

# *Water Utility Update*

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# *2019 – Year of Clean Drinking Water*

- Governor Evers’s Declaration in 2019 State of the State address
- “Right of every Wisconsinite to have safe, clean drinking water when they turn on their taps.”

# *Drinking Water Providers in WI*

- 73% of WI residents get their water from a “community water system”
  - 1,053 community water systems
  - “Municipal community water systems” are owned by cities, villages, towns or sanitary districts
    - 610 municipal systems in Wisconsin
    - Milwaukee Waterworks largest; smallest serve fewer than 50 people
  - “Other-than-municipal community water systems” serve residents living in areas supplied by privately-owned wells
    - Mobile home parks, apartment buildings, condominium complexes and long term care facilities
- 27% of WI residents get their water from private domestic wells

# *Drinking Water Quality*

- For community water systems
  - Safe Drinking Water Act regulates water quality
  - Water quality testing required
  - Water quality standards established
- For private domestic wells
  - Well construction requirements
  - Bacteria testing for new wells
  - No continued water quality testing required

# *Safe Drinking Water Act*

- EPA sets national limits for contaminants in drinking water
  - Maximum Contaminant Levels (MCLs)
  - EPA has drinking water regulations for more than 90 contaminants
- Establishes monitoring requirements for regulated contaminants
- Requires customer notification if requirements not met
- Corrective action required if an MCL is exceeded
- **99% of WI public water systems met all MCL standards during 2018**

# *Speaker's Task Force on Water Quality*

- 16 members; bipartisan
  - 12 from Assembly; 4 from Senate
- 14 hearings throughout the State in 2019
- Most input on:
  - Nitrate in groundwater
  - Nonpoint pollution
  - Pathogens in groundwater
  - Lead in drinking water
  - PFAS
- 1/8/20 - Report and recommendations for legislation

# *Public Water Utility Issues*

- Lead in drinking water
  - Lead pipes
- PFAS
  - Contaminant not currently regulated by the SDWA
- Nitrate, nonpoint pollution, and pathogens are primarily private well issues
  - Nitrate and pathogens addressed by SDWA

# *PFAS – An Unregulated Contaminant*

- PFAS stands for
  - perfluoroalkyl substances and polyfluoroalkyl substances
- Large family of man-made compounds containing carbon-fluorine bonds
- Wide variety of physical and chemical properties
- Manufacturing of PFAS began in 1940's
  - 3M primary manufacturer



# *Many Uses of PFAS*

- Highly useful characteristics
  - Repel oil and water
  - Reduce surface tension
  - Temperature resistance
  - Friction reduction
- Many different industries used PFAS in the manufacturing process
  - Corrosion prevention
  - Mechanical wear reduction
  - Wetting agent/fume suppressant for chrome, copper, nickel, and tin electroplating
- Many different industries incorporated PFAS in the goods they manufactured

# *PFAS in Commercial and Consumer Products*

- Paper and packaging
- Clothing and carpets
- Outdoor textiles and sporting equipment
- Ski and snowboard waxes
- Non-stick cookware (Teflon)
- Cleaning agents and fabric softeners
- Polishes and waxes, and latex paints
- Pesticides and herbicides
- Hydraulic fluids
- Windshield wipers
- Paints, varnishes, dyes and inks
- Adhesives
- Medical products
- Personal care products (ex. shampoo, conditioners, sunscreen, cosmetics, toothpaste, dental floss)

# *PFAS used in Firefighting Foam*

- Certain firefighting foam (aqueous film-forming foam (AFFF)) contains PFAS
- Designed to extinguish
  - Flammable and combustible liquids and gases
  - Petroleum greases, tars, oil, and gasoline
  - Solvents and alcohol
- Highly effective - when mixed with water, creates a film that spreads across the surface of the hydrocarbon fuel to extinguish flame and create a barrier to prevent re-ignition
  - Used at airports, military facilities, chemical plants

