CENTRAL VALLEY TOWN

CULINARY WATER MASTER PLAN

July 17, 2025

Project #: 2501-031

Prepared by:

Jones & DeMille Engineering

www.jonesanddemille.com
1.800.748.5275

HYDRAULIC ANALYSIS CERTIFICATION

I hereby certify that the hydraulic modeling analysis for:

Central Valley Town Culinary Water Master Plan
(Project Name or Description)

Central Valley Town
(Water System Name)

21006
(Water System Number)

(DDW File Number, If Available)

Meets all requirements as set forth in *R309-511* (*Hydraulic Modeling Rule*) and complies with the provisions thereof, as well as the sizing requirements of *R309-510*, and the minimum water pressures of *R309-105-9*. Where applicable the proposed additions to the distribution system will not cause the pressures at any new or existing connections to be less than those specified in *R309-105-9*. The model is sufficiently calibrated and accurate to represent the conditions within this water system. The velocities in the model are not excessive and are within industry standards. The hydraulic modeling method is use of computer software, and the computer software used was InfoWaterPro 2026.0.2.

Signature Parker Vercimak

Print Name Parker Vercimak

State of Utah P.E. License No. 11786001

Date July 16, 2025

PROFESSIONAL ENGINEER
07/16/2025
No. 11786001
PARKER CADE
VERCIMAK
STATE OF UTAH
Parker Cade Vercimak

(* This page must be **signed, sealed, and dated** by a professional engineer who oversees the completion of this hydraulic modeling analysis.)

TABLE OF CONTENTS

FIGURES

TABLES

1. EXECUTIVE SUMMARY

This Culinary Water Master Plan provides an analysis of existing system components, including sources, water rights, storage, and distribution system. The plan also provides recommendations for Central Valley Town (the Town) to supply water for a 20-year planning period, which accommodates projected growth through 2045. The recommendations in this plan are given to meet the minimum level of service required by the State of Utah Division of Drinking Water (the State) while also considering capital and operational costs to the Town.

Historical connection data (1980-2024) shows an average growth rate of 1.86% (see Section Demographics3). Census data (2010-2020) shows an average growth rate of 2.05%. However, based on proposed developments, the Town considers these rates to be too low. Future proposed future developments were considered and a rate of 5.00% was determined to represent the anticipated growth through 2030. A growth rate of 2.05% will then be used through 2045. The Town's population is expected to grow from 702 residents in 2024 to approximately 1,275 by 2045. The current population and connections are comparable to approximately 265 ERCs and are projected to be approximately 481 ERCs by 2045.

The Town currently has four storage tanks with a total of 800,000 gallons of storage. There are two main tanks located above Tunnel Springs (Tanks 3 and 4), another tank (Tank 2) is located directly below Tunnel Springs, and one tank (Tank 1) next to the Mecham Well. The Town has sufficient storage to meet existing and projected demands through 2045, but the Town has been issued 15 IPS points due to a tank roof showing signs of deterioration. This tank will need to be repaired to address the IPS points (see Section 6).

The Town has four sources of water: Tunnel Springs (North/South Springs), Mecham Spring, the Downtown Well, and the Mecham Well. The Downtown Well has not been used since 2022 and is considered a backup source. The other three sources flow through the chlorination building and are pumped through the booster station into the system and up to the upper tanks. The booster pump limits the sources' capacity. Based on current usage, the sources are not sufficient to meet the projected system demands through 2045.

The Town chlorinates all sources except the Downtown Well. The well has not had any water quality issues and is not mandated to be chlorinated. However, the well is in the middle of the distribution system and could reduce the chlorine residuals at the far ends of the system. It is recommended to chlorinate all sources to ensure water quality (see Section 7).

The Town currently has a total of 310.226 ac-ft per year of water rights for municipal use. This is sufficient to meet the demands of the existing system but will be deficient by 2030.

A hydraulic model was created using InfoWater Pro modeling software (2026.0.2) based on GIS data provided by the Town. The model was used to project demands based on the State's guidelines for minimum pressures during different flow scenarios, both in the existing state of the system and the projected 2045 buildout state of the system. The model results show that all minimum pressure requirements can be met, but there are multiple areas throughout the system that do not meet the minimum fire flow requirements. Improvements and modifications to the existing system will be required and are discussed more in Section 9.

A summary of system components with their respective ERC capacity is given in Table 1-1.

Table 1-1. System ERC Summary

System Component	ERC Capacity	Excess/(Deficient) ERC	Recommendations
Storage	644	379	- Rehab tank roof
Sources	427	163	- Install (2) 750 gpm booster pumps - Booster pumphouse/tank improvements - Install backup generator and transfer switch for well and booster pumps - Install chlorination equipment at the Downtown Well -Redevelop Tunnel Springs
Water Rights	357	92	- Purchase additional water rights and/or require new connections to bring water rights
Distribution System	NA	NA	- Replace/install 14,100 ft of 8" pipe - Replace/install 21,000 ft of 10" pipe

2. INTRODUCTION

2.1. PURPOSE

This plan establishes the system's minimum level of service, analyzes system capacities, identifies system deficiencies, and provides strategic improvements to address existing and future system deficiencies. This plan also identifies improvements to meet projected demands through the 20-year planning period (2045). Cost estimates and priorities have been assigned to improvement projects and potential funding sources identified to allow the Town to plan for and complete necessary improvements.

2.2. DEFINITIONS

ac-ft	Acre-feet
ADD	Average Day Demand
DDW	Division of Drinking Water
DWR	Division of Water Rights
EPA	Environmental Protection Agency
ERCs	Equivalent Residential Connections
ft	Feet
gpm	gallons per minute
IFC	International Fire Code
MG	Million Gallons
LOS	Level of Service
PDD	Peak Day Demand
PID	Peak Instantaneous Demand
PRV	Pressure Reducing Valve
psi	pounds per square inch
SRF	State Revolving Fund
UAC	Utah Administrative Code
WR	Water Right

3. DEMOGRAPHICS

3.1. HISTORIC POPULATION

According to U.S. Census data, between 2010 and 2020, the Town's population grew from 528 to 647. This results in a 2.05% growth rate. Residential connection data was also considered and taken from the water usage report submitted by the Town to the State from 1980 to 2024. The average growth rate for this time was approximately 1.86%. Both rates were reviewed with the Town, and it was determined that both rates were too low based on proposed developments. There are currently over 30 lots that have already been approved, and there are multiple other subdivisions that are anticipated to come in the next 3-5 years that have more than 100 residential lots combined. It was determined that a growth rate of 5.00% accurately represented the anticipated growth through 2030, and a growth rate of 2.05% would be used throughout the rest of the planning period.

3.2. PROJECTED POPULATION

To calculate the projected population, the future value formula was used, see Equation 1.

$$FP = CP \times (1 + r)^t \qquad (1)$$

Where:
FP = Future Population
CP = Current Population
r = Annual Growth Rate (%)
t = Number of Years Between Current and Future Population

Based on the projected growth rate, the population is projected to go from 702 in 2024 to 1,275 in 2045, see Figure 3-1.

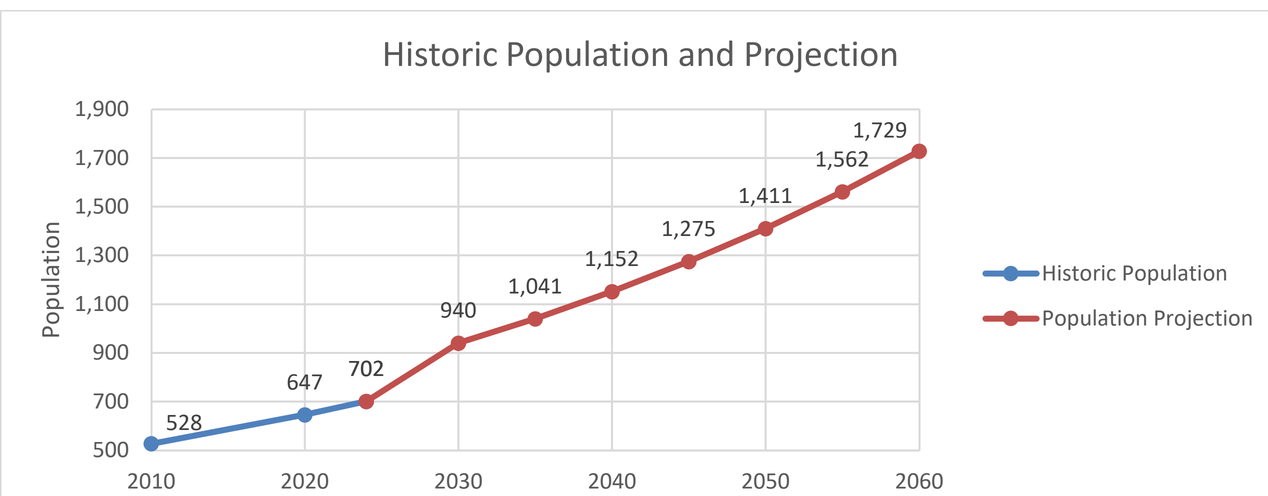


Figure 3-1. Population Projection

4. EQUIVALENT RESIDENTIAL CONNECTIONS

Currently, there are 255 connections reported to the State with a mix of residential, industrial, and institutional users. Water usage for these connections was determined based on water usage reports submitted to the State by the Town. Because the water usage data does not differentiate between indoor and outdoor water usage, the calculation for converting connections to ERCs is straightforward and combines indoor and outdoor use. Typically, for planning purposes, ERCs are used to define the capacities of system components. Equations 2 and 3 show the conversion from connections to ERCs. Some commercial connections use more than a typical residential connection and therefore have more ERCs than connections. A breakdown of connections and their ERC value is shown in Table 4-1.

$$\text{Water Usage per ERC} = \frac{\text{Total Water Used by Residential Connections}}{\text{Number of Residential Connections}} \qquad (2)$$

$$\text{Number of ERCs} = \frac{\text{Water Usage by Type of Connection}}{\text{Water Usage per ERC}} \qquad (3)$$

Table 4-1. Culinary Water Connections

Type	Connections	ERCs	Average ERC Value per Connection
Residential	246	246	1.00
Industrial	3	8.25	2.75
Institutional	6	10.40	1.73
TOTAL	**255**	**265**	**-**

4.1. ERC PROJECTIONS

To project future water demands, it was assumed that the system ERCs would grow at the same rate as the population with residential, industrial, and institutional connections growing proportionally. Table 4-2 shows existing (265 ERCs) and projected number of ERCs through 2045 (481 ERCs).

Table 4-2. ERC Projections

	2024	2025	2026	2027	2028	2029	2030	2035	2040	2045
Residential ERCs	246	258	271	285	299	314	330	365	404	447
Industrial ERCs	8	9	9	10	10	11	11	12	14	15
Institutional ERCs	10	11	11	12	13	13	14	15	17	19
Total ERCs	**265**	**278**	**292**	**306**	**322**	**338**	**355**	**393**	**434**	**481**

5. LEVEL OF SERVICE REQUIREMENTS

The State of Utah DDW Rules and the current IFC outline the minimum LOS that water systems are required to provide. Establishing a LOS allows the Town to provide new water users with the same quantity and quality of water as existing users.

In 2018, the DDW updated the requirements for calculations to determine the LOS for water systems serving more than 500 people. In general, the new sizing guideline utilizes recorded flow data from sources and water meter data by connection type to determine requirements for source, storage, and water rights. In 2023, the System-Specific Variation Factor requirement was removed.

The LOS for each system component will be discussed in their respective sections below.

6. STORAGE

6.1. LEVEL OF SERVICE

The LOS related to storage is the combination of the following:

- Equalization Storage: 777 gallons per ERC

  This volume is based on the Water System Minimum Sizing Requirements (Utah Code 19-4-104 and 114) and water usage data provided by the Town. Indoor and outdoor water usage is included and reflects the average day water usage.
- Fire storage: 300,000 gallons

  This volume is based on 2018 International Fire Code (IFC) for the Baptist Church building on the north side of Town. The building was assumed to be a type V-B and is approximately 6,000 square feet. The building is currently in the works to add an estimated 2,000 square foot addition to the building, which will require a fire flow of 2,500 gpm for 2 hours. This amount was verified by the local fire authority.
- Emergency Storage: 0 gallons
  - UAC Section R309.510-8(4), Facility Design and Operation: minimum Sizing Requirements, Storage Sizing, Emergency Storage states that, "*Emergency storage shall be considered during the design process. The amount of emergency storage shall be based upon an assessment of risk and the desired degree of system dependability. The Director may require emergency storage when it is warranted to protect public health and welfare*." The Town currently does not have a specific storage volume requirement for emergency storage.

