

CHERRY HILLS VILLAGE



Sanitary Sewer Rate
Development

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**CHERRY HILLS VILLAGE
TECHNICAL MEMORANDUM
SANITARY SEWER RATE STUDY
SECTION 1 – EXECUTIVE SUMMARY**

EXECUTIVE SUMMARY

Historically, the City of Cherry Hills Village (City) has charged its sewer customers a flat sewer rate of \$162 annually to its customers. Records indicate that the City has not had a rate adjustment since 1996. In order to effectively operate, maintain, and repair the collection system going forward the City recognizes that the sewer rate needs to be addressed.

The City's annual operating expenses for the sewer collection system has been determined to be \$27,220 and funding of a repair and replacement reserve requires \$78,000 annually. Based on the expense requirements for the City's sewer collection system, it was determined that the annual sewer rate for City customers should be \$503 annually.

Table ES-1: Proposed Annual Sewer Rates		
	Customer (\$/TE)	Connector (\$/TE)
Operation & Maintenance Fee	\$101/TE	\$33/TE
Capital Replacement Reserve	\$402/TE	\$0/TE
TOTAL	\$503/TE	\$33/TE

In addition to the developed rate, the most recent round of cleaning and inspection established that the collection system requires immediate repairs on approximately 23% of the entire system. This amounts to approximately \$600,000 in immediate repairs. Connectors to the collection system will contribute approximately \$150,000 per existing agreements. The City has the option of funding its portion of the repair cost, \$450,000, from the existing Sewer Fund.

In addition to the rate increase, it is recommended that the City undertake a public outreach program designed to educate and inform its customers about the reasons behind rate increases. Along with the public outreach program, it is recommended that the City adjust its current billing cycle from annually to monthly, or at a minimum quarterly.

End of Section 1

**CHERRY HILLS VILLAGE
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SECTION 2 – INTRODUCTION**

INTRODUCTION

The City of Cherry Hills Village (City) requested that TST Infrastructure, LLC (TST) develop a program for developing a sustainable rate to charge for providing sanitary sewer collection services. The City currently owns and operates a sanitary sewer collection system consisting of 141 manholes and approximately 36,155 linear feet of collection pipe. The system serves primarily residential customers with one commercial customer located within the collection service area.

The City has two different residential customer types utilizing the conveyance system to deliver sanitary waste to the City of Englewood’s (Englewood) collection system and ultimately to the Littleton/Englewood Wastewater Treatment Plant. There are 162 residential customers located within the City’s service area and 238 residential customers located outside the service area that connect to the City’s main trunk line (trunk line) conveying wastewater into Englewood’s collection system.

The collection system owned, operated and maintained by the City is comprised of three subdivisions:

- Cherry Hills Rancho
- Cherrymoor South
- Cherryridge

The City charges sewer rates based on a residential tap equivalent (TE). One residential customer is equivalent to 1 TE. The collection system consists of residential users, one commercial user, collection pipes, and manholes. The makeup of each of the three collection systems are summarized in the table below.

Table 1: Existing Collection System Characteristics			
Subdivision	Tap Equivalents (TE’s)	Collection Pipe (LF)	Manholes
Cherry Hills Rancho	37	6,600	29
Cherrymoor South	91	19,920	84
Cherryridge	66	9,635	28
Totals	194	36,155	141

Table 1 shows that Cherrymoor South has considerably more collection pipe than either of the other two subdivisions. The trunk line, conveying flow from all three subdivisions to the connection with Englewood, is approximately 12,000 feet in length and is within the Cherrymoor South subdivision. The subdivisions are entirely residential except for Cherrymoor South which includes the Cherry Hills Country Club (CHCC), a commercial customer. When the CHCC was included into the City’s service area it was agreed that CHCC would pay the equivalent of 32 TE’s. The 32 TE’s are included in Cherrymoor South’s subdivision and are included in Cherrymoor South’s 91 TE’s summarized in Table 1.

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SECTION 2 – INTRODUCTION**

In addition to the collection system owned and operated by the City, there are three subdivisions, outside of the City's service area, that connect to the trunk line. The three subdivisions and their number of TE's are shown in Table 2.

Table 2: Out of Service Area Connectors	
Subdivision	TE's
General Improvement District (GID) #1	150
Cherryvale	70
Country Homes	18
Totals	238

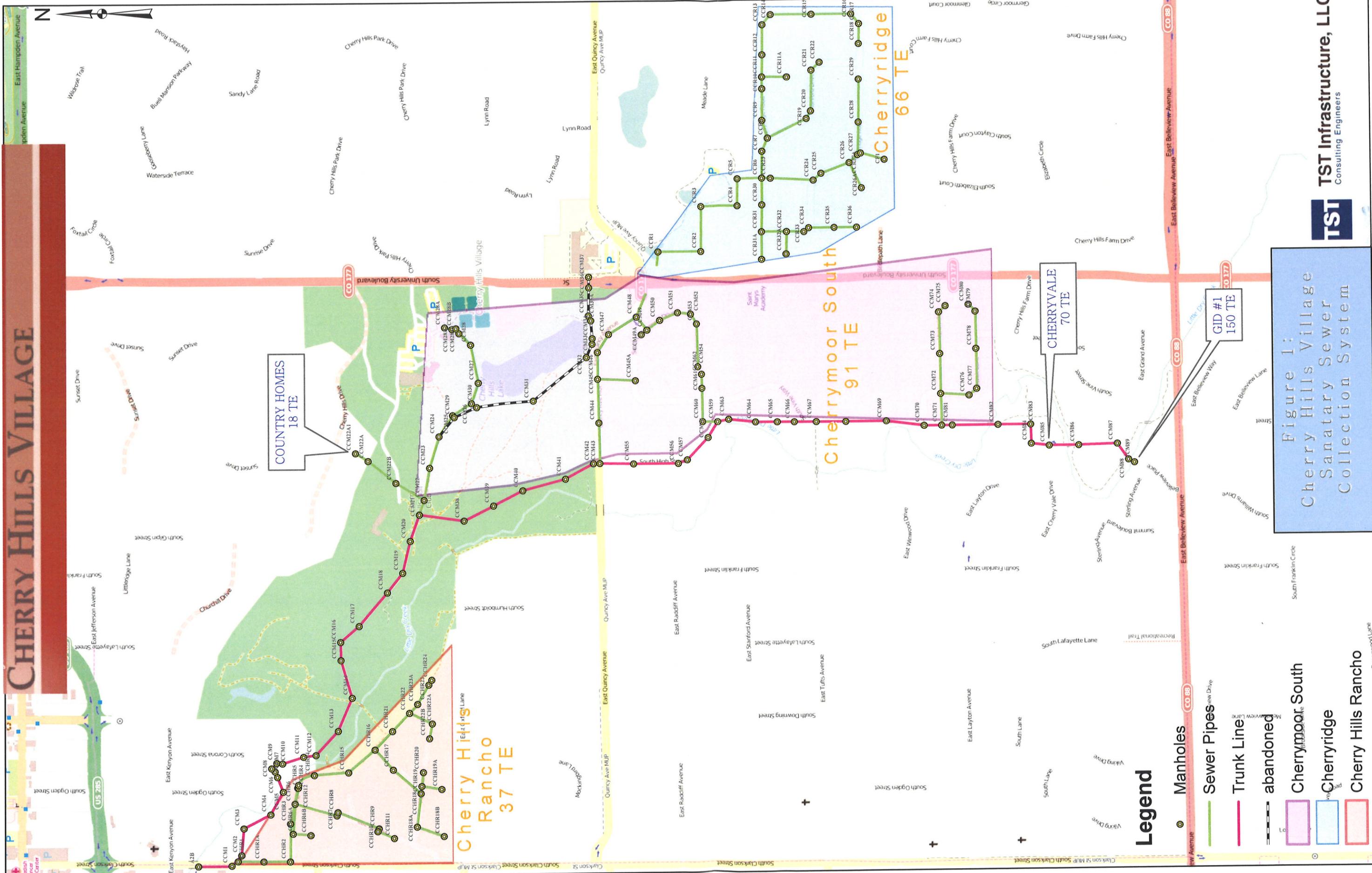
All the connectors outside of the City service area, participate by agreement, in repairs to the trunk line as well as its regular Operations and Maintenance (O&M) costs. Table 3 summarizes the number of TE's for each of the three subdivisions and the trunk line. Costs associated with the particular subdivisions are divided equally among the City's customers with the outside connectors participating only in the repair and maintenance of the trunk line.

Table 3: Subdivision Participants	
Subdivision	TE's
Cherry Hills Rancho	194
Cherrymoor South	194
Cherrymoor South Trunk Line	432
Cherryridge	194

The table shows that costs associated with the Cherrymoor South trunk line, both repairs and O&M costs, are shared by both the City customers (194 TE's) as well as the City connectors (238 TE's). Figure 1 shows the City subdivisions and their relationship to the Cherrymoor South Trunk Line as well as the City connectors and their connection points to the trunk line.

End of Section 2

CHERRY HILLS VILLAGE



COUNTRY HOMES
18 TE

Cherry Hills
Rancho
37 TE

Cherrymoor South
91 TE

Cherrystone
66 TE

CHERRYVALE
70 TE

GID #1
150 TE

Legend

- Manholes
- Sewer Pipes
- Trunk Line
- abandoned
- Cherrymoor South
- Cherrystone
- Cherry Hills Rancho

Figure 1:
Cherry Hills Village
Sanitary Sewer
Collection System

RATE DEVELOPMENT

The methodology used to develop sewer rates has been adapted from standard industry guidance, to meet the specific goals and requirements of the City of Cherry Hills Village. Sewer collection rates should reflect the actual cost of providing service, and all customers should pay their share of that cost based on their use of the system. The following methodologies were used to develop the sanitary sewer rates:

- Determine the revenue requirements including the specific costs as well as reserves.
- Determine the number of customers that should pay for the use of the system.
- Develop a suitable rate structure that meets the revenue requirements of the system.

SUSTAINABILITY

Sustainable rate development recognizes that the revenue requirements for any collection system include direct operating and maintenance costs, as well as the repair and periodic replacement of components within the collection system. The City currently maintains a Sewer Fund that contains operating and capital reserve for the City's sewer utility. Maintaining the reserve sewer fund will require an increase in the current billing rate.

To identify and quantify capital replacements, the City maintains a schedule of its sewer system assets, including estimated replacement cost for each asset (See Appendix A). Original construction cost data was not available and replacement costs were estimated using a unit price cost estimating approach based on current dollars. Depreciated costs were calculated using linear depreciation based on the useful life and current age for each specific asset. The useful life for the different assets was estimated using a conservative value based on industry information available for each asset.

The current value of the District's assets is established based on the replacement cost of the system less depreciation. For accounting purposes, current value of assets is based on original cost less depreciation, which provides an extremely conservative estimate of the current asset value, but significantly understates the real value of the assets. For asset management and planning purposes, the City uses Replacement Cost Less Depreciation to establish the current value of existing assets. The full replacement value of the collection system is approximately \$6,092,000. The current value (Replacement Cost Less Depreciation) of the City's sewer assets in 2014 is \$2,820,096.

Maintaining the long term sustainability of the City's sewer system requires the replacement of each asset as it approaches its useful life. Based on the current value of the existing assets, it is estimated that infrastructure replacement requires an annual revenue stream equal to the annual depreciation of the system. The current annual depreciation of the system is approximately \$78,000/yr. The City needs to collect \$78,000 annually in order to keep pace

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SECTION 3 – RATE DEVELOPMENT**

with the deterioration of the collection system. Dividing the annual depreciation rate by the number of City customers determines the annual fee required from each TE to fully fund the capital improvement reserve. Based on 194 TE's, each TE is required to pay \$402 annually in order to fully fund the capital improvement reserve.

Although capital replacement is an absolute requirement for sustainable systems, it is not currently feasible to increase user charges to completely fund the estimated capital replacement requirement. It is recommended that the City implement the funding of the capital improvement reserve over a period of time in order to lessen the impact of rising sewer rates. Funding for future capital replacement projects is expected to include the use of accumulated cash reserves, supplemented by debt financing as required.

Phasing in the rate increases will also coincide with the periodic inspection and cleaning activities. As the maintenance program cleans and inspects the collection system every 3 years, the City will also review its current billing rate to ensure that the amount of revenue collected is adequate to maintain the collection system. Every 3 years in concert with the cleaning and inspection activities the City will review its rate structure and the value of the collection system and adjust rates as needed.

METHODOLOGY

Generally accepted practice for establishing sewer rates is contained in the Water Environment Federation Manual of Practice MOP 27 – Financing and Charges for Wastewater Systems. Measuring individual sewer service flows is not standard practice in the wastewater industry, and sewer rates are most often based on a flat rate, a percentage of water use, or an estimation of the annual wastewater flow based on winter water use.

A customer's impact on the wastewater system is determined not only by the quantity of wastewater generated, but also by the characteristics of the wastewater. Some commercial and industrial users may contribute higher strength wastewater, which has a greater impact on the wastewater treatment systems than a typical residential wastewater. The City does not have any industrial customers and the Cherry Hills Country Club is the only commercial customer within the City's service area.

The City has two classes of residential customers for its wastewater collection service. The residential classes are City customers, located within the City's service area, and City connectors, located outside the City's service area but utilizing the trunk line to convey flow through the City's collection system. Historically, the City has utilized a flat fee for its residential sewer rates. Individual sewer services in the City are not metered, and rates must be based either on a flat fee or on an estimation of annual sewage quantity. The City does not provide water service to the residential customers making it difficult to estimate customer's winter water use.

