

Flagstaff Water Group Perspectives 2015 Utilities Rate Study

October 2015

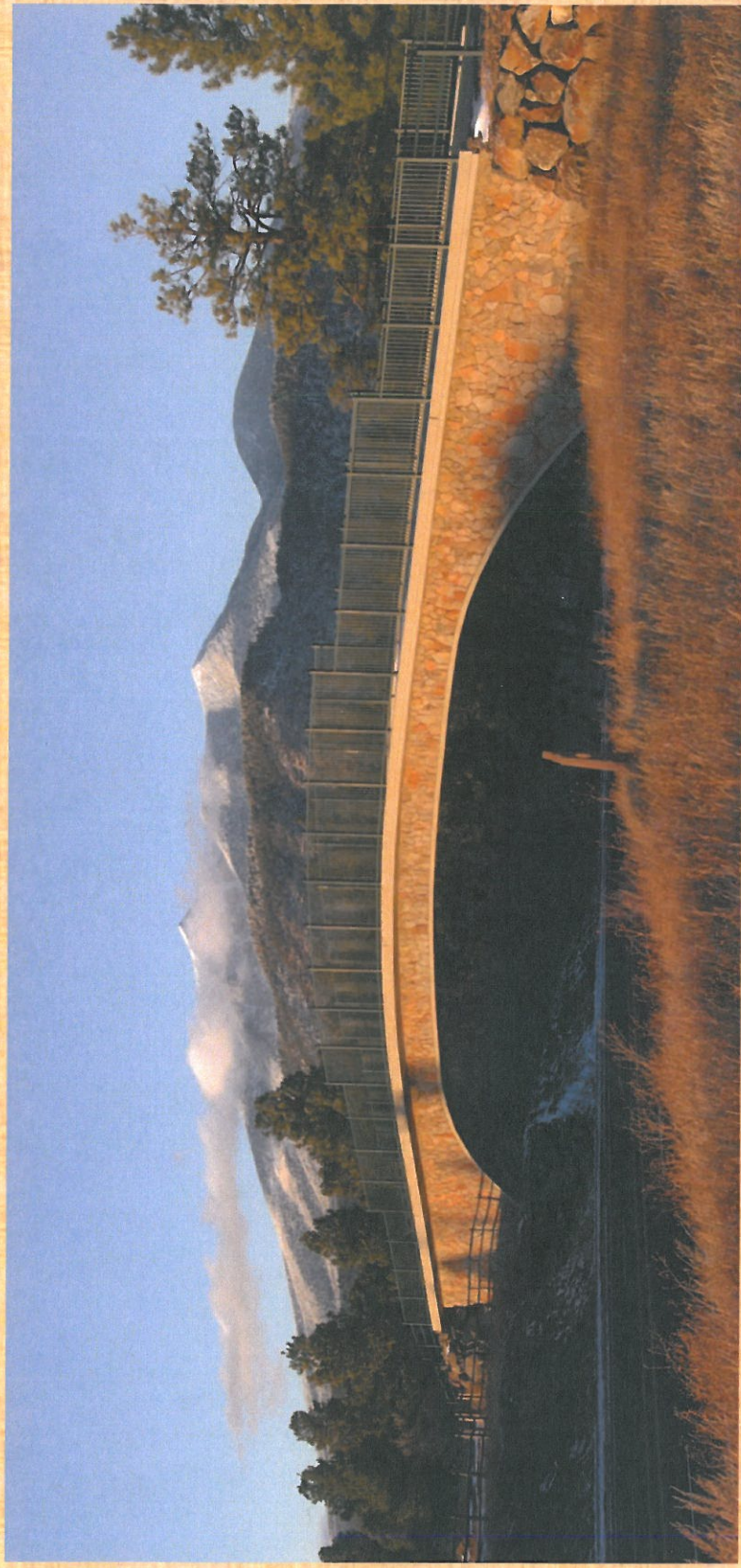


Photo by CK

Flagstaff Water Group (FWG)

A group of local scientists and engineers concerned about the safety and sustainability of Flagstaff's water supplies

1. Bryan Bates, MA Environmental Sciences; Science faculty of Coconino Community College
2. Ward Davis, BS Chemical Engineering; Career focused on crude oil refining (retired) and two small businesses
3. George Kladnik, BA; President Advanced Analytical
4. John Nauman, MS Chemistry; Career focused on laboratory education and lab safety
5. Robert Vane, AB Chemistry, BS Mechanical Engineering, MBA; Career focused on program management for conventional & advanced energy vehicles, Ford Motor Company (retired)

Executive Summary: Potable Water

Reservations About Present Rate Study	Recommendations for City Council
- Non-residential rates poorly conceived: - Flat rate options (1A, 1B, 2A, 2B) don't incentivize conservation - Tiered rate options (1C, 2C) are inequitable; increase costs > 30% for too many customers - Option 1 (3% increase) violates the city debt service guideline - Increasing the size (volume) of residential tiers is a step backwards for conservation	- Develop non-residential potable water tiers that - Drive conservation - Are not punitive - Use phase-in plans if necessary - Review the risks of exceeding the 20% debt service guideline, including looking at our investment trajectory beyond 2020 - Maintain or round down the monthly volume (gallons) of residential tiers (reject Options 1B, 2B)

Executive Summary: Reclaimed Water

Reservations About Present Rate Study	Recommendations for City Council
4. Flat rates don't incentivize conservation: • Highest use coincides with lowest rates; will likely remain over-committed during spring/summer • Lowest rates available to a single customer class; is this justified? • Rates too low overall, well below median of other Arizona cities • Are on a collision course with higher value uses in the future 5. The new reclaimed enterprise fund is not transparent and leaves unclear the value placed on A+ effluent	4. Develop new reclaimed water tiers that • Drive conservation • Are not punitive • Potentially consolidate customer classes • Are higher overall, reflecting fair value for A+ effluent from wastewater treatment plants 5. Ensure that an explicit value for A+ effluent is available to the public and is used as part of setting reclaimed water rates

Executive Summary: Other

Reservations About Present Rate Study

6. Conservation program is underfunded and inadequate given our location in the southwest and the cost of new supplies
 - Rebate program is exhausted mid-year
 - Negligible opportunities for commercial customers

7. Not enough information has been provided to know whether the capital investment program (CIP) provides a responsible and properly paced plan for maintaining our water infrastructure

Recommendations for City Council

6. Define content and funding for an expanded water conservation program
 - Target expanded opportunities for non-residential customers representing >60% of Flagstaff water consumption
7. Review the capital investment plan to verify it reflects a responsible plan for maintaining our infrastructure (neither too aggressive or too slow)

Executive Summary: Interim Action

1. Re-open the rate setting portion of the study (a small portion of the overall study) to address the recommendations above
2. Depending on the time required to complete the revisions, consider approving an interim across-the-board rate increase (3%-5% for water, 5.5% for sewer?) to keep the Utilities Enterprise Fund healthy

