

**FINAL**

**COST OF SERVICE STUDY**

San Diego Public Utilities Department  
Water Fund



PREPARED FOR

City of San Diego, CA

5 SEPTEMBER 2013

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B&V PROJECT NO. 176664



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# Table of Contents

<b>Introduction</b> .....	<b>5</b>
Background .....	5
Changes since the Last Rate Case .....	6
Current Rate Case Focus .....	6
Purpose .....	7
Scope of Work .....	8
Overview of Legal and Industry Best Practices for Cost-Of-Service Studies.....	8
Proposition 13.....	8
Proposition 218.....	8
Assembly Bill 2882.....	9
Proposition 26.....	10
Government Code Section §54999.7 .....	10
Generally Accepted Rate-Setting Standards .....	10
Disclaimer .....	10
<b>Water Rate Study</b> .....	<b>12</b>
Revenue and Revenue Requirements.....	12
Customer and Water Usage Projections.....	12
Revenue Projections.....	13
Operation and Maintenance Projections.....	14
Capital Improvement Program .....	15
Capital Fund Financing.....	16
Operating Fund Financing.....	18
Summary of Revenues, Expenditures, and Obligations .....	21
Cost Of Service Allocations .....	24
Functional Cost Components .....	24
Allocation to Cost Components.....	25
Fire Protection .....	27
Allocation of Operation and Maintenance Expenses .....	27
Allocation of Capital Costs .....	29
Units of Service .....	29
Cost of Service Allocations .....	33
Unit Costs of Service .....	33
Distribution of Costs of Service to Customer Classes .....	33
Adequacy of Existing Rates to Meet Costs of Service .....	35
Proposed Rate Adjustments.....	36

Existing Rates ..... 36  
Proposed Rate Options..... 36  
    Design of Base Fee ..... 37  
    Design of Volumetric Charges..... 37  
    Design of Private Fire Protection ..... 38  
    Design of Irrigation Rate Alternative ..... 38  
Revenue Sufficiency..... 41  
Comparison of Typical Bills..... 43

**LIST OF TABLES**

Table 1 Major Changes to Underlying 2007 Rate Case Assumptions..... 6

Table 2 Historic and Projected Number of Connections..... 12

Table 3 Historical and Projected Billed Volume..... 13

Table 4 Existing Rates (Effective Since March 1, 2011)..... 13

Table 5 Revenue under Existing Rates[+]..... 14

Table 6 Historical and Projected Operation and Maintenance Expenses ..... 15

Table 7 Capital Improvement Program ..... 16

Table 8 Uninflated Capital Improvement Program by Project without Adjustments ..... 17

Table 9 CIP Financing Plan..... 18

Table 10 Operating Fund Financing Plan – Part I: Revenues [+]..... 19

Table 11 Operating Fund Financing Plan – Part II: Revenue Requirements and Ending Balances [+]..... 20

Table 12 Estimated Debt Service Coverage on Existing Debt ..... 22

Table 13 Total Costs to be Recovered from Rates for TY 14 ..... 24

Table 14 O&M Allocation Percentage for TY 14..... 27

Table 15 Allocation of O&M Expenses to Functional Cost Components ..... 28

Table 16 Allocation of Net Capital Costs to Functional Cost Components ..... 30

Table 17 Units of Service for TY 14..... 32

Table 18 Unit Costs of Service for TY 14..... 33

Table 19 Allocation of COS to Customer Classes..... 34

Table 20 Comparison of Adjusted COS with Revenues under Existing Rates ..... 35

Table 21 Volumetric Cost Recovery over Tiers ..... 38

Table 22 Proposed Meter Rates - Effective January 1, 2014 ..... 39

Table 23 Proposed Meter Rates - Effective January 1, 2015..... 39

Table 24 Proposed Commodity Rates - Effective January 1, 2014 ..... 39

Table 25 Proposed Commodity Rates - Effective January 1, 2015..... 40

Table 26 Proposed Irrigation Commodity Rates - Effective January 1, 2014..... 40

Table 27 Proposed Irrigation Commodity Rates - Effective January 1, 2015..... 41

Table 28 Revenues under Proposed Rate Structure Options for TY 14..... 42

**LIST OF FIGURES**

Figure 1. Historical Effective Rate Paid for Purchased Water..... 7

Figure 2. Cost of Service Allocation Methodology..... 25

Figure 3. Water Cost of Service Concepts ..... 26

Figure 4. Single-Family Residential Bi-Monthly Typical Bill for ¾” Meter  
and Using 6 HCF ..... 43

Figure 5. Single-Family Residential Bi-Monthly Typical Bill for ¾” Meter  
and Using 12 HCF..... 43

Figure 6. Single-Family Residential Bi-Monthly Typical Bill for ¾” Meter  
and Using 30 HCF..... 44

Figure 7. Single-Family Residential Bi-Monthly Typical Bill for ¾” Meter  
and Using 44 HCF..... 44

## Introduction

This report was prepared for the City of San Diego Public Utilities Department (PUD) to document the development of multi-year financial plans, cost of service analyses, and the design of rate structures for the PUD's Water Fund. The specific goals of the study were to:

- Review and evaluate existing policies and procedures affecting utility rates;
- Evaluate the adequacy of projected revenues under existing rates to meet projected revenue requirements;
- Develop a sound financial plan for the Water Fund covering a two-year study period for both ongoing operations and planned capital improvements;
- Allocate projected Fiscal Year 2013-2014 (FY 14) revenue requirements to the various customer classes in accordance with the respective service requirements; and
- Develop a suitable rate schedule that produces revenues adequate to meet financial needs of each utility system while recognizing customer costs of service and local and state legal and policy considerations such as California Constitution Articles XIII C and D (Proposition 218), Proposition 26, and Senate Bill x7-7 (SBx7-7).

This Cost of Service (COS) study reviews the cost of providing water service to the City's customers. To that end, the study examines the revenues generated by each Fund and makes recommendations for revenue adjustments, as needed. This study is a recalibration of the City's rates to reflect current conditions and not a comparison of former rate cases to the present one.

## BACKGROUND

The City of San Diego (City) is located in San Diego County and stretches to the United States and Mexico international border. The City is the largest city in San Diego County with a population of roughly 1.3 million (2010 US Census). The City owns and operates two self-supporting enterprises (Water and Wastewater). Only the Water Fund is subject to this cost of service (COS) analysis.

The Water utility system provides service to residential, commercial and industrial customers as well as several wholesale customers such as California-American Water Company. The City, through PUD, operates the Water utility system as a self-supporting enterprise, with revenues and expenditures accounted for separately from other enterprise and General Fund activities.

The Water Enterprise (Water) serves over 1.3 million residential, commercial, industrial, and wholesale customers by providing potable water. To serve its customers, Water obtains water from two primary sources: local water sources and purchased water supplies from the San Diego County Water Authority (CWA). CWA purchases include treated water delivered to the City's water distribution system and raw water transported to the City's water treatment plants.

The Water system operates in an area subject to strict regulatory oversight by Federal and State agencies such as the U.S. Environmental Protection Agency, California Department of Public Health (DPH), and the Air Pollution Control District. Water must comply with a multitude of laws including, but not limited to, the Safe Water Drinking Act. Complying with these regulations and resulting mandates contributes to a large share of the cost burden on the system.

### Changes since the Last Rate Case

The City’s last utility rate case occurred in 2007. Since that time, a number of significant external and internal changes have occurred which have subsequently affected PUD’s finances and operations. Fundamental to the development of the 2007 Rate Case were four assumptions: No changes to economic conditions; moderate growth in water sales; timely issuance of long-term debt for capital projects; and purchased water cost increases in-line with historical averages. Table 1 summarizes the major changes to the assumptions underlying the 2007 Rate Case.

Table 1 Major Changes to Underlying 2007 Rate Case Assumptions

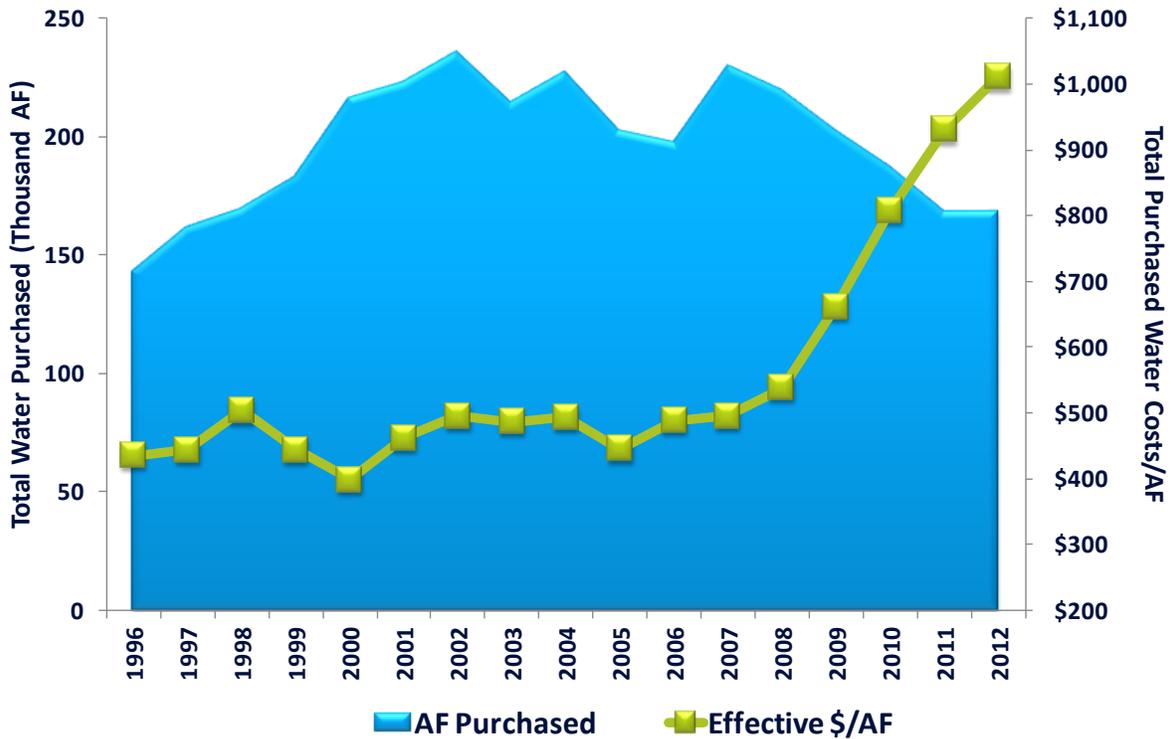
Assumption	Current Reality
Housing market boom will continue to fuel economic growth.	Housing bubble burst in 2008. The housing market is slowly recovering.
Growth will fuel increased water sales. Additionally, residential usage per account will be steady at current levels.	Drought hits the nation’s southwest in 2009. As a result, water conservation messaging becomes the norm and agencies develop drought restrictions. Per capita consumption drops to lowest levels in a decade.
Favorable debt market conditions for utilities.	The City experienced delays in executing its CIP. The financial market crash of late 2007 resulted in a tightening of lending activities and increased scrutiny on credit-worthiness.
CWA purchased water costs will increase at the same rate as seen over the past 5 years.	Since 2008, the effective rate that the City pays for purchased water from CWA (cost/acre-foot purchased) has doubled. Infrastructure investments by both CWA and Metropolitan Water District of Southern California, restricted allocations from the Colorado River, and the Bay-Delta all continue to drive costs up, while declining sales reflecting conservation efforts are driving down revenues.

### Current Rate Case Focus

Over the next few years, the City will be moving forward with the following projects: 1) an Indirect Potable Reuse (IPR) project and 2) the cost for desalinated water from Carlsbad that will become part of the CWA supply portfolio. As of the time of this report, the City is still evaluating the costs associated with these major projects. Consequently, the study period examined in the rate case presented herein (2013 Rate Case) is limited to the next two fiscal years (FY 14 and FY 15) and does not include the impact of desalination water costs or IPR.

One of the major drivers for the 2013 Rate Case is the increase in purchased water costs realized by the City over the past two years and over the study period. The City’s local water supply only provides about 10 to 15 percent of customer needs and the City purchases the vast majority of needed water from CWA. As noted previously, infrastructure investments, ongoing drought conditions and regulatory-imposed restrictions put upward pressure on purchased water costs. Figure 1 illustrates the City’s historical effective rate paid for purchased water. The effective rate is the total amount paid to CWA divided by the total volume of water purchased in acre-feet (AF).