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Flat rate is the preferred basis for the City’s sewer rates because it eliminates the requirement to estimate each customer’s wastewater contribution. Because most residential units tend to have similar indoor water use, it is unlikely that estimating individual wastewater contributions would improve accuracy sufficiently to justify the cost required to estimate each customer’s winter water use on an annual basis. In addition to being sufficiently accurate for use within the residential customer class, flat fees provide a stable revenue stream. Finally, the City receives wastewater treatment service from the Littleton/Englewood Wastewater Treatment Plant (L/E WWTP), and flat rate charges are consistent with Englewood’s charges for treatment. Englewood charges a treatment fee based on winter water use with a minimum treatment charge of \$220/yr.

Historically, the City has charged a \$12.00 administration fee along with a \$150.00 sewer repair and maintenance fee. The flat fee for City customers is \$162.00 per year. The City recognizes that this rate is not sufficient for the long term sustainability of the sewer collection system.

Steps in Sewer Rate Making Methodology

- Review previous year cost/revenue data
- Determine revenue requirements based on budget
 - Operating Costs
 - Reserves
 - Capital Improvements
 - Debt Service (if applicable)
- Calculate flat rate per TE required to meet budgeted expenses

2014 SEWER RATES

Background Information

The City provided financial information for 2013 and it is presented in Appendix B. Review of the 2013 information provides a basis for evaluating future rate requirements. In 2013, the City collected \$24,462 from the residential customers within the service area. The cost to each City customer was \$162.00/yr per TE. Service charges for 2013 are shown in the following table.

Table 4: 2013 Sewer Rates		
Rate	City Customers	City Connectors
Administration	\$12.00	\$5.00
Capital Replacement	\$150.00	\$0.00
Treatment Charge*	\$220.00	-

*Minimum charged by Englewood for treatment services.

Historically, these sewer rates have been held constant and have not been increased for a considerable amount of time. The City is aware that in order for the system to be sustainable the amount collected from each TE must be increased.

Revenue Requirement Determination

TST conducted an Operation & Maintenance (O&M) study that is included in Appendix C. The study determined the fixed operational costs required for the City to operate and maintain the sewer collection system. The O&M expenditures include:

- Administration
- Legal Counsel
- System Operator
- Maintenance and Inspection

The total amount required for the operation and maintenance of the system is \$27,220. Table 5 below summarizes the O&M fees developed in the study that are required from both the City customers and connectors to meet the operating and maintenance expenditures for the collection system.

Table 5: Annual O&M Fees	
City Customers	City Connectors
\$101.00	\$32.10

The above fees represent the amount of revenue required to operate and maintain the general state of the collection system. This rate adjustment raises the administration portion of the sewer rate from \$12 to \$101.

Capital Repair and Replacement Reserve

Historically, the City has collected fees to fund the repair and replacement reserve. In 2013 that fee was \$150/yr per TE. It has been determined that in order to fully fund the capital repair and replacement sewer reserve requires \$402/TE annually. This level of funding will provide for the annual depreciation of the collection system. The reserve fund is then utilized for the repairs and defects that are identified during regular maintenance and inspection activities. The recommendation is that the City clean and inspect the entire collection system every three years. Defects and required repairs identified during the inspection would then be scheduled and budgeted using the accumulated reserve fund.

TST conducted a Capital Improvement Program (CIP) study for the City. The intent was to provide options for repairing defects that have been identified during the latest round of cleaning and inspection. The study report is included in Appendix D. The CIP study indicated that approximately 23% of the entire collection system is in need of repair. The finding of the report determined that to fund the repair of high priority defects in the system will require approximately \$592,740. This is a considerable financial burden on the City and on the customers.

Affordability

Every sewer utility must develop its own service charges based upon conditions within that particular utility. Rates cannot be established based on rates in other sewer utilities, and higher or lower rates among sewer utilities are not an indicator of the efficiency of a given utility. While it may be interesting to understand how the City's rates compare to surrounding utilities, the information should not have significant influence on the rate making decisions. The data in Appendix E regarding rates in other utilities is provided only as a point of reference, and should be considered informational only. This data does not affect rate calculations for the City.

Affordability of sewer rates can also be evaluated by comparing the City's rates to affordability indexes used by EPA and CDPHE. EPA has not issued strict guidance regarding affordability but generally indicates that sewer rates should not exceed 2.0% to 2.5% of the median household income (MHI). CDPHE indicates that sewer rates should not exceed 1.5% of MHI. Using the 2008-2012 MHI for Cherry Hills Village of \$231,774, and the current average annual cost per City customer of \$162.00, a percentage of 0.06% of MHI is calculated for the City rates, which is far below the lowest applicable standard. More detailed information regarding affordability of rates is presented in Appendix E. The City recognizes that sewer rates will need to increase in order to have long term sustainability.

Rate Calculation

Key considerations for 2014 sewer rates include:

- The Operation and Maintenance budget for the collection system is \$27,220.
- Repairs to the high priority defects in the collection system have been estimated at \$592,740 (Funded from Reserve Sewer Fund).
- Annual depreciation for 2013 was approximately \$78,000, based on replacement cost of facilities.
- Existing revenues are well below the level required for sustainable replacement of sewer system components.

The O&M study indicates that the expenses for the regular maintenance of the system require flat-rate fees of \$101.01 for the City customers and \$32.10 for the City connectors. Repairs to the existing system as described in the CIP study will require the use of a portion of the existing Reserve Sewer Fund. A rate increase in order to adequately fund the reserve sewer fund going forward will be required. To avoid large increases and the accompanying rate shock, funding for the capital replacement reserve should be increased over a period of years.

The following rate calculation was developed to evaluate the effect of the recommended rates. In future years it may be preferable to first establish contributions to reserves, and then calculate revenues to support expenses plus reserve contributions.

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Steps for 2014 Rate Calculation

- Determine zero reserve rates
 - Revenue requirements – from budget (Appendix B).
 - Calculate flat fee assuming no contribution to reserves or repair program.
- Determine adequate combination of cash and debt funding for the capital repair program.
- Calculate expected contributions to reserves from surcharges.

Based on the revenue requirements of \$27,220 annually, the sewer fees, developed in the O&M study, with no contribution to reserves or the capital repair program, are shown in Table 6.

Table 6: 2014 Operation & Maintenance Fee	
City Customers	City Connectors
\$101.01/yr	\$32.10/yr

In addition to the regular operation and maintenance requirements the City recognizes that a capital repair program is needed to address the aging of the collection system.

As indicated in the CIP study the identified high priority repairs are estimated to cost approximately \$600K. \$182,000 will be paid to the City from the connectors for their portion of the trunk line. The City may then use the existing sewer fund to finance the remaining \$450,000. The remaining balance within the sewer fund will be approximately \$400,000, which represents approximately 6% of the current replacement value of the collection system.

In order to fully fund the capital replacement fund the City would require \$78K per year or \$402/yr per TE. Table 7 summarizes the proposed annual sewer rates for the City customers.

Table 7: 2014 Sewer Rates	
Operation & Maintenance Fee	\$101/TE
Capital Replacement Reserve	\$402/TE
*TOTAL	\$503/TE

*Total does not include \$220 minimum treatment charge from Englewood

Historically, the city has billed the sewer customers on an annual basis. Table 7 shows that the recommended annual rate for City customers is \$503/TE, which is a \$341 (210%) increase over the current annual billing rate of \$162/TE. A substantial increase to rates that customers are charged is often met with frustration and anger.

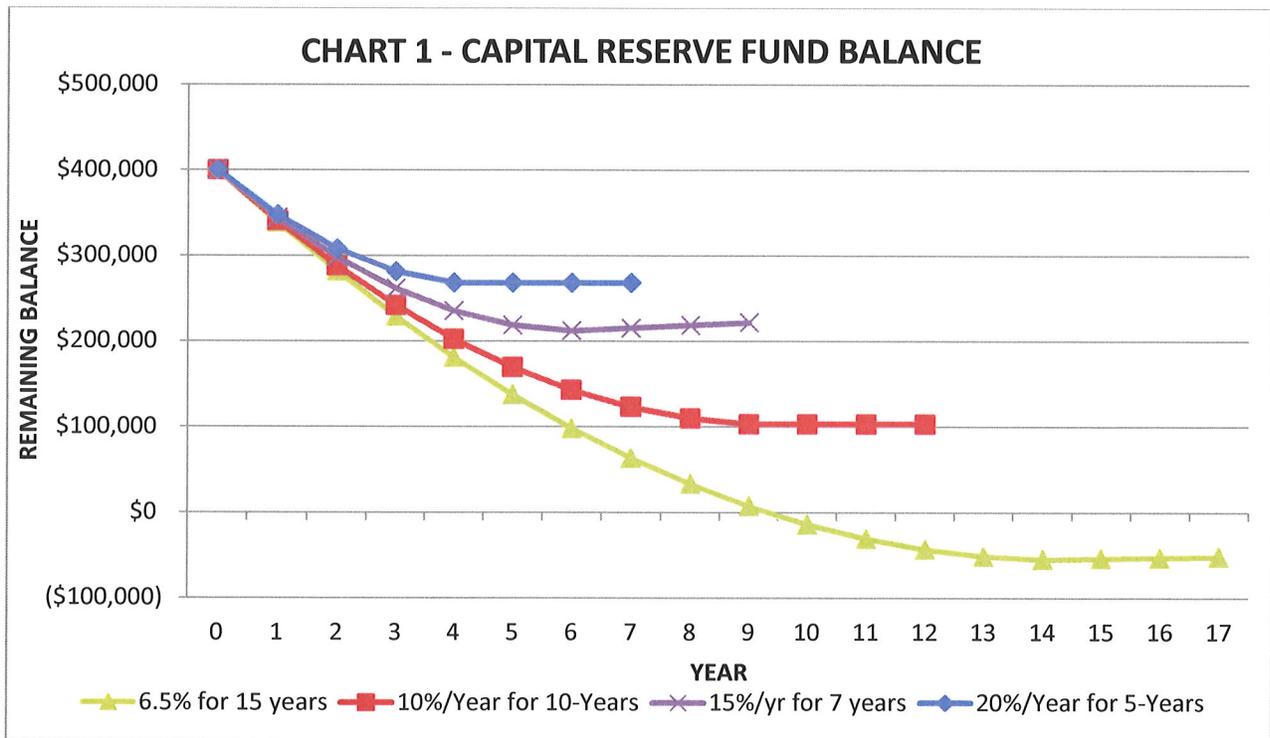
The City has a few different option to choose from to implement the rate increase a period of time. One option is that the City can choose to implement the rate increases ata consistent rate over various periods of time. Table 8, shows the scenarios for implementing the rate increase

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SECTION 3 – RATE DEVELOPMENT**

over different periods of time at a constant rate. The table also indicates the remaining balance in the sewer fund, based on the time frame for the rate increases. The goal is to raise the rate to the level that accounts for the operation and maintenance of the collection system as well as the deterioration and scheduled repairs to the system.

TABLE 8 – RATE INCREASE SCENARIOS			
Annual Increase		Time Frame	Remaining Fund Balance
%	\$	Years	
6.5	22.17	15	(\$51,000)
10	34.10	10	\$103,000
15	51.15	7	\$215,000
20	68.20	5	\$268,000

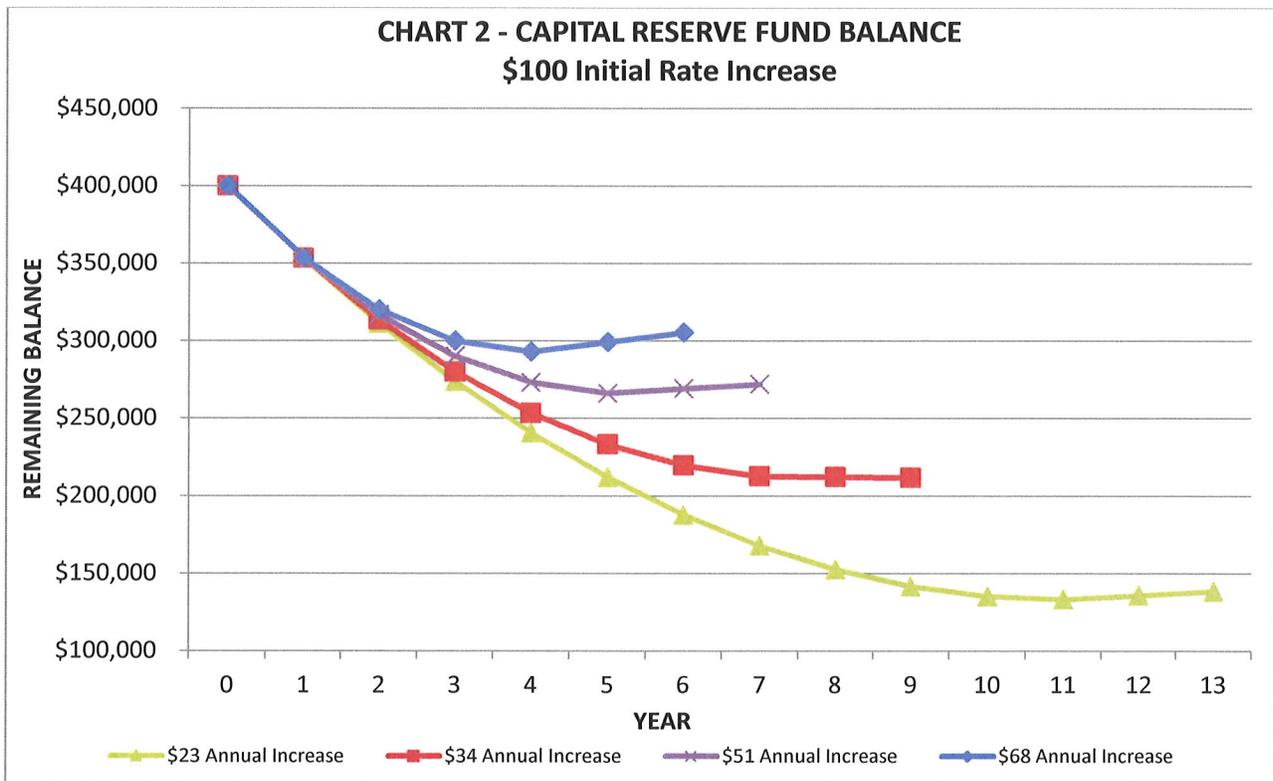
As described above the rate at which the operations costs as well deterioration costs are met is \$503/TE annually which is an increase of \$341 from the current sewer rate of \$162. The following chart graphically illustrates the scenarios for implementing the \$341 rate increase over different periods of time.



