



AMERICAN WATER

Trends in Water Efficiency

SEPA AWWA

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American Water



Outline

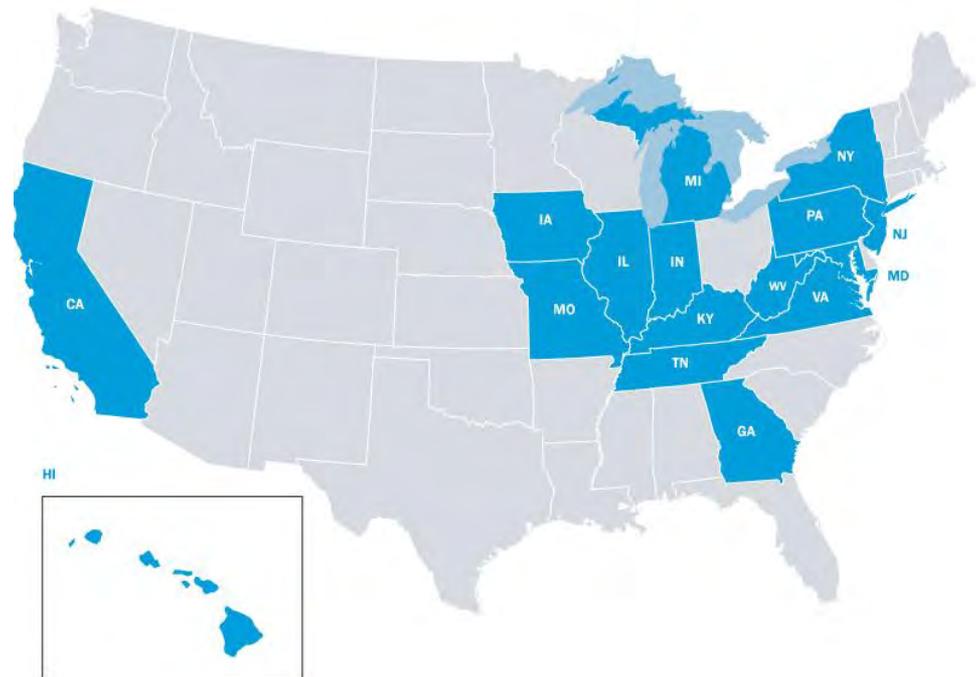
- **Overview**
- **Residential Trends**
- **Water Efficiency and Conservation**
- **Benefits of Water Efficiency**
- **Policy Considerations**
- **Conclusions**



About American Water

- American Water provides service to approx. 14 million people
- Comprised of approx. 375 individual water systems, ranging in size from 25 customers to over 350,000 customers
 - Operate as regulated utility in 16 states
 - Wide range of sources of supply, customer makeup, and demographics
- **Issues facing American Water systems are representative of those impacting water industry as a whole**

American Water's Regulated State Operations



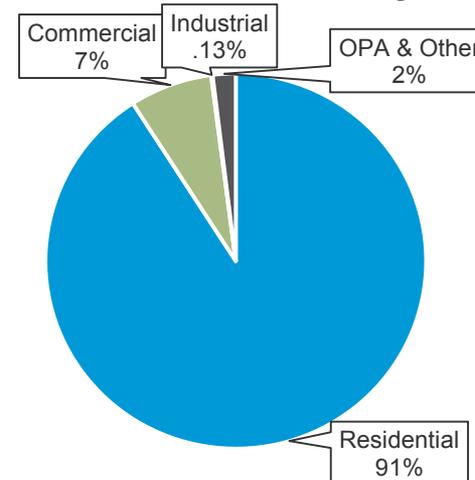
Pennsylvania American Water

- **Subsidiary of American Water Works Co. Inc.**
- **Roots date back to early 1800s, Incorporated in 1904**
- **Largest regulated water and wastewater service provider in PA**
- **Serving approximately 2.3 million people in 36 counties**
- **Approximately 1,000 employees**
- **Customer base:**
 - **Approx. 654,000 water customers**
 - 92% residential
 - 7% commercial
 - 1% industrial/other
 - **Approx. 55,000 wastewater customers**

