



American Water Works
Association

Dedicated to the World's Most Important Resource®

Impact of Draft PFAS MCLs on US Water Purveyors

Alliance for Risk Assessment (ARA): Beyond Science and Decision Workshop XIV

October 19, 2023

PRIMARY DRINKING WATER STANDARD

- Applies to public water systems (PWS)
- Describes a maximum contaminant level goal (MCLG)
 - *“No known or anticipated adverse effects on the health of persons occur and which allows an adequate margin of safety”*
- Sets minimum finished water quality
 - Maximum contaminant level (MCL) or
 - Treatment technique
- MCL must be:
 - As close to MCLG as “feasible” taking cost into account
- Compliance monitoring, compliance calculation, and reporting framework



BACKDROP FOR PFAS RULEMAKING

- Provisional PFAS Health Advisories for PFOA and PFOS
- Active regulatory action to list PFOA and PFOS as hazardous substances
- Lack of permanent PFAS disposal / destruction technology
- Significant advocacy and individual communities worried about sites with gross contamination

Chemical	Lifetime Health Advisory Level (ng/L)	Minimum Reporting Level (ng/L)
Perfluorooctanoic acid (PFOA)	0.004	4
Perfluorooctanesulfonic acid (PFOS)	0.02	4
Hexafluoropropylene oxide dimer acid (HFPO-DA)	10	5
Perfluorobutanesulfonic acid (PFBS)	2,000	3



OVERVIEW OF PFAS PROPOSAL

Chemical	MCLG	MCL	Critical Health Endpoint	Health Based Water Conc.
PFOA	0 ng/L	4.0 ng/L	Cancer	
PFOS	0 ng/L	4.0 ng/L	Cancer	
Perfluorohexanesulfonic acid (PFHxS)	Hazard Index of 1.0		Thyroid Effects	9.0 ng/L
Perfluorononanoic acid (PFNA)			Developmental Effects	10 ng/L
PFBS			Thyroid Effects	2000 ng/L
HFPO-DA			Liver Effects	10 ng/L

Trigger level for reduced monitoring is at one third of the MCLs, (1) PFOA and PFOS is 1.3 ng/L and (2) HI PFAS (PFHxS, HFPO-DA, PFNA, and PFBS), is 0.33



PFAS HAZARD INDEX

$$HI = \left(\frac{[PFHxS \text{ ng/L}]}{9.0 \text{ ng/L}} \right) + \left(\frac{[GenX \text{ ng/L}]}{10.0 \text{ ng/L}} \right) + \left(\frac{[PFNA \text{ ng/L}]}{10.0 \text{ ng/L}} \right) + \left(\frac{[PFBS \text{ ng/L}]}{2000 \text{ ng/L}} \right)$$

Example:

$$HI = 1.1 = \left(\frac{[5 \text{ ng/L}]}{9.0 \text{ ng/L}} \right) + \left(\frac{[0 \text{ ng/L}]}{10.0 \text{ ng/L}} \right) + \left(\frac{[5 \text{ ng/L}]}{10.0 \text{ ng/L}} \right) + \left(\frac{[0 \text{ ng/L}]}{2000 \text{ ng/L}} \right)$$

When the average of four consecutive quarter sample HI values >1.0 then that entry point (EPTDS) has a PFAS HI MCL violation.



PFAS IN DRINKING WATER – HAZARD INDEX

$$HI = \left(\frac{[PFHxS \text{ ng/L}]}{9.0 \text{ ng/L}} \right) + \left(\frac{[GenX \text{ ng/L}]}{10.0 \text{ ng/L}} \right) + \left(\frac{[PFNA \text{ ng/L}]}{10.0 \text{ ng/L}} \right) + \left(\frac{[PFBS \text{ ng/L}]}{2000 \text{ ng/L}} \right)$$

Example:

$$HI = \left(\frac{[4.5 \text{ ng/L}]}{9.0 \text{ ng/L}} \right) + \left(\frac{[5.2 \text{ ng/L}]}{10.0 \text{ ng/L}} \right) + \left(\frac{[5 \text{ ng/L}]}{10.0 \text{ ng/L}} \right) + \left(\frac{[0 \text{ ng/L}]}{2000 \text{ ng/L}} \right) = 1.52$$

