

**HANSFORD ECONOMIC
CONSULTING**

**Water Rate
Cost of Services Study**



March 15, 2016

HEC Project #14,0136

TABLE OF CONTENTS

SECTION	PAGE
1. Introduction	1
1.1 Purpose of the Study	1
1.2 Methodology	2
1.3 Organization of the Report	2
2. Summary of Findings	4
2.1 Major Findings	4
2.2 Key Assumptions	6
2.3 Calculated Rates	7
2.4 Rate Impacts	10
3. Current Conditions	11
3.1 City Water System	11
3.2 Customer Base	14
3.3 The Water Fund	15
4. Financial Projections	21
4.1 Revenue Requirement	21
4.2 Talent Irrigation District Non-Potable Irrigation Service	25
4.3 Meter Replacement Program	27
5. Cost of Service Analysis	29
5.1 Functional Cost Allocation	29
5.2 Rate Design	30
5.3 Water Demand Projection	37
5.4 Calculated Rates	38
5.5 Projected Cash Flow and Fund Balance	42
6. Impacts of New Rate Structure	44
6.1 Bill Impacts	44
6.2 Affordability Test	44
6.3 Comparison of Water Rates	45

LIST OF TABLES

TABLE		PAGE
1	Calculated Water Rates through 2022	8
2	Calculated Typical Home Bill for 1,000 Cubic Feet	9
3	Historical Potable Water Production	11
4	Historical Water Consumption	13
5	City Population Growth	14
6	Current Water Rates	17
7	Water System Development Charges	18
8	Forest Resiliency Program Fee Schedule	19
9	Historical Water Fund Balance	20
10	Summary of 10-Year CIP for Existing Customers	22
11	Estimated Water System Assets Depreciation	23
12	Projected Revenue Requirement	24
13	Calculated TID Use Rates for Fiscal Year 2015-2016	26
14	TID Revenue Offset	27
15	Estimated Meter Replacement Fee Program Costs	28
16	Calculated Meter Replacement Fees	28
17	Allocation of Revenue Requirement to Cost Functions	30
18	Calculation of Customer Service Costs per Account	31
19	Calculation of Monthly Service Charge by Meter Size	32
20	Estimated Meter Equivalent Units	32
21	Customer Usage Characteristics	34
22	Projected Potable Water Demand	37
23	Calculated Use Charges per Cubic Foot	39
24	Summary of Calculated Water Rates	40
25	Cost Allocation by Customer Type	41
26	Projected Operating Fund Cash Flow	42
27	Projected Water Fund Balance	43
28	Affordability Test	45
29	Calculated Typical Home Bill for 1,000 Cubic Feet	46

LIST OF FIGURES

FIGURE		PAGE
1	Cost of Service Redistribution of FY 2015-16 Revenue Requirement	4
2	Typical Monthly Bill for ¾" Single Family Home	9
3	Annual Water Consumption by Month	12
4	Water Use by Customer Type	15
5	Typical Annual Sources of Water Fund Revenue	16
6	Water Sales by Customer Type	16
7	Typical Annual Water Fund Expenses	19
8	Monthly Water Use by Customer Type	33
9	Residential Water Use by Tier	35
10	Non-Residential Water Use by Tier (current rate structure)	36
11	Commercial Water Use by Tier (proposed rate structure)	36
12	Redistribution of Costs to Customer Types	41
13	Water Fund Balance	43
14	Comparison of Single Family Monthly Water Bill	46

Section 1: INTRODUCTION

1.1 PURPOSE OF THE STUDY

The City of Ashland (City) contracted with Hansford Economic Consulting (HEC) to perform a Water Rates Cost of Service Study (Study). The purpose of this Study is two-fold: (1) to ensure that different customer types pay their fair share of water system costs by performing a cost of service analysis and (2) to collect sufficient revenues to adequately fund the water system in a safe manner; providing the residents and businesses of the City with a clean, safe and reliable potable water system that meets State and Federal requirements, by projecting revenue needs and determining a supporting rate schedule.

This report provides an explanation and justification of redistribution of water system costs to customer types and calculated water rates through fiscal year ending 2022. This report has been prepared with the following principles in mind:

- (1) Revenues derived from water fees should not exceed the funds required to provide the water service.
- (2) Revenues derived from water fees should not be used for any purpose other than that for which the fees were imposed.
- (3) Customer water bills should reflect the customer's fair share (proportional) cost of service to provide water to the customer.
- (4) Water fees should only be charged to customers using the service or with the ability to use the service at any time. Water fees should not be charged based on potential or future use of water.

The City conducted a Water Master Plan that was completed in 2012. The Water Master Plan called for several large capital improvement projects and the need to raise water rates to plan for those project costs. The City raised water rates July 2013, 2014, and 2015 by 10% each year as a result of the findings of the Water Master Plan.

Since the 2012 completion of the Water Master Plan the region has experienced a drought. Projected water demands have not been realized, which have resulted in (a) less revenue than anticipated, and (b) greater expenditure in earlier years to complete the Talent-Ashland-Phoenix (TAP) project to augment water supplies. The recent water rate increases were based on percentage increases needed from water sales and not based on cost of service. The City wanted to assess whether customers are paying their proportional share of costs of the water system (not subsidizing among customer types). The City also wanted to ensure that sufficient revenues would be available to pay for projects identified in the Master Plan, as well as other projects identified since completion of the 2012 Master Plan.

Given decreased water demand in recent years the City also anticipated that water rates would have to increase through fiscal year 2022 or necessary capital projects (most particularly a new water treatment plant) would have to be postponed.

1.2 METHODOLOGY

This report was prepared using the principles established by the American Water Works Association (AWWA). The AWWA “Principles of Water Rates, Fees, and Charges: Manual of Water Supply Practices M1” (the “M1 Manual”) establishes commonly accepted professional standards for cost of service studies. The M1 Manual general principles of rate structure design and the objectives of the Study are described below.

According to the M1 Manual, the first step in the ratemaking analysis is to determine the adequate and appropriate funding of a utility. This is referred to as the “revenue requirements” analysis. This analysis considers the short-term and long-term service objectives of the utility over a given planning horizon, including capital facilities and system operations and maintenance, to determine the adequacy of a utility’s existing rates to recover its costs. A number of factors may affect these projections, including the number of customers served, water-use trends, nonrecurring sales, weather, conservation, use restrictions, inflation, interest rates, wholesale contracts, water rights agreements, and other changes in operating and economic conditions.

After determining a utility’s revenue requirements, a utility’s next step is determining the cost of service. Utilizing a public agency’s approved budget, financial reports, operating data, and capital improvement plans, a rate study categorizes (functionalizes) the costs, expenses, and assets of the water system among major operating functions to determine the cost of service.

After the assets and the costs of operating those assets are properly categorized by function, the rate study allocates those “functionalized costs” to the various customer classes (e.g., single-family residential, multi-family residential and commercial) by determining the characteristics of those classes and the contribution of each to incurred costs such as peaking factors, different delivery costs, service characteristics and demand patterns. Rate design is the final part of the M1 Manual’s ratemaking procedure. The revenue requirement and cost of service analyses are used to determine appropriate rates for each customer class.

1.3 ORGANIZATION OF THE REPORT

The Study is presented in six sections.

Following this introduction, Section 2 provides a summary of major assumptions and findings of the study. Section 3 provides information on the City’s water system including historical water production and consumption, customer base, historical City growth, and health of the water enterprise fund. Section 4 projects revenue needs, “the revenue requirement”, through fiscal year 2021-22, calculates costs associated with City Talent Irrigation District (TID) non-potable water service, and determines a meter replacement program and its associated costs.

Section 5 presents the cost of service analysis, water demand projections, and details of the calculated water rates. The impacts of the new water rate structure are presented in Section 6, including a comparison of bills with other Oregon water providers.

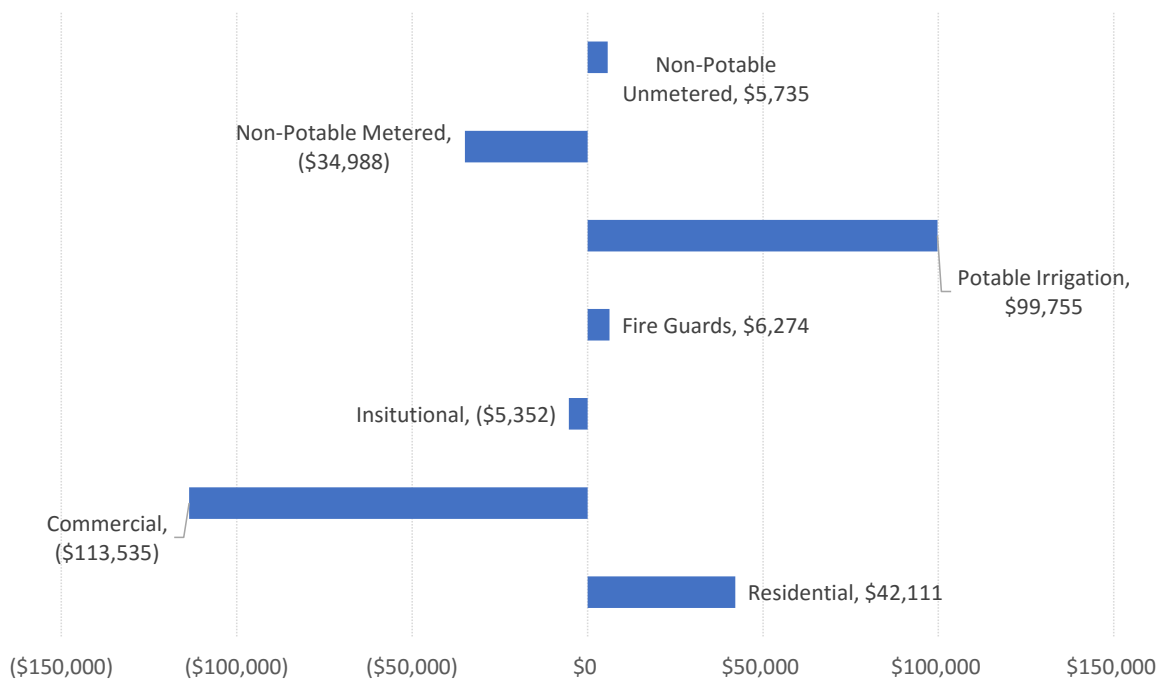
Appendix A includes support tables for the water rates analysis.

Section 2: SUMMARY OF FINDINGS

2.1 MAJOR FINDINGS

Cost of Service. The cost of service analysis finds that commercial, institutional, and non-potable metered irrigation customers are currently paying more than their proportional share of water system costs. Potable irrigation and non-potable unmetered irrigation customers are paying less than their proportional share of water system costs. This is illustrated in **Figure 1** below. Customer types with negative revenue requirement in the illustration should be paying less as a customer group than they are currently paying. Customer types with positive revenue requirement should be paying more as a customer group than they are currently paying. Although residential shows an underpayment of \$42,111, this is a very minimal difference, as it is only 1% of the current cost (see **Table 25**). As a result of the cost of service analysis (see Section 5) the rates from fiscal year 2016-17 onwards shift costs between customer types.

Figure 1
Cost of Service Redistribution of Fiscal Year 2015-16 Revenue Requirement



Costs are allocated to potable customers based on their potential to use system capacity and their water usage characteristics. Costs are allocated to non-potable customers based on typical annual water usage for metered customers and property acreage for unmetered customers.

Rate Structure Modifications. The current rate structure is proposed to be modified to better reflect customer usage patterns and cost of service, ensure accuracy for account billing, and encourage water use efficiency.

- **Flat Charges (All Customers).** Currently bills comprise one flat charge – the monthly service charge. Under the new rate structure bills would continue to have one flat charge which would include the service charge, but it would also include a customer charge for costs associated with administration of the water system and provision of customer service. The customer charge would be the same every month, and the same for every account (accounts with more than one meter only charged once). The service charge would continue to cover the costs of services and meters and a portion of system capacity costs; generally, the costs to be able to provide water service regardless of the amount of water used during a given period. The service charge would continue to apply to each meter at the property.

Service Charge Meter Ratios Change. The service charge meter ratios were adjusted to AWWA meter ratios established using safe maximum operating capacities for meters in the M1 Manual. These meter ratios more accurately capture the capacity of the water service to each customer than the current meter ratios. As a result of this change the larger meter sizes would pay more per month than under the current meter ratios. For 1” meter services the meter ratio was set equal to a ¾” meter to ensure that households required to upsize for fire code requirements are not penalized (this methodology was also used to establish the Forest Resiliency Program Fee in May, 2015 and is being used with greater frequency in cities in other Western U.S. states)¹.

- **Commercial Customers.** Commercial customers are separated into commercial, institutional, and potable water irrigation customers. Institutional customers include the current government/municipal customers. This change is made to better reflect the different customer water demand patterns associated with non-residential activity. The tiers for the new customer categories are also different from the current tiers. The rate structure is intended to fit typical customer usage patterns and promote water use efficiency as well as proportionately allocate the cost of service to those who place the greatest demands on the system.

The table on the following page shows proposed modifications to the non-residential customer tiers. Note that non-residential irrigation water would be charged at on peak and off peak rates. The purpose of seasonal rates for irrigation is to reduce the cost of irrigation water during the spring, fall, and winter months when water supply is not a concern and increase the cost of irrigation water when supplies may be impacted by drought.

¹ Source: HEC experience working with cities in California.

	TIER 1	TIER 2
	Cubic Feet	
CURRENT for ALL NON-RESIDENTIAL	< 50,000	>50,000
NEW		
INSTITUTIONAL	No tier – uniform rate	
IRRIGATION	No tier – seasonal rates	
COMMERCIAL 2" or less	< 2,500	>2,500
COMMERCIAL >2"	< 15,000	>15,000

- Residential Customers.** There is no change proposed for residential tiers. Residential customers with separate potable irrigation meters (about 5% of all potable irrigation customers) would pay a service charge each month for each meter but only one customer charge for the account each month. Metered potable irrigation water would be added to the domestic water for calculation of use charges. As the City is converting to new water billing software in 2016 there may be a transition period during which time residential potable irrigation water is billed starting at the Tier 2 rate for residential water. Billing would begin at Tier 2 because average water use is 460 cubic feet per month for indoor use (see **Table 21**) indicating that a typical home would be using some irrigation water in Tier 2. Once the new billing software is in place the irrigation metered use would be added to domestic metered use.
- Potable Water Irrigation Customers.** All potable irrigation customers (commercial and residential) would be billed the flat monthly charges (service charge and customer charge) year-round rather than only in the months that water is taken as is current practice. Potable irrigation customers would be treated the same as all other potable water customers in this regard, reflecting the ability for the customer to take water at any time of year. This shift from current billing practice may cause some potable irrigation customers to want to discontinue having a separate irrigation meter. This is an option for residential potable irrigation customers.²

2.2 KEY ASSUMPTIONS

Implementation. The new rate structure is assumed to be in effect beginning July 1, 2016 and to be increased each July 1 thereafter. The rate increases would coincide with the fiscal year as is current practice.

Water CIP Projects are funded through rates, connection fees, and City borrowing. Rates and City borrowing will be used to finance capital improvements that benefit existing customers. Connection fees will only be used for projects that are related to new growth in the City. Developer contributions may be required for certain facilities. It is assumed that the City will obtain Safe Drinking Water State Revolving Fund (DWSRF) money to finance construction of the new water treatment plant and Crowson II reservoir. If DWSRF money is not obtained the

² This is not an option for non-residential customers because of sewer billing methodology.

revenue requirement would increase (assuming all other costs do not change) and water rates would have to increase beyond those calculated in this report.

System rehabilitation costs are included in rates. Rates should include depreciation of existing assets so that funds are accumulated and available for replacement of assets on a timely basis, preferably paid for with cash. This Study uses estimated depreciation costs to collect for system rehabilitation. Rate money collected for system rehabilitation is used to fund capital improvement projects for existing customers. In some years system rehabilitation revenue may exceed capital improvement costs. In these years the excess revenue is added to reserves for future rehabilitation projects.

TAP Water Costs. The TAP emergency water pipeline was recently completed. This treated water source will be utilized by the City in late summer or early fall, as needed, to augment supplies. For purposes of the Study it is assumed that water is taken for 31 days each year. The current contract rate is 68 cents per 1,000 gallons of water. In the model it is assumed the cost increases to 75 cents per 1,000 gallons in 2016 and at 3.5% per year each year thereafter.

2.3 CALCULATED RATES

The Study provides a basis for adoption of new rates beginning July 1, 2016. By modifying the rate structure the City will generate sufficient revenue to continue to meet its bond covenants, build a healthy reserve, fund necessary capital improvements, and fully fund water operations.

The revenue requirement, which is the amount of money to be raised by rates, is calculated to increase by the following percentages:

2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
8%	4%	3%	3%	3%	3%

The revenue requirement percentage increases for the next 3 years match those calculated in the 2012 Water Master Plan; however, with the shift in costs between customer categories not all customer categories will experience the same percentage increases.

Table 1 on the following page shows calculated water rates through 2022 for all customer categories and compares the calculated rates with the current rate structure.

Table 2 on page 9 shows the calculated bill for a single family home using 1,000 cubic feet of water in a billing cycle. A typical residential bill would increase from \$51.72 to \$54.35 July 1, 2016.

Table 1
Calculated Water Rates through 2022

Rate Component	Rates Implementation						
	7/1/2015	7/1/2016	7/1/2017	7/1/2018	7/1/2019	7/1/2020	7/1/2021
Monthly Customer Charge per Bill	n.a.	\$11.74	\$12.19	\$12.54	\$12.89	\$13.25	\$13.64
Monthly Service Charge per Meter [1]							
3/4" and Fire Guards	\$23.50	\$13.75	\$14.27	\$14.68	\$15.10	\$15.52	\$15.98
1"	\$46.99	\$14.34	\$14.88	\$15.31	\$15.75	\$16.19	\$16.66
1.5"	\$66.99	\$65.61	\$68.13	\$70.07	\$72.08	\$74.10	\$76.24
2"	\$88.24	\$104.27	\$108.28	\$111.36	\$114.55	\$117.76	\$121.16
3"	\$184.50	\$209.08	\$217.12	\$223.30	\$229.69	\$236.13	\$242.95
4"	\$282.07	\$331.60	\$344.32	\$354.13	\$364.29	\$374.52	\$385.35
6"	\$528.92	\$652.47	\$677.56	\$696.84	\$716.81	\$736.90	\$758.18
8"	\$881.49	\$1,034.38	\$1,074.23	\$1,104.77	\$1,136.39	\$1,168.21	\$1,201.93
USE CHARGES FOR POTABLE WATER							
Residential [2]				per month, per unit			
0 to 300 cf	\$0.0243	\$0.0246	\$0.0256	\$0.0263	\$0.0271	\$0.0278	\$0.0287
301 to 1,000 cf	\$0.0299	\$0.0307	\$0.0319	\$0.0329	\$0.0338	\$0.0348	\$0.0358
1001 to 2,500 cf	\$0.0400	\$0.0415	\$0.0431	\$0.0444	\$0.0457	\$0.0470	\$0.0484
> 2,500 cf (2,501 - 3,600 cf June to Sept)	\$0.0517	\$0.0537	\$0.0559	\$0.0575	\$0.0592	\$0.0609	\$0.0627
> 3,600 cf (June to Sept only)	\$0.0673	\$0.0691	\$0.0719	\$0.0739	\$0.0761	\$0.0783	\$0.0806
Non-Residential				per month, per meter			
0-50,000 cf	\$0.0343	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
> 50,000 cf	\$0.0353	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Commercial <2" meter							
0-2,500 cf	n.a.	\$0.0307	\$0.0319	\$0.0329	\$0.0338	\$0.0348	\$0.0358
> 2,500 cf	n.a.	\$0.0415	\$0.0431	\$0.0444	\$0.0457	\$0.0470	\$0.0484
Commercial 2" + meter							
0-15,000 cf	n.a.	\$0.0307	\$0.0319	\$0.0329	\$0.0338	\$0.0348	\$0.0358
> 15,000 cf	n.a.	\$0.0415	\$0.0431	\$0.0444	\$0.0457	\$0.0470	\$0.0484
Insitutional	n.a.	\$0.0294	\$0.0305	\$0.0314	\$0.0323	\$0.0333	\$0.0342
Commercial and Institutional Irrigation							
October to May	n.a.	\$0.0331	\$0.0345	\$0.0356	\$0.0367	\$0.0378	\$0.0390
June to September	n.a.	\$0.0449	\$0.0469	\$0.0483	\$0.0498	\$0.0513	\$0.0530
Bulk Water [3]	same as non-res.	\$0.0338	\$0.0351	\$0.0362	\$0.0372	\$0.0383	\$0.0394
Fire Protection Service [4]							
Meter Replacement Charge	n.a.	\$1.18	\$1.22	\$1.26	\$1.30	\$1.34	\$1.38
Service Charge	\$23.50	\$13.75	\$14.27	\$14.68	\$15.10	\$15.52	\$15.98
Usage Charges	same as non-res.	\$0.0338	\$0.0351	\$0.0362	\$0.0372	\$0.0383	\$0.0394
TID Non-Potable Water				per irrigation season, per acre or portion of			
Unmetered Service	\$170.01	\$183.11	\$196.20	\$209.30	\$222.40	\$235.50	\$248.59
Metered Service:							
Service Charge	per meter as above	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Meter Replacement Fee [5]	none			per meter as above			
Water Consumption per c.f.	\$0.0055	\$0.0022	\$0.0023	\$0.0024	\$0.0025	\$0.0026	\$0.0026
Outside City Limits							
All rates and charges for water service provided outside the city limits will be 1.5 times the inside city rates and charges.							

Source: City of Ashland.

[1] Irrigation customers currently only billed charges when the service takes water. Effective July 1, 2016 these customers will be charged the flat monthly fees every month regardless of whether water is taken.

[2] For residential customers with separate irrigation meters the metered irrigation water is added to the domestic water use.

[3] For temporary water provided through a bulk meter on a fire hydrant.

[4] This rate shall apply to all water taken through fire protection services or fire guards.

[5] Due once per year on first TID non-potable water bill.

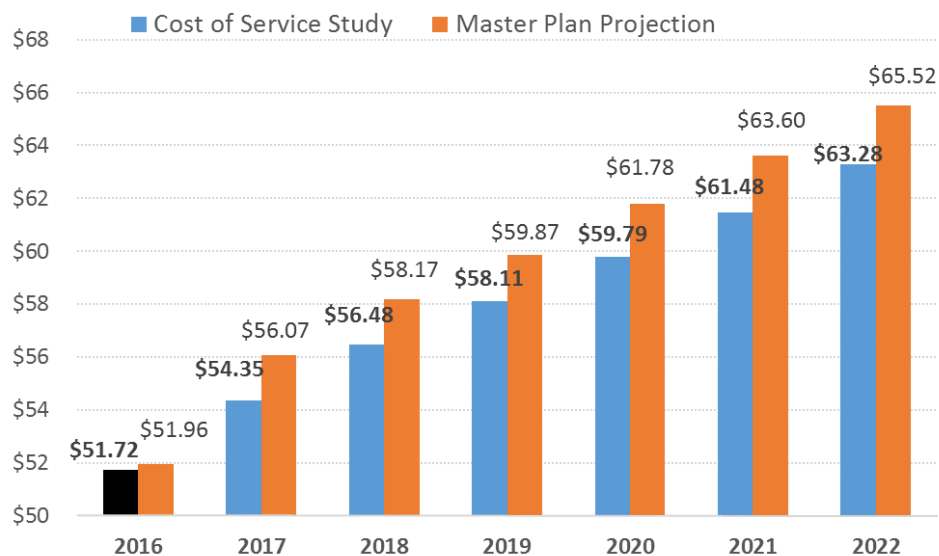
Table 2
Calculated Typical Home Bill for 1,000 Cubic Feet

Residential Charges	Fiscal Year Ending						
	2016 <i>current</i>	2017 1	2018 2	2019 3	2020 4	2021 5	2022 6
Flat Charges							
Customer Charge		\$11.74	\$12.19	\$12.54	\$12.89	\$13.25	\$13.64
Service Charge	\$23.50	\$13.75	\$14.27	\$14.68	\$15.10	\$15.52	\$15.98
Total Flat Charges	\$23.50	\$25.48	\$26.46	\$27.21	\$27.99	\$28.78	\$29.61
Use Charges							
Tier 1 per cu. ft.	\$0.0243	\$0.0246	\$0.0256	\$0.0263	\$0.0271	\$0.0278	\$0.0287
Tier 2 per cu. ft.	\$0.0299	\$0.0307	\$0.0319	\$0.0329	\$0.0338	\$0.0348	\$0.0358
Tier 1 Charges (300 cu ft)	\$7.29	\$7.37	\$7.67	\$7.89	\$8.12	\$8.35	\$8.60
Tier 2 Charges (700 cu ft)	\$20.93	\$21.50	\$22.36	\$23.01	\$23.68	\$24.35	\$25.07
Total Use Charges	\$28.22	\$28.87	\$30.02	\$30.89	\$31.80	\$32.70	\$33.67
Bill for 3/4" using 1,000 cu. ft.	\$51.72	\$54.35	\$56.48	\$58.11	\$59.79	\$61.48	\$63.28
Percentage Increase		5%	4%	3%	3%	3%	3%

Source: HEC.

Figure 2 shows the calculated bill for a single family home with a ¾" meter using 1,000 cubic feet in the cost of service study compared to the master plan projections through 2022. Bills may be lower or higher than shown depending on actual quantity of water used.

Figure 2
Typical Monthly Bill for ¾" Single Family Home



2.4 RATE IMPACTS

Residential. In 2016 residential water bills would experience increases of about 5% rather than the full 8% increase in revenue requirement because of the cost redistribution between customers. The bills for residential customers will remain affordable per the Oregon Drinking Water State Revolving Fund program definition (see Section 6).

Commercial. Many commercial water bills would decrease under the new rate structure in 2016. The reduction in bills is also due to the reallocation of costs under the cost of service analysis. Commercial customers with 2" and larger meters would pay a larger portion of their bill as a flat monthly charge due to the change in service charge meter ratios to AWWA safe maximum operating capacities for meters. Larger water meter commercial customers would have higher bills in 2016.

Institutional. Institutional customers would experience a slight increase in bills in the winter months and a decrease in bills in the summer months. Institutional customers have a relatively flat demand throughout the year, with a slight peak in the spring months before the irrigation season begins, so the change to a uniform use charge (the same rate per 1,000 gallons is charged regardless of total water use) is appropriate.

Potable Irrigation. During the peak summer months potable irrigation bills would increase in 2016 due to cost redistribution. The new rate design is intended to curb irrigation water use during the peak use months by having a higher "on peak" rate per 1,000 gallons June through September. During off-peak months (October through April) water bills would increase if no water was taken. This reflects billing the flat monthly charges regardless of whether water is used or not. For accounts using water during the off-peak, irrigation bills would decrease. The off-peak potable irrigation water rate encourages planting in spring and fall months when water supply is not a concern.

TID Non-Potable Water Irrigation. The unmetered customers' rate would increase from \$170.01 per acre to \$183.11 per acre July 1, 2016 as a result of cost redistribution. The TID metered customer rate would decrease from \$0.0055 per cubic foot to \$0.0022 per cubic foot July 1, 2016. In addition, TID metered customers would pay a meter replacement fee.

Section 3: CURRENT CONDITIONS

3.1 CITY WATER SYSTEM

The City operates a surface water supply system. The main water supply is from Ashland Creek and reservoir. This water is treated at a City owned and operated water treatment plant. Treated water enters the distribution system from this point and either flows directly to customers or to one of 4 reservoirs (water tanks) located in the City. In 2014 the TAP water supply was completed to Ashland. The City can take up to 2.13 million gallons per day (mgd) in emergency water supplies from the Medford Water Commission. This water source will be used in late summer or early fall as needed to augment supplies. In addition to these two sources of treated water the City also obtains water from the Talent Irrigation District (TID). Non-potable TID water is supplied to irrigation customers located along the TID canal. Under terms of the contracts with TID the City may also use the water for potable water demands. When used for potable needs, water from the canal is diverted to the Ashland Creek water treatment plant where it is treated and enters the City's potable water distribution system.

Potable water production averages 46 million gallons per month during the winter months (December through March). Peak month production is July or August when production averages 152 million gallons per month. The highest month production in the past 6 years was 180 million gallons in July 2009. **Table 3** shows historical potable water production.

Table 3
Historical Potable Water Production

Month Year	Calendar Year						Avg. Annual Water Delivery (MG)	Percent of Delivery by Month	
	2009	2010	2011	2012	2013	2014			
<i>Figures in Millions of Gallons</i>									
January	51.06	48.16	48.88	48.07	42.97	42.38	46.92	5%	
February	44.48	41.77	44.11	44.96	36.98	37.36	41.61	4%	
March	48.71	47.54	47.18	47.65	42.45	41.71	45.87	5%	
April	64.90	48.40	48.70	53.24	54.76	56.41	54.40	5%	
May	105.77	59.31	60.78	90.64	90.46	97.70	84.11	8%	
June	124.39	88.51	88.77	109.75	117.26	119.26	107.99	11%	
July	180.38	157.48	135.27	133.40	170.48	137.17	152.36	15%	
August	167.64	158.29	152.00	149.87	155.29	131.38	152.41	15%	
September	116.02	114.52	131.36	124.35	114.30	104.15	117.45	12%	
October	69.73	86.43	82.60	81.33	99.24	83.61	83.83	8%	
November	48.97	51.89	54.13	45.01	81.63	55.40	56.17	6%	
December	51.26	47.26	49.63	40.50	52.97	51.01	48.77	5%	
Total	1,073.32	949.57	943.42	968.78	1,058.79	957.53	A	991.90	100%
Base Monthly Flow (Dec - Mar)							B	45.79	
Average Annual Base Flow							C = B*12	549.53	55%
Average Annual Additional Flow							D = A-C	442.37	45%

Source: City of Ashland.