# *Concerns Emerge About PFAS*

- In early 2000s, PFAS began to be documented in environmental studies
- Initial attention focused on the “longer-chain” PFAS
  - PFOA and PFOS
  - Manufacturing changes reported eliminated the manufacture of PFOS and PFOA in the U.S.
- Replaced with “shorter-chain” PFAS
  - Less information on impact of shorter-chain PFAS

# *Pervasive Presence*

- Mobile, persistent, and bioaccumulative
- Not known to degrade in the environment
- PFAAs are found in many places throughout the globe, even in areas well beyond where they were initially used or manufactured
- PFAAs (such as PFOS and PFOA) are also found in the blood of most people whether exposed in the workplace or not

# *EPA Required Monitoring on PFAS*

- Federal Unregulated Contaminant Monitoring Rule (UCMR) allows EPA to requires certain drinking water systems to monitor for unregulated contaminants that may be present in drinking water
- 3rd Round of UCMR
  - 4,900 public water systems required to test (all systems serving more than 10,000 people plus a subset of smaller systems)
  - Monitored 6 PFAAs, including PFOS, PFOA and PFHxS
  - Sampling conducted between 2013 and 2015

# *National Results of UCMR3*

- 4,920 public water systems samples
- 194 systems detected one or more of the PFAS sampled
- 63 systems had levels above 70 ppt
  - 96% of water system tested had no detected level
  - 98.7% were below 70 ppt

# *Wisconsin Results of UCMR3*

- 94 systems sampled
- 3 samples detected one or more of the PFAS sampled
- 1 system had a PFOS level above 70 ppt



# *EPA Set Health Advisory for PFAS*

- In May 2016, EPA set a Health Advisory for PFOS and PFOA combined at 70 ppt
  - One part per trillion = four grains of sugar in an Olympic-size swimming pool
  - One part per trillion = One second in 32,000 years
- Health Advisories are non-enforceable and non-regulatory
- Provide technical information to state agencies and other public health officials on health effects, analytical methodologies, and treatment technologies associated with contaminants known or anticipated to occur in drinking water
- According to EPA, this health advisory level “offers a margin of protection for all Americans throughout their life from adverse health effects resulting from exposure to PFOA and PFOS in drinking water.”

# *EPA Slow to Act on PFAS*

- No movement on setting an MCL for PFAS after UCMR3
- SDWA includes a process for setting standards for additional contaminants
  - Lengthy process
  - No new standards set in 20 years
- Lack of confidence that EPA would act
  - States begin to act independently

# *Wisconsin Begins to Act on PFAS*

- Begins standard process for establishing groundwater protection standards under Wis. Stat., Ch. 160
  - March 2, 2018 - DNR asks DHS to provide recommendations for groundwater enforcement standards for PFOS and PFOA
  - June 21, 2019 - DHS responds and recommends a standard of 20 ppt for PFOS/PFOA combined

# *DHS Recommendation of 20 ppt*

- Recommendation based on animal studies
- Health effects identified in studies of workers and people living in areas with high levels of PFOA/PFOS
  - Increased cholesterol
  - Liver damage
  - Cause pregnancy-induced hypertension
  - Increase the risk for thyroid disease
  - Decrease antibody response to vaccines
  - Decrease fertility
  - Cause small decreases in birth weight
- Concludes approach used by EPA to set LHA of 70 ppt may not be adequately protective of infants of nursing mothers

# *Administrative Rule-Making Process on PFAS Begins*

- DNR issues Statements of Scope to develop PFAS standards for:
  - Groundwater (Revisions to NR 140)
  - Surface water (Revisions to NR 105, NR 106, and NR 219)
  - Drinking water (Revisions to NR 809)
- Public hearings and comments accepted
- January 22, 2020 -- Natural Resources Board authorizes DNR to begin permanent rulemaking for PFOA and PFOS
  - Rulemaking must be completed in 30 months per statute

