VIII. WASTEWATER RATE ANALYSIS

A. EXISTING USER RATES

The existing wastewater user rate is based on winter culinary water usage data. The towns average culinary water usage from December, January, and February was used to estimate the indoor water usage throughout the year. The current base rate is $55.20 and includes up to 10,000 gallons. The overage rate is currently set at $1.20 per thousand gallons over the 10,000 gallon base amount. The last rate increase took place in July, 2011.

In 2014, Hildale City and the Town of Colorado City completed a Culinary Water Impact Fee Facility Plan and Impact Fee Analysis. This report indicates that the average indoor daily culinary water usage per connection is approximately 800 gallons per day. Based on a 30 day month, the existing wastewater fee structure, and historic average indoor water usage, the average monthly wastewater bill would be approximately $72.00 per ERU. This is about $8.00 less than the amount calculated in the financing plan.

B. FUTURE AVERAGE RATE DETERMINATION

Annual revenues must be sufficient to cover the expenses incurred by the construction, maintenance, and administration of the wastewater system. These expenses include debt service, utilities, personnel salaries and benefits, system maintenance, legal and professional fees, and other miscellaneous items. It is also recommended that the wastewater utility continue to maintain a funded depreciation account or a repair and replacement fund to provide the money necessary for replacement and repair of wastewater facilities in the future.

This study investigates separating the average user rate into base and overage rates, and investigates several possible rate structures. Rate structures that promote water conservation support the understanding that expenses to operate the wastewater system decrease as the amount of water needing treatment decreases.

In order to investigate a possible base and overage schedule, the projected expenses for FY2018 have been separated into fixed and variable expenses (see Table VIII.B-1). In this type of scenario, it is recommended that the base rate should cover the fixed expenses of the system, while variable costs can be covered by the overage rates. The analysis shown in Table VIII.B-1 identifies base and overage rates that should satisfy the revenue requirements based on estimated operation and maintenance (O&M) expenses and anticipated wastewater flows. The City is able to set the rate structure to any amount it deems to be fair. However, the rates should be such that the system remains financially viable.

If population growth and development occur as projected, the City will need to determine a rate schedule that will generate an average rate of $80.60/ERU/month in order to provide for the necessary system improvements as recommended in this Plan and to maintain the required operation and maintenance. The base and overage rates should be examined each year to ensure that enough revenue is being generated to cover the expenses.

Table VIII.B-1: Fixed/Variable Rate Analysis

COLORADO CITY/HILDALE WASTEWATER SYSTEM FIXED/VARIABLE RATE ANALYSIS			
FY2018 Expenses	**Fixed**	**Variable**	**Total**
Personnel Costs (100-199)	$192,188	$0	$192,188
Materials & Supplies (200-299)	$61,002	$61,002	$122,004
Outside Services (300-399)	$40,845	$40,845	$81,689
Special Dept Material & Supplies (400-499)	$1,326	$1,326	$2,652
Other Charges (500-599)	$530	$530	$1,061
Capital Outlay (700-799)	$75,854	$75,854	$151,709
Additional O&M Expenses	$63,626	$63,626	$127,251
EXISTING DEBT SERVICE			
USRDA-A - Bond Payment	$29,220	$0	$29,220
USRDA-B - Bond Payment	$102,768	$0	$102,768
USRDA-C - Bond Payment	$19,440	$0	$19,440
DWQ - Bond Payment	$79,000	$0	$79,000
NEW DEBT SERVICE			
New Loan(s)	$143,686	$0	$143,686
Loan Reserve (Payment/10)	$14,400	$0	$14,400
REPAIR & REPLACEMENT FUND			
Repair & Replacement	$85,124	$28,375	$113,499
Total Expenses:	$909,009	$271,557	**$1,180,567**
Revenue from Impact Fees	$0	$96,401	$96,401
Revenue from User Rates	$909,009	$175,156	$1,084,166
Total Projected System Connections	1121	1121	1121
Monthly Cost/ERU	$67.57	$13.02	$80.60

The fixed/variable rate analysis shown above suggests that the fixed portion of the rate may need to be increased to $67.57 to help ensure the required revenue is able to be generated, especially in times of slow growth or significant conservation. The remaining $13.02 could be generated by an overage rate. This analysis assumes that personnel costs and debt service remain 100% fixed, revenue from impact fees is entirely variable, and the other expenses vary from 50% to 75% fixed. It is believed that these assumptions are reasonably conservative.

C. POSSIBLE RATE STRUCTURES

Table VIII.C-1 displays a possible change to the rate structure based on the analysis above. This potential rate change takes a balanced approach for the required revenue, splitting the increase fairly evenly between low and high water users. In this option, customers would be given an increase in the gallons included in their base rate to help justify the increase. Although this structure may be the most conservative in terms of being able to generate the required revenue, it does little to encourage conservation.