Water production includes Ashland Creek and TAP water supplies. Annual base water production is the winter monthly average production multiplied by 12. Base water production comprises 55% of annual production. Additional flow to meet demands that pick up during the spring, summer, and fall months comprises 45% of annual production.

Historical water consumption is shown in **Table 4**. Due to billing cycles, consumption by month in the table reflects the amount of water billed each month which is not exactly the same as total water used in each month; however, the pattern of use is very similar with peak month usage typically in July or August. **Figure 3** shows the seasonal pattern of water consumption.

Figure 3
Annual Water Consumption by Month

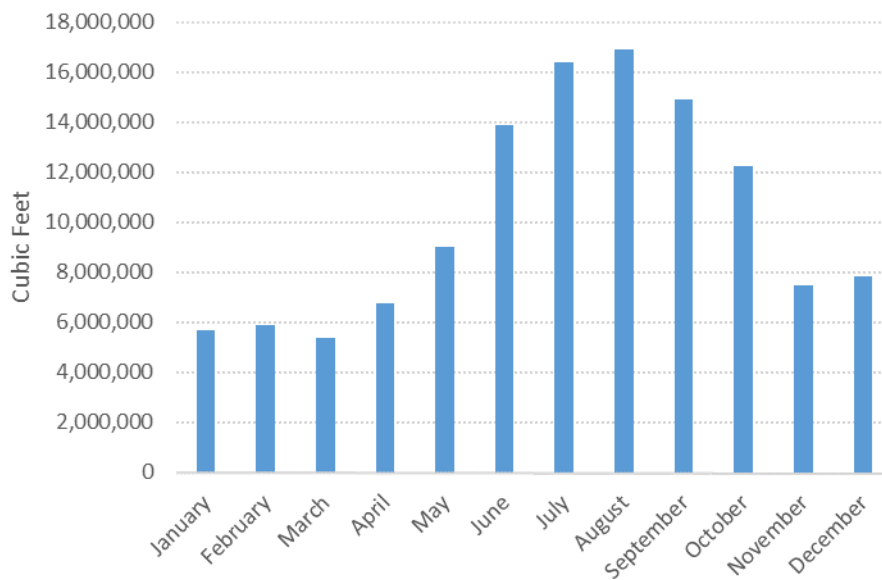


Table 4 compares potable water consumption and production. The figures show that about 4.5% of water produced is unbilled or unaccounted for. This figure is considered healthy for a water system³.

The total annual water usage billed increased 13% between 2010 and 2013 then fell back to almost the same level as 2010 in 2014. The decrease in water use between 2013 and 2014 is probably largely due to the drought. Oftentimes a decrease such as this can be sustained for many years, particularly if followed by another drought year, as has been the case in 2015. Referred to as ‘demand hardening,’ customers become accustomed to using less water. During the drought years they have retrofitted fixtures and reset irrigation clocks or changed out landscaping to reduce their water use.

³ “Most states have regulatory policies that set acceptable losses from public water system distribution systems at a maximum of between 10 and 15 percent of the water produced by the public water system.”, page vii of ‘Control and Mitigation of Drinking Water Losses in Distribution Systems’, EPA November 2010 publication.

Table 4
Historical Water Consumption

Month	Calendar Year				
	2010	2011	2012	2013	2014
Consumption	<i>Figures in Cubic Feet</i>				
January	5,688,024	6,377,053	5,822,654	6,398,479	5,698,647
February	5,099,644	5,088,576	5,264,148	5,106,362	5,903,155
March	5,997,480	5,766,127	6,218,217	6,620,823	5,395,848
April	6,277,962	5,688,600	5,835,945	6,921,512	6,737,313
May	6,175,787	6,517,554	9,374,536	11,570,159	9,004,008
June	10,178,300	10,104,520	13,707,604	15,747,969	13,874,124
July	15,731,277	14,807,946	17,927,282	20,205,591	16,364,166
August	20,686,522	18,804,858	20,516,243	21,154,339	16,915,748
September	17,851,518	19,930,790	17,585,640	16,960,380	14,895,165
October	11,796,560	13,546,376	16,327,008	9,331,983	12,225,379
November	7,824,931	7,349,883	7,001,274	7,667,451	7,481,362
December	5,685,693	6,519,096	6,151,560	6,465,232	7,819,658
Total Consumption (Cu. Ft.)	118,993,698	120,501,379	131,732,111	134,150,280	122,314,573
Total Consumption (Gallons)	890,072,861	901,350,315	985,356,190	1,003,444,094	914,913,006
Millions of Gallons Billed	890	901	985	1,003	915
Millions of Gallons Produced [1]	950	943	969	1,059	958
Production less Consumption	59	42	-17	55	43
Production as % of Billing	6.3%	4.5%	-1.7%	5.2%	4.5%

Source: City of Ashland.

[1] Includes TAP water of 6.3 MG in 2014. Production figures for 2012 unreliable due to calibration difficulties at the plant.

In selecting a base year as a platform for water use from which to project water demand over the Study time period it would be best to either use the average of the last five years or the most recent year of water use. This Study projects water use based on the most recent year of water use (2014). Unlike the Water Master Plan, in which the core objective is to ensure sufficient capacity is available for a ‘worst case’ growth in demand scenario (maximum likely use), this Study needs to ensure sufficient revenue is available in a ‘best case’ growth in demand scenario under which there are minimum increases in water use. The average annual water use of the last 5 years was 939 million gallons. The Study uses the 2014 use of 915 million gallons as the base for projecting water demand.

Over the same five-year period (2010-2014) the population of Ashland increased very slightly from an estimate of 20,100 to 20,300. Gallons of water produced per capita per day has remained flat at 129. Ashland’s population growth and gallons per capita per day is shown in **Table 5**.

Table 5
City Population Growth

Year	Certified Population Estimate	Annual Change	Annual % Change	Water Production Gallons per Capita per Day
	1-Jul			
2000	19,610			
2001	19,770	160	0.8%	
2002	20,130	360	1.8%	
2003	20,430	300	1.5%	
2004	20,590	160	0.8%	
2005	20,880	290	1.4%	160
2006	21,430	550	2.6%	161
2007	21,630	200	0.9%	154
2008	21,485	-145	-0.7%	153
2009	21,505	20	0.1%	137
2010	20,095	-1,410	-6.6%	129
2011	20,255	160	0.8%	128
2012	20,325	70	0.3%	131
2013	20,295	-30	-0.1%	143
2014	20,340	45	0.2%	129
Change	730	52		
	Average Annual Population Increases		0.26%	

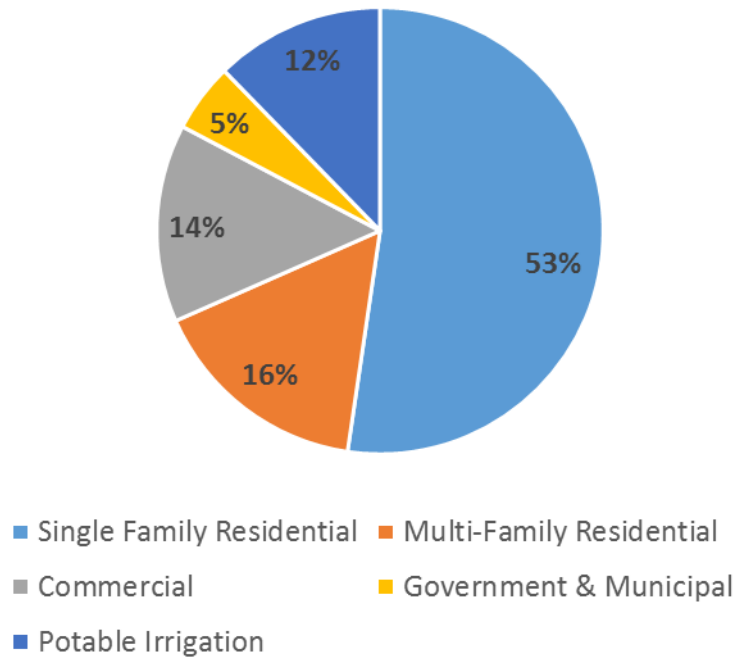
Source: Portland State University Population Research Center -
www.pdx.edu/prc and Carollo 2012 City of Ashland Comprehensive Water Master Plan.

3.2 CUSTOMER BASE

As shown in **Table 5**, the City services a population of approximately 20,300 and it has sustained an annual average population increase of 0.26% since 2000. City water customers include residential (single family and multi-family), commercial, institutional (government/municipal), potable irrigation and non-potable irrigation (TID) customers. **Figure 4** shows water use by customer type. The figure excludes water use by the non-potable irrigation customers.

As the pie chart shows, the majority of City water use (69%) is by residential customers.

Figure 4
Water Use by Customer Type



3.3 THE WATER FUND

The water enterprise fund accounts for the revenues and expenses associated with operating the water system.⁴

Revenues. Historically, 61% of the water enterprise fund’s operating revenue has been derived from water sales. Other operating revenue includes bond proceeds, system development charges (SDCs), new service installation fees, inter-government revenues, interest, and other miscellaneous revenues. **Table A-1** shows historical and budgeted water fund revenues. **Figure 5** shows the typical annual share of revenues by source.

Water sales by customer type is shown in **Figure 6**.

⁴ An enterprise fund is a fund that is intended to recover its costs through user fees and charges. Enterprise funds also provide the repayment capacity for, and make debt service payments on, any debt incurred for capital projects associated with the utility; therefore, any water enterprise fund bond-funded projects do not diminish the City’s general fund debt capacity.

Figure 5
Typical Annual Sources of Water Fund Revenue

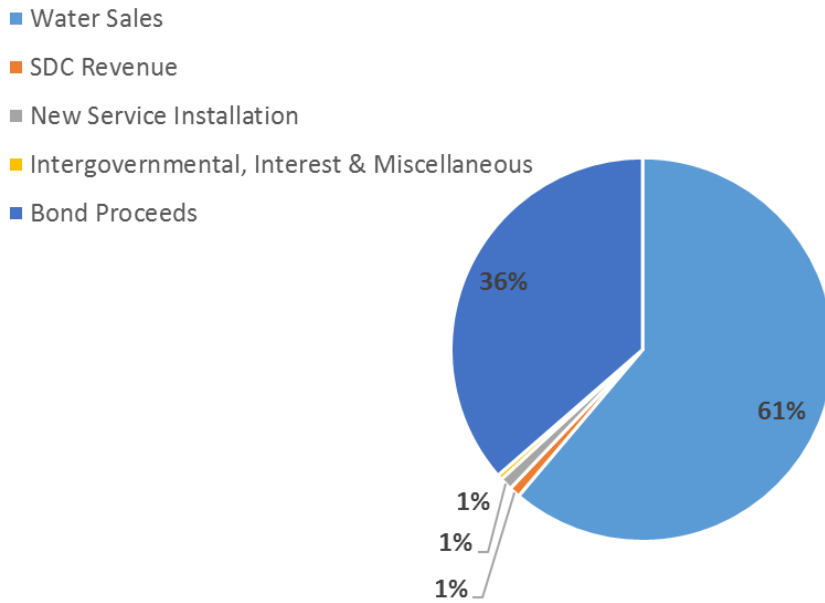
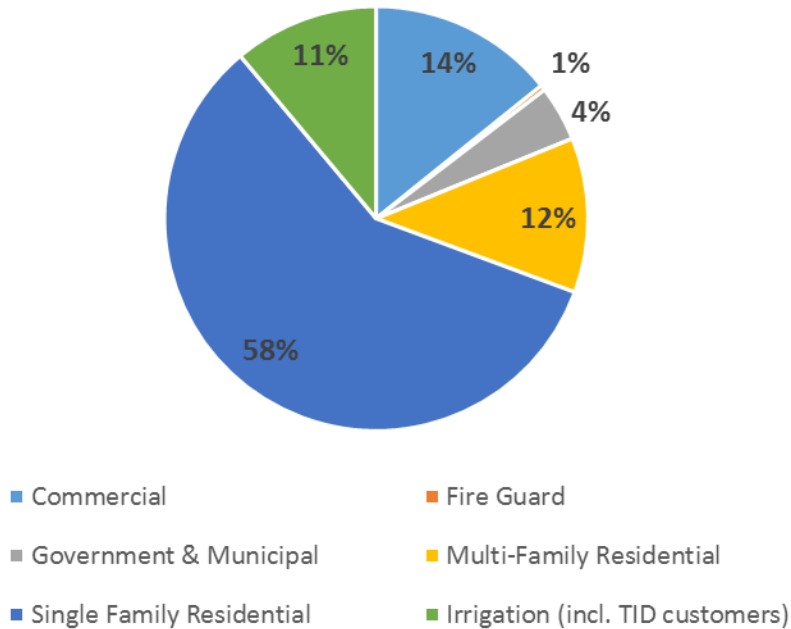


Figure 6
Water Sales by Customer Type



Rate revenue is generated according to the current water rate schedule shown in **Table 6**. Customers are billed fixed service charges according to their water meter size plus use charges.

**Table 6
Current Water Rates**

Rate Component	Rate Schedule 7/1/2015		
Monthly Service Charge			
Within City Limits			
Meter Size			
3/4"			\$23.50
1"			\$46.99
1.5"			\$66.99
2"			\$88.24
3"			\$184.50
4"			\$282.07
6"			\$528.92
8"			\$881.49
Usage Charges			
Residential [1]			
			October - May
0 to 300 cf	per month	per unit	\$0.0243
301 to 1,000 cf	per month	per unit	\$0.0299
1,001 to 2,500 cf	per month	per unit	\$0.0400
> 2,500 cf	per month	per unit	\$0.0517
			June - September
0 to 300 cf	per month	per unit	\$0.0243
301 to 1,000 cf	per month	per unit	\$0.0299
1,001 to 2,500 cf	per month	per unit	\$0.0400
2,501 to 3,600 cf	per month	per unit	\$0.0517
> 3,600 cf	per month	per unit	\$0.0673
Non-Residential [1]			
0-50,000 cf	per month		\$0.0343
> 50,000 cf	per month		\$0.0353
TID Irrigation Rates			
Unmetered Service	per acre or portion of		\$170.01
Metered Service	Base Service Charge	per meter as above	
	Water Consumption per cf		\$0.0055
Bulk Water Rate			
For water provided on a temporary basis through a bulk meter on a fire hydrant			
Deposit			\$1,859.28
Basic Fee			\$234.77
Cost of Water		same as non-residential	
Fire Protection Service			
This rate shall apply to all fire protection services or fire guards. The basic service charge will be equal to the minimum basic service charge. Water will be billed at non-residential rates.			
Outside City Limits			
All rates and charges for water service provided outside the city limits will be 1.5 times the rates for water service provided within the city limits.			

Source: City of Ashland.

[1] Irrigation customers only billed when the service takes water.

New development pays System Development Charges (SDC) fees to pay for new facilities necessary to accommodate the increased demand associated with new customers. The current SDC fee schedule is shown in **Table 7**. SDC charges are not updated as part of this Study.

Table 7
Water System Development Charges

Applicant	SDC Charges		
	Reimbursement	Improvement	Total
Residential			
All, per Sq. Ft. Habitable Area	\$0.9318	\$1.6751	\$2.6069
Commercial & Industrial			
Meter Size			
3/4"	\$1,792.89	\$3,084.22	\$4,877.11
1"	\$2,988.75	\$5,140.43	\$8,129.18
1.5"	\$5,975.70	\$10,280.87	\$16,256.57
2"	\$9,561.48	\$16,448.58	\$26,010.06
3"	\$20,917.65	\$35,983.04	\$56,900.69
4"	\$35,857.80	\$61,685.21	\$97,543.01
6"	\$74,704.35	\$128,508.83	\$203,213.18
8"	\$107,573.40	\$185,053.61	\$292,627.01

Source: Economic & Financial Analysis, June 5, 2014.

Water customers are also charged a fixed monthly fee by water meter size for the Ashland Forest Resiliency Program. This new fee was adopted by City Council in May 2015 and is also not part of the Study. The Forest Resiliency Program was included in the Water Fund prior to fiscal year 2015-16. It is now part of public safety. The Forest Resiliency Program fee schedule is shown in **Table 8** on the following page.

Expenses. The water fund incurs annual expenses for supply, distribution, treatment plant, and conservation functions. Costs for these functions are further grouped into ten categories in the Study:

Personnel (includes benefits)	Supplies
Repair & Maintenance	Communications
Contractual Services	Central Service
Miscellaneous Charges	Other Purchased Services
Conservation Programs	Franchise Tax

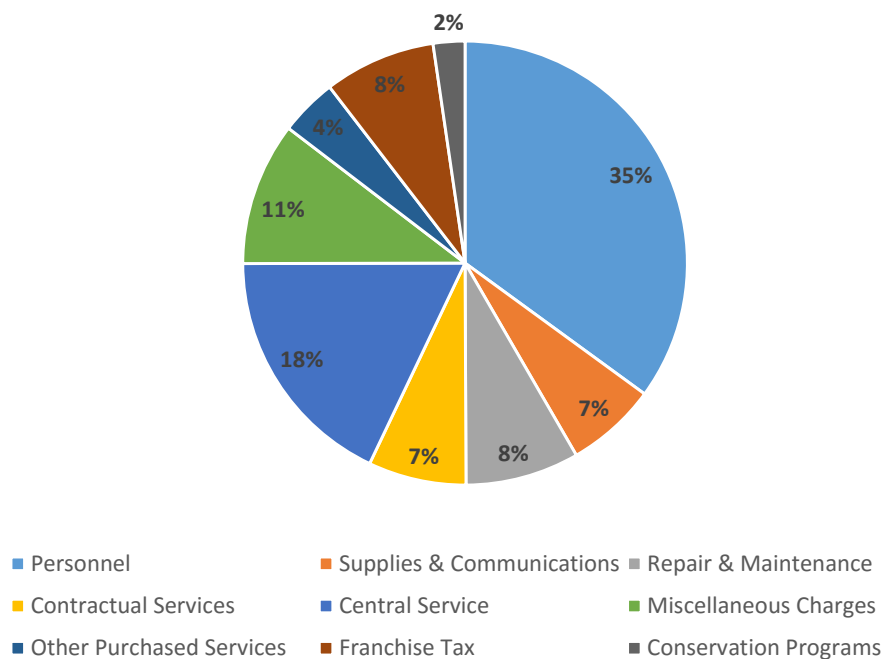
Table 8
Forest Resiliency Program Fee Schedule

Meter Size	Monthly Charge
3/4"	\$1.39
1"	\$1.39
1.5"	\$6.95
2"	\$11.12
3"	\$22.24
4"	\$34.75
6"	\$69.50
8"	\$111.20

Source: Resolution 2015-14 adding a surcharge to water meters for the purpose of generating and dedicating general fund resources for additional work in the forest interface as part of the Ashland Forest Resiliency Program, May 2015.

Over the past six years personnel costs (including salaries and benefits), central service costs (support from other departments allocated to water), and miscellaneous costs have been the largest expenditure items. Personnel costs have comprised approximately 35 percent of annual costs of the water utility. The percentage share of fiscal year 2015-16 budgeted expenses by expense category is shown in **Figure 7**.

Figure 7
Typical Annual Water Fund Expenses



An addition to the fiscal year 2015-16 budget is the cost of TAP water. This new water source first came online in the fall of 2014. The City anticipates using this water source one month every year in typical water years.

Table A-2 shows historical and budgeted expenditures by water system function. Operations expenditures are summarized in **Table A-3**.

Water Fund Balance. In 2010 and 2011 the water fund was unable to sustain itself. Inter-fund loans from other City funds were used to pay for operations of the water system. Following an increase in revenue in 2013 as a result of the completion of the Water Master Plan and implementation of increased rates, the water fund was able to sustain itself. The water fund balance increased from \$2.7 million to \$6.4 million. The inter-fund loans were repaid. The water fund balance decreased in fiscal years ending 2014 and 2015 (the last 2 fiscal years) to \$5.2 million as revenues decreased due to the drought (despite rate increases over the same time period). Bond proceeds have been used increasingly since 2013 to fund major capital improvements. The historical water fund balance is shown in **Table 9** below.

Table 9
Historical Water Fund Balance

Water Fund	Fiscal Year Ending					
	2010	2011	2012	2013	2014	2015
Revenues	\$4,455,768	\$4,806,604	\$5,745,624	\$8,280,514	\$6,322,141	\$6,604,338
Expenses	\$5,007,651	\$4,996,091	\$5,049,115	\$6,899,636	\$7,315,933	\$8,414,077
Excess (Deficiency)	(\$551,883)	(\$189,487)	\$696,509	\$1,380,878	(\$993,792)	(\$1,809,739)
Other Financing Sources	\$80,000	\$550,000	(\$200,000)	\$2,347,791	\$829,630	\$744,916
	<i>Interfund loan</i>	<i>Interfund loan</i>	<i>repayment of interfund loan</i>	<i>repayment of interfund loan & bond proceeds</i>	<i>repayment of interfund loan & bond proceeds</i>	<i>bond proceeds</i>
Net Change in Fund Balance	(\$471,883)	\$360,513	\$496,509	\$3,728,669	(\$164,162)	(\$1,064,823)
Fund Balance July 1	\$2,323,768	\$1,851,885	\$2,212,398	\$2,708,907	\$6,437,576	\$6,273,414
Fund Balance June 30	\$1,851,885	\$2,212,398	\$2,708,907	\$6,437,576	\$6,273,414	\$5,208,591

Source: City of Ashland CAFRs.

Section 4: FINANCIAL PROJECTIONS

4.1 REVENUE REQUIREMENT

The revenue requirement refers to the amount of money that must be raised annually through rates. The projection of revenue requirement is therefore the cornerstone for calculation of rates. This section explains the derivation of revenue requirement for this Study. Components of revenue requirement include:

- Capital Improvements
- Debt Service
- System Rehabilitation
- Operations Expenses and Reserves

City TID non-potable water sales revenue as well as other non-water sales revenue projections are credited against projected operations costs. Non-water sales include intergovernmental revenue, interest on investments, new service installation revenue, and other miscellaneous revenues.

4.1.1. Capital Improvements

The City's water system capital improvements plan (CIP) is shown in **Table A-4**. The table shows costs in inflated dollars to account for the increased cost of infrastructure over time. Project costs are increased 3.12% per year for inflation per the historical 1995-2015 20-year Engineering News-Record Construction Cost Index (ENR CCI) average annual increase.

The table only shows costs to be borne by existing customers. Improvements that benefit future customers will be paid for with system development charges. Total CIP costs benefiting existing customers is summarized in **Table 10**. Total costs (inflated) are estimated at \$28.6 million. Of this total, \$20.3 million (70%) is for the new water treatment plant and reservoir identified in the Master Plan.

Of the total identified \$28.6 million (inflated costs) in improvements, \$20.3 million is assumed to be funded with SRF loans, \$2.1 million is assumed to be funded with bond proceeds, \$3.8 million with cash raised by rates specifically for system rehabilitation, \$0.4 million with other water fund cash, and \$2.0 million with use of restricted reserves for capital improvements.

4.1.2. Debt Service

Existing debt service of the water fund is shown in **Table A-5**. Existing debt comprises City general obligation bonds as well as Medford Water Commission debt and State of Oregon revolving fund loan debt for the TAP project. State of Oregon revolving fund loan debt payments are estimated to begin in fiscal year 2017-18.

New debt service estimates for projects bond-funded by the City are shown in **Table A-6**. **Table A-7** shows the assumptions and debt service for financing the new water treatment plant and Crowson II reservoir with the Oregon DWSRF program.

Table 10
Summary of 10-Year CIP for Existing Customers

Item	Total	2015-16 Base	2016-17 1	2017-18 2	2018-19 3	2019-20 4	2020-21 5	2021-22 6
Total Project Costs (inflated dollars)	\$28,624,250	\$4,323,240	\$12,072,625	\$10,595,310	\$282,400	\$546,475	\$469,200	\$335,000
System Rehabilitation Cash [1]	\$3,792,224	\$0	\$1,004,428	\$1,154,721	\$282,400	\$546,475	\$469,200	\$335,000
Cash Funded (Rates)	\$402,240	\$402,240	\$0	\$0	\$0	\$0	\$0	\$0
Use of Restricted Reserves [2]	\$1,965,726	\$0	\$1,933,647	\$32,079	\$0	\$0	\$0	\$0
Treatment Plant (SRF Funded)	\$13,041,810	\$1,043,370	\$5,910,570	\$6,087,870	\$0	\$0	\$0	\$0
Crowson II (SRF Funded)	\$7,322,940	\$778,320	\$3,223,980	\$3,320,640	\$0	\$0	\$0	\$0
Bond Funded	\$2,099,310	\$2,099,310	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$28,624,250	\$4,323,240	\$12,072,625	\$10,595,310	\$282,400	\$546,475	\$469,200	\$335,000

Source: HEC

[1] During years that system rehabilitation cash collection is greater than the CIP, monies will be restricted for capital improvements.

[2] Reserves restricted for capital improvement projects.

4.1.3. System Rehabilitation

Depreciation is used as the basis for which to collect rates to cover system rehabilitation costs. It is recommended that the City collect water rates to fund system rehabilitation costs. **Table 11** shows the estimated cost of depreciation of the water system. The estimated cost includes replacement of existing assets and assets that are estimated to be constructed during the Study time period (see **Table A-8**).

Table 11
Estimated Water System Assets Depreciation

Assets	Annual Depreciation						
	2015-16 Base	2016-17 1	2017-18 2	2018-19 3	2019-20 4	2020-21 5	2021-22 6
Existing Assets							
Water Rights	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Buildings	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Equipment	\$11,832	\$8,189	\$1,390	\$1,390	\$1,390	\$1,390	\$1,390
Improvements	\$676,083	\$673,081	\$663,935	\$663,935	\$663,735	\$661,981	\$657,684
Total Existing	\$687,915	\$681,270	\$665,325	\$665,325	\$665,126	\$663,371	\$659,074
New Assets							
Improvements	\$121,580	\$323,159	\$489,396	\$494,288	\$503,811	\$511,829	\$517,412
Total New	\$121,580	\$323,159	\$489,396	\$494,288	\$503,811	\$511,829	\$517,412
Combined Existing & New	\$809,495	\$1,004,428	\$1,154,721	\$1,159,613	\$1,168,937	\$1,175,200	\$1,176,486
% Included in Rates		100%	100%	100%	100%	100%	100%
Amount In Rates		\$1,004,428	\$1,154,721	\$1,159,613	\$1,168,937	\$1,175,200	\$1,176,486

Source: City of Ashland and HEC.

4.1.4. Operations Expenses and Reserves

Table A-9 shows that operations costs of the water fund have increased at an average annual rate of 3.4% since 2010. This average annual increase is compared with a 2.7% Engineering News Record (ENR) Construction Cost Index (CCI) increase and 1.8%-2.2% Consumer Price Index (CPI) indexes. It is typical for utilities costs to increase at a faster rate than the price indexes shown.

This Study recommends using average annual increases of 4.0% for personnel costs, 3.5% for TAP water costs, and 3.0% for all other operating costs.

4.1.5. Calculated Revenue Requirement

Table 12 on the next page estimates the revenue requirement of the water fund for the next 10 years. In fiscal year 2015-16 the revenue requirement is calculated at \$5.78 million. The City projects revenues of \$6.52 million. Any realized additional revenue will be reserved for capital improvements identified in the Water Master Plan.

Table 12
Projected Revenue Requirement

Revenues and Expenses		2015-16 Base	2016-17 1	2017-18 2	2018-19 3	2019-20 4	2020-21 5	2021-22 6
Operating Expenses								
Personnel	4.0%	\$1,737,310	\$1,806,802	\$1,879,074	\$1,954,237	\$2,032,407	\$2,113,703	\$2,198,251
Supplies	3.0%	\$305,825	\$315,000	\$324,450	\$334,183	\$344,209	\$354,535	\$365,171
Repair & Maintenance [1]	3.0%	\$410,512	\$359,827	\$370,622	\$381,741	\$393,193	\$404,989	\$417,139
Communications	3.0%	\$22,380	\$23,051	\$23,743	\$24,455	\$25,189	\$25,945	\$26,723
Contractual Services	3.0%	\$353,600	\$364,208	\$375,134	\$386,388	\$397,980	\$409,919	\$422,217
Central Service	3.0%	\$887,650	\$914,280	\$941,708	\$969,959	\$999,058	\$1,029,030	\$1,059,901
Miscellaneous Charges	3.0%	\$517,020	\$532,531	\$548,507	\$564,962	\$581,911	\$599,368	\$617,349
Other Purchased Services	3.0%	\$207,320	\$213,540	\$219,946	\$226,544	\$233,340	\$240,341	\$247,551
Franchise Tax	3.0%	\$402,653	\$414,733	\$427,175	\$439,990	\$453,189	\$466,785	\$480,789
Conservation Programs	3.0%	\$114,500	\$117,935	\$121,473	\$125,117	\$128,871	\$132,737	\$136,719
TAP Water [2]	3.5%	\$44,000	\$48,000	\$50,000	\$52,000	\$54,000	\$56,000	\$58,000
Subtotal Operating Expenses		\$5,002,770	\$5,109,906	\$5,281,831	\$5,459,577	\$5,643,347	\$5,833,351	\$6,029,809
Debt Service								
Existing Debt (City bonds)		\$453,291	\$451,941	\$450,491	\$453,891	\$457,091	\$450,191	\$448,241
Existing Debt Medford Water Commission		\$163,768	\$163,768	\$163,768	\$163,768	\$163,768	\$163,768	\$163,768
Existing Debt (IFA note)		\$0	\$0	\$157,000	\$103,000	\$103,000	\$103,000	\$103,000
New City Debt [3]	Table A-6		\$188,000	\$188,000	\$188,000	\$188,000	\$188,000	\$188,000
New SRF Debt	Table A-7		\$53,736	\$313,722	\$581,505	\$1,145,400	\$1,145,400	\$1,145,400
Subtotal Debt Service		\$617,059	\$857,445	\$1,272,981	\$1,490,164	\$2,057,259	\$2,050,359	\$2,048,409
Capital Outlay Cash Funded		\$402,240	\$0	\$0	\$0	\$0	\$0	\$0
System Rehabilitation		\$0	\$1,004,428	\$1,154,721	\$1,159,613	\$1,168,937	\$1,175,200	\$1,176,486
Operating Reserves		\$0	\$310,000	(\$105,000)	(\$245,000)	(\$735,000)	(\$650,000)	(\$555,000)
Subtotal Annual Cost		\$6,022,069	\$7,281,780	\$7,604,533	\$7,864,353	\$8,134,543	\$8,408,910	\$8,699,704
Credits								
New Service Installation	2.0%	\$114,800	\$117,096	\$119,438	\$121,827	\$124,263	\$126,748	\$129,283
Intergovernmental Revenue	constant	\$14,000	\$14,000	\$14,000	\$14,000	\$14,000	\$14,000	\$14,000
Interest on Investments	constant	\$20,400	\$20,400	\$20,400	\$20,400	\$20,400	\$20,400	\$20,400
Miscellaneous	2.0%	\$12,000	\$12,240	\$12,485	\$12,734	\$12,989	\$13,249	\$13,514
Non-Potable Water (TID) Charges	Table 14	\$80,742	\$50,800	\$53,727	\$56,676	\$59,632	\$62,642	\$65,663
Subtotal Credits		\$241,942	\$214,536	\$220,050	\$225,637	\$231,284	\$237,040	\$242,860
REVENUE REQUIREMENT		\$5,780,127	\$7,067,244	\$7,384,483	\$7,638,716	\$7,903,258	\$8,171,870	\$8,456,844
base								
Change from Base Year Water Sales		\$6,515,358	\$551,886	\$869,124	\$1,123,358	\$1,387,900	\$1,656,512	\$1,941,485
Annual Change			\$551,886	\$317,239	\$254,234	\$264,542	\$268,612	\$284,974
Percentage Change			8%	4%	3%	3%	3%	3%

Source: HEC.