6.2. EXISTING STORAGE

The Town currently has four water storage tanks with a total storage volume of 800,000 gallons. The Lower Reservoir Tank, also known as Tank 1, is next to Mecham Spring and Mecham Well and was constructed in the 1940s. This tank is the lowest tank in the system and has a capacity of 75,000 gallons. The lid for this tank was replaced as part of the culinary water improvements project completed in 2018 and is in good condition.

Tanks 2, 3, and 4 are all next to each other and are by Tunnel Springs south of the Town. Tank 2, officially called the "Upper Tank – Below Spring", has a capacity of 250,000 gallons and currently has 15 IPS points due to the lid deteriorating. The hatch and ladder were both replaced in 2018 as part of the improvements project. Tunnel Springs is the only source that flows into Tank 2. This tank has a direct connection to the distribution system but would overflow if the valve were left open due to tanks 3 and 4 being higher in elevation. The water flows from this tank into the chlorination building before being pumped into the system and into tanks 3 and 4.

Tanks 3 and 4 (officially called “Upper Tank – Above Spring” and “South Upper Tank Above Spring”, respectively) are the highest tanks in the system and are at the same elevation. Tank 3 was constructed in 1994 and has a capacity of 175,000 gallons. Tank 4 was constructed in 2010 and has a capacity of 300,000 gallons. Water is pumped from the booster pump directly into the system and up to tanks 3 and 4. These tanks are in good condition and gravity-feed water to the system.

6.3. EQUALIZATION AND FIRE FLOW STORAGE

The existing ERC capacity was evaluated by first determining the required fire storage. Typically, this is based on the 2018 IFC standards. The LDS church building is the largest in the system, however, it has a fire suppression sprinkler system, which reduces the flow requirements. The next largest non-residential building in the system is the Baptist Church building. This building is approximately 6,000 square feet with an addition of 2,000 square feet in the works. It was assumed that the building is a Type V-B, which requires a fire flow of 2,500 gpm for 2 hours. This brings the required fire storage to 300,000 gallons.

After the fire storage is accounted for, the tanks may have additional storage for emergencies. Currently, the DDW does not specify the amount of storage volume required for emergencies. Since the existing storage tanks have not been planned or constructed with emergency storage, the current emergency storage LOS is 0 gallons.

Using the ERCs calculated in Section 4 and the equalization storage requirements outlined above, the required equalization storage per ERC was approximated at 777 gallons. The existing storage capacity provides for approximately 644 ERCs and is adequate to meet current and projected demands. A breakdown of the existing storage capacity is shown in Table 6-1.

Table 6-1. Existing Storage Tank Capacity

Name	Total Volume (gal)
Lower Reservoir (Tank 1)	75,000
Upper Tank – Below Spring (Tank 2)	250,000
Upper Tank – Above Spring (Tank 3)	175,000
South Upper Tank Above Spring (Tank 4)	300,000
Total Existing Storage	**800,000**

Table 6-2 summarizes the storage requirements and ERC capacity for the system.

Table 6-2. Storage Requirements

Storage Type	Required Volume (gal)
Total Fire Storage	300,000
Emergency Storage	0
Required Equalization Storage	205,635
Total Storage Used	**505,635**
System ERC Capacity	**644**

6.4. PROJECTED STORAGE REQUIREMENTS & DEFICIENCIES

The existing tanks are sufficient to meet the projected demands through 2045. However, Tank 2 currently has 15 IPS points issued due to deterioration of the lid.

6.5. STORAGE RECOMMENDED IMPROVEMENTS

It is recommended that the Town rehab the lid of Tank 2. Rehabbing the lid will likely require maintenance every 5-10 years, but doing so is significantly cheaper than replacing the tank. Based on the conditions of the other tanks, it is recommended to rehab Tank 2 until other tanks also need to be replaced, then construct a larger tank to replace the deteriorating tanks.

Consideration for emergency storage should be evaluated and is recommended to be included in the tank storage volume, which will increase the storage capacity required per ERC. Emergency storage is valuable during emergencies (e.g., natural disasters) and maintenance operations (e.g., well pump maintenance, spring redevelopment, and tank cleaning). The existing storage currently allows for a significant amount of emergency storage but making an emergency storage plan is recommended.

7. SOURCE

7.1. LEVEL OF SERVICE

The LOS related to source is as follows:

- Flow rate: provide a flow equal to the Peak Day Demand of 1.428 gpm per ERC for indoor and outdoor use.

These levels are consistent with the UAC Section R309-510-7, Source Sizing. The system has 4 sources of water: Mecham Spring, Tunnel Springs (North/South Springs group), Downtown Well, and the Mecham Well.

7.2. EXISTING SOURCE CAPACITY

7.2.1. SPRING CAPACITY

Mecham Spring is located south of town next to Tank 1. The spring flows had declined from 60 gpm in 1986 to 30 gpm in 2017, and it also had to be turned out at times due to poor water quality. This spring was redeveloped in 2018, which helped increase flows and addressed water quality issues. From 2022-2024, this spring produced on average approximately 30 gpm but has seen production as high as nearly 60 gpm. This spring flows directly into the chlorination building and into Tank 1.

Tunnel Springs (also known as the North/South Springs Group) is located south of town next to Tank 2. The spring flows directly into Tank 2 before flowing down to the chlorination building and into Tank 1. From 2022-2024, this spring has produced on average approximately 20 gpm but has produced flows over 35 gpm. It should be noted that flow measurements are collected for each spring and record the total source production, but overflow is not metered. This spring has historically produced poor quality water and has had bad bacteriological tests. The collection area currently is overgrown with vegetation, which could be a cause of the bad samples. It is unknown exactly when the springs were developed, and there are not any records that show the spring collection area.

Spring capacity is determined by taking the 25th percentile of the spring flow data for the previous three years (per UAC Section R309-515-7). This considers seasonal and annual variations and is typically used to determine the reliable capacity of a spring. Based on flow data submitted to the State's website, the Mecham Spring safe yield is approximately 24.53 gpm, and Tunnel Springs safe yield is approximately 17.26 gpm, which provides a total spring safe yield of 41.79 gpm. This flow is sufficient to meet the demands of approximately 29 ERCs.

7.2.2. WELL CAPACITY

Mecham Well is located near Tank 1 and Mecham Spring. This well produces most of the water for the Town and was drilled in 1965. There is not any record of a pump test being completed, so the full capacity of the well has yet to be determined. The pump and pump controls were replaced in 2019 to operate the well more efficiently, and the well now has a pump capacity of 430 gpm. This well pumps into the chlorination building and into Tank 1.

The Downtown Well is in the middle of the Town and was constructed in 1974. This well was pump tested when it was originally developed and had a capacity of 1,400 gpm. The pump and pump controls were also replaced in 2019 with a 360-gpm pump and new controls to operate the new pump more efficiently. This well is considered a backup source for the Town and is rarely used. The well has not had any water quality issues and is not mandated to be chlorinated. However, the well is in the middle of the distribution system and could reduce the chlorine residuals at the far ends of the system when used.

To identify a well's ability to provide water for a system, a well's safe yield is established based on two-thirds of the pumping rate from the aquifer drawdown test or well capacity. The safe yield determines the number of ERCs a well source can support. The Mecham Well is currently able to pump 430 gpm, which will be considered the pump test value. This would typically provide a safe yield of 300 gpm, however, the Mecham Spring, the Tunnel Springs, and the Mecham Well all flow into Tank 1 before being pumped into the system through a booster pump. This booster pump capacity is currently 250 gpm. This is the limiting factor and reduces the collective safe yield of these three sources. See Table 7-1 and Table 7-2 in the next section for a full breakdown of all source's safe yields.

The Downtown Well was pump tested at 1,400 gpm in 1974, which would equate to a safe yield of 933 gpm. However, the well is only equipped to pump 360 gpm, so this will be considered the safe yield of the well and can provide sufficient flow to supply approximately 252 ERCs.

It should be noted that even though a safe yield is used for planning purposes, a well can be pumped more than the safe yield or at the test pumping rate. If a well's safe yield capacity needs to be reevaluated, it is recommended a well pump test be conducted to determine a new safe yield capacity.

7.2.3. TOTAL SOURCE CAPACITY

The combined source capacity of the spring(s) and well(s) is approximately 702 gpm. However, due to the limiting capacity of the booster pump, the total source capacity of the system is approximately 610 gpm. This can provide sufficient flow for approximately 427 ERCs. The sources are sufficient to meet the existing system demands. Table 7-1 shows the current gross safe yield and ERC capacities.

Table 7-1. Total Gross Source Capacity

Source	Safe Yield Capacity (gpm)	ERC Capacity
Mecham Spring *	24.53	17.18
Tunnel Springs (North/South Springs Group) *	17.26	12.09
Mecham Well*	300	210.12
Downtown Well	360	252.14
Total	**702**	**491.53**

* - Limited by booster station

Table 7-2 shows the current safe yield with the booster pump as the limiting factor. This is considered the current safe yield of the system.

Table 7-2. Total Net Source Capacity

Source	Safe Yield Capacity (gpm)	ERC Capacity
Booster Station	250	175.10
Downtown Well	360	252.14
Total	**610**	**427.24**

It should be noted that the current operation of the system is not optimized. The Mecham Well is pumped when Tank 1 is low and helps to refill the tank. However, the shut-off point is near the full level of the tank, which causes overflow at Tank 1 due to Tunnel and Mecham Springs constantly flowing into the tank. The overflow drain is also in need of replacement due to aged infrastructure.

7.3. PROJECTED SOURCE REQUIREMENTS & DEFICIENCIES

The source requirements of the system are projected to be approximately 686 gpm (481 ERCs) by 2045. Based on the current net safe yield of the sources (Table 7-2), the sources are not sufficient to meet the projected demand. However, based on the gross safe yield of the sources (Table 7-1), the sources are sufficient to meet the projected demand. Should additional source capacity be needed during the planning period, a larger pump at the Downtown Well could also be considered.

The Town is also concerned that the Downtown Well is reducing the chlorine residuals on the north end of the system due to the well not being chlorinated. It is the only source in the system that is not treated.

7.4. RECOMMENDED IMPROVEMENTS

It is recommended to replace the booster station pump with a larger pump that will not limit the flow of the sources. Based on other deficiencies that will be discussed in Section 8, it is recommended to replace the existing 250 gpm pump with two 750 gpm pumps. This will allow the Town to utilize the full capacity of Tanks 1 and 2, as well as provide 1,500 gpm of fire flow into the system.

It is also recommended to optimize the control set points for Mecham Well to reduce overflow from the springs when refilling Tank 1. This will allow the springs to constantly flow without overflowing Tank 1 and reduce the run time and energy costs for the well. It is also recommended to construct an overflow/drain station to replace the existing drain.

It is recommended to redevelop Tunnel Springs to improve water quality and bring the source in compliance with state requirements. A sanitary survey was recently conducted and improvements will need to be made to the spring or IPS points will be issued.

It is recommended to install a backup generator that can provide power to the booster pumps and the Mecham Well. The pumps are critical to accessing the full capacity of Tanks 1 and 2, utilizing the full source capacity of the associated sources, and will also allow the Town to provide 1,500 gpm for fire flow suppression in the event of a power outage. These improvements will also require improving the existing pumphouse to allow for the larger pumps and controls and improving the tank to upsize the outlet pipe to allow for the increased flow.

It is recommended to install chlorination equipment at the Downtown Well to help maintain chlorine residuals throughout the system. The chlorine residuals decrease, especially at the north end of the system because this source is the only non-chlorinated source in the system. Adding chlorination equipment will help to maintain the chlorine residuals when the well is active.

8. WATER RIGHTS

8.1. LEVEL OF SERVICE

Water rights are defined by a flow rate (in cfs), a volume (in ac-ft), or sometimes have both. For surface sources (springs), the limiting factor is typically the flow rate. For underground sources (wells), there is typically not a flow rate on the water right and is limited by the volume. The Town has both wells and springs, and the peak day demand is able to be met between all the existing sources. This study will only consider the total volume of the water rights. Based on historical flow data reported by the Town to the State, each ERC uses approximately 0.87 ac-ft per year. This includes both indoor and outdoor use because there is not a secondary water system, so the Town uses culinary water to irrigate yards and gardens.

8.2. EXISTING RIGHTS

Table 8-1 shows a summary of the Town's existing water rights.

