> </table>			Northwest Quarter				Northeast Quarter				Southwest Quarter				Southeast Quarter				Section	BS TOWN RANG SC	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	Totals	SL 42S 11W 19				*			X									*X		0.0000	<b>Group Total:</b>																0.0000
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SL 42S 11W 19				*			X									*X		0.0000																																																							
<b>Group Total:</b>																0.0000																																																									

Continued on next page.

**4. LIMITATION(S):**

Water Right: 81-5318 is limited to:  
the irrigation requirements of 0.2000 acre.



# STATEMENT OF A WATER RIGHT SEGREGATION STATE OF UTAH

For the purpose of informing the State Engineer of the segregation of a portion of a perfected or water right application consistent with section 73-3-27, this statement is hereby made, based upon the following showing of facts.

**Water Right:**

(Document created on Oct 20, 2022 by SZUFELT)

Water Right Number: 81-5560      Application #: A40599b  
(SZUFELT)

Segregated From: 81-3106 (A40599b) on Oct 20, 2022  
Parent Water Right Type: Application To Appropriate  
Parent Water Right Status: Certificated

**Owners:**

Name: Big Plains Water and Sewer Special Service District  
Address: 1777 North Meadowlark Drive  
Apple Valley UT 84737

Interest:

Remarks:

**Dates:**

Filed: Jan 20, 1981

Priority: Apr 22, 1971

**General:**

Quantity of Water: 0.058 CFS OR 21.998 ACFT

Source: Underground Water Well  
County: Washington

Common Description:

Land Owned by Appl.:

County Tax Id#: .

**Points of Diversion:**

Points of Diversion - Underground:

(1) S 1893 ft. E 6 ft. from NW corner, Sec 19 T 42S R 11W SLBM

Well Diameter: 18 in.      Depth: 285 to ft.      Year Drilled:      Well Log:      Well Id#:

Elevation:      UTM: 309397.4, 4110503.995 (NAD83)

Source/Cmnt:

**Proposed Water Uses:**

Proposed Water Uses - Group Number: 609798

Water Rights Appurtenant to the following use(s):

81-2170(CERT), 81-2171(CERT), 81-3106(CERT), 81-5512(CERT), 81-5560(CERT),

Water Use Types:

**Irrigation-Beneficial Use Amount: 4.3096 acres Group Total: 44.83      Period of Use: 03/15 to 11/30**

Place Of Use:

	North West				North East				South West				South East				Section Totals
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	
Sec 19 T 42S R 11W SLBM Lot 2																	1.16
Sec 19 T 42S R 11W SLBM Lot 3																	
Sec 19 T 42S R 11W SLBM Lot 4																	
Sec 19 T 42S R 11W SLBM Lot 5																	

Place Of Use:

	North West				North East				South West				South East				Section
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	Totals
Sec 24 T 42S R 12W SLBM						17.12		2.36									19.48
Group Acreage Total :																20.64	

Proposed Water Uses - Group Number: 610408

Water Rights Appurtenant to the following use(s):

81-3106(CERT), 81-5512(CERT), 81-5560(CERT),

Water Use Types:

**Stock Water**-Beneficial Use Amount: 0 ELUs Group Total: 56

Period of Use: 01/01 to 12/31

**Domestic**-Beneficial Use Amount: 1 EDUs Group Total: 1

Period of Use: 01/01 to 12/31

**Use Totals:**

Irrigation sole-supply total: 4.3096 acres

for a group total of: 44.83 acres

Stock Water sole-supply total: 0 ELUs

for a group total of: 56 ELUs

Domestic sole-supply total: 1 EDUs

for a group total of: 1 EDUs

# **EXHIBIT 2**





Place Of Use:

North West				North East				South West				South East				Section
NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	Totals
Group Acreage Total :																105.22

**Use Totals:**

Irrigation sole-supply total: 1 acres

for a group total of: 105.22 acres

# Segregation History for 81-5512

Utah Division of Water Rights

10/20/2022 11:13 AM

Water Right: 81-5512

Application/Claim: A40599b

Certificate: 12054

## Segregation History:

This Right was Segregated from: 81-3106, with Appl.# A40599b, Approval Date:04/03/1981 under which Proof is to be

as originally filed:	Flow in CFS	AND/ OR/ BLANK	Quantity in Acre-Feet	Water Uses						
				Irrigated Acreage	Stock (ELUs)	Domestic (EDUs)	Acre-Feet			
							Municipal	Mining	Power	Other
			7.02	1.0904	56.0					

The following Water Rights have been Segregated from 81-5512:

(1) WrNum:81-5561	[0.0092]	OR	[3.5]	[0.5432]	[28.0]					
-------------------	----------	----	-------	----------	--------	--	--	--	--	--

AppNum: A40599b

Name: Big Plains Water & Sewer Special Service District

Filed: 10/20/2022

Comment:

This Right as currently calculated:	Flow in CFS		Quantity in Acre-Feet	Water Uses						
				Irrigate Acreage	Stock (ELUs)	Domestic (EDUs)	Acre-Feet			
							Municipal	Mining	Power	Other
	-0.0092		3.52	0.5472	28.0					



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## Water Right:

(Document created on Oct 20, 2022 by SZUFELT)

Water Right Number: 81-5562      Application #: A43996a  
(SZUFELT)

Segregated From: 81-5514 (A43996a) on Oct 20, 2022

Parent Water Right Type: Application To Appropriate  
Parent Water Right Status: Certificated

## Owners:

Name: BIG PLAINS WATER & SEWER SPECIAL SERVICE DISTRICT  
Address: 1777 N Meadowlark Dr.  
Apple Valley, UT 84737

Interest:

Remarks:

## Dates:

Filed: Sep 08, 1988

Priority: Aug 15, 1974

## General:

Quantity of Water: 7 ACFT

Source: Underground Water Well  
County: Washington

Common Description: West of Short Creek

Land Owned by Appl.:

County Tax Id#: .

## Points of Diversion:

Points of Diversion - Underground:

- (1) N 735 ft. W 597 ft. from SE corner, Sec 29 T 43S R 11W SLBM  
Well Diameter: 10 in.      Depth: 150 to ft.      Year Drilled:      Well Log: No      Well Id#:      Elevation:      UTM: 312381.136, 4098352.839 (NAD83)  
Source/Cmnt:
- (2) N 839 ft. E 150 ft. from W4 corner, Sec 31 T 43S R 11W SLBM  
Well Diameter: 10 in.      Depth: 145 to ft.      Year Drilled:      Well Log: No      Well Id#:      Elevation:      UTM: 309125.62, 4097658.533 (NAD83)  
Source/Cmnt:
- (3) S 1760 ft. W 110 ft. from N4 corner, Sec 31 T 43S R 11W SLBM  
Well Diameter: 10 in.      Depth: 160 to ft.      Year Drilled:      Well Log: No      Well Id#:      Elevation:      UTM: 310120.172, 4097645.11 (NAD83)  
Source/Cmnt:
- (4) S 646 ft. E 743 ft. from N4 corner, Sec 31 T 43S R 11W SLBM  
Well Diameter: 10 in.      Depth: 165 to ft.      Year Drilled:      Well Log: No      Well Id#:      Elevation:      UTM: 310380.166, 4097984.657 (NAD83)  
Source/Cmnt:

SCANNED

Segregation



Points of Diversion - Underground:

- (5) N 839 ft. E 1114 ft. from W4 corner, Sec 31 T 43S R 11W SLBM  
 Well Diameter: 10 in.    Depth: 165 to ft.    Year Drilled:    Well Log: No    Well Id#:    Elevation:    UTM: 309419.447, 4097658.533 (NAD83)  
 Source/Cmnt:
- (6) S 1705 ft. W 330 ft. from N4 corner, Sec 31 T 43S R 11W SLBM  
 Well Diameter: 10 in.    Depth: 180 to ft.    Year Drilled:    Well Log: No    Well Id#:    Elevation:    UTM: 310053.116, 4097661.874 (NAD83)  
 Source/Cmnt:
- (7) S 1856 ft. W 798 ft. from NE corner, Sec 31 T 43S R 11W SLBM  
 Well Diameter: 10 in.    Depth: 190 to ft.    Year Drilled:    Well Log: No    Well Id#:    Elevation:    UTM: 310711.797, 4097597.602 (NAD83)  
 Source/Cmnt:
- (8) N 206 ft. W 440 ft. from W4 corner, Sec 32 T 43S R 11W SLBM  
 Well Diameter: 10 in.    Depth: 155 to ft.    Year Drilled:    Well Log: No    Well Id#:    Elevation:    UTM: 310800.751, 4097422.861 (NAD83)  
 Source/Cmnt:

**Proposed Water Uses:**

Proposed Water Uses - Group Number: 610583

Water Rights Appurtenant to the following use(s):

81-3433(CERT), 81-5044(CERT), 81-5262(CERT), 81-5344(CERT), 81-5498(CERT),  
 81-5499(CERT), 81-5514(CERT), 81-5518(CERT), 81-5531(CERT), 81-5562(CERT),

Water Use Types:

**Irrigation-Beneficial** Use Amount: 1.4 acres    Group Total: 230    Period of Use: 03/01 to 11/30

Comments: QUANTITY OF WATER: WUC 3433 is limited to a total yearly diversion of 50.00 acre feet.

Place Of Use:

	North West				North East				South West				South East				Section Totals
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	
Sec 31 T 43S R 11W SLBM			30	40													70
Sec 32 T 43S R 11W SLBM	40	40	40	40													160
Group Acreage Total :																230	

**Use Totals:**

Irrigation sole-supply total: 1.4 acres

for a group total of: 230 acres

# STATEMENT OF A WATER RIGHT SEGREGATION STATE OF UTAH

For the purpose of informing the State Engineer of the segregation of a portion of a perfected or water right application consistent with section 73-3-27, this statement is hereby made, based upon the following showing of facts.

## Water Right:

(Document created on Nov 9, 2022 by SZUFELT)

Water Right Number: 81-5567  
(SZUFELT)

Application #: D3161

Segregated From: 81-1526 (D3161) on Nov 9, 2022  
Parent Water Right Type: Diligence Claim

## Owners:

Name: Big Plains Water and Sewer Special Service District  
Address: 1777 N Meadowlark Dr.  
Apple Valley, UT 84737

Interest:

Remarks:

## Dates:

Filed: Aug 18, 1975

Priority: 1864

## General:

Quantity of Water: 0.0307 CFS OR 1 ACFT

Source: Canaan Mountain Spring & Spg. Areas  
County: Washington

Common Description: Canaan Springs Ranch

Land Owned by Appl.:

County Tax Id#: .

## Points of Diversion:

Points of Diversion - Surface:

(1) N 2352 ft. W 1394 ft. from SE corner, Sec 7 T 43S R 10W SLBM

Diverting Works:

Elevation:

Source:

UTM: 320274.365, 4103510.759 (NAD83)

(2) N 2079 ft. W 240 ft. from SE corner, Sec 7 T 43S R 10W SLBM

Diverting Works:

Elevation:

Source:

UTM: 320626.104, 4103427.548 (NAD83)

(3) N 557 ft. E 2574 ft. from SW corner, Sec 8 T 43S R 10W SLBM

Diverting Works:

Elevation:

Source:

UTM: 321483.811, 4102963.643 (NAD83)

(4) N 52 ft. E 2719 ft. from SW corner, Sec 8 T 43S R 10W SLBM

Diverting Works:

Elevation:

Source:

UTM: 321528.007, 4102809.719 (NAD83)

(5) N 921 ft. E 2091 ft. from SW corner, Sec 8 T 43S R 10W SLBM

Diverting Works:

Elevation:

Source:

UTM: 321336.593, 4103074.59 (NAD83)

(6) S 475 ft. E 2924 ft. from NW corner, Sec 17 T 43S R 10W SLBM

SCANNED  
Segregation

**Points of Diversion - Surface:**

(1) N 2352 ft. W 1394 ft. from SE corner, Sec 7 T 43S R 10W SLBM

Diverting Works:	Source:
Elevation:	UTM: 321590.491, 4102649.089 (NAD83)

(7) N 1834 ft. E 2879 ft. from SW corner, Sec 17 T 43S R 10W SLBM

Diverting Works:	Source:
Elevation:	UTM: 321543.946, 4101742.772 (NAD83)

**Proposed Water Uses:**

Proposed Water Uses - Group Number: 609401

Water Rights Appurtenant to the following use(s):

81-1526(DIL), 81-5567(DIL),

Water Use Types:

**Irrigation**-Beneficial Use Amount: 0.2 acres      Group Total: 3.37      Period of Use: 01/01 to 12/31

Place Of Use:	North West				North East				South West				South East				Section Totals
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	
Sec 18 T 43S R 10W SLBM							X	X	X	X			X	X			
Group Acreage Total :																	

**Use Totals:**

Irrigation sole-supply total: 0.2 acres

for a group total of: 3.37 acres

**Reservoirs:**

Reservoir/Storage Name: Unnamed Reservoir #1

Dam Number:

Capacity: 1 acre-feet

Area Inundated: 0 acres

Dam Height: 10 feet

From: 01/01 to 12/31 inclusive

Area	North West Quarter				North East Quarter				South West Quarter				South East Quarter			
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE
Sec 18 T 43S R 10W SLBM																X

Reservoir/Storage Name: Unnamed Reservoir #2

Dam Number:

Capacity: 0.75 acre-feet

Area Inundated: 0 acres

Dam Height: 8 feet

From: 01/01 to 12/31 inclusive

Area	North West Quarter				North East Quarter				South West Quarter				South East Quarter			
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE
Sec 18 T 43S R 10W SLBM																X

# STATEMENT OF A WATER RIGHT SEGREGATION STATE OF UTAH

For the purpose of informing the State Engineer of the segregation of a portion of a perfected or water right application consistent with section 73-3-27, this statement is hereby made, based upon the following showing of facts.