# *State Legislation Seeks to Speed Up Standards for PFAS*

- Legislation introduced to
  - Require establishment of emergency rules
  - Require standards to be set at DHS health levels
- Assembly fails to act on most PFAS legislation
- PFAS legislation that passed or is still active
  - 2019 Act 101. Prohibit the use of firefighting foams that contain intentionally added PFAS in training
  - AB 792. Expands the clean sweep program to include collection of fire fighting foams that contain PFAS (Assembly passed, awaiting Senate action)
  - AA2 to SB 559. Authorizes UW System to study PFAS, the human health effects of PFAS, the safe destruction and disposal of PFAS, and safe levels of PFAS in the human body, groundwater, and drinking water (Assembly passed, requires Senate concurrence to amendment)

# *Governor's Executive Order on PFAS*

- Executive Order #40 creates a Coordinating Council comprised of state agencies including DNR, DHS and DATCP (WisPAC)
- WisPAC to develop an Action Plan by 6/30/20
- Action Plan to provide a roadmap for how agencies will address PFAS

# *PFAS - Where are we now in WI?*

- Uncertainty
- Public concern
- No definitive information to provide
- Lots of meetings
- Information gathering
- Focus on DNR rule-making



# *Water Utility Concerns on PFOA and PFOS Standards*

- Responsibility to protect public health
- Focus resources where they will provide the greatest public health protection
  - Are health risks from PFAS exposure in drinking water being evaluated the same way as health risks from other contaminants (like lead, radium, arsenic) have been evaluated?
  - Will PFAS drinking water standards be set in the same way that drinking water standards for other contaminants have been set?

# *SDWA Standard Setting Process*

- Maximum contaminant level goal (MCLG) based on health effects data
- Maximum contaminant level (MCL)
  - Set as close to the MCLG as feasible
  - Considers feasible MCL or treatment technique taking cost into consideration
  - Considers health risk reduction and cost analysis
    - Includes consideration of incremental costs and benefits associated with the proposed and alternative MCL values

# *Cost-Benefit Analysis*

- Inherent in every SDWA MCL is a determination that the marginal benefit of a stricter standard is outweighed by the additional cost to achieve that standard
- If an MCL is set too low, the cost of achieving the standard will be greater than the additional health benefits provided
- American Water Works Association (AWWA) recently provided the Congressional Budget Office its estimate of the national cost to treat PFOA and PFOS at differing MCLs using different treatment processes
  - Estimated a greater than 1,000% increase in both capital costs and annual operation and maintenance (O&M) costs between a 70 ppt MCL and a 20 ppt MCL

## National Capital Cost to Install Treatment

Treatment Objective	Capital Costs (\$ millions)		
	Granular Activated Carbon	Ion Exchange	Reverse Osmosis
< 70 ng/L	\$2,100 - \$4,400	\$1,900 - \$4,100	\$5,700 - \$12,000
< 40 ng/L	\$5,600 - \$12,000	\$5,400 - \$12,000	\$15,000 - \$33,000
< 20 ng/L	\$23,000 - \$50,000	\$22,000 - \$48,000	\$63,000 - \$140,000
Treatment Technique	\$140,000 - \$290,000	\$130,000 - \$280,000	\$370,000 - \$800,000

Source: American Water Works Association 8/8/19 letter to Congressional Budget Office



## National Annual Operating and Maintenance Cost for Installed Treatment

Treatment Objective	Annual Recurring Costs (\$ millions)		
	Granular Activated Carbon	Ion Exchange	Reverse Osmosis
≤ 70 ng/L	\$44 - \$90	\$210 - \$460	\$190 - \$410
≤ 40 ng/L	\$110 - \$240	\$540 - \$1,200	\$480 - \$1,000
≤ 20 ng/L	\$460 - \$980	\$2,200 - \$4,800	\$2,000 - \$4,200
Treatment Technique	\$2,700 - \$5,800	\$13,000 - \$28,000	\$12,000 - \$25,000

Source: American Water Works Association 8/8/19 letter to Congressional Budget Office



