

# BUILDING A WORLD OF DIFFERENCE

## **SAN ANTONIO WASTEWATER SYSTEM (SAWS) RATE ADVISORY COMMITTEE: MEETING 8**

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# RATE SETTING PROCESS

PURPOSE

COST OF SERVICE ANALYSIS

RATE DESIGN ANALYSIS

COD CONVERSION

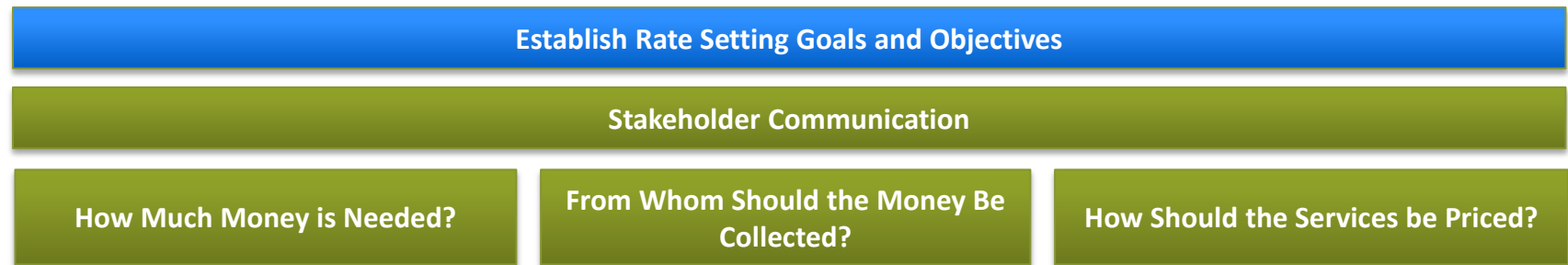
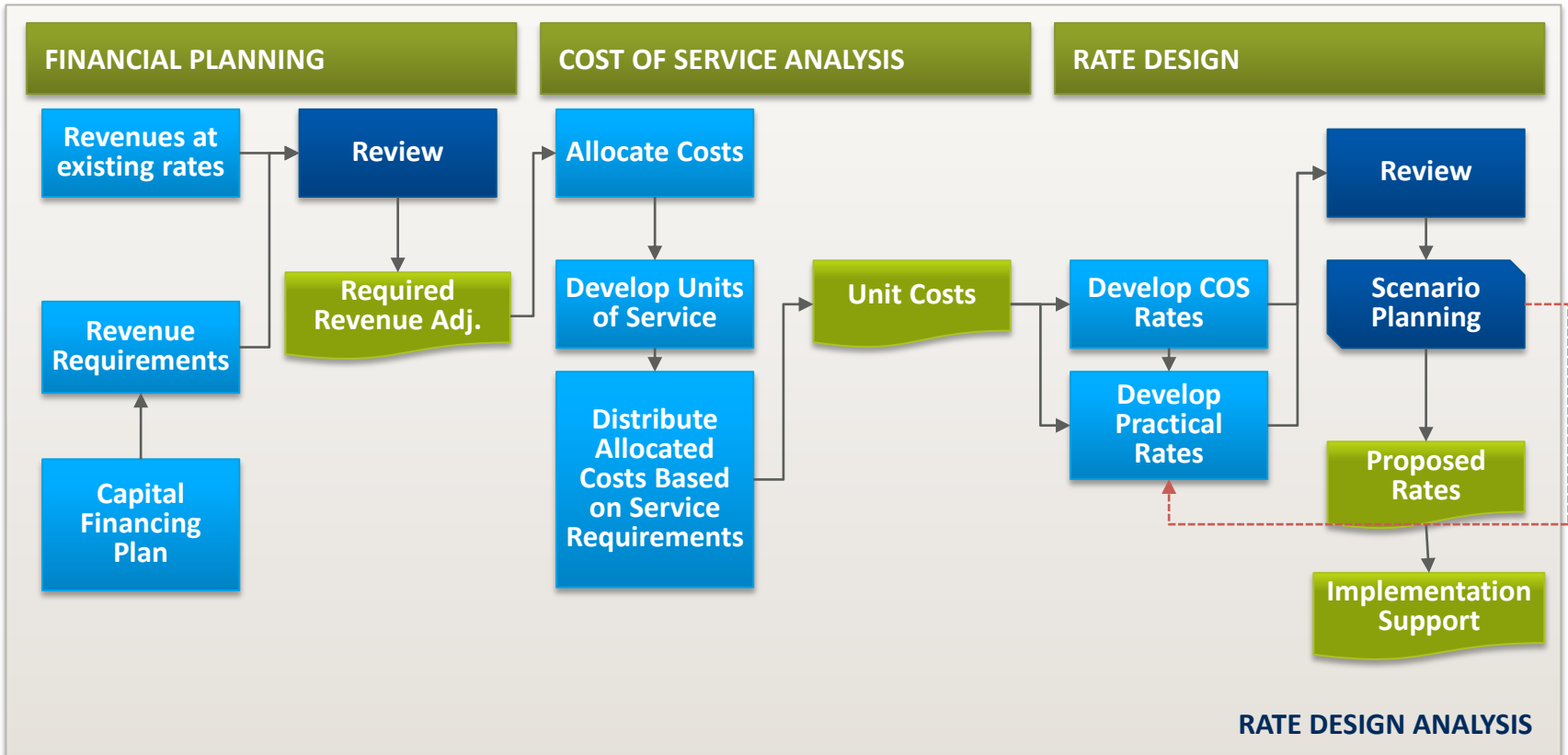
QUESTIONS

