This presentation premiered at WaterSmart Innovations

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INNOVATIONS

So What's Wrong With Water Rates?

"The study showed we weren't raising revenue through our billing to cover operating costs and capital costs for those systems," said Jeff Zoephel, director of finance, Chicago region water agency, April 2011.

"If we save more than 2% per year due to conservation, we have to raise rates." Coachella Valley WD Finance Director

"We saved water when you asked, now you raise our rates because you did not sell enough water. We need to vote you out." Typical customer

"Agencies create rate structures that are a bad business practice." Former City of Fairfield Water Official

" I have a large family and a large lot. Your rates penalize our family even if we are conservative water users". San Diego County resident

""All water suppliers shall increase water use efficiency, reducing per capita urban water use by 20% by 2020, with incremental progress toward this goal by reducing per capita demand 10% by the end of 2015." California SBx7-7 / 20% by 2020

So What's Wrong With Water Rates?

Current Rate Structures:

- They do not recover adequate fixed costs, especially if less water is used
- They do not identify water waste
- They do not allocate water to customers that (1) reflect SBX7 legislation and (2) are fair and equitable
- They force elected officials to raise water rates when not enough water is sold
- They send inconsistent messages to customers…political and public relations problems

From an Agency CFO:

"…60% of our cost to deliver water is fixed. We chose to recover 29% of fixed costs in our 'readiness to serve' charge. The rest of the fixed costs being recovered in the variable side…"

"Yes, we know we will have to raise rates almost every year…if we see more than 2% conservation then we will be raising rates due to conservation."

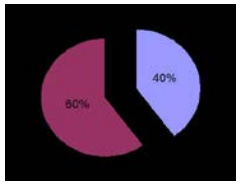
"We have been borrowing from reserves the last couple of years. Politically our board has not had the will to raise the rates as much as has been required, so we are playing catch-up."

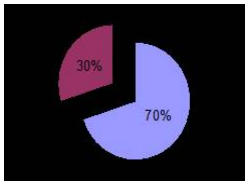
1) Revenue Stability 2) Efficiency 3) Allocate Water Equitably

Are Rate Structures Working?

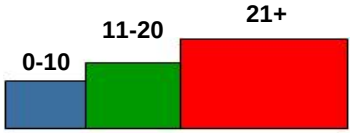
Current Rate Designs:

1. Does not meet <u>agency needs</u>
   - Do not recover the true costs of water





   - Agencies lose money if water is saved
2. Does not <u>target water waste</u>



3. Does not meet <u>customer needs</u>
   - Who is the target for water savings?

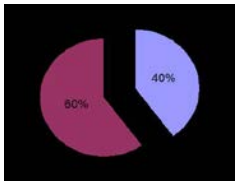
• 2 People
•1,200 sf
Used 10 ccf's

• 5 people
• 8,500 sf landscape
• Pool

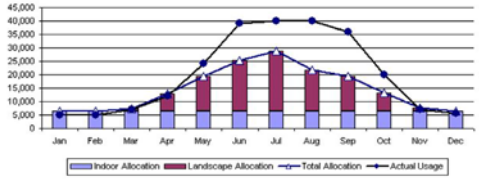
Used 23 ccf's

Water Budget Rates:

1. Recovers high % of fixed costs separate from variable costs



2. Identifies efficient users and water wasters each month

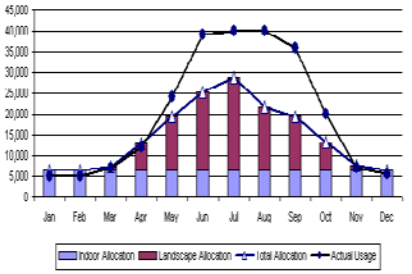


3. Allocates water for each customers specific need

Allocation of 8 ccf's (use 10 ccfs)

Allocation of 27 ccf's (use 23 ccfs)

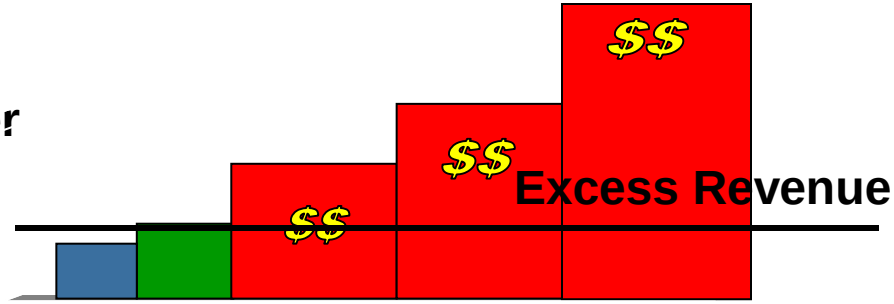
Meeting Conservation Goals



- **Allocate water based on actual account need**

  Residential: (# residents) (gpd) + (ET) (landscape factor) (sf) = Target water budget
  Irrigation: (ET) (landscape factor) (sf) = Target water budget

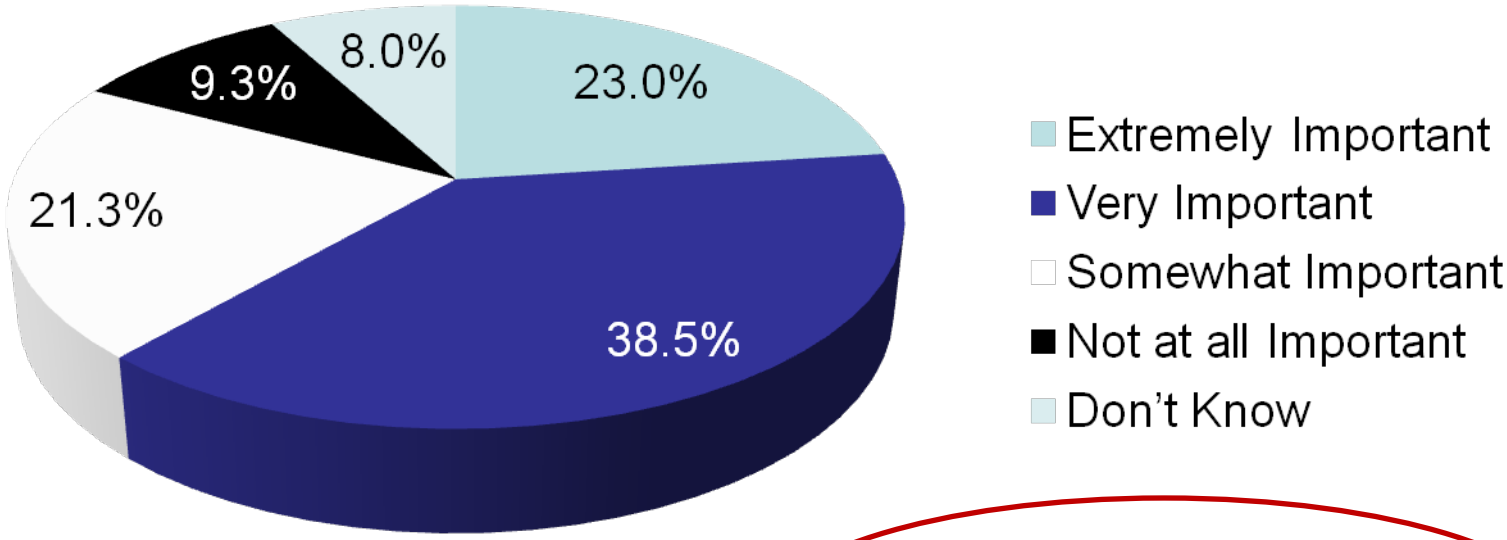
- **Identify and penalize water waste**
  - **Accurate target allocations**
  - **Steep costs for wasted water**



- **Fund conservation from water wasters only**
  - **Fixed costs covered w/ service fee and remaining % in first 2 tiers**
  - **Excess revenue (penalty tier revenues) funds conservation actions without impacting necessary agency revenues**

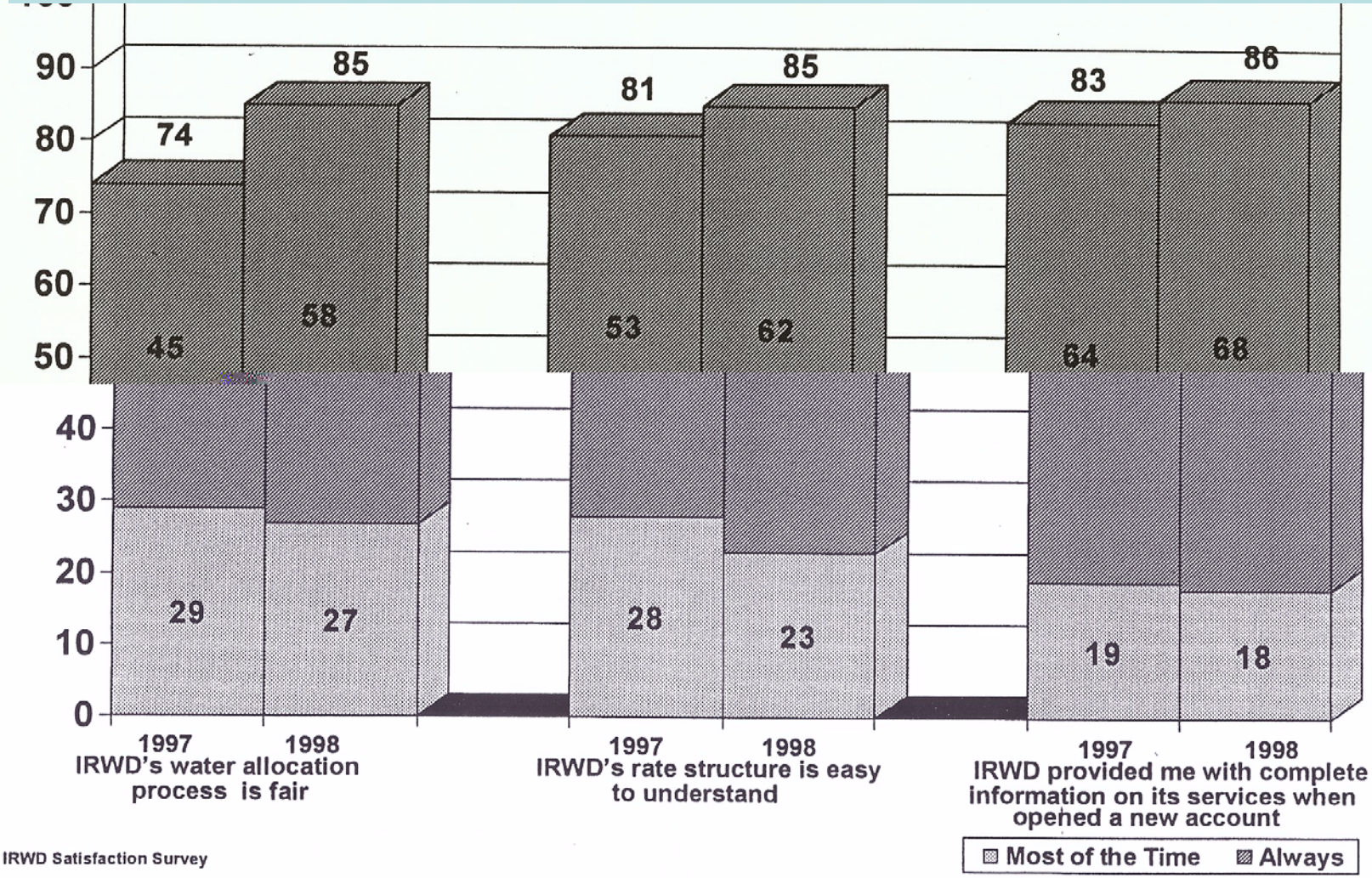
WMWD Customer Survey – March 2010

How important is it to reward water use efficiency by homes and businesses and to penalize water waste (for example, with higher water rates for waste)?



82.7% Say Reward/Penalty is Important!

Increased Customer Satisfaction



The Impact of Water Budget Rates at IRWD (1991-2011)

- **Stable revenue** (70/30)
- **61% landscape reduction**
- **25% residential reduction**
- **Funding mechanism for Conservation programs**
- **Reduced water runoff**
- **90% Customer satisfaction**
- **Re-election of board since 1991**

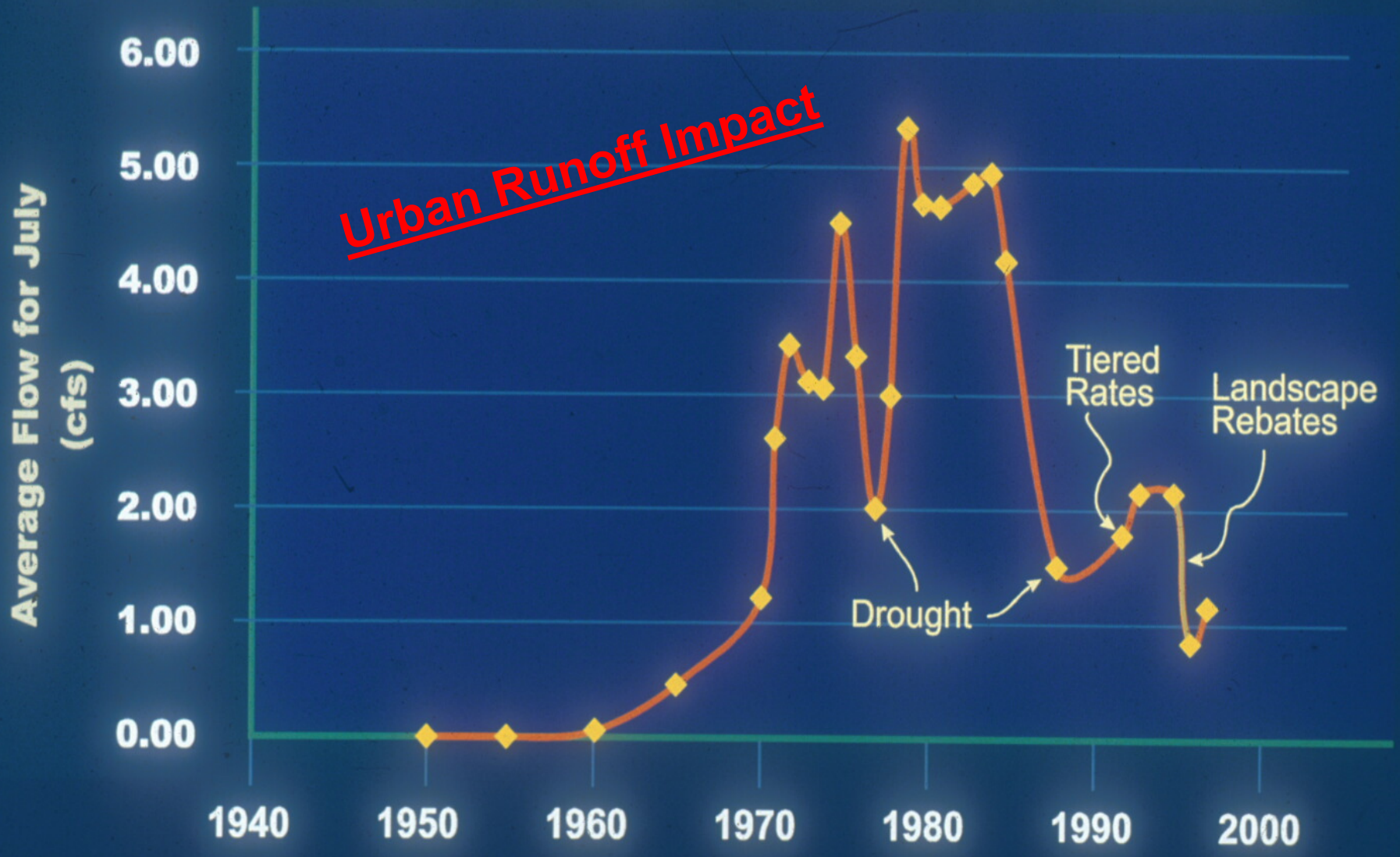
Water Budget Bill: The Waster

8/10/98	9/09/98	1255	1337	82 CCF
USAGE - LOW VOLUME DISCOUNT		16	.480	$7.68
USAGE - CONSERVATION BASE RATE		23	.640	$14.72
USAGE – PENALTY		20	1.280	$25.60
USAGE - EXCESSIVE		19	2.560	$48.64
USAGE - ABUSIVE		4	5.120	$20.48
WATER SERVICE CHARGE				$3.90
SEWER SERVICE CHARGE				$6.90
YOUR ALLOCATION FOR THIS BILL		39 CCF		
BILL CALCULATION BASED ON		.12 ACRES		
				$127.92

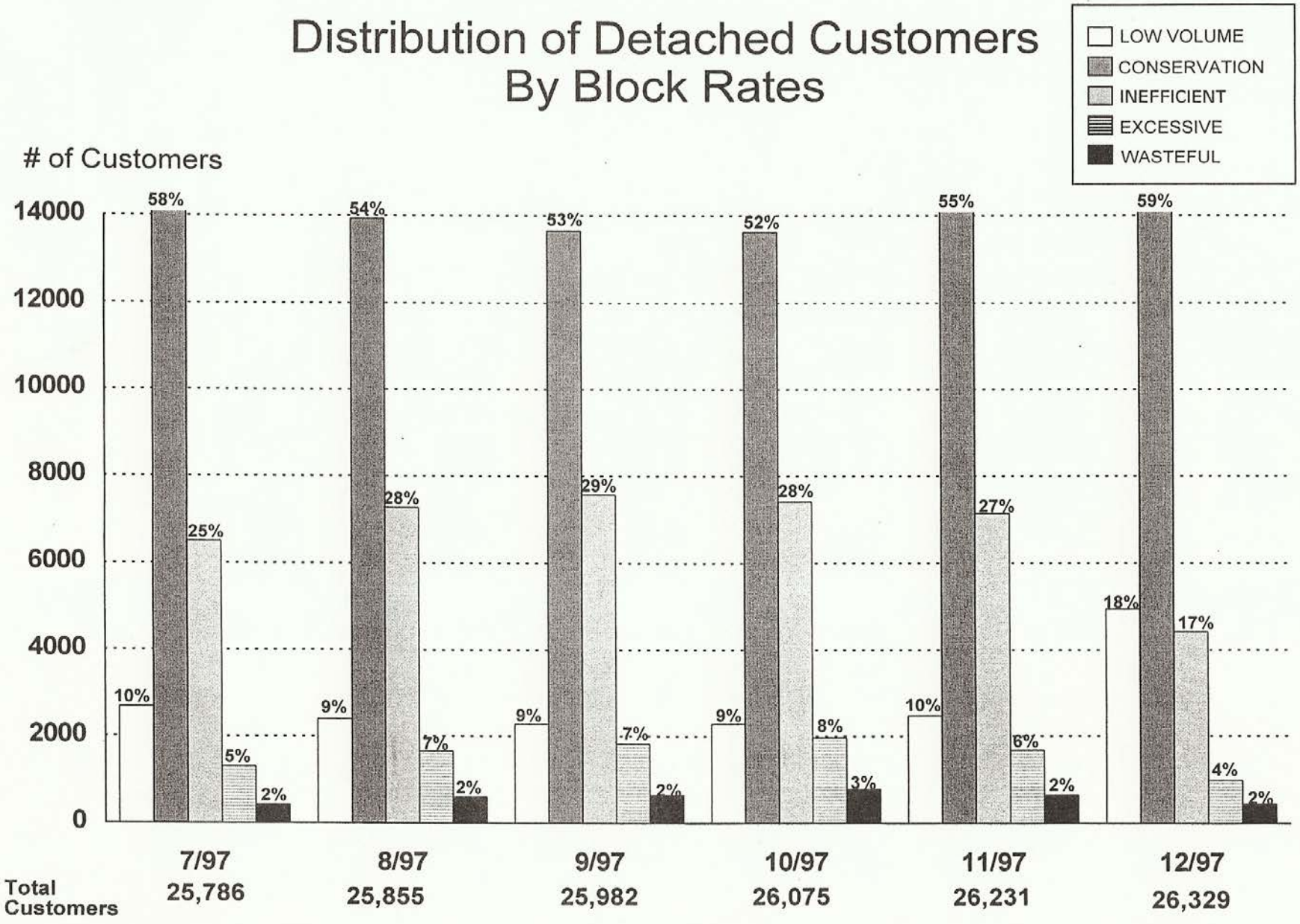
Water Budget Bill: Reformed Waster

2/11/99	3/15/99	1532	1548	16 CCF
USAGE - LOW VOLUME DISCOUNT			11 .480	$5.28
USAGE - CONSERVATION BASE RA			5 .640	$3.20
WATER SERVICE CHARGE				$3.90
SEWER SERVICE CHARGE				$6.90
YOUR ALLOCATION FOR THIS BILL		27 CCF		
BILL CALCULATION BASED ON		.12 ACRES		
				$19.28