**Water Right:**

(Document created on Nov 9, 2022 by SZUFELT)

Water Right Number: 81-5568      Application #: A41023a  
(SZUFELT)

Segregated From: 81-4988 (A41023a) on Nov 9, 2022  
Parent Water Right Type: Application To Appropriate  
Parent Water Right Status: Certificated

**Owners:**

Name: Big Plains Water and Sewer Special Service District  
Address: 1777 N Meadowlark Dr.  
Apple Valley, UT 84737

Interest:

Remarks:

**Dates:**

Filed: Jan 22, 1975

Priority: Nov 22, 1971

**General:**

Quantity of Water: 0.005 CFS OR 1 ACFT

Source: Underground Water Well  
County: Washington

Common Description: Big Plains Area

Land Owned by Appl.:

County Tax Id#: .

**Points of Diversion:**

Points of Diversion - Underground:

(1) N 420 ft. W 102 ft. from SE corner, Sec 22 T 42S R 12W SLBM

Well Diameter: 12 in.      Depth: 360 to ft.      Year Drilled: 1980      Well Log: Yes      Well Id#: .  
Elevation:      UTM: 306118.418, 4109682.486 (NAD83)  
Source/Cmnt:

**Proposed Water Uses:**

Proposed Water Uses - Group Number: 634154

Water Rights Appurtenant to the following use(s):

81-4988(CERT), 81-5568(CERT),

Water Use Types:

**Irrigation-Beneficial Use Amount:** 0.2 acres      **Group Total:** 0.4      **Period of Use:** 04/01 to 10/31

Place Of Use:

	North West				North East				South West				South East				Section Totals
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	
Sec 22 T 42S R 12W SLBM														X		X	
Sec 23 T 42S R 12W SLBM									X		X						

Group Acreage Total :



**Use Totals:**

Irrigation sole-supply total: 0.2 acres

for a group total of: 0.4 acres

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SCANNED



## **APPENDIX D**

# **OPINION OF PROBABLE COST**

**SUNRISE ENGINEERING, INC.**  
 11 North 300 West, Washington, Utah 84780  
 Tel: (435) 652-8450 Fax: (435) 652-8416  
**Engineer's Opinion of Probable Cost**

**Apple Valley Water System Improvements** 18-Nov-22

No.	Item	Qty	Unit	Engineer's Estimate	
				Unit Price	Amount
<b>DISTRIBUTION SYSTEM GENERAL CONSTRUCTION</b>					
1	Mobilization, Traffic Control, Dust Control, etc.	1	LS	\$ 75,000	\$ 75,000
2	16" C900 PVC, Fittings, Installation , Pipe Bedding, Trench Backfill	2,523	LF	\$ 110	\$ 278,000
3	12" C900 PVC, Fittings, Installation , Pipe Bedding, Trench Backfill	3,680	LF	\$ 90	\$ 331,000
4	10" C900 PVC, Fittings, Installation , Pipe Bedding, Trench Backfill	1,250	LF	\$ 80	\$ 100,000
5	8" C900 PVC, Fittings, Installation , Pipe Bedding, Trench Backfill	1,800	LF	\$ 75	\$ 135,000
6	PRV Vault	2	EA	\$ 50,000	\$ 100,000
7	Additional Fire Hydrant	20	EA	\$ 8,000.00	\$ 160,000.00
<b>SUBTOTAL</b>					<b>\$ 1,179,000</b>
<b>CONTINGENCY</b>				15%	<b>\$ 176,850</b>
<b>CONSTRUCTION TOTAL</b>					<b>\$ 1,355,900</b>
<b>STORAGE GENERAL CONSTRUCTION</b>					
1	Mobilization	1	LS	\$ 72,000	\$ 72,000
2	Earthwork 1,000,000 Gallon Storage Tank	1	LS	\$ 61,673	\$ 62,000
3	Construct 1,000,000 Gallon Storage Tank	1	LS	\$ 1,200,000	\$ 1,200,000
4	Tank Appurtenances	1	LS	\$ 53,964	\$ 54,000
5	Outlet & Overflow Structure	1	LS	\$ 115,638	\$ 116,000
6	Scada to All Tanks/Wells	5	EA	\$ 75,000	\$ 375,000
<b>SUBTOTAL</b>					<b>\$ 1,879,000</b>
<b>CONTINGENCY</b>				15%	<b>\$ 281,900</b>
<b>CONSTRUCTION TOTAL</b>					<b>\$ 2,161,000</b>
<b>INCIDENTALS</b>					
1	incidentals & professional services	20.0%	LS	\$ 611,600	\$ 611,600
<b>SUBTOTAL</b>					<b>\$ 611,600</b>
<b>TOTAL PROJECT COST</b>					<b>\$ 4,129,000</b>

*In providing opinions of probable construction cost, the Client understands that the Engineer has no control over costs or the price of labor, equipment or materials, or over the Contractor's method of pricing, and that the opinion of probable construction cost provided herein is made on the basis of the Engineer's qualifications and experience. The Engineer makes no warranty, expressed or implied, as to the accuracy of such opinions compared to bid or actual costs.*

**SUNRISE ENGINEERING, INC.**  
 11 North 300 West, Washington, Utah 84780  
 Tel: (435) 652-8450 Fax: (435) 652-8416  
**Engineer's Opinion of Probable Cost**

**CONNECTION OF THE THREE WATER SYSTEMS**

28-Jun-23

No.	Item	Qty	Unit	Engineer's Estimate	
				Unit Price	Amount
<b>DISTRIBUTION SYSTEM GENERAL CONSTRUCTION</b>					
1	Mobilization, Traffic Control, Dust Control, etc.	1	LS	\$ 75,000	\$ 75,000
2	8" C900 PVC, Fittings, Installation , Pipe Bedding, Trench Backfill (Apple to Cedar	23,865	LF	\$ 75	\$ 1,790,000
3	8" C900 PVC, Fittings, Installation , Pipe Bedding, Trench Backfill (Cedar to Cannan	23,180	LF	\$ 75	\$ 1,739,000
<b>SUBTOTAL</b>					<b>\$ 3,604,000</b>
<b>CONTINGENCY</b>				15%	<b>\$ 541,000</b>
<b>TOTAL PROJECT COST</b>					<b>\$ 4,145,000</b>

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**SUNRISE ENGINEERING, INC.**  
 11 North 300 West, Washington, Utah 84780  
 Tel: (435) 652-8450 Fax: (435) 652-8416  
**Engineer's Opinion of Probable Cost**

**Cannan Springs Water System Improvements**

18-Nov-22

No.	Item	Qty	Unit	Engineer's Estimate	
				Unit Price	Amount
<b>DISTRIBUTION SYSTEM GENERAL CONSTRUCTION</b>					
1	Mobilization, Traffic Control, Dust Control, etc.	1	LS	\$ 75,000.00	\$ 75,000.00
2	10" C900 PVC, Fittings, Installation , Pipe Bedding, Trench Backfill	2,730	LF	\$ 80.00	\$ 218,000.00
<b>SUBTOTAL</b>					<b>\$ 293,000.00</b>
<b>CONTINGENCY</b>				15%	<b>\$ 44,000.00</b>
<b>CONSTRUCTION TOTAL</b>					<b>\$ 337,000.00</b>