Table VIII.C-1: Possible Rate Structure

COLORADO CITY/HILDALE WASTEWATER SYSTEM Possible Rate Structure (Option 1)		
Base Rate	$67.00	ERU/Month
Includes	12,000	Gallons
Overage Steps		
Cost Per 1,000 Gal.	Low Gallons	High Gallons
$1.20	12,001	24,000
$1.25	24,001	34,000
$1.25	34,001	50,000
$1.25	50,001	& UP
Example of Wastewater Bill Based on Usage		
Usage	Rates	
(Gallons)	New Rate	Existing Rate
5,000	$ 67.00	$ 55.20
15,000	$ 70.60	$ 61.20
24000 (Average)	$ 81.40	$ 72.00
40,000	$ 105.66	$ 91.20
80,000	$ 151.40	$ 139.20

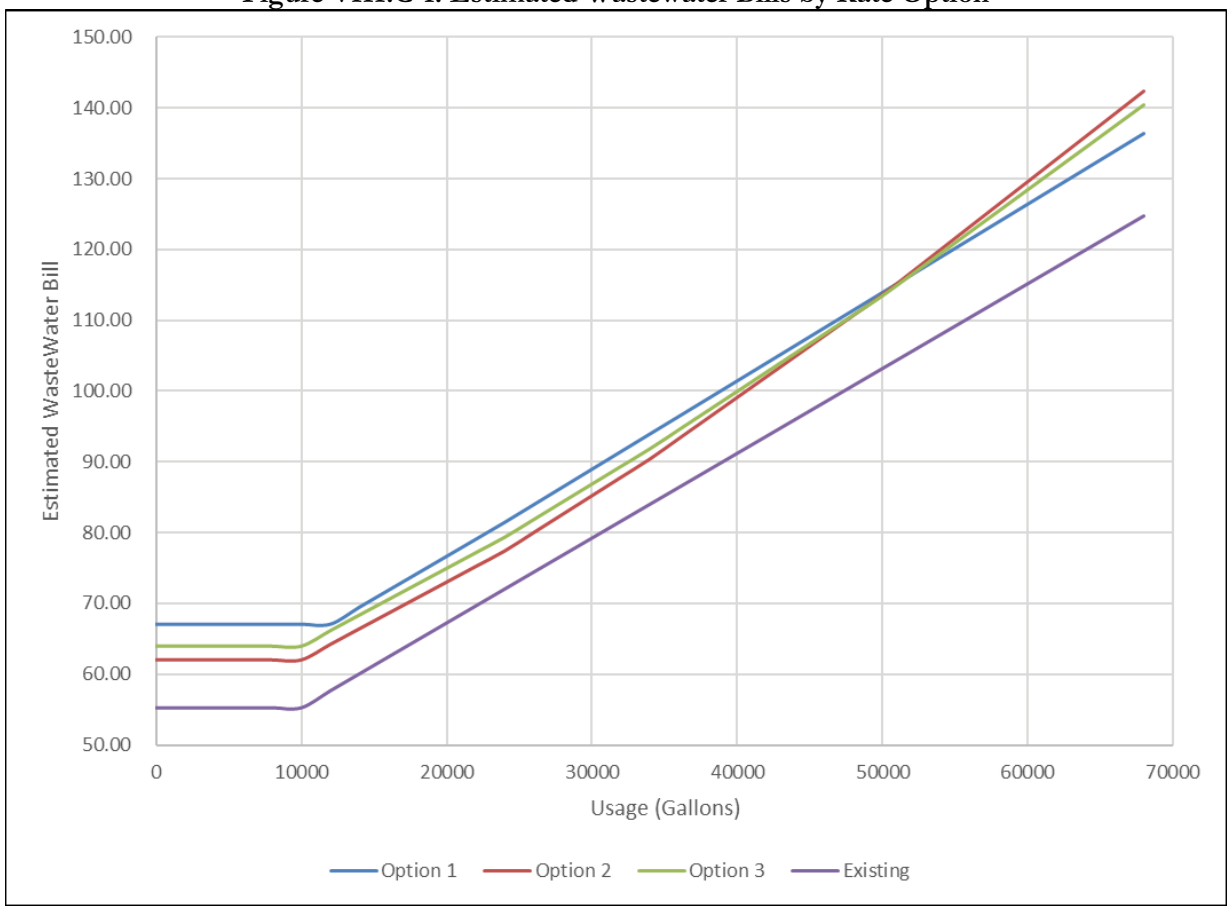
Table VIII.C-2 illustrates some alternate rate structures which may also provide the necessary revenue. In these options, the overage rate structure is stepped more dramatically to promote conservation by charging a higher amount for those using more water. These options take a less balanced approach, where the increase is less significant for lower water users and more significant for higher water users. Option 2 represents the most reward for conservation, and Option 3 is in the middle of the other two options. The best way to confirm that the average rate produced will cover annual expenses is to implement the structure and evaluate the results after a full year of use.