Flows in San Diego Creek at Culver



Distribution of Detached Customers By Block Rates



	Scenario 1	Scenario 2	
Fixed =	75%	25%	← Common cost recovery %
Variable =	25%	75%	

Allocations Inputs - SFR customers

Total Parcel Area (TA)	8,000	sq ft	
Area Factor (AF)	45%	of total area	
Landscape factor (LF)	70%	of ETo	by State of California Code of Regulation Title 23, Section 490-495
Household size (Size)	4	residents per acct	
GPCD	60	gallons per capita day	
Drought factor	100%	to control demand at different water supply conditions	

Tier Definitions % of water budgets

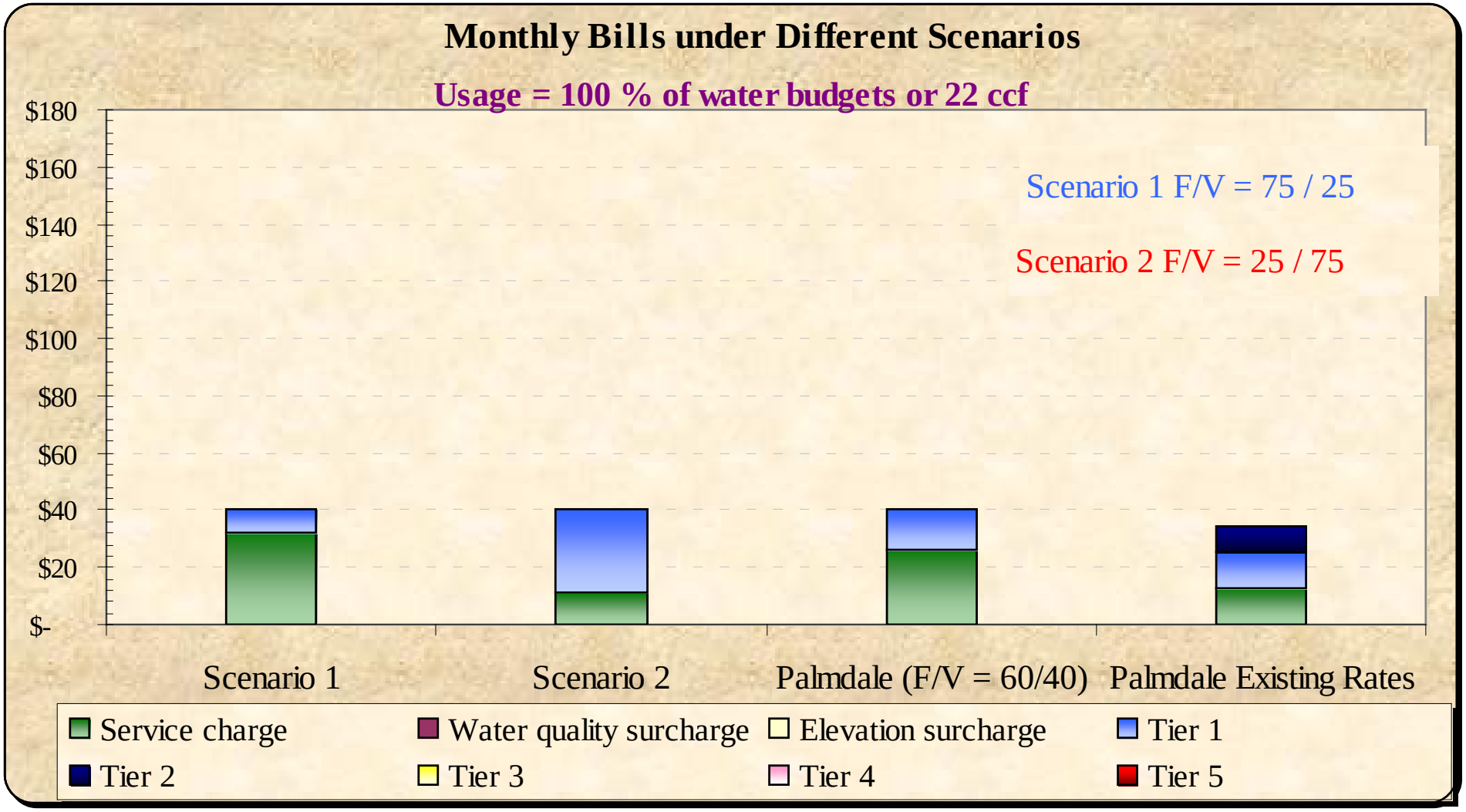
Tier 1	100%
Tier 2	125%
Tier 3	150%
Tier 4	175%
Tier 5	above 175 %

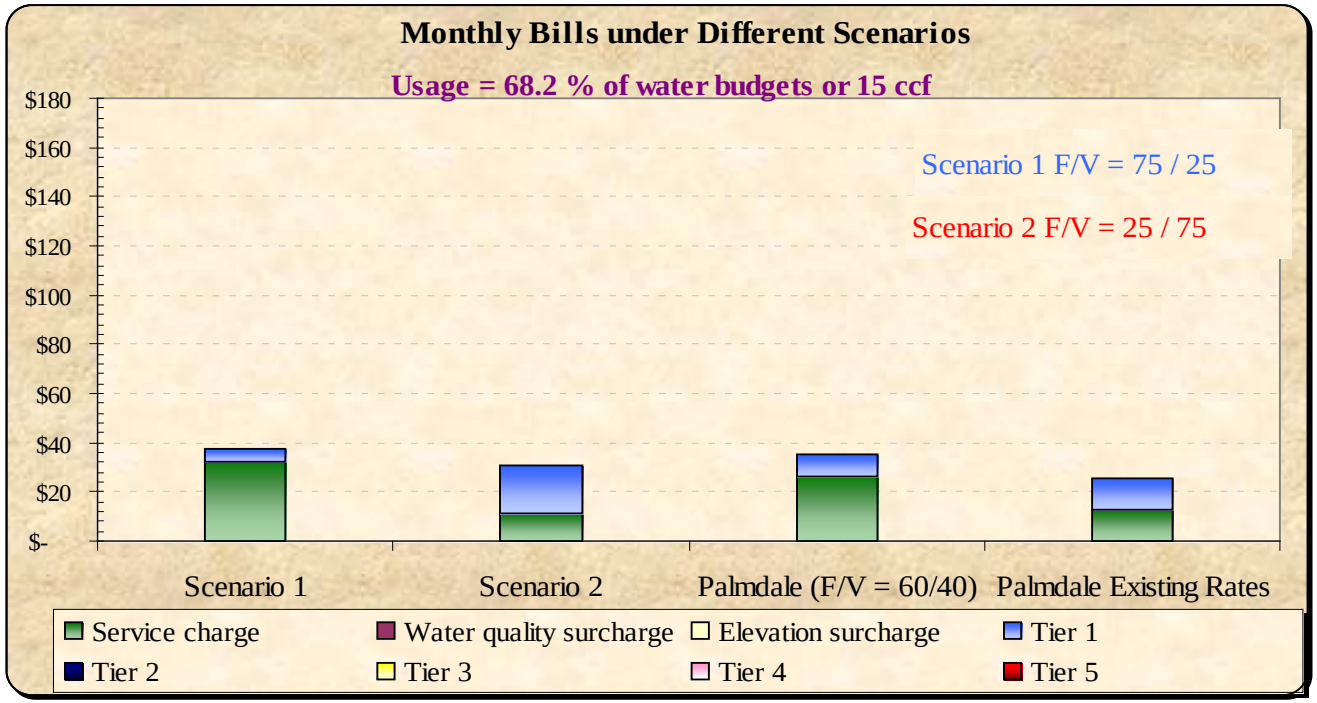
$$Indoor(ccf) = \frac{GPCD * Size * Days}{\left(748 gallons / 1 ccf\right)}$$

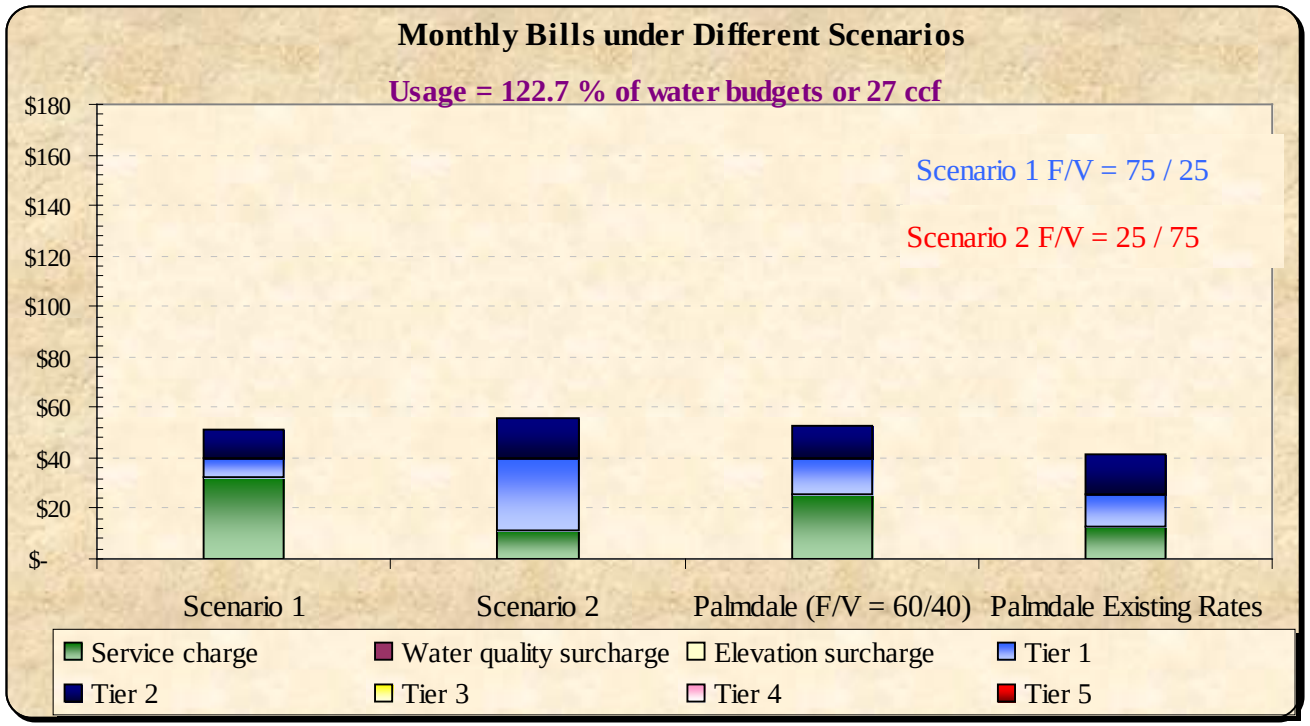
$$Outdoor(ccf) = \frac{ET_0 * TA * AF * LF * DF}{\left(12 inch / ft\right)\left(100 ft^3 / 1 ccf\right)}$$

	CY 2009	CY 2010	CY 2011	CY 2012	CY 2013	CY 2014
Conservation factor	100%	98%	97%	97%	98%	99%

High Fixed vs Low Fixed Costs




Monthly Bills under Different Scenarios
Usage = 68.2 % of water budgets or 15 ccf
$180
$160
$140
$120
$100
$80
$60
$40
$20
$-
Scenario 1 F/V = 75 / 25
Scenario 2 F/V = 25 / 75
Scenario 1
Scenario 2
Palmdale (F/V = 60/40)
Palmdale Existing Rates
Service charge
Water quality surcharge
Elevation surcharge
Tier 1
Tier 2
Tier 3
Tier 4
Tier 5


Monthly Bills under Different Scenarios
Usage = 122.7 % of water budgets or 27 ccf
$180
$160
$140
$120
$100
$80
$60
$40
$20
$-
Scenario 1 F/V = 75 / 25
Scenario 2 F/V = 25 / 75
Scenario 1
Scenario 2
Palmdale (F/V = 60/40)
Palmdale Existing Rates
Service charge
Water quality surcharge
Elevation surcharge
Tier 1
Tier 2
Tier 3
Tier 4
Tier 5

Model Illustration

Dashboard

RFC RAFTELIS FINANCIAL CONSULTANTS, INC

Select Consumption: CY 2009 Usage

Select Meter Ratio for Fixed Service Charges: Current Ratio

KEY VARIABLES

Accountable consumption	Delivery	Conservation	Revenue Offsets	Historical Demand	Potential Demand
Tier 1	100%		100%	7,077	8,181
Tier 2	100%		50%	9,577	16,984
Tier 3	25%			1,793	6,291
Tier 4		100%		1,247	6,291
Tier 5		200%		3,334	
Total				23,029	37,749
		Sales in Tier 1 & Tier 2 (AF)		16,654	25,166

Water Supply Info

Water Supply	AF Purchased	Unit Cost	AF Available for Sale	Effective Unit Cost
Groundwater	2,000	$ 611	1,880	$ 648
MWD Tier 1	16,280	$ 701	15,303	$ 743
MWD Tier 2	4,799	$ 811	4,511	$ 860
MWD Penalty		$ 1,622		$ 1,719
Total (AF)	23,079		21,694	$ 759

Water Loss: 6%

Rate & Charges Decimal Rounding: 2

District Delivery Costs (excl. Water Costs)

Descriptions	Budgeted	Projected
Admin Expenses	$ 8,855,448	$ 8,855,448
Maint. & Depr	$ 2,959,457	$ 2,959,457
Mat & Supplies	$ 429,500	$ 429,500
Misc Expenses	$ 775,972	$ 775,972
Outside Services	$ 511,500	$ 511,500
Reserve Funding	$ 1,124,240	$ 1,124,240
MWD Capacity	$ 746,992	$ 746,992
Pumping Power	$ 1,200,000	$ 1,200,000
Delinquent Rev	$ (500,000)	$ (500,000)
Other Rev	$ (40,000)	$ (40,000)
Total	$ 16,063,109	$ 16,063,109

Revenue Offsets

Descriptions	Budgeted	Projected
Property Tax	$ 6,450,997	$ 5,799,263
Interest	$ 2,634,900	$ 2,634,900
Total	$ 9,085,897	$ 8,434,163

Water Supply Total Cost

Descriptions	Budgeted	Projected
Groundwater	$ 1,295,320	$ 1,222,000
Purchased	$ 16,091,381	$ 15,304,269
Total	$ 17,386,701	$ 16,526,269

Other Program Costs

Program	Budgeted	Projected
Water Efficiency	$ 1,000,000	$ 1,000,000
Inefficient Water	$ 307,000	$ 307,000
Water Reliability	$ 742,266	$ 1,394,000
Water Sales (hcf)	9,450,020	9,450,020

Operating Rev	Budgeted	Projected
% Fixed	37.1%	40%
Service Charge	$ 5,958,362	$ 6,425,244
Delivery	$ 8,873,832	$ 8,406,950
Pumping Charge	$ 1,230,915	$ 1,230,915

Results

Fixed Service Charge

Meter	Current	Proposed
5/8-in	$ 18.69	$ 20.16
3/4-in	$ 18.69	$ 20.16
1-in	$ 30.19	$ 32.56
1 1/2-in	$ 60.38	$ 65.12
2-in	$ 74.75	$ 80.62
3-in	$ 90.57	$ 97.68
4-in	$ 104.94	$ 113.17
6-in	$ 119.32	$ 128.68
8-in	$ 135.13	$ 145.73
10-in	$ 149.51	$ 161.24
12-in	$ 165.32	$ 178.29

Pumping Charges ($ / hcf)

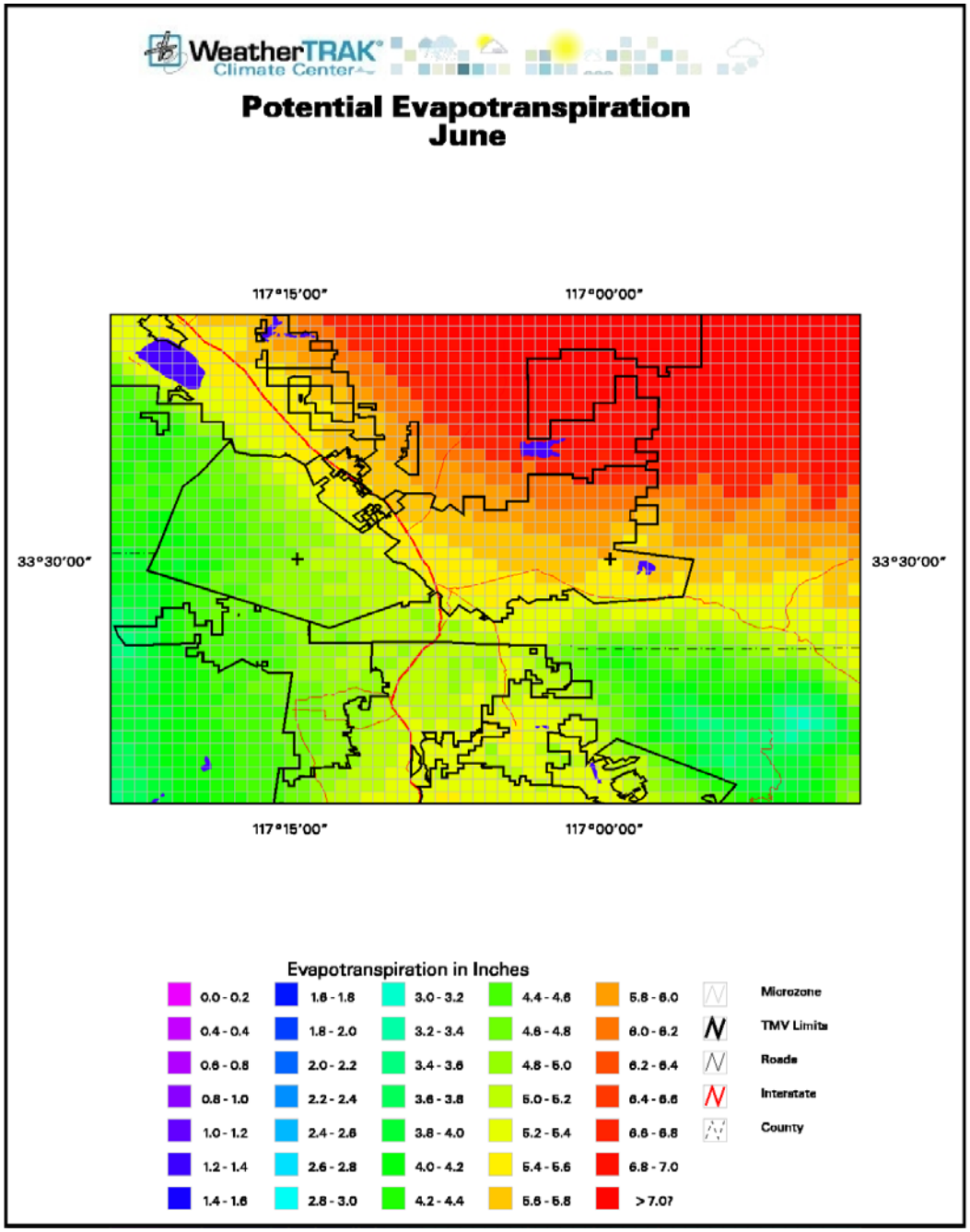
Power Zone	Current	Proposed
1	$ 0.096	$ 0.096
2	$ 0.143	$ 0.143
3	$ 0.131	$ 0.131
4	$ 0.321	$ 0.321
5	$ 0.560	$ 0.560
6	$ 0.620	$ 0.620

Water Reliability ($ / hcf)

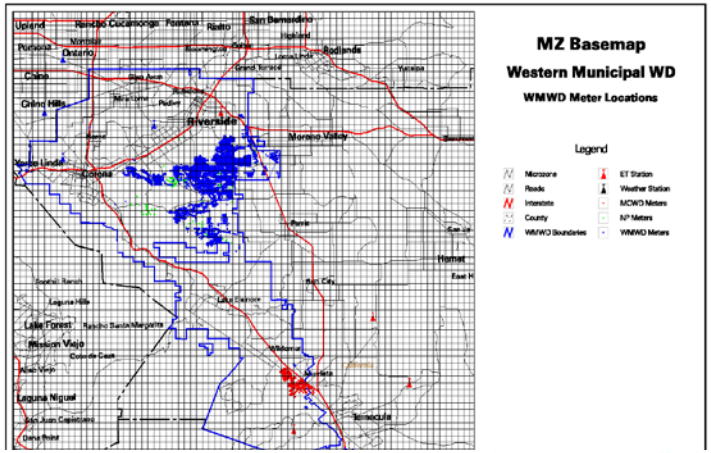
	Current	Proposed
WR Rate	$ 0.070	$ 0.140

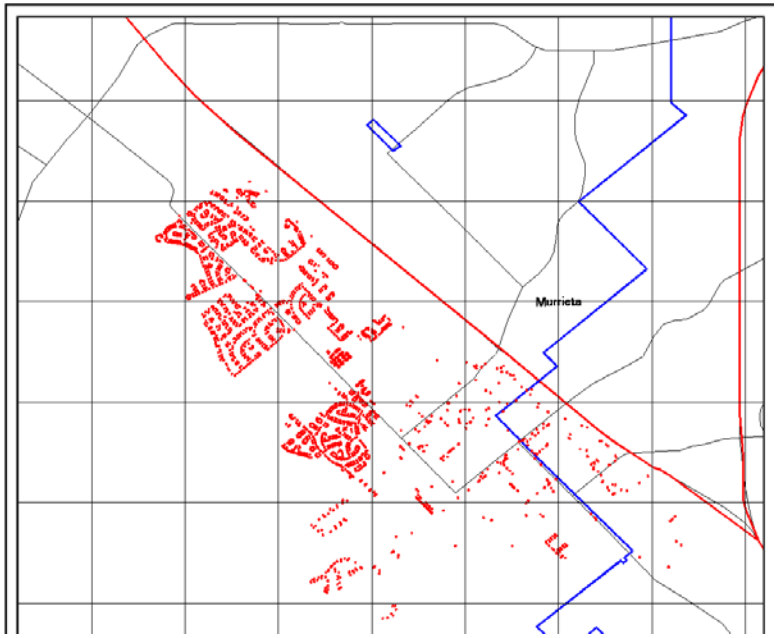
Current Water Rate ($/hcf): $ 1.58

Tiers	Water Supply	Delivery	Conservation	Rev Offset	Rates ($ / hcf)
Tier 1	$1.66	$1.13	$0.00	($1.63)	$ 1.16
Tier 2	$2.24	$1.13	$0.00	($0.82)	$ 2.55
Tier 3	$3.95	$0.29	$0.00	$0.00	$ 4.24
Tier 4	$3.95	$0.00	$0.38	$0.00	$ 4.33
Tier 5	$3.95	$0.00	$0.76	$0.00	$ 4.71



*** Accurate daily ET downloaded into the billing system for each climate zone at a lower cost than installation and maintenance of a single ET Station**





Each Residential Account Receives an Allocation (or water budget) to fit their specific needs. This feature of such rates is what customers appreciate, building customer satisfaction with the agency.