[1] Maintenance costs reduced in year 1 by \$63,000 which is the average amount spent on meter replacement in the City each year currently.

Meter replacement costs will be recouped in the new meter replacement monthly charges.

[2] Assumes 2.13 mgd for 31 days/year. In 2015 the cost is 68 cents per 1,000 gallons. The cost is assumed to increase to 75 cents per 1,000 gallons. in 2016 and thereafter 3.5% per year in the model.

[3] Assumes payments start the following year.

The revenue requirement is projected to increase to \$7.07 million in fiscal year 2016-17, and increase each year thereafter. The revenue requirement is projected to continue to increase fiscal years ending 2018 through 2022 to account for inflation, fund capital expenditures, and account for new debt. To keep rates at a 3% annual increase during this timeframe,

approximately \$2.3 million of existing cash reserves will be depleted. Note that the revenue requirement is the amount that must be collected from potable water customers; it excludes revenues from water sales to City TID customers. The percentage increases in revenue requirement match the 2012 Water Master Plan for the first three fiscal years.

4.2 TALENT IRRIGATION DISTRICT NON-POTABLE IRRIGATION SERVICE

Total annual costs of the water system to potable users is reduced by credits, including credit for water sales to TID non-potable water customers. In fiscal year 2015-16 TID charges are budgeted at \$81,000. This Study calculates the costs of the TID system at \$52,870 for fiscal year 2015-16. **Table A-10** shows annual costs comprise city canal maintenance costs as well as staffing and materials costs. **Table A-11** provides a supporting cost estimate for annual maintenance costs.

TID irrigation water is supplied under a 1924, 1926 and 1935 contract between the City and TID. This contract allows for use of 769 acre-feet for both non-potable irrigation and treated domestic water supplies. Use of TID deliveries by year since 2004 is shown in **Table A-12**. During drought years the contract may be reduced as it was in 2013 and 2014. The City also has a contract with TID for 600 acre-feet per year. The 600-acre feet contract is for potable water customers only.

The City diverts TID water to the Ashland Creek water treatment plant where it is treated and then enters the potable water distribution system. In drought years the City may also divert a portion or all the 769 acre-feet contract water to the treatment plant. Under this circumstance only the 'front side' canal users, located before the diversion to the treatment plant may receive water. As shown in **Table A-12**, on average, TID customers use 73% of the 769 acre-feet of water rights. This percentage is applied to the TID cost calculation for city canal maintenance costs. **Table 13** shows allocation of TID system costs between unmetered and metered non-potable water customers for fiscal year 2015-16.

Table 13
Calculated TID Use Rates for Fiscal Year 2015-16

Item	Calculation	Current Rates	Calculated 15/16 Rates
Total TID Annual Cost	a		\$52,870
Metered Rate per Cu. Ft.	b	\$0.0055	\$0.0022
SOU Annual Costs [1]	c = 7,101,690*b		\$15,348
Lithia Park (City) Annual Costs [1]	d = 1,020,495*b		\$2,205
Unmetered Irrigators Costs	e = a-c-d		\$35,316
Unmetered Irrigators Acres	e		174
Unmetered Annual Rate per Acre	f = d/e	\$170.01	\$202.97

Source: City of Ashland and HEC.

[1] Excludes service charge and meter replacement fee.

Cost share based on TID water use - see Table A-10:

Total Cubic Feet	24,463,405
SOU Cubic Feet	7,101,690
Lithia Park Cubic Feet	1,020,495
All Other Irrigators Cubic Feet	16,341,220

City of Ashland Ordinance 1288 provides for metered and unmetered TID irrigation water rates. The ordinance requires that rates shall be self-supporting so far as is practicable, so that domestic water users do not subsidize the cost of the TID irrigation water system; however, the ordinance also states that the primary use of the City's TID water is for domestic purposes in water-short years. In addition, TID non-potable water will be available for irrigation purposes at rates less than those in effect for domestic water.

The calculated rate for metered customers is less than the current rate. The rate for unmetered customers does not immediately increase to cost of service. It gradually increases over the next six years to cost of service.

	Current	7/1/2016	7/1/2017	7/1/2018	7/1/2019	7/1/2020	7/1/2021
Metered Rate per Cu. Ft.	\$0.0055	\$0.0022	\$0.0023	\$0.0024	\$0.0025	\$0.0026	\$0.0026
Unmetered Rate per Acre	\$170.01	\$183.11	\$196.20	\$209.30	\$222.40	\$235.50	\$248.59

Table 14 shows the calculated offset to the revenue requirement over the Study period.

Table 14
TID Revenue Offset

Costs	Assumption	2015-16 Base	2016-17 1	2017-18 2	2018-19 3	2019-20 4	2020-21 5	2021-22 6
TID Annual Cost Paid by Metered Customers								
Base Meter Charge [1]								
SOU		\$4,231	\$432	\$446	\$460	\$466	\$487	\$502
Lithia Park (City)		\$2,257	\$351	\$362	\$373	\$377	\$395	\$407
Metered Water Use [2]								
SOU		\$39,059	\$15,875	\$16,420	\$16,984	\$17,568	\$18,172	\$18,798
Lithia Park (City)		\$5,613	\$2,281	\$2,359	\$2,441	\$2,524	\$2,611	\$2,701
Total SOU		\$44,672	\$18,156	\$18,779	\$19,425	\$20,092	\$20,784	\$21,499
Total Lithia Park (City)		\$7,869	\$2,632	\$2,722	\$2,814	\$2,901	\$3,007	\$3,108
Total TID Metered Customers		\$52,541	\$20,788	\$21,501	\$22,238	\$22,993	\$23,790	\$24,608
All Other TID Users Costs								
Annual Flat Fees [3]		\$29,582	\$31,861	\$34,140	\$36,418	\$38,697	\$40,976	\$43,255
Total TID Unmetered Customers		\$29,582	\$31,861	\$34,140	\$36,418	\$38,697	\$40,976	\$43,255
Total Estimated TID Customer Payments								
Meter Fees		\$6,488	\$783	\$809	\$833	\$842	\$883	\$909
Use Fees		\$74,254	\$50,016	\$52,919	\$55,843	\$58,790	\$61,760	\$64,754
Total Fees		\$80,742	\$50,800	\$53,727	\$56,676	\$59,632	\$62,642	\$65,663
Contracted Water	2.0%	\$0	\$0	\$0	\$0	\$0	\$0	\$0
City Maintenance Costs	3.0%	\$30,070	\$30,972	\$31,901	\$32,858	\$33,844	\$34,859	\$35,905
Canal Depreciation	constant	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TID Billing Costs (personnel)	4.0%	\$22,800	\$23,712	\$24,660	\$25,647	\$26,673	\$27,740	\$28,849
Total Annual Cost (rounded)		\$52,870	\$54,684	\$56,562	\$58,505	\$60,517	\$62,599	\$64,754
Annual Percentage Increase			3.4%	3.4%	3.4%	3.4%	3.4%	3.4%

Source: City of Ashland and HEC.

[1] Customer charges and meter replacement fees for one 6" meter (SOU) and one 4" meter (Lithia Park).

[2], [3] Calculated Rates from Table 12.

Calculated Rate per Metered Connection	\$0.0055	\$0.0022	\$0.0023	\$0.0024	\$0.0025	\$0.0026	\$0.0026
Calculated Rate per Acre at Cost of Service	\$170.01	\$209.93	\$217.14	\$224.60	\$232.32	\$240.32	\$248.59
Calculated Rate per Acre at Gradual Increase		\$183.11	\$196.20	\$209.30	\$222.40	\$235.50	\$248.59

4.3 METER REPLACEMENT PROGRAM

City crews replace older water meters that are near the end of their useful life, or which are inaccurately measuring water flow. The City has not been collecting funds to routinely replace meters. The cost to replace meters, by size of meter, was used to determine the annual cost of a meter replacement program (it is estimated that meters will have to be replaced every 20 years). Meter replacement program costs will increase as the number of City water meters increases and as the cost of installation increases. It is estimated that the meter replacement program will increase annually from approximately \$138,000 in 2015 to \$172,000 fiscal year ending 2022, as shown in **Table 15**.

Table 15
Estimated Meter Replacement Fee Program Costs

Item	Assumption	Fiscal Year Ending						
		2015-16 Base	2016-17 1	2017-18 2	2018-19 3	2019-20 4	2020-21 5	2021-22 6
<i>Projected Growth in Water Meters</i>			0.59%	0.59%	0.59%	0.59%	0.59%	0.59%
Projected City Water Meters		8,819	8,871	8,923	8,976	9,029	9,082	9,136
Estimated Replacement Cost per Meter [1]	3.12%	\$312	\$322	\$332	\$342	\$353	\$364	\$376
Percentage of Meters Replaced	20-yr cycle	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Estimated Meter Replacement Program Cost		\$137,719	\$142,851	\$148,169	\$153,697	\$159,426	\$165,363	\$171,533

Source: City of Ashland and HEC.

[1] Weighted average cost of meters.

Assumptions for meter costs in 2015 are shown in **Table A-13**. Meter costs and fees are increased 3.12% per year per the historical 20-year average annual ENR CCI increase previously described. **Table 16** shows the calculated meter replacement fees. Since the revenues and costs of the meter replacement program are assumed to be equal each year, the program is not included in the revenue requirement calculation.

Table 16
Calculated Meter Replacement Fees

Meter Size	Effective July 1						
	2015-16 Base	2016-17 1	2017-18 2	2018-19 3	2019-20 4	2020-21 5	2021-22 6
	<i>Annual escalator 3.12%</i>						
3/4"	\$1.15	\$1.18	\$1.22	\$1.26	\$1.30	\$1.34	\$1.38
1"	\$1.72	\$1.77	\$1.83	\$1.88	\$1.94	\$2.00	\$2.07
1-1/2"	\$2.71	\$2.79	\$2.88	\$2.97	\$3.06	\$3.16	\$3.26
2"	\$3.65	\$3.76	\$3.88	\$4.00	\$4.12	\$4.25	\$4.38
3"	\$7.81	\$8.06	\$8.31	\$8.57	\$8.83	\$9.11	\$9.39
4"	\$16.98	\$17.51	\$18.05	\$18.62	\$19.20	\$19.80	\$20.41
6"	\$23.54	\$24.28	\$25.03	\$25.81	\$26.62	\$27.45	\$28.30
8"	\$28.39	\$29.27	\$30.18	\$31.12	\$32.10	\$33.10	\$34.13

Source: HEC.

Section 5: COST OF SERVICE ANALYSIS

5.1 FUNCTIONAL COST ALLOCATION

City water system costs were classified into different functions: customer costs, meter and services costs, capacity costs, and commodity costs. Customer costs, meter and services costs, and a portion of capacity costs are fixed costs. Fixed costs generally consist of costs that a utility incurs to serve customers irrespective of the amount or rate of water they use.⁵ A portion of capacity costs and all commodity costs are variable costs. Variable costs are those that change in total as the volume of activity changes, as measured in a specific time period. These commonly include the costs of chemicals used in the treatment process, energy related to pumping for transmission and distribution, and purchased water.

Table A-14 shows how the expenses in the City's budget were allocated to the different functions of water service. Expense functions were allocated based on one of five different methodologies. These methodologies include:

1. **Plant In Service.** Plant in service allocation is shown in **Table A-15**. Plant in service costs include the original cost of current water system assets. Total cost is allocated to customers, meters and services, capacity, and commodity.
2. **Ratio of Average to Peak Month.** The calculation of peak to average month flows is shown in **Table 3**. Expenses are allocated 55% to customers and 45% to use functions using this methodology.
3. **Utilities.** All utilities costs (electricity) are allocated 100% to commodity because they are directly affected by the amount of water delivered. TAP water is also allocated 100% to commodity.
4. **Customers.** Central service costs and costs such as office supplies, telephones, computers, postage and insurance are allocated 100% to customer costs. These costs are not affected by the amount of water delivered.
5. **Average of Classified Costs.** Many expenses are allocated to multiple functions of water service because they do not directly relate to capacity of the water system, or quantity of water deliveries. These expenses are allocated among the customer, meters and services, capacity, and commodity functions based on the combined percentage allocation of all other classified costs. Examples of expenses allocated using this methodology include salaries and other personnel costs, professional services, and training costs.

Customer, meters and services, and a portion of capacity costs are captured in flat monthly fees. Commodity costs and a portion of capacity costs are captured through variable water service fees (use fees). Capacity costs were split between flat monthly fees and use fees to reflect that some capacity or infrastructure costs must be recovered regardless of the amount of water used.⁶

⁵ M1 Manual, pp. 137-138.

⁶ M1 Manual page 139, fixed charges.

The portion of capacity costs allocated to the flat monthly fees is referred to as a readiness to serve charge. The allocation of revenue requirement using the functional allocation is shown in **Table 17**.

Table 17
Allocation of Revenue Requirement to Cost Functions

Costs	Functional Allocation	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Total Revenue Requirement		\$6,543,230	\$7,067,244	\$7,384,483	\$7,638,716	\$7,903,258	\$8,171,870	\$8,456,844
Customer	18%	\$1,177,781	\$1,272,104	\$1,329,207	\$1,374,969	\$1,422,587	\$1,470,937	\$1,522,232
Meters & Services	5%	\$327,162	\$353,362	\$369,224	\$381,936	\$395,163	\$408,594	\$422,842
Capacity (in flat charge) [1]	19%	\$1,243,214	\$1,342,776	\$1,403,052	\$1,451,356	\$1,501,619	\$1,552,655	\$1,606,800
Capacity (in use charge)	31%	\$2,028,401	\$2,190,846	\$2,289,190	\$2,368,002	\$2,450,010	\$2,533,280	\$2,621,622
Commodity	27%	\$1,766,672	\$1,908,156	\$1,993,810	\$2,062,453	\$2,133,880	\$2,206,405	\$2,283,348
Total	100%	\$6,543,230	\$7,067,244	\$7,384,483	\$7,638,716	\$7,903,258	\$8,171,870	\$8,456,844

Source: HEC.

[1] The readiness to serve charge.

[2] In 2014 the City collected 45% of water charges in flat monthly charges; however, this was a drought year. During drought years the base charges comprise a larger portion of total revenues.

5.2 RATE DESIGN

Allocation of costs to customer categories is based on the Commodity-Demand method described in the M1 Manual Chapter III.2. Once the revenue requirement has been projected and the functional allocation analysis performed the City has to arrive at a rate design (how the revenue requirement will be collected) with knowledge of how the City's water system costs are structured. In determining an appropriate rate design for Ashland, this Study considered the following key objectives:

- Rates must be capable of generating sufficient revenues to meet all annual financial obligations of the water enterprise fund;
- The rate structure should encourage water efficiency;
- Change to the rate structure must be administratively feasible (compatible with the existing billing system and straightforward to explain to customers);
- The rate structure should be as representative of local customer water use patterns as possible; and
- Revised rates must be supportive of City goals, keeping within affordability guidelines.

With these objectives in mind, the differential in costs by pumping zone was analyzed. The analysis did not show any significant differences in costs by pumping zone; this potential change to the rate design was discarded.

Flat Monthly Costs. The customer, meters and services, and readiness to serve costs should all be collected in flat monthly fees. Options for collection include combining all costs into one service charge based on meter size (as is currently done) or separating customer costs from capacity costs and collecting customer costs based on the number of accounts, rather than meter size. While both approaches are common, this Study recommends a customer charge and a service charge because this methodology more accurately captures the costs of service. Central services costs, which make up the majority of customer costs, are a direct function of the number of water accounts served, not capacity of the system (meters).

This Study recommends implementation of monthly customer charges as shown in **Table 18**. If a water account has multiple meters associated with it, the account would only pay the customer charge once. In contrast, capacity costs are collected for each meter with the potential to use the capacity of the system.

Table 18
Calculation of Customer Service Costs per Account

Allocated To	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
<i>Projected Annual Growth Rate</i>		0.59%	0.59%	0.59%	0.59%	0.59%	0.59%
Revenue Requirement Allocated	\$1,177,781	\$1,272,104	\$1,329,207	\$1,374,969	\$1,422,587	\$1,470,937	\$1,522,232
Total City Water Accounts	8,980	9,033	9,087	9,140	9,194	9,249	9,303
Customer Cost per Bill per Year	\$131.16	\$140.83	\$146.28	\$150.43	\$154.72	\$159.04	\$163.62
Cost per Month	\$10.93	\$11.74	\$12.19	\$12.54	\$12.89	\$13.25	\$13.64

Source: City of Ashland and HEC.

Table 19 on the next page shows allocation of meters and services and the readiness to serve costs. The calculation is based on total number of billable meter equivalents and the meter ratios of meter sizes to a 3/4" meter. Meter ratios reflect the difference in water volume that can be taken through the meter. Calculation of equivalent meter ratios is shown in **Tables 20** and **A-16**.

In addition to the customer and service charges calculated from the revenue requirement projection and allocation, the new rate structure adds the meter replacement fee (see Section 4) to the service charge. The revised flat monthly charge now includes three components: the service charge, the customer charge, and the meter replacement fee.

Variable (Use) Costs. Remaining capacity costs and commodity costs are recovered from customers through use charges applied to actual water consumption as measured through

water meters. In 2014 the City collected 55% of costs through use charges.⁷ This Study calculates rates with 58% of costs collected in use charges so that use charges continue to send a water conservation signal to customers. There are many ways that the City could collect use charges. This Study selected a rate structure based on City goals and customer water use patterns.

Table 19
Calculation of Monthly Service Charge by Meter Size

	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
	Base	1	2	3	4	5	6
Allocated Costs [1]	\$1,570,375	\$1,696,139	\$1,772,276	\$1,833,292	\$1,896,782	\$1,961,249	\$2,029,642
Est. Billable Meter Equivalents	11,184	11,250	11,317	11,384	11,451	11,519	11,587

Meter Size	Meter	Monthly Service Charge per Meter						
	Ratio							
3/4"	1.00	\$11.70	\$12.56	\$13.05	\$13.42	\$13.80	\$14.19	\$14.60
1"	1.00	\$11.70	\$12.56	\$13.05	\$13.42	\$13.80	\$14.19	\$14.60
1.5"	5.00	\$58.51	\$62.82	\$65.25	\$67.10	\$69.02	\$70.94	\$72.99
2"	8.00	\$93.61	\$100.51	\$104.41	\$107.36	\$110.43	\$113.51	\$116.78
3"	16.00	\$187.22	\$201.02	\$208.81	\$214.73	\$220.86	\$227.02	\$233.56
4"	25.00	\$292.53	\$314.10	\$326.27	\$335.51	\$345.09	\$354.72	\$364.94
6"	50.00	\$585.05	\$628.19	\$652.53	\$671.03	\$690.19	\$709.45	\$729.87
8"	80.00	\$936.08	\$1,005.11	\$1,044.05	\$1,073.65	\$1,104.30	\$1,135.12	\$1,167.80

Source: City of Ashland and HEC.

[1] Includes meter and services costs and portion of capacity costs that represent the readiness to serve.

Table 20
Estimated Meter Equivalent Units

Meter Size	Number of Meters	Ratio to 3/4" Service	Equivalent Meter Units
		[1]	
3/4"	7,814	1.0	7,814
1"	509	1.0	509
1.5"	167	5.0	835
2"	145	8.0	1,160
3"	21	16.0	336
4"	14	25.0	350
6"	2	50.0	100
8"	1	80.0	80
Total	8,673		11,184

Source: Table B-1 of the AWWA M1 Manual, City of Ashland, and HEC.

[1] Uses safe maximum operating capacities of C-700-09 Displacement Type Meters (bronze main case) for meters smaller than 2" and C-702-10 Compound Type, Class I for meters 2" and larger.

⁷ Percentage will fluctuate from year to year. Since 2014 was a drought year it is expected that use charges would normally comprise a larger share of total water rate revenues (between 55% and 60%).

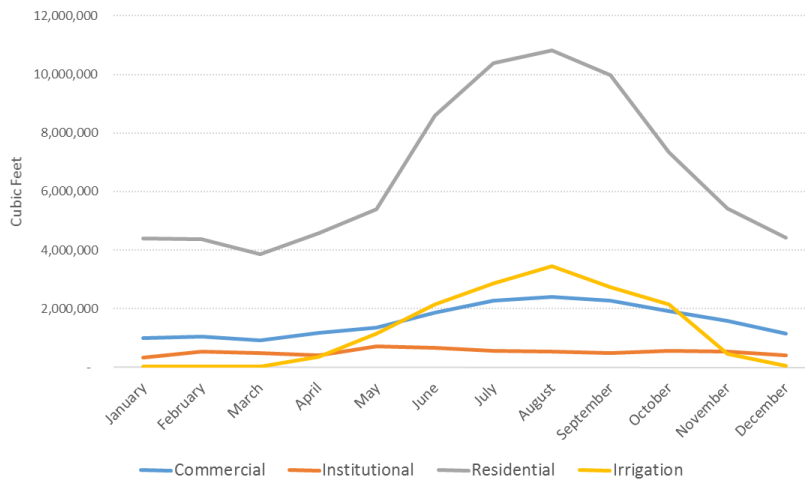
This Study proposes to keep the City’s current increasing block rate structure for most customers for use charges. Properly designed increasing block rates recover class-specific costs of service while sending a more conservation-oriented price signal to that class.⁸ The M1 Manual page 116 also summarizes that “increasing block rate structure have found growing use in areas experiencing growth in water demand that is reaching the safe yield or capacity of the system, where there has been an impetus for improved efficiency in water use.” Setting appropriate increasing blocks is determined by examining customer characteristics.

5.2.1. Customer Characteristics

Table 21 on the following page shows the customer characteristics of residential, non-residential, and irrigation customers. Average monthly use, monthly winter average and monthly summer average use as well as average annual use by customer type are calculated using 2014 meter reads. In the summer months all residential customers and commercial customers with meters 2” or less use approximately twice the amount of water that they do during the winter months. Larger commercial customers and institutional customers use about 1.5 times the amount of water during the summer months. The summer to average month ratio is close to one for institutional customers and the maximum month usage is in May, before the peak use for the water system as a whole. Institutional characteristics suggest one rate for all water use would be appropriate. Irrigation customers display very different usage to the other customer types. Only about 10% of irrigation customers take water throughout the year.

Figure 8 shows customer usage patterns by customer type throughout the year. The peaking patterns of residential and irrigation customers is pronounced compared with the other customer types. These customers also comprise 81% of total water use (see **Figure 4**) therefore a rate structure that encourages efficient use of water during the summer months is very important.

Figure 8
Monthly Water Use by Customer Type



⁸ M1 Manual page 111.

**Table 21
Customer Usage Characteristics**

Customer Type	Number of Billing		Median		Maximum		Average		Monthly		Monthly		Winter		Summer to	
	Meters	Units	Monthly Use	Monthly Use	Average (non-coincidental)	Average Month Use	Annual Use	Annual Use	Winter Average	Summer Average	Winter to Summer	Summer to Avg. Month	Ratio	Ratio	Ratio	Ratio
<i>cubic feet per month</i>																
<i>use per unit</i>																
Residential																
Master Metered	606	3,300	296	374	548	August	4,487	265	[1]	[2]	2.0	1.4				
Single Unit	6,993	6,993	505	772	1,296	August	9,265	460		1,201	2.6	1.6				
Non-Residential																
Commercial < 2"	504		588	1,672	2,601	August	20,064	1,080		2,360	2.2	1.4				
Commercial 2" or larger	51		5,310	11,224	15,989	August	134,691	9,094		14,918	1.6	1.3				
Institutional	77		994	6,780	9,543	May	81,366	5,876		7,360	1.3	1.1				
Irrigation [3]	325		1,657	6,442	10,652	September	77,301	647		8,808	13.6	1.4				
Total	8,556	10,293														

Source: City of Ashland and HEC.

[1] December through March consumption.

[2] June through September consumption.

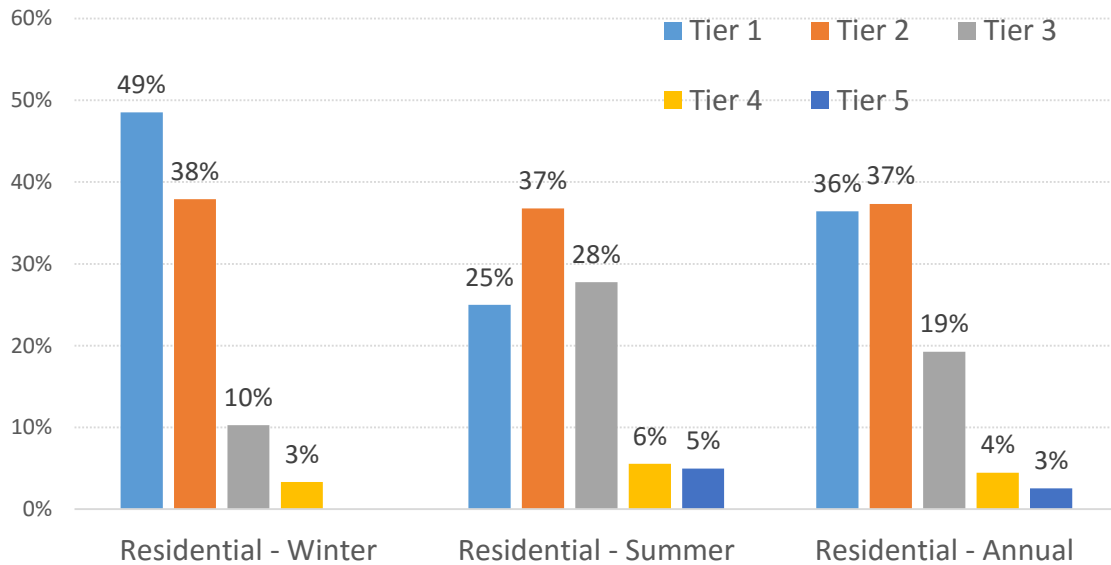
[3] Approximately 32 accounts (10%) use water year-round.

Use by customer type by month is further examined by water meter size in **Table A-17**. The table shows that use is driven by customer category and by meter size. Based on use characteristics by customer type the proposed rate structure includes five customer categories, designed to capture customer use patterns. The customer categories include residential, commercial 2" or smaller, commercial greater than 2", institutional, and irrigation.

Bill Tabulation. Bill tabulation is a tool used to analyze customer use data to determine appropriate rate blocks. Bill tabulations and analysis for residential customers are shown in **Tables A-18** through **A-20**. On an annual basis, residential customers take 36% of water in tier 1, 37% in tier 2, 19% in tier 3, 4% in tier 4 and 3% in tier 5 (summer months only). Residential use by tier is illustrated in **Figure 9**.

This Study recommends keeping the current tiers for residential customers. As is desired, the current rate structure is capturing the majority of water use in tiers 1, 2, and 3. Only excessive water users (the top 7% of water) are billed in tiers 4 and 5. Tier 5 only applies during the summer (June through September)⁹.

Figure 9
Residential Water Use by Tier



Non-residential bill tabulation under the current rate structure is shown in **Table A-21**. The table shows large discrepancies in water billed under tiers 1 and 2 among the different non-residential customer types (irrigation, commercial and institutional) as illustrated in **Figure 10**. This Study recommends only charging commercial customers two tiers. The proposed

⁹ Tier 1 is intended to capture typical customer monthly indoor water usage. Tier 2 is intended to capture typical customer monthly indoor usage and some outdoor water usage. Tier 3 is intended to apply to customers using more than the typical customer does in an average water use month.

two tiers result in the bill tabulation shown in **Table A-22**. As a result of changing the commercial tiers according to meter size (less than 2" and 2" and larger), 60-65% of water is billed in tier 1, providing consistency among different commercial users. This is shown in **Figure 11**. The current rate structure and proposed rate structure are compared in **Tables A-23** and **A-24**.