# PURPOSE

- Present the conceptual Wastewater System rate design and other rate design alternatives
- Obtain feedback from the RAC, and
- Determine the appropriateness of the range of rate design options presented to the RAC

# STUDY APPROACH

PURPOSE



**A rigorous, methodical, and transparent approach leads to defensible rates.**



# RATE SETTING OBJECTIVES

	2009 Rate Study Priorities
Essential	<ol style="list-style-type: none"> <li>1 Conservation/Demand Management</li> <li>2 Financial Sufficiency</li> <li>3 Rate Stability</li> </ol>
Very Important	<ol style="list-style-type: none"> <li>4 Revenue Stability</li> <li>5 Equitable Contributions from New Customers</li> <li>5 Affordability to Disadvantaged Customers</li> </ol>
Important	<ol style="list-style-type: none"> <li>7 Cost of Service Based Allocations</li> <li>8 Minimization of Customer Impacts</li> <li>9 Simple to Understand and Update</li> </ol>
Least Important	<ol style="list-style-type: none"> <li>10 Legality</li> <li>11 Ease of Implementation</li> <li>12 Economic Development</li> </ol>

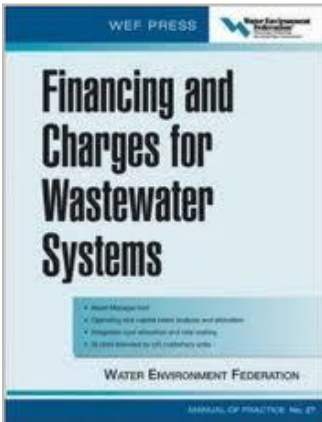
	2014 Rate Study Priorities
Essential	<ol style="list-style-type: none"> <li>1 Financial Sufficiency</li> <li>2 Cost of Service Based Allocations</li> <li>3 Revenue/Rate Stability</li> </ol>
Very Important	<ol style="list-style-type: none"> <li>4 Conservation</li> <li>5 Drought Management</li> <li>6 Economic Development</li> </ol>
Important	<ol style="list-style-type: none"> <li>7 Affordability to Disadvantaged Customers</li> <li>8 Simple to Understand/Update</li> </ol>
Least Important	<ol style="list-style-type: none"> <li>9 Minimize Customer Impact</li> <li>10 Ease of Implementation</li> </ol>

