



Cheesman, 1899



Roberts Tunnel, 1957



Conduit 7 & 8, 1917

# 2013 COST-OF-SERVICE STUDY FINAL REPORT



Strontia Springs, Today



Dillon Reservoir, Today



Gross Reservoir, Today

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# 1. Executive summary

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## 1.1 Introduction

Denver Water conducts an annual cost-of-service water rate study to equitably determine the costs to provide service to customers. The study includes:

- Development of the financial plan
- A cost-of-service analysis to determine the cost to provide service to customer classes
- Design of 2013 water rates

## 1.2 Public process

The adoption of rates is part of a multi-step public process. The public process includes at least three presentations to the Board along with presentations to various stakeholder groups. All of these meetings are open to the public<sup>1</sup>. The 2013 water rates public process included the following meetings with the Board of Water Commissioners and other stakeholders.

### 10-year financial plan presentations:

- **July 25, 2012.** Presentation to the Board of Water Commissioners.
- **August 16, 2012.** Presentation to the Denver Water Citizen's Advisory Committee.
- **August 21, 2012.** Presentation to the Distributors Forum

### 2013 water rates presentations:

- **September 12, 2012.** Presentation to the Board of Water Commissions.
- **September 18, 2012.** Presentation to the Distributors Forum.
- **September 20, 2012.** Presentation to the Denver Water Citizen's Advisory Committee.
- **September 26, 2012** Presentation for adoption to the Board of Water Commissioners.  
This Board action item is included in Appendix A at the end of this report.

## 1.3 Cost-of-service rate model methodology change

In May 2012, the Board adopted a new cost-of-service methodology for determining water rates. The previous methodology incorporated an investor-owned utility approach to determine outside city revenue requirements and a cash basis approach to determine inside city revenue requirements. The new methodology uses a cash based approach for both inside and outside city customers. The new methodology was designed to achieve the following objectives:

- Compliance with the City Charter, Distributor contracts, and case law
- Transparency
- Predictability
- Equitable distribution of costs

The new methodology follows the industry-accepted principles of cost-of-service rate making endorsed by the American Water Works Association (AWWA). Appendix A contains the adopted resolution with a discussion of the new methodology.

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<sup>1</sup> The public may provide comments through written communication or by attending any Board meeting.

# 1. Executive summary

## 1.4 Study findings

### 1.4.1 Revenue adjustment for 2013

Rate revenue should be sufficient to meet annual revenue requirements, cover debt service, and maintain adequate reserves. Revenue requirements include operation and maintenance expense, payments on existing and proposed debt service, and rate-funded capital projects. To meet these requirements, a rate revenue adjustment of 2.5% was adopted for 2013. This adjustment becomes effective January 1, 2013 and will produce approximately \$6.5 million in additional revenues to meet annual revenue requirements.

### 1.4.2 Adopted 2013 rates

The adopted rates are designed to recover the rate revenue needed to meet 2013's revenue requirements. 2013 rates retain the existing two-part structure, a monthly service charge regardless of meter size or customer class, and a volume charge that varies by customer class. Table 1-1 summarizes adopted rates for the residential and nonresidential water customer classes. The full adopted schedules are in Appendix A.

Table 1-1 2013 Adopted Rates					
Customer Class	Inside City	Outside City Read & Bill	Outside City Total Service	OCSA <sup>1</sup>	Master Meter <sup>2</sup>
<b>Service Charge, \$ per bill</b>	\$6.33	\$6.33	\$6.33	\$6.33	\$6.33
<b>Volume Charge, \$ per 1,000 gallons</b>					
<b>Single Family Residential</b>					
Block 1 (0 to 11,000 gallons)	\$2.59	\$2.61	\$2.93		
Block 2 (12 to 30,000 gallons)	5.18	5.22	5.86		
Block 3 (30 to 40,000 gallons)	7.77	7.83	8.79		
Block 4 (over 40,000 gallons)	10.36	10.44	11.72		
<b>Small Multifamily</b>					
Block 1 (0 to 15,000 gallons) <sup>3</sup>	\$2.83	\$3.30	\$3.99		
Block 2 (over 15,000 gallons)	3.40	3.96	4.79		
<b>All Other (Nonresidential)</b>					
Winter	\$1.78	\$2.26	\$2.54		
Summer	3.57	4.52	5.08		
<b>Irrigation Only</b>					
Winter	\$1.20	\$1.29	\$1.47		
Summer	4.81	5.15	5.88		
Raw	\$0.50	\$0.91	\$0.91	\$1.04	
Recycled	\$0.99			\$1.11	
Master Meter				\$4.25	\$3.81
1. Outside the combined service area 2. Master Meter customers are outside-city 3. Applies to two dwelling units. Threshold increases by 6,000 for each additional unit up to 5 units.					



### 2.1 Introduction

Denver Water provides service to approximately 1.3 million people in the Denver-metro area and is governed by a five-member Board appointed by the mayor of Denver. The utility’s mission is as follows:

*“Denver Water will be a responsible steward of the resources, assets and natural environments entrusted to us in order to provide a high quality water supply, a resilient and reliable system, and excellent customer service.”*

Denver Water’s service history predates Colorado statehood. The Denver City Water Company, a privately-held organization, was formed in 1870. A series of other water companies formed, merged and sometimes failed until 1894 when the Denver Union Water Company was formed to purchase the two surviving companies. In November 1918, Denver’s citizens approved the establishment of the Denver Board of Water Commissioners and purchase of the Denver Union Water Company to create Denver Water.

Denver Water is a public agency funded by water rates, system development charges, hydropower sales, and other miscellaneous revenues. Denver Water receives no tax revenue from city, state, or federal entities. Denver Water operates from the city’s water works fund, which ensures the separation between the city and Denver Water. The city government has no access to the water works fund and Denver Water has no access to the city’s general fund. Both funds are accounted for by the city auditor.

### 2.2 Governance

Article X of the Denver City Charter defines the creation, governance, and operation of Denver Water. Section 10.1.7 of Article X establishes a water works fund separate from the City and County of Denver’s general fund. This provision allows the city and Denver Water to operate independently of each other. The following charter excerpts details the rate-setting authority of Denver Water.

#### 2.2.1 Section 10.1.9 – water rates

This section outlines the rate-setting authority for all retail customers within the City and County of Denver.

*“The Board shall fix rates for which water shall be furnished for all purposes within the City and County of Denver, and rates shall be as low as good service will permit. Rates may be sufficient to pay for operation, maintenance, reserves, debt service, additions, extensions, betterments, including those reasonably required for the anticipated growth of the Denver Metropolitan area . . .”*

### 2.2.2 Section 10.1.12 – city government rates

This section defines cost recovered through rates charged to the City and County of Denver municipal customers. City and County of Denver accounts include city parks, zoo, museum, and municipal buildings, such as the courthouse and City Hall. This provision explicitly requires City and County municipal rates exclude capital-related charges.

*“... the Board shall furnish water to the municipal government of the City and County of Denver at rates which shall approximately equal but not exceed the cost of the water furnished, not including items in such rate for debt service, additions, extensions or betterments. Such rate shall not be applicable to agencies or authorities sponsored by or supported by the City and County . . . The Board shall furnish water out of the City Ditch or some equivalent source for the use of Denver in City Park and Washington Park, without any charge whatsoever.”*

In addition to the reduced-rate cost basis, City and County of Denver is not assessed system development charges (SDC) for new development.

### 2.2.3 Section 10.1.13 – water leases (outside-city rates)

This section outlines costs to be recovered from customers outside the City and County of Denver. This section requires that inside-city customers be fully reimbursed for the cost to provide service plus an additional amount as determined by the Board. The additional amount above the full cost serves as an offset to inside-city costs.

*“The Board shall have power to lease water and water rights for use outside the territorial limits of the City and County of Denver . . . Every such lease shall contain terms to secure payment of sufficient money to fully reimburse the people of Denver for the cost of furnishing the water together with an additional amount to be determined by the Board . . .*

## 2.3 Water system

Denver Water’s service area encompasses approximately 343 square miles and serves about 1.3 million people. This service area includes the City and County of Denver and a number of municipalities and special water districts immediately outside the city’s boundaries.

Denver Water owns and operates the entire utility system’s infrastructure, from mountain reservoirs to the treated water distribution system. This infrastructure is valued at more than \$1.3 billion. The list below provides statistical information on major infrastructure facilities for the utility<sup>2</sup>:

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<sup>2</sup> Taken from the Denver Water 2011 Comprehensive Annual Financial Report, Statistics Section and [www.denverwater.org](http://www.denverwater.org)

- 15 storage reservoirs with a total capacity of 691,966 acre-feet
- 77.5 miles of mountain collection system conduits and 47.7 miles of raw water supply mains
- 17 pump stations with a pumping capacity of 1,003.3 million gallons per day
- Three treatment plants (Foothills, Marston and Moffat) with a total capacity of 715 million gallons per day. One recycled water treatment plant with a total capacity of 30 million gallons per day
- 3,041 miles of treated water distribution system mains

### 2.3.1 Source of supply

Denver Water's primary source of supply is surface water from the central Rocky Mountains. The watersheds cover more than 3,100 square miles on the state's East and West Slope of the Rocky Mountains as illustrated in Figure 3-1. Source of supply water is provided through three collection systems in the Rocky Mountains. These are:

- South Platte
- Robert's Tunnel
- Northern

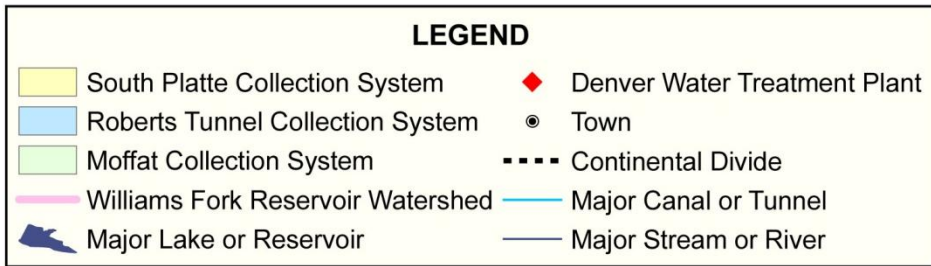
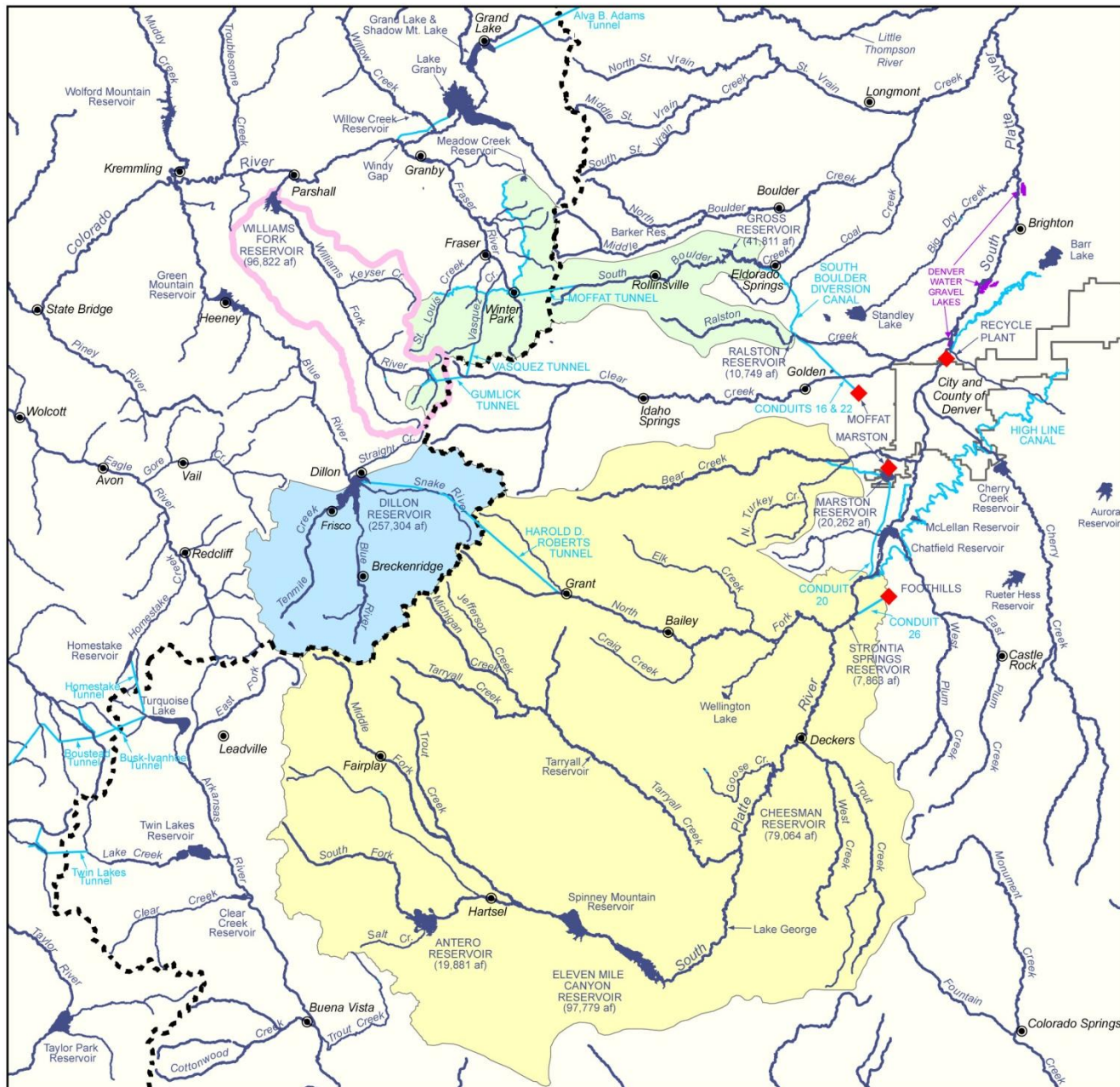
The South Platte Collection System includes Antero, Eleven Mile, Cheesman, and Strontia Springs reservoirs. The South Platte Collection System provides approximately 42% of Denver Water's supply. The Robert's Tunnel Collection System transports water from Dillon Reservoir through the Continental Divide and drains into the North Fork of the South Platte River. The Robert's Tunnel collection system supplies approximately 27% of Denver Water's supply. The Northern Collection System delivers water from the Williams Fork and Fraser rivers and provides approximately 31% of Denver Water's supply. The Northern Collection System relies on an integrated system of tunnels to transport the water to the Gross and Ralston reservoirs.

### 2.3.2 Treatment and distribution

The Foothills and Marston treatment plants treat water from the South Platte Collection System. The Moffat Treatment Plant treats water from the Northern Collection System, which includes Ralston Reservoir. Denver Water's total treatment plant capacity is 715 million gallons a day. Treated water is delivered through the treated water distribution system, which consists of approximately 3,041 miles of pipes, 23 clear water storage reservoirs, 17 pumping stations, and 19,553 fire hydrants. Denver Water also provides recycled water service to its customers. It is estimated the recycled water plant will eventually treat and distribute 30 million gallons of water per day.

## 2. Introduction

Figure 2-1  
Denver Water Collection System



### 2.4 Service area

Denver Water provides water service to customers inside the City and County of Denver as well as several water districts and municipalities located outside the City (referred to as “Distributors”).

Denver Water’s combined service area (CSA) consists of the City and County of Denver and the geographic areas of its suburban water distributors. Figure 2-2 on the following page illustrates the service area boundaries.

Denver Water provides service to 68 treated water distributors in the CSA and other individual contract customers outside the combined service area (OSCA). Distributors are classified as Read and Bill, Total Service, and Master Meter. The cost to provide service to these distributors varies based on their level of service requirement. Each distributor type is described below.

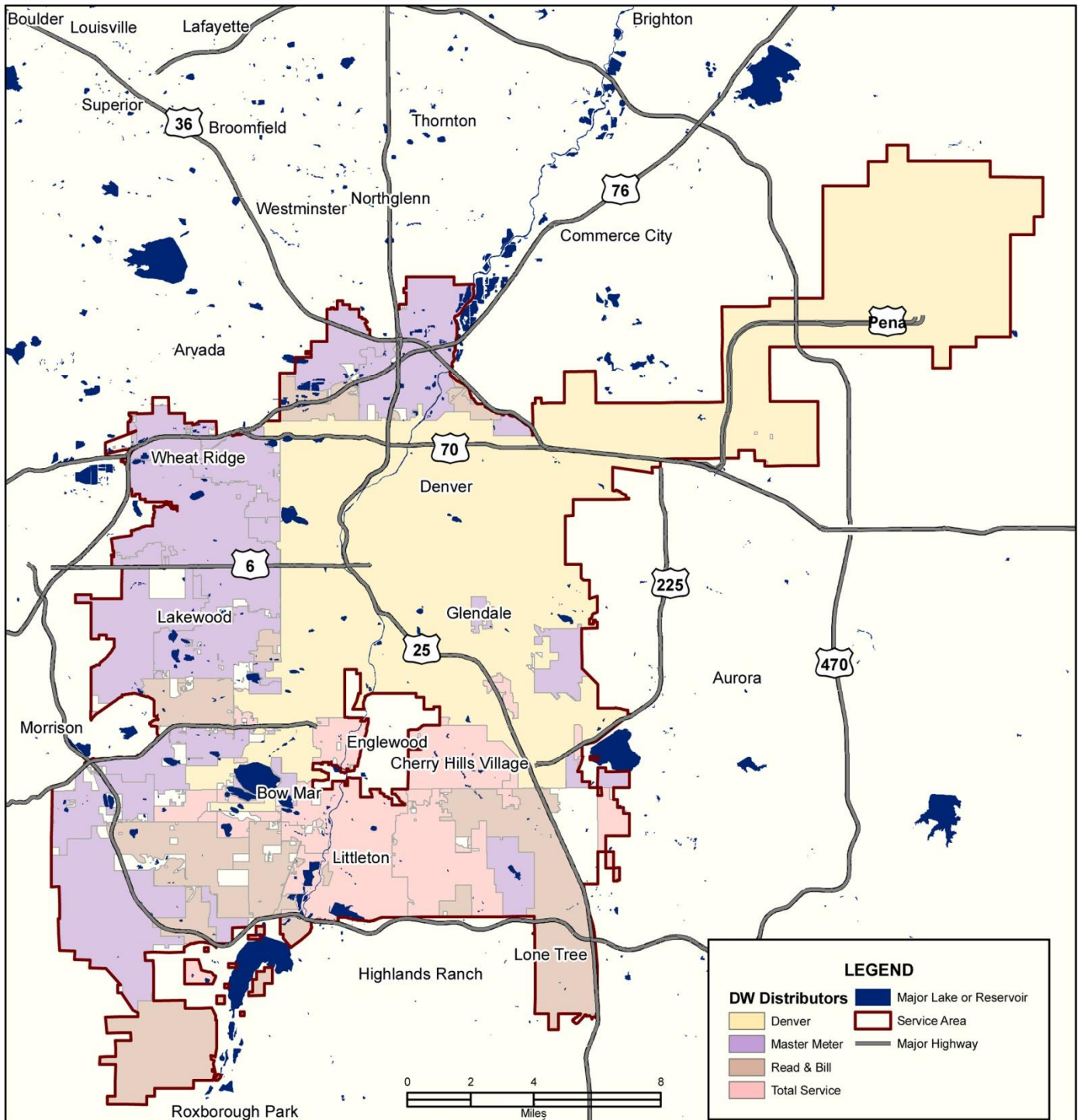
- **Master Meter.** Master Meter distributors purchase water on a wholesale basis from Denver Water and resell it to retail customers. Master Meter distributors own and operate the transmission and distribution systems in their service territories and are responsible for meter reading, billing, and customer service. Rates exclude local distribution costs, meter reading, billing and customer service costs for individual customers served by Master Meters. Denver Water serves 24 Master Meter distributors.
- **Read and Bill.** Read and Bill distributors own and operate the transmission and distribution systems within their service territories. Denver Water provides meter reading, billing, and customer service. Read and Bill rates exclude local distribution costs. Denver Water serves 15 Read and Bill distributors.
- **Total Service.** Denver Water provides full service to Total Service distributors. This includes operation of the local distribution system within their service territories as well as meter reading, billing, and customer service. Denver Water serves 29 Total Service distributors.

In addition to the water service provided within the CSA, Denver Water also sells water to OSCA customers through temporary, fixed-volume contracts. Treated, raw, and recycled water service is available in both the CSA and OSCA with one exception; recycled water is not currently available to outside-city customers within the CSA.

Approximately 55% of total water sold is to outside-city and OSCA customers. The remainder is sold to inside-city customers. Of that 55%, approximately 81% of outside-city water sales is attributed to treated water, 17% to raw water and 2% to recycled water. Of the total water sold to inside-city customers, approximately 97% is treated, 2% is raw, and 1% is recycled water.

## 2. Introduction

Figure 2-2  
Denver Water Service Area



### 2.5 Denver Water customer classes

Denver Water groups individual customers to classes based on similar usage characteristics. Revenue recovered through each customer classes' rates is commensurate with the cost to provide service. Cost responsibility is a function of customer rate class average and peak water demands relative to the demands of other customer rate classes, as well as billing, meter reading, and fire protection costs. Table 2-1 lists the customer classes served by location and type of service.

<b>Table 2-1 Denver Water Customer Classes</b>						
<b>Customer Rate Class</b>	<b>Inside City</b>		<b>Outside City</b>			
	<b>Retail<sup>1</sup></b>	<b>City/County</b>	<b>Read and Bill<sup>2</sup></b>	<b>Total Service<sup>3</sup></b>	<b>OCSA</b>	<b>Master Meter<sup>4</sup></b>
<b>Retail Treated Water</b>						
Single Family Residential	✓		✓	✓		
Single Family Irrigation-Only	✓		✓	✓		
Small Multifamily Residential	✓		✓	✓		
All Other (Nonresidential)	✓	✓	✓	✓		
Irrigation Only (Nonresidential)	✓	✓	✓	✓		
<b>Retail Nonpotable Water</b>						
Raw Water	✓	✓			✓	
Recycled Water	✓	✓			✓	
<b>Wholesale Treated Water</b>					✓	✓

1. *Inside City applies to customers inside the City and County of Denver.*  
 2. *Outside City Read and Bill applies to customers served by suburban Read and Bill distributor districts.*  
 3. *Outside City Total Service applies to customers served by suburban Total Service distributor districts.*  
 4. *Master Meter applies to customers served by suburban Master Meter distributor districts.*

## 2. Introduction

### 2.6 Historical rate structures

Denver Water's rate structures have varied by customer class over the years to reflect changing pricing and policy objectives. Table 2-2 provides a summary of Denver Water rate structure changes since 1958.