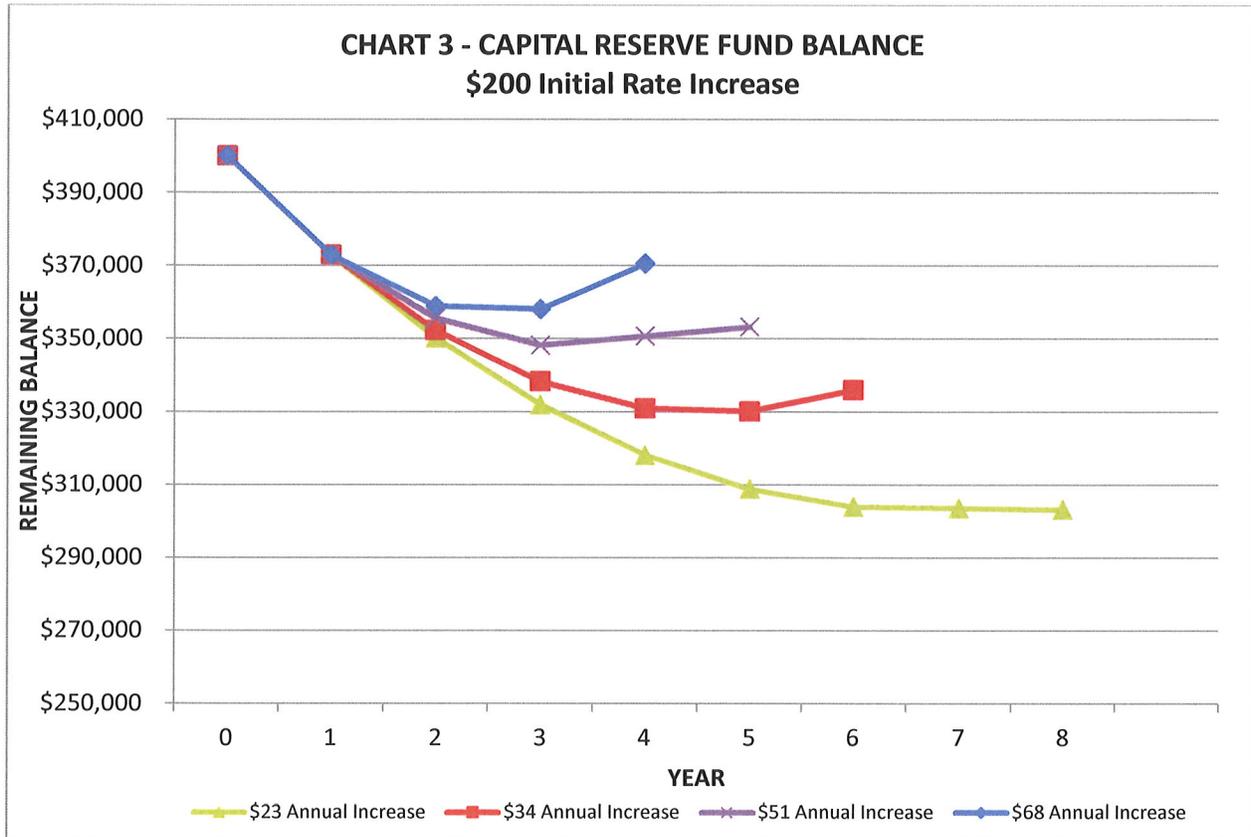
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As shown in Chart 1, spreading the constant rate increase over a long period of time results in a lower than ideal balance in the reserve fund. Only the 5- and 10-year plans maintain a suitable balance within the sewer fund. The scenarios that run longer than 5 or 10 years are not as suitable because the rates requirement will most likely change in the future as the system is maintained and updated going forward. Chart 1 along with the two that follow assume the annual depreciation of the collection system at \$78,000 and that is reflected as an expense to the system.

Another option for the City is to have a larger initial increase and then follow that with regular smaller increases as the rate approaches the fully funded reserve rate. Charts 3 and 4 below show two options where the initial rate increase is larger \$100 or \$200, respectively, and then the continuing rate increases are smaller. For instance, Chart 2 shows that with an initial rate increase of \$200 followed by an annual rate increase of \$34, the rate comes into balance with the expenses in approximately 4-5 years, with a remaining balance of approximately \$330,000 in the sewer fund.



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The rate schedule going forward will be reviewed and updated every 3 years to maintain a sustainable rate with respect to the changing value of the collection system. The recommended rate for full funding of the capital reserve along with the operational expenses may be different when the next review cycle is undertaken. It is recommended that the City balance the rate adjustment with the time-frame to reach a sustainable rate amount as well as with the remaining balance in the sewer fund. It is recommended that the City maintain a minimum balance in the sewer fund equal to approximately 5% of the replacement value of the system. 5% of the replacement value is equal to \$300,000.

The recommendation is that the City raise rates \$200 initially followed by an annual rate increase of \$34. In 3 years the next round of cleaning and inspection will take place and a review of current rates and sustainability will be review again.

Using the same affordability criteria as before the rate increase, the affordability measure for Cherry Hills Village indicates that the new sewer rate is approximately 0.2% of the most recent MHI. This is considerably lower than either of the affordability criteria.

In order to lessen the amount of frustration, it is recommended that the City adopt a public education and information campaign and potentially change its current billing philosophy.

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Public Outreach

Due to the substantial increase that the recommended rates represent, the City should begin a customer education process that will inform the public about the reasons and need for the rate adjustments. The customer outreach process should include mailers and open meetings to discuss the rate adjustments and the reasons behind them.

The City has historically billed its customers on an annual basis. During the public outreach program discussed above a discussion regarding the change from annual billing to quarterly or monthly billing should be addressed. This would help to spread billings over a larger period of time. For instance, if the City adopted a new billing cycle, the recommended annual sewer rate of \$503/TE would be \$125.75/quarter or \$41.92/month, depending on the billing cycle adopted by the City. A monthly billing cycle would also provide the City with greater contact to its customer base making the process of educating and distributing information, regarding the utility, easier.

End of Section 3

SECTION 4 – CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS AND RECOMMENDATIONS

Historically, the City has charged a flat sewer rate of \$162 annually. In order to continue to operate, maintain, and repair the collection system going forward the City recognizes that the sewer rate needs to be addressed.

The City’s annual operating expenses have been determined to be \$27,220 and funding of a repair and replacement reserve requires \$78,000 annually. Based on the expense requirement for the City, it was determined that the annual sewer rate for City customers should be \$503 annually.

It is further recommended that when the City undertakes the regular cleaning and inspection cycle for the collection system, it also reviews the current rates to verify that the revenues are meeting the expected expenses for the collection system.

Table 8: Annual Sewer Rates		
	Customer (\$/TE)	Connector (\$/TE)
Operation & Maintenance Fee	\$101/TE	\$33/TE
Capital Replacement Reserve	\$402/TE	\$0/TE
TOTAL	\$503/TE	\$33/TE

The recommendation for the rate adjustment is to have a higher initial increase, \$200, followed by smaller annual increases, \$34, as the rate approaches the sustainable amount identified in the study. Appendix E shows the recommended rate increases alongside current sewer rates within the City.

In addition to the developed rate, the most recent round of cleaning and inspection established that the collection system requires immediate repairs on approximately 23% of the entire system. This amounts to approximately \$600,000 in immediate repairs. Connectors to the collection system will contribute approximately \$150,000 per existing agreements. The City has the option of funding its portion of the repair cost, \$450,000, from the existing Sewer Fund.

TST recommends that the City undertake a public outreach program designed to educate and inform its customers about the reasons behind the rate increases. Along with the public outreach program, it is recommended that the City adjust its current billing cycle from annually to monthly, or quarterly.

End of Section 4

APPENDIX A
ASSET SCHEDULES

Cherry Hills Rancho

Material	Size (in.)	Comment	Subdivision	PipeID	Length	Priority	UpstreamMH	DNstreamMH	Installed	Service Life (yrs)	Remaining Life (yrs)	Replacement Cost	Annual Depreciation	Depreciation	Current Value	
VCP	8		Cherry Hills Rancho	CCHR1 - CCM1	68.92	Low	CCHR1	CCM1	1970	75	31	\$ 10,338	\$ 188	\$ 6,065	\$ 4,273	
PVC	8		Cherry Hills Rancho	CCHR1A - CCHR1	233.10	Low	CCHR1A	CCHR1	1990	100	76	\$ 34,966	\$ 350	\$ 8,392	\$ 26,574	
PVC	8		Cherry Hills Rancho	CCHR2 - CCHR1A	237.96	Low	CCHR2	CCHR1A	1990	100	76	\$ 35,694	\$ 357	\$ 8,567	\$ 27,128	
PVC	8		Cherry Hills Rancho	CCHR3 - CCHR2	347.32	Low	CCHR3	CCHR2	1990	100	76	\$ 52,098	\$ 521	\$ 12,503	\$ 39,594	
CP	8		Cherry Hills Rancho	CCHR4 - CCHR3	333.65	Monitor	CCHR4	CCHR3	1990	100	76	\$ 50,047	\$ 500	\$ 12,011	\$ 38,036	
CP	8		Cherry Hills Rancho	CCHR5 - CCHR4	5.87	Monitor	CCHR5	CCHR4	1970	75	31	\$ 881	\$ 12	\$ 517	\$ 364	
VCP	8		Cherry Hills Rancho	CCHR6 - CCHR5	143.80	Monitor	CCHR6	CCHR5	1970	75	31	\$ 21,570	\$ 288	\$ 12,654	\$ 8,916	
VCP	8		Cherry Hills Rancho	CCHR6A - CCHR6	273.40	Monitor	CCHR6A	CCHR6	1970	75	31	\$ 41,010	\$ 547	\$ 24,059	\$ 16,951	
CP	8		Cherry Hills Rancho	CCHR6B - CCHR6A	138.95	Monitor	CCHR6B	CCHR6A	1970	75	31	\$ 23,842	\$ 318	\$ 13,987	\$ 9,855	
DIP	8		Cherry Hills Rancho	CCHR7 - CCHR6	389.10	High	CCHR7	CCHR6	1990	100	76	\$ 58,365	\$ 584	\$ 14,008	\$ 44,357	
CP	8		Cherry Hills Rancho	CCHR8 - CCHR7	30.25	Monitor	CCHR8	CCHR7	1970	100	56	\$ 4,538	\$ 45	\$ 1,997	\$ 2,541	
DIP	8		Cherry Hills Rancho	CCHR9 - CCHR8	396.80	Monitor	CCHR9	CCHR8	1970	100	56	\$ 59,520	\$ 595	\$ 26,189	\$ 33,331	
VCP	8		Cherry Hills Rancho	CCHR10 - CCHR9	27.58	Monitor	CCHR10	CCHR9	1970	75	31	\$ 4,138	\$ 55	\$ 2,427	\$ 1,710	
CP	8		Cherry Hills Rancho	CCHR11 - CCHR10	157.10	High	CCHR11	CCHR10	1970	75	31	\$ 23,565	\$ 314	\$ 13,825	\$ 9,740	
CP	8		Cherry Hills Rancho	CCHR12 - CCHR11	26.11	Monitor	CCHR12	CCHR11	1970	75	31	\$ 3,917	\$ 52	\$ 2,298	\$ 1,619	
CP	8		Cherry Hills Rancho	CCHR14 - CCHR12	167.12	Low	CCHR14	CCHR12	1970	75	31	\$ 25,068	\$ 354	\$ 14,707	\$ 10,362	
CP	8		Cherry Hills Rancho	CCHR15 - CCHR14	310.30	Monitor	CCHR15	CCHR14	1970	75	31	\$ 46,545	\$ 621	\$ 27,306	\$ 19,239	
CP	8		Cherry Hills Rancho	CCHR16 - CCHR15	321.00	Monitor	CCHR16	CCHR15	1970	75	31	\$ 48,150	\$ 642	\$ 28,248	\$ 19,902	
CP	8		Cherry Hills Rancho	CCHR17 - CCHR16	250.00	Monitor	CCHR17	CCHR16	1970	75	31	\$ 37,500	\$ 500	\$ 22,000	\$ 15,500	
VCP	8		Cherry Hills Rancho	CCHR18 - CCHR17	329.70	High	CCHR18	CCHR17	1970	75	31	\$ 49,455	\$ 659	\$ 29,014	\$ 20,441	
CP	8		Cherry Hills Rancho	CCHR18B - CCHR18A	271.60	Low	CCHR18	CCHR18A	1970	75	31	\$ 40,740	\$ 543	\$ 23,901	\$ 16,839	
CP	8		Cherry Hills Rancho	CCHR18A - CCHR18	304.00	Monitor	CCHR18A	CCHR18	1970	75	31	\$ 45,600	\$ 608	\$ 26,752	\$ 18,848	
CP	8		Cherry Hills Rancho	CCHR19 - CCHR18	66.31	Monitor	CCHR19	CCHR18	1970	75	31	\$ 9,946	\$ 133	\$ 5,835	\$ 4,111	
CP	8		Cherry Hills Rancho	CCHR19A - CCHR19	202.00	Low	CCHR19A	CCHR19	1970	75	31	\$ 30,300	\$ 404	\$ 17,776	\$ 12,524	
CP	8		Cherry Hills Rancho	CCHR20 - CCHR19	130.80	Monitor	CCHR20	CCHR19	1970	75	31	\$ 19,620	\$ 262	\$ 11,510	\$ 8,110	
CP	8		Cherry Hills Rancho	CCHR21 - CCHR16	228.10	Monitor	CCHR21	CCHR16	1970	75	31	\$ 34,215	\$ 456	\$ 20,073	\$ 14,142	
CP	8		Cherry Hills Rancho	CCHR22 - CCHR21	226.00	Monitor	CCHR22	CCHR21	1970	75	31	\$ 33,900	\$ 452	\$ 19,888	\$ 14,012	
CP	8		Cherry Hills Rancho	CCHR22A - CCHR22	225.00	Monitor	CCHR22A	CCHR22	1970	75	31	\$ 33,750	\$ 450	\$ 19,800	\$ 13,950	
VCP	8		Cherry Hills Rancho	CCHR23 - CCHR22A	133.00	Monitor	CCHR23	CCHR22A	1970	75	31	\$ 19,950	\$ 266	\$ 11,704	\$ 8,246	
VCP	8	Yes	Cherry Hills Rancho	CCHR23A - CCHR23	201.20	High	CCHR23A	CCHR23	2005	100	91	\$ 30,180	\$ 302	\$ 2,716	\$ 27,464	
VCP	8		Cherry Hills Rancho	CCHR23A - CCHR23	109.73	High	CCHR23A	CCHR23	1970	75	31	\$ 16,459	\$ 219	\$ 9,656	\$ 6,803	
VCP	8		Cherry Hills Rancho	CCHR24 - CCHR23	48.40	Monitor	CCHR24	CCHR23	1970	75	31	\$ 7,260	\$ 97	\$ 4,259	\$ 3,001	
TOTALS													\$ 953,127	\$ 11,624	\$ 454,645	\$ 498,483
6,354.18																

