

CITY OF
Chandler

**Water, Wastewater and Reclaimed Water
Cost of Service Study**

Final Report / January 2022

This page intentionally left blank to facilitate two-sided printing.

January 31, 2022

Ms. Dawn Lang, CPA
Deputy City Manager | CFO
City of Chandler
Chandler City Hall
175 S. Arizona Avenue
Chandler, AZ 85225

Subject: Final 2021 Water, Wastewater and Reclaimed Water Cost of Service Study

Dear Ms. Lang,

Raftelis Financial Consultants, Inc. (Raftelis) is pleased to provide this report on the Water, Wastewater, and Reclaimed Water Cost of Service Update (COS Update) to the City of Chandler (City).

The objective of the COS Update was to determine a transition to cost of service-based rates for service over 5-year period from fiscal year (FY) 2021-22 to FY 2025-26 (the study period). This cost of service analysis was based on using updated customer demand and cost data, and the FY 2021-22 through FY 2025-26 revenue requirement for each customer class receiving water, wastewater and reclaimed water service.

This report provides a summary of the analytical procedures followed by Raftelis. It is intended to serve as a resource for stakeholders who seek to better understand the cost of service and rate design findings and recommendations made by Raftelis and adopted by the City.

It has been a pleasure working with you and other City personnel. We thank you for the insight, direction and support you provided during the course of the Cost of Service Update.

Sincerely,

Todd Cristiano
Senior Manager



TABLE OF CONTENTS

SECTION 1: EXECUTIVE SUMMARY	1
1.1 Introduction.....	1
1.2 City Financial Plan Revenue Forecast.....	1
1.3 Water Cost of Service Findings	2
1.4 Wastewater Cost of Service Findings	4
1.5 Reclaimed Water	8
SECTION 2: WATER COST OF SERVICE	9
2.1 Overview of the Water Cost of Service Study Process	9
2.2 Account, Demand, and Revenue Projections	10
2.3 Revenue Requirement	14
2.4 Comparison of FY 2021-22 Cost of Service to Revenue at Existing Rates	16
2.5 Revenue Requirement Cost Allocation	17
2.5 Cost Functionalization.....	17
2.6 System Demand Peaking Factors.....	17
2.7 Cost Classification.....	18
2.8 Allocated Revenue Requirement	21
2.9 Units of Service.....	22
2.10 Unit Cost of Service	23
2.11 Customer Class Revenue Requirement	24
2.12 Comparison of Cost of Service to Revenue at Existing Rates	26
2.13 Existing and Proposed Water Rates.....	27
SECTION 3: WASTEWATER COST OF SERVICE.....	29
3.1 Overview of the Wastewater Cost of Service Study	29
3.2 Account, Billable Volume, and Revenue Projections	30
3.4 Revenue Requirement	34
3.4 FY 2021-22 Cost of Service Results.....	35
3.5 Revenue Requirement Cost Allocation	36
3.6 Cost Functionalization.....	37
3.8 Cost Classification.....	37
3.9 Allocated Revenue Requirement	39
3.10 Units of Service.....	39
3.11 Unit Cost of Service.....	42
3.12 Customer Class Revenue Requirement	43
3.13 Comparison of FY 2025-26 Cost of Service to Revenue at Existing Rates	44
3.14 Existing and Proposed Wastewater Rates	46
SECTION 4: RESIDENTIAL CUSTOMER BILL IMPACTS	48
4.1 Water and Wastewater Residential Bill Impacts	48



Chandler · Arizona

SECTION 5: RECLAIMED WATER COST OF SERVICE	49
5.1 Reclaimed Water Revenue Requirement.....	49
5.2 Sources of Funds.....	49
5.3 Uses of Funds	49
5.4 Indicated Revenue Adjustments	50
5.3 Proposed FY 2020-21 Reclaimed Water Rates.....	51



LIST OF TABLES

Table 1: Forecasted Utility User Charge Revenue Increases [1, 2].....	1
Table 2: Water Utility Comparison of Water FY2021-22 Cost of Service to Revenue at Existing Rates [1]2	
Table 3: Water Utility Comparison of FY 2025-26 Cost of Service to Revenue at Existing Rates [1].....	3
Table 4: Water Utility Comparison of Existing and Proposed Monthly Base Charges and Volume Rates [1]	
.....	4
Table 5: Wastewater Utility Comparison of FY2021-22 Cost of Service to Revenue at Existing Rates.....	5
Table 6: Wastewater Utility Comparison of FY 2025-26 Cost of Service to Revenue at Existing Rates	
100% Cost of Service [1].....	6
Table 7: Wastewater Utility Comparison of FY 2025-26 Cost of Service to Revenue at Existing Rates 75%	
Cost of Service [1].....	7
Table 8: Wastewater Utility Monthly Base Charges and Volumetric Rates 75% COS Option [1,2]	8
Table 9: Reclaimed Water Rates (\$ per 1,000 gallons).....	8
Table 10: Water Utility Forecast Average Monthly Use per Bill (Kgal) [1]	11
Table 11: Water Utility Projected Water Customer Annual Total Bills [1]	12
Table 12: Water Utility Projected Billable Volume by Customer Class (Kgal) [1]	13
Table 13: Water Utility Projected Revenue at Existing Rates [1].....	14
Table 14: Water Utility Revenue Requirement Forecast [1]	15
Table 15: Water Utility Comparison of FY 2021-22 Cost of Service to Revenue at Existing Rates [1].....	16
Table 16: Water Utility Average Day to Maximum Day Treatment Plant Production (1,000 gallons) [1,2]	
.....	18
Table 17: Water Utility Functionalized and Allocated Operation and Maintenance Expense Test Year FY	
2025-26 [1]	20
Table 18: Water Utility Functionalized and Allocated Capital Costs Test Year FY 2025-26 [1]	21
Table 19: Water Utility Allocated Revenue Requirement Test Year FY 2025-26 [1].....	21
Table 20: Water Utility Customer Class Units of Service Test Year FY 2025-26 [1].....	23
Table 21: Water Utility Unit Cost of Service Test Year FY2025-26 [1]	24
Table 22: Water Utility Distribution of Cost to Customer Classes Test Year FY 2025-26 [1].....	25
Table 23: Water Utility Comparison of Cost of Service to Revenue at Existing Rate FY 2025-26 [1].....	27
Table 24: Water Utility Comparison of Existing and Proposed Monthly Base Charges and Volume Rates	
[1]	28
Table 25: Wastewater Utility Projected Billable Volume per Account [1].....	31
Table 26: Wastewater Utility Forecast Wastewater Customer Annual Bills [1]	32
Table 27: Wastewater Utility Projected Billable Volume by Customer Class (Kgal) [1].....	33
Table 28: Wastewater Utility Projected Revenue at Existing Rates [1,2]	34
Table 29: Wastewater Utility Wastewater Utility Revenue Requirement [1].....	35
Table 30: Wastewater Utility Comparison of FY 2021-22 Cost of Service to Revenue at Existing Rates [1]	
.....	36
Table 31: Wastewater Utility Functionalized and Allocated Operation and Maintenance Expense Test	
Year FY 2025-26 [1].....	38
Table 32: Wastewater Utility Functionalized and Allocated Capital Costs Test Year FY 2025-26 [1].....	39
Table 33: Wastewater Utility Allocated Revenue Requirement FY 2025-26 [1]	39
Table 34: Wastewater Utility Estimated Return Flows by Customer Class [1]	41
Table 35: Wastewater Utility Customer Class Units of Service FY 2025-26 [1]	42
Table 36: Wastewater Utility Unit Cost of Service Test Year FY 2025-26 [1].....	43



Table 37: Wastewater Utility Customer Class Revenue Requirement Test Year FY 2025-26 [1].....	44
Table 38: Wastewater Utility Comparison of FY 2025-26 to Revenue at Existing Rates 100% Cost of Service Transition [1]	45
Table 39: Wastewater Utility Comparison of FY 2025-26 to Revenue at Existing Rates 75% Cost of Service Transition [1]	46
Table 40: Wastewater Utility Comparison of Existing and Proposed Monthly Base Charges and Volume Rates 75% Cost of Service Option [1,2]	47
Table 41: Single Family Residential Combined Bill Impact	48
Table 42: Reclaimed Water Cash Flow Analysis [1].....	50
Table 43: Reclaimed Water User Charges (\$ per 1,000 gallons).....	51

LIST OF FIGURES

Figure 1: Determination of Water Customer Class Revenue Requirements	10
Figure 2: Determination of Wastewater Customer Class Revenue Requirements.....	30

LIST OF APPENDICES

- Appendix A: Water Cost of Service and Rate Design Tables
- Appendix B: Wastewater Cost of Service and Rate Design Tables
- Appendix C: Reclaimed Water Cash Flow Analysis



SECTION 1: EXECUTIVE SUMMARY

1.1 INTRODUCTION

The City of Chandler retained Raftelis to complete a comprehensive rate study for their water, wastewater, and reclaimed utilities. The primary components of this study included:

- Development of the 5-year revenue requirement, FY 2022-26:¹
- Allocation of the detailed revenue requirement to customer classes through a comprehensive, industry-accepted cost of service process; and
- Design of user charges or rates for service that transition from the current service charge and volume rate to the indicated cost of service rates over the FY 2021-22 to FY 2025-26 study period.

1.2 CITY FINANCIAL PLAN REVENUE FORECAST

The water, wastewater and reclaimed cost of service (COS) analyses and resulting user charges (fixed monthly service charges and volume rates) were designed to generate the specific amount of revenue identified in the City's financial planning models. The City provided Raftelis with the 5-year financial plan and proposed revenue adjustments/increases needed to maintain the fiscal integrity of the individual utility enterprise funds. The revenue requirement, cost of service analysis and rate design are based on these financial plans. The City's proposed revenue percentage increases for the study period for each of the three utility enterprise funds are shown in Table 1.

Table 1: Forecasted Utility User Charge Revenue Increases [1, 2]

Utility	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26
Water	2%	0%	2.5%	0%	2.5%
Wastewater	4%	0%	6%	0%	6%
Reclaimed Water	8%	0%	7%	0%	7%

[1] Source: City of Chandler Financial Plan
 [2] See Appendix Table A-3 Water, B3 Wastewater, C1 Reclaimed Water

The percentage values in Table 1 indicate the rate revenue increases required to meet annual revenue requirements for each utility including annual reserve and debt service coverage requirements. Revenue requirements include operation and maintenance expenses, rate-funded capital improvements, debt service and are net of other operating and non-operating income and changes in reserves.

¹ The City's fiscal year begins on July 1. For example, FY 2021-22 is the 12-months ending June 30, 2022.



1.3 WATER COST OF SERVICE FINDINGS

Table 2 compares the FY 2021-22 cost of service by customer class to revenue at existing rates. The variances between the classes are a result of the cost allocation process used in the COS analysis.

**Table 2: Water Utility
Comparison of Water FY2021-22 Cost of Service to Revenue at Existing Rates [1]**

Customer Class	FY 2021-22 Cost of Service	FY 2021-22 Revenue at Existing Rates	Change - \$	Change - %
Inside City				
Single Family	\$28,452,234	\$29,063,262	(\$611,029)	-2.1%
Multi Family	3,598,305	3,679,664	(81,359)	-2.2%
Non-Residential	5,366,759	5,124,267	242,492	4.7%
Industrial	8,558,416	8,020,416	538,000	6.7%
Landscape	8,841,493	7,840,135	1,001,359	12.8%
Inside City Subtotal	\$54,817,207	\$53,727,745	\$1,089,462	2.0%
Outside City				
Single Family	\$571,268	\$574,998	(\$3,731)	-0.6%
Multi Family	346	358	(12)	-3.4%
Non-Residential	81,039	80,541	499	0.6%
Landscape	34,273	32,175	2,098	6.5%
Outside City Subtotal	\$686,926	\$688,072	(\$1,146)	-0.2%
Total System	\$55,504,133	\$54,415,816	\$1,088,316	2.0%

[1] See Appendix Table A-30

The values shown columns 4 and 5 indicate a shift in cost between the classes as compared to the previous cost of service analysis. These changes or misalignment did not occur “overnight” and are primarily due to changes in customer class demands such as average use per account and peak day demands from outdoor usage following the 2016 cost of service study. The make-up of the accounts by meter size may influence the changes as well. Finally, changes in the allocation of costs (revenue requirements) would also impact these values. Section 2 provides more detail on the customer demand characteristics and the COS allocation process.

5-Year Cost of Service Transition

Table 3 compares the FY 2025-26 cost of service to revenue at existing rates. The percentage change in column 5 represents the cumulative change in revenue adjustments over the study



period. The transition plan scales the monthly base charge and volume rates based on the overall financial plan increases and adjustments needed to meet the indicated class cost of service in FY 2025-26. In other words, the rates developed during the transition period (FY 2021-22 to FY 2024-25) will recover the overall revenue requirement and not each classes' cost of service. Full class cost of service is anticipated to be achieved by FY 2025-26.

**Table 3: Water Utility
Comparison of FY 2025-26 Cost of Service to Revenue at Existing Rates [1]**

Customer Class	FY 2025-25 Cost of Service	FY 2025-26 Revenue at Existing Rates	Change - \$	Change - %
Inside City				
Single Family	\$30,521,686	\$29,610,487	\$911,199	3.1%
Multi Family	3,828,492	3,748,948	79,544	2.1%
Non-Residential	5,716,086	5,220,751	495,336	9.5%
Industrial	11,739,671	10,538,243	1,201,428	11.4%
Landscape	9,407,605	7,987,755	1,419,850	17.8%
Inside City Subtotal	\$61,213,541	\$57,106,183	\$4,107,358	7.2%
Outside City				
Single Family	\$611,583	\$585,825	\$25,758	4.4%
Multi Family	372	364	8	2.2%
Non-Residential	86,366	82,057	4,309	5.3%
Landscape	36,512	32,781	3,731	11.4%
Outside City Subtotal	\$734,833	\$701,027	\$33,806	4.8%
Total System	\$61,948,374	\$57,807,210	\$4,141,164	7.2%

[1] See Appendix A-31

Proposed Monthly Base Charge and Volume Rate 5-Year Transition

The proposed fixed monthly service or base charges and volume rates retain the existing structure. The monthly base charge varies by meter size and does not vary by class. The residential and multi-family volume rates are a 4-tiered increasing block structure. The multi-family volume rate is assessed on a per account basis (i.e., tiers do not vary based on the number of units). Non-residential, industrial, and landscape volume rates are uniform and do not vary with the quantity of water used. Table 4 shows the existing rates and the proposed 5-year transition base charges and volume rates for the study period. The FY 2025-26 rates recover each class's anticipated cost service in this fiscal year.



**Table 4: Water Utility
Comparison of Existing and Proposed Monthly Base Charges and Volume Rates [1]**

Customer Class	Existing FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26
Monthly Base Charge, \$ per bill						
5/8" x 3/4"	\$9.07	\$9.26	\$9.26	\$9.49	\$9.49	\$9.72
3/4"	10.35	10.56	10.56	10.83	10.83	11.09
1"	13.22	13.49	13.49	13.83	13.83	14.17
1 1/2"	20.82	21.24	21.24	21.77	21.77	22.31
2"	29.31	29.90	29.90	30.65	30.65	31.41
3"	61.79	63.03	63.03	64.61	64.61	66.22
4"	87.19	88.94	88.94	91.16	91.16	93.44
6"	165.56	168.88	168.88	173.10	173.10	177.42
8"	250.83	255.85	255.85	262.25	262.25	268.80
10"	427.38	435.93	435.93	446.83	446.83	458.00
12"	603.95	616.03	616.03	631.43	631.43	647.22
Volume Rate, \$ per 1,000 gallons						
Single Family						
First 10,000 Gallons	\$1.60	\$1.62	\$1.62	\$1.64	\$1.64	\$1.66
Next 10,000 Gallons	2.08	2.11	2.11	2.14	2.14	2.16
Next 40,000 Gallons	2.62	2.65	2.65	2.69	2.69	2.72
Over 60,000 Gallons	3.27	3.31	3.31	3.35	3.35	3.39
Multi-Family						
First 10,000 Gallons	\$0.87	\$0.89	\$0.89	\$0.90	\$0.90	\$0.91
Next 10,000 Gallons	1.07	1.09	1.09	1.11	1.11	1.12
Next 20,000 Gallons	1.47	1.49	1.49	1.52	1.52	1.54
Over 40,000 Gallons	2.21	2.25	2.25	2.28	2.28	2.32
Industrial	\$2.11	\$2.19	\$2.19	\$2.28	\$2.28	\$2.37
Landscape Service	2.55	2.70	2.70	2.89	2.89	3.08
Non-Residential	2.08	2.17	2.17	2.27	2.27	2.37
[1] See Appendix A-36						

1.4 WASTEWATER COST OF SERVICE FINDINGS

Table 5 compares the FY 2021-22 cost of service by customer class to revenue at existing rates. The variances between the classes are a result of the cost allocation process used in the COS analysis.



**Table 5: Wastewater Utility
Comparison of FY2021-22 Cost of Service to Revenue at Existing Rates [1]**

Customer Class	FY 2021-22 Cost of Service	FY 2021-22 Revenue at Existing Rates	Change - \$	Change - %
Inside City				
Single Family	\$22,942,174	\$26,193,281	(\$3,251,107)	-12.4%
Multi-Family	4,463,520	3,235,761	1,227,759	37.9%
Non-Residential	20,003,155	16,165,031	3,838,125	23.7%
Total Inside City	\$47,408,849	\$45,594,072	\$1,814,777	4.0%
Outside City				
Single Family	\$164,873	\$149,755	\$15,118	10.1%
Multi-Family	0	0	0	N/A
Landscape Service	11,803	11,486	317	2.8%
Total Outside City	\$176,676	\$161,240	\$15,435	9.6%
Total System	\$47,585,525	\$45,755,312	\$1,830,213	4.0%

[1] See Appendix Table B-24

The values shown in columns 4 and 5 indicate a shift in cost between the classes as compared to the previous cost of service analysis. These changes or misalignment did not occur “overnight” and are primarily due to a change in customer class flows and the estimated return factors² for the single family, multi-family, and non-residential classes. Chapter 3 provides more detail on the flow characteristics, the return factor estimates, and the allocation process.

5-Year Cost of Service Transition

Raftelis developed two alternatives to assess the changes the cost of service analysis would have on each class. Alternative 1 recovers the full cost of service in FY 2025-26 from each class and alternative 2 recovers 75% of the cost of service from multi-family and non-residential classes in FY 2025-26. Under alternative 2, the portion of cost of service not recovered by multi-family and non-residential classes would be distributed to other classes as a subsidy. Table 6 shows the 100% cost of service alternative and Table 7 shows the 75% of cost of service alternative.

Under both alternatives, the percentage change in column 5 represents the cumulative change in revenue adjustments over the study period. The transition plan scales the monthly base charge and

² Return factors are applied to the residential and multi-family billable water volume (which includes both indoor and outdoor usage) to estimate the amount of wastewater flow returning to the plant.



volume rate based on the overall financial plan increases and adjustments needed to meet cost of service in FY 2025-26. In other words, the rates developed during the transition period (FY 2021-22 to FY 2024-25) will recover the overall revenue requirement and not each class’s cost of service. Full class cost of service will be achieved by FY 2025-26.

**Table 6: Wastewater Utility
Comparison of FY 2025-26 Cost of Service to Revenue at Existing Rates
100% Cost of Service [1]**

Customer Class	Adjusted FY 2025-26 Cost of Service	FY 2025-26 Revenue at Existing Rates	Change - \$	Change - %
Inside City				
Single Family	\$24,509,430	\$25,614,044	(\$1,104,614)	-4.3%
Multi-Family	4,756,186	\$3,164,205	1,591,981	50.3%
Non-Residential	28,839,849	\$20,950,164	7,889,685	37.7%
Total Inside City	\$58,105,465	\$49,728,413	8,377,052	16.8%
Outside City				
Single Family	\$176,038	\$146,443	29,595	20.2%
Multi-Family	0	\$0	0	N/A
Non-Residential	12,586	\$11,232	1,354	12.1%
Total Outside City	\$188,624	\$157,675	30,949	19.6%
Total System	\$58,294,089	\$49,886,088	\$8,408,001	16.9%

[1] See Appendix Table B -25

City Council has given direction to pursue the 75% cost of service transition alternative. Therefore, Council adopted the 75% cost of service transition alternative. This 75% cost of service option would result in a continued, but lower than the present 50%, subsidy by the residential class to multi-family and commercial classes. In other words, the multi-family and non-residential rates would increase at a lower rate over the study period. Single family rates would increase slightly over the study period compared to a potential decrease under the 100% alternative. Table 7 shows the 75% cost of service alternative.



**Table 7: Wastewater Utility
Comparison of FY 2025-26 Cost of Service to Revenue at Existing Rates
75% Cost of Service [1]**

Customer Class	Adjusted FY 2025-26 Cost of Service	FY 2025-26 Revenue at Existing Rates	Change - \$	Change - %
Inside City				
Single Family	\$26,848,395	\$25,614,044	\$1,234,351	4.8%
Multi-Family	\$4,266,666	\$3,164,205	\$1,102,460	34.8%
Non-Residential	\$26,972,404	\$20,950,164	\$6,022,240	28.6%
Total Inside City	\$58,087,464	\$49,728,413	\$8,359,051	16.8%
Outside City				
Single Family	\$192,837	\$146,443	\$46,394	31.7%
Multi-Family	\$0	\$0	\$0	0.00%
Non-residential	\$13,787	\$11,232	\$2,555	22.8%
Total Outside City	\$206,624	\$157,675	\$48,950	31.0%
Total System	\$58,294,089	\$49,886,088	\$8,408,001	16.9%

[1] Appendix Table B-28

Proposed Monthly Base Charge and Volume Rate 5-Year Transition:

The proposed base charges and volume rates retain the existing structure. Single family and multi-family are assessed a monthly charge regardless of contributed volume. The non-residential class includes a monthly base charge and a volume rate for contributed wastewater volume based on return factors and water use. Table 8 shows the existing rates and the proposed 5-year transition base charges and volume rates for the study period. Outside City rates and charges are 60% greater than inside City.



**Table 8: Wastewater Utility
Monthly Base Charges and Volumetric Rates
75% COS Option [1,2]**

Customer Class	Existing FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26
Inside City						
Monthly Base Charge, \$ per Unit						
Single Family	\$27.32	\$27.65	\$27.65	\$28.15	\$28.15	\$28.68
Multi-family	9.76	10.57	10.57	11.84	11.84	13.17
Non-Residential [1]						
Volume Rate, \$ per 1,000 gallons	\$3.49	\$3.73	\$3.73	\$4.11	\$4.11	\$4.50
Monthly Base Charge	\$7.65	\$8.17	\$8.17	\$8.97	\$8.97	\$9.82
[1] Includes Industrial customer class						
[2] See Appendix Table A-29						

1.5 RECLAIMED WATER

Raftelis developed a reclaimed water rate for the study period. Reclaimed water provides a benefit to both the water utility and wastewater utility. For the water utility, reclaimed water sales serve as an offset to the need for using potable water for irrigation as well as reducing peak demands on the system. In addition, reclaimed water not sold to retail customers can be recharged to the aquifer, which also acts as an additional water supply. The City’s goal with reclaimed pricing is to continue to move towards a cost of service rate such that rates support operations and capital costs net of the contributions from the water and wastewater utility. Table 12 shows the existing and proposed reclaimed water rates for inside city customers.

Table 9: Reclaimed Water Rates (\$ per 1,000 gallons)

Customer Class	Existing FY 2020-21	Test Year FY 2021-22	Forecast FY 2022-23	Forecast FY 2023-24	Forecast FY 2024-25	Forecast FY 2025-26
Rate (\$ per 1,000 gallons)	\$0.69	\$0.75	\$0.75	\$0.80	\$0.80	\$0.85

SECTION 2: WATER COST OF SERVICE

2.1 OVERVIEW OF THE WATER COST OF SERVICE STUDY PROCESS

The purpose of a COS study is to allocate the water utility revenue requirement to each customer class in direct proportion to the demands they impose on the utility system in addition to the number of accounts and equivalent meters within the class. To accomplish this objective, Raftelis conducted a detailed analysis of customer water consumption characteristics and engaged in a multi-step cost allocation process. The procedures followed by Raftelis were based on the industry standard "base-extra capacity method" of cost allocations as published by the American Water Works Association in the Seventh Edition of the *Manual of Water Supply Practices M1, Principles of Water Rates, Fees, and Charges*.

The primary steps in the water cost of service study process include:

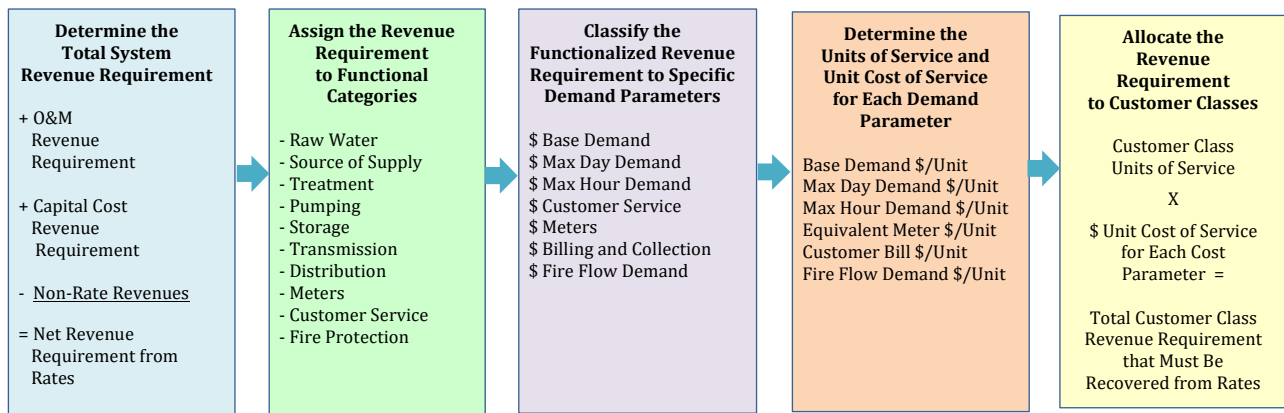
- **Account, Demand, and Revenue Projections:** Projecting the number of accounts and billed water volume over the study period, which is used to develop the user charges needed to meet revenue requirements.
- **Revenue Requirement:** Determining the amount of rate revenue required to meet annual operation and maintenance expenses (O&M), debt service, rate-funded capital, transfers, reserves, and debt service coverage requirements.
- **Cost Functionalization:** Allocating the O&M, capital, and non-rate revenue components of the revenue requirement to functional service categories. This process results in the assignment of costs to the specific types of water service the costs are incurred to provide.
- **Cost Classification:** Classifying the functionalized O&M, capital, and non-rate revenue components of the revenue requirement to specific cost parameters such as base demand, maximum day demand, and maximum hour demand. This process results in the assignment of costs to the specific types of water service they are incurred to serve.
- **Units of Service:** Determining the customer class units of service for each cost parameter based on metrics such as annual average day billed usage, maximum day and maximum hour extra capacity demand, the number of equivalent meters, and annual number of water bills.
- **Unit Cost of Service:** Determining the utility-wide unit cost of service for each cost parameter. The unit cost of service is determined by dividing the revenue

requirement assigned to each cost parameter by its associated utility-wide units of service.

- **Customer Class Revenue Requirements:** Calculating the customer class revenue requirement by multiplying the customer class specific units of service for each cost parameter by the associated utility-wide unit cost of service.

Figure 1 provides a visual overview of key steps in the water cost of service study process.

Figure 1: Determination of Water Customer Class Revenue Requirements



2.2 ACCOUNT, DEMAND, AND REVENUE PROJECTIONS

The process of estimating test year billed water consumption requires a determination of the average billed consumption for each major type of customer on the water utility system. This value is then multiplied by the projected growth in bills for each major type of customer for the study period. Projected revenue is determined by applying the existing monthly base charges to the number of accounts and the volume rate structure to the forecast demand by customer class. Table 10 shows the projected use per account by customer class. These values were determined through an analysis of historical billing data. Table 10 shows the full list of customer classes as identified in the City’s billing system. The medical, commercial, government, school, and industrial classes are combined later in the analysis because they are assessed the non-residential rates. The purpose for analyzing them as separate classes is to determine their respective demand profile prior to aggregation.



**Table 10: Water Utility
Forecast Average Monthly Use per Bill (Kgal) [1]**

Customer Class	Average Monthly Use per Bill (Kgal)
Inside City	
Single Family	10.5
Multi-Family	133.1
Medical - Other	103.8
Commercial - Other	61.3
Government - Other	81.0
School - Other	61.4
Industrial Consumption	7,873.5
Landscape Service	114.0
Hydrant Meter	151.3
Fireline	3.1
Outside City	
Single Family	13.5
Multi-Family	7.9
Medical - Other	6.3
Commercial	42.0
School - Other	19.5
Landscape Service	53.5
[1] See Appendix Table A-6	

Table 11 shows the projected number of customer bills used for the study period. The growth in bills/customer accounts is assumed to 0.50% annually from a baseline of FY 2019-20.



**Table 11: Water Utility
Projected Water Customer Annual Total Bills [1]**

Customer Class	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26
Inside City					
Single Family	935,405	940,082	944,783	949,507	954,254
Multi Family	11,639	11,697	11,755	11,814	11,873
Medical - Other	1,332	1,339	1,346	1,352	1,359
Commercial - Other	26,068	26,198	26,329	26,461	26,593
Government - Other	1,417	1,424	1,431	1,438	1,446
School - Other	2,932	2,947	2,961	2,976	2,991
Industrial Consumption	522	525	527	530	533
Landscape Service	24,796	24,920	25,045	25,170	25,296
Hydrant Meter	401	403	405	407	409
Fireline	1,236	1,242	1,249	1,255	1,261
Total Inside City	1,005,749	1,010,777	1,015,831	1,020,910	1,026,015
Outside City					
Single Family	10,642	10,695	10,748	10,802	10,856
Multi Family	12	12	12	12	12
Medical - Other	12	12	12	12	12
Commercial	503	506	508	511	513
School - Other	61	61	61	62	62
Landscape Service	145	146	147	148	148
Total Outside City	11,375	11,432	11,489	11,546	11,604
Total System	1,017,123	1,022,209	1,027,320	1,032,457	1,037,619

[1] See Appendix Table A-4



Table 12 shows the forecast billed water consumption in thousands of gallons (Kgal or 1,000 gallons) used in the water cost of service study update. The projected volume is the product of multiplying the number of bills by the use per bill.

**Table 12: Water Utility
Projected Billable Volume by Customer Class
(Kgal) [1]**

Customer Class	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26
Inside City					
Single Family	9,805,033	9,854,058	9,903,328	9,952,845	10,002,609
Multi Family	1,549,151	1,556,897	1,564,681	1,572,505	1,580,367
Medical - Other	138,226	138,917	139,612	140,310	141,011
Commercial - Other	1,596,770	1,604,754	1,612,777	1,620,841	1,628,945
Government - Other	114,795	115,369	115,946	116,526	117,109
School - Other	180,014	180,914	181,818	182,727	183,641
Industrial Consumption	3,746,274	3,214,575	3,783,830	4,914,646	4,939,219
Landscape Service	2,826,299	2,840,431	2,854,633	2,868,906	2,883,251
Hydrant Meter	60,660	60,963	61,268	61,575	61,882
Fireline	3,880	3,899	3,918	3,938	3,958
Total Inside City	20,021,102	19,570,777	20,221,813	21,434,819	21,541,993
Outside City					
Single Family	143,290	144,007	144,727	145,450	146,178
Multi Family	96	96	97	97	98
Medical - Other	76	76	77	77	77
Commercial	21,124	21,229	21,335	21,442	21,549
School - Other	1,183	1,189	1,195	1,201	1,207
Landscape Service	7,779	7,818	7,857	7,896	7,936
Total Outside City	173,548	174,415	175,287	176,164	177,045
Total System	20,194,649	19,745,192	20,397,100	21,610,983	21,719,038

[1] See Appendix Table A-7

Table 13 shows the projected revenue at current rates (FY 2019-20 rates). This includes hydrant meter and fire line revenue. For the purposes of this study, these are considered a part of miscellaneous revenue and are not customer-class rate revenue.