Acct. #1
- 2 Residents (Default 3)
- 1,500 sf of landscape

Acct. #2
- 4 Residents
- 3,500 sq feet of landscape

Acct. #3
- 4 Residents
- 1,500 sq feet of landscaping
- pool (650 sq feet)

Myths About Water Budget Rate Structures

- Current billing systems can't accommodate sophisticated water budget rates
- Customers won't understand the rate structure
- There is too much data needed for individual customer allocations
- It costs too much to implement a individualized water budget allocation structure
- The agency will have to add too many staff to conduct such a rate structure
- The agency does not have enough expertise to design and implement such a system
- Agencies can only recover 30% of fixed costs on a fixed service charge

Reality:

- **Agencies of all sizes have implemented successful water budget rate structures**
- Some agencies adapt their current billing systems, some agencies may need billing system upgrades
- **Data is available (from public and private sources) to help agencies establish allocations (parcel data, census data, ET data, etc.)**
- Staff, often temporary staff, may be needed to implement such rate structures (however staff increases are paid for by the new rate structure and improve customer service)
- **The costs to design and implement water budget rates are minor compared to the revenue loss found with current rate structures**
- Agencies w/ water budget rates are recovering fixed costs and achieving conservation in a more successful way than traditional rate structures

The Logic and Fairness of Water Budget Rates Creates Public Relations & Political Benefits

Current Rate Models:

- Arbitrarily allocates water
- May penalize efficient users
- Recovers too small a percentage of fixed costs (forcing rate increases if water sales go down)
- Agency must sell more water to generate adequate revenues or
- Elected officials must raise rates to recover lost fixed costs
- Conservation by customers results in rate increases…

WB Rate Model:

- **Allocates water based on individualized account needs**
- **Penalizes only those who waste water**
- **Recovers a majority of fixed costs in a fixed fee (does not force rate increases if less water is sold)**
- **Elected officials can be transparent about true water costs priced on the water bill**
- **Conservation by customers results in low bills** (and does not result in a rate increase…)

EAST BAY MUNICIPAL UTILITY DISTRICT

EBMUD CONSERVATION RATE EXPERIENCE

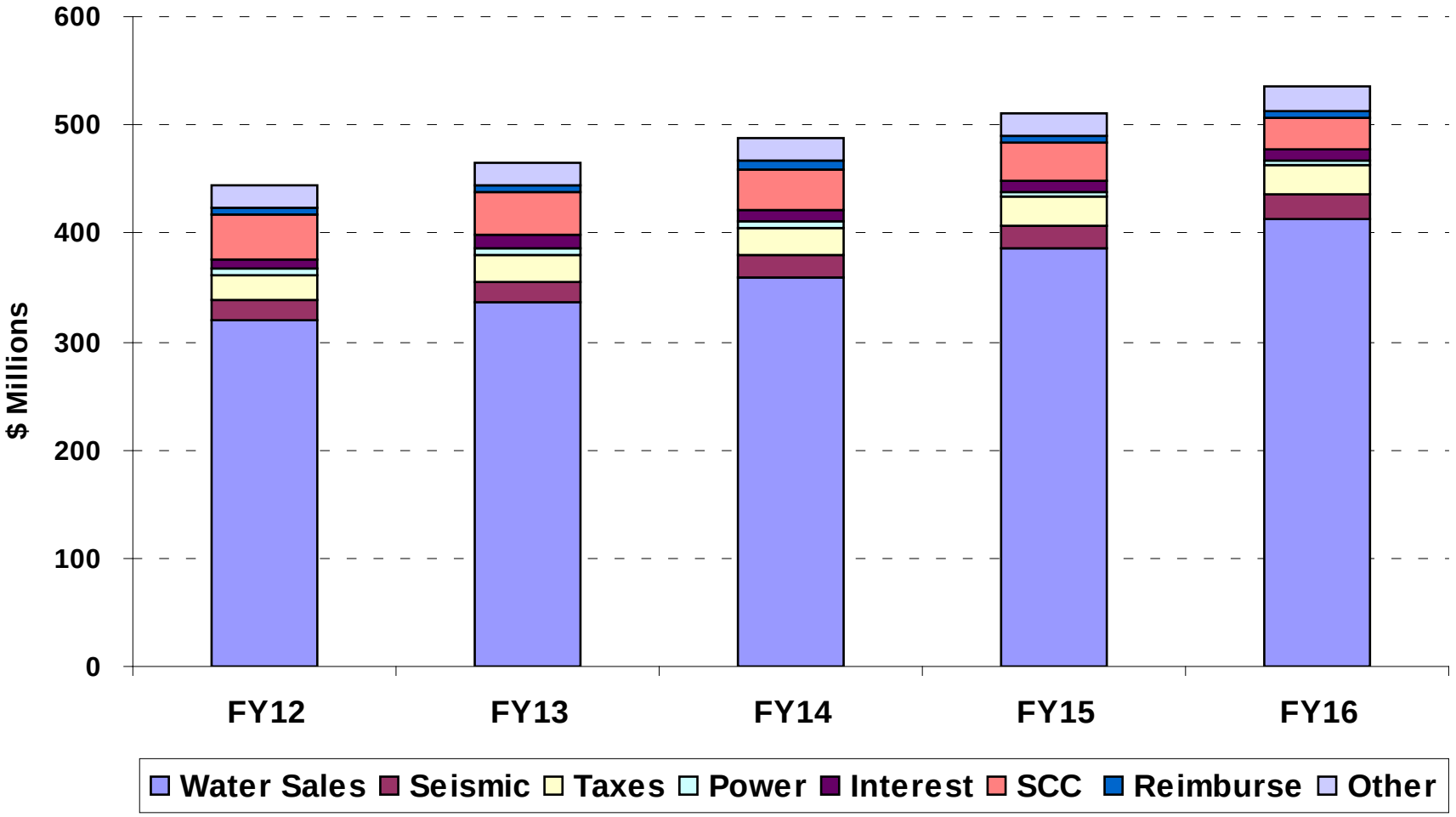
Richard Harris
Water Conservation Manager

2011 Watersmart Innovations
Conference & Exposition

Implementation of Conservation Rates at EBMUD

- Serve >1.3 million people
- 325 square mile service area
- Implemented inclining block rates for single-family residential customers in July 1995
- No geographic differentiation in rate structures
- “Revenue neutral” (i.e., projected revenues equal anticipated expenditures)
- Majority of revenues (>75%) collected through volume charge

Revenue Forecast
Water System



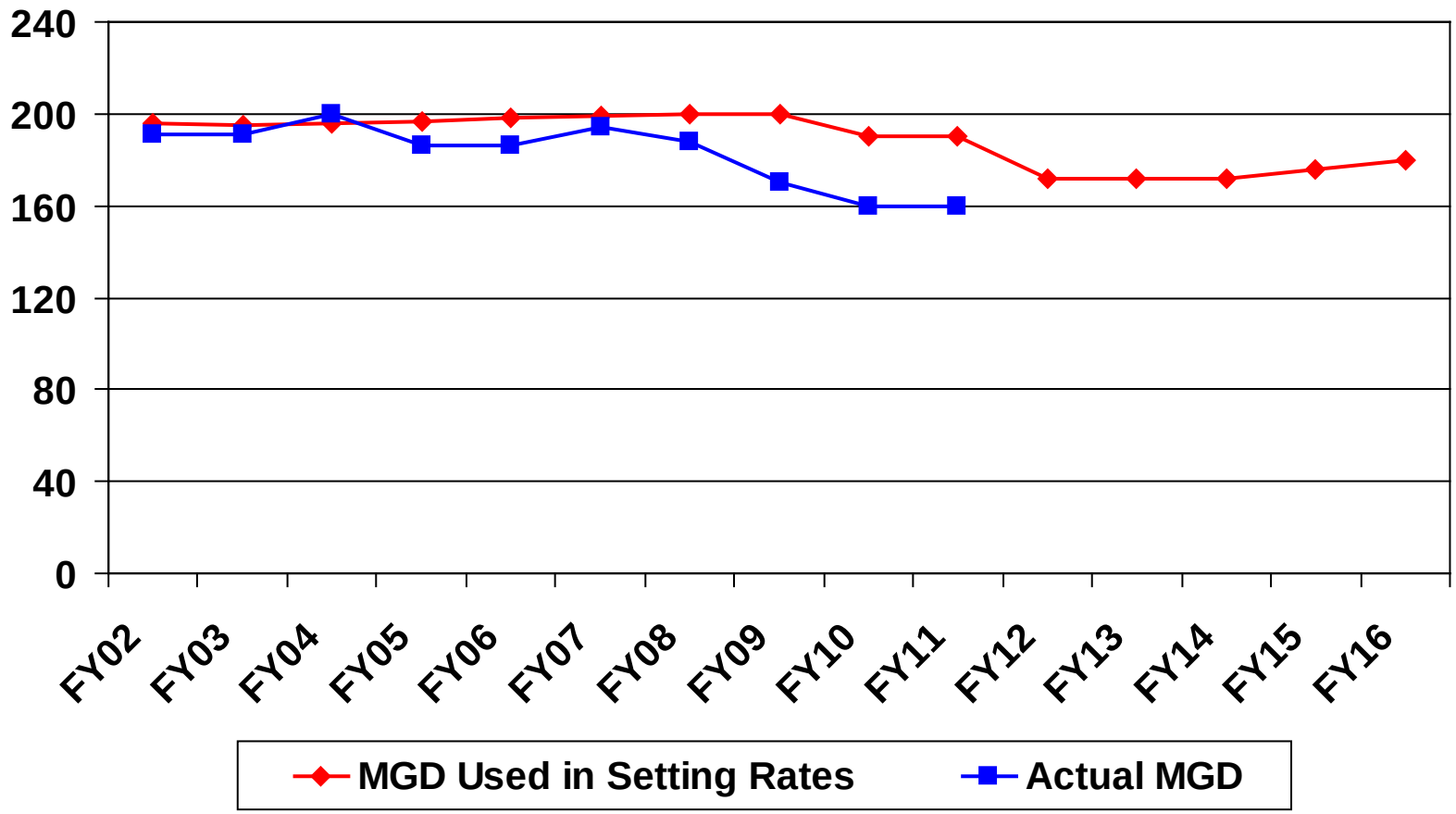
FY12 and FY13 Volume Charges with 5%/5% Increase

Volume Charges		FY11 Current	FY12 Proposed	% Change	FY13 Proposed	% Change
SFR	Tier 1 up to 7 Ccf	$2.15	$2.26	5.1%	$2.37	4.9%
	Tier 2 up to 16 Ccf	2.67	2.80	4.9%	2.94	5.0%
	Tier 3 over 16 Ccf	3.27	3.43	4.9%	3.60	5.0%
MFR		2.73	2.87	5.1%	3.01	4.9%
OTHER (commercial/industrial)		2.82	2.96	5.0%	3.11	5.1%
Seismic surcharge OTHER		0.11	0.12	9.1%	0.13	8.3%
Non Potable		2.34	2.46	5.1%	2.59	5.3%

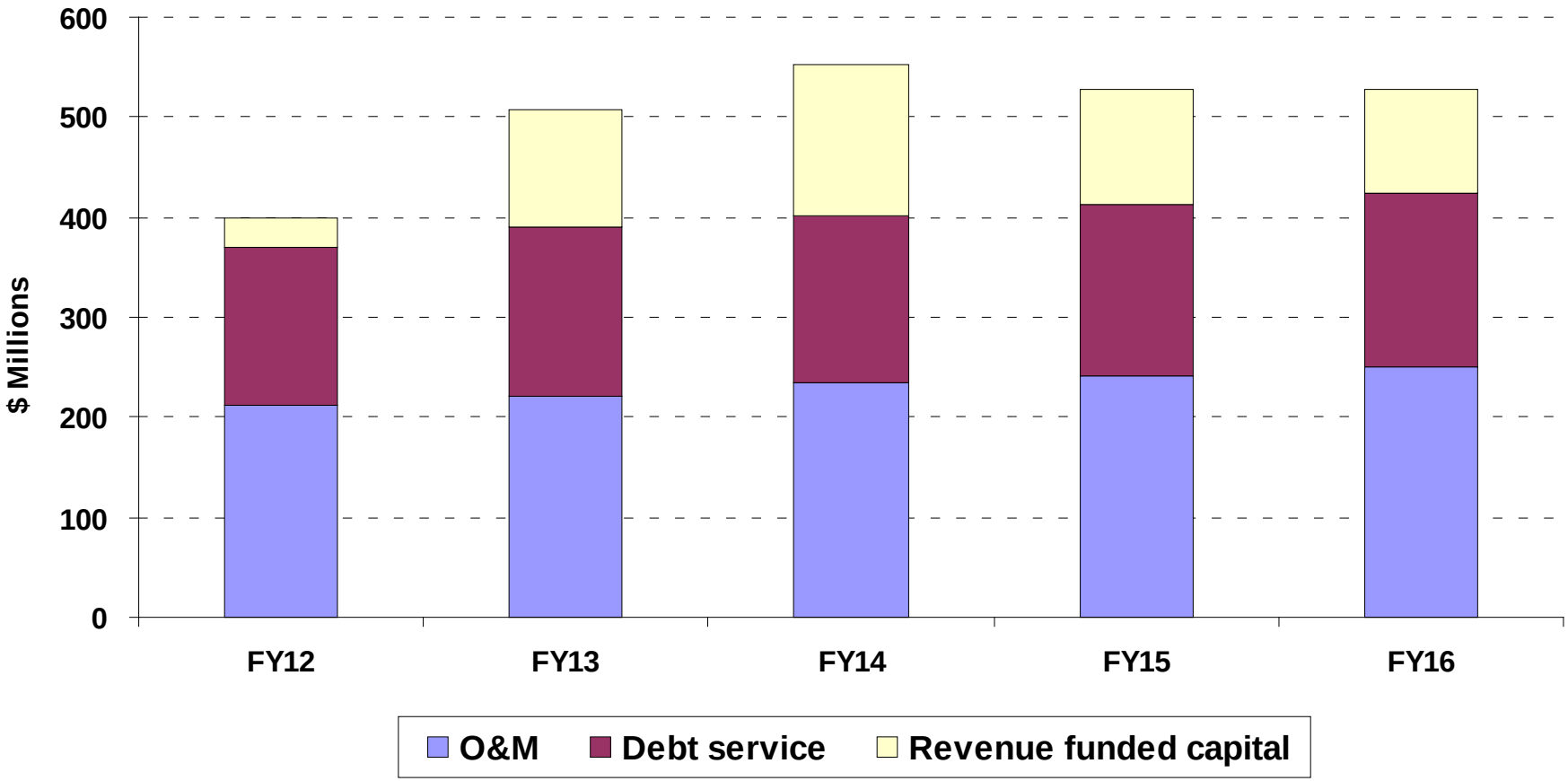
Other FY12 and FY13 Rates and Charges with 5%/5% Increase

Rates		FY11 Current	FY12 Proposed	% Change	FY13 Proposed	% Change
Service Charges						
	5/8" and 3/4"	$10.89	$11.43	5.0%	$12.00	5.0%
	2"	41.22	43.28	5.0%	45.44	5.0%
	4"	114.87	120.61	5.0%	126.64	5.0%
	18"	1371.35	1439.92	5.0%	1511.92	5.0%
Elevation						
	Band 2	0.41	0.43	4.9%	0.45	4.7%
	Band 3	0.83	0.87	4.8%	0.91	4.6%
Seismic Surcharges		varies		5.0%		5.0%