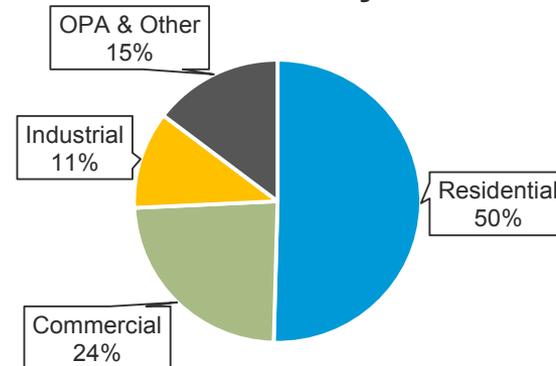
Water Use Characteristics

- American Water’s regulated businesses:
 - **Residential** Customers comprise 91% of the customer base and about 55% of the sales volume
 - **CII** customers comprise only 7% of the total customer base and over 24% of total water sales volume
 - **SFRS** are less than 1% of the customers but 15% of the sales volume

2016 AW Customers by Class



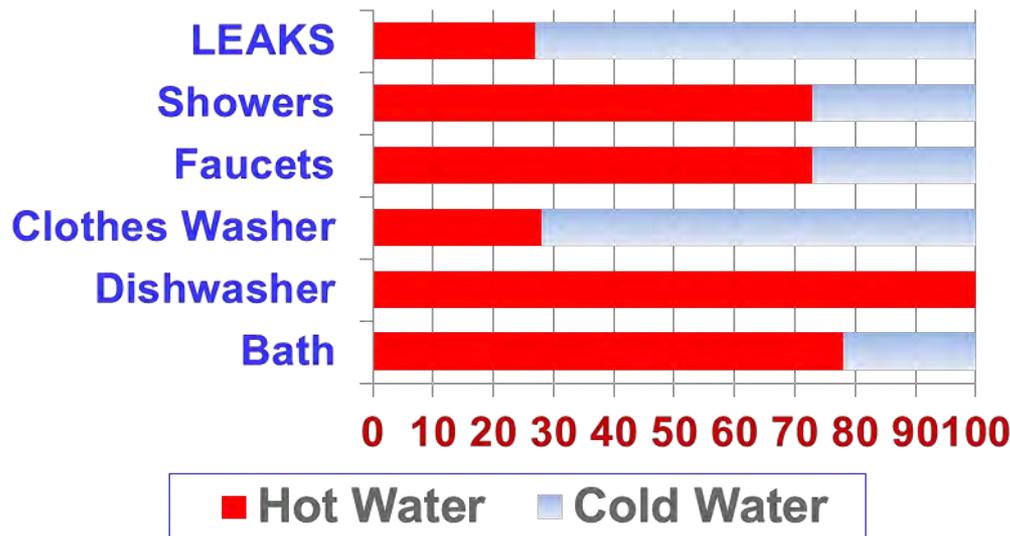
2016 AW Sales by Class



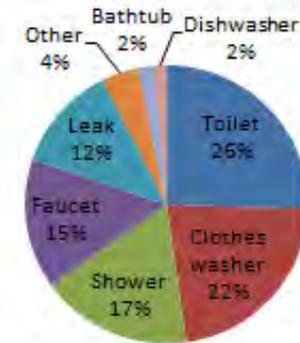
■ Residential ■ Commercial ■ Industrial ■ OPA & Other

Residential End Uses of Water

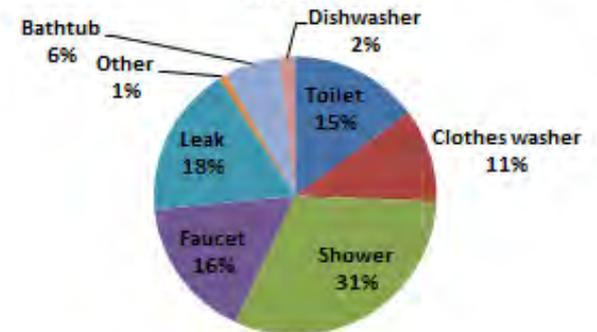
Hot and Cold Water Use Percentages for Homes



2015 Residential End Use of Water - Indoor



2030 Residential End Use of Water - Indoor



Water Efficiency vs. Water Conservation

Water conservation

- Doing with less, doing without and sacrificing
- Voluntary and mandatory restrictions