Figure 10
Non-Residential Water Use by Tier (current rate structure)

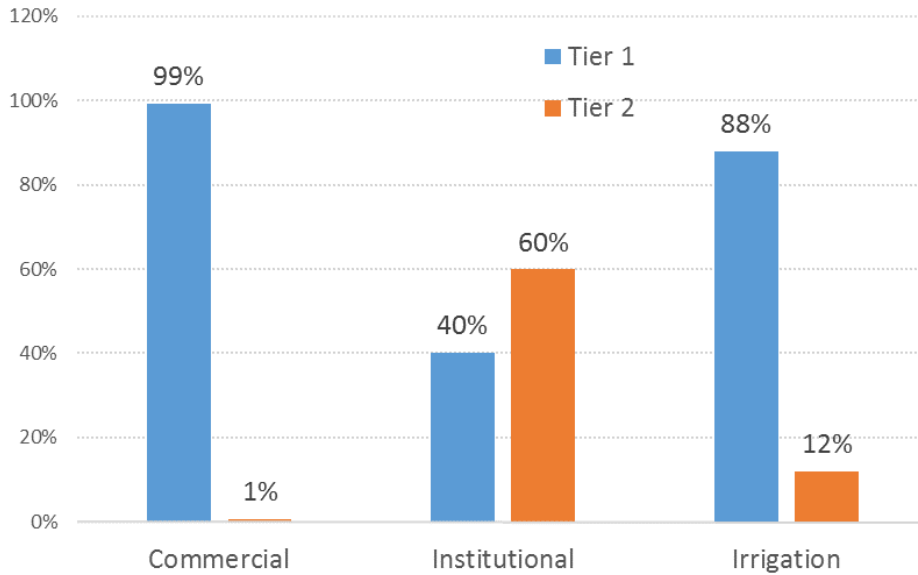
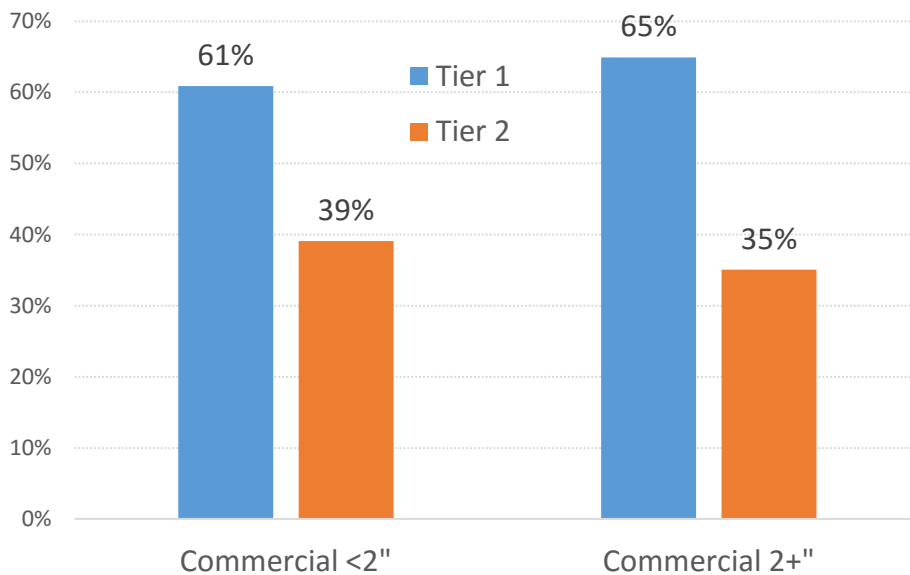


Figure 11
Commercial Water Use by Tier (proposed rate structure)



5.3 POTABLE WATER DEMAND PROJECTION

Historical potable water use by customer type is shown in **Table A-25**. Projected potable water demand is shown in **Table 22**. Total number of water users by customer category is projected using an average annual growth rate of 0.59%. The growth rate is based on the average of the State certified population estimates historical growth rate and the City’s Comprehensive Plan estimated growth rate. Projected water demand is based on average annual use by customer category for calendar year 2014.

Table 22
Projected Potable Water Demand

Potable Water Customer	2015-16 Base	2016-17 1	2017-18 2	2018-19 3	2019-20 4	2020-21 5	2021-22 6
Residential				Figures in Cubic Feet			
Single Family	62,048,584	62,463,798	62,760,506	63,092,739	63,426,063	63,763,271	64,099,340
Multi-Family	20,299,186	20,443,836	20,544,128	20,654,585	20,765,447	20,877,506	20,989,338
Subtotal Residential	82,347,770	82,907,634	83,304,634	83,747,324	84,191,510	84,640,777	85,088,678
Non-Residential							
Commercial <2" meter	10,276,017	10,477,157	10,522,645	10,576,058	10,629,590	10,683,875	10,737,773
Commercial 2"+ meter	7,446,478	7,592,234	7,625,196	7,663,901	7,702,694	7,742,031	7,781,088
Institutional	6,197,355	6,282,192	6,314,230	6,348,832	6,383,577	6,418,661	6,453,731
Irrigation	14,792,917	14,121,921	14,133,872	14,179,296	14,224,212	14,271,344	14,315,774
Subtotal Non-Residential	38,712,767	38,473,504	38,595,943	38,768,087	38,940,073	39,115,911	39,288,367
Total Billable	121,060,537	121,381,138	121,900,577	122,515,411	123,131,582	123,756,688	124,377,045
Tracking Water	1,254,006	1,261,422	1,268,881	1,276,385	1,283,932	1,291,525	1,299,162
Unaccounted Water	5,504,154	5,518,915	5,542,626	5,570,631	5,598,698	5,627,170	5,655,429
Estimated Water Produced	127,818,697	128,161,475	128,712,083	129,362,426	130,014,213	130,675,383	131,331,636

Source: City of Ashland and HEC.

Tables A-26 and **A-27** show the water demand calculations. Projected water demand accounts for decreased use of water due to reaction to increased water prices. This effect is called ‘price elasticity.’ Price elasticity measures the change in water use resulting from a price increase, all other things held equal. Price elasticity factors vary by location, pricing structure of both water and sewer rates, time of year, and customer type. Price elasticity is only applied to real price increases; that is the price increase adjusted for inflation, to keep the effect of the price of water independent of total cost increases. For example, if the price increase necessary to meet the revenue requirement is 10.0% and inflation is 2.0%, any change in water demand as a result of a price increase is calculated on an 8.0% increase. With a negative price elasticity of 0.1, a single family residential customer is expected to decrease water use by 1.0% when price increases 10.0%. Irrigation customers are anticipated to react the most to water price increases.

Table A-28 compares the water demand projection in the Study to water demand projections in the 2012 Water Master Plan. It also shows derivation of the average annual growth rate used in the Study. This cost of service water rate study projects lower demands than the 2012 Water Master Plan; however, this is considered reasonable for purposes of the Study. As described in Section 1 of the Study, the purpose of the Water Master Plan is to plan for maximum future use whereas the purpose of the Study is to plan for minimum future use.

5.4 CALCULATED RATES

The flat monthly charges were calculated in Section 5.2. Use charges are calculated based on the proposed new customer categories, rate structure (tiers), estimated water use by tier, and total projected water demand (Section 5.3).

Total costs allocated to use charges equals capacity costs allocated to use charges and commodity costs. The allocation of these costs by customer type is shown in **Table A-29**. A support table to the allocation of commodity costs is shown in **Table A-30**.

Table 23 on the next page shows the calculation of usage charges. The cost ratios between residential tier 1 and tier 2 is 0.80. Between tier 2 and tier 3 the ratio is 1.35, between tier 3 and tier 4 it is 1.75 and between tier 4 and tier 5 it is 2.25. As an example, tier 3 water is 35% more expensive than tier 2 water.

Commercial customers would be charged at the residential tier 2 and tier 3 rates.

On-peak and off-peak (seasonal) potable irrigation rates were calculated for commercial and institutional irrigation customers based on historical usage as shown in **Table A-31**. On-peak rates would be charged June through September.

Institutional customers would be charged one rate for all consumption.

Calculated water rates through the Study period are shown in **Table 24** on page 40. Monthly service charges include the meter replacement fee.

Table 23
Calculated Use Charges per Cubic Foot

Item	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	
	Base	1	2	3	4	5	6	
Allocated Cost	\$3,795,073	\$4,099,001	\$4,283,000	\$4,430,455	\$4,583,890	\$4,739,685	\$4,904,969	
Total Consumption	121,060,537	121,381,138	121,900,577	122,515,411	123,131,582	123,756,688	124,377,045	
Cost per Cubic Foot [1]	\$0.0313	\$0.0338	\$0.0351	\$0.0362	\$0.0372	\$0.0383	\$0.0394	
Institutional Costs								
Institutional Cost	\$170,913	\$184,600	\$192,887	\$199,528	\$206,438	\$213,454	\$220,898	
Institutional Use	6,197,355	6,282,192	6,314,230	6,348,832	6,383,577	6,418,661	6,453,731	
Institutional Cost per Cu. Ft.	\$0.0276	\$0.0294	\$0.0305	\$0.0314	\$0.0323	\$0.0333	\$0.0342	
Residential & Commercial Costs								
Residential Cost	\$2,613,129	\$2,822,401	\$2,949,094	\$3,050,626	\$3,156,275	\$3,263,548	\$3,377,356	
Commercial Cost	\$466,606	\$503,975	\$526,597	\$544,727	\$563,592	\$582,747	\$603,069	
Total Resid. & Comm'l Costs	\$3,079,735	\$3,326,375	\$3,475,692	\$3,595,353	\$3,719,866	\$3,846,295	\$3,980,425	
Estimated Usage by Customer Group by Tier								
Tier 1 (Residential)	29,979,403	30,183,226	30,327,758	30,488,923	30,650,632	30,814,192	30,977,254	
Tier 2 (Residential & Comm'l)	41,828,362	42,254,443	42,451,723	42,674,612	42,898,188	43,124,473	43,349,830	
Tier 3 (Residential & Comm'l)	22,486,770	22,724,357	22,830,151	22,949,856	23,069,927	23,191,461	23,312,483	
Tier 4 (Residential)	3,675,585	3,700,574	3,718,294	3,738,054	3,757,880	3,777,933	3,797,925	
Tier 5 (Residential June - Sept only)	2,100,145	2,114,423	2,124,548	2,135,838	2,147,167	2,158,624	2,170,047	
Total Use Residential & Comm'l	100,070,265	100,977,025	101,452,474	101,987,283	102,523,794	103,066,683	103,607,539	
Resid. & Comm'l Cost per Cu. Ft. Ratio								
Tier 1 (Residential)	0.80	\$0.0230	\$0.0246	\$0.0256	\$0.0263	\$0.0271	\$0.0278	\$0.0287
Tier 2 (Residential & Comm'l)	1.00	\$0.0287	\$0.0307	\$0.0319	\$0.0329	\$0.0338	\$0.0348	\$0.0358
Tier 3 (Residential & Comm'l)	1.35	\$0.0387	\$0.0415	\$0.0431	\$0.0444	\$0.0457	\$0.0470	\$0.0484
Tier 4 (Residential)	1.75	\$0.0502	\$0.0537	\$0.0559	\$0.0575	\$0.0592	\$0.0609	\$0.0627
Tier 5 (Residential June - Sept only)	2.25	\$0.0646	\$0.0691	\$0.0719	\$0.0739	\$0.0761	\$0.0783	\$0.0806
Irrigation Costs [2]								
Irrigation Cost	\$544,426	\$588,026	\$614,422	\$635,575	\$657,586	\$679,936	\$703,647	
Irrigation Off-Peak Use	27%	4,050,831	3,867,088	3,870,361	3,882,799	3,895,099	3,920,172	
Irrigation Summer (Peak) Use	73%	10,742,086	10,254,833	10,263,511	10,296,496	10,329,113	10,395,602	
Off-Peak Cost per Cu. Ft.	\$0.0292	\$0.0331	\$0.0345	\$0.0356	\$0.0367	\$0.0378	\$0.0390	
On-Peak Cost per Cu. Ft.	\$0.0397	\$0.0449	\$0.0469	\$0.0483	\$0.0498	\$0.0513	\$0.0530	

Source: HEC.

[1] Bulk water rate is the average cost of water collected in use charge for all customer types.

[2] Commercial and Institutional Irrigation services.

Table 24
Summary of Calculated Water Rates

Charges	Current	Rates Effective on July 1 Bills					
		2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
		Monthly Charges (\$ per Bill)					
Customer Charge	\$0.00	\$11.74	\$12.19	\$12.54	\$12.89	\$13.25	\$13.64
Service Charge		Monthly Charges (\$ per Meter Size)					
3/4" and Fire Guards	\$23.50	\$13.75	\$14.27	\$14.68	\$15.10	\$15.52	\$15.98
1"	\$46.99	\$14.34	\$14.88	\$15.31	\$15.75	\$16.19	\$16.66
1.5"	\$66.99	\$65.61	\$68.13	\$70.07	\$72.08	\$74.10	\$76.24
2"	\$88.24	\$104.27	\$108.28	\$111.36	\$114.55	\$117.76	\$121.16
3"	\$184.50	\$209.08	\$217.12	\$223.30	\$229.69	\$236.13	\$242.95
4"	\$282.07	\$331.60	\$344.32	\$354.13	\$364.29	\$374.52	\$385.35
6"	\$528.92	\$652.47	\$677.56	\$696.84	\$716.81	\$736.90	\$758.18
8"	\$881.49	\$1,034.38	\$1,074.23	\$1,104.77	\$1,136.39	\$1,168.21	\$1,201.93
Potable Water Use Charges		\$ per cubic foot					
Bulk Water	[1]	\$0.0338	\$0.0351	\$0.0362	\$0.0372	\$0.0383	\$0.0394
Institutional Water	[1]	\$0.0294	\$0.0305	\$0.0314	\$0.0323	\$0.0333	\$0.0342
Residential	[2]						
Tier 1	\$0.0243	\$0.0246	\$0.0256	\$0.0263	\$0.0271	\$0.0278	\$0.0287
Tier 2	\$0.0299	\$0.0307	\$0.0319	\$0.0329	\$0.0338	\$0.0348	\$0.0358
Tier 3	\$0.0400	\$0.0415	\$0.0431	\$0.0444	\$0.0457	\$0.0470	\$0.0484
Tier 4	\$0.0517	\$0.0537	\$0.0559	\$0.0575	\$0.0592	\$0.0609	\$0.0627
Tier 5 (Jun-Sep only)	\$0.0673	\$0.0691	\$0.0719	\$0.0739	\$0.0761	\$0.0783	\$0.0806
Commercial	[3]						
Tier 1	\$0.0343	\$0.0307	\$0.0319	\$0.0329	\$0.0338	\$0.0348	\$0.0358
Tier 2	\$0.0353	\$0.0415	\$0.0431	\$0.0444	\$0.0457	\$0.0470	\$0.0484
Irrigation [4]							
Off-Peak (Oct - May)	[1]	\$0.0331	\$0.0345	\$0.0356	\$0.0367	\$0.0378	\$0.0390
On-Peak (Jun - Sep)	[1]	\$0.0449	\$0.0469	\$0.0483	\$0.0498	\$0.0513	\$0.0530

Source: HEC.

[1] Currently charged the same as commercial customers.

[2] Tiers do not change under new rate structure. They are: Tier 1 - up to 300 cf, Tier 2 - 301-1,000 cf, Tier 3 - 1,001-2,500 cf, Tier 4 - 2,501-3,600 cf, Tier 5 - greater than 3,600 cf. Residential irrigation services currently charged the same as residential domestic services. Under the new rate structure irrigation use would be combined with domestic use.

[3] Commercial current tiers are <50,000 cf and >50,000 cf. New tiers are <2,500 cf and >2,500 cf for commercial customers with meters <2" and <15,000 and >15,000 for larger meters.

[4] Seasonal rates for commercial and institutional irrigation meters.

5.4.1. Cost of Service Redistribution of Costs

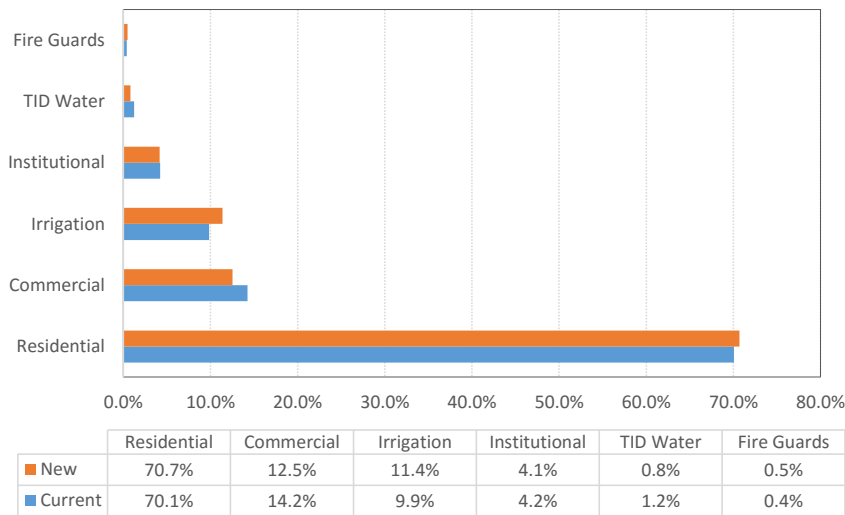
The cost of service analysis shows that currently there is subsidization of rates among customer classes. **Table 25** shows the reallocation of costs as a result of the cost of service analysis. Cost reallocation is also illustrated in **Figure 12**. Detailed calculations of revenues under the new rate structure are provided in **Table A-32**.

Table 25
Cost Allocation by Customer Type

Customer Type	Current (per Budget)		New (see Table A-32)		Cost Redistribution	
	Total	Share of Total	Total	Share of Total	As % of Current Cost	Total Difference
POTABLE						
Residential	\$4,621,000	70%	\$4,663,111	71%	1%	\$42,111
Non-Residential						
Commercial	\$938,800	14%	\$825,265	13%	-12%	(\$113,535)
Institutional	\$278,900	4%	\$273,548	4%	-2%	(\$5,352)
Fire Guards	\$25,500	0%	\$31,774	0%	25%	\$6,274
Irrigation	\$649,777	10%	\$749,532	11%	15%	\$99,755
Subtotal Potable	\$6,513,977	99%	\$6,543,230	99%	0%	\$29,253
NON-POTABLE (TID)						
Metered	\$52,541	1%	\$17,554	0%	-67%	(\$34,988)
Unmetered	\$29,582	0%	\$35,316	1%	19%	\$5,735
Subtotal Non-Potable	\$82,123	1%	\$52,870	1%	-36%	(\$29,253)
Total FY 2015-16	\$6,596,100	100%	\$6,596,100	100%	0%	\$0

Source: City of Ashland and HEC.

Figure 12
Redistribution of Costs to Customer Types



5-5 PROJECTED CASH FLOW AND FUND BALANCE

Table 26 projects cash flow through fiscal year 2021-22 for the operating fund. With adoption of the calculated rates it is anticipated that the City will be able to meet all water enterprise fund obligations, including existing and potential debt service coverage requirements, and achieve a targeted reserve of 20% of annual revenues in every year.

Table 26
Projected Operating Fund Cash Flow

Revenues and Expenses	2015-16 Base	2016-17 1	2017-18 2	2018-19 3	2019-20 4	2020-21 5	2021-22 6
	<i>New Rates Effective</i>	<i>7/1/2016</i>	<i>7/1/2017</i>	<i>7/1/2018</i>	<i>7/1/2019</i>	<i>7/1/2020</i>	<i>7/1/2021</i>
Revenue							
Municipal Water Sales	\$6,521,112	\$7,067,244	\$7,384,483	\$7,638,716	\$7,903,258	\$8,171,870	\$8,456,844
TID Water Sales	\$80,742	\$50,800	\$53,727	\$56,676	\$59,632	\$62,642	\$65,663
Other Revenue Sources	\$161,200	\$163,736	\$166,323	\$168,961	\$171,652	\$174,397	\$177,197
Total Revenues	\$6,763,054	\$7,281,780	\$7,604,533	\$7,864,353	\$8,134,543	\$8,408,910	\$8,699,704
Operating Expenses	\$5,002,770	\$5,109,906	\$5,281,831	\$5,459,577	\$5,643,347	\$5,833,351	\$6,029,809
Net Revenue before Debt Service and System Rehabilitation	\$1,760,284	\$2,171,874	\$2,322,701	\$2,404,776	\$2,491,196	\$2,575,559	\$2,669,895
Debt Service	\$617,059	\$857,445	\$1,272,981	\$1,490,164	\$2,057,259	\$2,050,359	\$2,048,409
<i>Debt Service Coverage [1]</i>	<i>2.85</i>	<i>2.53</i>	<i>1.82</i>	<i>1.61</i>	<i>1.21</i>	<i>1.26</i>	<i>1.30</i>
System Rehabilitation	\$0	\$1,004,428	\$1,154,721	\$1,159,613	\$1,168,937	\$1,175,200	\$1,176,486
Additional Cash for CIP Projects	\$402,240	\$1,933,647	\$32,079	\$0	\$0	\$0	\$0
Net Revenue	\$740,985	(\$1,623,647)	(\$137,079)	(\$245,000)	(\$735,000)	(\$650,000)	(\$555,000)
Beginning Balance [2]	\$3,264,915	\$4,005,900	\$2,382,253	\$2,245,174	\$2,877,387	\$2,764,848	\$2,820,848
Net Revenue	\$740,985	(\$1,623,647)	(\$137,079)	(\$245,000)	(\$735,000)	(\$650,000)	(\$555,000)
Transfer In (Out)	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Add Back Rehabilitation Net of CIP	\$0	\$0	\$0	\$877,213	\$622,462	\$706,000	\$841,486
Ending Balance	\$4,005,900	\$2,382,253	\$2,245,174	\$2,877,387	\$2,764,848	\$2,820,848	\$3,107,335
Target Balance [3]	\$1,352,611	\$1,456,356	\$1,520,907	\$1,572,871	\$1,626,909	\$1,681,782	\$1,739,941

Source: City of Ashland and HEC.

[1] Minimum requirement of 1.20 assumed.

[2] Beginning balance as of July 1, 2015.

[3] 20% of operating revenues.

Projected water fund balances are shown in **Table 27**. This table includes the capital fund which is funded with SDC revenues.

Figure 13 illustrates the historical and projected water fund balance. The water fund balance is projected to decrease from \$5.00 million to \$4.16 million in fiscal year 2021-22.

Figure 13
Water Fund Balance

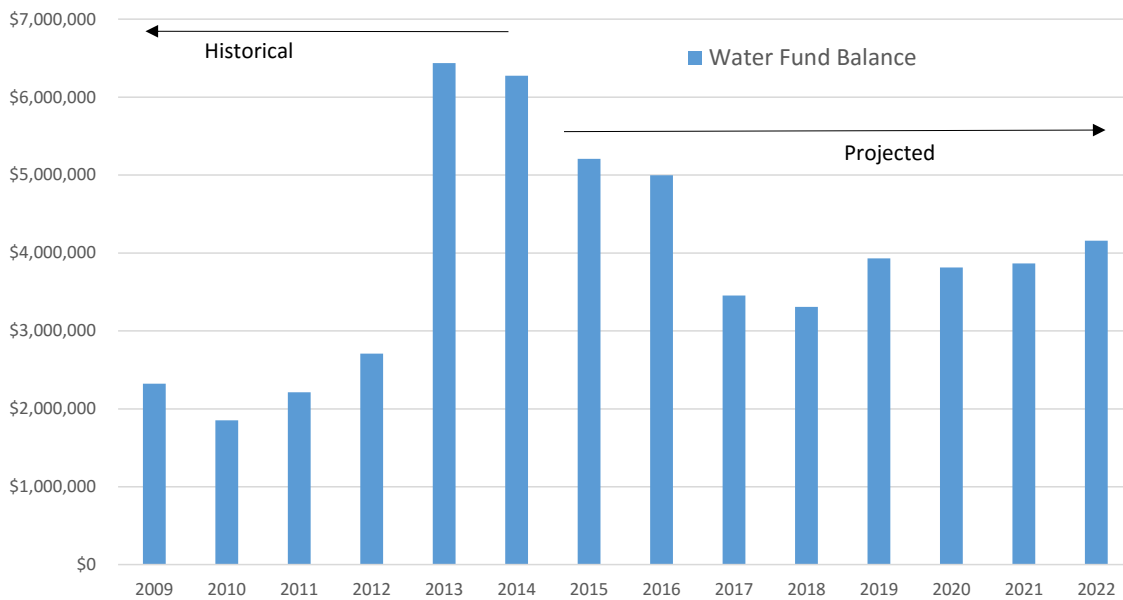


Table 27
Projected Water Fund Balance

Projected Cash Balances	2015-16 Base	2016-17 1	2017-18 2	2018-19 3	2019-20 4	2020-21 5	2021-22 6
Operating							
Beginning Balance	\$775,215	\$1,516,200	\$1,826,200	\$1,721,200	\$1,476,200	\$741,200	\$591,200
Revenues	\$6,763,054	\$7,281,780	\$7,604,533	\$7,864,353	\$8,134,543	\$8,408,910	\$8,699,704
Expenses	(\$6,022,069)	(\$8,905,427)	(\$7,741,612)	(\$8,109,353)	(\$8,869,543)	(\$9,058,910)	(\$9,254,704)
TAP Contingency	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Transfer In (Out)	\$0	\$1,933,647	\$32,079	\$0	\$0	\$500,000	\$500,000
Ending Operating Balance	\$1,516,200	\$1,826,200	\$1,721,200	\$1,476,200	\$741,200	\$591,200	\$536,200
System Rehabilitation							
Beginning Balance	\$2,489,700	\$2,489,700	\$556,053	\$523,974	\$1,401,187	\$2,023,649	\$2,229,649
System Rehabilitation Revenue	\$0	\$1,004,428	\$1,154,721	\$1,159,613	\$1,168,937	\$1,175,200	\$1,176,486
Revenue used for CIP Projects	\$0	(\$1,004,428)	(\$1,154,721)	(\$282,400)	(\$546,475)	(\$469,200)	(\$335,000)
Transfer In (Out)	\$0	(\$1,933,647)	(\$32,079)	\$0	\$0	(\$500,000)	(\$500,000)
Ending Rehabilitation Balance	\$2,489,700	\$556,053	\$523,974	\$1,401,187	\$2,023,649	\$2,229,649	\$2,571,135
Total Operating Balance	\$4,005,900	\$2,382,253	\$2,245,174	\$2,877,387	\$2,764,848	\$2,820,848	\$3,107,335
Capital							
Beginning Balance	\$1,943,676	\$991,716	\$1,070,716	\$1,061,716	\$1,052,716	\$1,048,716	\$1,044,716
Add SDC Revenue [1]	\$100,000	\$250,000	\$260,000	\$260,000	\$270,000	\$270,000	\$280,000
Future Customers CIP PAYG	(\$1,051,960)	\$0	\$0	\$0	\$0	\$0	\$0
Debt Service	\$0	(\$171,000)	(\$269,000)	(\$269,000)	(\$274,000)	(\$274,000)	(\$274,000)
Transfer In (Out)	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Ending Capital Balance	\$991,716	\$1,070,716	\$1,061,716	\$1,052,716	\$1,048,716	\$1,044,716	\$1,050,716
Water Fund Balance	\$4,997,616	\$3,452,969	\$3,306,890	\$3,930,103	\$3,813,564	\$3,865,564	\$4,158,051

Source: HEC.

[1] Assumes addition of 50 EDUs per year and annual increase of SDCs of 2%.

Section 6: IMPACTS OF NEW RATE STRUCTURE

6.1 BILL IMPACTS

Bill impact analysis is used to demonstrate the new rate structure and the redistribution of costs among customer types in **Tables A-33** through **A-41** for the first year of rate increase, fiscal year 2016-17. The tables demonstrate that the new rate structure has the desired outcome on each customer group.

Residential. Residential water bills would experience a small increase under the new rate structure due to the increase in revenue requirements and the reallocation of costs under the cost of service analysis (see **Table A-33**).

Commercial. Many commercial water bills would decrease under the new rate structure. The reduction in bills is also due to the reallocation of costs under the cost of service analysis. Larger meter sizes would be billed a greater portion of their total bill in flat monthly charges and would experience a total bill increase. Bill impacts are shown in **Tables A-34** through **A-37**.

Institutional. Institutional water bills would experience a slight increase in the winter months and a decrease in the summer months. Since institutional customers have a relatively flat demand throughout the year, with a slight peak in the spring months before the irrigation season begins, this is appropriate. Institutional bills for 2" and 4" customers are shown in **Tables A-38** and **A-39**.

Potable Irrigation. During peak summer months potable irrigation bills would increase. The rate design is intended to curb potable irrigation water use during the peak use months. During off-peak months water bills would increase if no water was taken. This reflects billing the flat monthly charges regardless of whether water is used or not. For accounts using water, irrigation bills would decrease. The off-peak potable irrigation water rate encourages planting in summer and fall months when water supply is not a concern. Irrigation bill impacts are shown in **Tables A-40** and **A-41**.

6.2 AFFORDABILITY TEST

Under the calculated water rates for July 1, 2016, a $\frac{3}{4}$ " meter single family home using 1,000 cubic feet in a month would pay \$54.35, which is 1.5% of the estimated median household income for Ashland. The proposed water rates are affordable under EPA guidelines. These calculations are shown in **Table 28**.

Table 28
Affordability Test

Item	Annual	Annual Increase	Monthly
Ashland Median Household Income [1]	\$43,500		
2015-16 Water Rates 3/4" using 1,000 cu. ft./mo	\$621		\$51.72
Current Water Rates as % of Ashland MHI	1.4%		
2016-17 Water Rates 3/4" using 1,000 cu. ft./mo	\$652		\$54.35
Proposed Water Rates % of Ashland MHI	1.5%		
Water Rates @ 2.0% of MHI [2]	\$870	\$870	\$72.50
Water Rates @ 2.5% of MHI [2]	\$1,088	\$1,087	\$90.63

Source: US Census.

[1] 2014 5-year American Community Survey estimate.

[2] Per EPA guidelines a water rate greater than 2% is high and a water rate higher than 2.5% is burdensome.

6.3 COMPARISON OF WATER RATES

Figure 14 illustrates what a household with a ¾" meter using 1,000 cubic feet in a month would pay for water in Ashland and several comparison communities as of August 1, 2015. Ashland's water rates are currently at the high end of the range and will remain at the high end of the range with the proposed rate increases.