Table 8-1. Water Right Summary

Water Right	Source	Quantity (cfs)	Quantity (ac-ft)	Proof Due Date	Notes
63-10	Wells (2) & Springs (3)	0.0700	50.680		Certificated
63-233	Wells (2) & Springs (3)	0.1800	53.556		Certificated
63-459	Wells (2) & Springs (3)	0.2160	81.802		Certificated
63-694	Wells (2) & Springs (3)	0.0223	1.654		Certificated
63-978	Wells (2) & Springs (3)	0.1000	72.400		Certificated
63-1071	Wells (2) & Springs (3)	0.0445	0.618		Certificated
63-1626	Wells (2) & Springs (3)	0.0446	18.840		Certificated
63-4473	Wells (2)		25.000	8/31/2030	a30877 Approved
63-2923	Wells (2) & Springs (3)	0.0150	1.200	8/31/2027	a38858 Approved
63-4635	Wells (2) & Springs (3)	0.0250	3.000	2/28/2030	a36923 Approved
63-4636	Wells (2) & Springs (3)	0.0019	0.120	2/28/2030	a36922 Approved
63-4637	Wells (2) & Springs (3)	0.0065	1.356	2/28/2030	a36921 Approved
	TOTAL	**0.7258**	**310.226**		

8.3. PROJECTED WATER RIGHT REQUIREMENTS & DEFICIENCIES

The Town's water rights are sufficient to meet the existing and projected demand through 2030, but an additional 112 ac-ft of water rights will be required to meet the projected demand through 2045.

8.4. RECOMMENDED IMPROVEMENTS

It is recommended that the Town requires all new connections to bring water rights or provide cash in-lieu-of to purchase additional water rights. The Town can also implement water conservation practices to reduce the amount of water each home uses to increase the ERC capacity of the existing water rights.

The Town also has water rights that have been approved but have not been certificated. Water rights that are put to full beneficial use should have a proof performed by a licensed engineer or surveyor to certificate the water right. If the water rights have not been put to full beneficial use by the time the proof is required, then an extension should be filed with the Water Rights Office.

9. DISTRIBUTION MINIMUM WATER PRESSURE REQUIREMENTS

9.1. LEVEL OF SERVICE

The LOS related to minimum water pressure is as follows:

- Minimum of 20 psi during fire flow and PDD
- Minimum of 30 psi during PID
- Minimum of 40 psi during PDD

These levels are consistent with the UAC Section R309-105-9, Minimum Water Pressure.

9.2. EXISTING DISTRIBUTION SYSTEM

The distribution system consists of mostly PVC pipe ranging between 4 and 10 inches. A 10-inch and an 8-inch pipe runs from the upper tanks to the south end of the system. Another 6-inch pipe runs from the booster station at Mecham Springs to Sevier River Road and ties into the main portion of the system at Main Street. A project completed in 2010 installed a new 10-inch pipe from the tanks to Central Boulevard around 310 S and replaced existing undersized pipe with 8-inch pipe throughout the system.

9.3. FIRE FLOW

The LOS related to fire flow is providing a minimum of the following:

- 1,500 gpm for residential homes with a finished square footage greater than 3,600 square feet
- Non-residential buildings vary based on finished square footage, usage, automatic sprinkler systems, and construction material type.

These levels are consistent with the UAC Section R309-550(5), Water Main Design, Fire Protection. The fire protection flow was set at 1,500 gpm for the system by the local fire authority. The control building was determined to be the Baptists Church on the north end of the system. The current size of the building requires a fire flow of 2,000 gpm for 2 hours. An addition is expected to be completed in the next five years, which will increase the flow requirement to 2,500 gpm for 2 hours. See contact information below. It should be noted that Central Valley does not have a fire department. Richfield City provides the Town fire protection service.

Dustin Anderson
Richfield Fire Chief
435-201-0593
Richfieldfirechief@gmail.com
75 E Center St
Richfield, UT 84701

The DDW rules require fire hydrants to meet a minimum specified flow while maintaining 20 psi of pressure throughout the system during the PDD plus fire flow event. The minimum flow varies based on building size, type, and use. In general, the minimum fire flow required is between 1,000 gpm and 1,500 gpm. Schools and other large commercial buildings may require greater flows, but the same minimum 20 psi pressure must be maintained. Facilities constructed prior to this rule may not be required to meet these conditions; when improvements are made to older facilities or newer facilities are constructed, they should provide the necessary system improvements to meet their required fire flow conditions.

9.4. HYDRAULIC MODELING

The hydraulic model was set up using information from GIS data provided by Town personnel. The water system was then modeled using the InfoWater Pro Version 2026.0.2 program.

Junctions were strategically placed at the beginning, middle and end of pipes, along major roads, intersections, and at other locations as necessary to achieve system representation. Junctions were used to represent the nearby ERC values of homes and businesses. The demand allocator tool was used to assign ERC data to the placed junctions, based on the nearest connection locations, and associated ERC values. The hydraulic model was used to check multiple scenarios for system performance in accordance with Utah drinking water laws and rules. The scenarios evaluated include ADD, PDD, PID and PDD plus Fire Flow. The scenarios include minimum system pressures that must be checked for the function of the system.

The hydraulic model was created to check existing conditions and evaluate future scenarios. The values described in Section 5 are the assigned rate values per ERC by scenario. These calculations were used as a global demand factor and adjusted for the required scenario.

The model was calibrated with existing flow data, PRV pressure gauges, and current fire flow tests, see Appendix D for Fire Flow Test results. Hazen-Williams roughness values were assigned based on pipe material. Typically, a roughness value of 130 is used for PVC. However, it was determined that a roughness of 100 provided results that were closer to the hydrant pressure and flow tests. This could be a result of partially or fully closed valves, aged or damaged pipe, sediment in the pipe, etc. Any recommended pipe improvements were assigned a roughness value of 130 to show aged PVC conditions.

Upon completing the existing system model, dependent scenarios were created for full buildout. By creating dependent scenarios, any changes to the base or parent model were carried out through the rest of the project. The system model was continually updated as adjustments were made during the modeling process.

Growth calculations were used to estimate future ERC values and were based on previously described growth data. Additional ERCs were added to the model in areas identified by Glendale Town personnel. The number of additional ERCs were distributed based on the estimated number of connections for the future development areas. A map of the evaluated growth areas identified by the Town is included in the future scenario maps shown in Appendix A. The exhibits and tables in Appendix A show the areas of growth, model junctions, and results for the modeled scenarios.

Table 9-1 shows model flows for various scenarios. Typically, the PID is calculated using Equation 4 below and dividing by the total amount of ERCs. However, this method provides a flow of 1.45 gpm per ERC. This is only slightly higher than the PDD and is not considered accurate for the system. It was determined that multiplying the PDD by 1.5 provided a more realistic PID value, which equates to approximately 2.139 gpm per ERC.

$$Total\ Flow\ (gpm) = 10.8 * Number\ of\ ERCs^{0.64} \quad (4)$$

Table 9-1. Model Flows

ADD Flow per ERC	PDD Flow per ERC	PID Flow Capacity per ERC (Existing System)
0.539 gpm	1.426 gpm	2.139 gpm

9.5. DEFICIENCIES

The existing system was evaluated for PDD, PID, and PDD plus Fire Flow. The system is able to provide adequate pressures for each scenario but is unable to provide the minimum fire flow to the north end of the system (see Exhibit 3 in Appendix A).

9.6. DISTRIBUTION SYSTEM RECOMMENDED IMPROVEMENTS

Recommendations have been classified by priority. The highest priority will go to the recommended improvements already discussed in previous sections. Priority 2 improvements are projects that need to be completed in the next five years, while Priority 3 improvements are more long-term/development focused. The recommended improvements are summarized below in Tables 9-2 and 9-3 and are shown in Exhibit 4 in Appendix A.

Table 9-2. Priority 2 Improvements

Improvement	Quantity
Upsize Existing 2” to 8”	355 ft
Upsize Existing 2” to 10”	590 ft
Upsize Existing 4” to 8”	845 ft
Upsize Existing 6” to 10”	3,420 ft
Upsize Existing 8” to 10”	660 ft
Install New 8”	3,540 ft
Install New 10”	9,800 ft
TOTAL	**19,210 ft**

Table 9-3. Priority 3 Improvements

Improvement	Quantity
Upsize Existing 2” to 8”	730 ft
Install New 8”	8,620 ft
Install New 10”	6,560 ft
TOTAL	**15,910 ft**

10. CAPITAL IMPROVEMENT RECOMMENDATIONS

10.1. WATER RIGHTS

Federal or state funding cannot be used to purchase water rights. Where additional rights are needed, it is recommended the Town start a water right fund to purchase rights as they become available.

10.2. PROJECT SUMMARIES

All recommended improvements have been classified into three groups: Priority 1, Priority 2, and Priority 3. Each group is summarized below. Detailed cost estimates for each group can be found in Appendix B.

Priority 1 improvements include the following:

- Install (2) 750 gpm booster pumps
- Booster pumphouse/Tank Improvements
- Install backup generator and transfer switch for Mecham Well and booster pumps
- Rehab Tank 2 roof
- Install chlorination equipment at the Downtown Well
- Redevelop Tunnel Springs

The estimated cost to complete Priority 1 improvements is approximately $1,230,000.

Priority 2 improvements include the following:

- Replace/install approximately 4,740 ft of 8” pipe
- Replace/install approximately 14,470 ft of 10” pipe
- Install drain station
- Sevier River crossing
- Annabella Canal crossing

The estimated cost to complete Priority 2 improvements is approximately $3,885,000.

Priority 3 improvements include the following:

- Install/replace approximately 9,350 ft of 8” pipe
- Install approximately 6,560 ft of 10” pipe

The estimated cost to complete Priority 3 improvements is approximately $2,400,000.

It should be noted that the Town does not have to complete the projects as discussed. Projects can be completed as determined reasonable by the Town and as funding is available. Costs are subject to change based on funding sources and requirements.

11. FUNDING SOURCES AVAILABLE

Several funding sources are available to the Town to help fund water system improvements and other public infrastructure/service projects. Interest rates are given based on 2025 data and recently funded projects.

11.1. UTAH DIVISION OF DRINKING WATER

The Utah Division of Drinking Water offers low interest loans from the Federal SRF and the SRF. These funds are available to all political entities of the state. The typical interest rate ranges between 1.5 to 4% with a 20-year term.

- The Federal SRF is provided to the states by the EPA. These funds are federal dollars and require compliance with the Davis Bacon Wage Act, the American Iron and Steel Act (Buy America), and the other federal programs.
- The SRF is administered by the state and offers low interest loans (2 to 4%) and grants. Typically, only about 5% of the SRF funds are awarded as grants.
- Most systems that have a Median Adjust Gross Income (MAGI) that is below the State of Utah’s average MAGI qualify for funding that is a mix of grant and low interest loan.

11.2. PERMANENT COMMUNITY IMPACT FUND BOARD (CIB)

The CIB is an entity of the state that provides loans and grants to cities. The typical conditions of a loan are a 20 to 30-year term at the going interest rate.

11.3. UTAH BOARD OF WATER RESOURCES

The Utah Board of Water Resources offers low interest loans for projects that conserve, protect, or more efficiently use present water supplies, develop new water, or provide flood control. This option is likely a less favorable funding option for culinary water infrastructure improvements. Typical loan terms are 20 to 30 years at 2 to 4%.

11.4. USDA RURAL DEVELOPMENT

11.4.1. USDA EMERGENCY COMMUNITY WATER ASSISTANCE GRANT (ECWAG)

The ECWAG grant can be applied for to aid communities that have experienced a significant decline in water quantity or quality from their sources due to a natural disaster or other emergency event, such as drought, flood, fire, earthquake, disease outbreak, chemical or leakage spill. The majority of the funding, over 70%, is designated for work at the source, while the remaining portion, approximately 30%, can be allocated to piping. Typical funding limits for projects are capped at $1,000,000. This funding source requires a Preliminary Engineering Report and an Environmental Report to be prepared and submitted with the application.

11.4.2. USDA COMMUNITY FACILITIES DIRECT LOAN & GRANT

This program provides affordable funding to develop essential community facilities in rural areas. These facilities provide an essential service to the local community for the orderly development of the community in a primary rural area populated with 20,000 residents or less.

Funds can be used to purchase, construct, and/or improve essential community facilities, purchase equipment, and pay related project expenses.

11.5. TOWN FUNDING (SELF-FUND)

This option is for the Town to self-fund individual projects. Although self-funding is the least expensive money over the life of the project, this option is likely not financially possible for all public water systems.

The most likely source to leverage the most favorable and obtainable funding terms for the Town culinary water infrastructure improvements is the CIB.