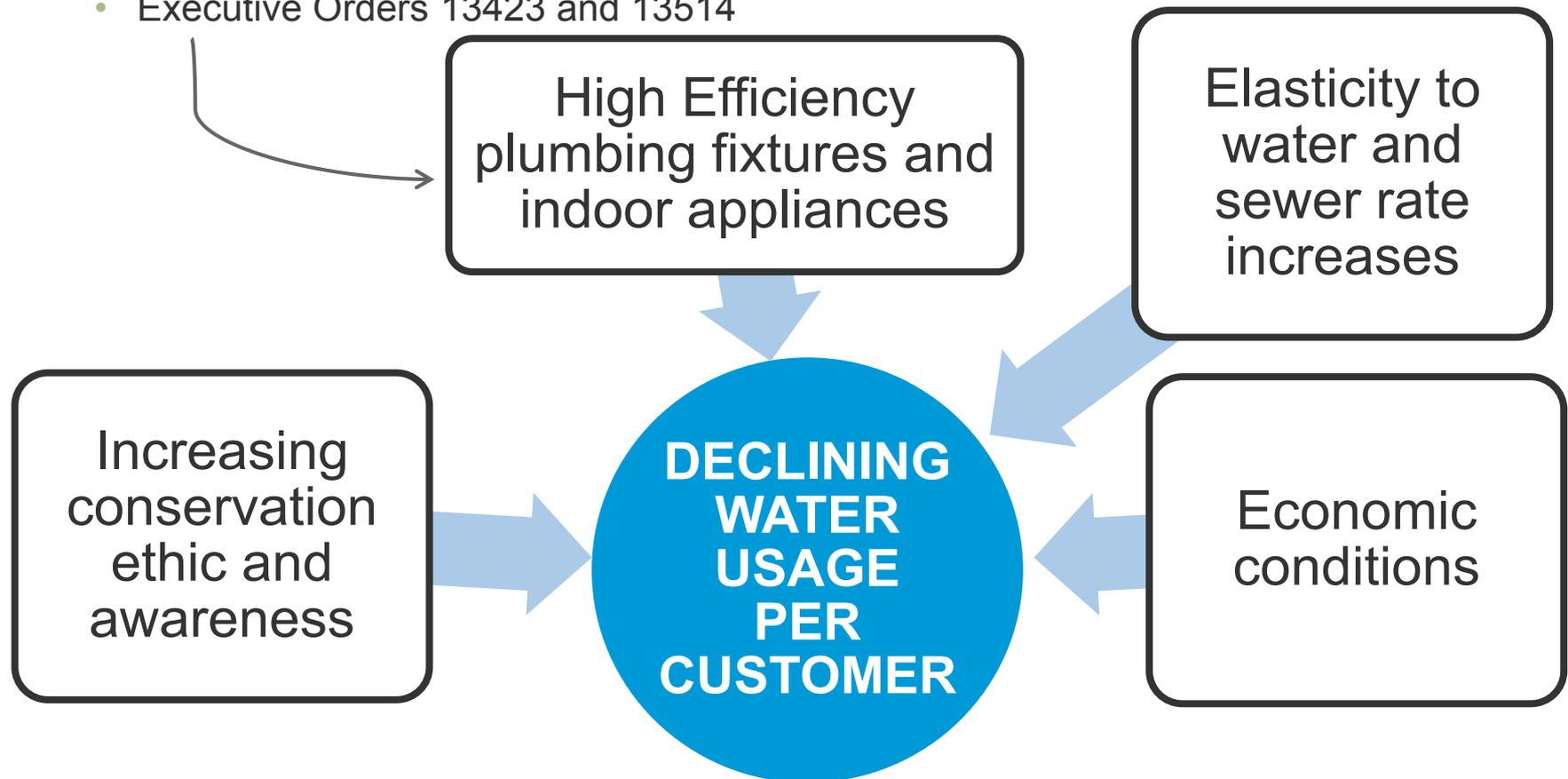
Water efficiency

- Improved technologies and practices that deliver equal or better service with less water
- Saves consumers money, protects the environment and enhances the economy



Declining Trends in Water Usage

- Energy Policy Act of 1992 (effective in 1994);
- Energy Policy Act of 2005 (effective in 2006); and
- Energy Independence and Security Act of 2007 (effective in 2010)
- Executive Orders 13423 and 13514