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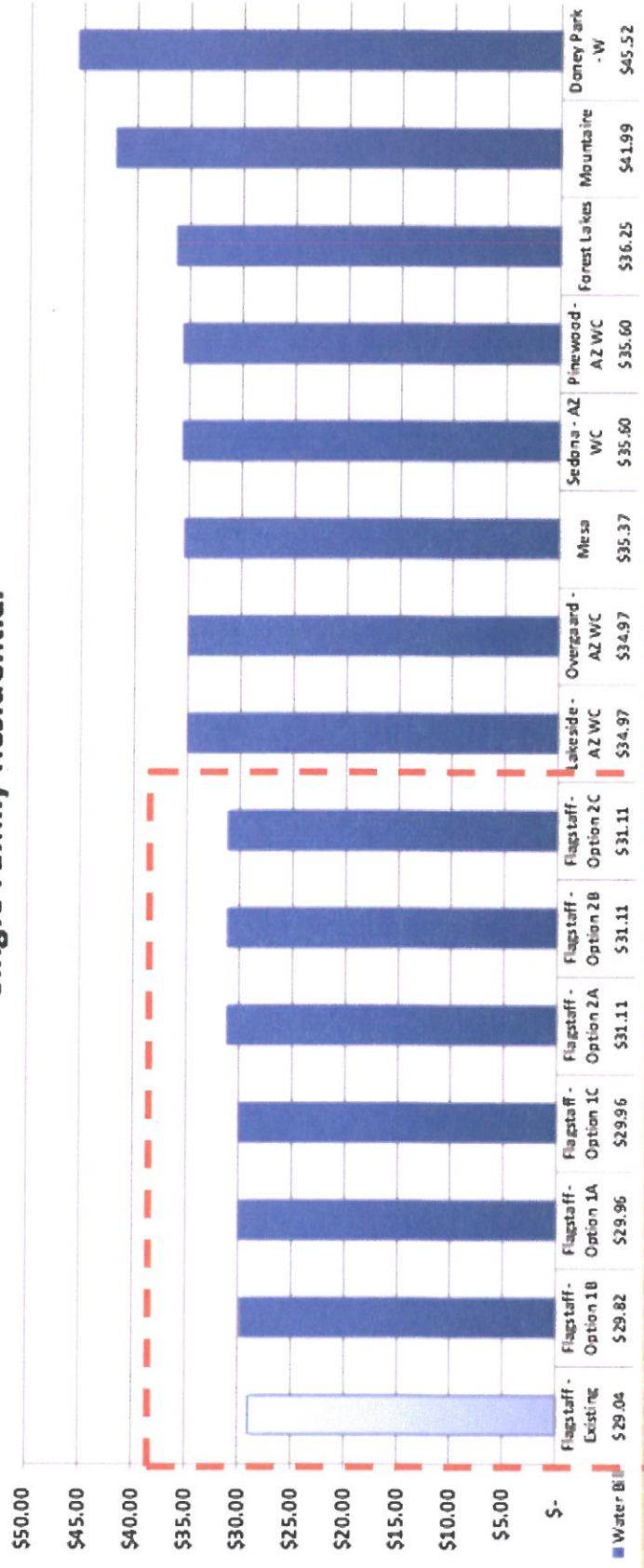
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1. Rate Proposals In Perspective - Water

- Water rate options (3% & 7%) are lower than all comparison cities (i.e., not excessive)*

**Survey of Monthly Water Bills @ 4,100 Gal/Mo
Single Family Residential**

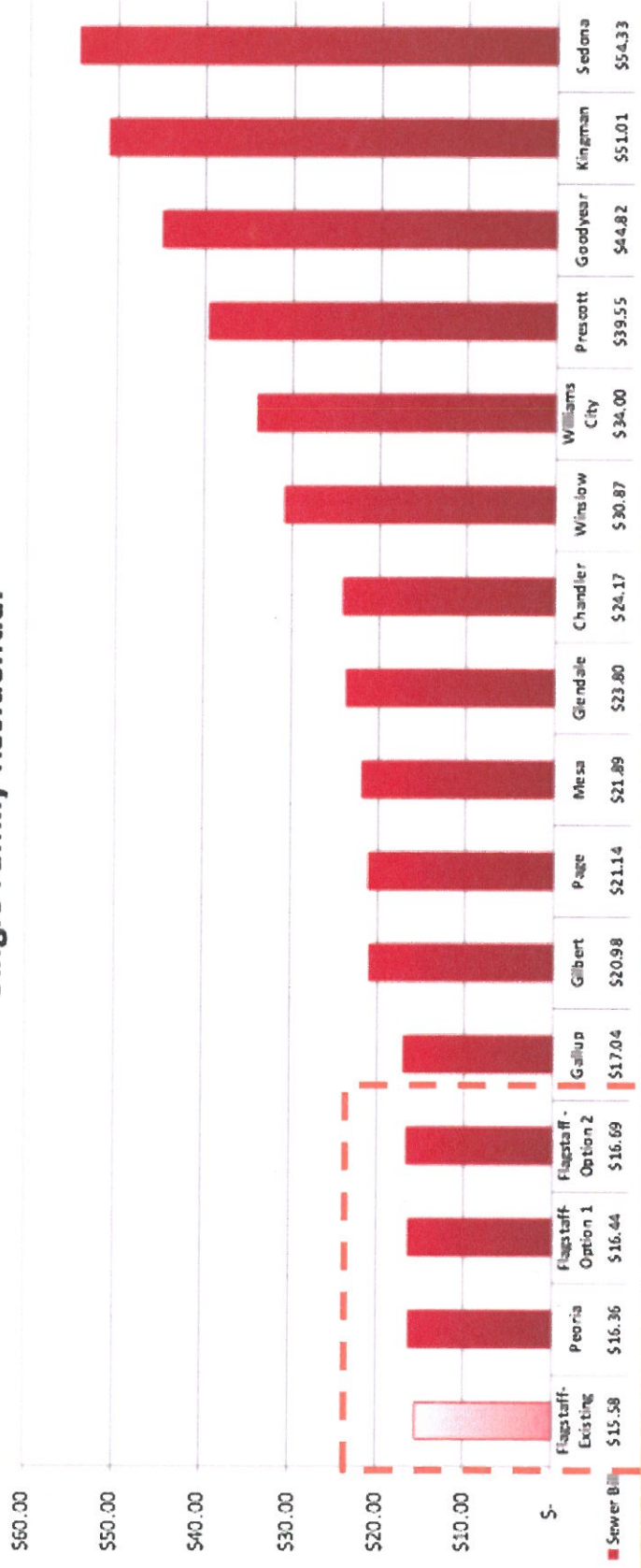


* Source: City of Flagstaff, Utilities Rate Study, Final Draft Report, 1 of 2, 8-6-15, p ES-7

Rate Proposals In Perspective - Sewer

- Sewer rate options (5.5% & 7%) are lower than all except one comparison city (i.e., not excessive)*

**Survey of Monthly Sewer Bills @ 4,100 Gal/Mo
Single Family Residential**



* Source: City of Flagstaff, Utilities Rate Study, Final Draft Report, 1 of 2, 8-6-15, p ES-10

Rate Proposals In Perspective - Overall

- An inconvenient truth --- increases may reflect the need to catch up to a reasonable schedule of infrastructure replacement
- Verification needed: Might a <7% increase meet the debt service guideline (FWG believes Option 2 revenue may be understated)?