Table 2-2 Denver Water Historical Rate Structures by Customer Class									
Year	All Customers	Residential	Duplex	SFR	SFR Irrigation	Small MF	All Other Retail	Other Irrigation	Irrigation Only
1957-58	DB (8)								
1959-79	DB (5)								
1980-89	DB (4)								
1990-94		IB (2)					DB (2)		
1995		IB (2)	IB (2)				UB		
1996-98				IB (2)		IB (2)	UB		
1999-05				IB (3)		IB (2)	Seasonal		
2006				IB (4)		IB (2)	Seasonal		
2007				IB (4)	Seasonal	IB (2)	Seasonal		
2008				IB (4)	Seasonal	IB (2)	Seasonal	Seasonal	
2009				IB (4)	Seasonal	IB (2)	Seasonal	Seasonal	
2010				IB (4)		IB (2)	Seasonal		Seasonal
<i>DB: Declining Block</i> <i>IB: Increasing Block</i> <i>UB: Uniform Block</i> <i>(#): Number of Blocks</i>									



### 3.1 Introduction

Denver Water operates from a self-supporting water works fund. Denver Water financial activities are independent of the City and County of Denver as stated in Article X of the City and County Charter. Funding for annual operations and maintenance expenses, capital projects, and debt service is met primarily through water rates, system development charges, participation fees, other miscellaneous revenue, and non-operating revenue. Appendix B contains the cash flow tables referenced in this chapter.

### 3.2 Cash flow fund analysis

The cash flow fund tracks activities associated with funding annual expenditures through rate revenue, bond proceeds, and other income.

#### 3.3.1 Sources of funds

##### 3.3.1.1 Operating revenue

Operating revenues consist of water sales, hydropower, reimbursement and grants, interest income and other miscellaneous revenue. Projected water sales are based on a detailed analysis of Denver Water's historical utility billing records in 2010 and 2011. This data is used to project revenue under existing rates by customer class, considering the projected number of accounts and projected water usage. Total water sales are projected to be 77.2 billion gallons in 2013, which will generate \$261.8 million in water sales under current 2012 rates. Growth in the number of accounts is projected at less than 0.5% for 2013. Hydropower revenue and special assessment average \$4.2 million and \$5.0 million annually. Other miscellaneous revenue averages approximately \$11.1 million annually. Interest income of 2% is applied to the average annual fund balance.

##### 3.3.1.2 Other sources

Other income sources include annual SDC revenue, participation fees, land sales, bond proceeds, and transfers from the specifically designated reserve fund for water rights mitigation. The reserve fund contains money recovered from rate payers for O&M and capital expenditures budgeted in the prior years but not spent. These expenditures have been carried over into the 2013 budget and will be funded through the reserve transfer. SDC revenue is based on an annual growth rate of approximately 0.5% and is projected to be approximately \$10 million for 2013. A bond issue of \$25.6 million is projected in 2013 to assist in funding expansion capital projects.

#### 3.3.2 Uses of funds

##### 3.3.2.1 Operation and maintenance expense

The operating fund revenue requirements include operation and maintenance expense, payments on existing and proposed debt service, and capital expenditures on expansion, repair and replacement projects, and equipment. Operation and maintenance expenses consist of personnel,

## 3. Financial plan

materials, and supplies to treat, distribute, and maintain the water system continuously. A portion of operations and maintenance indirect expenses are transferred to capital funds and are capitalized along with the completion of projects. Indirect operations and maintenance expenses include general and administrative costs associated with maintenance; employee benefits, prorated leaves, vehicles and equipment. Indirect expense total \$14.6 million for 2013. Payments on existing and proposed debt service total \$46.8 million for 2013. This average annual payment is net of Build America Bond Subsidies received from the federal government. The Build American Bond Subsidy is approximately \$2.3 million in 2013.

### 3.3.2.2 Capital expenditures

Capital expenditures include expansion, repair and replacement projects and other general equipment purchases. Expansion project costs total \$42.2 million for 2013; repair and replacement projects and general equipment total \$74.0 million for 2013. Table 3-1 summarizes projects by category.

<b>Table 3-1 2013 Capital Projects by Category</b>		
<b>Description</b>	<b>Amount (\$ thousands)</b>	<b>Percent of Total</b>
Source of supply	\$33,256	22%
Recycled	\$2,421	4%
Treatment	15,522	16%
Pumping and storage	22,370	18%
Transmission and distribution	29,329	30%
Miscellaneous general plant	<u>13,289</u>	<u>9%</u>
<b>Total 2013 capital projects</b>	<b>\$116,186</b>	<b>100%</b>

## 3.6 Target reserve requirements

Denver Water follows a financial management strategy designed to maintain smooth and predictable annual revenue increases to meet annual revenue requirements. Denver Water uses cash reserves and adjusts bond proceeds to assist with minimizing annual revenue increases. Denver Water strives to maintain a minimum reserve allowance as part of its financial strategy. The annual reserve requirement components are listed in Table 3-2 along with their 2013 requirements.

<b>Table 3-2 2013 Target Reserve Calculation</b>	
<b>Description</b>	<b>Amount (\$ thousands)</b>
Legally restricted-Debt reserve	\$32,856
90 days O&M expense	46,975
2% of fixed assets	50,780
Insurance reserve	10,000
Other	<u>4,777</u>
<b>Total 2013 Reserve Requirements</b>	<b>\$145,388</b>

### 3.7 Debt service coverage requirements

Denver Water maintains the stand-alone revenue bond rating of AA or better. Denver Water uses the following debt guidelines to meet or exceed this rating:

- A debt ratio less than or equal to 40%.

$$\text{Debt Ratio} = \text{Total Debt} \div (\text{Net Fixed Assets} + \text{Net Working Capital})$$

- Interest coverage equal to or greater than 2.5x.

$$\text{Interest Coverage} = \text{Net Revenues} \div (\text{Interest Requirements}-\text{SDC})$$

- Debt service coverage, as defined in the Master Bond Resolution should be equal to or greater than 2.2x. The minimum requirement stated is 1.2x

$$\text{Debt Service Coverage} = \text{Net Revenues} \div \text{Annual Debt Service}$$

- Year-end balance in the Water Works Fund, net of principal and interest should be equal to or greater than \$5 million.

### 3.8 Indicated revenue adjustments

Revenue should be sufficient to meet annual revenue requirements, bond covenants, and target reserves. To meet these requirements, a revenue adjustment of 2.5% is required in 2013. This adjustment will produce an additional \$6.5 million in rate revenue. Table 3-3 summarizes the 2013 financial performance metrics. Denver Water reviews, updates and adopts the budget and revenue increases on an annual basis.

<b>Table 3-3</b>					
<b>2013 Revenue Adjustment and Financial Performance Measures</b>					
Year	Annual Increase	Debt Ratio	Debt Service Coverage	Interest Coverage	Ratio of Target Reserves Met
2013	2.5%	22.2%	5.35	1.22x	1.21x

### 4.1 Introduction

In order to develop equitable water rates, Denver Water uses the industry-accepted cost-of-service principles to allocate costs to customer classes. Cost allocations recognize class usage, peak rates of demand, number of customers, and fire protection requirements. Denver Water's annual cost-of-service rate study uses the industry standard methodologies supported by the American Water Works Association M1 Manual<sup>3</sup>. A test year of 2013, the period in which resultant rates are effective, was selected for the cost-of-service study. Appendix C contains the supporting tables referenced in this chapter.

### 4.2 Cost-of-service process

The cost-of-service process is a method to assign costs based on each customer classes' proportionate share of water demands and number of customers to the total system customers and water demands. Because each customer classes' size and demands vary, the line item cost details in the revenue requirement must be classified based on those characteristics in order to allocate costs equitably. The cost-of-service analysis consists of the following eight steps:

1. Determine annual revenue requirement
2. Determine additional amount
3. Allocate costs to functions
4. Allocate costs to cost pools
5. Allocate costs to cost components
6. Determine system units of service
7. Determine customer class units of service
8. Distribute costs to customer classes

### 4.3 2013 revenue requirement

Expenditures for 2013 total \$343.2 million. Expenditures include annual operation and maintenance expenses, capital projects, and payments on existing and proposed debt service. Of that \$343.2 million, \$57.9 million are expenditures recovered through non-rate revenue sources consisting of system development charges, participation, bond proceeds and changes in reserves. The net of these costs, including an offset of miscellaneous operating revenue of \$17.0 million, represent the 2013 revenue requirement or revenue recovered from rates. The cost allocation process discussed in this chapter provides a means of assigning the revenue requirement between inside- and outside-city customer classes. The costs assigned to each customer class are then used to develop 2013 rates. Table 4-1 summarizes the 2013 revenue required from rates.

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<sup>3</sup> Woodcock, C.P.N., et al. Principles of Water Rates, Fees, and Charges: Manual of Water Supply Practices, M1. (2001). American Water Works Association: Denver, CO.

## 4. Cost of service

Table 4-1 2013 Revenue Requirement Summary			
Item	Total Expenditures	Non-rate Expenditures	Revenue Requirement
<b>Expenditures</b>			
Operation and maintenance expense	\$180.3	\$0	\$180.3
Capital costs	116.2	\$57.9	58.3
Debt service	<u>46.8</u>	<u>0</u>	<u>46.8</u>
<b>Total expenditures</b>	<b>\$343.2</b>	<b>\$57.9</b>	<b>\$238.6</b>
<b>Non-rate revenue adjustment</b>			
SDC and participation fees	(\$10.6)	(\$10.6)	\$0
2013 bond issue	(25.6)	(25.6)	0
Miscellaneous revenue	(17.0)	0	(\$17.0)
Specifically held project reserve	(4.1)	(4.1)	0
Operating reserves	<u>(17.6)</u>	<u>(17.6)</u>	<u>0</u>
<b>Non-rate revenue adjustment</b>	<b>(\$74.9)</b>	<b>(\$57.9)</b>	<b>(\$17.0)</b>
<b>Net revenue requirement</b>	<b>\$268.4</b>	<b>\$0</b>	<b>\$268.4</b>

### 4.4 Additional amount

Section 10.1.13 of the City and County Charter requires Denver Water to recover the full cost of providing water service to outside-city customers plus an additional amount to be determined by the Board. The Board of Water Commissioners adopted a method to calculate an additional amount that is based on a return on investment approach common with municipal and private utilities. The additional amount calculation consists of two components; the outside-city rate base and an equity risk premium derived from Denver Water's weighted average cost of capital or rate of return. The product of the rate base and the equity risk premium is the additional amount. Because the rate base and the rate of return do not vary significantly from year-to-year, this method for determining the additional amount will assist with rate stability for inside- and outside-city customers.

#### 4.4.1 Outside-city rate base

The outside-city rate base includes the original cost of existing assets less contributions and participation, and accumulated depreciation. Capital projects anticipated to be in service during the test year are included as part of the rate base. Assets for outside-city are based on the cost pool analysis discussion in Section 4.6. For joint-related assets, approximately 72.5% of costs are allocated to the outside-city rate base. This is based on Denver Water's 2002 long-term demand forecast between inside- and outside-city customers. The percentage allocated to outside-city will decrease over time. The 2013 outside-city rate base totals \$563,569.

## 4. Cost of service

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### 4.4.2 Equity risk premium

The equity risk premium is based on Denver Water's weighted average cost of capital (WACC). The WACC consists of the weighted amount of debt and equity that has been used to fund the utility's rate base. There are costs associated with using debt and using equity to fund capital. The cost of debt is the interest rate on outstanding debt. The cost of equity represents the return required by an investor for the opportunity costs of investing in the rate base. Whereas the cost of debt can be estimated from financial statements, the cost of equity is more difficult. Because Denver Water is not publically traded, the cost of equity analysis used is based on comparable companies in the utility industry. The cost of equity from these comparable companies was calculated using a discounted cash flow (DCF) analysis as well as the capital asset pricing model (CAPM). The rate of return is summarized below in Table 4-2:

Table 4-2 Weighted Average Cost of Capital				
Item	Amount (\$ million)	Ratio	Cost	Weighted Cost
Equity Capital	\$821	66.50%	8.74%	5.81%
Debt Capital	\$414	33.50%	4.00%	1.34%
<b>Total</b>	<b>\$1,235</b>	<b>100.0%</b>		<b>7.15%</b>
Less: Cost of debt				4.00%
<i>Equity risk premium for additional amount</i>				3.15%

The equity risk premium is the net of the rate of return less the cost of debt. This recognizes that the cost of debt for outside-city customers is already reflected in their revenue requirement (i.e. their portion of interest expense).

### 4.4.3 Additional amount calculation

The additional amount is the product of the equity risk premium and the rate base.

$$3.15\% \text{ equity risk premium} \times \$563,569 \text{ rate base} = \$17,768$$

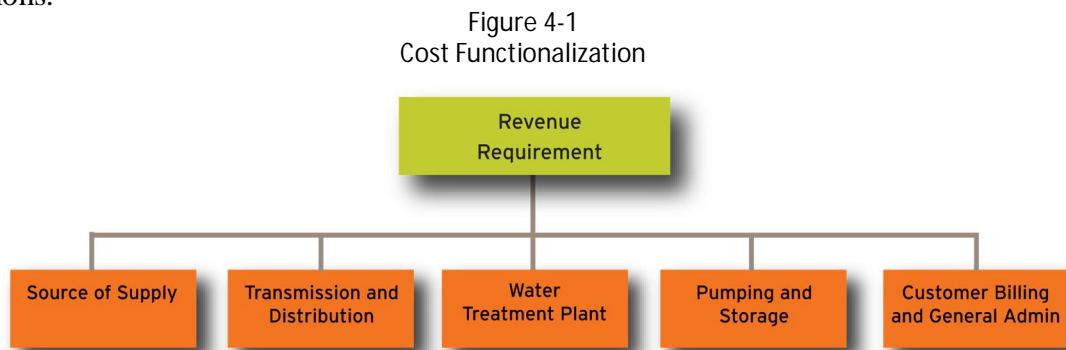
This amount is added to the outside-city revenue requirement and subtracted from the inside-city revenue requirement. The total utility revenue requirement remains unchanged at \$268.4 million.

### 4.5 Cost functionalization

The revenue requirement, or the annual costs to operate, maintain and expand the water system can be allocated to the facilities used to provide water service. For purposes of the cost-of-service analysis, costs are allocated into the following functional areas:

- Source of supply
- Treatment
- Pumping
- Storage
- Transmission and distribution
- Customer accounts
- General and administrative

Each of these functional categories contains specific facilities associated with that function. Costs can be further allocated to specific facilities to assist in the cost allocation process. For example, the storage functional component consists of the costs associated with the Capitol Hill, Green Mountain, and Bellevue storage facilities. Figure 4-1 illustrates the allocation of costs to functions.



### 4.6 Cost pools

Cost pools identify costs that are shared by a group of customers. Denver Water cost pools separate costs based on facilities that serve all customer classes, customers within the City and County and Denver, and customers outside the city. Allocating the functionalized costs described in Section 4.5 to cost pools provides a means for equitably recovering facility costs from those who benefit. Table 4-3 describes Denver Water’s cost pools.

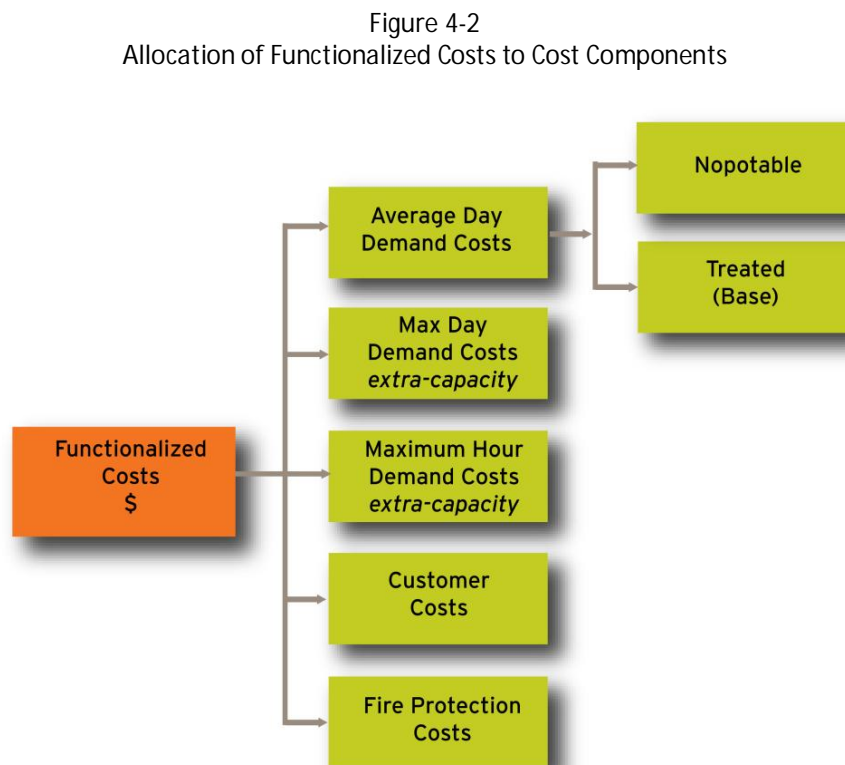
<b>Table 4-3 Denver Water Cost Pools</b>	
<b>Cost Pool</b>	<b>Revenue requirement cost Allocation</b>
Joint cost	Shared among all customer classes
Inside specific	Incurred by inside-city customer classes only
Outside specific	Incurred by all outside-city customer classes
Outside specific - total service	Incurred by outside-city total service customer classes only

For example, the cost of maintaining raw water supply reservoirs, such as the Gross and Antero reservoirs, benefits all customers. As such, all customer classes would share in the annual cost of these facilities based on their proportionate share of water usage characteristics. Costs associated with Capitol Hill storage facility serve and benefit only inside-city customers and as such, these costs are allocated to the specific inside-city cost pool. The Green Mountain and Bellview storage facilities benefit only outside-city customers, these costs are allocated to outside-city customers. In a similar manner, transmission and distribution mains outside the City and County of Denver benefit only specific outside-city customers. Costs associated with these facilities are allocated to the specific outside-city cost pool.

### 4.7 Cost component allocation

#### 4.7.1 Cost components

Once costs have been separated by function and by cost pool, they can be further allocated to cost components. Allocating to cost components provides a means of assigning costs based on the design and functional parameters that predominately influences the amount of that cost. Cost components include the annual water usage (base and nonpotable), peak rates of demand, number of customers, and fire protection requirements. Figure 4-2 illustrates the allocation of functionalized costs to cost components.





The cost components are described below:

- Base and nonpotable costs vary directly with the quantity of water sold under average day load conditions.
- Extra-capacity costs represent those costs incurred due to customer peak demands for water in excess of average day demand. Extra-capacity associated with maximum day demands represents usage in excess of average day demand.
- Extra-capacity costs associated with maximum hour demands represent usage in excess of maximum day.
- Customer costs vary based on the number of connections, meters served by them and billing expenses.
- Direct fire protection costs consist of maintenance of private fire lines. For the purposes of this report, direct fire protection costs, are included in the max day and max hour cost components.
- Indirect costs (not shown in Figure 4-2) include administrative overhead and are allocated in proportion to all other cost components.

For example, the Capital Hill, Green Mountain, and Belleview storage facilities are designed to meet maximum hour demand requirements. These facilities are part of the storage cost pool and their costs are allocated to the base, maximum day, and maximum hour cost components.

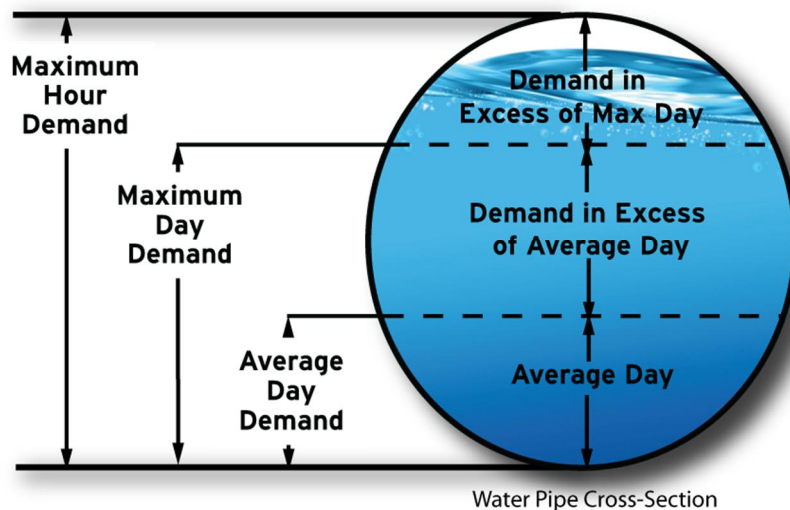
### 4.7.2 Allocation demand factors

Allocation demand factors determine the percent of costs that are allocated to the water demands cost components. Allocation factors for the customer component and the fire protection component are typically directly allocated. Allocation factors are based on the total water system demand profile as well as individual customer class demand profiles.

The allocation of each functionalized cost to cost components is based on the system demand factors or by direct assignment. Facilities are operated and designed to function together with other facilities to meet the overall demand requirements of the system. The capacities of water facilities are designed to meet coincidental demands of all classes because all customers do not exert their maximum demand for water at the same time. Coincidental peak demand represents the peak demand in the system at a particular point in time.

For every facility on the system, there is an underlying average demand, or uniform rate of usage, exerted coincidentally by customers for which the average day cost component applies. Certain facilities are operated and designed to meet the demand above the average day demand or maximum day extra-capacity demand. Costs associated with those facilities are allocated to both the average day and maximum day cost components. In a similar manner, other facilities are designed to meet demands in excess of maximum day requirements or maximum hour extra-capacity. Costs associated with these facilities are allocated to the average day, maximum day, and maximum hour cost components. Figure 4-3 represents the cross-section of a water pipe, which illustrates the relationship between average day, maximum day and maximum hour demands.

Figure 4-3  
Average and Peak Demand Relationships



The ratio of maximum day and average day demand is used to allocate costs between average day and maximum day cost components. A maximum day to average day ratio of 2.17 is used based on a four-year historical average. This indicates approximately 46% of the capacity of facilities designed and operated for maximum day demand is needed for average day demands use. Accordingly, the remaining 54% is for maximum day extra-capacity requirements.

A ratio of maximum hour to average day water use of 3.34 is based on demands experienced by Denver Water's system. This ratio indicates 30% of the capacity of facilities designed and operated for maximum hour demand is needed for average day demands, 35% is required to meet maximum day extra-capacity demand, and the remaining 35% is for maximum hour extra-capacity demand. These ratios are used to allocate the line item functionalized costs to cost components.

### 4.7.3 Allocation to cost components

Functionalized costs are allocated based on the system demand ratios described in Section 4.7.2 or by direct assignment. This separation of costs provides a means for distributing costs to customer classes based on their respective demand requirements (e.g. average day, maximum day, maximum hour, customer, etc.).

For example, storage reservoirs such as Gross and Antero are associated with storing raw water for delivery for the benefit of all customers. As such, these costs are allocated to the nonpotable cost component in the joint cost pool. In a similar manner, treatment plants are designed to meet average day and maximum day demands for all customers. Costs associated with the treatment

## 4. Cost of service

plants are allocated 46% to the average day cost component and 54% to the maximum day extra-capacity cost component in the joint cost pool.

Distribution-related expenses are designed to meet average day, maximum day, and maximum hour demands. Therefore, 30% of costs are allocated to the average day cost component, 35% of costs are allocated to the maximum day extra-capacity cost component, and 35% of costs are allocated to the maximum hour extra-capacity cost component. For example, distribution main costs associated with serving the Denver International Airport are allocated to the average day, maximum day, and maximum hour cost components in the specific inside-city cost pool.