Table VIII.D-2: Possible Water Rate Structure

COLORADO CITY/HILDALE WASTEWATER SYSTEM Possible Water Rate Structures (Options 2 and 3)					
Base Rate	$62.00	ERU/Month	Base Rate	$64.00	ERU/Month
Includes	10,000	Gallons	Includes	10,000	Gallons
Overage Steps			Overage Steps		
Cost Per 1,000 Gal.	Low Gallons	High Gallons	Cost Per 1,000 Gal.	Low Gallons	High Gallons
$1.10	10,001	24,000	$1.10	10,001	24,000
$1.30	24,001	34,000	$1.25	24,001	34,000
$1.45	34,001	50,000	$1.35	34,001	50,000
$1.60	50,001	& UP	$1.50	50,001	& UP
Example of Wastewater Bill Based on Usage			Example of Wastewater Bill Based on Usage		
Usage	Rates		Usage	Rates	
(Gallons)	New Rate	Existing Rate	(Gallons)	New Rate	Existing Rate
5,000	$ 62.00	$ 55.20	5,000	$ 64.00	$ 55.20
15,000	$ 67.50	$ 61.20	15,000	$ 69.50	$ 61.20
24000 (Average)	$ 77.40	$ 72.00	24000 (Average)	$ 79.40	$ 72.00
40,000	$ 104.04	$ 91.20	40,000	$ 104.60	$ 91.20
80,000	$ 161.60	$ 139.20	80,000	$ 158.50	$ 139.20

The chart below shows the estimated wastewater bills for the existing rate structure and each of the options based on usage. As can be seen, Option 1 has a balanced increase for both low and high water users, Option 2 has the smallest change for low water users and the most significant increase for high water users, and Option 3 is in the middle of the other two options. The existing rate structure is shown for comparison.

Figure VIII.C-1: Estimated Wastewater Bills by Rate Option



Consideration should also be given to an automatic rate increase based on inflation to help ensure that rates are keeping up with the expected increases in operation and maintenance.

D. CENTENNIAL PARK RATES

One thing that should be considered is that a large portion of the operation and maintenance expenses required for the wastewater collection system are directly related to providing wastewater service to the Centennial Park area. These expenses generally consist of those required to operate and maintain the lift station and force main. However, it is also believed that much of the corrosion damage requiring replacement of the A-Line manholes is due to the wastewater strength downstream of the force main tie-in which contributes to the generation of the hydrogen sulfide gas responsible for the corrosion.

Based on 2015 estimates, the Centennial Park area includes approximately 180 connections, and represents approximately 16.6% of the total number of connections. This is disproportionate to the annual costs associated with operating the lift station. These annual costs are estimated below based on review of 2014 to 2016 financial information provided by the Hildale Wastewater Department:

R&R Lift Station 30 HP Submersible Pump	$4,500.00
R&R Lift Station Generator (100 kw)	$650.00
R&R Lift Station Grinder	$3,000.00
R&R Lift Station Controlotron Flow Meter	$400.00
R&R Air Compressor	$1,000.00
*Other Department Expenses (16.6%)	$77,199.30
Other Department R&R (16.6%)	$17,255.48
Annual Electric Power (Not Lift Station) (16.6%)	$7,802.00
Annual Electric Power (Lift Station)	$10,000.00
Total	$121,806.78

*Electric Power has been excluded from Other Department Expenses

Based on the current billing procedures in place, the 2015 income from Centennial Park wastewater usage billing was approximately $115,171.05, which means the remaining costs associated with providing wastewater service to Centennial Park are being subsidized by the remaining customers.

It should be noted that these estimated expenses exclude costs associated with replacement of the manholes along A Line, which is believed to be primarily caused by the characteristics of wastewater being discharged from the force main into A Line. In an effort to collect revenue needed for associated repairs and to initiate effort on behalf of Centennial Park customers to make changes to effluent quality, consideration could be given to implementing a multiplier to the normal wastewater rates to account for wastewater characteristics/strength. This is described more indepth in the last portion of this section. It could be implemented based on sampling results taken from the force main effluent compared to average wastewater sampling results taken upstream of the force main discharge point.

Based on an estimated cost of $250,000 to replace the manholes and a service life of 15 years (current need of replacement and year of installation), the multiplier should be such that at least $16,667 dollars of revenue is generated annually for future replacement or repair work. Of this cost we assume that 90% is attributable to the impact of the Centennial Park flows. Thus manhole costs alone represent an average annual multiplier of approximately 1.13.