2. Flagstaff Water Supply and the Three-Fold Value of Water Conservation

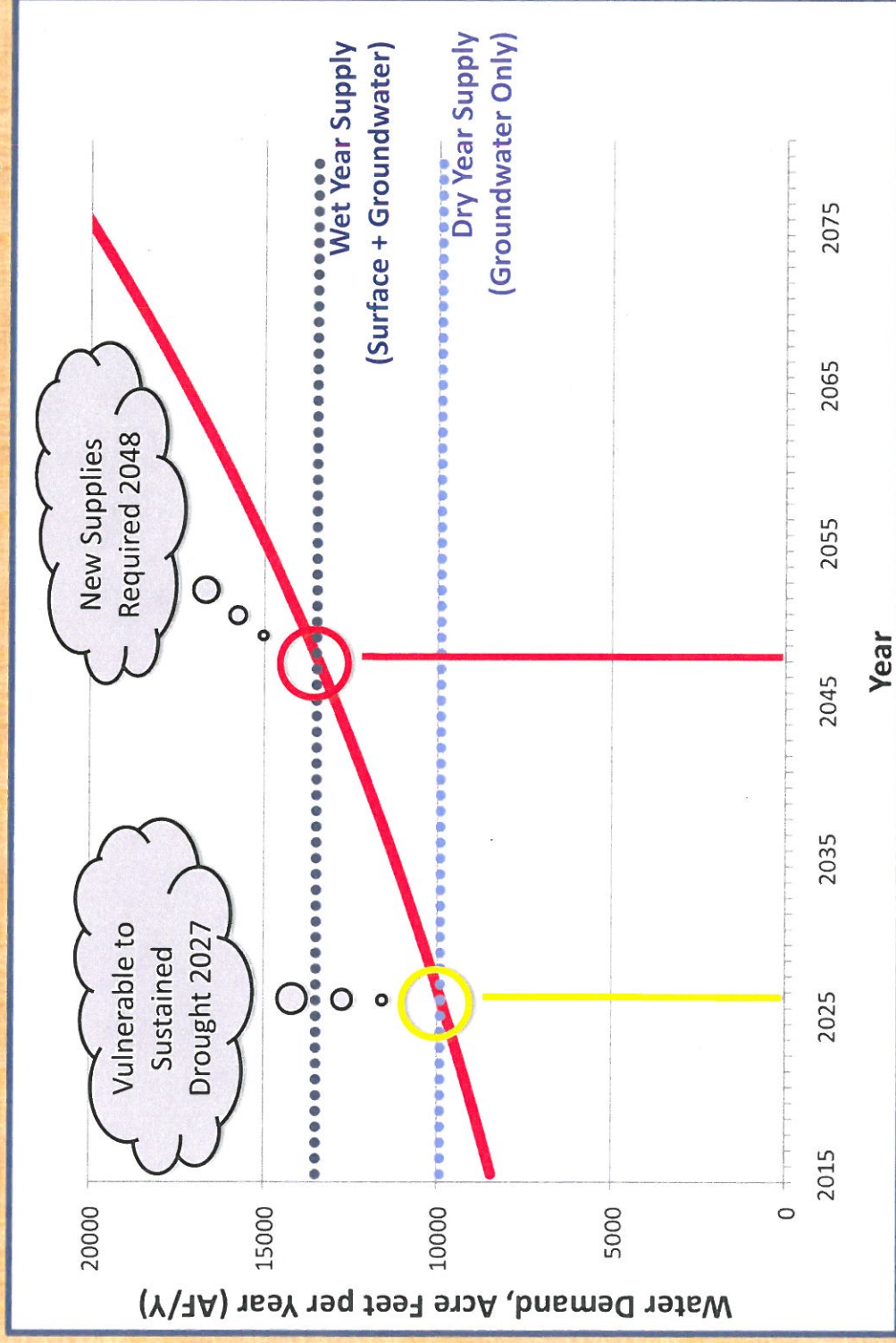
- Present water supply is adequate. Potable consumption (2014)* is:
 - 84% of groundwater supply (16% margin over “dry year” supply)
 - 62% of combined groundwater + surface water supply (38% margin over “wet year” supply)
- New supplies needed by ~ 2048 – 2063 (very sensitive to population growth and per capita consumption rates --- see charts)
- However, will need to identify supply solutions many years earlier to avoid vulnerability to sustained drought

* Source: 2015 Report to the Water Commission, Flagstaff Utilities Division, pp 8, 12

Projected Flagstaff Potable Water Consumption*

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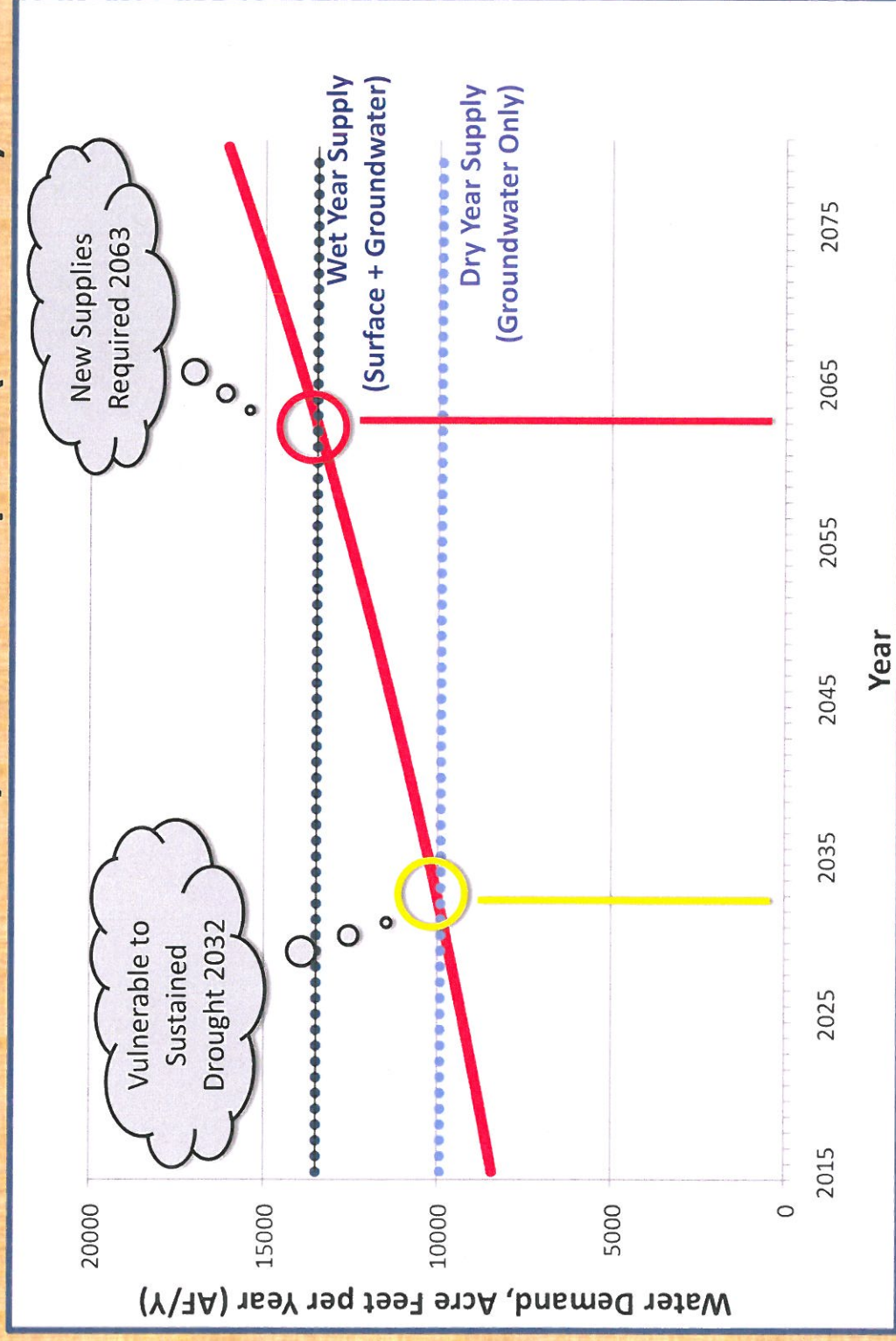
1.44% Annual Population Growth
Constant Per Capita Consumption (108 GPCD)



* Source: 2015 Report to the Water Commission, Flagstaff Utilities Division, pp 8, 12, re-initiated to 2014 actual conditions by FWG.