Other revenue requirements can be directly assigned to a specific cost component. Billing and administrative costs such as meter reading are allocated directly to the billing cost component. Indirect expenditures not specifically assigned are allocated in proportion to all other operations and maintenance cost components. Table 4-4 summarizes cost component categories by cost pool.

Table 4-4 Denver Water Cost Pool Cost Components				
Cost Components	Joint Costs	Inside Specific	Outside Specific	Outside Specific Total Service
Base	✓	✓	✓	✓
Maximum day	✓	✓	✓	✓
Maximum hour	✓	✓	✓	✓
Billing	✓	✓	✓	✓
Customer service	✓	✓	✓	✓
Fire	✓	✓	✓	
Indirect	✓			

### 4.8 System units of service

System units of service are based on the test year's projected water demands and customer data. The sum of each customer classes' usage characteristics equals the system demands for each usage characteristic. For example, the sum of all customer classes' average day demand equals the system's total average day demand. In a similar manner, the sum of all customer class bills equals the total number of system bills. These system units of service are used to calculate the unit cost of service.

### 4.9 Unit cost of service

Unit costs of service are calculated for each customer usage characteristics within each cost pool. The unit cost of service equals the total cost for each cost component (average day, maximum day, maximum hour, etc.) divided by system units of service for each cost component. Unit costs are calculated for each cost pool (e.g. joint, inside specific, etc.). For example, joint unit costs for

## 4. Cost of service

the base component equals total joint average day costs divided by joint system average day units. Table 4-5 lists each cost component's unit cost measurement.

Table 4-5 Unit Costs of Service	
Characteristic	Measurement
Average day demand <sup>1</sup>	
Nonpotable	\$ per average nonpotable daily use in 1,000 gallons
Base	\$ per average treated daily use in 1,000 gallons
Maximum day demand	\$ per demand in excess of the average day demand in gpd
Maximum hour demand	\$ per demand in excess of the maximum day demand in gpd
Customer	\$ per account
Billing	\$ per bill
Fire protection	\$ per demand in excess of the average day demand in gpd \$ per demand in excess of the maximum day demand in gpd
<i>(1) Denver Water separates average day demand into two components; nonpotable and base. Nonpotable measures average day water use for nonpotable water. Base measures average day water use for treated water.</i>	

### 4.10 Allocation of costs to customer classes

The revenue requirements allocated to cost functions, cost pools, and cost components can be distributed to each customer class based on their respective customer usage characteristics discussed in Section 4.7.

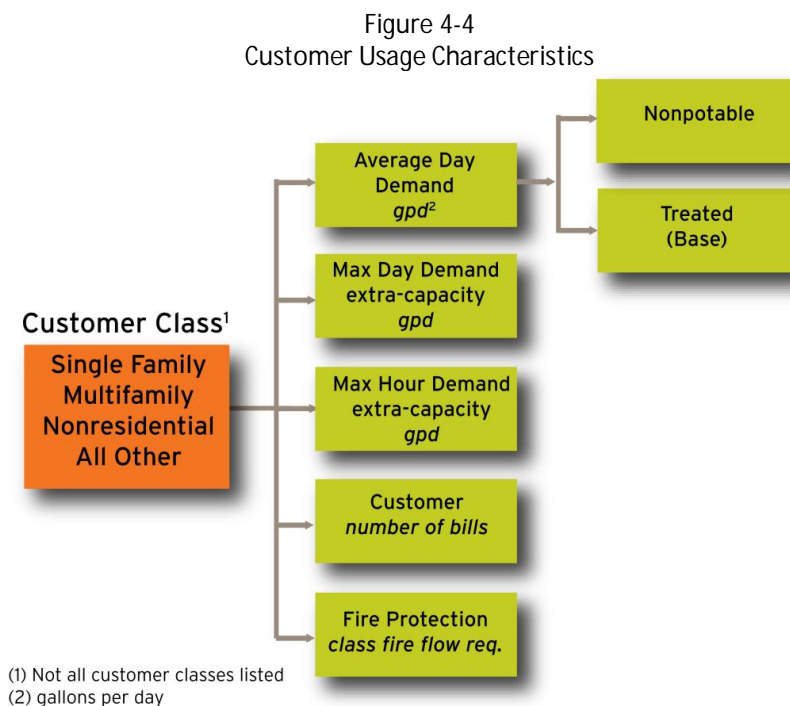
#### 4.10.1 Customer class units of service

Customers of a water utility are often identified according to customer class. Each customer class has unique water demand and usage characteristics. Because cost-of-service is based on the concept of proportionality, customer service characteristics for each customer class must be analyzed to allocate the system revenue requirements equitably. Table 4-6 lists these characteristics.

Table 4-6 Customer Class Characteristics	
Characteristics	Measurement
Average day demand <sup>1</sup>	Average day use in 1,000 gallons
Maximum day demand	Demand in excess of the average day demand in gallons per day <sup>2</sup> (maximum day demand less average day demand)
Maximum hour demand	Demand in excess of the max day demand in gallons per day (maximum hour demand less maximum day demand)
Customer	Number of accounts
Billing	Number of bills
Fire protection	Based on proportionate class usage characteristics
<i>(1) Denver Water separates average day demand into two components; nonpotable and base. Nonpotable measures average day water use for nonpotable water. Base measures average day water use for treated water.</i>	
<i>(2) Gallons per day</i>	

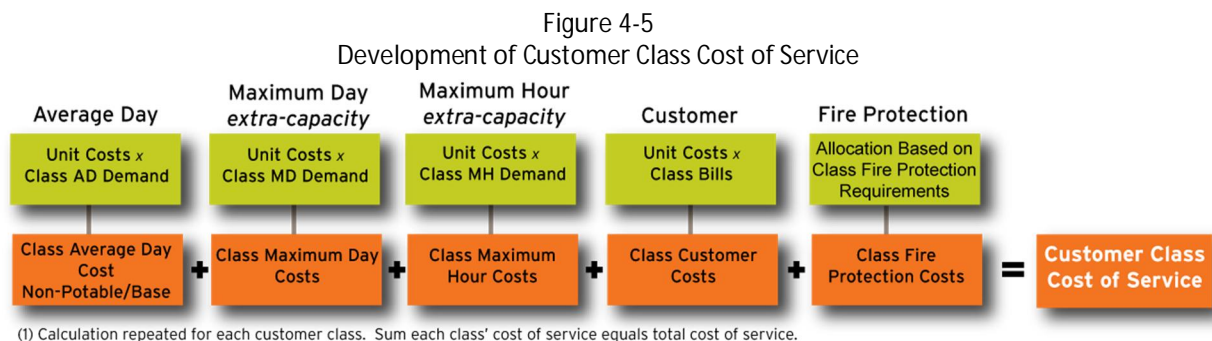
## 4. Cost of service

The average day cost responsibility of each customer class is related to the quantity of water used by each class under average day load conditions. The responsibility for extra-capacity costs varies with extra-capacity requirements for maximum day and maximum hour demands of each class. Average day usage and capacity factors, representing the estimated relationship between individual class peak demand and average day usage, are used to develop extra-capacity requirements for maximum day and maximum hour demands. The estimated capacity factors are based on an analysis of monthly usage characteristics for each customer class. These calculated average day, maximum day, and maximum hour demands are used to allocate the functionalized cost-of-service discussed above to each customer class. Figure 4-4 illustrates the customer characteristics allocation.



### 4.10.2 Customer class cost-of-service

The customer class cost of service is the sum of the unit costs for each cost component discussed in Section 4.9 times the customer class usage characteristics for each cost component. Figure 4-5 illustrates the calculation of the customer class cost of service.



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## 5.1 Introduction

The principle concern in establishing water rate schedules is to design rates reasonably commensurate with the cost of providing water service. Denver Water designed rate schedules by grouping customers into classes with similar usage characteristics. Practicality further dictates the use of a rate schedule that is simple to apply, reasonably recovers costs from all classes, and is subject to as few misinterpretations as possible.

*The Principles of Utility Rates*<sup>4</sup> and the AWWA M1 manual establish basic rate-making principles for water rate design. Denver Water combines these principles and utility-specific objectives to address community values and policy requirements when setting rates.

- **Revenue sufficiency** – Rates sufficient to meet annual revenue requirements
- **Predictability** – Minimize unexpected changes to revenues or rates
- **Ease of administration** – Compatible with utility billing processes
- **Easy to understand** – Understandable by customers and subject to proper interpretation
- **Defensibility** – Compliant with industry-standard guidelines and free from controversy
- **Equity** – Distribution of costs without arbitrariness or capriciousness
- **Conservation** – Promotes the efficient and effective use of water through technology, changes in consumer behavior and pricing signals

## 5.2 Water rates

### 5.1.1 Existing rates

Existing rates have been in effect since January 2012. The existing rate structure consists of a monthly service charge, which is uniform for all customer classes regardless of customer class, location, or meter size. A volume charge is assessed to customer classes for all water use. The volume charge structure varies by customer class. Table 5-1 details the volume rate structure for each customer class.

Table 5-1 Rate Structure Descriptions	
Rate Structure	Descriptions
Single Family Residential	Four-tiered increasing block
Multifamily	Two-tiered increasing block
All Other (Nonresidential)	Seasonal rate
Irrigation Only	Seasonal rate
Other classes	Uniform

<sup>4</sup> Bonbright, James C., Danielsen, Albert L., Kamerschen, David R. (1988). *Principles of Public Utility Rates*. Arlington, Virginia: Public Utilities Reports, Inc.

## 5.1.2 Comparison of existing and adopted 2013 rates

Adopted rates retain the existing rate structure. These rates are designed to generate the level of revenue sufficient to meet the 2013 revenue requirements. Tables 5-2 compares 2012 current rates with adopted 2013 rates. Appendix A contains the 2013 published rate schedules.

<b>Table 5-2</b>		
<b>Comparison of 2012 Rates with 2013 Adopted Rates</b>		
<b>Description</b>	<b>Existing 2012</b>	<b>Adopted 2013</b>
<b>Service Charge, \$ per bill</b>	\$6.33	\$6.33
<b>Volume Charge, \$ per 1,000 gallons</b>		
<b>Single Family Residential</b>		
<b>Inside City</b>		
Block 1 (0 to 11,000 gallons)	\$2.54	\$2.59
Block 2 (12 to 30,000 gallons)	5.09	5.18
Block 3 (30 to 40,000 gallons)	7.63	7.77
Block 4 (over 40,000 gallons)	10.17	10.36
<b>Read &amp; Bill</b>		
Block 1 (0 to 11,000 gallons)	\$2.49	\$2.61
Block 2 (12 to 30,000 gallons)	4.98	5.22
Block 3 (30 to 40,000 gallons)	7.47	7.83
Block 4 (over 40,000 gallons)	9.96	10.44
<b>Total Service</b>		
Block 1 (0 to 11,000 gallons)	\$2.85	\$2.93
Block 2 (12 to 30,000 gallons)	5.70	5.86
Block 3 (30 to 40,000 gallons)	8.55	8.79
Block 4 (over 40,000 gallons)	11.39	11.72
<b>Small Multifamily<sup>(1)</sup></b>		
<b>Inside City</b>		
Block 1 (0 to 15,000 gallons)	\$2.82	\$2.83
Block 2 (over 15,000 gallons)	3.38	3.40
<b>Read &amp; Bill</b>		
Block 1 (0 to 15,000 gallons)	\$3.21	\$3.30
Block 2 (over 15,000 gallons)	3.85	3.96
<b>Total Service</b>		
Block 1 (0 to 15,000 gallons)	\$3.84	\$3.99
Block 2 (over 15,000 gallons)	4.61	4.79
<b>All Other (Nonresidential)</b>		
<b>Inside City</b>		
Winter	\$1.78	\$1.78
Summer	3.57	3.57
<b>Read &amp; Bill</b>		
Winter	\$2.20	\$2.26
Summer	4.41	4.52
<b>Total Service</b>		
Winter	\$2.44	\$2.54
Summer	4.87	5.08
<i>(1) Applies to two dwelling units. Threshold increases by 6,000 for each additional unit up to 5 units.</i>		



<b>Table 5-2</b>		
<b>Comparison of 2012 Rates with 2013 Adopted Rates</b>		
<b>Description</b>	<b>Existing 2012</b>	<b>Adopted 2013</b>
<b>Irrigation Only</b>		
<b>Inside City</b>		
Winter	\$1.20	\$1.20
Summer	4.81	4.81
<b>Read and Bill</b>		
Winter	\$1.29	\$1.29
Summer	5.15	5.15
<b>Total Service</b>		
Winter	\$1.39	\$1.47
Summer	5.57	5.88
<b>All Other</b>		
Master Meter	\$3.64	\$3.81
Treated OCSA	\$4.05	\$4.25
<b>Raw Water</b>		
Inside City	\$0.50	\$0.50
Outside City	0.86	0.91
OCSA	1.01	1.04
<b>Recycled Water</b>		
Inside City	\$0.99	\$0.99
OCSA	1.11	1.11

### 5.3 Typical annual single family bills

A typical inside-city single family customer's annual bill will increase approximately \$5.89 per year based on annual consumption of 105,000 gallons.

A typical read & bill single family customer's annual bill will increase approximately \$21.60 per year based on annual consumption of 140,000 gallons.

A typical total service single family customer's annual bill will increase approximately \$15.76 per year based on annual consumption of 145,000 gallons.

Table 5-3 on the following page compares annual bills based on varying levels of consumption. The annual bill is based on a typical monthly usage distribution profile for a single family customer.

<b>Table 5-3</b>			
<b>Comparison of Annual Bills Under Existing and Adopted Rates</b>			
<b>Annual Usage Kgal</b>	<b>Existing 2012</b>	<b>Adopted 2013</b>	<b>Annual Change</b>
<b>Inside City</b>			
50	\$203	\$205	\$3
100	366	371	6
150	577	586	9
200	801	814	13
250	1,091	1,109	19
300	1,439	1,464	25
400	2,258	2,298	40
500	3,123	3,179	56
<b>Outside-city Read &amp; Bill</b>			
50	\$200	\$206	\$6
100	360	374	14
150	566	590	24
200	786	820	34
250	1,069	1,117	48
300	1,411	1,475	64
400	2,212	2,315	103
500	3,059	3,203	144
<b>Outside-city Total Service</b>			
50	\$218	\$222	\$4
100	401	410	9
150	637	653	16
200	888	911	23
250	1,213	1,245	32
300	1,603	1,646	43
400	2,521	2,590	69
500	3,489	3,586	97

#### 5.4 Typical monthly single family bills

Table 5-4 on the following page compares monthly bills for inside-city and outside-city customers at varying levels of consumption. Approximately 50% of monthly bills issued are for consumption 6,000 gallons and less.

## 5. Rates

<b>Table 5-4</b>			
<b>Comparison of Monthly Bills Under Existing and Adopted Rates</b>			
<b>Monthly Usage Kgal</b>	<b>Existing 2012</b>	<b>Adopted 2013</b>	<b>Bill Change</b>
<b>Inside City</b>			
0	\$6.33	\$6.33	\$0.00
1	8.87	8.92	0.05
2	11.41	11.51	0.10
3	13.95	14.10	0.15
4	16.49	16.69	0.20
5	19.03	19.28	0.25
10	31.73	32.23	0.50
15	54.63	55.54	0.91
20	80.08	81.44	1.36
30	130.98	133.24	2.26
50	308.98	314.54	5.56
<b>Outside City Read &amp; Bill</b>			
0	\$6.33	\$6.33	\$0.00
1	8.82	8.94	0.12
2	11.31	11.55	0.24
3	13.80	14.16	0.36
4	16.29	16.77	0.48
5	18.78	19.38	0.60
10	31.23	32.43	1.20
15	53.64	55.92	2.28
20	78.54	82.02	3.48
30	128.34	134.22	5.88
50	302.64	316.92	14.28
<b>Outside City Total Service</b>			
0	\$6.33	\$6.33	\$0.00
1	9.18	9.26	0.08
2	12.03	12.19	0.16
3	14.88	15.12	0.24
4	17.73	18.05	0.32
5	20.58	20.98	0.40
10	34.83	35.63	0.80
15	60.48	62.00	1.52
20	88.98	91.30	2.32
30	145.98	149.90	3.92
50	345.38	355.00	9.62

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**Appendix A**  
Board action items;  
2013 water rate schedules;  
rate model methodology resolution



**DENVER WATER**

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# DENVER BOARD OF WATER COMMISSIONERS

Meeting Date: September 26, 2012

Board Item: 2-B-2

## Proposed 2013 Revenue Requirements

Action by Consent

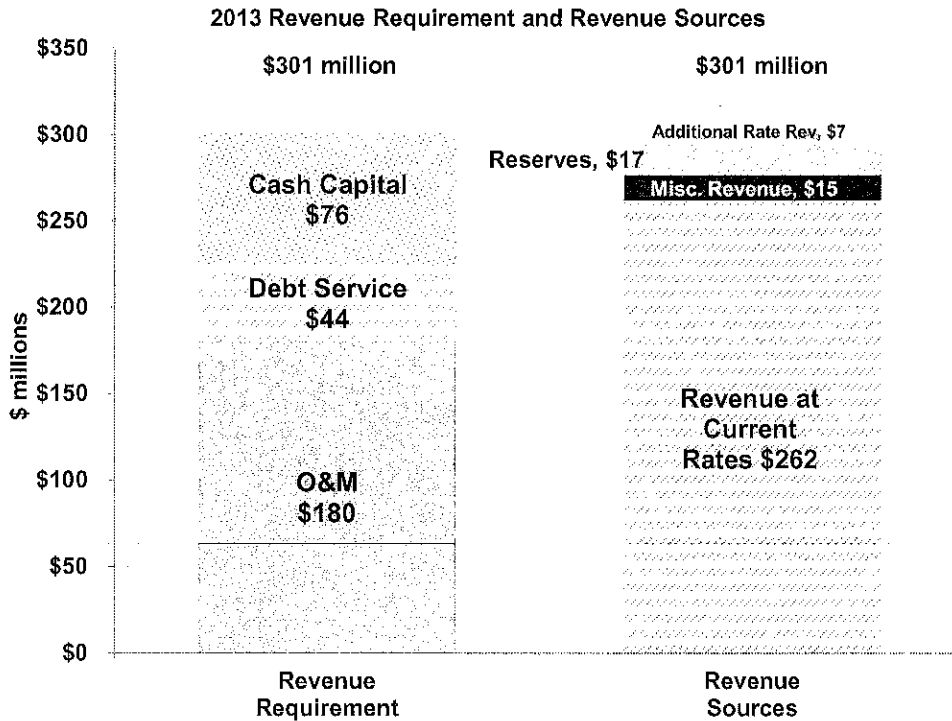
X Action

Information

This action item summarizes the revenue requirements and proposed rates for 2013. Staff recommends the proposed rate revenue adjustment of 2.5% for customers meters read on or after January 1, 2013.

### 2013 Revenue Requirements

Revenue requirements for 2013 total \$301 million and consist of operation and maintenance expenses, rate-funded expansion and repair and replacement capital, and debt service. These revenue requirements are met from rate revenue, miscellaneous revenue, and reserves. A revenue increase of 2.5% in 2013 is requested in order to meet these requirements. A 2.5% increase would generate approximately \$7 million additional revenue. The chart below summarizes the revenue requirements and revenue sources.



### 2013 Cost-of-Service Rates Discussion

The cost-of-service analysis developed for 2013 are based on the cash basis rate methodology. The Board adopted this methodology on May 23, 2012 following a year-long review process.

The 2013 revenue requirement is allocated to the various customer classes based on cost-causative rate making principles – i.e. those who cause the cost, pay the cost. These costs are allocated based on each customer classes’ usage characteristics and number of accounts in each class. Usage characteristics include customer class average day, peak day and peak hour demands as well as fire flow requirements. Changes in customer class usage characteristics have a direct effect on the cost required to serve them. Usage characteristics vary annually and as a result, the rates for customer classes may vary as well.

Recommendation:

It is recommended that the Board approve the 2013 Revenue Requirements and proposed rates.

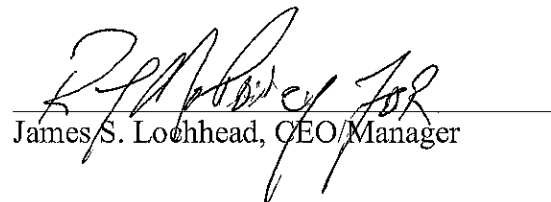
Respectfully submitted,

**Approvals:**



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Angela Bricmont, Director of Finance



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James S. Lochhead, CEO/Manager



**Denver Water**  
**Proposed Rate Schedule No. 1**  
**Inside City**  
**For Meters Read On or After January 1, 2013**

**A. Treated Water Consumption Charges**

<u>Single Family Residential</u>	<u>Monthly Consumption</u> <u>(Gallons)</u>	<u>Rate per</u> <u>1,000 Gallons</u>
Block 1	0,000 - 11,000	\$2.59
Block 2	12,000 - 30,000	\$5.18
Block 3	31,000-40,000	\$7.77
Block 4	Over 40,000	\$10.36

<u>Small Multi-Family (Duplex through</u> <u>Five-Plex with a Single Meter)</u>	<u>Monthly Consumption</u> <u>(Gallons)</u>	<u>Rate per</u> <u>1,000 Gallons</u>
Block 1	0 - 15,000	\$2.83
Block 2	Over 15,000	\$3.40

Applies to two dwelling units. Block threshold increases by 6,000 gallons per dwelling unit up to five (5) dwelling units.

<u>All Other (Non-Residential)</u>	<u>Monthly Consumption</u> <u>(Gallons)</u>	<u>Rate per</u> <u>1,000 Gallons</u>
Winter	All consumption	\$1.78
Summer	All consumption	\$3.57

Winter bills have billing periods ending on October 28 through April 30.  
 Summer bills have billing periods ending on May 1 through October 27.

<u>Irrigation-Only</u>	<u>Monthly Consumption</u> <u>(Gallons)</u>	<u>Rate per</u> <u>1,000 Gallons</u>
Winter	All consumption	\$1.20
Summer	All consumption	\$4.81

Applies to irrigation-only taps.  
 Winter bills have billing periods ending on October 28 through April 30.  
 Summer bills have billing periods ending on May 1 through October 27.

**B. Treated Water Fixed Charges**

<u>Service Charge (All Meter Sizes)</u>	<u>Monthly</u>
	\$6.33

**C. Private Fire Protection Charges**

<u>Sprinkler Systems and Standpipes</u>	
<u>Tap Size</u>	<u>Monthly</u>
1 Inch	\$3.78
2 Inch	\$6.31
4 Inch	\$9.75
6 Inch	\$13.92
8 Inch	\$24.36
10 Inch	\$34.80
12 Inch	\$55.68
16 Inch	\$139.20
 <u>Fire Hydrants</u>	 \$13.92

**D. Notes**

**Applicability:** Charges under this schedule are applicable to all licensees for treated water service or private fire protection service inside the limits of the City and County of Denver.

**Payment:** Bills are due and payable to Denver Water upon issuance. Monthly bills are delinquent 20 days after the billing date. Late charges will be assessed per Denver Water policy.