**STORAGE GENERAL CONSTRUCTION**

1	Mobilization	1	LS	\$ 24,000.00	\$ 24,000.00
2	Earthwork 100,000 Gallon Storage Tank	1	LS	\$ 50,000.00	\$ 50,000.00
3	Construct 100,000 Gallon Storage Tank	1	LS	\$ 320,000.00	\$ 320,000.00
4	Tank Appurtenances	1	LS	\$ 35,000.00	\$ 35,000.00
5	Outlet & Overflow Structure	1	LS	\$ 80,000.00	\$ 80,000.00
<b>SUBTOTAL</b>					<b>\$ 509,000.00</b>
<b>CONTINGENCY</b>				15%	<b>\$ 76,400.00</b>
<b>CONSTRUCTION TOTAL</b>					<b>\$ 585,400.00</b>

**WATER RIGHT MANAGEMENT**

1	Water Right lawer	1	LS	\$ 10,000.00	\$ 10,000.00
<b>SUBTOTAL</b>					<b>\$ 10,000.00</b>
<b>CONTINGENCY</b>				15%	<b>\$ 1,500.00</b>
<b>CONSTRUCTION TOTAL</b>					<b>\$ 11,500.00</b>



Water Source						
<b>WELL DRILLING</b>						
1	Mobilization	1	LS	\$	10,800.00	\$ 10,800.00
2	Conductor Casing	1	LS	\$	17,000.00	\$ 17,000.00
3	20" Diameter Well Drilling	250	LF	\$	160.00	\$ 40,000.00
4	Geophysical Logging	1	LS	\$	8,000.00	\$ 8,000.00
5	12" Diameter Casing	150	LF	\$	110.00	\$ 16,500.00
6	12" Diameter Stainless Steel Screen	100	LF	\$	340.00	\$ 34,000.00
7	2" Galvanized Tremie Pipe	180	LF	\$	25.00	\$ 4,500.00
8	Soil Sample Gradation Test	10	EA	\$	275.00	\$ 2,750.00
9	Furnish and Install Fine Silica Sand	5	CY	\$	700.00	\$ 3,500.00
10	Furnish and Install Pea Gravel (Disinfected)	5	CY	\$	140.00	\$ 700.00
11	Concrete Grout	3	CY	\$	750.00	\$ 2,250.00
12	Packer	2	EA	\$	1,500.00	\$ 3,000.00
13	Test Pump Furnishing, Installation and Removal	1	LS	\$	17,500.00	\$ 17,500.00
14	Development Pumping	120	HR	\$	400.00	\$ 48,000.00
15	Test Pumping	32	HR	\$	350.00	\$ 11,200.00
16	Sampling and Testing for Culinary Water Quality	1	LS	\$	3,750.00	\$ 3,750.00
17	Disinfection and Capping	1	LS	\$	1,300.00	\$ 1,300.00
18	Well Driller's Report Preparation	1	LS	\$	1,600.00	\$ 1,600.00
<b>SUBTOTAL</b>						<b>\$ 226,400.00</b>
<b>WELL CONSTRUCTION</b>						
1	Mobilization, Traffic Control, & Site Security	1	LS	\$	13,000.00	\$ 13,000.00
2	Quality Control Sampling & Testing	1	LS	\$	22,000.00	\$ 22,000.00
3	Construction Staking	1	LS	\$	5,500.00	\$ 5,500.00
4	Site Earthwork	1	LS	\$	8,000.00	\$ 8,000.00
5	Well Equipping	1	LS	\$	185,000.00	\$ 185,000.00
6	12" C900 DR18 PVC Pipe	40	LF	\$	80.00	\$ 3,200.00
7	12" Butterfly Valve Assembly	2	EA	\$	6,500.00	\$ 13,000.00
8	Miscellaneous Connections	1	LS	\$	5,000.00	\$ 5,000.00
9	6" Untreated Base Course	1,600	SF	\$	1.35	\$ 2,160.00
10	SCADA	1	LS	\$	15,000.00	\$ 15,000.00
<b>SUBTOTAL</b>						<b>\$ 271,900.00</b>
<b>CONTINGENCY</b>					15%	\$ 75,000.00
<b>CONSTRUCTION TOTAL</b>						<b>\$ 573,300.00</b>
<b>INCIDENTALS</b>						
1	Incidentals & professional services	20%	LS	\$	162,400.00	\$ 162,400.00
<b>SUBTOTAL</b>						<b>\$ 162,400.00</b>
<b>TOTAL PROJECT COST</b>						<b>\$ 1,669,600.00</b>
<i>In providing opinions of probable construction cost, the Client understands that the Engineer has no control over costs or the price of labor, equipment or materials, or over the Contractor's method of pricing, and that the opinion of probable construction cost provided herein is made on the basis of the Engineer's qualifications and experience. The Engineer makes no warranty, expressed or implied, as to the accuracy of such opinions compared to bid or actual costs.</i>						

**SUNRISE ENGINEERING, INC.**  
 11 North 300 West, Washington, Utah 84780  
 Tel: (435) 652-8450 Fax: (435) 652-8416  
**Engineer's Opinion of Probable Cost**

**Cedar Point Water System Improvements**

18-Nov-22

No.	Item	Qty	Unit	Engineer's Estimate	
				Unit Price	Amount
<b>DISTRIBUTION SYSTEM GENERAL CONSTRUCTION</b>					
1	Mobilization, Traffic Control, Dust Control, etc.	1	LS	\$ 50,000.00	\$ 50,000.00
2	8" C900 PVC, Fittings, Installation , Pipe Bedding, Trench Backfill	1,496	LF	\$ 75.00	\$ 112,200.00
3	3" C300 PVC, Fittings, Installation , Pipe Bedding, Trench Backfill	2,125	LF	\$ 40.00	\$ 85,000.00
4	4" C300 PVC, Fittings, Installation , Pipe Bedding, Trench Backfill	1,700	LF	\$ 45.00	\$ 76,500.00
5	Misc Valves and Appurtenances	1	LS	\$ 50,000.00	\$ 50,000.00
<b>SUBTOTAL</b>					\$ 373,700.00
<b>CONTINGENCY</b>				15%	\$ 56,055.00
<b>CONSTRUCTION TOTAL</b>					<b>\$ 429,800.00</b>

