COUNCIL INFORMATION PACKET

Work Session

Wednesday

March 8, 2023

5:00 p.m. MDT

TOWN OF COLORADO CITY
MEETING NOTICE

Pursuant to A.R.S. § 38-431.02, notice is hereby given to the members of the Colorado City Town Council and to the general public that the Town Council will hold a Mobile Work Session open to the public on Wednesday, March 8, 2023, at 5:00 p.m. beginning at the Colorado City Police Department Training Room 50 North Colvin Street, Colorado City, Arizona.

AGENDA:

1. Call to Order
2. Roll Call
3. Discussion on Proposed Water Impact Fee
4. Presentation from UEP Trust on Water Rights
5. Discussion on Department Reports
6. Adjournment

Agenda items and any variables thereto are set for consideration, discussion, approval or other action. All items are set for possible action. The Town Council may, by motion, recess into executive session, which will not be open to the public, to receive legal advice from the Town's attorney(s) on any item contained in this agenda pursuant to ARS § 38-431.03 (A) (3)(4), or regarding sensitive personnel issues pursuant to ARS § 38-431.03 (A) (1), or concerning negotiations for the purchase, sale or lease of real property; ARS § 38-431.03 (A) (7). One or more Council members may be attending by telephone. Agenda may be subject to change up to 24 hours prior to the meeting. Persons with a disability may request a reasonable accommodation by contacting the Town Clerk at 928.875.2646 as early as possible to allow sufficient time to arrange for the necessary accommodations. Town of Colorado City Council Meeting Agenda.

Town of Colorado City

TOWN COUNCIL
WORK SESSION
STAFF SUMMARY REPORT
Wednesday March 8, 2023,

5:00 p.m.

3. Discussion on Proposed Water Impact Fees

The Utilities Department completed a Culinary Water Masterplan Update in June of 2022. They have been working on a water impact fee analysis.
This session is to provide an update of the process to the Council.

4. Presentation from UEP Trust regarding Water Canyon Water Rights.

Jeff Barlow, Executive Director of the UEP Trust will present the sale of the water rights held by the UEP Trust to the Washington County Conservancy District and Washington County School District and how that will impact the development of water for Hildale and Colorado City.

5. Discussion on Department Reports

HCC UTILITY DEPARTMENT
MAKING CONNECTIONS

To: Colorado City Council, Hildale City Council, Eric Duthie, Vance Barlow
From: Project Manager Jerry Postema
Date: August 4, 2022
Re: Summary Culinary Water Master Plan

This Culinary Water Master Plan summary is to provide general information and background on why the Master Plan is needed and how it will be used.

General Summary:

Governmentally operated communities in Arizona and Utah are required to provide and update a Water Master Plan (Plan) for the state's Department of Environmental Quality (DEQ). The revisions or updates depend on the changes in the community and the water system. The Plan is needed to prepare a road map for the community's water systems. The road map looks at short term and long-term growth and changes in the water system and regulatory compliance updates. As growth occurs in the communities, the plan changes slightly to accommodate the new growth or lack of growth. The Plan is a living document but a solid outline, road map of the future needs for the communities and the water system along with an estimated cost for those improvements.

The Plan was updated in July of 2022 based primarily on the changes in growth and building activity in Colorado City and Hildale over the past few months. Hildale has a newly annexed service area and Colorado City has seen more development than previously expected under the previous Plan. The Plan was presented and discussed with the Utility Board on July 28, 2022, and the Utility Board moved to recommend the two City Councils adopt the 2022 Plan.

With the projects and costs outlined in the Plan, communities can submit for grants to help in getting funding for those needed improvements. The Plan identifies when the improvements are needed, what the exact needs are and where the best place is to start with making those changes or upgrades. The other part of the Plan is looking at the best option for funding the projects as they are needed. Funding can come from Development Impact Fees if it is growth related; rates If they are improvements to existing system to serve existing customers and to determine if bonds should be sold, other financing opportunities need to be looked at for the future improvements. It provides a great planning tool for the communities and the water system.

It is like people preparing for when they want to retire and enjoy their non-working life. How much longer do you expect to work? How much money would you need to save or put away now for using later to support your new life? What is the amount of estimated inflation for the retirement years? Finally, what are your needs for living the way you would like to comfortably during retirement?

Once the Plan is adopted by the City Councils, the Facilities Plan will be put together for future consideration. The Facilities Plan identifies the projects in the Plan, the dates when they are needed and how much each project will cost. This plan will come back to the City Councils for discussion on funding options.

The first step is to formally approve the Culinary Water Master Plan as the community's road map for the future.

HILDALE CITY & TOWN OF COLORADO CITY
CULINARY WATER MASTER PLAN UPDATE

JUNE 2022

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I. INTRODUCTION

Hildale City is located along Highway 59 in Washington County in southwestern Utah. The Town of Colorado City is neighboring Hildale, just across the border in Arizona. The water system is shared and funded by both communities and is operated and maintained by the Hildale Colorado City Utility Department. This plan was created with coordination from staff from Hildale City and the Hildale Colorado City Utility Department. For this plan "City Staff" is defined as staff from the City as well as the utility department.

Hildale City Completed a Culinary Water Master Plan Update in 2020 which was an update to their 2014 Plan. The City has contracted with Sunrise Engineering to complete an update to the 2020 plan. While this is a shorter window between plans than is typical, the city has recognized that conditions and future projections have changed significantly in that short time period. The intent of this update is to account for these changes.

The culinary water system has been analyzed under the State of Utah Division of Drinking Water guidelines to determine the current system status and to evaluate possible system needs as the community grows during the next 20 years. As part of this plan, Sunrise Engineering, Inc. has recommended some improvements to the culinary water system and has developed a potential financing plan that will help Hildale City and the Town of Colorado City obtain the necessary funds for the recommended improvements.

This report does not analyze water rights or a secondary water system. This plan also does not include a user rate analysis.

II. SYSTEM USERS' ANALYSIS

A. LENGTH OF PLANNING PERIOD

It is typical for a Master Plan to use a 10 or 20-year planning period. For example, the first year of a 10-year planning period would be the year 2023 with the 10th and final year being 2032. This plan will use fiscal years and will assume a 20-year (2023-2042) planning period for recommended improvements. This period will allow an adequate evaluation of the system for potential infrastructure improvements or other needs. Revenue sources should be carefully evaluated each year as budgets are set by the city council.

B. PROJECTED GROWTH RATE

An important element in the development of the water system and capacity analysis is the projection of the city's population growth rate on an annual basis. This projection gives the planner an idea of the potential future demands on the culinary water system for the length of the planning period.

Projecting the number of future culinary water connections can be a subjective process. The most effective method of estimating the number of future connections is by analyzing past historical numbers of connections and census records. Because Hildale and Colorado City utilize the same water system, the census records and past numbers of connections of both Hildale and Colorado City were included in the analysis. In the past five years the communities have seen a fluctuation of positive and negative growth rates. Due to this fluctuation, analyzing the historical growth rates is an inaccurate method of predicting future growth for these communities. Figure II-1 below shows the historic population and connections in both communities.

Figure II-1: Historic Population

Calandar year	Hildale Population	Colorado City Population	Total Population	Est. Growth Rate
1990	1325	2426	3751	
2000	1895	3258	5153	3.23%
2010	2660	4722	7382	3.66%
2015	2926	4808	7734	0.94%
2016	2926	4804	7730	-0.05%
2017	2916	4809	7725	-0.06%
2018	2916	4825	7741	0.21%
2019	2910	4836	7746	0.06%
2020	2727	4531	7258	-6.30%
2021	2825	4694	7519	3.60%
2022	2931	4871	7803	3.77%

In the past couple of years, the growth rate in both communities has changed drastically. At the time of the previous plan, the communities anticipated minimal to no growth for the first few years of the planning window. However, in the past year the communities have seen a significant increase in number of connections, and there are multiple new developments that will be built in the next couple of years. This abrupt change in growth is one of the main reasons that the City is updating their culinary water master plan after only a couple years.

City staff looked at the upcoming developments in different stages in the approval process to determine a realistic number of anticipated new connections in future years. The number of anticipated new connections was used to determine a growth rate. In the discussions with City staff, it was determined that the immediately foreseeable growth may not be sustainable over the 20-year planning period, and therefore a lesser growth rate was determined for the remainder of the planning period. The following growth rates were used for this study:

- 2023-2027 (first 5 years) – 3.5% per year
- 2028-2032 (second 5 years) – 3.25% per year
- 2033-2042 (last 10 years) – 2.0% per year

C. PROJECTED POPULATION & NUMBER OF CONNECTIONS

Based on the forecasted growth rates referenced above, the number of connections the City will need to plan for can be calculated with the compound interest formula shown below.

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

F = Future Population P = Present Population
i = Projected Growth Rate N = Years

This equation was used to project the community population and number of connections for each year in the planning period. Figure II-2 below shows a summary of the growth rate analysis. Appendix A shows the full analysis.

Figure II-2: Growth Rate Analysis Summary

Calendar year	Est. Growth Rate	Proj.Total Population
2023	3.50%	8076
2024	3.50%	8358
2025	3.50%	8651
2026	3.50%	8954
2027	3.50%	9267
2028	3.25%	9568
2029	3.25%	9879
2030	3.25%	10200
2031	3.25%	10532
2032	3.25%	10874
2033	2.00%	11091
2034	2.00%	11313
2035	2.00%	11540
2036	2.00%	11770
2037	2.00%	12006
2038	2.00%	12246
2039	2.00%	12491
2040	2.00%	12741
2041	2.00%	12995
2042	2.00%	13255

It is important to understand that projected growth rates are not the cornerstone of this plan. If the maximum number of system connections projected is reached earlier or later than anticipated, future improvements to support growth may come either earlier or later.

D. PROJECTED EQUILVALENT RESIDENTIAL UNITS (ERU)

The water system is made up of multiple connection types. Hildale City and the Town of Colorado City report their different connections to the state as either residential, commercial, industrial, or institutional. Figure II-3 shows a summary of the number of connections by type.

Figure II-3: Total Number of Units Per Connection Type

Year	Total	Residential	Commercial	Industrial	Institutional
2017	900	772	66	25	37
2018	985	834	81	28	42
2019	995	854	84	23	34
2020	936	814	82	23	17
2021	971	842	85	27	17

Each of these different connection types uses different amounts of water at different rates. In order to properly analyze the systems usage, the number of connections are converted to equivalent residential units (ERU). This is done by taking the usage per connection of each connection type and dividing by the usage per connection of residential connections. Figure II-4 and Figure II-5 show the ERU per connection type and the total number of ERUs. This plan will use the number of ERUs instead of number of connections.

Figure II-4: ERUs Per Connection Type

Residential	Commercial	Industrial	Institutional
1.0	1.0	0.5	5.8

Figure II-5: Total Number of ERUS Per Connection Type

Year	Total	Residential	Commercial	Industrial	Institutional
2017	896	772	64	14	46
2018	968	834	81	16	37
2019	1068	854	100	32	82
2020	1003	814	79	13	97
2021	1038	842	84	14	98

E. AVERAGE CULINARY WATER USAGE

The State of Utah Public Drinking Water regulations require public water system to meet requirements based upon usage. These requirements are found in the State R309 Code. The code provides a standard usage based upon the types of connections serviced in a system. For a

standard residential connection, the code says to assume an average day usage of 400 gallons per day (gpd) per ERU. Historical usage data was provided by Hildale City and that usage was compared against the 400 gpd to check if it would adequately represent the usage in the city's system.

The historical usage from the city was from meter data over the past 5 years (2017-2021). To check against the usage indicated in the State's R309 Code, the average usage per ERU was calculated from the historical usage. The total average usage over the past 5 years was divided by the average number of ERUs and then converted to gpd/ERU as shown in the calculations below.

283,416,000 gallons / 995 ERU = 284,840 gallon/ERU/year
284,840 gallon/ERU/year / 365 days/year = 781 gpd/ERU

Figure II-6 shows a summary of the average usage and historical data that is explained above.

Figure II-6: Hildale & Colorado City Historical Usage Summary

Year	Total Usage (Thousand gallons)	Number of Connections	Usage per Conn. (gpd/conn)	Number of ERUs	Usage Per ERU (gpd/ERU)
2017	315,703	900	961	896	965
2018	262,422	985	730	968	743
2019	260,656	995	718	1,068	669
2020	292,417	936	856	1,003	799
2021	285,883	971	807	1,038	755
5-Year Avg:	283,416	957	814	995	781
This Master Plan will use a historic daily usage of 781 gpd/ERU					

The 781 gpd/ERU average usage calculated from the City's historical usage is significantly higher than the usage that is indicated for use in the State Code. This is because the average household size in the communities of Hildale City and Colorado City are larger than the average household size in the rest of the state. Because of the larger usage per ERU, this plan will determine usage demand from the historical usage instead of the numbers from the State Code. This method will result in a more realistic analysis and is the more conservative of the two methods.

The calculations in this report will be based on the historical average usage of 781 gpd/ERU (0.54 gpm/ERU). It is recommended that future improvements be sized based on this average usage.

F. PEAK DAY DEMAND CULINARY WATER USAGE

Peak Day Demand (PDD) is defined by the Utah Administrative Code as the "anticipated water demand on the day of the highest water consumption". The state code uses 800 gpd/ERU for a peak day demand of a standard residential unit which is twice the average day demand. Therefore, it can be assumed that the PDD for this plan is double the 781 gpd/ERU average demand calculated above. Doubling the average usage results in a peak demand of 1561 gpd/ERU (1.1gpm/ERU).

G. PEAK INSTANTANEOUS DEMAND CULINARY WATER USAGE

Peak Instantaneous Demand (PID) can be described as the highest demand at any one instance in the system. This can be determined based on hourly usage if such data is available. Where hourly usage data does not exist, which is the case of this study, the State Code uses the following method to calculate the PID:

Indoor Usage:

$$Q_{peak\ indoor} = 10.8\ x\ N^{0.64}$$

Where N is the number of connections and Q is the flow in gpm

Outdoor Usage:

$$Q_{peak\ outdoor} = N\ x\ Irr.Acreage\ x\ Demand\ Factor$$

Where N is the number of connections, Irr. Acreage is the average area that is irrigated throughout the system and the Demand Factor is based on the zone given in Table 510-7 of R309-510 of the Utah Administrative Code.

The above calculations result in a PID of 1917 gpm. As demonstrated in the previous demand calculations, the communities' water use does not match with the assumptions the State uses for the calculations found in the administrative code. An alternative method to calculate PID was used to check against the State's equations.

The alternative method still includes a separate calculation for indoor and outdoor usage. A peaking factor was determined for both indoor and outdoor usage. After determining the peaking factors, the indoor and outdoor average usage was multiplied by the respective peaking factors resulting in a PID (indoor) and PID (outdoor). The sum of the two demands resulted in the PID used for this study.

The indoor peaking factor was defined as the PID determined by the State's equation above divided by the State's ADD of 400 gpd/ERU. The outdoor peaking factor was determined by examining the relationship of the outdoor instantaneous demand factor and the outdoor peak day demand factor from the tables in the R309 code. The peak instantaneous demand factor is twice the peak day demand. As mentioned above, the peak day demand can be defined as twice the average day demand and therefore it can be assumed that the outdoor peak instantaneous demand is four times the average outdoor demand. This method resulted in the following peaking factors:

- Indoor Peaking Factor = 3.15
- Outdoor Peaking Factor = 4

The average indoor usage was calculated from the average usage data from the past 5 years in the months of December through February. The average outdoor usage was calculated by subtracting the indoor average usage by the indoor average demand calculated in II-E. This resulted in the following:

- PID (indoor) = 1065 gpm
- PID (outdoor) = 984 gpm
- Total PID = 2049 gpm

This plan will use the more conservative 2049 gpm as the PID. The full calculations used to determine the PID are shown in Appendix B.

H. CONSERVATION

This plan assumes a conservation rate of 0.5% per year over the planning period. This conservation factor is used to represent any conservation efforts from the city, existing connections, or new connections. This rate also takes into account the decrease in average household size that is accompanying the community's current growth. This conservation results in the following demands at the end of the planning window

- ADD (2042) = 699 gpd/ERU
- PDD (2042) = 1397 gpd/ERU

The conservation factor is not used for the PID. As mentioned above, the PID is the highest demand on the system at any given moment. Conservation efforts do not have a major impact on the amount of water that could be used at any given moment.

III. WATER SOURCE CAPACITY ANALYSIS

A. EXISTING WATER SOURCE

To analyze source capacity, all available culinary water sources must first be identified. These sources are listed in Figure III-1. The flow capacity numbers were acquired from Hildale City.

Figure III-1: Hildale and Colorado City Existing Water Sources

Name/#	Flow (CFS)	Flow (gpm)
Wells		
4	0.223	100
8	0.134	60
10	0.189	85
11	0.223	100
15	0.000	0
17	0.000	0
19	0.323	145
21	0.468	210
22	0.267	120
24	0.223	100
Academy	0.579	260
Power Plant*	0.000	0
Subtotal	**2.629**	**1180**
Springs		
Jans Canyon	0.036	16
Maxwell Canyon	0.143	64
Subtotal	**0.178**	**80**
Total Source	**2.807**	**1260**

Listed spring flows are relatively constant. These springs were developed from a horizontal bore into the Navajo sandstone formation.