Figure 1. Historical Effective Rate Paid for Purchased Water



Historically, the City has passed increased rates from CWA through to its customers. However, over the past two years (Calendar Years 2012 and 2013), PUD has used one-time revenue sources, identified operational efficiencies, and additional local supplies to absorb the CWA pass-through increases, which is estimated to be approximately \$35 million. Annual increases are anticipated to continue on an annual basis. Continuing to absorb these increases creates a structural deficit that is not sustainable.

The 2013 Rate Case examines what actions the PUD should undertake to maintain the financial viability of the Water Enterprise in light of the results of the 2007 Rate Case, increasing purchased water costs, minimal economic growth, regulatory requirements, and needed future large infrastructure investments.

**PURPOSE**

The purpose of this report is to present the findings obtained from Black & Veatch Corporation’s (Black & Veatch’s) study of Water rate structures and alternatives, financing, and capital needs. The study develops a financial plan that projects operating revenue, expenses and capital financing costs for the City’s Water Enterprise Fund over a two-year planning period ending June 30, 2015. The plan considers future revenues under existing rates, operation and maintenance expense, principal and interest expense on debt, and capital improvement requirements. Black & Veatch made annual projections of the number of customers, water use, revenues, and expenditures based on historical data and estimates for the next two years.

## SCOPE OF WORK

The City retained Black & Veatch in 2012 to update its cost of service and rate study for its Water and Wastewater enterprises. Presented herein are the results of a study of the Water Fund's projected revenues, revenue requirements, cost of service, and rates for service.

For purposes of this report, the study period is the two fiscal years beginning July 1, 2013 and ending June 30, 2015. Unless otherwise noted, references in this report to a specific year are for the City's year ending June 30. To avoid confusion between calendar and fiscal years, the term FY refers to the year beginning July 1 and ending June 30. Black & Veatch projected revenues and revenue requirements for the study period based on a review of historical factors and Water's operating and capital budgets and financial policies. The study of revenue requirements recognizes projected operation and maintenance (O&M) expenses, establishment and/or maintenance of reserve funds, and capital financing requirements. Capital financing requirements include payments on outstanding bond and loan issues as well as capital improvement expenditures met from annual revenues and available reserve funds. All figures are presented to the nearest hundred and totals may not foot due to rounding.

The Water Fund's costs of service were allocated to customer classes utilizing a cost causative approach endorsed by the American Water Works Association (AWWA) M1 rate setting manual. The allocation methodologies produce cost of service allocations recognizing the projected customer service requirements for the City. The design of proposed rates is in accordance with allocated cost of service and local policy considerations, such as reserve funding levels. Additionally, this study evaluates the extent to which the existing rate structure recovers revenues from customer classes in accordance with cost of service allocations.

## OVERVIEW OF LEGAL AND INDUSTRY BEST PRACTICES FOR COST-OF-SERVICE STUDIES

Rate-setting procedures in California require that agencies responsible for imposing property-related charges must demonstrate a nexus between the cost of providing services and the services or benefits received. The state of California considers water and wastewater services as property-related fees and as such, subject to state constitutional and statutory requirements. Presented in the next few sections are brief summaries of the relevant laws governing the study.

### Proposition 13

Government Code Section §50076, adopted in 1979 provides that "special taxes shall not include any fee which does not exceed the reasonable cost of providing the service or regulatory activity for which the fee is charged."

### Proposition 218

California voters approved Proposition 218 in November 1996. This voter-approved initiative added Articles XIII C and D to the California Constitution. Article XIII D Section 2(e), is a definition of a "fee". Essentially, as defined by Proposition 218, a fee is "any levy other than an ad valorem tax, a special tax, or an assessment, imposed by an agency upon a parcel or upon a person as an incident of property ownership, including a user fee or charge for a property related service". Until 2006, sewer charges were considered property related services while water charge were not defined as property-related until the

2006 California Supreme Court decision in *Bighorn-Desert View Water Agency v. Verjil*. After this decision, water charges are now considered as property-related fees and any new or increased water charges must comply with the substantive and procedural requirements of Proposition 218. The substantive requirements include:

- Revenues derived from the fee or charge cannot exceed the funds required to provide the property related service.
- Revenues derived from the fee or charge cannot be used for any other purpose other than for which the fee or charge was imposed for.
- A property-related fee or charge cannot exceed the proportional cost of service attributable to the parcel.

### **Assembly Bill 2882**

The California legislature passed Assembly Bill (AB) 2882 in 2008 which amended the California Water Code (Sections 370 – 374) to provide criteria for establishing allocation-based conservation water pricing in support of California Constitution Article X, Section 2. Article X, Section 2 states that waste or unreasonable use of water shall be prevented. Allocation-based conservation water pricing allows for the design of water budget rate structures. Per AWWA M1, “a water-budget rate structure is a form of increasing block rates where the amount of water within the first block or blocks is based on the estimated, efficient water needs of the individual customer.”

Under AB 2882, allocation-based rates can be employed if they meet the following criteria:

- Billing based on metered use.
- A base allocation (water amount) is established based on each customer's needs and property characteristics.
- A basic charge is imposed for all water used within the customer's base allocation.
- A conservation charge is imposed on all excess of the customer's base allocation.

Under AB 2882, tiered rates can be employed if they meet the following criteria:

- Conservation best management practices, conservation education, irrigation controls and other conservation devices, and other demand management measures.
- Water system retrofitting, dual plumbing and facilities for production, distribution, and all uses of recycled water and other alternative water supplies.
- Projects and programs for prevention, control, or treatment of the runoff of water from irrigation and other outdoor water uses. Incremental costs shall not include the costs of stormwater management systems and programs.
- Securing dry-year water supply arrangements.
- Procuring water supplies to satisfy increments of water use in excess of the basic use allocations for the customers of the public entity, including supply or capacity contracts for water supply rights or entitlements and related energy costs for water delivery.

## Proposition 26

California voters approved Proposition 26 in November 2010. Included in the language of proposition, which amended California Constitution Article XIII C, Section 1, is a definition of “tax”. Essentially, as defined by Proposition 26, a tax is any “levy, charge, or exaction of any kind imposed by a local government” with specifically outlined exceptions. These exceptions are:

- A charge imposed for a specific benefit conferred or a privilege granted directly to the payor that is not provided to those not charged, and which does not exceed the reasonable costs to the local government of conferring the benefit or granting the privilege, and
- A charge imposed for a specific government service or product provided directly to the payor that is not provided to those not charged, and which does not exceed the reasonable costs to the local government of providing the service or product.

Proposition 26 establishes that the “...local government bears the burden of proving by a preponderance of the evidence that a levy, charge, or other exaction is not a tax, that the amount is no more than necessary to cover the reasonable costs of the governmental activity, and that the manner in which those costs are allocated to a payor bear a fair or reasonable relationship to the payor’s burdens on, or benefits received from, the governmental activity.”

## Government Code Section §54999.7

Under this section, rate-setting activities by public agencies are directed to follow cost-of-service principles and states that fees for “...for public utility service, other than electricity or gas, shall not exceed the reasonable cost of providing the utility service.” It also provides that these fees will be “established in consideration of service characteristics, demand patterns, and other relevant factors.”

## Generally Accepted Rate-Setting Standards

The American Water Works Association (AWWA) is the industry organization tasked with providing guidance on the operation and management of water utilities. AWWA has established a general set of principles used to guide the development of water rates. These principles were developed to provide a consistent approach and minimum standards to rate-setting procedures. It is important to note that AWWA observes that there is no prescribed single approach for establishing cost-based rates. Rather, agencies must exercise judgment to align rates and charges with local conditions and requirements, as well as applicable state law.

Black & Veatch has used the guidelines contained in the AWWA documents and followed the applicable State law, including Proposition 218, to conduct the analyses contained herein.

## DISCLAIMER

In conducting our study, we reviewed the books, records, agreements, capital improvement programs, customer sales and financial projections of the Water Fund, as we deemed necessary to express our opinion of the operating results and projections. While we consider such books, records, documents, and projections to be reliable, Black & Veatch has not verified the accuracy of these documents.

The projections set forth in this report are intended as “forward-looking statements”. In formulating these projections, Black & Veatch has made certain assumptions with respect to conditions, events, and

circumstances that may occur in the future. The methodology utilized in performing the analyses follows generally accepted practices for such projections. Such assumptions and methodologies are reasonable and appropriate for the purpose for which they are used. While we believe the assumptions are reasonable and the projection methodology valid, actual results may differ materially from those projected, as influenced by the conditions, events, and circumstances that actually occur. Such factors that may affect the Fund's ability to manage the system and meet water quality, and/or other regulatory or environmental requirements include the following: the City's ability to execute the capital improvement program as scheduled and within budget; regional climate and weather conditions affecting the demand for water; and adverse legislative, regulatory or legal decisions (including environmental laws and regulations).

## Water Rate Study

### REVENUE AND REVENUE REQUIREMENTS

To meet the costs associated with providing water service to its customers, the Water Fund derives revenue from a variety of sources including water user charges, other water sales, rental income, capacity fees, interest earned from the investment of available funds, meter installation fees, and other miscellaneous revenues. Black & Veatch used a combination of an analysis of historical and future system growth in terms of number of accounts and water consumption to project the level of future revenue generated in the study.

With revenue derived from the various sources, the Water Fund meets the cash requirements of operation and maintenance (O&M); principal, interest, and reserve payments on revenue bonds and State Revolving Fund (SRF) loans indebtedness; and recurring annual capital expenditures for replacements, system betterments, and extensions not debt financed. Operation and maintenance expenses are those expenditures necessary to maintain the system in good working order. Routine annual capital expenditures, which include equipment replacements, consist of recurring annual replacements, minor extensions, and betterments, which are normally revenue financed. Other capital costs include bond and loan covenant-required payments and cash financed capital improvements.

### Customer and Water Usage Projections

To forecast revenue, customer bills and billed water sales volume need to be determined within Water's service area. Recent historical trends demonstrate little to no growth in water connections over the past few years. This situation is largely due to depressed economic and housing activity within the City's service population. To be conservative for this two-year rate case, Black & Veatch has assumed no water connection growth for FY 14 and FY 15. Table 2 illustrates the historical customer accounts and anticipated customers for the next two fiscal years.

Table 2 Historic and Projected Number of Connections

Description	Fiscal Year Ending June 30,		
	Estimated	Projected	
	FY 13	FY 14	FY 15
	(Connections)	(Connections)	(Connections)
Single Family	221,949	221,949	221,949
Other Domestic	30,159	30,159	30,159
Non-Residential [*]	16,841	16,841	16,841
Temp Construction	347	347	347
Irrigation	7,497	7,497	7,497
Fire Service	5,575	5,575	5,575
<b>Total Accounts</b>	<b>282,368</b>	<b>282,368</b>	<b>282,368</b>

[\*] Non-Residential customers include Commercial, Industrial, and Outside City.

Projected water sales volumes use projected number of customers, customer bills and historical water usage patterns per customer class. Table 3 illustrates the historical and projected water billed volume in hundred cubic feet (HCF). Black & Veatch obtained several years of detailed consumption data and thus

historical patterns of customer water usage were determined. Using historical water usage as a benchmark, the projected water sales volumes remain flat over the study period as shown in Table 3.

Table 3 Historical and Projected Billed Volume

Description	Fiscal Year Ending June 30,		
	Estimated	Projected	
	FY 13	FY 14	FY 15
	(HCF)	(HCF)	(HCF)
Single Family	28,544,809	27,880,636	27,880,636
Other Domestic	17,093,304	17,521,723	17,521,723
Non-Residential [*]	19,469,054	20,319,467	20,319,467
Temp Construction	265,943	242,238	242,238
Irrigation	10,801,784	10,424,191	10,424,191
<b>Total Water Usage (HCF)</b>	<b>76,174,894</b>	<b>76,388,255</b>	<b>76,388,255</b>
<b>Total Water Usage (AF)</b>	<b>174,873</b>	<b>175,363</b>	<b>175,363</b>

[\*] Non-Residential customers include Commercial, Industrial, and Outside City.  
HCF = hundred cubic feet

### Revenue Projections

Water generates revenue primarily from water sales. Since revenue generated outside of water sales are not subject to rate increases, we have excluded them from this portion of the analysis. The cash flow portion of this report incorporates these additional revenue sources.