**Table 13: Water Utility
Projected Revenue at Existing Rates [1]**

Customer Class	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26
Inside City					
Single Family	\$29,063,262	\$29,221,007	\$29,351,575	\$29,463,171	\$29,610,487
Multi Family	3,679,664	3,699,636	3,716,167	3,730,296	3,748,948
Medical - Other	334,526	336,342	337,845	339,129	340,825
Commercial - Other	4,035,605	4,057,508	4,075,638	4,091,134	4,111,590
Government - Other	283,710	285,250	286,525	287,614	289,052
School - Other	470,427	472,980	475,093	476,900	479,284
Industrial Consumption	8,020,416	6,896,108	8,099,980	10,485,814	10,538,243
Landscape Service	7,840,135	7,882,688	7,917,910	7,948,015	7,987,755
Hydrant Meter	155,765	156,610	157,310	157,908	158,698
Fireline	22,171	22,291	22,391	22,476	22,588
Total Inside City	\$53,905,680	\$53,030,420	\$54,440,434	\$57,002,457	\$57,287,469
Outside City					
Single Family	\$574,998	\$578,119	\$580,702	\$582,910	\$585,825
Multi Family	358	360	361	363	364
Medical - Other	386	388	389	391	393
Commercial	74,916	75,322	75,659	75,947	76,326
School - Other	5,239	5,268	5,291	5,311	5,338
Landscape Service	32,175	32,350	32,494	32,618	32,781
Total Outside City	\$688,072	\$691,806	\$694,897	\$697,539	\$701,027
Total System	\$54,593,752	\$53,722,226	\$55,135,332	\$57,699,996	\$57,988,496

[1] See Appendix A-8

2.3 REVENUE REQUIREMENT

The study period revenue requirement used in this study was based on the FY 2021-22 water utility enterprise fund budget provided by the City.

Table 14 summarizes the water utility revenue requirement for the study period. The FY 2025-26 revenue requirement totals \$61.9 million. This consists of \$40.0 million in O&M expenses, \$0.6 million of net rate-funded capital (capital improvement program or CIP), \$17.8 million in debt service, and an \$11.0 million increase in reserves. This requirement is met by \$6.9 million in non-rate revenue and \$11.1 million to the change in reserves. The O&M amount includes a transfer to the reclaimed water fund for the funding operations. This transfer totals approximately \$1.3 million



annually. This is offset by the Gila River Indian Community (GRIC) avoided cost benefit to the water fund for offsetting the need to find new water resources.

Annual rate increases are implemented for 6 months of the fiscal year; anticipated to be effective January 1. The rate increases indicated in Table 1 will generate approximately 50% of the anticipated increase during the first year of adoption. For rate setting purposes, the revenue requirement must be set to recover the full 12 months of the increase. Rates from this ‘annualized’ revenue requirement will produce the full increase over a 12-month period. Because these rates are in effect for only 6 months, with existing rates in effect for the first 6 months, the overall recovery from rates will be 50% of the total indicated increase.

Table 14: Water Utility Revenue Requirement Forecast [1]

Item	Test Year FY 2021-22	Forecast FY 2022-23	Forecast FY 2023-24	Forecast FY 2024-25	Forecast FY 2025-26
Operation and Maintenance Expense	\$36,725,599	\$36,315,012	\$37,369,575	\$38,711,717	\$39,917,799
Capital Costs					
Total CIP Cash Outlay	72,437,411	15,986,856	18,500,415	27,799,788	38,911,708
Bond Financed CIP Adjustment	(19,432,360)	(7,680,776)	(14,949,514)	(22,346,991)	(38,266,828)
SDF / Other Financed CIP Adjustment [2]	(4,019,366)	0	0	0	0
Net Rate-Funded Capital	48,985,685	8,306,080	3,550,901	5,452,797	644,880
Debt Service	13,842,604	13,773,839	14,697,492	15,318,685	17,795,232
Annual Surplus/(Deficiency)					
Total Revenue Requirement	\$99,553,888	\$58,394,931	\$55,617,968	\$59,483,199	\$58,357,912
Revenue Requirement Adjustments					
Interest	(\$1,054,000)	(\$500,000)	(\$500,000)	(\$500,000)	(\$500,000)
All Other Sources of Non-Rate Revenue	(5,032,584)	(5,322,938)	(1,363,966)	(1,406,430)	(6,200,380)
Hydrant and Fireline Revenue	(177,935)	(178,901)	(179,701)	(180,384)	(181,286)
Change in Fund Balance	(38,320,023)	3,651,628	4,591,456	4,049,144	11,026,296
Annualized Revenue Requirement	534,787	(1,430,527)	(709,644)	(1,308,775)	(554,167)
Total Revenue Requirement Adjustment	(\$44,049,756)	(\$3,780,739)	\$1,838,144	\$653,555	\$3,590,463
Net Revenue Requirement From Rates	\$55,504,133	\$54,614,192	\$57,456,112	\$60,136,755	\$61,948,374

[1] See Appendix Table A-3

[2] SDF: System Development Fee



2.4 COMPARISON OF FY 2021-22 COST OF SERVICE TO REVENUE AT EXISTING RATES

Raftelis calculated the FY 2021-22 cost of service to determine the initial changes in cost between the customer classes. This COS analysis was completed using the steps outlined at the beginning of this Section. Table 15 summarizes the results.

**Table 15: Water Utility
Comparison of FY 2021-22 Cost of Service to Revenue at Existing Rates [1]**

Customer Class	FY 2021-22 Cost of Service	FY 2021-22 Revenue at Existing Rates	Change - \$	Change - %
<u>Inside City</u>				
Single Family	\$28,452,234	\$29,063,262	(\$611,029)	-2.1%
Multi Family	\$3,598,305	\$3,679,664	(\$81,359)	-2.2%
Non-Residential	\$5,366,759	\$5,124,267	\$242,492	4.7%
Industrial	\$8,558,416	\$8,020,416	\$538,000	6.7%
Landscape	\$8,841,493	\$7,840,135	\$1,001,359	12.8%
Inside City Subtotal	\$54,817,207	\$53,727,745	\$1,089,462	2.0%
<u>Outside City</u>				
Single Family	\$571,268	\$574,998	(\$3,731)	-0.6%
Multi Family	\$346	\$358	(\$12)	-3.4%
Non-Residential	\$81,039	\$80,541	\$499	0.6%
Landscape	\$34,273	\$32,175	\$2,098	6.5%
Outside City Subtotal	\$686,926	\$688,072	(\$1,146)	-0.2%
Total System	\$55,504,133	\$54,415,816	\$1,088,316	2.0%

[1] See Appendix Table A-30

The last column in Table 15 indicates the percentage change in cost that should be recovered from each class. These changes range from -3.4% for outside City multi-family to 12.8% for inside City landscape customers. The City has a practice of transitioning to cost of service over a 5-year period to mitigate the impacts to customers' bills resulting from the re-alignment of costs.

The section below presents the COS process in detail for determining the FY 2025-26 COS and rates. These results were developed using the process outlined at the beginning of this Section.



2.5 REVENUE REQUIREMENT COST ALLOCATION

The underlying principle in cost allocation is to convert the test year revenue requirement into functionalized costs that best reflect or align with the customer water demands placed on the system. Those costs are then proportionately allocated to customer classes based on their respective customer service characteristics to determine the customer class cost of service. Customer service characteristics include average day, peak day, and peak hour demands, the number of accounts, and the number of equivalent meters. The first step in allocating costs to cost components is to functionalize the revenue requirement to unit processes or functions. Costs assigned to these functions can then be further allocated to cost components.

2.5 COST FUNCTIONALIZATION

Water systems are comprised of several facilities (unit processes or functions) that are designed and operated to collect, treat, and distribute water to customers. The separation of costs into functional components provides a means for distributing costs to customer classes based on their respective responsibility in the system. The O&M revenue requirement can be functionalized based on the line item descriptions in the City's water enterprise fund annual budget. Water system assets serve as a reasonable basis for functionalizing annual capital costs. Annual capital projects vary by cost and type on an annual basis. Periodic changes in the planned and/or annual capital projects can shift cost allocations resulting in swings in the COS rates. Because the percent of costs by function in an asset listing do not vary as much over time, proportionately allocating the capital revenue requirement based on historic asset values can mitigate significant annual variation and provide a smooth and predictable method for allocating costs.

2.6 SYSTEM DEMAND PEAKING FACTORS

Water systems are designed and operated to meet the average and peak demands of their customers. Therefore, data on annual consumption and peak demand contributions are needed to allocate costs equitably among customer classes. Since customers do not exert their maximum demand for water at the same time, water facilities are designed to meet the coincidental demands on the system. Using system peak demand to average demand ratios provides a means for distributing costs equitably to customer classes.

For every facility in the system, there is an underlying average demand, or uniform rate of usage, exerted coincidentally by customers for which the average day cost component applies. Certain facilities are operated and designed to meet the demand above the average day demand or maximum day extra-capacity demand. Costs associated with those facilities are allocated to both the average day and maximum day cost components. Similarly, other facilities are designed to meet demands in excess of maximum day requirements or maximum hour extra-capacity. Costs associated with these facilities are allocated to the average day, maximum day, and maximum hour cost components.



The ratio of maximum day and average day demand is used to allocate costs between average day and maximum day cost components for facilities that operate or are designed to meet maximum day demands. These include facilities like treatment plants and transmission mains. A maximum day to average day ratio of 1.4 is used based on a 3-year historical average. This indicates approximately 71% of the capacity of facilities designed and operated for maximum day demand is needed for average day demand use. Accordingly, the remaining 29% is for maximum day extra-capacity requirements. Table 16 shows the development of the maximum day peaking factors.

Average Day Percentage: $1.0 \div 1.4 = 71.4\%$
Maximum Day Percentage: $0.4 \div 1.4 = 28.6\%$

**Table 16: Water Utility
Average Day to Maximum Day Treatment Plant Production
(1,000 gallons) [1,2]**

Fiscal Year	Annual Average Day	Maximum Day	Ratio of Maximum Day to Annual Average Day
2019-20	60,492,433	83,524,859	1.38
2018-19	54,541,778	80,872,462	1.48
2017-18	57,925,199	78,453,456	1.35
3-Year Average Peak Day to Average Day System Demand			1.40
[1] Peak hour to average day was estimated at 2.3.			
[2] See Appendix Table A-9			

Raftelis used a maximum hour demand ratio of 2.3 times average day demand based on data provided by the City’s Water Master Plan. This ratio is used to allocate costs for facilities that operate or are designed to meet maximum hour requirements. These facilities include treated storage, pumping, and distribution mains. This ratio indicates 43% of the capacity of facilities designed and operated for maximum hour demand is needed for average day demands, 17% is required to meet maximum day extra-capacity demand, and the remaining 39% is for maximum hour extra-capacity demand.

Average Day Percentage: $1.0 \div 2.3 = 43.2\%$
Maximum Day Percentage: $(1.4 - 1.0) \div 2.5 = 17.5\%$
Maximum Hour Percentage: $(2.3 - 1.4) \div 2.5 = 39.3\%$

2.7 COST CLASSIFICATION

Once the revenue requirement or costs have been separated by function, they can be further allocated to cost components using the demand factors identified in the System Demand Peaking Factors section. Allocating costs to cost components provides a means of assigning functionalized costs based on the design and functional parameters that each unit process serves in the system, which are described below.



- **Volume-related costs**
 - Average day costs vary directly with the quantity of water sold under average day load conditions.
 - Extra-capacity costs represent those costs incurred to meet water demands that exceed average levels of water usage by customers. These costs are incurred to meet the water usage variations and peak demands imposed on a water system. Extra capacity costs are incurred to meet the capacity above the maximum day and maximum hour demands. Extra capacity demand for maximum day and maximum hour is the net of maximum day demand less average day demand
- **Customer-related costs**
 - Meter and services costs vary based on the size of the meter and include meter repair and maintenance, and costs associated with field service crews addressing customer requests related to potential meter issues. Meters and services costs are based on a ¾" equivalent meter. Costs for larger meter size are scaled based on the relative cost of that meter to a ¾" meter³.
 - Billing and collection costs include the cost of billing, customer service, and customer accounting.
 - Fire protection costs capture indirect fire and direct fire protection costs. Indirect fire protection costs are the costs associated with delivering water during a fire event. Direct fire protection costs are associated with repair and maintenance of the valves, mains, and hydrants.

Functional O&M costs are generally allocated to the cost components that best reflect the design or functional parameter associated with that facility's expense. For example, the variable portion of water supply costs are allocated to the base or average day costs as source of supply facilities are designed to meet average day demands. Pump stations are designed to meet maximum hour demands. These costs are allocated to the average day, maximum day, and maximum hour cost components. Similarly, distribution mains are designed to meet maximum hour demand. These costs are allocated to the average day, maximum day, and maximum hour cost components. Meter repair is associated with repair and replacement of customer meters. These costs are allocated directly to the meters and services cost component. A portion of the water purchase's fixed charges are also allocated to the meter and services cost component. Table 17 shows the operation and maintenance expenses for the test year allocated to the cost components.

³ For example, if the total meter costs for a 3" meter were \$200 and a ¾" meter were \$50, then the 3" meter would be equivalent to four ¾"meters.



**Table 17: Water Utility
Functionalized and Allocated Operation and Maintenance Expense
Test Year FY 2025-26 [1]**

Cost Component	Total	Average Day	Maximum Day Extra Capacity	Maximum Hour Extra Capacity	Equivalent Meters	Billing
Wells	\$3,443,829	\$2,452,821	\$991,008	\$0	\$0	\$0
Raw / SOS	5,089,154	3,624,681	1,464,473	0	0	0
Storage	2,861,327	1,237,063	499,808	1,124,456	0	0
Treatment	13,677,558	9,741,656	3,935,902	0	0	0
Pumping	2,844,557	1,229,813	496,879	1,117,865	0	0
Transmission	2,537,749	1,097,168	443,287	997,295	0	0
Distribution	6,432,769	2,781,137	1,123,657	2,527,975	0	0
Meters & Services	1,254,267	0	0	0	1,254,267	0
Billing	1,776,590	0	0	0	0	1,776,590
Total	\$39,917,799	\$22,164,338	\$8,955,014	\$5,767,591	\$1,254,267	\$1,776,590

[1] See Appendix A-21

In a similar manner, water system assets provide a reasonable basis for allocating annual capital costs to cost components. Annual capital improvement program costs vary significantly from year-to-year as well as project types. Allocating the test year capital costs on a project-by-project basis might result in a distribution of cost allocations that may be very different in the following cost of service analysis. For this study, the total capital revenue requirement was distributed functionally based on the value of the replacement cost of assets for each functional category. These distributed functional costs can then be allocated to cost components. Table 18 shows the functionalized and allocated capital costs.



**Table 18: Water Utility
Functionalized and Allocated Capital Costs
Test Year FY 2025-26 [1]**

Cost Component	% Allocation of Assets	Total	Average Day	Maximum Day Extra Capacity	Maximum Hour Extra Capacity	Equivalent Meters	Billing
Wells	4.6%	\$1,347,927	\$960,043	\$387,884	\$0	\$0	\$0
Raw / SOS	21.2%	6,234,772	4,440,632	1,794,140	0	0	0
Storage	2.8%	813,159	351,560	142,040	319,558	0	0
Treatment	16.5%	4,867,682	3,466,941	1,400,741	0	0	0
Pumping	0.0%	0	0	0	0	0	0
Transmission	13.5%	3,990,757	1,725,360	697,094	1,568,304	0	0
Distribution	39.9%	11,748,377	5,079,281	2,052,172	4,616,924	0	0
Meters & Services	1.6%	463,735	0	0	0	439,450	24,285
Total	100.0%	\$29,466,408	\$16,023,816	\$6,474,071	\$6,504,786	\$439,450	\$24,285

[1] See Appendix Table A-14

2.8 ALLOCATED REVENUE REQUIREMENT

Table 19 summarizes the allocated revenue requirement from the analysis discussed in the Cost Functionalization section above. The allocated revenue requirement is then distributed to customer classes based on their proportionate share of total customer service characteristics.

**Table 19: Water Utility
Allocated Revenue Requirement
Test Year FY 2025-26 [1]**

Cost Component	Total	Average Day	Maximum Day Extra Capacity	Maximum Hour Extra Capacity	Equivalent Meters	Billing
Operation and Maintenance Expense	\$39,917,799	\$22,164,338	\$8,955,014	\$5,767,591	\$1,254,267	1,776,590
Capital Cost	29,466,408	16,023,816	6,474,071	6,504,786	439,450	24,285
Non-Rate Revenue Offsets	(6,881,666)	(3,062,634)	(1,237,390)	(1,242,229)	(1,005,631)	(333,781)
Change in Reserves	(554,167)	(311,434)	(125,828)	(97,797)	(6,101)	(13,008)
Total	\$61,948,374	\$34,814,086	\$14,065,867	\$10,932,351	\$681,985	\$1,454,085
<i>Percent of Total</i>	<i>100%</i>	<i>56%</i>	<i>23%</i>	<i>18%</i>	<i>1%</i>	<i>2%</i>

[1] See Appendix Table A-26



2.9 UNITS OF SERVICE

Customers of a water utility are often identified by grouping them into customer classes, each of which have unique water demands and usage characteristics. Because cost of service is based on the concept of proportionality, customer service characteristics for each customer class must be analyzed to distribute the functionalized and allocated system revenue requirements based on their respective demand profiles.

The peaking factors for each customer class were calculated using the City's FY 2018-19 through FY 2020-21 detailed billing data. Because the City does not have daily demands from customers, peak demands must be estimated using monthly class usage as well as system peaking data. The following equation is used to estimate the maximum day and maximum hour customer class peaking factors.

$$\text{Class Peaking Factor} = (\text{Average Day of Max Month} \div \text{Average Day}) \times (\text{System Max Day} \div \text{System Average Day of Max Month})$$

The class maximum day peaking factor is multiplied by the ratio of the system maximum hour to system maximum day demands.

Fire protection units are based on a fire event lasting 2 hours at 2,000 gallons per minute. These units of service are allocated to private fire and public fire based on the number of equivalent hydrants. Table 20 summarizes the customer class units of service.



**Table 20: Water Utility
Customer Class Units of Service
Test Year FY 2025-26 [1]**

Customer Class	Annual Demand 1,000 gal	Average Day Kgal/day	Max Day Demand Factor	Extra Demand Kgal/day	Max Hour Demand Factor	Extra Demand Kgal/day	Bills	Equivalent Meters Cost	Equivalent Meters Capacity
Inside City									
Single Family	10,002,609	27,404	148%	13,042	243%	39,285	954,254	136,349	96,767
Multi Family	1,580,367	4,330	127%	1,166	209%	4,711	11,873	13,844	4,851
Medical	141,011	386	141%	159	233%	513	1,359	818	341
Comm/Other	1,628,945	4,463	136%	1,617	225%	5,556	26,593	12,543	5,510
Gov't/Other	117,109	321	177%	248	291%	612	1,446	794	337
School/Other	183,641	503	168%	344	278%	893	2,991	1,834	763
Industrial	559,219	1,532	126%	402	208%	1,654	533	2,336	692
Intel	4,380,000	12,000	126%	3,149	208%	12,954	0	0	0
Landscape	2,883,251	7,899	164%	5,056	293%	15,270	25,296	9,693	4,513
Total In City	21,476,153	58,839		25,182		81,448	1,024,345	178,211	113,774
Outside City									
Single Family	146,178	400	147.6%	191	243.4%	574	10,856	1,347	1,040
Multi Family	98	0	126.9%	0	208.8%	0	12	3	1
Medical	77	0	141.3%	0	232.9%	0	12	1	1
Comm/Other	21,549	59	136.2%	21	224.5%	74	513	139	73
School/Other	1,207	3	168.4%	2	277.5%	6	62	23	11
Landscape	7,936	22	164.0%	14	293.3%	42	148	54	25
Total Out City	177,045	485		228		696	11,604	1,567	1,152
Fire Protec.				240		2,640			
Total System	21,653,198	59,324		25,650		84,785	1,035,949	179,778	114,925

[1] See Appendix Table A-25

2.10 UNIT COST OF SERVICE

The unit cost of service is the quotient of the allocated revenue requirement by cost component divided by the total units of service for each component. These unit costs are applied to each customer class's service characteristics to determine their respective test year revenue requirement.

The volume related unit costs are stated in \$ per 1,000 gallons for average day demand and \$ per 1,000 gpd of peak day and peak hour demands in excess of average day demands. Customer



service-related unit costs are stated in \$ per bill and \$ per equivalent meter (based on meter cost ratios). Table 21 shows the unit cost of service by cost component.

**Table 21: Water Utility
Unit Cost of Service
Test Year FY2025-26 [1]**

Cost Component	Total	Average Day	Maximum Day Extra Capacity	Maximum Hour Extra Capacity	Equivalent Meters	Billing
Revenue Requirement	\$61,948,374	\$34,814,086	\$14,065,867	\$10,932,351	\$681,985	\$1,454,085
Units of Service		<u>1,000 gal</u>	<u>gpd</u>	<u>ppd</u>	<u>Equivalent Meters Cost Basis</u>	<u># Bills</u>
Inside-City		21,476,153	25,182	81,448	113,774	1,024,345
Public Fire		-	240	2,640	-	-
Outside-City		<u>177,045</u>	<u>228</u>	<u>696</u>	<u>1,152</u>	<u>11,604</u>
Total Units of Service		21,653,198	25,650	84,785	114,925	1,035,949
Unit Costs of Service						
Inside City		\$1.60	\$546.43	\$128.52	\$5.91	\$1.40
Outside City (1.4 times inside City rates)		\$2.24	\$765.00	\$179.93	\$8.27	\$1.96
See Appendix Table A-26						

2.11 CUSTOMER CLASS REVENUE REQUIREMENT

The customer class units of service in Table 20 are multiplied by the unit cost of service in Table 21 to determine the distributed cost of service to customer classes. The COS results for Medical, Commercial, Government, and schools have been combined into a single Non-Residential customer class for the purposes of rate design. These groups of customers are assessed the same monthly base charge and volume rate. Industrial customers and Intel have also been combined into a single Industrial class as they are assessed at the same monthly base charge schedule and volume rate as well. The customer class costs for single family residential, multi-family, and commercial include the reallocated public fire protection costs. Fire protection costs are allocated to these classes based on their estimated fire flow requirements for a fire event. Table 22 shows the distribution of costs to customer classes by cost component.



**Table 22: Water Utility
Distribution of Cost to Customer Classes
Test Year FY 2025-26 [1]**

Customer Class	Total	Average Day	Maximum Day Extra Capacity	Maximum Hour Extra Capacity	Equivalent Meters	Billing	Fire Protection Reallocation
Inside City							
Single Family							
Units		10,002,609	13,042	39,285	96,767	954,254	
Cost of Service - \$	\$30,521,686	\$16,029,803	\$7,126,552	\$5,048,941	\$571,936	\$1,333,442	\$411,011
Multi-Family Inside							
Units		1,580,367	1,166	4,711	4,851	11,873	
Cost of Service - \$	\$3,828,492	\$2,532,637	\$636,948	\$605,460	\$28,674	\$16,591	\$8,182
Non-Residential							
Units		2,070,706	2,368	7,575	6,951	32,389	
Cost of Service - \$	\$5,716,086	\$3,318,436	\$1,293,912	\$973,558	\$41,083	\$45,259	\$43,839
Industrial							
Units		4,939,219	3,551	14,608	692	533	
Cost of Service - \$	\$11,739,671	\$7,915,406	\$1,940,134	\$1,877,372	\$4,087	\$744	\$1,927
Landscape							
Units		2,883,251	5,056	15,270	4,513	25,296	
Cost of Service - \$	\$9,407,605	\$4,620,589	\$2,762,513	\$1,962,480	\$26,676	\$35,347	\$0
Total Inside City	\$61,213,541	\$34,416,871	\$13,760,060	\$10,467,810	\$672,456	\$1,431,384	\$464,960

[1] See Appendix Table A-27

Table Continues on Next Page



**Table 22: Water Utility
Distribution of Cost to Customer Classes
Test Year FY 2025-26
(continued)**

Customer Class	Total	Average Day	Maximum Day Extra Capacity	Maximum Hour Extra Capacity	Equivalent Meters	Billing	Fire Protection Reallocation
Outside City							
Single Family							
Units		146,178	191	574	1,040	10,856	
Cost of Service - \$	\$611,583	\$327,962	\$145,806	\$103,299	\$8,603	\$21,238	\$4,676
Multi Family							
Units		98	0	0	1	12	
Cost of Service - \$	\$372	\$220	\$55	\$53	\$12	\$24	\$9
Commercial							
Units		22,833	24	80	85	587	
Cost of Service - \$	\$86,366	\$51,228	\$18,158	\$14,332	\$705	\$1,149	\$794
Landscape							
Units		7,936	14	42	25	148	
Cost of Service - \$	\$36,512	\$17,805	\$10,645	\$7,562	\$209	\$290	\$0
Total Outside City	\$734,833	\$397,215	\$174,664	\$125,246	\$9,529	\$22,701	\$5,478
Total System	\$61,948,374	\$34,814,086	\$14,065,867	\$10,932,351	\$681,985	\$1,454,085	\$0
Reallocation of Fire Protection Costs							
Fire Protection							
Units			240	2,640			
Cost of Service - \$	\$0		\$131,143	\$339,295			(\$470,438)

[1] See Appendix Table A-27

2.12 COMPARISON OF COST OF SERVICE TO REVENUE AT EXISTING RATES

The comparison of FY 2025-26 cost of service to revenue at current rates is shown in Table 23. The 7.2% system-wide change represents the cumulative financial plan revenue adjustments over the study period.



**Table 23: Water Utility
Comparison of Cost of Service to Revenue at Existing Rate
FY 2025-26 [1]**

Customer Class	FY 2025-25 Cost of Service	FY 2025-26 Revenue at Existing Rates	Change - \$	Change - %
<u>Inside City</u>				
Single Family	\$30,521,686	\$29,610,487	\$911,199	3.1%
Multi Family	3,828,492	3,748,948	79,544	2.1%
Non-Residential	5,716,086	5,220,751	495,336	9.5%
Industrial	11,739,671	10,538,243	1,201,428	11.4%
Landscape	9,407,605	7,987,755	1,419,850	17.8%
Total Inside City	\$61,213,541	\$57,106,183	\$4,107,358	7.2%
<u>Outside City</u>				
Single Family	\$611,583	\$585,825	\$25,758	4.4%
Multi Family	372	364	8	2.2%
Non-Residential	86,366	82,057	4,309	5.3%
Landscape	36,512	32,781	3,731	11.4%
Total Outside City	\$734,833	\$701,027	\$33,806	4.8%
Total System	\$61,948,374	\$57,807,210	\$4,141,164	7.2%

[1] See Appendix Table A-31

2.13 EXISTING AND PROPOSED WATER RATES

The proposed base charges and volume rates retain the existing structure. The monthly base charge varies by meter size and does not vary by class. The single family and multi-family volume rates are a 4-tiered increasing block structure. Commercial, industrial, and landscape volume rates are uniform and do not vary with the quantity of water used. Table 24 shows the existing rates and the proposed 5-year transition base charges and volume rates for the study period.



**Table 24: Water Utility
Comparison of Existing and Proposed Monthly Base Charges and Volume Rates [1]**

Customer Class	Existing FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26
Monthly Base Charge, \$ per bill						
5/8" x 3/4"	\$9.07	\$9.26	\$9.26	\$9.49	\$9.49	\$9.72
3/4"	10.35	10.56	10.56	10.83	10.83	11.09
1"	13.22	13.49	13.49	13.83	13.83	14.17
1 1/2"	20.82	21.24	21.24	21.77	21.77	22.31
2"	29.31	29.90	29.90	30.65	30.65	31.41
3"	61.79	63.03	63.03	64.61	64.61	66.22
4"	87.19	88.94	88.94	91.16	91.16	93.44
6"	165.56	168.88	168.88	173.10	173.10	177.42
8"	250.83	255.85	255.85	262.25	262.25	268.80
10"	427.38	435.93	435.93	446.83	446.83	458.00
12"	603.95	616.03	616.03	631.43	631.43	647.22
Volume Rate, \$ per 1,000 gallons						
Single Family						
First 10,000 Gallons	\$1.60	\$1.62	\$1.62	\$1.64	\$1.64	\$1.66
Next 10,000 Gallons	2.08	2.11	2.11	2.14	2.14	2.16
Next 40,000 Gallons	2.62	2.65	2.65	2.69	2.69	2.72
Over 60,000 Gallons	3.27	3.31	3.31	3.35	3.35	3.39
Multi-Family						
First 10,000 Gallons	\$0.87	\$0.89	\$0.89	\$0.90	\$0.90	\$0.91
Next 10,000 Gallons	1.07	1.09	1.09	1.11	1.11	1.12
Next 20,000 Gallons	1.47	1.49	1.49	1.52	1.52	1.54
Over 40,000 Gallons	2.21	2.25	2.25	2.28	2.28	2.32
Non-Residential						
Landscape Service	\$2.11	\$2.19	\$2.19	\$2.28	\$2.28	\$2.37
Industrial	2.55	2.70	2.70	2.89	2.89	3.08
Industrial	2.08	2.17	2.17	2.27	2.27	2.37

[1] See Appendix Table A-36

SECTION 3: WASTEWATER COST OF SERVICE

3.1 OVERVIEW OF THE WASTEWATER COST OF SERVICE STUDY

The purpose of a COS study is to allocate the wastewater utility revenue requirement to each customer class in direct proportion to the demands they impose on the utility system. To accomplish this objective, Raftelis conducted a detailed analysis of customer return flows to the City's wastewater reclamation facilities and engaged in a multi-step revenue requirement allocation process. The procedures followed by Raftelis were based on the industry standard cost allocations as published by the Water Environment Federation in the *Manual of Practice No. 27, Financing and Charges for Wastewater Systems*.

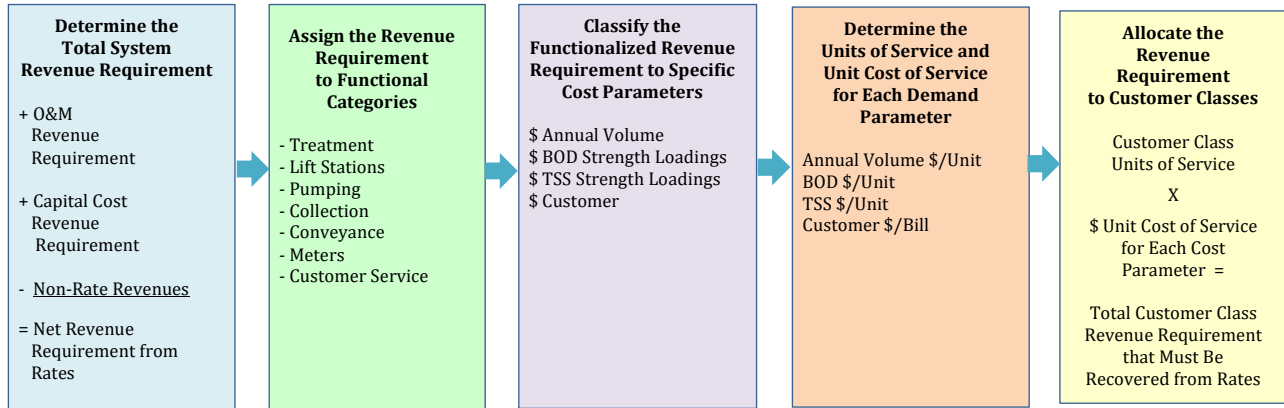
The primary steps in the wastewater cost of service study process include:

- **Account, Billable Volume and Revenue Projections:** Determining the test year revenue requirement and forecast billed contributed wastewater volume.
- **Revenue Requirement:** Determining the amount of rate revenue required to meet annual operation and maintenance expenses, debt service, rate-fund capital, transfers, reserves, and debt service coverage requirements.
- **Cost Functionalization:** Allocating the O&M, capital, and non-rate revenue components of the revenue requirement to functional service categories. This process results in the assignment of costs to the specific wastewater utility functional activities they are incurred to perform.
- **Cost Classification:** Classifying the functionalized O&M, capital, and non-rate revenue components of the revenue requirement to specific cost parameters such as volume or strength loadings (e.g., biochemical oxygen demand (BOD) or total suspended solids (TSS)). This process results in the assignment of costs to the specific types of wastewater service demands they are incurred to serve.
- **Units of Service:** Determining the customer class units of service for each cost parameter based on metrics such customer class annual wastewater discharge volumes, BOD and TSS strength loadings in pounds, and annual number of wastewater bills.
- **Unit Cost of Service:** Determining the utility-wide per unit cost of service for each cost parameter. The unit cost of service is determined by dividing the revenue requirement assigned to each cost parameter by its associated utility-wide units of service.