Figure 14
Comparison of Single Family Monthly Water Bill

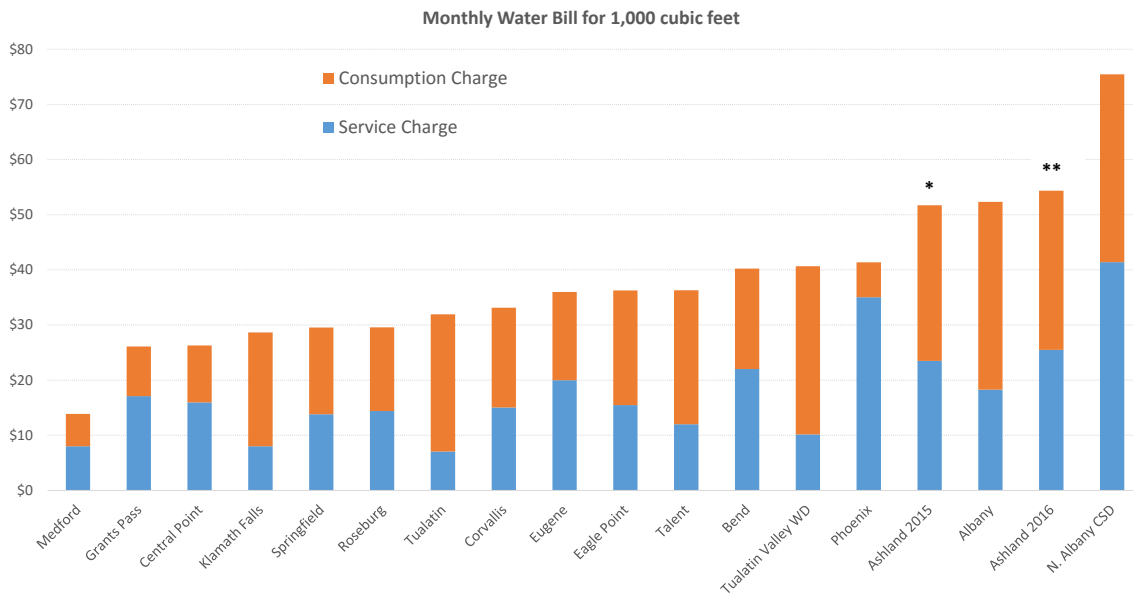


Table 29 compares fiscal year 2015-16 water bills for a typical single family home using 1,000 cubic feet under the current and new rate structures, and projects the calculated water bill through fiscal year ending 2022. Per EPA guidelines¹⁰, water rates would be considered affordable through fiscal year 2021-22.

Table 29
Calculated Typical Home Bill for 1,000 Cubic Feet

Residential Charges	2016 <i>current</i>	Fiscal Year Ending					
		2017 1	2018 2	2019 3	2020 4	2021 5	2022 6
Flat Charges							
Customer Charge		\$11.74	\$12.19	\$12.54	\$12.89	\$13.25	\$13.64
Service Charge	\$23.50	\$13.75	\$14.27	\$14.68	\$15.10	\$15.52	\$15.98
Total Flat Charges	\$23.50	\$25.48	\$26.46	\$27.21	\$27.99	\$28.78	\$29.61
Use Charges							
Tier 1 per cu. ft.	\$0.0243	\$0.0246	\$0.0256	\$0.0263	\$0.0271	\$0.0278	\$0.0287
Tier 2 per cu. ft.	\$0.0299	\$0.0307	\$0.0319	\$0.0329	\$0.0338	\$0.0348	\$0.0358
Tier 1 Charges (300 cu ft)	\$7.29	\$7.37	\$7.67	\$7.89	\$8.12	\$8.35	\$8.60
Tier 2 Charges (700 cu ft)	\$20.93	\$21.50	\$22.36	\$23.01	\$23.68	\$24.35	\$25.07
Total Use Charges	\$28.22	\$28.87	\$30.02	\$30.89	\$31.80	\$32.70	\$33.67
Bill for 3/4" using 1,000 cu. ft.	\$51.72	\$54.35	\$56.48	\$58.11	\$59.79	\$61.48	\$63.28
Percentage Increase		5%	4%	3%	3%	3%	3%

Source: HEC.

¹⁰ "Affordability Assessment Tool for Federal Water Mandates", prepared for the United States Conference of Mayors, The American Water Works Association, and the water Environment Federation by Stratus Consulting, Boulder, Colorado, 2013.

APPENDIX A

RATE STUDY SUPPORT TABLES

Table A-1
City of Ashland Water Rate Study
Historical and Budgeted Water Fund Revenues

REVENUES	Fiscal Year						
	2009-10 actual	2010-11 actual	2011-12 actual	2012-13 actual	2013-14 actual	2014-15 actual	2015-16 budget
Charges for Service							
Water Sales							
Commercial	\$580,812	\$603,874	\$679,370	\$762,567	\$816,152	\$892,585	\$938,800
Fire Guard	\$14,880	\$17,342	\$18,434	\$24,025	\$29,845	\$31,423	\$25,500
Government & Municipal	\$174,795	\$185,897	\$201,809	\$242,995	\$266,409	\$272,797	\$278,900
Multi-Family Residential	\$479,996	\$500,079	\$562,916	\$643,854	\$671,343	\$715,405	\$777,900
Single Family Residential	\$2,439,336	\$2,504,647	\$2,781,220	\$3,208,071	\$3,473,458	\$3,537,845	\$3,843,100
Irrigation (incl. TID customers)	\$444,284	\$419,039	\$528,824	\$609,199	\$581,370	\$624,453	\$731,900
Subtotal Water Sales	\$4,134,103	\$4,230,879	\$4,772,573	\$5,490,711	\$5,838,578	\$6,074,507	\$6,596,100
System Development Charges	\$151,864	\$180,604	\$491,612	\$266,196	\$269,029	\$328,414	\$100,000
Connection Fees	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Temporary Service	\$0	\$0	\$0	\$0	\$0	\$0	\$0
New Service Installation	\$12,627	\$18,086	\$83,058	\$29,262	\$35,746	\$50,837	\$114,800
Miscellaneous	\$0	\$1,290	\$35,601	\$27,587	\$39,308	\$38,580	\$12,000
Subtotal Charges for Service	\$164,491	\$199,980	\$610,272	\$323,046	\$344,084	\$417,831	\$226,800
Other Revenues							
1982 Water Bonds	\$46	\$21	\$24	\$18	\$24	\$14	\$0
1992 Water Bonds	\$54	\$24	\$28	\$21	\$28	\$15	\$0
Intergovernmental Revenue	\$99,928	\$344,396	\$336,811	\$1,969,979	\$89,747	\$70,473	\$14,000
Interest on Investments	\$22,991	\$10,006	\$16,598	\$19,542	\$32,527	\$24,080	\$20,400
Miscellaneous Income	\$34,154	\$21,297	\$9,318	\$477,199	\$17,154	\$17,420	\$0
Bond Proceeds	\$80,000	\$550,000	\$0	\$2,547,791	\$979,630	\$744,916	\$3,921,000
Subtotal Other Revenues	\$237,174	\$925,744	\$362,780	\$5,014,551	\$1,119,110	\$856,917	\$3,955,400
Total Revenues	\$4,535,767	\$5,356,603	\$5,745,625	\$10,828,307	\$7,301,772	\$7,349,255	\$10,778,300
Fund Balance					\$6,273,414	\$5,208,591	
Total Revenues					\$13,575,186	\$12,557,846	

Source: City of Ashland.

revs

Table A-2
City of Ashland Water Rate Study
Historical and Budgeted Expenditures by Water System Function

EXPENDITURES	Fiscal Year						
	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
SUPPLY	Actual	Actual	Actual	Actual	Actual	Actual	Adopted
Salaries & Wages					\$2,932	\$11,664	\$0
Benefits					\$235	\$2,150	\$0
Subtotal Personal Services					\$3,168	\$13,815	\$0
Infrastructure	\$0	\$0	\$800	\$0	\$135	\$28,011	\$0
Professional Services	\$7,442	\$19,997	\$23,211	\$34,853	\$54,508	\$54,303	\$229,600
Miscellaneous	\$109,916	\$109,457	\$113,392	\$112,533	\$140,783	\$145,109	\$151,050
Other	\$58,791	\$61,459	\$60,408	\$63,664	\$143,393	\$104,638	\$149,900
Subtotal Materials & Services	\$176,148	\$190,913	\$197,810	\$211,050	\$338,820	\$332,061	\$530,550
Capital Outlay	\$75,469	\$108,186	\$193,531	\$59,501	\$1,640,806	\$2,491,193	\$1,209,150
Debt Service	\$22,860	\$23,147	\$23,122	\$21,416	\$22,613	\$22,174	\$9,568
TOTAL SUPPLY	\$274,477	\$322,246	\$414,463	\$291,968	\$2,005,408	\$2,859,242	\$1,749,268
DISTRIBUTION							
Salaries & Wages	\$580,171	\$562,250	\$494,924	\$537,596	\$583,438	\$654,405	\$635,000
Benefits	\$278,819	\$275,600	\$265,372	\$301,271	\$365,844	\$378,422	\$394,750
Subtotal Personal Services	\$858,990	\$837,850	\$760,296	\$838,867	\$949,282	\$1,032,827	\$1,029,750
Office	\$2,195	\$1,480	\$1,605	\$4,120	\$1,322	\$1,252	\$2,650
Small Tools	\$1,873	\$2,961	\$5,473	\$3,503	\$3,081	\$5,545	\$4,000
Uniforms - Clothing	\$1,928	\$828	\$810	\$1,676	\$3,961	\$1,589	\$1,500
Uniforms - Other	\$175	\$1,769	\$2,678	\$404	\$0	\$1,339	\$3,000
Technical	\$3,075	\$2,788	\$6,113	\$859	\$5,174	\$5,433	\$15,000
Chemicals	\$706	\$307	\$1,253	\$2,516	\$3,563	\$111	\$5,500
County Services	\$3,200	\$4,000	\$3,600	\$2,800	\$0	\$3,200	\$4,950
Other	\$0	\$0	\$0	\$0	\$0	\$0	\$15,000
Books & Periodicals	\$48	\$82	\$51	\$89	\$252	\$111	\$200
Subtotal Supplies	\$13,200	\$14,215	\$21,582	\$15,967	\$17,352	\$18,582	\$51,800
Fleet Maintenance	\$73,500	\$73,500	\$66,340	\$66,340	\$66,340	\$66,340	\$66,340
Fuel	\$24,692	\$29,117	\$27,218	\$25,849	\$19,338	\$14,342	\$28,000
Replacement	\$51,300	\$51,300	\$51,300	\$51,300	\$51,300	\$51,300	\$61,560
Electricity	\$28,771	\$21,488	\$22,101	\$22,931	\$31,322	\$51,618	\$60,000
Water	\$881	\$460	\$385	\$0	\$0	\$0	\$0
Wastewater & Other	\$0	\$130	\$0	\$0	\$0	\$0	\$300
Custodial	\$0	\$9	\$16	\$0	\$0	\$0	\$0
Disposal	\$0	\$0	\$0	\$0	\$0	\$214	\$500
Infrastructure	\$42,570	\$43,741	\$67,480	\$91,824	\$91,296	\$73,007	\$115,000
Subtotal Rental, Repair, Maintenance	\$221,714	\$219,745	\$234,838	\$258,243	\$259,596	\$256,820	\$331,700
Local	\$1,207	\$1,178	\$1,167	\$1,222	\$1,347	\$1,353	\$1,200
Long Distance	\$12	\$15	\$17	\$16	\$16	\$18	\$20
Cellular	\$1,577	\$1,523	\$1,961	\$2,036	\$2,428	\$2,667	\$3,700
Computers	\$0	\$0	\$0	\$2,749	\$3,085	\$1,144	\$2,500
Postage	\$188	\$264	\$628	\$432	\$1,459	\$1,539	\$2,000
Radios	\$0	\$0	\$0	\$0	\$0	\$0	\$1,000
Subtotal Communications	\$2,985	\$2,981	\$3,773	\$6,456	\$8,334	\$6,721	\$10,420
Professional Services	\$5,626	\$1,113	\$4,159	\$20,679	\$22,745	\$33,767	\$60,000
Physician/Health	\$0	\$183	\$0	\$187	\$0	\$0	\$0
Other	\$0	\$0	\$184	\$244	\$90	\$39	\$50,000
Subtotal Contractual Services	\$5,626	\$1,296	\$4,343	\$21,110	\$22,835	\$33,806	\$110,000

Table A-2
City of Ashland Water Rate Study
Historical and Budgeted Expenditures by Water System Function

EXPENDITURES	Fiscal Year						
	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Central Service	\$549,753	\$549,753	\$570,000	\$632,000	\$646,640	\$659,530	\$692,510
Insurance Service	\$35,760	\$35,760	\$34,900	\$34,900	\$34,900	\$34,900	\$35,600
Technology Debt	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
Use of Facilities	\$125,883	\$125,883	\$80,000	\$80,000	\$80,000	\$80,000	\$80,000
Bad Debt Expense	\$6,204	\$10,089	\$7,894	\$3,620	\$22,504	\$13,224	\$12,000
Other	\$0	\$0	\$3,000	\$2,111	\$583	\$0	\$0
Licensing	\$5,546	\$8,623	\$8,423	\$6,321	\$10,965	\$5,104	\$37,700
Subtotal Miscellaneous Charges & Fees	\$773,147	\$780,109	\$754,217	\$808,951	\$845,592	\$842,758	\$907,810
Advertising	\$0	\$0	\$0	\$0	\$0	\$1,875	\$0
Air	\$0	\$0	\$0	\$0	\$0	\$1,533	\$3,000
Personal Vehicle Mileage	\$0	\$0	\$0	\$284	\$0	\$0	\$350
Lodging	\$0	\$517	\$0	\$510	\$0	\$939	\$2,000
Meals	\$0	\$1,006	\$0	\$113	\$0	\$334	\$350
Training	\$2,602	\$423	\$2,470	\$1,655	\$0	\$89	\$4,000
Dues	\$268	\$1,082	\$0	\$0	\$0	\$0	\$0
Medical & Laboratory	\$9,595	\$10,710	\$10,545	\$11,563	\$11,526	\$12,567	\$15,000
Subtotal Other Purchased Services	\$12,466	\$13,737	\$13,015	\$14,125	\$11,526	\$17,338	\$24,700
Franchise Tax	\$419,978	\$342,525	\$294,695	\$356,283	\$357,799	\$372,200	\$402,653
Capital Outlay	\$53,865	\$72,088	\$109,315	\$84,197	\$206,990	\$104,317	\$1,105,200
Debt Service	\$325,990	\$330,336	\$327,051	\$137,064	\$333,461	\$329,340	\$250,649
TOTAL DISTRIBUTION	\$2,687,960	\$2,614,882	\$2,523,125	\$2,541,263	\$3,012,767	\$3,014,709	\$4,224,682
TREATMENT PLANT							
Salaries & Wages	\$275,564	\$298,719	\$294,268	\$312,259	\$308,548	\$332,754	\$340,050
Benefits	\$112,364	\$140,315	\$134,534	\$154,592	\$158,437	\$177,449	\$197,320
Subtotal Personal Services	\$387,929	\$439,034	\$428,801	\$466,851	\$466,985	\$510,203	\$537,370
Office	\$2,330	\$5,154	\$5,196	\$2,214	\$1,544	\$1,180	\$2,000
Small Tools	\$798	\$324	\$463	\$739	\$559	\$1,142	\$800
Uniforms - Clothing	\$1,197	\$454	\$1,131	\$805	\$686	\$2,084	\$2,500
Uniforms - Other	\$245	\$443	\$774	\$567	\$60	\$383	\$500
Technical	\$12,154	\$10,438	\$9,766	\$15,213	\$20,128	\$10,446	\$22,000
Chemicals	\$147,418	\$131,893	\$111,049	\$128,767	\$157,280	\$171,617	\$220,000
Emergency Work	(\$12)	\$0	\$0	\$30	\$0	\$0	\$0
Books & Periodicals	\$0	\$140	\$126	\$186	\$0	\$170	\$150
Subtotal Supplies	\$164,131	\$148,846	\$128,505	\$148,521	\$180,257	\$187,021	\$247,950
Fleet Maintenance	\$10,200	\$10,200	\$9,200	\$9,200	\$9,200	\$9,200	\$9,397
Fuel	\$3,211	\$4,568	\$6,255	\$5,618	\$9,846	\$7,334	\$6,500
Replacement	\$900	\$900	\$900	\$900	\$900	\$900	\$1,080
Maintenance	(\$750)	\$0	\$622	\$0	\$0	\$0	\$0
Electricity	\$37,102	\$38,965	\$46,948	\$33,378	\$34,855	\$38,552	\$38,000
Custodial	\$170	\$476	\$26	\$98	\$86	\$116	\$1,000
Grounds Care	\$2,873	\$988	\$1,064	\$79	\$308	\$266	\$1,500
Infrastructure	\$9,023	\$7,077	\$11,042	\$10,176	\$4,871	\$21,531	\$15,000
Subtotal Rental, Repair, Maintenance	\$62,729	\$63,174	\$76,057	\$59,450	\$60,067	\$77,898	\$72,477

Table A-2
City of Ashland Water Rate Study
Historical and Budgeted Expenditures by Water System Function

EXPENDITURES	Fiscal Year						
	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Local	\$5,566	\$5,485	\$5,532	\$5,651	\$5,665	\$5,661	\$5,600
Long Distance	\$1	\$0	\$0	\$0	\$0	\$0	\$10
Cellular	\$477	\$444	\$262	\$263	\$252	\$493	\$500
Computers	\$0	\$0	\$0	\$2,037	\$960	\$9,611	\$2,500
Postage	\$5,408	\$1,933	\$221	\$40	\$217	\$22	\$3,000
Radios	\$0	\$0	\$0	\$0	\$0	\$300	\$100
Subtotal Communications	\$11,452	\$7,862	\$6,015	\$7,990	\$7,094	\$16,087	\$11,710
Professional Services	\$11,880	\$580	\$24,389	\$7,701	\$5,579	\$1,080	\$12,000
Other	\$72	\$0	\$0	\$0	\$0	(\$1,600)	\$0
Subtotal Contractual Services	\$11,952	\$580	\$24,389	\$7,701	\$5,579	(\$520)	\$12,000
Central Service	\$143,119	\$143,119	\$155,000	\$155,000	\$158,100	\$161,200	\$169,260
Insurance Service	\$8,030	\$8,030	\$4,000	\$4,000	\$4,000	\$4,000	\$4,080
Technology Debt	\$28,200	\$28,200	\$28,200	\$28,200	\$28,200	\$28,200	\$28,200
Use of Facilities	\$137,235	\$137,235	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
Other	\$0	\$0	\$3,000	\$2,111	\$583	\$0	\$0
Licensing	\$1,155	\$1,709	\$7,850	\$3,222	\$1,194	\$3,714	\$4,700
Subtotal Miscellaneous Charges & Fees	\$317,739	\$318,293	\$298,050	\$292,533	\$292,077	\$297,114	\$306,240
Personal Vehicle Mileage	\$180	\$0	\$198	\$261	\$0	\$142	\$200
Advertising	\$0	\$0	\$0	\$0	\$0	\$78	\$0
Lodging	\$773	\$813	\$1,000	\$1,117	\$1,357	\$2,064	\$2,000
Meals	\$289	\$180	\$389	\$380	\$362	\$188	\$600
Training	\$4,253	\$1,581	\$1,280	\$1,044	\$1,015	\$2,749	\$2,000
Dues	\$70	\$268	\$81	\$81	\$166	\$255	\$270
Medical & Laboratory	\$17,425	\$11,200	\$11,886	\$13,700	\$11,261	\$10,918	\$19,400
Subtotal Other Purchased Services	\$22,990	\$14,042	\$14,834	\$16,583	\$14,161	\$16,394	\$24,470
Capital Outlay	\$79,183	\$1,872	\$4,145	\$98,033	\$50,388	\$108,397	\$2,226,690
Debt Service	\$231,260	\$233,322	\$233,146	\$220,863	\$235,320	\$232,114	\$436,211
TOTAL TREATMENT PLANT	\$1,289,365	\$1,227,024	\$1,213,943	\$1,318,525	\$1,311,928	\$1,444,707	\$3,875,118
FOREST INTERFACE							
Salaries & Wages	\$66,540	\$130,770	\$151,035	\$146,031	\$97,935	\$92,753	\$0
Benefits	\$32,822	\$54,554	\$65,010	\$68,379	\$52,657	\$48,424	\$0
Subtotal Personal Services	\$99,361	\$185,324	\$216,045	\$214,410	\$150,592	\$141,177	\$0
Other	\$120,486	\$181,646	\$268,098	\$2,243,767	\$423,446	\$165,908	\$0
Advertising	\$0	\$465	\$302	\$900	\$1,670	\$1,280	\$0
Personal Vehicle Mileage	\$0	\$165	\$94	\$286	\$48	\$339	\$0
Meals	\$0	\$0	\$0	\$0	\$48	\$0	\$0
Training	\$594	\$658	\$930	\$463	\$2,146	\$2,605	\$0
Forest Commissions	\$575	\$858	\$258	\$258	\$87	\$130	\$0
TOTAL FOREST INTERFACE	\$221,016	\$369,116	\$485,728	\$2,460,085	\$578,038	\$311,440	\$0
SDC REIMBURSEMENT							
Capital Outlay	\$38,321	\$113,549	\$96,007	\$0	\$0	\$0	\$0
Debt Service	\$82,297	\$83,328	\$83,240	\$77,098	\$81,408	\$79,825	\$34,443
Unappropriated - Other Financing	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL SDC REIMBURSEMENT	\$120,618	\$196,877	\$179,246	\$77,098	\$81,408	\$79,825	\$34,443
SDC IMPROVEMENTS							
Contractual	\$0	\$413	\$0	\$1,600	\$947	\$27,093	\$0
Capital Outlay	\$198,014	\$48,370	\$45,273	\$30,537	\$101,554	\$34,419	\$1,298,360
Debt Service	\$41,147	\$41,664	\$41,620	\$38,549	\$40,704	\$383,799	\$180,977
Unappropriated - Other Financing	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL SDC REIMBURSEMENT	\$239,162	\$90,447	\$86,893	\$70,686	\$143,205	\$445,311	\$1,479,337

Table A-2
City of Ashland Water Rate Study
Historical and Budgeted Expenditures by Water System Function

EXPENDITURES	Fiscal Year						
	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
CONSERVATION							
Salaries & Wages	\$73,475	\$69,630	\$49,841	\$51,505	\$77,643	\$87,799	\$105,240
Benefits	\$34,263	\$34,852	\$23,111	\$22,385	\$42,088	\$44,734	\$64,950
Subtotal Personal Services	\$107,737	\$104,482	\$72,952	\$73,889	\$119,731	\$132,532	\$170,190
Office	\$651	\$511	\$1,914	\$231	\$581	\$536	\$4,550
Small Tools	\$24	\$27	\$918	\$13	\$35	\$78	\$200
Uniforms - Clothing	\$47	\$0	\$148	\$118	\$0	\$0	\$200
Uniforms - Other	\$0	\$0	\$0	\$29	\$0	\$0	\$125
Technical	\$0	\$0	\$0	\$40	\$0	\$740	\$800
Meetings	\$0	\$50	\$0	\$29	\$0	\$156	\$100
Books & Periodicals	\$16	\$0	\$224	\$41	\$0	\$0	\$100
Subtotal Supplies	\$739	\$588	\$3,204	\$500	\$616	\$1,510	\$6,075
Fleet Maintenance	\$300	\$300	\$270	\$270	\$270	\$270	\$270
Fuel	\$0	\$126	\$0	\$57	\$227	\$58	\$150
Replacement	\$5,790	\$5,790	\$5,790	\$5,790	\$5,790	\$5,790	\$5,790
Rental Charges	\$0	\$42	\$124	\$122	\$121	\$121	\$125
Subtotal Rental, Repair, Maintenance	\$6,090	\$6,258	\$6,184	\$6,240	\$6,408	\$6,239	\$6,335
Local	\$82	\$0	\$0	\$38	\$159	\$160	\$100
Long Distance	\$0	\$0	\$0	\$0	\$0	\$0	\$50
Cellular	\$112	\$95	\$94	\$95	\$214	\$525	\$0
Computers	\$0	\$0	\$756	\$317	\$0	\$0	\$0
Postage	\$0	\$0	\$36	\$0	\$0	\$28	\$100
Subtotal Communications	\$193	\$95	\$886	\$450	\$372	\$713	\$250
Professional Services	\$0	\$0	\$56	\$0	\$0	\$8,271	\$2,000
Central Service	\$23,625	\$23,625	\$23,700	\$23,700	\$24,170	\$24,650	\$25,880
Insurance Service	\$2,245	\$2,245	\$3,370	\$3,370	\$3,370	\$3,370	\$3,440
Use of Facilities	\$15,085	\$15,085	\$7,500	\$7,500	\$7,500	\$7,500	\$8,250
Subtotal Miscellaneous Charges & Fees	\$40,955	\$40,955	\$34,626	\$34,570	\$35,040	\$43,791	\$39,570
Advertising	\$333	\$0	\$2,113	\$1,068	\$290	\$132	\$1,600
Printing & Binding	\$36	\$0	\$0	\$10	\$16	\$0	\$200
Air	\$407	\$241	\$337	\$610	\$302	\$1,538	\$1,500
Personal Vehicle Mileage	\$22	\$215	\$0	\$0	\$106	\$407	\$500
Lodging	\$66	\$1,050	\$73	\$715	\$686	\$1,363	\$2,000
Meals	\$175	\$488	\$142	\$222	\$166	\$295	\$750
Training	\$811	\$0	\$1,220	\$169	\$779	\$730	\$1,000
Dues	\$508	\$125	\$440	\$381	\$783	\$785	\$700
Subtotal Other Purchased Services	\$2,358	\$2,118	\$4,324	\$3,175	\$3,128	\$5,250	\$8,250
Conservation Programs	\$16,982	\$20,999	\$23,539	\$21,191	\$17,884	\$68,805	\$114,500
TOTAL CONSERVATION	\$175,054	\$175,495	\$145,716	\$140,014	\$183,179	\$258,842	\$345,170
MISCELLANEOUS							
Interfund Loans	\$0	\$0	\$200,000	\$200,000	\$150,000	\$0	\$250,000
Contingency	\$0	\$0	\$0	\$0	\$0	\$0	\$170,000
Unappropriated	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL WATER FUND	\$5,007,651	\$4,996,087	\$5,249,115	\$7,099,639	\$7,465,934	\$8,414,076	\$12,128,018

Source: City of Ashland.

exp5

Table A-3
City of Ashland Water Rate Study
Historical and Budgeted Water Fund Operation Expenditures

Expenses	Fiscal Year						Adopted 2015-16
	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	
Water Fund Operating Expenses							
Personnel	\$1,454,017	\$1,566,691	\$1,478,094	\$1,594,018	\$1,689,757	\$1,830,555	\$1,737,310
Supplies	\$178,069	\$163,649	\$153,291	\$164,988	\$198,225	\$207,113	\$305,825
Repair & Maintenance	\$290,532	\$289,177	\$317,079	\$323,933	\$326,070	\$340,958	\$410,512
Communications	\$14,630	\$10,938	\$10,675	\$14,896	\$15,801	\$23,521	\$22,380
Contractual Services	\$25,020	\$21,873	\$51,999	\$63,664	\$82,921	\$95,860	\$353,600
Central Service	\$716,497	\$716,497	\$748,700	\$810,700	\$828,910	\$845,380	\$887,650
Miscellaneous Charges	\$525,259	\$532,316	\$451,585	\$437,887	\$484,583	\$483,392	\$517,020
Other Purchased Services	\$96,604	\$91,357	\$92,581	\$97,546	\$172,208	\$143,619	\$207,320
Franchise Tax	\$419,978	\$342,525	\$294,695	\$356,283	\$357,799	\$372,200	\$402,653
Conservation Programs	\$16,982	\$20,999	\$23,539	\$21,191	\$17,884	\$68,805	\$114,500
Other Forest Interface	\$221,016	\$369,116	\$485,728	\$2,460,085	\$578,038	\$311,440	\$0
Other Supply Costs	\$0	\$0	\$800	\$0	\$135	\$28,011	\$0
Subtotal Operating Expenses	\$3,958,605	\$4,125,137	\$4,108,767	\$6,345,190	\$4,752,332	\$4,750,855	\$4,958,770
Capital Outlay	\$208,517	\$182,146	\$306,991	\$241,732	\$1,898,185	\$2,703,906	\$4,541,040
Total	\$4,167,122	\$4,307,283	\$4,415,758	\$6,586,922	\$6,650,517	\$7,454,761	\$9,499,810

Source: City of Ashland.

op exp

Table A-4
City of Ashland Water Rate Study
Water Capital Improvement Projects Benefitting Existing Customers in Inflated Dollars