**Water Source**

<b>WELL DRILLING</b>					
1	Mobilization	1	LS	\$ 10,800.00	\$ 10,800.00
2	Conductor Casing	1	LS	\$ 17,000.00	\$ 17,000.00
3	20" Diamter Well Drilling	250	LF	\$ 160.00	\$ 40,000.00
4	Geophysical Logging	1	LS	\$ 8,000.00	\$ 8,000.00
5	12" Diamter Casing	150	LF	\$ 110.00	\$ 16,500.00
6	12" Diamter Stainless Stell Screen	100	LF	\$ 340.00	\$ 34,000.00
7	2" Galvanized Tremie Pipe	180	LF	\$ 25.00	\$ 4,500.00
8	Soil Sample Gradation Test	10	EA	\$ 275.00	\$ 2,750.00
9	Furnish and Install Fine Silica Sand	5	CY	\$ 700.00	\$ 3,500.00
10	Furnish and Install Pea Gravel (Disinfected)	5	CY	\$ 140.00	\$ 700.00
11	Concrete Grout	3	CY	\$ 750.00	\$ 2,250.00
12	Packer	2	EA	\$ 1,500.00	\$ 3,000.00
13	Test Pump Furnishing, Installation and Removal	1	LS	\$ 17,500.00	\$ 17,500.00
14	Development Pumping	120	HR	\$ 400.00	\$ 48,000.00
15	Test Pumping	32	HR	\$ 350.00	\$ 11,200.00
16	Sampling and Testing for Culinary Water Quality	1	LS	\$ 3,750.00	\$ 3,750.00
17	Disinfection and Capping	1	LS	\$ 1,300.00	\$ 1,300.00
18	Well Driller's Report Preparation	1	LS	\$ 1,600.00	\$ 1,600.00
<b>SUBTOTAL</b>					<b>\$ 226,400.00</b>

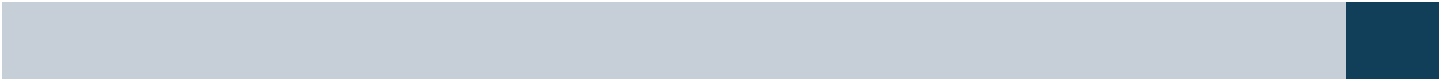
<b>WELL CONSTRUCTION</b>					
1	Mobilization, Traffic Control, & Site Security	1	LS	\$ 13,000.00	\$ 13,000.00
2	Quality Control Sampling & Testing	1	LS	\$ 22,000.00	\$ 22,000.00
3	Construction Staking	1	LS	\$ 5,500.00	\$ 5,500.00
4	Site Earthwork	1	LS	\$ 8,000.00	\$ 8,000.00
5	Well Equipping	1	LS	\$ 185,000.00	\$ 185,000.00
6	12" C900 DR18 PVC Pipe	40	LF	\$ 80.00	\$ 3,200.00
7	12" Butterfly Valve Assembly	2	EA	\$ 6,500.00	\$ 13,000.00
8	Miscellaneous Connections	1	LS	\$ 5,000.00	\$ 5,000.00
9	6" Untreated Base Course	1,600	SF	\$ 1.35	\$ 2,160.00
10	SCADA	1	LS	\$ 15,000.00	\$ 15,000.00
<b>SUBTOTAL</b>					\$ 271,900.00
<b>CONTINGENCY</b>				15%	\$ 75,000.00
<b>CONSTRUCTION TOTAL</b>					<b>\$ 573,300.00</b>

<b>INCIDENTALS</b>					
1	Incidentals & professional services	20%	LS	\$ 174,400.00	\$ 174,400.00
<b>SUBTOTAL</b>					<b>\$ 174,400.00</b>

**TOTAL PROJECT COST \$1,177,500.00**

*In providing opinions of probable construction cost, the Client understands that the Engineer has no control over costs or the price of labor, equipment or materials, or over the Contractor's method of pricing, and that the opinion of probable construction cost provided herein is made on the basis of the Engineer's qualifications and experience. The Engineer makes no warranty, expressed or implied, as to the accuracy of such opinions compared to bid or actual costs.*