Background – Flow rates from different appliances

Type of Use	Pre-Regulatory Flow*	New Regulatory Standards and Flows			WaterSense / ENERGY STAR Current Specification+
		New Standard (maximum)	Federal Standard	Year Effective	
Toilets	3.5 gpf 	1.6 gpf 	U.S. Energy Policy Act	1994	1.28 gpf
Clothes washers**	41 gpl (14.6 WF) 	≈26.6 gpl (9.5 WF) 	Energy Independence & Security Act of 2007	2011	≈22.4 gpl (8.0 WF)
Showers	2.75 gpm 	2.5 gpm at 80 psi 	U.S. Energy Policy Act	1994	2.0 gpm at 20 psi
Faucets***	2.75 gpm 	2.5 gpm at 80 psi (1.5 gpm) 	U.S. Energy Policy Act	1994	1.5 gpm at 60 psi
Dishwashers	14.0 gpc 	6.5 gpc for standard; 4.5 gpc for compact 	Energy Independence & Security Act of 2007	2010	5.8 gpc for standard; 4.0 gpc for compact



ABBREVIATIONS USED

gpf - gallons per flush

gpl - gallons per load

W.F - Water factor or gallons per cycle per cubic feet capacity of the washer

gpc - gallons per cycle

* Source: *Handbook of Water Use and Conservation*, Amy Vickers, May 2001

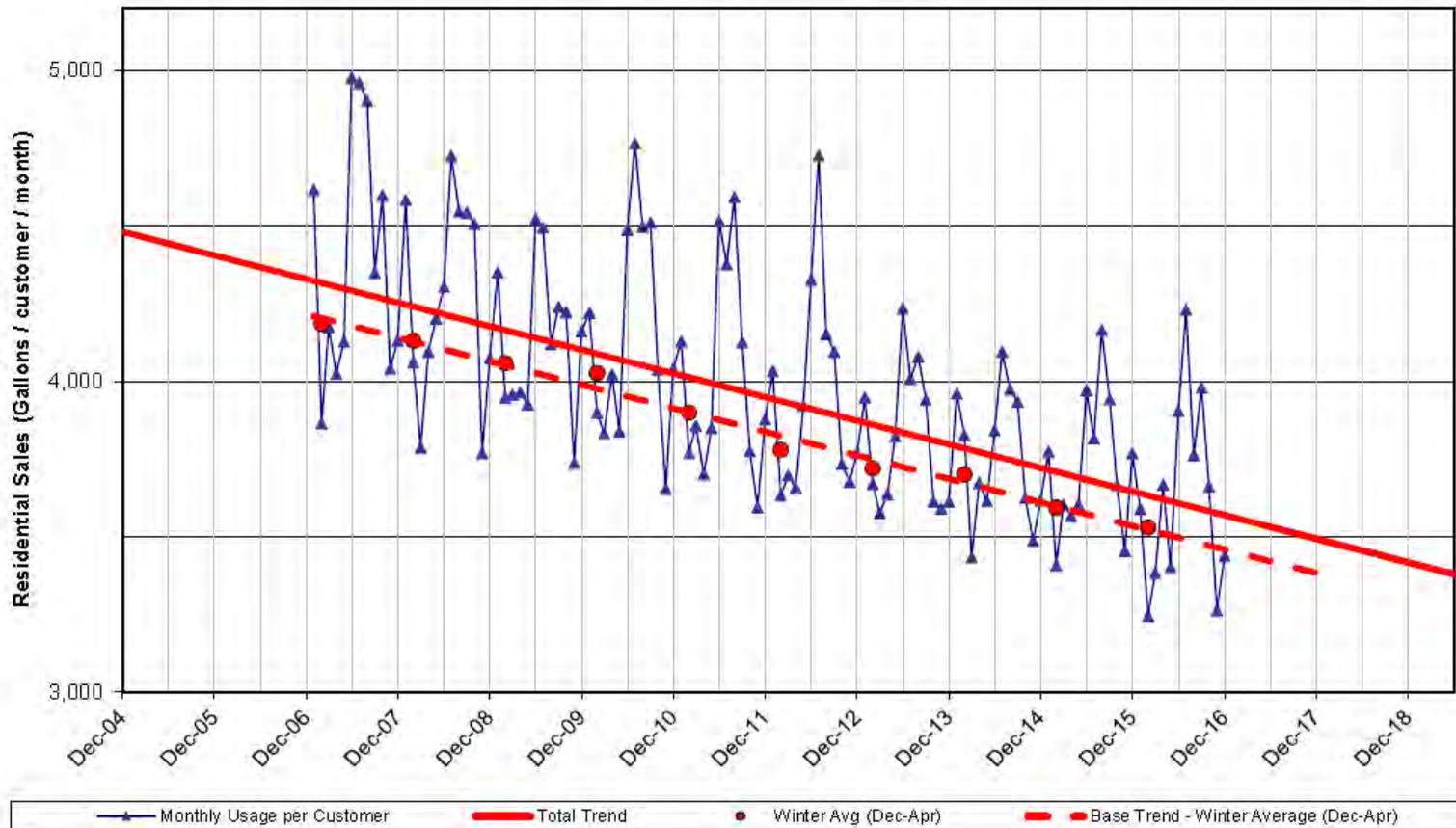
** Average estimated gallons per load and water factor (see calculations)