# COST OF SERVICE ANALYSIS

- **What is Cost of Service?**
  - A process by which the total system costs (O&M and Capital Costs) are allocated to the users of the system in proportion to the service rendered
- **Why should costs be allocated?**
  - Recognize differences in customer class characteristics
  - Charge users commensurate with service received
  - Establish a basis for defensible rate design

# COST OF SERVICE ANALYSIS

Major guidance manual for Wastewater System COS analysis:



Guidelines for Wastewater Cost of Service & Rate Making

# KEY STEPS OF THE COS ANALYSIS

**STEP 1 – Determine Total System Cost**

**STEP 2 – Allocate Total System Cost to Functional Cost Components**

**STEP 3 – Distribute by Function Cost Components to Customer Classes**



# COST OF SERVICE ANALYSIS

## STEP 1 – Wastewater Operational Cost

Line No.	Description	Operating Expense \$	Capital Cost \$	Total Cost \$
<b>Statement of Revenue Requirements:</b>				
1	O&M Expenses	105,623,107		105,623,107
2	Debt Service		77,146,358	77,146,358
3	Other Expenditure & Transfers	12,980,673	18,663,534	31,644,207
4	<b>Subtotal</b>	<b>118,603,781</b>	<b>95,809,892</b>	<b>214,413,673</b>
<b>Less Revenue Requirements from Other Sources:</b>				
5	Other Revenues	13,635,826	(27,170)	13,608,656
6	<b>Subtotal</b>	<b>13,635,826</b>	<b>(27,170)</b>	<b>13,608,656</b>
7	<b>Net Cost of Service</b>	<b>104,967,954</b>	<b>95,837,062</b>	<b>200,805,016</b>
<b>Restatement of Net Cost of Service:</b>				
8	O&M Expenses	104,967,954		104,967,954
9	Depreciation		49,218,785	49,218,785
10	Return		46,618,277	46,618,277
11	<b>Subtotal</b>	<b>104,967,954</b>	<b>95,837,062</b>	<b>200,805,016</b>
12	<b>Net Cost of Service</b>	<b>104,967,954</b>	<b>95,837,062</b>	<b>200,805,016</b>

# COST OF SERVICE ANALYSIS

## STEP 2 – Allocate Wastewater System Cost to Functional Cost Components

Line	Description	Volume	BOD	TSS	Customer Bills	Equivalent Meters
1	Land	✓	✓	✓	✓	✓
2	Pumping	✓				
3	Wet Well	✓		✓		
4	Treatment Services	✓	✓	✓		
5	Digesters		✓	✓		
6	Dewatering		✓	✓		
7	Collection System	✓				
8	Customers				✓	
9	Meters					✓
<b>10</b>	<b>Wastewater System Cost</b>	<b>83.7%</b>	<b>7.5%</b>	<b>6.6%</b>	<b>1.7%</b>	<b>0.4%</b>

# COST OF SERVICE ANALYSIS

## STEP 3 – Allocate Wastewater System Functional Cost Components to Customer Classes

Line	Description	Volume	BOD	TSS	Customer Bills	Equivalent Meters
1	Residential	58%	37%	51%	94%	82%
2	Multi-Family	16%	14%	18%	1%	10%
3	General	26%	20%	27%	5%	8%
4	Surcharge	0%	29%	4%	0%	0%
5	Wastewater System Units	100.0%	100.0%	100.0%	100.0%	100.0%

# COST OF SERVICE ANALYSIS

## STEP 3 – Customer Class Cost of Service

### Total Wastewater System Customer Class Cost of Service:

Line No.	Description	Allocated COS	Existing Revenues	Revenue Recovery Amount	Revenue Recovery Percent
		\$	\$	\$	%
<b>SAWS:</b>					
1	Residential	113,999,246	125,948,668	11,949,422	110.5%
2	Multi-Family	32,025,059	26,921,782	(5,103,277)	84.1%
3	General	49,877,393	42,639,190	(7,238,203)	85.5%
4	Surcharge	4,903,318	5,295,376	392,058	108.0%
5	<b>Total</b>	200,805,016	200,805,015	(0)	100.0%