Cherry Hills Rancho

Manhole ID	Diameter (ft.)	Depth (ft.)	NAVD88	Replacement Cost (\$)	Service Life	Annual Depreciation
CCHR1	4.0	10.5	5,344.52	\$ 3,100	100	\$ 31
CCHR1A	4.0	6.5	5,350.72	\$ 2,000	100	\$ 20
CCHR2	4.0	9.0	5,354.61	\$ 2,800	100	\$ 28
CCHR3	4.0		5,355.09		100	\$ -
CCHR4	4.0	4.0	5,352.23	\$ 1,500	100	\$ 15
CCHR5	4.0	4.0	5,352.62	\$ 1,500	100	\$ 15
CCHR6	4.0	6.0	5,356.38	\$ 2,000	100	\$ 20
CCHR6A	4.0	3.0	5,355.44	\$ 1,500	100	\$ 15
CCHR7	4.0	10.5	5,362.34	\$ 3,100	100	\$ 31
CCHR8	4.0	9.0	5,361.56	\$ 2,800	100	\$ 28
CCHR9	4.0	12.0	5,371.19	\$ 3,700	100	\$ 37
CCHR10	4.0	11.5	5,371.73	\$ 3,400	100	\$ 34
CCHR11	4.0	8.0	5,377.73	\$ 2,500	100	\$ 25
CCHR12	4.0	3.0	5,351.73	\$ 1,500	100	\$ 15
CCHR14	4.0	8.0	5,356.92	\$ 2,500	100	\$ 25
CCHR15	4.0	8.0	5,360.61	\$ 2,500	100	\$ 25
CCHR16	4.0	8.0	5,361.09	\$ 2,500	100	\$ 25
CCHR17	4.0	8.5	5,366.68	\$ 2,500	100	\$ 25
CCHR18	4.0	9.0	5,375.05	\$ 2,800	100	\$ 28
CCHR18A	4.0	8.0	5,381.20	\$ 2,500	100	\$ 25
CCHR19	4.0	7.0	5,374.33	\$ 2,000	100	\$ 20
CCHR21	4.0	8.0	5,363.47	\$ 2,500	100	\$ 25
CCHR22	4.0	9.0	5,368.80	\$ 2,800	100	\$ 28
CCHR22A	4.0	8.5	5,372.42	\$ 2,500	100	\$ 25
CCHR22B	4.0	6.0	5,372.32	\$ 2,000	100	\$ 20
CCHR23	4.0	9.0	5,371.28	\$ 2,800	100	\$ 28
CCHR23A	4.0	8.5	5,370.38	\$ 2,500	100	\$ 25
CCHR24	4.0	9.0	5,371.56	\$ 2,800	100	\$ 28
Cherry Hills Rancho Subtotal				\$ 66,600		\$ 666

Cherrymoor South

Material	Size (in.)	Comment	Subdivision	Pipe ID	Length	Priority	UpstreamMH	DNstreamMH	Installed	Service Life (yrs)	Remaining Life (yrs)	Replacement Cost	Annual Depreciation	Depreciation	Current Value	
PE	10		Cherrymoor	CCM23 - CCM22	298.33	Low	CCM23	CCM22	1970	75	31	\$ 55,936	\$ 746	\$ 32,815.87	\$ 23,120	
VCP	10		Cherrymoor	CCM24 - CCM23	298.28	High	CCM24	CCM23	1970	75	31	\$ 55,927	\$ 746	\$ 32,810.76	\$ 23,117	
PVC	10		Cherrymoor	CCM25 - CCM24	228.97	Low	CCM25	CCM24	1970	75	31	\$ 42,931	\$ 572	\$ 25,186.28	\$ 17,745	
DIP	10		Cherrymoor	CCM26 - CCM25	201.62	Monitor	CCM26	CCM25	1970	75	31	\$ 37,804	\$ 504	\$ 22,178.51	\$ 15,626	
VCP	8		Cherrymoor	CCM27 - CCM26	196.45	Low	CCM27	CCM26	1970	75	31	\$ 29,467	\$ 393	\$ 17,287.20	\$ 12,180	
VCP	10		Cherrymoor	CCM28 - CCM27	352.98	Monitor	CCM28	CCM27	1970	75	31	\$ 66,183	\$ 882	\$ 38,827.56	\$ 27,356	
PVC	10		Cherrymoor	CCM28A - CCM28A1	68.26	Monitor	CCM28A	CCM28A1	1970	75	31	\$ 12,798	\$ 171	\$ 7,508.08	\$ 5,290	
CP	6		Cherrymoor	CCM28A1 - CCM28A2	74.17	Monitor	CCM28A1	CCM28A2	1970	75	31	\$ 8,944	\$ 111	\$ 4,895.07	\$ 3,449	
CP	8		Cherrymoor	CCM28A2 - CCM28	148.63	High	CCM28A2	CCM28	1970	75	31	\$ 22,294	\$ 297	\$ 13,079.34	\$ 9,215	
CP	8		Cherrymoor	CCM28B - CCM28	149.29	Monitor	CCM28B	CCM28	1970	75	31	\$ 22,393	\$ 299	\$ 13,137.38	\$ 9,256	
PVC	8		Cherrymoor	CCM44 - CCM43	365.00	High	CCM44	CCM43	1970	75	31	\$ 54,750	\$ 730	\$ 32,120.00	\$ 22,630	
VCP	10		Cherrymoor	CCM45 - CCM44	399.91	High	CCM45	CCM44	1970	75	31	\$ 74,983	\$ 1,000	\$ 43,990.24	\$ 30,993	
CP	8		Cherrymoor	CCM45A - CCM45	346.56	Monitor	CCM45A	CCM45	1970	75	31	\$ 51,984	\$ 693	\$ 30,497.35	\$ 21,487	
VCP	10		Cherrymoor	CCM46 - CCM45	243.44	Monitor	CCM46	CCM45	1970	75	31	\$ 45,645	\$ 609	\$ 26,778.22	\$ 18,866	
VCP	10		Cherrymoor	CCM47 - CCM46	193.15	Monitor	CCM47	CCM46	1970	75	31	\$ 36,215	\$ 483	\$ 21,745.99	\$ 14,969	
CP	10		Cherrymoor	CCM48 - A32	312.80	Monitor	CCM48	A32	1970	75	31	\$ 58,650	\$ 782	\$ 34,407.74	\$ 24,242	
DIP	10		Cherrymoor	CCM48 - CCM47	300.14	Monitor	CCM48	CCM47	1970	75	31	\$ 56,276	\$ 750	\$ 33,015.40	\$ 23,261	
VCP	8		Cherrymoor	CCM49 - CCM48	151.50	Monitor	CCM49	CCM48	1970	75	31	\$ 22,725	\$ 303	\$ 13,332.02	\$ 9,393	
VCP	8		Cherrymoor	CCM49A - CCM49	65.00	Monitor	CCM49A	CCM49	1970	75	31	\$ 9,750	\$ 130	\$ 5,720.00	\$ 4,030	
VCP	8		Cherrymoor	CCM50 - CCM49	144.19	Monitor	CCM50	CCM49	1970	75	31	\$ 21,629	\$ 288	\$ 12,688.82	\$ 8,940	
VCP	8		Cherrymoor	CCM51 - CCM50	174.23	Monitor	CCM51	CCM50	1970	75	31	\$ 26,137	\$ 348	\$ 15,333.93	\$ 10,803	
VCP	8		Cherrymoor	CCM52 - CCM51	118.10	Monitor	CCM52	CCM51	1970	75	31	\$ 17,715	\$ 236	\$ 10,392.80	\$ 7,322	
VCP	8		Cherrymoor	CCM53 - CCM52	101.80	Low	CCM53	CCM52	1970	75	31	\$ 15,270	\$ 204	\$ 8,958.40	\$ 6,312	
VCP	8		Cherrymoor	CCM54 - CCM53	388.80	Low	CCM54	CCM53	1970	75	31	\$ 58,320	\$ 778	\$ 34,214.40	\$ 24,106	
CP	8		Cherrymoor	CCM59 - CCM60	137.67	Low	CCM59	CCM60	1970	75	31	\$ 20,651	\$ 275	\$ 12,114.98	\$ 8,536	
CP	8		Cherrymoor	CCM61 - CCM60	304.87	Monitor	CCM61	CCM60	1970	75	31	\$ 45,730	\$ 610	\$ 26,828.51	\$ 18,902	
CP	8		Cherrymoor	CCM62 - CCM61	128.10	Monitor	CCM62	CCM61	1970	75	31	\$ 19,215	\$ 256	\$ 11,272.77	\$ 7,942	
VCP	8		Cherrymoor	CCM72 - CCM71	289.40	High	CCM72	CCM71	1970	75	31	\$ 43,411	\$ 579	\$ 25,467.62	\$ 17,943	
VCP	8		Cherrymoor	CCM73 - CCM72	364.54	Monitor	CCM73	CCM72	1970	75	31	\$ 54,682	\$ 729	\$ 32,079.90	\$ 22,602	
VCP	8		Cherrymoor	CCM74 - CCM73	379.02	Low	CCM74	CCM73	1970	75	31	\$ 56,853	\$ 758	\$ 33,353.94	\$ 23,499	
PVC	8		Cherrymoor	CCM75 - CCM74	81.42	Monitor	CCM75	CCM74	1970	75	31	\$ 12,213	\$ 163	\$ 7,165.04	\$ 5,048	
VCP	8		Cherrymoor	CCM76 - CCM75	259.94	Monitor	CCM76	CCM75	1970	75	31	\$ 38,991	\$ 520	\$ 22,874.51	\$ 16,116	
VCP	8		Cherrymoor	CCM77 - CCM76	91.08	Monitor	CCM77	CCM76	1970	75	31	\$ 13,662	\$ 182	\$ 8,015.32	\$ 5,647	
VCP	8		Cherrymoor	CCM78 - CCM77	364.59	Monitor	CCM78	CCM77	1970	75	31	\$ 54,688	\$ 729	\$ 32,083.70	\$ 22,604	
CIPP	8		Cherrymoor	CCM79 - CCM78	340.08	Monitor	CCM79	CCM78	1970	75	31	\$ 51,012	\$ 680	\$ 29,927.12	\$ 21,085	
VCP	8		Cherrymoor	CCM80 - CCM79	86.98	Monitor	CCM80	CCM79	1970	75	31	\$ 13,047	\$ 174	\$ 7,654.10	\$ 5,393	
TOTALS													\$ 1,328,282	\$ 17,710	\$ 779,259	\$ 549,023
8,149.29																