*** Regulation maximum of 2.5 gpm at 80 psi, but lavatory faucets available at 1.5 gpm maximum (see calculations)

+ Source: <http://www.epa.gov/watersense/> and <http://www.energystar.gov> websites

Residential Trends

**Pennsylvania American
Residential Sales Per Customer
(10-Year Winter Trend)**



Water Efficiency is a Long Term Demographic Trend

Is the trend ending?

- Based on an assumed appliance and fixture lifetime, **continued progress is expected for another 10-15 years or more**
- High efficiency clothes washer and dishwasher technology has only recently become regulated
- Other drivers such as elasticity, conservation ethic, etc. are still showing impacts
- The theoretical usage is **38** gallons/capita/day for fully conserving indoor household consumption (compared to current usage of approx. 72 gal/capita/day)

28 gallons/capita/day with WaterSense

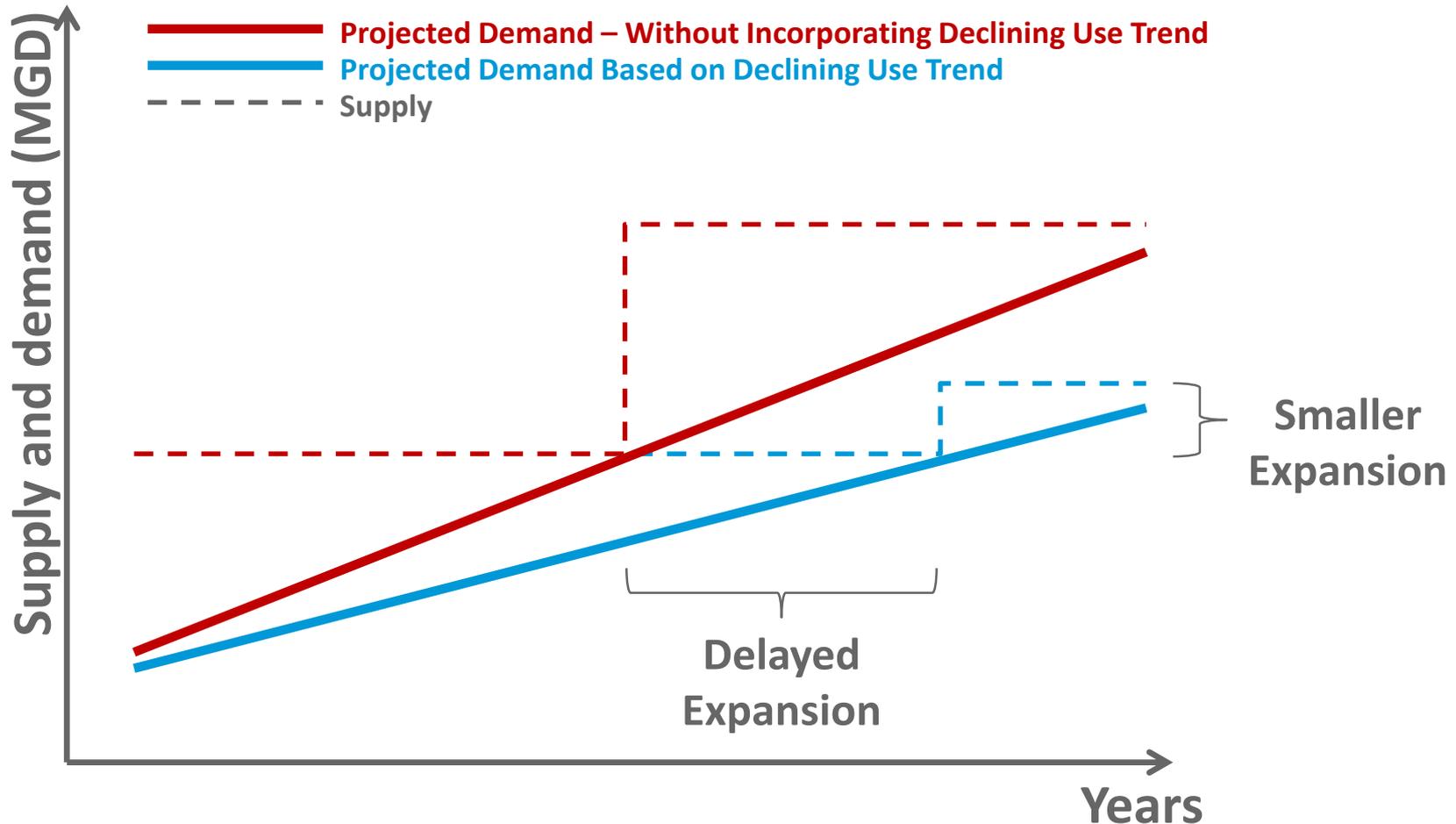
Our conclusion is that, in most places, the trend will not end soon.