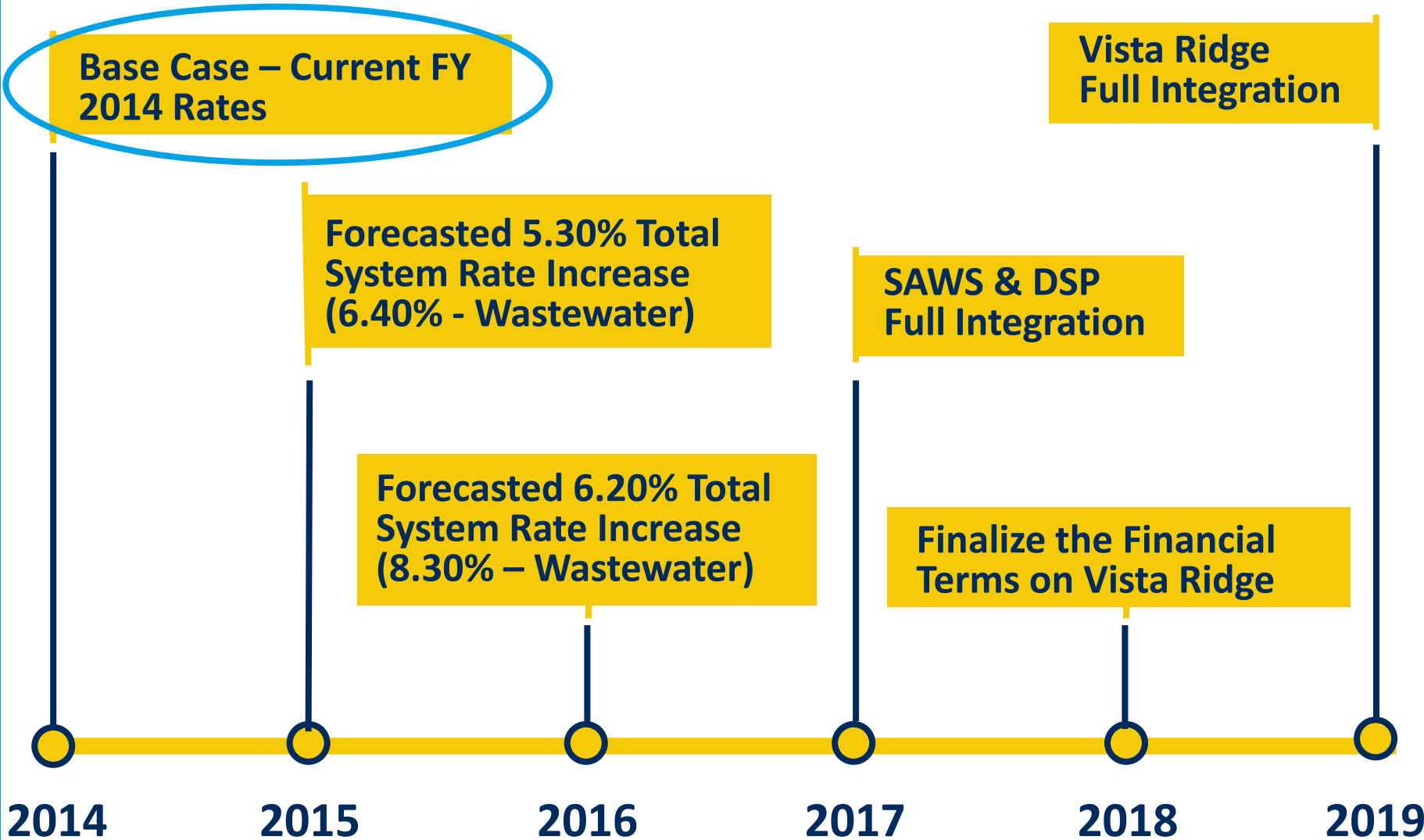
# COST OF SERVICE ANALYSIS

## Cost of Service Analysis Questions:

- Do we look at, and try to achieve, Cost of Service on a Individual Customer Class or Total System basis?
- How do we achieve Cost of Service Rates?
  - Single Year
  - Long Term Financial Plan

# FINANCIAL PLAN REQUIREMENTS TIMELINE

COST OF SERVICE ANALYSIS



# RATE DESIGN ANALYSIS

## Purpose:

Fundamental principle in rate making is to establish a rational nexus between costs incurred in providing service (cost of service) and charges assessed to rate payers

$$\text{Revenue Requirements} \div \text{Units of Service} = \text{Rates \& Charges}$$

# RATE DESIGN ANALYSIS

## Rate Design Considerations

1. Tiered Meter Charge
  - General/Multi-Family
  - Residential
2. Removal of Minimum Allowance
3. Multi-Family Class Designation?



# RATE DESIGN ANALYSIS

## Comparison of Meter Charge for Texas Cities

Wastewater Fixed Charges						
Line	Meter Sizes	Austin	Dallas	Fort Worth	Houston (A)	San Antonio (B)
1	5/8 Inch	\$10.30	\$4.45	\$5.50	\$8.75	\$11.93
2	3/4 Inch	\$10.30	\$6.00	\$5.50	\$8.75	\$11.93
3	1.0 Inch	\$10.30	\$8.75	\$6.60	\$9.19	\$11.93
4	1.5 Inch	\$10.30	\$16.60	\$10.30	\$10.66	\$11.93
5	2.0 Inch	\$10.30	\$26.15	\$14.75	\$11.10	\$11.93