Metered Consumption Trend

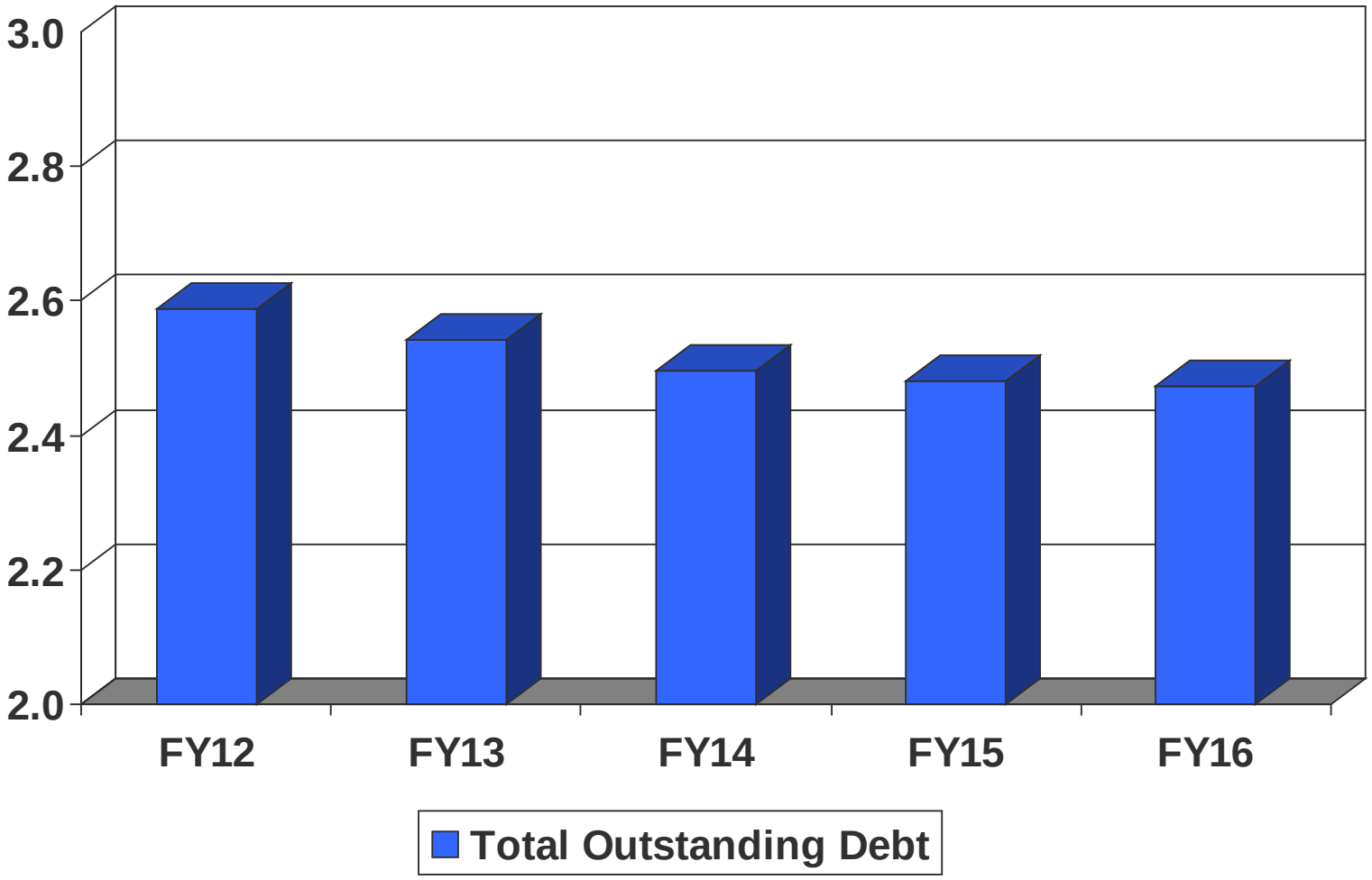


Operating Expenditure Forecast
Water System

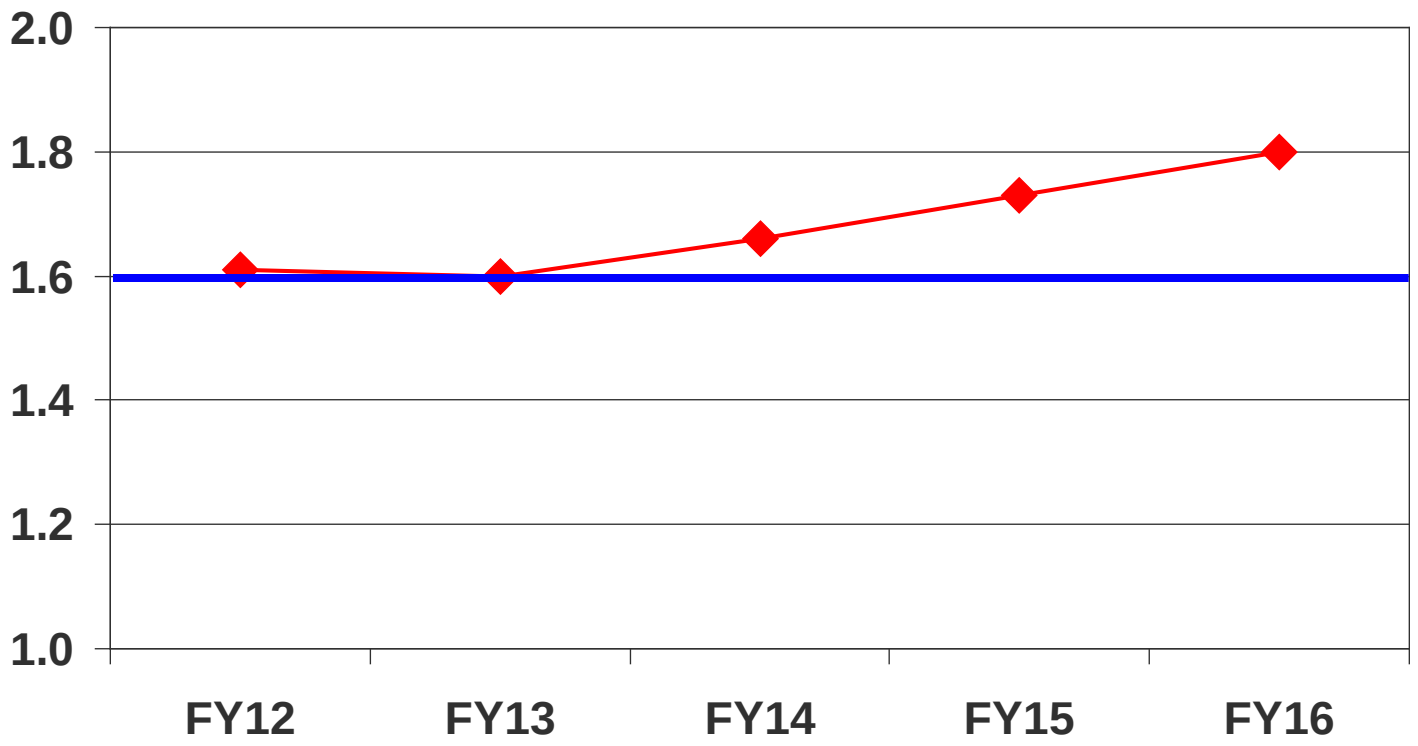


Total Water Outstanding Debt

(Billions)



Water System Revenue Bond Debt Coverage Ratio



RECLAMATION

Managing Water in the West

Effectiveness of conservation pricing in reducing water demand: Evidence from increasing block rate structures

U.S. Department of the Interior
Bureau of Reclamation

Summation

- Customers are most concerned about fairness
- Need understand customer consumption patterns and how rate structure will impact them
- Water budget (ET) based rates can help accommodate use differences
- Conservation rates can be effective in lowering water use
- Revenue stability key to utility viability

A Rate Structure that Promotes Conservation

October 6, 2011

WaterSmart Innovations

Karen Guz

Director – Water Conservation

SAWS at a Glance

Water System

- 359,700 Customer Connections
- $2.3 Billion in Total Assets
- 4,965 Miles of Distribution Mains
- Water Sources – Edwards, Trinity, Carrizo, Canyon Lake, Recycle and Aquifer Storage and Recovery

Wastewater System

- 404,000 Customer Connections
- $1.7 Billion in Total Assets
- 5,135 Miles of Collection Mains
- Water Recycling Centers – Dos Rios, Leon Creek and Medic Creek

Rate Structure: go to saws.org RAC

A Water Conservation Tool

- Sends a price signal so customers become more conscious of their lawn and landscape water use
- Rewards those who conserve water with lower water bills
- Not fair to ask all customers to pay more for the lawn watering demands of a few
- More fair to ask those who demand large amounts of water for irrigation purposes to pay for a higher cost of service

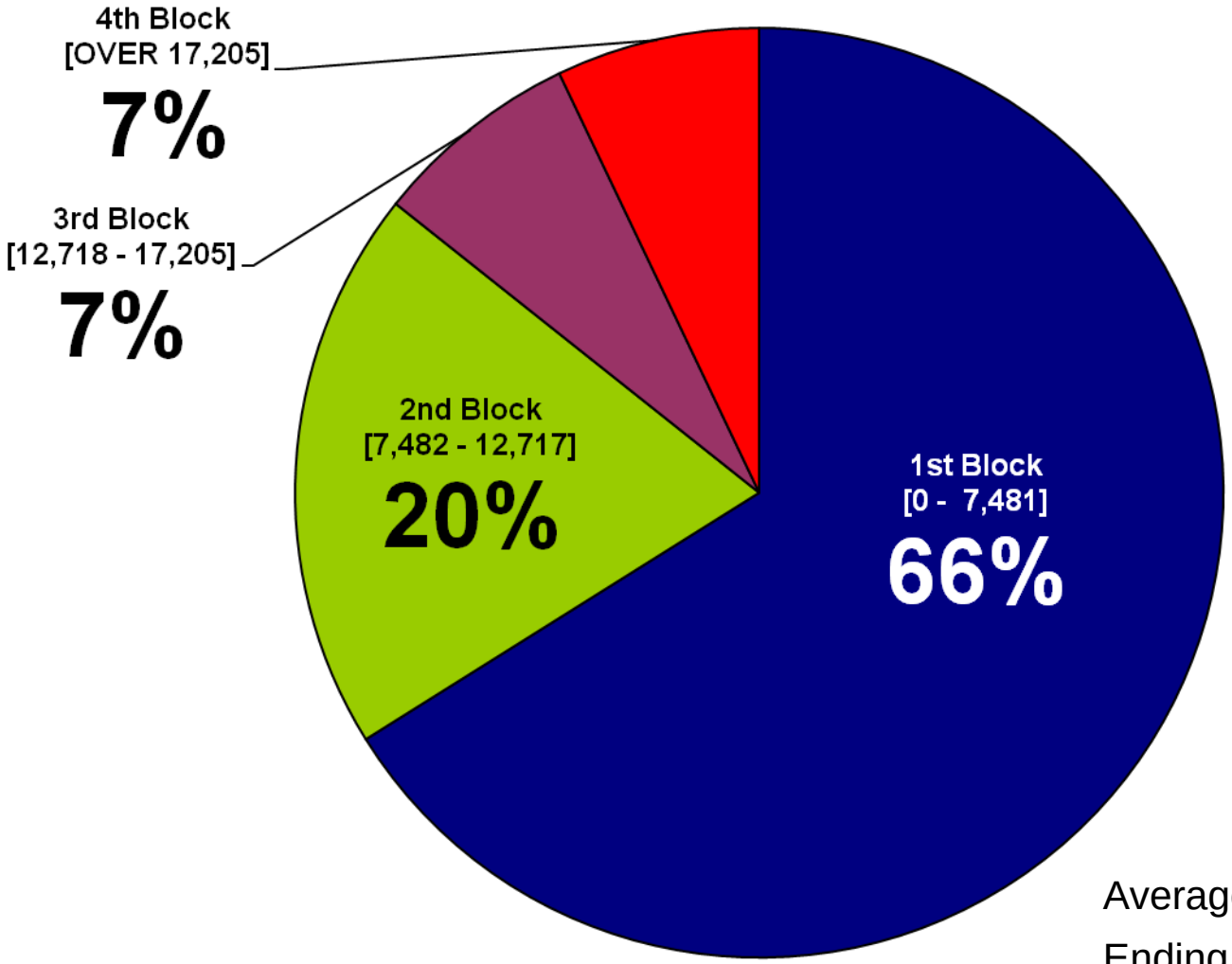
Rate Structure Process:

Philosophy and Direction

- Based on “Cost of Service”
- Revised with Community Input
  - “Inclusive and Transparent”
  - Rate Advisory Committee
- Supportive of the 2009 Water *Management Plan Update*, including conservation and water supply goals
- Financially Responsible
- Revenue Neutral

Residential Bills Per Block

93% of Bills End in the First Three Blocks



Average of 2009 and 2010

Ending in Existing Blocks

Increasing Block Rate

Conservation Based Rate Structure

- The increasing block rate structure is the most effective in encouraging conservation
  - Uniform and Decreasing Blocks Rate Structures provide no Incentives for Water Conservation
  - An industry standard commonly used by water utilities
    - Arlington, Austin, Corpus Christi, Dallas, Fort Worth, Plano
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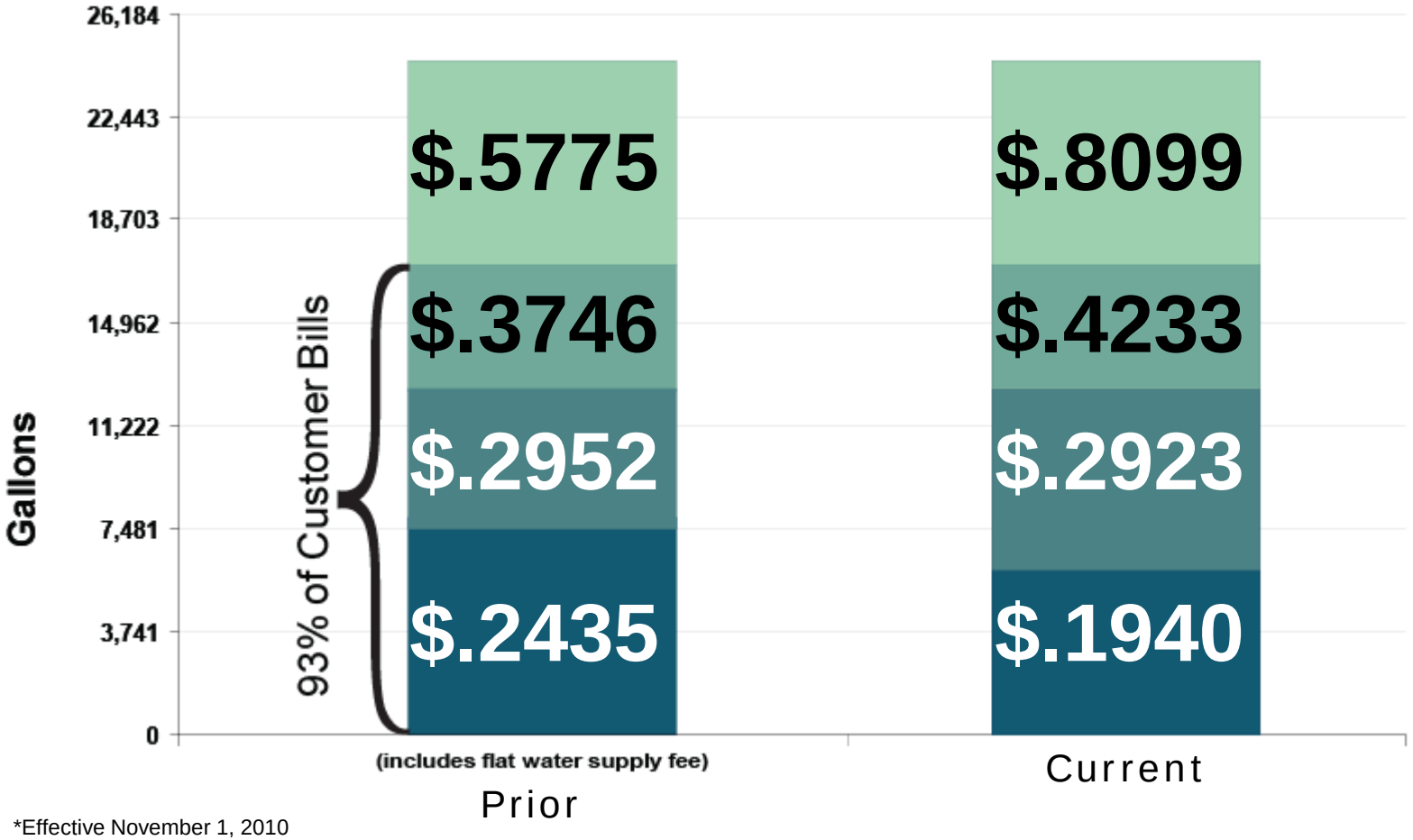
Residential Water Rate Structure*

Seasonal Rates (May – Sep)

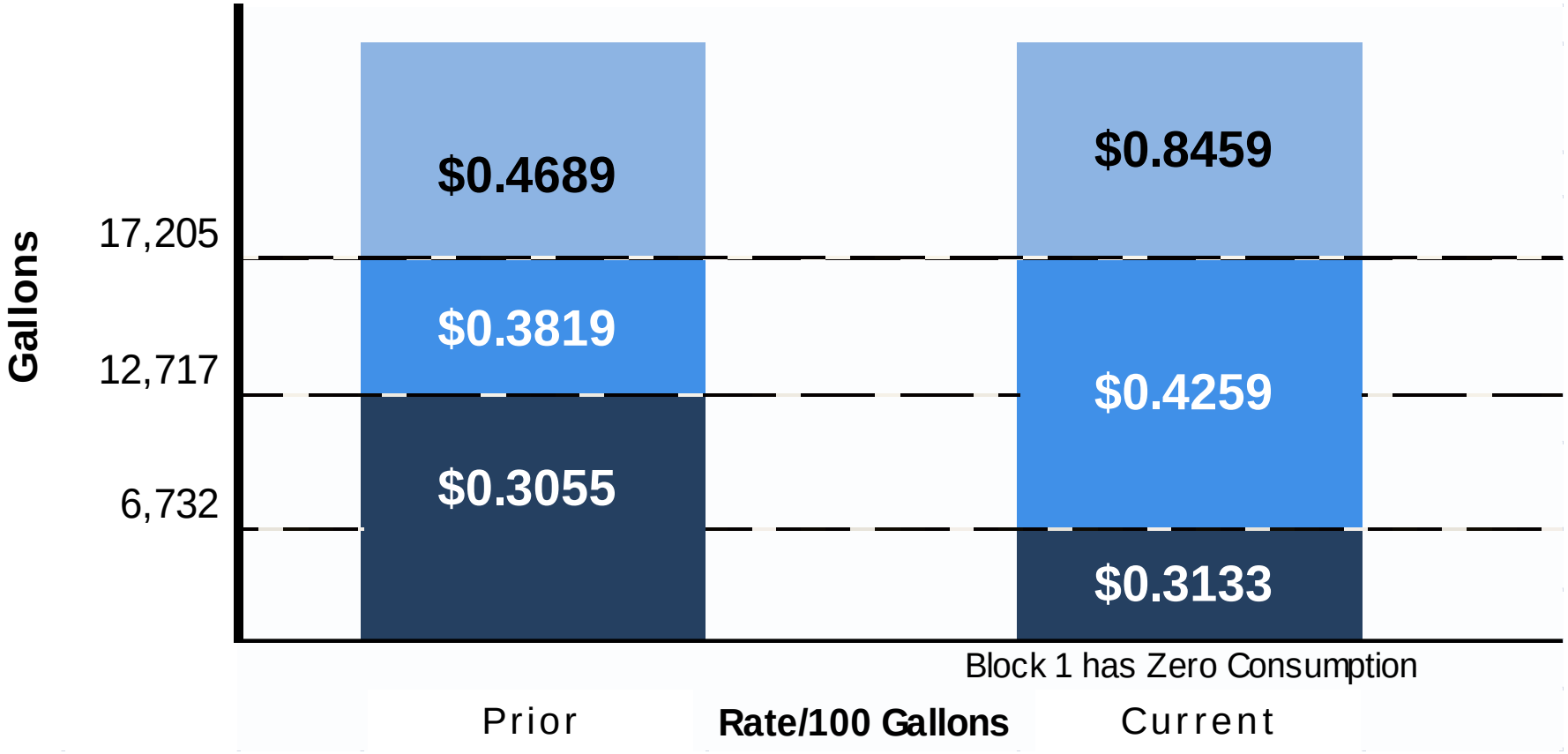


*Effective November 1, 2010

A Rate Structure that Promotes Conservation

Irrigation Rate Structure*

Blocks Altered, Seasonal Rates Adopted, & WS Fee Tiered



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Rates at SAWS go to: www.SAWS.org/RATES

Summary

- ✓ Established with Community involvement
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- ✓ Rates based on Cost of Service principles
  - ❖ All customers closely aligned to cost of service
  - ❖ Charging more for water that costs more
- ✓ Rate Structure consistent with the Water Management Plan
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  - ❖ Water conservation efforts rewarded
  - ❖ Designed to reduce annual discretionary demand by 1.4 billion gallons (4,300 ac-ft)

A Rate Structure that Promotes Conservation

October 6, 2011

WaterSmart Innovations

Karen Guz

Director – Water Conservation

Balancing Conservation and Revenue Stability

Opportunity or Oxymoron?

Juliet Christian-Smith

PACIFIC INSTITUTE

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Programs

- Water
- Community Strategies for Sustainability & Justice
- Globalization
- International Water and Communities Initiative
- Employment

News

[10/05/11] Peter Gleick and Phaedra Ellis-Lamkins blog at Forbes on Rebuilding Water Infrastructure and Creating Jobs, including Greens

[10/04/11] October 2011: Peter Gleick and Ven Te Chow Award, World's Water 7, Rebuilding Water Systems, and More

[10/04/11] New Report with Green For All Shows Economic and Environmental Benefits of Upgrading Nation's Water Systems

[9/28/11] Peter Gleick Receives Ven Te Chow Award from IWRA at World Water Congress in Brazil, Delivers Ven Te Chow Lecture

[9/19/11] Pacific Institute Seeks Research Associate for Community Strategies for Sustainability and Justice Program

[9/12/11] "Bottled and Sold" Now Available in Paperback - Peter Gleick Explores Our Obsession With Bottled Water

[9/08/11] September Update: World Water Week, Green Jobs, Fracking Mess, Peak Water Concepts, and More

More News...

Feature

Two New Reports Examine Water Issues in the Western U.S.

Municipal Deliveries of Colorado River Basin Water

Since 1990, the number of people in the U.S. and Mexico who use Colorado River basin water has increased by more than 10 million – but their overall per capita water use declined by an average of at least one percent per year from 1990 to 2008. Read more.

Impacts of the California Drought from 2007-2009

The Pacific Institute has just completed a nine-month assessment of new data from California's agricultural, energy, and environmental sectors to evaluate actual consequences of the drought for the state. Read more.