Cherrymoor South						
Manhole ID	Diameter (ft.)	Depth (ft.)	NAVD88	Replacement Cost (\$)	Service Life	Annual Depreciation
CCM23	4.0	5.0	5,365.70	\$ 2,000	100	\$ 20
CCM24	4.0	5.0	5,367.68	\$ 2,000	100	\$ 20
CCM25	4.0	5.0	5,374.71	\$ 2,000	100	\$ 20
CCM26	4.0	5.0	5,376.47	\$ 2,000	100	\$ 20
CCM27	4.0	6.0	5,381.55	\$ 2,000	100	\$ 20
CCM28	4.0	15.0	5,393.34	\$ 4,600	100	\$ 46
CCM28A	4.0	4.0	5,401.62	\$ 1,500	100	\$ 15
CCM28A1	4.0	6.5	5,398.98	\$ 2,000	100	\$ 20
CCM28A2	4.0	3.5	5,392.76	\$ 1,500	100	\$ 15
CCM28B	4.0	17.0	5,392.82	\$ 5,100	100	\$ 51
CCM29	Abandoned	Abandoned				
CCM30	Abandoned	Abandoned				
CCM31	Abandoned	Abandoned				
CCM32	Abandoned	Abandoned				
CCM33	Abandoned	Abandoned				
CCM34	Abandoned	Abandoned				
CCM35	Abandoned	Abandoned				
CCM35A	Abandoned	Abandoned				
CCM36	Abandoned	Abandoned				
CCM37	Abandoned	Abandoned				
CCM38	Abandoned	Abandoned				
CCM39	4.0	10.0	5,369.47	\$ 3,100	100	\$ 31
CCM40	4.0	10.0	5,370.78	\$ 3,100	100	\$ 31
CCM41	4.0	12.0	5,375.49	\$ 3,700	100	\$ 37
CCM42	4.0	12.0	5,376.15	\$ 3,700	100	\$ 37
CCM44	4.0	12.0	5,386.01	\$ 3,700	100	\$ 37
CCM45	4.0	8.0	5,383.04	\$ 2,500	100	\$ 25
CCM45A	4.0	6.0	5,404.88	\$ 2,000	100	\$ 20
CCM46	4.0	5.5	5,381.72	\$ 2,000	100	\$ 20
CCM47	4.0	7.0	5,384.44	\$ 2,000	100	\$ 20
CCM48	4.0	8.5	5,388.02	\$ 2,500	100	\$ 25
CCM49	4.0	8.0	5,394.49	\$ 2,500	100	\$ 25
CCM50	4.0	9.0	5,396.45	\$ 2,800	100	\$ 28
CCM51	4.0	13.0	5,402.44	\$ 4,000	100	\$ 40
CCM52	4.0	7.0	5,409.14	\$ 2,000	100	\$ 20
CCM53	4.0	8.0	5,414.35	\$ 2,500	100	\$ 25
CCM54	4.0	9.0	5,419.29	\$ 2,800	100	\$ 28
CCM60	4.0	4.0	5,389.23	\$ 1,500	100	\$ 15
CCM61	4.0	13.0	5,408.74	\$ 4,000	100	\$ 40
CCM62	4.0	10.5	5,416.24	\$ 3,100	100	\$ 31
Cherrymoor South Subtotal				\$ 78,200		\$ 782

Cherrymoor South Trunk Line						
Manhole ID	Diameter (ft.)	Depth (ft.)	NAVD88	Replacement Cost (\$)	Service Life	Annual Depreciation
CCM1	4.0	11.0	5,343.96	\$ 3,400	100	\$ 34
CCM2	4.0	9.0	5,343.10	\$ 2,800	100	\$ 28
CCM3	4.0	8.0	5,342.53	\$ 2,500	100	\$ 25
CCM4	4.0	9.0	5,342.69	\$ 2,800	100	\$ 28
CCM5	4.0	7.5	5,344.93	\$ 2,000	100	\$ 20
CCM6	4.0	5.0	5,345.17	\$ 2,000	100	\$ 20
CCM7	4.0	3.5	5,345.55	\$ 1,500	100	\$ 15
CCM8	4.0	4.0	5,346.01	\$ 1,500	100	\$ 15
CCM9	4.0	4.0	5,347.03	\$ 1,500	100	\$ 15
CCM10	4.0	5.0	5,346.01	\$ 2,000	100	\$ 20
CCM11	4.0	4.0	5,345.66	\$ 1,500	100	\$ 15
CCM12	4.0	2.0	5,348.60	\$ 1,500	100	\$ 15
CCM13	4.0	5.0	5,351.95	\$ 2,000	100	\$ 20
CCM14	4.0	5.0	5,351.71	\$ 2,000	100	\$ 20
CCM15	4.0	4.0	5,353.69	\$ 1,500	100	\$ 15
CCM16	4.0		5,359.27		100	\$ -
CCM17	4.0	8.0	5,359.19	\$ 2,500	100	\$ 25
CCM18	4.0	5.5	5,360.59	\$ 2,000	100	\$ 20
CCM19	4.0	6.0	5,362.25	\$ 2,000	100	\$ 20
CCM20	4.0	3.0	5,360.13	\$ 1,500	100	\$ 15
CCM21	4.0	3.0	5,360.83	\$ 1,500	100	\$ 15
CCM22	4.0	4.0	5,362.01	\$ 1,500	100	\$ 15
CCM22A	4.0	5.0	5,384.81	\$ 2,000	100	\$ 20
CCM22A1	4.0	3.0	0	\$ 1,500	100	\$ 15
CCM22B	4.0	3.0	5,365.47	\$ 1,500	100	\$ 15
CCM38	Abandoned	Abandoned	5,368.05		100	\$ -
CCM39	4.0	10.0	5,369.47	\$ 3,100	100	\$ 31
CCM40	4.0	10.0	5,370.78	\$ 3,100	100	\$ 31
CCM41	4.0	12.0	5,375.49	\$ 3,700	100	\$ 37
CCM42	4.0	12.0	5,376.15	\$ 3,700	100	\$ 37
CCM43	4.0	11.0	5,376.47	\$ 3,400	100	\$ 34
CCM55	4.0	?	5,379.88		100	\$ -
CCM56	4.0	12.0	5,381.69	\$ 3,700	100	\$ 37
CCM57	4.0	13.0	5,382.16	\$ 4,000	100	\$ 40
CCM58	4.0	14.5	5,384.84	\$ 4,300	100	\$ 43
CCM59	4.0	17.5	5,387.67	\$ 5,100	100	\$ 51
CCM66	4.0	13.4	5,381.66	\$ 4,000	100	\$ 40
CCM67	4.0	12.0	5,386.72	\$ 3,700	100	\$ 37
CCM68	4.0	14.0	5,389.32	\$ 4,300	100	\$ 43
CCM69	4.0	16.5	5,393.36	\$ 4,900	100	\$ 49
CCM70	4.0	10.5	5,388.50	\$ 3,100	100	\$ 31
CCM71	4.0	?	5,390.98		100	\$ -
CCM72	4.0	10.0	5,398.69	\$ 3,100	100	\$ 31
CCM73	4.0	10.0	5,403.71	\$ 3,100	100	\$ 31
CCM74	4.0	11.5	5,415.71	\$ 3,400	100	\$ 34
CCM75	4.0	9.5	5,418.96	\$ 2,800	100	\$ 28
CCM76	4.0	9.5	5,401.01	\$ 2,800	100	\$ 28
CCM77	4.0	9.5	5,401.65	\$ 2,800	100	\$ 28
CCM78	4.0	10.5	5,407.79	\$ 3,100	100	\$ 31
CCM79	4.0	10.0	5,417.09	\$ 3,100	100	\$ 31
CCM80	4.0	12.0	5,419.92	\$ 3,700	100	\$ 37
CCM81	4.0	16.0	5,396.08	\$ 4,900	100	\$ 49
CCM82	4.0	8.5	5,391.83	\$ 2,500	100	\$ 25
CCM83	4.0	9.5	5,396.91	\$ 2,800	100	\$ 28
CCM84	4.0	8.0	5,397.52	\$ 2,500	100	\$ 25
CCM85	4.0	10.0	5,401.38	\$ 3,100	100	\$ 31
CCM86	4.0	6.0	5,398.79	\$ 2,000	100	\$ 20
CCM87	4.0	14.0	5,408.14	\$ 4,300	100	\$ 43
CCM88	4.0	7.0	5,401.51	\$ 2,000	100	\$ 20
CCM89	4.0	7.0	5,402.67	\$ 2,000	100	\$ 20
Cherrymoor South Trunk Line Subtotal				\$ 154,600		\$ 1,546

Cherry Hills Village
 Sanitary Sewer Collection System
 Pipe Management and Value
 July 17, 2014

Current Year = 2014

Cherryridge																
Material	Size (in.)	Lined	Subdivision	Pipe ID	Length	Priority	UpstreamMH	DNStreamMH	Installed	Service Life (yrs)	Remaining Life (yrs)	Replacement Cost	Annual Depreciation	Depreciation	Current Value	
VCP	10		Cherry Ridge	CCR1 - B1	122.23	Monitor	CCR1	B1	1970	75	31	\$ 22,919	\$ 306	\$ 13,445.83	\$ 9,473	
CP	8		Cherry Ridge	CCR2 - CCR1	391.97	Monitor	CCR2	CCR1	1970	75	31	\$ 34,493.39	\$ 784	\$ 34,493.39	\$ 25,302	
CP	8		Cherry Ridge	CCR3 - CCR2	409.58	Monitor	CCR3	CCR2	1970	75	31	\$ 61,436	\$ 819	\$ 36,042.64	\$ 25,394	
CP	8		Cherry Ridge	CCR4 - CCR3	169.96	Monitor	CCR4	CCR3	1970	75	31	\$ 25,494	\$ 340	\$ 14,956.66	\$ 10,538	
CP	8		Cherry Ridge	CCR5 - CCR4	247.29	Monitor	CCR5	CCR4	1970	75	31	\$ 37,094	\$ 495	\$ 21,761.61	\$ 15,332	
VCP	8		Cherry Ridge	CCR6 - CCR5	228.16	Monitor	CCR6	CCR5	1970	75	31	\$ 34,224	\$ 456	\$ 20,077.81	\$ 14,146	
VCP	8		Cherry Ridge	CCR7 - CCR6	244.34	Monitor	CCR7	CCR6	1970	75	31	\$ 36,652	\$ 489	\$ 21,502.26	\$ 15,149	
VCP	8		Cherry Ridge	CCR8 - CCR7	128.92	Low	CCR8	CCR7	1970	75	31	\$ 19,338	\$ 258	\$ 11,345.09	\$ 7,993	
VCP	8		Cherry Ridge	CCR9 - CCR8	169.43	High	CCR9	CCR8	1970	75	31	\$ 25,414	\$ 339	\$ 14,909.83	\$ 10,505	
CP	8		Cherry Ridge	CCR10 - CCR9	288.47	Monitor	CCR10	CCR9	1970	75	31	\$ 43,271	\$ 577	\$ 23,385.69	\$ 17,885	
VCP	8		Cherry Ridge	CCR11 - CCR10	106.51	Monitor	CCR11	CCR10	1970	75	31	\$ 15,977	\$ 213	\$ 9,372.94	\$ 6,604	
CP	6		Cherry Ridge	CCR11A - CCR11	220.68	Monitor	CCR11A	CCR11	1970	75	31	\$ 24,826	\$ 331	\$ 14,564.76	\$ 10,262	
CP	8		Cherry Ridge	CCR12 - CCR11	202.13	Low	CCR12	CCR11	1970	75	31	\$ 30,319	\$ 404	\$ 17,787.05	\$ 12,532	
VCP	8		Cherry Ridge	CCR13 - CCR12	275.76	Monitor	CCR13	CCR12	1970	75	31	\$ 41,363	\$ 552	\$ 24,266.52	\$ 17,097	
VCP	8		Cherry Ridge	CCR14 - CCR13	118.47	Low	CCR14	CCR13	1970	75	31	\$ 17,770	\$ 237	\$ 10,435.15	\$ 7,345	
DIP	8	Yes	Cherry Ridge	CCR15 - CCR14	367.71	Low	CCR15	CCR14	2005	75	66	\$ 55,156	\$ 735	\$ 6,618.72	\$ 48,537	
VCP	8		Cherry Ridge	CCR16 - CCR15	366.30	Monitor	CCR16	CCR15	1970	75	31	\$ 54,946	\$ 733	\$ 32,234.76	\$ 22,711	
CP	8		Cherry Ridge	CCR17 - CCR16	113.65	Monitor	CCR17	CCR16	2005	75	66	\$ 17,047	\$ 227	\$ 2,045.69	\$ 15,002	
CP	8		Cherry Ridge	CCR18 - CCR17	182.34	High	CCR18	CCR17	1970	75	31	\$ 27,351	\$ 365	\$ 16,046.02	\$ 11,305	
CP	8	Yes	Cherry Ridge	CCR19 - CCR18	392.86	Low	CCR19	CCR18	2005	75	66	\$ 58,929	\$ 786	\$ 7,071.51	\$ 51,858	
CP	8	Yes	Cherry Ridge	CCR20 - CCR19	79.30	High	CCR20	CCR19	1970	75	31	\$ 11,895	\$ 159	\$ 6,978.49	\$ 4,917	
VCP	8		Cherry Ridge	CCR21 - CCR20	371.18	High	CCR21	CCR20	1990	100	76	\$ 55,676	\$ 557	\$ 13,362.35	\$ 42,314	
PVC	8		Cherry Ridge	CCR22 - CCR21	104.09	Monitor	CCR22	CCR21	1990	100	76	\$ 15,613	\$ 156	\$ 3,747.15	\$ 11,866	
CP	8		Cherry Ridge	CCR23 - CCR22	75.78	Monitor	CCR23	CCR22	1970	75	31	\$ 11,367	\$ 152	\$ 6,668.52	\$ 4,698	
VCP	8	Yes	Cherry Ridge	CCR24 - CCR23	388.68	Low	CCR24	CCR23	2005	75	66	\$ 58,302	\$ 777	\$ 6,996.25	\$ 51,306	
VCP	8		Cherry Ridge	CCR25 - CCR24	90.45	High	CCR25	CCR24	1970	75	31	\$ 13,568	\$ 181	\$ 7,959.60	\$ 5,608	
VCP	8	Yes	Cherry Ridge	CCR26 - CCR25	277.86	Low	CCR26	CCR25	2005	75	66	\$ 41,678	\$ 556	\$ 5,001.41	\$ 36,677	
VCP	8	Yes	Cherry Ridge	CCR26A - CCR26	254.04	Low	CCR26A	CCR26	2005	75	66	\$ 38,106	\$ 508	\$ 4,572.72	\$ 33,533	
VCP	8		Cherry Ridge	CCR27 - CCR26	103.99	Monitor	CCR27	CCR26	1970	75	31	\$ 15,598	\$ 208	\$ 9,151.12	\$ 6,447	
PVC	8		Cherry Ridge	CCR27A - CCR27	30.96	Monitor	CCR27A	CCR27	1990	100	76	\$ 4,643	\$ 46	\$ 1,114.41	\$ 3,529	
VCP	8		Cherry Ridge	CCR28 - CCR27	297.36	High	CCR28	CCR27	1970	75	31	\$ 44,604	\$ 595	\$ 26,167.56	\$ 18,436	
VCP	8	Yes	Cherry Ridge	CCR29 - CCR28	388.48	Monitor	CCR29	CCR28	2005	75	66	\$ 58,272	\$ 777	\$ 6,992.64	\$ 51,279	
VCP	8		Cherry Ridge	CCR30 - CCR29	242.76	Monitor	CCR30	CCR29	1970	75	31	\$ 36,414	\$ 486	\$ 21,363.11	\$ 15,051	
PVC	8		Cherry Ridge	CCR31 - CCR30	245.91	High	CCR31	CCR30	1990	100	76	\$ 36,887	\$ 369	\$ 8,852.76	\$ 28,034	
GIP	8		Cherry Ridge	CCR31A - CCR31	251.62	Monitor	CCR31A	CCR31	1970	75	31	\$ 37,743	\$ 503	\$ 22,142.31	\$ 15,600	
DIP	8		Cherry Ridge	CCR32 - CCR31	202.52	Monitor	CCR32	CCR31	1970	75	31	\$ 33,378	\$ 445	\$ 19,581.95	\$ 13,796	
VCP	6		Cherry Ridge	CCR32A - CCR32	203.61	Monitor	CCR32A	CCR32	1970	75	31	\$ 22,906	\$ 305	\$ 13,438.40	\$ 9,468	
VCP	8		Cherry Ridge	CCR33 - CCR32	158.31	High	CCR33	CCR32	1970	75	31	\$ 23,747	\$ 317	\$ 13,931.60	\$ 9,815	
VCP	8		Cherry Ridge	CCR34 - CCR33	55.75	Monitor	CCR34	CCR33	1970	75	31	\$ 8,362	\$ 111	\$ 4,905.85	\$ 3,456	
CP	8		Cherry Ridge	CCR35 - CCR34	230.66	Monitor	CCR35	CCR34	1970	75	31	\$ 34,599	\$ 461	\$ 20,298.08	\$ 14,301	
DIP	8		Cherry Ridge	CCR36 - CCR35	206.78	Monitor	CCR36	CCR35	1970	75	31	\$ 31,017	\$ 414	\$ 18,196.64	\$ 12,820	
CP	8		Cherry Ridge	CF1 - CCR27A	225.07	Monitor	CF-1	CCR27A	1970	75	31	\$ 33,760	\$ 450	\$ 19,806.09	\$ 13,954	
TOTALS													\$ 1,376,460	\$ 17,977	\$ 615,583	\$ 760,877