> MCL



PFAS IN DRINKING WATER – HAZARD INDEX

- Very few PWSs are likely to trigger hazard index as proposed

Chemical	Number of Systems with Detections	Number of Systems with PFAS > HBWC
PFHxS & PFNA	605 (7.5%)	32 (0.4%)
PFBS & PFHxS	765 (9.5 %)	0 (0%)
PFBS & PFNA	571 (7.0 %)	0 (0%)
PFBS, PFHxS & PFNA	551 (6.8 %)	0 (0%)



PFAS RULE - PROPOSAL

- Monitoring at each entry point to the distribution system
- Routine monitoring is quarterly with prospect of reduced monitoring
- Return to routine monitoring if a sample exceeds trigger
- Rolling annual average for compliance determination

Chemical	MCLG	MCL	Practical Quantitation Level	Trigger Level
Perfluorooctanoic acid (PFOA)	0 ng/L	4.0 ng/L	4.0 ng/L	1.3 ng/L
Perfluorooctanesulfonic acid (PFOS)	0 ng/L	4.0 ng/L	4.0 ng/L	1.3 ng/L

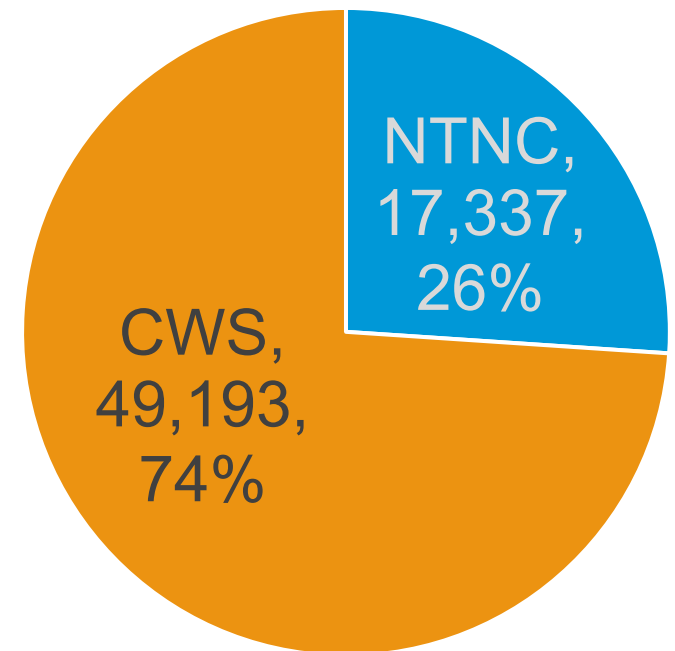


SYSTEMS IMPACTED

- Approximate 66,560 public water systems are subject to the proposed PFAS drinking water standard
- The majority of regulated entities are small, serving less than 10,000 persons

EPA estimates that 6.5% of PWSs (>4,300 systems) will exceed an MCL and have to install treatment or find an alternative water supply. Seventy-five percent of systems exceeding will serve less than 10,000 persons.

EPA's estimate is probably low – Data collected by Corona Environmental for AWWA place estimate at almost 7,300 systems with PFOA and PFOS greater than the MCLs.



SYSTEM SIZE IMPACTS

- System size has real implications for household level costs

PWS Size (persons served)	Cost per Household (annual \$)
<100	\$10,090 – 11,150
101 – 500	\$4,045 – 4,245
501 – 1,000	\$1,765 – 1,910
1,001 – 3,300	\$765 – 800
3,301 – 10,000	\$525 – 545
10,001 – 50,000	\$335 – 340
50,001 – 100,000	\$185 – 195
100,001 – 1 million	\$145 – 160
>1 million	\$80 - 105