Water Improvement	Total Cost Estimate	2015-16 Base	2016-17 1	2017-18 2	2018-19 3	2019-20 4	2020-21 5	2021-22 6
Water Supply								
FERC Part 12 Dam Safety Inspection (50% Electric, 50% Water) [1]	\$11,950	\$0	\$11,950	\$0	\$0	\$0	\$0	\$0
Ashland Creek West Fork Bridge Construction [1]	\$31,300	\$0	\$31,300	\$0	\$0	\$0	\$0	\$0
Sediment TMDL in Reeder Resv. [1]	\$32,800	\$0	\$15,925	\$0	\$0	\$16,875	\$0	\$0
Reeder Resv Access Road TMDL Compliance [1]	\$28,150	\$28,150	\$0	\$0	\$0	\$0	\$0	\$0
East & West Fork Transmission Line Rehabilitation	\$300,000	\$0	\$300,000	\$0	\$0	\$0	\$0	\$0
Reeder Resv Variable Depth Intake	\$126,700	\$0	\$0	\$0	\$0	\$126,700	\$0	\$0
TID Terrace St Pump Station Improvements	\$255,000	\$255,000	\$0	\$0	\$0	\$0	\$0	\$0
TID Canal Piping: Starlite to Terrace Street [1]	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Emergency TAP Pipeline & Pump	\$920,000	\$920,000	\$0	\$0	\$0	\$0	\$0	\$0
Subtotal Water Supply	\$1,705,900	\$1,203,150	\$359,175	\$0	\$0	\$143,575	\$0	\$0
Water Treatment & Storage								
Permanganate Feed Facility Study & Implementation	\$307,200	\$307,200	\$0	\$0	\$0	\$0	\$0	\$0
Raw Water Bypass Measurement	\$25,000	\$0	\$25,000	\$0	\$0	\$0	\$0	\$0
2.6-MG Reservoir & Clearwell ("Crowson II") [1]	\$7,322,940	\$778,320	\$3,223,980	\$3,320,640	\$0	\$0	\$0	\$0
2.5 MGD Water Treatment Plant [1]	\$13,041,810	\$1,043,370	\$5,910,570	\$6,087,870	\$0	\$0	\$0	\$0
Subtotal Treatment & Storage	\$20,696,950	\$2,128,890	\$9,159,550	\$9,408,510	\$0	\$0	\$0	\$0
Water Distribution								
Park Estates Pump Station/Loop Road Reservoir Alternatives	\$2,527,600	\$618,000	\$1,909,600	\$0	\$0	\$0	\$0	\$0
Radio Read Meter Program	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Hydrant Replacement Program	\$172,300	\$0	\$0	\$0	\$55,700	\$57,400	\$59,200	\$0
Granite Reservoir Valving	\$123,000	\$0	\$0	\$123,000	\$0	\$0	\$0	\$0
Subtotal Water Distribution	\$2,822,900	\$618,000	\$1,909,600	\$123,000	\$55,700	\$57,400	\$59,200	\$0
Mainline Projects (see page 2)	\$3,398,500	\$373,200	\$644,300	\$1,063,800	\$226,700	\$345,500	\$410,000	\$335,000
TOTAL WATER CAPITAL PROJECTS (inflated dollars)	\$28,624,250	\$4,323,240	\$12,072,625	\$10,595,310	\$282,400	\$546,475	\$469,200	\$335,000

Table A-4
City of Ashland Water Rate Study
Water Capital Improvement Projects Benefitting Existing Customers in Inflated Dollars

Water Improvement	Total Cost Estimate	2015-16 Base	2016-17 1	2017-18 2	2018-19 3	2019-20 4	2020-21 5	2021-22 6
Water Mainline Projects								
Oak Street - Nevada to Bear Creek Bridge	\$273,200	\$273,200	\$0	\$0	\$0	\$0	\$0	\$0
Lithia Water Line Replacement - Pioneer Street to Plaza	\$100,000	\$100,000	\$0	\$0	\$0	\$0	\$0	\$0
Ivy Lane - Morton Street to west end of Ivy Lane	\$346,200	\$0	\$346,200	\$0	\$0	\$0	\$0	\$0
Ivy Lane - South Mountain to FH-16AD-038	\$100,300	\$0	\$100,300	\$0	\$0	\$0	\$0	\$0
A Street - 1st St to 6th St	\$515,000	\$0	\$150,000	\$365,000	\$0	\$0	\$0	\$0
Parker Street - Walker Ave to Lit Way	\$198,500	\$0	\$23,900	\$174,600	\$0	\$0	\$0	\$0
Harmony Lane - Siskiyou Blvd to Lit Way	\$79,500	\$0	\$11,900	\$67,600	\$0	\$0	\$0	\$0
Lit Way - Joy Avenue to Ray Lane	\$42,900	\$0	\$6,000	\$36,900	\$0	\$0	\$0	\$0
Ray Lane - Lit Way to Joy Ave	\$66,300	\$0	\$6,000	\$60,300	\$0	\$0	\$0	\$0
Beach Street - Larkin Lane to Iowa Street	\$114,900	\$0	\$0	\$12,300	\$102,600	\$0	\$0	\$0
Siskiyou Boulevard - Crowson Road south towards I-5 Exit 11	\$168,800	\$0	\$0	\$168,800	\$0	\$0	\$0	\$0
AHS Property - Fire hydrant in school property	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Meade Street - Vista St/Hillcrest to Iowa Street	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Ditch Road - Strawberry PS to Grandview Dr	\$187,200	\$0	\$0	\$92,200	\$95,000	\$0	\$0	\$0
Lithia Water Line	\$86,100	\$0	\$0	\$86,100	\$0	\$0	\$0	\$0
Elkader Street - Ivy Lane to Pinecrest Trail	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Ivy Lane - South Mountain Ave to Elkader St	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
South Mountain Ave - S. Mountain Ave to Emma St	\$7,600	\$0	\$0	\$0	\$7,600	\$0	\$0	\$0
South Mountain Ave - From S. Mountain Ave to FH 16AD-043	\$21,500	\$0	\$0	\$0	\$21,500	\$0	\$0	\$0
Vista Street - Fork St to Hillcrest St	\$155,000	\$0	\$0	\$0	\$0	\$155,000	\$0	\$0
Vista Street - Intersection of Vista, Hillcrest, Glenview Dr	\$5,500	\$0	\$0	\$0	\$0	\$5,500	\$0	\$0
Pinecrest Terrace - Penny Drive to Woodland Drive	\$185,000	\$0	\$0	\$0	\$0	\$185,000	\$0	\$0
Pinecrest Terrace - Walker Ave to Starlight Place	\$410,000	\$0	\$0	\$0	\$0	\$0	\$410,000	\$0
Penny Drive - Woodland Dr to Weissenback Way	\$85,000	\$0	\$0	\$0	\$0	\$0	\$0	\$85,000
Woodland Drive - Leonard St to Pinecrest Terrace	\$55,000	\$0	\$0	\$0	\$0	\$0	\$0	\$55,000
Hiawatha Place - Walker Ave to FH 15CA-020	\$60,000	\$0	\$0	\$0	\$0	\$0	\$0	\$60,000
Morton Street - FH 16AC-023 to PRV 12	\$135,000	\$0	\$0	\$0	\$0	\$0	\$0	\$135,000
Subtotal Mainline Projects (inflated dollars)	\$3,398,500	\$373,200	\$644,300	\$1,063,800	\$226,700	\$345,500	\$410,000	\$335,000

Source: City of Ashland and HEC.

infl cip

[1] Portion (or all) of project to be funded by future customers (excluded from table).

**Table A-5
City of Ashland Water Rate Study
Existing Debt**

Bonds	2015-16 Base	2016-17 1	2017-18 2	2018-19 3	2019-20 4	2020-21 5	2021-22 6
2009 G.O Bonds	\$66,666	\$66,666	\$66,666	\$66,666	\$66,666	\$66,666	\$66,666
2013 G.O. Bonds	\$195,275	\$197,225	\$194,125	\$195,975	\$197,725	\$194,425	\$196,075
2013 G.O Bonds Refinancing	\$191,350	\$188,050	\$189,700	\$191,250	\$192,700	\$189,100	\$185,500
MWC Debt for SDC Purchase	\$163,768	\$163,768	\$163,768	\$163,768	\$163,768	\$163,768	\$163,768
Total Existing Debt Service	\$617,059	\$615,709	\$614,259	\$617,659	\$620,859	\$613,959	\$612,009
State of Oregon Revolving Fund (estimated) [1]			\$157,000	\$103,000	\$103,000	\$103,000	\$103,000
Total Existing Debt Service with SRF	\$617,059	\$615,709	\$771,259	\$720,659	\$723,859	\$716,959	\$715,009

Source: City of Ashland and HEC.

debt

[1] SRF Loan Principal \$2,561,027 *Project completed by May 2016. Assume first debt payment is due Dec 1, 2017.*

Years 29
Interest Rate 1.0%

	<u>2014-15</u>	<u>2015-16</u>	<u>2016-17</u>	<u>Total</u>
Estimated Disbursements	\$870,000	\$1,150,000	\$541,027	\$2,561,027
Interest	\$8,700	\$20,200	\$25,610	\$54,510

Table A-6
City of Ashland Water Rate Study
Estimated New City Debt

Facilities and Cost	<i>Assumptions</i>	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Water Improvements [1]		\$2,099,310	\$0	\$0	\$0	\$0	\$0	\$0
Bond Sizing								
Capitalized Interest	<i>6 months</i>	\$47,230	\$0	\$0	\$0	\$0	\$0	\$0
Issuance Costs	<i>3%</i>	\$62,980	\$0	\$0	\$0	\$0	\$0	\$0
Underwriter's Discount	<i>1%</i>	\$20,990	\$0	\$0	\$0	\$0	\$0	\$0
Bond Reserve Fund	<i>1 year debt service</i>	\$188,000	\$0	\$0	\$0	\$0	\$0	\$0
Estimated Bond Size		\$2,418,510	\$0	\$0	\$0	\$0	\$0	\$0
Bond Size Adjusted for Rounding	<i>1.160 bond load</i>	\$2,435,000	\$0	\$0	\$0	\$0	\$0	\$0
Estimated Annual Debt Service	[2]	\$188,000	\$0	\$0	\$0	\$0	\$0	\$0

Source: HEC

new debt

[1] Existing customer share only. Excludes cost of improvements benefitting future customers.

[2] Debt service estimate based on sale of revenue bonds with the following terms: Assumed first payment due the following fiscal year.

interest rate: 4.5%

years: 20

Table A-7
City of Ashland Water Rate Study
Estimated Debt for SRF Funded Facilities

Item	2015-16	2016-17	2017-18	Total
Treatment Plant				
2.5 MGD Water Treatment Plant	\$1,043,370	\$5,910,570	\$6,087,870	\$13,041,810
Contingency 10%	\$104,337	\$591,057	\$608,787	\$1,304,181
Total Estimated Treatment Plant Cost	\$1,147,707	\$6,501,627	\$6,696,657	\$14,345,991
Estimated Interest	\$24,561	\$163,696	\$307,004	\$495,261
Annual Debt Service [1]				\$652,900
Total Payments				\$19,587,000
Principal				\$14,345,991
Interest				\$5,241,009
Crowson II Reservoir				
Tank	\$778,320	\$3,223,980	\$3,320,640	\$7,322,940
Contingency (5%)	\$38,916	\$161,199	\$166,032	\$732,294
Total Estimated Reservoir Cost	\$817,236	\$3,385,179	\$3,486,672	\$8,055,234
Estimated Interest	\$29,175	\$150,026	\$274,500	\$453,702
Annual Debt Service [1]				\$492,500
Total Payments				\$12,312,500
Principal				\$8,055,234
Interest				\$4,257,266
TOTAL SRF ANNUAL DEBT SERVICE				\$1,145,400

Source: City of Ashland.

srf

[1] Terms assumed:	Plant	Tank
Interest	2.14%	3.57%
Years	30	25

Assumes projects completed by October 2017 and first debt payment is due Dec 1, 2018.

Table A-8
City of Ashland Water Rate Study
Estimated Depreciation of New Assets

Improvement	Life (years)	2015-16 Base	2016-17 1	2017-18 2	2018-19 3	2019-20 4	2020-21 5	2021-22 6
Water Supply								
FERC Part 12 Dam Safety Inspection (50% Electric, 50% Water) [1]	20	\$0	\$2,390	\$2,390	\$2,390	\$2,390	\$2,390	\$2,390
Ashland Creek West Fork Bridge Construction [1]	80	\$0	\$1,565	\$1,565	\$1,565	\$1,565	\$1,565	\$1,565
Sediment TMDL in Reeder Resv. [1]	50	\$0	\$1,274	\$1,274	\$1,274	\$2,624	\$2,624	\$2,624
Reeder Resv Access Road TMDL Compliance [1]	40	\$2,815	\$2,815	\$2,815	\$2,815	\$2,815	\$2,815	\$2,815
East & West Fork Transmission Line Rehabilitation	60	\$0	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
Reeder Resv Variable Depth Intake	100	\$0	\$0	\$0	\$0	\$1,267	\$1,267	\$1,267
TID Terrace St Pump Station Improvements	50	\$5,100	\$5,100	\$5,100	\$5,100	\$5,100	\$5,100	\$5,100
TID Canal Piping [1], [2]	60	\$47,000	\$47,000	\$47,000	\$47,000	\$47,000	\$47,000	\$47,000
Emergency TAP Pipeline & Pump	80	\$11,500	\$11,500	\$11,500	\$11,500	\$11,500	\$11,500	\$11,500
Subtotal Water Supply		\$66,415	\$76,644	\$76,644	\$76,644	\$79,261	\$79,261	\$79,261
Water Treatment & Storage								
Permanganate Feed Facility Study & Implementation	40	\$7,680	\$7,680	\$7,680	\$7,680	\$7,680	\$7,680	\$7,680
Raw Water Bypass Measurement	40	\$0	\$625	\$625	\$625	\$625	\$625	\$625
2.6-MG Reservoir & Clearwell ("Crowson II") [1]	60	\$14,413	\$74,117	\$135,610	\$135,610	\$135,610	\$135,610	\$135,610
2.5 MGD Water Treatment Plant [1]	80	\$14,491	\$96,583	\$181,136	\$181,136	\$181,136	\$181,136	\$181,136
Subtotal Treatment & Storage		\$36,585	\$179,004	\$325,051	\$325,051	\$325,051	\$325,051	\$325,051
Water Distribution								
Park Estates Pump Station/Loop Road Reservoir Alternatives	50	\$12,360	\$50,552	\$50,552	\$50,552	\$50,552	\$50,552	\$50,552
Radio Read Meter Program	15	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Hydrant Replacement Program	50	\$0	\$0	\$0	\$1,114	\$2,262	\$3,446	\$3,446
Granite Reservoir Valving	50	\$0	\$0	\$2,460	\$2,460	\$2,460	\$2,460	\$2,460
Subtotal Water Distribution		\$12,360	\$50,552	\$53,012	\$54,126	\$55,274	\$56,458	\$56,458
Water Mains	60	\$6,220	\$16,958	\$34,688	\$38,467	\$44,225	\$51,058	\$56,642
Total		\$121,580	\$323,159	\$489,396	\$494,288	\$503,811	\$511,829	\$517,412

Source: HEC.

new depr

[1] Portion (or all) of improvement project to be funded by future customers. Replacement costs paid for by existing customers.

[2] New canal improvements paid by new customers. Replacement costs paid by existing customers.

Table A-9
City of Ashland Water Rate Study
Average Annual Change in Operating Costs Compared with Indices

Expenses and Indices	Fiscal Year Ending						Change	% Change
	2010	2011	2012	2013	2014	2015		
Water Fund Operating Expenses [1]								
Personnel	\$1,454,017	\$1,566,691	\$1,478,094	\$1,594,018	\$1,689,757	\$1,830,555	\$376,538	4.7%
Supplies	\$178,069	\$163,649	\$153,291	\$164,988	\$198,225	\$207,113	\$29,044	3.1%
Repair & Maintenance	\$290,532	\$289,177	\$317,079	\$323,933	\$326,070	\$340,958	\$50,426	3.3%
Communications	\$14,630	\$10,938	\$10,675	\$14,896	\$15,801	\$23,521	\$8,891	10.0%
Contractual Services	\$25,020	\$21,873	\$51,999	\$63,664	\$82,921	\$95,860	\$70,839	30.8%
Central Service	\$716,497	\$716,497	\$748,700	\$810,700	\$828,910	\$845,380	\$128,883	3.4%
Miscellaneous Charges	\$525,259	\$532,316	\$451,585	\$437,887	\$484,583	\$483,392	(\$41,867)	-1.6%
Other Purchased Services	\$96,604	\$91,357	\$92,581	\$97,546	\$172,208	\$143,619	\$47,015	8.3%
Franchise Tax	\$419,978	\$342,525	\$294,695	\$356,283	\$357,799	\$372,200	(\$47,778)	-2.4%
Conservation Programs	\$16,982	\$20,999	\$23,539	\$21,191	\$17,884	\$68,805	\$51,823	32.3%
Total	\$3,737,590	\$3,756,021	\$3,622,240	\$3,885,105	\$4,174,159	\$4,411,404	\$673,814	3.4%
Engineering News Record								
	<i>June 2010</i>	<i>June 2011</i>	<i>June 2012</i>	<i>June 2013</i>	<i>June 2014</i>	<i>June 2015</i>		
ENR Construction Cost Index 20-City [2]	8,805.00	9,053.00	9,291.00	9,542.00	9,800.00	10,039.00	1,234.00	2.7%
Bureau of Labor Statistics								
Consumer Price Index - Size D (Cities<50,000)	211.09	218.86	223.83	228.61	233.39	234.06	22.96	2.1%
Consumer Price Index - US City Average	217.29	224.99	228.83	232.86	237.69	237.79	20.50	1.8%
Consumer Price Index - Portland-Salem, OR	217.51	223.11	228.75	233.74	239.75	242.98	25.47	2.2%

Source: City of Ashland, Engineering News Record, Bureau of Labor Statistics.

cpi

[1] Excludes Forest Interface which is no longer part of the Water Fund.

[2] Average annual increase for the past 20 years (June 1995-2015) is 3.12%.

Table A-10
City of Ashland Water Rate Study
Cost of TID Non-Potable Water Deliveries

TID Total Annual Cost		Estimated Cost	
Costs			
Contracted Water			\$0
City Maintenance Costs [1]			\$30,070
Canal Depreciation			\$0
TID Staffing and Materials Costs [2]			\$22,800
Total Annual Cost			\$52,870
		Typical Delivery [3]	
		Cubic Feet	Acre Feet
Total Use	a	24,463,405	562
SOU Use [4]	b	7,101,690	163
Lithia Park Use [4]	c	1,020,495	23
Remaining TID Irrigators	d = a-b-c	16,341,220	375

Source: City of Ashland and HEC.

tid calc

[1] See Table A-11. Costs shown are 73% of the total costs in 2013 - see Table A-12.

[2] Estimated finance and public works departments time and materials costs to manage T.I.D. agreements, billing and customer service.

[3] Under the 1924, 1926, and 1935 contract the City can take up to 769 acre feet in a typical year for any purpose. The City also has an agreement with TID for an additional 600 acre feet for municipal purposes. On average, City TID customers use 73% of the 769 acre feet contract and the City municipal customers use the 600 acre feet contract. See Table A-12.

[4] Uses water consumption from the last non-drought year (2012).

Table A-11
City of Ashland Water Rate Study
TID Canal Maintenance Costs

Cost	2013	2014
Man Hours	1205	1411
Labor Cost	\$33,076	\$30,753
Equipment Cost	\$8,098	\$33,671
Total Cost	\$41,174	\$64,425

Source: City of Ashland.

tid maint

Table A-12
City of Ashland Water Rate Study
Actual TID Non-Potable Water Deliveries (Past 10 Years)

Year	Total Acre-Feet	Municipal Use	Spill to Creek	Irrigation Use	1924, 1926 & 1935 Contract	Irrigation Use as % of Contract
	[1]	[2]			[3]	
<i>All Figures in Acre Feet</i>						
2004	751.71	0.00	123.75	627.96	769.00	82%
2005	478.57	0.00	123.75	354.82	769.00	46%
2006	659.93	0.00	123.75	536.18	769.00	70%
2007	560.14	0.00	123.75	436.39	769.00	57%
2008	726.56	0.00	123.75	602.81	769.00	78%
2009	742.90	224.24	123.75	394.91	769.00	51%
2010	818.73	0.00	123.75	694.98	769.00	90%
2011	755.37	0.00	123.75	631.62	769.00	82%
2012	731.81	0.00	123.75	608.06	769.00	79%
2013	981.49	205.15	123.75	652.59	654.00	100%
2014	1,173.94	565.44	123.75	484.75	654.00	74%
Average Excluding Drought Years [4]				561.60	769.00	73%

Source: Talent Irrigation District.

tid deliv

[1] TID measurements.

[2] City measurements.

[3] In 2013 and 2014 TID curtailed the amount allowed to 654 acre feet.

[4] Excludes drought years 2009, 2013, and 2014.

Table A-13
City of Ashland Water Rate Study
Meter Replacement Fee Calculation

Item	Assumption / Total	Meter Size							
		3/4"	1"	1-1/2"	2"	3"	4"	6"	8"
New Meter with Transponder [1]		\$220	\$330	\$520	\$700	\$1,500	\$3,260	\$4,520	\$5,450
Installation Costs [2]	20%	\$44	\$66	\$104	\$140	\$300	\$652	\$904	\$1,090
Administration Costs	5%	\$11	\$17	\$26	\$35	\$75	\$163	\$226	\$273
Total Cost per Meter	\$312	\$275	\$413	\$650	\$875	\$1,875	\$4,075	\$5,650	\$6,813
Replacement Interval (years)		20	20	20	20	20	20	20	20
Cost per Meter per Year		\$14	\$21	\$33	\$44	\$94	\$204	\$283	\$341
Monthly Cost per Meter		\$1.15	\$1.72	\$2.71	\$3.65	\$7.81	\$16.98	\$23.54	\$28.39
Cost per Billing Meter [3]		\$1.17	\$1.75	\$2.75	\$3.71	\$7.94	\$17.26	\$23.94	\$28.86

Source: City of Ashland and HEC.

meter prog

[1] Prices quoted from City vendor, November 2014.

[2] Actual installation costs vary by meter size as a percentage of meter cost.

[3] Accounts for 2% of meters not billable at any one time.

Table A-14
City of Ashland Water Rate Study
Calculation of Functional Allocation Revenue Requirement

Operating Expenditures	BUDGET 2015-16	Allocation Basis	Customer	Meters & Services	Capacity	Commodity	Unclassified
	<i>with addition of</i>	[1]					
	<i>TAP water</i>						
SUPPLY							
Salaries & Wages	\$0	Avg. of Classified	0%	0%	0%	0%	100%
Benefits	\$0	Avg. of Classified	0%	0%	0%	0%	100%
Infrastructure	\$0	Plant In Service	9%	2%	74%	15%	0%
Professional Services	\$229,600	Avg. of Classified	0%	0%	0%	0%	100%
Miscellaneous	\$151,050	Avg. of Classified	0%	0%	0%	0%	100%
Other	\$149,900	Avg. of Classified	0%	0%	0%	0%	100%
Capital Outlay	\$1,209,150	Plant In Service	9%	2%	74%	15%	0%
Debt Service	\$9,568	Peaking Month Use	0%	0%	55%	45%	0%
TAP Water	\$44,000	Utilities	0%	0%	0%	100%	0%
TOTAL SUPPLY	\$1,793,268						
DISTRIBUTION							
Salaries & Wages	\$635,000	Avg. of Classified	0%	0%	0%	0%	100%
Benefits	\$394,750	Avg. of Classified	0%	0%	0%	0%	100%
Office	\$2,650	Customers	100%	0%	0%	0%	0%
Small Tools	\$4,000	Peaking Month Use	0%	55%	0%	45%	0%
Uniforms - Clothing	\$1,500	Plant In Service	9%	2%	74%	15%	0%
Uniforms - Other	\$3,000	Plant In Service	9%	2%	74%	15%	0%
Technical	\$15,000	Peaking Month Use	0%	55%	0%	45%	0%
Chemicals	\$5,500	Peaking Month Use	0%	55%	0%	45%	0%
County Services	\$4,950	Customers	100%	0%	0%	0%	0%
Other	\$15,000	Avg. of Classified	0%	0%	0%	0%	100%
Books & Periodicals	\$200	Customers	100%	0%	0%	0%	0%
Fleet Maintenance	\$66,340	Peaking Month Use	0%	55%	0%	45%	0%
Fuel	\$28,000	Peaking Month Use	0%	55%	0%	45%	0%
Replacement	\$61,560	Peaking Month Use	0%	55%	0%	45%	0%
Electricity	\$60,000	Utilities	0%	0%	0%	100%	0%
Water	\$0	Utilities	0%	0%	0%	100%	0%
Wastewater & Other	\$300	Utilities	0%	0%	0%	100%	0%
Custodial	\$0	Avg. of Classified	0%	0%	0%	0%	100%
Disposal	\$500	Plant In Service	9%	2%	74%	15%	0%
Infrastructure	\$115,000	Plant In Service	9%	2%	74%	15%	0%
Local	\$1,200	Customers	100%	0%	0%	0%	0%
Long Distance	\$20	Customers	100%	0%	0%	0%	0%
Cellular	\$3,700	Customers	100%	0%	0%	0%	0%
Computers	\$2,500	Customers	100%	0%	0%	0%	0%
Postage	\$2,000	Customers	100%	0%	0%	0%	0%
Radios	\$1,000	Customers	100%	0%	0%	0%	0%
Professional Services	\$60,000	Avg. of Classified	0%	0%	0%	0%	100%
Physician/Health	\$0	Avg. of Classified	0%	0%	0%	0%	100%
Other	\$50,000	Avg. of Classified	0%	0%	0%	0%	100%
Central Service	\$692,510	Customers	100%	0%	0%	0%	0%
Insurance Service	\$35,600	Customers	100%	0%	0%	0%	0%
Technology Debt	\$50,000	Peaking Month Use	0%	55%	0%	45%	0%
Use of Facilities	\$80,000	Peaking Month Use	0%	55%	0%	45%	0%
Bad Debt Expense	\$12,000	Plant In Service	9%	2%	74%	15%	0%
Other	\$0	Customers	100%	0%	0%	0%	0%
Licensing	\$37,700	Plant In Service	9%	2%	74%	15%	0%
Air	\$3,000	Customers	100%	0%	0%	0%	0%
Personal Vehicle Mileage	\$350	Avg. of Classified	0%	0%	0%	0%	100%
Lodging	\$2,000	Avg. of Classified	0%	0%	0%	0%	100%
Meals	\$350	Avg. of Classified	0%	0%	0%	0%	100%
Training	\$4,000	Avg. of Classified	0%	0%	0%	0%	100%
Dues	\$0	Avg. of Classified	0%	0%	0%	0%	100%
Medical & Laboratory	\$15,000	Avg. of Classified	0%	0%	0%	0%	100%
Franchise Tax	\$402,653	Utilities	0%	0%	0%	100%	0%
Capital Outlay	\$1,105,200	Plant In Service	9%	2%	74%	15%	0%
Debt Service	\$250,649	Peaking Month Use	0%	0%	55%	45%	0%
TOTAL DISTRIBUTION	\$4,224,682						
TREATMENT PLANT							
Salaries & Wages	\$340,050	Avg. of Classified	0%	0%	0%	0%	100%
Benefits	\$197,320	Avg. of Classified	0%	0%	0%	0%	100%
Office	\$2,000	Customers	100%	0%	0%	0%	0%
Small Tools	\$800	Peaking Month Use	0%	55%	0%	45%	0%
Uniforms - Clothing	\$2,500	Plant In Service	9%	2%	74%	15%	0%
Uniforms - Other	\$500	Plant In Service	9%	2%	74%	15%	0%
Technical	\$22,000	Peaking Month Use	0%	55%	0%	45%	0%
Chemicals	\$220,000	Utilities	0%	0%	0%	100%	0%

Table A-14
City of Ashland Water Rate Study
Calculation of Functional Allocation Revenue Requirement

Operating Expenditures	BUDGET	Allocation Basis	Customer	Meters & Services	Capacity	Commodity	Unclassified
	2015-16						
	<i>with addition of</i>	[1]					
Emergency Work	\$0	Peaking Month Use	0%	55%	0%	45%	0%
Books & Periodicals	\$150	Customers	100%	0%	0%	0%	0%
Fleet Maintenance	\$9,397	Peaking Month Use	0%	55%	0%	45%	0%
Fuel	\$6,500	Peaking Month Use	0%	55%	0%	45%	0%
Replacement	\$1,080	Peaking Month Use	0%	55%	0%	45%	0%
Maintenance	\$0	Peaking Month Use	0%	55%	0%	45%	0%
Electricity	\$38,000	Utilities	0%	0%	0%	100%	0%
Custodial	\$1,000	Avg. of Classified	0%	0%	0%	0%	100%
Grounds Care	\$1,500	Avg. of Classified	0%	0%	0%	0%	100%
Infrastructure	\$15,000	Plant In Service	9%	2%	74%	15%	0%
Local	\$5,600	Customers	100%	0%	0%	0%	0%
Long Distance	\$10	Customers	100%	0%	0%	0%	0%
Cellular	\$500	Customers	100%	0%	0%	0%	0%
Computers	\$2,500	Customers	100%	0%	0%	0%	0%
Postage	\$3,000	Customers	100%	0%	0%	0%	0%
Radios	\$100	Customers	100%	0%	0%	0%	0%
Professional Services	\$12,000	Avg. of Classified	0%	0%	0%	0%	100%
Other	\$0	Avg. of Classified	0%	0%	0%	0%	100%
Central Service	\$169,260	Customers	100%	0%	0%	0%	0%
Insurance Service	\$4,080	Customers	100%	0%	0%	0%	0%
Technology Debt	\$28,200	Peaking Month Use	0%	55%	0%	45%	0%
Use of Facilities	\$100,000	Peaking Month Use	0%	55%	0%	45%	0%
Other	\$0	Customers	100%	0%	0%	0%	0%
Licensing	\$4,700	Utilities	0%	0%	0%	100%	0%
Personal Vehicle Mileage	\$200	Avg. of Classified	0%	0%	0%	0%	100%
Lodging	\$2,000	Avg. of Classified	0%	0%	0%	0%	100%
Meals	\$600	Avg. of Classified	0%	0%	0%	0%	100%
Training	\$2,000	Avg. of Classified	0%	0%	0%	0%	100%
Dues	\$270	Avg. of Classified	0%	0%	0%	0%	100%
Medical & Laboratory	\$19,400	Avg. of Classified	0%	0%	0%	0%	100%
Capital Outlay	\$2,226,690	Plant In Service	9%	2%	74%	15%	0%
Debt Service	\$436,211	Peaking Month Use	0%	0%	55%	45%	0%
TOTAL TREATMENT PLANT	\$3,875,118						
CONSERVATION							
Salaries & Wages	\$105,240	Avg. of Classified	0%	0%	0%	0%	100%
Benefits	\$64,950	Avg. of Classified	0%	0%	0%	0%	100%
Office	\$4,550	Customers	100%	0%	0%	0%	0%
Small Tools	\$200	Peaking Month Use	0%	55%	0%	45%	0%
Uniforms - Clothing	\$200	Plant In Service	9%	2%	74%	15%	0%
Uniforms - Other	\$125	Plant In Service	9%	2%	74%	15%	0%
Technical	\$800	Peaking Month Use	0%	55%	0%	45%	0%
Meetings	\$100	Customers	100%	0%	0%	0%	0%
Books & Periodicals	\$100	Customers	100%	0%	0%	0%	0%
Fleet Maintenance	\$270	Peaking Month Use	0%	55%	0%	45%	0%
Fuel	\$150	Peaking Month Use	0%	55%	0%	45%	0%
Replacement	\$5,790	Peaking Month Use	0%	55%	0%	45%	0%
Rental Charges	\$125	Peaking Month Use	0%	55%	0%	45%	0%
Local	\$100	Customers	100%	0%	0%	0%	0%
Long Distance	\$50	Customers	100%	0%	0%	0%	0%
Cellular	\$0	Customers	100%	0%	0%	0%	0%
Computers	\$0	Customers	100%	0%	0%	0%	0%
Postage	\$100	Customers	100%	0%	0%	0%	0%
Professional Services	\$2,000	Avg. of Classified	0%	0%	0%	0%	100%
Central Service	\$25,880	Customers	100%	0%	0%	0%	0%
Insurance Service	\$3,440	Customers	100%	0%	0%	0%	0%
Use of Facilities	\$8,250	Peaking Month Use	0%	55%	0%	45%	0%
Advertising	\$1,600	Customers	100%	0%	0%	0%	0%
Printing & Binding	\$200	Customers	100%	0%	0%	0%	0%
Air	\$1,500	Customers	100%	0%	0%	0%	0%
Personal Vehicle Mileage	\$500	Avg. of Classified	0%	0%	0%	0%	100%
Lodging	\$2,000	Avg. of Classified	0%	0%	0%	0%	100%
Meals	\$750	Avg. of Classified	0%	0%	0%	0%	100%
Training	\$1,000	Avg. of Classified	0%	0%	0%	0%	100%
Dues	\$700	Avg. of Classified	0%	0%	0%	0%	100%
Conservation Programs	\$114,500	Utilities	0%	0%	0%	100%	0%
TOTAL CONSERVATION	\$345,170						
TOTAL OPERATING EXPENDITURES	\$10,238,238		\$1,382,804	\$391,007	\$3,901,763	\$2,102,184	\$2,460,480
Unclassified Expenditures Reallocation			\$437,448	\$123,694	\$1,234,316	\$665,022	
Total with Reallocation	\$10,238,238		\$1,820,252	\$514,702	\$5,136,079	\$2,767,206	
Revenue Requirement Allocation Percentages			18%	5%	50%	27%	

Source: HEC.

func

[1] For allocation of plant in service see Table A-14. For allocation of peaking month use see Table 4.