# **APPENDIX E**

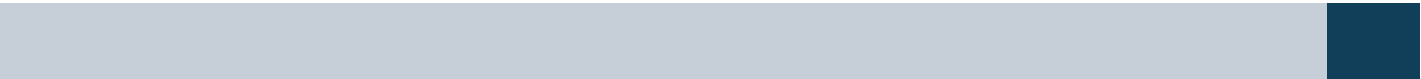
## **PROJECTED CASH FLOW**

Annual growth rate	5.00%														
Annual Inflation Rate	3.00%														
	<b>Year</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>	<b>2031</b>	<b>2032</b>
Average Rate ERU		\$41.58	\$45.73	\$66.06	\$61.62	\$61.62	\$73.91	\$73.91	\$73.91	\$73.91	\$73.91	\$73.91	\$73.91	\$73.91	\$73.91
Connection Fee per Connection		\$2,786	\$2,786	\$1,421	\$1,421	\$2,166	\$1,463	\$1,847	\$1,869	\$1,705	\$1,914	\$1,841	\$1,864	\$1,934	\$1,908
Impact fee		\$12,000	\$12,000	\$12,000	\$12,000	17,788	17,788	17,788	17,788	17,788	17,788	17,788	17,788	17,788	17,788
<b>System Users:</b>															
Total Existing ERU's		372	379	396	440	515	559	606	636	668	701	736	773	812	852
New ERU's:			7	17	44	75	44	46	30	32	33	35	37	39	41
<b>REVENUES:</b>															
User Fees (Water Sales)		185,422	207,787	313,612	325,201	380,835	496,065	537,277	564,141	592,348	621,965	653,063	685,716	720,002	756,002
Connection Fees		34,888	19,500	24,153	6,268	162,996	64,758	85,837	56,618	54,224	63,916	64,542	68,618	74,751	77,439
Water Standby Fees		36,694	32,948	50,993	39,270	41,176	42,411	43,683	44,994	46,343	47,734	49,166	50,641	52,160	53,725
Late Fees		5,257	0	333	0	0	0	0	0	0	0	0	0	0	0
Other Operating Income		30,565	18,390	42,021	6,133	31,235	32,172	33,137	34,131	35,155	36,210	37,296	38,415	39,568	40,755
Sundry Revenue		0	0	1,221	0	314	324	334	344	354	364	375	387	398	410
Interest Income		3,136	2,633	237	498	2,062	2,124	2,188	2,253	2,321	2,390	2,462	2,536	2,612	2,691
Grants		38,000	0	403,059	0										
Impact Fees		197,573	61,529	80,099	135,976	1,338,394	787,171	826,529	538,772	565,711	593,996	623,696	654,881	687,625	722,006
<b>TOTAL REVENUE:</b>		<b>\$531,535</b>	<b>\$342,787</b>	<b>\$915,728</b>	<b>\$513,346</b>	<b>\$1,957,012</b>	<b>\$1,425,024</b>	<b>\$1,528,984</b>	<b>\$1,241,252</b>	<b>\$1,296,456</b>	<b>\$1,366,576</b>	<b>\$1,430,601</b>	<b>\$1,501,194</b>	<b>\$1,577,117</b>	<b>\$1,653,028</b>
<b>EXPENSES:</b>															
clerical contractor labor		0	0	10,002	0	3,434	3,537	3,643	3,752	3,865	3,981	4,100	4,223	4,350	4,481
town interlocal agreement costs		430	0	0	0	148	152	157	161	166	171	176	182	187	193
water salaries and wages		45,006	45,006	51,487	54,163	48,581	50,039	51,540	53,086	54,679	56,319	58,009	59,749	61,541	63,388
water benefits		24,845	24,563	32,546	25,883	28,138	28,982	29,851	30,747	31,669	32,619	33,598	34,606	35,644	36,713
admin salaries and wages		23,705	0	0	0	8,139	8,383	8,634	8,893	9,160	9,435	9,718	10,010	10,310	10,619
admin benefits		12,831	0	0	0	4,405	4,537	4,674	4,814	4,958	5,107	5,260	5,418	5,581	5,748
public postings		807	401	392	0	549	566	583	600	618	637	656	676	696	717
travel/fuel		821	967	745	324	870	896	923	950	979	1,008	1,038	1,070	1,102	1,135
training		295	0	650	0	324	334	344	355	365	376	387	399	411	423
books/subscriptions/memberships		990	716	1,337	2,609	1,045	1,076	1,108	1,142	1,176	1,211	1,248	1,285	1,323	1,363
admin supplies and expenses		7,322	4,106	5,214	4,351	5,714	5,885	6,062	6,244	6,431	6,624	6,823	7,027	7,238	7,455
postage		908	133	346	642	476	490	505	520	536	552	569	586	603	621
bank servc charges		2,440	11	552	63	1,031	1,062	1,094	1,127	1,160	1,195	1,231	1,268	1,306	1,345
professional service		10,716	26,674	28,575	(17,141)	22,648	23,327	24,027	24,748	25,491	26,255	27,043	27,854	28,690	29,550
accounting & audit fees		6,611	6,921	5,700	19,800	6,603	6,801	7,005	7,215	7,432	7,655	7,884	8,121	8,364	8,615
water testing		7,308	5,692	5,155	7,854	6,233	6,420	6,613	6,811	7,016	7,226	7,443	7,666	7,896	8,133
legal fees		5,549	5,713	1,460	3,060	4,368	4,499	4,634	4,773	4,916	5,064	5,215	5,372	5,533	5,699
system maintenance and repairs		3,488	2,798	25,680	269	10,975	11,304	11,643	11,993	12,352	12,723	13,105	13,498	13,903	14,320
system equipment		10,824	6,617	0	11,361	5,988	6,168	6,353	6,543	6,740	6,942	7,150	7,365	7,586	7,813
well maintenance and repairs		3,572	1,305	0	256	1,674	1,725	1,776	1,830	1,885	1,941	1,999	2,059	2,121	2,185
tank maintenance and repairs		4,350	0	3,000	85	2,524	2,599	2,677	2,757	2,840	2,925	3,013	3,104	3,197	3,293
equipment costs other than fuel		2,993	3,960	2,783	1,087	3,343	3,443	3,546	3,653	3,762	3,875	3,991	4,111	4,234	4,361
equipment fuel		2,847	2,126	2,134	2,672	2,440	2,513	2,589	2,666	2,746	2,829	2,914	3,001	3,091	3,184
utilities		10,039	13,974	15,380	18,875	13,525	13,931	14,349	14,779	15,222	15,679	16,149	16,634	17,133	17,647
telephone and internet		553	0	152	0	242	249	257	264	272	281	289	298	307	316
insurance		4,644	4,087	5,910	2,890	5,027	5,178	5,333	5,493	5,658	5,827	6,002	6,182	6,368	6,559
depreciation expense		134,013	134,769	135,064	135,064	138,654	142,813	147,098	151,511	156,056	160,738	165,560	170,527	175,642	180,912
interest expense		94,609	93,152	88,251	82,991	94,764	97,607	100,535	103,551	106,658	109,858	113,153	116,548	120,044	123,646
<b>Sub-Total Operation &amp; Maintenance</b>		<b>(\$422,516)</b>	<b>(\$383,691)</b>	<b>(\$422,515)</b>	<b>(\$357,158)</b>	<b>(\$421,861)</b>	<b>(\$434,517)</b>	<b>(\$447,553)</b>	<b>(\$460,979)</b>	<b>(\$474,809)</b>	<b>(\$489,053)</b>	<b>(\$503,724)</b>	<b>(\$518,836)</b>	<b>(\$534,401)</b>	<b>(\$550,433)</b>
<b>EXISTING DEBT SERVICE</b>															
Debt Service-Principle-2013 Water Bond		85,000	85,000	85,000	85,000	85,000	85,000	85,000	84,000	85,000	84,000	85,000	84,000	85,000	84,000
Debt Service-Principle-2014A Water Bond		111,252	111,252	111,252	111,252	111,252	111,252	111,252	111,252	111,252	111,252	111,252	111,252	111,252	111,252
Debt Service-Principle-2014B Water Bond		15,228	15,228	15,228	15,228	15,228	15,228	15,228	15,228	15,228	15,228	15,228	15,228	15,228	15,228
Debt Service-Principle-well 59		4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	5,000	5,000	5,000
Debt Service-Principle-Canaan Springs		16,620	13,490	14,390	14,280	14,170	14,060	13,950	13,840	13,730	13,620	13,510	14,400	14,280	14,160
<b>Sub-Total Existing Debt Service</b>		<b>(\$211,480)</b>	<b>(\$211,480)</b>	<b>(\$211,480)</b>	<b>(\$229,760)</b>	<b>(\$229,650)</b>	<b>(\$229,540)</b>	<b>(\$229,430)</b>	<b>(\$228,320)</b>	<b>(\$229,210)</b>	<b>(\$228,100)</b>	<b>(\$228,990)</b>	<b>(\$229,880)</b>	<b>(\$230,760)</b>	<b>(\$229,640)</b>
<b>NEW DEBT SERVICE</b>															
New Project Loan						0	370,305	370,305	370,305	370,305	370,305	370,305	370,305	370,305	370,305
Renewal and Replacement Fund						0	43,452	43,452	43,452	43,452	43,452	43,452	43,452	43,452	43,452
<b>Sub-Total New Debt Service</b>						<b>\$0</b>	<b>\$413,757</b>	<b>\$413,757</b>	<b>\$413,757</b>	<b>\$413,757</b>	<b>\$413,757</b>	<b>\$413,757</b>	<b>\$413,757</b>	<b>\$413,757</b>	<b>\$413,757</b>
<b>Total Debt Service</b>		<b>(\$211,480)</b>	<b>(\$211,480)</b>	<b>(\$211,480)</b>	<b>(\$229,760)</b>	<b>(\$229,650)</b>	<b>(\$643,297)</b>	<b>(\$643,187)</b>	<b>(\$642,077)</b>	<b>(\$642,967)</b>	<b>(\$641,857)</b>	<b>(\$642,747)</b>	<b>(\$643,637)</b>	<b>(\$644,517)</b>	<b>(\$643,397)</b>
<b>PROJECTS</b>															
Impact Fee Facilities Plan Update(2027, 2032)															
Self Participation Reimbursement															
<b>TOTAL EXPENSES:</b>		<b>(\$633,996)</b>	<b>(\$595,171)</b>	<b>(\$633,995)</b>	<b>(\$586,918)</b>	<b>(\$651,511)</b>	<b>(\$1,027,814)</b>	<b>(\$1,090,739)</b>	<b>(\$1,103,056)</b>	<b>(\$1,177,775)</b>	<b>(\$1,130,909)</b>	<b>(\$1,146,471)</b>	<b>(\$1,162,473)</b>	<b>(\$1,178,918)</b>	<b>(\$1,253,830)</b>
<b>Net Cashflow</b>		<b>(\$102,461)</b>	<b>(\$252,384)</b>	<b>\$281,733</b>	<b>(\$73,572)</b>	<b>\$1,305,501</b>	<b>\$397,211</b>	<b>\$438,245</b>	<b>\$138,196</b>	<b>\$118,681</b>	<b>\$235,667</b>	<b>\$284,130</b>	<b>\$338,721</b>	<b>\$398,199</b>	<b>\$399,198</b>
<b>Total</b>		<b>(\$102,461)</b>	<b>(\$354,845)</b>	<b>(\$73,112)</b>	<b>(\$146,684)</b>	<b>\$1,158,817</b>	<b>\$1,556,027</b>	<b>\$1,994,273</b>	<b>\$2,132,469</b>	<b>\$2,251,150</b>	<b>\$2,486,816</b>	<b>\$2,770,946</b>	<b>\$3,109,667</b>	<b>\$3,507,866</b>	<b>\$3,907,064</b>
*Fund Balance is obtained by adding the previous year's balance to the net cash flow, minus any self funded portion of future projects. Fund Balance includes Impact Fees.															