Projected Flagstaff Potable Water Consumption* 1.0% Annual Population Growth Constant Per Capita Consumption (108 GPCD)

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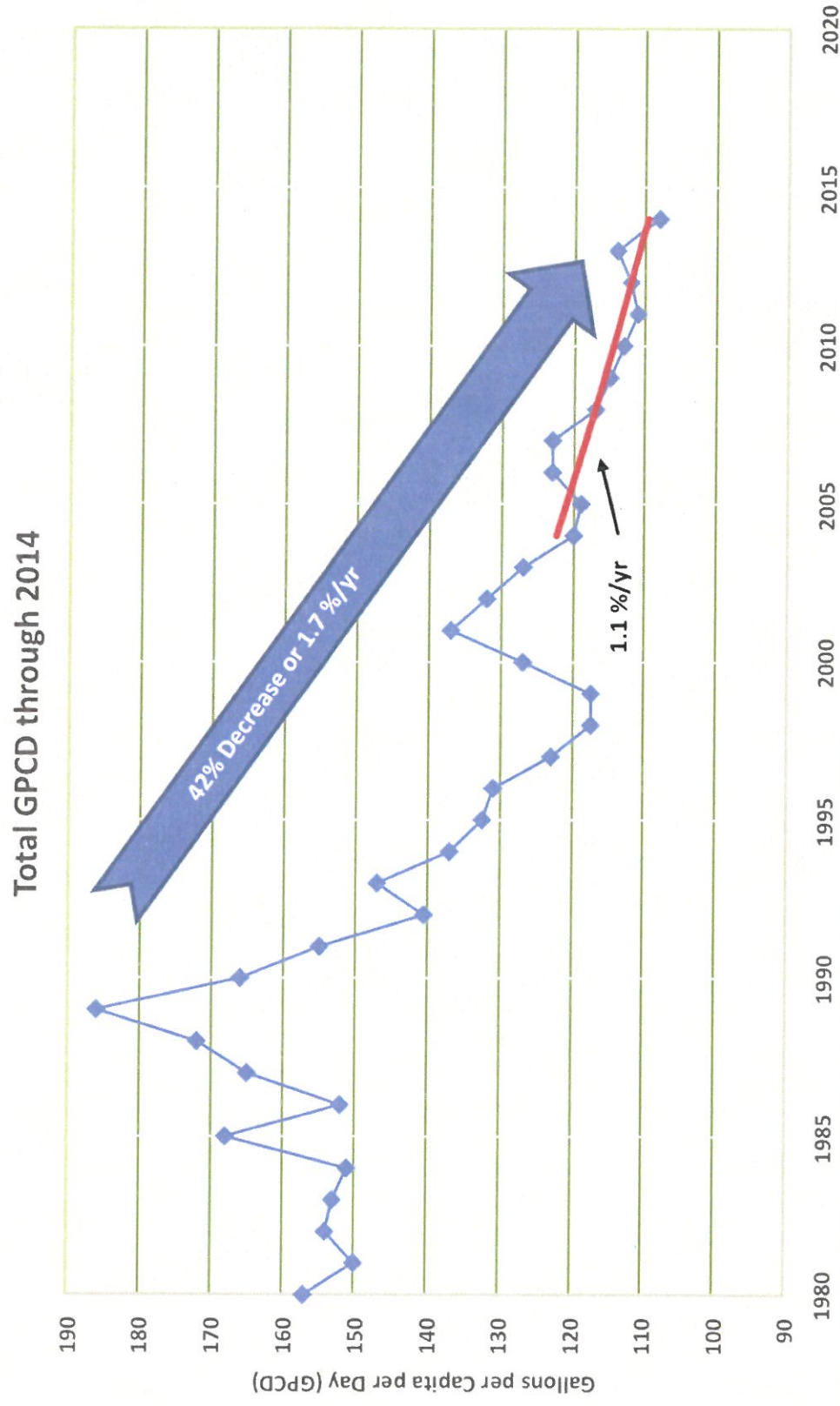


* Source: 2015 Report to the Water Commission, Flagstaff Utilities Division, pp 8, 12, re-initiated to 2014 actual conditions by FWG.

Impact of Conservation

- Flagstaff has averaged a 1.1% annual reduction in per capita water consumption over the past 10 years (see following chart)
- Actions to drive additional conservation may continue or improve on this pattern and defer the need for new supplies by decades (see following charts)
- Exact deferral depends on actual population growth rates and conservation levels achieved

Average 1.1%/Year Reduction In Per Capita Consumption Over Past 10 Years



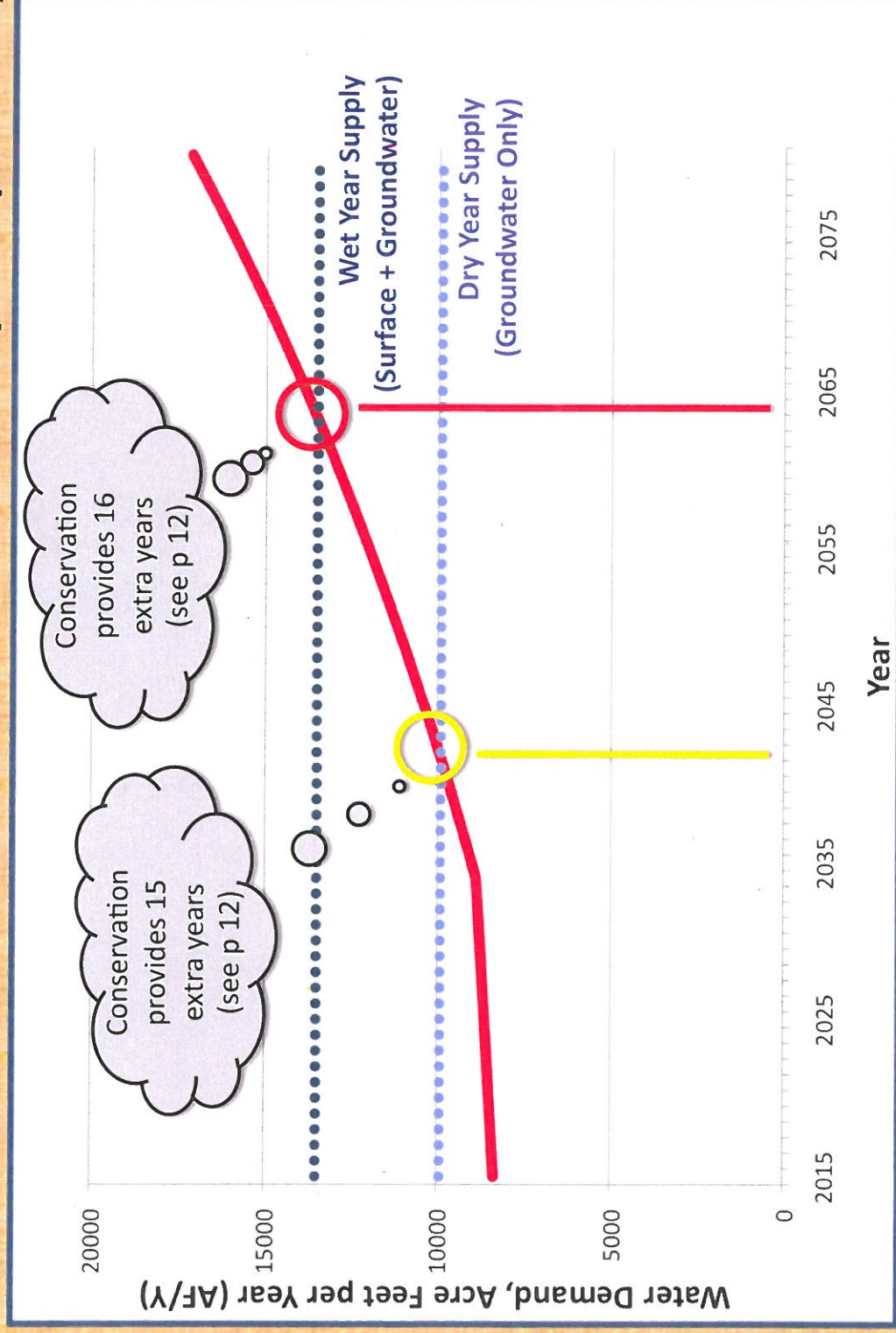
* Source: 2015 Report to the Water Commission, Flagstaff Utilities Division, p 42, and FWG Calculations