6	3.0 Inch	\$10.30	\$63.79	\$35.05	\$19.88	\$11.93
7	4.0 Inch	\$10.30	\$103.90	\$58.35	\$22.52	\$11.93
8	6.0 Inch	\$10.30	\$206.50	\$121.20	\$32.19	\$11.93
9	8.0 Inch	\$10.30	\$340.15	\$210.00	\$78.17	\$11.93
10	10.0 Inch	\$10.30	\$525.50	\$313.45	\$95.02	\$11.93
11	12.0 Inch	\$10.30	\$525.50	\$392.76	\$95.02	\$11.93

A. Figures shown are rates for commercial, industrial, and multi-family. Charges for the residential class is slightly higher

B. Currently includes the first 1,496 of sewer usage

# RATE DESIGN ANALYSIS

## Comparison of Volumetric Rates for Texas Cities

Wastewater Volumetric						
Line	Description	Austin (A)	Dallas	Fort Worth	Houston (B)	San Antonio
		\$ Per 1,000 Gallons				
1	Lifeline Residential	\$4.51	N/A	N/A	\$0.26	N/A
2	Residential	\$9.13	\$4.95	\$3.13	\$7.44	\$3.16
3	Multi-Family	\$8.79	\$3.70	\$3.13	\$5.56	N/A
4	Commercial	\$8.82	\$3.70	N/A	\$5.56	\$3.16
5	Industrial	\$7.32 - \$8.82	\$3.38	\$2.71 - \$3.97	\$6.09	N/A

A. The “Lifeline” residential rate is applied to volumes up to 2,000 gallons.

B. Houston has an effective “Lifeline” residential amount equivalent to 3,000 gallons. At 4,000 gallons, the rate increases from \$10.94 to \$25.10.

- No Texas cities have a minimum allowance (though Houston is close).
- Most multi-family rates are very close to commercial rates.