Annual growth rate	5.00%										
Annual Inflation Rate	3.00%										
<b>Year</b>	<b>2033</b>	<b>2034</b>	<b>2035</b>	<b>2036</b>	<b>2037</b>	<b>2038</b>	<b>2039</b>	<b>2040</b>	<b>2041</b>	<b>2042</b>	<b>2043</b>
Average Rate ERU	\$73.91	\$73.91	\$73.91	\$73.91	\$73.91	\$73.91	\$73.91	\$73.91	\$73.91	\$73.91	\$73.91
Connection Fee per Connection	\$1,956	\$1,978	\$1,990	\$2,026	\$2,044	\$2,068	\$2,096	\$2,118	\$2,145	\$2,170	\$2,195
Impact fee	17,788	17,788	17,788	17,788	17,788	17,788	17,788	17,788	17,788	17,788	17,788
<b>System Users:</b>											
Total Existing ERU's	895	940	987	1,036	1,088	1,142	1,199	1,259	1,322	1,388	1,458
New ERU's:	43	45	47	49	52	54	57	60	63	66	69
<b>REVENUES:</b>											
User Fees (Water Sales)	793,802	833,493	875,167	918,926	964,872	1,013,115	1,063,771	1,116,960	1,172,808	1,231,448	1,293,021
Connection Fees	83,351	88,534	93,493	99,961	105,866	112,495	119,704	126,988	135,033	143,467	152,377
Water Standby Fees	55,336	56,997	58,706	60,468	62,282	64,150	66,075	68,057	70,099	72,202	74,368
Late Fees	0	0	0	0	0	0	0	0	0	0	0
Other Operating Income	41,977	43,237	44,534	45,870	47,246	48,663	50,123	51,627	53,176	54,771	56,414
Sundry Revenue	423	435	448	462	476	490	505	520	535	551	568
Interest Income	2,771	2,854	2,940	3,028	3,119	3,213	3,309	3,408	3,511	3,616	3,724
Grants											
Impact Fees	758,106	796,012	835,812	877,603	921,483	967,557	1,015,935	1,066,732	1,120,069	1,176,072	1,234,876
<b>TOTAL REVENUE:</b>	<b>\$1,735,768</b>	<b>\$1,821,561</b>	<b>\$1,911,101</b>	<b>\$2,006,317</b>	<b>\$2,105,343</b>	<b>\$2,209,683</b>	<b>\$2,319,421</b>	<b>\$2,434,291</b>	<b>\$2,555,229</b>	<b>\$2,682,126</b>	<b>\$2,815,347</b>
<b>EXPENSES:</b>											
clerical contractor labor	4,615	4,753	4,896	5,043	5,194	5,350	5,511	5,676	5,846	6,022	6,202
town interlocal agreement costs	198	204	210	217	223	230	237	244	251	259	267
water salaries and wages	65,289	67,248	69,265	71,343	73,484	75,688	77,959	80,298	82,706	85,188	87,743
water benefits	37,815	38,949	40,117	41,321	42,561	43,837	45,152	46,507	47,902	49,339	50,820
admin salaries and wages	10,938	11,266	11,604	11,952	12,311	12,680	13,060	13,452	13,856	14,271	14,699
admin benefits	5,920	6,098	6,281	6,469	6,663	6,863	7,069	7,281	7,500	7,725	7,956
public postings	738	760	783	807	831	856	882	908	935	963	992
travel/fuel	1,169	1,204	1,240	1,277	1,315	1,355	1,396	1,437	1,481	1,525	1,571
training	436	449	463	476	491	505	521	536	552	569	586
books/subscriptions/memberships	1,404	1,446	1,490	1,534	1,580	1,628	1,677	1,727	1,779	1,832	1,887
admin supplies and expenses	7,679	7,909	8,146	8,391	8,643	8,902	9,169	9,444	9,727	10,019	10,320
postage	640	659	679	699	720	742	764	787	811	835	860
bank servc charges	1,386	1,427	1,470	1,514	1,560	1,606	1,655	1,704	1,755	1,808	1,862
professional service	30,437	31,350	32,291	33,259	34,257	35,285	36,343	37,434	38,557	39,713	40,905
accounting & audit fees	8,874	9,140	9,414	9,697	9,988	10,287	10,596	10,914	11,241	11,578	11,926
water testing	8,377	8,628	8,887	9,154	9,428	9,711	10,002	10,303	10,612	10,930	11,258
legal fees	5,870	6,046	6,228	6,414	6,607	6,805	7,009	7,219	7,436	7,659	7,889
system maintenance and repairs	14,749	15,192	15,648	16,117	16,601	17,099	17,612	18,140	18,684	19,245	19,822
system equipment	8,047	8,289	8,538	8,794	9,058	9,329	9,609	9,897	10,194	10,500	10,815
well maintenance and repairs	2,250	2,318	2,387	2,459	2,533	2,609	2,687	2,768	2,851	2,936	3,024
tank maintenance and repairs	3,391	3,493	3,598	3,706	3,817	3,932	4,049	4,171	4,296	4,425	4,558
equipment costs other than fuel	4,492	4,627	4,766	4,909	5,056	5,208	5,364	5,525	5,691	5,861	6,037
equipment fuel	3,279	3,378	3,479	3,583	3,691	3,802	3,916	4,033	4,154	4,279	4,407
utilities	18,176	18,722	19,283	19,862	20,458	21,071	21,704	22,355	23,025	23,716	24,428
telephone and internet	325	335	345	355	366	377	388	400	412	424	437
insurance	6,756	6,958	7,167	7,382	7,603	7,832	8,066	8,308	8,558	8,814	9,079
depreciation expense	186,339	191,929	197,687	203,618	209,726	216,018	222,499	229,174	236,049	243,130	250,424
interest expense	127,355	131,176	135,111	139,164	143,339	147,639	152,069	156,631	161,330	166,169	171,155
<b>Sub-Total Operation &amp; Maintenance</b>	<b>(\$566,946)</b>	<b>(\$583,955)</b>	<b>(\$601,473)</b>	<b>(\$619,517)</b>	<b>(\$638,103)</b>	<b>(\$657,246)</b>	<b>(\$676,963)</b>	<b>(\$697,272)</b>	<b>(\$718,190)</b>	<b>(\$739,736)</b>	<b>(\$761,928)</b>
<b>EXISTING DEBT SERVICE</b>											
Debt Service-Principle-2013 Water Bond	85,000	84,000	85,000	84,000	85,000	84,000	85,000	84,000	85,000	84,000	83,000
Debt Service-Principle-2014A Water Bond	111,252	111,252	111,252	111,252	111,252	111,252	111,252	111,252	111,252	111,252	111,252
Debt Service-Principle-2014B Water Bond	15,228	15,228	15,228	15,228	15,228	15,228	15,228	15,228	15,228	15,228	15,228
Debt Service-Principle-well 59	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Debt Service-Principle-Canaan Springs	14,040	13,920	13,800	13,680	13,560	13,440	14,320	14,190	14,060	13,930	13,800
<b>Sub-Total Existing Debt Service</b>	<b>(\$230,520)</b>	<b>(\$229,400)</b>	<b>(\$230,280)</b>	<b>(\$229,160)</b>	<b>(\$230,040)</b>	<b>(\$223,920)</b>	<b>(\$225,800)</b>	<b>(\$224,670)</b>	<b>(\$225,540)</b>	<b>(\$224,410)</b>	<b>(\$223,280)</b>
<b>NEW DEBT SERVICE</b>											
New Project Loan	370,305	370,305	370,305	370,305	370,305	370,305	370,305	370,305	370,305	370,305	370,305
Renewal and Replacement Fund	43,452	43,452	43,452	43,452	43,452	43,452	43,452	43,452	43,452	43,452	43,452
<b>Sub-Total New Debt Service</b>	<b>\$413,757</b>	<b>\$413,757</b>	<b>\$413,757</b>	<b>\$413,757</b>	<b>\$413,757</b>	<b>\$413,757</b>	<b>\$413,757</b>	<b>\$413,757</b>	<b>\$413,757</b>	<b>\$413,757</b>	<b>\$413,757</b>
<b>Total Debt Service</b>	<b>(\$644,277)</b>	<b>(\$643,157)</b>	<b>(\$644,037)</b>	<b>(\$642,917)</b>	<b>(\$643,797)</b>	<b>(\$637,677)</b>	<b>(\$639,557)</b>	<b>(\$638,427)</b>	<b>(\$639,297)</b>	<b>(\$638,167)</b>	<b>(\$637,037)</b>
<b>PROJECTS</b>											
Impact Fee Facilities Plan Update(2027, 2032)											
Self Participation Reimbursement											
<b>TOTAL EXPENSES:</b>	<b>(\$1,211,223)</b>	<b>(\$1,227,111)</b>	<b>(\$1,245,510)</b>	<b>(\$1,262,434)</b>	<b>(\$1,341,900)</b>	<b>(\$1,294,923)</b>	<b>(\$1,316,520)</b>	<b>(\$1,335,699)</b>	<b>(\$1,357,487)</b>	<b>(\$1,437,903)</b>	<b>(\$1,398,965)</b>
<b>Net Cashflow</b>	<b>\$524,545</b>	<b>\$594,450</b>	<b>\$665,591</b>	<b>\$743,882</b>	<b>\$763,444</b>	<b>\$914,761</b>	<b>\$1,002,901</b>	<b>\$1,098,592</b>	<b>\$1,197,742</b>	<b>\$1,244,224</b>	<b>\$1,416,382</b>
<b>Total</b>	<b>\$4,431,609</b>	<b>\$5,026,058</b>	<b>\$5,691,650</b>	<b>\$6,435,532</b>	<b>\$7,198,976</b>	<b>\$8,113,736</b>	<b>\$9,116,638</b>	<b>\$10,215,230</b>	<b>\$11,412,972</b>	<b>\$12,657,196</b>	<b>\$14,073,578</b>
*Fund Balance is obtained by adding the previous year's balance to the net cash flow, minus any self funded portion of future projects. Fund Balance includes Impact Fees.											