Projected Flagstaff Potable Water Consumption*

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1.44% Annual Population Growth

1.1% Annual Reduction In Per Capita Consumption (20 Years)



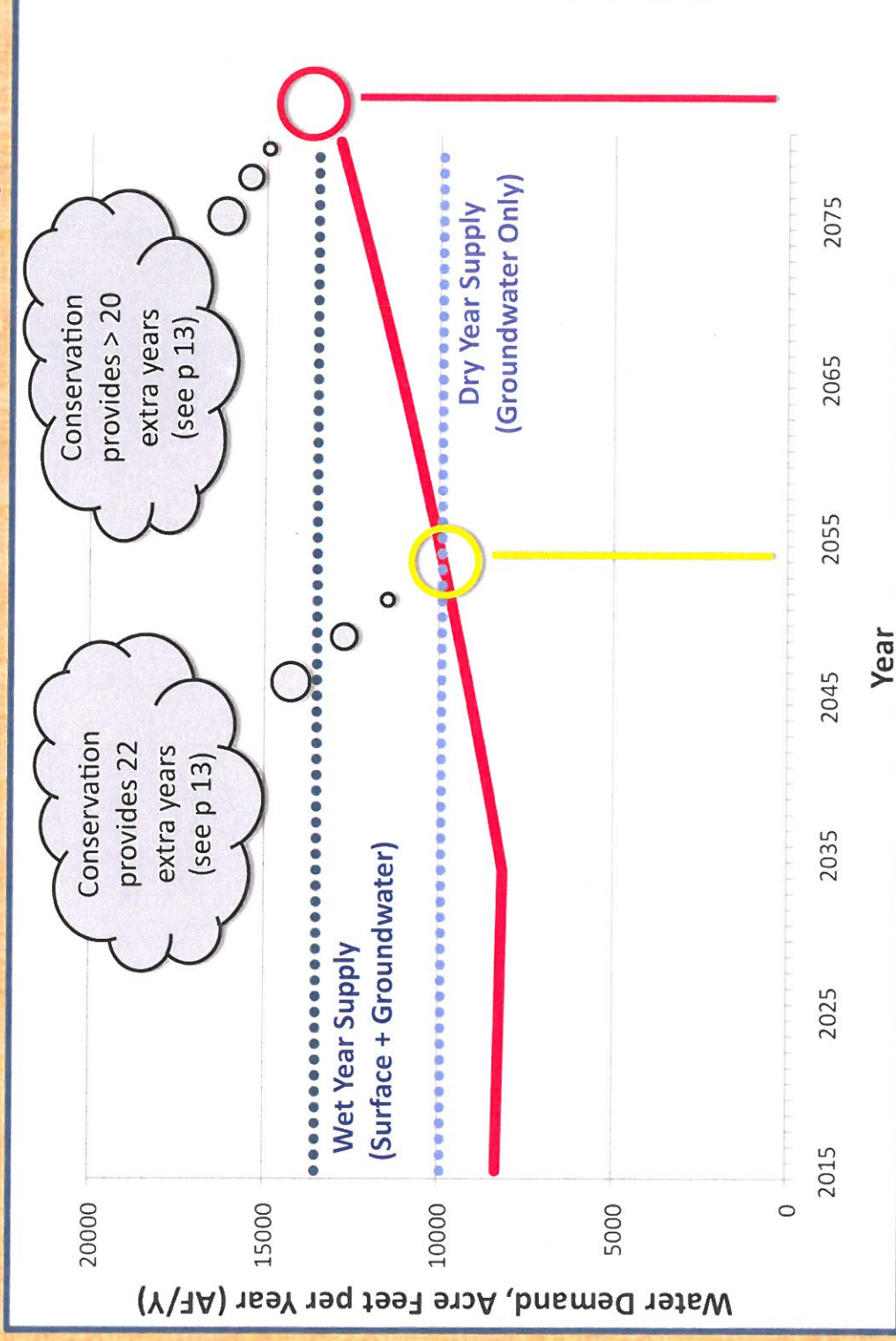
* Source: 2015 Report to the Water Commission, Flagstaff Utilities Division, pp 8, 12, re-initiated to 2014 actual conditions by FWG.

Projected Flagstaff Potable Water Consumption*

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1.0% Annual Population Growth

1.1% Annual Reduction In Per Capita Consumption (20 Years)

