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ACEEE Hot Water Forum 3/22/18

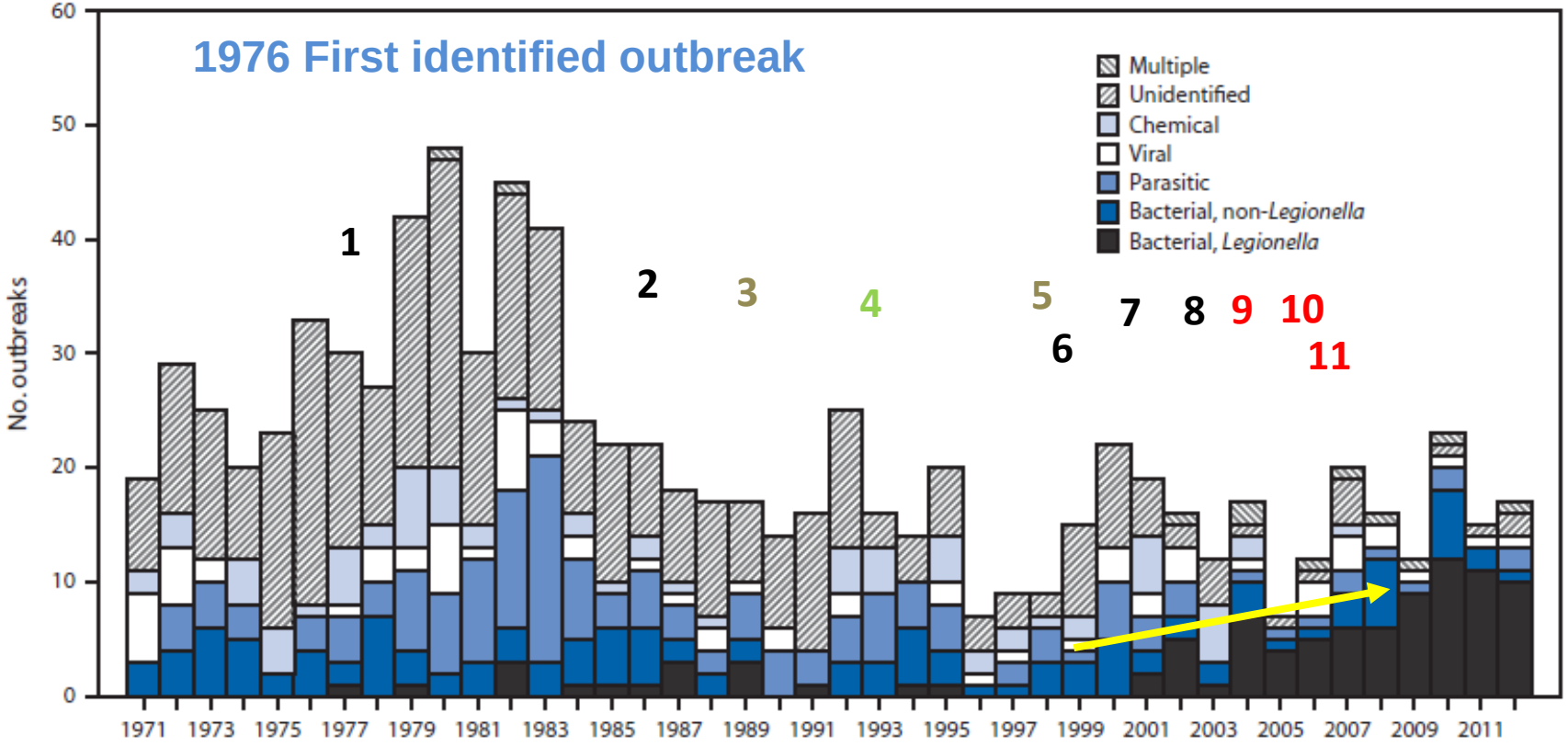
Report on ASHRAE Standard 188 and other Recent Regulations Regarding Legionellosis

