City of Flagstaff
Arizona

Final Report

Long-Term Financial Plan and Rate and Fee Study

April 7, 2010

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April 7, 2010

Mr. Randy Pellatz
Utilities Director
City of Flagstaff
211 West Aspen Avenue
Flagstaff, AZ 86001

Dear Mr. Pellatz,

Willdan Financial Services (Willdan) and TischlerBise are pleased to present this report on the long-term financial plan and rate and fee study conducted for the City of Flagstaff (City).

This report was undertaken as the City is facing several challenges to continuing its high-quality operations. The focus of this study is to ensure that the utilities have sufficient revenues to meet their operational, capital and debt service obligations and that rates are set proportionate to the costs of providing utility service to each customer class. Our report outlines the approach, methodology, findings, and conclusions of this study.

This report has been prepared using generally accepted rate setting techniques. The City's utility accounting, budgeting, and billing records were the primary sources for the data contained within the report. Furthermore, Willdan and TischlerBise have worked closely with City staff and the City's Water Commission over the course of this project. The conclusions contained within this report provide the City with a set of recommendations to provide stable defensible funding for continued high-quality operations. We are confident that the results developed based on the cost of service analysis will result in fair and equitable rates to the City's users.

It was a pleasure working with you, and we also wish to express our thanks to Ryan Roberts and other staff members at the City, along with the entire Water Commission, for the support and cooperation extended throughout the study.

Sincerely,

Willdan Financial Services

Pierce E. Rossum
Senior Analyst

TischlerBise

Brian Jewett
Vice-President

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Executive Summary

The City retained Willdan Financial Services (Willdan) to prepare a long-term financial plan and rate and fee study for each utility to ensure the utilities have sufficient revenues to meet their operational, capital and debt service obligations and that rates are set proportionate to the costs of providing utility service to each customer class. As part of this rate study, the consulting team, consisting of Willdan and TischlerBise, facilitated dialogue with the City's Water Commission and City staff at several Commission meetings. During these meetings, the Commission made recommendations to be incorporated into the study where appropriate. This report documents the findings, analyses and recommendations of the comprehensive rate and fee study effort.

The City desires rates and fees that fully fund operations, maintenance, and present and future capital costs for plant expansions as well as distribution systems and collection system capacity, infrastructure rehabilitation, enhancements, and expansion. The City is facing several challenges to continuing its high-quality operations. Utility revenues are not keeping pace with increasing operational and capital costs. Customer account growth has slowed to less than a 0.5% annual rate. A prolonged drought has necessitated the need to procure additional water supply through drilling of new wells. Utility infrastructure is aging and must be replaced soon. In fact, during the course of this financial study, six water mains ruptured resulting in large losses of water and other costs. Therefore, the purpose of the rate and fee financial study is to provide recommendations on changes to the current utility rate and fee structures to meet these challenges.

The graphs (Figures E-1, E-2 and E-3) below demonstrate the current and projected financial conditions of the water, wastewater and reclaimed water systems absent a comprehensive rate restructuring and assuming no rate increases over the next 10 years. As the figures illustrate, holding rate structures and rates constant will result in depleted reserve funds, potential General Fund borrowing, lower quality operations and deferred capital projects that are urgently needed.

Figure E-1: Projection Using Current Water Rates

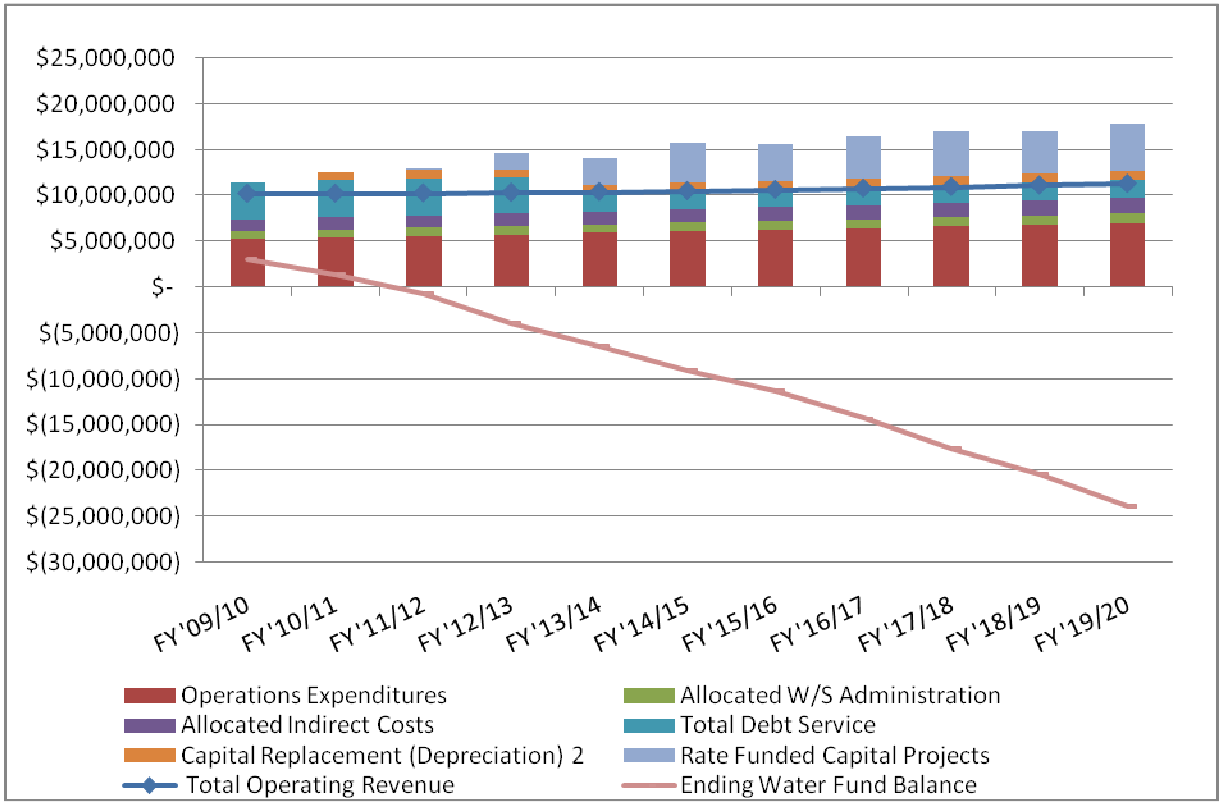


Figure E-2: Projection Using Current Wastewater Rates

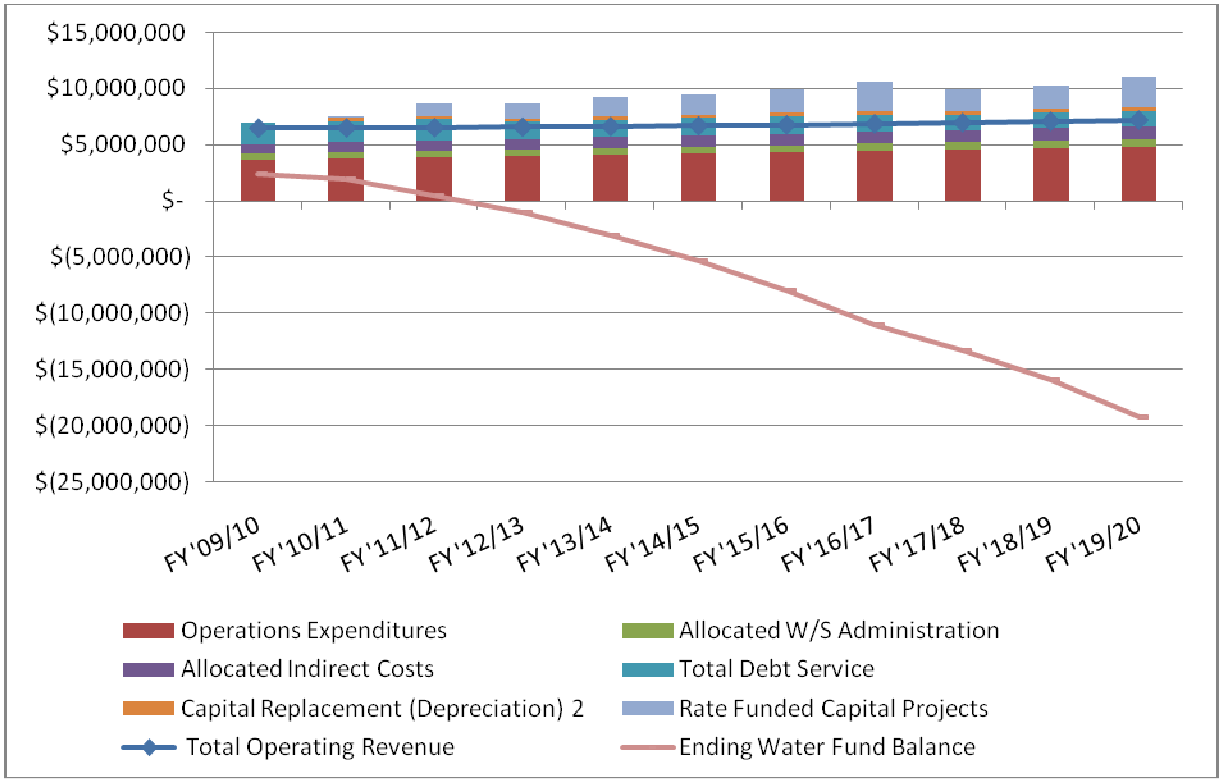
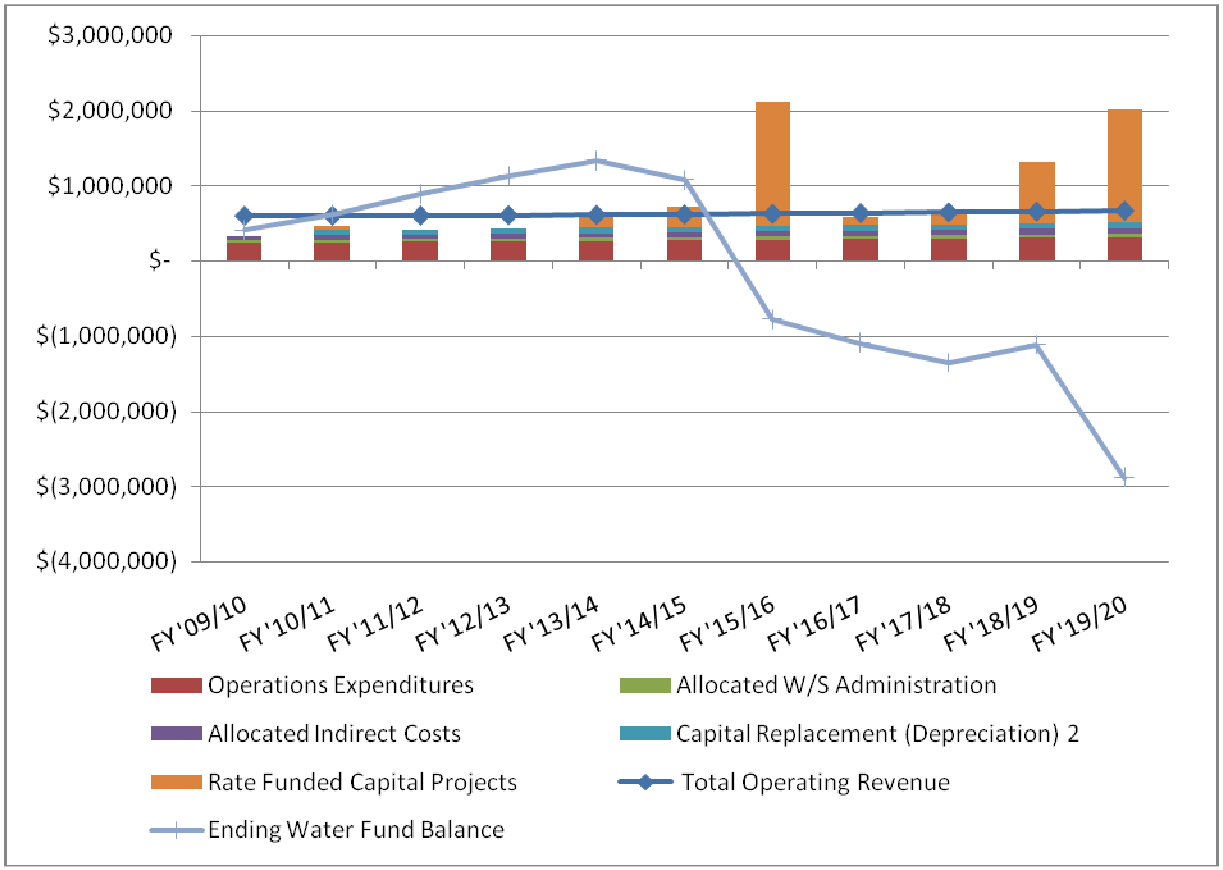


Figure E-3: Projection Using Current Reclaimed Water Rates



The graphs (Figures E-4, E-5 and E-6) below demonstrate the projected financial conditions of the water, wastewater and reclaimed water systems assuming adoption of a comprehensive rate restructuring and recommended rate increases over the next 10 years. As the figures illustrate, the proposed rate structures and rate increases will enable the City to continue its high quality operations, reduce the likelihood of future borrowing, establish prudent reserve fund levels, and fund capital projects that are urgently needed primarily on a "pay as you go" basis.

Figure E-4: Projection Using Proposed Water Rates

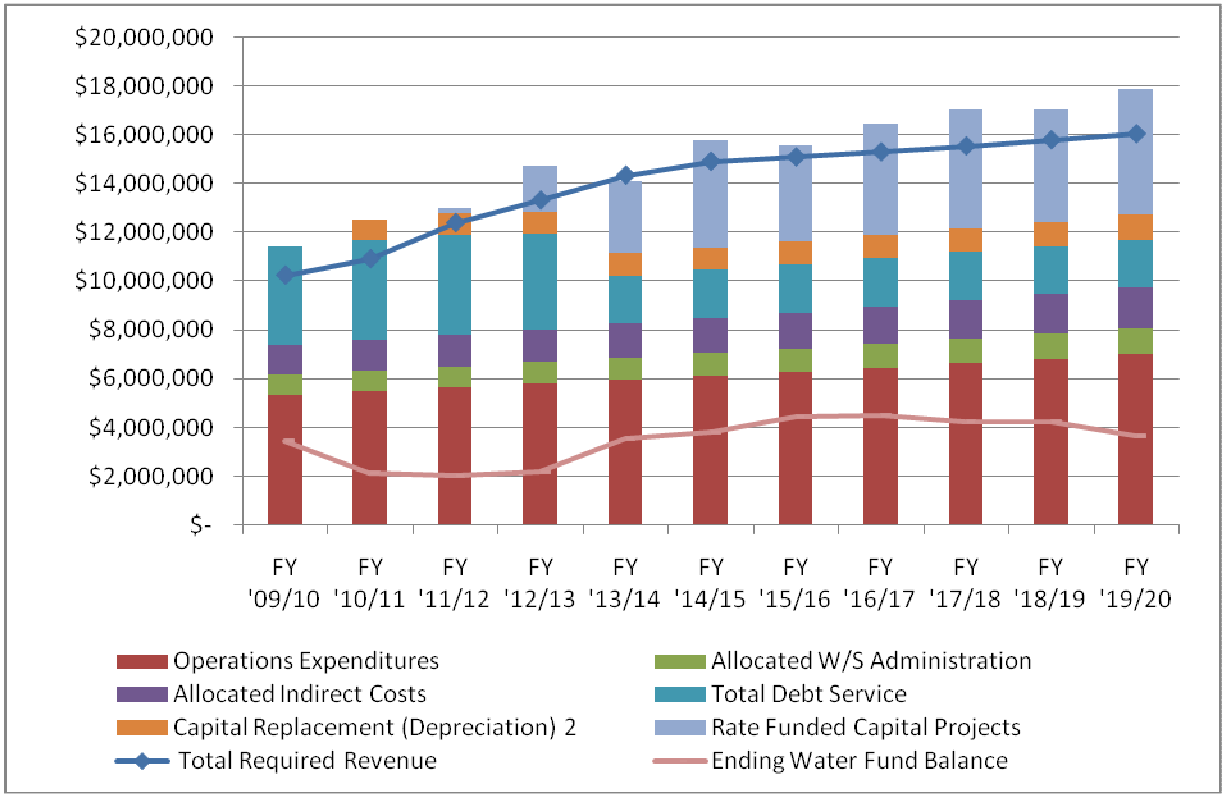


Figure E-5: Projection Using Proposed Wastewater Rates

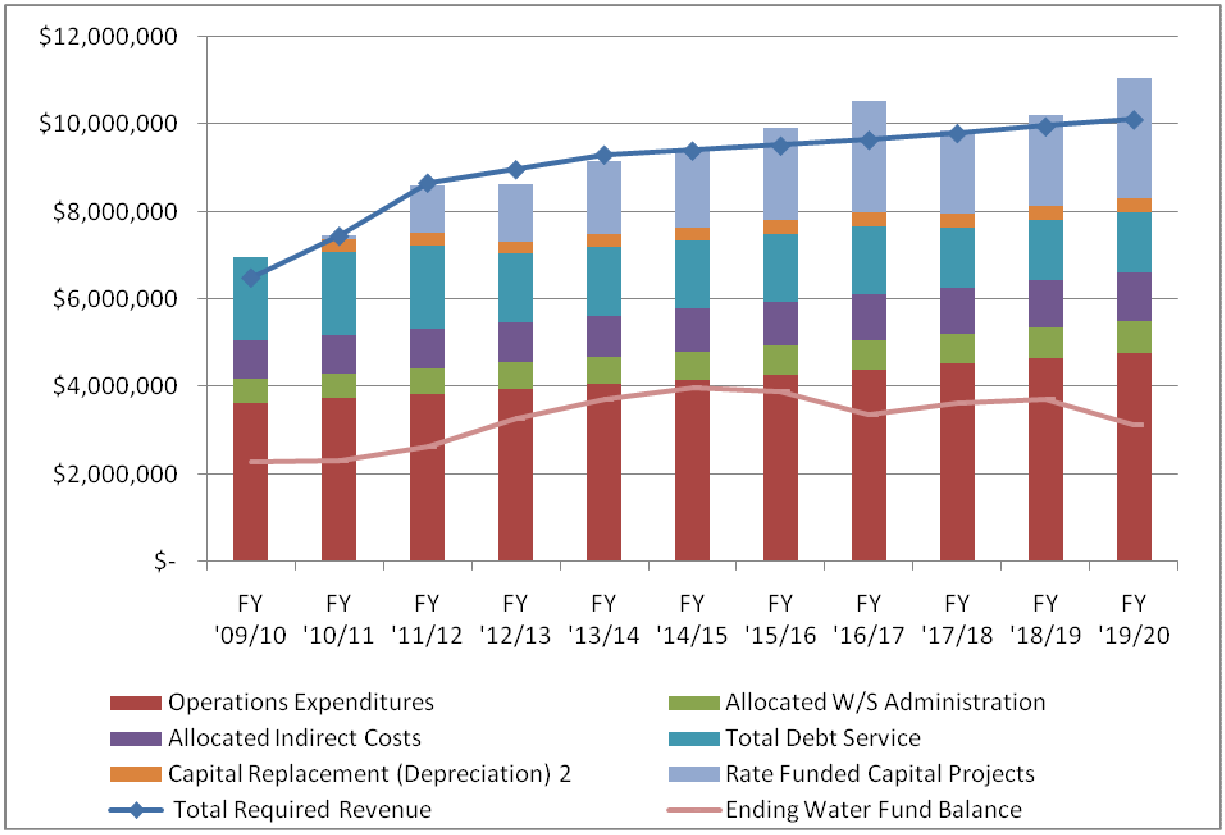
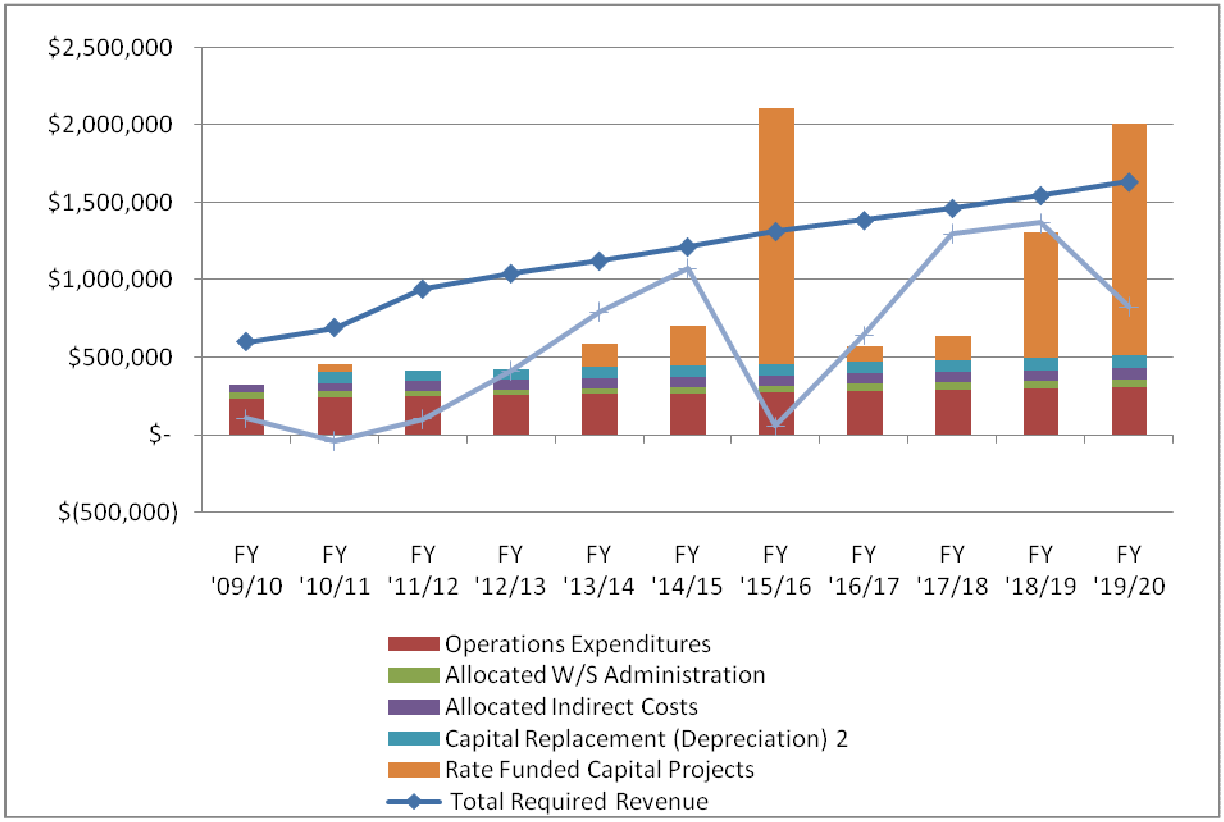


Figure E-6: Projection Using Proposed Reclaimed Water Rates



After completing the financial plans and rate studies, and after several meetings with the City Water Commission and City staff, the following tables (Figures E-7, E-8, E-9, and E-10) present the recommended rates and fees for each utility system. The following report provides detail regarding the supporting rate analysis and recommendations.