**APPENDIX F**

**IMPACT FEE CERTIFICATION**

## CERTIFICATION OF IMPACT FEE ANALYSIS BY CONSULTANT

In accordance with Utah Code Annotated, § 11-36a-306 Nathan Wallentine, P.E., on behalf of Sunrise Engineering, Inc., makes the following certification:

I certify that the attached impact fee facilities plan and impact fee analysis:

1. Includes only the costs for qualifying public facilities that are:
  - a. Allowed under the Impact Fees Act; and
  - b. Actually incurred; or
  - c. Projected to be incurred or encumbered within six years after each impact fee is paid;
2. Does not include:
  - a. costs of operation and maintenance of public facilities;
  - b. costs for qualifying public facilities that will raise the level of service for the facilities, through impact fees, above the level of service that is supported by existing residents;
  - c. an expense for overhead, unless the expense is calculated pursuant to a methodology that is consistent with generally accepted cost accounting practices and that methodological standards set forth by the federal Office of Management and Budget for federal grant reimbursement; and
3. Offsets costs with grants or other alternate sources of payment (if grants or other sources of payment have been applied for and received and such information was made available when the Impact Fee Analysis was prepared); and
4. Complies in each and every relevant respect with the Impact Fees Act.

Nathan Wallentine, P.E. makes this certification with the following qualifications:

1. All of the recommendations for implementations of the Impact Fee Facilities Plan (“IFFP”) made in the IFFP documents or in the Impact Fee Analysis documents are followed in their entirety by BPWSSD staff and elected officials.
2. If all or a portion of the IFFP’s or Impact Fee Analyses are modified or amended, this certification is no longer valid.
3. All information provided to Sunrise Engineering, Inc., its contractors or suppliers is assumed to be correct, complete and accurate. This includes information provided by BPWSSD and outside sources.
4. The undersigned is trained and licensed as a professional engineer and has not been trained or licensed as a lawyer. Nothing in the foregoing certification shall be deemed an opinion of law or an opinion of compliance with law which under applicable professional licensing laws or regulations or other laws or regulations must be rendered by a lawyer licensed in the State of Utah.
5. The foregoing Certification is an expression of professional opinion based on the undersigned’s best knowledge, information and belief and shall not be construed as a warranty or guaranty of any fact or circumstance.
6. The foregoing certification is made only to BPWSSD and may not be used or relied upon by any other person or entity without the expressed written authorization of the undersigned.

Sunrise Engineering, Inc.

By: \_\_\_\_\_

Dated: \_\_\_\_\_