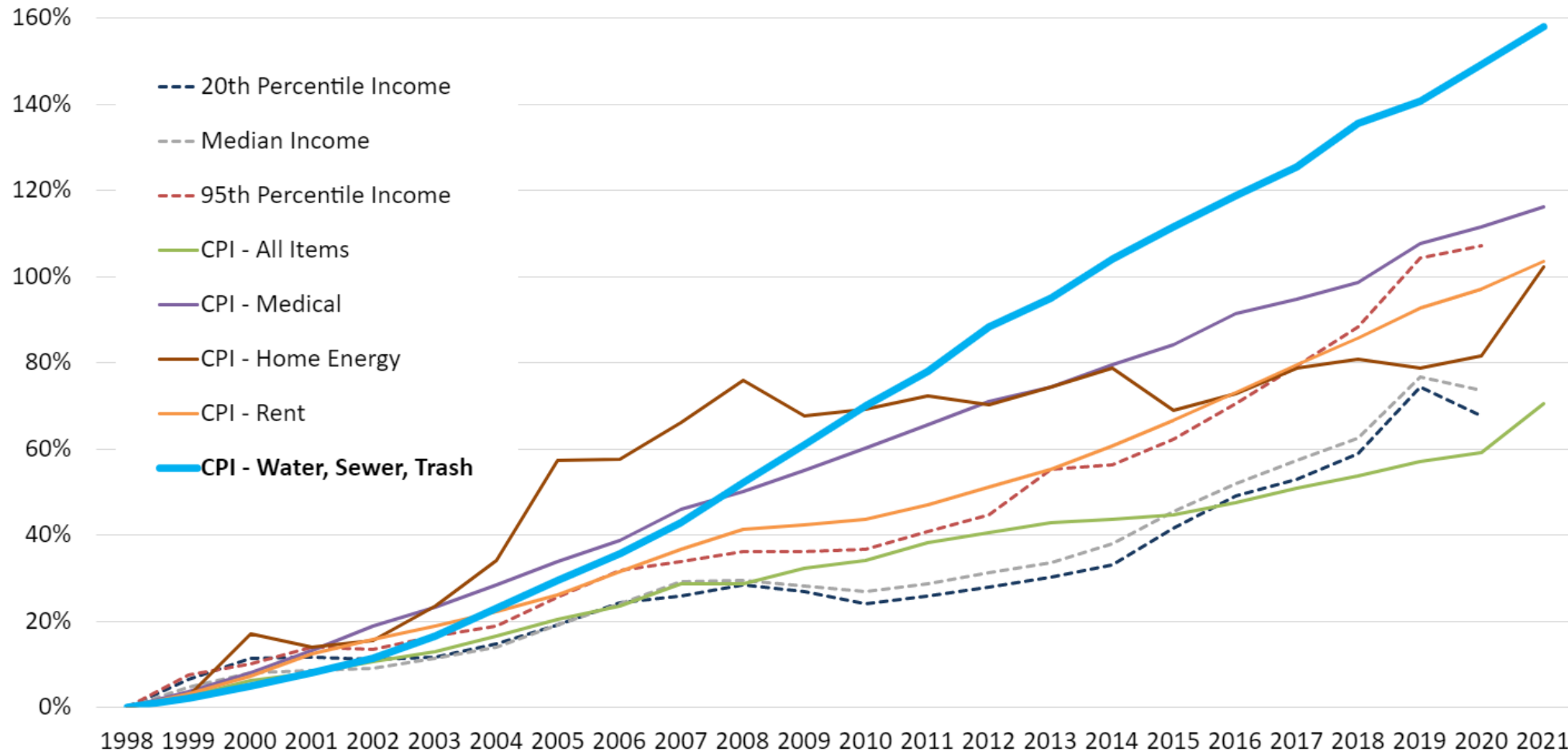
Black and Veatch Analysis (in 2022 \$s)

PWS Size (persons served)	Afford- ability Threshold	Baseline Water Cost
<100	\$1,384	\$507
101 – 500		
501 – 1,000	\$1,340	\$587
1,001 – 3,300		
3,301 – 10,000	\$1,468	\$613

EPA analysis of affordability based on median household income (in 2021\$) (88 FR 18687)



RELATIVE CHANGE IN COST OF WATER SERVICE



Source: Federal Reserve Economic Data. <https://fred.stlouisfed.org>, U.S. Census www.census.gov



EPA'S NATIONAL BENEFIT-COST ANALYSIS

COSTS		
Annualized Cost (\$2021 Millions)	Discount Rate	
	3%	7%
PWS Sampling	\$90.32	\$92.97
PWS Implementation and Administration	\$1.71	\$3.52
PWS Treatment	\$676.56	\$1,105.66
Total PWS	\$768.57	\$1,202.09
Primacy Agency Rule Implementation and Administration	\$7.96	\$8.76
Total	\$776.54	\$1,210.90

BENEFITS		
Annualized Benefit (\$2021 Millions)	Discount Rate	
	3%	7%
Birth Weight	\$177.66	\$139.01
Cardiovascular Disease	\$533.48	\$421.10
Renal Cell Carcinoma	\$300.56	\$217.37
Bladder Cancer (via DBP reduction)	\$221.30	\$130.63
Total	\$1,232.98	\$908.11