Figure E-7: Proposed Water Fixed Charge

Description	Current	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
All Customer Classes (except Private Fire)						
Meter Size	**Monthly Base Charge by Meter**					
3/4"	$ 6.48	$ 10.02	$ 11.38	$ 12.18	$ 13.03	$ 13.42
1"	8.02	11.80	13.40	14.34	15.34	15.80
1 1/2"	9.62	16.25	18.45	19.74	21.12	21.75
2"	14.00	21.58	24.50	26.22	28.06	28.90
3"	41.80	34.03	38.64	41.34	44.24	45.57
4"	58.00	51.82	58.83	62.95	67.36	69.38
6"	89.80	96.28	109.31	116.96	125.15	128.91
8"	124.00	149.64	169.89	181.78	194.51	200.34
10"	168.80	211.89	240.56	257.40	275.42	283.68
Private Fire Connections						
Connection Size	**Monthly Private Fire Protection Charge**					
4"	$ 22.68	$ 9.41	$ 10.68	$ 11.43	$ 12.23	$ 12.59
6"	44.23	27.33	31.02	33.19	35.52	36.58
8"	70.32	58.23	66.11	70.74	75.69	77.96

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Figure E-8: Proposed Water Rate Structure

Description	Current*	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Single Family Residential						
Tier 1 (0 - 3,700 gal)	3.02	2.07	2.34	2.51	2.68	2.77
Tier 2 (3,700 - 6,400 gal)	3.54	2.69	3.05	3.26	3.49	3.59
Tier 3 (6,400 - 11,700 gal)	5.03	4.13	4.69	5.02	5.37	5.53
Tier 4 (11,701+ gal)	8.77	8.26	9.38	10.04	10.74	11.06
Multi-Family Residential	2.37	2.66	3.02	3.23	3.45	3.56
Commercial/Schools	3.17	2.83	3.21	3.43	3.67	3.78
Lawn Meters [1]	3.02	2.83	3.21	3.43	3.67	3.78
Manufacturing	2.88	2.78	3.16	3.38	3.62	3.73
Northern Arizona University	2.80	2.73	2.95	3.15	3.37	3.47
Standpipes	5.60	4.88	5.07	5.34	5.63	5.78
Energy Surcharge [2]	-	0.75				

*Current Tier Structure: 0-5,000, 5,001-15,000, 15,001-25,000, & Over 25,001 gallons

[1] Lawn Meters are now tied to the Commercial/Schools rate, rather than the Single Family rate

[2] Energy Surcharge, per unit, applied to all customer classes.
Cost to be calculated annually based on a one-year rolling average of water related energy costs.

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Figure E-9: Proposed Wastewater Rate Structure

Description	Customer Class	Current	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
		Monthly Sewer Discharge Rates per 1,000 gal ($)					
Residential							
Single- and Multi-Family	R1 - R4	3.12	3.08	3.59	3.69	3.80	3.80
Non-Residential							
Car Washes	CW	2.58	3.06	3.56	3.70	3.82	3.82
Laundromats	L	2.81	3.14	3.65	3.80	3.91	3.92
Commercial	C	3.01	3.22	3.75	3.90	4.01	4.02
Hotels & Motels	H	4.09	4.32	5.03	5.21	5.37	5.38
Restaurants	RF	5.04	5.20	6.05	6.27	6.45	6.46
Industrial Laundries	IL	4.47	4.77	5.55	5.76	5.93	5.94
Manufacturing	MN	3.05	3.46	4.02	4.18	4.31	4.32
Pet Food Manufacturers	PF	8.34	7.64	8.89	9.19	9.47	9.48
Soft Drink Bottling	SD	7.31	6.05	7.04	7.29	7.50	7.51
Ice Cream Cone Mfg	IC	10.65	9.46	11.02	11.38	11.72	11.73
Northern Arizona University	NA	2.68	2.79	3.24	3.37	3.48	3.48

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Figure E-10: Proposed Reclaimed Water Rate Structure

Description	Customer Class	Current	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Notes
Commercial (no main Ext)	C	1.1095	1.25	1.38	1.46	1.55	1.59	35% of C
Commercial (w/Main Ext)	C	2.3775	2.68	2.97	3.14	3.32	3.40	75% of C
Manufacturing (no main Ext)	MN	1.0080	1.24	1.37	1.45	1.53	1.57	35% of Mfg
Manufacturing (w/Main Ext)	MN	2.1600	2.61	2.77	2.93	3.09	3.17	75% of Mfg
City Departmental	MU	2.2600	1.25	1.38	1.46	1.55	1.59	35% C
NAU (Sinclair Wash-Intramural Fields)	NA	0.9800	1.22	1.29	1.37	1.44	1.48	35% of NAU
NAU all other	NA	2.1000	2.61	2.77	2.93	3.09	3.17	75% of NAU
Private Residential								
Tier 1	R1	1.0570	0.98	1.08	1.14	1.20	1.23	35% of R1
Tier 2	R1	1.2390	1.20	1.33	1.40	1.48	1.52	35% of R1
Tier 3	R1	1.7605	1.71	1.90	2.02	2.14	2.20	35% of R1
Tier 4	R1	3.0695	3.15	3.54	3.77	4.02	4.13	35% of R1
Self Loading Stations and Hydrant Meters	RS/WR	1.0700	2.55	2.99	3.19	3.36	3.55	Cost Analysis
Off Peak/High Volume	WR	1.0700	1.25	1.38	1.46	1.55	1.59	35% of C

* Energy surcharge included

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Project Background

The City of Flagstaff owns and operates water, wastewater and reclaimed water systems for residents and businesses within City limits as well as for customers outside City limits. As of Fiscal Year 2009/10, the water system provides service to approximately 19,000 residential and non-residential potable water customers, the wastewater system provides service to approximately 17,350 residential and non-residential customers, and the reclaimed water system provides service to approximately 100 residential and non-residential customers. The City operates each system as a self-supporting enterprise, with revenues and expenditures accounted for within one enterprise fund, separate from other enterprise and General Fund activities.

The City's Utilities Department is responsible for water production and delivery, wastewater collection and treatment, reclaimed water delivery and stormwater management. Additionally, the Department is responsible for water resource management, water policy development, water conservation and industrial waste programs. The Department maintains approximately 415 miles of potable water mains on twelve major reservoirs operating on three distinct pressure zones. Recent water main breaks are creating an urgent demand to aggressively replace mains and other infrastructure as these assets are reaching useful life capacities. The Lake Mary Water Production Group operates an eight million gallons per day (MGD) surface water processing plant obtaining raw water from Lake Mary. Seasonal springs and a shallow well aquifer system are capable of up to two MGD of production during the summer. Eighteen deep wells in two major well fields and five local deep wells located within the corporate boundary of the City may contribute up to an additional 12 MGD of potable water.

The City operates two wastewater treatment plants that serve a population of approximately 65,000. The Wildcat Hill Wastewater Treatment Plant (WWTP) is a six MGD facility and the Rio de Flag Water Reclamation Plant can process up to a four MGD flow. The City maintains approximately 270 miles of gravity flow sanitary sewer lines. Additionally, the City maintains about 24 miles of Class A+ reclaimed water fed off a two million gallon storage tank. Currently, the largest users of reclaimed water are the City Parks and Recreation Division, Northern Arizona University, SCA Tissue, local golf courses, and various construction related uses. Reclaimed water service is available from the existing mains to the residential level for permitted non-potable uses.

The City's Utilities Department has completed a major upgrade to the Wildcat Hill WWTP from Class B to Class A+ quality reclaimed water. The Department is in the planning stages for major potable water acquisition projects. The City has purchased Red Gap Ranch located approximately 35 miles east of the City for potential groundwater development. Other water sources are under consideration and there is a possibility of a future Colorado River surface water allotment. Additional groundwater sources currently under development are the Ft. Tuthill and Sinagua deep-water wells that have been recently completed.

The City is facing several challenges to continuing its high-quality operations. Utility revenues are not keeping pace with increasing operational and capital costs. Customer account growth has slowed to less than a 0.5% annual rate. A prolonged drought has necessitated a need to procure additional water

supply through drilling of new wells. Additionally, with an aging utility infrastructure the Utility needs to implement an ongoing replacement program. In fact, during the course of this financial study, six water mains ruptured resulting in large losses of water and other costs.

The current water and wastewater rate model used by the City is over 10 years old. Due to the nature of the existing model and recent market conditions, the model does not accurately predict the revenue stream required for services provided. The City desires rates and fees that fully fund operations, maintenance, and present and future capital costs. The capital costs include plant expansions, distribution systems, and collection system rehabilitation, enhancements, and expansion.

Key Financial Plan Objectives

Several objectives were identified during the study to guide decisions regarding the proposed financial plans and rate structures. The major objectives of the study were:

- Utility rates and fees should generate sufficient revenues to meet operating costs, capital program requirements, debt service obligations, and maintain adequate reserves consistent with sound financial management practices
- Utility rates should be set proportionate to the cost of providing utility service to each customer class to promote fairness and equity
- A financial plan that shifts a majority of future capital funding to a "pay as you go" basis and reduces each utility's overall debt burden
- A financial plan that minimizes future rate and fee impacts on existing and new customers
- Utility rate and fee structures should be supported by a financial model that is easy to update should costs and assumptions change in the future beyond what was projected at the time of this report

In reviewing the above objectives, it should be noted that the City has limited control over external forces such as growth, consumer behavior, and system usage. Recognizing these factors, we believe that the recommendations in this study provide a fair, reasonable, and balanced set of proposed rates and fees for the City that, to the extent possible, meets these key objectives.

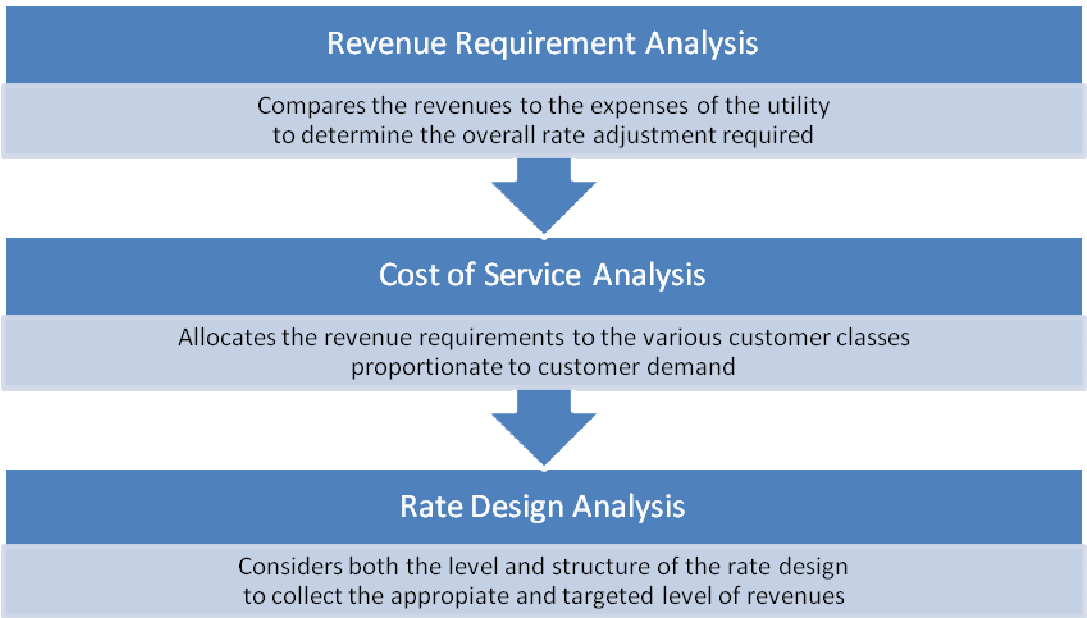
Overview of the Rate Study Process

The financial planning and rate study efforts were conducted in coordination with City staff and the Water Commission. During the course of the project, the consulting team facilitated several Commission meetings and discussions with Commission members and City staff to review, explore and analyze rate setting principles and utility financial, operational and capital issues. The meetings consisted of presentations of information and data related to the City's utility revenue needs, capital improvement plans, current rate structures, other relevant rate and financial issues. This process enabled the City staff, Commission members and the consulting team to develop a multi-faceted understanding of financing planning issues, and to develop a broad consensus on a number of policy items and rate recommendations.

The scope of the study resulted in the development of cost-based water, wastewater and reclaimed water user charges through a comprehensive cost of service and rate design study process. Utility rates must be set at a level where a utility's operating and capital expenses are met with the revenues received from customers. This is a significant point, as failure to achieve this level may lead to insufficient funds being available to appropriately maintain the system. To evaluate the adequacy of the City's existing rates, a comprehensive rate study was completed. A comprehensive rate study typically consists of following three interrelated analyses (Figure 1-1 provides an overview of these processes).

- Financial Planning/Revenue Requirement Analysis: Create a ten-year plan to support an orderly, efficient program of on-going maintenance and operating costs, capital improvement and replacement activities, and retirement of outstanding debt. In addition, the long-term plan should fund and maintain reserve balances to adequate levels based on industry standards and City fiscal policies.
- Cost of Service Analysis: Identifies and apportions annual revenue requirements to the different customer classes based on their demand on each utility system.
- Rate Design: Develops a fixed/variable schedule of rates for each customer class to proportionately recover the costs attributable to them. This is also, where other policy objectives can be achieved, such as discouraging wasteful water use. The policy objectives are balanced with the cost of service objectives to maintain the delicate balance between customer equity, financial stability and resource conservation goals.

Figure 1-1: Comprehensive Rate Study Interrelated Analysis



Overview of the Fee Study Process

Capacity fees are one-time charges that reflect the demands and costs created by new development for additional water and wastewater capacity. Generally, capacity fees are required to demonstrate a reasonable connection between the amount of the fee and the cost to serve new development (i.e. new

development's proportionate share of infrastructure capacity costs). This report documents the assumptions, methodologies, and calculations upon which the capacity fees are based. As documented in this section, the capacity fees are just and reasonable and represent new development's proportionate share of costs for capacity projects from which it will directly benefit.

The infrastructure included in capacity fees are large, system level components and do not include on-site or site specific improvements. Water system capacity can include components for water resources, production, storage, and distribution. Components of wastewater system capacity can include treatment, interceptors, and collection lines.

There are three basic methods used to calculate the various components of the City's capacity fees. The methodologies are used to determine the best measure of demand created by new development for each component of the capacity fees. The methodologies can be classified as looking at the past, present, and future capacities of infrastructure.

1. In instances where infrastructure has been built in advance of new development and has excess capacity available to be utilized by new development, the **buy-in methodology** is utilized. Under this methodology, new development repays the community for previous capacity investments via the capacity fee.
2. The **incremental expansion methodology** is used when a community plans to provide new development the same level-of-service (LOS) that is currently being provided to existing development in increments. Generally, utility infrastructure does not lend itself to this methodology given its nature of having to be in place prior to new development and capacity being constructed in large segments.
3. The **plan-based methodology** utilizes the City's capital improvement plan (CIP) and related master plans to determine new development's share of planned projects. Projects that do not add capacity, such as routine maintenance or replacement of existing facilities, are not included in the fees. Projects that add capacity are further evaluated as to the percentage of the project attributable to existing development versus new development. Only the portion of planned projects attributable to new development is included in the capacity fees.

The majority of the proposed capacity fees utilize the plan-based methodology, with the buy-in methodology being used for recent improvements to the Wildcat Hill Wastewater Treatment Plant.

Organization of the Report

This report is organized to provide an overview of utility rate setting principles, then a separate detailed review of each utility's rate design process. Each utility section contains the formerly mentioned three analyses. The following sections comprise the long-term financial plan and rate study report:

- Rate Setting Principles
- Water Rate Analysis
- Wastewater Rate Analysis
- Reclaimed Water Rate Analysis
- Water Capacity Fee Analysis
- Wastewater Capacity Fee Analysis

A separate Technical Appendix details the various technical analyses that were used in preparation of this study.

General Report Summary

This report will review the study in the development of cost-based water, wastewater and reclaimed water user charges through a comprehensive cost of service and rate design study process and review the comprehensive utility rate analyses prepared for the City of Flagstaff Utilities Department. This report has been prepared utilizing generally accepted rate and fee setting techniques. The next section of the report provides an abstract of the rate setting guidelines that were utilized to analyze and design the proposed utility rates.

Rate Setting Principles

The primary objective of conducting a comprehensive rate study is to determine the adequacy of the existing rates (pricing and structure) and provide the basis for any necessary adjustments to meet the Departments operating and capital needs. The City desires rate structures that fully fund operations, maintenance, and present and future capital costs (plant expansions, distribution systems, and collection system rehabilitation, enhancements, or expansion). Furthermore, the City desired to maintain or possibly enhance its current conservation-based rate structure. Significant consideration and dialogue took place between City staff, Committee members and the consulting team to review the existing rate structure and propose possible changes to meet this additional objective.

Over the past years, many generally accepted principles or guidelines have been established to assist in developing utility rates. The purpose of this section of the report is to provide a general background of the methodology and guidelines used for setting cost based utility rates. This will provide the reader with a higher-level understanding of the general process detailed later in this report.

Established Principles & Guidelines

As a practical matter, there should be a general set of principles to develop rates. The American Water Works Association (AWWA) establishes these principles in the M1 Manual – *Principles of Water Rates, Fees and Charges.* These guiding principles help to ensure there is a consistent global approach that is employed by all utilities in the development of their rates (water and water-related utilities including sewer and reclaimed water).

Provided below is a short summary listing the established guidelines around which public utilities should consider when setting their rates. These closely reflect the City's specified objectives.

- Rates should be cost-based and equitable, and set at a level such that they provide revenue sufficiency.
- Rates and process of allocating costs should conform to generally accepted rate setting techniques.
- Rates should provide reliable, stable and adequate revenue to meets the utility's financial, operation, and regulatory requirements.
- Rate levels should be stable from year to year (limit "rate shocks").
- Rates should be easy to understand and administer.

These guidelines, along with the City's objectives, have been utilized within this study to help develop utility rates that are cost-based and equitable.

Revenue Requirements

The method used by most public utilities to establish their revenue requirements is called the "cash basis" approach of setting rates. As the name implies, a public utility combines its cash expenditures over a period of time to determine their required revenues from user rates and other forms of income. The figure below presents the "cash basis" methodology.

Figure 2-1: Overview of the "Cash Basis" Design

+ Operation and Maintenance Expenses
+ Taxes/Transfers
+ Capital Additions Financed with Rate Revenue
+ Debt Service (Principal and Interest)
= Total Revenue Requirements

To ensure existing ratepayers are not paying for growth-related capital projects, Willdan reviewed existing, approved/pending, and proposed Capital Improvement Projects (CIPs) with City staff to allocate projects between new (growth) and existing customers (operations and maintenance or "O&M"). Additionally, capital replacement expense is sometimes included to stabilize annual required revenue requirements by spreading the replacement costs of a depreciated asset over the expected life of the asset.

Based on the revenue requirement analysis, the utility can determine the overall level of rate adjustment needed in order for the utility to meet its overall expenditure needs.

Financial Planning

In the development of the revenue requirements, many assumptions are utilized to project future expenditures, customer and consumption growth, and necessary revenue adjustments. The City's budget documents are used as the initial starting point; however, assumptions play a necessary role in projecting future required revenue.

Conservative growth assumptions and prudent financial planning are fundamental to ensuring adequate rate revenue to promote financial stability. The financial model developed by the consulting team appropriately considers the City's existing debt service coverage ratios and operating reserve balances. In addition, it is recommended that the City begin recognizing some of the cost associated with depreciation to allow the accumulation of a reserve for repair and replacement of depreciated items. This enables the City to mitigate future rate increases as money for repair and replacement is collected automatically each year.

Rate Design

The final element, the rate design process, applies the results from the revenue requirements to develop rates that achieve the general guidelines and objectives of the City. These objectives may include consideration of cost-based rates, but may also consider items such as ability to pay, continuity of past rate philosophy, conservation, encouragement of economic development, ease of administration, and legal requirements. While cost-based rates are an important objective, all objectives should be balanced appropriately.

While the general description of the utility rate setting process discussed in this section of the report is simplified and condensed, it does address the underlying fundamentals. One of the key principles for a comprehensive rate study is found in economic theory, which suggests the price of a commodity must roughly equal its cost if equity among customers is to be maintained – i.e. cost-based. For example, capacity-related costs are usually incurred by a water utility to meet peak use requirements. Consequently, the customers causing peak demands should properly pay for the demand-related facilities in proportion to their contribution to maximum demands. Through refinement of costing and pricing techniques, consumers of a product are given a more accurate price signal of what the commodity costs to produce and deliver.