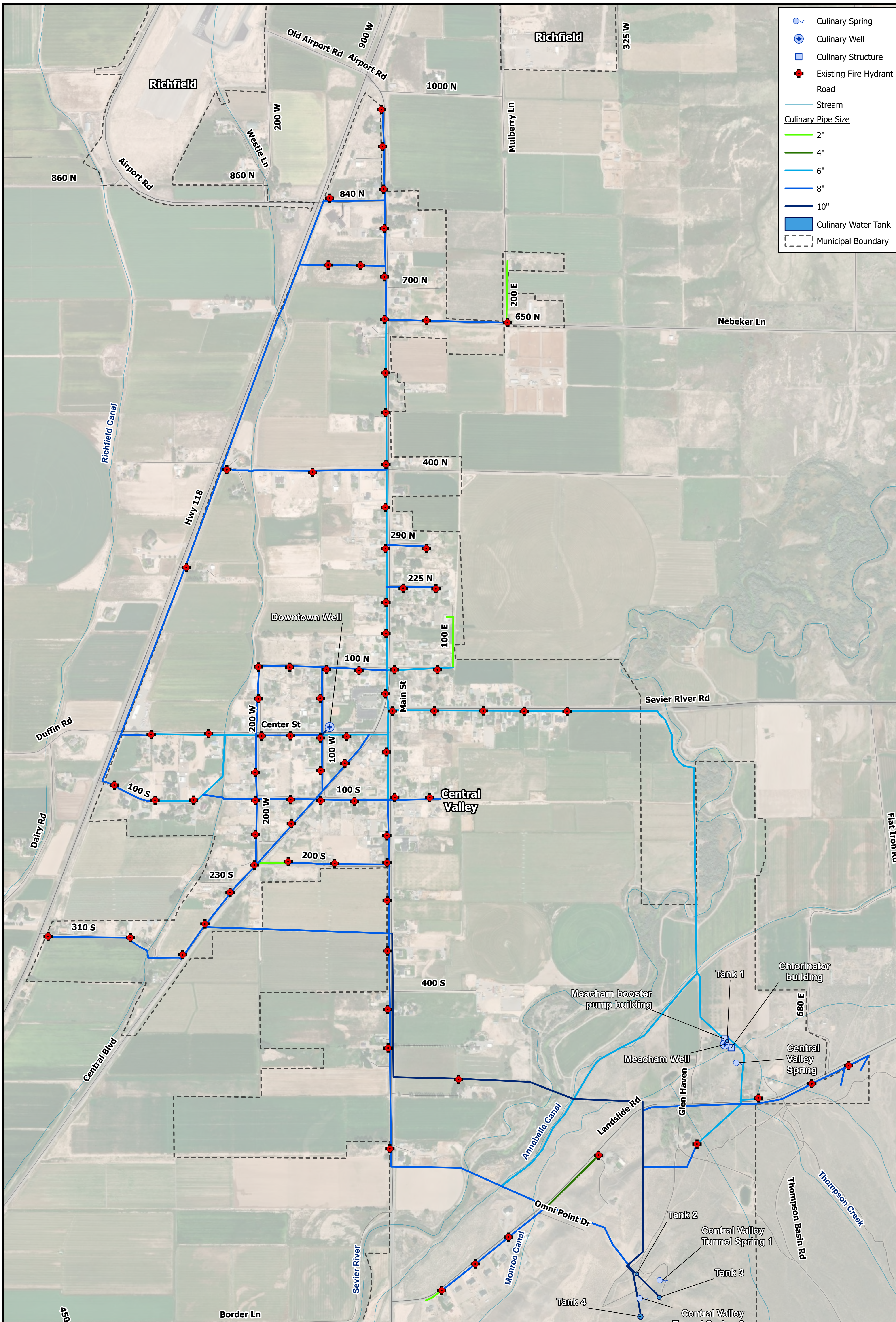
12. NEXT STEPS

The next steps for the Town are to address the Priority 1 improvements as soon as possible to address existing deficiencies in the system. These improvements will address IPS points, source deficiencies, and improve fire flow throughout the system.

The next steps would be to review the other recommended improvements and make a plan to implement them to improve fire flow throughout the system. The improvements can be reduced into phases and be completed over multiple projects.

It is also recommended Central Valley update their master plan every 10 years or as needed with new development that exceeds projected growth or in locations where development was not planned for.

APPENDIX A. MAPS AND EXHIBITS



N

Feet

0 500 1,000

Jones & DeMille Engineering

Central Valley Town

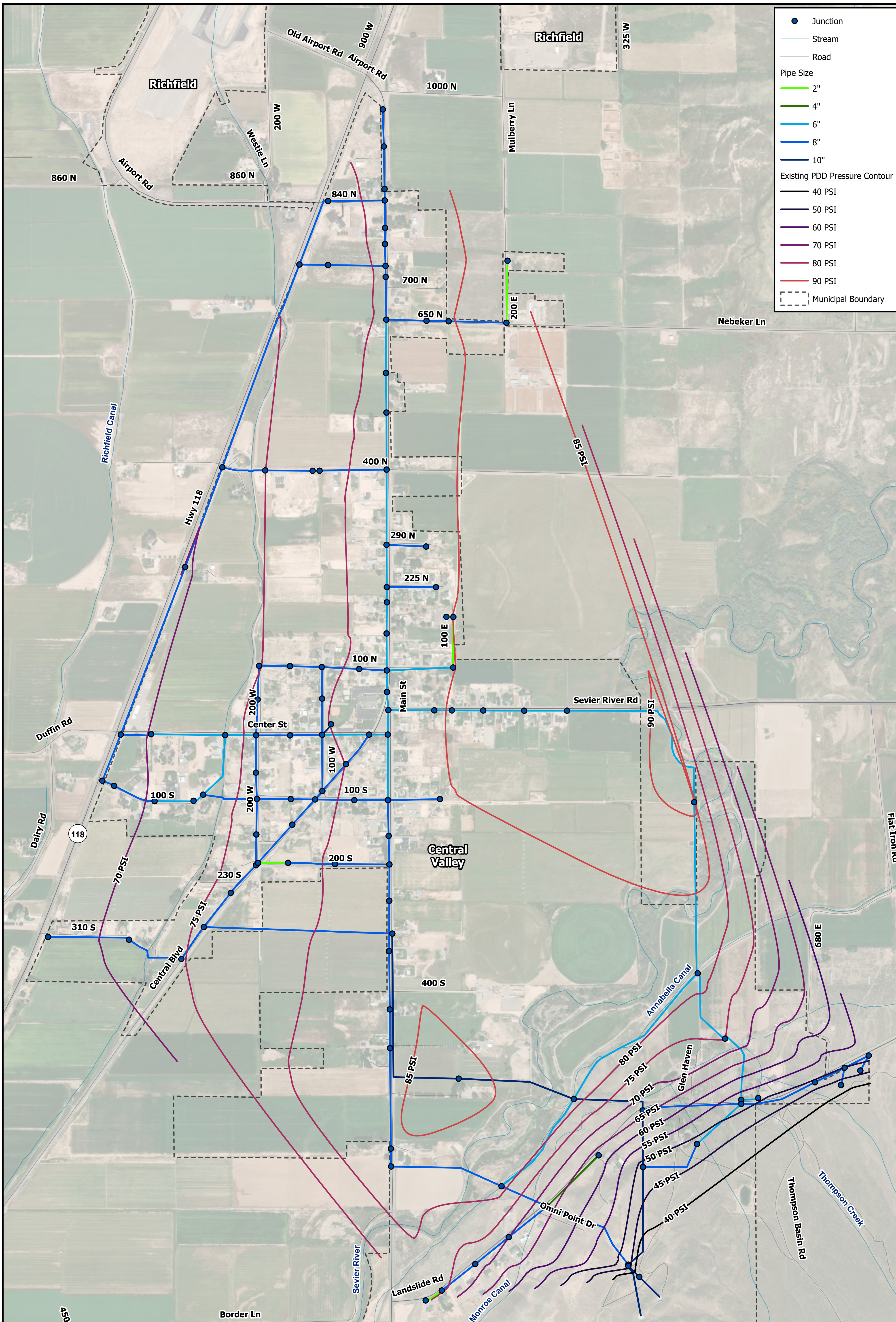
Culinary Water Master Plan
Existing System Overview

Map Name: H:\JD\Proj\2501-031\GIS\Projects\2501-031_Design\2501-031_Design.aprx - Existing System - Overview

Project Number: 2501-031 | Drawn by: TAS 06-25 | Last Edit: 07/02/2025

Sevier County, Utah

Scale: 1" = 1,000'



N

0 500 1,000 Feet

Jones & DeMille Engineering

Central Valley Town

Culinary Water Master Plan
Existing System - Peak Daily Demand (PDD) Pressures

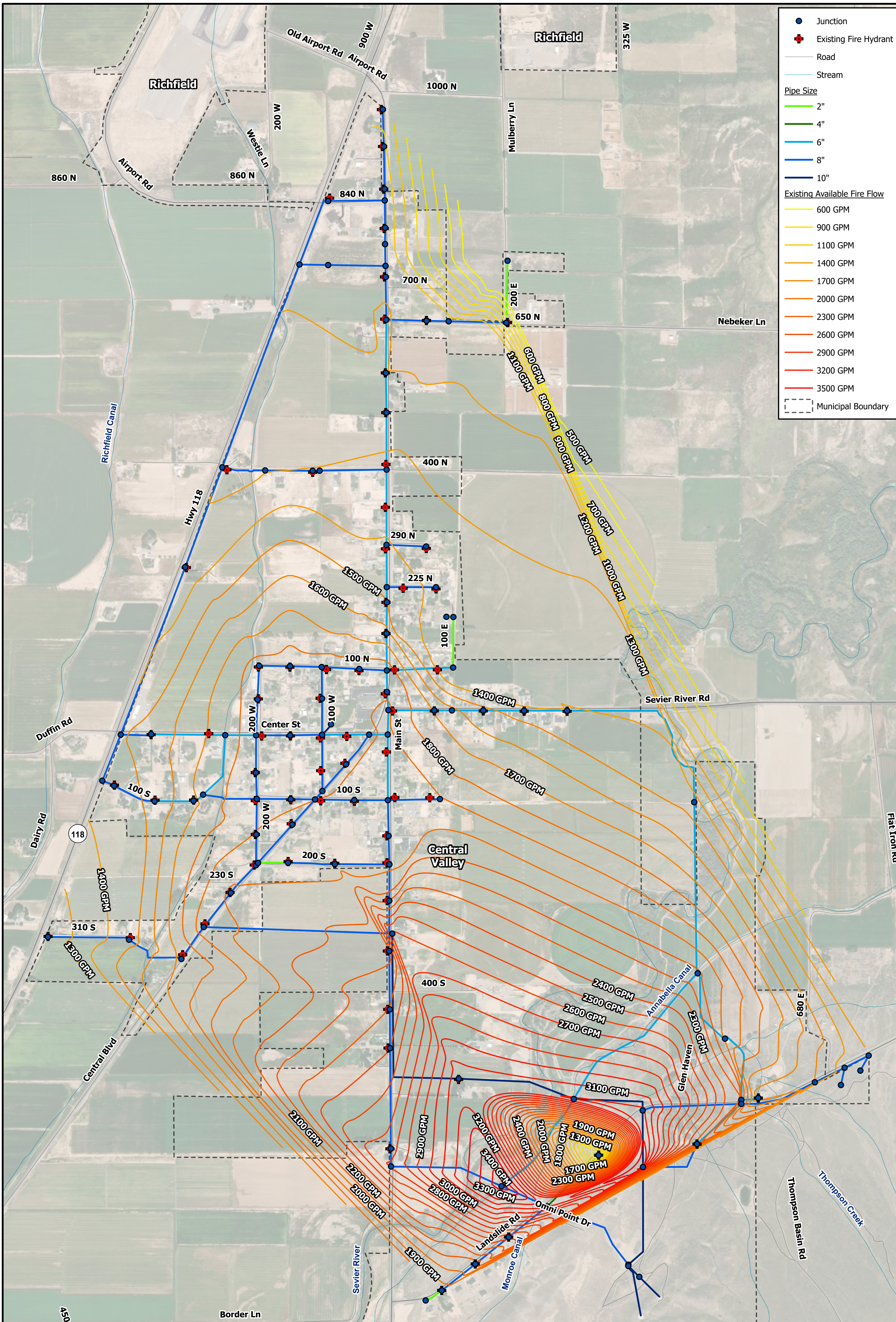
Map Name: H:\JD\Proj\2501-031\GIS\Projects\2501-031_Design\2501-031_Design.aprx - Existing System - PDD Pressures

Project Number: 2501-031 | Drawn by: TAS 06-25 | Last Edit: 07/01/2025

Sevier County, Utah

Scale: 1" = 1,000'