Cherryridge						
Manhole ID	Diameter (ft.)	Depth (ft.)	NAVD88	Replacement Cost (\$)	Service Life	Annual Depreciation
CCR1	4.0	3.0	5,384.84	\$ 1,500	100	\$ 15
CCR2	4.0	13.0	5,391.67	\$ 4,000	100	\$ 40
CCR3	4.0	4.0	5,387.69	\$ 1,500	100	\$ 15
CCR4	4.0	12.5	5,400.56	\$ 3,700	100	\$ 37
CCR5	4.0	4.0	5,392.60	\$ 1,500	100	\$ 15
CCR6	4.0	9.0	5,398.96	\$ 2,800	100	\$ 28
CCR7	4.0	12.5	5,404.27	\$ 3,700	100	\$ 37
CCR8	4.0	13.5	5,409.14	\$ 4,000	100	\$ 40
CCR9	4.0	13.5	5,411.53	\$ 4,000	100	\$ 40
CCR10	4.0	11.0	5,417.40	\$ 3,400	100	\$ 34
CCR11	4.0	12.0	5,419.53	\$ 3,700	100	\$ 37
CCR12	4.0	14.0	5,423.57	\$ 4,300	100	\$ 43
CCR13	4.0	16.0	5,429.58	\$ 4,900	100	\$ 49
CCR14	4.0	11.5	5,432.75	\$ 3,400	100	\$ 34
CCR15	4.0	12.0	5,441.85	\$ 3,700	100	\$ 37
CCR16	4.0	11.0	5,447.75	\$ 3,400	100	\$ 34
CCR17	4.0	11.0	5,449.66	\$ 3,400	100	\$ 34
CCR18	4.0	10.0	5,451.82	\$ 3,100	100	\$ 31
CCR19	4.0	13.0	5,433.11	\$ 4,000	100	\$ 40
CCR20	4.0	15.0	5,435.49	\$ 4,600	100	\$ 46
CCR21	4.0	15.5	5,437.80	\$ 4,600	100	\$ 46
CCR22	4.0	10.0	5,441.15	\$ 3,100	100	\$ 31
CCR23	4.0	7.0	5,398.35	\$ 2,000	100	\$ 20
CCR24	4.0	9.0	5,409.83	\$ 2,800	100	\$ 28
CCR25	4.0	6.0	5,409.97	\$ 2,000	100	\$ 20
CCR26	4.0	7.0	5,415.39	\$ 2,000	100	\$ 20
CCR26A	4.0	9.0	5,431.49	\$ 2,800	100	\$ 28
CCR27	4.0	8.0	5,420.17	\$ 2,500	100	\$ 25
CCR27A	4.0	8.0	5,421.73	\$ 2,500	100	\$ 25
CCR28	4.0	10.5	5,442.73	\$ 3,100	100	\$ 31
CCR29	4.0	8.0	5,450.79	\$ 2,500	100	\$ 25
CCR30	4.0	12.0	5,406.52	\$ 3,700	100	\$ 37
CCR31	4.0	12.0	5,417.21	\$ 3,700	100	\$ 37
CCR31A	4.0	13.0	5,428.37	\$ 4,000	100	\$ 40
CCR32	4.0	14.5	5,422.78	\$ 4,300	100	\$ 43
CCR33	4.0	11.5	5,426.99	\$ 3,400	100	\$ 34
CCR34	4.0	11.0	5,427.30	\$ 3,400	100	\$ 34
CCR35	4.0	12.0	5,436.83	\$ 3,700	100	\$ 37
CCR36	4.0	10.5	5,445.24	\$ 3,100	100	\$ 31
Cherryridge Subtotal				\$ 127,800		\$ 1,278

APPENDIX B
CHERRY HILLS VILLAGE BUDGET - 2014

WATER AND SEWER FUND 20

CHERRY HILLS VILLAGE 2014 BUDGET WORKSHEET

The City is currently involved in a program to incorporate the water and sewer districts located within the City boundaries into the municipal government. With this ongoing action, the City desires to account separately for the funds allocated to the project and its associated utility function. For this reason, the Water and Sewer Fund was created to account for all revenues and expenses associated with the consolidation and operation of water and sewer utilities coming under the auspices of the City of Cherry Hills Village.

DESCRIPTION	2011		2012		2013		2014		NOTES/EXPLANATIONS:
	ACTUAL	ACTUAL	ACTUAL	ACTUAL	ACTUAL	ACTUAL	BUDGET		
BEGINNING FUNDS AVAILABLE	824,678	808,513	871,056	607,096					
REVENUES:									
20-320-3220 TAP FEES	61,800	18,600	56,700	0					
20-320-3226 SEWER ADMINISTRATION FEES	2,749	31,104	31,104	1,812					\$12/yr to those with Englewood total service agreements. (151 homes)
20-320-3228 SEWER REPAIR & MAINTENANCE	34,050	56,542	4,103	22,650					\$150/yr for repairs and maintenance to those with Englewood agreements. (151 homes)
20-360-3611 INTEREST INCOME	788	1,672	843	800					
20-360-3680 OTHER REVENUES	-	0	11,000	0					
TOTAL REVENUE	99,387	107,917	103,749	25,262					
EXPENDITURES:									
20-461-4043 LEGAL COUNSEL	3,847	334	3,452	1,000					
20-461-4044 CHERRYMOOR SOUTH EXPENSES	158	1928	0	0					
20-461-4046 CHARLOU	0	0	0	0					
20-461-4047 ENGLEWOOD FIRE HYDRANT	0	0	0	0					
20-461-4049 OTHER CONTRACTUAL SERVICES	7,581	0	0	10,000					
20-461-5052 SEWER REPAIRS AND MAINTENANCE	81,528	15,084	8,228	100,000					Needed repairs to sewer lines discovered in engineering analysis.
20-461-6063 TRAINING, DUES & SUB	1,810	1,435	913	854					Technical Advisory Committee Membership
20-461-6068 MISCELLANEOUS EXPENSES	0	0	7,757	0					
20-461-7050 DEPRECIATION	23,612	23,612	23,612	26,750					
TOTAL EXPENDITURES	118,536	42,392	43,962	138,604					
INCREASE TO RESERVES	(19,149)	65,525	59,787	(113,342)					
BALANCE IN RESERVES	805,531	867,818	927,731	492,996					
EMERGENCY RESERVES	2,982	3,238	3,112	758					

APPENDIX C
OPERATION AND MAINTENANCE STUDY

**CHERRY HILLS VILLAGE
TECHNICAL MEMORANDUM
OPERATIONS AND MAINTENANCE BUDGET**

To: Jay Goldie, Public Works Director
City of Cherry Hills Village

Date: September 4, 2014

From: Dean Bedford, Engineer
TST infrastructure, LLC

Re: Operations and Maintenance Budget for Sanitary Collection System

INTRODUCTION

The City of Cherry Hills Village (City) has requested that TST Infrastructure, LLC (TST) develop an Operations and Maintenance (O&M) budget for the sanitary sewer collection system. Understanding the O&M expenses for a utility system and developing a budget, are critical to establishing sustainable billing rates. Developing a useful budget is one part of the planning for the annual sewer fee billed to customers.

The City currently owns and operates a sanitary sewer collection system consisting of 141 manholes and approximately 36,155 linear feet of collection pipe. The collection system is comprised of three separate subdivisions:

- Cherry Hills Rancho
- Cherrymoor South
- Cherryridge

A majority of the service customers within the City are residential customers. The City does have one commercial customer, the Cherry Hills Country Club (CHCC). Customers within the city service area are charged based on the collection service to the residence. Each residence is equivalent to one service tap. CHCC is charged for a total of 32 residential service tap equivalents (TE) in order to reflect the increased load on the collection system. The characteristics of the collection system for each of the three subdivisions are summarized in the table below.

Table 1: Existing Collection System Characteristics			
Subdivision	Tap Equivalents (TE)	Collection Pipe (LF)	Manholes
Cherry Hills Rancho	37	6,600	29
Cherrymoor South	91	19,920	84
Cherryridge	66	9,635	28
Totals	194	36,155	141

**CHERRY HILLS VILLAGE
TECHNICAL MEMORANDUM
OPERATIONS AND MAINTENANCE BUDGET**

Table 1 shows that Cherrymoor South has considerably more collection pipe than either of the other two subdivisions. The main trunk line that conveys flow from all three subdivisions to the connection with Englewood is contained within the Cherrymoor South subdivision. CHCC is located in the Cherrymoor South subdivision as well, and the 91 total TE's shown above includes the 32 associated with the CHCC.

In addition to the collection systems owned and operated by the City, there are three subdivisions, outside of the City's service area, that connect to the Cherrymoor South trunk line. These three subdivisions and their number of TE's are shown below in Table 2.

Subdivision	TE's
Greenwood Village General Improvement District (GID) #1	150
Cherryvale Sanitation District	70
Country Homes	18
Totals	238

The connectors outside of the City service area summarized above participate, by agreement, in the operation and maintenance costs of the Cherrymoor South trunk line. Table 3 below summarizes the total number of TE's associated with each of the three subdivisions. Costs within the City's service area are divided equally among the collection system, with outside connectors participating in the operation and maintenance of the Cherrymoor South trunk line.

Subdivision	TE's
Cherry Hills Rancho	194
Cherrymoor South	432
Cherryridge	194

The table shows that Cherrymoor South O&M costs are shared by both City customers and connectors. A map attached to this memorandum shows the subdivisions and their relationship to the Cherrymoor South Trunk Line. Included on the map are the connectors and their connection points to the trunk line.

O&M costs are established to determine the base costs for the regular operation and maintenance of the collection system. O&M costs include:

- Administration
- Legal Counsel
- Operator in Responsible Charge (ORC)
- Scheduled Maintenance

Administration costs include the billing and customer support as well as the overhead to manage and administer the collection system. **Legal Counsel** is retained to review contracts and agreements for the City.

The Colorado Department of Public Health and Environment (CDPHE) requires that an individual be designated as the **ORC**. The ORC has the ultimate responsibility for decisions regarding the daily operational activities of the collection system that will directly impact quantity and flow of wastewater through the collection system.

The current population within the City's service area, including the City connectors, is approximately 1,260 individuals and is classified as a Class 1 wastewater collection system. A Class 1 wastewater collection system requires an ORC with a minimum Class S Wastewater certification.

Scheduled Maintenance is the cost of regular required maintenance. For the collection system regular maintenance involves cleaning and inspection every three years. Cleaning includes jet wash cleaning and then inspection using closed circuit video.

METHODOLOGY

TST collected information from the City regarding current expenses and costs for the operation of the collection system. Administration costs were estimated by the City to be approximately \$3,500 annually, with approximately \$1,200 collected as \$5 annual administration fee to the City connectors. The City's administration expense is \$2,300. The legal counsel is retained for \$1,000 annually.

The City has contracted to an outside operations company to perform the duties of the ORC. The current contract states that the ORC duties will be provided for a fee of \$1,200 annually for each one of the City's three subdivisions.

The regular maintenance of the collection system consists of cleaning and inspection of all 141 manholes as well as cleaning and video inspection of the 36,155 linear feet of collection pipe within the system. Cleaning and inspection activities occur once every three years. The budgetary cost for the cleaning and inspection activities are summarized in the table below.