The above fundamentals have considerable foundation in economic literature. They also serve as primary guidelines for rate design by most utility regulators and administrative agencies. This "price-equals-cost" theory provides the basis for much of the subsequent analysis and comment. This theory is particularly important, as the proposed rate, structure has been modified to encourage conservation, while maintaining this economic principle.

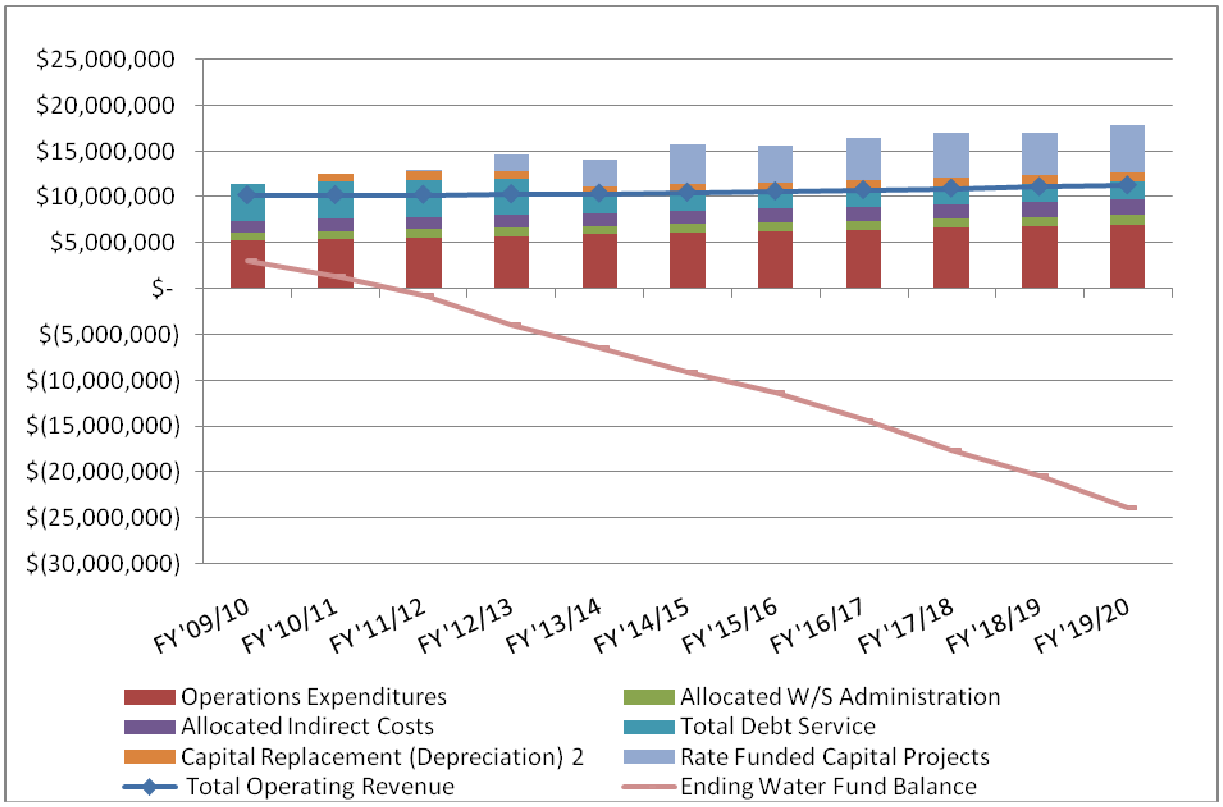
Rate Setting Principles Summary

This section of the report has provided a brief introduction to the general principles, techniques, and economic theory used to set utility rates. These principles, techniques, and economic theory were the starting point for this rate study and the groundwork used to meet the City's key objectives in analyzing and adjusting their utility rates.

Water Rate Analysis

The City is facing several challenges to continuing its high-quality operations. Utility revenues are not keeping pace with increasing operational and capital costs. Customer account growth has slowed to less than a 0.5% rate. A prolonged drought has necessitated a pressing need to procure additional water supply through drilling of new wells. Utility infrastructure is aging and must be replaced soon. In fact, during this study, six water mains broke resulting in large losses of water and other costs. The debt burden of the utilities, particular the water system, is high compared to its other expenditures. Considering the above variables, Figure 3-1 projects the adequacy of existing rate revenue to support ongoing operations and maintenance.

Figure 3-1: Revenue and Expenditure Projections – Existing Rates



As the above figure indicates, revenue increases are necessary to operate and maintain the water system. This will be evident as details of the process, data, and methodology utilized in the rate study are presented in this section of the report. Summary figures, outlining much of the analysis are included in this section of the report as well. Technical figures, which provide a greater level of detail and breadth, are provided in the Technical Appendix of this report.

Customer Statistics

During the Fiscal Year 2008, the City provided water service to an estimated 19,226 customers, distributing roughly 2.5 billion gallons (~7,650 acre feet) of potable water. Figure 3-2 shows usage and number of accounts by customer class as billed by the City.

Figure 3-2: Accounts and Consumption

Description	Class	Accounts	Actual Consumption (gal) [1]
Single Family: Sewer-Winter Quarter Ave	R1	14,055	889,393,512
Single Family: Sewer-Meter Related	R4	15	635,200
Commercial/Schools	C	1,618	631,975,404
Lawn Meters	LM	252	85,369,351
Manufacturing	MN	42	103,915,849
Northern Arizona University	NA	7	227,781,430
Multi-Family Units: Sewer-Winter Quarter Ave	R2	2,379	316,582,055
Multi-Family: Sewer-Meter Related	R3	593	213,732,734
Standpipes	SP	5	27,386,565
Total		18,966	2,496,772,100
Total Consumption (af)			7,662

1. Consumption period of March 2008 through February 2009.

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

A projection of customers, usage, and production requirements is necessary in the evaluation of the revenue requirements. This projection is critical for the determination of revenues from rates, escalation of production-related costs, and design of the rates.

Given the current economic climate and review of potential growth, in discussions with the consulting team, City staff determined to use a conservative growth rate starting at 0.2% (38 new accounts) in Fiscal Year 2010 rising slowly to a high of 1.6% (336 new accounts) in Fiscal Year 2020.

Revenue Requirements Analysis

Revenue from Existing Rates

The first step in developing the revenue requirements is to develop a projection of revenues from existing rates. The City expects to receive approximately $10 million in water sales in Fiscal Year 2010. By 2020, assuming the growth discussed above, water sales are projected to increase roughly 10% to $11 million. In addition to water sales, the City has average non-operating revenue estimated at a

quarter million dollars, consisting of interest income and water resource fee. Also included is a onetime secondary property tax transfer.

Projections of Operation and Maintenance Expenses

To project Operating and Maintenance (O&M) expenses over the ten-year planning horizon, two escalation factors were developed. The operations cost escalator, set at 2.75%, is applied to basic expenditures that the Department incurs: labor, benefits, materials, utilities, etc. The depreciation expense escalator, set at 2.0%, helps the City maintain appropriate recovery levels for depreciated facilities and other assets. Additionally, the City, as part of its financial policies, has established a reserve policy to provide 10% (37 days) of its annual operating and maintenance expenses in a reserve account.

Debt Service

Debt service is the Department's annual principal and interest obligations when projects are financed via long-term debt. The City currently has nine water obligations: two (2) General Obligation bonds and seven (7) Water Infrastructure Finance Authority (WIFA) loans. The current annual debt service payments total nearly $4 million reducing to approximately $2 million after Fiscal Year 2013. Figure 3-3 provides a summary of the City's water related debt service.

Figure 3-3: Existing Debt Service

Existing Debt

	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Water Debt Financing						
G.O. Bonds 1997	$ 77,878	$ 77,878	$ 77,878	$ 1,757,878	$ -	$ -
G.O. Series 2003 Refunding	1,958,177	1,990,653	2,030,203	196,503	-	-
WIFA - Red Gap	538,288	543,120	542,460	541,472	540,156	538,512
WIFA Series 2009 (#720011-10)	50,844	56,289	56,289	56,289	56,289	56,289
WIFA Series 2009 (#920173-10)	63,556	70,361	70,361	70,361	70,361	70,361
WIFA Series 2009	50,844	56,289	56,289	56,289	56,289	56,289
WIFA Series 2003	478,800	478,800	478,800	478,811	478,801	478,801
WIFA Series 2008 Water Wells	617,441	617,441	617,441	617,441	617,441	617,441
WIFA Series 2008 Red Gap Pipeline	163,648	163,648	163,648	163,648	163,648	163,648
Total Water Debt Requirements	$ 3,999,476	$ 4,054,479	$ 4,093,369	$ 3,938,692	$ 1,982,985	$ 1,981,341

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Capital Improvement Projects

The Department's capital improvements projects (CIPs) needs for the water utility are summarized in Figure 3-4. Individually, each project was identified by City staff as growth-related, existing needs (O&M) or a percentage of both to determine the appropriate funding mechanism (monthly rates or connection fee). The capital projects are required to meet the utilities projected growth and to maintain the existing quality of the system.

Figure 3-4: Water Capital Projects by Funding Source

Description	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Rate Funded Capital Projects	$ -	$ -	$ 225,000	$ 1,845,000	$ 2,960,000	$ 4,400,000
Fee Funded Capital Projects (Growth)	-	-	500,000	1,405,000	530,000	200,000
Total Rate and Fee Funded Project Costs	**$ -**	**$ -**	**$ 725,000**	**$ 3,250,000**	**$ 3,490,000**	**$ 4,600,000**

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Summary of Revenue Requirements Analysis

The above components comprise the foundation of the revenue requirement analysis. Given the current economic climate, the consulting team facilitated several meetings with City staff and committee members to assure the accuracy of financial and growth variables in developing the revenue requirement analysis. Particular emphasis was placed on attempting to minimize rates, yet still encompass adequate funds to support the operational activities and capital projects throughout the study period.

The revenue requirements analysis figure, presented below, provides a basis for evaluating the timing and level of water revenue increases required to meet the projected required revenue for the study period. The percentages shown at the bottom of the figure show the recommended revenue adjustments.

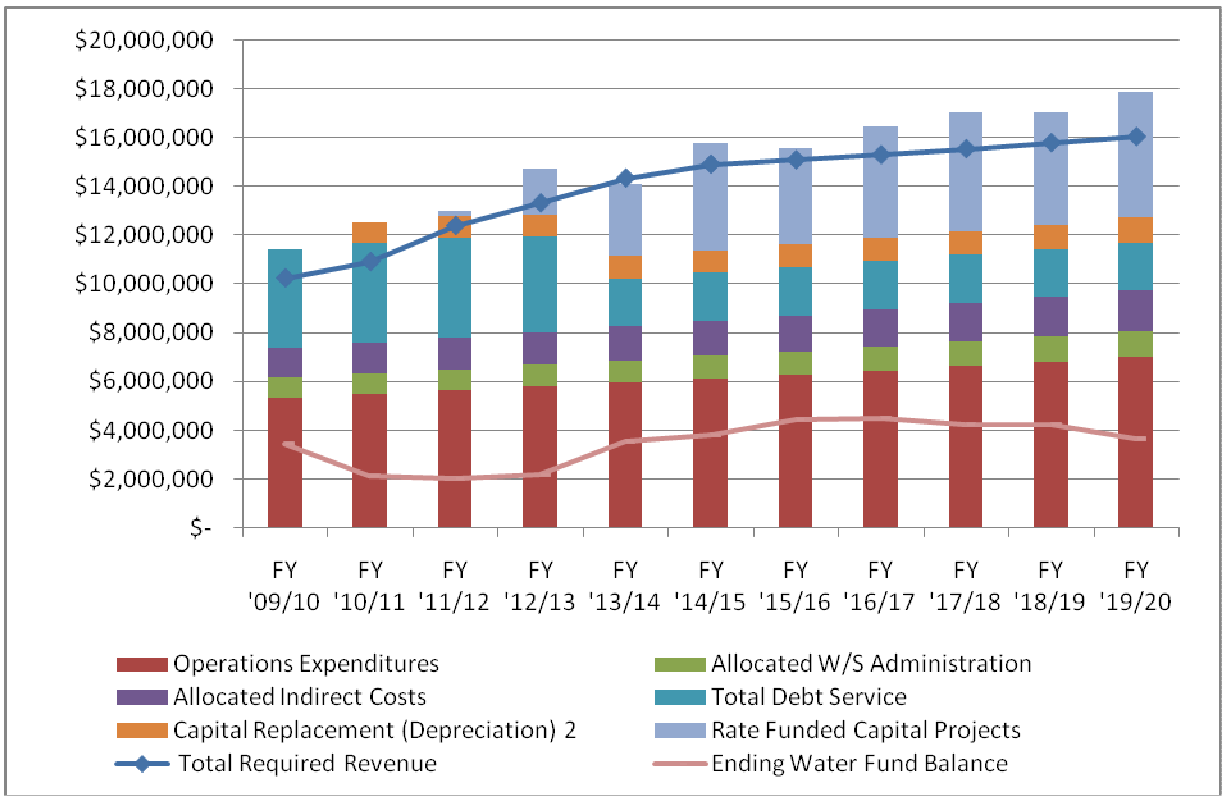
Figure 3-5: Revenue Requirements

Description	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Revenues						
Total Revenues (before increase)	$ 11,812,201	$ 10,550,184	$ 10,606,466	$ 10,635,320	$ 10,694,313	$ 10,813,471
Additional Water Sales (increase)	-	646,777	2,088,953	2,952,101	3,893,157	4,357,007
Total Revenues	**$ 11,812,201**	**$ 11,196,960**	**$ 12,695,418**	**$ 13,587,421**	**$ 14,587,470**	**$ 15,170,478**
Expenses						
Operating Expenses	$ 7,425,459	$ 7,629,659	$ 7,839,475	$ 8,055,060	$ 8,276,574	$ 8,504,180
Annual Debt Service	3,999,476	4,054,479	4,093,369	3,938,692	1,982,985	1,981,341
Capital Replacement	-	854,688	871,782	889,218	907,002	925,142
Capital Replacement (Incurred)	-	-	(225,000)	(1,301,470)	(889,218)	(907,002)
Rate Funded Capital Projects	-	-	225,000	1,845,000	2,960,000	4,400,000
Total Expenses	**$ 11,424,935**	**$ 12,538,826**	**$ 12,804,626**	**$ 13,426,500**	**$ 13,237,344**	**$ 14,903,661**
Net Income (Loss)	**$ 387,266**	**$ (1,341,866)**	**$ (109,207)**	**$ 160,921**	**$ 1,350,127**	**$ 266,816**
Ending Water Fund Balance	3,453,975	2,112,109	2,002,902	2,163,823	3,513,950	3,780,766
Ending Water CR Fund Balance	-	854,688	1,501,470	1,089,218	1,107,002	1,125,142
Additional Revenue Increase	**0.0%**	**13.0%**	**7.0%**	**7.0%**	**7.0%**	**3.0%**

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Based upon the revenue requirement analysis, the City will need to adjust the rates to increase revenue by 13% in the first year, following smaller revenue increase in subsequent years. This approach will result in a 43% revenue increase over the next five years. Figure 3-6 expands upon the earlier figure (Figure 3-1), to illustrate the positive impact of the revenue increase on the utility's financial condition.

Figure 3-6: Revenue and Expenditure Projections – Proposed Rates



Cost of Service Analysis

The cost of service analysis is a systematic process by which revenue requirements are used to generate a classification of fair and equitable costs in proportion to the service received for each user class.

Cost Allocation by Function

The cost of service allocation conducted in this study is established on the base-extra capacity method endorsed by the AWWA. Under the base-extra capacity method, revenue requirements are allocated to the different user classes proportionate to their use on the water system. Allocations are based on average day (base) usage, maximum day (peak) usage, meters and services, billing and collection, and fire protection. Use of this methodology results in an AWWA-accepted cost distribution among customer classes and a means of calculating and designing rates to proportionately recover those costs.

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Figure 3-7 presents the net plant in service analysis. This analysis is important in order to determine an appropriate and reasonable means of allocating debt service requirements and future capital projects to utility demand as well as customer and fire protection needs.

Figure 3-7: Functionalization of Net Plant Investment

Description	Plant Investment	Base Water Demand	Max Day (Peak) Water Demand	Customer Accounts	Meters & Services	Fire Protection	Basis of Classification
Land/Water Rights	$ 8,823,439	$ 5,179,686	$ 3,643,753	$ -	$ -	$ -	58.7% Base 41.3% Peak
Supply	41,993,764	24,651,899	17,341,865	-	-	-	58.7% Base 41.3% Peak
Treatment	14,250,856	8,365,781	5,885,074	-	-	-	58.7% Base 41.3% Peak
Pumping	7,189,228	4,220,344	2,968,884	-	-	-	58.7% Base 41.3% Peak
Transmission Lines	46,562,416	-	32,593,691	4,656,242	-	9,312,483	70% Peak 10% Cust 20% FP
Distribution Lines	42,240,431	-	29,568,302	4,224,043	-	8,448,086	70% Peak 10% Cust 20% FP
Meters	3,895,840	-	-	-	3,895,840	-	100% Meters & Services
Hydrants	6,513,372	-	-	-	-	6,513,372	100% Fire Protection
Treated Water Storage	62,532	36,708	25,823	-	-	-	58.7% Base 41.3% Peak
General Plant	8,841,600	2,162,709	5,131,644	515,749	-	1,031,498	As % of S, T, P, T & D
Total Plant in Service	$ 180,373,478	$ 44,617,128	$ 97,159,037	$ 9,396,034	$ 3,895,840	$ 25,305,439	
Less Contributed Plant	(31,155,184)	(7,706,537)	(16,781,889)	(1,622,939)	(672,913)	(4,370,907)	As % of Total Plant
Net Plant Investment	$ 149,218,294	$ 36,910,591	$ 80,377,148	$ 7,773,095	$ 3,222,927	$ 20,934,533	
% of Net Plant in Service		24.7%	53.9%	5.2%	2.2%	14.0%	

1. Supply, Treatment, Pumping, Transmission & Distribution.

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

The resulting net plant allocations were applied to the current system cost of service analysis depicted in Figure 3-8. This figure classifies the major functions of the water system and allocates those related costs to the demand factors average day (base), maximum day (peak) usage, meters and services, billing and collection, fire protection, and energy costs.

Figure 3-8: Classification of Water Expenses by Function

Description	Total Water Expenses	Base Water Demand	Max Day (Peak) Water Demand	Customer Accounts	Meters & Services	Fire Protection	Energy Costs	Basis of Classification
Source of Supply								
Wells	$ 649,512	$ 381,288	$ 268,224	$ -	$ -	$ -	$ 1,269,198	58.7% Base 41.3% Peak
Other Supply Expense	124,720	73,215	51,505	-	-	-	260	58.7% Base 41.3% Peak
Total Source of Supply Expense	$ 774,232	$ 454,503	$ 319,729	$ -	$ -	$ -	$ 1,269,458	
Water Treatment								
Operations Expense - Treatment	$ 585,592	$ 343,764	$ 241,828	$ -	$ -	$ -	$ 530,242	58.7% Base 41.3% Peak
Maintenance Expense	225,846	132,580	93,266	-	-	-	-	58.7% Base 41.3% Peak
Chemicals	233,248	233,248	-	-	-	-	-	100% Base
Other Treatment Expense	110,375	110,375	-	-	-	-	-	Assumed 100% Base
Total Water Treatment Expense	$ 1,155,061	$ 819,967	$ 335,094	$ -	$ -	$ -	$ 530,242	
Water Distribution								
Reservoirs	$ 35,674	$ 20,942	$ 14,732	$ -	$ -	$ -	$ 30,500	58.7% Base 41.3% Peak
Operations - Pumping	1,900	1,115	785	-	-	-	32,450	58.7% Base 41.3% Peak
Operations Expense - Distribution	402,142	236,072	166,070	-	-	-	5,200	58.7% Base 41.3% Peak
Maintenance - Mains	349,749	205,316	144,433	-	-	-	-	58.7% Base 41.3% Peak
Maintenance - Meters	89,468	-	-	-	89,468	-	-	100% Meters & Services
Maintenance - Hydrants	177,724	-	-	-	-	177,724	-	100% Fire Protection
Installation - Meters	363,707	-	-	-	363,707	-	-	100% Meters & Services
Other Distribution Expense	36,431	36,431	-	-	-	-	1,500	Assumed 100% Base
Total Water Distribution Expense	$ 1,456,795	$ 499,876	$ 326,020	$ -	$ 453,175	$ 177,724	$ 69,650	
General & Administrative								
Water Conservation	$ 282,072	$ -	$ -	$ 282,072	$ -	$ -	$ -	100% Customer Accounts
Misc General Expense	11,621	5,811	-	2,324	2,324	1,162	-	Base, CA, M&S, FP (50/20/20/10)
Allocated WS Administration	818,665	409,332	-	163,733	163,733	81,866	-	Base, CA, M&S, FP (50/20/20/10)
Allocated Indirect Costs	1,255,663	627,832	-	251,133	251,133	125,566	-	Base, CA, M&S, FP (50/20/20/10)
Total G&A Expense	$ 2,368,021	$ 1,042,974	$ -	$ 699,262	$ 417,190	$ 208,595	$ -	
Capital Requirements								
Capital Replacement	$ 850,782	$ 210,449	$ 458,278	$ 44,319	$ 18,376	$ 119,360	$ -	As Net Plant in Service
Rate Fund Capital Projects	2,957,033	731,451	1,592,820	154,038	63,868	414,856	-	As Net Plant in Service
Debt Service	2,596,914	642,372	1,398,840	135,279	56,090	364,333	-	As Net Plant in Service
Total Capital Requirements Expens	$ 6,404,728	$ 1,584,271	$ 3,449,937	$ 333,636	$ 138,334	$ 898,549	$ -	
TOTAL FUNCTIONALIZED COSTS	**$ 12,158,837**	**$ 4,401,592**	**$ 4,430,780**	**$ 1,032,898**	**$ 1,008,699**	**$ 1,284,868**	**$ 1,869,350**	
FUNCTIONALIZATION FACTOR	**100.0%**	**31.4%**	**31.6%**	**7.4%**	**7.2%**	**9.2%**	**13.3%**	

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

The resulting functionalization factors that appear at the bottom of Figure 3-8 are utilized to allocate system operating and capital costs to each customer class based on the each class' demand on the system. The energy costs column has been included in this cost analysis to reflect the additional expenses recovered by the creation an energy surcharge.