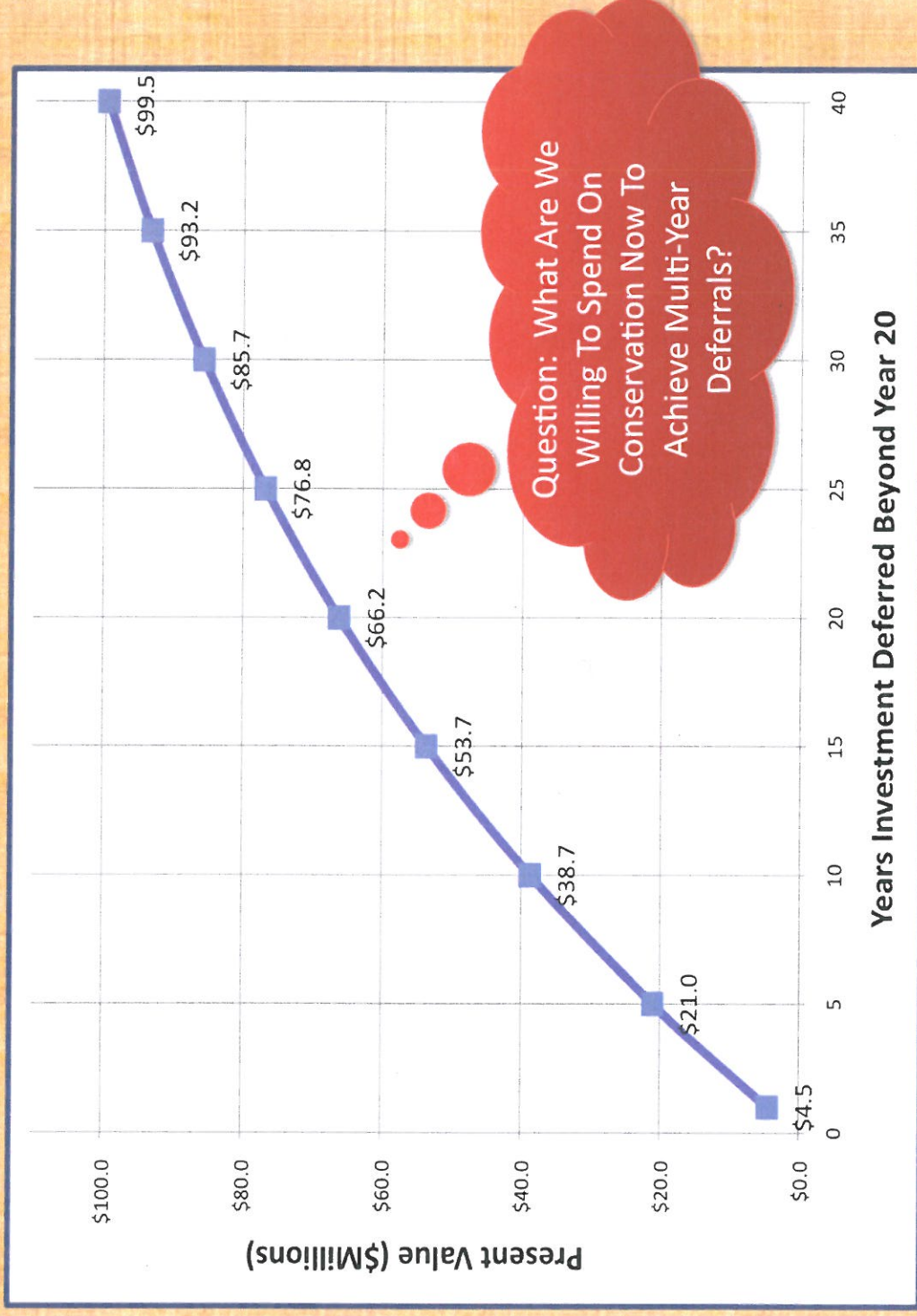


* Source: 2015 Report to the Water Commission, Flagstaff Utilities Division, pp 8, 12, re-initiated to 2014 actual conditions by FWG.

Three-Fold Value of Conservation

1. Conservation-driven deferrals of investment in new supplies are worth a lot of money (following page)!
2. Deferrals allow time for lower cost technologies to mature, offering the opportunity to solve water supply and contamination issues at less than half the cost of Red Gap Ranch
3. Conservation immediately makes us less vulnerable to sustained drought

Net Present Value of Deferring Implementation of a Red Gap Ranch Sized Investment (\$268 Million) Beyond Year 20



* Source: Flagstaff Water Group calculations, confirmed by Flagstaff City Management Services Director.

3. Non-Residential Water Conservation Opportunities

- Successes over the past decade demonstrate a range of methods and willingness to invest for water conservation

Entity	Potable Savings (Reductions)	Sources
1. NAU*	36% (100 million gallons/yr)	Technology, new practices, xeriscaping, reclaimed water
2. Flagstaff Medical Center*	35% (11 million gallons/yr)	Technology, other?
3. SCA Tissue*	60% (66 million gallons/yr)	Substitute reclaimed water
4. Panda Express** Stores (Tucson)	1000 gallons/day	WaterSmart Business audit (faucet aerators)

* Source: Arizona Daily Sun, 9-13-15, p 1A. ** <https://wrrc.arizona.edu/node/12512>

Studies Indicate Non-Residential Customers Are More Sensitive to Price Signals Than Residential*

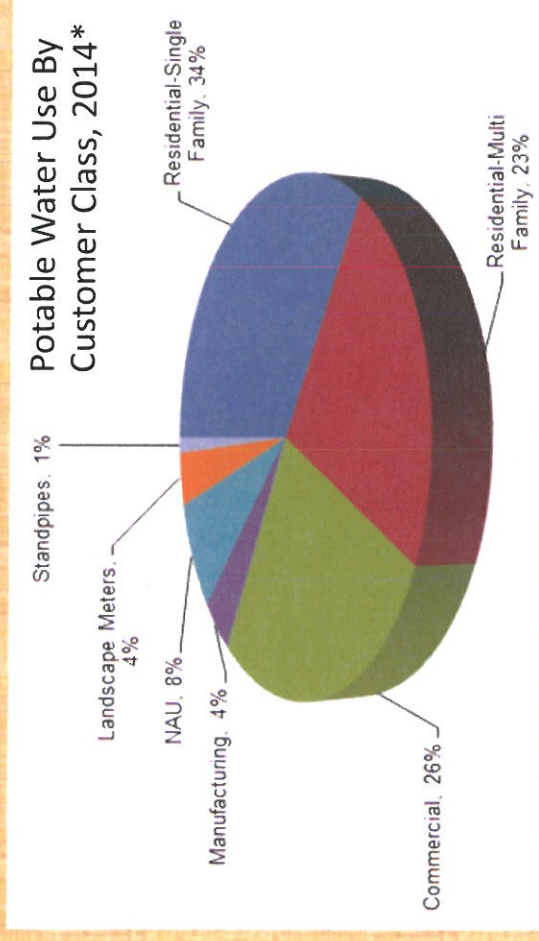
1. According to the American Water Works Association, more than 100 studies of the effects of price on water demand have been conducted in the past three decades.
2. General conclusions from these studies :
 - Most likely residential elasticity (of demand) is -0.10 to -0.30, meaning that a 10% increase in rates will lead to a 1.0% to 3.0% reduction in usage.
 - Commercial/industrial elasticity (of demand) is typically higher, up to -0.8% (10% rate increase = 8% reduction)

* Source: Developing Conservation Water Rates Without Sacrificing Revenue, Texas Water Conservation Association Fall Meeting, 2012, Dan V. Jackson, Managing Director, Economists.com, page 18.