2



N

Feet
0 500 1,000

Jones & DeMille Engineering

Central Valley Town

Culinary Water Master Plan
Existing System - Fire Flow

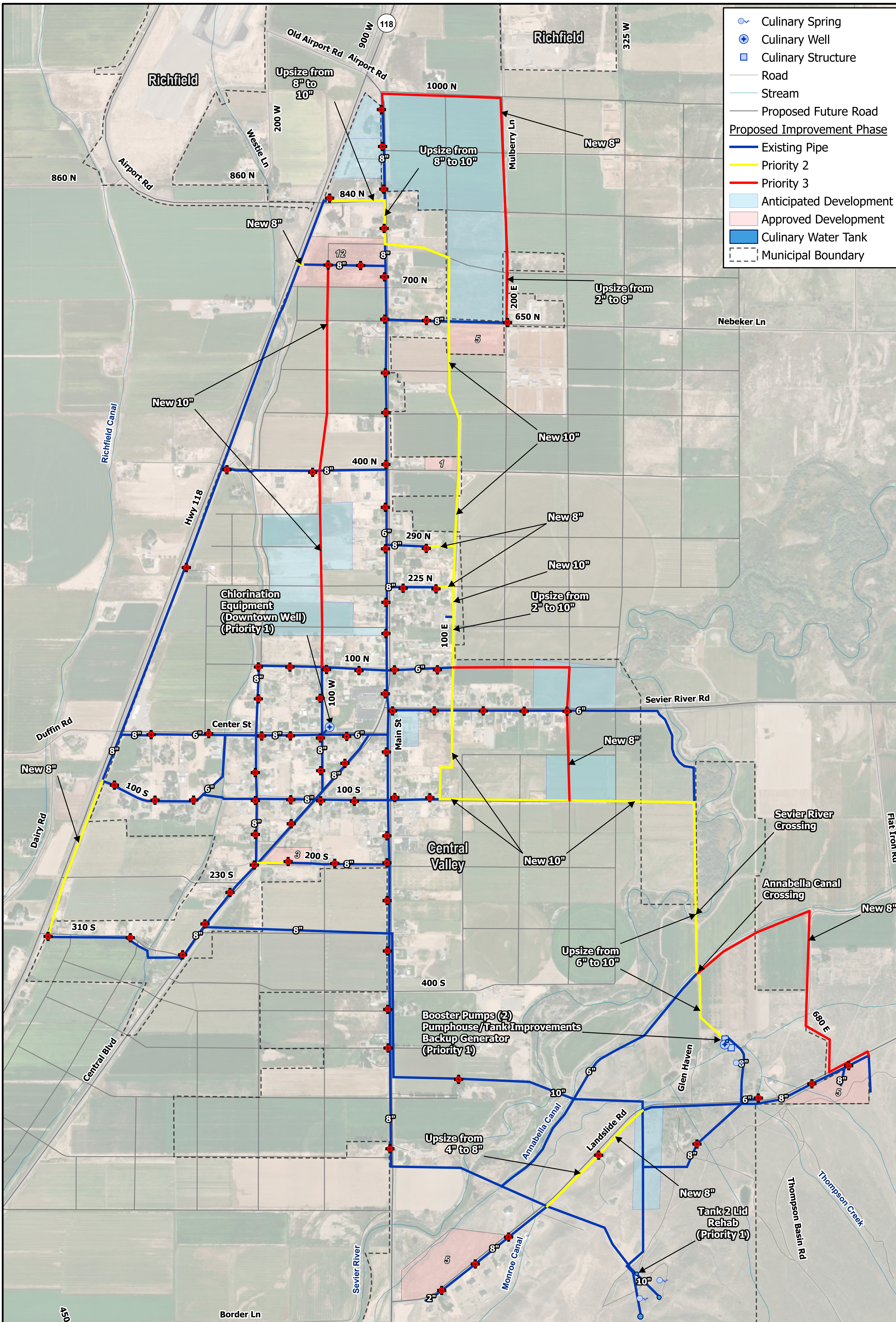
Map Name: H:\JD\Proj\2501-031\GIS\Projects\2501-031_Design\2501-031_Design.aprx - Existing System - Fire Flow

Project Number: 2501-031 | Drawn by: TAS 06-25 | Last Edit: 07/01/2025

Sevier County, Utah

Scale: 1" = 1,000'

3



N

Feet
0 500 1,000

Jones & DeMille Engineering

Central Valley Town

Culinary Water Master Plan
Future System - Improvements Overview

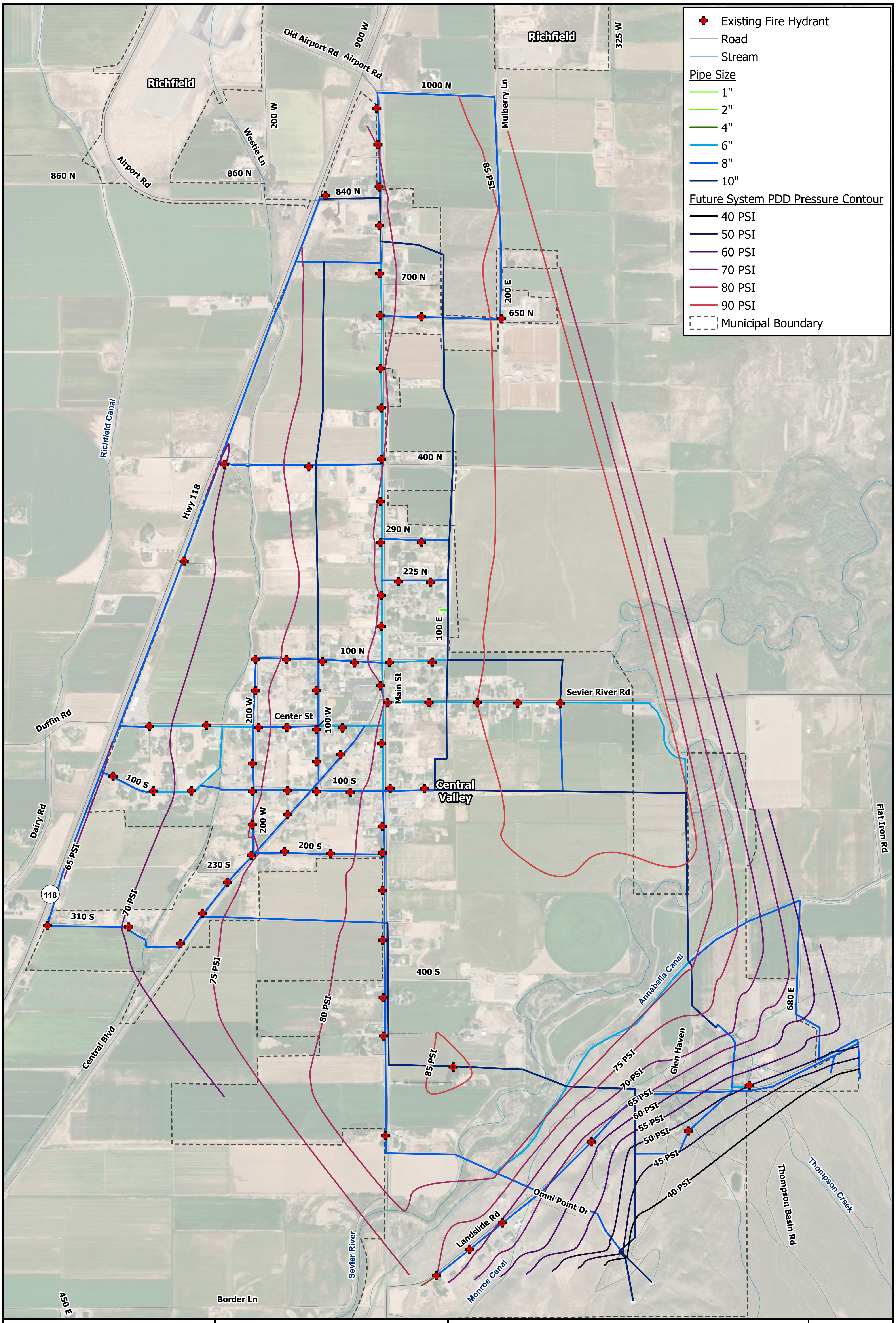
Map Name: H:\JD\Proj\2501-031\GIS\Projects\2501-031_Design\2501-031_Design.aprx - Future System - Overview

Project Number: 2501-031	Drawn by: TAS 06-25	Last Edit: 07/02/2025

Sevier County, Utah

Scale: 1" = 1,000'

4



N

Feet

0 500 1,000

Jones & DeMille Engineering

Central Valley Town

Culinary Water Master Plan
Future System - PDD Pressure

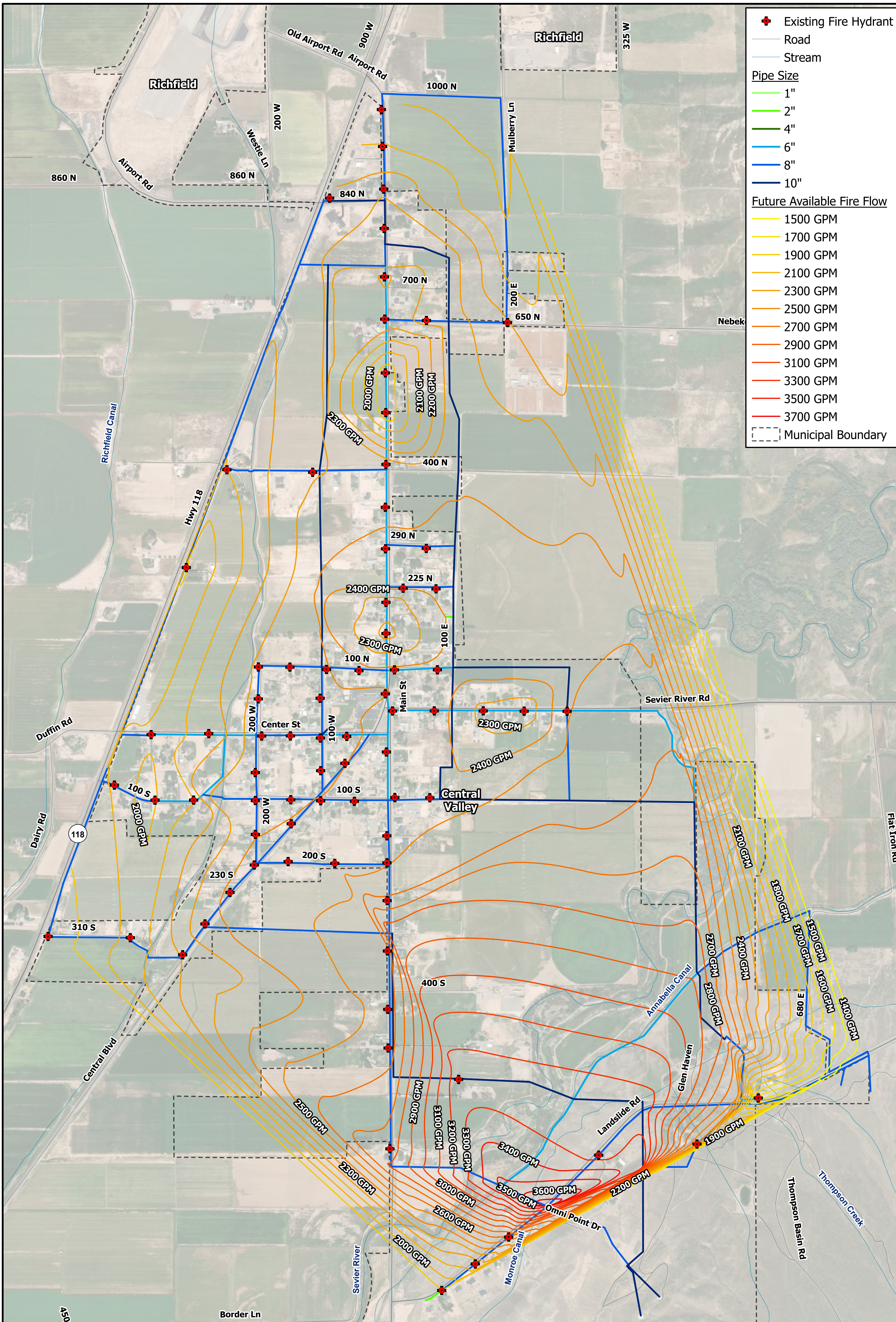
Map Name: H:\JD\Proj\2501-031\GIS\Projects\2501-031_Design\2501-031_Design.aprx - Future System - PDD Pressures

Project Number: 2501-031 | Drawn by: TAS 06-25 | Last Edit: 07/01/2025

Sevier County, Utah

Scale: 1" = 1,000'

5



Jones & DeMille Engineering

Central Valley Town

Culinary Water Master Plan
Future System - Fire Flow

Map Name: H:\JD\Proj\2501-031\GIS\Projects\2501-031_Design\2501-031_Design.aprx - Future System - Fire Flow

Project Number: 2501-031 | Drawn by: TAS 06-25 | Last Edit: 07/01/2025

Sevier County, Utah

Scale: 1" = 1,000'

6

APPENDIX B. COST ESTIMATES

Central Valley Town
Culinary Water Improvements
July 17, 2025
By: Parker Vercimak