**Rates:** Charges for treated water service consist of a consumption charge and a fixed charge. Fire protection charges include only a fixed charge. The consumption charge is based upon the amount of water delivered during the billing period. The fixed charge applies to all accounts that are active at any time during the billing period.

**Denver Water**  
**Proposed Rate Schedule No. 2**  
**Outside City - Read and Bill**  
**For Meters Read On or After January 1, 2013**

**A. Treated Water Consumption Charges**

<u>Single Family Residential</u>	<u>Monthly Consumption (Gallons)</u>	<u>Rate per 1,000 Gallons</u>
Block 1	0,000 - 11,000	\$2.61
Block 2	12,000 - 30,000	\$5.22
Block 3	31,000-40,000	\$7.83
Block 4	Over 40,000	\$10.44

<u>Small Multi-Family (Duplex through Five-Plex with a Single Meter)</u>	<u>Monthly Consumption (Gallons)</u>	<u>Rate per 1,000 Gallons</u>
Block 1	0 - 15,000	\$3.30
Block 2	Over 15,000	\$3.96

Applies to two dwelling units. Block threshold increases by 6,000 gallons per dwelling unit up to five (5) dwelling units.

<u>All Other (Non-Residential)</u>	<u>Monthly Consumption (Gallons)</u>	<u>Rate per 1,000 Gallons</u>
Winter	All consumption	\$2.26
Summer	All consumption	\$4.52

Winter bills have billing periods ending on October 28 through April 30.  
 Summer bills have billing periods ending on May 1 through October 27.

<u>Irrigation-Only</u>	<u>Monthly Consumption (Gallons)</u>	<u>Rate per 1,000 Gallons</u>
Winter	All consumption	\$1.29
Summer	All consumption	\$5.15

Applies to irrigation-only taps.

Winter bills have billing periods ending on October 28 through April 30.  
 Summer bills have billing periods ending on May 1 through October 27.

**B. Treated Water Fixed Charges**

<u>Service Charge (All Meter Sizes)</u>	<u>Monthly</u>
	\$6.33

**C. Private Fire Protection Charges**

<u>Sprinkler Systems and Standpipes</u>	
<u>Tap Size</u>	<u>Monthly</u>
1 Inch	\$2.02
2 Inch	\$3.37
4 Inch	\$5.21
6 Inch	\$7.44
8 Inch	\$13.02
10 Inch	\$18.60
12 Inch	\$29.76
16 Inch	\$74.40
 <u>Fire Hydrants</u>	 \$7.44

**D. Notes**

**Applicability:** Charges under this schedule are applicable to all licensees for treated water service or private fire protection service outside the limits of the City and County of Denver served in accordance with distributor contracts.

**Payment:** Bills are due and payable to Denver Water upon issuance. Monthly bills are delinquent 20 days after the billing date. Late charges will be assessed per Denver Water policy.

**Rates:** Charges for treated water service consist of a consumption charge and a fixed charge. Fire protection charges include only a fixed charge. The consumption charge is based upon the amount of water delivered during the billing period. The fixed charge applies to all accounts that are active at any time during the billing period.

**Denver Water**  
**Proposed Rate Schedule No. 3**  
**Outside City - Total Service**  
**For Meters Read On or After January 1, 2013**

**A. Treated Water Consumption Charges**

<u>Single Family Residential</u>	<u>Monthly Consumption (Gallons)</u>	<u>Rate per 1,000 Gallons</u>
Block 1	0,000 - 11,000	\$2.93
Block 2	12,000 - 30,000	\$5.86
Block 3	31,000-40,000	\$8.79
Block 4	Over 40,000	\$11.72

<u>Small Multi-Family (Duplex through Five-Plex with a Single Meter)</u>	<u>Monthly Consumption (Gallons)</u>	<u>Rate per 1,000 Gallons</u>
Block 1	0 - 15,000	\$3.99
Block 2	Over 15,000	\$4.79

Applies to two dwelling units. Block threshold increases by 6,000 gallons per dwelling unit up to five (5) dwelling units.

<u>All Other (Non-Residential)</u>	<u>Monthly Consumption (Gallons)</u>	<u>Rate per 1,000 Gallons</u>
Winter	All consumption	\$2.54
Summer	All consumption	\$5.08

Winter bills have billing periods ending on October 28 through April 30.  
 Summer bills have billing periods ending on May 1 through October 27.

<u>Irrigation-Only</u>	<u>Monthly Consumption (Gallons)</u>	<u>Rate per 1,000 Gallons</u>
Winter	All consumption	\$1.47
Summer	All consumption	\$5.88

Applies to irrigation-only taps.  
 Winter bills have billing periods ending on October 28 through April 30.  
 Summer bills have billing periods ending on April 28 through October 27.

**B. Treated Water Fixed Charges**

<u>Service Charge (All Meter Sizes)</u>	<u>Monthly</u>
	\$6.33

**C. Private Fire Protection Charges**

<u>Sprinkler Systems and Standpipes</u>	
<u>Tap Size</u>	<u>Monthly</u>
1 Inch	\$3.56
2 Inch	\$5.93
4 Inch	\$9.17
6 Inch	\$13.10
8 Inch	\$22.92
10 Inch	\$32.73
12 Inch	\$52.37
16 Inch	\$130.93
 <u>Fire Hydrants</u>	 \$13.10

**D. Notes**

**Applicability:** Charges under this schedule are applicable to all licensees for treated water service or private fire protection service outside the limits of the City and County of Denver served in accordance with distributor contracts.

**Payment:** Bills are due and payable to Denver Water upon issuance. Monthly bills are delinquent 20 days after the billing date. Late charges will be assessed per Denver Water policy.

**Rates:** Charges for treated water service consist of a consumption charge and a fixed charge. Fire protection charges include only a fixed charge. The consumption charge is based upon the amount of water delivered during the billing period. The fixed charge applies to all accounts that are active at any time during the billing period.

**Denver Water**  
**Proposed Rate Schedule No. 4**  
**Outside City - Master Meter**  
**For Meters Read On or After January 1, 2013**

**A. Treated Water Consumption Charges**

	<b>Rate per</b>
	<b><u>1,000 Gallons</u></b>
<b><u>All Consumption</u></b>	\$3.81

**B. Treated Water Fixed Charges**

	<b><u>Monthly</u></b>
<b><u>Service Charge (All Meter Sizes)</u></b>	\$6.33

**D. Notes**

**Applicability:** Charges for treated water service under this schedule are applicable to entities (i.e. municipalities, quasi-municipal districts and water companies outside the limits of the City and County of Denver) served under distributor agreements whereby the entity operates and maintains water systems to supply individual licensees. Denver Water bills distributors for water delivered through master meters. Each distributor establishes charges for its individual licensees for water service.

**Payment:** Bills are due and payable to Denver Water upon issuance. Monthly bills are delinquent 20 days after the billing date. Late charges will be assessed per Denver Water policy.

**Rates:** Charges for treated water service consist of a consumption charge and a fixed charge. The consumption charge is based upon the amount of water delivered during the billing period. The fixed charge applies to all accounts that are active at any time during the billing period.

**Denver Water**  
**Proposed Rate Schedule No. 5**  
**Raw and Recycled Water Service**  
**For Recycled Water Meters Read On or After January 1, 2013**  
**For Raw Water Billing Periods Ending On or After January 1, 2013**

**A. Raw Water Consumption and Fixed Charges**

<u>Consumption Charges (All Consumption)</u>	<u>Rate per 1,000 Gallons</u>	<u>Rate per Acre Foot</u>
Inside City	\$0.50	\$162.93
Outside City	\$0.91	\$296.52
Outside the Combined Service Area (See Rate Schedule No. 6)	\$1.04	\$338.88
 <u>Fixed Charges</u>	 Not Applicable	 Not Applicable

**B. Recycled Water Consumption and Fixed Charges**

<u>Consumption Charges (All Consumption)</u>	<u>Rate per 1,000 Gallons</u>	<u>Rate per Acre Foot</u>
Inside City	\$0.99	\$322.59
Outside City	Not Applicable	Not Applicable
Outside the Combined Service Area (See Rate Schedule No. 6)	\$1.11	\$361.69
 <u>Fixed Charges</u>	 <u>Monthly</u>	
Service Charge (All Meter Sizes)	\$6.33	

**C. Notes**

**Applicability:** Charges under this schedule are applicable to entities (i.e. municipalities, quasi-municipal districts and corporations) with whom Denver Water has contracts to deliver raw or recycled water service.

**Payment:** Bills are due and payable to Denver Water upon issuance. Monthly bills are delinquent 20 days after the billing date. Late charges will be assessed per Denver Water policy.

**Rates:** Charges for recycled water service consist of a consumption charge and a fixed charge. Raw water charges exclude the service charge. The consumption charge is based upon the amount of water delivered during the billing period. The fixed charge applies to all recycled accounts that are active at any time during the billing period.

**Denver Water**  
**Proposed Rate Schedule No. 6**  
**Outside the Combined Service Area**  
**For Treated and Recycled Water Meters Read On or After January 1, 2013**  
**For Raw Water Billing Periods Ending On or After January 1, 2013**

**A. Treated Water Consumption and Fixed Charges**

	<u>Rate per 1,000 Gallons</u>	<u>Rate per Acre Foot</u>
<u>Consumption Charges (All Consumption)</u>	\$4.25	\$1,384.86
<u>Fixed Charges</u>	<u>Monthly</u>	
Service Charge (All Meter Sizes)	\$6.33	

**B. Raw Water Consumption and Fixed Charges**

	<u>Rate per 1,000 Gallons</u>	<u>Rate per Acre Foot</u>
<u>Consumption Charges (All Consumption)</u>	\$1.04	\$338.88
<u>Fixed Charges</u>	Not Applicable	Not Applicable

**C. Recycled Water Consumption and Fixed Charges**

	<u>Rate per 1,000 Gallons</u>	<u>Rate per Acre Foot</u>
<u>Consumption Charges (All Consumption)</u>	\$1.11	\$361.69
<u>Fixed Charges</u>	<u>Monthly</u>	
Service Charge (All Meter Sizes)	\$6.33	

**D. Notes**

**Applicability:** Charges under this schedule are applicable to entities (including municipalities, quasi-municipal districts and corporations) served outside the combined service area with whom Denver Water has contracts to deliver a fixed amount of water each year. Denver Water is only obligated to provide specified amounts of treated, raw, or recycled water as specified by contract. Denver Water has no relationship with, or obligation to, individual customers of the entity holding the fixed amount contract.

**Payment:** Bills are due and payable to Denver Water upon issuance. Monthly bills are delinquent 20 days after the billing date. Late charges will be assessed per Denver Water policy.

**Rates:** Charges for raw water service consist of a consumption charge. The consumption charge is based upon the amount of water delivered during the billing period.

**Denver Water**  
**Proposed Rate Schedule No. 7**  
**City and County of Denver Government**  
**For Meters Read On or After January 1, 2013**

**A. Treated Water Charges**

<u>Consumption Charges</u>	<u>Rate per 1,000 Gallons</u>
Domestic	\$2.28
Irrigation	
Winter	\$1.05
Summer	\$2.63
Applies to irrigation-only taps.	
Winter bills have billing periods ending on October 28 through April 30.	
Summer bills have billing periods ending on April 28 through October 27.	
 <u>Fixed Charges</u>	 <u>Monthly</u>
Service Charge (All Meter Sizes)	\$6.33

**B. Raw Water Consumption and Fixed Charges**

<u>Consumption Charges (All Consumption)</u>	<u>Rate per 1,000 Gallons</u>
	\$0.27
 <u>Fixed Charges</u>	 Not Applicable

**C. Recycled Water Consumption and Fixed Charges**

<u>Consumption Charges (All Consumption)</u>	<u>Rate per 1,000 Gallons</u>
	\$0.30
 <u>Fixed Charges</u>	
Service Charge (All Meter Sizes)	\$6.33

**D. Notes**

**Applicability:** Charges under this schedule are applicable to all licensees for treated, raw, or recycled water service inside the limits of the City and County of Denver.

**Payment:** Bills are due and payable to Denver Water upon issuance. Monthly bills are delinquent 20 days after the billing date. Late charges will be assessed per Denver Water policy.

**Rates:** Charges for treated and recycled water service consist of a consumption charge and a fixed charge. Raw water is charged only for consumption. The consumption charge is based upon the amount of water delivered during the billing period. The fixed charge applies to all accounts that are active at any time during the billing period.

**Denver Water**  
**Proposed Rate Schedule No. 8**  
**Residential Multiplex (Inside City Only)**  
**For Meters Read On or After January 1, 2013**

**A. Treated Water Consumption Charges**

<u>Single Family Residential</u>	<u>Monthly Consumption (Gallons)</u>	<u>Rate per 1,000 Gallons</u>
Block 1	0,000 - 11,000	\$2.59
Block 2	12,000 - 30,000	\$5.18
Block 3	31,000-40,000	\$7.77
Block 4	Over 40,000	\$10.36

Block thresholds are determined for each multiplex based on the number of units.  
Each block threshold is multiplied by the number of units served by single meter.

**B. Treated Water Fixed Charges**

<u>Service Charge (All Meter Sizes)</u>	<u>Monthly</u>
	\$6.33

**C. Notes**

**Applicability:** Charges under this schedule are applicable to all licensees for treated water service that are classified as a residential multiplex inside the limits of the City and County of Denver.

**Payment:** Bills are due and payable to Denver Water upon issuance. Monthly bills are delinquent 20 days after the billing date. Late charges will be assessed per Denver Water policy.

**Rates:** Charges for treated water service consist of a consumption charge and a fixed charge. The consumption charge is based upon the amount of water delivered during the billing period. The fixed charge applies to all accounts that are active at any time during the billing period.





# 2013 Revenue Requirements

September 26, 2012

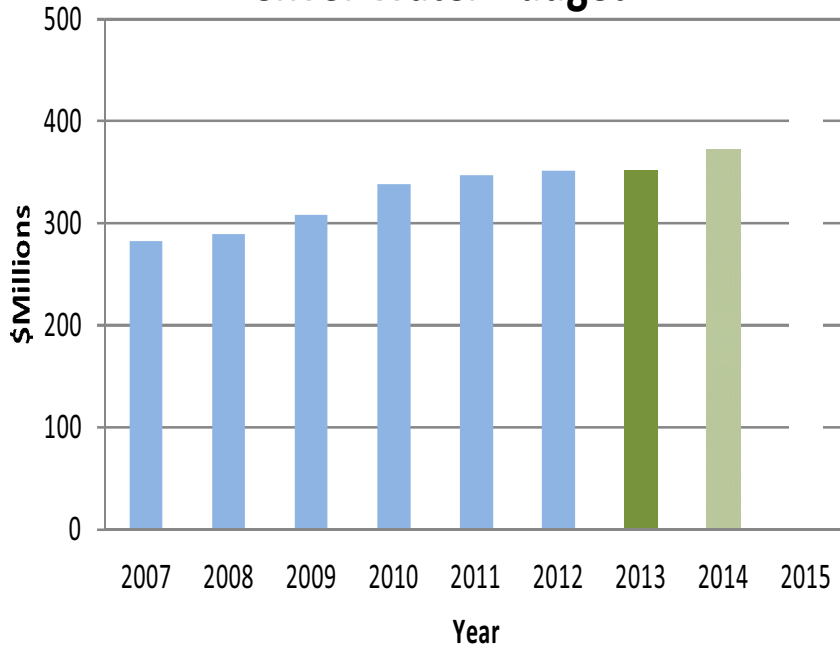
Board Item 2-B-B



## 2013

**Budget and revenue requirement  
new rate methodology  
and proposed 2013 rates**

## Denver Water Budget

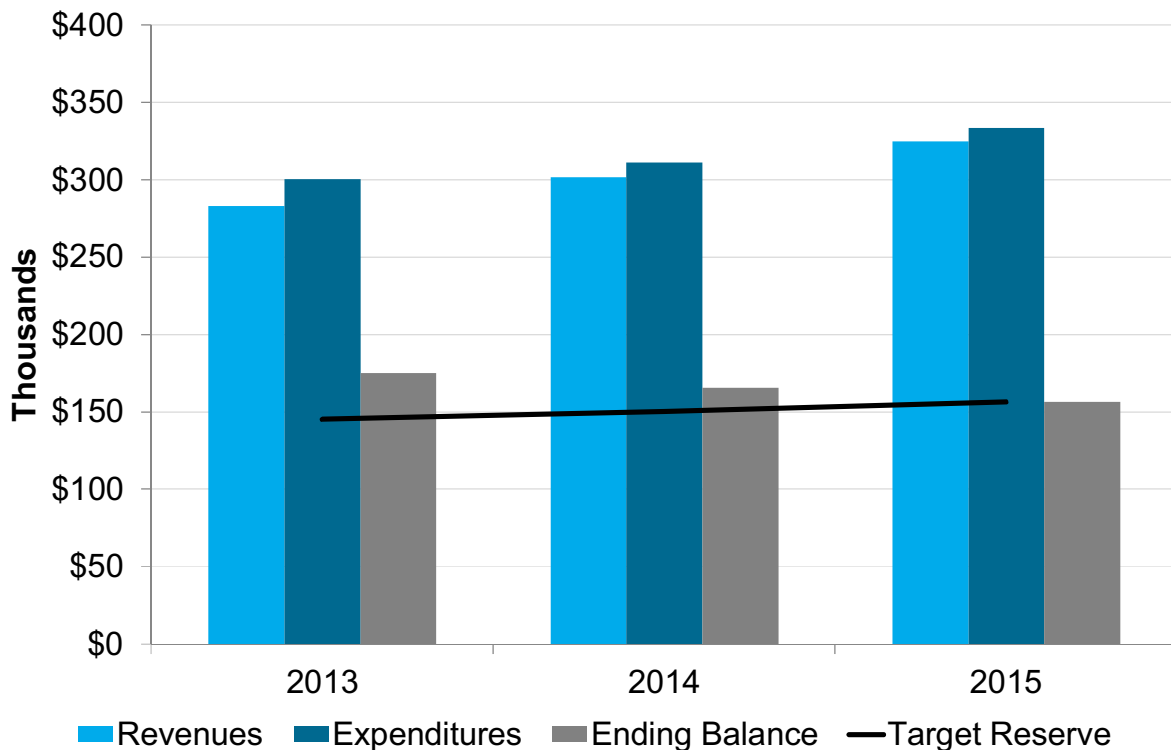


### Highlights

- Increasing capital costs over 3-years
- Operating costs flat

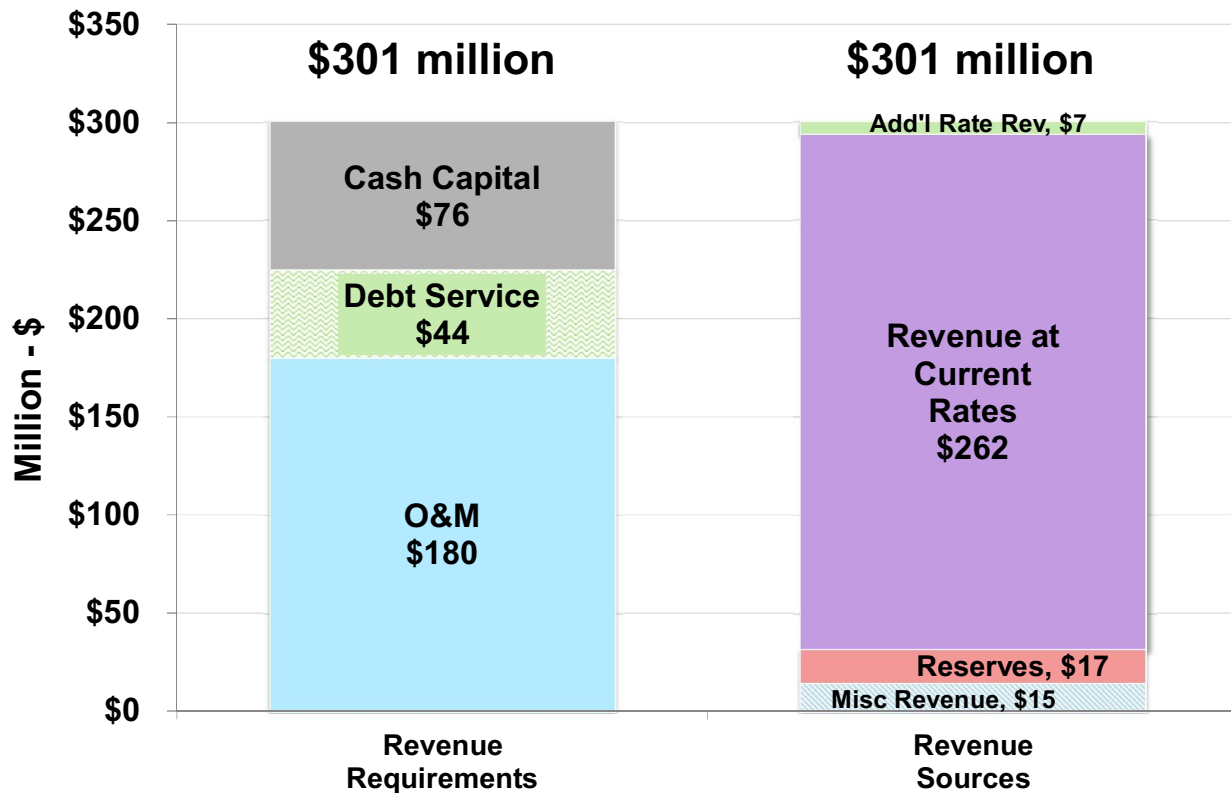
3

## Proposed financial plan 2.5% increase in 2013



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## 2013 Revenue requirement and revenue sources



5

## 2013 cost-of-service process

- Identifies annual cost to provide water service to customer classes
- Recognizes differing service characteristics
- Based on cash-based revenue requirements



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# Cost Allocation

## Summary of inside and outside costs

Line No	Item	\$ millions		
		Total	Outside City	Inside City
1	O&M	\$180	\$91	\$89
2	Annual Debt Service	\$44	\$26	\$19
3	Rate-Funded Capital	\$76	\$39	\$37
4	Additional Amount	\$0	\$18	(\$18)
5	<b>Total Revenue Requirement</b>	<b>\$301</b>	<b>\$174</b>	<b>\$127</b>
6	Less: Change in Reserves	(\$18)	(\$10)	(\$8)
7	Less: Miscellaneous Revenue	(\$15)	(\$8)	(\$7)
8	<b>Net Revenue Requirement</b>	<b>\$268</b>	<b>\$156</b>	<b>\$112</b>
<i>Additional amount</i>				
10	Outside-city net assets		\$564	
11	x Additional amount (%)		3.2%	
12	= Additional amount (\$)		<b>\$18</b>	

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## Proposed 2013 rates

- **Designed to recover the 2013 revenue requirement**
- **Service charge remains unchanged at \$6.33 per bill**
- **Increases vary by class and amount of use**

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# Comparison of existing and proposed 2013 rates

Customer Class	Inside City			Read & Bill			Total Service		
	2012	2013	Change (\$)	2012	2013	Change (\$)	2012	2013	Change (\$)
<b>Service Charge</b>	\$6.33	\$6.33	\$0.00	\$6.33	\$6.33	\$0.00	\$6.33	\$6.33	\$0.00