Of Interest

- WECalc — Try it!
- **WeTap**: The Pacific Institute and Google Smartphone App that Maps and Locates Public Water Fountains

Questions

- What are some of the main features of your utility and challenges that it faces?
- What factors were considered in the design of your water rates?
- What is the process to notify the public about rate changes?
- What have you found to be an effective way to deal with negative feedback?
- Your questions…

Panelists

- Karen Guz
  - Director of Conservation, San Antonio Water System
- Richard Harris
  - Water Conservation Manager, East Bay Municipal Utility District
- Tom Ash
  - Water Conservation and Rate Advisor to over a dozen agencies from Hydropoint data systems

A Rate Structure that Promotes Conservation

October 6, 2011

WaterSmart Innovations

Karen Guz

Director – Water Conservation

SAWS at a Glance

Water System

- 359,700 Customer Connections
- $2.3 Billion in Total Assets
- 4,965 Miles of Distribution Mains
- Water Sources – Edwards, Trinity, Carrizo, Canyon Lake, Recycle and Aquifer Storage and Recovery

Wastewater System

- 404,000 Customer Connections
- $1.7 Billion in Total Assets
- 5,135 Miles of Collection Mains
- Water Recycling Centers – Dos Rios, Leon Creek and Medic Creek

Rate Structure: go to saws.org RAC

A Water Conservation Tool

- Sends a price signal so customers become more conscious of their lawn and landscape water use
- Rewards those who conserve water with lower water bills
- Not fair to ask all customers to pay more for the lawn watering demands of a few
- More fair to ask those who demand large amounts of water for irrigation purposes to pay for a higher cost of service

Rate Structure Process:

Philosophy and Direction

- Based on “Cost of Service”
- Revised with Community Input
  - “Inclusive and Transparent”
  - Rate Advisory Committee
- Supportive of the 2009 Water *Management Plan Update*, including conservation and water supply goals
- Financially Responsible
- Revenue Neutral

Residential Bills Per Block

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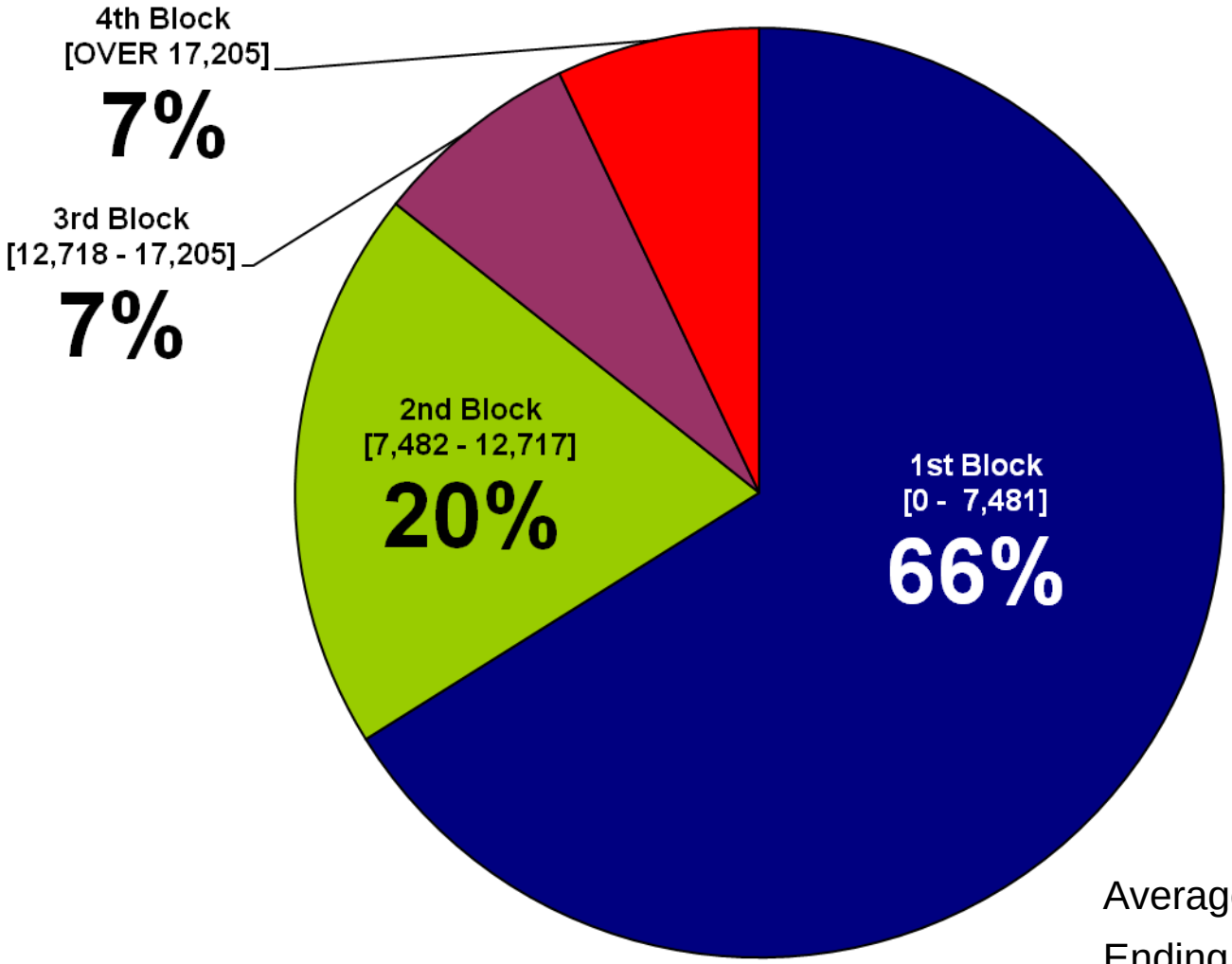

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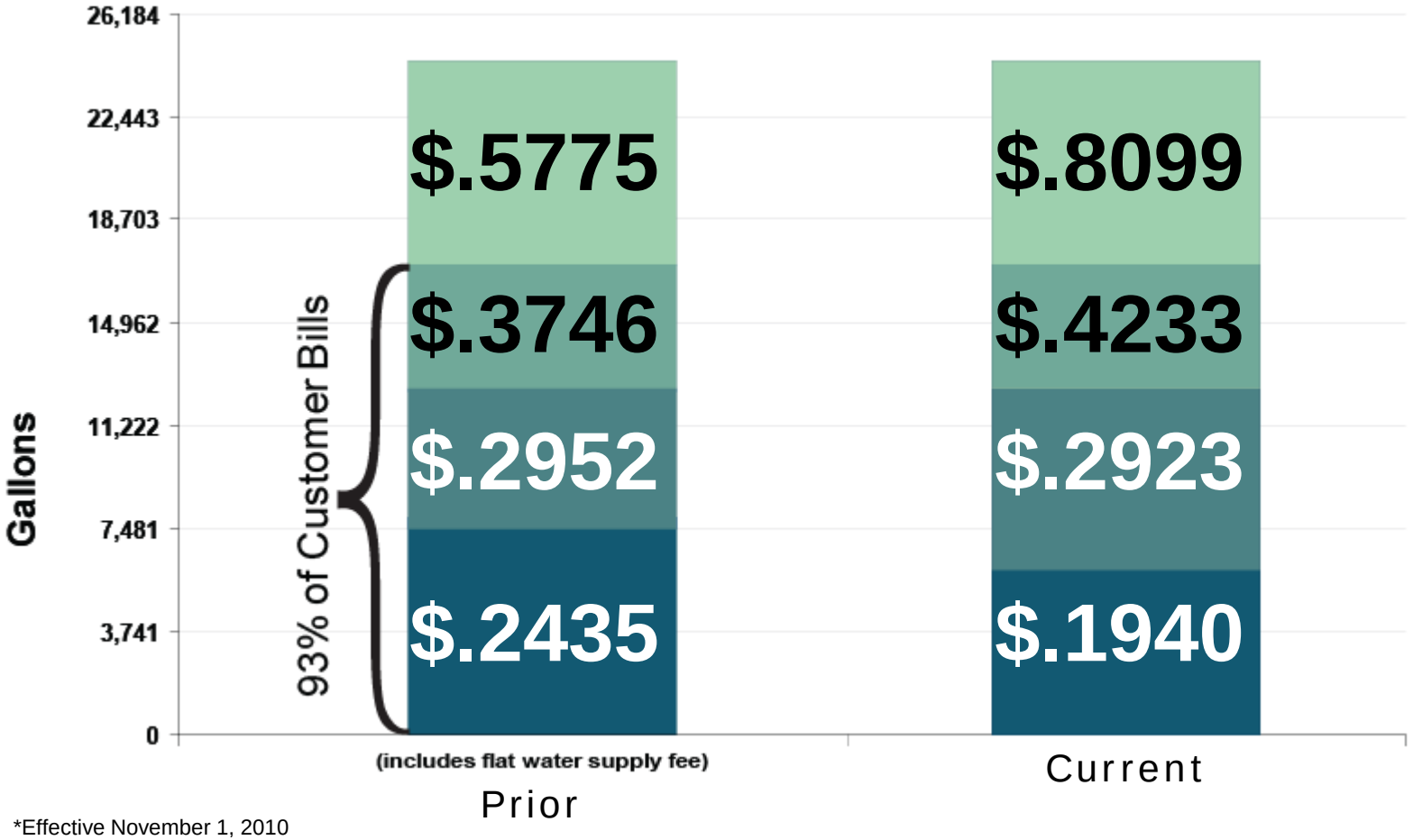

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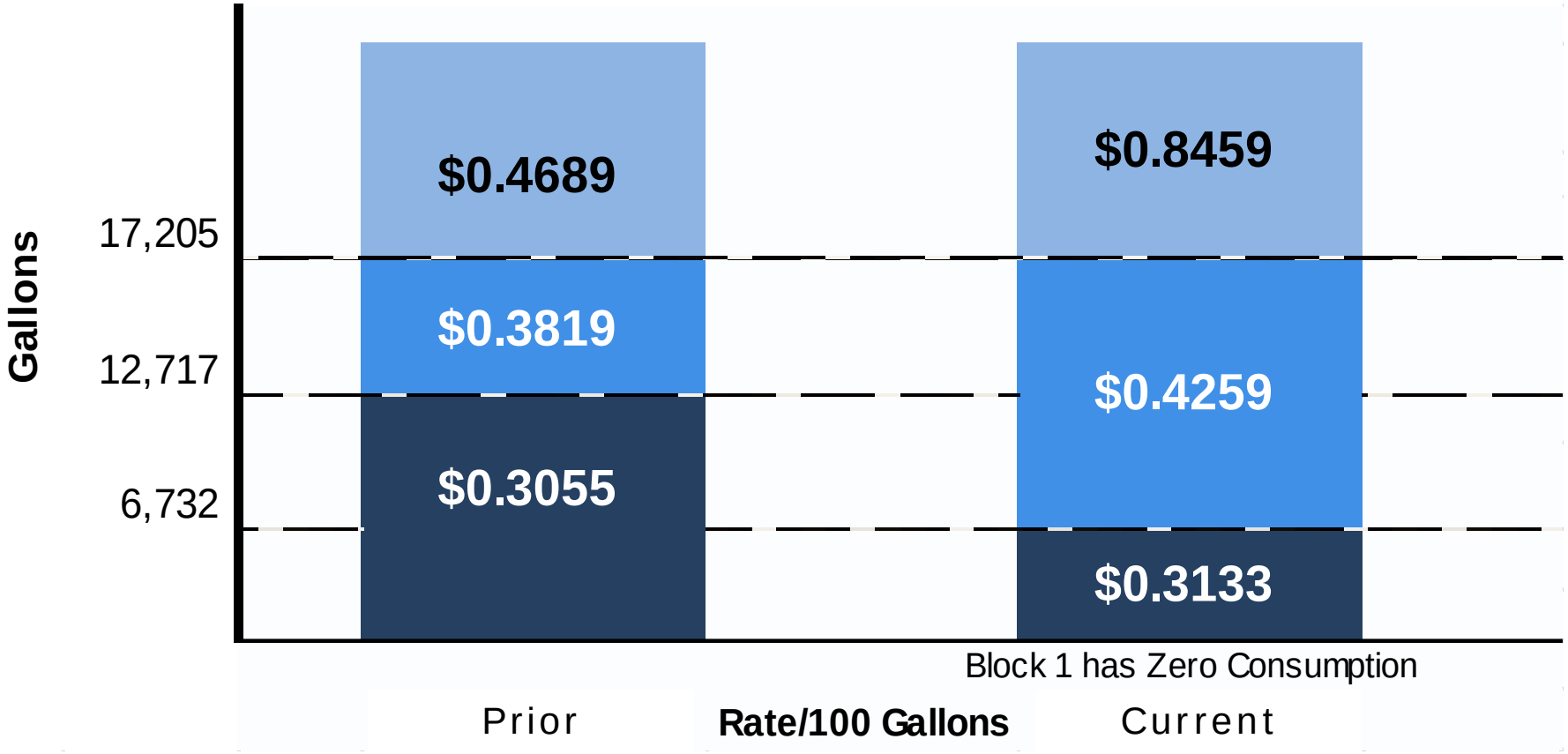

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EAST BAY MUNICIPAL UTILITY DISTRICT

EBMUD CONSERVATION RATE EXPERIENCE

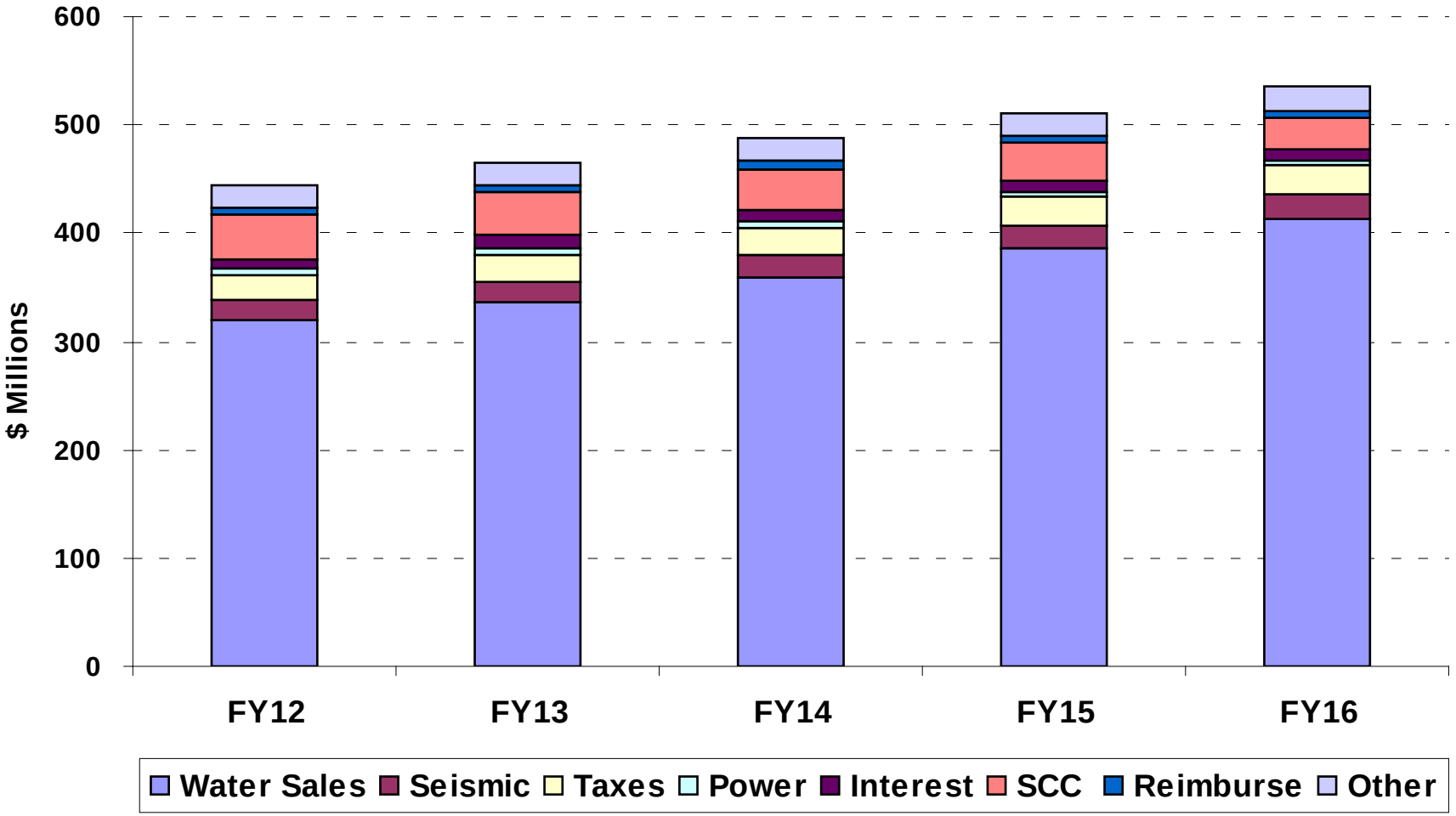
Richard Harris
Water Conservation Manager

2011 Watersmart Innovations
Conference & Exposition

Implementation of Conservation Rates at EBMUD

- Serve >1.3 million people
- 325 square mile service area
- Implemented inclining block rates for single-family residential customers in July 1995
- No geographic differentiation in rate structures
- “Revenue neutral” (i.e., projected revenues equal anticipated expenditures)
- Majority of revenues (>75%) collected through volume charge

Revenue Forecast
Water System



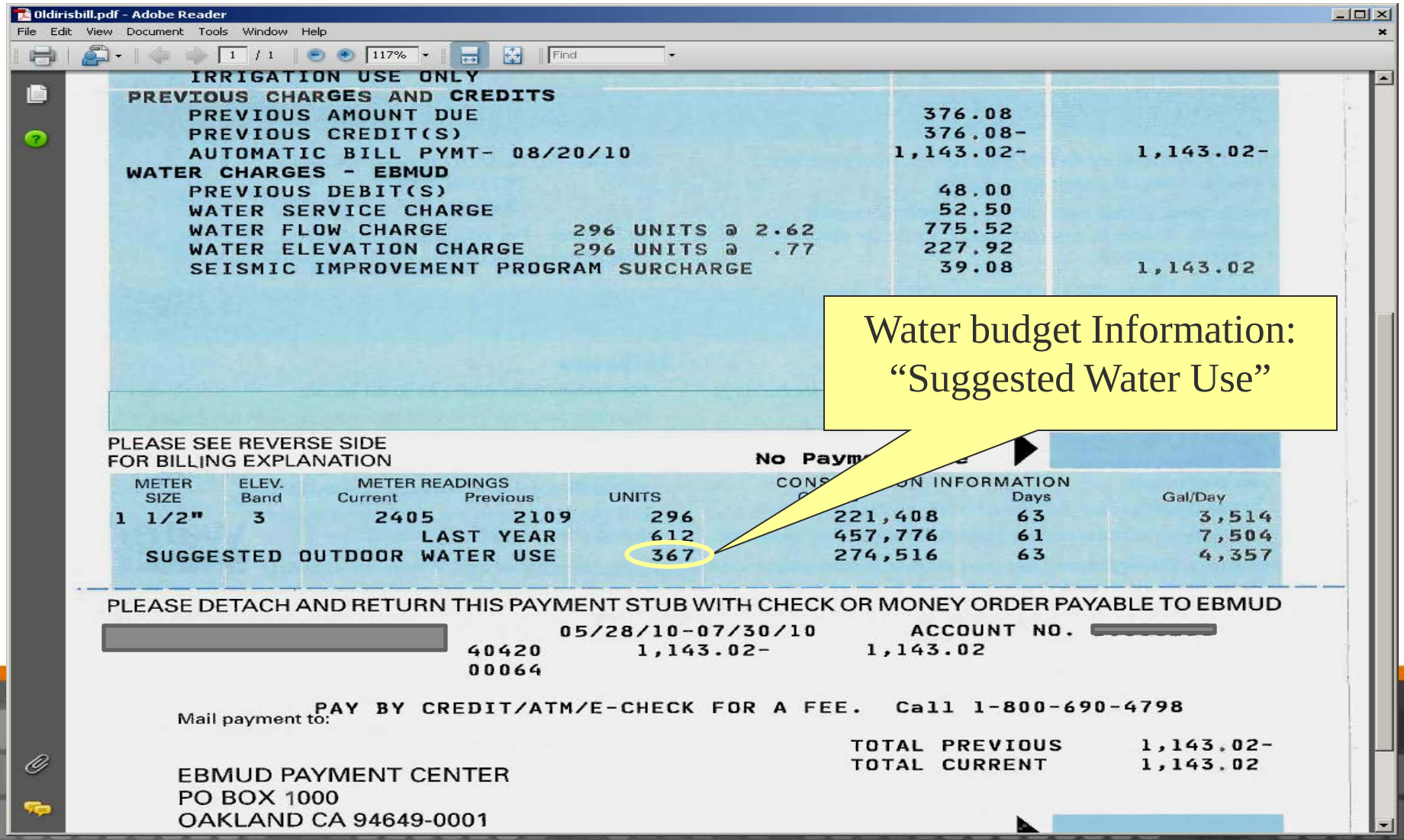
FY12 and FY13 Volume Charges with 5%/5% Increase