- **Customer Class Revenue Requirements:** Calculating the customer class revenue requirement by multiplying the customer class specific units of service for each cost parameter by the associated utility-wide per unit cost of service.

Figure 2 provides a visual overview of key steps in the wastewater cost of service study process.

Figure 2: Determination of Wastewater Customer Class Revenue Requirements



3.2 ACCOUNT, BILLABLE VOLUME, AND REVENUE PROJECTIONS

The process of estimating test year billed wastewater volumes or contributed billable flows requires a determination of the average wastewater discharges for each major type of customer on the wastewater utility system. This value is then multiplied by the projected growth in bills/accounts for each major type of customer for the study period. Projected revenue is determined by applying the existing monthly base charges to the number of accounts and the volume rate structure to the forecast contributed billable flow by customer class. Table 25 shows the projected volume per bill by customer class. These values were determined through an analysis of historical billing data⁴.

⁴ Tables 25 through Tables 28 show the Industrial class separately from the Non-Residential class. These are shown separately to develop the industrial specific projected volume and return factors. The classes are combined for cost of service and rate design because of the similar flow and strength characteristics.



**Table 25: Wastewater Utility
Projected Billable Volume per Account [1]**

Customer Class	Average Billable Volume per Bill (Kgal)
Inside City	
Single Family	5.0
Multi-Family [2]	91.2
Non-Residential	55.9
Industrial [3, 4]	6,175.2
Outside City	
Single Family	6.3
Multi-Family	-
Non-Residential	15.5
[1] See Appendix Table B-22	
[2] Approximately 2,900 gallons per unit	
[3] Large industrial customer Intel	
[4] The combined Non-Residential and Industrial billable volume per bill is 185,300 gallons. This value is used in the cost of service analysis as these two classes are combined for the purposes of determining the cost of service and rates.	

Table 26 shows the projected number of customer bills used for the study period. The projected billable wastewater volume by class is the product of the volume per bill and the number of bills. The growth in bills/customer accounts is assumed to 0.50% annually from a baseline of FY 2019-20.



**Table 26: Wastewater Utility
Forecast Wastewater Customer Annual Bills [1]**

Customer Class	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26
Inside City					
Single Family	925,027	929,652	934,301	938,972	943,667
Multi-Family	10,061	10,111	10,162	10,213	10,264
Non-Residential	29,410	29,557	29,705	29,853	30,003
Industrial [2]	635	638	642	645	648
Total Inside City	965,133	969,959	974,809	979,683	984,581
Outside City					
Single Family	3,305	3,321	3,338	3,355	3,371
Multi-Family	-	-	-	-	-
Non-Residential	97	97	98	98	99
Total Outside City	3,402	3,419	3,436	3,453	3,470
Total System	968,535	973,378	978,245	983,136	988,052

[1] See Appendix TableB-6

[2] The Industrial class is shown separately in this table from the Non-Residential class but is combined with Non-Residential for the cost of service analysis and rate design.

Table 27 shows the forecast billed wastewater volume adjusted by the return factors in 1,000 gallons used in the water cost of service study update. The projected volume is the product of the number of bills by the use per bill. Single family and multi-family are assessed a monthly base charge with no volume rate. However, the estimated billable volume is considered when developing their proportionate share of cost of service.



**Table 27: Wastewater Utility
Projected Billable Volume by Customer Class
(Kgal) [1]**

Customer Class	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26
Inside City					
Single Family	4,586,605	4,609,538	4,632,585	4,655,748	4,679,027
Multi-Family	917,143	921,729	926,337	930,969	935,624
Non-Residential	1,643,066	1,651,282	1,659,538	1,667,836	1,676,175
Industrial [2]	2,469,282	3,139,125	3,962,446	3,982,258	4,002,169
Total Inside City	9,616,096	10,321,673	11,180,906	11,236,811	11,292,995
Outside City					
Single Family	20,725	20,829	20,933	21,037	21,143
Multi-Family	0	0	0	0	0
Non-Residential	1,504	1,512	1,519	1,527	1,534
Total Outside City	22,229	22,340	22,452	22,564	22,677
Total System	9,638,325	10,344,013	11,203,358	11,259,375	11,315,672

[1] See Appendix Table B-7
 [2] The Industrial class is shown separately in this table from the Non-Residential class but is combined with Non-Residential for the cost of service analysis and rate design

Table 28 shows the projected revenue at current rates.



**Table 28: Wastewater Utility
Projected Revenue at Existing Rates [1,2]**

Customer Class	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26
Inside City					
Single Family	\$26,193,281	\$23,984,432	\$23,920,882	\$25,486,611	\$25,614,044
Multi-Family	3,235,761	2,962,893	2,955,042	3,148,463	3,164,205
Non-Residential	7,227,952	6,618,427	6,600,891	7,032,949	7,068,113
Industrial [3]	8,937,079	10,350,366	12,964,407	13,812,986	13,882,050
Total Inside City	\$45,594,072	\$43,916,117	\$46,441,222	\$49,481,008	\$49,728,413
Outside City					
Single Family	\$149,755	\$137,126	\$136,763	\$145,714	\$146,443
Multi-Family	0	0	0	0	0
Non-Residential	11,486	10,517	10,489	11,176	11,232
Total Outside City	\$161,240	\$147,643	\$147,252	\$156,890	\$157,675
Total System	\$45,755,312	\$44,063,760	\$46,588,474	\$49,637,898	\$49,886,088

[1] City records indicated a decrease in revenue from FY2021-22 to FY2022-23
 [2] See Appendix Table B-8
 [3] The Industrial class is combined with the Non-Residential class for the cost of service analysis and rate design

3.4 REVENUE REQUIREMENT

The study period revenue requirement used in this study was based on the FY 2021-22 wastewater fund budget provided by the City.

Table 29 summarizes the water utility revenue requirement for the study period. The FY 2025-26 revenue requirement totals \$58.3 million. This consists of \$26.7 million in O&M expenses, \$22.2 million of net rate-funded capital, \$18.0 million in debt service, and a \$1.0 million decrease in reserves. This requirement is met by \$9.1 million in non-rate revenue and \$2.0 million to the change in reserves. O&M includes a transfer to the reclaimed water fund for the funding of operations. This totals approximately \$1.3 million annually.

Annual rate increases are implemented for 6 months of the fiscal year, i.e., increase are effective January 1 of each year. The rate increases indicated in Table 1 will generate approximately 50% of the anticipated increase during the first year of adoption. For rate setting purposes, the revenue requirement must be set to recover the full 12 months of the increase. Rates from this 'annualized' revenue requirement will produce the full increase. Because these rates are in effect for only 6 months, with existing rates in effect for the first six months, the overall recovery from rates will be 50% of the total increase.



**Table 29: Wastewater Utility
Wastewater Utility Revenue Requirement [1]**

Item	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26
O&M Revenue Requirement	\$23,052,563	\$24,400,971	\$24,991,856	\$25,872,919	\$26,695,857
Capital					
Total CIP Cash Outlay	81,497,925	12,558,239	9,712,504	18,047,791	32,969,952
Bond Financed CIP Adjustment	(6,124,222)	0	0	(1,933,750)	(10,721,250)
System Development Fees	(16,600)	0	0	0	0
Rate Financed CIP	75,357,103	12,558,239	9,712,504	16,114,041	22,248,702
Debt Service	18,751,331	18,357,196	18,574,945	18,672,904	18,011,422
Gross Revenue Requirement from Rates	\$117,160,997	\$55,316,405	\$53,279,305	\$60,659,865	\$66,955,981
Revenue Requirement Adjustments					
Interest	(1,408,000)	(700,000)	(700,000)	(700,000)	(700,000)
Other Non-Rate Revenue	(8,179,462)	(1,013,743)	(1,049,224)	(11,585,947)	(8,387,465)
Change in Fund Balance	(60,903,116)	(7,699,539)	(1,639,936)	6,042,537	(1,539,323)
Annualized Revenue Requirements	915,106	(76,813)	1,468,988	304,364	1,964,896
Total Revenue Requirement Adjustments	(\$69,575,472)	(\$9,490,095)	(\$1,920,172)	(\$5,939,046)	(\$8,661,892)
Net Revenue Requirement From Rates	\$47,585,525	\$45,826,310	\$51,359,133	\$54,720,819	\$58,294,089

[1] See Appendix Table B-3

3.4 FY 2021-22 COST OF SERVICE RESULTS

Raftelis calculated the FY 2021-22 cost of service to determine the initial changes in cost between the customer classes. This COS analysis was completed using the steps outlined at the beginning of this Section. Table 30 summarizes the results.



**Table 30: Wastewater Utility
Comparison of FY 2021-22 Cost of Service to Revenue at Existing Rates [1]**

Customer Class	FY 2021-22 Cost of Service	FY 2021-22 Revenue at Existing Rates	Change -\$	Change - %
Inside City				
Single Family	\$22,942,174	\$26,193,281	(\$3,251,107)	-12.4%
Multi-Family	4,463,520	\$3,235,761	1,227,759	37.9%
Non-Residential	20,003,155	16,165,031	3,838,125	23.7%
Total Inside City	47,408,849	45,594,072	1,814,777	4.0%
Outside City				
Single Family	164,873	149,755	15,118	10.1%
Multi-Family	0	0	0	N/A
Landscape Service	11,803	11,486	317	2.8%
Total Outside City	176,676	161,240	15,435	9.6%
Total System	\$47,585,525	\$45,755,312	\$1,830,213	4.0%

See Appendix Table B-24

The last column in Table 30 indicates the percentage change in cost that should be recovered from each class. These changes range from -12.4% for inside City single family to 37.9% for multi-family. The City has a practice of transitioning to cost of service over a 5-year period to mitigate the impacts to customers' bills from the re-alignment of costs.

The section below presents the COS process in detail for determining the FY 2025-26 COS and rates. These results were developed using the process outlined at the beginning of this Section.

3.5 REVENUE REQUIREMENT COST ALLOCATION

The underlying principle in cost allocation is to convert the test year revenue requirement into costs that best reflect the cost associated with customer contributed flows through the collection system and to the treatment plant. Those costs are proportionately allocated to customer classes based on their respective customer service characteristics to determine class cost of service. For wastewater service, customer service characteristics include flow, strength, and the number of accounts. The first step in allocating costs to cost components is to functionalize the revenue requirement to unit processes or functions. Costs assigned to these functions can then be further allocated to cost components.

3.6 COST FUNCTIONALIZATION

Wastewater systems are comprised of several facilities (unit processes or functions) that are designed and operated to collect, treat, and discharge effluent to bodies of water or recharge to underground storage. The separation of costs into functional components provides a means for distributing costs to customer classes based on their respective responsibility in the system. The O&M revenue requirement can be functionalized based on the line-item descriptions in the budget. Wastewater system assets served as a reasonable basis for functionalizing annual capital costs. Annual capital projects vary by cost and type on an annual basis. Functionalizing annual capital based on the actual capital program can shift cost allocations resulting in swings in the COS rates. Because the percent of costs by function in an asset listing do not vary as much over time, proportionately allocating the capital revenue requirement based on assets provide a smooth and predictable method for allocating costs.

3.8 COST CLASSIFICATION

Once costs have been separated by function, they can be further allocated to cost components using the billable water volume adjusted by the return factor, strength, and number of accounts. Allocating costs to cost components provides a means of assigning functionalized costs based on the design and functional parameters that each unit process serves in the system, which are described below.

- Contributed flow represents the amount of volume reaching the wastewater treatment plant. For example, the single family class water usage includes a significant amount of irrigation or outdoor usage. This usage does not return to the wastewater treatment plant. Because wastewater flow is not measured at the customer level, the flow reaching the treatment plant must be estimated through a return flow factor. The return flow estimate typically uses winter months as the basis for indoor usage. This indoor usage as a percent of total water use is the return factor.
- Strength costs such as biochemical oxygen demand (BOD) and total dissolved solids (TSS) vary directly with the biological matter contained in the wastewater influent.
- Customer costs include those activities associated with billing, customer service, and other general administrative functions.

Functional O&M costs are generally allocated to the cost components that best reflect the design or functional parameter associated with that facility's expense. For each cost center, costs are allocated based on the facility that most influences that cost. For example, the costs in the cost centers associated with the City's wastewater department (Department 3940) are allocated 50% to flow, 25% to BOD and 25% to TSS. Similarly, cost centers within the collection department (Department 3900) are allocated 100% to flow. The allocated personnel costs include costs that are allocated to treatment (50% flow, 25% BOD, and 25% TSS) as well as collection costs (100% flow).



Table 31 summarizes the O&M cost allocations by cost center. Table 31 shows the allocated O&M costs.

**Table 31: Wastewater Utility
Functionalized and Allocated Operation and Maintenance Expense
Test Year FY 2025-26 [1]**

Cost Center/Item	Total	Flow	BOD	TSS	Customer
5100 - Personnel Services	\$8,312,579	\$4,339,962	\$1,877,101	\$1,877,101	218,415
5200 - Professional/Contract Services	4,441,641	2,892,787	770,219	770,219	8,417
5300 - Operating Supplies (less chemicals)	1,465,960	827,504	313,438	313,438	11,579
5318 - Chemicals	2,206,764	1,132,616	537,074	537,074	0
5400 - Repairs & Maintenance	617,934	329,430	144,252	144,252	0
5500 - Communication/Transportation	65,092	38,484	12,748	12,748	1,112
5600 - Insurance/Taxes	4,730	2,890	920	920	0
5700 - Rents & Utilities (less utilities)	337,111	168,556	84,278	84,278	0
5716 - Utilities	5,713,332	2,979,941	1,366,696	1,366,696	0
5800 - Other Charges & Services	163,943	93,667	34,900	34,900	475
5900 - Contingency/Reserves	1,599,400	765,200	417,100	417,100	0
6200 - Building/Improvements	0	0	0	0	0
6300 - Machinery & Equipment	160,805	80,402	40,201	40,201	0
6400 - Office Furniture & Equipment	0	0	0	0	0
6700 - Water System Improvements	0	0	0	0	0
Indirect Cost Allocations	2,701,806	1,282,245	387,455	387,455	644,651
Subtotal Primary Allocations	\$27,791,096	\$14,933,684	\$5,986,381	\$5,986,381	884,650
<i>Subtotal - %</i>	<i>0%</i>	<i>54%</i>	<i>22%</i>	<i>22%</i>	<i>3%</i>
All Other O&M Adjustments	(\$1,095,239)	(\$588,532)	(\$235,922)	(\$235,922)	(34,864)
Total O&M Revenue Requirement	\$26,695,857	\$14,345,152	\$5,750,459	\$5,750,459	\$849,786

[1] See Appendix Table B-19

In a similar manner, wastewater system assets provide a reasonable basis for allocating annual capital costs to cost components. Annual capital improvement program costs vary significantly from year to year as well as project types. Allocating the test year capital costs on a project-by-project basis might result in a distribution of cost allocations that may be very different in the following cost of service analysis. For this study, the total capital revenue requirement was distributed functionally based on the replacement cost value of all currently in-service wastewater assets for each functional category. These distributed functional costs can then be allocated to cost components. Table 32 shows the functionalized and allocated capital costs.



**Table 32: Wastewater Utility
Functionalized and Allocated Capital Costs
Test Year FY 2025-26 [1]**

Item	Total	Flow	BOD	TSS	Customer
Capital Asset Percentage Allocations	100.0%	81.1%	9.5%	9.5%	0.003%
Capital Related Revenue Requirements					
Rate Financed Capital	\$22,248,702	\$18,033,346	\$2,107,311	\$2,107,311	\$735
Annual Debt Service	18,011,422	14,598,883	1,705,972	1,705,972	595
Annual Surplus (Deficit)	(1,539,323)	(1,247,675)	(145,799)	(145,799)	(51)
Total Capital Revenue Requirement	\$38,720,801	\$31,384,554	\$3,667,484	\$3,667,484	\$1,278

[1] See Appendix Table B-13

3.9 ALLOCATED REVENUE REQUIREMENT

Table 33 summarizes the allocated revenue requirement from the analysis discussed in Cost Functionalization section above. The allocated revenue requirement is distributed to customer classes based on their proportionate share of total customer service characteristics.

**Table 33: Wastewater Utility
Allocated Revenue Requirement
FY 2025-26 [1]**

Cost Component	Total	Flow	BOD	TSS	Customer
Operation and Maintenance Expense	\$26,695,857	\$14,345,152	\$5,750,459	\$5,750,459	\$849,786
Capital Cost	38,720,801	31,384,554	3,667,484	3,667,484	1,278
Non-Rate Revenue Offsets	(9,087,465)	(6,790,877)	(1,110,832)	(1,110,832)	(74,923)
Change in Reserves	1,964,896	1,358,279	289,772	289,772	27,074
Total	\$58,294,089	\$40,297,108	\$8,596,883	\$8,596,883	\$803,214
<i>Percent of Total</i>	<i>100%</i>	<i>69.1%</i>	<i>14.7%</i>	<i>14.7%</i>	<i>1.4%</i>

[1] See Appendix Table B-22

3.10 UNITS OF SERVICE

Customers of a wastewater utility are often identified by grouping them into customer classes, each of which have unique return flows and strength characteristics. Because cost of service is based on the concept of proportionality, customer service characteristics for each customer class must be analyzed to distribute the functionalized and allocated system revenue requirements based on their respective demand profiles.



The costs allocated to wastewater customer classes as part of the COS study process are primarily dependent on the amount of customer class water consumption that is returned to the water reclamation facilities. Wastewater customer classes with low levels of outdoor irrigation water consumption return a larger proportionate share of their overall water consumption to water reclamation facilities in the form of wastewater influent. Conversely, wastewater customer classes with a high levels of outdoor irrigation consumption return a smaller proportional share of their overall water consumption to water reclamation facilities in the form of wastewater influent.

To develop a reasonable estimate of the volume of water consumption returning to the City's water reclamation facilities, Raftelis analyzed the actual monthly and seasonal water consumption characteristics of each wastewater customer class during FY 2019-20. This analysis produced an estimate of the indoor water consumption for each customer class (i.e., the amount returning to water reclamation facilities) and the outdoor irrigation water consumption for each customer class (i.e., the amount not returning to the water reclamation facilities). These return flow estimates were then correlated to the aggregate volume of influent recorded at the City's water reclamation facilities.

Table 34 shows the return flow estimates used in the COS analysis. These results have been reviewed in detail by City Staff. As shown in Table 34, the percentage of billed water consumption for the multi-family residential class estimated to return to the City's water reclamation facilities is 69.28%. In the 2016 COS, multi-family residential return flows were assumed to be 92.36%. This reduction was a result of a detailed analysis of multi-family customer billing data; the result of more refined data being available from the City's customer billing system. The City provided multi-family water billing data for complexes with separate domestic and irrigation meters. Raftelis evaluated the water use from the domestic meters for the period December through February to establish indoor water use. This value, approximately 2,900 gallons per unit, was assumed to be 100% returned to the plant. The ratio of total indoor usage for the multi-family class divided by the total billable water volume yields the return factor. The return flows shown in Table 34 are calculated from FY 2019 – 20 data and are assumed to remain constant through the study period.



**Table 34: Wastewater Utility
Estimated Return Flows by Customer Class [1]**

Customer Class	Estimated FY 2019-20 Return Flow Percentages
Single Family	47.4%
Multi Family	69.3%
Non-Residential [2]	
Medical	77.9%
Commercial	87.1%
Government	67.2%
School	69.7%
Industrial	88.4%
Subtotal Non-Residential	85.0%
[1] See Appendix Table B-9	
[2] The Industrial is assumed to be 100% but is not included in the Non-Residential class average of 85.0%	

The process of determining the units of service involves developing estimates, in consultation with City staff, of the projected test year contributed units of service (i.e., wastewater flowing to the water reclamation plants), units of service, return flows, and strength loadings. Table 35 shows the customer class units of service.



**Table 35: Wastewater Utility
Customer Class Units of Service
FY 2025-26 [1]**

Customer Class	Contributed Flow 1,000 gal	BOD lbs/day	TSS lbs/day	Customer bills
Inside City				
Single Family	4,679,027	6,457	6,892	943,667
Multi Family	935,624	1,291	1,378	10,264
Non-Residential	5,678,344	7,836	8,364	30,651
Total Inside City	11,292,995	15,585	16,634	984,581
Outside City				
Single Family	21,143	29	31	3,371
Multi Family	0	0	0	0
Non-Residential	1,534	2	2	99
Total Outside City	22,677	31	33	3,470
Total System	11,315,672	15,616	16,668	988,052

[1] See Appendix Table B-22

3.11 UNIT COST OF SERVICE

The unit cost of service is the quotient of the allocated revenue requirement by cost component divided by the total units of service for each. These unit costs are applied to each customer classes service characteristics to determine their test year revenue requirement.

The volume related unit costs are stated in \$ per 1,000 gallons for contributed flow (water use adjusted by the return factor) and \$ per pound of BOD and TSS. Customer service-related unit costs are stated in \$ per bill. Table 36 shows the unit cost of service by cost component.



**Table 36: Wastewater Utility
Unit Cost of Service
Test Year FY 2025-26 [1]**

Cost Component	Total	Flow	BOD	TSS	Customer
Operation and Maintenance Expense	\$26,695,857	\$14,345,152	\$5,750,459	\$5,750,459	\$849,786
Capital Cost	38,720,801	31,384,554	3,667,484	3,667,484	1,278
Non-Rate Revenue Offsets	(9,087,465)	(6,790,877)	(1,110,832)	(1,110,832)	(74,923)
Change in Reserves	1,964,896	1,358,279	289,772	289,772	27,074
Total	\$58,294,089	\$40,297,108	\$8,596,883	\$8,596,883	\$803,214
<i>Percent of Total</i>	<i>100%</i>	<i>69%</i>	<i>15%</i>	<i>15%</i>	<i>1%</i>
<u>Units</u>		<u>1,000 gal</u>	<u>lbs</u>	<u>lbs</u>	<u>Bills</u>
Inside City		\$3.5569	\$549.8627	\$515.1571	\$0.8112
Outside City		\$5.6910	\$879.7803	\$824.2513	\$1.2979

[1] See Appendix Table B-22

3.12 CUSTOMER CLASS REVENUE REQUIREMENT

The customer class units of service in Table 35 are multiplied by the unit cost of service in Table 36 to determine the distributed cost of service to customer classes. Table 37 shows this distributed cost. It should be noted that Intel flows are included with the non-residential class.



**Table 37: Wastewater Utility
Customer Class Revenue Requirement
Test Year FY 2025-26 [1]**

Customer Class	Total	Flow	BOD	TSS	Customer
Inside City					
Single Family					
Units		4,679,027	6,457	6,892	943,667
Cost of Service - \$	\$24,509,430	\$16,642,831	\$3,550,540	\$3,550,540	\$765,520
Multi Family Inside					
Units		935,624	1,291	1,378	10,264
Cost of Service - \$	\$4,756,186	\$3,327,920	\$709,970	\$709,970	\$8,326
Non-Residential					
Units		5,678,344	7,836	8,364	30,651
Cost of Service - \$	\$28,839,849	\$20,197,302	\$4,308,841	\$4,308,841	\$24,864
Total Inside City	\$58,105,465	\$40,168,053	\$8,569,351	\$8,569,351	\$798,710
Outside City					
Single Family					
Units		21,143	29	31	0
Cost of Service - \$	\$176,038	\$120,323	\$25,669	\$25,669	\$0
Multi Family					
Units		0	0	0	0
Cost of Service - \$	\$0	\$0	\$0	\$0	\$0
Commercial					
Units		1,534	2	2	0
Cost of Service - \$	\$12,586	\$8,732	\$1,863	\$1,863	\$128
Total Outside City	\$188,624	\$129,055	\$27,532	\$27,532	\$4,504
Total System	\$58,294,089	\$40,297,108	\$8,596,883	\$8,596,883	\$803,214

[1] See Appendix Table B-23

3.13 COMPARISON OF FY 2025-26 COST OF SERVICE TO REVENUE AT EXISTING RATES

Table 38 compares the FY 2025-26 cost of service to Revenue at existing rates. The changes for inside City multi-family and inside City non-residential indicate large changes, similar to FY 2021-22. At the City’s direction, Raftelis developed two alternatives – a transition to 50% cost of service and 75% percent cost of service. These results were presented to the City Council for their review and feedback. The Council adopted the 75% cost of service option and corresponding rates at the November 1 work session. Table 39 shows the 75% cost of service alternative.



**Table 38: Wastewater Utility
Comparison of FY 2025-26 to Revenue at Existing Rates
100% Cost of Service Transition [1]**

Customer Class	FY 2025-26 Cost of Service	FY 2025-26 Revenue at Existing Rates	Change - \$	Change - %
Inside City				
Single Family	\$24,509,430	\$25,614,044	(\$1,104,614)	-4.3%
Multi-Family	4,756,186	\$3,164,205	1,591,981	50.3%
Non-Residential	28,839,849	20,950,164	7,889,685	37.7%
Total Inside City	\$58,105,465	\$49,728,413	\$8,377,052	16.8%
Outside City				
Single Family	176,038	146,443	29,595	20.2%
Multi-Family	0	0	0	N/A
Landscape Service	12,586	B11,232	1,354	12.1%
Total Outside City	\$188,624	\$157,675	\$30,949	19.6%
Total System	\$58,294,089	\$49,886,088	\$8,408,001	16.9%

[1] See Appendix Table B-25

City Council has given direction to pursue the 75% cost of service transition alternative. Therefore, Council adopted the 75% cost of service transition alternative. This 75% cost of service option would result in a continued, but lower than the present 50%, subsidy by the residential class to multi-family and commercial classes. In other words, the multi-family and non-residential rates would increase at a lower rate over the study period. Single family rates would increase slightly over the study period compared to a potential decrease under the 100% alternative. Table 39 shows the 75% cost of service alternative.



**Table 39: Wastewater Utility
Comparison of FY 2025-26 to Revenue at Existing Rates
75% Cost of Service Transition [1]**

Customer Class	Adjusted FY 2025-26 Cost of Service	FY 2025-26 Revenue at Existing Rates	Change - \$	Change - %
Inside City				
Single Family	\$26,848,395	\$25,614,044	\$1,234,351	4.8%
Multi-Family	\$4,266,666	\$3,164,205	\$1,102,460	34.8%
Non-Residential	\$26,972,404	\$20,950,164	\$6,022,240	28.6%
Total Inside City	\$58,087,464	\$49,728,413	\$8,359,051	16.8%
Outside City				
Single Family	\$192,837	\$146,443	\$46,394	31.7%
Multi-Family	\$0	\$0	\$0	0.00%
Non-Residential	\$13,787	\$11,232	\$2,555	22.8%
Total Outside City	\$206,624	\$157,675	\$48,950	31.0%
Total System	\$58,294,089	\$49,886,088	\$8,408,001	16.9%

[1] See Appendix Table B-28

The 75% cost of service option reduces the change in inside City multi-family by 15.9 percentage points. Similarly, the non-residential change has been reduced by 9.1 percentage points. All other class's cost of service increase from the redistribution of costs from inside City multi-family and inside City non-residential. For example, the inside City single family class's cost of service will increase by \$2.34 million. These reductions indicate that by FY 2025-26, these classes will be closer to cost of service; however, the following cost of service study should re-evaluate the transition to full cost of service over the selected study period.

3.14 EXISTING AND PROPOSED WASTEWATER RATES

The proposed base charges and volume rates retain the existing structure. Single family and multi-family are assessed a monthly charge regardless of contributed volume. The non-residential class includes a monthly base charge and a volume rate for contributed wastewater volume based on return factors and water use. Table 40 shows the existing rates and the proposed 5-year transition base charges and volume rates for the study period. Outside City rates and charges are 60% greater than inside City.



**Table 40: Wastewater Utility
Comparison of Existing and Proposed Monthly Base Charges and Volume Rates
75% Cost of Service Option [1,2]**

Customer Class	Existing FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26
Inside City						
Monthly Base Charge, \$ per unit						
Single Family	\$27.32	\$27.65	\$27.65	\$28.15	\$28.15	\$28.68
Multi-Family	\$9.76	\$10.57	\$10.57	\$11.84	\$11.84	\$13.17
Non-Residential [1]						
Volume Rate, \$ per 1,000 gallons	\$3.49	\$3.73	\$3.73	\$4.11	\$4.11	\$4.50
Monthly Base Charge	\$7.65	\$8.17	\$8.17	\$8.97	\$8.97	\$9.82
[1] Includes Industrial customer class (Intel)						
[2] See Appendix Table B-29						



SECTION 4: RESIDENTIAL CUSTOMER BILL IMPACTS

4.1 WATER AND WASTEWATER RESIDENTIAL BILL IMPACTS

The combined monthly water and wastewater summer bill impact for a typical inside city, single family residential customer is illustrated in Table 41. Over the five-year study period the combined bill is projected to increase from \$56.55 to \$59.32; an increase of \$2.77 or 4.9%.

Table 41: Single Family Residential Combined Bill Impact

Description	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26
Monthly Water Bill (12,000 Kgal)						
Monthly Base Charge, 5/8" Meter, \$ per Bill	\$9.07	\$9.26	\$9.26	\$9.49	\$9.49	\$9.72
Consumption Charge	20.16	20.42	20.42	20.68	20.68	20.92
Total Water Bill	\$29.23	\$29.68	\$29.68	\$30.17	\$30.17	\$30.64
Wastewater Bill						
Monthly Base Charge, \$ per Bill	\$27.32	\$27.65	\$27.65	\$28.15	\$28.15	\$28.68
Total Monthly Bill	\$56.55	\$57.33	\$57.33	\$58.32	\$58.32	\$59.32
Change - \$		\$0.78	\$0.00	\$0.99	\$0.00	\$1.00
Change - %		1.4%	0.0%	1.7%	0.0%	1.7%
Cumulative 5-Year Change - \$						\$2.77
Cumulative 5-Year Change - %						4.9%



SECTION 5: RECLAIMED WATER COST OF SERVICE

5.1 RECLAIMED WATER REVENUE REQUIREMENT

Reclaimed water provides a benefit to both the water utility and wastewater utility. For the water utility, reclaimed water sales serve as an offset to the need for using potable water for irrigation as well as reducing peak demands on the system. In addition, reclaimed water not sold to retail customers can be recharged to the aquifer, which also acts as an additional water supply. The City's goal with reclaimed pricing is to continue to move towards a cost of service rate such that rates support operations and capital costs net of the contributions from the water and wastewater utility. The reclaimed water revenue requirement used by Raftelis in the cost of service update was based on the City's proposed FY 2021-22 Reclaimed Fund budget.

5.2 SOURCES OF FUNDS

The beginning fund balance for FY 2021-22 is \$1.5 million based on the City's FY 2021-22 budget documents.

Sources of funds include rate revenue from the sales of reclaimed water, transfers from the water fund, wastewater fund and other miscellaneous sources. Revenue at existing rates averages \$1.8 million annually and includes a 0.5% growth in reclaimed sales. Water sales come from three users: Ocotillo Management Group (OMG), Gila River Indian Community (GRIC), and retail customers. OMG is under a contractual agreement to purchase reclaimed water at a set price. In exchange for the reclaimed water it receives, the GRIC provides water from the Central Arizona Project (CAP). This exchange allows the City to avoid incremental purchases of CAP water for their supply portfolio. The third customer class is retail customers who purchase reclaimed water primarily for irrigation purposes. Other revenue sources include miscellaneous revenue, which averages about \$15,000 annually.

Transfers from the water and wastewater funds are required to offset operation and maintenance expenses and assist in funding capital improvements. Transfers from these funds begin in FY 2022-23 and total \$1,310,250 from each utility (\$2.6 million total) and are projected to increase by 1.0% each year.

5.3 USES OF FUNDS

Uses of funds include operation and maintenance expenses and capital costs. Annual O&M is for the daily maintenance and operations of the reclaimed facilities. O&M includes personnel costs, materials and supply costs, and other miscellaneous expenses. Transfers to the wastewater fund are required to fund a portion of the treatment process costs associated with treating to a higher



standard so the wastewater effluent can be used for reclaimed purposes. This is a benefit to the reclaimed fund so costs are being transferred to the wastewater fund. These savings are accrued to the wastewater fund and average \$1.1M annually. In a similar fashion, the GRIC avoided cost for CAP exchanges is accrued to the water utility. This transfer averages \$1.4 million annually. Capital projects includes repair and replacement projects, which average \$150,000 annually.