## Volume Rate, \$ per Kgal

### Single Family

Blk 1: 0 - 11 Kgal	\$2.54	\$2.59	\$0.05	\$2.49	\$2.61	\$0.12	\$2.85	\$2.93	\$0.08
Blk 2: 12 - 30	5.09	5.18	0.09	4.98	5.22	0.24	5.70	5.86	0.16
Blk 3: 31 - 40	7.63	7.77	0.14	7.47	7.83	0.36	8.55	8.79	0.24
Blk 4: Over 40	10.17	10.36	0.19	9.96	10.44	0.48	11.39	11.72	0.33

### Multifamily

Block 1: 0 - 15	\$2.82	\$2.83	\$0.01	\$3.21	\$3.30	\$0.09	\$3.84	\$3.99	\$0.15
Block 2: Over 15	3.38	\$3.40	\$0.02	3.85	\$3.96	\$0.11	4.61	\$4.79	\$0.18

### Nonresidential

Winter	\$1.78	\$1.78	\$0.00	\$2.20	\$2.26	\$0.06	\$2.44	\$2.54	\$0.10
Summer	3.57	3.57	0.00	4.41	4.52	0.11	4.87	5.08	0.21

### Irrigation

Winter	\$1.20	\$1.20	\$0.00	\$1.29	\$1.29	\$0.00	\$1.39	\$1.47	\$0.08
Summer	4.81	4.81	0.00	5.15	5.15	0.00	5.57	5.88	0.31

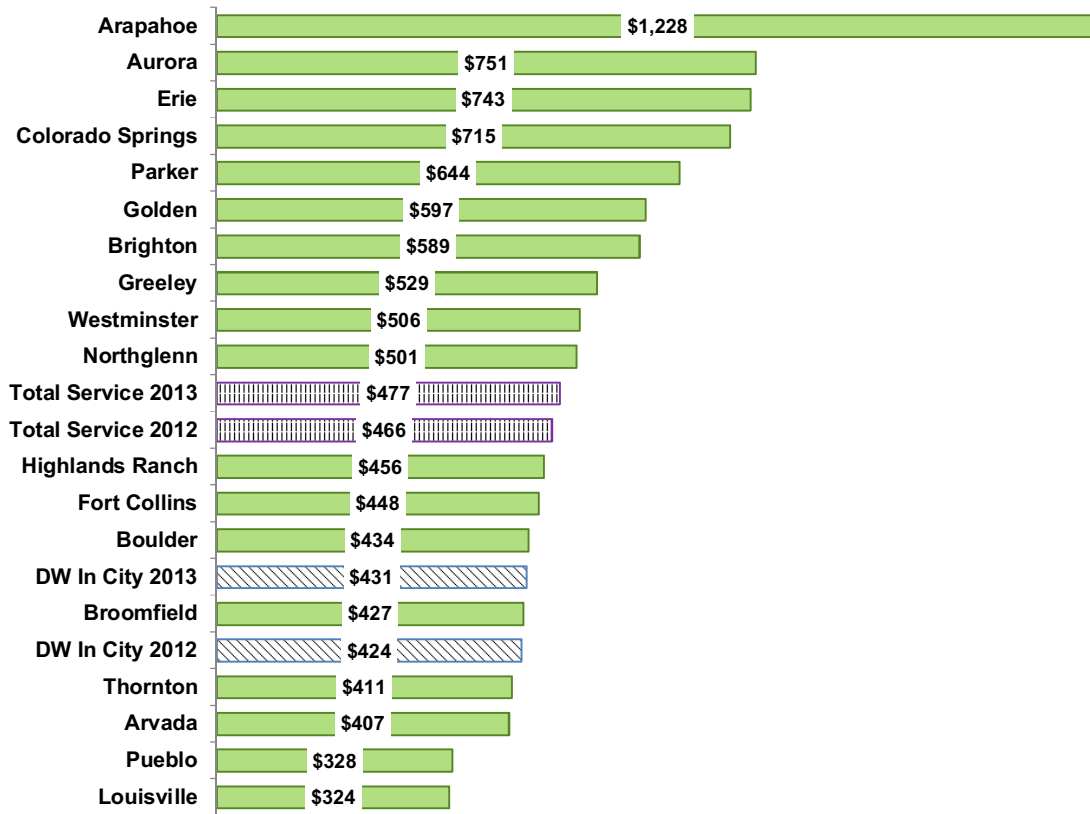
9

## Annual bill comparison 115,000 gallons annual usage

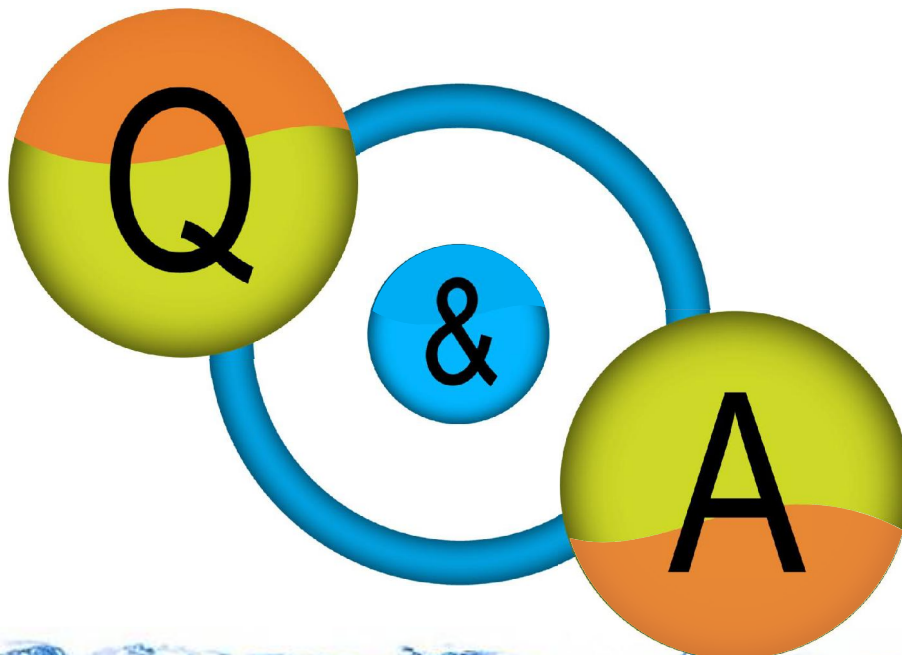
Customer Class	2012	2013	% Change
<b>Inside City (IC)</b>			
<b>Annual bill at 115,000 gal</b>	<b>\$424.16</b>	<b>\$430.79</b>	<b>1.6%</b>
Annual bill increase	----	\$6.63	----
Average monthly increase	----	\$0.55	----
Average summer increase	----	\$0.85	----
Average rate, per 1,000 gal	\$3.69	\$3.75	1.6%
<b>Read &amp; Bill (R&amp;B)</b>			
<b>Annual bill at 115,000 gal</b>	<b>\$417.09</b>	<b>\$433.53</b>	<b>3.9%</b>
Annual bill increase	----	\$16.44	----
Average monthly increase	----	\$1.37	----
Average summer increase	----	\$2.12	----
Average rate, per 1,000 gal	\$3.63	\$3.77	3.9%
<b>Total Service (TS)</b>			
<b>Annual bill at 115,000 gal</b>	<b>\$466.41</b>	<b>\$477.37</b>	<b>2.3%</b>
Annual bill increase	----	\$10.96	----
Average monthly increase	----	\$0.91	----
Average summer increase	----	\$1.41	----
Average rate, per 1,000 gal	\$4.06	\$4.15	2.3%

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## 2012 Front Range Survey-Single Family Residential 115,000 Gallons Annual Use



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# DENVER BOARD OF WATER COMMISSIONERS

Meeting Date: May 23, 2012

Board Item: 2-A-2

## Adoption of New Rate Methodology

Action by Consent

Action

Information

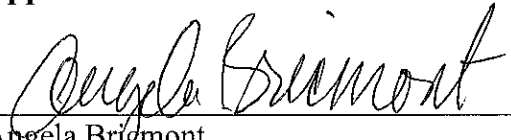
Since 1990, the Board has established water rates using a split-allocation, utility basis rate methodology. In the intervening decades, important changes have occurred, especially the creation of the Combined Service Area and significant increases in the capital budget, and it became increasingly clear that the 1990 rate methodology needed to be reviewed and modified. The attached resolution, the product of a fifteen-month public involvement process, will adopt a cash basis rate methodology to be used beginning with 2013 rates.

### Recommendation:

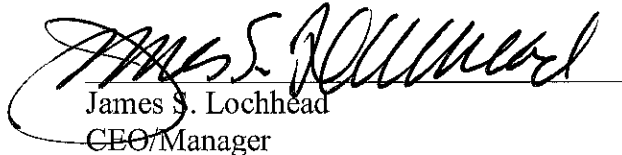
It is recommended that the Board adopt the attached resolution, Adopting Cash Basis Rate Methodology.

### **Approvals:**

Respectfully submitted,



Angela Brimont  
Director of Finance



James S. Lochhead  
CEO/Manager



Patricia Wells  
General Counsel

**Resolution of the Board of Water Commissioners  
Adopting Cash Basis Rate Methodology  
May 23, 2012**

Background

In establishing rates for water service, the Board is bound primarily by Denver's Charter, which requires that inside-City rates be "as low as good service will permit" and that outside-City rates recover the full cost of providing water service "together with an additional amount to be determined by the Board." The Charter also provides that rates must be related to the service furnished or the volume of water used. In general, therefore, all rates must be based on cost, volume, and other attributes of water use, and outside-Denver customers will pay more for the same level of service than City customers pay.

History of Current Rate Methodology

In 1990, the Board was faced with a unique set of circumstances, a decrease in the number of City customers over the previous decade, coupled with explosive growth in its suburban customer base. In response, the Board adopted a split-allocation, utility basis rate methodology to establish outside City costs. The methodology was based on a model commonly used by investor-owned, regulated utilities. While inside-City costs were based on the projected cash budget for the year in which the rates would become effective, costs for outside-City customers were determined by a non-cash accrual method using depreciation expense and rate of return. As a result, annual costs to inside- and outside-City customers moved independently of each other, sometimes in large and unpredictable swings from year to year. In addition, the investor-owned utility model was appropriate since the suburban customer base was expanding. In 1994, however, the Combined Service Area was created, which eventually slowed growth in the customer base. Over the years, the current rate methodology has become less suitable, more complex, and more opaque. The Board has determined that the 1990 rate methodology has become unworkable under current conditions.

Process for Developing New Rate Methodology

In February of 2011, the Board authorized a public involvement process to modify the 1990 rate methodology to reflect current circumstances and also to achieve the following objectives:

- Compliance with the Charter, Distributor contracts, and case law
- Transparency
- Predictability
- Equitable distribution of costs

The Rates staff engaged in a thorough process of stakeholder involvement, facilitating over 20 meetings during the past year. Meetings have been held with the Citizens Advisory Committee, the Distributor Forum, the Distributors' Technical Advisory Committee (TAC), and members of Distributors' boards of directors. Denver Water Board members have attended one meeting with Distributor representatives and an open house for Distributor board members. The Denver Water Board has been briefed during several Board meetings and has received verbal and written communication from external parties on the subject of the rate methodology. The Rates staff has been advised throughout the process by expert rate consultants. Finally, Rates staff spent two days with the TAC's rate consultant, going over the technical aspects of the proposed new rate model. That model was formally recommended to the Board at its meeting on May 9, 2012.



### Cash Basis Rate Methodology

The Board has determined that the cash basis, cost-of-service methodology, as presented on May 9, best meets the objectives established for this process. The proposed methodology will establish the overall revenue requirement using the projected cash budget for the year in which the new rates will become effective. The cash basis revenue requirement typically includes operation and maintenance expense, principal and interest payments on outstanding debt, rate-funded capital expenditures, and increases in cash reserves. The revenue requirement is reduced by any decrease in cash reserves and any non-rate revenue. The revenue requirement is then allocated to inside- and outside-City customers using generally accepted rate making practices. Allocations will be based on relative water demands, capacity needs, or by direct assignment, and the additional amount will be added to the costs allocated to outside-City customers.

The Board finds that the cash basis methodology will provide more stability and predictability in rates for its customers than the current utility basis. In general, Denver Water's budget does not experience dramatic changes from year to year. Because outside-City costs are based on the same budgeted amounts as inside-City costs, changes in revenue requirements will be shared proportionately between the two groups and rates should generally move along a similar trajectory. Rates may change rapidly under exceptional circumstances, but inside-City and outside-City customers would experience those changes in essentially the same way.

To fulfill its duty under the Denver Charter to include an additional amount in rates charged to outside-City customers, the Board has determined that the following method is an appropriate guideline to use in establishing an additional amount. The cost of infrastructure assets required to provide service to outside-City customers will be determined, and a credit will be provided for system development charges, participation payments and reimbursements received from outside-City customers. A risk premium percentage will be applied to the net asset figure. The risk premium will be determined using components of a rate of return on investment, but excluding the cost of debt. The rate of return may be based on historic or current returns obtained by other utilities of similar risk, or from historic returns earned by Denver Water from outside-City customers.

The Board has concluded that this method to determine the additional amount represents a fair and equitable method to compensate the inside-City customers for assuming the responsibility for serving customers outside the City. The inputs for determining the additional amount should not vary significantly from year-to-year and should therefore provide stability in the annual determination of the additional amount. The Board is exercising legislative authority in establishing rates and the additional amount, and may determine that a recommendation from staff produces a result that is inappropriate in a particular set of circumstances.

The Board is interested in further simplifying the determination of rates to produce even more transparency, but is satisfied that the cash basis methodology being adopted today represents a significant improvement over the 1990 methodology. The Board appreciates the efforts of its Rate staff, and the time and energy dedicated to this process by the Distributors.

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Board President

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# New Rate Methodology Recommendation

May 23, 2012



## Rate model review process highlights

- **Defined common objectives**
- **Active stakeholder involvement**
- **Transparent and open discussions**

# Recommended methodology: Cash basis

- Meets charter, contract, and court case provisions
- Easier to understand
  - Based on cash budget
  - Inside- and outside-city costs on same cost basis
- Predictable
  - Budget changes affect inside- and outside-city in similar manner
- Equitability
  - Timing of capital cost recovery



## Comparison of utility and cash basis

Line No.	Utility Basis	Modified Cash Basis
1	+ Operation and maintenance expense	+ Operation and maintenance expense
2	+ Depreciation expense	+ Debt service (principal and interest)
3	+ Return on outside-city assets <sup>[1]</sup>	+ Rate-funded capital
		+ Additional amount <sup>[2]</sup>
4	- Miscellaneous revenues	± Change in reserves
5	= Net revenue requirements	- Miscellaneous revenues
		= Net revenue requirements
	<b>[1] Return on outside-city assets</b>	<b>[2] Additional amount</b>
6	Outside-city net assets	Outside-city net assets
7	x Rate of return (%)	x Additional amount (%)
8	= Return on outside-city assets (\$)	= Additional amount (\$)

[3] Assets = Outside city assets **less** accumulated depreciation and contributions

## **Collaborative process successfully addressed complex model issues**

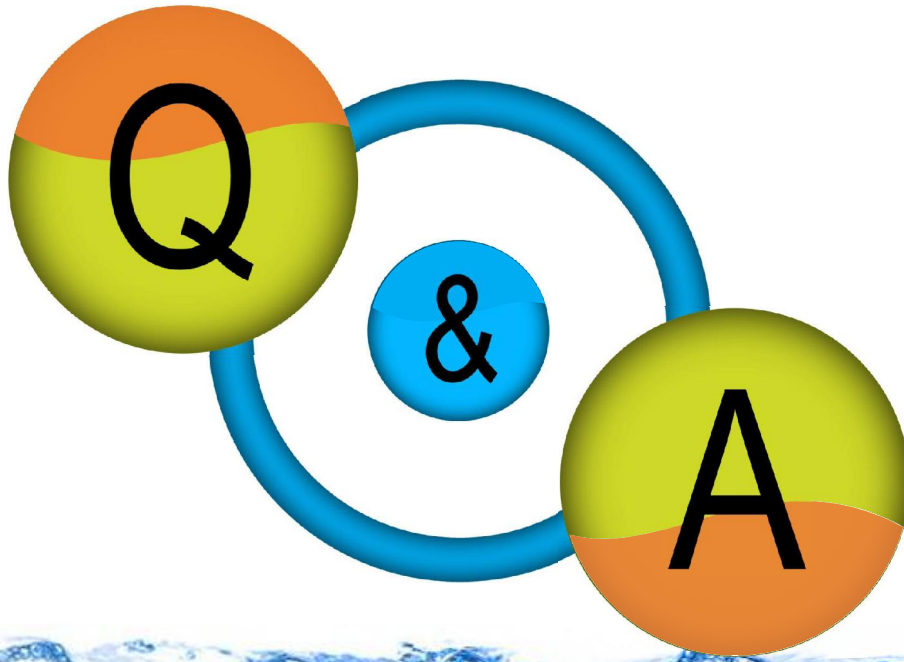
- ✔ Full accounting of rate base and contributed capital
- ✔ Clear allocation of operating and capital expenditures
- ✔ Predictable additional amount calculation



## **Collaborative process successfully addressed complex model issues**

- ✔ Transition of split allocation costs in rate base
- ✔ Annual capital costs allocated on water demands
- ✔ Cash reserves allocated between inside- *and* outside-city





**Appendix B**  
Financial plan



**DENVER WATER**





**Table B-1**  
**2013 Cost-of-service study**  
**Combined cash flow summary (\$ thousands)**

Line No	Description	2013
<b>Sources of funds</b>		
Rate revenue		
1	Revenue under existing rates	\$261,833
2	Additional revenue required	6,546
3	<b>Total water sales revenue</b>	<u>\$268,379</u>
Operating revenue		
4	Power generation	\$4,147
5	Special assessments	5,019
6	<b>Total operating revenue</b>	<u>\$9,166</u>
Other Income		
7	Miscellaneous fees	\$2,248
8	Ditch fees	321
9	All other	514
10	CIS billing	721
11	BABS subsidy	2,344
12	Interest income	1,694
13	Transfer FROM Specific Reserve Func	4,100
14	<b>Total other income</b>	<u>\$11,942</u>
15	Bond proceeds	\$25,600
16	System development charges	8,640
17	Participation fees	1,911
18	<b>Total sources of funds</b>	<u><b>\$325,637</b></u>
<b>Expenditures</b>		
Operation and maintenance expense		
19	O&M (including capital indirects)	\$194,825
20	Less: O&M Capital indirects	14,560
21	<b>Net O&amp;M</b>	<u>\$180,265</u>
Debt service		
22	Existing debt service	\$46,212
23	Proposed debt service	576
24	Debt issuance costs	0
25	<b>Total debt service</b>	<u>\$46,788</u>
Capital plans with indirects		
26	Part 1	\$42,180
27	Part 2	64,901
28	Part 3	9,106
29	<b>Total capital plans</b>	<u>\$116,186</u>
30	Transfer to specific reserve fund	0
31	<b>Total expenditures</b>	<u><b>\$343,240</b></u>
32	<i>Annual surplus / (deficiency)</i>	<i>(\$17,603)</i>
33	Plus: beginning balance	\$193,057
34	<b>Ending balance</b>	<u><b>\$175,454</b></u>
35	Ending balance	\$175,454
36	Operating reserves	145,400
37	<b>Variance from target</b>	<u><b>\$30,054</b></u>
Debt service coverage		
38	Including SDC and participation	2.51
39	Excluding SDC and participation	2.28
40	Effective month (1=Jan, 2=Feb, etc.)	1
41	Annual revenue adjustments	2.5%
42	Cumulative adjustments	2.5%

**Table B-2**  
**2013 Cost-of-service study**  
**O&M expense detail (\$ thousands)**

Line No	Description	2013
<b>Source of Supply</b>		
1	Supervision and engineering	
2	Plant department	\$593
3	Engineering department	3
4	Storage reservoirs	
5	Antero reservoir	331
6	Antero reservoir - recreational	88
7	Eleven mile reservoir	440
8	Eleven mile reservoir - recreational	6
9	Cheesman reservoir	855
10	Cheesman reservoir - recreational	39
11	Gross reservoir	523
12	Gross reservoir - recreational	225
13	Dillon reservoir	1,457
14	Dillon reservoir - recreational	18
15	Ralson reservoir	911
16	Williams fork reservoir	540
17	Williams fork reservoir - recreational	57
18	Strontia springs reservoir	4,382
19	Marston reservoir	156
20	Wolford mountain reservoir	0
21	Platte canyon reservoir	2
22	Leyden gulch reservoir	0
Diversion dams, intakes and raw water pump stations		
23	Last chance intake	9
24	Metro sewer pump station	37
25	Miller/cat pump station	60
26	Hazeltine/howe-haller/roadrunner's rest pump station	4
27	Kassler raw water pump station	25
28	Burns park nonpotable pump station	2
Wells		
29	Cherry creek wells	11
30	Littleton wells	0
31	Cherry creek park wells	13
32	Kennedy wells	8
33	Garland park well	12
Collection and transmission facilities - raw water		
34	Harriman ditch	85
35	Moffat collection system	1,230
36	Moffat collection system - recreational	0
37	William's fork collection system	309
38	South boulder diversion system	444
39	Ralston - clear creek canal	16
40	North fork of the south platte river	479
41	Moffat water tunnel	61
42	Roberts tunnel	182
43	Strontia springs intake	1
44	Waterton canyon road	17
45	Waterton canyon road - recreational	51

**Table B-2**  
**2013 Cost-of-service study**  
**O&M expense detail (\$ thousands)**

Line No	Description	2013
46	Conduit #20 - intake to marston lake or treatment plant	140
47	Conduit #8 - conduit #20 to platte canyon reservoir	1
48	Conduit #22 - ralston lake to moffat filter plant	42
49	Conduit #15 - harriman lake to marston lake	6
50	Conduit #16 - ralston lake to moffat filter plant	88
51	Conduit #26 - strontia springs tunnel to foothills treatment plant	5
52	Interconnect - conduit #26 to aurora conduit	0
	Ditch assessments and other expenses	
53	Nevada ditch	57
54	City ditch	0
55	Last chance ditch	7
56	Epperson ditch	0
57	Bear creek ditches	0
58	High line canal	205
59	Soda lakes	9
60	Harriman lake	5
61	Other assessments	25
	Power generating facilities	
62	Williams fork	125
63	Strontia springs	133
64	Roberts tunnel	154
65	Dillon dam	116
66	Gross dam	42
	Power transmission facilities	
67	Williams fork	1
68	Strontia springs	3
69	Dillon	102
70	Roberts tunnel	1
71	Gross dam	0
	Generation replacement	
72	Purchased power - green mountain reservoir/mt elbert	297
73	Generated power - green mountain reservoir	0
74	Credit for power generation applied - williams fork	(205)
	Gravel pits (water storage)	
75	Miller/cat ponds	91
76	Hazeltine/howe-haller/roadrunner's rest ponds	192
77	<b>Source of supply total</b>	<b>\$15,326</b>
	<b>Treatment</b>	
	Supervision and engineering	
78	Plant department	\$631
79	Engineering department	6
80	Telemetry and supervisory control	0
	Treatment plants	
81	Kassler	31
82	Marston	5,706
83	Marston pre-treatment	0
84	Marston solids handling	130
85	Foothills solids handling	69
86	Moffat solids handling	91