Rate Design Balance

There is some flexibility in the design of the rate structure to meet the City's pricing objectives while being consistent with cost of service principles. There are positives and negatives associated with the decrease in fixed revenue. Typically, a larger percentage of fixed rate revenue results in greater revenue stability since a greater percentage of total revenues are not influenced by fluctuations in consumption due to the weather. At the same time, the decrease in fixed revenue will improve equitability concerning cost recovery and the impact of conservation measures while reducing revenue stability, as users have greater control over their consumption and ultimately their bill. The fixed portion of the proposed water rates generates an estimated 24% of total rate revenue

Rate Design Analysis

The final step of the rate study is the design of the water rates to collect the desired level of revenue determined in the revenue requirement analysis. During this analysis, consideration is given to both the level of rates and the structure of the rates. This section reviews the proposed water rate design for the City.

Criteria and Considerations

In determining the appropriate rate level and structure, the consulting team, in conjunction with City staff and the City's Water Commission, analyzed various generated financial scenarios concerning the proposed adjustments and the implications attributed to those decisions.

A simplified list of some of the design considerations that were reviewed is listed:

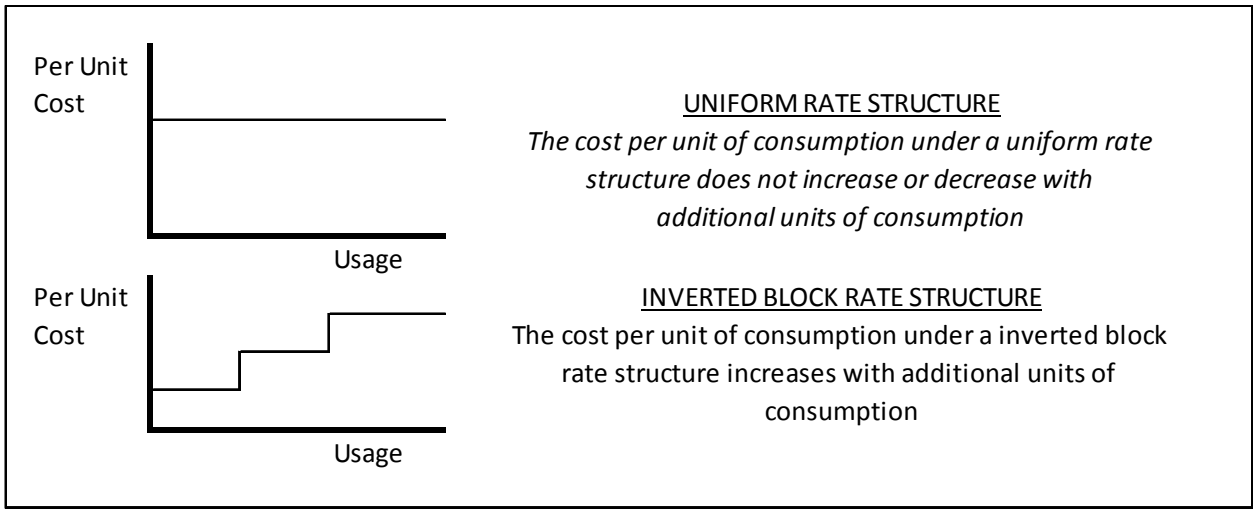
- Consideration of the customer's ability to pay
- Clear and understandable rates
- Easily administered
- Conservation measures
- Revenue stability (month to month and year to year)
- Efficient allocation of resources
- Implementation of Capital Improvements (rate of improving the existing system)
- Fair and equitable (cost-based) rates
- Energy Surcharge

Every consideration has merit and plays an important role in a comprehensive rate study. When developing the City's proposed rates all of the aforementioned criteria were taken into consideration. Determining the appropriate balance is crucial, as some of the criteria sometime conflict with one another, i.e. the customers ability to pay and cost-based. In designing rates, there will always be concessions between the various objectives; however, we attempt to ensure the proposed rates meet all of the leading objectives of the City.

Overview of Existing Rate Structure

The City has two rate structures currently implemented: increasing block rate and uniform rate. While each rate structure is similar by having a fixed monthly charge, how the structures charge for consumption is different. Figure 3-9 provides an overview of the two rate structures.

Figure 3-9: Rate Structure Overview



The Single Family Residential (SFR) water rate structure, shown in Figure 3-10 currently employs an inverted block rate structure that is the (variable) cost per unit of consumption increases with additional units of consumption. The City's existing structure consists of three blocks of consumption levels at which the unit price increases. These blocks may also be referred to as tiers. Under a uniform rate structure, the cost per unit of consumption does not increase or decrease with additional units of consumption. This uniform pricing method currently applies to Multi-Family, Commercial, Lawn Meters, Manufacturing, Northern Arizona University, and Standpipes, as outlined in Figure 3-11. All customer classes are charged a fixed monthly fee as shown in Figure 3-12.

Figure 3-10: Existing Single Family Rate Structure

Description	Gallon	Existing
Tier 1	0 - 5,000	3.02
Tier 2	5,001 - 15,000	3.54
Tier 3	15,001 - 25,000	5.03
Tier 4	> 25,001	8.77

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Figure 3-11: Existing Non-Single-Family Residential Rate Structure

Description	Current
Multi-Family Residential	2.88
Commercial/Schools	3.17
Lawn Meters	3.02
Manufacturing	2.88
Northern Arizona University	2.80
Standpipes	5.60

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Figure 3-12: Existing Fixed Charge

Meter Size	Charge
3/4"	$ 6.48
1"	8.02
1 1/2"	9.62
2"	14.00
3"	41.80
4"	58.00
6"	89.80
8"	124.00
10"	168.80

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Proposed Rate Adjustments

Energy Surcharge

In Fiscal Year 2009 the City's cost base had been significantly inflated by high energy costs which may continue to rise for some time. City staff asked the consulting team to introduce a rate structure, distinct from a normal bundled cost, where the City could separate out the energy element of the water rates that is directly related to fuel and energy prices.

In Fiscal Year 2009 the energy component of the Utilities operating expenses came to 3.49 million dollars. Approximately 33% of the Utilities annual operating budget is due to power and energy costs. At a time when energy costs are rising faster than the City's rates can be adjusted the consulting team proposes to separate out the energy component of the rate structure and list it as an energy surcharge. This surcharge would pay for energy and power related operating expenses that are subject to annual

variations. This type of operating expense needs periodic reevaluation without the need of a general rate case.

This Commission continues to be supportive of the City's investments in energy conservation and sustainability efforts. By separating out the energy component of the rates, the City can better monitor, measure and adjust its costs related to energy and power. In addition, if the City chooses to pursue renewable energy sources for Utility operations, any cost savings may be reflected in the energy surcharge fund. The Commission recognizes that exploring renewable energy sources and prudent conservation continues to make sense from both a societal and economic prospective

Figure 3-13 details the methodology used to generate the energy surcharge. To calculate the energy surcharge divide all of the water related energy costs by the total consumption. The City update the surcharge annually based on a one-year rolling average of water related energy costs.

Figure 3-13: Energy Surcharge

Total Energy Cost*	$	1,869,350
Total Consumption (Tg)		2,496,772
Surcharge per Tg	$	0.75

* Based on 2009 Budget Figures

Conservation

In addition to a cost-based approach, a secondary objective of the City is to encourage water conservation through design and implementation of the new rate and structure. Beyond the revenue adjustments established in the required revenue analysis and the allocation of cost determined in the cost of service analysis, the consulting team and the City discussed changes to the number of and consumption levels of the blocks (tiers). Figure 3-14 illustrates SFR consumption by percentile. Percentiles are shown for winter, summer, and annual average to provide an understanding of the seasonal consumption patterns.

Figure 3-14: Consumption by Percentile

Percentile	Winter	Summer	Average
10%	1.28	2.12	2.02
20%	2.02	3.19	2.87
25%	2.34	3.67	3.23
30%	2.65	4.16	3.55
40%	3.25	5.20	4.23
50%	3.82	6.44	4.92
60%	4.45	8.01	5.68
70%	5.15	10.26	6.64
75%	5.56	11.74	7.29
80%	6.09	13.38	7.98
90%	7.88	18.87	10.23
95%	9.81	24.80	12.59
98%	12.92	33.05	15.74
100%	648.51	164.40	89.71

* Percentiles calculated from average monthly consumption and are presented in 1,000 gallons.

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Figure 3-14 also illustrates that the existing blocks are not currently set at appropriate levels to encourage a residential customers to reduce consumption. The City's existing consumption blocks, most notably Tiers 3 and 4, see very limited application. For example, in summer, more than 80% of SFR accounts fall within Tier 2. Figure 3-15, below, outlines the proposed changes to the block design.

Figure 3-15: Residential Tier Changes

Description	Existing (gal)	Proposed (gal)
Tier 1	0 - 5,000	0 - 3,700
Tier 2	5,001 - 15,000	3,701 - 6,400
Tier 3	15,001 - 25,000	6,401- 11,700
Tier 4	> 25,001	> 11,701

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

The proposed consumption blocks, tiers, enable the City to encourage conservation, while reducing the burden on those already conserving. By matching the consumption blocks to consumption levels, The City should be able to achieve their conservation goals.

Fixed Charge (Monthly Fee)

When the City last reviewed the water utility rates, the fixed monthly charge was not increased. As a result, a majority of the revenue increase will be captured in the monthly fixed charge.

Summary of Water Rate Study

Throughout the process of the water rate study, many renditions and scenarios were considered. Presented below is the culmination of numerous analyses and discussions. Figure 3-16 recaps the proposed monthly base charge rate and Figure 3-17 summarizes the variable charges by customer class as designed in this study.

Figure 3-16: Monthly Service/Standby Fixed Charge

Description	Current	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
All Customer Classes (except Private Fire)						
Meter Size	**Monthly Base Charge by Meter**					
3/4"	$ 6.48	$ 10.02	$ 11.38	$ 12.18	$ 13.03	$ 13.42
1"	8.02	11.80	13.40	14.34	15.34	15.80
1 1/2"	9.62	16.25	18.45	19.74	21.12	21.75
2"	14.00	21.58	24.50	26.22	28.06	28.90
3"	41.80	34.03	38.64	41.34	44.24	45.57
4"	58.00	51.82	58.83	62.95	67.36	69.38
6"	89.80	96.28	109.31	116.96	125.15	128.91
8"	124.00	149.64	169.89	181.78	194.51	200.34
10"	168.80	211.89	240.56	257.40	275.42	283.68
Private Fire Connections						
Connection Size	**Monthly Private Fire Protection Charge**					
4"	$ 22.68	$ 9.41	$ 10.68	$ 11.43	$ 12.23	$ 12.59
6"	44.23	27.33	31.02	33.19	35.52	36.58
8"	70.32	58.23	66.11	70.74	75.69	77.96

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Figure 3-17: Proposed Commodity Charges

Description	Current*	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Single Family Residential						
Tier 1 (0 - 3,700 gal)	3.02	2.07	2.34	2.51	2.68	2.77
Tier 2 (3,700 - 6,400 gal)	3.54	2.69	3.05	3.26	3.49	3.59
Tier 3 (6,400 - 11,700 gal)	5.03	4.13	4.69	5.02	5.37	5.53
Tier 4 (11,701+ gal)	8.77	8.26	9.38	10.04	10.74	11.06
Multi-Family Residential	2.37	2.66	3.02	3.23	3.45	3.56
Commercial/Schools	3.17	2.83	3.21	3.43	3.67	3.78
Lawn Meters [1]	3.02	2.83	3.21	3.43	3.67	3.78
Manufacturing	2.88	2.78	3.16	3.38	3.62	3.73
Northern Arizona University	2.80	2.73	2.95	3.15	3.37	3.47
Standpipes	5.60	4.88	5.07	5.34	5.63	5.78
Energy Surcharge [2]	-	0.75				

*Current Tier Structure: 0-5,000, 5,001-15,000, 15,001-25,000, & Over 25,001 gallons

[1] Lawn Meters are now tied to the Commercial/Schools rate, rather than the Single Family rate

[2] Energy Surcharge, per unit, applied to all customer classes.
Cost to be calculated annually based on a one-year rolling average of water related energy costs.

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Impact of Revenue Increase

In Fiscal Year 2011, the proposed 13% increase in required revenue does not directly correlate to a 13% increase in rates. The cost of service analysis and, in Single Family Residential's case, the restructuring of the consumption blocks dictate the actual adjustments to the rates.

Figure 3-18 details a comparison of the City's existing rates with the proposed single-family rates (rate increase effective January 2011). Average usage for SFR is 5,000 gallons – fifty percent (50%) of billed customers consume less than 5,000 gallons. If an "average family" of four were assumed, generally, consumption would fall between 7,500 and 10,000 gallons a month. As revealed in the comparison, those who burden the system the greatest, over 10,000 gallons, see a sharp increase in their monthly bill. Those who reduce, or already consume an average amount, will see their bills relatively unchanged.

Figure 3-18: Comparative Water Bills - SFR

Monthly Consumption (gal)	Current Monthly Bill	Proposed 2011 Rate Monthly Bill*	$ Difference from Current Rates
3,500	17.05	19.87	2.82
5,000	21.58	24.90	3.32
7,500	30.43	35.07	4.64
10,000	39.28	47.27	7.99
15,000	56.98	85.30	28.32
20,000	82.13	130.35	48.22
25,000	107.28	175.41	68.13
30,000	151.13	220.46	69.33

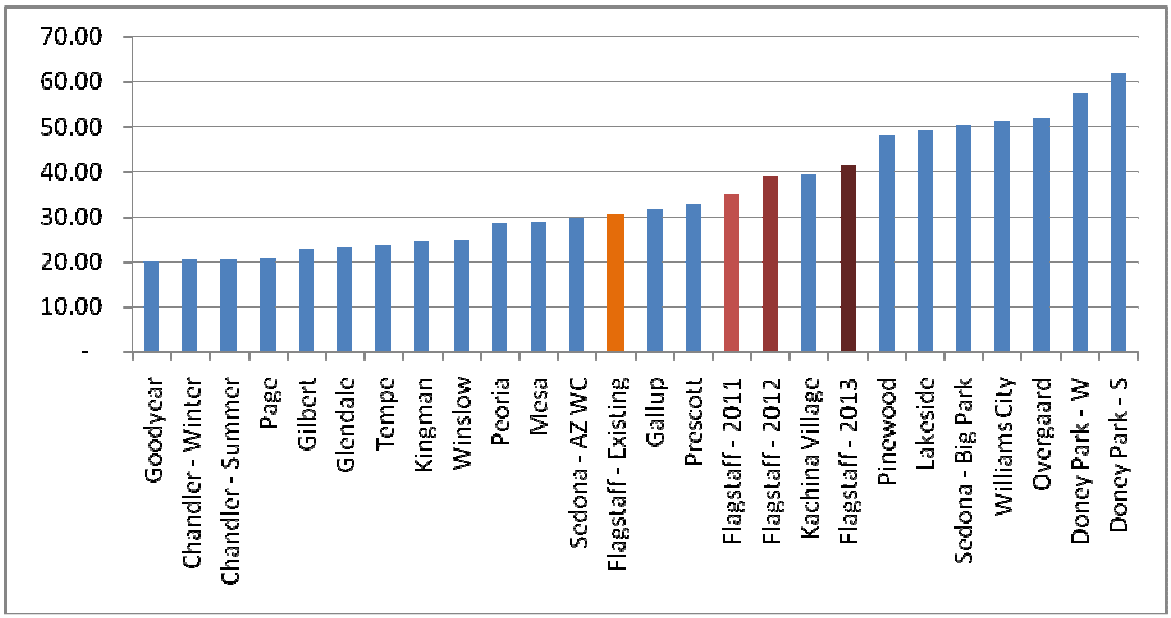
* Includes Energy Surcharge

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Rate Comparison

While the cost structure and facilities vary greatly between Water Utilities, rate comparisons provide the City a barometer of its rates in relation to surrounding communities. The figure compares the estimated monthly bill for 7,500 gallon of consumption. The proposed rates (2011, 2012, and 2013) use the 2011 energy surcharge.

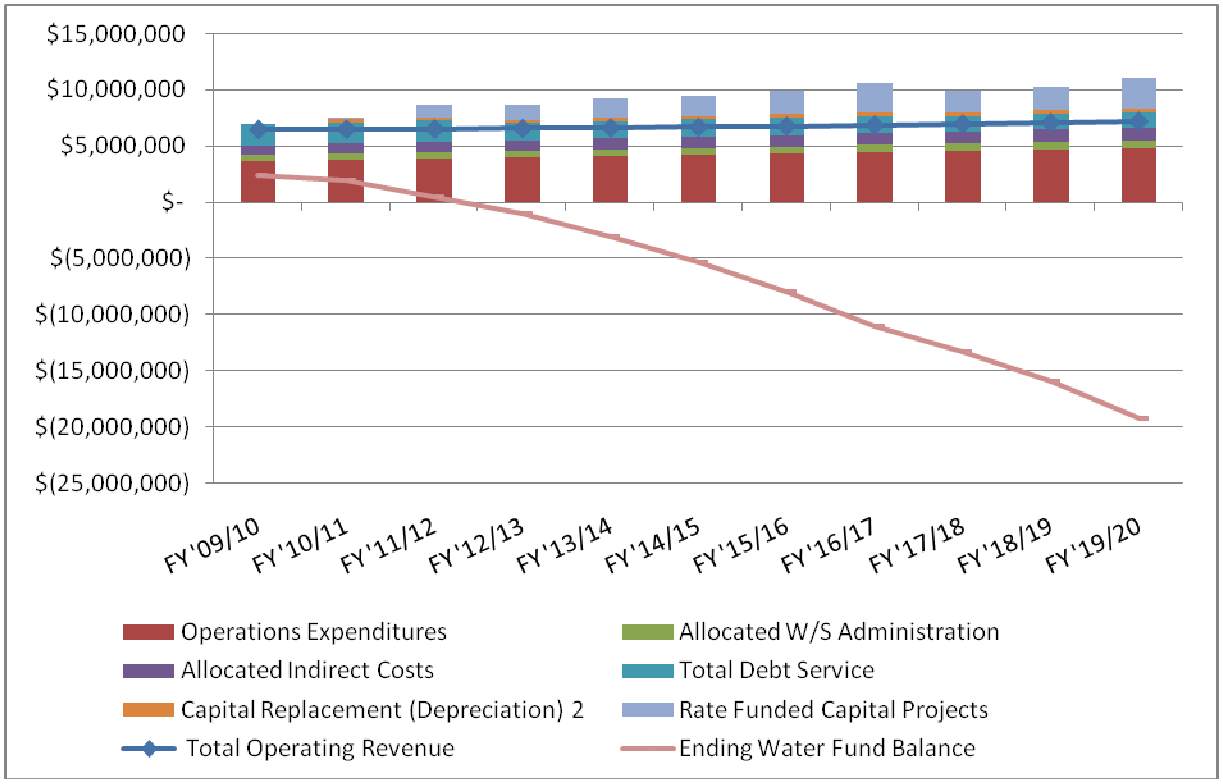
Figure 3-19: SFR Rate Comparison –7,500 gallons



Wastewater Rate Analysis

Wastewater is in a similar position when compared to the City's water utility. Wastewater is facing increased costs related to operations and an increasing need to repair and replace existing infrastructure. Figure 4-1, below, projects the adequacy of existing rate revenue.

Figure 4-1: Revenue and Expenditure Projections – Existing Rates



As the above figure indicates, revenue increases are necessary to operate and maintain the wastewater system. The bars in the figure represent total expenditures of the wastewater system, whereas the lines represent the utility's fund balance and operating revenue. This graph shows the read that the utility is not covering its cost resulting in reserve fund depletion. The reserve is shown to turn negative in Fiscal year 2012. Details of the process, data, and methodology utilized in the rate study are presented in this section of the report. Summary figures, outlining much of the analysis are included in this section of the report as well, while technical figures, which provide a greater level of detail and breadth, are provided in the Technical Appendix.

Customer Statistics

During the Fiscal Year 2008, it is estimated that the City provided wastewater service to an estimated 17,352 customers, discharging roughly 2.1 billion gallons of wastewater. Figure 4-2 shows usage and number of accounts by customer class as billed by the City.

Figure 4-2: Accounts and Consumption (2009)

Description	Class	Accounts	Estimated Sewer Flow (1,000 gal)
Residential			
Single- and Multi-Family	R1 - R4	15,879	1,242,245
Non-Residential			
Car Washes	CW	12	15,881
Laundromats	L	4	19,375
Commercial	C	1,192	294,822
Hotels & Motels	H	99	195,386
Restaurants	RF	123	78,828
Industrial Laundries	IL	1	19,740
Manufacturing	MN	32	107,928
Pet Food Manufacturers	PF	1	6,453
Soft Drink Bottling	SD	2	4,736
Ice Cream Cone Mfg	IC	1	1,157
Northern Arizona University	NA	6	156,769
Total		17,352	2,143,319
Total Consumption (af)		17,617	

1. Consumption period of March 2008 through February 2009.

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

A projection of accounts, discharge, and loading strengths is necessary in the evaluation of the revenue requirements. This projection is critical for the determination of revenues from rates, escalation of treatment-related costs, and design of the rates.