Wells 15 and 17 are shown as 0 gpm in the source table due to both wells being unavailable during peak demands. The pumps for these wells are set at too high an elevation to be able to supply water during peak summer days. The City is planning on a replacement project for both wells to get them back in service. See the recommended improvements section below for more details on that project.

B. EXISTING REQUIRED WATER SOURCE CAPACITY

The Utah State Code R309-510-7 states that a water system's source needs to meet "the anticipated water demands on the day of the highest water consumption which is the Peak Day Demand". The PDD was determined above as 1,561 gpd/ERU. The source capacity demand for the water system was calculated by multiplying the PDD from Section II-F by the total number of ERUs existing in the system. The results of the analysis are presented in gallons per minute. The results of this analysis are shown in Figure III-2.

Figure III-2: Required Source Capacity (Existing Conditions)

Total Required Source Capacity	1,168 gpm
Total Existing Source Available	1,260 gpm
Existing Culinary System Source Capacity Surplus	92 gpm

C. PROJECTED REQUIRED WATER SOURCE CAPACITY

Projecting growth to the 10-year and 20-year planning periods and using the same method of calculating required source capacity reveals that the water system will have a deficit of source capacity. The projected required source capacity for the 10-year and 20-year planning periods are shown in Figure III-3 and Figure III-4.

Figure III-3: Required Source Capacity (10-Year Planning Period)

Total Required Source Capacity	1,546 gpm
Total Existing Source Available	1,260 gpm
Existing Culinary System Source Capacity Deficiency	-286 gpm

Figure III-4: Required Source Capacity (20-Year Planning Period)

Total Required Source Capacity	1,786 gpm
Total Existing Source Available	1,260 gpm
Existing Culinary System Source Capacity Surplus	-526 gpm

D. RECOMMENDED WATER SOURCE CAPACITY IMPROVEMENTS

The analysis above shows that the existing available source is not sufficient to accommodate a peak day demand. The historical experience has been that during peak summer months with the system running at full capacity, the City is unable to provide enough water. Without being able to provide enough water to meet system demand the water levels in the storage tanks gradually drop during summer months affecting available fire flow and water pressures. This has caused both communities to enact water restrictions during summer months for the last several years.

Source availability improvements are needed now as well as in upcoming years. Hildale City and The Town of Colorado City have performed multiple studies over the years looking at different ways to improve the quantity and quality of available source. These studies, as well as this plan, suggest the following improvements:

1. 1 TO 5 YEAR IMPROVEMENTS

- Replace Wells 15 and 17 – As mentioned above, these are existing wells that are currently not able to produce water during peak demands. It is recommended that the City replace both of these wells. Both wells should be drilled to a deeper depth and have the pump installed at a deeper elevation than the existing pumps. It is anticipated that Well 15 would produce 20gpm and Well 17 would produce 80 gpm.

- Treatment Plant Wells – The quickest available option to help increase source capacity is to drill additional wells in the Arizona side of the system. This portion of Arizona is an open basin and does not require obtaining water rights to drill and use a well. The City is currently working on a study to evaluate the locations of these two wells. The preliminary idea is to drill the wells at the treatment plant. Based on the output of existing wells, it is anticipated that these wells will produce roughly 80 gpm for the shallow well and 120 gpm for the deep well. The well study will help refine these estimated flows.

- Trailhead Well 1 - The City is looking at drilling additional wells in the nearby canyons to the northeast. The water from these canyons would be obtained from different geologic formations than their current wells. The hope is that the water quality is similar to the Jans and Mawell Canyon springs. The Trailhead Well 1 would be located on City owned property by the Squirrel Canyon Trailhead. This well would provide additional source to the town but primarily will act as a test to determine potential quantity and quality of water. It is estimated that this well could produce 175 gpm. These wells are in Utah and will require water rights to drill and use the well. The City currently has water rights that can be transferred to use the proposed well.

2. 5 TO 10 YEAR IMPROVEMENTS

- Trailhead Well 2- If the Trailhead Well 1 proves to be a successful route for obtaining additional source, it is recommended that the City continue to pursue this source with an additional well on the city owned land next to the Squirrel Canyon Trailhead. This well and all future wells up the canyon will require obtaining additional water rights. This Well is also estimated to produce 175 gpm

3. 10 TO 20 YEAR IMPROVEMENTS

- Hildale Groundwater Project Phase I - If the Trailhead Wells are successful at producing good quality water, this plan recommends that additional wells be drilled in the area Northeast of Hildale. These wells would be located on BLM property and would require environmental studies and going through BLM's process (such as a SF299 application and Plan of Development) for obtaining Right-of-Way on BLM land. The City has already begun working through this process with the help of the Washington County Water Conservancy District. Based on the best available information that the City has, it is estimated that this project would produce roughly 350 gpm. The exact location of these wells will be determined through coordination with the City and BLM.

- Hildale Groundwater Project Phase II- This phase involves drilling two additional wells in different location than Phase I but in the same general BLM owned area. Phase II would require the same BLM process and need for additional water rights. This phase is also estimated to produce roughly 350 gpm.

- Hildale Groundwater Project Phase III – This phase is similar to first two and involves additional wells in the BLM owned area Northeast of Hildale. It is estimated that this phase will produce 175 gpm.

These recommended improvements are summarized in Figure III-5. Appendix D includes an exhibit showing the location of these improvements.

Figure III-5: Summary of Recommended Source Improvements

Name/#	Flow (CFS)	Flow (gpm)	Est. Year Installed
	Wells		
Treatment Plan Shallow	0.178	80	2023
Treatment Plant Deep	0.267	120	2023
Well 15 Replacement	0.045	20	2023
Well 17 Replacement	0.178	80	2023
Trailhead Well 1	0.390	175	2025
Trailhead Well 2	0.390	175	2028
Hildale Groundwater Project PH I	0.780	350	2032
Hildale Groundwater Project PH II	0.780	350	2036
Hildale Groundwater Project PH III	0.390	175	2040
Total Projected New Source	**3.398**	**1525**	

E. SOURCE CAPACITY SUMMARY

Figure III-6 and Figure III-7 both show the comparison between the available source capacity and the projected required source capacity. The available source capacity in Figure III-7 represents the source capacity available with the implementation of the recommended improvements.

Figure III-6: Projected Source Capacity with Existing Conditions

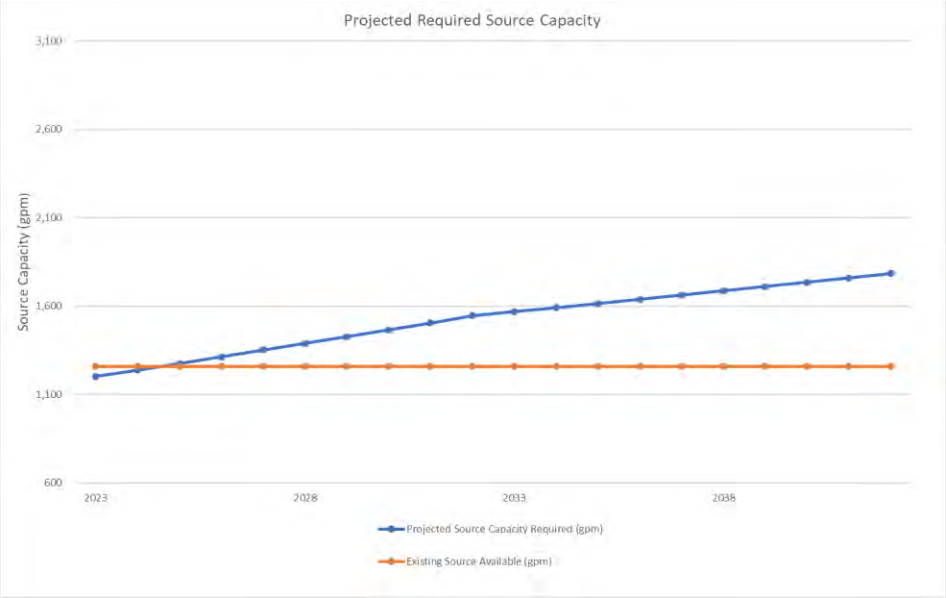
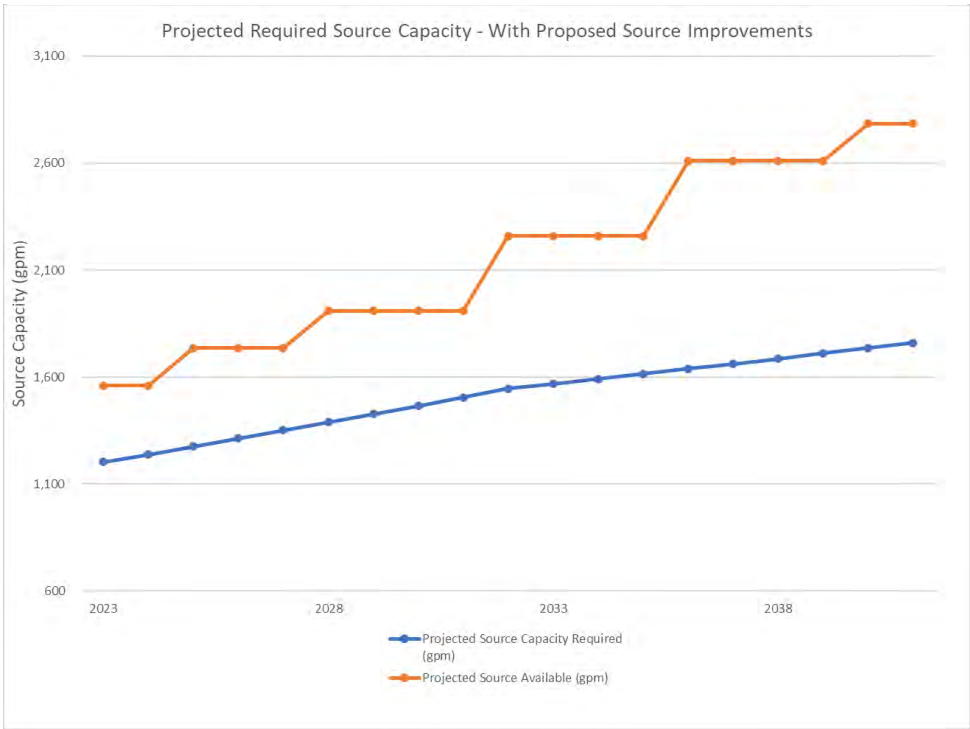


Figure III-7: Projected Source Capacity with Recommended Improv Improvements



IV. WATER STORAGE CAPACITY ANALYSIS

Water storage capacity requirements are found in the State of Utah Public Drinking Water Regulations, R309-510. These regulations require storage for the community's culinary water system to meet one full day's average use requirement for all connections in the community in addition to fire flows for a minimum of two hours and emergency storage as deemed necessary.

A. EXISTING WATER STORAGE CAPACITY

There are currently four existing water storage tanks. These tanks are identified in Figure IV-1 below. The Saddle Tank is higher than the other three, and it receives the water from the springs. The outlet to the Saddle Tank is near the top of the tank allowing unpressurized outflow. In an emergency, there is a valve that can be opened to utilize the storage in the tank. The other three tanks all have the same high-water elevation and receive water from the wells through the treatment plant.

Figure IV-1: Storage Capacity Summary

Existing Tank	Available Storage (gal)
Saddle Tank	60,000
800,000 Gallon Tank	800,000
600,000 Gallon Tank	600,000
Elm Street Tank	1,000,000
Total Existing Storage Capacity	**2,460,000**

B. EXISTING REQUIRED WATER STORAGE CAPACITY

As shown in Section II-E, average water usage per ERU also known as the Average Day Demand (ADD) in the water system is 781 gpd/ERU. In general, fire flow requirements are set by the local Fire Authority or are based on building size and type of construction. This plan uses the same minimum fire flow as the previous plans of 1,500 gpm. Also included in required storage is emergency storage. For planning purposes, this master plan will use an amount of 25% of the total required storage as the emergency storage. The emergency storage is on top of the storage required for an average day and fire flow.

The required storage capacity was calculated by multiplying the ADD by the total number of ERUs currently existing in the system. When compared with the system's total storage capacity summarized above, the calculation shows that the City has considerable surplus total storage capacity under current conditions. The results of this analysis are shown in Figure IV-2.

Figure IV-2: Required Storage Capacity (Existing Conditions)

Total Required Storage Capacity	**1,276,105** gal
Total Existing Storage Available	**2,460,000** gal
Existing Culinary System Storage Capacity Surplus	**1,183,895** gal

C. PROJECTED REQUIRED WATER STORAGE CAPACITY

The projected culinary water storage capacity required at the end of the planning period is determined from the same factors explained in Section B above, but the projected number of ERUs is inserted into the calculations instead of the number of existing ERUs. The results of the analysis are shown below in Figure IV-3 and Figure IV-4.

Figure IV-3: Required Storage Capacity (10-Year Planning Window)

Total Required Storage Capacity	1,616,624 gal
Total Existing Storage Available	2,460,000 gal
Projected Culinary System Storage Capacity Surplus	843,376 gal

Figure IV-4: Required Storage Capacity (20-Year Planning Window)

Total Required Storage Capacity	1,832,099 gal
Total Existing Storage Available	2,460,000 gal
Projected Culinary System Storage Capacity Surplus	627,901 gal

D. STORAGE CAPACITY CHALLENGES

The storage capacity analysis results show that the city has a surplus of storage through the planning window. However, there are still some concerns and shortcomings with the existing storage facilities.

- During summer months water operators have expressed concerns that because they are barely able to meet system demands with the wells during the day, they are not able to keep the tanks full and therefore do not have the full available storage shown in the calculation above.

- The water system consists of a single pressure zone. There are multiple areas around the community within each of the cities' limits that are at an elevation higher than the maximum elevation the existing tanks can serve.

E. RECOMMENDED WATER STORAGE CAPACITY IMPROVEMENTS

To help mitigate the concerns mentioned above and to improve the overall system, this plan recommends the following improvements:

1. 1 TO 5 YEAR IMPROVEMENTS

- Sandhill Tank – This tank would be constructed above the Elm Street tank to create a higher-pressure zone that would cover the area north of Utah Ave and east of the highway. This project would include a booster pump to get water to the tank and valving to create the new pressure zone. It is recommended this tank be at least a 1-million-gallon tank.

Based on the existing ADD this tank would be able to serve 1,000 ERUs in the new pressure zone.

2. 5 TO 10 YEAR IMPROVEMENTS

- Tank Near Squirrel Canyon Trail Head- This tank would be installed on the same site as the two wells recommended in the same area in Section III-D. This tank would serve two purposes. First, it would collect the water from the proposed Trailhead Well and eventually the Hildale Groundwater Project wells. The second purpose is to create a higher-pressure zone on the northeast side of Hildale. This pressure zone would serve the existing and new building up the canyons north of Williams Ave. This plan recommends the tank capacity to be 500,000 gallons, but the capacity should be reevaluated after the City receives results on how much water can be obtained from the Trailhead Well 1.

3. 10 TO 20 YEAR IMPROVEMENTS

- Tank for New Annexation Area – Recently Hildale City annexed land west of the previous city limits. It is anticipated that new developments will begin to come into the area in the next couple of years. As this new area grows it is recommended the city consider construction of a storage facility closer to the development areas than their existing tanks. This plan uses a recommended storage capacity of 1,000,000 gallons. However, the location and size of the tank should be determined based on how the area grows over the next several years. Because of these unknowns, the tank is not depicted in the recommended improvement exhibit. However, a cost estimate is provided for this project in Appendix C

These recommended storage improvements are summarized in. Appendix D includes an exhibit showing the location of these improvements.

Figure IV-5: Summary of Recommended Storage Improvements

Proposed Tank	Available Storage (gal)	Est. Installation Date
Sandhilll Tank	1,000,000	2024
Trailhead Tank	500,000	2028
Tank For Annexation Area	1,000,000	2042
Total Projected New Storage	**2,500,000**	

F. STORAGE CAPACITY SUMMARY

- Figure IV-6 and Figure IV-7 both show the comparison between the available storage capacity and the projected required storage capacity. The available storage capacity in Figure IV-7 represents the storage capacity available with the implementation of the recommended improvements.