**Table B-2**  
**2013 Cost-of-service study**  
**O&M expense detail (\$ thousands)**

Line No	Description	2013
87	Foothills	8,707
88	Moffat	5,645
89	Sterilization units	2
90	Water quality lab	4,089
91	Chlorine recording stations	2
92	De-chlorination facility - city ditch	51
	Power generation and transmission facilities	
93	Foothills power generation facilities	207
	Recycling	
94	Airport gateway recycling plant	0
95	Denver water recycling plant	3,979
96	Recycling solids handling	81
97	Advanced water treatment research center	0
	Waste disposal closure & postclosure care	
98	Foothills landfill	(4)
99	Ralston reservoir drying ponds	238
<b>100</b>	<b>Total treatment</b>	<b>\$29,662</b>
	<b>Pumping</b>	
	Supervision and engineering	
101	Plant department	\$399
102	Engineering department	0
103	Telemetry and supervisory control	0
	Pumping stations	
104	Charles m. einfeldt	300
105	Capitol hill	157
106	Castlewood	30
107	Lakeridge	122
108	Mexico avenue	1
109	Chips barry (formerly montclair)	152
110	Lone tree	308
111	Cherry hills	408
112	Hillcrest	532
113	Northside marston	613
114	Belleview and simms	622
115	Yale and lamar	82
116	Kassler - raw water pump station	121
117	56th avenue	381
118	64th avenue	210
119	South clarkson street	177
120	South colorado blvd.	18
121	Highlands	840
122	Kendrick	585
123	Broomfield	407
124	Elizabeth street	35
125	Green mountain	417
126	Garland park pump station	25
127	Portable pump station #1	3
128	Burns park nonpotable pump station	10
129	Cherry creek park pump station	4

**Table B-2**  
**2013 Cost-of-service study**  
**O&M expense detail (\$ thousands)**

Line No	Description	2013
130	Recycled pump station	281
131	Chatfield pump station	372
132	<b>Total pumping</b>	<b>\$7,612</b>
<b>Transmission &amp; distribution (T&amp;D)</b>		
Supervision and engineering		
133	Plant department	\$3,126
134	Engineering department	16
135	Water load control	1,485
136	Miscellaneous t&d expenses	3,611
137	Telemetry and supervisory control	3
138	Dia	0
Storage facilities		
139	Broomfield reservoir	51
140	56th avenue reservoir	91
141	Bellevue & simms reservoir	40
142	Kassler reservoir	42
143	Ashland reservoir	156
144	Capitol hill reservoir	165
145	Montclair reservoir	27
146	Hillcrest reservoir	88
147	Highlands reservoir	105
148	Green mountain reservoir	62
149	Ken caryl reservoir	30
150	Kendrick reservoir	71
151	Lone tree reservoir	38
152	Hogback reservoir	19
153	64th ave reservoir	30
154	Colorow reservoir	43
155	Chatfield reservoir	31
156	Recycle reservoir	6
Distribution mains - potable		
157	Mains - inside denver - under 24"	4,486
158	Mains - inside denver - lowry	2
159	Mains - inside denver - stapleton	0
160	Mains - inside denver - dia	175
161	Mains - outside denver - under 24"	2,041
162	Valves - inside denver - distribution mains	2,701
163	Valves - inside denver - dia	56
164	Valves - outside denver	1,198
Distribution mains - nonpotable		
165	Mains - inside denver	26
166	Mains - inside denver - dia	42
167	Valves - inside denver	9
168	Valves - inside denver -dia	2
Transmission mains		
169	Conduit valves	415
170	Numbered conduits	3,440
171	Numbered conduits - nonpotable	96
Fire hydrants		

**Table B-2**  
**2013 Cost-of-service study**  
**O&M expense detail (\$ thousands)**

Line No	Description	2013
172	Inside denver - except dia	1,071
173	Inside denver - dia	115
174	Outside denver	286
	Service lines potable	
175	Inside denver	2,026
176	Inside denver - lowry	0
177	Inside denver - stapleton	4
178	Inside denver - dia	3
179	Outside denver	616
	Service lines non-potable	
180	Inside denver - dia	2
181	Inside denver	9
182	Outside denver	0
	Meter shop expenses	
183	Supervision	859
184	Office	94
185	Meter repair - inside denver	490
186	Meter repair - outside denver total service	2
187	Meter repair - outside denver distributor's area	1
188	Maintenance of meter division - meter equipment	556
189	Maintenance of meter division - building	0
190	Water control - customer requested inspec. and maint.	642
191	Recycled water vaults	22
192	Decentralized station expenses	400
193	Leased properties - southwest metro	7
	Power generation and transmission facilities	
194	Hillcrest - power generation facilities	63
195	Hillcrest - power transmission facilities	0
196	<b>Total transmission and distribution</b>	<b>\$31,291</b>
	<b>Customer accounts</b>	
	Administration and supervision	
197	Field service	\$517
198	Meter reading	236
199	Inspections	1
200	Customer information	0
201	Customer records	221
202	Water sales administration	1,314
	Customer service expenses	
203	Field service	6,454
204	Meter reading	810
205	Inspections	76
206	Customer information	3,017
207	Customer records	694
	Water sales expenses	
208	Tap sales	0
	Water conservation	
209	Promotion	1
210	Enforcement	49
211	Drought related activities	383

**Table B-2**  
**2013 Cost-of-service study**  
**O&M expense detail (\$ thousands)**

Line No	Description	2013
212	Accounts written off or recovered	61
213	Bankruptcy accounts written off	30
214	Customer credit slips	92
215	<b>Total customer accounts</b>	<b>\$13,956</b>
<b>General &amp; administrative</b>		
<b>General</b>		
216	Voice radio equipment	\$2
217	Data radio equipment	0
Structures and improvements		
218	Administration building	1,919
219	Cafeteria	2
220	Three stones buildings	173
221	Kassler historic/rec. facility	165
222	555 quivas st.	38
Risk management and insurance		
223	Property insurance	541
224	Liability claims not covered by ins.	1,002
	Fidelity and surety bonds	6
225	Other insurance	112
226	Admin. costs of risk mgmt and insurance	92
227	Office supplies & petty cash	186
228	Non-stock freight expense	94
Safety & security		
229	Safety & loss control administration	866
230	Security	1,432
231	Access control	472
232	Health	301
Environmental		
233	Hazardous materials activities	745
234	Solids handling facility - foothills	0
235	Solids handling facility - moffat	0
<b>Administrative expenses</b>		
Manager and staff division		
236	Manager and staff	1,846
237	Internal audit	218
238	Reduction in workforce	157
239	Human resources	4,609
Public affairs division		
240	Director of public affairs	2,938
241	Director of community relations	16
242	Community relations	2,282
243	Conservation	7,611
244	Cis business support	204
245	Reproduction services	(7)
246	Central services	553
Legal division		
247	Legal division	4,431
Finance division		
248	Director of finance	460

**Table B-2**  
**2013 Cost-of-service study**  
**O&M expense detail (\$ thousands)**

Line No	Description	2013
249	Finance computer support	5
250	Treasury operations	2,586
251	Budget	629
252	Purchasing	1,587
253	Accounting	2,267
254	Rate administration	442
255	Central records	888
	Information technology division	
256	Information technology division	23,329
	Engineering division	
257	Director of engineering	4,483
258	Programs and projects	6,637
259	Survey	546
260	Distribution property management	1,310
261	Construction management	382
	Planning division	
262	Director of planning	1,398
263	Environmental planning	121
264	Raw water supply	1,141
265	Water rights	325
266	Water resources analysis	2,217
267	Water resources planning	132
268	General planning	935
269	Hydraulics	1,308
270	Administrative expense transferred	(7,964)
271	<b>General &amp; administration total</b>	<b>\$78,165</b>
272	<b>Total operation and maintenance expense</b>	<b>\$176,012</b>
273	Indirect Allocation	\$4,253
274	<b>Adjusted Operation and Maintenance Expense</b>	<b>\$180,265</b>



**Table B-3**  
**2013 Cost-of-service study**  
**Capital Projects**  
*(\$ thousands)*

Line No	Description	2013
<b>Expansion capital projects</b>		
1	Strontia Spgs, 11 Mile, Antero, Cheesman	\$166
2	North Fork - South Platte	50
3	Williams Fork Collection Sys	15
4	Moffat Tunnel Coll System	585
5	South Boulder / Gross Reservoir	250
6	Water rights	4,683
7	Ralston Reservoir/Conduit 16 & 22	2,615
8	Land acquisition and sales	397
9	IRP - Integrated Resource Planning	4,066
10	Downstream reservoir project	1,219
11	Hydropower	89
12	Misc. raw water	50
13	Recycled water facility	4,333
14	Treatment facilities	1,291
15	Pumping & storage	12,364
16	Transmission & distribution	4,524
17	Modifications to Westside & other locati	-
18	Subtotal expansion capital projects	<u>\$36,696</u>
19	Inflation	\$605
20	O&M indirects	4,879
21	<b>Total expansion capital costs</b>	<b><u>\$42,180</u></b>
<b>Repair and replacement capital projects</b>		
22	Raw water facilities	\$6,801
23	Hydropower	486
24	Recreational improvements	-
25	Dam safety improvements	426
26	Recycled water facility	126
27	Treatment facilities	15,093
28	Pumping & storage	6,009
29	Corrosion prevention	195
30	Transmission & distribution	17,820
31	Vault modification program	2,551
32	Pipe rehabilitation program	4,401
33	Drought & fire	-
34	Customer service	-
35	Modifications to Westside & other locati	391
36	Control instrumentation & telemetering	366
37	Security upgrades at various locations	757
38	Subtotal repair and replacement capital	<u>\$55,423</u>
39	Inflation	\$914
40	O&M indirects	8,564
41	<b>Total Repair and Replacement Capital Costs</b>	<b><u>\$64,901</u></b>
<b>General equipment capital projects</b>		
42	Vehicles hvy equip radios	\$2,215
43	Specialized equipment	224
44	Centralized hardware	1,133
45	Capitalized computer systems	-
46	Capitalized computer systems	4,287
47	Subtotal general equipment capital projects	<u>\$7,859</u>
48	Inflation	\$130
49	O&M indirects	1,117
50	<b>Total General Equipment Project Costs</b>	<b><u>\$9,106</u></b>
51	<b>Total capital projects</b>	<b><u>\$116,186</u></b>

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**Appendix C**  
Cost-of-service analysis



**DENVER WATER**



**Table C-1**  
**2013 Cost-of-service study**  
**Projected 2013 units of Service**

Line No	Description	Nonpotable <i>Kgal</i>	Ave day <i>Kgal</i>	Max day <i>gpd</i>	Max hour <i>gpd</i>	Bills <i>bills</i>	Customers <i>accounts</i>	Fire <i>Eq. hydrants</i>
<b>Inside city</b>								
1	Single family residential	13,527,282	13,527,282	38,914	41,138	1,587,311	132,276	0
2	Duplex	775,909	775,909	1,488	1,956	70,063	5,839	0
3	3-plex	234,124	234,124	449	590	16,541	1,378	0
4	4-plex	342,273	342,273	656	863	18,083	1,507	0
5	5-plex	169,967	169,967	326	428	7,005	584	0
6	Commercial	12,209,985	12,209,985	20,071	28,769	175,799	14,650	0
7	Industrial	1,202,770	1,202,770	1,977	2,834	3,148	262	0
8	Government	608,638	608,638	1,001	1,434	2,885	240	0
9	Irrigation only	998,416	998,416	5,143	4,267	14,568	1,214	0
10	City and County of Denver	2,201,248	2,201,248	9,348	8,323	14,010	1,168	0
11	Private fire protection	0	0	500	2,510	0	0	5,203
12	Subtotal treated Inside City	32,270,612	32,270,612	79,873	93,111	1,909,412	159,118	5,203
13	Raw	588,000						
14	City and County of Denver raw	252,000						
15	Recycled	327,720	327,720			130	11	0
16	City and County of Denver recycler	234,718	234,718			184	15	0
17	Subtotal non-potable Inside City	1,402,438	562,438	0	0	314	26	0
18	<b>Total inside city</b>	<b>33,673,049</b>	<b>32,833,049</b>	<b>79,873</b>	<b>93,111</b>	<b>1,909,727</b>	<b>159,144</b>	<b>5,203</b>
<b>Outside city</b>								
Read & bill								
19	Single family residential	4,533,674	4,533,674	13,912	14,284	395,116	32,926	0
20	Duplex	24,643	24,643	51	64	1,728	144	0
21	3-plex	23,514	23,514	49	61	1,467	122	0
22	4-plex	67,964	67,964	142	177	2,973	248	0
23	5-plex	11,413	11,413	24	30	469	39	0
24	Commercial	2,388,851	2,388,851	6,545	7,068	29,596	2,466	0
25	Industrial	138,854	138,854	380	411	72	6	0
26	Government	310,360	310,360	850	918	674	56	0
27	Irrigation only	571,440	571,440	2,755	2,333	4,914	410	0
28	Private Fire Protection	0	0	80	400	0	0	834
29	Total read & bill	8,070,713	8,070,713	24,788	25,746	437,009	36,417	834
Total service								
30	Single family residential	4,876,541	4,876,541	14,964	15,364	385,981	32,165	0
31	Duplex	46,106	46,106	102	124	3,268	272	0
32	3-plex	27,674	27,674	61	74	1,371	114	0
33	4-plex	72,648	72,648	161	195	2,529	211	0
34	5-plex	23,871	23,871	53	64	933	78	0
35	Commercial	2,231,670	2,231,670	5,014	5,992	32,766	2,730	0
36	Industrial	43,542	43,542	98	117	103	9	0
37	Government	205,620	205,620	462	552	971	81	0
38	Irrigation only	656,655	656,655	3,040	2,609	6,653	554	0
39	Private Fire Protection	0	0	90	430	0	0	903
40	Total total service	8,184,326	8,184,326	24,045	25,521	434,574	36,214	903
41	Master meter	17,020,030	17,020,030	48,495	51,293	480	40	0
42	OCSA treated	1,339,865	1,339,865	4,552	4,442	104	9	0
43	Total treated outside city	34,614,935	34,614,935	101,881	107,003	872,167	72,681	1,737
44	Raw	6,048,000						
45	OCSA raw	2,036,966						
46	OCSA recycled	850,000	0			12	1	0
47	Subtotal non-potable Outside city	8,934,966	0	0	0	12	1	0
48	<b>Total outside city</b>	<b>43,549,901</b>	<b>34,614,935</b>	<b>101,881</b>	<b>107,003</b>	<b>872,179</b>	<b>72,682</b>	<b>1,737</b>
49	<b>Total treated</b>	<b>66,885,547</b>	<b>66,885,547</b>	<b>181,753</b>	<b>200,114</b>	<b>2,781,579</b>	<b>231,798</b>	<b>6,940</b>
50	<b>Total raw</b>	<b>8,924,966</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
51	<b>Total recycled</b>	<b>1,412,438</b>	<b>562,438</b>	<b>0</b>	<b>0</b>	<b>326</b>	<b>27</b>	<b>0</b>
52	<b>Total</b>	<b>77,222,950</b>	<b>67,447,984</b>	<b>181,753</b>	<b>200,114</b>	<b>2,781,905</b>	<b>231,825</b>	<b>6,940</b>

**Table C-2**  
**2013 Cost-of-service study**  
**Revenue requirement (\$ thousands)**

Line No	Description	2013
	Operations & Maintenance	
1	Total O&M and Indirects Allocated to Capital	\$194,825
2	Less: Indirect O&M Allocated to Capital	(14,560)
3	Total O&M Not Allocated to Capital	<u>\$180,265</u>
	Capital Costs	
4	Expansion projects	\$42,180
5	Repair & Replacement/Gen. Equipment	74,007
6	Debt service	46,788
7	Total Capital	<u>\$162,975</u>
	<b>Revenue Requirements</b>	<b>\$343,240</b>
	<b>Less: Revenue Requirement Adjustments</b>	
	Non-rate Revenue	
8	SDC and participation	(\$10,551)
9	Bond issue	(25,600)
10	Other interest income	(1,694)
11	Operating revenue	(9,166)
12	Other income	(3,804)
13	BABS subsidy	(2,344)
14	Interest income	0
15	Transfers In	(4,100)
16	Total Non-Rate Revenue	<u>(\$57,258)</u>
17	Annual Surplus/(Deficiency)	<u>(\$17,603)</u>
18	<b>Total Revenue Requirement Adjustments</b>	<b>(\$74,861)</b>
19	<b>Total Cost of Service</b>	<b><u>\$268,379</u></b>

**Table C-3**  
**2013 Cost-of-service study**  
**Allocation of O&M expense by cost pool (\$ thousands)**

Line No	Description	Total	Joint	Inside specific	Total Service	Outside specific
1	Source of supply	\$15,326	\$15,326	\$0	\$0	\$0
2	Treatment	29,662	29,662	0	0	0
3	Pumping	7,612	2,474	1,380	0	3,758
4	Transmission and distribution	31,291	16,980	9,661	4,161	489
5	Customer	13,956	13,949	6	1	0
6	General & Administrative	82,418	82,418	0	0	0
7	Indirect	0	0	0	0	0
8	<b>Total</b>	<b>\$180,265</b>	<b>\$160,809</b>	<b>\$11,047</b>	<b>\$4,162</b>	<b>\$4,247</b>
9	<i>Percent Allocation</i>		89.2%	6.1%	2.3%	2.4%

**Table C-4**  
**2013 Cost-of-service study**  
**Allocation of O&M expense by cost pool by cost component**

Line No	Description	Total	Nonpotable	Base	Max day	Max hour	Customer service
<b>Joint to all customers</b>							
1	Source of supply	\$15,326	\$13,311	\$89	\$1,739	\$187	\$0
2	Treatment	29,662	\$4,060	11,743	13,785	73	0
3	Pumping	2,474	\$121	869	1,017	466	0
4	Transmission and distribution	16,980	\$96	6,087	4,874	4,874	1,050
5	Storage	0	\$0	0	0	0	0
6	Customer	13,949	\$0	4,881	0	0	9,068
7	General & Administrative	82,418	18,407	34,129	17,233	4,506	8,142
8	<b>Total</b>	<b>\$160,809</b>	<b>\$35,995</b>	<b>\$57,799</b>	<b>\$38,649</b>	<b>\$10,106</b>	<b>\$18,260</b>
9	<i>Percent Allocation</i>		22.4%	35.9%	24.0%	6.3%	11.4%
<b>Allocation of Joint O&amp;M to Inside and Outside Cost Components</b>							
10	<b>Joint Capital Costs</b>	<b>\$160,809</b>	<b>\$35,995</b>	<b>\$57,799</b>	<b>\$38,649</b>	<b>\$10,106</b>	<b>\$18,260</b>
<b>Units of Service</b>							
11	Inside City		33,673,049	32,833,049	79,873	93,111	159,144
12	Outside City		43,549,901	34,614,935	101,881	107,003	72,682
13	<b>Total</b>		<b>77,222,950</b>	<b>67,447,984</b>	<b>181,753</b>	<b>200,114</b>	<b>231,825</b>
14	Inside City, % of Total by CSC		43.6%	48.7%	43.9%	46.5%	68.6%
15	Outside City, % of Total by CSC		56.4%	51.3%	56.1%	53.5%	31.4%
	<b>Total</b>		<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>
16	Inside City, \$ of Total by CSC	\$78,054	\$15,696	\$28,136	\$16,984	\$4,702	\$12,535
17	Outside City, \$ of Total by CSC	82,756	20,300	29,663	21,664	5,404	5,725
18	<b>Total</b>	<b>\$160,809</b>	<b>\$35,995</b>	<b>\$57,799</b>	<b>\$38,649</b>	<b>\$10,106</b>	<b>\$18,260</b>
<b>Percent Allocation Inside/Outside by Cost Component</b>							
19	Inside City, (Line 17/Line 19)	100.0%	20.1%	36.0%	21.8%	6.0%	16.1%
20	Outside City, (Line 18/Line 19)	100.0%	24.5%	35.8%	26.2%	6.5%	6.9%
<b>Inside specific</b>							
21	Source of supply	\$0	\$0	\$0	\$0	\$0	\$0
22	Treatment	0	0	0	0	0	0
23	Pumping	611	0	611	385	385	0
24	Transmission and distribution	2,694	0	2,694	3,484	3,484	0
25	Storage	0	0	0	0	0	0
26	Customer	6	0	6	0	0	0
27	General & Administrative	0	0	0	0	0	0
28	<b>Total</b>	<b>\$11,047</b>	<b>\$0</b>	<b>\$3,311</b>	<b>\$3,868</b>	<b>\$3,868</b>	<b>\$0</b>
29	<i>Percent Allocation</i>	100.0%	0.0%	30.0%	35.0%	35.0%	0.0%
<b>Outside specific - total service</b>							
30	Source of supply	\$0	\$0	\$0	\$0	\$0	\$0
31	Treatment	0	0	0	0	0	0
32	Pumping	0	0	0	0	0	0
33	Transmission and distribution	1,176	0	1,176	1,492	1,492	0
34	Storage	0	0	0	0	0	0
35	Customer	1	0	1	0	0	0
36	General & Administrative	0	0	0	0	0	0
37	<b>Total</b>	<b>\$4,162</b>	<b>\$0</b>	<b>\$1,178</b>	<b>\$1,492</b>	<b>\$1,492</b>	<b>\$0</b>
38	<i>Percent Allocation</i>	100.0%	0.0%	28.3%	35.9%	35.9%	0.0%
<b>Outside specific</b>							
39	Source of supply	\$0	\$0	\$0	\$0	\$0	\$0
40	Treatment	0	0	0	0	0	0
41	Pumping	1,254	0	1,254	1,465	1,039	0
42	Transmission and distribution	147	0	147	171	171	0
43	Storage	0	0	0	0	0	0
44	Customer	0	0	0	0	0	0
45	General & Administrative	0	0	0	0	0	0
46	<b>Total</b>	<b>\$4,247</b>	<b>\$0</b>	<b>\$1,400</b>	<b>\$1,636</b>	<b>\$1,210</b>	<b>\$0</b>
47	<i>Percent Allocation</i>	100.0%	0.0%	33.0%	38.5%	28.5%	0.0%

\*Totals may not add due to rounding.