Given the current economic climate and review of potential growth, City staff was determined to use a conservative a growth rate starting at 0.2% (35 new account accounts) in Fiscal Year 2010 rising slowly and topping off at 1.6% (304 new accounts) by Fiscal Year 2020.

Revenue Requirements Analysis

Revenue from Existing Rates

The first step in developing the revenue requirements is to develop a projection of revenues from existing rates. The City expects to receive approximately $6.5 million in wastewater related charges in Fiscal Year 2010. By 2020, assuming the growth discussed above, wastewater charges are projected to increase roughly 10% to $7.2 million.

Projections of Operation and Maintenance Expenses

To project Operating and Maintenance (O&M) expenses over the ten-year planning horizon, two escalation factors were developed. The operations cost escalator, set at 2.75%, is applied to basic expenditures that the Department incurs: labor, benefits, materials, utilities, etc. The depreciation expense escalator, set at 2.0%, helps the City maintain appropriate recovery levels for depreciated facilities and other assets. Additionally, the City, as part of its financial policies, has established a reserve policy to provide 10% (37 days) of its annual operating and maintenance expenses in a reserve account.

Debt Service

Debt service is the Department's annual debt service obligations (principal and interest) when projects are financed via long-term debt. The City's wastewater obligations are spread between wastewater and reclaimed water as this debt benefited both systems. Figure 4-3 provides a summary of the City's wastewater related debt service and the system's final annual obligation.

Figure 4-3: Debt Service Report

Existing Debt

	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Wastewater Debt Financing						
Wells Fargo Lease Payable - APSES	$ 250,956	$ 250,956	$ 250,956	$ 250,956	$ 250,956	$ 250,956
SRF Loan 910007-93	421,955	420,819	419,646	-	-	-
ADEQ-WIFA - Wildcat	1,686,675	1,686,675	1,686,675	1,686,675	1,686,675	1,686,675
Total Wastewater Debt Requirements	$ 2,359,586	$ 2,358,450	$ 2,357,277	$ 1,937,631	$ 1,937,631	$ 1,937,631
Reclaimed Water's Portion of Debt	$ 459,782	$ 459,560	$ 459,332	$ 377,561	$ 377,561	$ 377,561
Remainder to Wastewater system	$ 1,899,804	$ 1,898,890	$ 1,897,945	$ 1,560,070	$ 1,560,070	$ 1,560,070

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Capital Improvement Projects

The Department's capital improvements projects (CIPs) for the wastewater utility are summarized in Figure 4-4. Individually, each project was identified by City staff as growth-related, existing needs (O&M) or a percentage of both to determine the appropriate funding mechanism (monthly rates or connection fee). The capital projects are required to meet the utilities projected growth and to maintain the existing quality of the system.

Figure 4-4: Wastewater Capital Projects by Funding Source

Description	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Rate Funded Capital Projects	$ -	$ 100,000	$ 1,095,000	$ 1,300,000	$ 1,685,000	$ 1,820,000
Fee Funded Capital Projects (Growth)	-	-	30,000	-	380,000	180,000
Total Rate and Fee Funded Project Costs	**$ -**	**$ 100,000**	**$ 1,125,000**	**$ 1,300,000**	**$ 2,065,000**	**$ 2,000,000**

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Summary of Revenue Requirements Analysis

The above components comprise the foundation of the revenue requirement analysis. Given the current economic climate, the consulting team facilitated several meetings with City staff and committee members to assure the accuracy of financial and growth variables in developing the revenue requirement analysis. Particular emphasis was placed on attempting to minimize rates, yet still encompass adequate funds to support the operational activities and capital projects throughout the study period.

The revenue requirements analysis figure, presented below, provides a basis for evaluating the timing and level of wastewater revenue increases required to meet the projected required revenue for the study period. The percentages shown at the bottom of the figure show the recommended revenue adjustments.

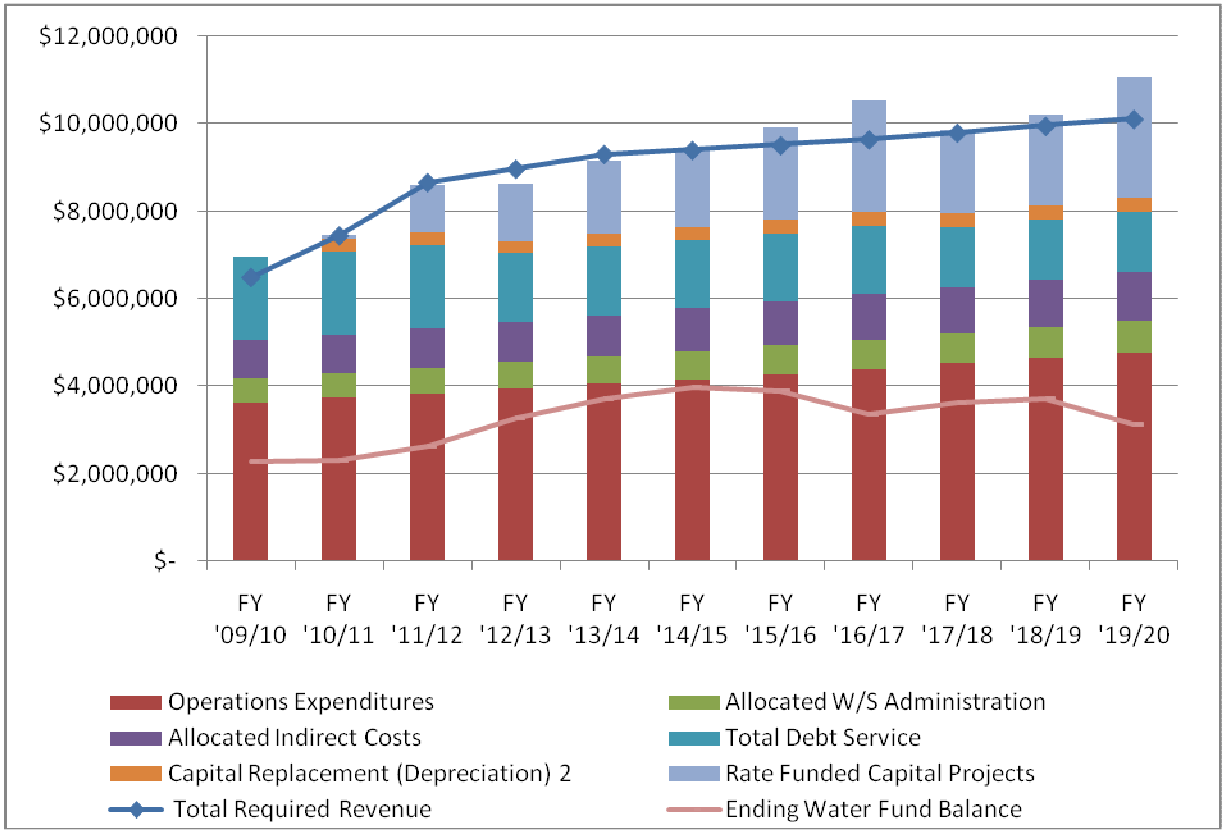
Figure 4-5: Summary of Wastewater Revenue Requirements

Description	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Revenues						
Total Revenues (before increase)	$ 7,143,278	$ 6,548,488	$ 6,582,597	$ 6,606,396	$ 6,647,271	$ 6,719,546
Additional Rate Revenue (increase)	-	938,303	2,129,046	2,395,617	2,678,283	2,705,066
Total Revenues	**$ 7,143,278**	**$ 7,486,790**	**$ 8,711,643**	**$ 9,002,012**	**$ 9,325,554**	**$ 9,424,612**
Expenses						
Operating Expenses	$ 5,051,474	$ 5,190,390	$ 5,333,126	$ 5,479,787	$ 5,630,481	$ 5,785,319
Annual Debt Service	1,899,804	1,898,890	1,897,945	1,560,070	1,560,070	1,560,070
Capital Replacement	-	278,025	283,586	289,258	295,043	300,944
Capital Replacement (Incurred)	-	-	(228,025)	(283,586)	(289,258)	(295,043)
Rate Funded Capital Projects	-	100,000	1,095,000	1,300,000	1,685,000	1,820,000
Total Expenses	**$ 6,951,279**	**$ 7,467,305**	**$ 8,381,631**	**$ 8,345,529**	**$ 8,881,336**	**$ 9,171,290**
Net Income (Loss)	**$ 191,999**	**$ 19,485**	**$ 330,012**	**$ 656,484**	**$ 444,218**	**$ 253,322**
Ending Wastewater Fund Balance	2,278,255	2,297,740	2,627,752	3,284,235	3,728,454	3,981,775
Ending Wastewater CR Fund Balance	-	278,025	333,586	339,258	345,043	350,944
Additional Revenue Increase	**0.0%**	**30.0%**	**3.0%**	**3.0%**	**3.0%**	**0.0%**

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Based upon the revenue requirement analysis, the City will need to adjust their rates to increase revenue by 30% in the first year, following smaller revenue increases in subsequent years, approximately 42% over the next five years. Figure 4-6 expands upon the earlier figure (Figure 4-1), to illustrate the positive impact of the revenue increase on the utility's financial condition.

Figure 4-6: Revenue and Expenditure Projections – Proposed Rates



Cost of Service Analysis

This section of the report discusses the allocation of operating and capital costs to the Flow, Suspended Solids (SS) and Biochemical Oxygen Demand (BOD) parameters, the determination of unit rates, and the calculation of user class cost responsibility.

Cost Allocation by Function

The cost of service allocation conducted in this study is established on the flow and strength characteristics method, which is endorsed by the Water Environmental Federation (WEF). Under this method, revenue requirements are allocated to the different user classes proportionate to their use of the wastewater system. Allocations are based on flow volume, SS, BOD, customer accounts, and wastewater monitoring. Use of this methodology results in a generally accepted cost distribution among customer classes and a means of calculating and designing rates to proportionately recover those costs.

Figure 4-7 presents the net plant in service analysis. This analysis is important in order to determine an appropriate and reasonable means of allocating debt service requirements and future capital projects to utility demand.

Figure 4-7: Functionalization of Net Plant Investment

Description	Plant Investment	Flow Volume	BOD	SS	Customer Accounts	Basis of Classification
Preliminary Treatment	$ 3,787,538	$ 378,754	$ 1,136,261	$ 2,272,523	$ -	10% Flow 30% BOD 60% SS
Primary Sedimentation	7,511,344	751,134	2,253,403	4,506,806	-	10% Flow 30% BOD 60% SS
Primary Effluent Pump Station	978,751	978,751	-	-	-	100% Flow
Biofilters	5,503,767	-	5,503,767	-	-	100% BOD
Secondary Sedimentation	5,526,528	2,763,264	2,763,264	-	-	50% Flow 50% BOD
Chlorination Facilities	1,047,036	1,047,036	-	-	-	100% Flow
Reclamation Water Pump - Wildcat Hill	357,303	357,303	-	-	-	100% Flow
Reclamation Water Pump - Rio de Flag	225,395	225,395	-	-	-	100% Flow
Digesters	6,578,116	-	3,289,058	3,289,058	-	50% BOD 50% SS
Storm Drain Pump Station	136,570	136,570	-	-	-	100% Flow
Outside Piping	4,552,330	4,552,330	-	-	-	100% Flow
Aeration Basins	11,272	-	11,272	-	-	100% BOD
Reclaimed Water Plant	21,086,572	21,086,572	-	-	-	100% Flow
General Plant-Treatment Plant	20,560,924	6,353,217	8,491,570	5,716,137	-	As Plant before Gen. Plant
Total Treatment Plant	$ 77,863,446	$ 38,630,325	$ 23,448,595	$ 15,784,525	$ -	
Liquid Waste Disposal	$ 1,084,890	1,084,890	-	-	-	100% Flow
WWTP Sludge Disposal	44,038	-	22,019	22,019	-	50% BOD 50% SS
Collection System	84,969,240	84,969,240	-	-	-	100% Flow
General Plant	4,951,539	4,949,006	1,266	1,266	-	As Plant before Gen. Plant
Total Plant	$ 91,049,707	$ 91,003,136	$ 23,286	$ 23,286	$ -	
Less Contributed Plant	(176,058)	(175,968)	(45)	(45)	-	As % of Total Plant
Net Plant Investment	$ 168,913,152	$ 129,633,461	$ 23,471,881	$ 15,807,811	$ -	
% of Net Plant in Service	100.0%	76.75%	13.90%	9.36%	0.0%	

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

The resulting net plant allocations were applied to the current system cost of service analysis depicted in Figure 4-7. This figure classifies the major functions of the water system and allocates those related costs to the demand factors flow volume, SS, BOD, customer accounts.

Figure 4-8: Classification of Sewer Expenses by Function

Description	Total Sewer Expenses	Flow Volume	BOD	SS	Customer Accounts	Wastewater Monitoring	Basis of Classification
Wastewater Treatment							
Operations Expense-Treatment	$ 821,693	$ 82,169	$ 246,508	$ 493,016	$ -	$ -	10% Flow 30% BOD 60% SS
Maintenance Services-Treatment	584,897	58,490	175,469	350,938	-	-	10% Flow 30% BOD 60% SS
Other WW Treatment Expense	220,680	22,068	66,204	132,408	-	-	10% Flow 30% BOD 60% SS
Total WW Treatment Expense	$ 1,627,270	$ 162,727	$ 488,181	$ 976,362	$ -	$ -	
Wastewater Collection and Transmission							
Operations Expense-Collection	$ 245,179	$ 245,179	$ -	$ -	$ -	$ -	100% Vol
Maintenance Services-Collection	668,917	668,917	-	-	-	-	100% Vol
Total WW Collection and Transmission Expense	$ 914,096	$ 914,096	$ -	$ -	$ -	$ -	
Wastewater Monitoring [1]							
Operations Expense-Monitoring	$ 300,801	$ -	$ -	$ -	$ -	$ 300,801	100% Vol
Total WW Monitoring Expense	$ 300,801	$ -	$ -	$ -	$ -	$ 300,801	
Rio Reclaimed Water Plant							
Operations Expense-Reclaim	$ 515,179	$ 171,726	$ 171,726	$ 171,726	$ -	$ -	33% Flow 33% BOD 33% SS
Maintenance Services-Reclaim	195,156	65,052	65,052	65,052	-	-	33% Flow 33% BOD 33% SS
Monitoring Expense-Reclaim	84,177	28,059	28,059	28,059	-	-	33% Flow 33% BOD 33% SS
Total Rio Plant Expense	$ 794,513	$ 264,838	$ 264,838	$ 264,838	$ -	$ -	
General & Administrative							
Misc General Expense	$ 3,648	$ 1,824	$ -	$ -	$ 1,824	$ -	50% Vol 50% CA
Allocated WS Administration	556,930	278,465	-	-	278,465	-	50% Vol 50% CA
Allocated Indirect Costs	854,217	427,108	-	-	427,108	-	50% Vol 50% CA
Total G&A Expense	$ 1,414,795	$ 707,398	$ -	$ -	$ 707,398	$ -	
Capital Requirements							
Capital Replacement	$ 276,755	$ 212,397	$ 38,457	$ 25,900	$ -	$ -	As Net Plant in Service
Rate Fund Capital Projects	1,579,224	1,211,985	219,446	147,792	-	-	As Net Plant in Service
Debt Service	1,597,367	1,225,909	221,967	149,490	-	-	As Net Plant in Service
Total Capital Requirements Expense	$ 3,453,345	$ 2,650,292	$ 479,871	$ 323,183	$ -	$ -	
TOTAL FUNCTIONALIZED COSTS	**$ 8,504,820**	**$ 4,699,350**	**$ 1,232,889**	**$ 1,564,382**	**$ 707,398**	**$ 300,801**	
FUNCTIONALIZATION FACTOR	**100.0%**	**55.3%**	**14.5%**	**18.4%**	**8.3%**	**3.5%**	

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

The resulting functionalization factors that appear at the bottom of Figure 4-8 are utilized to allocate system operating and capital costs to each customer class based on the unique stress each class demands on the system.

Rate Design Analysis

The final step of the rate study is the design of the wastewater rates to collect the desired level of revenue determined in the revenue requirement analysis. During this analysis, consideration is given to the levels of the rates. This section reviews the proposed wastewater rate design for the City.

Criteria and Considerations

In determining the appropriate rate level and structure, the consulting team, in conjunction with City staff and the City's Water Commission, analyzed various generated financial scenarios concerning the proposed adjustments and the implications attributed to those decisions.

Listed below is a simplified list of the design considerations that were reviewed:

- Consideration of the customer's ability to pay
- Clear and understandable rates
- Easily administered
- Outdoor water usage
- Revenue stability (month to month and year to year)
- Efficient allocation of resources
- Implementation of Capital Improvements (rate of improving the existing system)
- Fair and equitable (cost-based) rates

When developing the City's proposed rates all of the aforementioned criteria were taken into consideration. Determining the appropriate balance is crucial, as some of the criteria sometime conflict with one another, i.e. the customers ability to pay and cost-based. In designing rates, there will always be concessions between the various objectives; however, the proposed rates meet all of the leading objectives of the City.

Overview of Existing Rate Structure

The City's existing wastewater rate structure is a uniform rate, per thousand gallons, based on the amount of metered water less irrigation deduction. All wastewater accounts are charged a uniform rate. Figure 4-9 shows the City's existing rate structure and rates.

Figure 4-9: Current Sewer Discharge Rates by Customer Class

Description	Customer Class	Current
Residential		
Single- and Multi-Family	R1 - R4	3.12
Non-Residential		
Car Washes	CW	2.58
Laundromats	L	2.81
Commercial	C	3.01
Hotels & Motels	H	4.09
Restaurants	RF	5.04
Industrial Laundries	IL	4.47
Manufacturing	MN	3.05
Pet Food Manufacturers	PF	8.34
Soft Drink Bottling	SD	7.31
Ice Cream Cone Mfg	IC	10.65
Northern Arizona University	NA	2.68

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Proposed Rate Adjustments

Figure 4-10 recaps the proposed variable rates by customer class as designed in this study.

Figure 4-10: Monthly Sewer Discharge Rates by Customer Class

Description	Customer Class	Current	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
		Monthly Sewer Discharge Rates per 1,000 gal ($)					
Residential							
Single- and Multi-Family	R1 - R4	3.12	3.08	3.59	3.69	3.80	3.80
Non-Residential							
Car Washes	CW	2.58	3.06	3.56	3.70	3.82	3.82
Laundromats	L	2.81	3.14	3.65	3.80	3.91	3.92
Commercial	C	3.01	3.22	3.75	3.90	4.01	4.02
Hotels & Motels	H	4.09	4.32	5.03	5.21	5.37	5.38
Restaurants	RF	5.04	5.20	6.05	6.27	6.45	6.46
Industrial Laundries	IL	4.47	4.77	5.55	5.76	5.93	5.94
Manufacturing	MN	3.05	3.46	4.02	4.18	4.31	4.32
Pet Food Manufacturers	PF	8.34	7.64	8.89	9.19	9.47	9.48
Soft Drink Bottling	SD	7.31	6.05	7.04	7.29	7.50	7.51
Ice Cream Cone Mfg	IC	10.65	9.46	11.02	11.38	11.72	11.73
Northern Arizona University	NA	2.68	2.79	3.24	3.37	3.48	3.48

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Impact of Revenue Increase

In Fiscal Year 2011, the proposed 30% increase in required revenue does not directly correlate to a 30% increase in rates. The cost of service analysis redistributes the required revenue proportionate to each customer class' demand on the system. Thus, the proposed rate adjustments may vary between customer classes.

Figure 4-11 details a comparison of the City's existing wastewater rates with the proposed single-family rates (rate effective January 2011). Average usage for SFR is 5,000 gallons – fifty percent (50%) of billed customers discharge fewer than 5,000 gallons. If an "average family" of four were assumed, generally, consumption would be between 7,500 and 10,000 gallons a month. As revealed in the comparison, the proposed rates have a greater impact on high water users.

Figure 4-11: Comparative Wastewater Bills – SFR

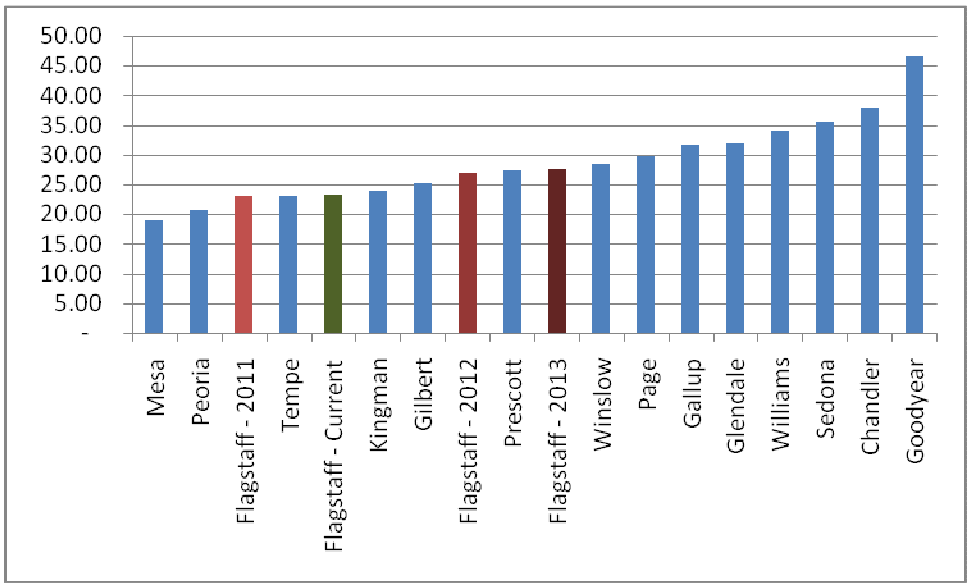
Monthly Discharge (gal)	Current Monthly Bill - FY 09/10	Proposed 2011 Monthly Bill	$ Difference from Current Rates
3,500	10.92	10.78	(0.14)
5,000	15.60	15.40	(0.20)
7,500	23.40	23.09	(0.31)
10,000	31.20	30.79	(0.41)
15,000	46.80	46.19	(0.61)
20,000	62.40	61.59	(0.81)
25,000	78.00	76.98	(1.02)
30,000	93.60	92.38	(1.22)

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Rate Comparison

While the cost structure and facilities vary greatly between wastewater utilities, rate comparisons provide City staff with a barometer of its rates in relation to surrounding communities. In the figure below, monthly bill estimates, assuming 7,500 gallons of discharge are compared to other Arizona utilities.