Clear Indicators for the Success of Non-Residential Tiers

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- Local success stories, professional studies, and Flagstaff residential experience all suggest that major conservation opportunities exist for the 61% of water consumption represented by non-residential customers



Customer Class	2014 Consumption*	Cumulative Consumption
Commercial	26%	26%
Residential-Multi-Family	23%	49%
NAU	8%	57%
Manufacturing	4%	61%

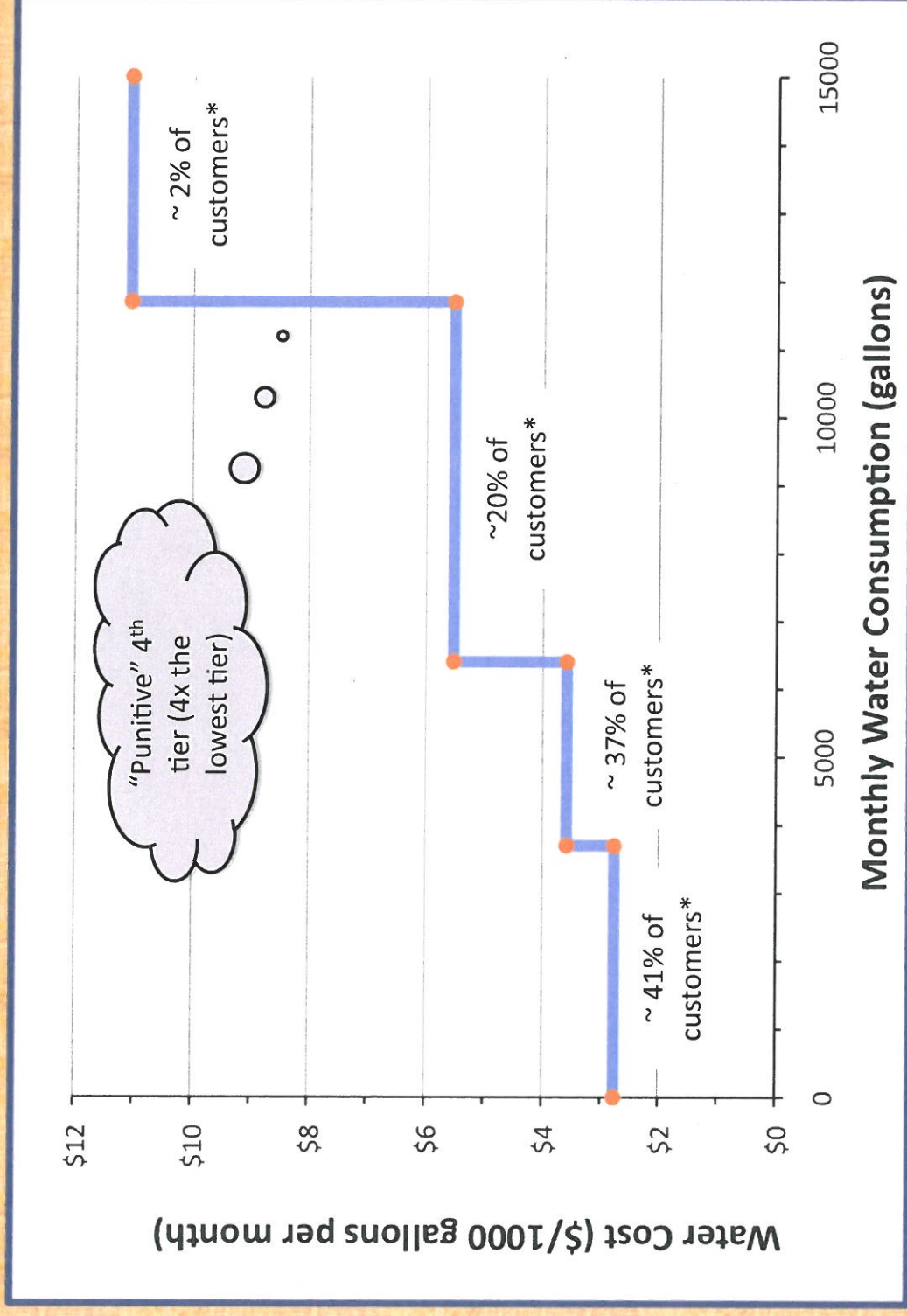
* Source: 2015 Report to the Water Commission, Flagstaff Utilities Division, p 9

4. Construction of Tiered Rates

- Increasing tiers: an attractive rate-based method to incentivize conservation
- Correcting misconceptions:
 - Tiers don't imply a rate hike (in fact, >80% of customers typically pay less)
 - May be designed for any chosen revenue level
 - Offer businesses an opportunity for leveraged savings
- Lots of ways to build tiers:
 - Should be structured to achieve clear goals
- "Punitive" top tiers are inappropriate and make it harder to achieve an equitable tier structure (especially commercial)
- Will be some dislocations in any rate structure change --- some will pay more, some less than before

Observations About Flagstaff's Existing Residential Water Tiers

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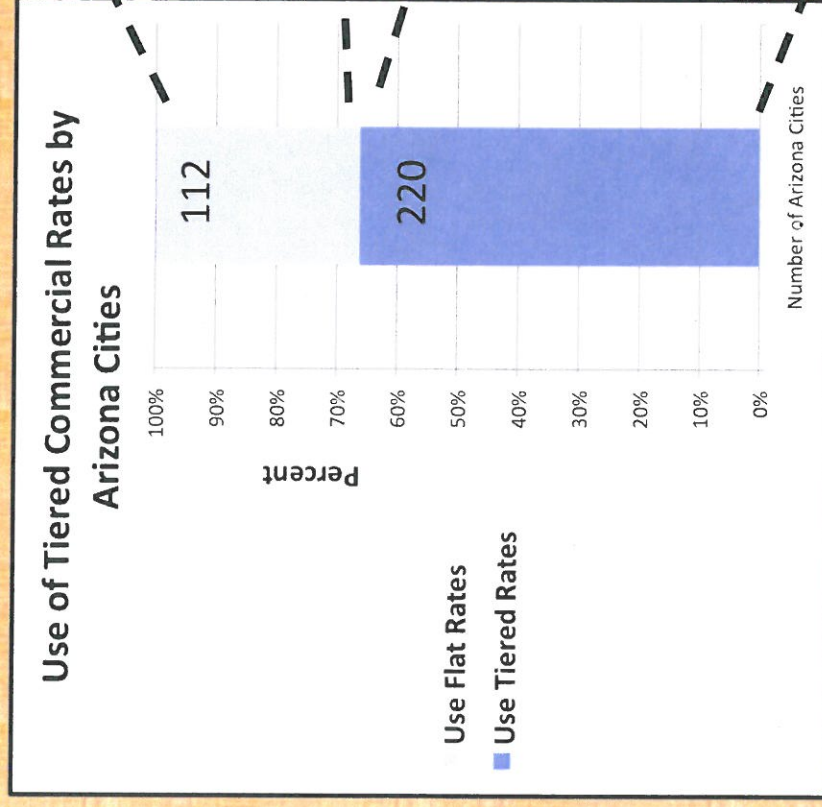


* Source: FWG calculations, based on 2014 City data. Calculations eliminate empty households