EPA'S BENEFIT-COST ANALYSIS

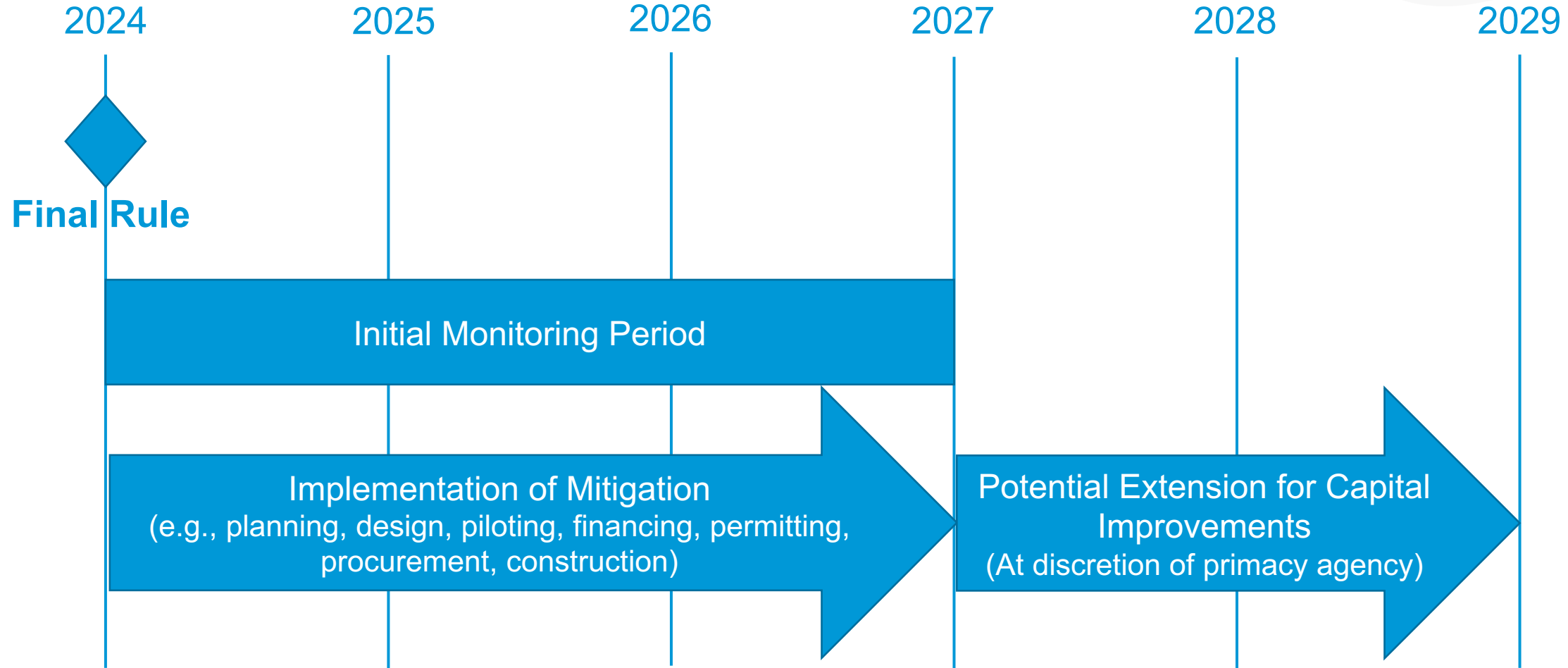
An analysis developed for AWWA by Black & Veatch estimated annualized cost to be at least three times as great.

The Black & Veatch cost estimate, \$2.9 billion or \$3.8 billion (\$2022) at 3% and 7% discount rates, respectively, assumed:

- Primacy agency implementation capacity exists
- Laboratory capacity is adequate
- Manufacturing, fabrication, and construction capacity is adequate