Table A-15
City of Ashland Water Rate Study
Allocation of Plant in Service

Facility	Percent Allocation					Cost Allocation				
	Customer	Meters & Services	Capacity	Commodity	Total	Customer	Meters & Services	Capacity	Commodity	Cost Basis
Water Rights	100%				100%	\$930,299	\$0	\$0	\$0	\$930,299
Buildings			50%	50%	100%	\$0	\$0	\$12,400	\$12,400	\$24,800
Equipment										
Clorinator Unit				100%	100%	\$0	\$0	\$0	\$15,380	\$15,380
Residual Analyzer				100%	100%	\$0	\$0	\$0	\$5,913	\$5,913
Treatment Plant			100%		100%	\$0	\$0	\$51,935	\$0	\$51,935
Distribution			80%	20%	100%	\$0	\$0	\$15,186	\$3,797	\$18,983
Services & Meters		100%			100%	\$0	\$35,893	\$0	\$0	\$35,893
Vehicles & Trailers	50%			50%	100%	\$25,445	\$0	\$0	\$25,445	\$50,890
Miscellaneous Equipment		25%		75%	100%	\$0	\$22,362	\$0	\$67,085	\$89,446
Subtotal Equipment						\$25,445	\$58,254	\$67,121	\$117,619	\$268,440
Improvements										
Services & Meters		100%			100%	\$0	\$236,605	\$0	\$0	\$236,605
Subdivision Water Lines	20%		80%		100%	\$1,905,096	\$0	\$7,620,382	\$0	\$9,525,478
Water Mains			100%		100%	\$0	\$0	\$10,885,740	\$0	\$10,885,740
Reservoir				100%	100%	\$0	\$0	\$0	\$2,238,247	\$2,238,247
Pump Station				100%	100%	\$0	\$0	\$0	\$102,415	\$102,415
Miscellaneous Distribution		25%		75%	100%	\$0	\$526,629	\$0	\$1,579,888	\$2,106,518
Miscellaneous Other				100%	100%	\$0	\$0	\$0	\$759,813	\$759,813
Water Treatment Plant			100%		100%	\$0	\$0	\$5,987,687	\$0	\$5,987,687
Fire Hydrants			100%		100%	\$0	\$0	\$40,433	\$0	\$40,433
Subtotal Improvements						\$1,905,096	\$763,234	\$24,534,242	\$4,680,363	\$31,882,935
Total Plant in Service						\$2,860,840	\$821,489	\$24,613,763	\$4,810,382	\$33,106,474
% of Plant in Service						9%	2%	74%	15%	100%

Source: City of Ashland and HEC.

plant

Table A-16
City of Ashland Water Rate Study
Number of Billing Meters

Meter Size	% of Total	TOTAL	Customer Category					
			Residential		Commercial	Irrigation	Government	Fire
			SF	MF				
3/4"	90.1%	7,814	6,723	444	332	179	19	117
1"	5.9%	509	256	68	108	61	16	0
1.5"	1.9%	167	11	51	64	35	6	0
2"	1.7%	145	3	35	45	40	22	0
3"	0.2%	21	0	4	4	7	6	0
4"	0.2%	14	0	4	2	2	6	0
6"	0.0%	2	0	0	0	1	1	0
8"	0.0%	1	0	0	0	0	1	0
Total	100.0%	8,673	6,993	606	555	325	77	117
% of Total		100%	81%	7%	6%	4%	1%	1%

Source: City of Ashland.

meters

Table A-17
City of Ashland Water Rate Study
Typical Water Consumption by Meter Size by Customer Type

Meter Size/ Customer Type	Consumption (2014 Data)												Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
3/4"	Figures in Cubic Feet												
Residential SF	486	460	428	448	550	795	1,073	1,178	1,136	955	678	483	8,187
Residential MF	839	826	813	896	1,057	1,572	1,715	1,733	1,548	1,260	943	851	14,054
Commercial	892	850	767	940	1,077	1,472	1,703	1,773	1,518	1,309	993	856	14,148
Institutional	300	318	352	400	480	791	1,326	1,086	896	1,143	711	378	8,180
Irrigation	297	347	163	533	1,467	2,913	3,503	3,581	3,010	2,099	914	238	19,064
1"													
Residential SF	478	469	474	774	877	1,479	1,948	1,779	1,553	1,318	638	506	12,293
Residential MF	1,242	1,326	1,073	1,223	1,316	1,923	2,171	2,004	1,754	1,534	1,208	1,033	17,809
Commercial	1,258	1,213	1,006	1,322	1,638	2,420	2,513	3,081	2,828	2,141	1,449	1,258	22,127
Institutional	1,010	805	591	856	961	1,176	1,029	983	1,017	1,118	977	634	11,157
Irrigation	234	704	970	718	2,547	3,314	4,647	5,037	3,775	3,014	858	500	26,317
1.5"													
Residential SF	636	594	522	848	1,142	1,699	2,308	2,314	2,265	1,525	1,145	1,156	16,154
Residential MF	2,697	3,479	2,856	3,052	3,511	4,579	4,859	5,116	4,968	4,307	3,773	3,142	46,339
Commercial	2,401	2,227	2,316	3,080	3,757	5,231	6,141	6,234	5,329	4,922	3,518	2,646	47,804
Institutional	1,976	1,818	2,222	1,338	7,820	2,048	1,665	847	797	692	2,650	870	24,743
Irrigation	414	322	308	1,922	4,713	8,614	12,982	13,984	11,558	8,031	1,719	840	65,407
2"													
Residential SF	963	260	680	550	613	1,210	1,703	2,533	3,210	2,450	1,687	630	16,490
Residential MF	10,187	10,694	9,899	11,196	12,200	20,561	22,593	20,322	19,732	15,615	12,704	12,281	177,984
Commercial	5,734	7,046	6,603	7,748	8,205	10,157	12,221	12,657	11,344	9,747	8,280	6,964	106,707
Institutional	6,145	10,434	9,260	8,995	19,053	15,680	16,262	14,952	9,444	10,082	10,929	8,452	139,689
Irrigation	640	377	506	8,343	11,538	20,023	22,624	23,745	19,845	15,143	7,106	2,996	132,884
3"													
Residential MF	14,005	15,605	13,263	11,863	15,288	23,425	21,040	19,945	21,543	22,723	21,983	19,908	220,588
Commercial	17,618	15,500	16,216	17,592	22,458	36,710	35,242	34,500	31,320	28,940	23,784	20,630	300,510
Institutional	3,518	8,547	7,499	7,241	8,906	12,434	10,264	9,852	9,912	8,154	6,711	5,177	98,214
Irrigation	6,910	1,200	1,400	2,735	41,146	36,502	62,480	85,750	49,291	62,530	7,330	580	357,854
4" and greater													
Residential MF	30,753	38,173	36,985	42,868	48,143	66,950	60,238	56,803	53,973	46,845	56,272	38,135	576,134
Commercial	13,250	10,500	9,750	19,000	38,000	35,250	57,750	53,000	55,500	41,500	30,250	23,250	387,000
Institutional	19,699	25,883	22,005	16,579	20,048	24,384	16,585	13,043	16,731	23,835	23,206	17,993	239,989
Irrigation	0	467	667	14,000	55,500	70,327	66,111	123,030	122,227	86,404	1,576	0	540,309

Source: City of Ashland and HEC.

use by size

Table A-18
City of Ashland Water Rate Study
Bill Tabulation for Rate Design - Residential - Winter

Potable Water Customer	Block Limit	Billing Units	Cumulative Bills through Block	Total Use of Bills Stopping in Block	Cumulative Use of Bills Stopping in Block	Total Use to This Block of Bills Passing Through Block	Cumulative Billed Usage	Percent Cumulative Billed Usage
Master Metered								
Zero Use		164	4,920	0	0	0	0	0%
Tier 1	300	2,072	4,756	407,866	407,866	805,200	1,213,066	65%
Tier 2	1,000	2,525	2,684	1,221,745	1,629,611	159,000	1,788,611	97%
Tier 3	2,500	152	159	200,941	1,830,552	17,500	1,848,052	100%
Tier 4	> 2,500	7	7	22,156	1,852,708	0	1,852,708	100%
Total		4,920		1,852,708				
Single Family								
Zero Use		1,660	56,630	0	0	0	0	0%
Tier 1	300	18,399	54,970	3,204,856	3,204,856	10,971,300	14,176,156	47%
Tier 2	1,000	30,748	36,571	16,592,584	19,797,440	5,823,000	25,620,440	86%
Tier 3	2,500	5,148	5,823	7,328,780	27,126,220	1,687,500	28,813,720	96%
Tier 4	> 2,500	675	675	2,740,988	29,867,208	0	29,867,208	100%
Total		56,630		29,867,208				

Source: City of Ashland and HEC.

smaller bill tab

Table A-19
City of Ashland Water Rate Study
Bill Tabulation for Rate Design - Residential - Summer

Potable Water Customer	Block Limit	Billing Units	Cumulative Bills through Block	Total Use of Bills Stopping in Block	Cumulative Use of Bills Stopping in Block	Total Use to This Block of Bills Passing Through Block	Cumulative Billed Usage	Percent Cumulative Billed Usage
Master Metered								
Zero Use		65	2,460	0	0	0	0	0%
Tier 1	300	481	2,395	97,968	97,968	574,200	672,168	41%
Tier 2	1,000	1,454	1,914	832,998	930,966	460,000	1,390,966	85%
Tier 3	2,500	428	460	584,380	1,515,346	80,000	1,595,346	98%
Tier 4	3,600	23	32	67,452	1,582,798	32,400	1,615,198	99%
Tier 5	> 3,600	9	9	47,668	1,630,466	0	1,630,466	100%
Total		2,460		1,630,466				
Single Family								
Zero Use		543	28,315	0	0	0	0	0%
Tier 1	300	4,704	27,772	794,582	794,582	6,920,400	7,714,982	24%
Tier 2	1,000	11,461	23,068	6,951,500	7,746,082	11,607,000	19,353,082	61%
Tier 3	2,500	8,941	11,607	14,060,337	21,806,419	6,665,000	28,471,419	89%
Tier 4	3,600	1,684	2,666	4,966,874	26,773,293	3,535,200	30,308,493	95%
Tier 5	> 3,600	982	982	5,185,537	31,958,830	0	31,958,830	100%
Total		28,315		31,958,830				

Source: City of Ashland and HEC.

res tab

Table A-20
City of Ashland Water Rate Study
Estimated Percent Water Billed by Residential by Tier

Potable Water					Cumulative Billed Usage					Percent Cumulative Billed Usage					Percent Use by Tier				
Customer Type	Block 1	Block 2	Block 3	Block 4	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5
Winter					Figure in Cubic Feet														
	<i>per unit</i>																		
Master Metered	300	1,000	2,500		1,213,066	1,788,611	1,848,052	1,852,708		65%	97%	100%	100%		65%	31%	3%	0%	
Single Unit	300	1,000	2,500		14,176,156	25,620,440	28,813,720	29,867,208		47%	86%	96%	100%		47%	38%	11%	4%	
Total					15,389,222	27,409,051	30,661,772	31,719,916		49%	86%	97%	100%		49%	38%	10%	3%	
Summer																			
Master Metered	300	1,000	2,500	3,600	672,168	1,390,966	1,595,346	1,615,198	1,630,466	41%	85%	98%	99%	100%	41%	44%	13%	1%	1%
Single Unit	300	1,000	2,500	3,600	7,714,982	19,353,082	28,471,419	30,308,493	31,958,830	24%	61%	89%	95%	100%	24%	36%	29%	6%	5%
Total					8,387,150	20,744,048	30,066,765	31,923,691	33,589,296	25%	62%	90%	95%	100%	25%	37%	28%	6%	5%
Annual																			
Master Metered					1,885,234	3,179,577	3,443,398	3,467,906	3,483,174	54%	91%	99%	100%	100%	54%	37%	8%	1%	0%
Single Unit					21,891,138	44,973,522	57,285,139	60,175,701	61,826,038	35%	73%	93%	97%	100%	35%	37%	20%	5%	3%
Total					23,776,372	48,153,099	60,728,537	63,643,607	65,309,212	36%	74%	93%	97%	100%	36%	37%	19%	4%	3%

Source: HEC.

percent block

Table A-21
City of Ashland Water Rate Study
Bill Tabulation for Rate Design - Non-Residential Current

Potable Water Customer	Block Limit	Billing Units	Cumulative Bills through Block	Total Use of Bills Stopping in Block	Cumulative Use of Bills Stopping in Block	Total Use to This Block of Bills Passing Through Block	Cumulative Billed Usage	Percent Cumulative Billed Usage
Irrigation	0	0	0	0	0	0	0	0%
Zero Use	0	1,700	4,080	0	0	0	0	0%
Tier 1	50,000	2,327	2,380	10,314,213	10,314,213	2,650,000	12,964,213	88%
Tier 2 >	50,000	53	53	4,422,250	14,736,463	0	14,736,463	100%
Total		4,080		14,736,463				
Commercial								
Zero Use	0	519	7,306	0	0	0	0	0%
Tier 1	50,000	6,774	6,787	16,932,837	16,932,837	650,000	17,582,837	99%
Tier 2 >	50,000	13	13	781,010	17,713,847	0	17,713,847	100%
Total		7,306		17,713,847				
Institutional								
Zero Use	0	121	1,032	0	0	0	0	0%
Tier 1	50,000	887	911	13,388	13,388	1,200,000	1,213,388	40%
Tier 2 >	50,000	24	24	3,012,632	3,026,020	0	3,026,020	100%
Total		1,032		3,026,020				

Source: City of Ashland and HEC.

nonres bill tab

Table A-22
City of Ashland Water Rate Study
Bill Tabulation for Rate Design - Commercial Proposed

Potable Water Customer	Block Limit	Billing Units	Cumulative Bills through Block	Total Use of Bills Stopping in Block	Cumulative Use of Bills Stopping in Block	Total Use to This Block of Bills Passing Through Block	Cumulative Billed Usage	Percent Cumulative Billed Usage
Commercial <2"								
Zero Use		460	6,586	0	0	0	0	0%
Tier 1	2,500	4,851	6,126	3,074,096	3,074,096	3,187,500	6,261,596	61%
Tier 2	> 2,500	1,275	1,275	7,209,273	10,283,369	0	10,283,369	100%
		6,586		10,283,369				
Commercial 2+"								
Zero Use		59	720	0	0	0	0	0%
Tier 1	15,000	472	661	1,989,468	1,989,468	2,835,000	4,824,468	65%
Tier 2	> 15,000	189	189	5,441,010	7,430,478	0	7,430,478	100%
		720		7,430,478				

Source: City of Ashland and HEC.

comm tab

Table A-23
City of Ashland Water Rate Study
Estimated Percent Water Billed by Non-Residential by Tier

Potable Water Customer Type	Block 1	Cumulative Billed Usage		Percent Cumulative Billed Usage		Percent Use by Tier	
		Tier 1	Tier 2	Tier 1	Tier 2	Tier 1	Tier 2
	<i>per meter</i>	Figure in Cubic Feet					
Commercial	50,000	17,582,837	17,713,847	99%	100%	99%	1%
Institutional	50,000	1,213,388	3,026,020	40%	100%	40%	60%
Irrigation	50,000	12,964,213	14,736,463	88%	100%	88%	12%

Source: HEC.

Table A-24
City of Ashland Water Rate Study
Estimated Percent Water Billed by Proposed Commercial by Tier

Potable Water Customer Type	Block 1	Cumulative Billed Usage		Percent Cumulative Billed Usage		Percent Use by Tier	
		Tier 1	Tier 2	Tier 1	Tier 2	Tier 1	Tier 2
	<i>per meter</i>	Figure in Cubic Feet					
Commercial <2"	2,500	6,261,596	10,283,369	61%	100%	61%	39%
Commercial 2+"	15,000	4,824,468	7,430,478	65%	100%	65%	35%

Source: HEC.

new com block

Table A-25
City of Ashland Water Rate Study
Historical Potable Water Use by Customer Category

Potable Water Customer	Calendar Year					Average 2010-2014	% of Average Of Billable
	2010	2011	2012	2013	2014		
Residential	Figures in Cubic Feet						
Single Family	63,405,528	63,352,392	68,180,377	70,350,997	62,048,584	65,467,576	52%
Multi-Family	19,189,790	19,088,252	20,975,821	20,914,108	20,299,186	20,093,431	16%
Subtotal Residential	82,595,318	82,440,644	89,156,198	91,265,105	82,347,770	85,561,007	68%
Non-Residential							
Commercial <2" meter	9,745,579	10,280,935	10,542,620	10,727,829	10,276,017	10,314,596	8%
Commercial 2"+ meter	7,574,577	7,605,973	7,760,214	7,643,038	7,446,478	7,606,056	6%
Institutional	5,833,489	6,101,302	6,386,428	6,687,351	6,197,355	6,241,185	5%
Subtotal Non-Residential	23,153,645	23,988,210	24,689,262	25,058,218	23,919,850	24,161,837	19%
Irrigation	13,024,294	13,867,288	17,633,025	17,566,099	14,792,917	15,376,725	12%
Total Billable	118,773,257	120,296,142	131,478,485	133,889,422	121,060,537	125,099,569	
Tracking (non-billable)	220,441	205,237	253,626	260,858	1,254,006	438,834	
Total Demand	118,993,698	120,501,379	131,732,111	134,150,280	122,314,543	125,538,402	

Source: City of Ashland.

use

Table A-26
City of Ashland Water Rate Study
Assumptions for the Effect of Increasing Prices on Water Demand (Price Elasticity)

Customer Type	Estimated Elasticity	2016-17 1	2017-18 2	2018-19 3	2019-20 4	2020-21 5	2021-22 6
% Change in Price to Meet Rev. Requirement		8.47%	4.49%	3.44%	3.46%	3.40%	3.49%
Assumption for Inflation [1]		2.25%	2.25%	2.25%	2.25%	2.25%	2.25%
Price Increase Adjusted for Inflation		6.22%	2.24%	1.19%	1.21%	1.15%	1.24%
Residential	[2]	[3]					
Single Family	-0.10	0.40%	-0.6%	-0.2%	-0.1%	-0.1%	-0.1%
Multi-Family	-0.10	0.40%	-0.6%	-0.2%	-0.1%	-0.1%	-0.1%
Non-Residential							
Commercial <2" meter	-0.15	1.80%	-0.9%	-0.3%	-0.2%	-0.2%	-0.2%
Commercial 2"+ meter	-0.15	1.80%	-0.9%	-0.3%	-0.2%	-0.2%	-0.2%
Institutional	-0.10	1.00%	-0.6%	-0.2%	-0.1%	-0.1%	-0.1%
Irrigation	-0.25	-3.75%	-1.6%	-0.6%	-0.3%	-0.3%	-0.3%

Source: HEC.

elasticity

[1] All Urban Consumers Price Index 1st half 2005 to 1st half 2015 average annual increase - <http://library.uoregon.edu/govdocs/cpi.html>.

[2] Based on HEC review of price elasticity of water literature.

[3] Due to cost redistribution (per the cost of service study), in the first year the actual price change will be different for each customer type.

This effect is applied to each customer group in the base year. Percentage changes by customer group are approximately:

Residential	-4%
Commercial	-12%
Institutional	-10%
Irrigation	15%

Table A-27
City of Ashland Water Rate Study
Projected Changes in Potable Water Demand due to Price Changes

	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
	Base	1	2	3	4	5	6
<i>Projected Growth</i>	[1]	0.59%	0.59%	0.59%	0.59%	0.59%	0.59%
Residential	Figures in Cubic Feet						
Single Family	62,296,778	62,665,170	62,833,177	63,131,640	63,465,838	63,801,133	64,140,335
Multi-Family	20,380,383	20,500,902	20,564,731	20,665,616	20,776,726	20,888,244	21,000,965
Subtotal Residential	82,677,161	83,166,073	83,397,908	83,797,256	84,242,564	84,689,376	85,141,301
Non-Residential							
Commercial <2" meter	10,460,985	10,522,846	10,539,114	10,584,870	10,638,599	10,692,449	10,747,054
Commercial 2"+ meter	7,580,515	7,625,342	7,637,130	7,670,287	7,709,222	7,748,244	7,787,813
Institutional	6,259,329	6,296,343	6,319,342	6,351,569	6,386,376	6,421,326	6,456,618
Irrigation	14,238,183	14,322,380	14,205,431	14,217,453	14,263,145	14,308,327	14,355,738
Subtotal Non-Residential	38,539,011	38,766,912	38,701,017	38,824,180	38,997,342	39,170,345	39,347,223
Total Billable Water	121,216,172	121,932,984	122,098,926	122,621,436	123,239,906	123,859,721	124,488,524
Change in Demand Due to Price [2]							
Residential							
Single Family		-201,373	-72,671	-38,901	-39,775	-37,862	-40,995
Multi-Family		-57,066	-20,603	-11,030	-11,279	-10,737	-11,627
Subtotal Residential		-258,439	-93,274	-49,932	-51,054	-48,599	-52,623
Non-Residential							
Commercial <2" meter		-45,689	-16,470	-8,813	-9,009	-8,573	-9,281
Commercial 2"+ meter		-33,108	-11,935	-6,386	-6,528	-6,213	-6,725
Institutional		-14,151	-5,112	-2,737	-2,799	-2,665	-2,886
Irrigation		-200,459	-71,559	-38,157	-38,933	-36,982	-39,964
Subtotal Non-Residential		-293,407	-105,075	-56,093	-57,269	-54,434	-58,856
Total Billable Water		-551,846	-198,349	-106,025	-108,324	-103,033	-111,479

Source: HEC.

elas demand

[1] Base demand adjusted by cost of service cost reallocation per Table A-27.

[2] Change applied to summer months consumption only.

Table A-28
City of Ashland Water Rate Study
Comparison of Projected and Actual Production from 2012 Water Master Plan

Year	Population Estimates			Actual Billed	Projected Master Plan	COS [1]	Average Day Demands (MGD)				
	Certified	Comp. Plan	COS [1]				Water Master Plan Projections				
							No Add'l Conserv.	5% Conserv.	10% Conserv.	15% Conserv.	
Growth		187 / year	0.59%				Actual				
				<i>consumption numbers</i>			<i>production numbers</i>				
				<i>Figures in Million Gallons per Day</i>							
2000	19,610	19,110									
2001	19,770	19,297									
2002	20,130	19,484									
2003	20,430	19,671									
2004	20,590	19,858									
2005	20,880	20,045					3.33				
2006	21,430	20,232					3.44				
2007	21,630	20,419					3.33				
2008	21,485	20,606					3.28				
2009	21,505	20,793			3.07		2.93	3.35			
2010	20,095	20,980		2.43			2.60		3.38	3.38	
2011	20,255	21,167		2.47			2.58				
2012	20,325	21,354		2.69			2.65				
2013	20,295	21,541		2.74			2.90				
2014	20,340	21,728		2.48			2.62				
2015		21,915	20,393			2.48					
2016		22,102	20,446			2.48					
2017		22,289	20,500			2.49					
2018		22,476	20,554			2.50					
2019		22,663	20,607			2.51					
2020		22,850	20,661		3.29	2.52	3.59	3.50	3.41	3.32	
2021		23,037	20,715			2.54					
2022		23,224	20,769			2.55					
Change 2000-2014	730	2,618									
Avg. Annual % Inc.	0.26%	0.92%	0.59%								

Source: Portland State University Population Research Center, City of Ashland Comprehensive Plan, 2012 Water Master Plan (Carollo), and HEC.

mp comp

[1] Cost of Service Water Rate Study.