Table C-5  
2013 Cost-of-service study  
Development of O&M unit cost of service (\$ thousands)

Line No	Description	Total	Nonpotable	Base	Max day	Max hour	Billing	Customer service
<b>Percent Allocation of O&amp;M Expense by Cost Pool by Cost Component</b>								
Joint								
1	Joint Inside, (Table C-4, Line 20)	100.0%	20.1%	36.0%	21.8%	6.0%	0.0%	16.1%
2	Joint Outside (Table C-4, Line 21)	100.0%	24.5%	35.8%	26.2%	6.5%	0.0%	6.9%
3	Inside specific, (Table C-4, Line 31)	100.0%	0.0%	30.0%	35.0%	35.0%	0.0%	0.0%
4	Outside specific - total service, (Table C-4, Line 41)	100.0%	0.0%	28.3%	35.9%	35.9%	0.0%	0.0%
5	Outside specific, (Table C-4, Line 51)	100.0%	0.0%	33.0%	38.5%	28.5%	0.0%	0.0%
<b>Allocation of O&amp;M by Cost Pool by CSC</b>								
Joint								
6	Joint Inside	\$78,054	\$15,696	\$28,136	\$16,984	\$4,702	\$0	\$12,535
7	Joint Outside	\$82,756	\$20,300	\$29,663	\$21,664	\$5,404	\$0	\$5,725
8	Inside specific	\$11,047	\$0	\$3,311	\$3,868	\$3,868	\$0	\$0
9	Outside specific - total service	\$4,162	\$0	\$1,178	\$1,492	\$1,492	\$0	\$0
10	Outside specific	\$4,247	\$0	\$1,400	\$1,636	\$1,210	\$0	\$0
	<b>Total</b>	<b>\$180,265</b>	<b>\$35,995</b>	<b>\$63,688</b>	<b>\$45,645</b>	<b>\$16,677</b>	<b>\$0</b>	<b>\$18,260</b>
<b>Customer Service Characteristics, Kgal</b>								
Joint								
11	Joint Inside		33,673,049					
	Joint Inside (excluding recycled)			32,833,049	79,873	93,111	1,909,727	159,144
12	Joint Outside		43,549,901	34,614,935	101,881	107,003	872,179	72,682
13	Inside specific		33,673,049	32,833,049	79,873	93,111	1,909,727	159,144
14	Outside specific - total service		8,184,326	8,184,326	24,045	25,521	434,574	36,214
15	Outside specific		43,549,901	34,614,935	101,881	107,003	872,179	72,682
<b>Unit Cost by Cost Pool by CSC</b>								
Joint								
16	Joint Inside		\$0.47	\$0.86	\$212.64	\$50.50	\$0.00	\$78.77
17	Joint Outside		0.47	0.86	212.64	50.50	0.00	78.77
18	Inside specific		0.00	0.10	48.43	41.54	0.00	0.00
19	Outside specific - total service		0.00	0.14	62.06	58.47	0.00	0.00
20	Outside specific		0.00	0.04	16.06	11.31	0.00	0.00
Inside City								
21	Joint		\$0.47	\$0.86	\$212.64	\$50.50	\$0.00	\$78.77
22	Inside specific		0.00	0.10	48.43	41.54	0.00	0.00
23	Total inside city O&M		\$0.47	\$0.96	\$261.07	\$92.04	\$0.00	\$78.77
Outside city (Read & Bill, Master Meter)								
24	Joint		0.47	0.86	212.64	50.50	0.00	78.77
25	Joint		0.47	0.86	212.64	50.50	0.00	78.77
26	Outside specific		0.00	0.04	16.06	11.31	0.00	0.00
	<b>Total</b>		<b>\$0.47</b>	<b>\$0.90</b>	<b>\$228.71</b>	<b>\$61.81</b>	<b>\$0.00</b>	<b>\$78.77</b>
Total Service								
27	Joint		0.47	0.86	212.64	50.50	0.00	78.77
28	Outside specific		0.00	0.04	16.06	11.31	0.00	0.00
29	Outside specific - total service		0.00	0.14	62.06	58.47	0.00	0.00
30	Total TS specific O&M		\$0.47	\$1.04	\$290.76	\$120.28	\$0.00	\$78.77

\*Totals may not add due to rounding.

**Table C-6**  
**2013 Cost-of-service study**  
**Functional allocation of capital to cost pools (\$ thousands)**

Line No	Function	2013 Capital	Joint		Inside specific	Total service	Outside specific
			Inside	Outside			
<b>Expansion Capital</b>							
1	Source of supply	\$20,791	\$9,066	\$11,725	\$0	\$0	\$0
2	Recycled distribution	2,421	0	0	2,421	0	0
3	Treatment	2,016	879	1,137	0	0	0
4	Distribution mains <26"	2,240	947	1,225	53	15	0
5	Treated pumping	1,851	634	820	0	0	397
6	Treated Storage	11,517	0	1	11,516	0	0
7	Distribution mains >26"	1,273	518	669	83	3	0
8	General plan	72	31	40	0	0	0
9	Fire	0	0	0	0	0	0
10	Customer	0	0	0	0	0	0
<b>11</b>	<b>Total</b>	<b>\$42,180</b>	<b>\$12,075</b>	<b>\$15,617</b>	<b>\$14,073</b>	<b>\$18</b>	<b>\$397</b>
12	<i>Percent of Total</i>		28.6%	37.0%	33.4%	0.0%	0.9%
<b>Repair and Replacement, General Equipment Capital</b>							
13	Source of supply	\$12,465	\$5,436	\$7,030	\$0	\$0	\$0
14	Recycled distribution	0	0	0	0	0	0
15	Treatment	13,505	5,889	7,616	0	0	0
16	Distribution mains <26"	15,714	1,953	2,526	8,307	2,927	0
17	Treated pumping	8,203	1,926	2,490	0	0	3,787
18	Treated Storage	799	100	129	0	0	571
19	Distribution mains >26"	10,102	3,505	4,533	694	0	1,371
20	General plan	13,217	5,763	7,454	0	0	0
21	Fire	0	0	0	0	0	0
22	Customer	0	0	0	0	0	0
<b>23</b>	<b>Total</b>	<b>\$74,007</b>	<b>\$24,571</b>	<b>\$31,778</b>	<b>\$9,001</b>	<b>\$2,927</b>	<b>\$5,729</b>
24	<i>Percent of Total</i>	0	31.7%	41.1%	13.9%	4.5%	8.8%

**Table C-7**  
**2013 Cost-of-service study**  
**2013 Capital costs - allocation to cost pools (\$ thousands)**

Line No	Description	Joint		Inside specific	Total service	Outside specific	Total
		Inside	Outside				
1	Expansion facilities	28.6%	37.0%	33.4%	0.0%	0.9%	100.0%
2	Bond proceeds	28.6%	37.0%	33.4%	0.0%	0.9%	100.0%
3	SDCs	43.9%	56.1%				100.0%
4	Existing debt service	45.3%	54.7%				100.0%
5	2013 Debt Service	28.6%	37.0%	33.4%	0.0%	0.9%	100.0%
6	Repair and replacement	33.2%	42.9%	12.2%	4.0%	7.7%	100.0%
7	Interest income	45.3%	54.7%				100.0%
8	Babs subsidy (2009a and 2010b)			100.0%			100.0%
9	Transfer in	45.3%	54.7%				100.0%
10	Reserves	45.3%	54.7%				100.0%

Line No	Description	Joint		Inside specific	Total service	Outside specific	Total
		Inside	Outside				
11	Expansion facilities	\$12,075	\$15,617	\$14,073	\$18	\$397	\$42,180 OK
12	Bond proceeds	(7,329)	(9,479)	(8,541)	(11)	(241)	(25,600) OK
13	SDCs	(4,633)	(5,917)				(10,551) OK
14	Existing debt service	20,929	25,283				46,212 OK
15	2013 Debt Service	165	213	192	0	5	576 OK
16	Repair and replacement	24,571	31,778	9,001	2,927	5,729	74,007 OK
17	Interest income	0	0	0	0	0	0 OK
18	Babs subsidy (2009a and 2010b)			(2,344)			(2,344) OK
19	Transfer In	(1,857)	(2,243)	0	0	0	(4,100) OK
20	Reserves	(7,972)	(9,631)	0	0	0	(17,603) OK
21	<b>Total</b>	<b>\$35,949</b>	<b>\$45,622</b>	<b>\$12,381</b>	<b>\$2,934</b>	<b>\$5,891</b>	<b>\$102,777 OK</b>

**Table C-8**  
**2013 Cost-of-service study**  
**2013 Capital revenue requirement allocation to cost pools (\$ thousands)**

Line No	Allocation	Nonpotable	Ave day	Max day	Max hour	Fire	Total	%	% of Joint
	Joint	\$416,736	\$284,414	\$244,125	\$52,964	\$0	\$998,239		
1	Inside city	43.6%	48.7%	43.9%	46.5%	68.6%			
2	Outside city	56.4%	51.3%	56.1%	53.5%	31.4%			
3	Inside city	\$181,717	\$138,450	\$107,282	\$24,644	\$0	\$452,094	28.6%	45.3%
4	Outside city	\$235,018	\$145,964	\$136,843	\$28,320	\$0	\$546,145	34.5%	54.7%
5	Inside city specific	\$0	\$182,897	\$131,884	\$131,884	\$0	\$446,665	28.2%	
6	Total service specific	\$0	\$11,750	\$16,581	\$16,581	\$0	\$44,911	2.8%	
7	Outside city speciic	\$0	\$31,682	\$30,820	\$28,861	\$0	\$91,362	5.8%	
8	<b>2013 NBV, ex. water rights</b>	<b>\$416,736</b>	<b>\$510,742</b>	<b>\$423,410</b>	<b>\$230,289</b>	<b>\$0</b>	<b>\$1,581,177</b>	<b>100.0%</b>	
	<b>Cost component allocation</b>								
9	Joint inside city	40.2%	30.6%	23.7%	5.5%	0.0%	100.0%		
10	Joint outside city	43.0%	26.7%	25.1%	5.2%	0.0%	100.0%		
11	Inside city specific	0.0%	40.9%	29.5%	29.5%	0.0%	100.0%		
12	Total service specific	0.0%	26.2%	36.9%	36.9%	0.0%	100.0%		
13	Outside city specific	0.0%	34.7%	33.7%	31.6%	0.0%	100.0%		
14	Total inside allocation	20.2%	35.8%	26.6%	17.4%	0.0%	100.0%		
15	Total outside allocation	34.4%	27.8%	27.0%	10.8%	0.0%	100.0%		
16	System allocation	26.4%	32.3%	26.8%	14.6%	0.0%	100.0%		
	<b>Inside city cost pool allocation</b>								
17	Joint	100.0%	43.1%	44.9%	15.7%	0.0%	50.3%		
18	Specific	0.0%	56.9%	55.1%	84.3%	100.0%	49.7%		
19	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%		
	<b>Outside city cost pool allocation</b>								
20	Joint	100.0%	77.1%	74.3%	38.4%	0.0%	80.0%		
21	Total service	0.0%	6.2%	9.0%	22.5%	0.0%	6.6%		
22	Outside city	0.0%	16.7%	16.7%	39.1%	0.0%	13.4%		
23	Total	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%		
24	<b>Total capital requirement</b>	<b>\$27,088</b>	<b>\$33,198</b>	<b>\$27,522</b>	<b>\$14,969</b>	<b>\$0</b>	<b>102,777</b>		
	<b>Outside city capital requirement</b>								
25	Outside city joint	\$19,632	\$12,193	\$11,431	\$2,366	\$0	\$45,622		
26	Total service	\$0	\$768	\$1,083	\$1,083	\$0	\$2,934		
27	Specific outside city	\$0	\$2,043	\$1,987	\$1,861	\$0	\$5,891		
28	<b>Total outside city capital req</b>	<b>\$19,632</b>	<b>\$15,003</b>	<b>\$14,502</b>	<b>\$5,310</b>	<b>\$0</b>	<b>\$54,447</b>		
	<b>Outside city risk premium</b>								
29	Outside city joint	\$6,407	\$3,979	\$3,730	\$772	\$0	\$14,888		
30	Total service	\$0	\$251	\$354	\$354	\$0	\$958		
31	Specific outside city	\$0	\$667	\$648	\$607	\$0	\$1,922		
32	<b>Total outside city risk premi</b>	<b>\$6,407</b>	<b>\$4,896</b>	<b>\$4,732</b>	<b>\$1,733</b>	<b>\$0</b>	<b>\$17,768</b>		
33	<i>Inside city capital requirement</i>	<i>\$7,456</i>	<i>\$18,195</i>	<i>\$13,020</i>	<i>\$9,659</i>	<i>\$0</i>	<i>\$48,330</i>		
34	<i>Additional amount credit</i>	<i>(\$6,407)</i>	<i>(\$4,896)</i>	<i>(\$4,732)</i>	<i>(\$1,733)</i>	<i>\$0</i>	<i>(\$17,768)</i>		

Table C-9  
2013 Cost-of-service study  
Projected 2013 capital unit costs (\$ thousands)

Line No	Description	Nonpotable	Ave day	Max day	Max hour	Total
1	Inside city capital costs	\$7,456	\$18,195	\$13,020	\$9,659	\$48,330
2	Inside city additional amount	(\$6,655)	(\$4,968)	(\$4,811)	(\$1,756)	(\$18,189)
3	Percentage inside joint costs	100.0%	43.1%	44.9%	15.7%	
4	Percentage inside specific costs	0.0%	56.9%	55.1%	84.3%	
<b>Unit cost summary</b>						
Inside city joint unit cost						
5	Cost	\$7,456	\$7,839	\$5,840	\$1,521	\$22,656
6	Inside city demand excluding ccd	30,985				
7	Inside city demand w/o recycled and ccd		30,069	71	85	
8	Inside city joint unit cost	\$0.24	\$0.26	\$82.81	\$17.94	
Inside city joint unit cost - additional amount credit						
9	Cost	(\$6,655)	(\$2,140)	(\$2,158)	(\$276)	(\$11,230)
10	Inside city demand excluding ccd	30,985				
11	Inside city demand w/o recycled and ccd		30,069	71	85	
12	Inside city joint unit cost	(\$0.21)	(\$0.07)	(\$30.60)	(\$3.26)	
13	<b>Unit cost - joint inside city</b>	<b>\$0.03</b>	<b>\$0.19</b>	<b>\$52.22</b>	<b>\$14.68</b>	
Inside city specific costs						
14	Inside city demand		10,356	7,180	8,138	\$25,674
15	Inside city specific unit costs		30,397	71	85	
15	Inside city specific unit costs		\$0.34	\$101.80	\$95.98	
Inside city specific costs - additional amount						
16	Total inside city demand		30,397	71	85	
17	Inside city specific unit costs		(\$0.09)	(\$37.61)	(\$17.45)	(\$6,959)
18	<b>Net unit cost - specific inside city</b>		<b>\$0.25</b>	<b>\$64.19</b>	<b>\$78.54</b>	
Outside city joint unit cost						
19	Joint outside city cost	\$19,632	\$12,193	\$11,431	\$2,366	\$45,622
20	Outside city demand	43,550				
21	Outside city demand excluding recycled		34,615	102	107	
22	Outside city joint unit cost	\$0.45	\$0.35	\$112.20	\$22.11	
Outside city joint unit costs - additional amount						
23	Joint outside city cost	\$6,407	\$3,979	\$3,730	\$772	\$14,888
24	Total outside city demand	43,550				
25	Outside city demand w/o recycled		34,615	102	107	
26	Oc joint unit cost - additional amou 3616128.819	\$0.15	\$0.11	\$36.61	\$7.21	
27	<b>Net unit cost - joint outside city</b>	<b>\$0.60</b>	<b>\$0.47</b>	<b>\$148.82</b>	<b>\$29.32</b>	
Outside city specific cost						
28	Outside city specific cost		\$2,043	\$1,987	\$1,861	\$5,891
29	Total outside city demand		34,615	102	107	
30	Outside city specific unit cost		\$0.06	\$19.50	\$17.39	
Outside city specific cost - additional amount						
31	Outside city specific cost - additional amount		\$666.58	\$648.44	\$607.22	\$1,922
32	Total outside city demand		34,615	102	107	
33	Outside city specific unit cost - additional amount		\$0.02	\$6.36	\$5.67	
34	<b>Net unit cost - specific outside city</b>		<b>\$0.08</b>	<b>\$25.87</b>	<b>\$23.06</b>	

**Table C-9**  
**2013 Cost-of-service study**  
**Projected 2013 capital unit costs (\$ thousands)**

Line No	Description	Nonpotable	Ave day	Max day	Max hour	Total
35	Outside city total service specific cost		\$768	\$1,083	\$1,083	\$2,934
36	Total service demand		8,184	24	26	
37	Outside city total service specific unit cost		\$0.09	\$45.06	\$42.45	
38	Oc total service specific cost - additional amount		\$251	\$354	\$354	\$958
39	Total service demand		8,184	24	26	
40	Oc total service specific unit cost - additional amount		\$0.03	\$14.70	\$13.85	
41	<b>Net unit cost - total service</b>		<b>\$0.12</b>	<b>\$59.76</b>	<b>\$56.30</b>	
42	<b>Outside city specific unit cost</b>	<b>\$0.60</b>	<b>\$0.55</b>	<b>\$174.68</b>	<b>\$52.39</b>	
43	<b>Outside city total service specific unit cost</b>	<b>\$0.60</b>	<b>\$0.67</b>	<b>\$234.44</b>	<b>\$108.69</b>	
44	<b>Additional amount unit costs</b>					
45	Joint outside	\$0.06	\$0.05	\$14.65	\$2.89	
46	Specific outside		\$0.01	\$2.55	\$2.27	
<b>Ocsa units of service</b>						
47	Treated	1,339,865	1,339,865	4,552	4,442	
48	Raw	2,036,966				
49	Recycled	850,000	0	0	0	
50	Treated	\$79	\$72	\$78	\$23	\$252
51	Raw	\$120				\$120
52	Recycled	\$50	\$0	\$0	\$0	\$50
53	<b>Total</b>	<b>\$249</b>	<b>\$72</b>	<b>\$78</b>	<b>\$23</b>	<b>\$422</b>
<b>Capital unit cost summary</b>						
Inside city						
54	Inside city joint	\$0.03	\$0.19	\$52.22	\$14.68	
55	Specific inside	\$0.00	\$0.25	\$64.19	\$78.54	
56	<b>Total inside city</b>	<b>\$0.03</b>	<b>\$0.44</b>	<b>\$116.41</b>	<b>\$93.21</b>	
Outside city (read & bill, master meter)						
57	Joint outside	\$0.60	\$0.47	\$148.82	\$29.32	
58	Specific outside	\$0.00	\$0.08	\$25.87	\$23.06	
59	<b>Total outside city</b>	<b>\$0.60</b>	<b>\$0.55</b>	<b>\$174.68</b>	<b>\$52.39</b>	
Total service						
60	Joint outside	\$0.60	\$0.47	\$148.82	\$29.32	
61	Specific outside	\$0.00	\$0.08	\$25.87	\$23.06	
62	Total service	\$0.00	\$0.12	\$59.76	\$56.30	
63	<b>Total total service</b>	<b>\$0.60</b>	<b>\$0.67</b>	<b>\$234.44</b>	<b>\$108.69</b>	

**Table C-10**  
**2013 Cost-of-service study**  
**Weighted average cost of capital**

<b>Capital Structure</b>	<b>Amount</b>	<b>Ratio</b>	<b>Cost <sup>3</sup></b>	<b>Weighted Cost</b>
Total Equity Capital <sup>1</sup>	\$821,144,410	66.45%	8.74%	5.81%
Total Debt Capital <sup>2</sup>	\$414,550,810	33.55%	4.00%	1.34%
<b>Total</b>	<b>\$1,235,695,220</b>	<b>100.00%</b>		<b>7.15%</b>
			WACC	7.15%
			Less: Cost of Debt	4.00%
			<b>Equity RP</b>	<b>3.15%</b>

Notes:

(1). The amount of equity capital shown above is the sum of general ledger accounts: 216.000 Retained Earnings; 216.009 Transfers of Expense to Contributions in Aid of Construction; and 216.109; and 2011 net income.

(2) Page II-17 in 2011 CAFR. Debt is sum of revenue bonds, G.O. bonds, Obligations under capital lease, discounts and net of premiums. Discounts total \$162,000 and premium totals \$1,255,000.

(3) The cost of equity capital from Table 9. The cost of debt is the weighted average yield to maturity of all outstanding debt.