Non-Residential Tiers Are Used Widely In

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Arizona*



Nearly 2/3rds of cities use tiered commercial rates rather than flat rates

Sample Cities Using Flat Rates

- Phoenix
- Mesa
- Chandler
- Glendale
- Tempe

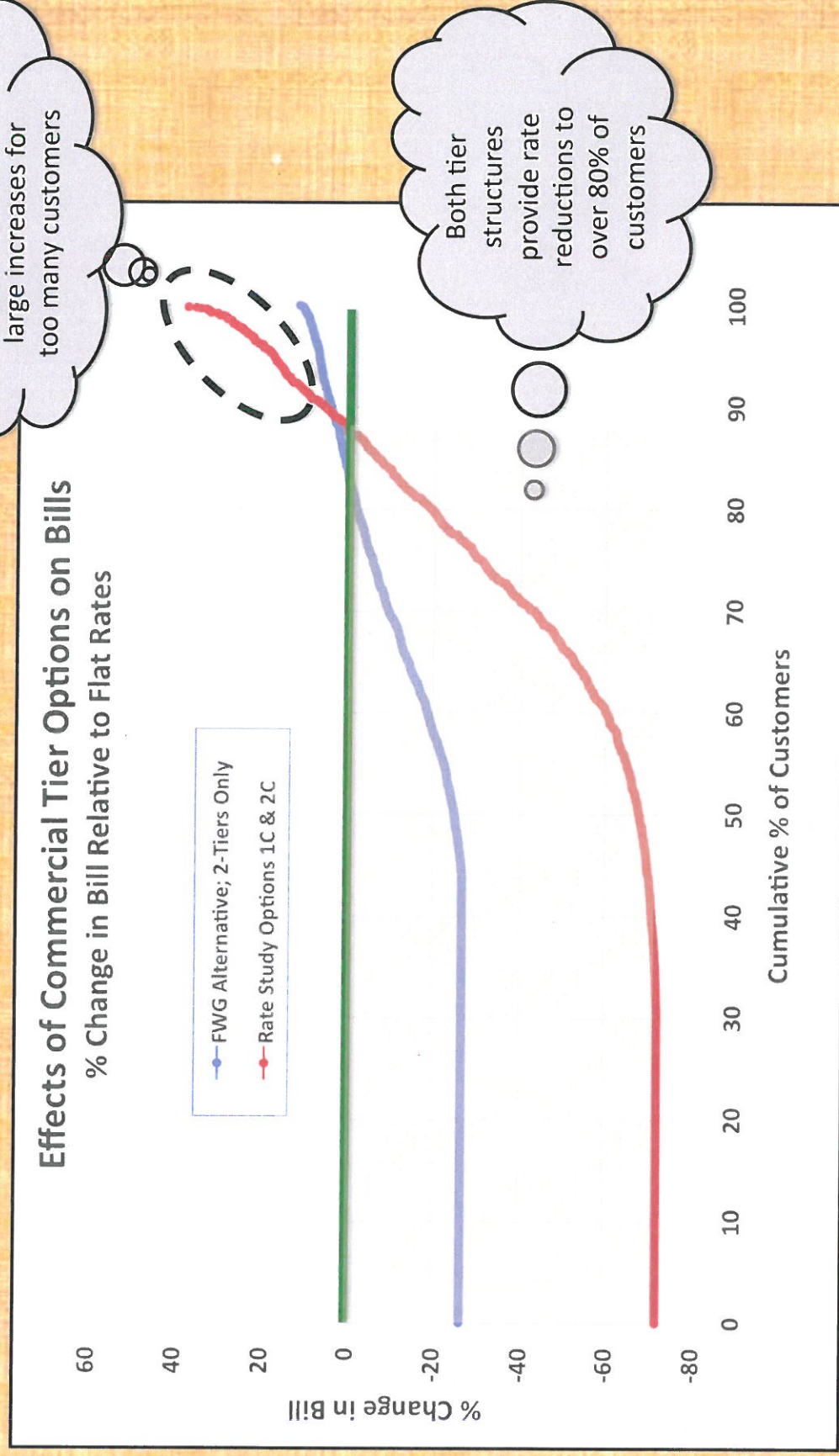
Sample Cities Using Tiered Rates

- Scottsdale
- Gilbert
- Peoria
- Avondale
- Apache Junction
- Lake Havasu
- Prescott

* Source: Water Infrastructure Finance Authority of Arizona, 2014 data.

Tiers Are Easily Adjusted To Achieve Desired Goals*

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* Source: 2015 Utilities Rate Study Final Draft Report and FWG calculations using 2014 City data.

5. Reclaimed Water Management and Rates

- Present flat rates have multiple flaws:
 - Don't incentivize conservation
 - Rates too low overall --- well below Arizona median of \$1.67*
 - 35% & 75% of potable rates on the books, but 75% rate never used
 - Creates a collision course for when reclaimed water is needed for potable water and other higher value uses
- Lowest subsidized rate (29% of potable) and highest demand coincide (golf usage is not “off peak”). Is this justified?

Subsidy for 29% vs 35% Rate (2014)	
	Affected Gallons
Continental CC	290,184,000
Pine Canyon CC	60,986,000
	\$ Subsidy
	\$81,000
	\$17,000

* Source: Water Infrastructure Financial Authority of Arizona, April 2015.

Reclaimed Water Management and Rates

- Supplies are presently over-committed in May/June; need conservation and contract revisions to make room for new customers or to allocate more for riparian habitat and aquifer recharge
- The declining tier for “Off Peak; Golf” encourages consumption (relic)
- The new reclaimed enterprise fund is not transparent and leaves unclear the value placed on A+ effluent

Issues With Present Reclaimed Water Rates

No Customers
Actually Pay 75%
Rates

CITY OF FLAGSTAFF WATER & SEWER RATES

Effective January 1, 2015 (**Subject to Change**)

RECLAIMED WATER: (per 1,000 gallons)

	Customer Class	Inside City Rate	Outside City Rate
Private Residential	R1	\$ 1.23	\$ 1.35
		1.52	1.67
		2.20	2.42
		4.13	4.54
Commercial (no main Ext):	C	1.59	1.75
Commercial (w/ main Ext):	C	3.40	3.74
Manufacturing (no main Ext):	MN	1.57	1.73
Manufacturing (w/ main Ext):	MN	3.17	3.49
NAU (Sinclair Wash-Intramural Fields):	NA	1.48	N/A
NAU (all other):	NA	3.17	N/A
City Departmental	MU	1.59	N/A
Hydrant Meter	WR	3.55	N/A
Standpipe**	RS	3.87	N/A
Off Peak/Golf Course:	WR	1.38	1.52
	WR	1.38	1.52
	WR	1.38	1.52
	WR	1.07	1.18
Untreated Surface Water		1.32	1.45

- 3 identical tiers enjoy lowest rates (~ 29% of potable)
- 4th tier declining (anti-conservation)

Golf is not "off peak," yet receives lowest rates

6. Ideas for a More Effective Water Conservation Program

- Key elements of the present conservation program:
 - Project WET for 4th graders
 - Toilet, turf, & rainwater rebates, but funds exhausted mid-year
- Potential New Business-Focused Opportunities
 - New category of rebates for business investments meeting defined water conservation criteria
 - Conserve-2-Enhance WaterSmart Business program
 - Developer connection fees tied to water efficient design
- Potential New Opportunities for All
 - Billing feedback: “How does my water use compare?”
 - Subsidized/free water audits (residential & commercial)
 - Expanded outreach, education, best practice models
 - Full funding of rebate program

7. Council's Oversight Responsibilities³¹

Study Input:
Council Goals

Simplified Rate Study Process

1. Define Costs

- Operating
- Capital
- Conservation

0-(Start) Provide overall study goals

1-Does CIP maintain city infrastructure?

2-Does

conservation program support Council goals?

2. Apply Policies

- Financial
- Rate Structure

3-Do financial guidelines remain valid?

4-Would a revised rate structure better serve community goals?

3. Verify Reasonableness

- vs. Other Communities
- Public Outreach
- Council Review

5-Is the plan fair to rate payers?

6-Is the plan competitive vs other communities?

4. Publish Final Report

- Based on Council Direction

7-Provide clear direction and approve final recommendations

Key Council Oversight Actions

Reference

Flagstaff City Council Goal #2

2014 - 2016

Ensure Flagstaff has a long-term water supply for current and future needs

- Identify financing, complete designs and construct the Red Gap Waterline
- Secure ROW for Red Gap Waterline
- Review current water rate structure
- Integrate conservation strategies into all water resource management activities
- Expand the use of reclaimed water