# *New Hampshire Example of Cost-Benefit Difference*

- New Hampshire Department of Environmental Services (NHDES) proposed initial standards for four PFAS substances and then promulgated lower standards for those substances
- Lower standards increased estimated capital costs between 2,700% and 3,500%, while the estimated annual O&M costs increased roughly 6,000%

	Initial Standards	Final Standards
PFOA	38 ppt	12 ppt
PFOS	70 ppt	15 ppt
PFHxS	85 ppt	18 ppt
PFNA	23 ppt	11 ppt
Initial Treatment Costs	\$1,851,354 - \$ 5,171,022	\$ 65,046,987 - \$ 142,822,884
Annual O&M Costs	\$ 114,912 - \$ 223,439	\$ 6,914,552 - \$13,444,963

# State Standards Vary

Table 1: State Regulation of PFAS for Finished Drinking Water (February 3, 2020)

Type of Guidance	State	Status	Year	Drinking Water Limit (ng/L or ppt)											
				Combined PFAS	GenX	PFBA	PFBS	PFHpA	PFHxA	PFHxS	PFOA	PFOS	PFNA	PFDA	
Maximum Contaminant Level	Vermont (i)	Effective	May 2019	20				*		*	*	*	*		
	New Hampshire		July 2019							18	12	15	11		
	New Jersey		Sept 2018										13		
		New York (ii)	Rulemaking Proposed	April 2019								14	13		
		July 2019									10	10			
		Michigan (iii)		Oct 2019		370		420			400,000	51	8	16	6
		Massachusetts		June 2019	20				*		*	*	*	*	*
		Connecticut	Pre-Proposal Development Phase	Nov 2019	**				*		*	*	*	*	*
		Pennsylvania		Feb 2018	Specific PFAS Targeted Not Yet Announced										
		Rhode Island		Oct 2019	Specific PFAS Targeted Not Yet Announced										
		Washington		Dec 2017	Specific PFAS Targeted Not Yet Announced										
	Wisconsin	Jan 2020										**	**		
Health Based Guidance Levels	Alaska (iv)	Effective	Apr 2019	70								*	*		
	California (v)		June 2018	Detection Limit											
			Aug 2019									5.1	6.5		
			Connecticut	Dec 2016	70				*		*	*	*	*	
			Maine	Jan 2017	70						*	*	*	*	
			Massachusetts	June 2018	70				*		*	*	*	*	
			Michigan	Feb 2019	70							*	*		
				Feb 2019				1,000				84	9	8	9
				Apr 2017								47		15	
			Minnesota	May 2017								35			
				Aug 2017			7,000								
				Dec 2017				2,000							
			New Jersey	2007								40			
			North Carolina	Sep 2017		140									
	Pennsylvania	2016	70							*	*				
	Rhode Island (iv)	Oct 2017	70							*	*				
	Vermont	July 2018	20							*	*	*	*		

\* Compounds with this symbol shown are included in a group limit.

\*\* Compound limits not yet proposed.



# *Finding the Right Balance*

- According to WI's 2018 Annual Drinking Water Report, WI public water systems already face costs of \$8.5 billion over the next 15 years to meet existing drinking water priorities, like the elimination of lead service lines
- New PFAS drinking water standards could substantially increase that cost
- The NR 809 Statement of Scope estimates that the cost of adding PFAS treatment at one large municipal public water system could be at least \$25 million
- The numerical level set by the DNR will significantly impact the public dollars that must be spent to achieve the standard
- Public health protections achieved from new standards should justify the costs of meeting the numerical standard set



# *A New Twist: EPA Announces Plans to Regulate PFOA and PFOS*

- On 2/20/20, EPA announced its preliminary determination to regulate PFOA and PFOS under the Safe Drinking Water Act
- Preliminary determination provides:
  - Substances may have adverse human health effects
  - Are found in drinking water systems with a frequency and at levels of public health concern
  - Regulating the compounds will reduce health risks
- Next step: acceptance and consideration of public comments, then a final notice with the final regulatory determination
- After final determination to regulate, EPA can begin rulemaking process
- Will it make any difference in states that have already set their own standards already?

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