Table C-11  
2013 Cost-of-service study  
Projected 2013 rate base (\$ thousands)

Line No	Description	Inside	Outside	Total	Inside	Outside	Allocation	
<b>2013 NBV</b>								
1	Specific assignment	446,665	136,272	582,938	76.6%	23.4%	Specifically allocated	
2	Joint	274,380	723,859	998,239	27.5%	72.5%	LTD Forecast	
3	Water rights	18,204	48,024	66,228	27.5%	72.5%	2013 Water Use	
4	Other assets	9,691	12,533	22,224			Number of Customers	
5	<b>Total 2013 nbv</b>	<b>748,939</b>	<b>920,690</b>	<b>1,669,629</b>				
<b>New projects</b>								
6	2012	39,441	50,815	90,257	43.7%	56.3%	EOY 2011 CWIP Projects	
7	2012	41,674	53,691	95,365	43.7%	56.3%	2012 new projects	
8	2013	22,157	28,656	50,813	43.6%	56.4%	2013 new projects * 50%	
9	<b>Total future capital costs</b>	<b>\$103,273</b>	<b>\$133,163</b>	<b>\$236,436</b>				
<b>Accumulated depreciation</b>								
10	2012	(1,182)	(1,526)	(2,708)	43.7%	56.3%	CWIP Projects	<u>Years</u> 1.5
11	2012	(1,248)	(1,613)	(2,861)	43.7%	56.3%	2012 Cap Plan Projects	1.5
12	2013	(221)	(287)	(508)	43.6%	56.4%	2013 Cap Plan Projects	0.5
13	<b>Total accumulated depreciation</b>	<b>(\$2,651)</b>	<b>(\$3,426)</b>	<b>(\$6,077)</b>				
<b>Contributions</b>								
14	Existing ciac through 2011	(\$419,112)	(\$629,793)	(\$1,048,906)			Does not change after 2011	
15	2012	(7,416)	(8,664)	(16,081)				
16	2013	(4,633)	(5,917)	(10,551)				
17	<b>Total contributions</b>	<b>(\$431,162)</b>	<b>(\$644,375)</b>	<b>(\$1,075,537)</b>				
<b>CIAC amortization</b>								
18	Existing ciac amort through 2013	\$104,672	\$157,290	\$261,962				
19	2012	159	186	345				
20	2013	33	42	75				
21	<b>Total CIAC amortization</b>	<b>\$104,864</b>	<b>\$157,518</b>	<b>\$262,382</b>				
22	<b>Net assets</b>	<b>\$523,264</b>	<b>\$563,569</b>	<b>\$1,086,833</b>				
23	Risk premium (WACC less cost of debt)		3.15%					
24	Additional amount		\$17,768					



**Table C-12**  
**2013 Cost-of-service study**  
**Projected 2013 non-rate revenue unit costs (\$ thousands)**

Line No	Description	Nonpotable	Ave day	Max day	Max hour	Customers	Total
Operation and maintenance expense by cost pool							
1	Joint	\$35,995	\$57,799	\$38,649	\$10,106	\$18,260	\$160,809
2	Inside specific		3,311	3,868	3,868		11,047
3	Outside specific - total service		1,178	1,492	1,492		4,162
4	Outside specific		1,400	1,636	1,210		4,247
5	Total O&M expense	\$35,995	\$63,688	\$45,645	\$16,677	\$18,260	\$180,265
6	Total capital	\$27,088	\$33,198	\$27,522	\$14,969	\$0	\$102,777
		28282.41634	34662.30685	28735.37241	15628.9553	0	
7	Total revenue requirements	\$63,083	\$96,886	\$73,167	\$31,646	\$18,260	\$283,042
		22.3%	34.2%	25.9%	11.2%	6.5%	100.0%
8	Operating revenue	\$2,320,241	\$3,563,545	\$2,691,140	\$1,163,943	\$671,613	\$10,410,483
9	Non-operating revenue	4,252,974					\$4,252,974
10	Demand	77,222,950	67,447,984	181,753	200,114	231,825	
11	Non-rate unit costs	\$0.09	\$0.05	\$14.81	\$5.82	\$2.90	\$14,663,457
12	Inside non-rate revenue	\$0	\$0	\$0	\$0	\$0	\$0
13	Inside demand	33,673,049	32,833,049	79,873	93,111	159,144	
14	Inside non-rate unit costs	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
15	Outside non-rate revenue	\$0	\$0	\$0	\$0	\$0	\$0
16	Outside demand	43,549,901	34,614,935	101,881	107,003	72,682	
17	Outside non-rate unit costs	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
18	Operations and maintenance	\$35,995	\$63,688	\$45,645	\$16,677	\$18,260	\$180,265
19	Capital	27,088	33,198	27,522	14,969	0	102,777
20	Non-rate revenue	6,573	3,564	2,691	1,164	672	14,663
21	Other non-rate revenue	0	0	0	0	0	0
22	Total revenue requirements from rates	\$56,510	\$93,323	\$70,476	\$30,482	\$17,588	\$268,379

**Table C-13**  
**2013 Cost-of-service study**  
**Unit cost of service**

Line No	Description	Type of cost	Nonpotable \$ per Kgal	Ave day \$ per Kgal	Max day \$ per gpd	Max hour \$ per gpd	Customers \$ per account
1	Inside city specific	O&M	\$0.47	\$0.96	\$261.07	\$92.04	\$78.77
2		Capital inside joint	0.03	0.19	52.22	14.68	
3		Capital inside specific		0.25	64.19	78.54	
4		Capital total	\$0.03	\$0.44	\$116.41	\$93.21	
5		Non-rate revenue	0.09	0.05	14.81	5.82	2.90
6		Total	\$0.41	\$1.35	\$362.68	\$179.44	\$75.87
7	City and county of Denver	O&M	\$0.47	\$0.96	\$261.07	\$92.04	\$78.77
8		Return benefit					
9		Non-rate revenue	0.09	0.05	14.81	5.82	2.90
10		Total	\$0.38	\$0.91	\$246.27	\$86.23	\$75.87
11	Outside city specific	O&M	\$0.47	\$0.90	\$228.71	\$61.81	\$78.77
12		Capital outside	0.60	0.55	174.68	52.39	
13		Non-rate revenue	0.09	0.05	14.81	5.82	2.90
14		Total	\$0.98	\$1.40	\$388.58	\$108.38	\$75.87
15	Oc total service specific	O&M	\$0.47	\$1.05	\$290.76	\$120.28	\$78.77
16		Capital outside	0.60	0.67	234.44	108.69	
17		Non-rate revenue	0.09	0.05	14.81	5.82	2.90
18		Total	\$0.98	\$1.67	\$510.40	\$223.15	\$75.87

**Table C-14**  
**2013 Cost-of-service study**  
**Projected 2013 O&M cost of service (\$ thousands)**

Line No	Description	Nonpotable	Ave day	Max day	Max hour	Customers	Total
<b>Inside city</b>							
1	Single family residential	\$6,305	\$13,054	\$10,159	\$3,787	\$10,419	\$43,724
2	Duplex	362	749	388	180	460	2,139
3	3-plex	109	226	117	54	109	615
4	4-plex	160	330	171	79	119	859
5	5-plex	79	164	85	39	46	414
6	Commercial	5,691	11,782	5,240	2,648	1,154	26,516
7	Industrial	561	1,161	516	261	21	2,519
8	Government	284	587	261	132	19	1,283
9	Irrigation only	465	963	1,343	393	96	3,260
10	City and County of Denver	1,026	2,124	2,440	766	92	6,449
		0	0	0	0	0	0
11	Private fire protection	0	0	131	231	0	362
12	Subtotal treated Inside City	\$15,042	\$31,141	\$20,853	\$8,570	\$12,533	\$88,139
13	Raw	\$274	\$0	\$0	\$0	\$0	\$274
14	City and County of Denver raw	117	0	0	0	0	117
15	Recycled	153	33	0	0	1	187
16	City and County of Denver recycled	109	24	0	0	1	134
17	Subtotal non-potable Inside City	\$654	\$57	\$0	\$0	\$2	\$712
18	<b>Total inside city</b>	<b>\$15,696</b>	<b>\$31,197</b>	<b>\$20,853</b>	<b>\$8,570</b>	<b>\$12,535</b>	<b>\$88,851</b>
<b>Outside city</b>							
Read & bill							
19	Single family residential	\$2,113	\$4,101	\$3,182	\$883	\$2,593	\$12,873
20	Duplex	11	22	12	4	11	61
21	3-plex	11	21	11	4	10	57
22	4-plex	32	61	32	11	20	156
23	5-plex	5	10	5	2	3	26
24	Commercial	1,113	2,161	1,497	437	194	5,402
25	Industrial	65	126	87	25	0	303
26	Government	145	281	194	57	4	681
27	Irrigation only	266	517	630	144	32	1,590
28	Private Fire Protection	0	0	18	25	0	43
29	Total read & bill	\$3,762	\$7,301	\$5,669	\$1,591	\$2,868	\$21,192
Total service							
30	Single family residential	\$2,273	\$5,113	\$4,351	\$1,848	\$2,534	\$16,119
31	Duplex	21	48	30	15	21	136
32	3-plex	13	29	18	9	9	78
33	4-plex	34	76	47	23	17	197
34	5-plex	11	25	15	8	6	65
35	Commercial	1,040	2,340	1,458	721	215	5,774
36	Industrial	20	46	28	14	1	109
37	Government	96	216	134	66	6	519
38	Irrigation only	306	689	884	314	44	2,236
39	Private Fire Protection	0	0	26	52	0	78
40	Total total service	\$3,815	\$8,581	\$6,991	\$3,070	\$2,852	\$25,310
41	Master meter	\$7,933	\$15,396	\$11,091	\$3,171	\$3	\$37,595
42	OCSA treated	625	1,212	1,041	275	1	3,153
43	Total treated outside city	\$16,135	\$32,491	\$24,793	\$8,106	\$5,725	\$87,249
44	Raw	\$2,819	\$0	\$0	\$0	\$0	\$2,819
45	OCSA raw	949	0	0	0	0	949
46	OCSA recycled	396	0	0	0	0	396
47	Subtotal non-potable Outside City	\$4,165	\$0	\$0	\$0	\$0	\$4,165
48	<b>Total outside city</b>	<b>\$20,300</b>	<b>\$32,491</b>	<b>\$24,793</b>	<b>\$8,106</b>	<b>\$5,725</b>	<b>\$91,414</b>
49	<b>Total treated</b>	<b>\$31,177</b>	<b>\$63,631</b>	<b>\$45,645</b>	<b>\$16,677</b>	<b>\$18,258</b>	<b>\$175,388</b>
50	<b>Total raw</b>	<b>\$4,160</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$4,160</b>
51	<b>Total recycled</b>	<b>\$658</b>	<b>\$57</b>	<b>\$0</b>	<b>\$0</b>	<b>\$2</b>	<b>\$717</b>
52	<b>Total</b>	<b>\$35,995</b>	<b>\$63,688</b>	<b>\$45,645</b>	<b>\$16,677</b>	<b>\$18,260</b>	<b>\$180,265</b>

**Table C-15**  
**2013 Cost-of-service study**  
**Projected 2013 capital cost of service (\$ thousands)**

Line No	Description	Nonpotable	Ave day	Max day	Max hour	Customer	Total
<b>Inside city</b>							
1	Single family residential	\$350	\$5,914	\$4,530	\$3,835	\$0	\$14,628
2	Duplex	20	339	173	182	0	715
3	3-plex	6	102	52	55	0	216
4	4-plex	9	150	76	80	0	315
5	5-plex	4	74	38	40	0	157
6	Commercial	315	5,338	2,336	2,682	0	10,672
7	Industrial	31	526	230	264	0	1,051
8	Government	16	266	116	134	0	532
9	Irrigation only	26	436	599	398	0	1,459
10	City and County of Denver	0	0	0	0	0	0
		0	0	0	0	0	0
11	Private fire protection	0	0	58	234	0	292
12	Subtotal treated Inside City	\$777	\$13,146	\$8,210	\$7,903	\$0	\$30,036
13	Raw	\$15	\$0	\$0	\$0	\$0	\$15
14	City and County of Denver raw	0	0	0	0	0	0
15	Recycled	8	81	0	0	0	90
16	City and County of Denver recycled	0	0	0	0	0	0
17	Subtotal non-potable Inside City	\$24	\$81	\$0	\$0	\$0	\$105
18	<b>Total inside city</b>	<b>\$801</b>	<b>\$13,227</b>	<b>\$8,210</b>	<b>\$7,903</b>	<b>\$0</b>	<b>\$30,141</b>
<b>Outside city</b>							
Read & bill							
19	Single family residential	\$2,711	\$2,473	\$2,430	\$748	\$0	\$8,362
20	Duplex	15	13	9	3	0	40
21	3-plex	14	13	9	3	0	39
22	4-plex	41	37	25	9	0	112
23	5-plex	7	6	4	2	0	19
24	Commercial	1,428	1,303	1,143	370	0	4,245
25	Industrial	83	76	66	22	0	247
26	Government	186	169	149	48	0	552
27	Irrigation only	342	312	481	122	0	1,257
28	Private Fire Protection	0	0	14	21	0	35
29	Total read & bill	\$4,826	\$4,402	\$4,330	\$1,349	\$0	\$14,907
Total service							
30	Single family residential	\$2,916	\$3,267	\$3,508	\$1,670	\$0	\$11,361
31	Duplex	28	31	24	13	0	96
32	3-plex	17	19	14	8	0	58
33	4-plex	43	49	38	21	0	151
34	5-plex	14	16	12	7	0	50
35	Commercial	1,334	1,495	1,175	651	0	4,656
36	Industrial	26	29	23	13	0	91
37	Government	123	138	108	60	0	429
38	Irrigation only	393	440	713	284	0	1,829
39	Private Fire Protection	0	0	21	47	0	68
40	Total total service	\$4,893	\$5,483	\$5,637	\$2,774	\$0	\$18,787
41	Master meter	\$10,176	\$9,284	\$8,471	\$2,687	\$0	\$30,619
42	OCSA treated	880	803	873	256	0	2,812
43	Total treated outside city	\$20,775	\$19,971	\$19,312	\$7,066	\$0	\$67,124
44	Raw	\$3,616	\$0	\$0	\$0	\$0	\$3,616
45	OCSA raw	1,338	0	0	0	0	1,338
46	OCSA recycled	558	0	0	0	0	558
47	Subtotal non-potable Outside City	\$5,512	\$0	\$0	\$0	\$0	\$5,512
48	<b>Total outside city</b>	<b>\$26,287</b>	<b>\$19,971</b>	<b>\$19,312</b>	<b>\$7,066</b>	<b>\$0</b>	<b>\$72,637</b>
49	<b>Total treated</b>	<b>\$21,552</b>	<b>\$33,117</b>	<b>\$27,522</b>	<b>\$14,969</b>	<b>\$0</b>	<b>\$97,160</b>
50	<b>Total raw</b>	<b>\$4,969</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$4,969</b>
51	<b>Total recycled</b>	<b>\$567</b>	<b>\$81</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$648</b>
52	<b>Total</b>	<b>\$27,088</b>	<b>\$33,198</b>	<b>\$27,522</b>	<b>\$14,969</b>	<b>\$0</b>	<b>\$102,777</b>

**Table C-16**  
**2013 Cost-of-service study**  
**Projected 2013 non-rate revenue cost of service (\$ thousands)**

Line No	Description	Nonpotable	Ave day	Max day	Max hour	Customers	Total
<b>Inside city</b>							
1	Single family residential	\$1,151	\$715	\$576	\$239	\$383	\$3,065
2	Duplex	66	41	22	11	17	157
3	3-plex	20	12	7	3	4	46
4	4-plex	29	18	10	5	4	66
5	5-plex	14	9	5	2	2	32
6	Commercial	1,039	645	297	167	42	2,191
7	Industrial	102	64	29	16	1	212
8	Government	52	32	15	8	1	108
9	Irrigation only	85	53	76	25	4	242
10	City and County of Denver	187	116	138	48	3	494
		0	0	0	0	0	0
11	Private fire protection	0	0	7	15	0	22
12	Subtotal treated Inside City	\$2,747	\$1,705	\$1,183	\$542	\$461	\$6,637
13	Raw	\$50	\$0	\$0	\$0	\$0	\$50
14	City and County of Denver raw	21	0	0	0	0	21
15	Recycled	28	17	0	0	0	45
16	City and County of Denver recycled	20	12	0	0	0	32
17	Subtotal non-potable Inside City	\$119	\$30	\$0	\$0	\$0	\$149
18	<b>Total inside city</b>	<b>\$2,866</b>	<b>\$1,735</b>	<b>\$1,183</b>	<b>\$542</b>	<b>\$461</b>	<b>\$6,786</b>
<b>Outside city</b>							
Read & bill							
19	Single family residential	\$386	\$240	\$206	\$83	\$95	\$1,010
20	Duplex	2	1	1	0	0	5
21	3-plex	2	1	1	0	0	5
22	4-plex	6	4	2	1	1	13
23	5-plex	1	1	0	0	0	2
24	Commercial	203	126	97	41	7	475
25	Industrial	12	7	6	2	0	27
26	Government	26	16	13	5	0	61
27	Irrigation only	49	30	41	14	1	134
28	Private Fire Protection	0	0	1	2	0	4
29	Total read & bill	\$687	\$426	\$367	\$150	\$106	\$1,736
Total service							
30	Single family residential	\$415	\$258	\$222	\$89	\$93	\$1,077
31	Duplex	4	2	2	1	1	9
32	3-plex	2	1	1	0	0	5
33	4-plex	6	4	2	1	1	14
34	5-plex	2	1	1	0	0	5
35	Commercial	190	118	74	35	8	425
36	Industrial	4	2	1	1	0	8
37	Government	18	11	7	3	0	39
38	Irrigation only	56	35	45	15	2	152
39	Private Fire Protection	0	0	1	3	0	4
40	Total total service	\$697	\$432	\$356	\$148	\$105	\$1,738
41	Master meter	\$1,449	\$899	\$718	\$298	\$0	\$3,364
42	OCSA treated	114	71	67	26	0	278
43	Total treated outside city	\$2,946	\$1,829	\$1,509	\$622	\$211	\$7,117
44	Raw	\$515	\$0	\$0	\$0	\$0	\$515
45	OCSA raw	173	0	0	0	0	173
46	OCSA recycled	72	0	0	0	0	72
47	Subtotal non-potable Outside City	\$761	\$0	\$0	\$0	\$0	\$761
48	<b>Total outside city</b>	<b>\$3,707</b>	<b>\$1,829</b>	<b>\$1,509</b>	<b>\$622</b>	<b>\$211</b>	<b>\$7,877</b>
49	<b>Total treated</b>	<b>\$5,693</b>	<b>\$3,534</b>	<b>\$2,691</b>	<b>\$1,164</b>	<b>\$672</b>	<b>\$13,754</b>
50	<b>Total raw</b>	<b>\$760</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$760</b>
51	<b>Total recycled</b>	<b>\$120</b>	<b>\$30</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$150</b>
52	<b>Total</b>	<b>\$6,573</b>	<b>\$3,564</b>	<b>\$2,691</b>	<b>\$1,164</b>	<b>\$672</b>	<b>\$14,663</b>

**Table C-17**  
**2013 Cost-of-service study**  
**Projected 2013 cost of service (\$ thousands)**

Line No	Description	Nonpotable	Ave day	Max day	Max hour	Customers	Total
<b>Inside city</b>							
1	Single family residential	\$5,503	\$18,253	\$14,113	\$7,382	\$10,036	\$55,287
2	Duplex	316	1,047	540	351	443	2,696
3	3-plex	95	316	163	106	105	784
4	4-plex	139	462	238	155	114	1,108
5	5-plex	69	229	118	77	44	538
6	Commercial	4,967	16,475	7,279	5,162	1,111	34,996
7	Industrial	489	1,623	717	509	20	3,358
8	Government	248	821	363	257	18	1,707
9	Irrigation only	406	1,347	1,865	766	92	4,476
10	City and County of Denver	839	2,008	2,302	718	89	5,955
		0	0	0	0	0	0
11	Private fire protection	0	0	181	450	0	632
12	Subtotal treated Inside City	\$13,072	\$42,581	\$27,880	\$15,932	\$12,072	\$111,537
13	Raw	\$239	\$0	\$0	\$0	\$0	\$239
14	City and County of Denver raw	96	0	0	0	0	96
15	Recycled	133	97	0	0	1	231
16	City and County of Denver recycled	89	11	0	0	1	102
17	Subtotal non-potable Inside City	\$558	\$108	\$0	\$0	\$2	\$668
18	<b>Total inside city</b>	<b>\$13,630</b>	<b>\$42,690</b>	<b>\$27,880</b>	<b>\$15,932</b>	<b>\$12,074</b>	<b>\$112,206</b>
<b>Outside city</b>							
Read & bill							
19	Single family residential	\$4,438	\$6,335	\$5,406	\$1,548	\$2,498	\$20,225
20	Duplex	24	34	20	7	11	96
21	3-plex	23	33	19	7	9	91
22	4-plex	67	95	55	19	19	254
23	5-plex	11	16	9	3	3	43
24	Commercial	2,338	3,338	2,543	766	187	9,173
25	Industrial	136	194	148	45	0	523
26	Government	304	434	330	100	4	1,172
27	Irrigation only	559	798	1,071	253	31	2,712
28	Private Fire Protection	0	0	31	43	0	74
29	Total read & bill	\$7,900	\$11,277	\$9,632	\$2,791	\$2,763	\$34,363
Total service							
30	Single family residential	\$4,774	\$8,122	\$7,637	\$3,429	\$2,440	\$26,402
31	Duplex	45	77	52	28	21	222
32	3-plex	27	46	31	17	9	130
33	4-plex	71	121	82	44	16	334
34	5-plex	23	40	27	14	6	110
35	Commercial	2,185	3,717	2,559	1,337	207	10,005
36	Industrial	43	73	50	26	1	192
37	Government	201	342	236	123	6	909
38	Irrigation only	643	1,094	1,552	582	42	3,913
39	Private Fire Protection	0	0	46	96	0	142
40	Total total service	\$8,012	\$13,631	\$12,273	\$5,695	\$2,748	\$42,359
41	Master meter	\$16,661	\$23,781	\$18,845	\$5,559	\$3	\$64,849
42	OCSA treated	1,390	1,944	1,847	504	1	5,686
43	Total treated outside city	\$33,964	\$50,633	\$42,596	\$14,549	\$5,514	\$147,257
44	Raw	\$5,920	\$0	\$0	\$0	\$0	\$5,920
45	OCSA raw	2,114	0	0	0	0	2,114
46	OCSA recycled	882	0	0	0	0	882
47	Subtotal non-potable Outside City	\$8,916	\$0	\$0	\$0	\$0	\$8,916
48	<b>Total outside city</b>	<b>\$42,880</b>	<b>\$50,633</b>	<b>\$42,596</b>	<b>\$14,549</b>	<b>\$5,514</b>	<b>\$156,173</b>
49	<b>Total treated</b>	<b>\$47,036</b>	<b>\$93,215</b>	<b>\$70,476</b>	<b>\$30,482</b>	<b>\$17,586</b>	<b>\$258,794</b>
50	<b>Total raw</b>	<b>\$8,370</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$8,370</b>
51	<b>Total recycled</b>	<b>\$1,105</b>	<b>\$108</b>	<b>\$0</b>	<b>\$0</b>	<b>\$2</b>	<b>\$1,215</b>
52	<b>Total</b>	<b>\$56,510</b>	<b>\$93,323</b>	<b>\$70,476</b>	<b>\$30,482</b>	<b>\$17,588</b>	<b>\$268,379</b>

**Table C-18**  
**2013 Cost-of-service study**  
**Adjusted cost of service**

Line No	Description	2013 COS	Adjustment	Adjusted COS
<b>Inside city</b>				
1	Single family residential	\$55,287	\$466	\$55,752
2	Duplex	2,696	23	2,719
3	3-plex	784	7	791
4	4-plex	1,108	9	1,118
5	5-plex	538	5	542
6	Commercial	34,996	295	35,291
7	Industrial	3,358	28	3,386
8	Government	1,707	14	1,722
9	Irrigation only	4,476	38	4,514
10	City and County of Denver	5,955	(835)	5,120
11	Private fire protection	632	5	637
12	Subtotal treated Inside City	\$111,537	\$54	\$111,592
13	Raw	\$239	\$2	\$241
14	City and County of Denver raw	96	(28)	68
15	Recycled	231	2	233
16	City and County of Denver recycled	102	(30)	72
17	Subtotal non-potable Inside City	\$668	(\$54)	\$614
18	<b>Total inside city</b>	\$112,206	\$0	\$112,206
<b>Outside city</b>				
Read & bill				
19	Single family residential	\$20,225	\$0	\$20,225
20	Duplex	96	0	96
21	3-plex	91	0	91
22	4-plex	254	0	254
23	5-plex	43	0	43
24	Commercial	9,173	0	9,173
25	Industrial	523	0	523
26	Government	1,172	0	1,172
27	Irrigation only	2,712	0	2,712
28	Private Fire Protection	74	0	74
29	Total read & bill	\$34,363	\$0	\$34,363
Total service				
30	Single family residential	\$26,402	\$0	\$26,402
31	Duplex	222	0	222
32	3-plex	130	0	130
33	4-plex	334	0	334
34	5-plex	110	0	110
35	Commercial	10,005	0	10,005
36	Industrial	192	0	192
37	Government	909	0	909
38	Irrigation only	3,913	0	3,913
39	Private Fire Protection	142	0	142
40	Total total service	\$42,359	\$0	\$42,359
41	Master meter	\$64,849	\$0	\$64,849
42	OCSA treated	5,686	0	5,686
43	Total treated outside city	\$147,257	\$0	\$147,257
44	Raw	\$5,920	\$0	\$5,920
45	OCSA raw	2,114	0	2,114
46	OCSA recycled	882	0	882
47	Subtotal non-potable Outside city	\$8,916	\$0	\$8,916
48	<b>Total outside city</b>	\$156,173	\$0	\$156,173
49	<b>Total treated</b>	\$258,794	\$54	\$258,849
50	<b>Total raw</b>	\$8,370	(\$26)	\$8,344
51	<b>Total recycled</b>	\$1,215	(\$28)	\$1,187
52	<b>Total</b>	\$268,379	\$0	\$268,379

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