Figure IV-6: Projected Storage Capacity with Existing Conditions

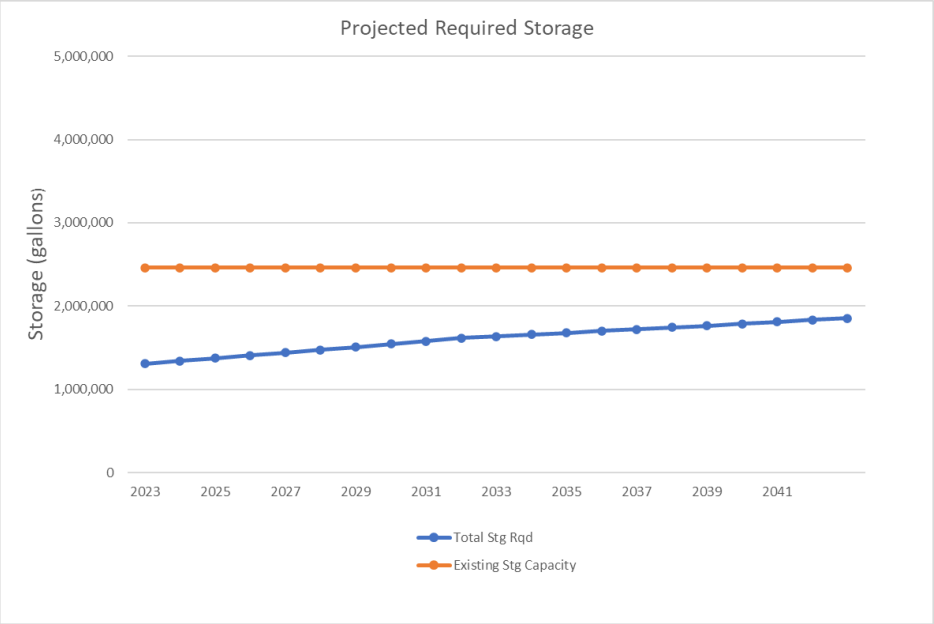
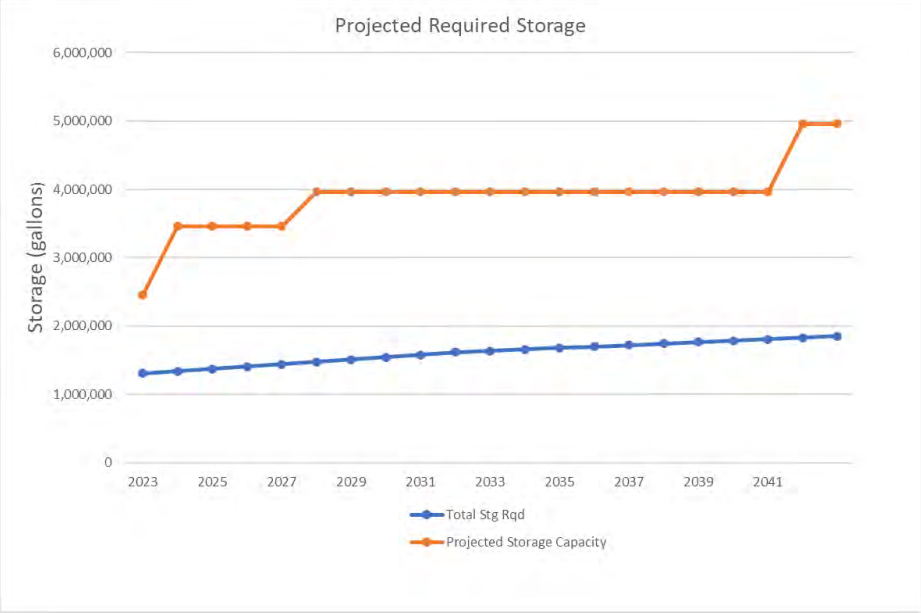


Figure IV-7: Projected Storage Capacity with Recommended Improvements



V. WATER TREATMENT REQUIREMENTS AND ANALYSIS

A. GENERAL REQUIREMENTS

The State of Utah Public Drinking Water Regulations, in accordance with the National Safe Drinking Water Act, have adopted "primary;" regulations for the protection of public health and "secondary" regulations related to the taste and aesthetics. The regulations recommend that all culinary water sources have provisions for continuous disinfection. Hildale/Colorado City have culinary water treatment facility to treat the existing wells in an effort to meet the minimum requirements.

B. EXISTING TREATMENT FACILITIES

The existing culinary water treatment plant uses a greensand filtration process which includes injecting the water with potassium permanganate. The system wells are pumped to the treatment plant where the plant treats for iron, manganese, and radium. The plant contains 6 pressure vessels designed to operate in parallel and treat 2,400 gpm. Historically, operating the vessels in parallel has not treated the water as effectively as operators would like, and the system has been unable to deliver 1200 gpm throught the filters. So, the plant has been operated in series (water going through two vessels instead of one) for the past several years. Operating the plant in series reduces the max capacity to 1,200 gpm.

C. RECOMMENDED WATER TREATMENT FACILITY IMPROVEMENTS

The City is in the process of a refurbishing and improving the plant. The project is being referred to as the Mohave County ARPA Project. This project includes the following elements:

- Installing one additional filter on each filter train. This will provide a redundant filter so that during backwashes or maintenance, the filtration rate through the vessels will not need to fluctuate.
- Install a pretreatment system up stream of the pressure vessels.
- Change out filter media in the vessels. Media will be replaced with a newer media that is believed to be more robust than what is currently being used in the plant.

Plant operators expect these improvements to allow for the treatment plant to operate in parallel again and reach the design flow of 2,400 gpm.

In addition to the improvements to the treatment plant, this plan recommends improvements to the raw water transmission lines which carry water from the wells to the treatment plant. These lines are old, undersized, and estimated to have iron and other mineral deposits adhering to the pipe. It is possible the amount of flow going to the treatment plant is restricted by these deposits.

It is recommended that a new 12" transmission line be installed in Richard St. to convey water from the wells south of the treatment plant. It is also recommended that access points be installed that

allow water operators to flush and clean out the lines on the new line and on the remaining existing raw water lines.

Both the treatment improvements and the improvements to the raw waterline are in the 0 to 5 year improvements window.

VI. WATER DISTRIBUTION SYSTEM ANALYSIS

The State of Utah Public Water Regulations, R309-105-9, states three pressure conditions which must be met to demonstrate adequate service capacity of a system. These conditions are:

- At least 40 psi must be retained as residual pressure in the distribution system under a Peak Day Demand (PDD).
- At least 30 psi must be retained as residual pressure in the distribution system under Peak Instantaneous Demand (PID)
- At least 20 psi must be retained as residual pressure in the distribution system under PDD plus fire flow conditions.

A. EXISTING DISTRIBUTION SYSTEM ANALYSIS

The existing PDD and PID were calculated in Section II. These flows are shown below:

- PDD – 1,561 gpd/ERU = 1,169 gpm with the existing number of ERUs
- PID – 2,049 gpm

As mentioned in Section IV, this report used a fire flow of 1,500 gpm.

The existing Hildale and Colorado City culinary water distribution system has been modeled using the computer program Infowater® by Innovyze, Inc. For the existing system network there are areas which provide less than the required 40 psi of pressure for PDD, areas that provide less than 30 psi for PID, and areas that do not provide adequate fire flow. For the most part, the deficiencies in each of these requirements fall in the same areas of the system. Exhibits showing the areas of low pressure and fire flow are located in Appendix D. Below is a summary of these areas:

- Northwest Hildale (area between Newel Ave. and the Elm Street tank) - This area suffers from poor fire flow, lack of hydrants, and low pressure during PDD and PID. Fire flows in this area have been modeled as low as 657 gpm during PDD. This is largely the result of proximity to the elevation of the Elm St. tank. Pressures during PDD and PID are as low as 23 psi and 19 psi respectively.

- Northeast Hildale (area north of Jessop Ave. and west of Carlin St.) – This area suffers from poor fire flow, lack of hydrants, and low pressure during PDD and PID. Fire flows in this area have been modeled as low as 637 gpm during PDD. This largely is a result of proximity in elevation to the tanks, smaller line sizes, and lack of looping. Pressure during PDD and PID are as low as 33 psi and 27 psi respectively.

- East Colorado City (Between Edson Ave. and E Johnson Ave.) – This area suffers from poor fire flow and slightly low pressures during PDD scenarios. Fire Flows have been modeled as low as 585 gpm during PDD. This is largely due to smaller line sizes and lack of looping. The lowest pressure in the area during PDD was at 34 psi.

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 connections for the 20-year planning window is inserted into the calculations. The results of this calculation for both PDD and PID are shown below:

- PDD – 1,307 gpd/ERU = 1,787 gpm with the projected number of ERUs
- PID – 3,481 gpm

The same water model that was used to examine the existing distribution system was used to analyze the scenarios of the projected system at the end of the 20-year window. According to the model, the areas of the system not meeting the conditions of R309-105-9 at the end of the planning period are the same areas that don't currently meet these conditions. There are no additional areas of concern that arise in the existing system.

C. FIRE HYDRANTS

State regulations require all new fire hydrants to be served from 8" diameter or larger pipelines unless it can be proven through the use of modeling that 6" lines are sufficient. There are a number of existing hydrants in the system that are on 6" or smaller pipes.

State requirements also state that hydrant spacing be no more than 500 feet. There are numerous locations throughout the system where additional fire hydrants are required to meet the 500-foot maximum spacing.

D. RECOMMENDED DISTRIBUTION SYSTEM IMPROVEMENTS

From the system deficiencies observed in the analysis, this plan recommends the following improvements:

1. 0 TO 5 YEAR IMPROVEMENTS

- Fire Hydrants – Install additional fire hydrants to meet the minimum required spacing. In placing these new hydrants, some smaller lines will need to be replaced with 8" lines to meet the requirements mentioned above. It is recommended that this project replace all undersized lines which are not already included in the other improvements. This project would help bring the system into compliance with fire flow requirements.

- Jessop Ave. Line – Install a new 8" diameter water main on Jessop Ave from Juniper St. to Redwood St. and tie into the existing north and south water mains on Redwood St, Maple St., Elm St., and Juniper St. Some of the north and south lines will need to be extended with

an 8" line to reach Jessop Ave. This water main will provide some looping in the area and mitigate the low pressures experienced in this area.

2. 5 TO 10 YEAR IMPROVEMENTS

- University Ave. Line – Install a new 8" water main that would go from University Ave east and then down the irrigation canal alignment to Township Ave. This added water main will provide looping to the east side of Colorado City mentioned above that is experiencing inadequate fire flow.

- Canyon St Line – Install a new 8" water main in Canyon St. from Memorial St. to Newel Ave. This would provide looping to the northeast Hildale area and help mitigate some of the low pressures and low fire flows. This water main would also act as a trunkline for delivering water from the new wells in the Hildale Groundwater Project and the Trailhead Wells.

3. 10 TO 20 YEAR IMPROVEMENTS

- Provide water to Annexation Area – As mentioned in previous sections, the City of Hildale has recently annexed new land west of the current city boundary. Currently there is no water infrastructure in place to provide water to this area. It is recommended the City create a plan to provide water to these areas to include the portion to be provided by the City and the portion to be provided by developer(s). For planning purposes this plan assumes two trunk lines to be installed, one from Utah Ave. to the south side of the annexation area and the second line from the new Sandhill Tank to the north side of the annexation area.

These recommended improvements are summarized in Figure VI-1. Appendix D includes an exhibit showing the location of these improvements.

Figure VI-1: Summary of Recommended Distribution Improvements

Proposed Improvement	Est. Installation Date
Fire Hydrant Project	2023
Jessop Ave. Line	2025
University Ave. Line	2028
Canyon St. Line	2030
Annexation Trunklines	2040

VII. WATER AVAILABILITY

A major concern for the community is long term availability of their water source. With the ongoing drought, this is a concern for most, if not all, communities in the surrounding counties. The following are ideas that the City could investigate to potentially lengthen the availability of water in the area. These ideas are not recommended improvements but starting points for future conversations.

1. WATER CONSERVATION PROGRAM

Implementing a water conservation program is a good way to reduce current water usage and prolong water availability as well as defer the need for some water infrastructure improvements. A conservation program is cheap in that it does not require any construction of infrastructure prior to implementation. Below is a potential list of items that could be included in such a program:

- Provide education on how much water local grasses and trees require and encourage residents to limit outdoor watering to not exceed what is needed.
- Perform a "water audit" on city owned irrigation to determine if outdoor water use could be reduced on city owned property.
- Look into capturing rainwater for outdoor watering. (This would require some investigation on how much water Utah and Arizona will allow to be captured and used)
- Provide incentives for residents to change their existing landscaping to something which requires less water such as Xeriscape.

2. CONSTRUCTION WATER

Currently construction water is typically obtained from fire hydrants. This means that the construction in town is typically using culinary water for construction. This may not be a major usage of the culinary water system, but there may be some inexpensive options to provide non culinary grade water for use as construction water.

The Power Plant Well that is unavailable for use in the culinary water system. This well could be setup with a connection to provide non culinary grade construction water. While this option does alleviate some strain from the culinary water system, it is still using the same aquifer (source) that the culinary water system is using.

3. RECYCLE BACKWASH WATER AT TREATMENT PLANT

Part of the process of the existing treatment plant includes backwashing the filters occasionally with clean, culinary grade water. Currently the backwash water is sent into the sewer system which is common in many similar plants. It is possible to capture the backwash water, reuse a portion of it, and send it back through the plant. This option saves a minimal amount of water, backwashes do not happen frequently, and they do not use a large amount of water per backwash. However, this adjustment would save water and should be considered when making future improvements to the treatment facility.

4. SECONDARY WATER SYSTEM

Implementing a secondary water system would be a major benefit to the culinary water system. A secondary system in Hildale/Colorado City would reduce the culinary water use by roughly 40%. This reduction would greatly help with the deficiencies discussed in previous sections of this plan. However, constructing a new water system from the ground up is not cheap, and the added irrigation user rate needed to implement a new system would increase most customer water bills. It is possible to install a complete system in phases or install a small system just for parks or specific high outdoor use areas.

5. WASTEWATER REUSE

Treating wastewater for reuse is an option that would provide more water to use which is not coming from the same sources as the culinary water system. Treating wastewater sufficiently to be used for human consumption is very expensive and not likely practical for Hildale/Colorado City. However, reuse could be used for things such as construction water or irrigation for parks and agriculture that is not for human consumption. Treatment to this level is cheaper and may provide a cost effective alternative for the city.

VIII. ANALYSIS OF FUTURE GROWTH AREAS

Working with City staff, multiple areas have been identified as locations of future large developments. These are areas in which developers have had some discussions with the city on potential developments, and there is a possibility of the developments being built within the 20-year window. Below is a list of growth areas that were specifically looked at in this plan:

- Area around and west of the Elm Street Tank
- The recent annexation area west of Hildale City
- Larger empty lots on the northeast side of Colorado City

During the water modeling discussed in Section VI, these areas were included in the model as having at least partial developments. The demands used for the projected system water model was based on assumptions made with the current information that is available regarding developments in these areas. The recommended improvements identified in the previous sections included providing water to these growth areas. However, the timing in which these areas develop could adjust the time frame in which the recommended improvements are needed for the system.

These potential growth areas are in different stages of development planning. It is recommended that the city reevaluate the timing, location, and size of the recommended improvements for these areas as these areas move closer to being developed and more information is available.

IX. SUMMARY OF RECOMMENDED IMPROVEMENTS

A. PRIORITY OF IMPROVEMENTS

Figure IX-1 shows a summary of the proposed improvements with the estimated cost for the project in today's dollars, the estimated year the improvements will be installed and the estimated cost of the project accounting for inflation. This plan uses an assumed inflation rate of 3%.

Figure IX-1: Summary of Recommended Improvements

Project	Cost Estimate (Todays $)	Est. Year of Installation	Estimated Costs with Inflation
0 To 5 Year Improvements			
Treatment Plant Wells	$ 1,288,650.00	2023	$ 1,327,309.50
Wells 15 and 17 Replacement	$ 1,288,650.00	2023	$ 1,327,309.50
Fire Hydrant Project	$ 1,733,500.00	2023	$ 1,785,505.00
Mohave County ARPA Project	$ 948,000.00	2023	$ 976,440.00
Raw Water Transmission Line	$ 998,800.00	2023	$ 1,028,764.00
Trailhead Well 1	$ 2,445,250.00	2025	$ 2,671,990.70
Sandhilll Tank	$ 3,983,400.00	2025	$ 4,352,768.73
Jessop Ave. Line	$ 808,770.00	2025	$ 883,764.82
Total Costs for 0 to 5 Year Improvements	**$ 13,495,020.00**		**$ 14,353,852.24**
5 To 10 Year Improvements			
Trailhead Well 2	$ 1,713,100.00	2028	$ 2,045,530.99
Trailhead Tank	$ 1,864,100.00	2028	$ 2,225,832.89
Canyon St. Line	$ 374,900.00	2028	$ 447,650.21
Universiy Ave. Line	$ 326,000.00	2030	$ 412,967.05
Total Costs for 5 to 10 Year Improvements	**$ 4,278,100.00**		**$ 5,131,981.13**
10 To 20 Year Improvements			
Hildale Groundwater Project PH I	$ 3,691,800.00	2032	$ 4,961,470.49
Hildale Groundwater Project PH II	$ 4,220,100.00	2036	$ 6,383,279.90
Hildale Groundwater Project PH III	$ 2,887,050.00	2040	$ 4,915,009.37
Annexation Trunklines	$ 2,329,700.00	2040	$ 3,966,158.30
Tank For Annexation Area	$ 3,658,500.00	2042	$ 6,607,657.95
Total Costs for 10 to 20 Year Improvements	**$ 16,787,150.00**		**$ 26,833,576.01**
Total Costs for All Improvements	**$ 34,560,270.00**		**$ 46,319,409.38**

The detailed cost estimate for each project is located in Appendix C.