# RATE DESIGN ANALYSIS

## Wastewater System Rate Structure Alternatives:

### 1. Scenario 1:

- i. Apply SAWS Water Meter Based Equivalency Factors
- ii. Remove the Existing Minimum Allowance
- iii. Develop a Multi-Family Rate Designation

### 2. Scenario 2:

- i. Implement Lower Residential Class Billing Charge
- ii. Remove the Existing Minimum Allowance
- iii. Develop a Multi-Family Rate Designation

# RATE DESIGN ANALYSIS

## Scenario 1 – Comparison of Existing and Proposed Rates:

Line	Description	Existing Rates	Proposed Rates		
		(All Customers)	Residential	Multi-Family	General
	<b>Availability Charge (1):</b>				
1	5/8 Inch	\$11.93	\$9.17	\$9.17	\$9.17
2	3/4 Inch	\$11.93	\$12.87	\$12.87	\$12.87
3	1.0 Inch	\$11.93	\$20.24	\$20.24	\$20.24
4	1.5 Inch	\$11.93	\$38.66	\$38.66	\$38.66
5	2.0 Inch	\$11.93	\$60.74	\$60.74	\$60.74
6	3.0 Inch	\$11.93	\$112.33	\$112.33	\$112.33
7	4.0 Inch	\$11.93	\$186.00	\$186.00	\$186.00
8	6.0 Inch	\$11.93	\$370.20	\$370.20	\$370.20
9	8.0 Inch	\$11.93	\$591.23	\$591.23	\$591.23
10	10.0 Inch	\$11.93	\$849.09	\$849.09	\$849.09
11	12.0 Inch	\$11.93	\$1,585.86	\$1,585.86	\$1,585.86
12	<b>Volumetric Rate (2)</b>	\$0.3163	\$0.2682	\$0.2612	\$0.2918

**Note:**

1. The existing availability charge includes a minimum allowance of 1,496 gallons.
2. The volumetric rates outlines above are assessed for wastewater flow per 100 gallons.

# RATE DESIGN ANALYSIS

## Scenario 2 – Comparison of Existing and Proposed Rates:

Line	Description	Existing Rates	Proposed Rates		
		(All Customers)	Residential	Multi-Family	General
	<b>Availability Charge (1):</b>				
1	5/8 Inch	\$11.93	\$9.17	\$11.93	\$11.93
2	3/4 Inch	\$11.93	\$9.17	\$11.93	\$11.93
3	1.0 Inch	\$11.93	\$9.17	\$11.93	\$11.93
4	1.5 Inch	\$11.93	\$9.17	\$11.93	\$11.93
5	2.0 Inch	\$11.93	\$9.17	\$11.93	\$11.93
6	3.0 Inch	\$11.93	\$9.17	\$11.93	\$11.93
7	4.0 Inch	\$11.93	\$9.17	\$11.93	\$11.93
8	6.0 Inch	\$11.93	\$9.17	\$11.93	\$11.93
9	8.0 Inch	\$11.93	\$9.17	\$11.93	\$11.93
10	10.0 Inch	\$11.93	\$9.17	\$11.93	\$11.93
11	12.0 Inch	\$11.93	\$9.17	\$11.93	\$11.93
12	<b>Volumetric Rate (2)</b>	\$0.3163	\$0.2935	\$0.3179	\$0.3058