Water’s user-charge sales are composed of two parts, a monthly service charge and a commodity charge. The monthly service charge is an amount based on meter size designed to recover fixed costs, which do not vary with the volume of water used by a customer such as meter reading, customer billing, and debt service. The commodity charge is an amount based on units of consumption measured by the number of HCF of water consumed during the billing cycle. An HCF unit of water is approximately 748 gallons. Included in the commodity charge are the costs associated with water purchases. Table 4 summarizes the City’s current water rates for all customer classes.

Table 4 Existing Rates (Effective Since March 1, 2011)

Fiscal Year 13									
Service Charge (\$/month)				Fire Protection (\$/Month)				Commodity Charge (\$/HCF)	
Meter	Rate	Meter	Rate	Line	Rate	Line	Rate	Class	Rate
3/4"	\$19.33	6"	\$440.73	<1"	\$6.26	6"	\$25.05	Single Family [**]	
1"	\$28.46	8"	\$701.64	1"	\$6.26	8"	\$33.40	Tier 1	\$3.61
1.5"	\$49.34	10"	\$1,006.94	1.5"	\$6.26	10"	\$41.75	Tier 2	\$3.92
2"	\$75.44	12"	\$1,875.82	2"	\$8.35	12"	\$50.10	Tier 3	\$4.40
3"	\$136.74	16"	\$3,267.86	3"	\$12.53	16"	\$66.80	Multi Family	\$3.92
4"	\$224.15			4"	\$16.70			Non-Residential [*]	\$3.76
								Temp Construction	\$4.01
								Irrigation	\$4.01

[\*] Non-Residential customers include Commercial, Industrial, and Outside City.

[\*\*] Tier 1 = 0-7 HCF monthly; Tier 2 = 8-14 HCF monthly; and Tier 3 = 15+ HCF monthly. Bi-Monthly Tiers = 2x Monthly Tiers.

Table 5 incorporates the existing water rates, demonstrates water sales revenue remaining flat during the study period (FY 14 and FY 15).

Table 5 Revenue under Existing Rates[+]

Description	Fiscal Year Ending June 30,		
	Estimated	Projected	
	FY 13	FY 14	FY 15
	(\$)	(\$)	(\$)
Single Family	162,784,500	160,376,000	160,376,000
Other Domestic	80,106,900	82,090,200	82,090,200
Non-Residential [*]	85,070,400	87,273,500	87,273,500
Temp Construction	1,423,300	1,286,400	1,286,400
Irrigation	48,725,500	47,111,800	47,111,800
Fire Service	1,724,700	1,770,900	1,770,900
<b>Total Revenue</b>	<b>\$379,835,300</b>	<b>\$379,908,800</b>	<b>\$379,908,800</b>

[\*] Non-Residential customers include Commercial, Industrial, and Outside City.

[+] Revenues by customer class are from CCS billing system reports and adjusted to include accruals.

### Operation and Maintenance Projections

Summarized in Table 6 are Water's projected O&M expenditures. These expenditures include costs related to personnel, contract services, operating supplies, utilities, and general and administrative. The forecasted expenditures are based on Black & Veatch and City staff's expertise and knowledge. The figure box to the right summarizes key assumptions for inflation rates used in the O&M expense projections and applied to FY 15. Purchased water increases reflect adopted calendar year 2014 (CY 14) CWA rates and CWA's estimated projection for CY 15. The levels of adjustment illustrated above are consistent with recent increases seen throughout the area. Total O&M increases to roughly \$383.9 million in FY 14 and \$395 million in FY 15, due mainly to the increased cost of purchased water and the additional planned activities listed below:

- *Personnel Services: 0%*
- *Operating Supplies: 1%*
- *Contracts: 1%*
- *IT Expenses: 0%*
- *Energy & Utilities: 5%*
- *Routine Capital: 0%*
- *Other Expenses: 0%*

- A multi-year condition assessment program that will focus on evaluating 2,100 miles of asbestos cement (AC) water pipelines, along with the water conveyance and transmission pipelines
- An operational efficiency evaluation intended to focus on optimizing plant and distribution system processes

FY13 is based on estimated actuals as of August 8, 2013 and FY14 is based on the final budget. Compared to the prior fiscal year, FY14 is showing a projected increase in expenditures. This is due predominately to the increased cost to purchase water in addition to a multi-year condition assessment and an operational efficiency evaluation.

Based on PUD's historical performance, Black & Veatch has applied an adjustment to PUD's FY 14 and FY 15 budgets to reflect more closely expected expenditure levels. Applying the O&M adjustment factors produces expenditures of \$376.4 million in FY 14 and \$389.0 million in FY 15.

Table 6 Historical and Projected Operation and Maintenance Expenses

Description	Fiscal Year Ending June 30,		
	Estimated	Projected	
	FY 13	FY 14	FY 15
	(\$)	(\$)	(\$)
Department Management	11,411,700	15,348,000	17,965,100
Finance & Information Technology	16,458,300	19,118,500	19,586,900
Employee Services & Quality Assurance	4,256,100	5,653,100	4,815,900
Customer Support Services	9,746,600	8,697,300	9,397,500
Long Range Planning	11,294,500	12,134,200	12,989,500
Engineering Program Management	5,267,000	9,244,200	10,967,700
Environmental Monitoring & Technical Services	4,277,800	5,538,900	4,953,700
Water Operations	74,489,500	88,078,300	85,152,300
Water Supply	204,947,400	220,110,100	229,124,500
<b>Subtotal O&amp;M Expenses</b>	<b>342,148,900</b>	<b>383,922,600</b>	<b>394,953,100</b>
Less O&M Adjustments		(7,500,000)	(6,000,000)
<b>Total O&amp;M Expenses</b>	<b>\$342,148,900</b>	<b>\$376,422,600</b>	<b>\$388,953,100</b>

### Capital Improvement Program

While O&M expenses cover day-to-day operations, Water incurs additional capital expenditures to repair and replace existing water assets. As a result, Water has developed a long-term Capital Improvement Program (CIP) that identifies future water facilities needs. The CIP shown in Table 7 is for FY 14 through FY 15 and summarizes the capital improvement projects by category during the study period. As part of the financial plan analyses, starting in FY 15, Black & Veatch applied an annual inflation allowance of 2.27 percent based on the most recent 5-year Engineering News Record’s (ENR’s) historical average for Construction Cost Indices.

Table 8 presents a detailed listing of projects (uninflated values) for the study period. The CIP is a constantly evolving program and PUD staff review all projects on an annual basis. Consequently, projects may shift out in time or drop off the CIP if they become unnecessary. Conversely, PUD may add projects as the need arises. Black & Veatch suggests that the reader not construe the projects listed in Table 8 as “set in stone”, but rather as indicative of the nature of projects planned for execution over the study period. We note that the CIP project totals presented in Tables 7 and 8 reflect capital expenditures (cash out the door) versus the budgeted (encumbered) values shown in the City’s approved CIP. Furthermore, as part of the current rate case, Black & Veatch in discussions with PUD staff have applied a 15 percent discount rate to the CIP (expenditure) values to more closely align study period project execution with historic levels.

Black & Veatch notes that over the past few years, the City has implemented a number of business process changes including the following:

- Changes to the Municipal Code allowing for Multiple Award Construction Contracts (MACC) that accelerate the selection and award process for design build procurements,

- Increasing the task limits for Job Order Contracts, and
- Developing an order project cascade list to allow CIP funds remaining in a project at completion to move directly to a priority project.

The PUD expects to see the full effect of these changes after the current rate case.

Table 7 Capital Improvement Program

Description	Fiscal Year Ending June 30,	
	Projected	
	FY 14	FY 15
	(\$)	(\$)
Water Treatment Plants	4,742,900	2,407,800
Pipeline Projects	74,251,300	52,361,600
Recycled Water Projects	1,947,800	247,300
Storage Projects	5,247,300	13,355,000
Pump Stations	6,043,500	16,518,600
Pipeline - Transmission	6,150,200	19,095,000
Miscellaneous	5,252,500	9,222,600
Groundwater-Related Projects	311,200	200,000
<b>Subtotal Capital Improvement Program</b>	<b>103,946,700</b>	<b>113,407,900</b>
Less Adjustments	(15,592,000)	(17,011,100)
Add Inflationary Factor		2,188,200
<b>Total Capital Improvement Program (Inflated)</b>	<b>\$88,354,700</b>	<b>\$98,585,000</b>

The proposed CIP includes a slow ramp-up for main replacement – moving from an average of 20 miles/year from the past two years to 23 miles of small diameter cast iron mains for FY 14 and then 28 miles for FY 15. PUD’s target is 30+ miles per year thereafter. Another priority CIP project for PUD during the study period is the SAP Enterprise Asset Management (EAM) project, which will help PUD prioritize future repair and replacement projects.

As described in the 2007 Rate Case, Water is under a California Department of Public Health (DPH) compliance order. Of the proposed Water CIP, approximately \$23.1 million is associated with DPH-dictated projects. From FY 14 through FY 15, Water is projecting expenditures of \$186,939,600 (after adjustments) for the Water CIP.

### Capital Fund Financing

Table 9 presents a proposed financing plan for Water’s CIP. Financing for the CIP comes from a combination of funds on hand, State Revolving Fund (SRF) loan proceeds, grant monies, capacity fees, reserve fund transfers, and cash financing. PUD follows a general guideline of 20 percent PAYGO funding, which is reflected in Table 9. PAYGO funding is cash receipts from operating revenues. Additionally, PUD will use cash on hand (Other Cash Financing) and draw down the funds in the Dedicated Reserve from Efficiency and Savings (DRES) reserve. For the 2013 Rate Case, PUD will not be issuing any new debt and is funding this study period CIP with PAYGO, Other Cash Financing, capacity fees, SFR proceeds, and DRES monies.



Table 9 CIP Financing Plan

Description	Fiscal Year Ending June 30,	
	Projected	
	FY 14	FY 15
	(\$)	(\$)
<b>Source of Funds</b>		
Bond Proceeds	0	0
SRF Proceeds	9,213,800	0
Grants	644,000	0
Capacity Fees	7,952,300	7,972,000
PAYGO Funds	17,670,900	19,717,000
Other Cash Financing	22,971,900	70,896,000
DRES Transfers	29,901,800	0
Capital Reserve Transfers	0	0
<b>Total Sources</b>	<b>\$88,354,700</b>	<b>\$98,585,000</b>
<b>Use of Funds</b>		
Capital Projects	88,354,700	98,585,000
<b>Total Uses</b>	<b>\$88,354,700</b>	<b>\$98,585,000</b>

Water maintains several funds used to finance CIP projects as well as to separate the commingling of rate funds, bond proceeds and capacity fee funds. The capital funds revenue from developer capacity fees, transfers and debt proceeds. With new development in the City being relatively flat, Water will depend on rate and fee revenue, reserves and loan proceeds to execute planned CIP projects. PUD is proposing no debt financing for the study period CIP. As stated above, PUD proposes to finance the 2013 Rate Case CIP through a combination of fully drawing down DRES reserves and using cash on hand.

### Operating Fund Financing

Tables 10 and 11 summarize the proposed operating financial plan for Water over the study period. This financial plan generates sufficient funds to cover short-term and long-term expenses. Sources of revenue include water sales under existing rates, additional revenues realized from proposed rate adjustments, miscellaneous revenue and interest earnings on available balances.

The projected water revenue under existing rates represents service and commodity charges at current rate levels that are subject to rate adjustments. Based on the existing revenue indicated, additional annual revenue adjustments are necessary to meet operating fund requirements and fiscal policy objectives. To reduce ratepayer confusion over multiple adjustments throughout the year, PUD proposes to implement revenue adjustments effective January 1 of 2014 and January 1 of 2015, as shown on Lines 2 and 3. This timing corresponds to the effective date for CWA increases. Any changes to the capital-financing policies and/or CIP may alter these results since the operating fund helps supplement funds for traditional repair and replacement projects. Line 4 illustrates the resulting dollar impact of the proposed revenue adjustments.