X. POSSIBLE FINANCING PLAN

The City is currently in the process of applying and obtaining grant funds through different federal and state agencies. They have received notice that they will be receiving 1.4 million dollars of ARPA funds from the recent infrastructure bills through Mohave County. It is anticipated that these grant funds will be used to fund the projects on the 0-5 year improvement list.

The purpose of this possible finance plan is to show what a funding plan may look like to pay for the projects recommended for 2023. The City may also choose to complete the improvements in separate smaller projects. The projects are assumed to be paid with loan and grant money, including the ARPA funding mentioned above. It should be noted agencies may require some amount of self-participation in order to provide funding.

Figure X-1 outlines a possible financing plan from the Utah Division of Drinking Water (DDW). This plan assumes 30% of the funding from DDW will be grant while the remaining 70% is loan at a 2.5% interest rate and payback term of 30 years. It is possible a lower interest rate or higher portion of grants will be available. It is recommended that, as the City prepares to start this project, they contact DDW and other funding agencies such as the Water Infrastructure Finance Authority of Arizona, US Department of Agriculture - Rural Development, or the Utah Community Impact Board to determine what funding is available and where they can get the best funding package.

The possible financing plan shown in Figure X-1 results in an annual payment of $147,181.73. This annual payment along with other O&M expenses for the water system, would require an average charge for culinary water user rates to be $59.24.

The City is looking into adjusting their culinary water impact fees. A majority of the recommended improvements in this plan are fully or partially Impact Fee eligible. If the City were to begin collecting impact fees this would help to fund the recommended improvements.

Figure X-1: Possible Financing plan

HILDALE CITY/TOWN OF COLORADO CITY						
POSSIBLE FINANCING PLAN 2023 projects						
Total Project Cost (Construction + Professional Services):					$	6,445,328
Proposed Funding:	% of Proj	Rate	Term	Principal		Est. Payment
ARPA Grant (Mohave County)	22%			$ 1,400,000.00		
Self Participation	10%			$ 644,532.80		
DDW Grant	20%			$ 1,320,238.56		
DDW Loan	48%	2.50%	30	$ 3,080,556.64		$147,181.73
TOTAL PROJECT ANNUAL PAYMENT (2023):						$147,181.73
O&M EXPENSES: (First Year of New Debt Service Payment)						
Office Expenses and Travel					$	29,267.63
Repairs and Maintenance					$	366,075.73
Utilities					$	190,554.97
Legal and Professional Fees					$	64,482.00
Renewal and Replacement Fund						$0
Interest Income					$	(5,062.58)
Subtotal Expenses:						$645,318
EXISTING DEBT SERVICE						
Existing Debt Service						$0
Subtotal Existing Annual Debt Service:						$0
GRAND TOTAL EXPENSES:						$792,499
ANNUAL INCOME						
Impact Fees Expended for 2023 Projects					$	-
Total Number Of ERU						1,115
Average Monthly Water User Rate/ERU						$59.24
Charges for Services, Fees, etc.						$792,499
GRAND TOTAL INCOME:						$792,499

APPENDIX A
Growth Rate Analysis

Population & Growth Rate						
Calandar year	Hildale Population	Colorado City Population	Total Population	Est. Growth Rate	# of Conn.	# of ERU
1990	1325	2426	3751			
2000	1895	3258	5153	3.23%		
2010	2660	4722	7382	3.66%		
2015	2926	4808	7734	0.94%		
2016	2926	4804	7730	-0.05%	891	868
2017	2916	4809	7725	-0.06%	895	891
2018	2916	4825	7741	0.21%	862	968
2019	2910	4836	7746	0.06%	995	1068
2020	2727	4531	7258	-6.30%	936	1004
2021	2825	4694	7519	3.60%	971	1039
2022	2931	4871	7803	3.77%	1009	1078
2023	3034	5042	8076	3.50%	1044	1116
2024	3140	5218	8358	3.50%	1081	1155
2025	3250	5401	8651	3.50%	1119	1195
2026	3364	5590	8954	3.50%	1158	1237
2027	3481	5786	9267	3.50%	1198	1280
2028	3595	5974	9568	3.25%	1237	1322
2029	3711	6168	9879	3.25%	1278	1365
2030	3832	6368	10200	3.25%	1319	1409
2031	3957	6575	10532	3.25%	1362	1455
2032	4085	6789	10874	3.25%	1406	1502
2033	4167	6925	11091	2.00%	1434	1532
2034	4250	7063	11313	2.00%	1463	1563
2035	4335	7204	11540	2.00%	1492	1594
2036	4422	7348	11770	2.00%	1522	1626
2037	4510	7495	12006	2.00%	1553	1659
2038	4600	7645	12246	2.00%	1584	1692
2039	4692	7798	12491	2.00%	1615	1726
2040	4786	7954	12741	2.00%	1648	1760
2041	4882	8113	12995	2.00%	1681	1796
2042	4980	8276	13255	2.00%	1714	1831

APPENDIX B
Water Use Analysis

Year	Total Usage (Thousand gallons)	Number of Connections	Usage per Conn. (gpd/conn)	Number of ERUs	Usage Per ERU (gpd/ERU)
2017	315,703	900	961	895	966
2018	262,422	985	730	968	743
2019	260,656	995	718	1,068	669
2020	292,417	936	856	1,004	798
2021	285,883	971	807	1,039	754
5-Year Avg:	283,416	957	814	995	781

Peak Instantaneous Demand Calculations (State)			
Indoor Peak Instantaneous Demand			
Q=	10.8 X N^.64		N= No. of ERU
2022	Q=	943	gpm
	Q=	1259	gpd/ERU
Outdoor Peak Instantaneous Demand			
Irrigation Zone 5 =		9.04	gpm/Irrigated Acre
Irrigatated Acres /ERU		0.1	Irrigated Acres/ERU
Q=	Irr Acres/ERU X Irr Zone FactorX No. ERU		
Example:			
2022	Q=	975	gpm

Peak Instantaneous Demand Calculations (Alternative)			
Indoor Peaking Factor			
P.F.= Q(PID)/Q(ADD) =		3.15	
Q= Indoor ADD * P.F.			
Q=	1422	gpd/ERU	
Q=	1065	gpm	
Outdoor Peaking Factor			
P.F.= Zone 5 PID (9.04))/Zone 5 PDD (4.52) =			2 for PDD to PID
- Because of this we can assume that he P.F. for ADD to PID is 4			
Q= Outdoor ADD* P.F.			
Q=	1315	gpd/ERU	
Q=	984	gpm	

$$Required\ Source\ Capacity = \#ERU\ X\ \frac{gpd}{\#ERU}\ X\ \frac{1\ Day}{24\ hr}\ X\ \frac{1\ hr}{60\ min}$$

$$Required\ Storage\ Capacity = \#ERU\ X\ \frac{gpd}{\#ERU} + Fire\ Flow\ (1{,}500gpm)\frac{60\ min}{1\ hr}\ X\ 2hr$$

*This plan added a 25% Emergency Storage on top of the calculated Required Storage Capacity.

Current & Projected Required Source Capacity								
Year	# of ERU	Percent Reduction In Usage Per ERU	Peak Day Usage (gpd/ERU)	Source Capacity Required (gpm)	Existing Source Available (gpm)	Treatment Plan Capacity (gpm)	Source Capacity Surplus/Deficit (gpm)	Projected Source Available (gpm)
2022	1078	0.0%	1,561	1,169	1490	1200	321	1,490
2023	1116	0.5%	1,553	1,204	1490	1200	286	1,760
2024	1155	0.5%	1,546	1,239	1490	1200	251	1,760
2025	1195	0.5%	1,538	1,276	1490	1200	214	1,760
2026	1237	0.5%	1,530	1,314	1490	1200	176	2,010
2027	1280	0.5%	1,522	1,353	1490	1200	137	2,010
2028	1322	0.5%	1,514	1,390	1490	1200	100	2,260
2029	1365	0.5%	1,506	1,428	1490	1200	62	2,260
2030	1409	0.5%	1,499	1,467	1490	1200	23	2,260
2031	1455	0.5%	1,491	1,507	1490	1200	(17)	2,260
2032	1502	0.5%	1,483	1,547	1490	1200	(57)	2,760
2033	1532	0.5%	1,475	1,570	1490	1200	(80)	2,760
2034	1563	0.5%	1,467	1,593	1490	1200	(103)	2,760
2035	1594	0.5%	1,460	1,616	1490	1200	(126)	2,760
2036	1626	0.5%	1,452	1,640	1490	1200	(150)	2,760
2037	1659	0.5%	1,444	1,663	1490	1200	(173)	2,760
2038	1692	0.5%	1,436	1,688	1490	1200	(198)	2,760
2039	1726	0.5%	1,428	1,712	1490	1200	(222)	2,760
2040	1760	0.5%	1,421	1,737	1490	1200	(247)	3,010
2041	1796	0.5%	1,413	1,762	1490	1200	(272)	3,010
2042	1831	0.5%	1,405	1,787	1490	1200	(297)	3,010
2043	1868	0.5%	1,397	1,813	1490	1201	(323)	3,010

Storage Capacity Analysis										
Year	Number of ERU	Percent Reduction In Usage Per ERU	Avg. Usage (gpd/ERU)	Storage Required (gal)	Fire Flow Stg Rqd	Emergency Supply (25%)	Existing Stg Capacity	Total Stg Rqd	Storage Capacity Surplus/Deficit (gal)	Projected Storage Capacity
2022	1078	0.0%	781	841,484	180,000	255,371	2,460,000	1,276,855	1,183,145	2,460,000
2023	1116	0.5%	777	866,582	180,000	261,645	2,460,000	1,308,227	1,151,773	2,460,000
2024	1155	0.5%	773	892,405	180,000	268,101	2,460,000	1,340,506	1,119,494	3,460,000
2025	1195	0.5%	769	918,974	180,000	274,744	2,460,000	1,373,718	1,086,282	3,460,000
2026	1237	0.5%	765	946,310	180,000	281,578	2,460,000	1,407,888	1,052,112	3,460,000
2027	1280	0.5%	761	974,434	180,000	288,608	2,460,000	1,443,042	1,016,958	3,460,000
2028	1322	0.5%	757	1,000,944	180,000	295,236	2,460,000	1,476,179	983,821	3,960,000
2029	1365	0.5%	753	1,028,147	180,000	302,037	2,460,000	1,510,184	949,816	3,960,000
2030	1409	0.5%	749	1,056,061	180,000	309,015	2,460,000	1,545,077	914,923	3,960,000
2031	1455	0.5%	745	1,084,704	180,000	316,176	2,460,000	1,580,880	879,120	3,960,000
2032	1502	0.5%	742	1,114,094	180,000	323,523	2,460,000	1,617,617	842,383	3,960,000
2033	1532	0.5%	738	1,130,395	180,000	327,599	2,460,000	1,637,993	822,007	3,960,000
2034	1563	0.5%	734	1,146,902	180,000	331,725	2,460,000	1,658,627	801,373	3,960,000
2035	1594	0.5%	730	1,163,617	180,000	335,904	2,460,000	1,679,522	780,478	3,960,000
2036	1626	0.5%	726	1,180,543	180,000	340,136	2,460,000	1,700,678	759,322	3,960,000
2037	1659	0.5%	722	1,197,680	180,000	344,420	2,460,000	1,722,100	737,900	3,960,000
2038	1692	0.5%	718	1,215,030	180,000	348,757	2,460,000	1,743,787	716,213	3,960,000
2039	1726	0.5%	714	1,232,595	180,000	353,149	2,460,000	1,765,744	694,256	3,960,000
2040	1760	0.5%	710	1,250,377	180,000	357,594	2,460,000	1,787,971	672,029	3,960,000
2041	1796	0.5%	706	1,268,377	180,000	362,094	2,460,000	1,810,471	649,529	3,960,000
2042	1831	0.5%	703	1,286,596	180,000	366,649	2,460,000	1,833,245	626,755	4,460,000
2043	1868	0.5%	699	1,305,038	180,000	371,259	2,460,000	1,856,297	603,703	4,460,000

Water Distribution Analysis						
Year	No. ERU	ADD (gpm)	PDD (gpm)	PID Indoor (gpm)	PID Outdoor (gpm)	PID Total (gpm)
2022	1078	584	1,169	1065	984	2049
2023	1116	602	1,204	1102	1019	2121
2024	1155	620	1,239	1141	1054	2195
2025	1195	638	1,276	1181	1091	2272
2026	1237	657	1,314	1222	1129	2351
2027	1280	677	1,353	1265	1169	2434
2028	1322	695	1,390	1306	1207	2513
2029	1365	714	1,428	1348	1246	2594
2030	1409	733	1,467	1392	1287	2679
2031	1455	753	1,507	1437	1329	2766
2032	1502	774	1,547	1484	1372	2856
2033	1532	785	1,570	1514	1399	2913
2034	1563	796	1,593	1544	1427	2971
2035	1594	808	1,616	1575	1456	3030
2036	1626	820	1,640	1606	1485	3091
2037	1659	832	1,663	1638	1515	3153
2038	1692	844	1,688	1671	1545	3216
2039	1726	856	1,712	1705	1576	3280
2040	1760	868	1,737	1739	1607	3346
2041	1796	881	1,762	1773	1639	3413
2042	1831	893	1,787	1809	1672	3481

APPENDIX C
Engineers Opinion of Probable Cost

SUNRISE ENGINEERING

11 North 300 West, Washington Utah 84780
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Engineer's Opinion of Probable Cost

Treatment Plant Wells 16-Jun-22
Hildale City BCW/tcd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 37,800.00	$ 37,800.00
2	Pre-Construction DVD and Project Sign	1	LS	$ 1,500.00	$ 1,500.00
3	GeoPhysical Logging	1	LS	$ 15,000.00	$ 15,000.00
4	Disinfection and Capping	1	LS	$ 4,000.00	$ 4,000.00
5	Well Driller's Report	1	LS	$ 2,500.00	$ 2,500.00
6	Site Restoration	1	LS	$ 10,000.00	$ 10,000.00
7	Misc. Electrical Improvements	1	LS	$ 15,000.00	$ 15,000.00
DEEP WELL					
8	Conductor Casing	100	LF	$ 400.00	$ 40,000.00
9	20" Diameter Well Drilling	700	LF	$ 123.00	$ 86,100.00
10	12" Diameter Well Drilling - Pilot Hole	700	LF	$ 160.00	$ 112,000.00
11	12" Well Casing	600	LF	$ 170.00	$ 102,000.00
12	2" Galvanized Tremie Pipe	100	LF	$ 40.00	$ 4,000.00
13	Furnish and Install Pea Gravel	400	LF	$ 115.00	$ 46,000.00
14	Bentonite Packer	1	LS	$ 6,000.00	$ 6,000.00
15	Conductor Casing Removal	1	LS	$ 8,000.00	$ 8,000.00
16	Flow Meter	1	EA	$ 10,000.00	$ 10,000.00
17	Initial Well Development	40	HR	$ 700.00	$ 28,000.00
18	Install Pump for Development and Testing	1	LS	$ 40,000.00	$ 40,000.00
19	Well Development and Pumping	80	HR	$ 700.00	$ 56,000.00
20	Misc. Well and Pump Testing	1	LS	$ 10,000.00	$ 10,000.00
21	Well Head, Disinfection and Capping	1	LS	$ 8,500.00	$ 8,500.00
22	Well Pad and Pipping	1	LS	$ 15,000.00	$ 15,000.00
SHALLOW WELL					
23	Conductor Casing	1	LS	$ 40,000.00	$ 40,000.00
24	16" Diameter Well Drilling	120	LF	$ 270.00	$ 32,400.00
25	8" Well Casing	80	LF	$ 100.00	$ 8,000.00
26	8" Stainless Steel Screen	40	LF	$ 300.00	$ 12,000.00
27	2" Galvanized Tremie Pipe	20	LF	$ 40.00	$ 800.00
28	Instrument Pipe	120	LF	$ 50.00	$ 6,000.00
29	Furnish and Install Fine Silica Sand	120	LF	$ 125.00	$ 15,000.00
30	Bentonite Packer	1	LS	$ 6,000.00	$ 6,000.00
31	Conductor Casing Removal	1	LS	$ 6,000.00	$ 6,000.00
32	Sanitary Grout Seal	1	LS	$ 150.00	$ 150.00
33	Flow Meter	1	LS	$ 10,000.00	$ 10,000.00
34	Initial Well Development	40	HR	$ 700.00	$ 28,000.00
35	Install Pump for Development and Testing	1	LS	$ 40,000.00	$ 40,000.00
36	Well Development and Pumping	80	HR	$ 700.00	$ 56,000.00
37	Misc. Well and Pump Testing	1	LS	$ 10,000.00	$ 10,000.00
38	Well Head, Disinfection and Capping	1	LS	$ 8,500.00	$ 8,500.00
39	Well Pad and Pipping	1	LS	$ 15,000.00	$ 15,000.00
			SUBTOTAL		**$ 951,250.00**
			CONTINGENCY	20%	**$ 190,300.00**
			CONSTRUCTION TOTAL		**$ 1,141,550.00**
INCIDENTALS					
1	Engineering Design	4.3%	LS	$ 55,000.00	$ 55,000.00
2	Bidding & Negotiating	0.6%	HR	$ 7,500.00	$ 7,500.00
3	Engineering Construction Services	3.7%	HR	$ 47,600.00	$ 47,600.00
4	Topographic & Property Survey	0.4%	EST	$ 5,000.00	$ 5,000.00
5	Permitting	0.8%	EST	$ 10,000.00	$ 10,000.00
6	Funding and Administrative Services	0.9%	EST	$ 12,000.00	$ 12,000.00
7	Miscellaneous Professional Services	0.8%	EST	$ 10,000.00	$ 10,000.00
			SUBTOTAL		$ 147,100.00
			TOTAL PROJECT COST		**$ 1,288,650.00**