5.4 INDICATED REVENUE ADJUSTMENTS

Revenues should be sufficient to meet annual operating and capital requirements while meeting financial policy reserve targets. The reclaimed water utility reserve target is 20% of rate revenues or about \$300,000. To meet these requirements, revenue adjustments of 8.0% in FY 2021-22 followed by 7.0% in FY 2023-24 and 7.0% in FY 2025-26 are required. Table 42 shows the reclaimed cash flow forecast summary for the study period as adopted by the City.

Table 42: Reclaimed Water Cash Flow Analysis [1]

Description	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26
Beginning Balance	\$1,523,849	\$421,242	\$436,811	\$448,604	\$463,699
Sources of Funds					
Rate Revenues	\$1,860,444	\$1,878,576	\$1,950,126	\$2,030,228	\$2,107,554
Other Non-Rate Revenue	\$21,000	\$2,641,500	\$2,674,232	\$2,736,397	\$2,803,472
Total Sources of Funds	\$1,881,444	\$4,520,076	\$4,624,358	\$4,766,625	\$4,911,026
Uses of Funds					
O&M	\$2,879,935	\$4,166,746	\$4,228,606	\$4,292,572	\$4,537,730
Capital	104,116	337,761	383,959	458,959	362,298
Total Uses of Funds	\$2,984,051	\$4,504,507	\$4,612,565	\$4,751,531	\$4,900,028
<i>Annual Surplus/(Deficiency)</i>	<i>(\$1,102,608)</i>	<i>\$15,570</i>	<i>\$11,793</i>	<i>\$15,094</i>	<i>\$10,997</i>
Ending Balance	\$421,242	\$436,811	\$448,604	\$463,699	\$474,696
Target Reserve	\$372,089	\$375,715	\$390,025	\$406,046	\$421,511
Over/(Under) Target	\$49,153	\$61,096	\$58,579	\$57,653	\$53,185
Annual Revenue Adjustment	8.0%	0.0%	7.0%	0.0%	7.0%
[1] See Appendix Table C-1					



5.3 PROPOSED FY 2020-21 RECLAIMED WATER RATES

Based on the analysis of the reclaimed water revenue requirement, a forecast of rates was developed. While the subsidy from water and wastewater to reclaimed water is expected to continue, the proposed rate increases will help reduce this while avoiding steep rate increases for reclaimed water customers.

Table 43 shows the proposed reclaimed water user charges under the recommended five-year transition during the period FY 2021-22 through FY 2025-26. This recommendation is consistent with the City’s goal to continue to “move” the reclaimed water rates towards a “full” cost of service rate; user rates that fully support the operations and capital costs net of the contributions from the water and wastewater utilities.

**Table 43: Reclaimed Water User Charges
(\$ per 1,000 gallons)**

Customer Class	Existing FY 2020-21	Test Year FY 2021-22	Forecast FY 2022-23	Forecast FY 2023-24	Forecast FY 2024-25	Forecast FY 2025-26
Rate (\$ per 1,000 gallons)	\$0.69	\$0.75	\$0.75	\$0.80	\$0.80	\$0.85

APPENDIX A

Water Utility Cost of Service and Rates

Table A-1
City of Chandler
2020 Water Utility COS Study
Historical Bills & Projected Growth Table

Line No	Class	Historical Actual			FY17-18 Growth	FY18-19 Growth	2-Yr Avg	USE
		FY 2017 - 18	FY 2018 - 19	FY 2019 - 20				
<u>Inside City</u>								
1	Single Family Inside	911,001	917,413	926,121	0.70%	0.95%	0.83%	0.50%
2	Multi Family Inside	11,242	11,359	11,523	1.04%	1.44%	1.24%	0.50%
3	Medical - Other - Inside	1,232	1,287	1,319	4.46%	2.49%	3.47%	0.50%
4	Commercial - Other - Inside	24,458	25,335	25,809	3.59%	1.87%	2.72%	0.50%
5	Government - Other - Inside	1,345	1,395	1,403	3.72%	0.57%	2.13%	0.50%
6	School - Other - Inside	2,876	2,885	2,903	0.31%	0.62%	0.47%	0.50%
7	Industrial Consumption - Inside	524	518	517	-1.15%	-0.19%	-0.67%	0.50%
8	INTEL - Industrial Consumption - Inside							0.50%
9	Landscape Service - Inside	23,862	24,201	24,550	1.42%	1.44%	1.43%	0.50%
10	Hydrant Meter - Inside	95	157	397	65.26%	152.87%	104.42%	0.50%
11	Fireline - Inside	1,224	1,236	1,224	0.98%	-0.97%	0.00%	0.50%
12	Inside City Subtotal	977,859	985,786	995,766	0.81%	1.01%	0.91%	
<u>Outside City</u>								
13	Single Family Outside	10,402	10,460	10,536	0.56%	0.73%	0.64%	0.50%
14	Multi Family Outside	12	12	12	0.00%	0.00%	0.00%	0.50%
15	Medical - Other - Outside	12	12	12	0.00%	0.00%	0.00%	0.50%
16	Commercial - Other - Outside	509	514	498	0.98%	-3.11%	-1.09%	0.50%
17	School - Other - Outside	60	60	60	0.00%	0.00%	0.00%	0.50%
18	Landscape Service - Outside	178	156	144	-12.36%	-7.69%	-10.06%	0.50%
19	Outside City Subtotal	11,173	11,214	11,262	0.37%	0.43%	0.40%	
20	Total System	989,032	997,000	1,007,028	0.81%	1.01%	0.91%	

Table A-3
City of Chandler
2020 Water Utility COS Study
Water Rate Revenue Requirement Summary
Test Year FY 2025-26

Line No	Description	YE Estimate FY 2020 - 21	Forecast FY 2021 - 22	Forecast FY 2022 - 23	Forecast FY 2023 - 24	Forecast FY 2024 - 25	Forecast FY 2025 - 26
<u>Uses of Funds</u>							
1	O&M Expense	\$35,235,642	\$36,725,599	\$36,315,012	\$37,369,575	\$38,711,717	\$39,917,799
Capital Projects							
2	Total CIP Cash Outlay	\$3,720,795	\$72,437,411	\$15,986,856	\$18,500,415	\$27,799,788	\$38,911,708
3	Bond Financed CIP Adjustment	(2,442,093)	(19,432,360)	(7,680,776)	(14,949,514)	(22,346,991)	(38,266,828)
4	SDF / Other Financed CIP Adjustment	(88,553)	(4,019,366)	0	0	0	0
5	Rate Financed Capital	1,190,149	48,985,685	8,306,080	3,550,901	5,452,797	644,880
6	Annual Debt Service	\$13,876,087	\$13,842,604	\$13,773,839	\$14,697,492	\$15,318,685	\$17,795,232
7	Annual Surplus (Deficit)	6,846,622	(38,320,023)	3,651,628	4,591,456	4,049,144	11,026,296
8	Gross Rate Revenue Requirement	\$57,148,500	\$61,233,865	\$62,046,559	\$60,209,423	\$63,532,344	\$69,384,208
Non-Rate Revenue Offsets							
9	Interest	\$1,145,000	\$1,054,000	\$500,000	\$500,000	\$500,000	\$500,000
10	All Other Sources of Non-Rate Revenue	\$961,500	\$5,032,584	\$5,322,938	\$1,363,966	\$1,406,430	\$6,200,380
11	Total Non-Rate Revenue Offsets	\$2,106,500	\$6,086,584	\$5,822,938	\$1,863,966	\$1,906,430	\$6,700,380
12	Net Revenue Requirement from Rates (Includes Increase)	\$55,042,000	\$55,147,281	\$56,223,620	\$58,345,457	\$61,625,914	\$62,683,827
13	Hydrant Meter & Fireline Offset	\$173,645	\$177,935	\$178,901	\$179,701	\$180,384	\$181,286
14	Net Revenue Requirement from Rates Less Hydrant & Fireline	\$54,868,355	\$54,969,346	\$56,044,719	\$58,165,757	\$61,445,530	\$62,502,542
15	Water Rate Increase - %		2.00%	0.00%	2.50%	0.00%	2.50%
16	Cumulative Water Rate Increase - %		2.00%	2.00%	4.55%	4.55%	7.16%
				\$54,945,803.02			\$0.0172
Reconciliation to City of Chandler Financial Plan							
17	Net Revenue Requirement from Rates	54,868,355	54,969,346	56,044,719	58,165,757	61,445,530	62,502,542
18	Plus Hydrant Meter & Fireline Sales	173,645	177,935	178,901	179,701	180,384	181,286
19	GRIC Reallocation	0	0	(1,388,800)	(1,388,800)	(1,388,800)	(1,388,800)
20	Total	55,042,000	55,147,281	54,834,820	56,956,657	60,237,114	61,295,027
21	City of Chandler Rate Revenue Requirement	55,042,000	55,147,281	54,834,821	56,956,658	60,237,113	61,295,028
22	Difference	0	0	0	0	0	0
23	Annualized Revenue Requirement		\$55,504,133	\$54,614,192	\$57,456,112	\$60,136,755	\$61,948,374

Table A-4
City of Chandler
2020 Water Utility COS Study
Projected Bills

Line No	Class	Historical Actual			Projected					
		FY 2017 - 18	FY 2018 - 19	FY 2019 - 20	FY 2020 - 21	FY 2021 - 22	FY 2022 - 23	FY 2023 - 24	FY 2024 - 25	FY 2025 - 26
<u>Inside City</u>										
1	Single Family Inside	911,001	917,413	926,121	930,752	935,405	940,082	944,783	949,507	954,254
2	Multi Family Inside	11,242	11,359	11,523	11,581	11,639	11,697	11,755	11,814	11,873
3	Medical - Other - Inside	1,232	1,287	1,319	1,326	1,332	1,339	1,346	1,352	1,359
4	Commercial - Other - Inside	24,458	25,335	25,809	25,938	26,068	26,198	26,329	26,461	26,593
5	Government - Other - Inside	1,345	1,395	1,403	1,410	1,417	1,424	1,431	1,438	1,446
6	School - Other - Inside	2,876	2,885	2,903	2,918	2,932	2,947	2,961	2,976	2,991
7	Industrial Consumption - Inside	524	518	517	520	522	525	527	530	533
8	INTEL - Industrial Consumption - Inside	-	-	-	-	0	0	0	0	0
9	Landscape Service - Inside	23,862	24,201	24,550	24,673	24,796	24,920	25,045	25,170	25,296
10	Hydrant Meter - Inside	95	157	397	399	401	403	405	407	409
11	Fireline - Inside	1,224	1,236	1,224	1,230	1,236	1,242	1,249	1,255	1,261
12	Inside City Subtotal	977,859	985,786	995,766	1,000,745	1,005,749	1,010,777	1,015,831	1,020,910	1,026,015
<u>Outside City</u>										
13	Single Family Outside	10,402	10,460	10,536	10,589	10,642	10,695	10,748	10,802	10,856
14	Multi Family Outside	12	12	12	12	12	12	12	12	12
15	Medical - Other - Outside	12	12	12	12	12	12	12	12	12
16	Commercial - Other - Outside	509	514	498	500	503	506	508	511	513
17	School - Other - Outside	60	60	60	60	61	61	61	62	62
18	Landscape Service - Outside	178	156	144	145	145	146	147	148	148
19	Outside City Subtotal	11,173	11,214	11,262	11,318	11,375	11,432	11,489	11,546	11,604
20	Total System	989,032	997,000	1,007,028	1,012,063	1,017,123	1,022,209	1,027,320	1,032,457	1,037,619

Table A-5
 City of Chandler
 2020 Water Utility COS Study
 Bill Distribution by Meter Size (FY 2019)

Line No	Description	Total	Meter Size											
			5/8"	3/4"	1"	1.5"	2"	3"	4"	6"	8"	10"	12"	16"
<u>Inside City</u>														
1	Single Family Inside	926,121	472,271	25,472	425,982	2,218	178							
2	Multi Family Inside	11,523	3,241	156	1,644	997	3,789	124	168	535	869			
3	Medical - Other - Inside	1,319	235	12	121	361	451	25	114					
4	Commercial - Other - Inside	25,809	2,966	443	5,531	7,188	8,941	395	229	80	36			
5	Government - Other - Inside	1,403	24	120	264	192	732	36	35					
6	School - Other - Inside	2,903	228	48	250	468	1,693	168	36	12				
7	Industrial Consumption - Inside	505	12		25	36	180	60	24	48	36	48	12	
8	INTEL - Industrial Consumption - Inside	12								12			24	
9	Landscape Service - Inside	24,550	1,778	2,315	7,634	5,183	7,544	72	12	12				
10	Hydrant Meter - Inside	397						397						
11	Fireline - Inside	1,224	1,080	36	96					12				
12	Inside City Subtotal	995,766	481,835	28,602	441,547	16,643	23,508	1,277	630	699	941	48	12	24
<u>Outside City</u>														
13	Single Family Outside	10,536	7,011	720	2,587	206	12							
14	Multi Family Outside	12			12									
15	Medical - Other - Outside	12	12											
16	Commercial - Other - Outside	498	132	24	200	60	82							
17	School - Other - Outside	60			12	48								
18	Landscape Service - Outside	144			96	48								
19	Outside City Subtotal	11,262	7,155	744	2,907	314	142	-	-	-	-	-	-	-
20	Total System	1,007,028	488,990	29,346	444,454	16,957	23,650	1,277	630	699	941	48	12	24
									52.5	58.25	78.4166667	4	1	2
<u>Inside City</u>														
21	Single Family Inside	100.0%	51.0%	2.8%	46.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
22	Multi Family Inside	100.0%	28.1%	1.4%	14.3%	8.7%	32.9%	1.1%	1.5%	4.6%	7.5%	0.0%	0.0%	0.0%
23	Medical - Other - Inside	100.0%	17.8%	0.9%	9.2%	27.4%	34.2%	1.9%	8.6%	0.0%	0.0%	0.0%	0.0%	0.0%
24	Commercial - Other - Inside	100.0%	11.5%	1.7%	21.4%	27.9%	34.6%	1.5%	0.9%	0.3%	0.1%	0.0%	0.0%	0.0%
25	Government - Other - Inside	100.0%	1.7%	8.6%	18.8%	13.7%	52.2%	2.6%	2.5%	0.0%	0.0%	0.0%	0.0%	0.0%
26	School - Other - Inside	100.0%	7.9%	1.7%	8.6%	16.1%	58.3%	5.8%	1.2%	0.4%	0.0%	0.0%	0.0%	0.0%
27	Industrial Consumption - Inside	100.0%	2.4%	0.0%	5.0%	7.1%	35.6%	11.9%	4.8%	9.5%	7.1%	9.5%	2.4%	4.8%
28	INTEL - Industrial Consumption - Inside	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
29	Landscape Service - Inside	100.0%	7.2%	9.4%	31.1%	21.1%	30.7%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
30	Hydrant Meter - Inside	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
31	Fireline - Inside	100.0%	88.2%	2.9%	7.8%	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	0.0%	0.0%	0.0%
32	Inside City Subtotal	100.0%	48.4%	2.9%	44.3%	1.7%	2.4%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%
<u>Outside City</u>														
33	Single Family Outside	100.0%	66.5%	6.8%	24.6%	2.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
34	Multi Family Outside	100.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
35	Medical - Other - Outside	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
36	Commercial - Other - Outside	100.0%	26.5%	4.8%	40.2%	12.0%	16.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
37	School - Other - Outside	100.0%	0.0%	0.0%	20.0%	80.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
38	Landscape Service - Outside	100.0%	0.0%	0.0%	66.7%	0.0%	33.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
39	Outside City Subtotal	100.0%	63.5%	6.6%	25.8%	2.8%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
40	Total System	100.0%	48.6%	2.9%	44.1%	1.7%	2.3%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%

Table A-6
City of Chandler
2020 Water Utility COS Study
Historical & Projected Use Per Bill [1]

Line No	Class	Historical Actual			2-Yr Avg	3-Yr Avg	USE
		FY 2017 - 18	FY 2018 - 19	FY 2019 - 20			
<u>Inside City</u>							
1	Single Family Inside	10.89	10.44	10.48	10.46	10.60	10.5
2	Multi Family Inside	126.89	130.05	133.11	131.58	130.02	133.1
3	Medical - Other - Inside	113.81	106.84	103.76	105.30	108.14	103.8
4	Commercial - Other - Inside	64.31	64.56	61.25	62.91	63.37	61.3
5	Government - Other - Inside	102.29	79.48	81.01	80.24	87.59	81.0
6	School - Other - Inside	63.16	60.12	61.39	60.76	61.56	61.4
7	Industrial Consumption - Inside	6,658.41	6,953.69	7,873.49	7,413.59	7,161.86	7,873.5
8	INTEL - Industrial Consumption - Inside						
9	Landscape Service - Inside	122.22	113.97	113.98	113.98	116.73	114.0
10	Hydrant Meter - Inside	151.67	120.52	151.28	135.90	141.16	151.3
11	Fireline - Inside	2.95	0.56	3.14	1.85	2.22	3.1
<u>Outside City</u>							
12	Single Family Outside	13.44	12.99	13.47	13.23	13.30	13.5
13	Multi Family Outside	10.92	8.17	7.92	8.04	9.00	7.9
14	Medical - Other - Outside	1.42	0.92	6.25	3.58	2.86	6.3
15	Commercial - Other - Outside	44.78	43.59	42.00	42.79	43.45	42.0
16	School - Other - Outside	11.90	16.62	19.52	18.07	16.01	19.5
17	Landscape Service - Outside	44.28	52.07	53.49	52.78	49.94	53.5

[1] Continued on next page

Table A-7
City of Chandler
2020 Water Utility COS Study
Projected Volume

Line No	Class	Historical Actual			Projected					
		FY 2017 - 18	FY 2018 - 19	FY 2019 - 20	FY 2020 - 21	FY 2021 - 22	FY 2022 - 23	FY 2023 - 24	FY 2024 - 25	FY 2025 - 26
<u>Inside City</u>										
1	Single Family Inside	9,920,387	9,576,620	9,707,713	9,756,252	9,805,033	9,854,058	9,903,328	9,952,845	10,002,609
2	Multi Family Inside	1,426,489	1,477,284	1,533,775	1,541,444	1,549,151	1,556,897	1,564,681	1,572,505	1,580,367
3	Medical - Other - Inside	140,217	137,508	136,854	137,538	138,226	138,917	139,612	140,310	141,011
4	Commercial - Other - Inside	1,572,800	1,635,702	1,580,921	1,588,826	1,596,770	1,604,754	1,612,777	1,620,841	1,628,945
5	Government - Other - Inside	137,579	110,870	113,656	114,224	114,795	115,369	115,946	116,526	117,109
6	School - Other - Inside	181,640	173,447	178,227	179,118	180,014	180,914	181,818	182,727	183,641
7	Industrial Consumption - Inside	3,489,007	3,602,014	4,070,594	4,090,947	461,274	477,075	498,830	534,646	559,219
8	INTEL - Industrial Consumption - Inside	-	-	-	-	3,285,000	2,737,500	3,285,000	4,380,000	4,380,000
9	Landscape Service - Inside	2,916,397	2,758,293	2,798,247	2,812,238	2,826,299	2,840,431	2,854,633	2,868,906	2,883,251
10	Hydrant Meter - Inside	14,409	18,921	60,058	60,358	60,660	60,963	61,268	61,575	61,882
11	Fireline - Inside	3,613	691	3,841	3,860	3,880	3,899	3,918	3,938	3,958
12	Inside City Subtotal	19,802,538	19,491,350	20,183,886	20,284,805	20,021,102	19,570,777	20,221,813	21,434,819	21,541,993
<u>Outside City</u>										
13	Single Family Outside	139,761	135,927	141,868	142,577	143,290	144,007	144,727	145,450	146,178
14	Multi Family Outside	131	98	95	95	96	96	97	97	98
15	Medical - Other - Outside	17	11	75	75	76	76	77	77	77
16	Commercial - Other - Outside	22,792	22,403	20,914	21,019	21,124	21,229	21,335	21,442	21,549
17	School - Other - Outside	714	997	1,171	1,177	1,183	1,189	1,195	1,201	1,207
18	Landscape Service - Outside	7,881	8,123	7,702	7,741	7,779	7,818	7,857	7,896	7,936
19	Outside City Subtotal	171,296	167,559	171,825	172,684	173,548	174,415	175,287	176,164	177,045
20	Total System	19,973,834	19,658,909	20,355,711	20,457,490	20,194,649	19,745,192	20,397,100	21,610,983	21,719,038

Table A-8
City of Chandler
2020 Water Utility COS Study
Projected Total Revenue @ Existing Rates

Line No	Class	Historical Actual			Projected					
		FY 2017 - 18	FY 2018 - 19	FY 2019 - 20	FY 2020 - 21	FY 2021 - 22	FY 2022 - 23	FY 2023 - 24	FY 2024 - 25	FY 2025 - 26
<u>Inside City</u>										
2	Single Family Inside	28,448,577	27,419,103	27,652,163	28,362,550	29,063,262	29,221,007	29,351,575	29,463,171	29,610,487
3	Multi Family Inside	3,346,542	3,395,720	3,501,007	3,590,948	3,679,664	3,699,636	3,716,167	3,730,296	3,748,948
4	Medical - Other - Inside	329,553	319,936	318,284	326,461	334,526	336,342	337,845	339,129	340,825
5	Commercial - Other - Inside	3,871,061	3,956,752	3,839,665	3,938,306	4,035,605	4,057,508	4,075,638	4,091,134	4,111,590
6	Government - Other - Inside	324,495	264,935	269,935	276,870	283,710	285,250	286,525	287,614	289,052
7	School - Other - Inside	463,251	438,801	447,586	459,085	470,427	472,980	475,093	476,900	479,284
8	Industrial Consumption - Inside	7,331,322	7,439,845	8,367,764	8,582,732	1,053,642	1,087,992	1,133,929	1,208,817	1,261,246
9	INTEL - Industrial Consumption - Inside	0	0	0	0	6,966,774	5,808,116	6,966,051	9,276,997	9,276,997
10	Landscape Service - Inside	7,900,945	7,379,707	7,459,475	7,651,110	7,840,135	7,882,688	7,917,910	7,948,015	7,987,755
11	Hydrant Meter - Inside	36,273	48,800	148,202	152,009	155,765	156,610	157,310	157,908	158,698
12	Fireline - Inside	21,047	14,764	21,094	21,636	22,171	22,291	22,391	22,476	22,588
13	Inside City Subtotal	52,073,067	50,678,365	52,025,176	53,361,707	53,905,680	53,030,420	54,440,434	57,002,457	57,287,469
<u>Outside City</u>										
14	Single Family Outside	550,379	531,319	547,081	561,135	574,998	578,119	580,702	582,910	585,825
15	Multi Family Outside	395	345	340	349	358	360	361	363	364
16	Medical - Other - Outside	203	182	367	376	386	388	389	391	393
17	Commercial - Other - Outside	78,544	76,214	71,278	73,110	74,916	75,322	75,659	75,947	76,326
18	School - Other - Outside	3,735	4,496	4,985	5,113	5,239	5,268	5,291	5,311	5,338
19	Landscape Service - Outside	32,767	32,509	30,613	31,399	32,175	32,350	32,494	32,618	32,781
20	Outside City Subtotal	666,022	645,066	654,664	671,482	688,072	691,806	694,897	697,539	701,027
21	Total System	52,739,090	51,323,431	52,679,840	54,033,189	54,593,752	53,722,226	55,135,332	57,699,996	57,988,496

Table A-9
City of Chandler
2020 Water Utility COS Study
System Coincidental Demand Factors

Line No.	Description	FY 2017-18	FY 2018-19	FY 2019-20	Average
1	Total System Production	21,142,698	19,907,749	22,140,231	21,063,559
2	Average Annual Day	57,925	54,542	60,492.434	57,656
3	Annual Retail Treated Consumption	19,973,834	19,658,909	20,355,711	19,996,151
4	Estimated Water Loss - Gal	1,168,864	248,840	1,784,520	1,067,408
5	Estimated Water Loss - %	5.5%	1.2%	8.1%	4.9%
6	Max Month Production	2,273,462	2,287,170	2,270,084	2,276,905
7	Month	July	July	July	
8	Days in Month	31	31	31	31
9	Average Day - Max Month	73,337	73,780	73,229	73,449
10	Max Day Production	78,453	80,872	83,525	80,950
11	Date	7/10/2017	7/28/2018	6/26/2020	
12	Max Day / Annual Avg Day	1.35	1.48	1.38	1.40
13	Max Day / Avg Day Max Month	1.07	1.10	1.14	1.10
14	Max Hour / Avg Annual Day	2.31	2.31	2.31	2.31
15	Estimated Max Hour Production	133,981	126,155	139,919	133,358
16	Max Hour / Average Day Max Month	1.83	1.71	1.91	1.82

Line No.	Description	Use
1	System Max Day to Average D	1.40
2	System Max Hour to Average	2.31

Line No.	Description	Factor	Allocation
Max Day Extra Capacity			
1	Base	1.00	71%
2	Max Day	0.40	29%
3	Total	1.40	100%
Max Hour Extra Capacity			
4	Base	1.00	43.2%
5	Max Day	0.40	17.5%
6	Max Hour	0.91	39.3%
7	Total	2.31	100%

Table A-10
City of Chandler
2020 Water Utility COS Study
Peaking Values Assigned for COS Analysis

Line No	Class	Peaking COS Class	Max Day	Max Hour
<u>Inside City</u>				
1	Single Family Inside	Single Family	1.48	2.43
2	Multi Family Inside	Multi Family	1.27	2.09
3	Medical - Other - Inside	Medical	1.41	2.33
4	Commercial - Other - Inside	Commercial	1.36	2.25
5	Government - Other - Inside	Government	1.77	2.91
6	School - Other - Inside	School	1.68	2.78
7	Industrial Consumption - Inside	Industrial	1.26	2.08
8	INTEL - Industrial Consumption - Inside	Industrial	1.26	2.08
9	Landscape Service - Inside	Landscape	1.64	2.93
10	Hydrant Meter - Inside	N/A		
11	Fireline - Inside	N/A		
<u>Outside City</u>				
12	Single Family Outside	Single Family	1.48	2.43
13	Multi Family Outside	Multi Family	1.27	2.09
14	Medical - Other - Outside	Medical	1.41	2.33
15	Commercial - Other - Outside	Commercial	1.36	2.25
16	School - Other - Outside	School	1.68	2.78
17	Landscape Service - Outside	Landscape	1.64	2.93

Table A-11
City of Chandler
2020 Water Utility COS Study
Water Existing Assets Replacement Cost

Line No	Asset Category	Unit	Existing Units	Unit Cost	Replacement Cost at 5/4/18	Additions through Test Year FY 2025 - 26	Replacement Cost at Test Year FY 2025 - 26
1	Water Supplies	gallons/day	79,650,000	\$5.69	\$453,208,500	103,800	\$453,312,300
2	Treatment Plant Capacity	gallons/day			\$255,360,000	102,850,566	\$358,210,566
3	Well Capacity	gallons/day			\$91,590,000	7,603,329	\$99,193,329
4	Storage Capacity	gallons			\$59,840,000	0	\$59,840,000
5	WQMS						\$0
6	PRVs						\$0
7	Booster Pump Station Capac	gallons/day	161,300,000	\$0.50	\$0	0	\$0
8	4" Distribution Lines	linear feet	16,551	\$68.00	\$1,125,455	85,017	\$1,210,472
9	6" Distribution Lines	linear feet	1,611,535	\$102.00	\$164,376,570	12,417,005	\$176,793,575
10	8" Distribution Lines	linear feet	2,699,294	\$136.00	\$367,103,984	27,731,032	\$394,835,016
11	10" Distribution Lines	linear feet	29,109	\$170.00	\$4,948,530	373,812	\$5,322,342
12	12" Distribution Lines	linear feet	1,305,302	\$204.00	\$266,281,608	20,114,911	\$286,396,519
13	16" Transmission Lines	linear feet	556,197	\$272.00	\$151,285,584	6,552,280	\$157,837,864
14	20" Transmission Lines	linear feet	8,005	\$340.00	\$2,721,700	117,879	\$2,839,579
15	24" Transmission Lines	linear feet	127,648	\$408.00	\$52,080,384	2,255,636	\$54,336,020
16	30" Transmission Lines	linear feet	41,900	\$510.00	\$21,369,000	925,506	\$22,294,506
17	36" Transmission Lines	linear feet	53,949	\$612.00	\$33,016,788	1,429,979	\$34,446,767
18	42" Transmission Lines	linear feet	11,572	\$714.00	\$8,262,408	357,850	\$8,620,258
19	48" Transmission Lines	linear feet	14,438	\$816.00	\$11,781,408	510,261	\$12,291,669
20	54" Transmission Lines	linear feet	68	\$816.00	\$55,488	2,403	\$57,891
21	60" Transmission Lines	linear feet	1,120	\$816.00	\$913,920	39,582	\$953,502
22	5/8" Meter	Mtr Cost + Labor	40,269	\$266.65	\$10,737,618	2,817,942	\$13,555,560
23	3/4" Meter	Mtr Cost + Labor	3,039	\$283.62	\$861,779	226,162	\$1,087,942
24	1" Meter	Mtr Cost + Labor	32,796	\$329.88	\$10,818,854	2,839,262	\$13,658,116
25	1.5" Meter	Mtr Cost + Labor	1,301	\$467.58	\$608,166	159,605	\$767,771
26	2" Meter	Mtr Cost + Labor	1,854	\$568.91	\$1,054,807	276,820	\$1,331,626
27	3" Meter	Mtr Cost + Labor	68	\$568.91	\$38,686	10,153	\$48,838
28	4" Meter	Mtr Cost + Labor	39	\$568.91	\$22,330	5,860	\$28,190
29	6" Meter	Mtr Cost + Labor	41	\$568.91	\$23,183	6,084	\$29,267
30	8" Meter	Mtr Cost + Labor	55	\$568.91	\$31,290	8,212	\$39,502
31	10" Meter	Mtr Cost + Labor	4	\$568.91	\$2,276	597	\$2,873
32	12" Meter	Mtr Cost + Labor	1	\$568.91	\$569	149	\$718
33	16" Meter	Mtr Cost + Labor	2	\$568.91	\$1,138	299	\$1,436
34	Administration	Dollars	-	\$1.00	\$0	3,574,201	\$3,574,201
35	Land	Dollars				\$5,501,842	\$5,501,842
36	Total				\$1,969,522,022	\$198,898,035	\$2,168,420,056

Table A-12
City of Chandler
2020 Water Utility COS Study
Water Asset Functionalization

Line No	Asset Category	Replacement												
		Cost at Test Year FY 2025 - 26	Wells	Raw / SOS	Storage	Treatment	Pumping	Transmission	Distribution	Meters & Services	Billing	Public Fire		
1	Water Supplies	\$453,312,300		100.0%										
2	Treatment Plant Capacity	358,210,566					100.0%							
3	Well Capacity	99,193,329	100.0%											
4	Storage Capacity	59,840,000			100.0%									
5	WQMS	0								100.0%				
6	PRVs	0						100.0%						
7	Booster Pump Station Capacity	0					100.0%							
8	4" Distribution Lines	1,210,472								100.0%				
9	6" Distribution Lines	176,793,575								100.0%				
10	8" Distribution Lines	394,835,016								100.0%				
11	10" Distribution Lines	5,322,342								100.0%				
12	12" Distribution Lines	286,396,519								100.0%				
13	16" Transmission Lines	157,837,864							100.0%					
14	20" Transmission Lines	2,839,579							100.0%					
15	24" Transmission Lines	54,336,020							100.0%					
16	30" Transmission Lines	22,294,506							100.0%					
17	36" Transmission Lines	34,446,767							100.0%					
18	42" Transmission Lines	8,620,258							100.0%					
19	48" Transmission Lines	12,291,669							100.0%					
20	54" Transmission Lines	57,891							100.0%					
21	60" Transmission Lines	953,502							100.0%					
22	5/8" Meter	13,555,560									100.0%			
23	3/4" Meter	1,087,942									100.0%			
24	1" Meter	13,658,116									100.0%			
25	1.5" Meter	767,771									100.0%			
26	2" Meter	1,331,626									100.0%			
27	3" Meter	48,838									100.0%			
28	4" Meter	28,190									100.0%			
29	6" Meter	29,267									100.0%			
30	8" Meter	39,502									100.0%			
31	10" Meter	2,873									100.0%			
32	12" Meter	718									100.0%			
33	16" Meter	1,436									100.0%			
34	Administration	3,574,201									50.0%	50.0%		
35	Land	5,501,842		100.0%										
36	Total Asset Replacment Cost by Function	\$2,168,420,056	\$99,193,329	\$458,814,142	\$59,840,000	\$358,210,566	\$0	\$293,678,057	\$864,557,923	\$32,338,939	\$1,787,101	\$0		
37	Capital Cost Allocation Factors	100.0%	4.6%	21.2%	2.8%	16.5%	0.0%	13.5%	39.9%	1.5%	0.1%	0.0%		