Volume Charges		FY11 Current	FY12 Proposed	% Change	FY13 Proposed	% Change
SFR	Tier 1 up to 7 Ccf	$2.15	$2.26	5.1%	$2.37	4.9%
	Tier 2 up to 16 Ccf	2.67	2.80	4.9%	2.94	5.0%
	Tier 3 over 16 Ccf	3.27	3.43	4.9%	3.60	5.0%
MFR		2.73	2.87	5.1%	3.01	4.9%
OTHER (commercial/industrial)		2.82	2.96	5.0%	3.11	5.1%
Seismic surcharge OTHER		0.11	0.12	9.1%	0.13	8.3%
Non Potable		2.34	2.46	5.1%	2.59	5.3%

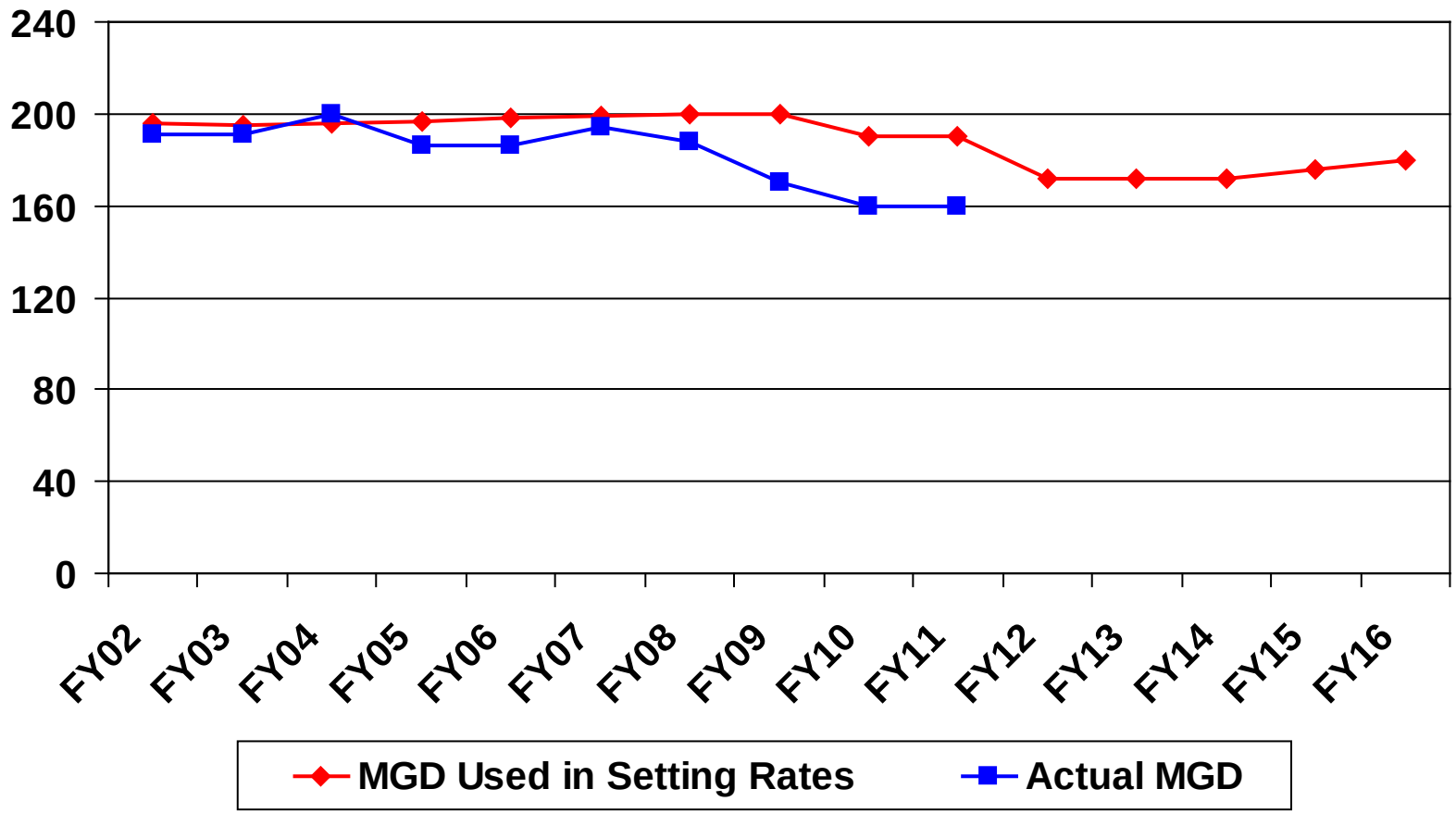
Other FY12 and FY13 Rates and Charges with 5%/5% Increase

Rates		FY11 Current	FY12 Proposed	% Change	FY13 Proposed	% Change
Service Charges						
	5/8" and 3/4"	$10.89	$11.43	5.0%	$12.00	5.0%
	2"	41.22	43.28	5.0%	45.44	5.0%
	4"	114.87	120.61	5.0%	126.64	5.0%
	18"	1371.35	1439.92	5.0%	1511.92	5.0%
Elevation						
	Band 2	0.41	0.43	4.9%	0.45	4.7%
	Band 3	0.83	0.87	4.8%	0.91	4.6%
Seismic Surcharges		varies		5.0%		5.0%

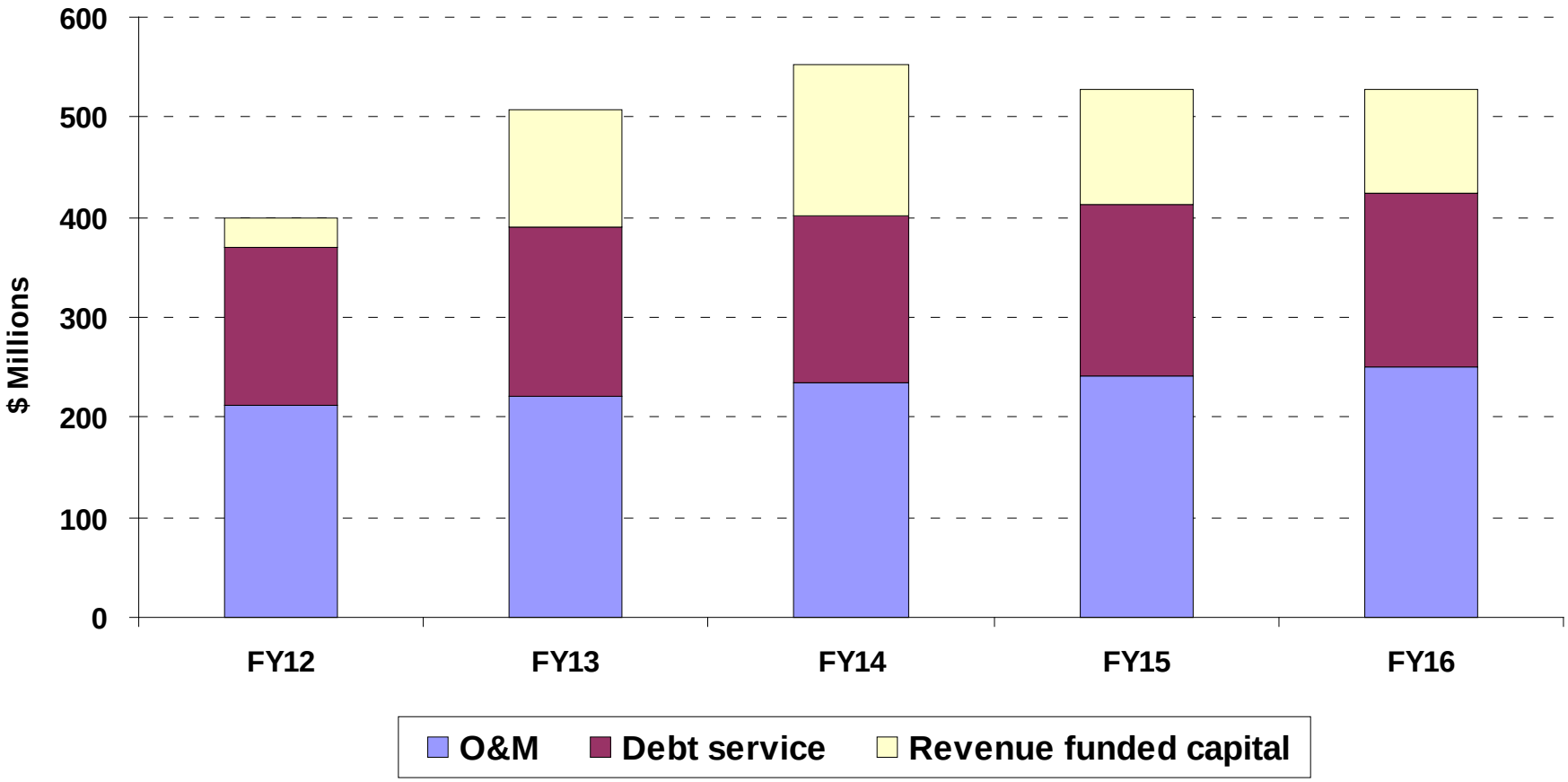
EAST BAY MUNICIPAL UTILITY DISTRICT



Metered Consumption Trend

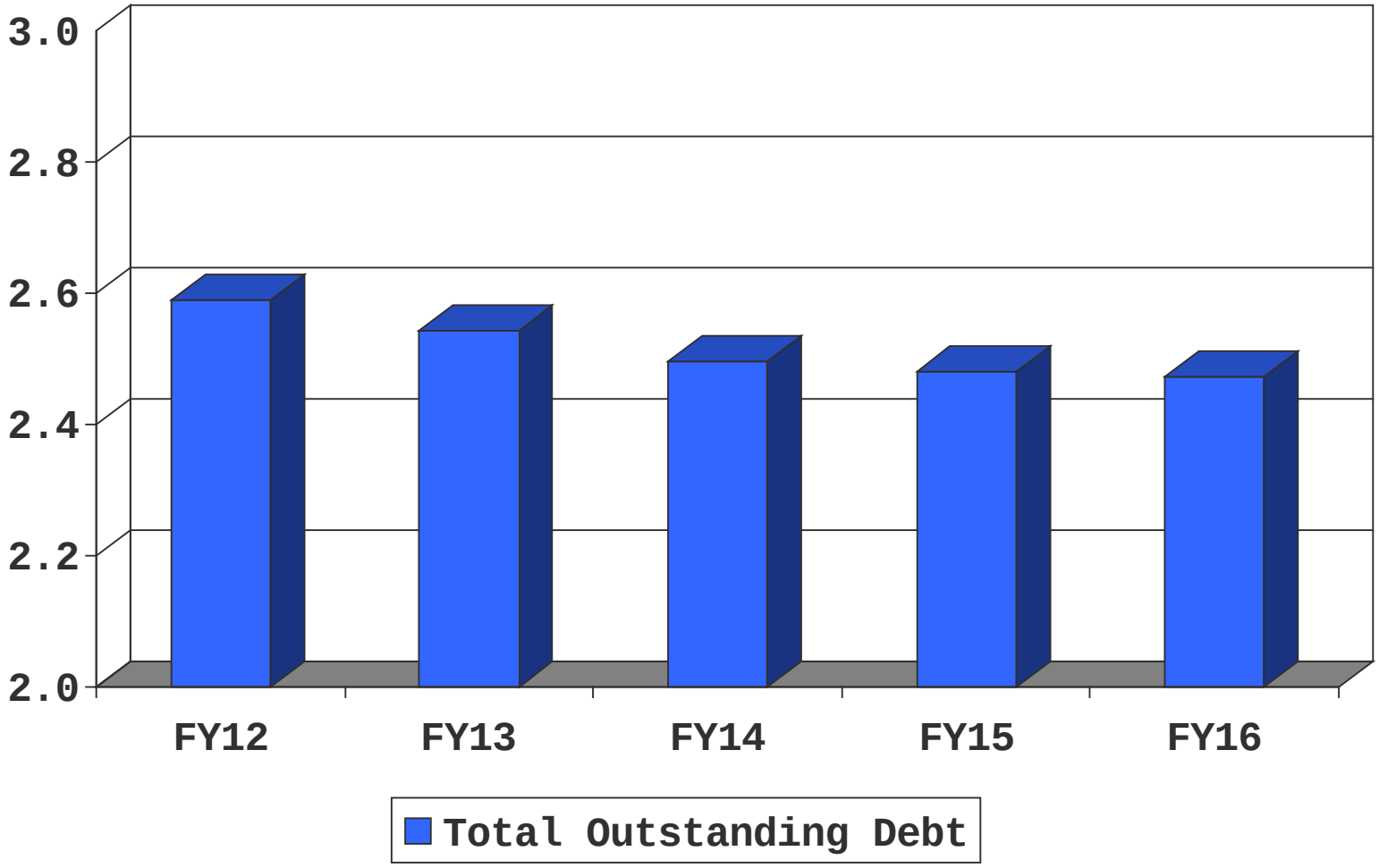


Operating Expenditure Forecast
Water System

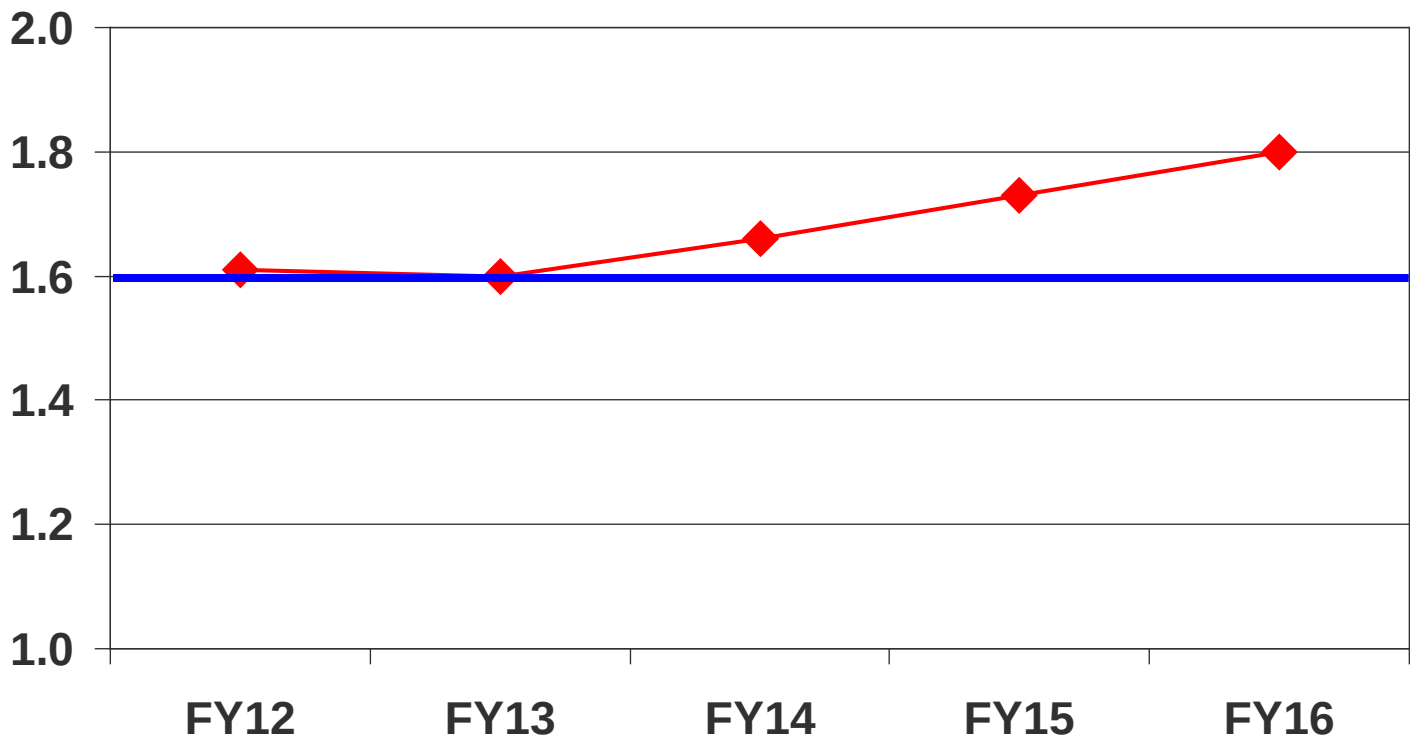


Total Water Outstanding Debt

(Billions)



Water System Revenue Bond Debt Coverage Ratio



RECLAMATION

Managing Water in the West

Effectiveness of conservation pricing in reducing water demand: Evidence from increasing block rate structures

U.S. Department of the Interior
Bureau of Reclamation

Summation

- Customers are most concerned about fairness
- Need understand customer consumption patterns and how rate structure will impact them
- Water budget based rates can help accommodate use differences
- Conservation rates can be effective in lowering water use
- Revenue stability key to utility viability

So What's Wrong With Water Rates?

"The study showed we weren't raising revenue through our billing to cover operating costs and capital costs for those systems," said Jeff Zoephel, director of finance, Chicago region water agency, April 2011.

"If we save more than 2% per year due to conservation, we have to raise rates." Coachella Valley WD Finance Director

"We saved water when you asked, now you raise our rates because you did not sell enough water. We need to vote you out." Typical customer

"Agencies create rate structures that are a bad business practice." Former City of Fairfield Water Official

" I have a large family and a large lot. Your rates penalize our family even if we are conservative water users". San Diego County resident

""All water suppliers shall increase water use efficiency, reducing per capita urban water use by 20% by 2020, with incremental progress toward this goal by reducing per capita demand 10% by the end of 2015." California SBx7-7 / 20% by 2020

So What's Wrong With Water Rates?

Current Rate Structures:

- They do not recover adequate fixed costs, especially if less water is used
- They do not identify water waste
- They do not allocate water to customers that (1) reflect SBX7 legislation and (2) are fair and equitable
- They force elected officials to raise water rates when not enough water is sold
- They send inconsistent messages to customers…political and public relations problems

From an Agency CFO:

"…60% of our cost to deliver water is fixed. We chose to recover 29% of fixed costs in our 'readiness to serve' charge. The rest of the fixed costs being recovered in the variable side…"

"Yes, we know we will have to raise rates almost every year…if we see more than 2% conservation then we will be raising rates due to conservation."

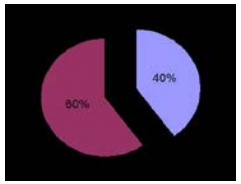
"We have been borrowing from reserves the last couple of years. Politically our board has not had the will to raise the rates as much as has been required, so we are playing catch-up."

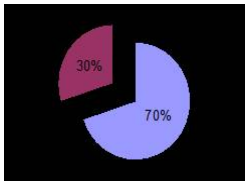
1) Revenue Stability 2) Efficiency 3) Allocate Water Equitably

Are Rate Structures Working?