Table 10 Operating Fund Financing Plan – Part I: Revenues [+]

Line No.	Description	Fiscal Year Ending June 30,		
		Estimated	Projected	
		FY 13	FY 14	FY 15
		(\$)	(\$)	(\$)
	<b>Revenue</b>			
	<b>Rate Revenue</b>			
1	Revenue from Existing Rates	379,835,300	379,908,800	379,908,800
	Year      Months Effective      Rate Adjustment			
2	FY 14      6      7.25%		13,771,700	27,543,400
3	FY 15      6      7.50%			15,279,500
4	Increased Revenue Due to Adjustments	0	13,771,700	42,822,900
5	Subtotal Rate Revenue	379,835,300	393,680,500	422,731,700
	<b>Other Operating Revenue</b>			
6	Cal Amercian Sales	11,677,700	12,437,700	13,355,500
7	Other Water Sales	8,935,300	8,030,300	7,892,900
8	Service Charges	1,087,400	1,216,000	1,267,000
9	New Water Services	503,000	300,000	750,000
10	Contribution in Aid	707,600	0	0
11	Land and Building Rentals	5,893,300	5,809,000	5,867,100
12	Services Rendered Other Funds	7,525,700	6,236,000	6,218,000
13	Other Revenue	5,175,100	2,181,000	2,182,000
14	Subtotal Other Operating Revenue	41,505,100	36,210,000	37,532,500
	<b>Non-Operating Revenue</b>			
15	Damages Recovered	270,700	225,000	225,000
16	Sale of Land	1,007,700	0	0
17	Earnings on Investments	1,946,700	2,494,500	3,664,000
18	Subtotal Non-Operating Revenue	3,225,100	2,719,500	3,889,000
	<b>Transfers</b>			
19	From Operating Reserve	0	0	0
20	From Rate Stabilization Reserve	0	0	0
21	From Secondary Purchase Reserve	0	0	0
22	From DRES Reserve	0	0	0
23	Subtotal Non-Operating Revenue	0	0	0
24	<b>Total Revenue</b>	<b>\$424,565,500</b>	<b>\$432,610,000</b>	<b>\$464,153,200</b>

Table 11 Operating Fund Financing Plan – Part II: Revenue Requirements and Ending Balances [+]

Line No.	Description	Fiscal Year Ending June 30,		
		Estimated	Projected	
		FY 13	FY 14	FY 15
		(\$)	(\$)	(\$)
	<b>Revenue Requirements</b>			
	<b>Operating &amp; Maintenance</b>			
25	O&M Expenses	137,201,500	156,312,500	159,828,600
26	Water Supply	204,947,400	220,110,100	229,124,500
27	Subtotal O&M	342,148,900	376,422,600	388,953,100
	<b>Debt Service</b>			
28	Existing Revenue Bonds	58,641,600	62,119,600	62,123,800
29	Existing SRF Loans	4,509,900	4,715,100	5,330,000
30	Proposed Revenue Bonds	0	0	0
31	Total Debt Service	63,151,500	66,834,700	67,453,800
	<b>Transfers</b>			
32	To CIP Fund (PAYGO)	14,589,100	17,670,900	19,717,000
33	To CIP Fund (Other Capital Financing) [*]	30,486,500	22,971,900	70,896,000
34	To Operating Reserve	0	144,900	950,700
35	To Capital Reserve	0	0	0
36	To Rate Stabilization Reserve	0	0	0
37	To Secondary Purchase Reserve	0	40,600	1,203,000
38	To DRES	2,253,100	0	0
39	Total Transfers	47,328,700	40,828,300	92,766,700
40	<b>Total Revenue Requirements</b>	<b>\$452,629,100</b>	<b>\$484,085,600</b>	<b>\$549,173,600</b>
41	Net Annual Cash Balance	(28,063,600)	(51,475,600)	(85,020,400)
42	Beginning Fund Balance	359,067,000	331,003,400	279,527,800
43	<b>Net Cumulative Fund Balance</b>	<b>\$331,003,400</b>	<b>\$279,527,800</b>	<b>\$194,507,400</b>
	<b>Minimum Target Reserves Balances [**]</b>			
44	Operating Reserve	29,556,500	29,701,400	30,652,100
45	Capital Reserve	5,000,000	5,000,000	5,000,000
46	Rate Stabilization Reserve	38,500,000	20,500,000	20,500,000
47	Secondary Purchase Reserve	12,503,900	12,544,500	13,747,500
48	DRES Reserve	29,901,800	0	0
49	Total Minimum Target Reserves	115,462,200	67,745,900	69,899,600
50	<b>Cumulative Fund Balance Less Reserves</b>	<b>\$215,541,200</b>	<b>\$211,781,900</b>	<b>\$124,607,800</b>

[+] Amounts may not total due to rounding.

[\*] Other Capital Financing consists of capital cash balance, transfers from operating and interest income, etc.

[\*\*] Reserve targets are set by the City's Reserve Policy.

In addition to rate revenue, other operating and non-operating revenues contribute to the income of the Water Enterprise. Typically, these revenue sources are minimal and volatile. For the purposes of this report, they remain constant in the revenue projections and in the absence of specific data. Non-operating sources include interest income, revenue from damages recovered, and sale of land.

For the 2013 Rate Case, PUD expects to draw down available monies from the Rate Stabilization Reserve. The transfer of \$18 million from the Rate Stabilization Reserve for FY 14 is the maximum available and leaves the minimum required balance per City Reserve Policy. Line 24 shows total revenues for the study period.

Lines 25 and 26 present O&M expenses less anticipated O&M savings and water purchase expense, respectively, which match the figures from Table 6. A summary of debt service on existing bond issues and SRF loans is on Lines 28 and 29, while Line 30 shows debt service from any proposed revenue bonds. Transfers to fund the CIP and other reserve accounts in accordance with the City's Reserve Policy occur on Lines 32 through 38. The total revenue requirements for the study period appear on Line 40.

Line 41 calculates the net annual cash balance for each year and then Lines 42 and 43 summarize the impact to the ending fund balances for Water. Finally, we note that the Net Cumulative fund balance shown on Line 43 for FY 13 is inclusive of reserve amounts. To obtain a true picture of the operating condition for Water, we subtract out these reserve amounts, as shown on Lines 44 through 48. Line 50 presents the net cumulative fund balance less reserves but including contractual obligations (encumbrances).

Black & Veatch notes that the figures presented in Tables 10 and 11 are based on Tables 2 through 9 and may not total due to rounding.

### Summary of Revenues, Expenditures, and Obligations

To maintain financial viability as an enterprise fund, Water's annual revenues must be sufficient to satisfy three elements:

1. Adequate cash flow to cover O&M, capital and debt obligations
2. Meet debt service coverage (DSC) covenants
3. Maintain reserve funds

Long-term financial viability requires meeting all three elements. The need for revenue adjustments is either "cash flow" driven or "debt service coverage" driven depending on which of the first two elements creates the larger adjustment.

Table 12 summarizes Water's current outstanding senior (parity) and subordinate debt obligations. Water's debt requirements have two separate DSC requirements. For senior or parity debt, the DSC is 1.2 times net utility revenues (1.2x); for aggregate debt, the DSC is 1.0x net revenues. Black & Veatch recommends that PUD consider using a 1.25x net revenues minimum target for aggregate debt instead of the 1.0x net revenues. Factors that bond Rating Agencies evaluate to determine the credit rating of a utility system include the system's financial profile, economic conditions, governance and management, operating profile, and legal provisions of bond documents. In recent years, the Rating Agencies have noted the pressure on Water's DSC and that continued lowering of the DSC could lower the system's financial profile, which could result in a negative rating action. Raising the minimum target to 1.25x net revenues in addition to implementing pass-through increases could help mitigate such negative credit implications.

Based on the analyses of revenues and revenue requirements, it is evident that Water is coverage-driven and needs revenue increases in order to meet revenue requirements and satisfy DSC covenants.

Table 12 Estimated Debt Service Coverage on Existing Debt

Line No.	Description	Fiscal Year Ending June 30,		
		Estimated	Projected	
		FY 13	FY 14	FY 15
		(\$)	(\$)	(\$)
<b>Debt Service Coverage Calculation</b>				
<b>Operating Revenue</b>				
1	Water Sales	400,448,300	414,148,500	443,980,100
2	Service Charges	1,087,400	1,216,000	1,267,000
3	New Water Services	503,000	300,000	750,000
4	Land and Building Rentals	5,893,300	5,809,000	5,867,100
5	Services Rendered Other Funds	7,525,700	6,236,000	6,218,000
6	Other Revenue, including Contributions in Aid of Construction	5,882,700	2,181,000	2,182,000
7	<b>Total Operating Revenue</b>	<b>421,340,400</b>	<b>429,890,500</b>	<b>460,264,200</b>
<b>Operating Expenses</b>				
8	Department Expenses	137,201,500	156,312,500	159,828,600
9	Water Purchase	204,947,400	220,110,100	229,124,500
10	<b>Total Operating Expenses</b>	<b>342,148,900</b>	<b>376,422,600</b>	<b>388,953,100</b>
<b>Net Operating Revenue</b>				
		79,191,500	53,467,900	71,311,100
11	Transfer (to)/from Rate Stabilization Fund	11,800,000	18,000,000	0
12	Interest Income on Operating Funds	1,946,700	2,494,500	3,664,000
13	Interest Income on Debt Service Reserve Fund	1,528,100	1,334,600	1,334,600
14	Capacity Fee Proceeds	11,704,400	7,952,300	7,972,000
15	Less: Senior Debt Service Reserve Fund Interest	(1,173,700)	(980,200)	(980,200)
16	<b>Total Net Adjusted System Revenues</b>	<b>\$104,997,000</b>	<b>\$82,269,100</b>	<b>\$83,301,500</b>
<b>Debt Service</b>				
17	Adjusted Total Parity Debt Service	38,705,300	39,084,200	39,702,000
18	<b>Total Aggregate Debt Service</b>	<b>64,382,285</b>	<b>66,834,665</b>	<b>67,453,874</b>
<b>Senior Debt Service Coverage (Line 16 / Line 17)</b>				
19	<b>Senior Debt Service Coverage without Revenue Adjustments [*]</b>	<b>2.71</b>	<b>1.74</b>	<b>0.99</b>
20	<b>Senior Debt Service Cover with Revenue Adjustments</b>	<b>2.71</b>	<b>2.10</b>	<b>2.10</b>
<b>Aggregate Debt Service Coverage ((Line 16 - Line 15) / Line 18)</b>				
21	<b>Aggregate Debt Service Coverage without Revenue Adjustments [*]</b>	<b>1.65</b>	<b>1.03</b>	<b>0.60</b>
22	<b>Aggregate Debt Service Coverage with Revenue Adjustments</b>	<b>1.65</b>	<b>1.25</b>	<b>1.25</b>

[\*] Excludes the use of the Rate Stabilization Reserve in FY 15.

Over the last two years (Calendar Years [CY] 2012 and 2013), PUD absorbed CWA's purchased water increases. PUD estimates that the cumulative impact of these increases is approximately \$35 million. PUD was able to absorb the impacts through a combination of drafting more local water, drawing on reserves, and implementing operational efficiencies. However, as Tables 10 and 11 indicate, continued absorption of the CY 12 & CY 13 pass-through increases and trying to absorb the CWA CY 14 increase is not a sustainable practice. If the City does not make revenue adjustments in FY 14, then by FY 15, PUD will not meet DSC requirements for senior or aggregate debt. The aggregate debt coverage requirement will not be met in 2015 even with the use of the Rate Stabilization Reserve balance of \$20.5M.

The revenue requirements of Water consist of system O&M expenses, routine capital outlay for minor expenditures on equipment not financed from bond proceeds, debt service requirements on existing

and proposed bonded debt, and transfers to other funds. Moreover, the revenues generated should be sufficient to meet reserve requirements, rate covenant requirements, and adequate levels of working capital.

As shown on Line 40 in Table 11, the increase in total revenue requirements for Water during the study period can be correlated with prior year (CY 12 and CY 13) and current (FY 14 and FY 15) increases in water purchase costs. The total revenue requirements will increase to \$484.1 million in FY 14 and \$549.2 million in FY 15. Subtracting total revenue requirements from total revenues results in the projected annual operating fund surpluses or deficits shown on Line 41 of Table 11.

The suggested revenue adjustments are 7.25 percent in FY 14 and 7.5 percent in FY 15 as shown on Lines 2 and 3 of Table 10. The 7.25 percent in FY 14 represents 5 percent cost recovery of prior year CWA pass-through costs and a 2.25 percent increase due to CWA's CY 14 increase. For FY 15, the Water Fund requires 0.5 percent of the increase to meet the target aggregate coverage ratio of 1.25x, 2.25 percent for the CWA CY 15 increase, and the remainder for prior years CWA increases. Black & Veatch notes that the CY 15 increase from CWA is an estimate. For the purpose of the 2013 Rate Case, only 5.25 percent is "known". The additional 2.25 percent, bringing the total to 7.5 percent, will be the maximum requested by PUD.