Jones & DeMille Engineering
www.jonesanddemille.com

PRELIMINARY OPINION OF PROBABLE COST - PRIORITY 1

	ITEM	QUANTITY	UNIT	UNIT PRICE	COST
1-1	Mobilization	1	LUMP	$ 70,000.00	$ 70,000.00
1-2	750 GPM Booster Pumps	2	EACH	$ 75,000.00	$ 150,000.00
1-3	Booster Pumphouse/Tank Improvements	1	LUMP	$ 100,000.00	$ 100,000.00
1-4	Generator & Transfer Switch	1	LUMP	$ 150,000.00	$ 150,000.00
1-5	Tank 2 Lid Rehab	1	LUMP	$ 25,000.00	$ 25,000.00
1-6	Chlorination Equipment	1	LUMP	$ 20,000.00	$ 20,000.00
1-7	Tunnel Springs Redevelopment	1	LUMP	$ 350,000.00	$ 350,000.00
				SUBTOTAL	$ 865,000.00
				Construction Contingency (20%)	$ 175,000.00
				PRIORITY 1 SUBTOTAL	**$ 1,040,000.00**
1a.	Pre-Construction Engineering Services	1	LUMP	$ 75,000.00	$ 75,000.00
1b.	Construction Engineering Services	1	LUMP	$ 85,000.00	$ 85,000.00
1c.	Environmental Studies/NEPA/Permitting*	1	LUMP	$ 20,000.00	$ 20,000.00
1d.	Admin/Legal/Bonding	1	LUMP	$ 10,000.00	$ 10,000.00
				TOTAL PROBABLE PROJECT COST	**$ 1,230,000.00**

PRELIMINARY OPINION OF PROBABLE COST - PRIORITY 2

	ITEM	QUANTITY	UNIT	UNIT PRICE	COST
2-1	Mobilization	1	LUMP	$ 200,000.00	$ 200,000.00
2-2	Traffic Control/Exploratory Excavation	1	LUMP	$ 32,000.00	$ 32,000.00
2-3	Drain Station	1	LUMP	$ 15,000.00	$ 15,000.00
2-4	8" Ø Water Pipe	4,740	L.F.	$ 75.00	$ 356,000.00
2-5	10" Ø Water Pipe	14,470	L.F.	$ 85.00	$ 1,230,000.00
2-6	8" Gate Valve	20	EACH	$ 3,500.00	$ 70,000.00
2-7	10" Gate Valve	60	EACH	$ 5,000.00	$ 300,000.00
2-8	Road Repair	2,310	S.Y.	$ 150.00	$ 347,000.00
2-9	Sevier River Crossing	1	LUMP	$ 150,000.00	$ 150,000.00
2-10	Annabella Canal Crossing	1	LUMP	$ 50,000.00	$ 50,000.00
				SUBTOTAL	$ 2,750,000.00
				Construction Contingency (20%)	$ 550,000.00
				PRIORITY 2 SUBTOTAL	**$ 3,300,000.00**
2a.	Pre-Construction Engineering Services	1	LUMP	$ 230,000.00	$ 230,000.00
2b.	Construction Engineering Services	1	LUMP	$ 265,000.00	$ 265,000.00
2c.	Environmental Studies/NEPA/Permitting*	1	LUMP	$ 30,000.00	$ 30,000.00
2d.	Easement/ROW and Water Right Coordination	1	LUMP	$ 50,000.00	$ 50,000.00
2e.	Admin/Legal/Bonding	1	LUMP	$ 10,000.00	$ 10,000.00
				TOTAL PROBABLE PROJECT COST	**$ 3,885,000.00**

PRELIMINARY OPINION OF PROBABLE COST - PRIORITY 3

	ITEM	QUANTITY	UNIT	UNIT PRICE	COST
3-1	Mobilization	1	LUMP	$ 120,000.00	$ 120,000.00
3-2	Traffic Control/Exploratory Excavation	1	LUMP	$ 20,000.00	$ 20,000.00
3-3	8" Ø Water Pipe	9,350	L.F.	$ 75.00	$ 702,000.00
3-4	10" Ø Water Pipe	6,560	L.F.	$ 85.00	$ 558,000.00
3-5	8" Gate Valve	40	EACH	$ 3,500.00	$ 140,000.00
3-6	10" Gate Valve	30	EACH	$ 5,000.00	$ 150,000.00
				SUBTOTAL	$ 1,690,000.00
				Construction Contingency (20%)	$ 340,000.00
				PRIORITY 3 SUBTOTAL	**$ 2,030,000.00**
3a.	Pre-Construction Engineering Services	1	LUMP	$ 140,000.00	$ 140,000.00
3b.	Construction Engineering Services	1	LUMP	$ 165,000.00	$ 165,000.00
3c.	Environmental Studies/NEPA/Permitting*	1	LUMP	$ 30,000.00	$ 30,000.00
3d.	Easement/ROW and Water Right Coordination	1	LUMP	$ 25,000.00	$ 25,000.00
3e.	Admin/Legal/Bonding	1	LUMP	$ 10,000.00	$ 10,000.00
				TOTAL PROBABLE PROJECT COST	**$ 2,400,000.00**

In providing estimates of probable construction cost, the Client understands that the Consultant has no control over the cost or availability of labor, equipment or materials, or over market conditions or the Contractor's method of pricing, and that the Consultant's estimates of probable construction costs are made on the basis of the Consultant's professional judgment and experience. The Consultant makes no warranty, express or implied, that the bids or the negotiated cost of the Work will not vary from the Consultant's estimate of probable construction cost.

APPENDIX C. CALCULATIONS

Water System Analysis Tool

Project Title:	Central Valley - Culinary Water MP
Client:	Central Valley
Project Number:	2501-031
Project Manager:	Parker Vercimak
Project Engineer:	Kyler Nielsen

Table of Contents:

Historic Population and Projection

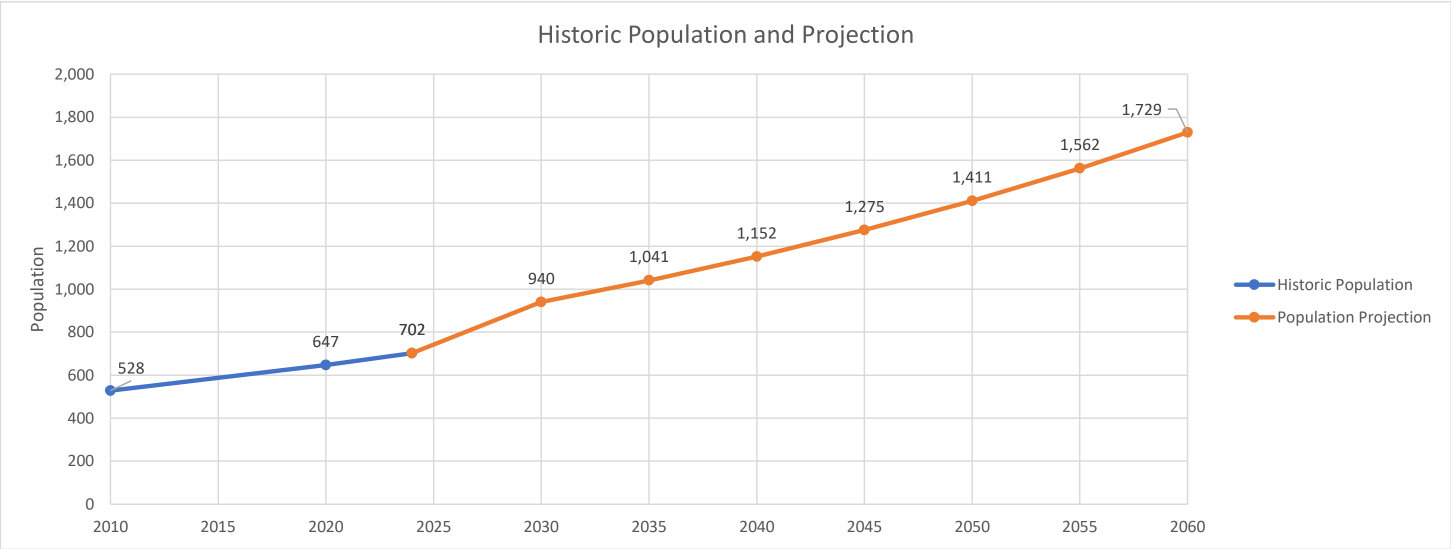
Year	2010	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2035	2040	2045	2050	2055	2060
Population	528	647	660	674	688	702	737	774	812	853	896	940	1,041	1,152	1,275	1,411	1,562	1,729
Avg Growth		2.05%	2.05%	2.05%	2.05%	2.05%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	2.05%	2.05%	2.05%	2.05%	2.05%	2.05%

https://www.census.gov/
https://gardner.utah.edu/demographics/population-projections/

Growth Rate through 2030	Growth Rate from 2030+
5.00%	**2.05%**

ERC Projections

	2024	2025	2026	2027	2028	2029	2030	2035	2040	2045	2050	2055	2060
Residential ERCs	246	258	271	285	299	314	330	365	404	447	495	548	606
Industrial ERCs	8	9	9	10	10	11	11	12	14	15	17	18	20
Institutional ERCs	10	11	11	12	13	13	14	15	17	19	21	23	26
Total ERCs	**265**	**278**	**292**	**306**	**322**	**338**	**355**	**393**	**434**	**481**	**532**	**589**	**652**



Water System Information

(Last 3 years of reported data)

Residential Connections

Year	Residential Connections	Residential Water Use (Ac ft/yr)	Residential Water Use (gallons per day)	Residential Water Use (gallons per connection per day)	Residential ERCs
2024	246	214.05	191,091.52	776.79	246.00
2023	243	180.43	161,077.52	662.87	243.00
2022	239	186.93	166,880.35	698.24	239.00

Industrial Connections

Year	Industrial Connections	Industrial Water Use (Ac ft)	Industrial Water Use (gallons per day)	Industrial Water Use (gallons per connection per day)	Industrial ERCs
2024	3	7.18	6,409.89	2,136.63	8.25
2023	3	4.82	4,303.02	1,434.34	6.49
2022	3	6.29	5,615.35	1,871.78	8.04

Institutional Connections

Year	Institutional Connections	Institutional Water Use (Ac ft)	Institutional Water Use (gallons per day)	Institutional Water Use (gallons per connection per day)	Insitutional ERCs
2024	6	9.05	8,079.32	1,346.55	10.40
2023	6	9.51	8,489.98	1,415.00	12.81
2022	6	8.72	7,784.71	1,297.45	11.15

ERC Summary

2024	Connections	ERCs	Avg ERC Value per Connection
Residential	246	246.00	1.00
Industrial	3	8.25	2.75
Institutional	6	10.40	1.73
Total	**255**	**265**	

Calculation Table

Year	Date	Peak Day Amount (Ac-ft)	Peak Day Amount (gallons)	Total Annual Use (Ac-ft)
2024	8/8/2024	1.67	544,171	230.27
2023	8/6/2023	1.54	501,811	194.76
2022	8/5/2022	1.46	475,742	201.95

Average Annual Demand (gallons)	ERCs	Peak Day Demand per ERC Data (gal/day)	Average Annual Demand per ERC (gal/year)	Equalization Storage per ERC (gal/day)
75,033,710	265	2,053	283,146	776
63,462,741	262	1,915	242,224	664
65,805,609	258	1,844	255,061	699
	Max	**2,053**	**283,146**	**776**

Modeling Factors

Scenario	Total Flow (gpm)	Flow Per ERC (gpm)	Notes	Min Pressure
ADD	143	0.539		>60 psi (not req)
PDD	377	1.426		40 psi
PID	566	2.139	1.5 PDD	30 Psi

Future Growth Factor*

Current Population	702
20 Year Population	1,053
Global Factor	**1.50**

**Note: If specific locations for growth aren't identified, a global system factor may be applied to existing system demands. This does assume that growth happens equally throughout the system where that may or may not be possible. Make sure to state this assumption in the modeling report.*

Level of Service

Year	Total Annual Use (Ac-ft)	Avg Annual Demand (gal)	ERCs	Avg Annual Demand per ERC (gal/year)	Equalization Storage per ERC (gal/day)	Equalization Storage Req'd (gal)
2024	230.3	75,033,710	265	283,518	777	205,635
2023	194.8	63,462,741	262	241,948	663	173,904
2022	202.0	65,805,609	258	254,872	698	180,217
			Max	**283,518**	**777**	**205,635**

Storage ID	Storage Name	Effective Volume (gal)	
ST001	Lower Reservoir	75,000	
ST002	Upper Tank - Below Spring	250,000	
ST003	Upper Tank - Above Spring	175,000	Gravity feed
ST004	South Upper Tank Above Spring	300,000	Gravity feed
	Total	**800,000**	