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SUNRISE ENGINEERING

11 North 300 West, Washington Utah 84780
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Engineer's Opinion of Probable Cost

Well 15 and 17 Replacement 16-Jun-22
Hildale City BCW/tcd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 37,800.00	$ 37,800.00
2	Pre-Construction DVD and Project Sign	1	LS	$ 1,500.00	$ 1,500.00
3	GeoPhysical Logging	1	LS	$ 15,000.00	$ 15,000.00
4	Disinfection and Capping	1	LS	$ 4,000.00	$ 4,000.00
5	Well Driller's Report	1	LS	$ 2,500.00	$ 2,500.00
6	Site Restoration	1	LS	$ 10,000.00	$ 10,000.00
7	Misc. Electrical Improvements	1	LS	$ 15,000.00	$ 15,000.00
Well 17					
8	Conductor Casing	100	LF	$ 400.00	$ 40,000.00
9	20" Diameter Well Drilling	700	LF	$ 123.00	$ 86,100.00
10	12" Diameter Well Drilling - Pilot Hole	700	LF	$ 160.00	$ 112,000.00
11	12" Well Casing	600	LF	$ 170.00	$ 102,000.00
12	2" Galvanized Tremie Pipe	100	LF	$ 40.00	$ 4,000.00
13	Furnish and Install Pea Gravel	400	LF	$ 115.00	$ 46,000.00
14	Bentonite Packer	1	LS	$ 6,000.00	$ 6,000.00
15	Cunductor Casing Removal	1	LS	$ 8,000.00	$ 8,000.00
16	Flow Meter	1	EA	$ 10,000.00	$ 10,000.00
17	Initial Well Development	40	HR	$ 700.00	$ 28,000.00
18	Install Pump for Development and Testing	1	LS	$ 40,000.00	$ 40,000.00
19	Well Development and Pumping	80	HR	$ 700.00	$ 56,000.00
20	Misc. Well and Pump Testing	1	LS	$ 10,000.00	$ 10,000.00
21	Well Head, Disinfection and Capping	1	LS	$ 8,500.00	$ 8,500.00
22	Well Pad and Pipping	1	LS	$ 15,000.00	$ 15,000.00
Well 15					
23	Conductor Casing	1	LS	$ 40,000.00	$ 40,000.00
24	16" Diameter Well Drilling	120	LF	$ 270.00	$ 32,400.00
25	8" Well Casing	80	LF	$ 100.00	$ 8,000.00
26	8" Stainless Steel Screen	40	LF	$ 300.00	$ 12,000.00
27	2" Galvanized Tremie Pipe	20	LF	$ 40.00	$ 800.00
28	Instrument Pipe	120	LF	$ 50.00	$ 6,000.00
29	Furnish and Install Fine Silica Sand	120	LF	$ 125.00	$ 15,000.00
30	Bentonite Packer	1	LS	$ 6,000.00	$ 6,000.00
31	Conductor Casing Removal	1	LS	$ 6,000.00	$ 6,000.00
32	Sanitary Grout Seal	1	LS	$ 150.00	$ 150.00
33	Flow Meter	1	LS	$ 10,000.00	$ 10,000.00
34	Initial Well Development	40	HR	$ 700.00	$ 28,000.00
35	Install Pump for Development and Testing	1	LS	$ 40,000.00	$ 40,000.00
36	Well Development and Pumping	80	HR	$ 700.00	$ 56,000.00
37	Misc. Well and Pump Testing	1	LS	$ 10,000.00	$ 10,000.00
38	Well Head, Disinfection and Capping	1	LS	$ 8,500.00	$ 8,500.00
39	Well Pad and Pipping	1	LS	$ 15,000.00	$ 15,000.00
			SUBTOTAL		**$ 951,250.00**
			CONTINGENCY	20%	**$ 190,300.00**
			CONSTRUCTION TOTAL		**$ 1,141,550.00**
INCIDENTALS					
1	Engineering Design	4.3%	LS	$ 55,000.00	$ 55,000.00
2	Bidding & Negotiating	0.6%	HR	$ 7,500.00	$ 7,500.00
3	Engineering Construction Services	3.7%	HR	$ 47,600.00	$ 47,600.00
4	Topographic & Property Survey	0.4%	EST	$ 5,000.00	$ 5,000.00
5	Permitting	0.8%	EST	$ 10,000.00	$ 10,000.00
6	Funding and Administrative Services	0.9%	EST	$ 12,000.00	$ 12,000.00
7	Miscellaneous Professional Services	0.8%	EST	$ 10,000.00	$ 10,000.00
			SUBTOTAL		$ 147,100.00
			TOTAL PROJECT COST		**$ 1,288,650.00**

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SUNRISE ENGINEERING

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Engineer's Opinion of Probable Cost

Fire Hydrant Improvements
Hildale City

16-Jun-22
BCW/tcd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 61,700.00	$ 61,700.00
2	Pre-Construction DVD and Project Sign	1	LS	$ 2,500.00	$ 2,500.00
3	Traffic Control	1	LS	$ 10,000.00	$ 10,000.00
4	Subsurface Investigation	24	HR	$ 250.00	$ 6,000.00
5	Materials Sampling & Testing	1	LS	$ 16,000.00	$ 16,000.00
6	Dust Control & Watering	1	LS	$ 9,000.00	$ 9,000.00
7	Construction Staking	1	LS	$ 13,000.00	$ 13,000.00
8	Erosion Control Compliance	1	LS	$ 6,000.00	$ 6,000.00
9	6" PVC (C900) Line, Fitting, Tracer Wire, Bedding, & Backfill	2,100	LF	$ 50.00	$ 105,000.00
10	6" Gate Valve Assembly	80	EA	$ 2,000.00	$ 160,000.00
11	8" PVC (C900) Line, Fitting, Tracer Wire, Bedding, & Backfill	2,930	LF	$ 65.00	$ 190,450.00
12	8" Gate Valve Assembly	8	EA	$ 2,900.00	$ 23,200.00
13	Fire Hydrant Assembly	78	EA	$ 7,000.00	$ 546,000.00
14	Restore Gravel Road	21,200	SF	$ 3.25	$ 68,900.00
15	Pavement Restoration	9,100	SF	$ 7.50	$ 68,250.00
16	Restore Surface Improvements	1	LS	$ 10,000.00	$ 10,000.00
			SUBTOTAL		**$ 1,296,000.00**
			CONTINGENCY	20%	**$ 259,200.00**
			CONSTRUCTION TOTAL		**$ 1,555,200.00**
INCIDENTALS					
1	Engineering Design	4.6%	LS	$ 79,000.00	$ 79,000.00
2	Bidding & Negotiating	0.4%	HR	$ 7,500.00	$ 7,500.00
3	Engineering Construction Services	3.7%	HR	$ 64,800.00	$ 64,800.00
4	Topographic & Property Survey	0.6%	EST	$ 10,000.00	$ 10,000.00
5	Funding and Administrative Services	0.7%	EST	$ 12,000.00	$ 12,000.00
6	Miscellaneous Engineering Services	0.3%	EST	$ 5,000.00	$ 5,000.00
			SUBTOTAL		$ 178,300.00
			TOTAL PROJECT COST		**$ 1,733,500.00**

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SUNRISE ENGINEERING

11 North 300 West, Washington Utah 84780
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Engineer's Opinion of Probable Cost

Mohave County ARPA Project
Hildale City

16-Apr-22
BCW/tcd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Media Changeout for Pressure Vessels	1	LS	$ 125,000.00	$ 125,000.00
2	Chemical Pretreatment System	1	LS	$ 80,000.00	$ 80,000.00
3	Installation of Additional Vessels	2	EA	$ 225,000.00	$ 450,000.00
4	Misc Pipping and Appurtenances for Additional Vessels	1	LS	$ 60,000.00	$ 60,000.00
			SUBTOTAL		**$ 715,000.00**
			CONTINGENCY	20%	**$ 143,000.00**
			CONSTRUCTION TOTAL		**$ 858,000.00**
INCIDENTALS					
1	Engineering Design	5.3%	LS	$ 50,000.00	$ 50,000.00
6	Funding and Administrative Services	1.6%	EST	$ 15,000.00	$ 15,000.00
7	Regulatory Compliance	1.6%	EST	$ 15,000.00	$ 15,000.00
10	Miscellaneous Professional Services	1.1%	EST	$ 10,000.00	$ 10,000.00
			SUBTOTAL		$ 90,000.00
			TOTAL PROJECT COST		**$ 948,000.00**

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SUNRISE ENGINEERING

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Engineer's Opinion of Probable Cost

Raw Water Transmission Line
Hildale City

16-Jun-22
BCW/tcd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 34,300.00	$ 34,300.00
2	Traffic Control	1	LS	$ 10,000.00	$ 10,000.00
3	Pre-Construction DVD & Project Sign	1	LS	$ 1,500.00	$ 1,500.00
4	Dust Control & Watering	1	LS	$ 10,000.00	$ 10,000.00
5	Subsurface Investigation	10	HR	$ 250.00	$ 2,500.00
6	Restore Surface Improvements	1	LS	$ 15,000.00	$ 15,000.00
7	Construction Staking	1	LS	$ 10,000.00	$ 10,000.00
8	Erosion Control Compliance	1	LS	$ 5,000.00	$ 5,000.00
9	Materials Sampling & Testing	1	LS	$ 12,500.00	$ 12,500.00
10	Excavation & Demolition	1	LS	$ 20,000.00	$ 20,000.00
11	12" PVC (C900) Line, Fitting, Tracer Wire, Bedding, & Backfill	2,500	LF	$ 80.00	$ 200,000.00
12	12" Gate Valve Assembly	8	EA	$ 6,750.00	$ 54,000.00
13	Pavement Restoration	26,400	SF	$ 7.75	$ 204,600.00
14	Access/Cleanout Structure	4	EA	$ 5,000.00	$ 20,000.00
15	Misc. Fittings, Connections, and Tie-Ins	1	LS	$ 20,000.00	$ 20,000.00
16	Electrical Conduit	2,500	LF	$ 40.00	$ 100,000.00
			SUBTOTAL		**$ 719,400.00**
			CONTINGENCY	20%	**$ 143,900.00**
			CONSTRUCTION TOTAL		**$ 863,300.00**
INCIDENTALS					
1	Engineering Design	5.0%	LS	$ 50,000.00	$ 50,000.00
2	Bidding & Negotiating	0.8%	HR	$ 7,500.00	$ 7,500.00
3	Engineering Construction Services	3.6%	HR	$ 36,000.00	$ 36,000.00
4	Topographic & Property Survey	1.5%	EST	$ 15,000.00	$ 15,000.00
5	Permitting	0.5%	EST	$ 5,000.00	$ 5,000.00
6	Funding and Administrative Services	1.2%	EST	$ 12,000.00	$ 12,000.00
7	Miscellaneous Engineering Services	1.0%	EST	$ 10,000.00	$ 10,000.00
			SUBTOTAL		$ 135,500.00
			TOTAL PROJECT COST		**$ 998,800.00**

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SUNRISE ENGINEERING
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Engineer's Opinion of Probable Cost

Trailhead Well 1 16-Jun-22
Hildale City BCW/tcd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 83,600.00	$ 83,600.00
2	Pre-Construction DVD & Project Sign	1	LS	$ 1,500.00	$ 1,500.00
3	Traffic Control	1	LS	$ 5,000.00	$ 5,000.00
4	Subsurface Investigation	4	HR	$ 250.00	$ 1,000.00
5	Materials Sampling & Testing	1	LS	$ 7,500.00	$ 7,500.00
6	Dust Control & Watering	1	LS	$ 10,000.00	$ 10,000.00
7	Construction Staking	1	LS	$ 10,000.00	$ 10,000.00
8	Erosion Control Compliance	1	LS	$ 7,500.00	$ 7,500.00
9	Geophysical Survey	1	LS	$ 20,000.00	$ 20,000.00
10	Access and Drill Pad Construction	1	LS	$ 145,000.00	$ 145,000.00
11	Conductor Casing and Seal	100	LF	$ 650.00	$ 65,000.00
12	Drill 12" Pilot Borehole	600	LF	$ 160.00	$ 96,000.00
13	Drill 20" Reamed Borehole	600	LF	$ 123.00	$ 73,800.00
14	Geophysical Logging	1	LS	$ 9,000.00	$ 9,000.00
15	Well Installation - 12" Steel Casing	500	LF	$ 170.00	$ 85,000.00
16	Well Installation - 12" SS Screen 70 Slot	200	LF	$ 350.00	$ 70,000.00
17	Installation of Gravel Pack - 8-12	550	LF	$ 115.00	$ 63,250.00
18	Installation of Annular Grout Seal	150	LF	$ 115.00	$ 17,250.00
19	Initial Well Development	40	HR	$ 750.00	$ 30,000.00
20	Install Pump for Development and Testing	1	LS	$ 42,000.00	$ 42,000.00
21	Well Development by pumping	80	HR	$ 425.00	$ 34,000.00
22	Misc. Well and Pump Testing	1	LS	$ 10,000.00	$ 10,000.00
23	Well Disinfecting	1	LS	$ 5,000.00	$ 5,000.00
24	Well Head	1	LS	$ 2,500.00	$ 2,500.00
25	Well Capping	1	LS	$ 750.00	$ 750.00
26	Roadway Restoration	48,000	SF	$ 6.00	$ 288,000.00
27	10" PVC (C900) Line, Fitting, Tracer Wire, Bedding, & Backfill	8,000	LF	$ 72.00	$ 576,000.00
28	10" Gate Valve Assembly	4	EA	$ 5,000.00	$ 20,000.00
29	Misc. Connections, Fittings and Tie-ins	1	LS	$ 20,000.00	$ 20,000.00
			SUBTOTAL		**$ 1,798,650.00**
			CONTINGENCY	20%	**$ 359,700.00**
			CONSTRUCTION TOTAL		**$ 2,158,350.00**
INCIDENTALS					
1	Engineering Design	4.5%	LS	$ 110,000.00	$ 110,000.00
2	Bidding & Negotiating	0.3%	HR	$ 7,500.00	$ 7,500.00
3	Engineering Construction Services	3.7%	HR	$ 89,900.00	$ 89,900.00
4	Topographic & Property Survey	0.7%	EST	$ 17,500.00	$ 17,500.00
5	Water Right Change Application	0.8%	EST	$ 20,000.00	$ 20,000.00
6	Funding and Administrative Services	0.5%	EST	$ 12,000.00	$ 12,000.00
7	Permitting	0.4%	EST	$ 10,000.00	$ 10,000.00
8	Miscellaneous Professional Services	0.8%	EST	$ 20,000.00	$ 20,000.00
			SUBTOTAL		$ 286,900.00
			TOTAL PROJECT COST		**$ 2,445,250.00**

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Engineer's Opinion of Probable Cost