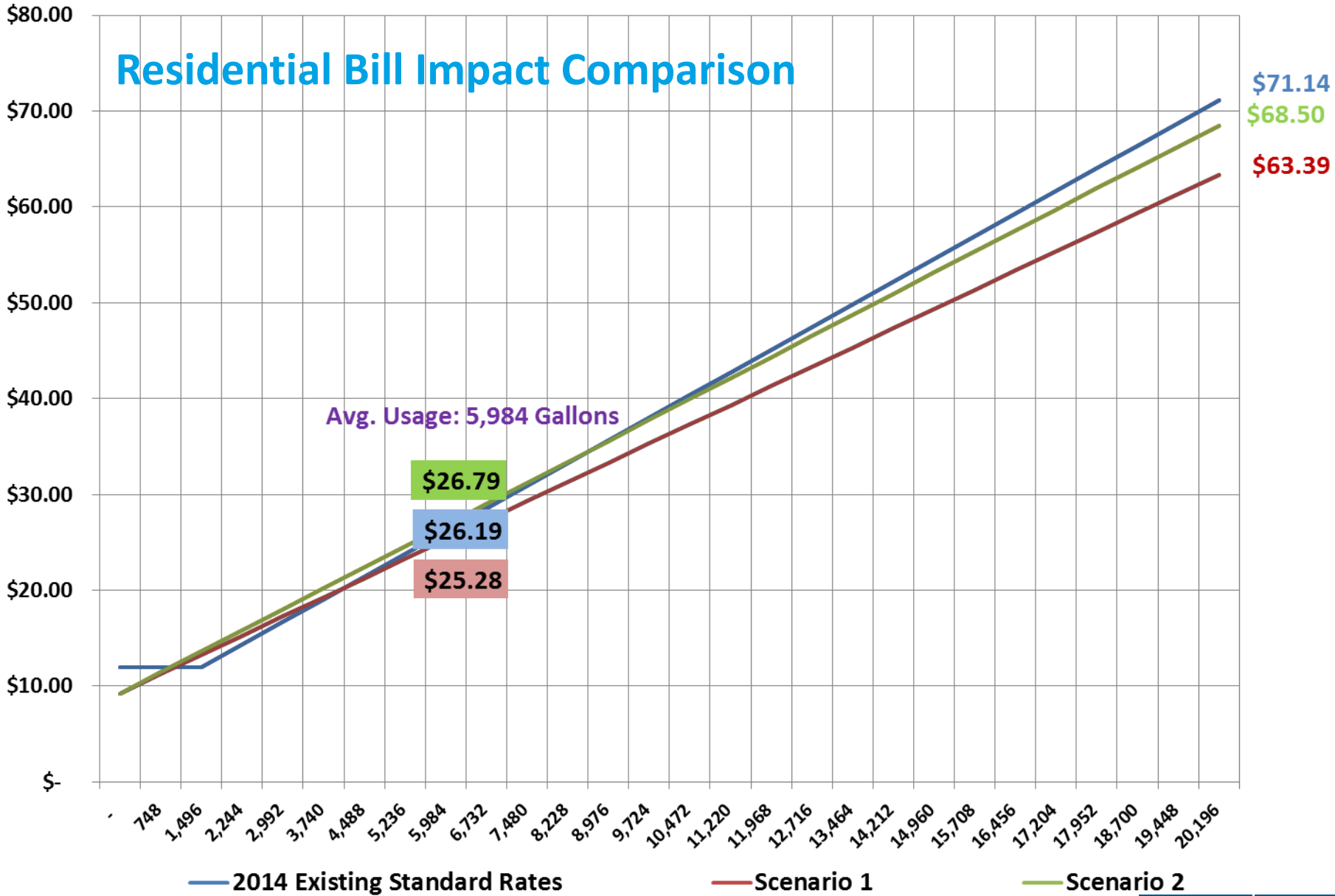
**Note:**

1. The existing availability charge includes a minimum allowance of 1,496 gallons.
2. The volumetric rates outlines above are assessed for wastewater flow per 100 gallons.