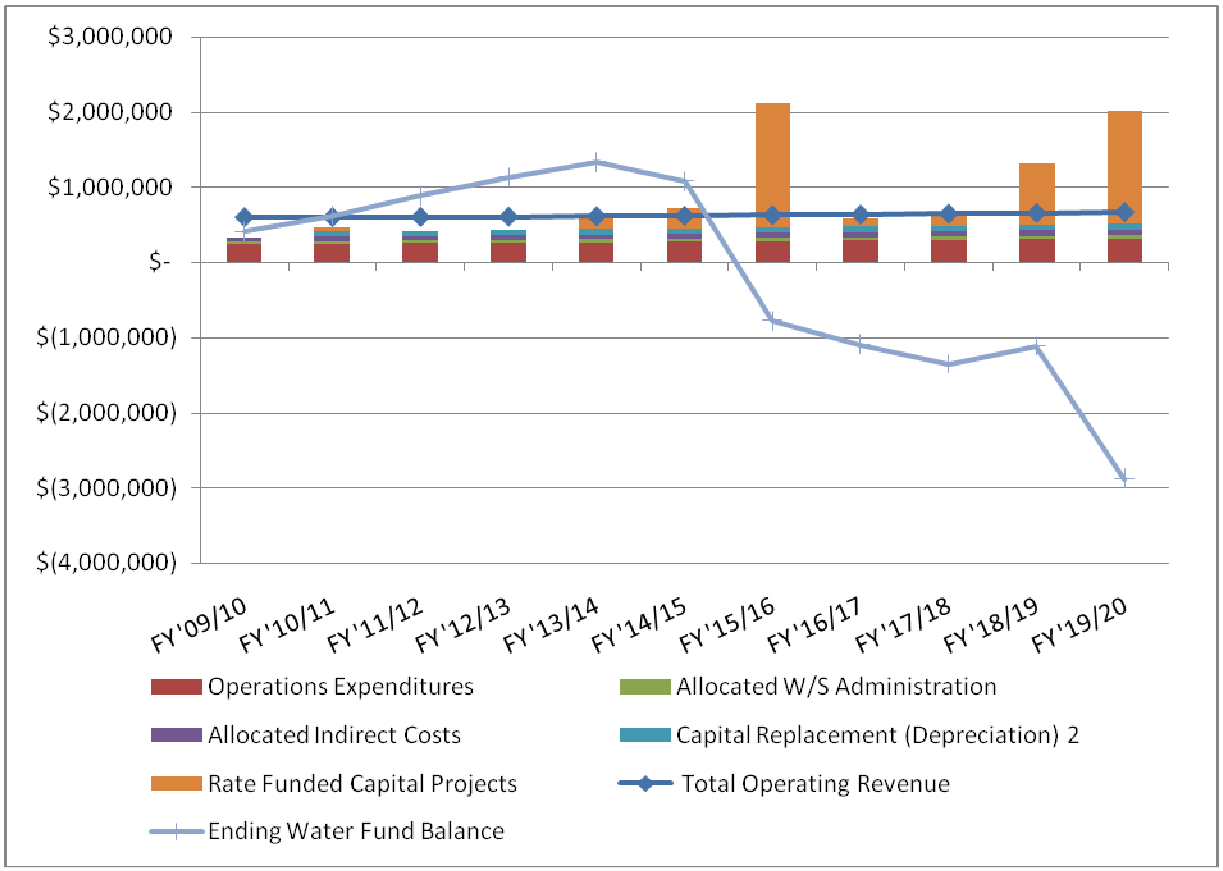
Figure 4-12: SFR Rate Comparison –7,500 gallons



Reclaimed Water Rate Analysis

The City recently completed a major upgrade to the Wildcat Hill WWTP from Class B to Class A+ quality reclaimed water. Escalating capital and operation and maintenance costs for the reclaimed system exceed the current revenue stream produced by the reclaimed water rates. Figure 5-1 projects the adequacy of existing rate revenue assuming no rate increases.

Figure 5-1: Revenue and Expenditure Projections – Existing Rates



As the figure indicates, revenue increases are necessary to operate and maintain the reclaimed water system as the ending fund balance becomes negative. This is evident as details of the process, data, and methodology utilized in the rate study are presented in this section of the report. Summary figures, outlining much of the analysis, are included in this section of the report. Technical figures, which provide a greater level of detail and breadth, are provided in the Technical Appendix.

Customer Statistics

During the Fiscal Year 2008, it is estimated that the City provided reclaimed water service to 101 customers, consuming roughly 700 million gallons of reclaimed water. Figure 5-2 shows usage and number of accounts by customer class as billed by the City.

Figure 5-2: Reclaimed Water Consumption by Class

Description	Class	Accounts	Consumption (1,000 gal) [1]
Commercial	C	30	46,945,930
Manufacturing	MN	1	63,940,000
City Departmental	MU	31	60,989,071
Northern Arizona University	NA	6	29,858,210
Private Residential	R1	9	1,892,811
Self Loading Stations and Hydrant Meters	RS/WR	9	33,009,086
Off Peak/High Volume	WR	15	452,975,500
Total		101	689,610,608

1. Consumption period is 2008.

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

A projection of accounts and consumption is necessary in the evaluation of the revenue requirements. This projection is critical for the determination of revenues from rates, escalation of production and delivery related costs, and design of the rates. Due to the nature of the reclaimed water system and existing users, no growth is assumed in users or usage.

Revenue Requirements Analysis

Revenue from Existing Rates

The first step in developing the revenue requirements is to develop a projection of revenues from existing rates. The City expects to receive approximately $600,000 in reclaimed water related charges in Fiscal Year 2010. By 2020, assuming zero growth as discussed above, reclaimed water sales will remain unchanged.

Projections of Operation and Maintenance Expenses

To project Operating and Maintenance (O&M) expenses over the ten-year planning horizon, two escalation factors were developed. The operations cost escalator, set at 2.75%, applies to basic expenditures that the Department incurs: labor, benefits, materials, utilities, etc. The depreciation expense escalator, set at 2.0%, helps the City maintain appropriate recovery levels for depreciated facilities and other assets. Additionally, the City, as part of its financial policies, has established a reserve policy to provide 10% (37 days) of its annual operating and maintenance expenses in a reserve account.

Debt Service

Debt service is the Department's annual debt service obligations (principal and interest) when projects are financed via long-term debt. The City's wastewater obligations are spread between wastewater and

reclaimed water as this debt benefited both systems. Figure 5-3 provides a summary of the City's reclaimed water related debt service and the systems final annual obligation.

Figure 5-3: Debt Service Report

Existing Debt	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Wastewater Debt Financing						
Wells Fargo Lease Payable - APSES	$ 250,956	$ 250,956	$ 250,956	$ 250,956	$ 250,956	$ 250,956
SRF Loan 910007-93	421,955	420,819	419,646	-	-	-
ADEQ-WIFA - Wildcat	1,686,675	1,686,675	1,686,675	1,686,675	1,686,675	1,686,675
Total Wastewater Debt Requirements	$ 2,359,586	$ 2,358,450	$ 2,357,277	$ 1,937,631	$ 1,937,631	$ 1,937,631
Reclaimed Water's Portion of Debt	$ 459,782	$ 459,560	$ 459,332	$ 377,561	$ 377,561	$ 377,561
Remainder to Wastewater system	$ 1,899,804	$ 1,898,890	$ 1,897,945	$ 1,560,070	$ 1,560,070	$ 1,560,070

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Capital Improvement Projects

The Department's capital improvements projects (CIPs) for reclaimed water are summarized below in Figure 5-4. City staff specified each project as growth-related, existing needs (O&M) or a percentage of both to determine the appropriate funding mechanism (monthly rates or connection fee). The capital projects are required to meet the utilities projected growth and to maintain the existing quality of the system.

Figure 5-4: Reclaimed Water Capital Projects by Funding Source

Description	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Rate Funded Capital Projects	$ -	$ 50,000	$ -	$ -	$ 150,000	$ 260,000
Fee Funded Capital Projects (Growth)	-	-	-	-	-	50,000
Total Rate and Fee Funded Project Costs	**$ -**	**$ 50,000**	**$ -**	**$ -**	**$ 150,000**	**$ 310,000**

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Summary of Revenue Requirements Analysis

The above components comprise the foundation of the revenue requirement analysis. Given the current economic climate, the consulting team facilitated several meetings with City staff and committee members to assure the accuracy of financial and growth variables in developing the revenue requirement analysis.

The revenue requirements analysis figure, presented below, provides a basis for evaluating the timing and level of reclaimed water revenue increases required to meet the projected required revenue for the study period. The percentages shown at the bottom of the figure show the recommended revenue adjustments.

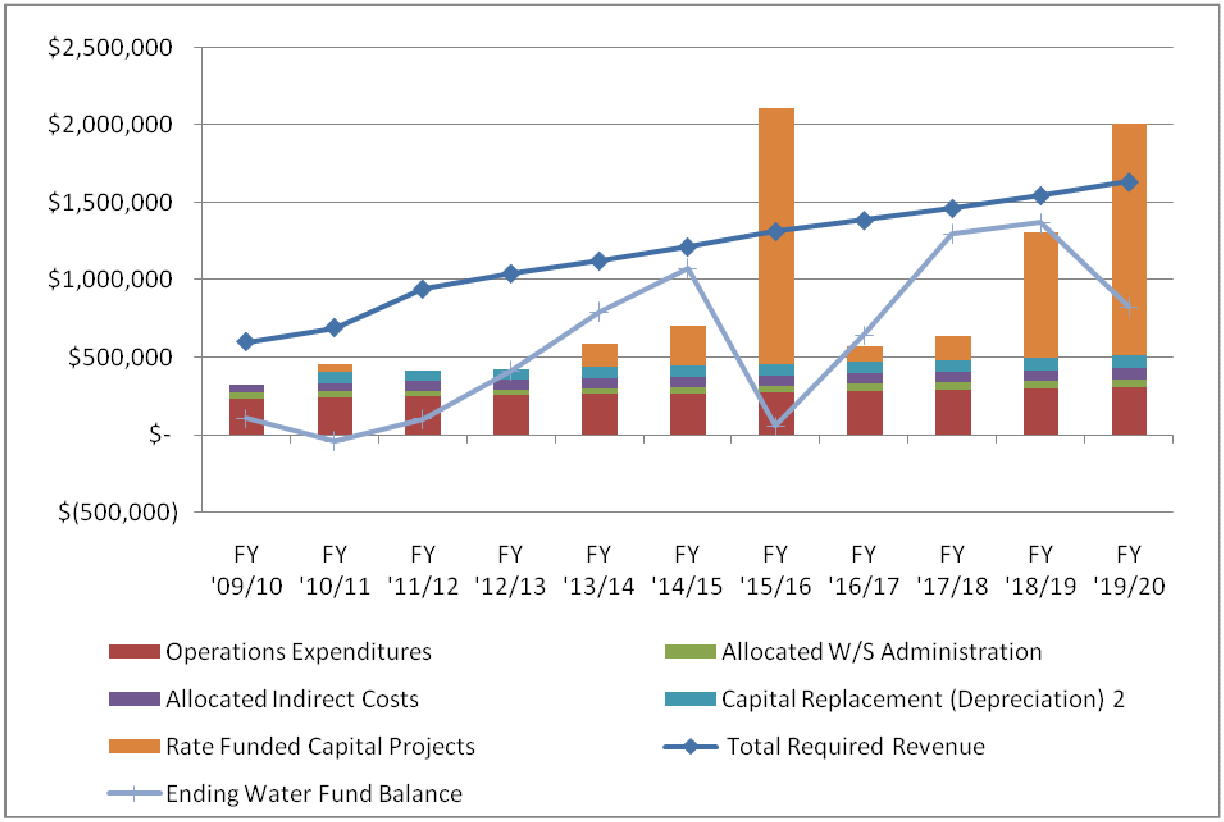
Figure 5-5: Summary of Reclaimed Water Revenue Requirements Analysis

Description	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Revenues						
Total Revenues (before increase)	$ 756,453	$ 610,081	$ 614,073	$ 613,714	$ 615,602	$ 623,163
Additional Rate Revenue (increase)	-	90,080	337,646	434,294	511,211	595,692
Total Revenues	**$ 756,453**	**$ 700,161**	**$ 951,719**	**$ 1,048,009**	**$ 1,126,813**	**$ 1,218,855**
Expenses						
Operating Expenses	$ 329,493	$ 338,554	$ 347,864	$ 357,430	$ 367,260	$ 377,359
Annual Debt Service	459,782	459,560	459,332	377,561	377,561	377,561
Capital Replacement (Depreciation)	-	67,286	68,632	70,005	71,405	72,833
Capital Replacement (Incurred)	-	-	-	-	(150,000)	(77,328)
Rate Funded Capital Projects	-	50,000	-	-	150,000	260,000
Total Expenses	**$ 789,274**	**$ 915,400**	**$ 875,828**	**$ 804,996**	**$ 816,225**	**$ 1,010,425**
Net Income (Loss)	**$ (32,821)**	**$ (215,239)**	**$ 75,891**	**$ 243,013**	**$ 310,588**	**$ 208,430**
Ending Reclaim Fund Balance	103,259	(44,694)	99,830	412,847	794,840	1,076,103
Ending Reclaim CR Fund Balance	-	67,286	135,918	205,923	127,328	122,833
Additional Revenue Increase	**0.0%**	**30.0%**	**20.0%**	**10.0%**	**7.0%**	**7.0%**

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Based upon the revenue requirement analysis, the City will need to adjust their rates to increase revenue by 30% in the first year, following smaller revenue increase in subsequent years, approximately 96% over the next five years. Figure 5-6 expands upon the earlier figure (Figure 5-1) to illustrate the positive impact of the revenue increase on the utility's financial condition.

Figure 5-6: Revenue and Expenditure Projections – Proposed Rates



Cost of Service Analysis

This section of the report discusses the allocation of operating and capital costs to the volume (usage) and customer accounts, the determination of unit rates, and the calculation of user class cost responsibility.

Cost Allocation by Function

The base method was conducted to establish the cost of service allocation. Under this method, revenue requirements are allocated to the different user classes proportionate to their use of the reclaimed water system. Allocations are based on flow volume and customer accounts. Use of this methodology results in a generally accepted cost distribution amongst customer classes and a means of calculating and designing rates to proportionately recover those costs.

This figure classifies the major functions of the reclaimed water system and allocates those related costs to the demand factors volume and customer accounts.

Figure 5-7: Classification of Reclaimed Water Expenses by Function

Description	Total Reclaim Expenses	Reclaimed Water Volume	Customer Accounts	Basis of Classification
Water Distribution				
Operations Expense - Distribution	$ 23,040	$ 23,040	$ -	100% Vol
Total WW Monitoring Expense	$ 23,040	$ 23,040	$ -	
Wastewater Treatment				
Operations Expense-Treatment	$ 42,316	$ 42,316	$ -	100% Vol
Maintenance Services-Treatment	7,000	7,000	-	100% Vol
Total WW Treatment Expense	$ 49,316	$ 49,316	$ -	
Wastewater Collection and Transmission				
Operations Expense-Collection	$ 22,224	$ 22,224	$ -	100% Vol
Total WW Collection and Transmission Expense	$ 22,224	$ 22,224	$ -	
Rio Reclaimed Water Plant				
Operations Expense-Reclaim	$ 92,676	$ 92,676	$ -	100% Vol
Maintenance Services-Reclaim	10,000	10,000	-	100% Vol
Monitoring Expense-Reclaim	12,168	12,168	-	100% Vol
Total Rio Plant Expense	$ 114,843	$ 114,843	$ -	
General & Administrative				
Water Conservation	$ 94,024	$ 47,012	$ 47,012	50% Vol 50% CA
Allocated WS Administration	36,327	18,163	18,163	50% Vol 50% CA
Allocated Indirect Costs	55,718	27,859	27,859	50% Vol 50% CA
Total G&A Expense	$ 186,069	$ 93,034	$ 93,034	
Capital Requirements				
Capital Replacement	$ 73,677	$ 73,677	$ -	100% Vol
Rate Fund Capital Projects	467,000	467,000	-	100% Vol
Total Capital Requirements Expense	$ 540,677	$ 540,677	$ -	
TOTAL FUNCTIONALIZED COSTS	**$ 936,169**	**$ 843,135**	**$ 93,034**	
FUNCTIONALIZATION FACTOR	**100.0%**	**90.1%**	**9.9%**	

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

The resulting functionalization factors that appear at the bottom of Figure 5-7 are utilized to allocate system operating and capital costs to each customer class based on the unique stress each class demands on the system.

Rate Design Analysis

The final step of the rate study is the design of the reclaimed water rates to collect the desired level of revenue, determined in the revenue requirement analysis. During this analysis, consideration is given to the levels of the rates. Changes to the rates structure were discussed, but not pursued further. This section reviews the proposed reclaimed rate design for the City.

Criteria and Considerations

In determining the appropriate rate level and structure, one must consider numerous options and the implications attributed to those decisions. In several meetings with City staff and the City's Water Commission, a great deal of consideration transpired. The City reflected on past consequences while reviewing many scenarios concerning the proposed adjustments to the rate level.

A simplified list of some of the design considerations that were reviewed is listed:

- Consideration of the customer's ability to pay
- Clear and understandable rates
- Easily administered
- Price differential between reclaimed and potable
- Revenue stability (month to month and year to year)
- Efficient allocation of resources
- Implementation of Capital Improvements (rate of improving the existing system)
- Fair and equitable (cost-based) rates

The last consideration, cost-based rates, is considered by many of the City's staff as the primary goal. While the consulting team agrees with this position, every consideration has merit and plays an important role in a comprehensive rate study. When developing the City's proposed rates all of the aforementioned criteria were taken into consideration. Determining the appropriate balance is crucial, as some of the criteria sometime conflict with one another, i.e. the customers ability to pay and cost-based. In designing rates, there will always be concessions between the various objectives; however, the proposed rates meet all of the leading objectives of the City.

Overview of Existing Rate Structure

The City's existing reclaimed rate structure consists of seven (7) customer classes. As shown below in Figure 5-8, six of the classes employ a uniform rate. Off Peak or High Volume customers are currently charged a declining rate, where the cost decreased with each additional unit of consumption. The City's existing reclaimed rates are based on a percentage of the customer class' potable water rate and whether or not a customer has a main extension.

Figure 5-8: Monthly Reclaimed Water Rates by Customer Class

Description	Customer Class	Current	Notes
Commercial (no main Ext)	C	1.1095	35% of C
Commercial (w/Main Ext)	C	2.3775	75% of C
Manufacturing (no main Ext)	MN	1.0080	35% of Mfg
Manufacturing (w/Main Ext)	MN	2.1600	75% of Mfg
City Departmental	MU	2.2600	75% LM
NAU (Sinclair Wash-Intramural Fields)	NA	0.9800	35% of NAU
NAU all other	NA	2.1000	75% of NAU
Private Residential			
Tier 1	R1	1.0570	35% of R1
Tier 2	R1	1.2390	35% of R1
Tier 3	R1	1.7605	35% of R1
Tier 4	R1	3.0695	35% of R1
Self Loading Stations and Hydrant Meters	RS/WR	1.0700	Cost Analysis
Off Peak/High Volume	WR	1.0700	Cost Analysis

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Proposed Rate Adjustments

The proposed rates shown in Figure 5-9 below are not the cost-based rates. While cost-based rates were developed, the City decided to maintain their existing reclaimed water rate design. In order to incentivize use of reclaimed water, the cost of the water must be below that of regular potable water. After reviewing the cost-based rates, City staff and the Water Commission decided to maintain the existing rate structure where possible. Furthermore, it was decided that a declining block rate was no longer prudent and was modified to a uniform rate as determined by the rate analysis.

Figure 5-9: Monthly Reclaimed Water Rates by Customer Class

Description	Customer Class	Current	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Notes
Commercial (no main Ext)	C	1.1095	1.25	1.38	1.46	1.55	1.59	35% of C
Commercial (w/Main Ext)	C	2.3775	2.68	2.97	3.14	3.32	3.40	75% of C
Manufacturing (no main Ext)	MN	1.0080	1.24	1.37	1.45	1.53	1.57	35% of Mfg
Manufacturing (w/Main Ext)	MN	2.1600	2.61	2.77	2.93	3.09	3.17	75% of Mfg
City Departmental	MU	2.2600	1.25	1.38	1.46	1.55	1.59	35% C
NAU (Sinclair Wash-Intramural Fields)	NA	0.9800	1.22	1.29	1.37	1.44	1.48	35% of NAU
NAU all other	NA	2.1000	2.61	2.77	2.93	3.09	3.17	75% of NAU
Private Residential								
Tier 1	R1	1.0570	0.98	1.08	1.14	1.20	1.23	35% of R1
Tier 2	R1	1.2390	1.20	1.33	1.40	1.48	1.52	35% of R1
Tier 3	R1	1.7605	1.71	1.90	2.02	2.14	2.20	35% of R1
Tier 4	R1	3.0695	3.15	3.54	3.77	4.02	4.13	35% of R1
Self Loading Stations and Hydrant Meters	RS/WR	1.0700	2.55	2.99	3.19	3.36	3.55	Cost Analysis
Off Peak/High Volume	WR	1.0700	1.25	1.38	1.46	1.55	1.59	35% of C

* Energy surcharge included

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Impact of Revenue Increase

In Fiscal Year 2011, the proposed 30% increase required revenue does not directly correlate to a 30% increase in rates. The cost of service analysis redistributes the required revenue proportionate to the users demand on the system. Thus, the proposed rate adjustments may vary between customer classes.