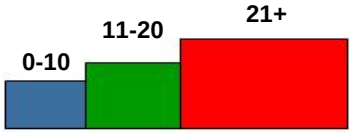
Current Rate Designs:

1. Does not meet <u>agency needs</u>
   - Do not recover the true costs of water





   - Agencies lose money if water is saved
2. Does not <u>target water waste</u>



3. Does not meet <u>customer needs</u>
   - Who is the target for water savings?

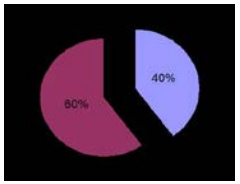
• 2 People
•1,200 sf
Used 10 ccf's

• 5 people
• 8,500 sf landscape
• Pool

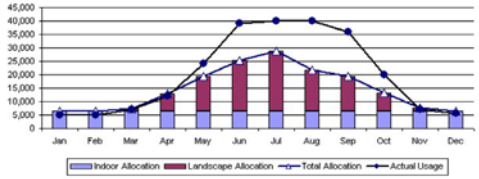
Used 23 ccf's

Water Budget Rates:

1. Recovers high % of fixed costs separate from variable costs



2. Identifies efficient users and water wasters each month

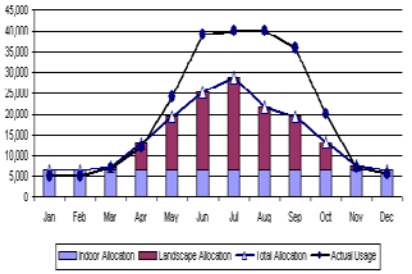


3. Allocates water for each customers specific need

Allocation of 8 ccf's (use 10 ccfs)

Allocation of 27 ccf's (use 23 ccfs)

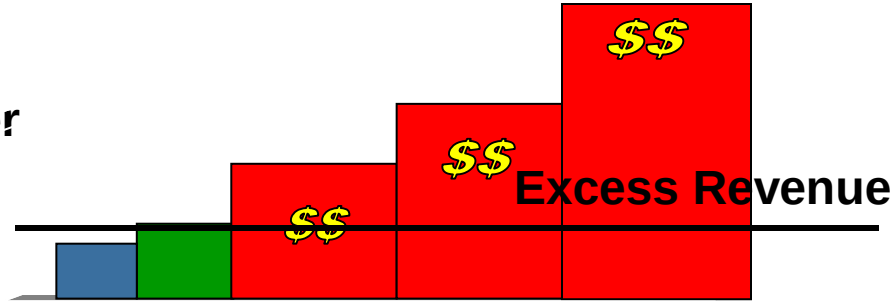
Meeting Conservation Goals



- **Allocate water based on actual account need**

  Residential: (# residents) (gpd) + (ET) (landscape factor) (sf) = Target water budget
  Irrigation: (ET) (landscape factor) (sf) = Target water budget

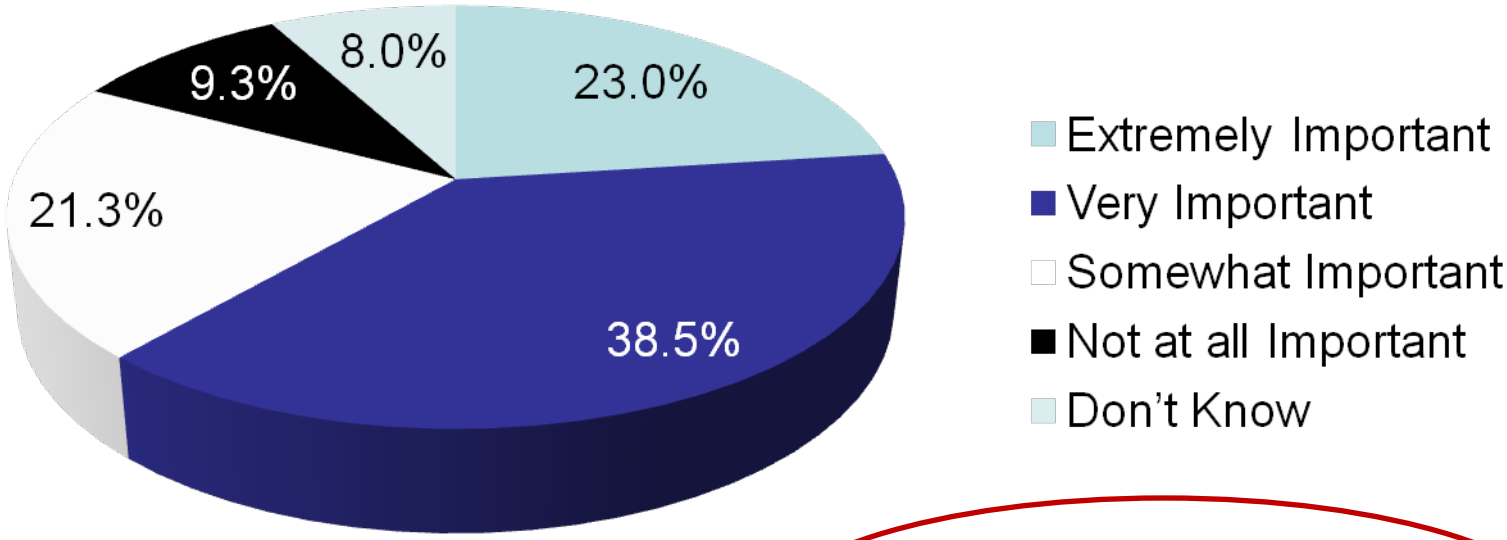
- **Identify and penalize water waste**
  - **Accurate target allocations**
  - **Steep costs for wasted water**



- **Fund conservation from water wasters only**
  - **Fixed costs covered w/ service fee and remaining % in first 2 tiers**
  - **Excess revenue (penalty tier revenues) funds conservation actions without impacting necessary agency revenues**

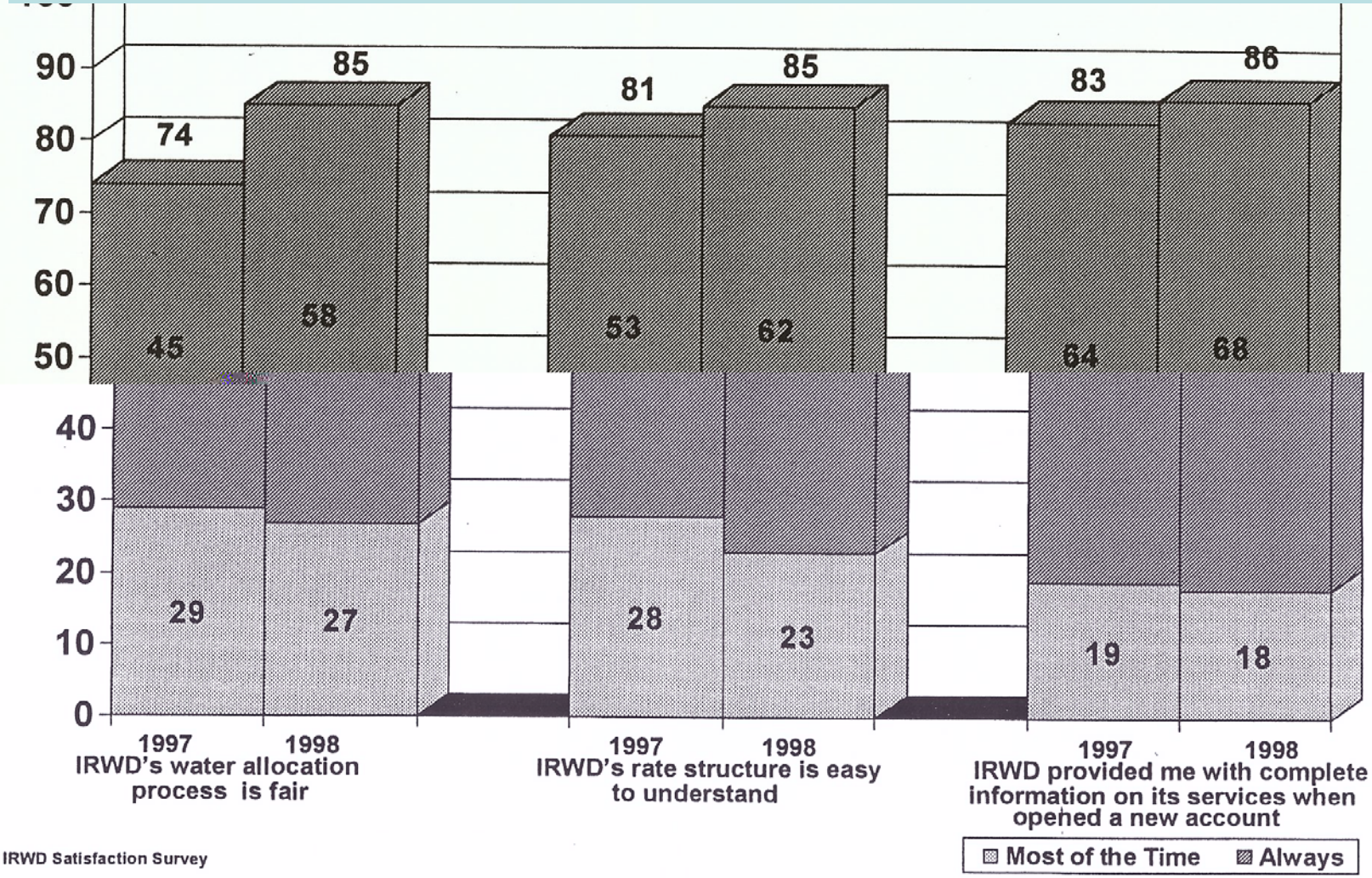
WMWD Customer Survey – March 2010

How important is it to reward water use efficiency by homes and businesses and to penalize water waste (for example, with higher water rates for waste)?



82.7% Say Reward/Penalty is Important!

Increased Customer Satisfaction



The Impact of Water Budget Rates at IRWD (1991-2011)

- **Stable revenue** (70/30)
- **61% landscape reduction**
- **25% residential reduction**
- **Funding mechanism for Conservation programs**
- **Reduced water runoff**
- **90% Customer satisfaction**
- **Re-election of board since 1991**

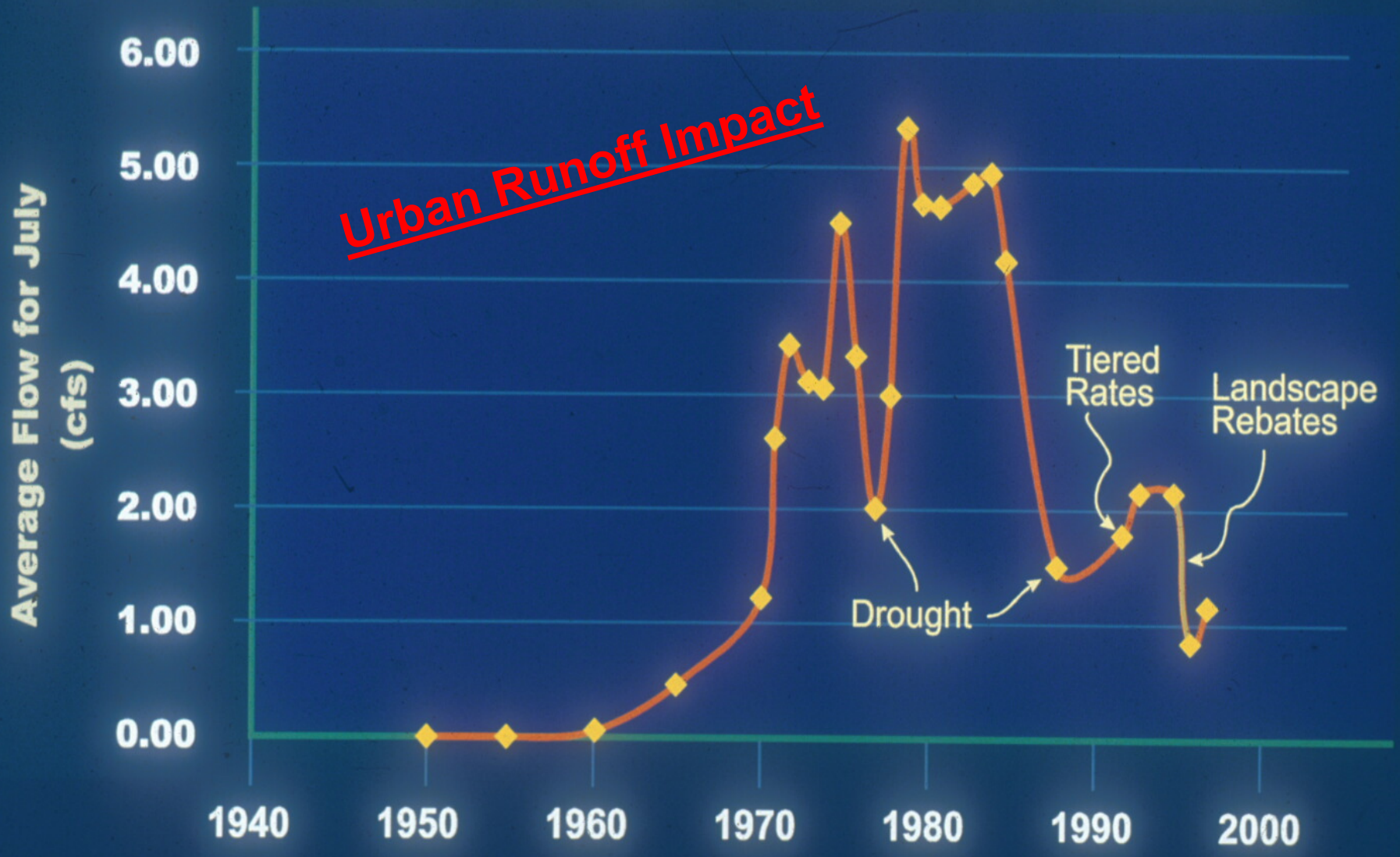
Water Budget Bill: The Waster

8/10/98	9/09/98	1255	1337	82 CCF
USAGE - LOW VOLUME DISCOUNT		16	.480	$7.68
USAGE - CONSERVATION BASE RATE		23	.640	$14.72
USAGE – PENALTY		20	1.280	$25.60
USAGE - EXCESSIVE		19	2.560	$48.64
USAGE - ABUSIVE		4	5.120	$20.48
WATER SERVICE CHARGE				$3.90
SEWER SERVICE CHARGE				$6.90
YOUR ALLOCATION FOR THIS BILL		39 CCF		
BILL CALCULATION BASED ON		.12 ACRES		
				$127.92

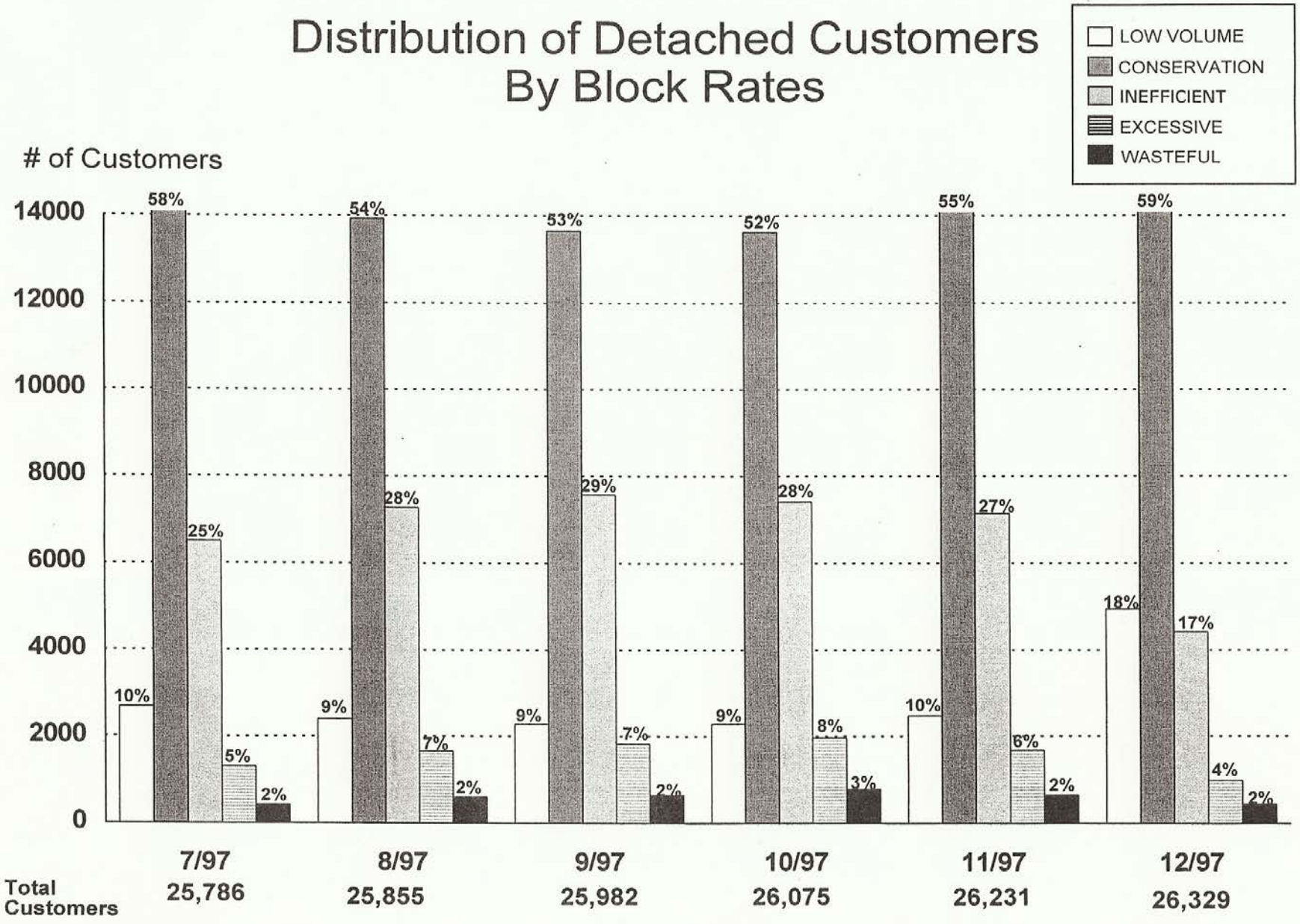
Water Budget Bill: Reformed Waster

2/11/99	3/15/99	1532	1548	16 CCF
USAGE - LOW VOLUME DISCOUNT			11 .480	$5.28
USAGE - CONSERVATION BASE RA			5 .640	$3.20
WATER SERVICE CHARGE				$3.90
SEWER SERVICE CHARGE				$6.90
YOUR ALLOCATION FOR THIS BILL		27 CCF		
BILL CALCULATION BASED ON		.12 ACRES		
				$19.28

Flows in San Diego Creek at Culver



Distribution of Detached Customers By Block Rates



	Scenario 1	Scenario 2	
Fixed =	75%	25%	← Common cost recovery %
Variable =	25%	75%	

Allocations Inputs - SFR customers

Total Parcel Area (TA)	8,000	sq ft	
Area Factor (AF)	45%	of total area	
Landscape factor (LF)	70%	of ETo	by State of California Code of Regulation Title 23, Section 490-495
Household size (Size)	4	residents per acct	
GPCD	60	gallons per capita day	
Drought factor	100%	to control demand at different water supply conditions	

Tier Definitions % of water budgets

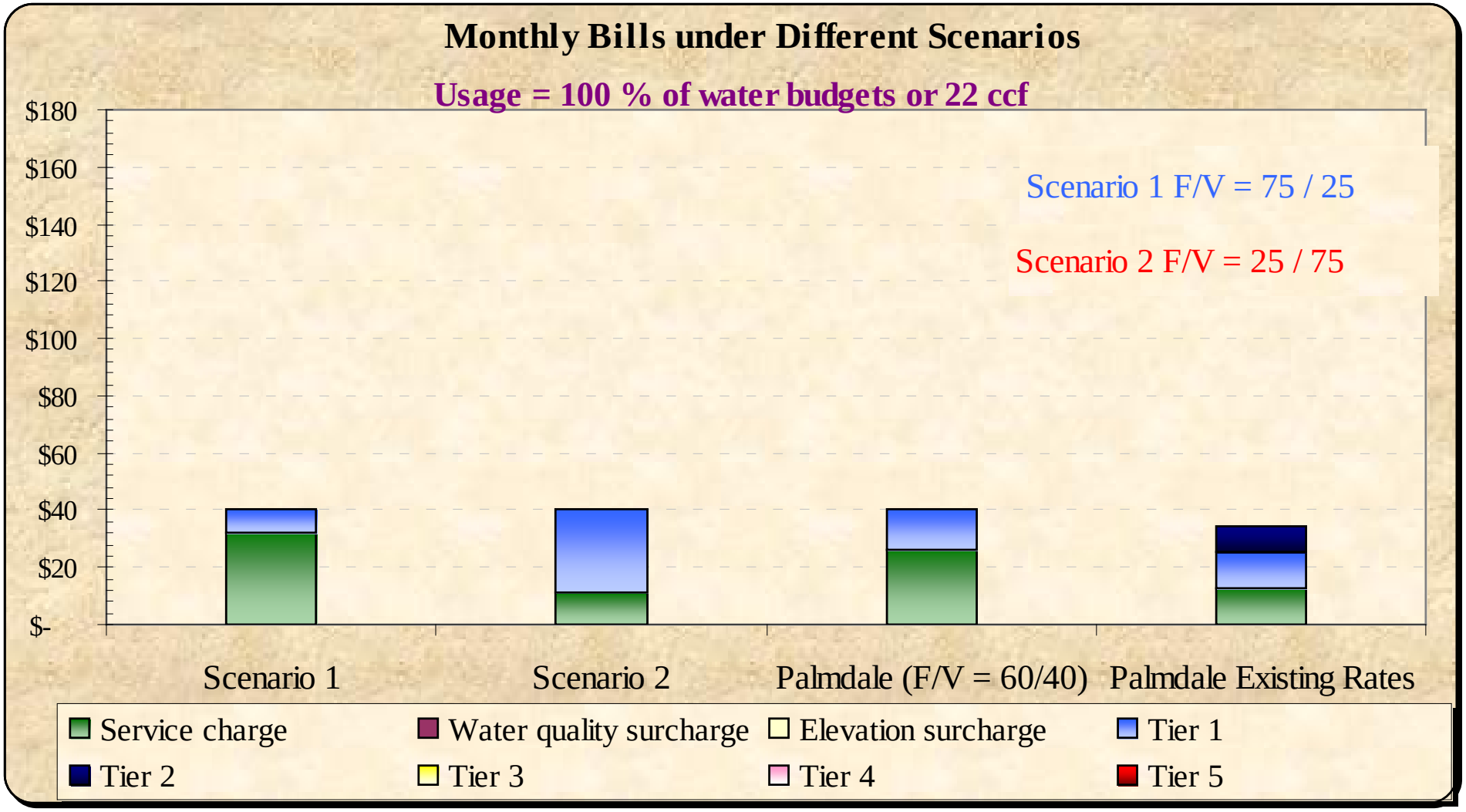
Tier 1	100%
Tier 2	125%
Tier 3	150%
Tier 4	175%
Tier 5	above 175 %