**CHERRY HILLS VILLAGE
TECHNICAL MEMORANDUM
OPERATIONS AND MAINTENANCE BUDGET**

Maintenance Activity	Manholes¹	Pipelines²	Total Costs
3 - Year Cleaning and Inspection	\$4,230	\$53,100	\$57,330
Annual Costs	\$1,410	\$17,700	\$19,110

1. Budget cost based on \$30 per manhole.
2. Budget cost based on \$1.50 per linear foot for cleaning and inspection.

The table above indicates that to pay for the cost to clean and inspect the collection system once every three years, requires that the City collect approximately \$19,000 annually. Based on the costs summarized above an annual cost per TE can be established in order to collect adequate funds to sustainably operate and maintain the system.

Table 5 below summarizes the costs per TE. The costs shown in Table 5 are based on 194 TE's within the City's collection area with 238 additional TE's outside the City's collection area.

Expense Item	Annual Expense	Cost / TE (Customers)	Cost / TE (Connectors)
Administration	\$3,500	\$12	\$5
Legal Counsel	\$1,000	\$5.15	0
Operator	\$3,600	\$15.15	\$2.78
Clean and Inspect	\$19,120	\$68.71	\$24.32
Totals	\$27,220	\$101.01	\$32.10

As shown in Table 5, the minimum annual cost to each TE in order to collect adequate funds to operate and maintain the system is \$101.01/TE for City customers and \$32.10/TE for all out of service area connectors.

CONCLUSION

The City should incorporate the O&M costs established above into the regular rates set for sewer collection. The table below summarizes the minimum O&M Costs that should be applied to each of the collection systems.

Table 6: Annual O&M Costs		
Customers (194 TE's)		
37	Cherry Hills Rancho	\$101.01/TE
91	Cherrymoor South	\$101.01/TE
66	Cherryridge	\$101.01/TE
Connectors (238 TE's)		
150	GID #1	\$32.10/TE
70	Cherryvale	\$32.10/TE
18	Country homes	\$32.10/TE

The O&M fees established above should be incorporated into the annual billing and rate structure for the City's sewer collection fee.

APPENDIX D

CAPITAL IMPROVEMENT PROGRAM STUDY

**CHERRY HILLS VILLAGE
TECHNICAL MEMORANDUM
CAPITAL IMPROVEMENT PROGRAM**

To: Jay Goldie, Public Works Director
City of Cherry Hills Village

Date: September 4, 2014

From: Dean Bedford, Engineer
TST infrastructure, LLC

Re: Capital Improvement Program for Sanitary Collection System

INTRODUCTION

The City of Cherry Hills Village (City) has requested that TST Infrastructure, LLC (TST) investigate options for developing a Capital Improvement Program (CIP) for the sanitary sewer collection system. A regular CIP will aid the City in scheduling the repair and replacement of the collection system as needs are identified through the maintenance and inspection program.

The City currently owns and operates a sanitary sewer collection system consisting of 141 manholes and approximately 36,155 linear feet of collection pipe. The City's collection system is comprised of three subdivisions:

- Cherry Hills Rancho
- Cherrymoor South
- Cherryridge

The subdivisions are composed of primarily residential customers. The City does have one commercial customer, the Cherry Hills Country Club (CHCC). The City charges customers based on a residential tap equivalent (TE). One residential customer is equivalent to 1 TE. The CHCC is charged for 32 TE's to reflect the increased load to the collection system from the commercial enterprise. The characteristics of each of the three subdivisions are summarized in the table below.

Table 1: Existing Collection System Characteristics			
Subdivision	TE's	Collection Pipe (LF)	Manholes
Cherry Hills Rancho	37	6,600	29
Cherrymoor South	91	19,920	84
Cherryridge	66	9,635	28
Totals	194	36,155	141

Table 1 shows that Cherrymoor South has considerably more collection pipe than either of the other two subdivisions. The main trunk line, conveying flow from all three subdivisions to the connection with the City of Englewood's collection system, is included within the Cherrymoor South subdivision. In addition to the main trunk line the Cherrymoor South subdivision also includes the CHCC, its 32 TE's are reflected in the table above.

In addition to the collection systems that are owned, maintained, and operated by the City, there are three subdivisions, outside of the City's service area, that connect to the Cherrymoor South collection system and utilize the main trunk line to convey flow to the connection with City of Englewood. These three subdivisions and the number of TE's are shown below in Table 2.

Subdivision	TE's
Greenwood Village General Improvement District (GID) #1	150
Cherryvale Sanitation District	70
Country Homes	18
Totals	238

The connectors summarized above participate, by agreement, in the operation, maintenance, and repair costs of the Cherrymoor South main trunk line.

The map attached at the end of this memorandum shows the subdivisions and connectors as well as the main trunk line.

METHODOLOGY

The City cleaned, using jet-wash methods, and inspected the complete collection system; inspection included videos of the collection pipe. TST reviewed the videos, identified deficiencies and prioritized repairs within the collection system.

The identified defects were prioritized into three categories: high, medium, and low. High priority repairs were identified by conditions within the system that allowed water to flow either directly into or out of the collection system. Fractures that have separated, joints that have separated, or broken tap connections were all identified as eminent spill threats and therefore classified as high priority repairs.

Medium priority defects include pipeline cracks, minor root intrusions, and poor slope and grades within the pipe, effecting flow. Medium priority defects within the manholes included rusting rings, and deteriorated benches. All of these defects were identified as items to be monitored but do not warrant immediate repair.

Pipelines and manholes that were identified as low priority showed no immediate defects.

A map was developed showing the priority repairs throughout the entire system and is attached at the end of this memorandum. The high priority repairs are identified on the attached map as red highlighted pipelines.

Table 3 below summarizes the pipelines and the required repairs identified as high priority. Spreadsheets for each of the collection systems are also included at the end of this memorandum.

**CHERRY HILLS VILLAGE
TECHNICAL MEMORANDUM
CAPITAL IMPROVEMENT PROGRAM**

Table 3: High Priority Repairs				
Cherryridge				
Pipe Segment	Pipe Material	Length (LF)	Repair	Cost
CCR4 – CCR3	VCP/Steel	336	Liner	\$13,440
CCR5 – CCR4	VCP/PVC	251	Liner	\$10,040
CCR6 – CCR5	DIP	231	Liner	\$9,240
CCR13 – CCR12	VCP	275	Liner	\$11,000
CCR16 – CCR15	VCP	369	Liner	\$14,760
CCR24 – CCR23	VCP-Lined	395	Replace	\$59,250
CCR25 – CCR24	VCP	94	Tap Repair	\$200
CCR33 – CCR32	VCP	154	Replace	\$23,100
Subtotal Cherryridge				\$141,030
Cherry Hills Rancho				
CCHR1 – CCM1	VCP	70	Clean	\$1,000
CCHR11 – CCHR10	VCP	160	Liner	\$6,400
CCHR18 – CCHR17	Concrete	337	Liner	\$13,480
CCHR19A – CCHR19	HDPE/Concrete	205	Liner	\$8,200
Subtotal Cherry Hills Rancho				\$29,080
Cherrymoor South				
CCM44 – CCM43	VCP	370	Liner	14,800
Stub – CCM48	VCP	215	Replace	34,500
CCM54 – CCM53	VCP	171	Replace	30,000
CCM72 – CCM71	VCP	290	Liner	11,600
Subtotal Cherrymoor South				\$90,900
Cherrymoor South Main Trunk Line				
CCM2 – CCM1	VCP	131	Replace	\$19,650
CCM5 – CCM4	VCP	237	Liner	\$9,480
CCM6 – CCM5	VCP-Lined	103	Replace	\$22,500
CCM7 – CCM6	VCP	54	Replace	\$7,500
CCM11 – CCM10	VCP-Lined	202	Replace	\$30,300
CCM15 – CCM14	VCP	364	Liner	\$14,600
CCM22 – CCM21	VCP	140	Liner	\$5,600
CCM55 – CCM43	VCP	314	Replace	\$47,100
CCM56 – CCM55	VCP	410	Replace	\$61,500
CCM57 – CCM56	VCP	87	Liner	\$3,480
CCM65 – CCM64	VCP	354	Replace	\$53,100
CCM67 – CCM66	VCP	202	Liner	\$8,080
CCM68 – CCM67	VCP	280	Liner	\$11,200
CCM69 – CCM68	VCP	374	Liner	\$15,000
CCM81 – CCM71	VCP	97	Liner	\$3,880
CCM82 – CCM81	VCP	419	Liner	\$16,760
CCM86 – CCM85	VCP	268	Cleaning	\$1,000
Subtotal Cherrymoor South Trunk Line				\$330,730
Total Identified High Priority Repairs				\$592,740

Table 3 shows that total repairs for the high priority defects is approximately \$593,000 for the entire system. The table also indicates that approximately 8,234 linear feet of pipe within the collection system is in need of repair. 8,234 linear feet represents approximately 23% of the entire collection system.

The main trunk line accounts for \$330,730 of the identified repairs. The repair of the main trunk line is paid for by all of the City customers and connectors. Out of the total amount identified for needed repair \$182,308 total will be collected from the City connectors. The City will then be responsible for the remaining repairs, which is equal to the total repair cost (\$593,000), less the contribution for the main trunk line (\$182,308) from the City connectors. \$410,692 is the amount that the City should budget for repair to the high priority defects in the collection system.

The next step in developing a repair schedule is to review the options the City has for financing the repair program.

FINANCING

The City has options for financing the needed repairs. The first option would be to utilize funds that exist within the City’s Sewer Fund. Currently the Sewer Fund is holding a balance of approximately \$850,000. The balance represents approximately 14% of the current replacement value of the collection system. The City may choose to pay for the needed repairs using \$450,000 out of this existing fund. Once the repairs are funded the remaining funds would represent approximately 7% of the current replacement value of the collection system.

The recommendation to the City is that the Sewer Fund maintains a minimum balance representing 5% of the current replacement value of the collection system. The current replacement valuation of \$6M for the existing collection system would require a minimum balance of \$300,000 be maintained in the Sewer Fund. The City has the capacity to fund the identified repairs while maintaining the minimum balance in the Sewer Fund. Utilizing the existing Sewer Fund would have no immediate effect on the current fees and rates required from the sewer customers.

Another option available to the City is to finance with cash from fees collected. Due to the high priority nature of the identified defects, the recommendation is to perform the needed repairs within a relatively short period of time, no more than 5 years. Table 4 summarizes the proposed budget costs for repairs under various time-frames, from 1-year to 5-years.

Table 4: High Priority Repair Costs					
	1 - Year	2 - Years	3 - Years	4 - Years	5 - Years
Total Annual Cost	\$593,000	\$296,500	\$197,667	\$148,250	\$118,600
Annual Cost per TE (Customers, 194)	\$2,117	\$1,059	\$705	\$529	\$423
Annual Cost per TE (Connectors, 238)	\$766	\$383	\$255	\$192	\$153

Illustrated in the table above, the annual repair costs are reduced when the repair timeframe is extended out to 5 years. In addition, the table summarizes the impact to annual sewer rates based on the timeframe scenarios. The annual cost impacts are shown for both the City customers as well as the connectors.

As shown in Table 4, the impact to the annual rates for both customer and connector taps is very significant. Using the 5-year scenario, the annual impact to the sewer rates would be \$423/TE for City customers and \$153/TE for the connectors. Not reflected in this cost is the risk associated with delaying some of the high priority repairs for up to 5 years.

Another option available to the City is to finance the identified repairs by applying for a utility loan and financing the repair costs over a longer timeframe. For instance, the City may elect to apply for a \$450,000 loan from the Colorado Water Resources and Power Development Authority (CWRPDA) and repay the loan over a 20-year term. In this example, a \$450,000 loan with a 20 year term at 4% interest would require an annual repayment of \$33,112. The City customers would see an annual increase to their sewer fee of \$171 or approximately \$14 per month. The connectors would be charged for their portion of the main trunk line as the repairs are performed, per agreement.

RESERVE

While the development of a repair program will address the high priority deficiencies currently identified within the system, it is recommended that the City continue to maintain the capital reserve sewer fund addressing the deterioration of the system going forward. The capital reserve fund should be utilized to address repairs going forward and maintaining the fund requires the City collect a percentage of the replacement value of the system each year. As stated previously it is recommended that the Sewer Fund maintain a minimum balance representing 5% of the current replacement value of the collection system.

Pipelines that have been installed correctly and have not been disturbed by crossing utilities or other local disturbances have a reasonable service life of 75 – 100 years. Based on the expected service life, the City should budget to collect 1% – 1.5% of the replacement value of the system each year in order to address ongoing repairs as the system deteriorates over time. This collected fee represents the linear depreciation of the collection system.

Currently the replacement value of the entire system is \$6,092,000. The replacement value is today's cost of replacing the entire system all pipes and all manholes. The current annual depreciation of the system is approximately \$78,000 and represents 1.3% of the replacement value of the system. It is recommended that the City collect this amount annually in order to address repairs and replacements for the system going forward.

In order to collect the \$78,000 annually, the City customers will be required to pay \$402/TE to fund the depreciation of the collection system. The connectors pay for the replacement and

repairs as they occur, per the agreements with the City. The connectors do not participate in the reserve account as they pay as the repairs and replacements are performed. Based on the current identified repairs required for the main trunk line, the amount charged to the City connectors would be \$766/TE as indicated in Table 4.

The City may choose to phase in the collection of the reserve fund fee over a period of time. For instance, an annual increase may be implemented in order to raise the reserve fund over time to the appropriate funding level.

CONCLUSION

The City has identified approximately 8,234 linear feet of pipeline within its sanitary sewer collection system that requires repair. The overall cost for the identified repairs is approximately \$592,740. Developing a repair program to address the immediate repair needs as well as maintaining a capital reserve sewer fund to finance repairs going forward, are both keys to establishing sustainable utility rates.