Black & Veatch further notes that the indicated percentage revenue increases discussed above are overall revenue increases. The results of the cost of service analysis presented later in this report may indicate that rate increases may vary from this average for the various customer classes with some classes receiving a greater than average increase, while others receive a less than average increase or perhaps a decrease.

## COST OF SERVICE ALLOCATIONS

The revenue requirements to be derived from rates and charges for water service are summarized in Lines 1 through 9 of Table 13. In analyzing the Water Fund's cost of service for allocation to customer classes, the annual revenue requirements for FY 14 are selected as the Test Year (TY) requirements to demonstrate the development of cost of service water rates. In determining the costs of service met by charges for water service, we use the figures presented in Tables 10 and 11 and deduct income received from other sources that are not subject to rate adjustments from the total revenue requirements. The adjustments section includes recognition that available cash is used (Line 10) and the addition of 6 months additional rate revenue from the revenue increase since it is effective for only 6 months (Line 11) of the fiscal year. As a result, the total cost of service to be recovered from rates is shown on Line 13, Column 5.

Table 13 Total Costs to be Recovered from Rates for TY 14

Line No. (1)	Description (2)	Operating Expense (3)	Capital Cost (4)	Total Cost (5)
		(\$)	(\$)	(\$)
<b>Revenue Requirements</b>				
1	O&M Expenses	156,312,500		156,312,500
2	Water Supply	220,110,100	0	220,110,100
3	Debt Service	0	66,834,700	66,834,700
4	Transfers	185,500	40,642,800	40,828,300
5	Subtotal	376,608,100	107,477,500	484,085,600
<b>Less Revenue Requirements Met from Other Sources</b>				
6	Other Operating Revenue	36,210,000	0	36,210,000
7	Other Non-Operating Revenue	2,719,500	0	2,719,500
8	Transfers	0	0	0
9	Subtotal	38,929,500	0	38,929,500
<b>Adjustments</b>				
10	Adjustment for Annual Cash Balance	51,475,600	0	51,475,600
11	Adjustment to Annualize Rate Increase	(13,771,700)	0	(13,771,700)
12	Subtotal	37,703,900	0	37,703,900
13	Cost of Service to be Recovered from Rates	299,974,700	107,477,500	407,452,200

### Functional Cost Components

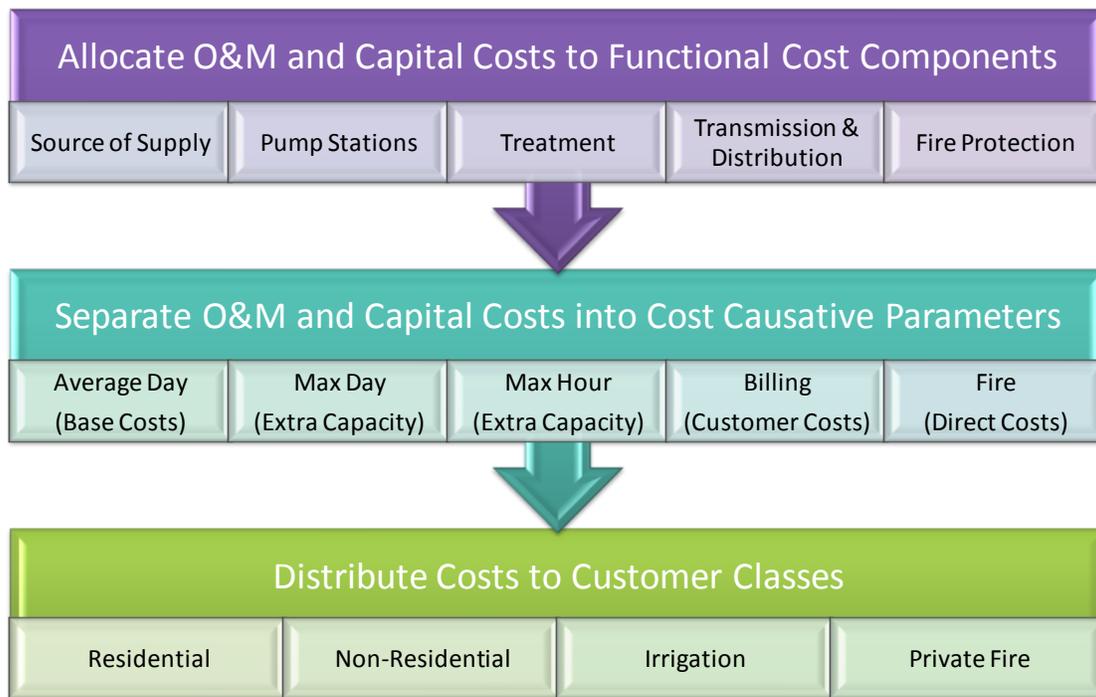
In developing an equitable rate structure, we allocate revenue requirements to the various customer classifications according to the cost of service rendered. Allocations of these requirements to customer classes of Water should take into account water flow, the number of customers, and other relevant factors.

Customer classification occurs to reflect groups of customers with similar service requirements for whom a utility can serve at a similar cost. Each class represents a particular type of service requirement. For the purposes of the cost of service analysis, the customer classifications in this study include single

family and multi-family residential, commercial, industrial, irrigation, outside City, construction, and private fire protection.

Figure 2 illustrates the process for allocating costs of service to customer classes. The cost-of-service methodology first allocates costs to functional cost components, then to cost categories, and subsequently distributes the costs to customer classes. In this analysis, there are six primary cost categories: (1) base flow, or volume costs, (2) maximum day cost, (3) peak hour costs, (4) meter services, (5) customer and billing costs, and (6) fire protection.

Figure 2. Cost of Service Allocation Methodology



### Allocation to Cost Components

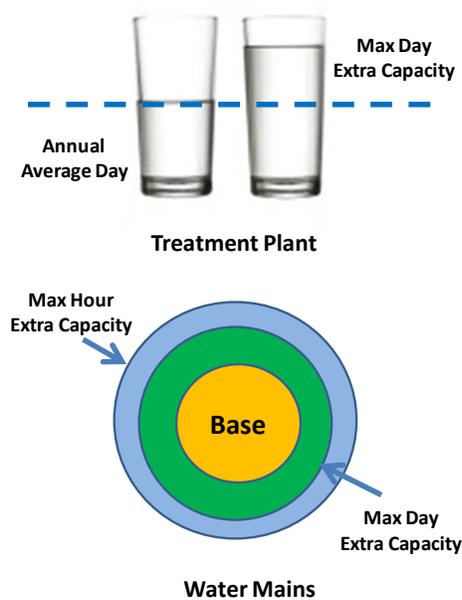
In this report, Black & Veatch analyzes the cost of providing water service by system function in order to properly allocate the costs to the various classes of customers and subsequently design rates. As a basis for allocating costs of service among customer classes, we have separated costs into the following four basic functional cost components: (1) “Base”; (2) “Extra Capacity”; (3) “Customer”; and (4) “Direct Assignment.” In order to provide service to its customers at all times, PUD must be capable of not only providing the total amount of water used, but also meet peak or maximum rates of demand.

- Base costs include the purchase of water, regulatory fees, debt service costs, water treatment, energy, administration, and operating and maintenance costs of the System associated with service to customers to the extent required for a constant, or average annual rate of use.
- Extra Capacity costs represent those operating costs incurred in meeting demands in excess of average, and capital related costs for additional plant and system capacity beyond that required for the average rate of use.

- Customer costs are those elements that tend to vary in proportion to the number of customers connected to the system. These include meter reading, billing, collecting and accounting, and maintenance and capital costs associated with meters and services.
- Directly assigned costs are costs specifically identified as, those incurred to serve a specific customer group(s). The separation of costs of service into these principal categories facilitates allocating such costs to the various customer classes based on the respective service requirements of each class.

Similar to the 2007 Rate Case, this rate case also uses the base-extra capacity allocation method. Figure 3 illustrates some of the base-extra capacity concepts for water systems.

Figure 3. Water Cost of Service Concepts



Black & Veatch has allocated each element of cost to functional cost components using the parameter or parameters having the most significant influence on the magnitude of that element of cost. We allocate O&M and general and administrative (G&A) expense items directly to appropriate cost components, while the allocation of capital and replacement costs uses a detailed allocation of related capital investment. The separation of costs into functional components provides a means for distributing such costs to the various classes of customers based on their respective responsibilities for each particular type of service.

For volume-related cost allocations, the first step in determining the allocation percentages is to assign system peaking factors. The Base element is equal to the average daily demand (ADD) and assigned a value of 1.0. PUD’s maximum day (Max Day) demand is estimated to be 1.50 times the ADD.

Thus, the Max Day is assigned a value of 1.50. The maximum instantaneous usage is approximated by the maximum hourly (Max Hour) usage and is estimated to be 2.25 times the ADD. Thus, Max Hour is assigned a value of 2.25. These peaking factors are based on a combination of historic billing data and discussions with PUD staff.

Cost components that are solely Base-related, are allocated 100 percent to Base. Cost components that are designed to meet Max Day requirements, such as reservoirs, are allocated to Base and Max Day factors as follows:

$$\text{Base} = (1.0/1.50) \times 100 = 66.7\%$$

$$\text{Max Day} = (1.50 - 1.0)/1.50 \times 100 = 33.3\%$$

Cost components that are designed to meet Max Hour design requirements, such as Distribution, are allocated in a similar fashion, as follows:

$$\begin{aligned} \text{Base} &= (1.0/2.25) \times 100 = 44.4\% \\ \text{Max Day} &= (1.50 - 1.0)/2.25 \times 100 = 22.2\% \\ \text{Max Hour} &= (2.25 - 1.50)/2.25 \times 100 = 33.3\% \end{aligned}$$

### Fire Protection

A direct cost to the water system is fire protection. Fire protection consists of those costs associated with having the capability to provide public (municipal fire hydrants) and private (individual fire sprinklers) fire suppression services. While a small amount of water is actually consumed for fire suppression and fire training, the water system is still designed to accommodate relatively large flows of water for short durations at suitable pressure. Therefore, when allocating O&M and capital expenses to the four basic functional costs factors, a pro rata share of O&M and capital expenses is directly assigned to the fire protection category.

### Allocation of Operation and Maintenance Expenses

Table 14 summarizes the allocation percentages used in Table 15. Table 15 shows the allocation of O&M expense to cost functions. Where possible, percentage allocations use data gathered from employee time cards. O&M costs such as general and administrative expenses (G&A) are distributed to functional cost components based on the average of the other line item costs. The total Test Year expense less funds available from other sources equal the net O&M expense recovered from rates. Line 15 of Table 15 presents a Net Test Year O&M expense of approximately \$300 million.