TIMELINE FOR IMPLEMENTATION

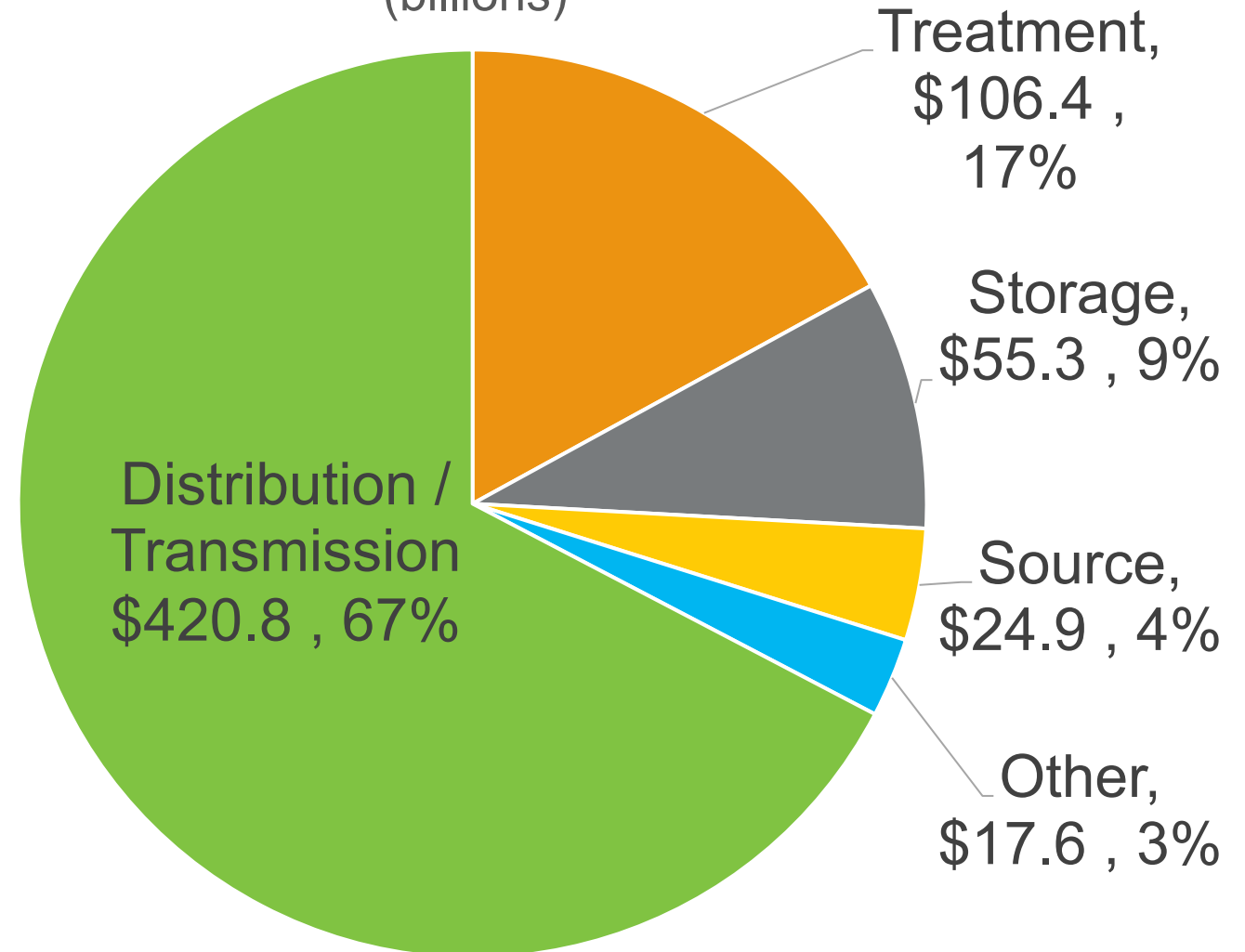


COMPETING INFRASTRUCTURE DEMANDS

Lead Service Line
Replacement
(9.2 million lines,
\$91.1 billion)

PFAS Drinking Water
Standard
(>\$36.1 billion)

Seventh Needs Survey
(billions)



IMPACT ON POLICY SETTING

... The Administrator shall, ... determines that— (i) the contaminant **may have an adverse effect on the health of persons**;
(ii) ... known to occur or there is a **substantial likelihood that the contaminant will occur** ...
(iii) ...presents a **meaningful opportunity for health risk reduction** ...

...**Use of science** in decision making.

... shall ensure ... presentation of information on public health effects is comprehensive, informative, and understandable. ...

(C) **Health risk reduction and cost analysis.**— ...

- (II) Quantifiable and nonquantifiable health risk reduction benefits for which there is an actual basis in the rulemaking record ...
- (III) Quantifiable and nonquantifiable costs for which there is a factual basis in the rulemaking record
- ... analysis of the health risk reduction benefits and costs likely to be experienced as the result of compliance with the treatment technique and alternative treatment techniques that are being considered, ...

CLOSING REMARKS

- Resources are limited and those expended to overcome one challenge are not available for other pressing needs
- The national costs of the PFAS standard are substantial and they are almost entirely borne by a small fraction of water systems – many of which are small systems
- For regulations to be effective they must be implementable