# RATE DESIGN ANALYSIS

## Residential Bill Impact Comparison

RATE DESIGN ANALYSIS



\$71.14  
\$68.50  
\$63.39

Residential Class Charges  
Assumes 5/8" Meter and includes EAA and TCEQ Fees



# RATE DESIGN ANALYSIS

## Multi-Family Bill Impact Comparison

Water Usage (Gallons per Month)	Current Monthly Charge (2014)	Scenario 1	Difference		Scenario 2	Difference	
			\$	%		\$	%
10,000 (5/8" Meter)	\$38.89	\$31.44	(\$7.45)	-19.2%	\$39.02	\$0.13	0.3%
<b>26,180 (1" Meter) AVG</b>	\$90.07	\$84.77	(\$5.30)	-5.9%	\$90.46	\$0.39	0.4%
50,000 (2" Meter)	\$165.41	\$187.49	\$22.08	13.3%	\$166.18	\$0.77	0.5%
250,000 (4" Meter)	\$798.01	\$835.15	\$37.14	4.7%	\$801.98	\$3.97	0.5%
500,000 (6" Meter)	\$1,588.76	\$1,672.35	\$83.59	5.3%	\$1,596.73	\$7.97	0.5%
750,000 (6" Meter)	\$2,379.51	\$2,325.35	(\$54.16)	-2.3%	\$2,391.48	\$11.97	0.5%
1,000,000 (6" Meter)	\$3,170.26	\$2,978.35	(\$191.91)	-6.1%	\$3,186.23	\$15.97	0.5%

# RATE DESIGN ANALYSIS

## General Bill Impact Comparison

Water Usage (Gallons per Month)	Current Monthly Charge (2014)	Scenario 1	Difference		Scenario 2	Difference	
			\$	%		\$	%
10,000 (5/8" Meter)	\$38.89	\$34.04	(\$4.85)	-12.5%	\$38.00	(\$0.89)	-2.3%
<b>18,700 (5/8" Meter) AVG</b>	\$66.41	\$59.43	(\$6.98)	-10.5%	\$64.60	(\$1.81)	-2.7%
50,000 (2" Meter)	\$165.41	\$202.33	\$36.92	22.3%	\$160.32	(\$5.09)	-3.1%
250,000 (4" Meter)	\$798.01	\$911.19	\$113.18	14.2%	\$771.92	(\$26.09)	-3.3%
500,000 (6" Meter)	\$1,588.76	\$1,824.89	\$236.13	14.9%	\$1,536.42	(\$52.34)	-3.3%
750,000 (6" Meter)	\$2,379.51	\$2,554.39	\$174.88	7.3%	\$2,300.92	(\$78.59)	-3.3%
1,000,000 (6" Meter)	\$3,170.26	\$3,283.89	\$113.63	3.6%	\$3,065.42	(\$104.84)	-3.3%



# RATE DESIGN ANALYSIS

## Next Steps

- Wholesale Rates
- Special Service Charges
- Vista Ridge Rate Impact
- SAWS/DSP Rate Convergence
- Affordability Adjustments

# COD CONVERSION

- Provide an overview of the general considerations associated with converting from BOD to COD.

# BOD = BIOCHEMICAL OXYGEN DEMAND

- Measures the oxygen uptake of microorganisms during the degradation of organic matter
- Standard analysis for organic load per Clean Water Act and NPDES discharge permits



# COD = CHEMICAL OXYGEN DEMAND

- COD assay measures the chemical oxidation of the wastewater by a strong oxidizing agent
- Standard analysis for organic load in treatment plant design
- Standard analysis for discharge permit in Europe



# BOD & COD COMPARISON

## BOD

- Five-day test duration
  - slow response time
- Extensive sample preparation
- Inhibition by metals, anti-microbials, toxic compounds
  - Potential for underestimation of organic load
- Does not allow for rerun of samples

## COD

- Short analysis time of 2 hours => quick response time
- Simple test procedure
- Limited inhibition
- Ability to rerun sample if suspect results

# GENERAL CONSIDERATIONS

- Do we develop Cost of Service Rates on an Individual Customer Class or Total System basis?
- If Individual Class Cost of Service Rates?
  - Single Year
  - Long Term Financial Plan
- Feedback on Tiered Meter Charges
- Feedback on the elimination of Minimum Allowance
- Feedback on the development of a Multi-Family Rate Designation

# QUESTIONS

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**Together**



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