Table 14 O&M Allocation Percentage for TY 14

Description	Common to All Customers					Fire Protection
	Base	Extra Capacity		Customer		
	Base	Max. Day	Max. Hour	Meters	Cust/Bill.	
	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)
<b>Operating Expenses</b>						
Department Management	48.0%	25.0%	20.0%	5.0%	0.0%	2.0%
Finance & Information Technology	53.0%	15.0%	15.0%	7.5%	7.5%	2.0%
Employee Services & Quality Assurance	48.0%	25.0%	20.0%	5.0%	0.0%	2.0%
Customer Support Services	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%
Long Range Planning	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Engineering Program Management	45.0%	25.0%	25.0%	0.0%	0.0%	5.0%
Environmental Monitoring & Technical Services	66.7%	33.3%	0.0%	0.0%	0.0%	0.0%
Water Operations	35.0%	25.0%	20.0%	15.0%	0.0%	5.0%
Fringe Benefits Adjustments	48.0%	25.0%	20.0%	5.0%	0.0%	2.0%
Water Supply	70.0%	0.0%	0.0%	18.5%	10.0%	1.5%

Table 15 Allocation of O&M Expenses to Functional Cost Components

Line No.	Description	Total Costs (\$)	Common to All Customers						Fire Protection (\$)
			Base		Extra Capacity		Customer		
			Base (\$)	Max. Day (\$)	Max. Hour (\$)	Meters (\$)	Cust./Bill. (\$)	Fire Protection (\$)	
<b>Operating Expenses</b>									
1	Department Management	14,645,300	7,029,700	3,661,300	2,929,100	732,300	0	292,900	
	Finance & Information								
2	Technology	18,243,200	9,668,900	2,736,500	2,736,500	1,368,200	1,368,200	364,900	
	Employee Services & Quality								
3	Assurance	5,394,300	2,589,200	1,348,600	1,078,900	269,700	0	107,900	
4	Customer Support Services	8,299,100	0	0	0	0	8,299,100	0	
5	Long Range Planning	11,578,600	11,578,600	0	0	0	0	0	
	Engineering Program								
6	Management	8,821,000	3,969,300	2,205,300	2,205,300	0	0	441,100	
	Environmental Monitoring &								
7	Technical Services	5,285,300	3,523,500	1,761,800	0	0	0	0	
8	Water Operations	84,045,700	29,416,000	21,011,400	16,809,100	12,606,900	0	4,202,300	
9	Water Supply	220,110,100	154,077,000	0	0	40,720,400	22,011,000	3,301,700	
10	Total O&M Expenses	376,422,600	221,852,200	32,724,900	25,758,900	55,697,500	31,678,300	8,710,800	
11	Transfers	185,500	64,900	46,400	37,100	27,800	0	9,300	
12	<b>Total</b>	<b>376,608,100</b>	<b>221,917,100</b>	<b>32,771,300</b>	<b>25,796,000</b>	<b>55,725,300</b>	<b>31,678,300</b>	<b>8,720,100</b>	
<b>Less Other Revenue</b>									
13	Miscellaneous Revenues	38,929,500	13,625,300	9,732,400	7,785,900	5,839,400	0	1,946,500	
14	Other Adjustments	37,703,900	13,196,300	9,426,000	7,540,800	5,655,600	0	1,885,200	
15	<b>Net Operating Expenses</b>	<b>\$299,974,700</b>	<b>\$195,095,500</b>	<b>\$13,612,900</b>	<b>\$10,469,300</b>	<b>\$44,230,300</b>	<b>\$31,678,300</b>	<b>\$4,888,400</b>	

### Allocation of Capital Costs

The estimated investment in water system facilities serves as a proxy for the further distribution of capital-related costs to the various customer classes. Table 16 illustrates the allocation of estimated plant investment serving water customers for the Test Year. The total plant investment of just over \$2 billion shown on Line 13 represents the estimated Test Year original cost less accumulated depreciation of plant in service.

The allocation of specific items of investment to identified cost categories uses the basis previously described. For example, source of supply items correspond to flow (volume cost component) and then further delineated by whether the asset is common-to-all or primarily serves specific customers. Water treatment designs rely on treatment plant flow and are assigned to the volume cost function. Elements such as storage facilities serve to address system peaking needs, and as such have a peak hour cost component.

### Units of Service

To establish the total cost responsibility of each class of service, Black & Veatch developed the unit costs of service for each cost function and assigned those costs to the customer classes based on the respective service requirements of each. Each customer class receives its share of base, maximum day and peak hour costs. The number of units of service required by each customer class provides a means for the proportionate distribution of costs previously allocated to respective cost categories. Table 17 summarizes the estimated units of service for the various customer classes.

The cost of service responsibility for base costs varies with the volume of water requirements and may be distributed to customer classes on that basis. Extra-capacity costs are those costs associated with meeting peak rates of water use, and are distributed to customer classes based on their respective system capacity requirements in excess of average requirement rates. Customer costs, which consist of meter related costs, billing, collection and accounting costs, are allocated based on the number of equivalent meters and bills. Private fire protection costs are allocated based on equivalent fire hydrants.

Table 17 shows the estimated units of service for the various customer classifications. Estimates of test year annual water consumption, shown in Column 1, are based on the projections of total water sales from Table 3. Average daily use of all water sales, which is simply Column 1 divided by 365 days, is presented in Column 2. Columns 3 through 8 represent the estimated maximum day and peak hour capacity factors for each customer class.

Table 16 Allocation of Net Capital Costs to Functional Cost Components

Line No.	Description	Total Costs (\$)	Common to All Customers						Fire Protection (\$)
			Base (\$)	Max. Day (\$)	Max. Hour (\$)	Meters & Billing (\$)	Customer Cust./Bill. (\$)	Extra Capacity (\$)	
<b>Plant Assets</b>									
1	Source of Supply	139,961,100	139,961,100	0	0	0	0	0	0
2	Pumping	41,246,400	27,497,600	13,748,800	0	0	0	0	0
3	Treatment	520,542,700	347,028,500	173,514,200	0	0	0	0	0
4	Transmission & Distribution	1,192,994,300	530,219,700	265,109,800	397,664,800	0	0	0	0
5	Meters & Service	39,852,900	0	0	0	39,852,900	0	0	0
6	Hydrants	3,321,100	0	0	0	0	0	0	3,321,100
7	Customer Billing	0	0	0	0	0	0	0	0
8	General Plant	28,821,800	15,423,500	6,722,300	6,036,200	590,400	0	0	49,400
9	Recycled Water	34,119,200	15,164,100	7,582,000	11,373,100	0	0	0	0
10	<b>Total Plant Assets</b>	<b>2,000,859,500</b>	<b>1,075,294,500</b>	<b>466,677,100</b>	<b>415,074,100</b>	<b>40,443,300</b>	<b>0</b>	<b>3,370,500</b>	
<b>Less Other Revenue</b>									
11	Miscellaneous Revenues	0	0	0	0	0	0	0	0
12	Other Adjustments	0	0	0	0	0	0	0	0
13	<b>Net Capital Expenses</b>	<b>\$2,000,859,500</b>	<b>\$1,075,294,500</b>	<b>\$466,677,100</b>	<b>\$415,074,100</b>	<b>\$40,443,300</b>	<b>\$0</b>	<b>\$3,370,500</b>	
14	<b>Capital Cost Allocation</b>	<b>\$107,477,500</b>	<b>\$57,514,600</b>	<b>\$25,067,900</b>	<b>\$22,509,200</b>	<b>\$2,201,600</b>	<b>\$0</b>	<b>\$184,200</b>	

In the overall rate-setting process, there is a need to establish a base level of cost for which the cost of all customers can be measured. Customer-related meter and service costs are allocated based on the number of equivalent 5/8" and 3/4" meters because these meter sizes are the most prevalent meter sizes found in many water utilities. Included in the development of meter cost ratios is the direct cost of the various categories of labor involved in the installation, fringe benefit related overheads and other appropriate administrative overheads applicable to the labor costs, all direct materials and supplies costs, and the cost of equipment used in the installation.

Generally, equivalent meter cost ratios should be used when assigning elements of costs specifically related to meters among the various sizes of meters used by the customer in the system. PUD's most prevalent meter size is 3/4" and therefore is considered equal to one-meter equivalent. All larger meters are given a meter equivalent ratio based on hydraulic capacity, as illustrated in the box to the right. Thus, a 6-inch meter is the equivalent of thirty-three 3/4" meters based on hydraulic capacity. The equivalent number of meters and services shown in the third column from the end of Table 17 were estimated using AWWA standard meter flow rate equivalencies as adjusted to set 5/8" and 3/4" meters to an equivalency of 1.0. The equivalent number of private fire connections shown in the last column of Table 17 were estimated using AWWA standard meter flow rate equivalencies with 6" fire protection connections assigned an equivalency of 1.0. All public fire hydrants are assumed to be a 6" connection.

Meter Size	Capacity	Fire
	Meter Ratio	Hydrant Ratio
5/8", 3/4"	1.00	
1"	1.70	0.01
1.5"	3.30	0.03
2"	5.30	0.06
3"	10.00	0.16
4"	16.70	0.34
6"	33.30	1.00
8"	53.30	2.13
10"	76.70	3.83
12"	143.30	6.19
16"	250.00	13.19

Customer billing and accounting costs are distributed to classes based on number of bills for each customer class. The final column presents direct charges for fire protection and these costs are allocated using equivalent hydrant ratios summarized in the box above.

In accordance with M1 standards and typical engineering design, the provision of the maximum hour component addresses peak system needs, in addition to those posed by fire protection requirements. To the extent possible, actual system and billing data by customer class is used to derive maximum day and maximum hour capacity factors. For the purposes of this analysis, peak factors were obtained from the City's Water Facilities Master Plan, January 2011, and from the City Engineering Department. As noted previously, these data sources yielded a maximum day to average day, or base, demand ratio of 1.50 and a maximum hour ratio of 2.25. These ratios are within the ranges typically experienced by other utilities across the nation.

Table 17 Units of Service for TY 14

Line No.	Description	Consumption		Maximum Day		Maximum Hour		Meters	Cust/Bills	Fire Protection		
		Annual (1)	Avg. Day (2) = (1)/365 (HCF/day)	Factor (3)	Total (4) = (3) x (2) (HCF/day)	Extra (5) = (4) - (2) (HCF/day)	Factor (6)				Total (7) = (6) x (2) (HCF/day)	Extra (8) = (7) - (4) (HCF/day)
	Column Reference	(1)	(2) = (1)/365 (HCF/day)	(3)	(4) = (3) x (2) (HCF/day)	(5) = (4) - (2) (HCF/day)	(6)	(7) = (6) x (2) (HCF/day)	(8) = (7) - (4) (HCF/day)	(9)	(10) (Bills)	(12) (EHs)
	Units of Measure	(HCF)	(HCF/day)		(HCF/day)	(HCF/day)	(EMs)	(EMs)	(Bills)	(EMs)	(Bills)	(EHs)
1	Single Family	27,880,636	76,385	175%	133,674	57,289	325%	248,252	114,578	235,295	2,663,388	0
2	Other Domes tics	17,521,723	48,005	185%	88,809	40,804	335%	160,816	72,007	71,431	361,908	0
3	Non-Residential [*]	20,319,467	55,670	200%	111,340	55,670	270%	150,308	38,969	61,721	202,092	0
4	Temp Construction	242,238	664	225%	1,493	830	425%	2,821	1,327	1,839	4,164	0
5	Irrigation	10,424,191	28,559	200%	57,119	28,559	420%	119,950	62,831	30,043	89,964	0
6	Subtotal	76,388,255	209,283		392,435	183,152		682,147	289,712	400,329	3,321,516	
	<b>Fire Service</b>											
7	Public Fire	0	0	0	1,249	1,249		5,994	4,745	0	0	25,060
8	Subtotal	0	0	0	1,249	1,249		5,994	4,745	0	0	25,060
9	<b>Total Water System</b>	<b>76,388,255</b>	<b>209,283</b>		<b>393,683</b>	<b>184,400</b>		<b>688,140</b>	<b>294,457</b>	<b>400,329</b>	<b>3,321,516</b>	<b>25,060</b>

[\*] Non-Residential customers include Commercial, Industrial, and Outside City.

### Cost of Service Allocations

Costs of service are allocated to the customer classes by application of unit costs of service to respective service requirements. Unit costs of service are based upon the total costs previously allocated to functional components and the total number of applicable units of service. Dividing the costs allocated to functional cost components by the respective total units of service requirements develops unit costs of operation and maintenance expense, and net capital costs.

### Unit Costs of Service

Table 18 presents total Test Year O&M expense (Table 15) and net capital costs (Table 16) allocated to functional cost components.

Table 18 Unit Costs of Service for TY 14

Line No.	Description	Total Costs	Common to All Customers					Fire Protection
			Base	Extra Capacity		Customer		
			Base	Max. Day	Max. Hour	Meters	Cust/Bill.	
		(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	
	<b>Unit Cost of Service</b>							
1	Net Operating Expense	299,974,700	195,095,500	13,612,900	10,469,300	44,230,300	31,678,300	4,888,400
2	Capital Costs	107,477,500	57,514,600	25,067,900	22,509,200	2,201,600	0	184,200
3	Total Cost of Service	407,452,200	252,610,100	38,680,800	32,978,500	46,431,900	31,678,300	5,072,600
4	Units of Service (Total)		76,388,255	184,756	295,808	400,329	3,388,416	32,196
5	Cost per Unit		\$3.31	\$209.36	\$111.49	\$115.98	\$9.35	\$157.55
6	per Unit		HCF	HCF/Day	HCF/Day	EM	Bill	EH

### Distribution of Costs of Service to Customer Classes

The customer class responsibility for service is obtained by applying the unit costs of service to the number of units for which the customer class is responsible. Table 19 illustrates this process, in which the unit costs of service are applied to the customer class units of service.