PA Water Efficiency Program

- PA American Water has a low-income customer water efficiency program
 - Budget of about \$100,000 annually
 - PA partners with Dollar Energy Fund, provides approximately 1,200 kits per year
 - If customer qualifies through DollarEnergy, PAW provides minor plumbing repairs, retrofit kits (including showerheads, faucet aerators, and leak dye tablets)



Water Efficiency can reduce supply and treatment capital needs



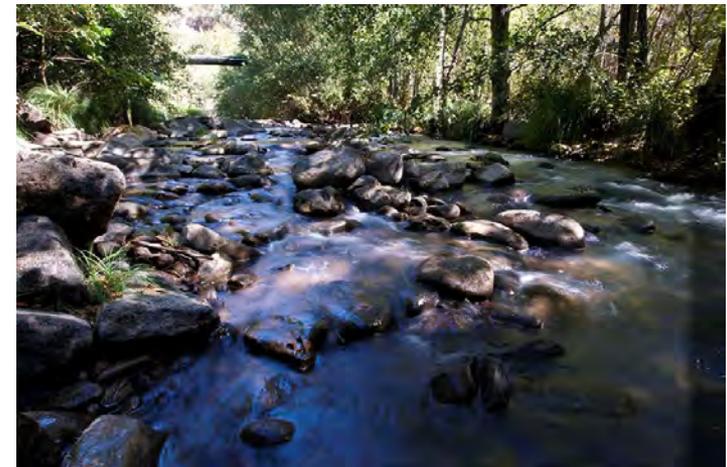
Water Efficiency programs can accelerate the savings

- Many Energy Utilities are provided Demand Side Management funding from their Utility Commissions for Energy Efficiency programs
- Hot water savings could offer opportunities for water and energy utilities to collaborate
 - ◆ Efficiency kits and education content could include lighting (CFL's or LED), Water Saving Measures - High Efficiency Shower Head, and Faucet Aerators



Benefits of Water Efficiency

- **Helps to maintain source water supplies**
- **Allows more water for passing flows, environmental benefit, or drought reserve**
- **Reductions in power consumption, chemical usage, and waste disposal helps with:**
 - Water utility operating costs
 - Environmental benefits, such as reduced carbon footprint and waste streams
- **Water is heavy to pump – nearly a ton of product is delivered to each customer every day**



Policy Considerations

- **Benefits of a revenue stabilization mechanism**
 - Sets a regulatory climate that aligns the utility's interests with the State's interest in water efficiency – win/win.
 - Removes the utility's incentive to promote sales
 - Allows utility management to refocus on least-cost investment decisions
 - More closely aligns the utility's revenues with costs
 - May lead to less frequent rate cases



Conclusions

- **Reduced water consumption has environmental and economic benefits for consumers**
- **Water efficiency trend is likely to continue for at least 10-15 more years**
- **Encourage Water Efficiency**
 - In 2016, American Water provided 33,000 conservation kits of various types.
- **Incorporate into capacity planning & supply optimization (system specific)**
- **Implement rate policies and practices that align the State's and utility's interests.**

Questions?