Sandhill Tank
Hildale City

16-Jun-22
BCW/tcd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 137,900.00	$ 137,900.00
2	Traffic Control	1	LS	$ 5,000.00	$ 5,000.00
3	Pre-Construction DVD & Project Sign	1	LS	$ 1,500.00	$ 1,500.00
4	Dust Control & Watering	1	LS	$ 10,000.00	$ 10,000.00
5	Subsurface Investigation	8	HR	$ 250.00	$ 2,000.00
6	Restore Surface Improvements	1	LS	$ 10,000.00	$ 10,000.00
7	Construction Staking	1	LS	$ 12,000.00	$ 12,000.00
8	Materials Sampling & Testing	1	LS	$ 35,000.00	$ 35,000.00
9	Excavation & Demolition	1	LS	$ 25,000.00	$ 25,000.00
10	Earthwork & Grading	1	LS	$ 80,000.00	$ 80,000.00
11	1MG Concrete Storage Tank	1	LS	$ 1,750,000.00	$ 1,750,000.00
12	Tank Site Appurtenances	1	LS	$ 75,000.00	$ 75,000.00
13	Metering Station	1	LS	$ 40,000.00	$ 40,000.00
14	12" PVC (C900), Fittings, Installation, Pipe Bedding, Trench Backfill	4,000	LF	$ 80.00	$ 320,000.00
15	12" Gate Valve Assembly	10	EA	$ 6,750.00	$ 67,500.00
16	Misc. Connections, Fittings and Tie-ins	1	LS	$ 30,000.00	$ 30,000.00
17	Surface Restoration	1	LS	$ 15,000.00	$ 15,000.00
18	PRV and Vault	1	EA	$ 50,000.00	$ 50,000.00
19	Valving and Piping to Create New Pressure Zone	1	LS	$ 45,000.00	$ 45,000.00
20	Misc Electrical and SCADA Improvements	1	LS	$ 30,000.00	$ 30,000.00
21	Tank Access Road	32,000	SF	$ 2.50	$ 80,000.00
22	Fence and Gate	1	LS	$ 75,000.00	$ 75,000.00
			SUBTOTAL		**$ 2,895,900.00**
			CONTINGENCY	20%	**$ 579,200.00**
			CONSTRUCTION TOTAL		**$ 3,475,100.00**
INCIDENTALS					
1	Engineering Design	5.0%	LS	$ 200,000.00	$ 200,000.00
2	Bidding & Negotiating	0.2%	HR	$ 7,500.00	$ 7,500.00
3	Engineering Construction Services	4.4%	HR	$ 173,800.00	$ 173,800.00
4	Topographic & Property Survey	0.4%	EST	$ 15,000.00	$ 15,000.00
5	Geotechnical Report	0.3%	EST	$ 10,000.00	$ 10,000.00
6	Funding and Administrative Services	0.3%	EST	$ 12,000.00	$ 12,000.00
7	Permitting	0.3%	EST	$ 10,000.00	$ 10,000.00
8	Environmental (Including Biological and Archeological) Report	0.8%	EST	$ 30,000.00	$ 30,000.00
9	SCADA Design	0.4%	EST	$ 15,000.00	$ 15,000.00
10	BLM ROW Negotiation (SF299 Application & POD)	0.3%	EST	$ 10,000.00	$ 10,000.00
11	Miscellaneous Engineering Services	0.6%	EST	$ 25,000.00	$ 25,000.00
			SUBTOTAL		$ 508,300.00
			TOTAL PROJECT COST		**$ 3,983,400.00**

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SUNRISE ENGINEERING

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Engineer's Opinion of Probable Cost

Jessop Ave. Line 16-Jun-22
Hildale City BCW/tcd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 27,700.00	$ 27,700.00
2	Pre-Construction DVD	1	LS	$ 1,500.00	$ 1,500.00
3	Traffic Control	1	LS	$ 7,500.00	$ 7,500.00
4	Subsurface Investigation	16	HR	$ 250.00	$ 4,000.00
5	Materials Sampling & Testing	1	LS	$ 10,000.00	$ 10,000.00
6	Dust Control & Watering	1	LS	$ 7,500.00	$ 7,500.00
7	Construction Staking	1	LS	$ 7,500.00	$ 7,500.00
8	Erosion Control Compliance	1	LS	$ 6,000.00	$ 6,000.00
9	8" PVC (C900) Line, Fitting, Tracer Wire, Bedding, & Backfill	5,060	LF	$ 65.00	$ 328,900.00
10	8" Gate Valve Assembly	14	EA	$ 2,900.00	$ 40,600.00
11	Reconnect Water Services	5	EA	$ 1,500.00	$ 7,500.00
12	Restore Gravel Road	30,360	SF	$ 3.25	$ 98,670.00
13	Restore Surface Improvements	1	LS	$ 10,000.00	$ 10,000.00
14	Misc. Connections, Fittings, and Tie-Ins	1	LS	$ 10,000.00	$ 10,000.00
15	6" Fire Hydrant Assembly	2	EA	$ 7,000.00	$ 14,000.00
			SUBTOTAL		**$ 581,370.00**
			CONTINGENCY	20%	**$ 116,300.00**
			CONSTRUCTION TOTAL		**$ 697,670.00**
INCIDENTALS					
1	Engineering Design	5.6%	LS	$ 45,000.00	$ 45,000.00
2	Bidding & Negotiating	0.9%	HR	$ 7,500.00	$ 7,500.00
3	Engineering Construction Services	3.6%	HR	$ 29,100.00	$ 29,100.00
4	Topographic & Property Survey	0.9%	EST	$ 7,500.00	$ 7,500.00
5	Funding and Administrative Services	1.5%	EST	$ 12,000.00	$ 12,000.00
6	Permitting	0.6%	EST	$ 5,000.00	$ 5,000.00
7	Miscellaneous Proffesional Services	0.6%	EST	$ 5,000.00	$ 5,000.00
			SUBTOTAL		$ 111,100.00
			TOTAL PROJECT COST		**$ 808,770.00**

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Engineer's Opinion of Probable Cost

Trailhead Well 2
Hildale City

16-Jun-22
BCW/tcd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 32,000.00	$ 32,000.00
2	Erosion Control Compliance	1	LS	$ 5,000.00	$ 5,000.00
3	Geophysical Survey	1	LS	$ 20,000.00	$ 20,000.00
4	Access and Drill Pad Construction	1	LS	$ 50,000.00	$ 50,000.00
5	Conductor Casing and Seal	100	LF	$ 650.00	$ 65,000.00
6	Drill 12" Pilot Borehole	600	LF	$ 175.00	$ 105,000.00
7	Drill 20" Reamed Borehole	600	LF	$ 123.00	$ 73,800.00
8	Geophysical Logging	1	LS	$ 9,000.00	$ 9,000.00
9	Well Installation - 12" Steel Casing	170	LF	$ 170.00	$ 28,900.00
10	Well Installation - 12" SS Screen 70 Slot	200	LF	$ 350.00	$ 70,000.00
11	Installation of Gravel Pack - 8-12	550	LF	$ 115.00	$ 63,250.00
12	Installation of Annular Grout Seal	150	LF	$ 115.00	$ 17,250.00
13	Initial Well Development	40	HR	$ 750.00	$ 30,000.00
14	Install Pump for Development and Testing	1	LS	$ 42,000.00	$ 42,000.00
15	Well Development by pumping	80	HR	$ 425.00	$ 34,000.00
16	Misc. Well and Pump Testing	1	LS	$ 10,000.00	$ 10,000.00
17	Well Disinfecting	1	LS	$ 5,000.00	$ 5,000.00
18	Well Head	1	LS	$ 2,500.00	$ 2,500.00
19	Well Capping	1	LS	$ 750.00	$ 750.00
20	8" PVC (C900) Line, Fitting, Tracer Wire, Bedding, & Backfill	150	LF	$ 65.00	$ 9,750.00
21	8" Gate Valve Assembly	1	EA	$ 2,900.00	$ 2,900.00
22	Water Right Procurement	1	LS	$ 650,000.00	$ 650,000.00
			SUBTOTAL		**$ 1,326,100.00**
			CONTINGENCY	20%	**$ 265,200.00**
			CONSTRUCTION TOTAL		**$ 1,591,300.00**
INCIDENTALS					
1	Engineering Design	2.6%	LS	$ 45,000.00	$ 45,000.00
2	Bidding & Negotiating	0.4%	HR	$ 7,500.00	$ 7,500.00
3	Engineering Construction Services	2.0%	HR	$ 33,800.00	$ 33,800.00
4	Topographic & Property Survey	0.2%	EST	$ 3,500.00	$ 3,500.00
5	Permitting	0.6%	EST	$ 10,000.00	$ 10,000.00
6	Funding and Administrative Services	0.7%	EST	$ 12,000.00	$ 12,000.00
39	Miscellaneous Professional Services	0.6%	EST	$ 10,000.00	$ 10,000.00
			SUBTOTAL		$ 121,800.00
			TOTAL PROJECT COST		**$ 1,713,100.00**

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Engineer's Opinion of Probable Cost

Trailhead Tank
Hildale City

20-Apr-20
BCW/tcd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 62,500.00	$ 62,500.00
2	Traffic Control	1	LS	$ 5,000.00	$ 5,000.00
3	Pre-Construction DVD & Project Sign	1	LS	$ 1,500.00	$ 1,500.00
4	Dust Control & Watering	1	LS	$ 75,000.00	$ 75,000.00
5	Subsurface Investigation	4	HR	$ 250.00	$ 1,000.00
6	Restore Surface Improvements	1	LS	$ 7,500.00	$ 7,500.00
7	Construction Staking	1	LS	$ 5,000.00	$ 5,000.00
8	Materials Sampling & Testing	1	LS	$ 7,500.00	$ 7,500.00
9	Earthwork	1	LS	$ 65,000.00	$ 65,000.00
10	500K Concrete Storage Tank	1	LS	$ 800,000.00	$ 800,000.00
11	Tank Site Appurtenances	1	LS	$ 35,000.00	$ 35,000.00
12	Fence and Gate	1	LS	$ 75,000.00	$ 75,000.00
13	Metering Station	1	LS	$ 32,000.00	$ 32,000.00
14	Tank Access Rd	5,500	SF	$ 2.50	$ 13,750.00
15	10" PVC (C900), Fittings, Installation, Pipe Bedding, Trench Backfill	1,000	LF	$ 72.00	$ 72,000.00
16	10" Gate Valve Assembly	3	EA	$ 5,000.00	$ 15,000.00
17	Misc. Connections, Fittings, and Tie-Ins	1	LS	$ 20,000.00	$ 20,000.00
18	Misc Electrical and SCADA Improvements	1	LS	$ 20,000.00	$ 20,000.00
			SUBTOTAL		**$ 1,312,750.00**
			CONTINGENCY	20%	**$ 262,550.00**
			CONSTRUCTION TOTAL		**$ 1,575,300.00**
INCIDENTALS					
1	Engineering Design	5.1%	LS	$ 95,000.00	$ 95,000.00
2	Bidding & Negotiating	0.4%	HR	$ 7,500.00	$ 7,500.00
3	Engineering Construction Services	4.2%	HR	$ 78,800.00	$ 78,800.00
4	Topographic & Property Survey	0.4%	EST	$ 8,000.00	$ 8,000.00
5	Geotechnical Report	0.5%	EST	$ 10,000.00	$ 10,000.00
6	Funding and Administrative Services	0.6%	EST	$ 12,000.00	$ 12,000.00
7	Permitting	0.5%	EST	$ 10,000.00	$ 10,000.00
10	Environmental (Including Biological and Archeological) Report	1.3%	EST	$ 25,000.00	$ 25,000.00
11	BLM ROW Negotiation (SF299 Application & POD)	0.5%	EST	$ 10,000.00	$ 10,000.00
39	Miscellaneous Professional Services	1.1%	EST	$ 20,000.00	$ 20,000.00
			SUBTOTAL		$ 288,800.00
			TOTAL PROJECT COST		**$ 1,864,100.00**

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Engineer's Opinion of Probable Cost

Canyon Street Line
Hildale City

16-Jun-22
BCW/tcd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 11,900.00	$ 11,900.00
2	Pre-Construction DVD	1	LS	$ 1,500.00	$ 1,500.00
3	Traffic Control	1	LS	$ 10,000.00	$ 10,000.00
4	Subsurface Investigation	8	HR	$ 250.00	$ 2,000.00
5	Materials Sampling & Testing	1	LS	$ 10,000.00	$ 10,000.00
6	Dust Control & Watering	1	LS	$ 10,000.00	$ 10,000.00
7	Construction Staking	1	LS	$ 7,500.00	$ 7,500.00
8	Erosion Control Compliance	1	LS	$ 7,500.00	$ 7,500.00
9	8" PVC (C900) Line, Fitting, Tracer Wire, Bedding, & Backfill	1,500	LF	$ 65.00	$ 97,500.00
10	8" Gate Valve Assembly	5	EA	$ 2,900.00	$ 14,500.00
11	Restore Surface Improvements	1	LS	$ 10,000.00	$ 10,000.00
12	Pavement Restoration	9,000	SF	$ 6.00	$ 54,000.00
13	Misc. Connections, Fittings, and Tie-Ins	1	LS	$ 7,500.00	$ 7,500.00
14	Reconnect Water Services	5	EA	$ 1,200.00	$ 6,000.00
			SUBTOTAL		**$ 249,900.00**
			CONTINGENCY	20%	**$ 50,000.00**
			CONSTRUCTION TOTAL		**$ 299,900.00**
INCIDENTALS					
1	Engineering Design	6.7%	LS	$ 25,000.00	$ 25,000.00
2	Bidding & Negotiating	2.0%	HR	$ 7,500.00	$ 7,500.00
3	Engineering Construction Services	4.7%	HR	$ 17,500.00	$ 17,500.00
4	Topographic & Property Survey	2.0%	EST	$ 7,500.00	$ 7,500.00
5	Funding and Administrative Services	2.7%	EST	$ 10,000.00	$ 10,000.00
6	Permitting	1.3%	EST	$ 5,000.00	$ 5,000.00
7	Miscellaneous Engineering Services	0.7%	EST	$ 2,500.00	$ 2,500.00
			SUBTOTAL		$ 75,000.00
			TOTAL PROJECT COST		**$ 374,900.00**

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Engineer's Opinion of Probable Cost

University to Township Line
Hildale City

16-Jun-22
BCW/tcd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 8,400.00	$ 8,400.00
2	Pre-Construction DVD	1	LS	$ 1,500.00	$ 1,500.00
3	Traffic Control	1	LS	$ 18,000.00	$ 18,000.00
4	Subsurface Investigation	4	HR	$ 250.00	$ 1,000.00
5	Materials Sampling & Testing	1	LS	$ 7,500.00	$ 7,500.00
6	Dust Control & Watering	1	LS	$ 7,500.00	$ 7,500.00
7	Construction Staking	1	LS	$ 7,000.00	$ 7,000.00
8	Erosion Control Compliance	1	LS	$ 7,500.00	$ 7,500.00
9	8" PVC (C900) Line, Fitting, Tracer Wire, Bedding, & Backfill	1,500	LF	$ 65.00	$ 97,500.00
10	8" Gate Valve Assembly	4	EA	$ 2,900.00	$ 11,600.00
11	Restore Surface Improvements	1	LS	$ 8,500.00	$ 8,500.00
			SUBTOTAL		**$ 176,000.00**
			CONTINGENCY	20%	**$ 35,200.00**
			CONSTRUCTION TOTAL		**$ 211,200.00**
INCIDENTALS					
1	Engineering Design	7.7%	LS	$ 25,000.00	$ 25,000.00
2	Bidding & Negotiating	2.3%	HR	$ 7,500.00	$ 7,500.00
3	Engineering Construction Services	3.8%	HR	$ 12,300.00	$ 12,300.00
4	Topographic & Property Survey	2.3%	EST	$ 7,500.00	$ 7,500.00
5	Funding and Administrative Services	3.1%	EST	$ 10,000.00	$ 10,000.00
6	Land & RoW Negotiation/Acquisition	15.3%	EST	$ 50,000.00	$ 50,000.00
7	Miscellaneous Engineering Services	0.8%	EST	$ 2,500.00	$ 2,500.00
			SUBTOTAL		$ 114,800.00
			TOTAL PROJECT COST		**$ 326,000.00**

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Engineer's Opinion of Probable Cost

Hildale Groundwater Project PH I 16-Jun-22
Hildale City BCW/tcd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 132,900.00	$ 132,900.00
2	Pre-Construction DVD & Project Sign	1	LS	$ 1,500.00	$ 1,500.00
3	Traffic Control	1	LS	$ 5,000.00	$ 5,000.00
4	Subsurface Investigation	4	HR	$ 250.00	$ 1,000.00
5	Materials Sampling & Testing	1	LS	$ 7,500.00	$ 7,500.00
6	Dust Control & Watering	1	LS	$ 10,000.00	$ 10,000.00
7	Construction Staking	1	LS	$ 10,000.00	$ 10,000.00
8	Erosion Control Compliance	1	LS	$ 7,500.00	$ 7,500.00
9	Geophysical Survey	1	LS	$ 23,000.00	$ 23,000.00
10	Access and Drill Pad Construction	1	LS	$ 130,000.00	$ 130,000.00
11	Conductor Casing and Seal	100	LF	$ 650.00	$ 65,000.00
12	Drill 12" Pilot Borehole	650	LF	$ 175.00	$ 113,750.00
13	Drill 20" Reamed Borehole	650	LF	$ 123.00	$ 79,950.00
14	Geophysical Logging	1	LS	$ 9,000.00	$ 9,000.00
15	Caliper	1	LS	$ 6,500.00	$ 6,500.00
16	Well Installation - 12" Steel Casing	550	LF	$ 100.00	$ 55,000.00
17	Well Installation - 12" SS Screen 70 Slot	200	LF	$ 350.00	$ 70,000.00
18	Installation of Gravel Pack - 8-12	600	LF	$ 115.00	$ 69,000.00
19	Installation of Annular Grout Seal	150	LF	$ 115.00	$ 17,250.00
20	Initial Well Development	40	HR	$ 750.00	$ 30,000.00
21	Install Pump for Development and Testing	1	LS	$ 42,000.00	$ 42,000.00
22	Well Development by pumping	80	HR	$ 425.00	$ 34,000.00
23	Misc. Well and Pump Testing	1	LS	$ 10,000.00	$ 10,000.00
24	Well Disinfecting	1	LS	$ 5,000.00	$ 5,000.00
25	Well Head	1	LS	$ 2,500.00	$ 2,500.00
26	Well Capping	1	LS	$ 750.00	$ 750.00
27	Roadway Restoration	30,000	SF	$ 7.75	$ 232,500.00
28	8" PVC (C900) Line, Fitting, Tracer Wire, Bedding, & Backfill	5,000	LF	$ 65.00	$ 325,000.00
29	8" Gate Valve Assembly	8	EA	$ 2,900.00	$ 23,200.00
30	Misc. Connections, Fittings and Tie-ins	1	LS	$ 15,000.00	$ 15,000.00
31	Water Right Procurement	1	LS	$ 1,300,000.00	$ 1,300,000.00
			SUBTOTAL		**$ 2,833,800.00**
			CONTINGENCY	20%	**$ 566,800.00**
			CONSTRUCTION TOTAL		**$ 3,400,600.00**
INCIDENTALS					
1	Engineering Design	2.7%	LS	$ 100,000.00	$ 100,000.00
2	Bidding & Negotiating	0.2%	HR	$ 7,500.00	$ 7,500.00
3	Engineering Construction Services	2.1%	HR	$ 76,700.00	$ 76,700.00
4	Topographic & Property Survey	0.5%	EST	$ 20,000.00	$ 20,000.00
5	Funding and Administrative Services	0.3%	EST	$ 12,000.00	$ 12,000.00
6	Permitting	0.3%	EST	$ 10,000.00	$ 10,000.00
7	Environmental (Including Biological and Archeological) Report	0.9%	EST	$ 35,000.00	$ 35,000.00
8	BLM ROW Negotiation (SF299 Application & POD)	0.3%	EST	$ 10,000.00	$ 10,000.00
9	Miscellaneous Engineering Services	0.5%	EST	$ 20,000.00	$ 20,000.00
			SUBTOTAL		$ 291,200.00
			TOTAL PROJECT COST		**$ 3,691,800.00**