Fire Suppression Req'd (gpm)	Duration (hours)	Fire Storage Req'd (gal)	Total Storage Capacity Req'd (gal)
2,500	2	300,000	505,635

Projected Storage Requirements

Equalization Storage per ERC 777 gallons/day
Water Conservation 0%
Equalization Storage per ERC 777 gallons/day

	Year	Population	ERC	Additional Storage (gal)	Additional Equalization (ERC)	Cumulative Storage Capacity (gal)	Storage Capacity (ERC)
Short Term Planning Period	2024	702	265			800,000	644
	2025	737	278			800,000	644
	2026	774	292			800,000	644
	2027	812	306			800,000	644
	2028	853	322			800,000	644
	2029	896	338			800,000	644
	2030	940	355			800,000	644
Long Term Planning Period	2035	1,041	393			800,000	644
	2040	1,152	434			800,000	644
	2045	1,275	481			800,000	644
		Total Storage Added		**0**	**gal**		

Level of Service

Year	Date	PDD Amount ac-ft	PDD Amount gal	ERCs	PDD/ERC (gpm)	Req'd Source Capcity (gpm)
2024	8/8/2024	1.67	544,171	265	1.428	378
2023	8/6/2023	1.54	501,811	262	1.328	348
2022	8/5/2022	1.46	475,742	258	1.280	330
				Max	**1.428**	**378**

Spring Yield Calculation

Source: Mecham Spring

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Method
2024	2.84	3.67	3.52	3.61	3.65	5.82	5.64	7.91	4.12	3.94	5.56	3.55	53.83	Meter
2023	2.34	2.34	4.69	3.45	3.45	4.06	6.86	2.95	4.23	4.79	4.52	5.27	48.95	Meter
2022	3.27	2.93	3.51	3.04	3.56	3.50	3.38	2.59	3.58	4.59	2.14	3.64	39.73	Meter

3.30	ac-ft per month
39.57	ac-ft per year
0.11	ac-ft per day
24.53	gpm

	Volume (ac-ft)	Flow (gpm)
Avg	3.96	29.45
Max	7.91	58.85
Min	2.14	15.92

Source: North/South Springs Group (Tunnel Springs)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Method
2024	2.15	1.99	2.32	2.45	2.51	2.67	2.63	2.68	2.52	2.61	2.54	2.32	29.39	Meter
2023	2.02	2.02	4.03	2.46	2.46	2.35	3.27	0.10	1.41	2.75	2.58	3.07	28.52	Meter
2022	2.53	2.53	3.13	2.51	2.21	2.31	3.32	2.35	5.05	2.41	2.69	2.60	33.64	Meter

2.32	ac-ft per month
27.84	ac-ft per year
0.08	ac-ft per day
17.26	gpm

	Volume (ac-ft)	Flow (gpm)
Avg	2.54	18.92
Max	5.05	37.57
Min	0.10	0.74

Notes:
Spring Flow data is taken from DWRi water use data (https://www.waterrights.utah.gov/wateruse/WaterUseList.asp)
Springs- yield is set at the 25th percentile of spring flow data. UAC R309-515-7 (5)(b)
Wells- safe yield is 2/3 of the pumping rate from the aquifer drawdown test or well capacity. UAC R309-515-6 (10)(c)

Total Source Capacity

Source Summary (Ac-ft)

	Source ID	Source Name	2024	2023	2022	Well Pump Capacity (gpm)	Pump Test (gpm)	Safe Yield (gpm)	ERC Capacity
(Spring)		Mecham Spring*	53.83	48.95	39.71	-	-	24.53	17.18
(Spring)		North/South Springs Group*	29.38	28.53	86.64	-	-	17.26	12.09
(Well)		Mecham Well*	162.29	137.44	148.17	450	450	208	145.83
(Well)		Downtown Well	0.23	0.05	79.73	360	1,400	360	252.14
	Total		**245.73**	**214.97**	**354.25**	**810**	**1,850.00**	**610**	**427.24**

Projected Source Requirements

Peak Day Demand/Source gpm per ERC	1.428	gpm
Water Conservation	0%	
Peak Day Demand/Source gpm per ERC	1.428	gpm
Existing Total Source Capacity	610	gpm

	Year	Population	ERC	Additional Source (gpm)	Additional Source Capcity (ERC)	Cumulative Source Capacity (gpm)	Capacity (ERC)
Short Term Planning Period	2024	702	265			610	427
	2025	737	278			610	427
	2026	774	292			610	427
	2027	812	306			610	427
	2028	853	322			610	427
	2029	896	338			610	427
	2030	940	355			610	427
Long Term Planning Period	2035	1,041	393			610	427
	2040	1,152	434	80	56	690	483
	2045	1,275	481			690	483
			Total Source Added	**80**	**gpm**		

Level of Service

Water Right #	Change App	Source	Quantity (cfs)	Quantity (ac-ft)	Proof Due Date	Nature of Use	Status	Notes	Link
63-10		Wells (2) & Springs (3)	0.0700	50.680		Municipal	Certificated		63-10
63-233		Wells (2) & Springs (3)	0.1800	53.556		Municipal	Certificated	Period of use is Nov 2 to Mar 31	63-233
63-459		Wells (2) & Springs (3)	0.2160	81.802		Municipal	Certificated	Period of use is Apr 1 to Nov 1	63-459
63-694		Wells (2) & Springs (3)	0.0223	1.654		Municipal	Certificated		63-694
63-978		Wells (2) & Springs (3)	0.1000	72.400		Municipal	Certificated		63-978
63-1071		Wells (2) & Springs (3)	0.0445	0.618		Municipal	Certificated		63-1071
63-1626		Wells (2) & Springs (3)	0.0446	18.840		Municipal	Certificated		63-1626
63-4473	a30877	Wells (2)		25.000	8/31/2030	Irrigation, Municipal	Approved	Can be used for municipal or 8.333 acres for irrigation	63-4473
63-2923	a38858	Wells (2) & Springs (3)	0.0150	1.200	8/31/2027	Municipal	Approved		63-2923
63-4635	a36923	Wells (2) & Springs (3)	0.0250	3.000	2/28/2030	Municipal	Approved		63-4635
63-4636	a36922	Wells (2) & Springs (3)	0.0019	0.120	2/28/2030	Municipal	Approved		63-4636
63-4637	a36921	Wells (2) & Springs (3)	0.0065	1.356	2/28/2030	Municipal	Approved		63-4637
		Total Available	**0.7258**	**310.226**					
			325.78						

Projected Water Right Requirements

Water Conservation	0%	
Water Right per ERC	0.870	ac-ft
Existing Water Rights	310.23	ac-ft

	Year	Population	ERC	Additional Water Rights Required (ac-ft)	Additional Source Capcity (ERC)	Cumulative Water Rights (ac-ft/yr)	Capacity (ERC)
Short Term Planning Period	2024	702	265			310	357
	2025	737	278			310	357
	2026	774	292			310	357
	2027	812	306			310	357
	2028	853	322			310	357
	2029	896	338			310	357
	2030	940	355			310	357
Long Term Planning Period	2035	1,041	393	112	128.72	422	485
	2040	1,152	434			422	485
	2045	1,275	481			422	485

APPENDIX D. FIRE FLOW TEST RESULTS

Jones & DeMille Engineering

Date: 6/5/2025

Flow Test Data Sheet

Project Title: Culinary Water masterplan

Client: Central Valley

Project Number: 2501-031

Property & Address: 50 W Center St, Central Valley, UT 84754

Test By Kyler Nielsen

Witnessed By: Koy Barton & Brandon Barney (Water Operator)

Purpose of Test: Flow

Type of Test: ■ Single-Hydrant Test ☐ Two-Hydrant Test

Test Data

GAUGE HYDRANT Static: 76 PSI Residual 38 PSI

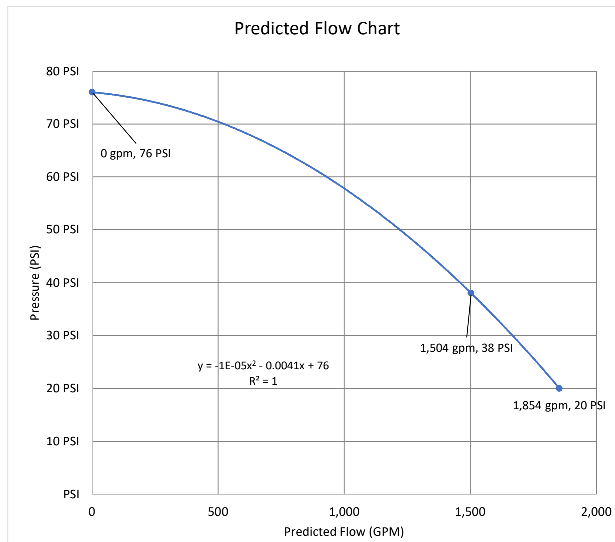
% Pressure Drop **50.00%** *Verify 25% pressure drop from static to residual psi. If 25% pressure drop is unattainable you will need a larger test kit or mutiple small kits.*

FLOW HYDRANT

Outlet Diameter	**4-1/2"**	in	Little Boy Hose Monster is 2-1/2"
Nozzle Pressure	16	PSI	Big Boy Hose Monster is 4-1/2"
Calculated Flow	1,504	GPM	
Length of Test	5	Mins	
Amount of Water Used	7,520	Gallons	
Rated Capacity at 20 psi:	1,854	gpm	

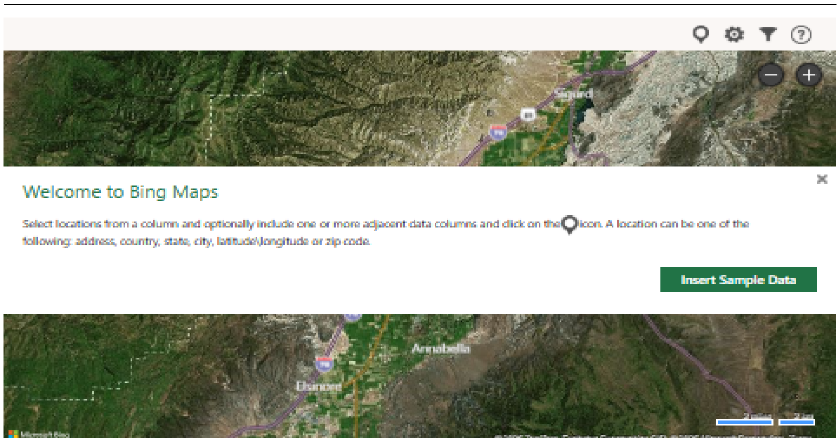
More Information

FocusonFireProtection.pdf



Remarks:

https://www.hosemonster.com/hydrant-flow-test-calculator-calculate-rated-capacity-at-20-psi/



EQUATION FOR DETERMINING RATED CAPACITY

Computes the flow-rate available at a specified residual pressure (a.k.a. Rated Capacity). The example below enables you to find the predicted flow-rate at 20 psi residual pressure. Use this when fire flow testing hydrants.

$QR = QF \times (HR^{0.54} / HF^{0.54})$

QR = Flow-rate predicted at the desired residual pressure in GPM

QF = Total test flow-rate measured during test in GPM (GPM measured from Hose Monster or Pitotless Nozzle)

HR = Pressure drop from static pressure to desired residual pressure (Static – 20 psi [if 20 psi is the desired residual pressure])

HF = Actual pressure drop measured during the test (Static – Actual Residual)

THEORETICAL DISCHARGE THROUGH CIRCULAR ORIFICES FORMULA

Computes a flow-rate in GPM given a psi and coefficient of the flow device.