It is recommended that Colorado City and Hildale look into the possibility of altering current billing policies/agreements in order to ensure that revenue generated covers the cost associated with providing wastewater service to this area. Colorado City and Hildale would like to make sure that the amount of revenue received from Centennial Park covers their actual costs. They would also like to consider the possibility of charging by flow volume, thus eliminating the need to track and/or confirm number of ERU's outside of their jurisdiction, as well as a minor consideration of giving the Centennial Park the actual lift station since it only serves that development.

We will analyze the two options as shown below. Both options should be structured to bring revenues to the level of actual costs, plus Centennial Park's share of the improvements for their connection:

1. Leave billing/charge structure as is, individual user based. Increase the user rate structure charts as shown for the municipal customers by a multiplier to cover the shortfall, the and the future replacement of manholes.
2. Charge by the quantity of flow added into the system by CP.

There are also two potential adjustments that could be applied to either option:

1. Transfer lift station ownership and O&M to Centennial Park, removing the CP lift station costs from either option above would account for this.
2. Considerations could also include the cost to treat higher strength wastewater, but calculations to determine these costs may be difficult to perform and to justify.

If the billing structure is left as is, and in order to provide the necessary service without losing money as shown previously, the utility should apply a multiplier to the proposed rates. Methodology for this multiplier is calculated and the total amount of revenue needed from CP is as shown below:

- Total CP cost calculated previously $121,807
- 16.6% of $158,086 New Project Debt Service $ 26,242
- R&R on Manholes in A-line for (see above) $ 15,000
- Total Revenue Goal for Centennial Park $163,049

As indicated above, the 2015 revenue for the CP connection was $115,171. This would mean that multiplier in comparison to the existing rate would be as follows:

- Multiplier calculation $163,049/$115,171 = 1.4157

If the desire is to have it more similar to the charges within Hildale/Colorado City, then the new project debt service would be eliminated from the calculation and the resultant multiplier would then be applied to the user rate selected by the utility for those users within their own boundaries. This would be 1.1879.

Interest in simplifying the charge required us to analyze a cost based on flow instead of number of users. If the utility company charges by quantity of wastewater from Centennial Park the following calculations would be applied, using current year CP population of 1,330 and average flow from previous sections:

- Revenue goal $163,049
- 55.8 gal/cap/day X 1330 people => 74,214 gal/day or 27,088,000 gal/year
- Charge based on flow rate $163,049/27,088 **=> $6.02/1,000 gallons**

Adjustments to either method could be addressed as follows:

1. Charge with lift station ownership and operation turned over to the Centennial Park Subdivision. As shown above the revenue goal is $163,049 remove items related to lift station

operation and maintenance. Removing the lift station related annual O&M costs detailed below:

	Annual
• R&R Lift Station 30 HP Submersible Pump	$4,500
• R&R Lift Station Generator (100 kw)	$650
• R&R Lift Station Grinder	$3,000
• Annual Electric Power (Lift Station)	$10,000
	$18,150

i. $163,049 – 18,150 = $144,899/$163,049
ii. Multiplier to remove the lift station = .8887

This multiplier would be applied to either option above and would mean that the resultant multiplier in Option 1 would go down from 1.4157 to 1.0182 and the cost per 1,000 gallons in Option 2 would go from $6.02 to $5.35/1,000 gallons.

2. Since many of the difficulties experienced with the existing system have been directly related to the quality of the wastewater, there is an interest in perhaps adding a surcharge to the amount charged based on certain characteristics of the wastewater. The levels of BOD in the waste are almost double the normal amount which, as previously discussed, has made the existing treatment facility obsolete and unable to stay under the maximum BOD loading requirements. The levels of the dissolved solids have removed the ability to reuse the water on an irrigated crop. Potential Multipliers for Quality Constituents such as BOD, COD and Salinity (TDS) can be considered but would be difficult to administer and track. Although the samples would only be a snap shot in time and as such should provide a fairly good average representation, it would not likely capture some of the higher events that may take place. The methodology for this style of surcharge could be one or more, or a combination of the following, to have a combined surcharge multiplier or per pound cost.

   i. BOD
      1. Design BOD = 204 mgl
      2. Take reading of CP BOD/204 mgl and use that as a multiplier
      3. Or charge per lb of BOD over design
   ii. COD
      1. Take reading of COD upstream from CP discharge MH
      2. Take sample of CP COD
      3. Use ratio of #2/#1 as a multiplier if greater than one.
      4. Or charge per lb of COD over design
   iii. Salinity (TDS)
      1. TDS goal = 1000 mg/l
      2. Take reading of CP TDS divide by 1000 mg/l and use that as a multiplier if greater than one. Or use as a ratio of the rest of the system.
      3. Or charge per lb of TDS over design