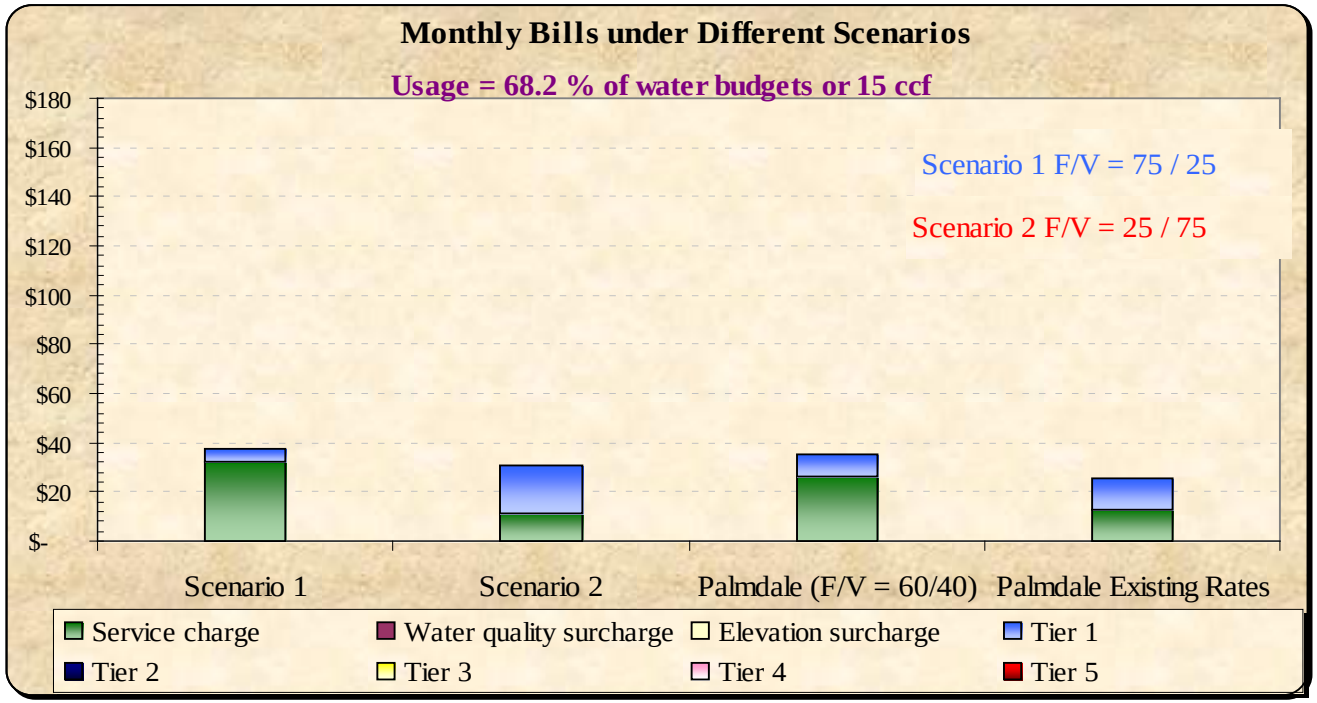
$$Indoor(ccf) = \frac{GPCD * Size * Days}{\left(748 gallons / 1 ccf\right)}$$

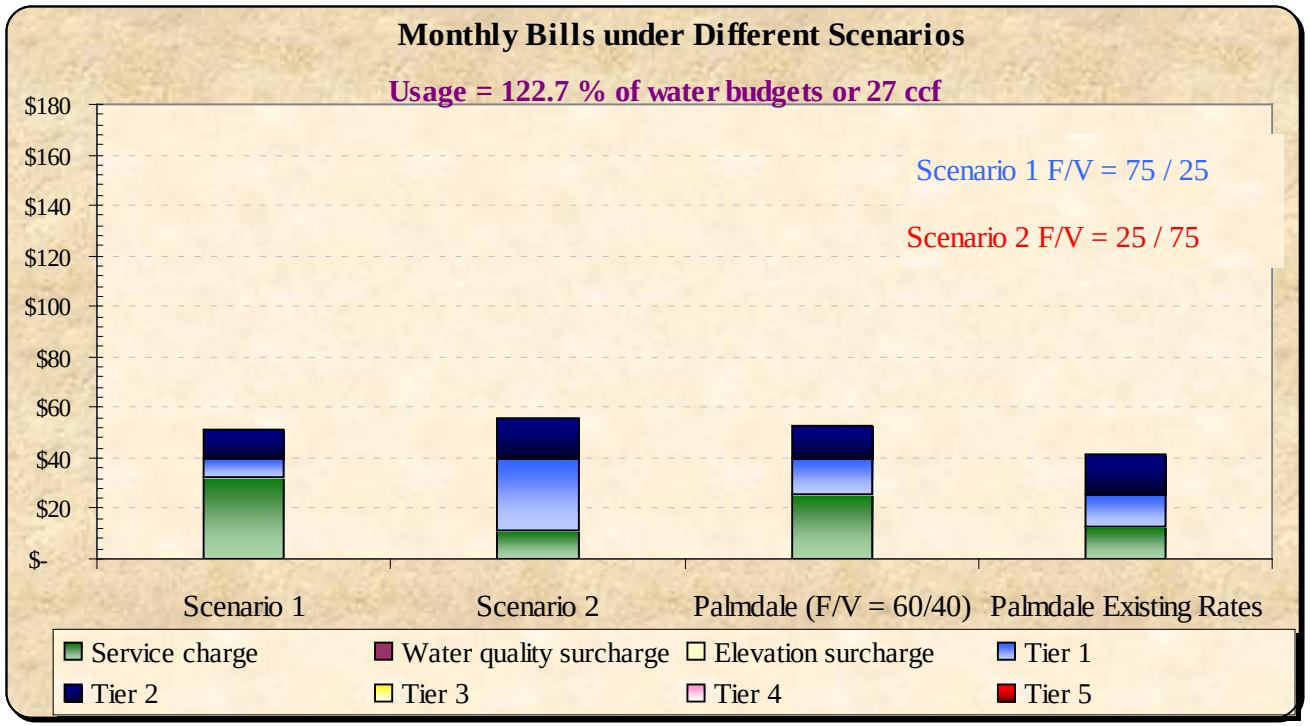
$$Outdoor(ccf) = \frac{ET_0 * TA * AF * LF * DF}{\left(12 inch / ft\right)\left(100 ft^3 / 1 ccf\right)}$$

	CY 2009	CY 2010	CY 2011	CY 2012	CY 2013	CY 2014
Conservation factor	100%	98%	97%	97%	98%	99%

High Fixed vs Low Fixed Costs




Monthly Bills under Different Scenarios
Usage = 68.2 % of water budgets or 15 ccf
$180
$160
$140
$120
$100
$80
$60
$40
$20
$-
Scenario 1 F/V = 75 / 25
Scenario 2 F/V = 25 / 75
Scenario 1
Scenario 2
Palmdale (F/V = 60/40)
Palmdale Existing Rates
Service charge
Water quality surcharge
Elevation surcharge
Tier 1
Tier 2
Tier 3
Tier 4
Tier 5


Monthly Bills under Different Scenarios
Usage = 122.7 % of water budgets or 27 ccf
$180
$160
$140
$120
$100
$80
$60
$40
$20
$-
Scenario 1 F/V = 75 / 25
Scenario 2 F/V = 25 / 75
Scenario 1
Scenario 2
Palmdale (F/V = 60/40)
Palmdale Existing Rates
Service charge
Water quality surcharge
Elevation surcharge
Tier 1
Tier 2
Tier 3
Tier 4
Tier 5

Model Illustration

Dashboard

RFC RAFTELIS FINANCIAL CONSULTANTS, INC

Select Consumption: CY 2009 Usage

Select Meter Ratio for Fixed Service Charges: Current Ratio

KEY VARIABLES

Accountable consumption	Delivery	Conservation	Revenue Offsets	Historical Demand	Potential Demand
Tier 1	100%		100%	7,077	8,181
Tier 2	100%		50%	9,577	16,984
Tier 3	25%			1,793	6,291
Tier 4		100%		1,247	6,291
Tier 5		200%		3,334	
Total				23,029	37,749
		Sales in Tier 1 & Tier 2 (AF)		16,654	25,166

Water Supply Info

Water Supply	AF Purchased	Unit Cost	AF Available for Sale	Effective Unit Cost
Groundwater	2,000	$ 611	1,880	$ 648
MWD Tier 1	16,280	$ 701	15,303	$ 743
MWD Tier 2	4,799	$ 811	4,511	$ 860
MWD Penalty		$ 1,622		$ 1,719
Total (AF)	23,079		21,694	$ 759

Water Loss: 6%

Rate & Charges Decimal Rounding: 2

District Delivery Costs (excl. Water Costs)

Descriptions	Budgeted	Projected
Admin Expenses	$ 8,855,448	$ 8,855,448
Maint. & Depr	$ 2,959,457	$ 2,959,457
Mat & Supplies	$ 429,500	$ 429,500
Misc Expenses	$ 775,972	$ 775,972
Outside Services	$ 511,500	$ 511,500
Reserve Funding	$ 1,124,240	$ 1,124,240
MWD Capacity	$ 746,992	$ 746,992
Pumping Power	$ 1,200,000	$ 1,200,000
Delinquent Rev	$ (500,000)	$ (500,000)
Other Rev	$ (40,000)	$ (40,000)
Total	$ 16,063,109	$ 16,063,109

Revenue Offsets

Descriptions	Budgeted	Projected
Property Tax	$ 6,450,997	$ 5,799,263
Interest	$ 2,634,900	$ 2,634,900
Total	$ 9,085,897	$ 8,434,163

Water Supply Total Cost

Descriptions	Budgeted	Projected
Groundwater	$ 1,295,320	$ 1,222,000
Purchased	$ 16,091,381	$ 15,304,269
Total	$ 17,386,701	$ 16,526,269

Other Program Costs

Program	Budgeted	Projected
Water Efficiency	$ 1,000,000	$ 1,000,000
Inefficient Water	$ 307,000	$ 307,000
Water Reliability	$ 742,266	$ 1,394,000
Water Sales (hcf)	9,450,020	9,450,020

Operating Rev	Budgeted	Projected
% Fixed	37.1%	40%
Service Charge	$ 5,958,362	$ 6,425,244
Delivery	$ 8,873,832	$ 8,406,950
Pumping Charge	$ 1,230,915	$ 1,230,915

Results

Fixed Service Charge

Meter	Current	Proposed
5/8-in	$ 18.69	$ 20.16
3/4-in	$ 18.69	$ 20.16
1-in	$ 30.19	$ 32.56
1 1/2-in	$ 60.38	$ 65.12
2-in	$ 74.75	$ 80.62
3-in	$ 90.57	$ 97.68
4-in	$ 104.94	$ 113.17
6-in	$ 119.32	$ 128.68
8-in	$ 135.13	$ 145.73
10-in	$ 149.51	$ 161.24
12-in	$ 165.32	$ 178.29

Pumping Charges ($ / hcf)

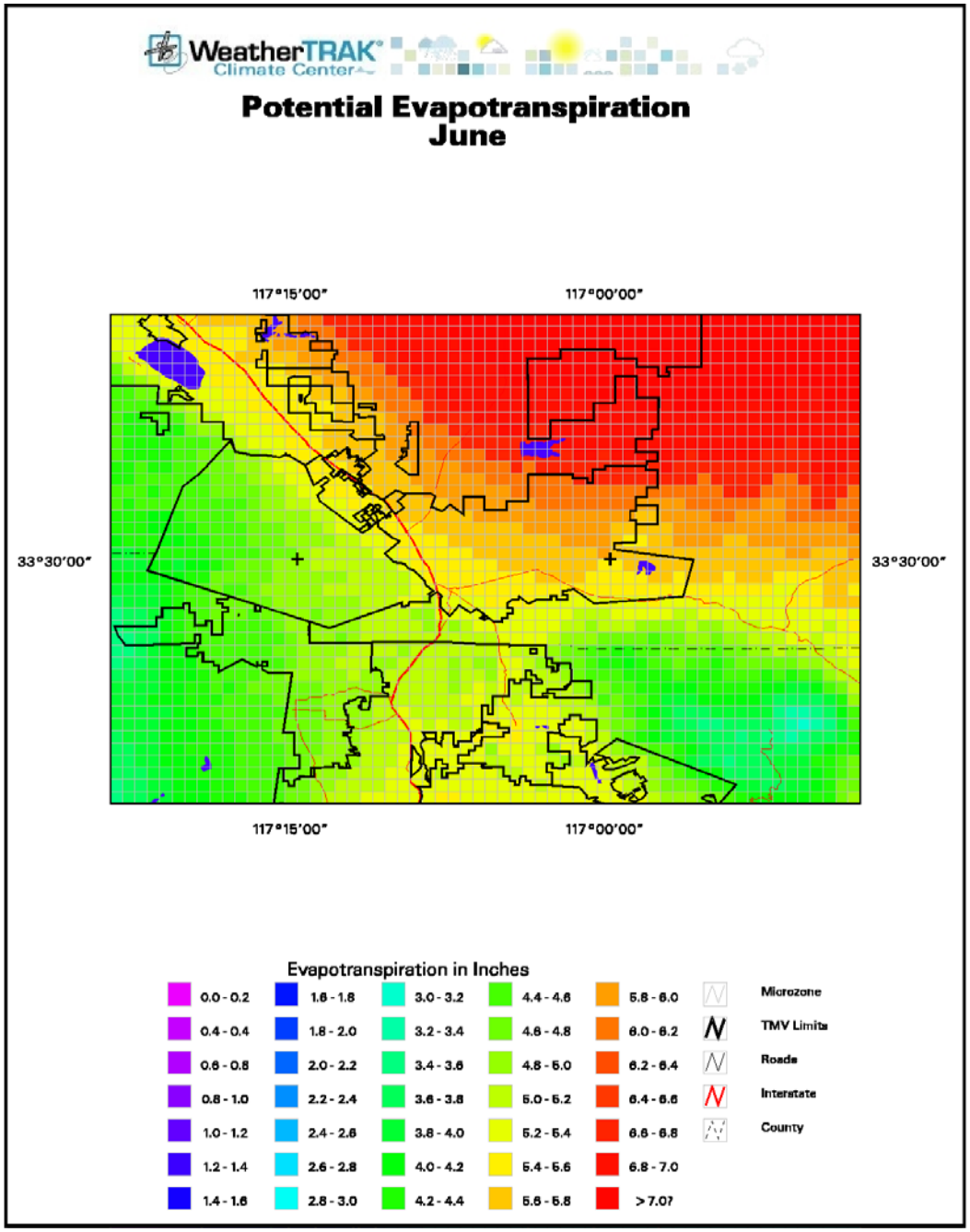
Power Zone	Current	Proposed
1	$ 0.096	$ 0.096
2	$ 0.143	$ 0.143
3	$ 0.131	$ 0.131
4	$ 0.321	$ 0.321
5	$ 0.560	$ 0.560
6	$ 0.620	$ 0.620

Water Reliability ($ / hcf)

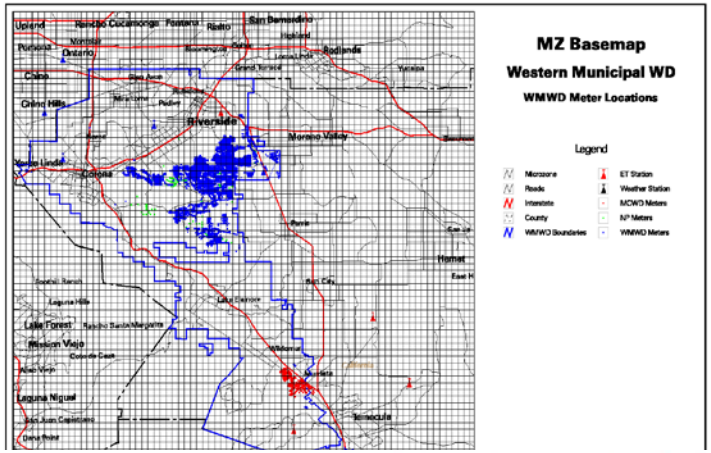
	Current	Proposed
WR Rate	$ 0.070	$ 0.140

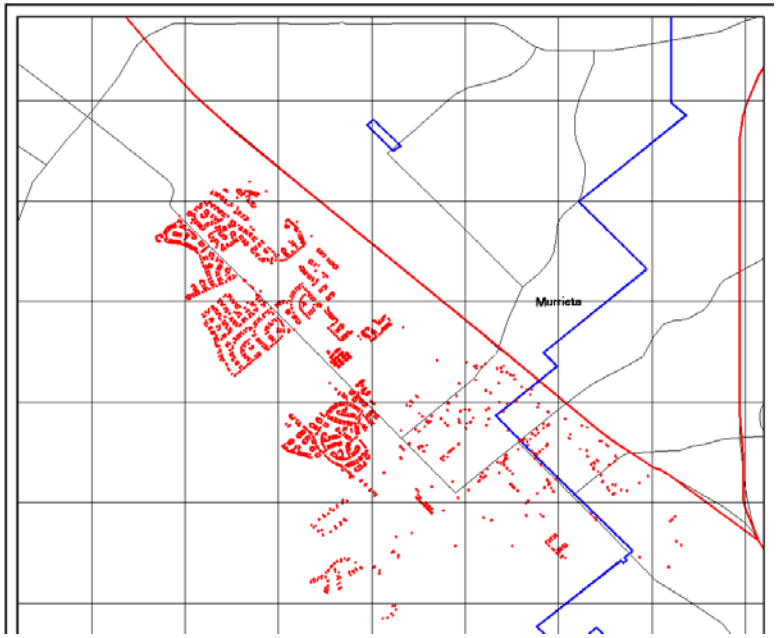
Current Water Rate ($/hcf): $ 1.58

Tiers	Water Supply	Delivery	Conservation	Rev Offset	Rates ($ / hcf)
Tier 1	$1.66	$1.13	$0.00	($1.63)	$ 1.16
Tier 2	$2.24	$1.13	$0.00	($0.82)	$ 2.55
Tier 3	$3.95	$0.29	$0.00	$0.00	$ 4.24
Tier 4	$3.95	$0.00	$0.38	$0.00	$ 4.33
Tier 5	$3.95	$0.00	$0.76	$0.00	$ 4.71



*** Accurate daily ET downloaded into the billing system for each climate zone at a lower cost than installation and maintenance of a single ET Station**





Each Residential Account Receives an Allocation (or water budget) to fit their specific needs. This feature of such rates is what customers appreciate, building customer satisfaction with the agency.

Acct. #1
- 2 Residents (Default 3)
- 1,500 sf of landscape

Acct. #2
- 4 Residents
- 3,500 sq feet of landscape

Acct. #3
- 4 Residents
- 1,500 sq feet of landscaping
- pool (650 sq feet)

Myths About Water Budget Rate Structures

- Current billing systems can't accommodate sophisticated water budget rates
- Customers won't understand the rate structure
- There is too much data needed for individual customer allocations
- It costs too much to implement a individualized water budget allocation structure
- The agency will have to add too many staff to conduct such a rate structure
- The agency does not have enough expertise to design and implement such a system
- Agencies can only recover 30% of fixed costs on a fixed service charge

Reality:

- **Agencies of all sizes have implemented successful water budget rate structures**
- Some agencies adapt their current billing systems, some agencies may need billing system upgrades
- **Data is available (from public and private sources) to help agencies establish allocations (parcel data, census data, ET data, etc.)**
- Staff, often temporary staff, may be needed to implement such rate structures (however staff increases are paid for by the new rate structure and improve customer service)
- **The costs to design and implement water budget rates are minor compared to the revenue loss found with current rate structures**
- Agencies w/ water budget rates are recovering fixed costs and achieving conservation in a more successful way than traditional rate structures

The Logic and Fairness of Water Budget Rates Creates Public Relations & Political Benefits

Current Rate Models:

- Arbitrarily allocates water
- May penalize efficient users
- Recovers too small a percentage of fixed costs (forcing rate increases if water sales go down)
- Agency must sell more water to generate adequate revenues or
- Elected officials must raise rates to recover lost fixed costs
- Conservation by customers results in rate increases…

WB Rate Model:

- **Allocates water based on individualized account needs**
- **Penalizes only those who waste water**
- **Recovers a majority of fixed costs in a fixed fee (does not force rate increases if less water is sold)**
- **Elected officials can be transparent about true water costs priced on the water bill**
- **Conservation by customers results in low bills** (and does not result in a rate increase…)