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SUNRISE ENGINEERING

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Engineer's Opinion of Probable Cost

Hildale Groundwater Project PH II 16-Jun-22
Hildale City BCW/tcd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 152,000.00	$ 152,000.00
2	Pre-Construction DVD & Project Sign	1	LS	$ 1,500.00	$ 1,500.00
3	Traffic Control	1	LS	$ 5,000.00	$ 5,000.00
4	Subsurface Investigation	4	HR	$ 250.00	$ 1,000.00
5	Materials Sampling & Testing	1	LS	$ 7,500.00	$ 7,500.00
6	Dust Control & Watering	1	LS	$ 10,000.00	$ 10,000.00
7	Construction Staking	1	LS	$ 10,000.00	$ 10,000.00
8	Erosion Control Compliance	1	LS	$ 7,500.00	$ 7,500.00
9	Geophysical Survey	1	LS	$ 23,000.00	$ 23,000.00
10	Access and Drill Pad Construction	1	LS	$ 130,000.00	$ 130,000.00
11	Conductor Casing and Seal	100	LF	$ 650.00	$ 65,000.00
12	Drill 12" Pilot Borehole	650	LF	$ 175.00	$ 113,750.00
13	Drill 20" Reamed Borehole	650	LF	$ 123.00	$ 79,950.00
14	Geophysical Logging	1	LS	$ 9,000.00	$ 9,000.00
15	Caliper	1	LS	$ 6,500.00	$ 6,500.00
16	Well Installation - 12" Steel Casing	550	LF	$ 100.00	$ 55,000.00
17	Well Installation - 12" SS Screen 70 Slot	200	LF	$ 350.00	$ 70,000.00
18	Installation of Gravel Pack - 8-12	600	LF	$ 115.00	$ 69,000.00
19	Installation of Annular Grout Seal	150	LF	$ 115.00	$ 17,250.00
20	Initial Well Development	40	HR	$ 750.00	$ 30,000.00
21	Install Pump for Development and Testing	1	LS	$ 42,000.00	$ 42,000.00
22	Well Development by pumping	80	HR	$ 425.00	$ 34,000.00
23	Misc. Well and Pump Testing	1	LS	$ 10,000.00	$ 10,000.00
24	Well Disinfecting	1	LS	$ 5,000.00	$ 5,000.00
25	Well Head	1	LS	$ 2,500.00	$ 2,500.00
26	Well Capping	1	LS	$ 750.00	$ 750.00
27	Roadway Restoration	50,400	SF	$ 7.75	$ 390,600.00
28	8" PVC (C900) Line, Fitting, Tracer Wire, Bedding, & Backfill	8,400	LF	$ 65.00	$ 546,000.00
29	8" Gate Valve Assembly	9	EA	$ 2,900.00	$ 26,100.00
30	Misc. Connections, Fittings and Tie-ins	1	LS	$ 15,000.00	$ 15,000.00
31	Water Right Procurement	1	LS	$ 1,300,000.00	$ 1,300,000.00
			SUBTOTAL		**$ 3,234,900.00**
			CONTINGENCY	20%	**$ 647,000.00**
			CONSTRUCTION TOTAL		**$ 3,881,900.00**
INCIDENTALS					
1	Engineering Design	2.8%	LS	$ 120,000.00	$ 120,000.00
2	Bidding & Negotiating	0.2%	HR	$ 7,500.00	$ 7,500.00
3	Engineering Construction Services	2.3%	HR	$ 96,700.00	$ 96,700.00
4	Topographic & Property Survey	0.5%	EST	$ 22,000.00	$ 22,000.00
5	Funding and Administrative Services	0.3%	EST	$ 12,000.00	$ 12,000.00
6	Permitting	0.2%	EST	$ 10,000.00	$ 10,000.00
7	Environmental (Including Biological and Archeological) Report	0.9%	EST	$ 40,000.00	$ 40,000.00
8	BLM ROW Negotiation (SF299 Application & POD)	0.2%	EST	$ 10,000.00	$ 10,000.00
9	Miscellaneous Engineering Services	0.5%	EST	$ 20,000.00	$ 20,000.00
			SUBTOTAL		$ 338,200.00
			TOTAL PROJECT COST		**$ 4,220,100.00**

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Engineer's Opinion of Probable Cost

Hildale Groundwater Project PH III 16-Jun-22
Hildale City BCW/tcd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 110,000.00	$ 110,000.00
2	Pre-Construction DVD & Project Sign	1	LS	$ 1,500.00	$ 1,500.00
3	Traffic Control	1	LS	$ 5,000.00	$ 5,000.00
4	Subsurface Investigation	4	HR	$ 250.00	$ 1,000.00
5	Materials Sampling & Testing	1	LS	$ 7,500.00	$ 7,500.00
6	Dust Control & Watering	1	LS	$ 10,000.00	$ 10,000.00
7	Construction Staking	1	LS	$ 10,000.00	$ 10,000.00
8	Erosion Control Compliance	1	LS	$ 7,500.00	$ 7,500.00
9	Geophysical Survey	1	LS	$ 23,000.00	$ 23,000.00
10	Access and Drill Pad Construction	1	LS	$ 130,000.00	$ 130,000.00
11	Conductor Casing and Seal	100	LF	$ 650.00	$ 65,000.00
12	Drill 12" Pilot Borehole	600	LF	$ 175.00	$ 105,000.00
13	Drill 20" Reamed Borehole	600	LF	$ 123.00	$ 73,800.00
14	Geophysical Logging	1	LS	$ 9,000.00	$ 9,000.00
15	Caliper	1	LS	$ 6,500.00	$ 6,500.00
16	Well Installation - 12" Steel Casing	500	LF	$ 170.00	$ 85,000.00
17	Well Installation - 12" SS Screen 70 Slot	200	LF	$ 350.00	$ 70,000.00
18	Installation of Gravel Pack - 8-12	550	LF	$ 115.00	$ 63,250.00
19	Installation of Annular Grout Seal	150	LF	$ 115.00	$ 17,250.00
20	Initial Well Development	40	HR	$ 750.00	$ 30,000.00
21	Install Pump for Development and Testing	1	LS	$ 42,000.00	$ 42,000.00
22	Well Development by pumping	80	HR	$ 425.00	$ 34,000.00
23	Misc. Well and Pump Testing	1	LS	$ 10,000.00	$ 10,000.00
24	Well Disinfecting	1	LS	$ 5,000.00	$ 5,000.00
25	Well Head	1	LS	$ 2,500.00	$ 2,500.00
26	Well Capping	1	LS	$ 750.00	$ 750.00
27	Roadway Restoration	39,000	SF	$ 8.00	$ 312,000.00
28	8" PVC (C900) Line, Fitting, Tracer Wire, Bedding, & Backfill	6,500	LF	$ 65.00	$ 422,500.00
29	8" Gate Valve Assembly	8	EA	$ 2,900.00	$ 23,200.00
30	Misc. Connections, Fittings and Tie-ins	1	LS	$ 20,000.00	$ 20,000.00
31	Water Right Procurement	1	LS	$ 650,000.00	$ 650,000.00
			SUBTOTAL		**$ 2,352,250.00**
			CONTINGENCY	10%	**$ 235,200.00**
			CONSTRUCTION TOTAL		**$ 2,587,450.00**
INCIDENTALS					
1	Engineering Design	3.5%	LS	$ 100,000.00	$ 100,000.00
2	Bidding & Negotiating	0.3%	HR	$ 7,500.00	$ 7,500.00
3	Engineering Construction Services	2.9%	HR	$ 85,100.00	$ 85,100.00
4	Topographic & Property Survey	0.7%	EST	$ 20,000.00	$ 20,000.00
5	Funding and Administrative Services	0.4%	EST	$ 12,000.00	$ 12,000.00
6	Permitting	0.3%	EST	$ 10,000.00	$ 10,000.00
7	Environmental (Including Biological and Archeological) Report	1.2%	EST	$ 35,000.00	$ 35,000.00
8	BLM ROW Negotiation (SF299 Application & POD)	0.3%	EST	$ 10,000.00	$ 10,000.00
9	Miscellaneous Engineering Services	0.7%	EST	$ 20,000.00	$ 20,000.00
			SUBTOTAL		$ 299,600.00
			TOTAL PROJECT COST		**$ 2,887,050.00**

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Engineer's Opinion of Probable Cost

Annexation Trunklines
Hildale City

16-Jun-22
BCW/tcd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 82,700.00	$ 82,700.00
2	Traffic Control	1	LS	$ 12,000.00	$ 12,000.00
3	Pre-Construction DVD	1	LS	$ 1,500.00	$ 1,500.00
4	Dust Control & Watering	1	LS	$ 20,000.00	$ 20,000.00
5	Subsurface Investigation	8	HR	$ 250.00	$ 2,000.00
6	Restore Surface Improvements	1	LS	$ 12,000.00	$ 12,000.00
7	Erosion Control Compliance	2	LS	$ 8,000.00	$ 16,000.00
8	Construction Staking	1	LS	$ 12,500.00	$ 12,500.00
9	Materials Sampling & Testing	1	LS	$ 12,000.00	$ 12,000.00
10	Roadway Restoration	91,000	SF	$ 4.50	$ 409,500.00
11	12" PVC (C900) Line, Fitting, Tracer Wire, Bedding, & Backfill	13,000	LF	$ 80.00	$ 1,040,000.00
12	12" Gate Valve Assembly	12	EA	$ 6,750.00	$ 81,000.00
13	Misc. Connections, Fittings and Tie-ins	1	LS	$ 35,000.00	$ 35,000.00
			SUBTOTAL		**$ 1,736,200.00**
			CONTINGENCY	20%	**$ 347,200.00**
			CONSTRUCTION TOTAL		**$ 2,083,400.00**
INCIDENTALS					
1	Engineering Design	4.5%	LS	$ 105,000.00	$ 105,000.00
2	Bidding & Negotiating	0.3%	HR	$ 7,500.00	$ 7,500.00
3	Engineering Construction Services	3.7%	HR	$ 86,800.00	$ 86,800.00
4	Topographic & Property Survey	0.6%	EST	$ 15,000.00	$ 15,000.00
5	Funding and Administrative Services	0.5%	EST	$ 12,000.00	$ 12,000.00
6	Permitting	0.2%	EST	$ 5,000.00	$ 5,000.00
7	Miscellaneous Engineering Services	0.6%	EST	$ 15,000.00	$ 15,000.00
			SUBTOTAL		$ 246,300.00
			TOTAL PROJECT COST		**$ 2,329,700.00**

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Engineer's Opinion of Probable Cost

Tank for Annexation Area
Hildale City

16-Jun-22
BCW/tcd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 127,200.00	$ 127,200.00
2	Materials Sampling & Testing	1	LS	$ 35,000.00	$ 35,000.00
3	Excavation and Demolition	1	LS	$ 25,000.00	$ 25,000.00
4	Earthwork	1	LS	$ 100,000.00	$ 100,000.00
5	1MG Concrete Storage Tank	1	LS	$ 1,750,000.00	$ 1,750,000.00
6	Tank Site Appurtenances	1	LS	$ 90,000.00	$ 90,000.00
7	Metering Station	1	LS	$ 50,000.00	$ 50,000.00
8	12" PVC (C900), Fittings, Installation, Pipe Bedding, Trench Backfill	2,500	LF	$ 80.00	$ 200,000.00
9	12" Gate Valve Assembly	8	EA	$ 6,750.00	$ 54,000.00
10	Misc. Connections, Fittings and Tie-ins	1	LS	$ 20,000.00	$ 20,000.00
11	Surface Restoration	1	LS	$ 10,000.00	$ 10,000.00
12	Tank Access Road	20,000	SF	$ 4.00	$ 80,000.00
13	Fence and Gate	1	LS	$ 80,000.00	$ 80,000.00
14	Misc Electrical and SCADA Improvements	1	LS	$ 50,000.00	$ 50,000.00
			SUBTOTAL		**$ 2,671,200.00**
			CONTINGENCY	20%	**$ 534,200.00**
			CONSTRUCTION TOTAL		**$ 3,205,400.00**
INCIDENTALS					
1	Engineering Design	5.5%	LS	$ 200,000.00	$ 200,000.00
2	Bidding & Negotiating	0.2%	HR	$ 7,500.00	$ 7,500.00
3	Engineering Construction Services	3.7%	HR	$ 133,600.00	$ 133,600.00
4	Topographic & Property Survey	0.3%	EST	$ 10,000.00	$ 10,000.00
5	Geotechnical Report	0.3%	EST	$ 10,000.00	$ 10,000.00
6	Funding and Administrative Services	0.3%	EST	$ 12,000.00	$ 12,000.00
7	Permitting	0.1%	EST	$ 5,000.00	$ 5,000.00
8	Miscellaneous Engineering Services	0.7%	EST	$ 25,000.00	$ 25,000.00
9	Easement/ROW Acuisition	1.4%	EST	$ 50,000.00	$ 50,000.00
			SUBTOTAL		$ 453,100.00
			TOTAL PROJECT COST		**$ 3,658,500.00**

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APPENDIX D
System Maps

EXISTING WATER SYSTEM

MAP LEGEND

NORTH

0 1,000 2,000

1 In = 2,000 Feet

- 2"
- 4"
- 6"
- 8"
- 12"

- w_Hydrants
- Water Tank
- Treatment Plant
- State Boundary

Hildale City
WELCOME HOME

Map Date: 06.30.2022

LOW FIRE FLOW AREA

MAP LEGEND

North

0 1,000 2,000

1 In = 2,000 Feet

- 2"
- 4"
- 6"
- 8"
- 12"

- Hydrants
- Water Tank
- Treatment Plant
- Low Fire Flow
- State Boundary

Hildale City
WELCOME HOME

Map Date: 06.30.2022

LOW PRESSURE DURING PDD SCENARIO

MAP LEGEND

North

0 1,000 2,000

1 In = 2,000 Feet

2"
4"
6"
8"
12"

Hydrants
Water Tank
Treatment Plant
Low Pressure Area

State Boundary

Hildale City
WELCOME HOME

Map Date: 06.30.2022

LOW PRESSURE DURING PID SCENARIO

MAP LEGEND

North

0 1,000 2,000

1 In = 2,000 Feet

2"
4"
6"
8"
12"

Hydrants
Water Tank
Treatment Plant
Low Pressure Area

State Boundary

Hildale City
WELCOME HOME

Map Date: 06.30.2022

RECOMMENDED IMPROVEMENTS

Sand Hill Tank
Trailhead Tank
Trailhead Wells 1 and 2
Jessop Ave. Line
Canyon Ave. Line
Replace Well 17
University Ave. Line
Treatment Plant Improvements
Treatment Plant Wells
Replace Well 15
Raw Water Transmission Line

MAP LEGEND

0 1,000 2,000
1 In = 2,000 Feet

Recommended Improvements
- Water Mains
- Water Hydrants
- Water Tank
- Production Well
- Hildale Ground Water Project Area

Existing Water System
- w_mains
- Water Tank
- Treatment Plant

State Boundary

Map Date: 06.30.2022

HILDALE CITY & TOWN OF COLORADO CITY CULINARY WATER IMPACT FEE FACILITIES PLAN

October 2022

PREPARED BY:

SUNRISE ENGINEERING, INC.
11 North 300 West
Washington, UT 84780
TEL: 435-652-8450
FAX: 435-652-8416

DRAFT

_____
Dustyn W. Shaffer, P.E.
Project Engineer
State of Arizona No. 38923

_____
Vern Maloy, P.E.
Project Engineer
State of Utah No. 8272145

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I. INTRODUCTION

Sunrise Engineering, Inc. has been retained by Hildale City and the Town of Colorado City to complete an Impact Fee Facilities Plan (IFFP) and an Impact Fee Analysis (IFA) for the culinary water system.