Capacity Fees Background

Capacity fees are one-time charges that reflect the demands and costs created by new development for additional water and wastewater capacity. Generally, capacity fees are required to demonstrate a reasonable connection between the amount of the fee and the cost to serve new development (i.e. new development's proportionate share of infrastructure capacity costs). This section of the report documents the assumptions, methodologies, and calculations upon which the capacity fees are based. As documented in this section, the capacity fees are just and reasonable and represent new development's proportionate share of costs for capacity projects from which it will directly benefit.

The infrastructure included in capacity fees are large, system level components and do not include on-site or site specific improvements. Water system capacity can include components for water resources, production, storage, and distribution. Components of wastewater system capacity can include treatment, interceptors, and collection lines.

Figure 6-1: Capacity Fee Components

Water Capacity Fee Components:	Wastewater Capacity Fee Components:
Resources	Treatment
Production	Interceptors
Storage	Collection Lines
Distribution	Planning and Study Efforts
Reclaimed Water	
Planning and Study Efforts	

Sources: City of Flagstaff; Wildan Financial Services; TischlerBise.

The capacity fees are based on water meter size. The capacity fees are calculated by multiplying the net capital cost per gallon of capacity by the average peak daily demand per residential connection (a ¾ inch water meter). The capacity fees for water meters larger than ¾ inches are derived from capacity ratios published by the AWWA.

Calculation Methodologies

There are three basic methods used to calculate the various components of the City's capacity fees. The methodologies are used to determine the best measure of demand created by new development for each component of the capacity fees. The methodologies can be classified as looking at the past, present, and future capacities of infrastructure.

4. In instances where infrastructure has been built in advance of new development and has excess capacity available to be utilized by new development, the **buy-in methodology** is utilized. Under this methodology, new development repays the community for previous capacity investments via the capacity fee.

5. The **incremental expansion methodology** is used when a community plans to provide new development the same level-of-service (LOS) that is currently being provided to existing development in increments. Generally, utility infrastructure does not lend itself to this methodology given its nature of having to be in place prior to new development and capacity being constructed in large segments.
6. The **plan-based methodology** utilizes the City's capital improvement plan (CIP) and related master plans to determine new development's share of planned projects. Projects that do not add capacity, such as routine maintenance or replacement of existing facilities, are not included in the fees. Projects that add capacity are further evaluated as to the percentage of the project attributable to existing development versus new development. Only the portion of planned projects attributable to new development is included in the capacity fees.

The majority of the proposed capacity fees utilize the plan-based methodology, with the buy-in methodology being used for recent improvements to the Wildcat Hill Wastewater Treatment Plant. A summary of the capacity fee components and methodologies is shown in the figure below:

Figure 6-2: Capacity Fee Components

Water Capacity Fee Components:	Calculation Methodology:
Resources	Plan-based
Production	Plan-based
Storage	Plan-based
Distribution	Plan-based
Reclaimed Water	Plan-based
Planning and Study Efforts	Plan-based
Wastewater Capacity Fee Components:	**Calculation Methodology:**
Treatment	Buy-in and Plan-based
Interceptors	Plan-based
Collection Lines	Plan-based
Planning and Study Efforts	Plan-based

Sources: City of Flagstaff; Wildan Financial Services; TischlerBise.

To better ensure the capacity fees are just and reasonable, a credit for capacity projects which have been funded with bonds backed by utility rates is deducted from the capacity fees. The inclusion of this credit in the capacity fee calculations is intended to avoid "double payment" situations whereby the payer of a capacity fee pays for the same capacity twice: once via the capacity fee and again via the utility rates. This calculation is discussed in greater detail in the wastewater capacity fee analysis.

Current Estimates and Projections of Utility Demands

Future projections of customers and usage are necessary in evaluating of the capacity of the City's current systems and analyzing plans for future capacity expansions. The City plans and sizes its utility infrastructure for all potential users and demands. Thus, the capacity fees utilize projections of peak daily demands since this standard is utilized to design and build the infrastructure.

Water

As noted earlier, given the current economic climate and review of potential growth, City staff recommended using a conservative a growth rate starting at 0.2% in FY2010 rising slowly and topping off at 1.6% in FY2020.

The net increase in projected peak water demand from FY2010 to FY2020 is 260,075 gallons per day.

Figure 6-3: Water Peaking Factor Projections

Description	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Single Family	1,472,072,346	1,475,016,491	1,359,120,551	1,364,557,034	1,372,744,376	1,383,726,331	1,397,563,594	1,414,334,357	1,434,135,038	1,457,081,199	1,480,394,498	1,504,080,810
Multi-family	627,669,808	628,925,148	568,739,626	571,014,584	574,440,672	579,036,197	584,826,559	591,844,478	600,130,300	609,732,385	619,488,103	629,399,913
Residential Peak Annual Consumption (gal)	**2,099,742,155**	**2,103,941,639**	**1,927,860,177**	**1,935,571,618**	**1,947,185,047**	**1,962,762,528**	**1,982,390,153**	**2,006,178,835**	**2,034,265,339**	**2,066,813,584**	**2,099,882,601**	**2,133,480,723**
Commercial/Schools	854,467,152	856,176,086	774,244,972	777,341,952	782,006,003	788,262,051	796,144,672	805,698,408	816,978,186	830,049,837	843,330,634	856,823,924
Lawn Meters	231,922,050	232,385,894	232,850,666	233,782,069	235,184,761	237,066,239	239,436,902	242,310,145	245,702,487	249,633,726	253,627,866	257,685,912
Manufacturing	136,225,051	136,497,501	123,435,942	123,929,686	124,673,264	125,670,650	126,927,357	128,450,485	130,248,792	132,332,773	134,450,097	136,601,299
Northern Arizona University	319,127,607	319,765,863	320,405,394	321,687,016	323,617,138	326,206,075	329,468,136	333,421,754	338,089,658	343,499,093	348,995,078	354,578,999
Standpipes	41,465,075	41,548,006	41,631,102	41,797,626	42,048,412	42,384,799	42,808,647	43,322,351	43,928,864	44,631,726	45,345,833	46,071,366
Nonresidential Peak Annual Consumption (gal)	**1,583,206,936**	**1,586,373,350**	**1,492,568,076**	**1,498,538,349**	**1,507,529,579**	**1,519,589,815**	**1,534,785,714**	**1,553,203,142**	**1,574,947,986**	**1,600,147,154**	**1,625,749,508**	**1,651,761,501**
Total Peak Annual Consumption (gal)	**3,682,949,090**	**3,690,314,989**	**3,420,428,253**	**3,434,109,966**	**3,454,714,626**	**3,482,352,343**	**3,517,175,867**	**3,559,381,977**	**3,609,213,325**	**3,666,960,738**	**3,725,632,110**	**3,785,242,224**
Total Daily Peak Consumption (gal)	**10,090,271**	**10,110,452**	**9,371,036**	**9,408,520**	**9,464,972**	**9,540,691**	**9,636,098**	**9,751,731**	**9,888,256**	**10,046,468**	**10,207,211**	**10,370,527**

Sources: Table A-10: Water Peaking Factor by Customer Class and Growth, Inflation, and Finance Assumptions

Sources: City of Flagstaff; Wildan Financial Services; TischlerBise.

The net increase in projected water customers from FY2010 to FY2020 is 2,069, of which 1,859 are residential and 210 are nonresidential.

Figure 6-4: Water Customer Projections

Description	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Single Family: Sewer-Winter Quarter Ave	14,055	14,083	14,111	14,168	14,253	14,367	14,510	14,685	14,890	15,128	15,370	15,616
Single Family: Sewer-Meter Related	15	15	15	15	15	15	15	16	16	16	16	17
Multi-Family Units: Sewer-Winter Quarter Ave	2,379	2,384	2,389	2,398	2,412	2,432	2,456	2,486	2,520	2,561	2,602	2,643
Multi-Family: Sewer-Meter Related	593	594	595	598	601	606	612	620	628	638	648	659
Total Residential Accounts	**17,042**	**17,076**	**17,110**	**17,179**	**17,282**	**17,420**	**17,594**	**17,805**	**18,055**	**18,343**	**18,637**	**18,935**
Commercial/Schools	1,618	1,621	1,624	1,631	1,641	1,654	1,670	1,690	1,714	1,742	1,769	1,798
Lawn Meters	252	253	253	254	256	258	260	263	267	271	276	280
Manufacturing	42	42	42	42	43	43	43	44	44	45	46	47
Northern Arizona University	7	7	7	7	7	7	7	7	7	8	8	8
Standpipes	5	5	5	5	5	5	5	5	5	5	5	6
Total Nonresidential Accounts	**1,924**	**1,928**	**1,932**	**1,939**	**1,951**	**1,967**	**1,986**	**2,010**	**2,038**	**2,071**	**2,104**	**2,138**
Total Potable Water Accounts	**18,966**	**19,004**	**19,042**	**19,118**	**19,233**	**19,387**	**19,581**	**19,816**	**20,093**	**20,414**	**20,741**	**21,073**

Taken from Table A-12: Projected Water Accounts by Customer Class

Sources: City of Flagstaff; Wildan Financial Services; TischlerBise.

Wastewater

The net increase in projected peak wastewater demand from FY2010 to FY2020 is 957,637 gallons per day.

Figure 6-5: Wastewater Peaking Factor Projections

Description	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Peak Water Consumption (Daily)	10,090,271											
% of Water returned to Wastewater System	87%											
Growth Assumptions		0.20%	0.20%	0.40%	0.60%	0.80%	1.00%	1.20%	1.40%	1.60%	1.60%	1.60%
Peak Wastewater Daily Consumption	**8,778,536**	**8,796,093**	**8,813,685**	**8,848,940**	**8,902,034**	**8,973,250**	**9,062,983**	**9,171,738**	**9,300,143**	**9,448,945**	**9,600,128**	**9,753,730**

Source: Based on Peak Daily Water Consumption, percentage of water returned to the wastewater system, and growth assumptions.

Sources: City of Flagstaff; Wildan Financial Services; TischlerBise.

Since all new water customers will hook up to the City's wastewater system, the number of new wastewater customers will equal the number of new water customers (2,069).

Water Capacity Fees

The figure below lists the water CIP attributable to new development as prepared by City staff. As a part of the rate setting process, CIP projects are identified as growth-related, existing needs (O&M) or a percentage of both. The CIP presented below represents the capital project requirements needed to meet projected growth. The O&M portion will be utilized in the revenue requirements analysis for the rate analysis.

Figure 7-1: Water Capital Improvement Program Allocated to New Growth

ID #	Project	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020	TOTAL
523	Well Pumphouse Buildings	$ -	$ -	$ -	$ 800,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 800,000
	New Well and Pumphouse	-	-	-	-	-	-	2,500,000	-	-	-	-	2,500,000
	Red Gap Ranch drill 10 proving wells	-	-	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	1,350,000
	Red Gap Pump test of wells	-	-	-	-	-	-	4,000,000	3,000,000	2,000,000	-	-	9,000,000
	GO BONDS	-	-	-	-	-	-	800,000	800,000	800,000	900,000	-	3,300,000
	Red Gap Environmental Impact Study & Statement	-	-	-	-	-	-	-	-	4,500,000	4,500,000	-	9,000,000
	Red Gap ROW Acquisition	-	-	350,000	350,000	350,000	-	750,000	750,000	750,000	750,000	-	4,050,000
327	Sunnyside	-	-	-	30,000	30,000	50,000	50,000	50,000	50,000	-	-	260,000
543	Chesire Tank Upgrade-Zone A	-	-	-	-	-	-	700,000	-	-	-	-	700,000
167	Water System Optimization	-	-	-	-	-	-	-	20,000	-	-	-	20,000
538	Franklin WL Replacement	-	-	-	-	-	-	-	326,500	-	-	-	326,500
75	Water System Master Plan	-	-	-	75,000	-	-	-	75,000	-	-	75,000	225,000
486	West/Center Street Waterline 2650ft @300/LF	-	-	-	-	-	-	-	-	-	500,000	-	500,000
	Elm St. Waterline	-	-	-	-	-	-	-	115,000	-	-	-	115,000
50	Mohawk Dr. Waterline	-	-	-	-	-	-	-	-	44,000	-	-	44,000
495	Pinal/Papago Alley Waterline	-	-	-	-	-	-	-	-	-	37,000	-	37,000
20	Park St.Waterline (Santa Fe to Dale)	-	-	-	-	-	-	-	-	-	80,000	-	80,000
161	Aspen Waterline (Sitgreaves/Aztec)	-	-	-	-	-	-	-	-	-	-	40,000	40,000
73	Pine Del Waterline	-	-	-	-	-	-	-	-	150,000	450,000	-	600,000
106	Walapai Dr. Alley Waterline	-	-	-	-	-	-	-	-	-	26,000	-	26,000
278	Tombstone Ave./Alley Waterline	-	-	-	-	-	-	-	-	-	40,000	-	40,000
	Westside Detention Waterline Extension 3500 ft	-	-	-	-	-	-	-	-	-	400,000	-	400,000
	Lake Mary WTP treatment basin upgrades	-	-	-	-	-	-	-	-	-	-	1,000,000	1,000,000
	Growth CIP Total	**$ -**	**$ -**	**$ 500,000**	**$ 1,405,000**	**$ 530,000**	**$ 200,000**	**$ 8,950,000**	**$ 5,286,500**	**$ 8,444,000**	**$ 7,833,000**	**$ 1,265,000**	**$ 34,413,500**

Taken from Table A-4: Allocated Water Capital Improvement Program

Sources: City of Flagstaff; Wildan Financial Services; TischlerBise.

Water Resources

The City's CIP identifies $26,700,000 to be spent on the first phase of the Red Gap Ranch water resources project over the next ten years. However, the first phase does not include any construction costs which are conservatively projected to total $200,000,000. Inclusion of only the Phase 1 costs in the water capacity fees could potentially understate the cost to serve new development. The extent to which capacity fees may fund completion of the Red Gap Ranch project is an important fiscal and policy decision. The water resources component includes two options for consideration:

- Option 1: Phase 1 of Red Gap Ranch **without** construction costs.
- Option 2: Phase 1 of Red Gap Ranch **with** construction costs.

Under Option 1, the City plans to spend $26,700,000 on the first phase of the Red Gap Ranch water resources project over the next ten years. Upon completion, the planned daily capacity is 13,389,904 gallons (based on 15,000 acre feet per year).

The cost per gallon for these planned water resources projects is $1.99 ($26,700,000/13,389,904 gallons = $1.99 per gallon).

Figure 7-2: Water Resources Capital Improvement Program Allocated to New Growth – Option 1

Project	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020
Red Gap Ranch drill 10 proving wells	$ -	$ -	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000
Red Gap Pump test of wells	-	-	-	-	-	-	4,000,000	3,000,000	2,000,000	-	-
Red Gap Pipeline & Wellfield Final Design	-	-	-	-	-	-	800,000	800,000	800,000	900,000	-
Red Gap Environmental Impact Study & S	-	-	-	-	-	-	-	-	4,500,000	4,500,000	-
Red Gap ROW Acquisition	-	-	350,000	350,000	350,000	-	750,000	750,000	750,000	750,000	-
Total	**$ -**	**$ -**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 150,000**	**$ 5,700,000**	**$ 4,700,000**	**$ 8,200,000**	**$ 6,300,000**	**$ 150,000**
										10 Year Total	**$ 26,700,000**
										Gallons of Capacity per Day*	13,389,904
										Cost per Gallon	**$ 1.99**

* Based on 15,000 acre feet per year.

Sources: City of Flagstaff; Wildan Financial Services; TischlerBise.

Under Option 2, the City plans to spend a total of $226,700,000 on the Red Gap Ranch water resources project (including construction). Upon completion, the planned daily capacity is 13,389,904 gallons (based on 15,000 acre feet per year).

The cost per gallon for these planned water resources projects is $16.93 ($226,700,000 /13,389,904 gallons = $16.93 per gallon).

Figure 7-3: Water Resources Capital Improvement Program Allocated to New Growth – Option 2

Project	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020
Red Gap Ranch drill 10 proving wells	$ -	$ -	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000
Red Gap Pump test of wells	-	-	-	-	-	-	4,000,000	3,000,000	2,000,000	-	-
Red Gap Pipeline & Wellfield Final Design	-	-	-	-	-	-	800,000	800,000	800,000	900,000	-
Red Gap Environmental Impact Study & Statement	-	-	-	-	-	-	-	-	4,500,000	4,500,000	-
Red Gap ROW Acquisition	-	-	350,000	350,000	350,000	-	750,000	750,000	750,000	750,000	-
Red Gap Construction	-	-	-	-	-	-	-	-	-	-	200,000,000
Total	**$ -**	**$ -**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 150,000**	**$ 5,700,000**	**$ 4,700,000**	**$ 8,200,000**	**$ 6,300,000**	**$ 200,150,000**
										10 Year Total	**$ 226,700,000**
										Gallons of Capacity per Day*	13,389,904
										Cost per Gallon	**$ 16.93**

* Based on 15,000 acre feet per year.

Sources: City of Flagstaff; Wildan Financial Services; TischlerBise.

Water Production

The City plans to spend $6,800,000 on two wells over the next ten years. The wells are designed to produce 300 gallons per minute each. These wells will produce 864,000 gallons of water on a daily basis.

The cost per gallon for the planned water production projects is $7.87 ($6,800,000 /864,000 gallons = $7.87 per gallon).

Figure 7-4: Water Production Capital Improvement Program Allocated to New Growth

Project	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020
Well Pumphouse Buildings	$ -	$ -	$ -	$ 800,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -
New Well and Pumphouse	-	-	-	-	-	2,500,000	-	-	-	2,500,000	-
Lake Mary WTP treatment basin upgrades	-	-	-	-	-	-	-	-	-	-	1,000,000
Total	**$ -**	**$ -**	**$ -**	**$ 800,000**	**$ -**	**$2,500,000**	**$ -**	**$ -**	**$ -**	**$2,500,000**	**$ 1,000,000**
										10 Year Total	**$ 6,800,000**
										Gallons of Capacity per Day	864,000
										Cost per Gallon	**$ 7.87**

Sources: City of Flagstaff; Wildan Financial Services; TischlerBise.

Water Storage

The City plans to spend $1,800,000 on two water storage tanks over the next ten years. The tanks will provide 2,000,000 gallons of combined storage.

The cost per gallon for the planned water storage project is $0.90 ($1,800,000/2,000,000 gallons = $0.90 per gallon).

Figure 7-5: Water Storage Capital Improvement Program Allocated to New Growth

Project	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020
Chesire Tank Upgrade-Zone A	$ -	$ -	$ -	$ -	$ -	$ -	$ 700,000	$ -	$ -	$ -	$ -
Railroad Springs Tank #3 - Zone A+	-	-	-	-	-	-	-	1,100,000	-	-	-
Total	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 700,000**	**$ 1,100,000**	**$ -**	**$ -**	**$ -**
										10 Year Total	**$ 1,800,000**
										Gallons of Capacity Per Day	2,000,000
										Cost per Gallon	**$ 0.90**

Sources: City of Flagstaff; Wildan Financial Services; TischlerBise.

Water Distribution

The City plans to spend $2,468,500 on the water distribution projects over the next ten years. Discussions with City staff indicates these projects will provide sufficient capacity through FY2025. Based on projections of peak water demand from new development, new development over this period of time is projected to add the need for an additional 1,116,693 gallons of water.

The cost per gallon for the planned water distribution projects is $2.21 ($2,468,500 /1,116,693 gallons = $2.21 per gallon).

Figure 7-6: Water Distribution Capital Improvement Program Allocated to New Growth

Project	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020
Sunnyside	$ -	$ -	$ -	$ 30,000	$ 30,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ -	$ -
Franklin WL Replacement	-	-	-	-	-	-	-	326,500	-	-	-
West/Center Street Waterline 2650ft @30	-	-	-	-	-	-	-	-	-	500,000	-
Elm St. Waterline	-	-	-	-	-	-	-	115,000	-	-	-
Mohawk Dr. Waterline	-	-	-	-	-	-	-	-	44,000	-	-
Pinal/Papago Alley Waterline	-	-	-	-	-	-	-	-	-	37,000	-
Park St.Waterline (Santa Fe to Dale)	-	-	-	-	-	-	-	-	-	80,000	-
Aspen Waterline (Sitgreaves/Aztec)	-	-	-	-	-	-	-	-	-	-	40,000
Pine Del Waterline	-	-	-	-	-	-	-	-	150,000	450,000	-
Walapai Dr. Alley Waterline	-	-	-	-	-	-	-	-	-	26,000	-
Tombstone Ave./Alley Waterline	-	-	-	-	-	-	-	-	-	40,000	-
Westside Detention Waterline Extension 3	-	-	-	-	-	-	-	-	-	400,000	-
Total	**$ -**	**$ -**	**$ -**	**$ 30,000**	**$ 30,000**	**$ 50,000**	**$ 50,000**	**$ 491,500**	**$ 244,000**	**$ 1,533,000**	**$ 40,000**
										10 Year Total	**$ 2,468,500**
										Net Increase in Peak Daily Gallons FY2010-FY2025	1,116,693
										Cost per Gallon	**$ 2.21**

Sources: City of Flagstaff; Wildan Financial Services; TischlerBise.

Reclaimed Water

The City plans to spend $600,000 on reclaimed water projects over the next ten years. Discussions with City staff indicates these projects will provide sufficient capacity through FY2020. Based on projections of peak water demand from new development, new development over this period of time is projected to add the need for an additional 260,075 gallons of water.