Table A-13
City of Chandler
2020 Water Utility COS Study
Water Asset Functionalization (continued)

Line No	Asset Category	Replacement												
		Cost at Test Year FY 2025 - 26	Wells	Raw / SOS	Storage	Treatment	Pumping	Transmission	Distribution	Meters & Services	Billing	Public Fire		
1	Water Supplies	\$453,312,300	-	\$453,312,300	-	-	-	-	-	-	-	-	-	-
2	Treatment Plant Capacity	\$358,210,566	-	-	-	\$358,210,566	-	-	-	-	-	-	-	-
3	Well Capacity	\$99,193,329	\$99,193,329	-	-	-	-	-	-	-	-	-	-	-
4	Storage Capacity	\$59,840,000	-	-	\$59,840,000	-	-	-	-	-	-	-	-	-
5	WQMS	\$0	-	-	-	-	-	-	-	-	-	-	-	-
6	PRVs	\$0	-	-	-	-	-	-	-	-	-	-	-	-
7	Booster Pump Station Capacity	\$0	-	-	-	-	-	-	-	-	-	-	-	-
8	4" Distribution Lines	\$1,210,472	-	-	-	-	-	-	-	\$1,210,472	-	-	-	-
9	6" Distribution Lines	\$176,793,575	-	-	-	-	-	-	-	\$176,793,575	-	-	-	-
10	8" Distribution Lines	\$394,835,016	-	-	-	-	-	-	-	\$394,835,016	-	-	-	-
11	10" Distribution Lines	\$5,322,342	-	-	-	-	-	-	-	\$5,322,342	-	-	-	-
12	12" Distribution Lines	\$286,396,519	-	-	-	-	-	-	-	\$286,396,519	-	-	-	-
13	16" Transmission Lines	\$157,837,864	-	-	-	-	-	\$157,837,864	-	-	-	-	-	-
14	20" Transmission Lines	\$2,839,579	-	-	-	-	-	\$2,839,579	-	-	-	-	-	-
15	24" Transmission Lines	\$54,336,020	-	-	-	-	-	\$54,336,020	-	-	-	-	-	-
16	30" Transmission Lines	\$22,294,506	-	-	-	-	-	\$22,294,506	-	-	-	-	-	-
17	36" Transmission Lines	\$34,446,767	-	-	-	-	-	\$34,446,767	-	-	-	-	-	-
18	42" Transmission Lines	\$8,620,258	-	-	-	-	-	\$8,620,258	-	-	-	-	-	-
19	48" Transmission Lines	\$12,291,669	-	-	-	-	-	\$12,291,669	-	-	-	-	-	-
20	54" Transmission Lines	\$57,891	-	-	-	-	-	\$57,891	-	-	-	-	-	-
21	60" Transmission Lines	\$953,502	-	-	-	-	-	\$953,502	-	-	-	-	-	-
22	5/8" Meter	\$13,555,560	-	-	-	-	-	-	-	\$13,555,560	-	-	-	-
23	3/4" Meter	\$1,087,942	-	-	-	-	-	-	-	\$1,087,942	-	-	-	-
24	1" Meter	\$13,658,116	-	-	-	-	-	-	-	\$13,658,116	-	-	-	-
25	1.5" Meter	\$767,771	-	-	-	-	-	-	-	\$767,771	-	-	-	-
26	2" Meter	\$1,331,626	-	-	-	-	-	-	-	\$1,331,626	-	-	-	-
27	3" Meter	\$48,838	-	-	-	-	-	-	-	\$48,838	-	-	-	-
28	4" Meter	\$28,190	-	-	-	-	-	-	-	\$28,190	-	-	-	-
29	6" Meter	\$29,267	-	-	-	-	-	-	-	\$29,267	-	-	-	-
30	8" Meter	\$39,502	-	-	-	-	-	-	-	\$39,502	-	-	-	-
31	10" Meter	\$2,873	-	-	-	-	-	-	-	\$2,873	-	-	-	-
32	12" Meter	\$718	-	-	-	-	-	-	-	\$718	-	-	-	-
33	16" Meter	\$1,436	-	-	-	-	-	-	-	\$1,436	-	-	-	-
34	Administration	\$3,574,201	-	-	-	-	-	-	-	\$1,787,101	\$1,787,101	-	-	-
35	Land	\$5,501,842	-	\$5,501,842	-	-	-	-	-	-	-	-	-	-
36	Total Asset Replacment Cost by Function	\$2,168,420,056	\$99,193,329	\$458,814,142	\$59,840,000	\$358,210,566	\$0	\$293,678,057	\$864,557,923	\$32,338,939	\$1,787,101		\$0	
37	Capital Cost Allocation Factors	100.0%	4.6%	21.2%	2.8%	16.5%	0.0%	13.5%	39.9%	1.5%	0.1%		0.0%	

Table A-14
City of Chandler
2020 Water Utility COS Study
Water Capital Cost Revenue Requirement Classification - % [1]

Line No	Cost Component	% of Total	Test Year FY 2025 - 26 Capital Expense	Common to All			Customer Service		Public Fire	Total
				Base	Max Day Extra Capacity	Max Hour Extra Capacity	Equivalent Meters	Bills		
1	Wells	4.6%	\$1,347,927	71.2%	28.8%	0.0%	0.0%	0.0%	0.0%	100.0%
2	Raw / SOS	21.2%	\$6,234,772	71.2%	28.8%	0.0%	0.0%	0.0%	0.0%	100.0%
3	Storage	2.8%	\$813,159	43.2%	17.5%	39.3%	0.0%	0.0%	0.0%	100.0%
4	Treatment	16.5%	\$4,867,682	71.2%	28.8%	0.0%	0.0%	0.0%	0.0%	100.0%
5	Pumping	0.0%	\$0	43.2%	17.5%	39.3%	0.0%	0.0%	0.0%	100.0%
6	Transmission	13.5%	\$3,990,757	43.2%	17.5%	39.3%	0.0%	0.0%	0.0%	100.0%
7	Distribution	39.9%	\$11,748,377	43.2%	17.5%	39.3%	0.0%	0.0%	0.0%	100.0%
8	Meters & Services	1.5%	\$439,450	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%
9	Billing	0.1%	\$24,285	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
10	Public Fire	0.0%	\$0	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
11	Total	100.0%	\$29,466,408							
<u>Capital Related Revenue Requirements</u>										
12	Rate Financed Capital	2.2%	644,880							
13	Annual Debt Service	60.4%	17,795,232							
14	Annual Surplus (Deficit)	37.4%	11,026,296							
15	Total Capital Cost Revenue Requirement	100.0%	\$29,466,408	54.4%	22.0%	22.1%	1.5%	0.1%	0.0%	100.0%

[1] Continued on next page

Table A-14 (continued)
City of Chandler
2020 Water Utility COS Study

Water Capital Cost Revenue Requirement Classification - \$

Line No	Cost Component	% of Total	Test Year FY 2025 - 26 Capital Expense	Common to All			Customer Service		Public Fire	Total
				Base	Max Day Extra Capacity	Max Hour Extra Capacity	Equivalent Meters	Bills		
1	Wells	4.6%	\$1,347,927	\$960,043	\$387,884	\$0	\$0	\$0	\$0	\$1,347,927
2	Raw / SOS	21.2%	6,234,772	4,440,632	1,794,140	0	0	0	0	6,234,772
3	Storage	2.8%	813,159	351,560	142,040	319,558	0	0	0	813,159
4	Treatment	16.5%	4,867,682	3,466,941	1,400,741	0	0	0	0	4,867,682
5	Pumping	0.0%	0	0	0	0	0	0	0	0
6	Transmission	13.5%	3,990,757	1,725,360	697,094	1,568,304	0	0	0	3,990,757
7	Distribution	39.9%	11,748,377	5,079,281	2,052,172	4,616,924	0	0	0	11,748,377
8	Meters & Services	1.5%	439,450	0	0	0	439,450	0	0	439,450
9	Billing	0.1%	24,285	0	0	0	0	24,285	0	24,285
10	Public Fire	0.0%	0	0	0	0	0	0	0	0
11	Total	100.0%	\$29,466,408	\$16,023,816	\$6,474,071	\$6,504,786	\$439,450	\$24,285	\$0	\$29,466,408
<u>Capital Related Revenue Requirments</u>										
12	Rate Financed Capital	2.2%	\$644,880	350,685	141,687	142,359	9,617	531	0	644,880
13	Annual Debt Service	60.4%	\$17,795,232	9,677,037	3,909,795	3,928,344	265,391	14,666	0	17,795,232
14	Annual Surplus (Deficit)	37.4%	\$11,026,296	5,996,093	2,422,590	2,434,083	164,442	9,087	0	11,026,296
15	Total Capital Cost Revenue Requirement	100.0%	\$29,466,408	\$16,023,816	\$6,474,071	\$6,504,786	\$439,450	\$24,285	\$0	\$29,466,408

Table A-15
City of Chandler
2020 Water Utility COS Study
Account Descriptions

Line No	Acct #	Acct Name	Description
1	3050	Admin	Administration related expenses.
2	3800	Water Distribution	Maintain mains, hydrants, and valves. Includes location and marking of mains.
3	3820	Water Capital	Capital costs.
4	3830	Water Treatment Plant	Provides customers with sufficient & continuous supply of potable water.
5	3840	Environmental Resources	Water Supply & Resource planning. Promoting conservation.
6	3850	Water Quality	Ensure water meets compliance standards. Accomplished through sampling/testing/record keeping. Also manages backflow prevention and flushing programs.
7	3860	Water Systems Maintenance	Responsible for providing sufficient and continuous potable water. Accomplished through pumping wells & boosting water from storage reservoirs.
8	3870	San Tan Vista WTP	Provides customers with sufficient & continuous supply of potable water. Joint effort with Town of Gilbert.
9	3880	Meter Services	Responsible for collecting monthly water usage. Also responds to customer requests to start and finalize water service, verify water meter accuracy, and detect water leaks.

Table A-16
City of Chandler
2020 Water Utility COS Study
Water O&M Functionalization - FY 2021 - 22 Budgeted O&M by Department / Cost Center

Line No	Description	Admin 3050	Water Distribution 3800	Water Capital 3820	Water Treatment Plant 3830	Environmental Resources 3840	Water Quality 3850	Water Systems Maintenance 3860	San Tan Vista		Total
									Water Treatment Plant 3870	Meter Services 3880	
1	5100 - Personnel Services	521,326	2,525,749		1,516,645	1,055,103	1,257,477	2,256,533	0	785,122	9,917,955
2	5200 - Professional/Contract Services	24,532	317,668		107,194	119,710	150,317	130,310	2,082,519	19,050	2,951,300
3	5231 - Water Purchases	0	0		0	7,109,673	0	0	0	0	7,109,673
4	5300 - Operating Supplies (less chemicals)	25,179	1,931,864		42,707	49,879	173,132	654,337	0	174,331	3,051,429
5	5318 - Chemicals	0	0		1,608,737	0	20,250	312,105	0	0	1,941,092
6	5400 - Repairs & Maintenance	2,000	52,186		196,177	36,730	6,000	877,849	0	26,710	1,197,652
7	5500 - Communication/Transportation	12,526	23,671		7,957	11,856	39,375	29,700	0	7,474	132,559
8	5600 - Insurance/Taxes	0	5,250		1,000	0	500	2,500	0	500	9,750
9	5700 - Rents & Utilities (less utilities)	0	0		0	0	0	10,000	0	0	10,000
10	5716 - Utilities	0	24,000		2,012,533		0	1,626,940	0	1,000	3,664,473
11	5800 - Other Charges & Services	24,640	76,962		51,588	187,499	28,879	65,125	0	3,900	438,593
12	5900 - Contingency/Reserves	0	0		436,550	0	0	0	0	9,510	446,060
13	6200 - Building/Improvements	0	0		0	0	0	0	0	0	0
14	6300 - Machinery & Equipment	0	24,402		0	0	68,380	0	0	0	92,781
15	6400 - Office Furniture & Equipment	0	0		0	0	0	0	0	0	0
16	6700 - Water System Improvements	0	208,578		0	0	0	600,650	0	0	809,228
17	8403/8404 - Capital Replacement	2,876	79,910		12,222	9,171	13,066	44,953	0	16,075	178,273
18	Intel Expansion Expenses	-	-		-	-	-	-	0	-	0
19	8400 - Transfers										0
20	Indirect Cost Allocations	874,629	484,474	591,642	309,988	323,021	207,974	423,349	63,330	151,798	3,430,205
21	Total	1,487,708	5,754,713	591,642	6,303,298	8,902,642	1,965,350	7,034,351	2,145,849	1,195,470	35,381,023

Table A-17
City of Chandler
2020 Water Utility COS Study
Water O&M Functionalization - % by Department / Cost Center

Line No	Description	Admin 3050	Water Distribution 3800	Water Capital 3820	Water Treatment	Environmental	Water Quality 3850	Waster Systems	San Tan Vista		Total
					Plant 3830	Resources 3840		Maintenance 3860	Water Treatment Plant 3870	Meter Services 3880	
1	5100 - Personnel Services	5.3%	25.5%	0.0%	15.3%	10.6%	12.7%	22.8%	0.0%	7.9%	100.0%
2	5200 - Professional/Contract Services	0.8%	10.8%	0.0%	3.6%	4.1%	5.1%	4.4%	70.6%	0.6%	100.0%
3	5231 - Water Purchases	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%
4	5300 - Operating Supplies (less chemicals)	0.8%	63.3%	0.0%	1.4%	1.6%	5.7%	21.4%	0.0%	5.7%	100.0%
5	5318 - Chemicals	0.0%	0.0%	0.0%	82.9%	0.0%	1.0%	16.1%	0.0%	0.0%	100.0%
6	5400 - Repairs & Maintenance	0.2%	4.4%	0.0%	16.4%	3.1%	0.5%	73.3%	0.0%	2.2%	100.0%
7	5500 - Communication/Transportation	9.4%	17.9%	0.0%	6.0%	8.9%	29.7%	22.4%	0.0%	5.6%	100.0%
8	5600 - Insurance/Taxes	0.0%	53.8%	0.0%	10.3%	0.0%	5.1%	25.6%	0.0%	5.1%	100.0%
9	5700 - Rents & Utilities (less utilities)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%
10	5716 - Utilities	0.0%	0.7%	0.0%	54.9%	0.0%	0.0%	44.4%	0.0%	0.0%	100.0%
11	5800 - Other Charges & Services	5.6%	17.5%	0.0%	11.8%	42.8%	6.6%	14.8%	0.0%	0.9%	100.0%
12	5900 - Contingency/Reserves	0.0%	0.0%	0.0%	97.9%	0.0%	0.0%	0.0%	0.0%	2.1%	100.0%
13	6200 - Building/Improvements	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
14	6300 - Machinery & Equipment	0.0%	26.3%	0.0%	0.0%	0.0%	73.7%	0.0%	0.0%	0.0%	100.0%
15	6400 - Office Furniture & Equipment	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
16	6700 - Water System Improvements	0.0%	25.8%	0.0%	0.0%	0.0%	0.0%	74.2%	0.0%	0.0%	100.0%
17	8403/8404 - Capital Replacement	1.6%	44.8%	0.0%	6.9%	5.1%	7.3%	25.2%	0.0%	9.0%	100.0%
18	Intel Expansion Expenses	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
19	8400 - Transfers	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
20	Indirect Cost Allocations	25.5%	14.1%	17.2%	9.0%	9.4%	6.1%	12.3%	1.8%	4.4%	100.0%

Table A-19
City of Chandler
2020 Water Utility COS Study
Test Year Water O&M Expense Functionalization

Line No	Cost Center Description	Test Year FY 2025 - 26 O&M Expense	Wells	Raw / SOS	Storage	Treatment	Pumping	Transmission	Distribution	Meters & Services	Billing	Public Fire	Total
1	5100 - Personnel Services	\$12,816,921	9.7%	5.3%	6.6%	28.2%	6.6%	7.3%	23.1%	7.1%	6.1%	0.0%	100.0%
2	5200 - Professional/Contract Services	3,121,868	2.7%	2.0%	1.4%	78.2%	1.4%	3.1%	9.6%	0.6%	0.9%	0.0%	100.0%
3	5231 - Water Purchases	8,183,968	8.3%	50.0%	8.3%	8.3%	8.3%	8.3%	8.3%	0.0%	0.0%	0.0%	100.0%
4	5300 - Operating Supplies (less chemicals)	3,354,683	6.9%	0.8%	5.5%	9.7%	5.5%	16.2%	48.8%	5.1%	1.4%	0.0%	100.0%
5	5318 - Chemicals	2,310,456	4.3%	0.0%	4.0%	87.4%	4.0%	0.0%	0.3%	0.0%	0.0%	0.0%	100.0%
6	5400 - Repairs & Maintenance	1,257,693	18.7%	1.5%	18.6%	35.2%	18.6%	1.4%	3.6%	2.0%	0.4%	0.0%	100.0%
7	5500 - Communication/Transportation	141,087	13.8%	4.5%	6.3%	27.2%	6.3%	5.3%	21.5%	5.1%	10.0%	0.0%	100.0%
8	5600 - Insurance/Taxes	10,247	7.7%	0.0%	6.4%	19.2%	6.4%	13.7%	41.5%	4.6%	0.5%	0.0%	100.0%
9	5700 - Rents & Utilities (less utilities)	10,931	25.0%	0.0%	25.0%	25.0%	25.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
10	5716 - Utilities	4,805,708	11.1%	0.0%	11.1%	66.0%	11.1%	0.2%	0.5%	0.0%	0.0%	0.0%	100.0%
11	5800 - Other Charges & Services	460,967	8.9%	21.4%	7.3%	22.3%	7.3%	8.0%	18.3%	0.8%	5.7%	0.0%	100.0%
12	5900 - Contingency/Reserves	446,060	0.0%	0.0%	0.0%	97.9%	0.0%	0.0%	0.0%	1.9%	0.2%	0.0%	100.0%
13	6200 - Building/Improvements	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
14	6300 - Machinery & Equipment	92,781	18.4%	0.0%	0.0%	36.9%	0.0%	6.7%	38.1%	0.0%	0.0%	0.0%	100.0%
15	6400 - Office Furniture & Equipment	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
16	6700 - Water System Improvements	850,507	18.6%	0.0%	18.6%	18.6%	18.6%	6.5%	19.2%	0.0%	0.0%	0.0%	100.0%
17	Indirect Cost Allocations	3,665,917	6.2%	8.4%	4.3%	20.6%	3.9%	6.7%	19.7%	4.2%	26.0%	0.0%	100.0%
18	Subtotal Primary Allocations	\$41,529,794			\$2,977,058	\$14,230,765	\$2,959,609	\$2,640,391	\$6,692,951	\$1,304,997	\$1,848,446	\$0	\$41,529,794
19	Subtotal - %		8.6%	12.7%	7.2%	34.3%	7.1%	6.4%	16.1%	3.1%	4.5%	0.0%	100.0%
20	8403/8404 - Capital Replacement	\$180,383	8.6%	12.7%	7.2%	34.3%	7.1%	6.4%	16.1%	3.1%	4.5%	0.0%	100.0%
21	Intel Impacts Increase/Decrease Estimates	0	8.6%	12.7%	7.2%	34.3%	7.1%	6.4%	16.1%	3.1%	4.5%	0.0%	100.0%
22	COVID-19 Adjustment	0	8.6%	12.7%	7.2%	34.3%	7.1%	6.4%	16.1%	3.1%	4.5%	0.0%	100.0%
23	Estimated Underspending	(3,000,000)	8.6%	12.7%	7.2%	34.3%	7.1%	6.4%	16.1%	3.1%	4.5%	0.0%	100.0%
24	1290 - Nondepartmental Piece	665,600	8.6%	12.7%	7.2%	34.3%	7.1%	6.4%	16.1%	3.1%	4.5%	0.0%	100.0%
25	1290 Operating Encumbrance Carryforward (592:	0	8.6%	12.7%	7.2%	34.3%	7.1%	6.4%	16.1%	3.1%	4.5%	0.0%	100.0%
26	Bad Debt Expense (46%)	345,000	8.6%	12.7%	7.2%	34.3%	7.1%	6.4%	16.1%	3.1%	4.5%	0.0%	100.0%
27	Environmental Position	24,945	8.6%	12.7%	7.2%	34.3%	7.1%	6.4%	16.1%	3.1%	4.5%	0.0%	100.0%
28	Transfers to Funds 736 - Safety Analyst Position	31,376	8.6%	12.7%	7.2%	34.3%	7.1%	6.4%	16.1%	3.1%	4.5%	0.0%	100.0%
29	Transfers to Funds 403	138,266	8.6%	12.7%	7.2%	34.3%	7.1%	6.4%	16.1%	3.1%	4.5%	0.0%	100.0%
30	Value of Gric	(1,388,800)	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
31	Service Charge Rev	0	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
32	Shift to RW	1,391,236	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
33	Total O&M Revenue Requirement	\$39,917,799	\$3,443,829	\$5,089,154	\$2,861,327	\$13,677,558	\$2,844,557	\$2,537,749	\$6,432,769	\$1,254,267	\$1,776,590	\$0	\$39,917,799

Table A-20
City of Chandler
2020 Water Utility COS Study
Water O&M Allocation to Cost Components

Line No	Cost Component	% of Total	Test Year FY 2025 - 26 O&M Expense	Common to All					Public Fire	Total
				Base	Max Day Extra Capacity	Max Hour Extra Capacity	Customer Service			
							Equivalent Meters	Bills		
1	Wells	8.6%	\$3,443,829	71.2%	28.8%	0.0%	0.0%	0.0%	0.0%	100.0%
2	Raw / SOS	12.7%	5,089,154	71.2%	28.8%	0.0%	0.0%	0.0%	0.0%	100.0%
3	Storage	7.2%	2,861,327	43.2%	17.5%	39.3%	0.0%	0.0%	0.0%	100.0%
4	Treatment	34.3%	13,677,558	71.2%	28.8%	0.0%	0.0%	0.0%	0.0%	100.0%
5	Pumping	7.1%	2,844,557	43.2%	17.5%	39.3%	0.0%	0.0%	0.0%	100.0%
6	Transmission	6.4%	2,537,749	43.2%	17.5%	39.3%	0.0%	0.0%	0.0%	100.0%
7	Distribution	16.1%	6,432,769	43.2%	17.5%	39.3%	0.0%	0.0%	0.0%	100.0%
8	Meters & Services	3.1%	1,254,267	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%
9	Billing	4.5%	1,776,590	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
10	Public Fire	0.0%	0	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
11	Total	100.0%	\$39,917,799	55.5%	22.4%	14.4%	3.1%	4.5%	0.0%	100.0%

Table A-21
 City of Chandler
 2020 Water Utility COS Study
 Water O&M Allocation to Cost Components

Line No	Cost Component	Test Year FY 2025 - 26 O&M Expense	Common to All				Customer Service		Public Fire	Total
			Base	Max Day Extra Capacity	Max Hour Extra Capacity	Equivalent Meters	Bills			
		\$	\$	\$	\$	\$	\$	\$	\$	
1	Wells	3,443,829	2,452,821	991,008	0	0	0	0	3,443,829	
2	Raw / SOS	5,089,154	3,624,681	1,464,473	0	0	0	0	5,089,154	
3	Storage	2,861,327	1,237,063	499,808	1,124,456	0	0	0	2,861,327	
4	Treatment	13,677,558	9,741,656	3,935,902	0	0	0	0	13,677,558	
5	Pumping	2,844,557	1,229,813	496,879	1,117,865	0	0	0	2,844,557	
6	Transmission	2,537,749	1,097,168	443,287	997,295	0	0	0	2,537,749	
7	Distribution	6,432,769	2,781,137	1,123,657	2,527,975	0	0	0	6,432,769	
8	Meters & Services	1,254,267	0	0	0	1,254,267	0	0	1,254,267	
9	Billing	1,776,590	0	0	0	0	1,776,590	0	1,776,590	
10	Public Fire	0	0	0	0	0	0	0	0	
11	Total	39,917,799	22,164,338	8,955,014	5,767,591	1,254,267	1,776,590	0	39,917,799	

Table A-22
City of Chandler
2020 Water Utility COS Study
Water Non-Rate Revenue Offset Allocations - %

Line No	Non-Rate Revenue Offsets	% of Total	Test Year FY 2025 - 26 Amount	Common to All			Customer Service		Public Fire	Total
				Base	Max Day Extra Capacity	Max Hour Extra Capacity	Equivalent Meters	Bills		
1	4718 METERS AND SERVICE	0.5%	\$34,426	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%
2	4725 CONNECT FEES	6.3%	436,862	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%
3	4726 NEW AND REPLACEMENT METER	6.3%	430,321	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%
4	4731 LATE FEE CHARGES - UTILIT	4.4%	302,698	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
5	Loan Repayment from Water SDF Fund (603) - (FY08 loan of \$15.9M)	14.5%	1,000,000	54.4%	22.0%	22.1%	1.5%	0.1%	0.0%	100.0%
6	Loan Rpymnt from Water SDF Fund (603) for Debt Service- (FY07 loan of \$46.7M)	21.8%	1,500,000	54.4%	22.0%	22.1%	1.5%	0.1%	0.0%	100.0%
7	Loan Rpymnt from Water SDF Fund (603) for Debt Service- (FY09 loan of \$46.2M)	29.1%	2,000,000	54.4%	22.0%	22.1%	1.5%	0.1%	0.0%	100.0%
8	Loan Rpymnt from Water SDF Fund (603) for Debt Service- (FY14 loan of \$3.0M)	3.6%	250,000	54.4%	22.0%	22.1%	1.5%	0.1%	0.0%	100.0%
9	Loan Repayment FROM WW Reclaimed SDF Fund 606 (FY01 loan of \$6.5M)	0.0%	0	54.4%	22.0%	22.1%	1.5%	0.1%	0.0%	100.0%
10	Loan Repayment FROM WW Reclaimed SDF Fund 606/610 (FY01 loan of \$6.5M)	2.2%	150,714	54.4%	22.0%	22.1%	1.5%	0.1%	0.0%	100.0%
11	Loans TO Water Bond Fund (601)	0.0%	0	54.4%	22.0%	22.1%	1.5%	0.1%	0.0%	100.0%
12	Transfer from Fund 602	0.0%	0	55.5%	22.4%	14.4%	3.1%	4.5%	0.0%	100.0%
13	Transfers from Funds 713	0.0%	0	55.5%	22.4%	14.4%	3.1%	4.5%	0.0%	100.0%
14	Lump Sum Agreement	0.0%	0	55.5%	22.4%	14.4%	3.1%	4.5%	0.0%	100.0%
15	Land Sale - \$8,647,334	0.0%	0	55.5%	22.4%	14.4%	3.1%	4.5%	0.0%	100.0%
16	Series 2013 Deposit to Debt Service Fund	0.0%	0	55.5%	22.4%	14.4%	3.1%	4.5%	0.0%	100.0%
17	Intel Repayment	0.0%	0	55.5%	22.4%	14.4%	3.1%	4.5%	0.0%	100.0%
18	Intel Reimbursement for Water Purchase	0.0%	0	55.5%	22.4%	14.4%	3.1%	4.5%	0.0%	100.0%
19	Intel Revenue Adjustment from Fund 615	0.0%	0	55.5%	22.4%	14.4%	3.1%	4.5%	0.0%	100.0%
20	Water SDF Debt Service Loan Payback	0.0%	0	55.5%	22.4%	14.4%	3.1%	4.5%	0.0%	100.0%
21	Subtotal	88.7%	\$6,105,021	43.7%	17.6%	17.7%	16.0%	5.0%	0.0%	100.0%
	<u>Other Miscellaneous</u>									
22	Interest Earnings - Operating Fund	7.3%	\$500,000	55.5%	22.4%	14.4%	3.1%	4.5%	0.0%	100.0%
23	4491 - Svc Chg on NSF Chg	0.2%	15,033	43.7%	17.6%	17.7%	16.0%	5.0%	0.0%	100.0%
24	4620 - Surplus Property Sales	0.9%	59,671	43.7%	17.6%	17.7%	16.0%	5.0%	0.0%	100.0%
25	4710 WATER SERVICE CHARGES	0.3%	20,655	43.7%	17.6%	17.7%	16.0%	5.0%	0.0%	100.0%
26	Hydrant Meter & Fireline Revenue	2.6%	181,286	43.2%	17.5%	39.3%	0.0%	0.0%	0.0%	100.0%
27	Total Non-Rate Revenue Offsets	100.0%	\$6,881,666	44.5%	18.0%	18.1%	14.6%	4.9%	0.0%	100.0%

Table A-23
City of Chandler
2020 Water Utility COS Study
Water Non-Rate Revenue Offset Allocations - \$

Line No	Non-Rate Revenue Offsets	% of Total	Test Year FY 2025 - 26 Amount \$	Common to All					Public Fire \$	Total \$
				Base \$	Max Day Extra Capacity \$	Max Hour Extra Capacity \$	Customer Service			
				Equivalent Meters \$	Bills \$					
1	4718 METERS AND SERVICE	0.5%	34,426	0	0	0	34,426	0	0	34,426
2	4725 CONNECT FEES	6.3%	436,862	0	0	0	436,862	0	0	436,862
3	4726 NEW AND REPLACEMENT METER	6.3%	430,321	0	0	0	430,321	0	0	430,321
4	4731 LATE FEE CHARGES - UTILIT	4.4%	302,698	0	0	0	0	302,698	0	302,698
5	Loan Repayment from Water SDF Fund (603) - (FY08 loan of \$15.9M)	14.5%	1,000,000	543,799	219,710	220,753	14,914	824	0	1,000,000
6	Loan Rpymnt from Water SDF Fund (603) for Debt Service- (FY07 loan of \$46.7M)	21.8%	1,500,000	815,699	329,565	331,129	22,370	1,236	0	1,500,000
7	Loan Rpymnt from Water SDF Fund (603) for Debt Service- (FY09 loan of \$46.2M)	29.1%	2,000,000	1,087,599	439,420	441,505	29,827	1,648	0	2,000,000
8	Loan Rpymnt from Water SDF Fund (603) for Debt Service- (FY14 loan of \$3.0M)	3.6%	250,000	135,950	54,928	55,188	3,728	206	0	250,000
9	Loan Repayment FROM WW Reclaimed SDF Fund 606 (FY01 loan of \$6.5M)	0.0%	0	0	0	0	0	0	0	0
10	Loan Repayment to Water Operating Fund (605) - (FY20 loan of \$1.5M)	2.2%	150,714	81,958	33,113	33,271	2,248	124	0	150,714
11	Loans TO Water Bond Fund (601)	0.0%	0	0	0	0	0	0	0	0
12	Transfer from Fund 602	0.0%	0	0	0	0	0	0	0	0
13	Transfers from Funds 713	0.0%	0	0	0	0	0	0	0	0
14	Lump Sum Agreement	0.0%	0	0	0	0	0	0	0	0
15	Land Sale - \$8,647,334	0.0%	0	0	0	0	0	0	0	0
16	Series 2013 Deposit to Debt Service Fund	0.0%	0	0	0	0	0	0	0	0
17	Intel Repayment	0.0%	0	0	0	0	0	0	0	0
18	Intel Reimbursement for Water Purchase	0.0%	0	0	0	0	0	0	0	0
19	Intel Revenue Adjustment from Fund 615	0.0%	0	0	0	0	0	0	0	0
20	Water SDF Debt Service Loan Payback	0.0%	0	0	0	0	0	0	0	0
21	Subtotal	88.7%	6,105,021	2,665,006	1,076,737	1,081,845	974,696	306,737	0	6,105,021
<u>Other Miscellaneous</u>										
22	Interest Earnings - Operating Fund	7.3%	500,000	277,625	112,168	72,243	15,711	22,253	0	500,000
23	4491 - Svc Chg on NSF Chg	0.2%	15,033	6,562	2,651	2,664	2,400	755	0	15,033
24	4620 - Surplus Property Sales	0.9%	59,671	26,048	10,524	10,574	9,527	2,998	0	59,671
25	4710 WATER SERVICE CHARGES	0.3%	20,655	9,017	3,643	3,660	3,298	1,038	0	20,655
26	Hydrant Meter & Fireline Revenue	2.6%	181,286	78,377	31,666	71,242	0	0	0	181,286
27	Total Non-Rate Revenue Offsets	100.0%	6,881,666	3,062,634	1,237,390	1,242,229	1,005,631	333,781	0	6,881,666