This IFFP incorporates by reference associated portions of the "Hildale City and Town of Colorado City Culinary Water Master Plan Update" (CWMP), completed by Sunrise Engineering, Inc. and dated June 2022, which provides a plan for Capital Improvements over the design horizon of 20 years.

According to the State of Utah Impact Fee Act, a community that is less than 5,000 people as of the last census need not conform to all the requirements of the IFFP. Regardless, any impact fee from the entity with less than 5,000 people should still be based on a "reasonable plan".

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.

LENGTH OF PLANNING PERIOD

The CWMP uses a planning period of 20 years. This IFFP considers a planning period of 10 years, encompassing the start of FY2023 to the end of FY2032, based on regulations on impact fee collection and use. Impact fees must be encumbered within six (6) years of their receipt according to Utah State Impact Fee law and within ten (10) years of receipt according to Arizona State Development Fee law. This plan accounts for all incoming fees to be encumbered for eligible projects and debts in the continuous six (6) year window to satisfy the more stringent law.

PROJECTED GROWTH RATE

Hildale City and the Town of Colorado city are unique communities that share their water system across the Utah and Arizona border. Although their combined population is more than 5,000, Each community's population is estimated to be below population requirement of 3,000 according to the US Census Bureau estimates. Therefore, Hildale and the Town of Colorado City, respectively, are not required to comply with all the requirements of the IFFP.

Per the information in the CWMP, the growth rate is analyzed in Equivalent Residential Units (ERUs). Table 1 allocates the ERU value by type of connection from the CWMP.

Table 1: ERUs Per Connection Type

Residential	Commercial	Industrial	Institutional
1.0	1.0	0.5	5.8

The projected number of ERUs at the end of the 10-year planning period is 1502. Table 2 details the CWMP growth rate analysis.

Table 2: Growth Rate Analysis

Population & Growth Rate						
Calandar year	Hildale Population	Colorado City Population	Total Population	Est. Growth Rate	# of Conn.	# of ERU
1990	1325	2426	3751			
2000	1895	3258	5153	3.23%		
2010	2660	4722	7382	3.66%		
2015	2926	4808	7734	0.94%		
2016	2926	4804	7730	-0.05%	891	868
2017	2916	4809	7725	-0.06%	895	891
2018	2916	4825	7741	0.21%	862	968
2019	2910	4836	7746	0.06%	995	1068
2020	2727	4531	7258	-6.30%	936	1004
2021	2825	4694	7519	3.60%	971	1039
2022	2931	4871	7803	3.77%	1009	1078
2023	3034	5042	8076	3.50%	1044	1116
2024	3140	5218	8358	3.50%	1081	1155
2025	3250	5401	8651	3.50%	1119	1195
2026	3364	5590	8954	3.50%	1158	1237
2027	3481	5786	9267	3.50%	1198	1280
2028	3595	5974	9568	3.25%	1237	1322
2029	3711	6168	9879	3.25%	1278	1365
2030	3832	6368	10200	3.25%	1319	1409
2031	3957	6575	10532	3.25%	1362	1455
2032	4085	6789	10874	3.25%	1406	1502
2033	4167	6925	11091	2.00%	1434	1532
2034	4250	7063	11313	2.00%	1463	1563
2035	4335	7204	11540	2.00%	1492	1594
2036	4422	7348	11770	2.00%	1522	1626
2037	4510	7495	12006	2.00%	1553	1659
2038	4600	7645	12246	2.00%	1584	1692
2039	4692	7798	12491	2.00%	1615	1726
2040	4786	7954	12741	2.00%	1648	1760
2041	4882	8113	12995	2.00%	1681	1796
2042	4980	8276	13255	2.00%	1714	1831

II. SUMMARY OF CAPITAL IMPROVEMENTS

The capital improvements recommended for Hildale City and the Town of Colorado City for the 20-year planning period are listed in the CWMP. This Impact Facilities Fee Plan will consider projects in the 0 to 10-year improvements window.

A. WATER SOURCE

- **Well 15 Replacement –** Well 15 is currently being constructed to replace the existing Well 15 which is unable to produce water during peak demands. It is anticipated Replacement Well 15 will produce 20 gpm. This project is anticipated to be completed prior to adoption of impact fees. Therefore, it is not included in the impact fee calculations.

- **Well 17 Replacement** – This is an existing well that is unable to produce water during peak demands. The CWMP recommends that the City replace this well. It is expected that Well 17 would produce 80 gpm after replacement.

- **Treatment Plant Wells** – The CWMP proposes to drill additional wells in the Arizona side of the system. The City is currently working on a study to evaluate the locations of these two wells. The preliminary idea is to drill the wells at the treatment plant, one deep well and one shallow well. Based on evaluation of the output of existing wells, the CWMP anticipates that these wells will produce roughly 80 gpm for the shallow well and 120 gpm for the deep well.

- **Trailhead Well 1** – The City is looking at drilling additional wells in the nearby canyons to the northeast. The water from these canyons would be obtained from different geologic formations than their current wells. The Trailhead Well 1 would be located on City owned property by the Squirrel Canyon Trailhead. This well would provide additional source to the town The CWMP estimates that this well could produce 175 gpm.

- **Trailhead Well 2** – The CWMP recommends that the City drill an additional well on the City-owned land next to the Squirrel Canyon Trailhead. This well and all future wells up the canyon will require obtaining additional water rights. The CWMP estimates that this well will produce 175 gpm.

B. WATER TREATMENT

- **Mohave County ARPA Project** – According to the CWMP, the City is in the process of refurbishing and improving the existing treatment plant. Plant operators expect these improvements to allow for the treatment plant to operate the filters in parallel again and reach the design flow of 2,400 gpm.

- **Raw Water Transmission Line** – The CWMP recommends improvements to the transmission lines that carry the raw water from the wells to the treatment plant. The recommendation includes installation of a new 12" transmission line to convey water from the wells south of the treatment plant, including installation of maintenance access points.

C. WATER STORAGE

- **Sandhill Tank** – This tank would be constructed above the Elm Street tank to create a higher-pressure zone that would supply water to the area north of Utah Ave and east of the highway. The CWMP recommends this tank be at least a 1-million-gallon tank.

Based on the existing ADD, the Sandhill Tank would be able to serve 1,000 ERUs in the new pressure zone.

- **Tank Near Squirrel Canyon Trailhead** – This tank would be installed on the same site as Trailhead Wells 1 & 2. This tank would serve two purposes. First, it would collect the water from the proposed Trailhead Wells and eventually the Hildale Groundwater Project wells detailed in the CWMP. The second purpose is to create a higher-pressure zone on the northeast side of Hildale. This pressure zone would serve the existing and new building up the canyons north of Williams Ave. The CWMP recommends the tank capacity to be 500,000 gallons.

D. WATER DISTRIBUTION

- **Fire Hydrants** – This project proposes to install additional fire hydrants to meet the minimum required spacing. The CWMP recommends that this project replace all undersized lines, based on fire flow, which are not already included in the other improvements. This project would help bring the system into compliance with fire flow requirements.

- **Jessop Ave Line** – This project proposes to install a new 8" diameter line on Jessop Ave from Juniper St. to Redwood St. and tie into the existing north and south lines on Redwood St, Maple St., Elm St., and Juniper St. This line will provide some looping in the area and mitigate the low pressures experienced in this area.

- **University Ave Line** – This project proposes to install a new 8" that would extend from University Ave east to the irrigation canal and then down the irrigation canal alignment to Township Ave. This added line will provide looping to the east side of Colorado City that is experiencing inadequate fire flow.

- **Canyon St Line** – This project proposes to install a new 8" water main in Canyon St. from Memorial St. to Newel Ave. This would provide looping to the northeast Hildale area and help mitigate some of the low pressures and low fire flows. This water main would also function as a trunkline for delivering water from the new wells in the Hildale Groundwater Project and the Trailhead Wells.

III. PROPORTIONATE SHARE ANALYSIS

Impact fee laws in Utah and Arizona require that only that portion of the facility, whether existing, new, or future, that is required for growth may be included in the impact fee calculations. A proportionate share analysis must be made of all the facilities to determine a reasonable and logical ratio of cost for each improvement.

A. WATER SOURCE

Analysis of the water source projects proposed in the CWMP found that, except for the Well 15 Replacement Project, all proposed source projects in the 10-year planning period are partially impact fee eligible. According to data from the CWMP, Hildale City and the Town of Colorado City are projected to be in a source deficit of 286 gpm by the year 2032. The proportion of the estimated 630 gpm produced by the eligible proposed source projects required for future growth was used to determine the percentage of eligibility. Based on this analysis, the proposed source projects are 45.4% impact fee eligible.

B. WATER TREATMENT

The two water treatment projects listed in the CWMP intend to improve the existing water treatment system. The goal of these improvements is for the treatment system to be able to produce the amount of water it was originally built to produce. The issues addressed by these two projects are not the result of growth. Neither of the treatment projects are impact fee eligible.

C. WATER STORAGE

Two water storage projects are proposed in the CWMP during the planning period. The Sandhill Tank project will create a new pressure zone to serve new growth in the area north of Utah Avenue. This tank project is 100% impact fee eligible. The Tank near Squirrel Canyon Trail Head project will function as storage for the proposed Trailhead Well and create a new pressure zone for existing and future developments up the canyons north of Williams Avenue. Based on the proportion of available buildable area to existing developed area within the zoned boundary north of Williams Avenue, the Tank near Squirrel Canyon Trail Head project is 43% impact fee eligible.

D. WATER DISTRIBUTION

All CWMP proposed water distribution projects in the 10-year planning period serve to improve the existing level of service for the system users or provide currently needed fire flows. These projects are not considered impact fee eligible.

E. FUTURE PLANNING

Utah and Arizona Law require the capital facilities plan be updated every five (5) years. Since this plan update falls within the 10-year planning period, it is 100% impact fee eligible.

IV. IMPACT FEE ANALYSIS

The total cost that is eligible for the impact fee assessment is equal to the portion of any planned water improvements project that will be constructed in the next 10 years 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. Please note that this impact fee calculation assumes that Hildale City and the Town of Colorado City will not need to purchase any additional water rights. Should the City choose otherwise, the impact fee should be adjusted accordingly.

It is recommended that Hildale City and the Town of Colorado City begin charging impact fees per ERU. The maximum allowable impact fee was calculated to be $22,684.23. Table 3 contains the analysis performed to determine the impact fee.

Table 3: Impact Fee Analysis

Source Projects	Current Costs	Year	Costs w/ Inflation*	Financed Costs**	% IF El.	IF El. Cost
Well 15 Replacement	$ 644,325.00	2023	$ 663,655	$ 758,284	0.0%	$ -
Well 17 Replacement	$ 644,325.00	2023	$ 663,655	$ 758,284	45.4%	$ 344,536
Treatment Plant Wells	$ 1,288,650.00	2023	$ 1,327,310	$ 1,516,567	45.4%	$ 689,072
Trailhead Well 1	$ 2,445,250.00	2025	$ 2,671,991	$ 3,052,984	45.4%	$ 1,387,163
Trailhead Well 2	$ 1,713,100.00	2028	$ 2,045,531	$ 2,337,198	45.4%	$ 1,061,937
		Sub total	$ 23,631,900			
Water Treatment Projects	**Current Costs**	**Year**	**Costs w/ Inflation**			
Mohave County ARPA Project	$ 948,000.00	2023	$ 976,440	$ 1,115,668	0.0%	$ -
Raw Water Transmission Line	$ 998,800.00	2023	$ 1,028,764	$ 1,175,453	0.0%	$ -
		Sub total	$ 2,005,204			
Storage Projects	**Current Costs**	**Year**	**Costs w/ Inflation**			
Sandhill Tank	$ 3,983,400.00	2025	$ 4,352,769	$ 4,973,420	100.0%	$ 4,973,420
Tank Near Squirrel Canyon Trail Head	$ 1,864,100.00	2028	$ 2,225,833	$ 2,543,209	43.0%	$ 1,093,580
		Sub total	$ 12,993,804			
Distribution System Projects	**Current Costs**	**Year**	**Costs w/ Inflation**			
Fire Hydrants	$ 1,733,500.00	2023	$ 1,785,505	$ 2,040,096	0.0%	$ -
Jessop Ave Line	$ 808,770.00	2025	$ 883,765	$ 1,009,779	0.0%	$ -
University Ave Line	$ 326,000.00	2030	$ 412,967	$ 471,851	0.0%	$ -
Canyon St Line	$ 374,900.00	2028	$ 447,650	$ 511,480	0.0%	$ -
		Sub total	$ 3,529,887			
Future Planning Projects	**Current Costs**	**Year**	**Costs w/ Inflation**			
Capital Facilities Plan and IFFP & IFA Update	$ 50,000	2028	$ 59,703	$ 68,215	100.0%	$ 68,215
		Sub total	$ 59,703		Impact Fee Amount	$ 9,617,924
Total			$ 38,690,611		Number of New ERUs	424
					Impact Fee per ERU	**$ 22,684.23**

* Inflation is assumed at 3%

**Financed costs assume a 10-year 2.5% interest loan

It is important to note that these impact fees are for the improvements summarized in this Plan and do not provide for the City 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.

V. IMPACT FEE CERTIFICATION

In general, it is beneficial to update this impact fee facilities plan and analysis at least every five years, or more frequently if drastic growth or changes affect the assumptions and data in this plan. It is assumed that this plan will be updated as recommended.

There are items relating to impact fees that Hildale City and the Town of Colorado City must consider when planning for, collecting, and expending impact fees in accordance with Utah Code 11-36a-101 and Arizona Code 9-463.05.

City staff must understand that impact fees can only be expended for a system improvement that is identified in the Impact Fee Facilities Plan and that is for the specific facility type for which the fee was collected. Impact fees must be expended or encumbered for a permissible use within six years of their receipt unless Utah Code 11-36a-602(2)(b) applies. Also, impact fees must have a proper accounting (track each fee in and out) in accordance with Utah Code 11-36a-601 and Arizona Code 9-463.05.

In accordance with Utah Code 11-36a-306 a certification of impact fee analysis is located in Appendix A.

Source Projects	Current Costs	Year	Costs w/ Inflation*	Financed Costs**	% IF El.	IF El. Cost
Well 15 Replacement	$ 644,325.00	2023	$ 663,655	$ 758,284	0.0%	$ -
Well 17 Replacement	$ 644,325.00	2023	$ 663,655	$ 758,284	42.3%	$ 320,754
Treatment Plant Wells	$ 1,288,650.00	2023	$ 1,327,310	$ 1,516,567	42.3%	$ 641,508
Trailhead Well 1	$ 2,445,250.00	2025	$ 2,671,991	$ 3,052,984	42.3%	$ 1,291,412
Trailhead Well 2	$ 1,713,100.00	2028	$ 2,045,531	$ 2,337,198	42.3%	$ 988,635
		Sub total	$ 23,631,900			
Water Treatment Projects	**Current Costs**	**Year**	**Costs w/ Inflation**			
Mohave County ARPA Project	$ 948,000.00	2023	$ 976,440	$ 1,115,668	0.0%	$ -
Raw Water Transmission Line	$ 998,800.00	2023	$ 1,028,764	$ 1,175,453	0.0%	$ -
		Sub total	$ 2,005,204			
Storage Projects	**Current Costs**	**Year**	**Costs w/ Inflation**			
Sandhill Tank ***	$ 3,983,400.00	2025	$ 4,352,769	$ 4,973,420	100.0%	$ 4,973,420
Tank Near Squirrel Canyon Trail Head	$ 1,864,100.00	2028	$ 2,225,833	$ 2,543,209	43.0%	$ 1,093,580
		Sub total	$ 12,993,804			
Distribution System Projects	**Current Costs**	**Year**	**Costs w/ Inflation**			
Fire Hydrants	$ 1,733,500.00	2023	$ 1,785,505	$ 2,040,096	0.0%	$ -
Jessop Ave Line	$ 808,770.00	2025	$ 883,765	$ 1,009,779	0.0%	$ -
University Ave Line	$ 326,000.00	2030	$ 412,967	$ 471,851	0.0%	$ -
Canyon St Line	$ 374,900.00	2028	$ 447,650	$ 511,480	0.0%	$ -
		Sub total	$ 3,529,887			
Future Planning Projects	**Current Costs**	**Year**	**Costs w/ Inflation**			
Capital Facilities Plan and IFFP & IFA Update	$ 50,000	2028	$ 59,703	$ 68,215	100.0%	$ 68,215
		Sub total	$ 59,703		Impact Fee Amount	$ 9,377,524
Total			$ 38,690,611		Number of New ERUs	424
					Impact Fee per ERU	**$ 22,117.24**

* Inflation is assumed at 3%

**Financed costs assume a 10-year 2.5% interest loan

*** This tank is needed for Hildale to expand north and west. This option is for the City to be responcible for the project and use funds from impact fees to cover 100% of the project costs.