The cost per gallon for these projects is $2.31 ($600,000 /260,075 gallons = $2.31 per gallon).

Figure 7-7: Reclaimed Water Capital Improvement Program Allocated to New Growth

Project	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020
Expand Reclaim System	$ -	$ -	$ -	$ -	$ -	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ -	$ -
Reclaim Storage	-	-	-	-	-	-	400,000	-	-	-	-
Total	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 50,000**	**$ 450,000**	**$ 50,000**	**$ 50,000**	**$ -**	**$ -**
										10 Year Total	**$ 600,000**
										Net Increase in Daily Peak Gallons FY2010-FY2020	260,075
										Cost per Gallon	**$ 2.31**

Sources: City of Flagstaff; Wildan Financial Services; TischlerBise.

Planning and Study Efforts

The City plans to spend $245,000 on studies and planning efforts for the water system over the next ten years for new development. The City updates its Master Plan every three years. Thus, the plan completed in FY2020 will serve new development through FY2023. Based on projections of peak water demand from new development, new development over this period of time is projected to add the need for an additional 765,867 gallons of water.

The cost per gallon for these studies and planning efforts is $0.32 ($245,000 /765,867 gallons = $0.32 per gallon).

Figure 7-8: Water Studies and Planning Efforts Capital Improvement Program Allocated to New Growth

Project	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020
Water System Optimization	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 20,000	$ -	$ -	$ -
Water System Master Plan	-	-	-	75,000	-	-	-	75,000	-	-	75,000
Total	**$ -**	**$ -**	**$ -**	**$ 75,000**	**$ -**	**$ -**	**$ -**	**$ 95,000**	**$ -**	**$ -**	**$ 75,000**
										10 Year Total	**$ 245,000**
										Net Increase in Daily Peak Gallons FY2010-FY2023	765,867
										Cost per Gallon	**$ 0.32**

Sources: City of Flagstaff; Wildan Financial Services; TischlerBise.

Cost Summary

The figures below summarize the demand factors and cost per gallon for additional water capacity for the following options:

- Option 1: Phase 1 of Red Gap Ranch **without** construction costs.
- Option 2: Phase 1 of Red Gap Ranch **with** construction costs.

Figure 7-9: Water Capacity Fees Demand and Cost Summary – Option 1

Demand Summary	Factors:
Gallons per Day per Residential Connection*	236
Residential Peaking Factor**	1.6
Gallon per Peak Day per Single Family Connection	**378**

Cost Summary	
Water Resources Cost per Gallon	$ 1.99
Water Production Cost per Gallon	7.87
Water Storage Cost per Gallon	0.90
Water Distribution Cost per Gallon	2.21
Study and Planning Efforts Cost per Gallon	0.32
Reclaimed Water Cost per Gallon	2.31
Net Capital Cost per Gallon of Capacity	**$ 15.60**

* Source: City of Flagstaff, *2009 Report to Water Commission*.
** Source: Table A-10: Water Peaking Factors by Customer Class.

Sources: City of Flagstaff; Wildan Financial Services; TischlerBise.

Figure 7-10: Water Capacity Fees Demand and Cost Summary – Option 2

Demand Summary	Factors:
Gallons per Day per Residential Connection*	236
Residential Peaking Factor**	1.6
Gallon per Peak Day per Single Family Connection	**378**

Cost Summary	
Water Resources Cost per Gallon	$ 16.93
Water Production Cost per Gallon	7.87
Water Storage Cost per Gallon	0.90
Water Distribution Cost per Gallon	2.21
Study and Planning Efforts Cost per Gallon	0.32
Reclaimed Water Cost per Gallon	2.31
Net Capital Cost per Gallon of Capacity	**$ 30.54**

* Source: City of Flagstaff, *2009 Report to Water Commission*.
** Source: Table A-10: Water Peaking Factors by Customer Class.

Sources: City of Flagstaff; Wildan Financial Services; TischlerBise.

Water Capacity Fees

The water capacity fees are based on water meter sizes. A capacity ratio by meter size is used to convert the residential equivalent fee for a ¾ inch meter into a proportionate fee for larger meter sizes. The capacity ratios by meter size are consistent with the ratios used in the utility rate model.

Using a ¾ inch water meter under Option 1 as an example: 378 peak gallons per residential connection (from Figure 7-9) x $15.60 per gallon (from Figure 7-9) x 1.0 demand ratio = $5,891 per ¾ inch water meter.

Figure 7-11: Water Capacity Fees – Option 1

Water Meter Size (inches)	Capacity Ratio*	Resources	Production	Storage	Distribution	Planning	Water	TOTAL	Current
3/4"	1.0	$ 753	$ 2,972	$ 340	$ 835	$ 121	$ 871	$ 5,891	$ 2,160
1"	1.7	$ 1,255	$ 4,953	$ 566	$ 1,391	$ 201	$ 1,452	$ 9,819	$ 3,600
1 1/2"	3.3	$ 2,510	$ 9,906	$ 1,133	$ 2,782	$ 403	$ 2,904	$ 19,638	$ 7,200
2"	5.3	$ 4,016	$ 15,850	$ 1,812	$ 4,452	$ 644	$ 4,646	$ 31,420	$11,520
3.0"	10.0	$ 7,529	$ 29,719	$ 3,398	$ 8,347	$ 1,208	$ 8,711	$ 58,913	$21,600
4.0"	16.7	$ 12,549	$ 49,531	$ 5,664	$ 13,912	$ 2,013	$14,519	$ 98,188	$36,000
6.0"	33.3	$ 25,098	$ 99,062	$11,328	$ 27,823	$ 4,026	$29,038	$196,376	$72,000
8.0"	53.3	$ 40,157	$ 158,499	$18,125	$ 44,517	$ 6,442	$46,461	$314,201	Calculate
10.0"	76.7	$ 57,726	$ 227,842	$26,054	$ 63,994	$ 9,261	$66,787	$451,664	Calculate

* Based on water meter equivalents developed as part of rate study.

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Figure 7-12: Water Capacity Fees – Option 2

Water Meter Size (inches)	Capacity Ratio*	Resources	Production	Storage	Distribution	Planning	Water	TOTAL	Current
3/4"	1.0	$ 6,393	$ 2,972	$ 340	$ 835	$ 121	$ 871	$ 11,531	$ 2,160
1"	1.7	$ 10,655	$ 4,953	$ 566	$ 1,391	$ 201	$ 1,452	$ 19,219	$ 3,600
1 1/2"	3.3	$ 21,310	$ 9,906	$ 1,133	$ 2,782	$ 403	$ 2,904	$ 38,438	$ 7,200
2"	5.3	$ 34,096	$ 15,850	$ 1,812	$ 4,452	$ 644	$ 4,646	$ 61,500	$11,520
3.0"	10.0	$ 63,930	$ 29,719	$ 3,398	$ 8,347	$ 1,208	$ 8,711	$115,313	$21,600
4.0"	16.7	$ 106,550	$ 49,531	$ 5,664	$ 13,912	$ 2,013	$14,519	$192,189	$36,000
6.0"	33.3	$ 213,101	$ 99,062	$11,328	$ 27,823	$ 4,026	$29,038	$384,378	$72,000
8.0"	53.3	$ 340,961	$ 158,499	$18,125	$ 44,517	$ 6,442	$46,461	$615,005	Calculate
10.0"	76.7	$ 490,132	$ 227,842	$26,054	$ 63,994	$ 9,261	$66,787	$884,070	Calculate

* Based on water meter equivalents developed as part of rate study.

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Wastewater Capacity Fees

The figure below lists the wastewater CIP attributable to new development as prepared by City staff. As a part of the rate setting process, CIP projects are identified as growth-related, existing needs (O&M) or a percentage of both. The CIP presented below represents the capital project requirements needed to meet projected growth. The O&M portion will be utilized in the revenue requirements analysis for the rate analysis.

Figure 8-1: Wastewater Capital Improvement Program Allocated to New Growth

ID #	Project	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020	TOTAL
523	Well Pumphouse Buildings	$ -	$ -	$ -	$ 800,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 800,000
	New Well and Pumphouse	-	-	-	-	-	-	2,500,000	-	-	-	-	2,500,000
	Red Gap Ranch drill 10 proving wells	-	-	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	1,350,000
	Red Gap Pump test of wells	-	-	-	-	-	-	4,000,000	3,000,000	2,000,000	-	-	9,000,000
	GO BONDS	-	-	-	-	-	-	800,000	800,000	800,000	900,000	-	3,300,000
	Red Gap Environmental Impact Study & Statement	-	-	-	-	-	-	-	-	4,500,000	4,500,000	-	9,000,000
	Red Gap ROW Acquisition	-	-	350,000	350,000	350,000	-	750,000	750,000	750,000	750,000	-	4,050,000
327	Sunnyside	-	-	-	30,000	30,000	50,000	50,000	50,000	50,000	-	-	260,000
543	Chesire Tank Upgrade-Zone A	-	-	-	-	-	-	700,000	-	-	-	-	700,000
167	Water System Optimization	-	-	-	-	-	-	-	20,000	-	-	-	20,000
538	Franklin WL Replacement	-	-	-	-	-	-	-	326,500	-	-	-	326,500
75	Water System Master Plan	-	-	-	75,000	-	-	-	75,000	-	-	75,000	225,000
486	West/Center Street Waterline 2650ft @300/LF	-	-	-	-	-	-	-	-	-	500,000	-	500,000
	Elm St. Waterline	-	-	-	-	-	-	-	115,000	-	-	-	115,000
50	Mohawk Dr. Waterline	-	-	-	-	-	-	-	-	44,000	-	-	44,000
495	Pinal/Papago Alley Waterline	-	-	-	-	-	-	-	-	-	37,000	-	37,000
20	Park St.Waterline (Santa Fe to Dale)	-	-	-	-	-	-	-	-	-	80,000	-	80,000
161	Aspen Waterline (Sitgreaves/Aztec)	-	-	-	-	-	-	-	-	-	-	40,000	40,000
73	Pine Del Waterline	-	-	-	-	-	-	-	-	150,000	450,000	-	600,000
106	Walapai Dr. Alley Waterline	-	-	-	-	-	-	-	-	-	26,000	-	26,000
278	Tombstone Ave./Alley Waterline	-	-	-	-	-	-	-	-	-	40,000	-	40,000
	Westside Detention Waterline Extension 3500 ft	-	-	-	-	-	-	-	-	-	400,000	-	400,000
	Lake Mary WTP treatment basin upgrades	-	-	-	-	-	-	-	-	-	-	1,000,000	1,000,000
	Growth CIP Total	**$ -**	**$ -**	**$ 500,000**	**$ 1,405,000**	**$ 530,000**	**$ 200,000**	**$ 8,950,000**	**$ 5,286,500**	**$ 8,444,000**	**$ 7,833,000**	**$ 1,265,000**	**$ 34,413,500**

Taken from Table A-4: Allocated Water Capital Improvement Program

Sources: City of Flagstaff; Wildan Financial Services; TischlerBise.

Treatment

The City recently invested $39 million in upgrading the Wildcat Hill Wastewater Treatment Plant. Approximately 80% of this project was related to wastewater treatment. The plant is currently operating at approximately 80% of committed capacity. Given the available capacity for new development to utilize, the buy-in methodology is used to calculate this component of the Wastewater Capacity Fee.

The original cost to the City for the wastewater components ($31,400,582) is divided by the capacity of the plant (6,000,000 gallons) which yields a buy-in cost of $5.23 per gallon ($31,400,582/6,000,000 gallons = $5.23).

Figure 8-2: Treatment Buy-in Component

Wildcat Hill Treatment Plant Upgrade*	$31,400,582
Total Gallons of Capacity	6,000,000
Cost per Gallon	$5.23

* Original cost. Does not include portion attributable to reclaimed water.

Sources: City of Flagstaff; Wildan Financial Services; TischlerBise.

The City plans to spend $2,240,000 on treatment upgrade projects over the next ten years. Based on projections of peak wastewater demand from new development, new development is projected to add the need for an additional 957,637 gallons of wastewater over the next ten years.

The cost per gallon for the planned treatment upgrades is $2.34 ($2,240,000 /957,637 gallons = $2.34 per gallon).

Figure 8-3: Treatment Upgrades Allocated to New Growth

Project	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020
Third Digester at Wildcat	$ -	$ -	$ -	$ -	$ -	$ 150,000	$ 300,000	$ 450,000	$ -	$ -	$ -
Rio Filter Expansion,TF-1	-	-	-	-	-	-	-	-	-	-	500,000
Solids Disposal at Wildcat	-	-	-	-	-	-	-	-	640,000	-	-
Back up Generator at Rio	-	-	-	-	-	-	-	-	-	-	200,000
Total	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 150,000**	**$ 300,000**	**$ 450,000**	**$ 640,000**	**$ -**	**$ 700,000**
										10 Year Total	**$ 2,240,000**
										Net Increase in Daily Peak Gallons FY2010-FY2020	957,637
										Cost per Gallon	**$ 2.34**

Sources: City of Flagstaff; Wildan Financial Services; TischlerBise.

Debt Service Credit

To avoid "double payment" for the Wildcat Hill Treatment Plant expansion through both the Wastewater Capacity Fees and rates, a future debt service credit is calculated and deducted from the Wastewater Capacity Fees. Due to the time value of future payments, a net present value adjustment equivalent to the bond's interest rate is used in the calculation of the credit. The credit is calculated to be $1.55 per gallon on a net present value basis.

Figure 8-4: Debt Service Credit

Fiscal Year	Principal Payment	Projected Peak Gallons	Credit per Gallon
2010	$ 1,358,015	8,796,093	$ 0.15
2011	1,358,015	8,813,685	0.15
2012	1,358,015	8,848,940	0.15
2013	1,358,015	8,902,034	0.15
2014	1,358,015	8,973,250	0.15
2015	1,358,015	9,062,983	0.15
2016	1,358,015	9,171,738	0.15
2017	1,358,015	9,300,143	0.15
2018	1,358,015	9,448,945	0.14
2019	1,358,015	9,600,128	0.14
2020	1,358,015	9,753,730	0.14
2021	1,358,015	9,909,790	0.14
2022	1,358,015	10,068,347	0.13
2023	1,358,015	10,229,440	0.13
		Interest Rate	4%
		Net Present Value	**$1.55**

Taken from Table A-3: Debt Service

Sources: City of Flagstaff; Wildan Financial Services; TischlerBise.

Interceptors

The City plans to spend $910,000 on interceptor projects over the next ten years which are the result of new development. Based on projections of peak wastewater demand from new development, new development is projected to add the need for an additional 957,637 gallons of wastewater over the next ten years.

The cost per gallon for the planned interceptors is $0.95 ($910,000/957,637 gallons = $0.95 per gallon).

Figure 8-5: Interceptors Allocated to New Growth

Project	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020
West Side Interceptor Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 700,000	$ -
Rio Outfall Interceptor Improvements	-	-	-	-	-	-	-	-	-	105,000	105,000
Total	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 805,000**	**$ 105,000**
										10 Year Total	**$ 910,000**
										Net Increase in Daily Peak Gallons FY2010-FY2020	957,637
										Cost per Gallon	**$ 0.95**

Sources: City of Flagstaff; Wildan Financial Services; TischlerBise.

Collection

The City plans to spend $1,164,032 on collection projects over the next ten years which are the result of new development. Based on projections of peak wastewater demand from new development, new development is projected to add the need for an additional 957,637 gallons of wastewater over the next ten years.

The cost per gallon for the planned collection projects is $1.22 ($1,164,032 /957,637 gallons = $1.22 per gallon).

Figure 8-6: Collection Lines Allocated to New Growth

Project	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020
Ellery Sewer Replacement	-	-	-	-	380,000	-	-	-	-	-	-
Circle View Sewer	-	-	-	-	-	-	-	-	135,357	-	-
Terrace/Birch Sewer	-	-	-	-	-	-	-	-	311,500	-	-
Upper Greenlaw Phase 2	-	-	-	-	-	-	-	-	-	337,175	-
Growth Collection Total	**$ -**	**$ -**	**$ -**	**$ -**	**$ 380,000**	**$ -**	**$ -**	**$ -**	**$ 446,857**	**$ 337,175**	**$ -**
										10 Year Total	**$ 1,164,032**
										Net Increase in Daily Peak Gallons FY2010-FY2020	957,637
										Cost per Gallon	**$ 1.22**

Sources: City of Flagstaff; Wildan Financial Services; TischlerBise.

Planning and Study Efforts

The City plans to spend $90,000 on wastewater studies and planning efforts over the next ten years as a result of new development. The City updates its master plan every three years. Thus, the plan completed in FY2018 will serve new development through FY2021. Based on projections of peak wastewater demand, new development is projected to add the need for an additional 1,113,697 gallons of wastewater through FY2021.

The cost per gallon for the planned collection projects is $0.08 ($90,000 /1,113,697 gallons = $0.08 per gallon).

Figure 8-7: Planning and Study Efforts Allocated to New Growth

Project	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020
Rate Study-every 3 years	$ -	$ -	$ 30,000	$ -	$ -	$ 30,000	$ -	$ -	$ 30,000	$ -	$ -
										10 Year Total	**$ 90,000**
										Net Increase in Daily Peak Gallons FY2010-FY2021	1,113,697
										Cost per Gallon	**$ 0.08**

Sources: City of Flagstaff; Wildan Financial Services; TischlerBise.

Cost Summary

The figure below summarizes the demand factors and cost per gallon for additional wastewater capacity.

Figure 8-8: Wastewater Capacity Fees Demand and Cost Summary

Demand Summary	Factors:
Gallons of Water Per Peak Day per Residential Connection*	378
Percentage of Water Returned to Wastewater System**	87%
Gallon per Peak Day per Single Family Connection	**329**

Cost Summary	
Treatment Upgrades Cost per Gallon	$ 7.57
Less Credit for Future Debt Service Payments	(1.55)
Interceptor Cost per Gallon	0.95
Collection Cost per Gallon	1.22
Study and Planning Efforts Cost per Gallon	0.08
Net Capital Cost per Gallon of Capacity	**$ 8.27**

* Water Capacity Fees.
** Based on current percentage of water returned to wastewater system.

Sources: City of Flagstaff; Wildan Financial Services; TischlerBise.

Wastewater Capacity Fees

The wastewater capacity fees are based on water meter sizes. A capacity ratio by meter size is used to convert the residential equivalent fee for a ¾ inch meter into a proportionate fee for larger meter sizes. The capacity ratios by meter size are consistent with the ratios used in the City's utility rate model.

Using a ¾ inch water meter as an example: 329 gallons per peak day per residential connection (from Figure 8-8) x $8.27 per gallon (from Figure 8-8) x 1.0 demand ratio = $3,126 per ¾ inch water meter.

Figure 8-9: Wastewater Capacity Fees

Water Meter Size (inches)	Capacity Ratio*	Treatment	Interceptor	Collection	Planning	TOTAL	Current
3/4"	1.0	$ 2,277	$ 359	$ 459	$ 31	$ 3,126	$ 2,410
1"	1.7	$ 3,794	$ 599	$ 766	$ 51	$ 5,210	$ 4,300
1 1/2"	3.3	$ 7,588	$ 1,197	$ 1,532	$ 102	$ 10,419	$ 8,600
2"	5.3	$ 12,141	$ 1,916	$ 2,450	$ 163	$ 16,671	$13,760
3.0"	10.0	$ 22,765	$ 3,592	$ 4,595	$ 305	$ 31,257	$27,520
4.0"	16.7	$ 37,942	$ 5,987	$ 7,658	$ 509	$ 52,095	$42,931
6.0"	33.3	$ 75,884	$ 11,973	$ 15,316	$ 1,018	$104,191	$85,862
8.0"	53.3	$121,414	$ 19,157	$ 24,505	$ 1,629	$166,705	Calculate
10.0"	76.7	$174,532	$ 27,538	$ 35,226	$ 2,342	$239,639	Calculate

* Based on water meter equivalents developed as part of rate study.

Sources: City of Flagstaff; Willdan Financial Services, TischlerBise.

Service Fees

In addition to the utility rate analysis, conducted by the consulting team, the City's Utility department reviewed their existing service fee schedule for possible updates and additions. Figure 9-1 outlines the department's proposed service fees.

Figure 9-1: Proposed Service Fees

Description	Existing Service Fee	Proposed Service Fee
New Customer turn on/off working hours-account activation fee for new customer at existing location	$24.00	$24.00
Emergency turn on/off working hours	$24.00	$24.00
New Customer turn on/off after hours	$65.00	$65.00
Collection/ Non Payment charge	$24.00	$24.00
Existing Meter Testing Rate Accuracy test (at customer's request) of a meter permanently connected to the water system. The fee is waived if meter testing reveals the meter was reading inaccurately	$74.00	$74.00
Non Payment Turn-off Delinquent Service Charge: Water Meter Lock Meter locked for non-payment of water bill.	$24.00	$24.00
Backflow Prevention Permit Fee Inspection of backflow assembly whose installation has been authorized by permit.	-	$87.00
Backflow Compliance Fee Additional site visit after customer has failed to correct backflow or reclaimed meter-related deficiencies for which they have received prior written notice. This fee recovers the cost of the additional field visit.	-	$87.00
Unauthorized Connection Fee For illegal service connections made to the public water main. Payable at the time of violation	-	Twice the System Capacity and Resource Fees
Large Meter Vault – Design Fee for Non-Std City of Flagstaff may provide design and construction documents for the large meter vaults required by the special needs of Developer-required facilities.	-	Billed at Cost
Perform ADEQ Regulatory Engineering Review and Permitting Services. City of Flagstaff may provide Engineering review and issue permits on behalf of ADEQ under a delegation agreement with ADEQ for water and sewer facilities.	-	Billed at Current ADEQ Rates in accordance with AAC R18-14-103