Table A-24
City of Chandler
2020 Water Utility COS Study
Fireflow Estimates

Line No.	Description	Amount
<u>Estimate of Max Day Fire Flow Volumes</u>		
1	Fire Flow per Minute	2,000
2	Fire Duration in Hours	2
3	Fire Duration in Minutes	120
4	Total Max Day Fire Flow	240,000
<u>Estimate of Max Hour Fire Flow Volumes</u>		
5	Fire Flow per Minute	2,000
6	Duration - 24-hour basis	1,440
7	Total Max Hour Fire Flow	2,880,000

Line No.	Customer Class	(1) Average Active Taps	(2) Max Needed Fire Flow gpm	(3) Duration hrs	(4) Participation		(6) Weighted Fire Protection Units of Service (1 x 2 x 3 x (4 or 5))		(8) Fire Protection Allocation	
					(4) Direct Fire	(5) Indirect Fire	Direct	Indirect	Direct Fire	Indirect Fire
					1=Yes/0=No	1=Yes/0=No				
<u>Inside City</u>										
1	Single Family Inside	79,521	1,250	2	1	1	199	199	87.4%	87.4%
2	Multi Family Inside	989	2,000	2	1	1	4	4	1.7%	1.7%
3	Medical - Other - Inside	113	6,000	2	1	1	1	1	0.6%	0.6%
4	Commercial - Other - Inside	2,216	3,500	2	1	1	16	16	6.8%	6.8%
5	Government - Other - Inside	120	3,500	2	1	1	1	1	0.4%	0.4%
6	School - Other - Inside	249	7,000	2	1	1	3	3	1.5%	1.5%
7	Industrial Consumption - Inside	44	7,000	3	1	1	1	1	0.4%	0.4%
8	INTEL - Industrial Consumption - Inside	0	7,000	3	1	1	0	0	0.0%	0.0%
9	Landscape Service - Inside	2,108	0	0	0	0	0	0	0.0%	0.0%
10	Hydrant Meter - Inside									
11	Fireline - Inside									
Inside City Subtotal		85,362					225	225	98.8%	98.8%
<u>Outside City</u>										
12	Single Family Outside	905	1,250	2	1	1	2	2	1.0%	1.0%
13	Multi Family Outside	1	2,000	2	1	1	0	0	0.0%	0.0%
14	Medical - Other - Outside	1	6,000	2	1	1	0	0	0.0%	0.0%
15	Commercial - Other - Outside	43	3,500	2	1	1	0	0	0.1%	0.1%
16	School - Other - Outside	5	7,000	2	1	1	0	0	0.0%	0.0%
17	Landscape Service - Outside	12	0	0	0	0	0	0	0.0%	0.0%
Outside City Subtotal		967					3	3	1.2%	1.2%
19	Total System	86,329					228	228	100.0%	100.0%

Table A-25
City of Chandler
2020 Water Utility COS Study
Units of Service
Test Year FY 2025-26

Line No.	Customer Class	Water Use		Maximum Day Demand			Maximum Hour Demand			Bills	Equivalent Meters	
		Annual 1,000 gal	Average Day 1,000 gal	Demand Factor	Total Demand	Extra Demand	Demand Factor	Total Demand	Extra Demand		Capacity	Cost
<u>Inside City</u>												
1	Single Family Inside	10,002,609	27,404	147.6%	40,446	13,042	243.4%	66,689	39,285	954,254	136,349	96,767
2	Multi Family Inside	1,580,367	4,330	126.9%	5,495	1,166	208.8%	9,041	4,711	11,873	13,844	4,851
3	Medical - Other - Inside	141,011	386	141.3%	546	159	232.9%	900	513	1,359	818	341
4	Commercial - Other - Inside	1,628,945	4,463	136.2%	6,079	1,617	224.5%	10,019	5,556	26,593	12,543	5,510
5	Government - Other - Inside	117,109	321	177.2%	568	248	290.8%	933	612	1,446	794	337
6	School - Other - Inside	183,641	503	168.4%	847	344	277.5%	1,396	893	2,991	1,834	763
7	Industrial Consumption - Inside	559,219	1,532	126.2%	1,934	402	207.9%	3,186	1,654	533	2,336	692
	INTEL - Industrial Consumption - Inside	4,380,000	12,000	126.2%	15,149	3,149	207.9%	24,954	12,954	0	0	0
8	Landscape Service - Inside	2,883,251	7,899	164.0%	12,955	5,056	293.3%	23,169	15,270	25,296	9,693	4,513
	Hydrant Meter - Inside											
	Fireline - Inside											
9	Inside City Subtotal	21,476,153	58,839		84,020	25,182		140,287	81,448	1,024,345	178,211	113,774
<u>Outside City</u>												
10	Single Family Outside	146,178	400	147.6%	591	191	243.4%	975	574	10,856	1,347	1,040
11	Multi Family Outside	98	0	126.9%	0	0	208.8%	1	0	12	3	1
12	Medical - Other - Outside	77	0	141.3%	0	0	232.9%	0	0	12	1	1
13	Commercial - Other - Outside	21,549	59	136.2%	80	21	224.5%	133	74	513	139	73
14	School - Other - Outside	1,207	3	168.4%	6	2	277.5%	9	6	62	23	11
15	Landscape Service - Outside	7,936	22	164.0%	36	14	293.3%	64	42	148	54	25
16	Outside City Subtotal	177,045	485		713	228		1,181	696	11,604	1,567	1,152
17	Public Fire Protection					240			2,640			
18	Total System	21,653,198	59,324		84,734	25,650		141,468	84,785	1,035,949	179,778	114,925

Table A-26
City of Chandler
2020 Water Utility COS Study
Unit Cost of Service
Test Year FY 2025-26

Line No.	Description	Common to All					Bills
		Total	Volume		Customer Service		
			Base	Max Day Extra Capacity	Max Hour Extra Capacity	Equivalent Meters	
Cost of Service							
1	Operation and Maintenance Expense	\$39,917,799	\$22,164,338	\$8,955,014	\$5,767,591	\$1,254,267	\$1,776,590
2	Capital Cost	29,466,408	16,023,816	6,474,071	6,504,786	439,450	24,285
3	Non-Rate Revenue Offsets	(6,881,666)	(3,062,634)	(1,237,390)	(1,242,229)	(1,005,631)	(333,781)
4	Incremental Change from Annualization	(554,167)	(311,434)	(125,828)	(97,797)	(6,101)	(13,008)
5	Total Cost of Service	\$61,948,374	\$34,814,086	\$14,065,867	\$10,932,351	\$681,985	\$1,454,085
6	Allocation for Incremental Change	100%	56%	23%	18%	1%	2%
7	%	100%	56%	23%	18%	1%	2%
Units of Service							
		<u>1,000 gal</u>	<u>gpd</u>	<u>gpd</u>	<u>Equivalent Mtr Cost Ratio</u>	<u># Bills</u>	
8	Inside-City	21,476,153	25,182	81,448	113,774	1,024,345	
9	Public Fire	0	240	2,640	0	0	
10	Outside-City	177,045	228	696	1,152	11,604	
11	Total Units of Service	21,653,198	25,650	84,785	114,925	1,035,949	
Unit Costs of Service							
12	Outside-City Multiplier [1]	1.4					
13	Inside City Unit Costs	\$1.60	\$546.43	\$128.52	\$5.91	\$1.40	
14	Outside City Unit Costs	\$2.24	\$765.00	\$179.93	\$8.27	\$1.96	

[1] See Table A-39

Table A-27
City of Chandler
2020 Water Utility COS Study
Customer Class Cost of Service [1]
Test Year FY 2025-26

Line No.	Description	Total	Common to All				
			Base	Volume		Customer Service	
				Max Day Extra Capacity	Max Hour Extra Capacity	Equivalent Meters	Bills
1	Inside City Unit Costs of Service - \$/unit		\$1.60	\$546.43	\$128.52	\$5.91	\$1.40
	Customer Class						
	<u>Inside City</u>						
	Single Family Inside						
2	Units		10,002,609	13,042	39,285	96,767	954,254
3	Cost of Service - \$	\$30,110,675	\$16,029,803	\$7,126,552	\$5,048,941	\$571,936	\$1,333,442
	Multi Family Inside						
4	Units		1,580,367	1,166	4,711	4,851	11,873
5	Cost of Service - \$	\$3,820,310	\$2,532,637	\$636,948	\$605,460	\$28,674	\$16,591
	Medical - Other - Inside						
6	Units		141,011	159	513	341	1,359
7	Cost of Service - \$	\$382,990	\$225,979	\$87,110	\$65,987	\$2,015	\$1,899
	Commercial - Other - Inside						
8	Units		1,628,945	1,617	5,556	5,510	26,593
9	Cost of Service - \$	\$4,277,701	\$2,610,486	\$883,378	\$714,112	\$32,565	\$37,160
	Government - Other - Inside						
10	Units		117,109	248	612	337	1,446
11	Cost of Service - \$	\$405,651	\$187,674	\$135,294	\$78,670	\$1,993	\$2,020
	School - Other - Inside						
12	Units		183,641	344	893	763	2,991
13	Cost of Service - \$	\$605,905	\$294,296	\$188,130	\$114,790	\$4,510	\$4,180
	Industrial Consumption - Inside						
14	Units		559,219	402	1,654	692	533
15	Cost of Service - \$	\$1,333,234	\$896,184	\$219,662	\$212,556	\$4,087	\$744
	INTEL - Industrial Consumption - Inside						
16	Units		4,380,000	3,149	12,954	0	0
17	Cost of Service - \$	\$10,404,510	\$7,019,222	\$1,720,471	\$1,664,816	\$0	\$0
	Landscape Service - Inside						
18	Units		2,883,251	5,056	15,270	4,513	25,296
19	Cost of Service - \$	\$9,407,605	\$4,620,589	\$2,762,513	\$1,962,480	\$26,676	\$35,347
20	Subtotal - Inside City	\$60,748,581	\$34,416,871	\$13,760,060	\$10,467,810	\$672,456	\$1,431,384

[1] Continued on next page

Table A-27 (continued)
City of Chandler
2020 Water Utility COS Study
Customer Class Cost of Service [1]
Test Year FY 2025-26

Line No.	Description	Total	Common to All				Equivalent Meters	Bills
			Base	Volume		Customer Service		
				Max Day Extra Capacity	Max Hour Extra Capacity			
23	Outside City Unit Costs of Service - \$/unit	0	\$2.24	\$765.00	\$179.93	\$8.27	\$1.96	
	Customer Class							
	<u>Outside City</u>							
	Single Family Outside							
24	Units		146,178	191	574	1,040	10,856	
25	Cost of Service - \$	\$606,907	\$327,962	\$145,806	\$103,299	\$8,603	\$21,238	
	Multi Family Outside							
26	Units		98	0	0	1	12	
27	Cost of Service - \$	\$364	\$220	\$55	\$53	\$12	\$24	
	Medical - Other - Outside							
28	Units		77	0	0	1	12	
29	Cost of Service - \$	\$324	\$173	\$67	\$51	\$9	\$24	
	Commercial - Other - Outside							
30	Units		21,549	21	74	73	513	
31	Cost of Service - \$	\$79,544	\$48,348	\$16,361	\$13,226	\$606	\$1,004	
	School - Other - Outside							
32	Units		1,207	2	6	11	62	
33	Cost of Service - \$	\$5,705	\$2,707	\$1,730	\$1,056	\$91	\$121	
	Landscape Service - Outside							
34	Units		7,936	14	42	25	148	
35	Cost of Service - \$	\$36,512	\$17,805	\$10,645	\$7,562	\$209	\$290	
36	Subtotal - Outside City	\$729,356	\$397,215	\$174,664	\$125,246	\$9,529	\$22,701	
	Public Fire Protection							
37	Units		0	240	2,640	0	0	
38	Cost of Service - \$	\$470,438	\$0	\$131,143	\$339,295	\$0	\$0	
39	Total System Cost of Service	\$61,948,374	\$34,814,086	\$14,065,867	\$10,932,351	\$681,985	\$1,454,085	

Table A-28
City of Chandler
2020 Water Utility COS Study
Development of Customer Class Cost of Service
Test Year FY 2025-26

Line No.	Customer Class	Cost of Service	Public Fire Allocation	Public Fire Adjustment	Subtotal Adjusted COS
<u>Inside City</u>					
1	Single Family Inside	\$30,110,675	87.4%	\$411,011	\$30,521,686
2	Multi Family Inside	3,820,310	1.7%	8,182	3,828,492
3	Medical - Other - Inside	382,990	0.6%	2,810	385,800
4	Commercial - Other - Inside	4,277,701	6.8%	32,071	4,309,772
5	Government - Other - Inside	405,651	0.4%	1,743	407,394
6	School - Other - Inside	605,905	1.5%	7,215	613,120
7	Industrial Consumption - Inside	1,333,234	0.4%	1,927	1,335,161
8	<i>INTEL - Industrial Consumption - Inside</i>	<i>10,404,510</i>	<i>0.0%</i>	<i>0</i>	<i>10,404,510</i>
9	Landscape Service - Inside	9,407,605	0.0%	0	9,407,605
10	Hydrant Meter - Inside	0	0.0%	0	0
11	Fireline - Inside	0	0.0%	0	0
12	Inside City Subtotal	\$60,748,581			\$61,213,541
<u>Outside City</u>					
13	Single Family Outside	\$606,907	1.0%	\$4,676	\$611,583
14	Multi Family Outside	364	0.0%	9	372
15	Medical - Other - Outside	324	0.0%	26	349
16	Commercial - Other - Outside	79,544	0.1%	619	80,163
17	School - Other - Outside	5,705	0.0%	149	5,854
18	Landscape Service - Outside	36,512	0.0%	0	36,512
19	Outside City Subtotal	\$729,356			\$734,833
20	Public Fire Protection	\$470,438	-100.0%	(\$470,438)	\$0
21	Total System	\$61,948,374			\$61,948,374

Table A-29
City of Chandler
2020 Water Utility COS Study
Comparison of Cost of Service With Revenues Under Existing Rates
Increase to Reach 100% COS
Inside City with Intel Class and Outside City
Test Year FY 2025-26

Line No.	Customer Class	Cost of Service	Revenue Under Existing Rates	Indicated Revenue Adjustment
		\$	\$	%
<u>Inside City</u>				
1	Single Family Inside	\$30,521,686	\$29,610,487	3.1%
2	Multi Family Inside	\$3,828,492	\$3,748,948	2.1%
3	Medical - Other - Inside	\$385,800	\$340,825	13.2%
4	Commercial - Other - Inside	\$4,309,772	\$4,111,590	4.8%
5	Government - Other - Inside	\$407,394	\$289,052	40.9%
6	School - Other - Inside	\$613,120	\$479,284	27.9%
7	Industrial Consumption - Inside	\$1,335,161	\$1,261,246	5.9%
8	INTEL - Industrial Consumption - Inside	\$10,404,510	\$9,276,997	12.2%
9	Landscape Service - Inside	\$9,407,605	\$7,987,755	17.8%
10	Hydrant Meter - Inside			
11	Fireline - Inside			
12	Inside City Subtotal	\$61,213,541	\$57,106,183	7.2%
<u>Outside City</u>				
13	Single Family Outside	\$611,583	\$585,825	4.4%
14	Multi Family Outside	\$372	\$364	2.2%
15	Medical - Other - Outside	\$349	\$393	-11.1%
16	Commercial - Other - Outside	\$80,163	\$76,326	5.0%
17	School - Other - Outside	\$5,854	\$5,338	9.7%
18	Landscape Service - Outside	\$36,512	\$32,781	11.4%
19	Outside City Subtotal	\$734,833	\$701,027	4.8%
20	Total System	\$61,948,374	\$57,807,210	7.2%

Table A-30
City of Chandler
2020 Water Utility COS Study
Comparison of Cost of Service With Revenues Under Existing Rates
Increase to Reach 100% COS
Inside City and Outside City
Test Year FY 2021-22

Line No.	Customer Class	Cost of Service	Revenue		
			Under Existing Rates	Required Change in Revenue	
		\$	\$	\$	%
	<u>Inside City</u>				
1	Single Family	\$28,452,234	\$29,063,262	(\$611,029)	-2.1%
2	Multi Family	\$3,598,305	\$3,679,664	(\$81,359)	-2.2%
3	Non-Residential	\$5,366,759	\$5,124,267	\$242,492	4.7%
4	Industrial	\$8,558,416	\$8,020,416	\$538,000	6.7%
5	Landscape	\$8,841,493	\$7,840,135	\$1,001,359	12.8%
6	Inside City Subtotal	\$54,817,207	\$53,727,745	\$1,089,462	2.0%
	<u>Outside City</u>				
7	Single Family	\$571,268	\$574,998	(\$3,731)	-0.6%
8	Multi Family	\$346	\$358	(\$12)	-3.4%
9	Non-Residential	\$81,039	\$80,541	\$499	0.6%
10	Landscape	\$34,273	\$32,175	\$2,098	6.5%
11	Outside City Subtotal	\$686,926	\$688,072	(\$1,146)	-0.2%
12	Total System	\$55,504,133	\$54,415,816	\$1,088,316	2.0%

Table A-31
City of Chandler
2020 Water Utility COS Study
Comparison of Cost of Service With Revenues Under Existing Rates
Increase to Reach 100% COS
Inside City and Outside City
Test Year FY 2025-26

Line No.	Customer Class	Cost of Service	Revenue		
			Under Existing Rates	Required Change in Revenue	
		\$	\$	\$	%
<u>Inside City</u>					
1	Single Family	\$30,521,686	\$29,610,487	\$911,199	3.1%
2	Multi Family	\$3,828,492	\$3,748,948	\$79,544	2.1%
3	Non-Residential	\$5,716,086	\$5,220,751	\$495,336	9.5%
4	Industrial	\$11,739,671	\$10,538,243	\$1,201,428	11.4%
5	Landscape	\$9,407,605	\$7,987,755	\$1,419,850	17.8%
6	Inside City Subtotal	\$61,213,541	\$57,106,183	\$4,107,358	7.2%
<u>Outside City</u>					
7	Single Family	\$611,583	\$585,825	\$25,758	4.4%
8	Multi Family	\$372	\$364	\$8	2.2%
9	Non-Residential	\$86,366	\$82,057	\$4,309	5.3%
10	Landscape	\$36,512	\$32,781	\$3,731	11.4%
11	Outside City Subtotal	\$734,833	\$701,027	\$33,806	4.8%
12	Total System	\$61,948,374	\$57,807,210	\$4,141,164	7.2%

Table A-32
City of Chandler
2020 Water Utility COS Study
Comparison of Cost of Service With Revenues Under Existing Rates
Increase to Reach 100% COS
System Customer Class
Test Year FY 2025-26

Line No.	Customer Class	Cost of Service	Revenue		
			Under Existing Rates	Required Change in Revenue	
		\$	\$	\$	%
	<u>Total System</u>				
1	Single Family	\$31,133,269	\$30,196,312	\$936,958	3.1%
2	Multi Family	\$3,828,865	\$3,749,312	\$79,553	2.1%
3	Non-Residential	\$5,802,452	\$5,302,808	\$499,644	9.4%
4	Industrial	\$11,739,671	\$10,538,243	\$1,201,428	11.4%
5	Landscape	\$9,444,117	\$8,020,535	\$1,423,581	17.7%
6	Total System	<u>\$61,948,374</u>	<u>\$57,807,210</u>	<u>\$4,141,164</u>	7.2%

Table A-33
City of Chandler
2020 Water Utility COS Study
Development of Inside City Base Charge Revenue
Test Year FY 2025-26

Line No.	Meter Size	FY 2025-26 Base Charge	Single Family		Multi Family		Non-Residential		Industrial		Landscape		Total - Inside City	
			Bills	Revenue	Bills	Revenue	Bills	Revenue	Bills	Revenue	Bills	Revenue	Bills	Revenue
1	5/8"	\$9.72	486,617	\$4,729,801	3,339	\$32,459	3,558	\$34,582	13	\$123	1,832	\$17,807	495,359	\$4,814,771
2	3/4"	11.09	26,246	291,104	161	1,783	642	7,120	0	0	2,385	26,457	29,434	326,463
3	1"	14.17	438,922	6,218,233	1,694	23,998	6,353	90,008	26	374	7,866	111,437	454,862	6,444,049
4	1.5"	22.31	2,285	50,990	1,027	22,920	8,458	188,719	38	847	5,340	119,153	17,149	382,630
5	2"	31.41	183	5,761	3,904	122,627	12,176	382,444	190	5,964	7,773	244,153	24,227	760,948
6	3"	66.22	0	0	128	8,460	643	42,574	63	4,191	74	4,912	908	60,138
7	4"	93.44	0	0	173	16,174	427	39,858	25	2,365	12	1,155	637	59,553
8	6"	177.42	0	0	551	97,803	95	16,819	51	8,983	12	2,194	709	125,799
9	8"	268.80	0	0	895	240,682	37	9,971	38	10,208	0	0	970	260,860
10	10"	458.00	0	0	0	0	0	0	51	23,190	0	0	51	23,190
11	12"	647.22	0	0	0	0	0	0	13	8,193	0	0	13	8,193
12	16"	647.22	0	0	0	0	0	0	25	16,385	0	0	25	16,385
13	Total		954,254	\$11,295,888	11,873	\$566,906	32,389	\$812,093	533	\$80,823	25,296	\$527,268	1,024,345	\$13,282,978

Table A-34
City of Chandler
Development of Outside City Base Charge Revenue
Test Year FY 2025-26

Line No.	Meter Size	FY 2025-26 Base Charge	Single Family		Multi Family		Non-Residential		Landscape		N/A		Total - Inside City	
			Bills	Revenue	Bills	Revenue	Bills	Revenue	Bills	Revenue	Bills	Revenue	Bills	Revenue
1	5/8"	\$13.61	7,224	\$98,301	0	\$0	148	\$2,019	0	\$0		\$0	7,372	\$100,320
2	3/4"	\$15.53	742	\$11,520	0	\$0	25	\$384	0	\$0		\$0	767	\$11,904
3	1"	\$19.83	2,666	\$52,869	12	\$245	218	\$4,333	99	\$1,962		\$0	2,995	\$59,409
4	1.5"	\$31.24	212	\$6,630	0	\$0	111	\$3,476	0	\$0		\$0	324	\$10,106
5	2"	\$43.97	12	\$544	0	\$0	84	\$3,715	49	\$2,175		\$0	146	\$6,434
6	3"	\$92.70	0	\$0	0	\$0	0	\$0	0	\$0		\$0	0	\$0
7	4"	\$130.81	0	\$0	0	\$0	0	\$0	0	\$0		\$0	0	\$0
8	6"	\$248.39	0	\$0	0	\$0	0	\$0	0	\$0		\$0	0	\$0
9	8"	\$376.32	0	\$0	0	\$0	0	\$0	0	\$0		\$0	0	\$0
10	10"	\$641.20	0	\$0	0	\$0	0	\$0	0	\$0		\$0	0	\$0
11	12"	\$906.10	0	\$0	0	\$0	0	\$0	0	\$0		\$0	0	\$0
12	16"	\$906.10	0	\$0	0	\$0	0	\$0	0	\$0		\$0	0	\$0
13	Total		10,856	\$169,864	12	\$245	587	\$13,927	148	\$4,137		\$0	11,604	\$188,173

Table A-35
City of Chandler
2020 Water Utility COS Study
Development of COS Volume Charge
FY 2025-26

Line No.	Customer Class					Tiered Rate Calculation				Projected Volume Revenue
		Total COS	Base Charge Recovery	Volume Charge Allocation	Upper Limit of Tier (Kgal)	Tier Differential	% Use in Tier	Distribution of Usage	Volume Rates	
<i>Rounded</i>										
<u>Inside City</u>										
1	Single Family	\$30,521,686	\$11,295,888	\$19,225,798						
2	Tier 1				10,000	1.00	64.8%	6,477,491	\$1.66	\$10,752,635
3	Tier 2				20,000	1.30	21.2%	2,123,719	\$2.16	\$4,579,019
4	Tier 3				60,000	1.64	12.7%	1,270,662	\$2.72	\$3,450,986
5	Tier 4				Over	2.04	1.3%	130,737	\$3.39	\$443,159
6	Total							10,002,609		\$19,225,798
7	Multi Family	\$3,828,492	\$566,906	\$3,261,586						
8	Tier 1				10,000	1.00	6.8%	107,764	\$0.91	\$98,065
9	Tier 2				20,000	1.23	5.6%	88,243	\$1.12	\$98,761
10	Tier 3				40,000	1.69	8.1%	128,374	\$1.54	\$197,386
11	Tier 4				Over	2.54	79.5%	1,255,987	\$2.31	\$2,903,351
12	Total							1,580,367		\$3,297,563
13	Non-Residential	\$5,716,086	\$812,093	\$4,903,994		1.00	100.0%	2,070,706	\$2.37	\$4,907,574
14	Industrial	\$11,739,671	\$80,823	\$11,658,848		1.00	100.0%	4,939,219	\$2.37	\$11,705,950
15	Landscape	\$9,407,605	\$527,268	\$8,880,337		1.00	100.0%	2,883,251	\$3.08	\$8,880,412
16	Inside City Subtotal	\$61,213,541	\$13,282,978	\$47,930,563						\$48,017,297
<u>Outside City</u>										
17	Single Family	\$611,583	\$169,864	\$441,719						
18	Tier 1				10,000	1.00	50.9%	74,340	\$2.32	\$172,765
19	Tier 2				20,000	1.30	19.7%	28,827	\$3.02	\$87,016
20	Tier 3				60,000	1.64	23.2%	33,967	\$3.80	\$129,153
21	Tier 4				Over	2.04	6.2%	9,044	\$4.75	\$42,917
22	Total							146,178		\$431,852
23	Multi Family	\$372	\$245	\$127						
24	Tier 1				10,000	1.00	65.3%	64	\$1.27	\$81
25	Tier 2				20,000	1.23	34.7%	34	\$1.57	\$53
26	Tier 3				40,000	1.69	0.0%	0	\$2.15	\$0
27	Tier 4				Over	2.54	0.0%	0	\$3.24	\$0
28	Total							98		\$135
29	Non-Residential	\$86,366	\$13,927	\$72,439		1.00	100.0%	22,833	\$3.32	\$75,760
30	Landscape	\$36,512	\$4,137	\$32,375		1.00	100.0%	7,936	\$4.31	\$34,220
31	Outside City Subtotal	\$734,833	\$188,173	\$546,661						\$541,967
32	Total System	\$61,948,374	\$13,471,151	\$48,477,224						\$48,559,264

Table A-36
City of Chandler
2020 Water Utility COS Study
5-Year Transition to 100% Cost of Service Rates
Test Year FY 2025-26

Proposed Inside City Rates (100% Cost of Service)						
	Existing	Proposed				
	FY 2020 - 21	FY 2021 - 22	FY 2022 - 23	FY 2023 - 24	FY 2024 - 25	FY 2025 - 26
	\$	\$	\$	\$	\$	\$
Base Charge, \$ per bill						
<u>Meter Size</u>						
5/8" x 3/4"	9.07	9.26	9.26	9.49	9.49	9.72
3/4"	10.35	10.56	10.56	10.83	10.83	11.09
1"	13.22	13.49	13.49	13.83	13.83	14.17
1 1/2"	20.82	21.24	21.24	21.77	21.77	22.31
2"	29.31	29.90	29.90	30.65	30.65	31.41
3"	61.79	63.03	63.03	64.61	64.61	66.22
4"	87.19	88.94	88.94	91.16	91.16	93.44
6"	165.56	168.88	168.88	173.10	173.10	177.42
8"	250.83	255.85	255.85	262.25	262.25	268.80
10"	427.38	435.93	435.93	446.83	446.83	458.00
12"	603.95	616.03	616.03	631.43	631.43	647.22
<i>Annual Increase</i>		2.1%	0.0%	2.5%	0.0%	2.4%
Volume Rate, \$ per 1,000 gallons						
Single Family Residential Inside						
<i>First 10 Kgal</i>	1.60	1.62	1.62	1.64	1.64	1.66
<i>Next 10 Kgal</i>	2.08	2.11	2.11	2.14	2.14	2.16
<i>Next 40 Kgal</i>	2.62	2.65	2.65	2.69	2.69	2.72
<i>Over 60 Kgal</i>	3.27	3.31	3.31	3.35	3.35	3.39
Multi-Family Residential Inside						
<i>First 10 Kgal</i>	0.87	0.89	0.89	0.90	0.90	0.91
<i>Next 10 Kgal</i>	1.07	1.09	1.09	1.11	1.11	1.12
<i>Next 20 Kgal</i>	1.47	1.49	1.49	1.52	1.52	1.54
<i>Over 40 Kgal</i>	2.21	2.25	2.25	2.28	2.28	2.32
Non-Residential	2.11	2.19	2.19	2.28	2.28	2.37
Landscape	2.55	2.70	2.70	2.89	2.89	3.08
Industrial	2.08	2.17	2.17	2.27	2.27	2.37

Table A-37
City of Chandler
2015 Water Utility COS Study
Proposed Transition Rates
Test Year FY 2025-26

<i>Outside City Differential</i>	<i>1.40</i>
----------------------------------	-------------

Proposed Outside City Rates Schedule						
	Existing	Proposed				
	FY 2020 - 21	FY 2021 - 22	FY 2022 - 23	FY 2023 - 24	FY 2024 - 25	FY 2025 - 26
	\$	\$	\$	\$	\$	\$
Base Charge, \$ per bill						
<u>Meter Size</u>						
5/8" x 3/4"	12.70	12.97	12.97	13.29	13.29	13.61
3/4"	14.49	14.79	14.79	15.17	15.17	15.53
1"	18.51	18.89	18.89	19.37	19.37	19.84
1 1/2"	29.15	29.74	29.74	30.48	30.48	31.24
2"	41.04	41.86	41.86	42.91	42.91	43.98
3"	86.51	88.25	88.25	90.46	90.46	92.71
4"	122.07	124.52	124.52	127.63	127.63	130.82
6"	231.79	236.44	236.44	242.34	242.34	248.39
8"	351.17	358.19	358.19	367.15	367.15	376.32
10"	598.34	610.31	610.31	625.57	625.57	641.20
12"	845.53	862.45	862.45	884.01	884.01	906.11
Volume Rate, \$ per 1,000 gallons						
Single Family Residential Inside						
<i>First 10 Kgal</i>	2.24	2.27	2.27	2.30	2.30	2.33
<i>Next 10 Kgal</i>	2.92	2.96	2.96	3.00	3.00	3.03
<i>Next 40 Kgal</i>	3.67	3.71	3.71	3.77	3.77	3.81
<i>Over 60 Kgal</i>	4.58	4.64	4.64	4.69	4.69	4.75
Multi-Family Residential Inside						
<i>First 10 Kgal</i>	1.22	1.25	1.25	1.26	1.26	1.28
<i>Next 10 Kgal</i>	1.50	1.53	1.53	1.56	1.56	1.57
<i>Next 20 Kgal</i>	2.06	2.09	2.09	2.13	2.13	2.16
<i>Over 40 Kgal</i>	3.10	3.15	3.15	3.20	3.20	3.25
Non-Residential	2.85	3.07	3.07	3.20	3.20	3.32
Landscape	3.39	3.78	3.78	4.05	4.05	4.32
Industrial	2.83	3.04	3.04	3.18	3.18	3.32

Table A-38
City of Chandler
2020 Water Utility COS Study
Increase to Reach 75% COS
Inside City and Outside City
Test Year FY 2025-26

Line No.	Customer Class	Cost of Service	COS Change from Existing Rates	Transition Adjustment to COS	Transition Adjustment to COS	Adjusted COS	Revenue Under Existing Rates	Required Change in Revenue	
		\$	\$	%	\$	\$	\$	\$	%
<u>Inside City</u>									
1	Single Family	\$30,521,686	\$911,199		\$980,437	\$31,502,123	\$29,610,487	\$1,891,636	6.39%
2	Multi Family	\$3,828,492	\$79,544		\$122,981	\$3,951,474	\$3,748,948	\$202,526	5.40%
3	Non-Residential	\$5,716,086	\$495,336		\$183,616	\$5,899,702	\$5,220,751	\$678,952	13.00%
4	Industrial	\$11,739,671	\$1,201,428	50%	(\$600,714)	\$11,138,957	\$10,538,243	\$600,714	5.70%
5	Landscape	\$9,407,605	\$1,419,850	50%	(\$709,925)	\$8,697,680	\$7,987,755	\$709,925	8.89%
Inside City Subtotal		\$61,213,541	\$4,107,358		(\$23,605)	\$61,189,936	\$57,106,183	\$4,083,753	7.15%
<u>Outside City</u>									
6	Single Family	\$611,583	\$25,758		\$19,646	\$631,229	\$585,825	\$45,404	7.75%
7	Multi Family	\$372	\$8		\$12	\$384	\$364	\$20	5.51%
8	Non-Residential	\$86,366	\$4,309		\$2,774	\$89,140	\$82,057	\$7,083	8.63%
9	Landscape	\$36,512	\$3,731		\$1,173	\$37,685	\$32,781	\$4,904	14.96%
10	Outside City Subtotal	\$734,833	\$33,806		\$23,605	\$758,438	\$701,027	\$57,411	8.2%
11	Total System	\$61,948,374	\$4,141,164		\$0	\$61,948,374	\$57,807,210	\$4,141,164	7.16%

Table A-39
City of Chandler
2020 Water Utility COS Study
FY 20-21 Outside City Rate Differential

Line No	Description	
1	Net Book Value of Water Assets [1]	\$330,222,602
2	Assumed Rate of Return on Rate Base Assets	6.00%
3	Rate of Return	\$19,813,356
4	Annual Depreciation [1]	\$17,194,951
5	O&M Rev Requirement	\$35,235,642
6	Total Utility Basis Revenue Requirement	\$72,243,949
7	Total Cash Basis Revenue Requirement	\$54,868,355
8	% Variance	
9	Calculated Outside City Water Multiplier	1.32
10	Current Outside City Water Multiplier	1.40
11	Water Outside City Multiplier to Use	1.40

[1] Source: City of Chandler FY19-20 Annual Report

APPENDIX B

Wastewater Utility Cost of Service and Rates

Table B-1
City of Chandler
2020 Wastewater Utility COS Study
Historical Bills & Projected Growth Table

Line No	Class	Historical Actual			FY17-18 Growth	FY18-19 Growth	2-Yr Avg	USE
		FY 2017 - 18	FY 2018 - 19	FY 2019 - 20				
<u>Inside City</u>								
1	Single Family Inside	900,616	908,724	915,846	0.90%	0.78%	0.84%	0.50%
2	Multi-Family Inside	9,820	9,887	9,961	0.68%	0.75%	0.72%	0.50%
3	Non-Residential Inside	27,962	28,809	29,118	3.03%	1.07%	2.05%	0.50%
4	Industrial [1]	690	633	629	-8.26%	-0.63%	-4.52%	0.50%
5	Inside City Subtotal	939,088	948,053	955,554	0.95%	0.79%	0.87%	
<u>Outside City</u>								
6	Single Family Outside	3,255	3,260	3,272	0.15%	0.37%	0.26%	0.50%
7	Multi-Family Outside	-	-	-	0.00%	0.00%	0.00%	0.50%
8	Non-Residential Outside	96	96	96	0.00%	0.00%	0.00%	0.50%
9	Outside City Subtotal	3,351	3,356	3,368	0.15%	0.36%	0.25%	
10	Total System	942,439	951,409	958,922	0.95%	0.79%	0.87%	

[1] Industrial is combined with the Non-Residential class for determine their cost of service and rates.