Table 19 Allocation of COS to Customer Classes

Line No.	Description	Total Costs (\$)	Common to All Customers							Fire Protection (\$)
			Base		Extra Capacity			Customer		
			Base (\$)	HCF	Max. Day (\$)	HCF/Day	Max. Hour (\$)	HCF/Day	Meters (\$)	
1	Cost per Unit		\$3.31	\$209.36	\$111.49	\$115.98	\$9.35		\$157.55	
	<b>Single Family</b>									
2	Units		27,880,636	57,289	114,578	235,295	2,663,388	0	0	
3	All allocation of costs of service	169,157,700	92,199,200	11,994,200	12,773,800	27,290,500	24,900,000	0	0	
	<b>Other Domestic</b>									
4	Units		17,521,723	40,804	72,007	71,431	361,908	0	0	
5	All allocation of costs of service	86,181,900	57,943,000	8,542,800	8,027,800	8,284,800	3,383,500	0	0	
	<b>Non-Residential [*]</b>									
6	Units		20,319,467	55,670	38,969	61,721	202,092	0	0	
7	All allocation of costs of service	92,242,600	67,194,900	11,655,100	4,344,500	7,158,700	1,889,400	0	0	
	<b>Temp Construction</b>									
8	Units		242,238	830	1,327	1,839	4,164	0	0	
9	All allocation of costs of service	1,375,000	801,100	173,700	148,000	213,300	38,900	0	0	
	<b>Irrigation</b>									
10	Units		10,424,191	28,559	62,831	30,043	89,964	0	0	
11	All allocation of costs of service	51,781,600	34,472,000	5,979,200	7,004,800	3,484,500	841,100	0	0	
	<b>Public Fire</b>									
12	Units		0	1,249	4,745	0	0	25,060	0	
13	All allocation of costs of service	4,738,700	0	261,400	529,000	0	0	3,948,300	0	
	<b>Private Fire</b>									
14	Units		0	356	1,351	0	66,900	7,136	0	
15	All allocation of costs of service	1,974,700	0	74,400	150,600	0	625,400	1,124,300	0	
16	<b>TOTAL COSTS OF SERVICE</b>	<b>\$407,452,200</b>	<b>\$252,610,200</b>	<b>\$38,680,800</b>	<b>\$32,978,500</b>	<b>\$46,431,800</b>	<b>\$31,678,300</b>	<b>\$5,072,600</b>	<b>\$5,072,600</b>	

[\*] Non-residential customers include Commercial, Industrial, and Outside City.

### Adequacy of Existing Rates to Meet Costs of Service

Presented in Table 20 is a comparison of the allocated costs of service and revenues under existing rates for the system in total. For the Water Enterprise, public fire protection provides a general benefit to all customers, and thus, is allocated to all customers in Column 2. Adjusted allocated costs of service are shown in Column 3. The last column in the table indicates the approximate adjustment to customer class rate levels necessary to recover 100 percent of the allocated costs of service.

Table 20 Comparison of Adjusted COS with Revenues under Existing Rates

Line No.	Description	Allocated COS (\$)	Beneficial Use Allocation (\$)	Adjusted COS (\$)	Rev Under Existing Rates (\$)	Indicated Rev Increase (%)
	Column Reference	(1)	(2)	(3)	(4)	(5)
1	Single Family	169,157,700	2,306,200	171,463,900	160,376,000	6.91%
2	Other Domestic	86,181,900	1,174,900	87,356,800	82,090,200	6.42%
3	Non-Residential [*]	92,242,600	1,257,600	93,500,200	87,273,500	7.13%
4	Construction	1,375,000	0	1,375,000	1,286,400	6.89%
5	Irrigation	51,781,600	0	51,781,600	47,111,800	9.91%
6	Subtotal	400,738,800	4,738,700	405,477,500	378,137,900	7.23%
7	Public Fire	4,738,700	(4,738,700)	0	0	0.00%
8	Private Fire	1,974,700	0	1,974,700	1,770,900	11.51%
9	Subtotal	6,713,400	(4,738,700)	1,974,700	1,770,900	11.51%
10	<b>Total Water System</b>	<b>\$407,452,200</b>	<b>\$0</b>	<b>\$407,452,200</b>	<b>\$379,908,800</b>	<b>7.25%</b>

[\*] Non-Residential customers include Commercial, Industrial, and Outside City.

## PROPOSED RATE ADJUSTMENTS

The initial consideration in the derivation of water rate schedules for utility service is the establishment of equitable charges to the customers commensurate with the cost of providing that service. While the cost of service allocations to customer classes should not be construed as literal or exact determinations, they offer a guide to the necessity for, and the extent of, rate adjustments. Practical considerations sometimes modify rate adjustments by taking into account additional factors such as the extent of change from previous rate levels, existing contracts, and past local policies and practices.

### Existing Rates

A summary of existing water rates was presented earlier in Table 4. The existing rates consist of a service charge, which varies by customer class and meter size, and a separate commodity charge for each customer class applicable to each hundred cubic feet of billed water sales. The commodity charge incorporates a tier structure for single-family residential customers while all other classes are charged a uniform rate regardless of water consumption.

### Proposed Rate Options

The cost of service analysis described in the preceding sections of this report provides a basis for the design of rates. It is important to note that the COS analysis represents current conditions and as discussed earlier in this report, current conditions are significantly different from those present during the 2007 Rate Case. As such, the discussions that follow illustrate a recalibration of the COS analysis to reflect a more accurate depiction of the costs of providing service to each customer class and rate recovery.

The rate schedule shown in Tables 21 through 26 takes into consideration City policies and shows rates reflecting some modifications to the existing tier structure (for single-family residential customers) in order to proportionally recover costs of service. At the request of the City, Black & Veatch examined four rate structures for the single-family residential (SFR) class and two options for the irrigation class. In order to implement any proposed rate structure modifications by January 1, 2014, modifications to other customer classes are not included due to lack of detailed customer data and / or the need to validate specific customer information. Rate structure modifications to these other customer classes may be included as part of the 2016 Rate Case.

The four SFR options examined are as follows:

- Option 1 – Maintain the existing rate structure
- Option 2 – Increase the pricing differential between tiers
- Option 3 - Add a fourth tier
- Option 4 – Modify Option 3 to account for different allocations in all 4 tiers

The two Irrigation rate structure options are as follows:

- Option 1 – Maintain the existing structure
- Option 2 – Develop a three tiered block structure that varies by meter size

## Design of Base Fee

With the exception of Option 1, the meter charge or base fee and the fire protection charge, reflects the estimated cost of service rate. It includes the allocated cost of billing, meter service, and some elements of water supply (fixed costs charged by CWA). As described previously, the meter charges also reflect the recommendation of applying hydraulic capacity ratios to the meter sizes noted from the last rate case. Because the City does not charge fire departments for public fire hydrant service, the industry standard for recovering this cost is via the meters and services component of the water user charge. Black & Veatch has reflected the cost of public fire protection in the proposed meter charges.

## Design of Volumetric Charges

Any proposed rate structure should provide for full cost recovery. However, in addition to this fundamental requirement, the design of water rate structures should also meet the following objectives:

- Mitigate revenue volatility
- Promote water conservation
- Minimize excessive customer bill impacts

Consequently, water rate design must balance financial management, long-range planning, and public policy considerations.

Since the City's last rate case, Southern California has experienced severe drought conditions. As a result, consumer awareness regarding the need to conserve water is very high. Moreover, the increased use of water-efficient devices (toilets, dishwashers, washers, etc.) has helped customers conserve. To provide an incentive for those who conserve, the proposed rate structure for single-family residential customers now includes a fourth tier. This new tier replaces the existing Tier 1 and is much smaller.

The proposed tier breakpoints reflect general usage patterns of San Diego's single-family residential customers as well as rate setting industry standards and AWWA household usage survey data. AWWA survey data indicate that typical indoor residential water consumption is roughly 50 to 60 gallons per person per day. Depending on typical residential family sizes of 2 to 3 persons per household, approximate monthly residential water use can range from 3,000 gallons per month to over 5,000 gallons per month (or 4 HCF to 7 HCF per month). Because water resource supply in San Diego is limited and expensive, it is reasonable to base the Tier 1 breakpoint at 3 to 4 HCF per month. This range would serve to recognize water efficiency within this customer class.

The Tier 2 breakpoint is set at 12 HCF per month to reflect typical single-family customer water consumption. The bill tabulation analysis performed as part of the COS indicates that approximately 50 percent of billed usage for this class is about 12 HCF of water use. This average amount reasonably serves as the Tier 2 breakpoint. The breakpoint between Tiers 3 and 4, at 18 to 20 HCF, represents an outdoor irrigation or landscape allowance for this customer class. Single-family residential use beyond 18 HCF per month would represent high use for this class.

The pricing differentials between tiers are based on factors similar to the maximum day and peak hour peaking factors described earlier in this report as well as City water conservation program costs and

local and non-local water supply costs. Non-local water supply costs also include expenses related to distribution and administration costs. In addition, changing the mix of water supplies through the tiers also contributes to the differentials. Black & Veatch has utilized a combination of these factors as well as peak demand considerations in setting the proposed tiers.

The units of water included in Tier 1 are priced at the lowest rate since it represents the City’s least expensive source of water – local supply. As water consumption increases beyond the base tier, water supplies to meet this demand lead to greater investments by the City in alternate sources of supply, yet at much higher costs per acre foot. The use of peaking factors reasonably represents the relationship between higher water consumption and increasing water supply costs. As a check on the reasonableness of proposed pricing differentials for the tiers, Black & Veatch estimated the cost of local water (\$0.54/HCF) and the cost of treated Tier I CWA water (\$2.49/HCF). These figures **only** reflect treatment costs and **do not include** such expenses as distribution and pumping. Roughly speaking, the cost of treated Tier I CWA water, which is the most expensive water that the City purchases is 4.61 times the cost of local supply. Thus, Black & Veatch has limited the pricing differential between Tier 1 and Tier 4 to less than 4.61x.

In addition to the above considerations, mitigating revenue volatility during the summer irrigation season is also a priority. To address this concern, Black & Veatch used the following cost recovery allocation to guide cost recovery by tier. Table 21 is an illustrative example of the allocation used for Option 4 and shows that the first two tiers recover the majority of base demand costs, which represent the majority of costs for the single-family residential class. Tiers 3 and 4 primarily recover maximum hour costs, which reflect peaking (irrigation) demands.

Table 21 Volumetric Cost Recovery over Tiers

Description	Percentage of Cost Recovery in				Total
	Tier 1	Tier 2	Tier 3	Tier 4	
Base Demand Costs	40%	50%	10%	0%	100%
Maximum Day Costs	15%	45%	30%	10%	100%
Maximum Hour Costs			30%	70%	100%

### Design of Private Fire Protection

The design of private fire protection connection charges is essentially the same as that for the base fee. The difference is that for private fire connections, the industry standard is to designate the 6” diameter connection as having a flow equivalency of 1.0.

### Design of Irrigation Rate Alternative

The City’s irrigation class is a very diverse customer group, with users that range from large homeowners to large commercial properties. Since subdividing this class is not possible at this point in time, Black & Veatch proposed to develop a tiering structure based on meter size, as a proxy for customer type.

Tables 22 through 27 summarize the proposed rates for each proposed option.