Table A-29
City of Ashland Water Rate Study
Allocation of Potable Water Customer Use Charges (Portion of Capacity and Commodity Costs)

Potable Water Customer Type		2015-16 Base	2016-17 1	2017-18 2	2018-19 3	2019-20 4	2020-21 5	2021-22 6
Capacity Cost Share								
Total Cost Share	<i>Table A-30</i>	\$2,028,401	\$2,190,846	\$2,289,190	\$2,368,002	\$2,450,010	\$2,533,280	\$2,621,622
Residential	69%	\$1,404,825	\$1,517,330	\$1,585,441	\$1,640,025	\$1,696,822	\$1,754,493	\$1,815,676
Commercial < 2"	7%	\$136,059	\$146,956	\$153,552	\$158,839	\$164,340	\$169,925	\$175,851
Commercial 2" or larger	4%	\$77,469	\$83,673	\$87,429	\$90,439	\$93,571	\$96,752	\$100,126
Institutional	4%	\$82,774	\$89,403	\$93,416	\$96,632	\$99,979	\$103,377	\$106,982
Irrigation	16%	\$327,274	\$353,483	\$369,351	\$382,067	\$395,298	\$408,733	\$422,987
Total Capacity Costs	100%	\$2,028,401	\$2,190,846	\$2,289,190	\$2,368,002	\$2,450,010	\$2,533,280	\$2,621,622
Commodity Cost Share								
Total Cost Share	<i>Table A-25</i>	\$1,766,672	\$1,908,156	\$1,993,810	\$2,062,453	\$2,133,880	\$2,206,405	\$2,283,348
Residential	68%	\$1,208,303	\$1,305,070	\$1,363,653	\$1,410,601	\$1,459,453	\$1,509,056	\$1,561,680
Commercial < 2"	8%	\$145,664	\$157,330	\$164,392	\$170,052	\$175,941	\$181,920	\$188,265
Commercial 2" or larger	6%	\$107,414	\$116,016	\$121,224	\$125,397	\$129,740	\$134,149	\$138,828
Institutional	5%	\$88,139	\$95,197	\$99,471	\$102,895	\$106,459	\$110,077	\$113,916
Irrigation	12%	\$217,152	\$234,543	\$245,071	\$253,508	\$262,288	\$271,202	\$280,660
Total Commodity Costs	100%	\$1,766,672	\$1,908,156	\$1,993,810	\$2,062,453	\$2,133,880	\$2,206,405	\$2,283,348
Total Costs to be Recovered through Use Charges								
Residential	69%	\$2,613,129	\$2,822,401	\$2,949,094	\$3,050,626	\$3,156,275	\$3,263,548	\$3,377,356
Commercial < 2"	7%	\$281,723	\$304,285	\$317,944	\$328,890	\$340,280	\$351,846	\$364,115
Commercial 2" or larger	5%	\$184,883	\$199,689	\$208,653	\$215,837	\$223,311	\$230,901	\$238,953
Institutional	5%	\$170,913	\$184,600	\$192,887	\$199,528	\$206,438	\$213,454	\$220,898
Irrigation	14%	\$544,426	\$588,026	\$614,422	\$635,575	\$657,586	\$679,936	\$703,647
Total Use Charges	100%	\$3,795,073	\$4,099,001	\$4,283,000	\$4,430,455	\$4,583,890	\$4,739,685	\$4,904,969

Source: City of Ashland and HEC.

commodity

Table A-30
City of Ashland Water Rate Study
Calculation of Share of Maximum Day Water Use by Customer Category

Customer Type	Non-Coincident		MM/AM Ratio	MD Peak Ratio	Max Daily Use	% of Avg. Month	% of Peak Month	% of Max. Day
	Average Month Use (AM)	Maximum Month Use (MM)						
	<i>a</i>	<i>b</i>	$c = b/a$	<i>d (below)</i>	$e = d*(b/31)$	$f = a/\text{total } a$	$g = b/\text{total } b$	$h = e/\text{total } e$
	cu. ft.	cu. ft.			cu. ft.			
Residential								
Master Metered	1,233,889	1,807,603	1.46	2.22	129,200	12%	10%	10%
Single Unit	5,399,033	9,066,113	1.68	2.54	742,780	51%	53%	59%
Non-Residential								
Commercial < 2"	842,679	1,311,138	1.56	2.00	84,453	8%	8%	7%
Commercial 2" or larger	572,439	815,422	1.42	1.83	48,085	5%	5%	4%
Institutional	522,097	734,827	1.41	2.17	51,378	5%	4%	4%
Irrigation	2,093,565	3,461,986	1.65	1.82	203,140	20%	20%	16%
Total	10,689,965	17,248,262	1.61		1,259,036	100%	100%	101%

Calculation of MD Peak Factor	Master		Comm'l.	Comm'l.	Institutional	Irrigation
	Metered	Single Unit	< 2"	2" +		
MM/AD Factor	1.46	1.68	1.56	1.42	1.41	1.65
System MD/MM Production Ratio [1]	1.10	1.10	1.10	1.10	1.10	1.10
Weekly Usage Adjustment	1.38	1.38	1.17	1.17	1.40	1.00
Calculated MD Peak Factor	2.22	2.54	2.00	1.83	2.17	1.82

Source: City of Ashland, AWWA M1 Manual, and HEC.

peaks

[1] Calculation:	2010	2011	2012	2013	2014	Average
Maximum Day (MG)	5.88	5.36	5.14	5.95	4.80	
Maximum Month (MG)	158.29	152.00	149.87	170.48	137.17	
Average MGD in the Max. Month (max. day / 31)	5.11	4.90	4.83	5.50	4.42	
Ratio of Max. Day to Avg. in Max. Month	1.15	1.09	1.06	1.08	1.08	1.10

Table A-31
City of Ashland Water Rate Study
Potable Water Irrigation Peak Cost Allocation Calculation

Month	Potable Water Only	
	All Water	Irrigation
	<i>cubic feet</i>	
January	5,698,647	25,023
February	5,903,155	19,250
March	5,395,848	34,123
April	6,737,313	352,456
May	9,004,008	1,158,194
June	13,874,124	2,148,917
July	16,364,166	2,862,767
August	16,915,748	3,451,333
September	14,895,165	2,740,545
October	12,225,379	2,146,283
November	7,481,362	458,953
December	7,819,658	43,004
Total	122,314,573	15,440,848
On Peak	62,049,203	11,203,562
Peak as % of Total	51%	73%

Source: City of Ashland.

irr peak

Table A-32
City of Ashland Water Rate Study
Cost of Service Cost Allocation for the Base Year 2015-16

Customer Type	New Charges																					New TID Charges	Grand Total	Share of Total		
	Customer			Service			Use																		Total Use	Total Bills
	# Bills	\$ per Bill	Total	Meter Equivs.	\$ per Meter Equiv.	Total	Tier 1	\$ per CF	Total	Tier 2	\$ per CF	Total	Tier 3	\$ per CF	Total	Tier 4	\$ per CF	Total	Tier 5	\$ per CF	Total					
	[1]			[1]																						
POTABLE																										
Residential	7,605	\$10.93	\$997,442	8,269	\$11.70	\$1,161,072	29,979,403	\$0.0230	\$688,207	30,736,386	\$0.0287	\$881,980	15,856,251	\$0.0387	\$614,243	3,675,585	\$0.0502	\$184,574	2,100,145	\$0.0646	\$135,593	82,347,770	\$2,504,596	\$4,663,111	71%	
Non-Residential																										
Commercial	586	\$10.93	\$76,857	1,234	\$11.70	\$173,269	11,091,976	\$0.0287	\$318,284	6,630,519	\$0.0387	\$256,855			\$0						\$0	17,722,495	\$575,138	\$825,265	13%	
Institutional	122	\$10.93	\$16,001	617	\$11.70	\$86,635	6,197,355	\$0.0276	\$170,913			\$0			\$0						\$0	6,197,355	\$170,913	\$273,548	4%	
Fire Guards	117	\$10.93	\$15,345	117	\$11.70	\$16,428			\$0			\$0			\$0						\$0	0	\$0	\$31,774	0%	
Irrigation	550	\$10.93	\$72,136	947	\$11.70	\$132,971	4,050,831	\$0.0292	\$118,338	10,742,086	\$0.0397	\$426,087			\$0						\$0	14,792,917	\$544,426	\$749,532	11%	
Subtotal Potable	8,980		\$1,177,781	11,184		\$1,570,375	51,319,565	\$0	\$1,295,742	48,108,991		\$1,564,922	15,856,251		\$614,243	3,675,585		\$184,574	2,100,145		\$135,593	121,060,537	\$3,795,073	\$0	\$6,543,230	99%
NON-POTABLE (TID)																										
Metered																								\$17,554	\$17,554	0%
Unmetered																								\$35,316	\$35,316	1%
Subtotal Non-Potable																								\$52,870	\$52,870	1%
Total FY 2015-16	8,980		\$1,177,781	11,184		\$1,570,375																			\$6,596,100	100%

Source: HEC.

[1] Does not apply to TID customers.

cos distr

Table A-33
City of Ashland Water Rate Study
Bill Impact for Single Family Residential

Fiscal Year 2016-17

Residential 3/4" Off-Peak

Monthly Water Use (Cu. Ft.)	Current (2015)						New Structure						Monthly Bill Increase	
	Service Charge	Tier 1	Tier 2	Tier 3	Tier 4	Total Bill	Customer Charge	Service Charge	Tier 1	Tier 2	Tier 3	Tier 4		Total Bill
		\$0.0243	\$0.0299	\$0.0400	\$0.0517				\$0.0246	\$0.0307	\$0.0415	\$0.0537		
<i>Block Threshold (Cu. Ft.)</i>		300	1,000	2,500					300	1,000	2,500			
Zero	\$23.50					\$23.50	\$11.74	\$13.75					\$25.48	\$1.98
200	\$23.50	\$4.86				\$28.36	\$11.74	\$13.75	\$4.91				\$30.39	\$2.03
400	\$23.50	\$7.29	\$2.99	<i>winter average</i>		\$33.78	\$11.74	\$13.75	\$7.37	\$3.07			\$35.92	\$2.14
600	\$23.50	\$7.29	\$8.97			\$39.76	\$11.74	\$13.75	\$7.37	\$9.21			\$42.06	\$2.30
800	\$23.50	\$7.29	\$14.95			\$45.74	\$11.74	\$13.75	\$7.37	\$15.36			\$48.21	\$2.47
1,000	\$23.50	\$7.29	\$20.93	<i>summer average</i>		\$51.72	\$11.74	\$13.75	\$7.37	\$21.50			\$54.35	\$2.63
1,200	\$23.50	\$7.29	\$20.93	\$8.00		\$59.72	\$11.74	\$13.75	\$7.37	\$21.50	\$8.29		\$62.64	\$2.92
1,400	\$23.50	\$7.29	\$20.93	\$16.00		\$67.72	\$11.74	\$13.75	\$7.37	\$21.50	\$16.58		\$70.93	\$3.21
1,600	\$23.50	\$7.29	\$20.93	\$24.00		\$75.72	\$11.74	\$13.75	\$7.37	\$21.50	\$24.88		\$79.23	\$3.51
1,800	\$23.50	\$7.29	\$20.93	\$32.00		\$83.72	\$11.74	\$13.75	\$7.37	\$21.50	\$33.17		\$87.52	\$3.80
2,000	\$23.50	\$7.29	\$20.93	\$40.00		\$91.72	\$11.74	\$13.75	\$7.37	\$21.50	\$41.46		\$95.81	\$4.09
2,200	\$23.50	\$7.29	\$20.93	\$48.00		\$99.72	\$11.74	\$13.75	\$7.37	\$21.50	\$49.75		\$104.10	\$4.38
2,400	\$23.50	\$7.29	\$20.93	\$56.00		\$107.72	\$11.74	\$13.75	\$7.37	\$21.50	\$58.04		\$112.39	\$4.67
2,600	\$23.50	\$7.29	\$20.93	\$60.00	\$5.17	\$116.89	\$11.74	\$13.75	\$7.37	\$21.50	\$62.19	\$5.37	\$121.91	\$5.02
2,800	\$23.50	\$7.29	\$20.93	\$60.00	\$15.51	\$127.23	\$11.74	\$13.75	\$7.37	\$21.50	\$62.19	\$16.12	\$132.66	\$5.43
3,000	\$23.50	\$7.29	\$20.93	\$60.00	\$25.85	\$137.57	\$11.74	\$13.75	\$7.37	\$21.50	\$62.19	\$26.87	\$143.41	\$5.84

Source: HEC.

impact res

Table A-34

City of Ashland Water Rate Study

Bill Impact for 3/4" Commercial Customer

Fiscal Year 2016-17

Commercial 3/4"

Monthly	Current (2015)				New Structure				Monthly Bill
	Service Charge	Tier 1	Tier 2	Total Bill	Customer Charge	Service Charge	Tier 1	Tier 2	
		\$0.0343	\$0.0353				\$0.0307	\$0.0415	
<i>Block Threshold (Cu. Ft.)</i>		<i>50,000</i>					<i>2,500</i>		
Zero	\$23.50			\$23.50	\$11.74	\$13.75			\$25.48
200	\$23.50	\$6.86		\$30.36	\$11.74	\$13.75	\$6.14		\$31.62
400	\$23.50	\$13.72		\$37.22	\$11.74	\$13.75	\$12.28		\$37.77
600	\$23.50	\$20.58		\$44.08	\$11.74	\$13.75	\$18.43		\$43.91
800	\$23.50	\$27.44		\$50.94	\$11.74	\$13.75	\$24.57		\$50.05
1000	\$23.50	\$34.30	<i>winter avg.</i>	\$57.80	\$11.74	\$13.75	\$30.71		\$56.19
1200	\$23.50	\$41.16		\$64.66	\$11.74	\$13.75	\$36.85		\$62.33
1400	\$23.50	\$48.02		\$71.52	\$11.74	\$13.75	\$43.00		\$68.48
1600	\$23.50	\$54.88		\$78.38	\$11.74	\$13.75	\$49.14		\$74.62
1800	\$23.50	\$61.74		\$85.24	\$11.74	\$13.75	\$55.28		\$80.76
2000	\$23.50	\$68.60		\$92.10	\$11.74	\$13.75	\$61.42		\$86.90
2200	\$23.50	\$75.46	<i>summer avg.</i>	\$98.96	\$11.74	\$13.75	\$67.56		\$93.05
2400	\$23.50	\$82.32		\$105.82	\$11.74	\$13.75	\$73.71		\$99.19
2600	\$23.50	\$89.18		\$112.68	\$11.74	\$13.75	\$76.78	\$4.15	\$106.40
2800	\$23.50	\$96.04		\$119.54	\$11.74	\$13.75	\$76.78	\$12.44	\$114.70
3000	\$23.50	\$102.90		\$126.40	\$11.74	\$13.75	\$76.78	\$20.73	\$122.99

Source: HEC.

impact com3/4

Table A-35

City of Ashland Water Rate Study

Bill Impact for 1" Commercial Customer

Fiscal Year 2016-17

Commercial 1"

Monthly Water Use (Cu. Ft.)	Current (2015)				New Structure					Monthly Bill Increase (Decrease)
	Service Charge	Tier 1	Tier 2	Total Bill	Customer Charge	Service Charge	Tier 1	Tier 2	Total Bill	
		\$0.0343	\$0.0353				\$0.0307	\$0.0415		
<i>Block Threshold (Cu. Ft.)</i>		<i>50,000</i>					<i>2,500</i>			
Zero	\$46.99			\$46.99	\$11.74	\$14.34			\$26.07	(\$20.92)
400	\$46.99	\$13.72		\$60.71	\$11.74	\$14.34	\$12.28		\$38.36	(\$22.35)
800	\$46.99	\$27.44	<i>winter avg.</i>	\$74.43	\$11.74	\$14.34	\$24.57		\$50.64	(\$23.79)
1200	\$46.99	\$41.16		\$88.15	\$11.74	\$14.34	\$36.85		\$62.92	(\$25.23)
1600	\$46.99	\$54.88		\$101.87	\$11.74	\$14.34	\$49.14		\$75.21	(\$26.66)
2000	\$46.99	\$68.60	<i>summer avg.</i>	\$115.59	\$11.74	\$14.34	\$61.42		\$87.49	(\$28.10)
2400	\$46.99	\$82.32		\$129.31	\$11.74	\$14.34	\$73.71		\$99.78	(\$29.53)
2800	\$46.99	\$96.04		\$143.03	\$11.74	\$14.34	\$76.78	\$12.44	\$115.29	(\$27.74)
3200	\$46.99	\$109.76		\$156.75	\$11.74	\$14.34	\$76.78	\$29.02	\$131.87	(\$24.88)
3600	\$46.99	\$123.48		\$170.47	\$11.74	\$14.34	\$76.78	\$45.61	\$148.45	(\$22.02)
4000	\$46.99	\$137.20		\$184.19	\$11.74	\$14.34	\$76.78	\$62.19	\$165.04	(\$19.15)
4400	\$46.99	\$150.92		\$197.91	\$11.74	\$14.34	\$76.78	\$78.77	\$181.62	(\$16.29)
4800	\$46.99	\$164.64		\$211.63	\$11.74	\$14.34	\$76.78	\$95.36	\$198.21	(\$13.42)
5200	\$46.99	\$178.36		\$225.35	\$11.74	\$14.34	\$76.78	\$111.94	\$214.79	(\$10.56)
5600	\$46.99	\$192.08		\$239.07	\$11.74	\$14.34	\$76.78	\$128.53	\$231.37	(\$7.70)
6000	\$46.99	\$205.80		\$252.79	\$11.74	\$14.34	\$76.78	\$145.11	\$247.96	(\$4.83)

Source: HEC.

impact.com1

Table A-36

City of Ashland Water Rate Study

Bill Impact for 2" Commercial Customer

Fiscal Year 2016-17

Commercial 2"

Monthly Water Use (Cu. Ft.)	Current (2015)				New Structure				Monthly Bill Increase (Decrease)	
	Service Charge	Tier 1	Tier 2	Total Bill	Customer Charge	Service Charge	Tier 1	Tier 2		Total Bill
		\$0.0343	\$0.0353				\$0.0307	\$0.0415		
<i>Block Threshold (Cu. Ft.)</i>		<i>50,000</i>					<i>15,000</i>			
Zero	\$88.24			\$88.24	\$11.74	\$104.27			\$116.01	\$27.77
1200	\$88.24	\$41.16		\$129.40	\$11.74	\$104.27	\$36.85		\$152.86	\$23.46
2400	\$88.24	\$82.32		\$170.56	\$11.74	\$104.27	\$73.71		\$189.71	\$19.15
3600	\$88.24	\$123.48		\$211.72	\$11.74	\$104.27	\$110.56		\$226.57	\$14.85
4800	\$88.24	\$164.64		\$252.88	\$11.74	\$104.27	\$147.41		\$263.42	\$10.54
6000	\$88.24	\$205.80		\$294.04	\$11.74	\$104.27	\$184.27		\$300.27	\$6.23
7200	\$88.24	\$246.96		\$335.20	\$11.74	\$104.27	\$221.12		\$337.12	\$1.92
8400	\$88.24	\$288.12	<i>winter avg.</i>	\$376.36	\$11.74	\$104.27	\$257.97		\$373.98	(\$2.38)
9600	\$88.24	\$329.28		\$417.52	\$11.74	\$104.27	\$294.83		\$410.83	(\$6.69)
10800	\$88.24	\$370.44		\$458.68	\$11.74	\$104.27	\$331.68		\$447.68	(\$11.00)
12000	\$88.24	\$411.60		\$499.84	\$11.74	\$104.27	\$368.53		\$484.54	(\$15.30)
13200	\$88.24	\$452.76		\$541.00	\$11.74	\$104.27	\$405.38		\$521.39	(\$19.61)
14400	\$88.24	\$493.92	<i>summer avg.</i>	\$582.16	\$11.74	\$104.27	\$442.24		\$558.24	(\$23.92)
15600	\$88.24	\$535.08		\$623.32	\$11.74	\$104.27	\$460.66	\$24.88	\$601.55	(\$21.77)
16800	\$88.24	\$576.24		\$664.48	\$11.74	\$104.27	\$460.66	\$74.63	\$651.30	(\$13.18)
18000	\$88.24	\$617.40		\$705.64	\$11.74	\$104.27	\$460.66	\$124.38	\$701.05	(\$4.59)

Source: HEC.

impact.com2

Table A-37

City of Ashland Water Rate Study

Bill Impact for 4" Commercial Customer

Fiscal Year 2016-17

Commercial 4"

Monthly Water Use (Cu. Ft.)	Current (2015)				New Structure					Monthly Bill Increase (Decrease)
	Service Charge	Tier 1	Tier 2	Total Bill	Customer Charge	Service Charge	Tier 1	Tier 2	Total Bill	
		\$0.0343	\$0.0353				\$0.0307	\$0.0415		
<i>Block Threshold (Cu. Ft.)</i>		<i>50,000</i>					<i>15,000</i>			
Zero	\$282.07			\$282.07	\$11.74	\$331.60			\$343.34	\$61.27
2000	\$282.07	\$68.60		\$350.67	\$11.74	\$331.60	\$61.42		\$404.76	\$54.09
4000	\$282.07	\$137.20		\$419.27	\$11.74	\$331.60	\$122.84		\$466.18	\$46.91
6000	\$282.07	\$205.80		\$487.87	\$11.74	\$331.60	\$184.27		\$527.61	\$39.74
8000	\$282.07	\$274.40	<i>winter avg.</i>	\$556.47	\$11.74	\$331.60	\$245.69		\$589.03	\$32.56
10000	\$282.07	\$343.00		\$625.07	\$11.74	\$331.60	\$307.11		\$650.45	\$25.38
12000	\$282.07	\$411.60		\$693.67	\$11.74	\$331.60	\$368.53		\$711.87	\$18.20
14000	\$282.07	\$480.20	<i>summer avg.</i>	\$762.27	\$11.74	\$331.60	\$429.95		\$773.29	\$11.02
16000	\$282.07	\$548.80		\$830.87	\$11.74	\$331.60	\$460.66	\$41.46	\$845.46	\$14.59
18000	\$282.07	\$617.40		\$899.47	\$11.74	\$331.60	\$460.66	\$124.38	\$928.38	\$28.91
20000	\$282.07	\$686.00		\$968.07	\$11.74	\$331.60	\$460.66	\$207.30	\$1,011.30	\$43.23
22000	\$282.07	\$754.60		\$1,036.67	\$11.74	\$331.60	\$460.66	\$290.22	\$1,094.22	\$57.55
24000	\$282.07	\$823.20		\$1,105.27	\$11.74	\$331.60	\$460.66	\$373.14	\$1,177.14	\$71.87
26000	\$282.07	\$891.80		\$1,173.87	\$11.74	\$331.60	\$460.66	\$456.06	\$1,260.06	\$86.19
28000	\$282.07	\$960.40		\$1,242.47	\$11.74	\$331.60	\$460.66	\$538.98	\$1,342.98	\$100.51
30000	\$282.07	\$1,029.00		\$1,311.07	\$11.74	\$331.60	\$460.66	\$621.90	\$1,425.90	\$114.83

Source: HEC.

impact com4

Table A-38
City of Ashland Water Rate Study
Bill Impact for 2" Institutional Customer

Fiscal Year 2016-17

Institutional 2"

Monthly Water Use (Cu. Ft.)	Current (2015)				New Structure				Monthly Bill Increase (Decrease)
	Service Charge	Tier 1	Tier 2	Total Bill	Customer Charge	Service Charge	Tier 1	Total Bill	
		\$0.0343	\$0.0353				\$0.0294		
<i>Block Threshold (Cu. Ft.)</i>		50,000					<i>n.a.</i>		
Zero	\$88.24			\$88.24	\$11.74	\$104.27		\$116.01	\$27.77
1500	\$88.24	\$51.45		\$139.69	\$11.74	\$104.27	\$44.08	\$160.08	\$20.39
3000	\$88.24	\$102.90		\$191.14	\$11.74	\$104.27	\$88.15	\$204.16	\$13.02
4500	\$88.24	\$154.35	<i>winter avg.</i>	\$242.59	\$11.74	\$104.27	\$132.23	\$248.24	\$5.65
6000	\$88.24	\$205.80	<i>summer avg.</i>	\$294.04	\$11.74	\$104.27	\$176.31	\$292.31	(\$1.73)
7500	\$88.24	\$257.25		\$345.49	\$11.74	\$104.27	\$220.39	\$336.39	(\$9.10)
9000	\$88.24	\$308.70		\$396.94	\$11.74	\$104.27	\$264.46	\$380.47	(\$16.47)
10500	\$88.24	\$360.15		\$448.39	\$11.74	\$104.27	\$308.54	\$424.55	(\$23.84)
12000	\$88.24	\$411.60		\$499.84	\$11.74	\$104.27	\$352.62	\$468.62	(\$31.22)
13500	\$88.24	\$463.05		\$551.29	\$11.74	\$104.27	\$396.69	\$512.70	(\$38.59)
15000	\$88.24	\$514.50		\$602.74	\$11.74	\$104.27	\$440.77	\$556.78	(\$45.96)
16500	\$88.24	\$565.95		\$654.19	\$11.74	\$104.27	\$484.85	\$600.85	(\$53.34)
18000	\$88.24	\$617.40		\$705.64	\$11.74	\$104.27	\$528.92	\$644.93	(\$60.71)
19500	\$88.24	\$668.85		\$757.09	\$11.74	\$104.27	\$573.00	\$689.01	(\$68.08)
21000	\$88.24	\$720.30		\$808.54	\$11.74	\$104.27	\$617.08	\$733.08	(\$75.46)
22500	\$88.24	\$771.75		\$859.99	\$11.74	\$104.27	\$661.16	\$777.16	(\$82.83)

Source: HEC.

impact inst2

Table A-39
City of Ashland Water Rate Study
Bill Impact for 4" Institutional Customer

Fiscal Year 2016-17

Institutional 4"

Monthly Water Use (Cu. Ft.)	Current (2015)				New Structure				Monthly Bill Increase (Decrease)
	Service Charge	Tier 1	Tier 2	Total Bill	Customer Charge	Service Charge	Tier 1	Total Bill	
		\$0.0343	\$0.0353				\$0.0294		
<i>Block Threshold (Cu. Ft.)</i>		<i>50,000</i>					<i>n.a.</i>		
Zero	\$282.07			\$282.07	\$11.74	\$331.60		\$343.34	\$61.27
2500	\$282.07	\$85.75		\$367.82	\$11.74	\$331.60	\$73.46	\$416.80	\$48.98
5000	\$282.07	\$171.50	<i>winter avg.</i>	\$453.57	\$11.74	\$331.60	\$146.92	\$490.26	\$36.69
7500	\$282.07	\$257.25	<i>summer avg.</i>	\$539.32	\$11.74	\$331.60	\$220.39	\$563.73	\$24.41
10000	\$282.07	\$343.00		\$625.07	\$11.74	\$331.60	\$293.85	\$637.19	\$12.12
12500	\$282.07	\$428.75		\$710.82	\$11.74	\$331.60	\$367.31	\$710.65	(\$0.17)
15000	\$282.07	\$514.50		\$796.57	\$11.74	\$331.60	\$440.77	\$784.11	(\$12.46)
17500	\$282.07	\$600.25		\$882.32	\$11.74	\$331.60	\$514.23	\$857.57	(\$24.75)
20000	\$282.07	\$686.00		\$968.07	\$11.74	\$331.60	\$587.69	\$931.03	(\$37.04)
22500	\$282.07	\$771.75		\$1,053.82	\$11.74	\$331.60	\$661.16	\$1,004.50	(\$49.32)
25000	\$282.07	\$857.50		\$1,139.57	\$11.74	\$331.60	\$734.62	\$1,077.96	(\$61.61)
27500	\$282.07	\$943.25		\$1,225.32	\$11.74	\$331.60	\$808.08	\$1,151.42	(\$73.90)
30000	\$282.07	\$1,029.00		\$1,311.07	\$11.74	\$331.60	\$881.54	\$1,224.88	(\$86.19)
32500	\$282.07	\$1,114.75		\$1,396.82	\$11.74	\$331.60	\$955.00	\$1,298.34	(\$98.48)
35000	\$282.07	\$1,200.50		\$1,482.57	\$11.74	\$331.60	\$1,028.46	\$1,371.80	(\$110.77)
37500	\$282.07	\$1,286.25		\$1,568.32	\$11.74	\$331.60	\$1,101.93	\$1,445.27	(\$123.05)

Source: HEC.

impact inst4

Table A-40

City of Ashland Water Rate Study

Bill Impact for Potable Water Irrigation Customer On Peak

Fiscal Year 2016-17

Irrigation On-Peak 3/4"

Monthly Water Use (Cu. Ft.)	Current (2015)				New Structure				Monthly Bill Increase (Decrease)
	Service Charge	Tier 1	Tier 2	Total Bill	Customer Charge	Service Charge	Tier 1	Total Bill	
		\$0.0343	\$0.0353				\$0.0449		
<i>Block Threshold (Cu. Ft.)</i>		50,000					<i>n.a.</i>		
Zero	\$23.50			\$23.50	\$11.74	\$13.75		\$25.48	\$1.98
800	\$23.50	\$27.44		\$50.94	\$11.74	\$13.75	\$35.90	\$61.38	\$10.44
1600	\$23.50	\$54.88		\$78.38	\$11.74	\$13.75	\$71.80	\$97.28	\$18.90
2400	\$23.50	\$82.32		\$105.82	\$11.74	\$13.75	\$107.71	\$133.19	\$27.37
3200	\$23.50	\$109.76		\$133.26	\$11.74	\$13.75	\$143.61	\$169.09	\$35.83
4000	\$23.50	\$137.20		\$160.70	\$11.74	\$13.75	\$179.51	\$204.99	\$44.29
4800	\$23.50	\$164.64		\$188.14	\$11.74	\$13.75	\$215.41	\$240.89	\$52.75
5600	\$23.50	\$192.08		\$215.58	\$11.74	\$13.75	\$251.31	\$276.79	\$61.21
6400	\$23.50	\$219.52		\$243.02	\$11.74	\$13.75	\$287.22	\$312.70	\$69.68
7200	\$23.50	\$246.96		\$270.46	\$11.74	\$13.75	\$323.12	\$348.60	\$78.14
8000	\$23.50	\$274.40		\$297.90	\$11.74	\$13.75	\$359.02	\$384.50	\$86.60
8800	\$23.50	\$301.84	<i>summer avg.</i>	\$325.34	\$11.74	\$13.75	\$394.92	\$420.40	\$95.06
9600	\$23.50	\$329.28		\$352.78	\$11.74	\$13.75	\$430.82	\$456.30	\$103.52
10400	\$23.50	\$356.72		\$380.22	\$11.74	\$13.75	\$466.73	\$492.21	\$111.99
11200	\$23.50	\$384.16		\$407.66	\$11.74	\$13.75	\$502.63	\$528.11	\$120.45
12000	\$23.50	\$411.60		\$435.10	\$11.74	\$13.75	\$538.53	\$564.01	\$128.91

Source: HEC.

impact irr on

Table A-41

City of Ashland Water Rate Study

Bill Impact for Potable Water Irrigation Customer Off Peak

Fiscal Year 2016-17

Irrigation Off Peak 3/4"

Monthly Water Use (Cu. Ft.)	Current (2015)				New Structure				Monthly Bill Increase (Decrease)
	Service Charge	Tier 1	Tier 2	Total Bill	Customer Charge	Service Charge	Tier 1	Total Bill	
		\$0.0343	\$0.0353				\$0.0331		
<i>Block Threshold (Cu. Ft.)</i>		50,000					<i>n.a.</i>		
Zero	\$0.00			\$0.00	\$11.74	\$13.75		\$25.48	\$25.48
200	\$23.50	\$6.86		\$30.36	\$11.74	\$13.75	\$6.61	\$32.09	\$1.73
400	\$23.50	\$13.72		\$37.22	\$11.74	\$13.75	\$13.22	\$38.70	\$1.48
600	\$23.50	\$20.58	<i>winter avg.</i>	\$44.08	\$11.74	\$13.75	\$19.83	\$45.31	\$1.23
800	\$23.50	\$27.44		\$50.94	\$11.74	\$13.75	\$26.44	\$51.92	\$0.98
1000	\$23.50	\$34.30		\$57.80	\$11.74	\$13.75	\$33.05	\$58.53	\$0.73
1200	\$23.50	\$41.16		\$64.66	\$11.74	\$13.75	\$39.66	\$65.14	\$0.48
1400	\$23.50	\$48.02		\$71.52	\$11.74	\$13.75	\$46.27	\$71.75	\$0.23
1600	\$23.50	\$54.88		\$78.38	\$11.74	\$13.75	\$52.88	\$78.36	(\$0.02)
1800	\$23.50	\$61.74		\$85.24	\$11.74	\$13.75	\$59.49	\$84.97	(\$0.27)
2000	\$23.50	\$68.60		\$92.10	\$11.74	\$13.75	\$66.10	\$91.59	(\$0.51)
2200	\$23.50	\$75.46		\$98.96	\$11.74	\$13.75	\$72.71	\$98.20	(\$0.76)
2400	\$23.50	\$82.32		\$105.82	\$11.74	\$13.75	\$79.32	\$104.81	(\$1.01)
2600	\$23.50	\$89.18		\$112.68	\$11.74	\$13.75	\$85.94	\$111.42	(\$1.26)
2800	\$23.50	\$96.04		\$119.54	\$11.74	\$13.75	\$92.55	\$118.03	(\$1.51)
3000	\$23.50	\$102.90		\$126.40	\$11.74	\$13.75	\$99.16	\$124.64	(\$1.76)

Source: HEC.

impact irr off