Table B-2
 City of Chandler
 2020 Wastewater Utility COS Study
 Historical Bills & Projected Growth Table

Line No	Class	Historical Actual			Projected					
		FY 2017 - 18	FY 2018 - 19	FY 2019 - 20	FY 2020 - 21	FY 2021 - 22	FY 2022 - 23	FY 2023 - 24	FY 2024 - 25	FY 2025 - 26
<u>Inside City</u>										
1	Single Family Inside		0.90%	0.78%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
2	Multi-Family Inside		0.68%	0.75%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
3	Non-Residential Inside		3.03%	1.07%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
4	Industrial [1]		-8.26%	-0.63%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
<u>Outside City</u>										
5	Single Family Outside		0.15%	0.37%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
6	Multi-Family Outside		0.00%	0.00%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
7	Non-Residential Outside		0.00%	0.00%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%

[1] Industrial is combined with the Non-Residential class for determine their cost of service and rates.

Table B-3
City of Chandler
2020 Wastewater Utility COS Study
Wastewater Rate Revenue Requirement Summary
Test Year FY 2025-26

Line No	Description	Forecast FY 2021 - 22	Forecast FY 2022 - 23	Forecast FY 2023 - 24	Forecast FY 2024 - 25	Forecast FY 2025 - 26
<u>Uses of Funds</u>						
1	O&M Expense	\$23,052,563	\$24,400,971	\$24,991,856	\$25,872,919	\$26,695,857
Capital Projects						
2	Total CIP Cash Outlay	81,497,925	12,558,239	9,712,504	18,047,791	32,969,952
3	Bond Financed CIP Adjustment	(6,124,222)	0	0	(1,933,750)	(10,721,250)
4	SDF / Other Financed CIP Adjustment	(16,600)	0	0	0	0
5	Reclaimed CIP Repayment	0	0	0	0	0
6	Rate Financed Capital	75,357,103	12,558,239	9,712,504	16,114,041	22,248,702
7	Annual Debt Service	18,751,331	18,357,196	18,574,945	18,672,904	18,011,422
8	Change in Cash	(60,903,116)	(9,009,789)	(2,965,052)	4,687,838	(2,930,559)
9	Gross Rate Revenue Requirement	56,257,881	46,306,617	50,314,253	65,347,703	64,025,422
Non-Rate Revenue Offsets						
10	Interest	1,408,000	700,000	700,000	700,000	700,000
11	All Other Sources of Non-Rate Revenue	8,179,462	1,013,743	1,049,224	11,585,947	8,387,465
12	Total Non-Rate Revenue Offsets	9,587,462	1,713,743	1,749,224	12,285,947	9,087,465
13	Net Revenue Requirement from Rates	\$46,670,419	\$44,592,874	\$48,565,029	\$53,061,756	\$54,937,957
14	Wastewater Rate Increase - %	4.0%	0.0%	6.0%	0.0%	6.0%
15	Cumulative Wastewater Rate Increase - %	4.00%	4.00%	10.24%	10.24%	16.8544%
Reconciliation to City of Chandler Financial Plan						
16	Net Revenue Requirement from Rates	\$46,670,419	\$44,592,874	\$48,565,029	\$53,061,756	\$54,937,957
17	OMG Reclaimed Revenue Reallocation	0	0	0	0	0
18	Shift to RW	0	1,310,250	1,325,116	1,354,699	1,391,236
19	Reclaimed CIP Repayment	0	0	0	0	0
20	Total	\$46,670,419	\$45,903,124	\$49,890,145	\$54,416,455	\$56,329,193
21	City of Chandler Rate Revenue Requirement	46,670,419	45,903,124	49,890,145	54,416,455	56,329,193
22	Difference	\$0	\$0	\$0	\$0	\$0
23	Annualized Cost of Service	\$47,585,525	\$45,826,310	\$51,359,133	\$54,720,819	\$58,294,088

Table B-4
City of Chandler
2020 Wastewater Utility COS Study
Historical & Projected water Use Per Bill (Before Return Factors)

Line No	Class	Historical Actual			2-Yr Avg	3-Yr Avg	USE
		FY 2017 - 18	FY 2018 - 19	FY 2019 - 20			
<u>Inside City</u>							
1	Single Family Inside	10.89	10.44	10.48	10.46	10.60	10.46
2	Multi-Family Inside	126.89	130.05	133.11	131.58	130.02	131.58
3	Non-Residential Inside	65.74	67.20	64.30	65.75	65.75	65.75
4	Industrial [1]	5,472.13	6,250.76	7,243.77	6,747.26	6,322.22	6,747.26
<u>Outside City</u>							
5	Single Family Outside	13.44	12.99	13.47	13.23	13.30	13.23
6	Multi-Family Outside	-	-	-	-	-	-
7	Non-Residential Outside	19.30	17.77	18.74	18.26	18.60	18.26

[1] Industrial is combined with the Non-Residential class to determine their cost of service and rates.

Table B-5
City of Chandler
2020 Wastewater Utility COS Study
Historical & Projected Use Per Bill Table 2

Line No	Class	Historical Actual			Projected					
		FY 2017 - 18	FY 2018 - 19	FY 2019 - 20	FY 2020 - 21	FY 2021 - 22	FY 2022 - 23	FY 2023 - 24	FY 2024 - 25	FY 2025 - 26
<u>Inside City</u>										
1	Single Family Inside	10.89	10.44	10.48	10.46	10.46	10.46	10.46	10.46	10.46
2	Multi-Family Inside	126.89	130.05	133.11	131.58	131.58	131.58	131.58	131.58	131.58
3	Non-Residential Inside	65.74	67.20	64.30	65.75	65.75	65.75	65.75	65.75	65.75
4	Industrial [1]	5,472.13	6,250.76	7,243.77	4,744.91	3,886.76	4,916.54	6,175.16	6,175.16	6,175.16
<u>Outside City</u>										
5	Single Family Outside	13.44	12.99	13.47	13.23	13.23	13.23	13.23	13.23	13.23
6	Multi-Family Outside	-	-	-	-	-	-	-	-	-
7	Non-Residential Outside	19.30	17.77	18.74	18.26	18.26	18.26	18.26	18.26	18.26

[1] Industrial is combined with the Non-Residential class for calculating their cost of service and rates.

Table B-6
City of Chandler
2020 Wastewater Utility COS Study
Projected Bills

Line No	Class	Historical Actual			Projected					
		FY 2017 - 18	FY 2018 - 19	FY 2019 - 20	FY 2020 - 21	FY 2021 - 22	FY 2022 - 23	FY 2023 - 24	FY 2024 - 25	FY 2025 - 26
<u>Inside City</u>										
1	Single Family Inside	900,616	908,724	915,846	920,425	925,027	929,652	934,301	938,972	943,667
2	Multi-Family Inside	9,820	9,887	9,961	10,011	10,061	10,111	10,162	10,213	10,264
3	Non-Residential Inside	27,962	28,809	29,118	29,264	29,410	29,557	29,705	29,853	30,003
4	Industrial [1]	690	633	629	632	635	638	642	645	648
5	Inside City Subtotal	939,088	948,053	955,554	960,332	965,133	969,959	974,809	979,683	984,581
<u>Outside City</u>										
6	Single Family Outside	3,255	3,260	3,272	3,288	3,305	3,321	3,338	3,355	3,371
7	Multi-Family Outside	-	-	-	-	-	-	-	-	-
8	Non-Residential Outside	96	96	96	96	97	97	98	98	99
9	Outside City Subtotal	3,351	3,356	3,368	3,385	3,402	3,419	3,436	3,453	3,470
10	Total System	942,439	951,409	958,922	963,717	968,535	973,378	978,245	983,136	988,052

[1] Industrial is combined with the Non-Residential class for calculating their cost of service and rates.

Table B-7
City of Chandler
2020 Wastewater Utility COS Study
Projected Volume Adjusted for Return to Sewer Factors

Line No	Class	Return Factor	Historical Actual			Projected					
			FY 2017 - 18	FY 2018 - 19	FY 2019 - 20	FY 2020 - 21	FY 2021 - 22	FY 2022 - 23	FY 2023 - 24	FY 2024 - 25	FY 2025 - 26
<u>Inside City</u>											
1	Single Family Inside	47.40%	4,648,758	4,496,420	4,550,500	4,563,786	4,586,605	4,609,538	4,632,585	4,655,748	4,679,027
2	Multi-Family Inside	69.28%	863,275	890,843	918,569	912,580	917,143	921,729	926,337	930,969	935,624
3	Non-Residential Inside	84.97%	1,561,910	1,645,039	1,590,833	1,634,892	1,643,066	1,651,282	1,659,538	1,667,836	1,676,175
4	Industrial	100.00%	3,775,773	3,956,731	4,556,329	2,999,472	2,469,282	3,139,125	3,962,446	3,982,258	4,002,169
5	Inside City Subtotal		10,849,715	10,989,033	11,616,232	10,110,730	9,616,096	10,321,673	11,180,906	11,236,811	11,292,995
<u>Outside City</u>											
6	Single Family Outside	47.40%	20,730	20,081	20,884	20,622	20,725	20,829	20,933	21,037	21,143
7	Multi-Family Outside	69.28%	0	0	0	0	0	0	0	0	0
8	Non-Residential Outside	84.97%	1,574	1,450	1,529	1,497	1,504	1,512	1,519	1,527	1,534
9	Outside City Subtotal		22,305	21,530	22,412	22,118	22,229	22,340	22,452	22,564	22,677
10	Total System		10,872,020	11,010,563	11,638,644	10,132,848	9,638,325	10,344,013	11,203,358	11,259,375	11,315,672

[1] Industrial is combined with the Non-Residential class for calculating their cost of service and rates.

Table B-8
City of Chandler
2020 Wastewater Utility COS Study
Projected Total Revenue @ Existing Rates

Line No	Class	Historical Actual			Projected					
		FY 2017 - 18	FY 2018 - 19	FY 2019 - 20	FY 2020 - 21	FY 2021 - 22	FY 2022 - 23	FY 2023 - 24	FY 2024 - 25	FY 2025 - 26
<u>Inside City</u>										
1	Single Family Inside	24,604,829	24,352,722	24,023,202	24,111,116	26,193,281	23,984,432	23,920,882	25,486,611	25,614,044
2	Multi-Family Inside	3,047,181	3,009,443	2,967,682	2,978,543	3,235,761	2,962,893	2,955,042	3,148,463	3,164,205
3	Non-Residential Inside	6,629,241	6,844,057	6,487,453	6,653,385	7,227,952	6,618,427	6,600,891	7,032,949	7,068,113
4	Industrial	13,182,726	13,550,304	15,272,131	10,041,971	8,937,079	10,350,366	12,964,407	13,812,986	13,882,050
5	Inside City Subtotal	47,463,977	47,756,526	48,750,469	43,785,015	45,594,072	43,916,117	46,441,222	49,481,008	49,728,413
<u>Outside City</u>										
6	Single Family Outside	142,309	139,808	137,348	137,850	149,755	137,126	136,763	145,714	146,443
7	Multi-Family Outside	-	-	-	-	0	0	0	0	0
8	Non-Residential Outside	11,533	10,507	10,784	10,573	11,486	10,517	10,489	11,176	11,232
9	Outside City Subtotal	153,842	150,315	148,131	148,423	161,240	147,643	147,252	156,890	157,675
10	Total System	47,617,819	47,906,841	48,898,600	43,933,438	45,755,312	44,063,760	46,588,474	49,637,898	49,886,088

[1] Revenue at Existing Rates is based on the projected bills, volume applied against the FY 2020-21 rate structure.

Table B-9
City of Chandler
2020 Wastewater Utility COS Study
Estimated Return Flows to Water [1]
Reclamation Facilities
Test Year FY 2025-26

Line No	Customer Class	Billed Water Consumption from Water Peaking Factor Calculation(Excluding Landscape)												Winter Average	
		Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun		Total
	<i>Days in Month</i>	31	31	30	31	30	31	31	28	31	30	31	30		
1	Single Family	1,121,229	1,091,752	986,026	776,230	843,001	657,788	577,722	498,655	571,775	627,653	879,302	1,012,936	9,644,067	549,384
2	Multi Family (1)	126,867	127,647	112,718	100,522	115,203	113,643	105,834	94,805	97,598	98,726	113,231	119,072	1,325,864	99,412
	Non-Residential														
3	Medical	13,816	13,386	14,673	13,661	11,565	10,654	9,349	8,688	8,639	8,891	11,450	12,157	136,929	8,892
4	Commercial	172,889	178,066	161,322	135,996	131,335	132,470	122,767	110,072	115,905	91,919	112,888	136,206	1,601,835	116,248
5	Government	15,426	14,847	13,719	10,686	8,107	9,080	6,983	5,712	6,394	4,880	7,801	10,021	113,656	6,363
6	School	20,267	24,145	22,802	16,562	16,890	14,154	11,115	10,838	9,326	6,712	11,107	15,480	179,398	10,426
7	Industrial	62,880	70,630	69,149	55,639	54,998	45,825	52,341	49,678	49,922	54,707	61,061	61,058	687,888	50,647
8	Subtotal Non-Residential	285,278	301,074	281,665	232,544	222,895	212,183	202,555	184,988	190,186	167,109	204,307	234,922	2,719,706	192,576
9															
10															
11															
12															

[1] Continued on next page

[2] Performed analysis on sample of multi family accounts with a separate irrigation only meter to calculate average indoor use per account of 2,900 gallons / month. Multi family adjustment to winter average of 23.0% in chart above results in the average monthly use per multi family unit to 2,900 gallons.

Table B-9 (continued)

City of Chandler

2020 Wastewater Utility COS Study

Estimated Return Flows to Water

Reclamation Facilities

Test Year FY 2025-26

		Estimated Return Flows					
Line		Adj. to Winter	Adjusted	Total	% of	Billed	Final
No	Customer Class	Ave. for Outdoor	Winter	Indoor	Annual	WW	Estimated
		Irrigation in	Average	Returning to	Returning to	Volumes	Return
		Winter [2]	(Indoor)	to WRFs	to WRFs		Flow
<i>Days in Month</i>							
1	Single Family	30.66%	380,949	4,571,384	47.4%	9,644,067	4,571,384
2	Multi Family (1)	23.00%	76,547	918,569	69.3%	1,325,864	918,569
Non-Residential							
3	Medical	0.00%	8,892	106,704	77.9%		
4	Commercial	0.00%	116,248	1,394,976	87.1%		
5	Government	0.00%	6,363	76,356	67.2%		
6	School	0.00%	10,426	125,116	69.7%		
7	Industrial	0.00%		607,764	88.4%		
8	Subtotal Non-Residential		192,576	2,310,916	85.0%	1,874,043	1,592,362
9						Add Metered Non-Residential	4,556,329
10						Total Return Flow	11,638,644
11						Inflow Into WRFs	11,638,644
12						Difference	0

[1] Performed analysis on sample of multi family accounts with a separate irrigation only meter to calculate average indoor use per account of 2,900 gallons / month. Multi family adjustment to winter average of 23.0% in chart above results in the average monthly use per multi family unit to 2,900 gallons.

Table B-10
City of Chandler
2020 Wastewater Utility COS Study
Wastewater Existing Assets Replacement Cost

Line No	Asset Category	Unit	Existing Units	Unit Cost	Replacement Cost at 5/4/18	Additions through Test Year FY 2025 - 26	Replacement Cost at Test Year FY 2025 - 26
1	Treatment Plants	gallons/day			\$765,375,000	57,830,631	\$823,205,631
2	Lift Stations	gallons/day			\$78,671,000	0	\$78,671,000
3	18" Gravity Mains	linear feet	117,816	\$408.00	\$48,068,928	0	\$48,068,928
4	20" Gravity Mains	linear feet	35,896	\$442.00	\$15,866,032	0	\$15,866,032
5	21" Gravity Mains	linear feet	34,513	\$476.00	\$16,428,188	0	\$16,428,188
6	24" Gravity Mains	linear feet	87,864	\$544.00	\$47,798,016	0	\$47,798,016
7	27" Gravity Mains	linear feet	54,978	\$612.00	\$33,646,536	0	\$33,646,536
8	28" Gravity Mains	linear feet	16,195	\$646.00	\$10,461,970	0	\$10,461,970
9	30" Gravity Mains	linear feet	66,166	\$680.00	\$44,992,880	0	\$44,992,880
10	33" Gravity Mains	linear feet	7,326	\$748.00	\$5,479,848	0	\$5,479,848
11	36" Gravity Mains	linear feet	16,230	\$816.00	\$13,243,680	0	\$13,243,680
12	39" Gravity Mains	linear feet	5,285	\$885.00	\$4,677,225	0	\$4,677,225
13	42" Gravity Mains	linear feet	38,553	\$953.00	\$36,741,009	0	\$36,741,009
14	48" Gravity Mains	linear feet	20,738	\$1,066.00	\$22,106,708	0	\$22,106,708
15	60" Gravity Mains	linear feet	220	\$1,361.00	\$299,420	0	\$299,420
16	66" Gravity Mains	linear feet	14,207	\$1,497.00	\$21,267,879	0	\$21,267,879
17	12 - 42" Force Mains				\$55,717,268	0	\$55,717,268
18	3" Collection Mains	linear feet	149	\$68.00	\$10,156	483	\$10,639
19	4" Collection Mains	linear feet	27,138	\$90.67	\$2,460,473	116,947	\$2,577,420
20	6" Collection Mains	linear feet	55,598	\$136.00	\$7,561,328	359,391	\$7,920,719
21	8" Collection Mains	linear feet	3,639,291	\$181.33	\$659,924,768	31,366,321	\$691,291,089
22	10" Collection Mains	linear feet	250,322	\$226.67	\$56,739,653	2,696,844	\$59,436,497
23	12" Collection Mains	linear feet	382,440	\$272.00	\$104,023,680	4,944,261	\$108,967,941
24	15" Collection Mains	linear feet	120,832	\$340.00	\$41,082,880	1,952,675	\$43,035,555
25	16" Collection Mains	linear feet	8,042	\$374.00	\$3,007,708	142,957	\$3,150,665
26	Administration	Dollars	-	\$0.00	\$0	72,926	\$72,926
27	Land				\$13,609,524	0	\$13,609,524
28	Total				\$2,109,261,758	\$99,483,436	\$2,208,745,194

Table B-11
City of Chandler
2020 Wastewater Utility COS Study
Wastewater Asset Functionalization - %

Line No	Asset Category	Flow	BOD	TSS	Unused	Unused	Customer Charges	Total
1	Treatment Plants	50.0%	25.0%	25.0%				100.0%
2	Lift Stations	100.0%						100.0%
3	18" Gravity Mains	100.0%						100.0%
4	20" Gravity Mains	100.0%						100.0%
5	21" Gravity Mains	100.0%						100.0%
6	24" Gravity Mains	100.0%						100.0%
7	27" Gravity Mains	100.0%						100.0%
8	28" Gravity Mains	100.0%						100.0%
9	30" Gravity Mains	100.0%						100.0%
10	33" Gravity Mains	100.0%						100.0%
11	36" Gravity Mains	100.0%						100.0%
12	39" Gravity Mains	100.0%						100.0%
13	42" Gravity Mains	100.0%						100.0%
14	48" Gravity Mains	100.0%						100.0%
15	60" Gravity Mains	100.0%						100.0%
16	66" Gravity Mains	100.0%						100.0%
17	12 - 42" Force Mains	100.0%						100.0%
18	3" Collection Mains	100.0%						100.0%
19	4" Collection Mains	100.0%						100.0%
20	6" Collection Mains	100.0%						100.0%
21	8" Collection Mains	100.0%						100.0%
22	10" Collection Mains	100.0%						100.0%
23	12" Collection Mains	100.0%						100.0%
24	15" Collection Mains	100.0%						100.0%
25	16" Collection Mains	100.0%						100.0%
26	Administration						100.0%	100.0%
27	Land	50.0%	25.0%	25.0%				100.0%

Table B-12
City of Chandler
2020 Wastewater Utility COS Study
Wastewater Asset Functionalization - \$

Line No	Asset Category	Replacement Cost at Test Year				Unused	Unused	Customer Charges
		FY 2025 - 26	Flow	BOD	TSS			
		\$	\$	\$	\$	\$	\$	
1	Treatment Plants	823,205,631	411,602,816	205,801,408	205,801,408	0	0	\$0
2	Lift Stations	78,671,000	78,671,000	0	0	0	0	0
3	18" Gravity Mains	48,068,928	48,068,928	0	0	0	0	0
4	20" Gravity Mains	15,866,032	15,866,032	0	0	0	0	0
5	21" Gravity Mains	16,428,188	16,428,188	0	0	0	0	0
6	24" Gravity Mains	47,798,016	47,798,016	0	0	0	0	0
7	27" Gravity Mains	33,646,536	33,646,536	0	0	0	0	0
8	28" Gravity Mains	10,461,970	10,461,970	0	0	0	0	0
9	30" Gravity Mains	44,992,880	44,992,880	0	0	0	0	0
10	33" Gravity Mains	5,479,848	5,479,848	0	0	0	0	0
11	36" Gravity Mains	13,243,680	13,243,680	0	0	0	0	0
12	39" Gravity Mains	4,677,225	4,677,225	0	0	0	0	0
13	42" Gravity Mains	36,741,009	36,741,009	0	0	0	0	0
14	48" Gravity Mains	22,106,708	22,106,708	0	0	0	0	0
15	60" Gravity Mains	299,420	299,420	0	0	0	0	0
16	66" Gravity Mains	21,267,879	21,267,879	0	0	0	0	0
17	12 - 42" Force Mains	55,717,268	55,717,268	0	0	0	0	0
18	3" Collection Mains	10,639	10,639	0	0	0	0	0
19	4" Collection Mains	2,577,420	2,577,420	0	0	0	0	0
20	6" Collection Mains	7,920,719	7,920,719	0	0	0	0	0
21	8" Collection Mains	691,291,089	691,291,089	0	0	0	0	0
22	10" Collection Mains	59,436,497	59,436,497	0	0	0	0	0
23	12" Collection Mains	108,967,941	108,967,941	0	0	0	0	0
24	15" Collection Mains	43,035,555	43,035,555	0	0	0	0	0
25	16" Collection Mains	3,150,665	3,150,665	0	0	0	0	0
26	Administration	72,926	0	0	0	0	0	72,926
27	Land	13,609,524	6,804,762	3,402,381	3,402,381	0	0	0
28	Total Asset Replacement Cost by Function	2,208,745,194	1,790,264,690	209,203,789	209,203,789	0	0	72,926
29	Capital Cost Allocation Factors	100.0%	81.1%	9.5%	9.5%	0.0%	0.0%	0.0%

Table B-13
City of Chandler
2020 Wastewater Utility COS Study
Wastewater Capital Cost Revenue Requirement

Line No	Cost Component	Revenue Requirement FY 2025 - 26	Flow	BOD	TSS	Unused	Unused	Customer Charges
1	Capital Asset Percentage Allocations	100.0%	81.1%	9.5%	9.5%	0.0%	0.0%	0.003%
<u>Capital Related Revenue Requirements</u>								
2	Rate Financed Capital	\$22,248,702	\$18,033,346	\$2,107,311	\$2,107,311	\$0	\$0	\$735
3	Annual Debt Service	18,011,422	14,598,883	1,705,972	1,705,972	0	0	595
4	Annual Surplus (Deficit)	(1,539,323)	(1,247,675)	(145,799)	(145,799)	0	0	(51)
5	Total Capital Cost Revenue Requirement	\$38,720,801	\$31,384,554	\$3,667,484	\$3,667,484	\$0	\$0	\$1,278

Table B-14
City of Chandler
2020 Wastewater Utility COS Study
Account Descriptions

Line No	Acct #	Acct Name	Description
1	3050	Administration	Administration related expenses.
2	3900	Collection	
3	3910	Wastewater Capital	Capital costs.
4	3940	Treatment	
5	3950	Quality	
6	3960	Airport Water Reclamation Facility	
7	3970	Ocotillo Water Reclamation	

Table B-15
City of Chandler
2020 Wastewater Utility COS Study
Wastewater O&M Functionalization - FY 2021 - 22 Budgeted O&M by Department / Cost Center

Line No	Description	Administration 3050	Collection 3900	Wastewater Capital 3910	Treatment 3940	Quality 3950	Airport Water Reclamation Facility 3960	Ocotillo Water Reclamation 3970	Total
1	5100 - Personnel Services	172,850	907,292		152,713	443,732	2,696,649	2,205,203	6,578,439
2	5200 - Professional/Contract Services	7,800	1,316,844		298,020	63,562	1,187,122	1,242,916	4,116,264
3	5300 - Operating Supplies (less chemicals)	12,520	281,181		119,531	64,255	575,508	532,060	1,585,055
4	5318 - Chemicals	0	53,751		297,074	5,500	722,631	742,160	1,821,116
5	5400 - Repairs & Maintenance	0	38,278		31,200	0	378,115	130,350	577,943
6	5500 - Communication/Transportation	1,044	16,444		3,070	4,253	14,976	21,310	61,097
7	5600 - Insurance/Taxes	0	1,500		500	500	1,000	1,000	4,500
8	5700 - Rents & Utilities (less utilities)	0	0		58,050	0	1,980	5,500	65,530
9	5716 - Utilities	0	198,505		408,018	0	2,186,969	1,806,500	4,599,992
10	5800 - Other Charges & Services	446	31,069		4,185	8,680	56,872	52,540	153,792
11	5900 - Contingency/Reserves	0	10,000		10,400	79,000	1,000,000	500,000	1,599,400
12	6200 - Building/Improvements	0	0		0	0	0	0	0
13	6300 - Machinery & Equipment	0	0		28,000	0	87,172	25,000	140,172
14	6400 - Office Furniture & Equipment	0	0		0	0	0	0	0
15	6700 - Water System Improvements	0	0		0	0	0	0	0
16	8403/8404 - Capital Replacement	0	43,539		2,292	10,838	22,072	27,669	106,410
17	Intel Expansion Expenses								0
18	8400 - Transfers								0
19	Indirect Cost Allocations	589,968	213,233	525,131	57,105	75,079	537,260	474,920	2,472,696
20	Total	784,628	3,111,636	525,131	1,470,158	755,399	9,468,326	7,767,128	23,882,406

Table B-16
City of Chandler
2020 Wastewater Utility COS Study
Wastewater O&M Functionalization - % by Department / Cost Center

Line No	Description	Administration 3050	Collection 3900	Wastewater Capital 3910	Treatment 3940	Quality 3950	Airport Water Reclamation Facility 3960	Ocotillo Water Reclamation 3970	Total
1	5100 - Personnel Services	2.6%	13.8%	0.0%	2.3%	6.7%	41.0%	33.5%	100.0%
2	5200 - Professional/Contract Services	0.2%	32.0%	0.0%	7.2%	1.5%	28.8%	30.2%	100.0%
3	5300 - Operating Supplies (less chemicals)	0.8%	17.7%	0.0%	7.5%	4.1%	36.3%	33.6%	100.0%
4	5318 - Chemicals	0.0%	3.0%	0.0%	16.3%	0.3%	39.7%	40.8%	100.0%
5	5400 - Repairs & Maintenance	0.0%	6.6%	0.0%	5.4%	0.0%	65.4%	22.6%	100.0%
6	5500 - Communication/Transportation	1.7%	26.9%	0.0%	5.0%	7.0%	24.5%	34.9%	100.0%
7	5600 - Insurance/Taxes	0.0%	33.3%	0.0%	11.1%	11.1%	22.2%	22.2%	100.0%
8	5700 - Rents & Utilities (less utilities)	0.0%	0.0%	0.0%	88.6%	0.0%	3.0%	8.4%	100.0%
9	5716 - Utilities	0.0%	4.3%	0.0%	8.9%	0.0%	47.5%	39.3%	100.0%
10	5800 - Other Charges & Services	0.3%	20.2%	0.0%	2.7%	5.6%	37.0%	34.2%	100.0%
11	5900 - Contingency/Reserves	0.0%	0.6%	0.0%	0.7%	4.9%	62.5%	31.3%	100.0%
12	6200 - Building/Improvements	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
13	6300 - Machinery & Equipment	0.0%	0.0%	0.0%	20.0%	0.0%	62.2%	17.8%	100.0%
14	6400 - Office Furniture & Equipment	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
15	6700 - Water System Improvements	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
16	8403/8404 - Capital Replacement	0.0%	40.9%	0.0%	2.2%	10.2%	20.7%	26.0%	100.0%
17	Intel Expansion Expenses	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
18	8400 - Transfers	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
19	Indirect Cost Allocations	23.9%	8.6%	21.2%	2.3%	3.0%	21.7%	19.2%	100.0%

Table B-18
City of Chandler
2020 Wastewater Utility COS Study
Test Year Wastewater O&M Expense Cost Allocation