$Q = 29.84 \times \sqrt{P} \times D^2 \times C$

Q = flow-rate in GPM

P = velocity pressure in psi

D = orifice diameter in inches

C = coefficient of flow device

Jones & DeMille Engineering

Date: 6/5/2025

Flow Test Data Sheet

Project Title: Culinary Water masterplan

Client: Central Valley

Project Number: 2501-031

Property & Address: 380 S Central Blvd, Central Valley, UT 84754

Test By Koy Barton

Witnessed By: Kyler Nielsen & Brandon Barney (Water Operator)

Purpose of Test: Flow

Type of Test: ■ Single-Hydrant Test ☐ Two-Hydrant Test

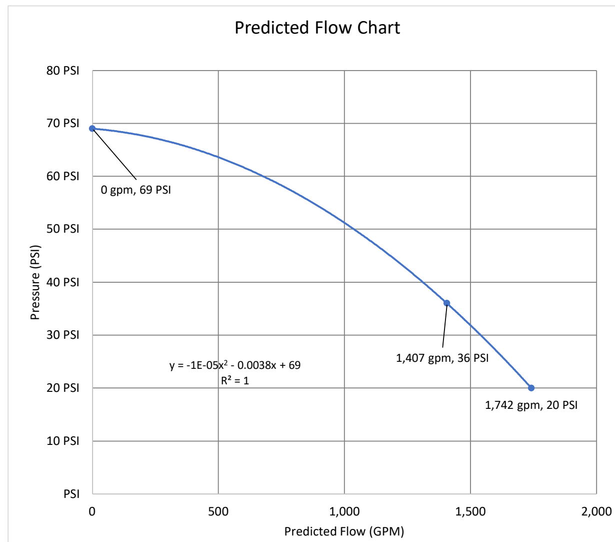
Test Data

GAUGE HYDRANT Static: 69 PSI Residual 36 PSI

% Pressure Drop **47.83%** *Verify 25% pressure drop from static to residual psi. If 25% pressure drop is unattainable you will need a larger test kit or mutiple small kits.*

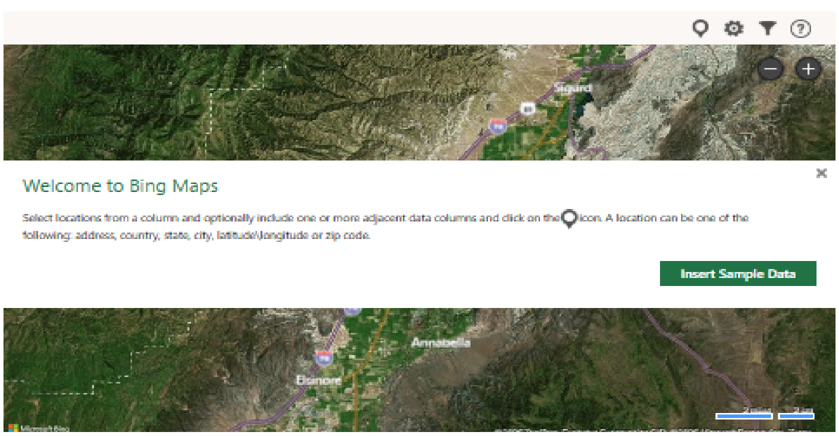
FLOW HYDRANT

Outlet Diameter	**4-1/2"**	in	Little Boy Hose Monster is 2-1/2"
Nozzle Pressure	14	PSI	Big Boy Hose Monster is 4-1/2"
Calculated Flow	1,407	GPM	
Length of Test	5	Mins	**More Information**
Amount of Water Used	7,035	Gallons	FocusonFireProtection.pdf
Rated Capacity at 20 psi:	1,742	gpm	



Remarks:

https://www.hosemonster.com/hydrant-flow-test-calculator-calculate-rated-capacity-at-20-psi/



EQUATION FOR DETERMINING RATED CAPACITY

Computes the flow-rate available at a specified residual pressure (a.k.a. Rated Capacity). The example below enables you to find the predicted flow-rate at 20 psi residual pressure. Use this when fire flow testing hydrants.

$QR = QF \times (HR^{0.54} / HF^{0.54})$

QR = Flow-rate predicted at the desired residual pressure in GPM

QF = Total test flow-rate measured during test in GPM (GPM measured from Hose Monster or Pitotless Nozzle)

HR = Pressure drop from static pressure to desired residual pressure (Static – 20 psi [if 20 psi is the desired residual pressure])

HF = Actual pressure drop measured during the test (Static – Actual Residual)

THEORETICAL DISCHARGE THROUGH CIRCULAR ORIFICES FORMULA

Computes a flow-rate in GPM given a psi and coefficient of the flow device.

$Q = 29.84 \times \sqrt{P} \times D^2 \times C$

Q = flow-rate in GPM

P = velocity pressure in psi

D = orifice diameter in inches

C = coefficient of flow device

Jones & DeMille Engineering

Date: 6/5/2025

Flow Test Data Sheet

Project Title:	Culinary Water masterplan	**Property & Address:**	86 E Landslide Rd, Central Valley, UT 84754
Client:	Central Valley	**Test By**	Koy Barton
Project Number:	2501-031	**Witnessed By:**	Kyler Nielsen & Brandon Barney (Water Operator)
		Purpose of Test:	Flow

Type of Test: ■ Single-Hydrant Test ☐ Two-Hydrant Test

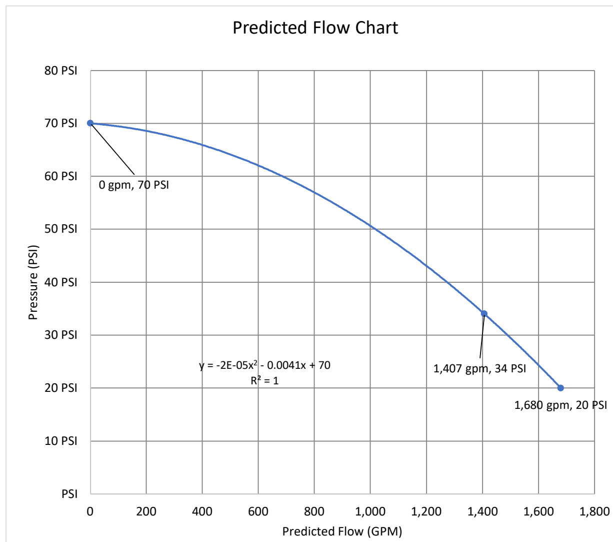
Test Data

GAUGE HYDRANT Static: 70 PSI Residual 34 PSI

% Pressure Drop **51.43%** *Verify 25% pressure drop from static to residual psi. If 25% pressure drop is unattainable you will need a larger test kit or mutiple small kits.*

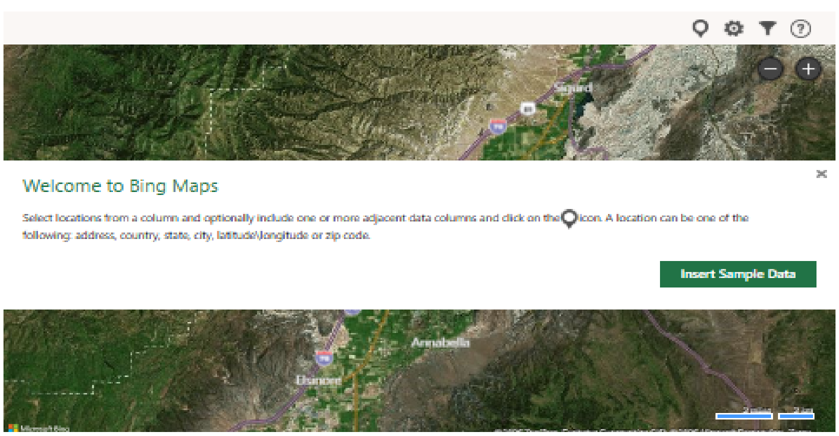
FLOW HYDRANT

Outlet Diameter	**4-1/2"**	in	Little Boy Hose Monster is 2-1/2"
Nozzle Pressure	14	PSI	Big Boy Hose Monster is 4-1/2"
Calculated Flow	1,407	GPM	
Length of Test	5	Mins	**More Information**
Amount of Water Used	7,035	Gallons	FocusonFireProtection.pdf
Rated Capacity at 20 psi:	1,680	gpm	



https://www.hosemonster.com/hydrant-flow-test-calculator-calculate-rated-capacity-at-20-psi/

Remarks:



EQUATION FOR DETERMINING RATED CAPACITY

Computes the flow-rate available at a specified residual pressure (a.k.a. Rated Capacity). The example below enables you to find the predicted flow-rate at 20 psi residual pressure. Use this when fire flow testing hydrants.

$QR = QF \times (HR^{0.54} / HF^{0.54})$

QR = Flow-rate predicted at the desired residual pressure in GPM

QF = Total test flow-rate measured during test in GPM (GPM measured from Hose Monster or Pitotless Nozzle)

HR = Pressure drop from static pressure to desired residual pressure (Static – 20 psi [if 20 psi is the desired residual pressure])

HF = Actual pressure drop measured during the test (Static – Actual Residual)

THEORETICAL DISCHARGE THROUGH CIRCULAR ORIFICES FORMULA

Computes a flow-rate in GPM given a psi and coefficient of the flow device.

$Q = 29.84 \times \sqrt{P} \times D^2 \times C$

Q = flow-rate in GPM

P = velocity pressure in psi

D = orifice diameter in inches

C = coefficient of flow device

Jones & DeMille Engineering

Date: 6/5/2025

Flow Test Data Sheet

Project Title: Culinary Water masterplan

Client: Central Valley

Project Number: 2501-031

Property & Address: 985 N Main St, Central Valley, UT 84754

Test By Koy Barton

Witnessed By: Kyler Nielsen & Brandon Barney (Water Operator)

Purpose of Test: Flow

Type of Test: ■ Single-Hydrant Test ☐ Two-Hydrant Test

Test Data

GAUGE HYDRANT Static: 78 PSI Residual 22 PSI

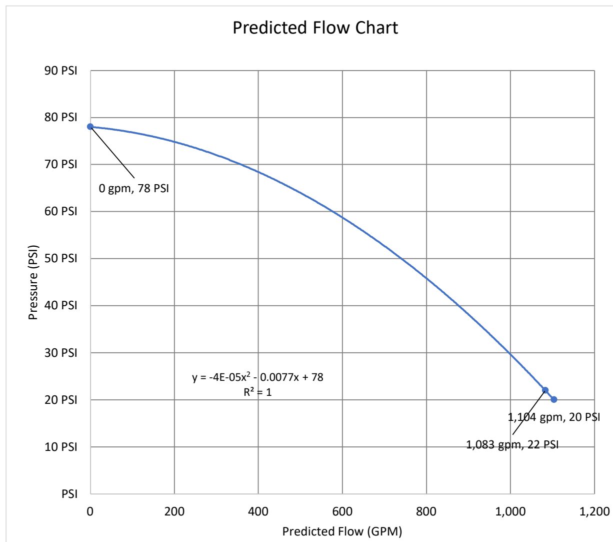
% Pressure Drop **71.79%** *Verify 25% pressure drop from static to residual psi. If 25% pressure drop is unattainable you will need a larger test kit or mutiple small kits.*

FLOW HYDRANT

Outlet Diameter	**4-1/2"**	in	Little Boy Hose Monster is 2-1/2"
Nozzle Pressure	8	PSI	Big Boy Hose Monster is 4-1/2"
Calculated Flow	1,083	GPM	
Length of Test	5	Mins	
Amount of Water Used	5,415	Gallons	
Rated Capacity at 20 psi:	1,104	gpm	

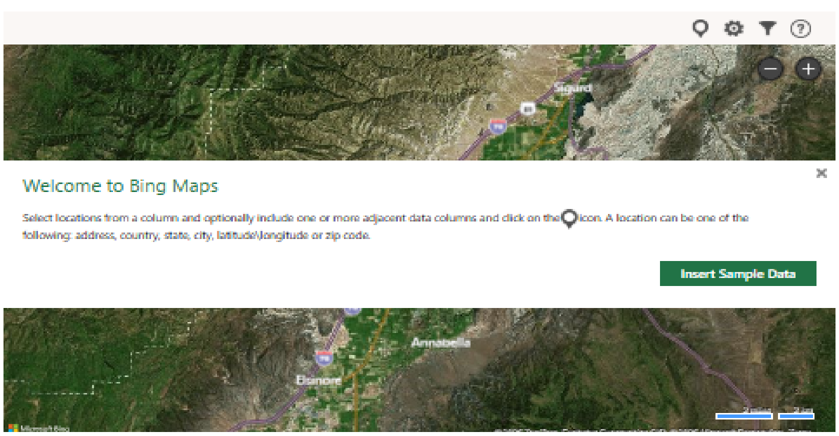
More Information

FocusonFireProtection.pdf



https://www.hosemonster.com/hydrant-flow-test-calculator-calculate-rated-capacity-at-20-psi/

Remarks:



EQUATION FOR DETERMINING RATED CAPACITY

Computes the flow-rate available at a specified residual pressure (a.k.a. Rated Capacity). The example below enables you to find the predicted flow-rate at 20 psi residual pressure. Use this when fire flow testing hydrants.

$QR = QF \times (HR^{0.54} / HF^{0.54})$

QR = Flow-rate predicted at the desired residual pressure in GPM

QF = Total test flow-rate measured during test in GPM (GPM measured from Hose Monster or Pitotless Nozzle)

HR = Pressure drop from static pressure to desired residual pressure (Static – 20 psi [if 20 psi is the desired residual pressure])

HF = Actual pressure drop measured during the test (Static – Actual Residual)

THEORETICAL DISCHARGE THROUGH CIRCULAR ORIFICES FORMULA

Computes a flow-rate in GPM given a psi and coefficient of the flow device.

$Q = 29.84 \times \sqrt{P} \times D^2 \times C$

Q = flow-rate in GPM

P = velocity pressure in psi

D = orifice diameter in inches

C = coefficient of flow device