Table 22 Proposed Meter Rates - Effective January 1, 2014

Meter Size or Fire Line Size	Meter Charge			Private Fire Protection		
	Existing Rates	Option 1	Options 2, 3 & 4	Existing Rates	Option 1	Options 2, 3 & 4
	(\$/monthly)	(\$/monthly)	(\$/monthly)	(\$/monthly)	(\$/monthly)	(\$/monthly)
5/8", 3/4"	19.33	20.34	18.89			
1"	28.46	29.95	25.59	6.26	6.57	2.40
1.5"	49.34	51.94	40.89	6.26	6.57	2.40
2"	75.44	79.42	60.03	8.35	8.77	3.73
3"	136.74	143.98	104.98	12.53	13.16	14.42
4"	224.15	236.03	169.07	16.70	17.54	18.44
6"	440.73	464.10	327.86	25.05	26.30	27.23
8"	701.64	738.85	519.16	33.40	35.07	38.46
10"	1,006.94	1,060.36	742.99	41.75	43.84	49.68
12"	1,875.82	1,975.34	1,380.05	50.10	52.61	59.29
16"	3,267.86	3,441.25	2,400.67	66.80	70.14	96.14

Table 23 Proposed Meter Rates - Effective January 1, 2015

Meter Size or Fire Line Size	Meter Charge			Private Fire Protection		
	Existing Rates	Option 1	Options 2, 3 & 4	Existing Rates	Option 1	Options 2, 3 & 4
	(\$/monthly)	(\$/monthly)	(\$/monthly)	(\$/monthly)	(\$/monthly)	(\$/monthly)
5/8", 3/4"	19.33	21.87	20.31			
1"	28.46	32.19	27.51	6.26	7.06	2.58
1.5"	49.34	55.84	43.96	6.26	7.06	2.58
2"	75.44	85.38	64.53	8.35	9.43	4.00
3"	136.74	154.78	112.86	12.53	14.15	15.50
4"	224.15	253.73	181.75	16.70	18.86	19.82
6"	440.73	498.91	352.44	25.05	28.27	29.27
8"	701.64	794.27	558.10	33.40	37.70	41.34
10"	1,006.94	1,139.88	798.72	41.75	47.13	53.41
12"	1,875.82	2,123.49	1,483.55	50.10	56.56	63.74
16"	3,267.86	3,699.34	2,580.72	66.80	75.40	103.35

Table 24 Proposed Commodity Rates - Effective January 1, 2014

Class	Monthly Tiers [*]		Rate			Monthly Tiers [*]		Rate	Monthly Tiers [*]		Rate
	From	To	Existing Rates	Option 1	Option 2	From	To	Option 3	From	To	Option 4
	hcf	hcf	\$/hcf	\$/hcf	\$/hcf	hcf	hcf	\$/hcf	hcf	hcf	\$/hcf
Single Family	0	7	3.61	3.89	3.71	0	3	3.52	0	4	3.64
	8	14	3.92	4.21	4.62	4	10	4.05	5	12	4.08
	15+		4.40	4.72	5.54	11	20	5.29	13	18	5.82
						21+		7.40	19+		8.19
Other Domestics			3.92	4.21	4.34			4.34			4.34
Non Residential			3.76	4.04	4.17			4.17			4.17
Temp Construction			4.01	4.31	4.62			4.62			4.62

[\*] Bi-monthly tiers are twice monthly allowances

Table 25 Proposed Commodity Rates - Effective January 1, 2015

Class	Monthly Tiers [*]		Rate			Monthly Tiers [*]		Rate	Monthly Tiers [*]		Rate
	From	To	Existing Rates	Option 1	Option 2	From	To	Option 3	From	To	Option 4
	hcf	hcf	\$/hcf	\$/hcf	\$/hcf	hcf	hcf	\$/hcf	hcf	hcf	\$/hcf
Single Family	0	7	3.61	4.18	3.99	0	3	3.79	0	4	3.91
	8	14	3.92	4.53	4.97	4	10	4.36	5	12	4.38
	15+		4.40	5.07	5.96	11	20	5.68	13	18	6.26
						21+		7.95	19+		8.80
Other Domestics			3.92	4.53	4.67			4.67			4.67
Non Residential			3.76	4.34	4.49			4.49			4.49
Temp Construction			4.01	4.63	4.97			4.97			4.97

[\*] Bi-monthly tiers are twice monthly allowances

Table 26 Proposed Irrigation Commodity Rates - Effective January 1, 2014

Class	Monthly Tiers [*]		Rate		Meter Size	Monthly Tiers [*]		Option 2
	From	To	Existing Rates	Option 1		From	To	
	hcf	hcf	\$/hcf	\$/hcf	inches	hcf	hcf	\$/hcf
Irrigation	All Use		4.01	4.62	≤ 1	0	25	4.45
						26	70	4.58
						>71		4.72
					1½ & 2	0	80	4.45
						81	200	4.58
						>201		4.72
					≥ 3	0	525	4.45
						526	4,100	4.58
						> 4,100		4.72

[\*] Bi-monthly tiers are twice monthly allowances

Table 27 Proposed Irrigation Commodity Rates - Effective January 1, 2015

Class	Monthly Tiers [*]		Rate		Meter Size	Monthly Tiers [*]		Option 2
	From	To	Existing Rates	Option 1		From	To	
	hcf	hcf	\$/hcf	\$/hcf	inches	hcf	hcf	\$/hcf
Irrigation	All Use		4.01	4.97	≤ 1	0	25	4.78
						26	70	4.93
						>71		5.07
					1½ & 2	0	80	4.78
						81	200	4.93
						>201		5.07
					≥ 3	0	525	4.78
						526	4,100	4.93
						> 4,100		5.07

[\*] Bi-monthly tiers are twice monthly allowances

### Revenue Sufficiency

Presented in Table 28 is a comparison of Test Year allocated cost of service with revenues for each rate structure option. Test year costs of service are obtained from Table 19 and the proposed rates recover essentially 100 percent of the total cost of service.

Table 28 Revenues under Proposed Rate Structure Options for TY 14

Line No	Description	Rev Under SFR Option 1		Rev Under SFR Option 2		Rev Under SFR Option 3 & Option 1		Rev Under SFR Option 4 & Option 1		
		Adjusted Cost of Service (\$)	Rev Under SFR & Irrigation (\$)	Percent Recovery (%)	Rev Under SFR & Irrigation (\$)	Percent Recovery (%)	Rev Under SFR & Irrigation (\$)	Percent Recovery (%)	Rev Under SFR & Irrigation (\$)	Percent Recovery (%)
1	Single Family	171,463,900	171,904,800	100%	171,252,900	100%	171,498,600	100%	170,966,600	100%
2	Other domestics	87,356,800	87,665,400	100%	87,931,900	101%	87,665,400	100%	87,665,400	100%
3	Non-Residential [*]	93,500,200	93,795,600	100%	93,600,400	100%	93,795,600	100%	93,795,600	100%
4	Construction	1,375,000	1,369,300	100%	1,374,700	100%	1,369,300	100%	1,369,300	100%
5	Irrigation	51,781,600	52,459,600	101%	51,734,200	100%	52,459,600	101%	52,459,600	101%
6	Subtotal	405,477,500	407,194,700	100%	405,894,100	100%	406,788,500	100%	406,256,500	100%
Fire Service										
7	Private Fire	1,974,700	1,973,800	100%	1,989,800	100%	1,989,800	100%	1,989,800	100%
8	Subtotal	1,974,700	1,973,800	100%	1,989,800	100%	1,989,800	100%	1,989,800	100%
9	<b>Total Water System</b>	<b>\$407,452,200</b>	<b>\$409,168,500</b>	<b>100%</b>	<b>\$407,883,900</b>	<b>100%</b>	<b>\$408,778,300</b>	<b>100%</b>	<b>\$408,246,300</b>	<b>100%</b>

[\*] Non-Residential customers include Commercial, Industrial, and Outside City.

### Comparison of Typical Bills

While the rate structures considered above recover essentially 100 percent of the necessary costs of service for each customer class, Black & Veatch believes it is important to review the impact of any revenue adjustment and rate structure change on typical bills. Figures 4 through 7 illustrate a comparison of a typical bi-monthly bill for a single-family residential customer at water consumption levels of 6 HCF, 12 HCF, 30 HCF, and 44 HCF for each rate option.

Figure 4. Single-Family Residential Bi-Monthly Typical Bill for ¾" Meter and Using 6 HCF

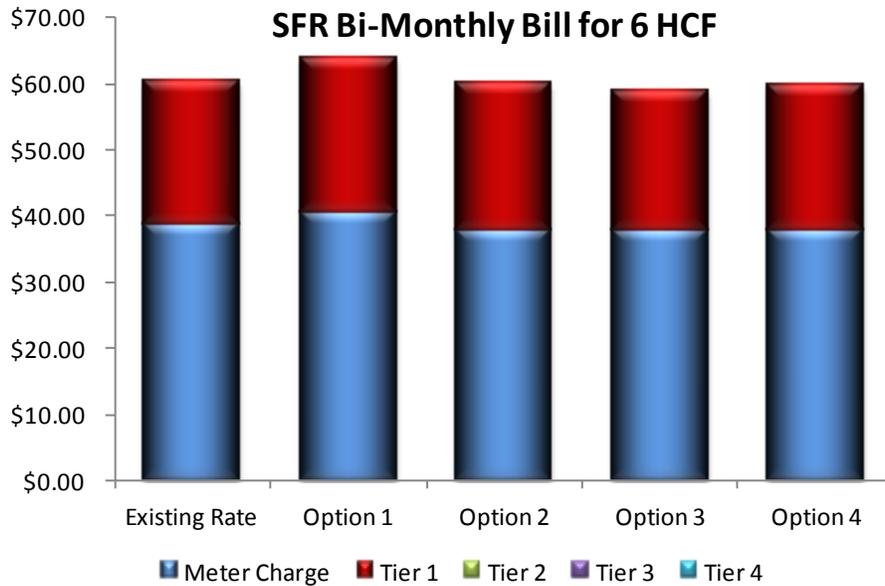


Figure 5. Single-Family Residential Bi-Monthly Typical Bill for ¾" Meter and Using 12 HCF

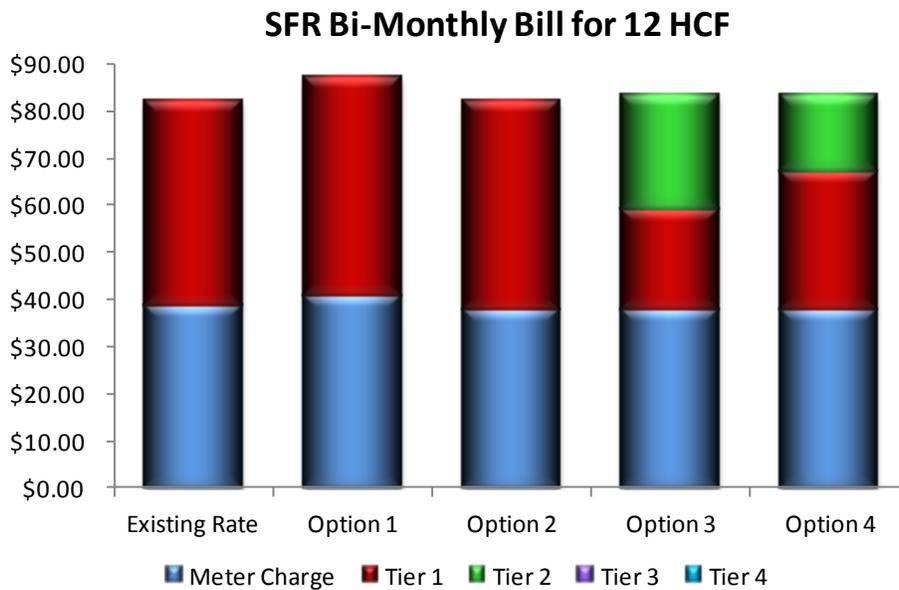


Figure 6. Single-Family Residential Bi-Monthly Typical Bill for ¾" Meter and Using 30 HCF

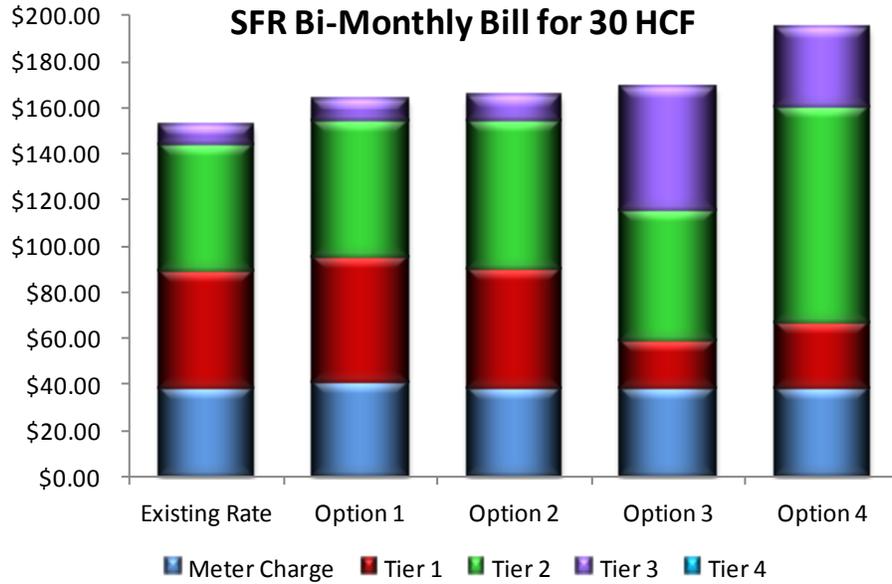


Figure 7. Single-Family Residential Bi-Monthly Typical Bill for ¾" Meter and Using 44 HCF