Line No	Cost Center	Description	Test Year					Unused	Unused	Customer Charges	Total
			FY 2025 - 26 O&M Expense	Flow	BOD	TSS					
1	5100 - Personnel Services		\$8,312,579	52.2%	22.6%	22.6%	0.0%	0.0%	2.6%	100.0%	
2	5200 - Professional/Contract Services		4,441,641	65.1%	17.3%	17.3%	0.0%	0.0%	0.2%	100.0%	
3	5300 - Operating Supplies (less chemicals)		1,465,960	56.4%	21.4%	21.4%	0.0%	0.0%	0.8%	100.0%	
4	5318 - Chemicals		2,206,764	51.3%	24.3%	24.3%	0.0%	0.0%	0.0%	100.0%	
5	5400 - Repairs & Maintenance		617,934	53.3%	23.3%	23.3%	0.0%	0.0%	0.0%	100.0%	
6	5500 - Communication/Transportation		65,092	59.1%	19.6%	19.6%	0.0%	0.0%	1.7%	100.0%	
7	5600 - Insurance/Taxes		4,730	61.1%	19.4%	19.4%	0.0%	0.0%	0.0%	100.0%	
8	5700 - Rents & Utilities (less utilities)		337,111	50.0%	25.0%	25.0%	0.0%	0.0%	0.0%	100.0%	
9	5716 - Utilities		5,713,332	52.2%	23.9%	23.9%	0.0%	0.0%	0.0%	100.0%	
10	5800 - Other Charges & Services		163,943	57.1%	21.3%	21.3%	0.0%	0.0%	0.3%	100.0%	
11	5900 - Contingency/Reserves		1,599,400	47.8%	26.1%	26.1%	0.0%	0.0%	0.0%	100.0%	
12	6200 - Building/Improvements		0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
13	6300 - Machinery & Equipment		160,805	50.0%	25.0%	25.0%	0.0%	0.0%	0.0%	100.0%	
14	6400 - Office Furniture & Equipment		0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
15	6700 - Water System Improvements		0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
16	Indirect Cost Allocations		2,701,806	47.5%	14.3%	14.3%	0.0%	0.0%	23.9%	100.0%	
17	Subtotal Primary Allocations		\$27,791,096	\$14,933,684	\$5,986,381	\$5,986,381	\$0	\$0	\$884,650	\$27,791,096	
18	Subtotal - %			53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%	
19	8403/8404 - Capital Replacement		100,580	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%	
20	Intel Expansion Expenses		0	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%	
21	Intel Impacts Increase/Decrease Estimates		0	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%	
22	COVID-19 Adjustment		0	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%	
23	Estimated Underspending		(2,500,000)	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%	
24	1290		555,200	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%	
25	1290 Operating Encumbrance Carryforward (5922)		0	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%	
26	Bad Debt Expense (46%)		285,000	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%	
27	Environmental Position - Transfer to Fund 738		26,192	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%	
28	Transfers to Funds 736 - Safety Analyst Position		21,987	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%	
29	Transfers to/from Funds 403		96,071	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%	
30	Additional Shift of O&M (to) / from Reclaimed Water Fund		(1,071,505)	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%	
31	Shift to RW		1,391,236	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%	
32	Expense Reallocation from Fund 612 - OMG Subsidy		0	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	
33	Total O&M Revenue Requirement		\$26,695,857	\$14,345,152	\$5,750,459	\$5,750,459	\$0	\$0	\$849,786	\$26,695,857	

Table B-19
City of Chandler
2020 Wastewater Utility COS Study
Test Year Wastewater O&M Expense Cost Allocation

Line No	Cost Center	Description	Test Year					Unused	Unused	Customer Charges
			FY 2025 - 26 O&M Expense	Flow	BOD	TSS				
1	5100 - Personnel Services		\$8,312,579	\$4,339,962	\$1,877,101	\$1,877,101	\$0	\$0	\$218,415	
2	5200 - Professional/Contract Services		4,441,641	2,892,787	770,219	770,219	0	0	8,417	
3	5300 - Operating Supplies (less chemicals)		1,465,960	827,504	313,438	313,438	0	0	11,579	
4	5318 - Chemicals		2,206,764	1,132,616	537,074	537,074	0	0	0	
5	5400 - Repairs & Maintenance		617,934	329,430	144,252	144,252	0	0	0	
6	5500 - Communication/Transportation		65,092	38,484	12,748	12,748	0	0	1,112	
7	5600 - Insurance/Taxes		4,730	2,890	920	920	0	0	0	
8	5700 - Rents & Utilities (less utilities)		337,111	168,556	84,278	84,278	0	0	0	
9	5716 - Utilities		5,713,332	2,979,941	1,366,696	1,366,696	0	0	0	
10	5800 - Other Charges & Services		163,943	93,667	34,900	34,900	0	0	475	
11	5900 - Contingency/Reserves		1,599,400	765,200	417,100	417,100	0	0	0	
12	6200 - Building/Improvements		0	0	0	0	0	0	0	
13	6300 - Machinery & Equipment		160,805	80,402	40,201	40,201	0	0	0	
14	6400 - Office Furniture & Equipment		0	0	0	0	0	0	0	
15	6700 - Water System Improvements		0	0	0	0	0	0	0	
16	Indirect Cost Allocations		2,701,806	1,282,245	387,455	387,455	0	0	644,651	
17	Subtotal Primary Allocations		\$27,791,096	\$14,933,684	\$5,986,381	\$5,986,381	\$0	\$0	\$884,650	
18	Subtotal - %		0.0%	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	
19	8403/8404 - Capital Replacement		\$100,580	\$54,047	\$21,666	\$21,666	\$0	\$0	\$3,202	
20	Intel Expansion Expenses		0	0	0	0	0	0	0	
21	Intel Impacts Increase/Decrease Estimates		0	0	0	0	0	0	0	
22	COVID-19 Adjustment		0	0	0	0	0	0	0	
23	Estimated Underspending		(2,500,000)	(1,343,388)	(538,516)	(538,516)	0	0	(79,580)	
24	1290		555,200	298,339	119,594	119,594	0	0	17,673	
25	1290 Operating Encumbrance Carryforward (5922)		0	0	0	0	0	0	0	
26	Bad Debt Expense (46%)		285,000	153,146	61,391	61,391	0	0	9,072	
27	Environmental Position - Transfer to Fund 738		26,192	14,074	5,642	5,642	0	0	834	
28	Transfers to Funds 736 - Safety Analyst Position		21,987	11,815	4,736	4,736	0	0	700	
29	Transfers to/from Funds 403		96,071	51,624	20,694	20,694	0	0	3,058	
30	Additional Shift of O&M (to) / from Reclaimed Water Fund		(1,071,505)	(575,779)	(230,809)	(230,809)	0	0	(34,108)	
31	Shift to RW		1,391,236	747,588	299,681	299,681	0	0	44,286	
32	Expense Reallocation from Fund 612 - OMG Subsidy		0	0	0	0	0	0	0	
33	Total O&M Revenue Requirement		\$26,695,857	\$14,345,152	\$5,750,459	\$5,750,459	\$0	\$0	\$849,786	

Table B-20
City of Chandler
2020 Wastewater Utility COS Study
Wastewater Non-Rate Revenue Offset Allocations - % [1]

Line No	Non-Rate Revenue Offsets	% of Total	Test Year FY 2025 - 26 Amount	Flow	BOD	TSS	Unused	Unused	Customer Charges	Total
1	4724 INDUSTRIAL USER ANALYSIS	2.3%	\$207,609	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%
2	4731 LATE FEE CHARGES - UTILIT	9.5%	859,256	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%
3	4736 MISC.CHARGES FOR SERV.-WW	0.0%	0	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%
4	Unused	0.0%	0	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%
5	Unused	0.0%	0	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%
6	Loan Repayment FROM Wastewater SDC Fund (614) - (FY04 loan of \$9.0M)	0.0%	0	81.1%	9.5%	9.5%	0.0%	0.0%	0.0%	100.0%
7	Loan Repayment FROM Reclaimed Water SDC Fund (610) - (FY09 loan of \$13.7M)	5.5%	500,000	81.1%	9.5%	9.5%	0.0%	0.0%	0.0%	100.0%
8	Loan Repayment FROM Wastewater SDC Fund (614) - (FY09 loan of \$38.1M)	16.5%	1,500,000	81.1%	9.5%	9.5%	0.0%	0.0%	0.0%	100.0%
9	Loan Repayment FROM Wastewater SDC Fund (614) - (FY09 loan of \$27.6M)	16.5%	1,500,000	81.1%	9.5%	9.5%	0.0%	0.0%	0.0%	100.0%
10	Loan Repayment FROM Wastewater SDC Fund (614) - (FY14 loan of \$12.1M)	16.5%	1,500,000	81.1%	9.5%	9.5%	0.0%	0.0%	0.0%	100.0%
11	Loan Repayment FROM Wastewater SDC Fund (614) - (FY16 loan of \$63.2M)	22.0%	2,000,000	81.1%	9.5%	9.5%	0.0%	0.0%	0.0%	100.0%
12	Loan Repayment FROM Reclaimed Water SDC Fund (610) - (FY07 loan of \$7.7M)	0.0%	0	81.1%	9.5%	9.5%	0.0%	0.0%	0.0%	100.0%
13	Lump Sum Agreement	0.0%	0	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%
14	Loan Repayment FROM Reclaimed Water SDC Fund (610) - (FY20 loan of \$3.0M)	3.3%	301,518	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%
15	Unused	0.0%	0	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%
16	Unused	0.0%	0	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%
17	Unused	0.0%	0	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%
18	Unused	0.0%	0	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%
19	Unused	0.0%	0	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%
20	Unused	0.0%	0	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%
21	Subtotal	92.1%	\$8,368,383	76.6%	11.4%	11.4%	0.0%	0.0%	0.5%	100.0%
	<u>Other Miscellaneous</u>									
22	Interest Earnings - Operating Fund	7.7%	\$700,000	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%
23	4491 - Svc Chg on NSF Chg	0.1%	8,515	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
24	4620 - Surplus Property Sales	0.1%	10,567	53.7%	21.5%	21.5%	0.0%	0.0%	3.2%	100.0%
25	Total Non-Rate Revenue Offsets	100.0%	\$9,087,465	74.7%	12.2%	12.2%	0.0%	0.0%	0.8%	100.0%

[1] Continued on next page.

Table B-20 (Continued)
City of Chandler
2020 Wastewater Utility COS Study
Wastewater Non-Rate Revenue Offset Allocations - \$

Line No	Non-Rate Revenue Offsets	% of Total	Test Year FY 2025 - 26 Amount	Flow	BOD	TSS	Unused	Unused	Customer Charges	Total
1	4724 INDUSTRIAL USER ANALYSIS	2.3%	\$207,609	\$111,559	\$44,720	\$44,720	\$0	\$0	\$6,609	\$207,609
2	4731 LATE FEE CHARGES - UTILIT	9.5%	859,256	461,726	185,089	185,089	0	0	27,352	859,256
3	4736 MISC.CHARGES FOR SERV.-WW	0.0%	0	0	0	0	0	0	0	0
4	Unused	0.0%	0	0	0	0	0	0	0	0
5	Unused	0.0%	0	0	0	0	0	0	0	0
6	Loan Repayment FROM Wastewater SDC Fund (614) - (FY04 loan of \$9.0M)	0.0%	0	0	0	0	0	0	0	0
7	Loan Repayment FROM Reclaimed Water SDC Fund (610) - (FY09 loan of \$13.7M)	5.5%	500,000	405,267	47,358	47,358	0	0	17	500,000
8	Loan Repayment FROM Wastewater SDC Fund (614) - (FY09 loan of \$38.1M)	16.5%	1,500,000	1,215,802	142,074	142,074	0	0	50	1,500,000
9	Loan Repayment FROM Wastewater SDC Fund (614) - (FY09 loan of \$27.6M)	16.5%	1,500,000	1,215,802	142,074	142,074	0	0	50	1,500,000
10	Loan Repayment FROM Wastewater SDC Fund (614) - (FY14 loan of \$12.1M)	16.5%	1,500,000	1,215,802	142,074	142,074	0	0	50	1,500,000
11	Loan Repayment FROM Wastewater SDC Fund (614) - (FY16 loan of \$63.2M)	22.0%	2,000,000	1,621,069	189,432	189,432	0	0	66	2,000,000
12	Loan Repayment FROM Reclaimed Water SDC Fund (610) - (FY07 loan of \$7.7M)	0.0%	0	0	0	0	0	0	0	0
13	Lump Sum Agreement	0.0%	0	0	0	0	0	0	0	0
14	Loan Repayment FROM Reclaimed Water SDC Fund (610) - (FY20 loan of \$3.0M)	3.3%	301,518	162,022	64,949	64,949	0	0	9,598	301,518
15	Unused	0.0%	0	0	0	0	0	0	0	0
16	Unused	0.0%	0	0	0	0	0	0	0	0
17	Unused	0.0%	0	0	0	0	0	0	0	0
18	Unused	0.0%	0	0	0	0	0	0	0	0
19	Unused	0.0%	0	0	0	0	0	0	0	0
19	Unused	0.0%	0	0	0	0	0	0	0	0
20	Subtotal	92.1%	\$8,368,383	\$6,409,051	\$957,771	\$957,771	\$0	\$0	\$43,790	\$8,368,383
<u>Other Miscellaneous</u>										
21	Interest Earnings - Operating Fund	7.7%	\$700,000	\$376,149	\$150,785	\$150,785	\$0	\$0	\$22,282	\$700,000
22	4491 - Svc Chg on NSF Chg	0.1%	8,515	0	0	0	0	0	8,515	8,515
23	4620 - Surplus Property Sales	0.1%	10,567	5,678	2,276	2,276	0	0	336	10,567
24	Total Non-Rate Revenue Offsets	100.0%	\$9,087,465	\$6,790,877	\$1,110,832	\$1,110,832	\$0	\$0	\$74,923	\$9,087,465

Table B-21
City of Chandler
2020 Wastewater Utility COS Study
Water Reclamation Facility Plant Balance Analysis

Line No	Customer Class	Estimated Billed Volumes (Kgal) FY19-20	Estimated Return % FY 2025 - 26	Estimated Return Flow (Kgal) FY19-20	Test Year (Kgal) FY 2025 - 26	BOD (Note 1)		TSS		Test Year (Kgal) FY 2025 - 26
						mg/L	Pounds	mg/L	Pounds	
1	Single Family Inside	9,600,009	47.40%	4,550,500	4,679,027	165.36	6,457	176.50	6,892	13,349
2	Single Family Outside	44,058	47.40%	20,884	21,143	165.36	29	176.50	31	60
3	Multi-Family Inside	1,325,864	69.28%	918,569	935,624	165.36	1,291	176.50	1,378	2,669
4	Multi-Family Outside	0	69.28%	0	0	165.36	0	176.50	0	0
5	Non-Residential Inside	1,872,244	84.97%	1,590,833	1,676,175	165.36	2,313	176.50	2,469	4,782
6	Non-Residential Outside	1,799	84.97%	1,529	1,534	165.36	2	176.50	2	4
7	Metered Non-Residential Inside (Sewer Meters)	4,556,329	100.00%	4,556,329	4,002,169	165.36	5,523	176.50	5,895	11,418
8	Total System Billed Volumes	17,400,303		11,638,644	11,315,672	165.36	15,616	176.50	16,668	32,284
				31,887	31,002					
9	Infiltration / Inflow	0	0%	0	0	15.00	0	15.00	0	0
10	Forecast Treatment Plant Influent	0		11,638,644	11,315,672	165.36	15,616	176.50	16,668	32,284
11	Difference (Estimated Influent vs. Actual Influent)			0	0					

Table B-22
City of Chandler
2020 Wastewater Utility COS Study
Unit Cost of Service
Test Year FY 2025-26

Line No	Customer Class	Total Rev. Req.	Volumetric			Customer Charges	Use Per Bill
			Flow	BOD	TSS		
			1,000 gal	lbs	lbs	Bills	
Single Family							
1	Total Units of Service		4,679,027	6,457	6,892	943,667	5.0
Multi-Family							
2	Total Units of Service		935,624	1,291	1,378	10,264	91.2
Non-Residential							
3	Total Units of Service		5,678,344	7,836	8,364	30,651	185.3
4	Total Inside City		11,292,995	15,585	16,634	984,581	
Single Family Outside							
Billed Volumes							
			21,143	29	31		
			Infiltration & Inflow Allocated on Volume	0	0	0	
			Infiltration & Inflow Allocated on Accounts	0	0	3,371	
5	Total Units of Service		21,143	29	31	3,371	6.3
Multi-Family Outside							
6	Total Units of Service		0	0	0	0	N/A
Non-Residential Outside							
7	Total Units of Service		1,534	2	2	99	15.5
8	Total Outside City		22,677	31	33	3,470	
9	Total System Units of Service		11,315,672	15,616	16,668	988,052	
			<i>check</i>	\$0	\$0	\$0	\$0
10	O&M Revenue Requirement	\$26,695,857	\$14,345,152	\$5,750,459	\$5,750,459	\$849,786	
11	Capital Revenue Requirement	38,720,801	31,384,554	3,667,484	3,667,484	1,278	
12	Less Non-Rate Revenue Requirement	(9,087,465)	(6,790,877)	(1,110,832)	(1,110,832)	(74,923)	
13	Incremental Change from Annualization	1,964,896	1,358,279	289,772	289,772	27,074	
14	Net Revenue Requirement	\$58,294,089	\$40,297,108	\$8,596,883	\$8,596,883	\$803,214	
15	Inside City Unit Cost of Service		\$3.5569	\$549.8627	\$515.1571	\$0.8112	
16	Outside City Unit Cost of Service		\$5.6910	\$879.7803	\$824.2513	\$1.2979	



Table B-23
City of Chandler
2020 Wastewater Utility COS Study
Distribution of Costs to Customer Classes
Test Year FY 2025-26

Line No	Customer Class	Metric	Total Rev. Req.	Volumetric			Unused	Customer Charges
				Flow	BOD	TSS		
1	Inside City Unit Cost of Service			\$3.5569	\$549.8627	\$515.1571	\$0.0000	\$0.8112
2	Outside City Unit Cost of Service			\$5.6910	\$879.7803	\$824.2513	\$0.0000	\$1.2979
Allocation to Customer Classes								
3	Single Family	Units of Service		4,679,027	6,457	6,892	0	943,667
4	Single Family	Revenue Requireme	\$24,509,430	\$16,642,831	\$3,550,540	\$3,550,540	\$0	\$765,520
5	Multi-Family	Units of Service		935,624	1,291	1,378	0	10,264
6	Multi-Family	Revenue Requireme	\$4,756,186	\$3,327,920	\$709,970	\$709,970	\$0	\$8,326
7	Non-Residential	Units of Service		5,678,344	7,836	8,364	0	30,651
8	Non-Residential	Revenue Requireme	\$28,839,849	\$20,197,302	\$4,308,841	\$4,308,841	\$0	\$24,864
9	Single Family Outside	Units of Service		21,143	29	31	0	3,371
10	Single Family Outside	Revenue Requireme	\$176,038	\$120,323	\$25,669	\$25,669	\$0	\$4,376
11	Multi-Family Outside	Units of Service		0	0	0	0	0
12	Multi-Family Outside	Revenue Requireme	\$0	\$0	\$0	\$0	\$0	\$0
13	Non-Residential Outside	Units of Service		1,534	2	2	0	99
14	Non-Residential Outside	Revenue Requireme	\$12,586	\$8,732	\$1,863	\$1,863	\$0	\$128
15	Total Units of Service			11,315,672	15,616	16,668	0	988,052
		<i>check</i>		0	0	0	0	0
16	Total System Revenue Requirement		\$58,294,089	\$40,297,108	\$8,596,883	\$8,596,883	\$0	\$803,214
		<i>check</i>	0	0	0	0	0	0

Table B-24
City of Chandler
2020 Wastewater Utility COS Study
Comparison of Cost of Service with Revenues Under Existing Rates
Increase to Reach 100% of COS
Test Year FY 2021-22

Line No	Rate Class	Cost of Service	Test Year Revenue @ Existing Rates	\$ Change	% Change
		\$	\$	\$	%
Inside City					
1	Single Family	\$22,942,174	\$26,193,281	(\$3,251,107)	-12.4%
2	Multi-Family	4,463,520	3,235,761	1,227,759	37.9%
3	Non-Residential	20,003,155	16,165,031	3,838,125	23.7%
Outside City					
4	Single Family	164,873	149,755	15,118	10.1%
5	Multi-Family	0	0	0	
6	Non-Residential	11,803	11,486	317	2.8%
7	Total	\$47,585,525	\$45,755,312	\$1,830,213	4.0%

Table B-25
City of Chandler
2020 Wastewater Utility COS Study
Comparison of Cost of Service with Revenues Under Existing Rates
Increase to Reach 100% of COS
Test Year FY 2025-26

Line No	Rate Class	Cost of Service	Test Year Revenue @ Existing Rates	\$ Change	% Change
		\$	\$	\$	%
Inside City					
1	Single Family	\$24,509,430	\$25,614,044	(\$1,104,614)	-4.3%
2	Multi-Family	4,756,186	3,164,205	1,591,981	50.3%
3	Non-Residential	28,839,849	20,950,164	7,889,685	37.7%
Outside City					
4	Single Family	176,038	146,443	29,595	20.2%
5	Multi-Family	0	0	0	
6	Non-Residential	12,586	11,232	1,354	12.1%
7	Total	\$58,294,089	\$49,886,088	\$8,408,001	16.9%

Table B-26
City of Chandler
2020 Wastewater Utility COS Study
Development of COS Rates (100% Cost of Service)
Test Year FY 2025-26

Line No	Customer Class	Total Revenue Requirement	Forecast Demand	Forecast Bills	Calculated Rate	Current Rate	\$ Change	% Change
<u>Inside City</u>								
1	Single Family	\$24,509,430		937,557	\$26.18	\$27.32	(\$1.14)	-4.2%
2	Multi-Family	\$4,756,186		324,201	\$14.67	\$9.76	\$4.91	50.3%
<u>Non-Residential</u>								
3	Volume Charge	\$28,518,084	5,936,162		\$4.80	\$3.49	\$1.31	37.7%
4	Customer Charge	\$321,765		30,452	\$10.57	\$7.65	\$2.92	38.1%
<u>Outside City</u>								
5	Single Family	\$176,038		3,350	\$41.89	\$43.72	(\$1.83)	-4.2%
6	Multi-Family	\$0			\$23.47	\$15.62	\$7.85	50.3%
<u>Non-Residential</u>								
7	Volume Charge	\$12,446	1,794		\$7.69	\$5.59	\$2.10	37.5%
8	Customer Charge	\$140		98	\$16.91	\$12.24	\$4.67	38.1%

Table B-27
 City of Chandler
 2020 Wastewater Utility COS Study
 5-Year Transition to 100% COS Rates
 Test Year FY 2025-26

Line No	Customer Class	Existing	Proposed					
		FY 2020 - 21	FY 2021 - 22	FY 2022 - 23	FY 2023 - 24	FY 2024 - 25	FY 2025 - 26	
	<u>Inside City</u>							
1	Single Family	\$27.32	\$27.32	\$27.32	\$27.32	\$27.32	\$27.32	
2	Multi-Family	\$9.76	\$10.93	\$10.93	\$12.75	\$12.75	\$14.68	
	<u>Non-Residential</u>							
3	Volume Charge	\$3.49	\$3.81	\$3.81	\$4.30	\$4.30	\$4.81	
4	Customer Charge	\$7.65	\$8.35	\$8.35	\$9.43	\$9.43	\$10.57	
	<u>Outside City</u>							
5	Single Family	\$43.72	\$43.72	\$43.72	\$43.72	\$43.72	\$43.72	
6	Multi-Family	\$15.62	\$17.49	\$17.49	\$20.40	\$20.40	\$23.48	
	<u>Non-Residential</u>							
7	Volume Charge	\$5.59	\$6.09	\$6.09	\$6.87	\$6.87	\$7.69	
8	Customer Charge	\$12.24	\$13.35	\$13.35	\$15.08	\$15.08	\$16.91	

Table B-28
City of Chandler
2020 Wastewater Utility COS Study
Increase to Reach 75% COS
Inside City and Outside City
Test Year FY 2025-26

Line No.	Customer Class	Cost of Service	COS Change	Transition to COS [1] %	Transition to COS \$	Adjusted COS	Revenue Under Existing Rates	Required Change in Revenue \$	%
Inside City									
1	Single Family	\$24,509,430	\$941,523		\$2,338,965	\$26,848,395	\$25,614,044	\$1,234,351	4.82%
2	Multi-Family	\$4,756,186	\$1,958,083	25%	(\$489,521)	\$4,266,666	\$3,164,205	\$1,102,460	34.84%
3	Non-Residential	\$28,839,849	\$7,469,779	25%	(\$1,867,445)	\$26,972,404	\$20,950,164	\$6,022,240	28.75%
	Inside City Subtotal	\$58,105,465	\$10,369,384		(\$18,001)	\$58,087,464	\$49,728,413	\$8,359,051	16.81%
Outside City									
4	Single Family	\$176,038	\$30,125		\$16,799	\$192,837	\$146,443	\$46,394	31.68%
5	Multi-Family	\$0	\$0		\$0	\$0	\$0	\$0	0.00%
6	Non-Residential	\$12,586	\$5,338		\$1,201	\$13,787	\$11,232	\$2,555	22.75%
7	Outside City Subtotal	\$188,624	\$35,463		\$18,001	\$206,624	\$157,675	\$48,950	31.04%
8	Total System	\$58,294,089	\$10,404,847		\$0	\$58,294,089	\$49,886,088	\$8,408,001	16.9%

[1] The percentage shown in this column represents the amount of COS that will be retained within the class. For example, a value of 25% indicates that 75% of the COS change will be reallocated to other classes.

Table B-29
City of Chandler
2020 Wastewater Utility COS Study
5-Year Transition to 75% COS Rates
Test Year FY 2025-26

Line No	Customer Class	Existing	Proposed					
		FY 2020 - 21	FY 2021 - 22	FY 2022 - 23	FY 2023 - 24	FY 2024 - 25	FY 2025 - 26	FY 2026 - 27
	<u>Inside City</u>							
1	Single Family	\$27.32	\$27.65	\$27.65	\$28.15	\$28.15	\$28.68	\$28.68
2	Multi-Family	\$9.76	\$10.57	\$10.57	\$11.84	\$11.84	\$13.17	\$13.17
	<u>Non-Residential</u>							
3	Volume Charge	\$3.49	\$3.73	\$3.73	\$4.11	\$4.11	\$4.50	\$4.50
4	Customer Charge	\$7.65	\$8.17	\$8.17	\$8.97	\$8.97	\$9.82	\$9.82
	<u>Outside City</u>							
5	Single Family	\$43.72	\$44.24	\$44.24	\$45.04	\$45.04	\$45.89	\$45.89
6	Multi-Family	\$15.62	\$16.92	\$16.92	\$18.93	\$18.93	\$21.06	\$21.06
	<u>Non-Residential</u>							
7	Volume Charge	\$5.59	\$5.97	\$5.97	\$6.57	\$6.57	\$7.19	\$7.19
8	Customer Charge	\$12.24	\$13.07	\$13.07	\$14.35	\$14.35	\$15.70	\$15.70

APPENDIX C
Reclaimed Water Financial Plan

Table C-1
City of Chandler
2020 Wastewater Utility COS Study
Reclaimed Water Rate Calculation
Test Year FY 2025-26

Line No	Description	FY 2020 - 21	FY 2021 - 22	FY 2022 - 23	FY 2023 - 24	FY 2024 - 25	FY 2025 - 26		
1	Beginning Balance		\$1,523,849	\$421,242	\$436,811	\$448,604	\$463,699		
	Sources of Funds								
	Proposed Rate Revenues								
2	Estimated Retail Demand (1,000 gallons)	2,190,000	2,608,695	2,617,860	2,539,782	2,644,104	2,565,244		
3	Rate, \$ per 1,000 gallons	\$0.69	\$0.69	\$0.69	\$0.69	\$0.69	\$0.69		
4	Estimated Revenue at Existing Rates	\$1,511,100	\$1,800,000	\$1,806,323	\$1,752,450	\$1,824,432	\$1,770,018		
	Revenue Adjustment								
5	2022		8.0%	6	\$60,444	\$72,253	\$70,098	\$72,977	\$70,801
6	2023		0.0%	12	-	-	-	-	
7	2024		7.0%	12		127,578	132,819	128,857	
8	2025		0.0%	12		-	-	-	
9	2026		7.0%	12				137,877	
10	2027		0.0%	12					
11	2028		8.0%	12					
12	2029		0.0%	12					
13	2030		8.0%	12					
14	Proposed Rate Revenue	\$1,511,100	\$1,860,444	\$1,878,576	\$1,950,126	\$2,030,228	\$2,107,554		
	Other Non-Rate Revenue								
15	Transfers In - Water	\$0	\$0	\$1,310,250	\$1,325,116	\$1,354,699	\$1,391,236		
16	Transfers In - Wastewater	\$0	0	1,310,250	1,325,116	1,354,699	1,391,236		
17	Miscellaneous Revenue	\$23,000	21,000	21,000	24,000	27,000	21,000		
18	Total Sources of Funds	\$1,534,100	\$1,881,444	\$4,520,076	\$4,624,358	\$4,766,625	\$4,911,026		
	Uses of Funds								
19	Reclaimed Operating & Maintenance	\$1,610,739	\$2,879,935	\$4,166,746	\$4,228,606	\$4,292,572	\$4,537,730		
20	Transfer to Water Fund		\$1,850,240	\$1,737,954	\$1,789,414	\$1,842,876	\$2,077,425		
21	Transfer to Wastewater Fund		\$0	\$1,388,800	\$1,388,800	\$1,388,800	\$1,388,800		
22	Debt Service	0	\$1,029,695	\$1,039,992	\$1,050,392	\$1,060,896	\$1,071,505		
23	Capital Costs	0	0	0	0	0	0		
24	Total Uses of Funds	\$1,610,739	\$2,984,051	\$4,504,507	\$4,612,565	\$4,751,531	\$4,900,028		
25	Surplus (Deficit)	(\$76,639)	(\$1,102,608)	\$15,570	\$11,793	\$15,094	\$10,997		
26	Ending Balance		\$421,242	\$436,811	\$448,604	\$463,699	\$474,696		
27	Target Reserve (20% of Rate Revenues)	\$302,220	\$372,089	\$375,715	\$390,025	\$406,046	\$421,511		
28	Over Under Target Reserves	(\$302,220)	\$49,153	\$61,096	\$58,579	\$57,653	\$53,185		
	Assumed Inflation Rate:	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%		
	Value of GRIC/Transfer from Water	\$1,388,800	\$1,388,800	\$1,388,800	\$1,388,800	\$1,388,800	\$1,388,800		
	Existing								
29	Rate (\$/kgal)	\$0.69	\$0.75	\$0.75	\$0.80	\$0.80	\$0.85		
30	Average Potable Rate	\$2.03	\$2.07	\$2.07	\$2.12	\$2.12	\$2.26		
31	Average Landscape Rate	\$2.55	\$2.60	\$2.69	\$2.85	\$2.85	\$3.12		
32	Average Cost of Water	\$ 2.24	(\$1.34)	(\$1.37)	(\$1.28)	(\$1.23)	(\$1.18)		
			34%	\$0.35	33%	36%	38%		

Table C-2
City of Chandler
2020 Wastewater Utility COS Study
GRIC Avoided Water Purchase Cost Calculation

Line No	Description				
	<u>CAWCD Delivery Rate Components:</u>		<u>\$ / AF</u>		
1	Capital Charge		\$56.00		<i>OMG charged this rate</i>
2	OM&R Charge (2)		\$99.00		
3	Pumping Energy Charge		\$56.00		<set to zero, previously 56
	<u>Chandler's CY 2020 Water Purchase</u>				
	<u>Source</u>	<u>Rate Components</u>	<u>Cost per AF</u>	<u>2020 Water Delivery (AF)</u>	<u>Total Cost</u>
4	M&I	1,2,3	\$211.00	8,654	\$1,825,994
5	Hohokam	1,2,3	\$211.00	2,952	\$622,872
6	Welton-Mohawk	2,3	\$155.00	4,064	\$629,920
7	RWCD	2,3	\$155.00	972	\$150,660
8	GRIC Lease	3	\$56.00	2,400	\$134,400
9	GRIC Exchange	3	\$56.00	8,960	\$501,760
	<u>GRIC Exchange Agreement Avoided Costs</u>				
10	GRIC Exchange AF				8,960
	<u>Fully-Loaded Cost</u>				
11	Cost per AF				\$211.00
12	Total Cost				<u>\$1,890,560</u>
	<u>CY 2020 Actual Cost (1)</u>				
13	Cost per AF				\$56.00
14	Total Cost				<u>\$501,760</u>
15	Avoided Cost				\$1,388,800

(1) Current delivery cost assessed to Chandler for GRIC Exchange water.

(2) The federal government through the Basin Development Fund is currently paying Chandler's portion of the OM&R charge for GRIC Exchange water. This funding will eventually run out. This cost represents Chandler's full costs excluding this federal subsidy.