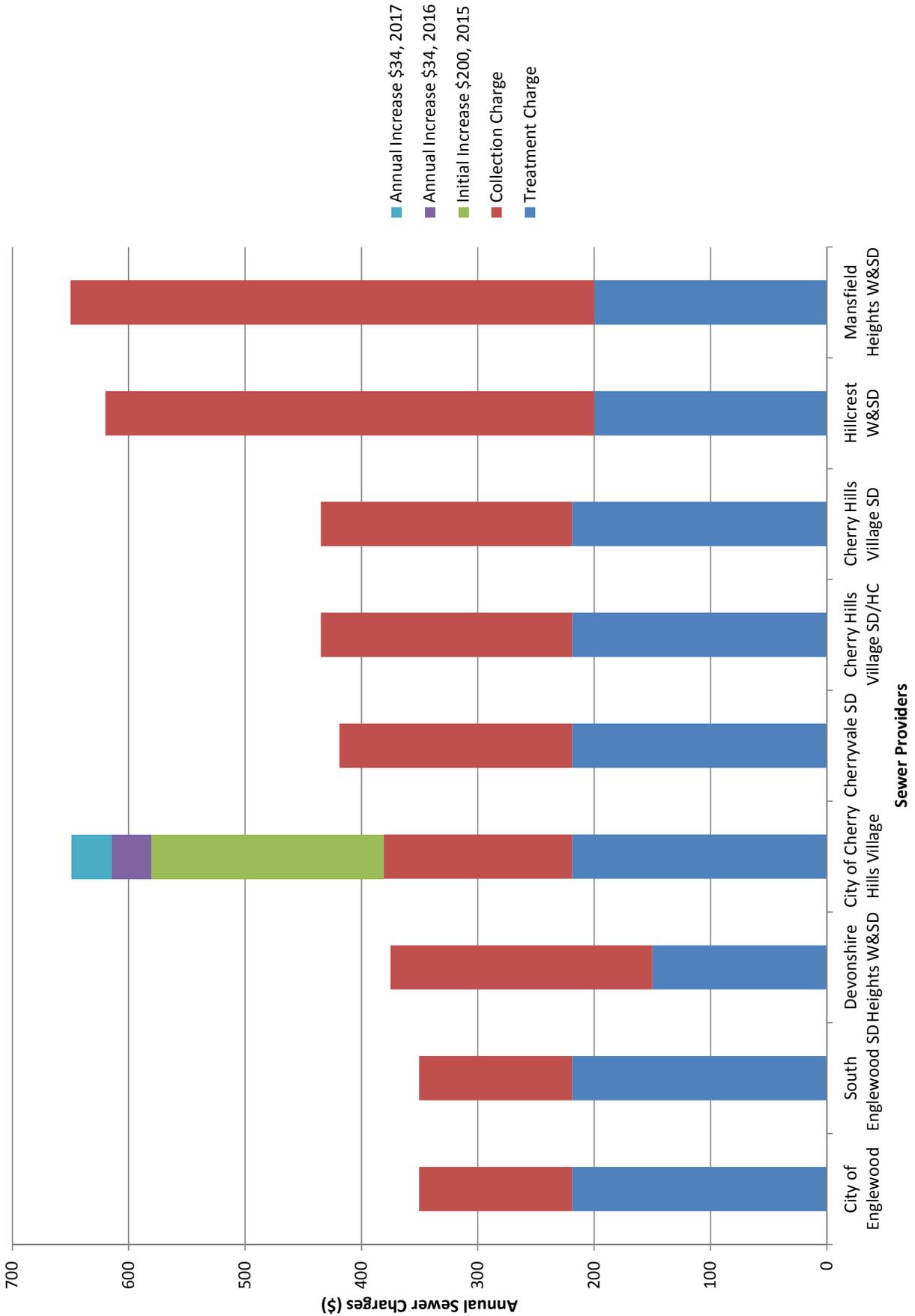
The City has options as to how to finance the repairs. The city may choose to fund the high priority repairs using the existing Sewer Fund, which has a current balance of approximately \$850,000. This option would have no immediate impact on the City customers and the City connectors would be required to fund \$766/TE for the repairs to the main trunk line. Once the repairs have been completed the City would then proceed to fund the reserve fund through a rate increase going forward. If the City chooses to fund the repair in this manner it will reduce the existing fund balance to approximately \$400,000.

The City may choose to apply for a loan to cover the initial high priority repairs, with a term of 20-years, the impact to the City customers would be \$171 annually or approximately \$14 monthly. Per the agreement with the City connectors, they would be responsible for the repairs at the time the repairs are performed. The identified repairs for the main trunk line will require \$766/TE be collected from the City connectors.

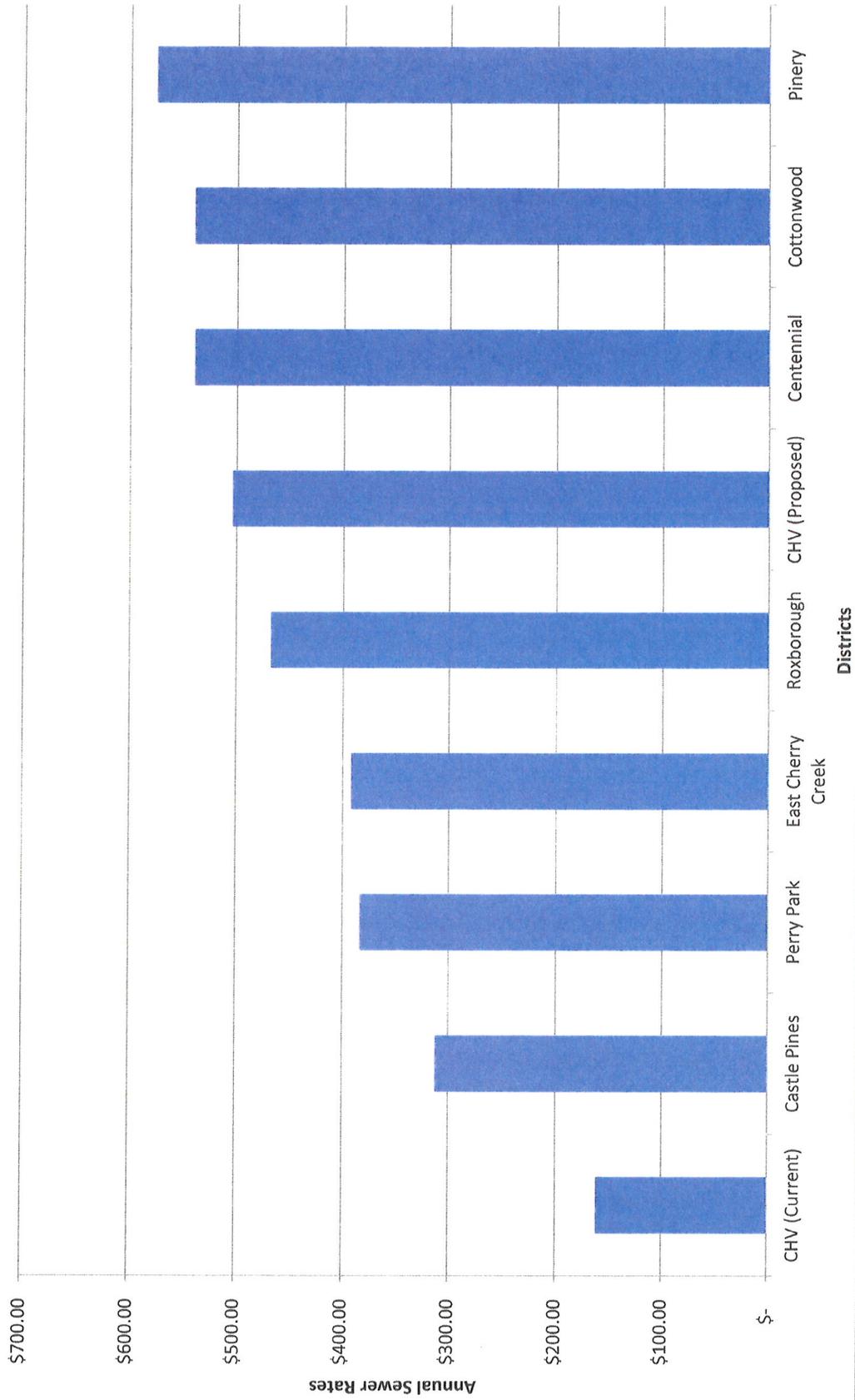
Ongoing funding of the Sewer Fund for capital repair and replacement requires that the City institute a capital reserve fund fee. The fee for the capital reserve fund could be phased in over a period of time to lessen the immediate impact of increased sewer fees. The goal of the capital reserve funding is to collect the amount equivalent to the annual depreciation of the collection system. The current annual depreciation of the system is approximately \$78,000 and would require an annual fee of \$402/TE from the City customers. The recommendation is that the capital reserve fee be phased in over a period of time to reduce the sudden impact of a rate increase on the customers.

APPENDIX E
RATE COMPARISONS

SEWER RATES WITHIN CHERRY HILLS VILLAGE



RESIDENTIAL RATES IN OTHER DISTRICTS





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APPENDIX

C

The 4 Percent Benchmark for Affordability

The Environmental Protection Agency has never adopted a measure to indicate how much an individual household can pay for water services before they become unaffordable. Yet participants in the current debate use (and attribute to EPA) the assumption that any household with water bills in excess of 4 percent of its income is experiencing a hardship. In adopting that notion, they mistakenly apply to individual households "affordability criteria" that the agency developed for whole water systems.

The distinction is important because EPA's criteria compare the revenues collected by a water system to the median household income (MHI) in a service area, not to individual household income. Certainly, average household costs that correspond to 4 percent of a community's MHI represent an even higher percentage of the income of an individual household earning less than the median. Thus, EPA's (subjective) judgment that 4 percent of MHI is a reasonable ceiling on a water system's yield does not translate into a judgment that each individual household served by that system should pay no more than 4 percent of its income for water services.

The 4 percent benchmark reflects EPA's separate figures of 2 percent each for wastewater and drinking water. The origins of those individual figures highlight the subjectivity inherent in setting affordability criteria.

EPA's Affordability Criterion for Wastewater Systems

EPA's guidance on the affordability of investment in wastewater systems uses an average household rate of 2 percent of MHI as one assessment factor in conjunction with measures of the system's debt, socioeconomic conditions of the area, and financial management conditions.⁽¹⁾ The focus on affordability at the system level is also reflected in the guidance's reference to a 1988 study examining municipal governments' ability to issue revenue bonds to finance environmental compliance. EPA assumed that lending institutions would initially be reluctant to accept ratios of user fees to income that were much above those already in existence in most communities, but the agency was clearly not concerned about whether individual households could afford higher rates—it asserted that as new environmental regulations gained wider acceptance, lenders would not be put off by higher ratios.⁽²⁾

EPA's Affordability Criterion for Drinking Water Systems

EPA was led to establish an affordability criterion for drinking water systems by the 1996 Amendments to the Safe Drinking Water Act. The amendments specified that small public drinking water systems would be allowed to use less effective pollutant control technologies when designated technologies capable of achieving a maximum contaminant level for a pollutant or satisfying a treatment technique requirement were not "affordable." EPA judged that a technology was not affordable for a small system if the associated average expense per household served exceeded 2 percent of the service area's MHI.

EPA settled on 2 percent after seeking a value that would be "closer to the cost of other utilities, and not significantly less than the cost of specific discretionary items."⁽³⁾

Consumer expenditures on alcohol and tobacco represented 1.5 percent of 1995 pretax MHI, and expenditures on energy and fuels accounted for 3.3 percent.⁽⁴⁾ From that range, the agency selected 2 percent, in part because it was roughly consistent with the premium that some households were choosing to pay when installing a drinking water treatment device or purchasing bottled water.⁽⁵⁾

EPA recently decided to raise the value to 2.5 percent of MHI, which highlights the subjective underpinnings of the agency's affordability criterion. The change allows EPA to designate point-of-use treatment devices as "compliance technologies" because it ensures that average household charges by small systems installing such devices would remain below the affordability criterion. In effect, the change limits the recourse of small drinking water systems to less effective pollutant control technologies.

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1. See Environmental Protection Agency, Office of Water, Office of Wastewater Management, "Combined Sewer Overflows—Guidance for Financial Capability Assessment and Schedule Development," EPA 832-B-97-004 (February 1997).
 2. Financial markets do not use a household-level affordability criterion in determining a system's overall financial condition and credit capacity. But they do consider whether rates that are comparatively low for a region may constrain asset maintenance and whether rates that are too high may limit expansion of the industrial customer base. Rate assessments allow for timely capital improvement plans and rates that reflect the full cost of service. In addition to rates, financial analysts examine the diversity and breadth of a system's customer base, the strength of the local economy, the system's governance and organizational structure, the quality of its management and strategic focus, and its liquidity. See Mary Francoeur, Chee Mee Hu, and Thomas Paolicelli, *Rating Methodology: Analytical Framework for Water and Sewer System Ratings* (Moody's Investor Service, Municipal Credit Research, August 1999). Conversation with Chee Mee Hu, December 17, 2001.
 3. See International Consultants and others, "National Level Affordability Criteria Under the 1996 Amendments to the Safe Drinking Water Act (Final Draft Report)," USEPA Contract 68-C6-0039 (August 1998), pp. 6-2, 4-6; and Environmental Protection Agency, Office of Water, "Variance Technology Findings for Contaminants Regulated Before 1996," EPA 815-R-98-003 (September 1998), p. 19.
 4. Environmental Protection Agency, Office of Water, "Variance Technology Findings," p. 45.
 5. International Consultants, "National Level Affordability Criteria," p. 4-3.

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