2009 Legionnaires' Disease becomes #1 Drinking Water outbreaks in US

CDC Reported DW Outbreaks 1971 - 2012

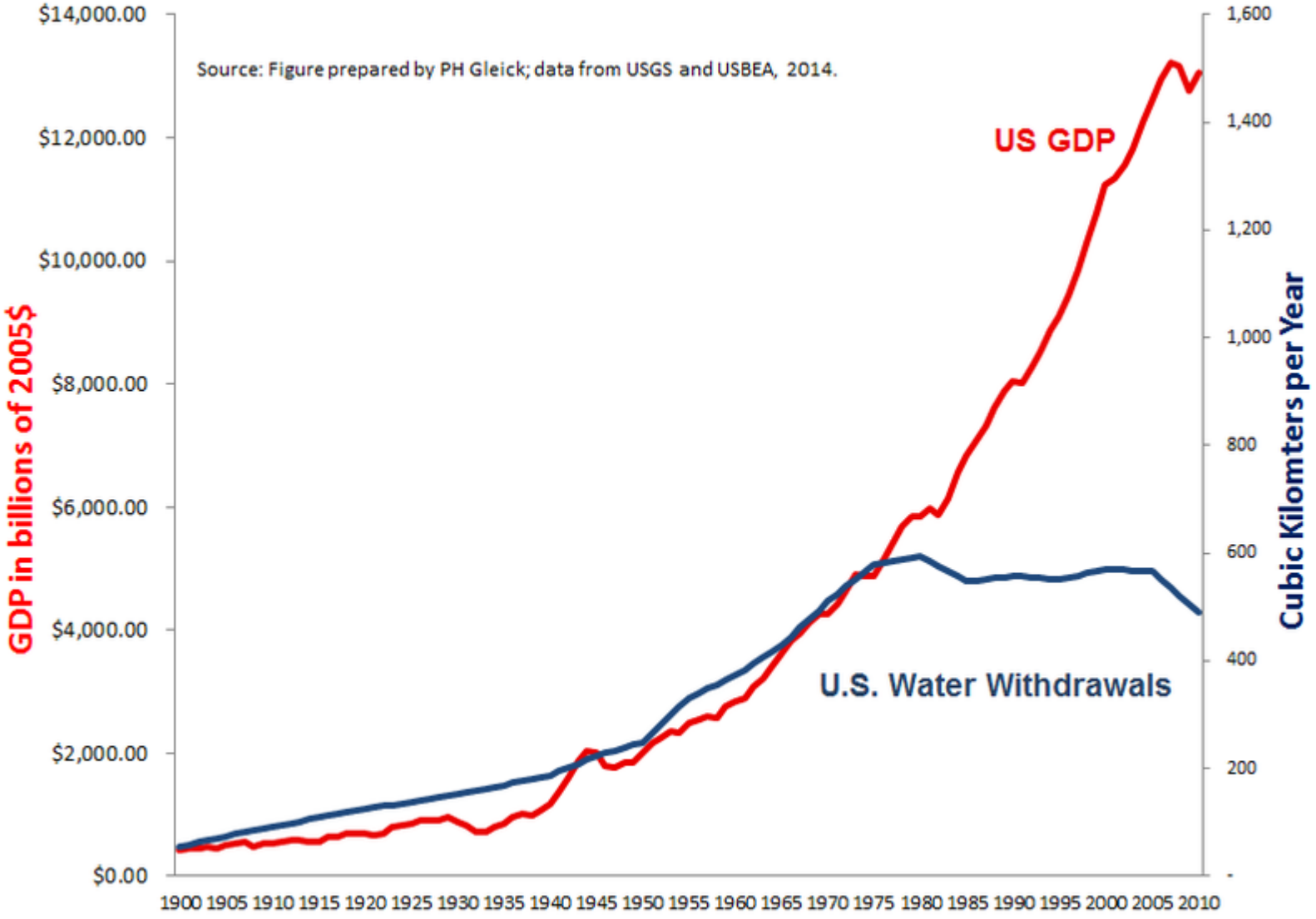
1 – 1974 EPA SDWA
2 – 1987 South Dakota Plumbing Code
3 – 1989 ASHRAE 90.1
4 - 1998 OSHA Legionella Guideline
5 – 1998 USGBC LEED
6 – 1999 ACHD Legionella
7 - 2000 ASHRAE Guideline 12
8 – 2001 Joint Commission EOC
9 - 2003 CDC EIC Guideline
10 – 2006 IPC Public Handwashing Sinks 85 to 110
11 - 2007 EPA Water Sense

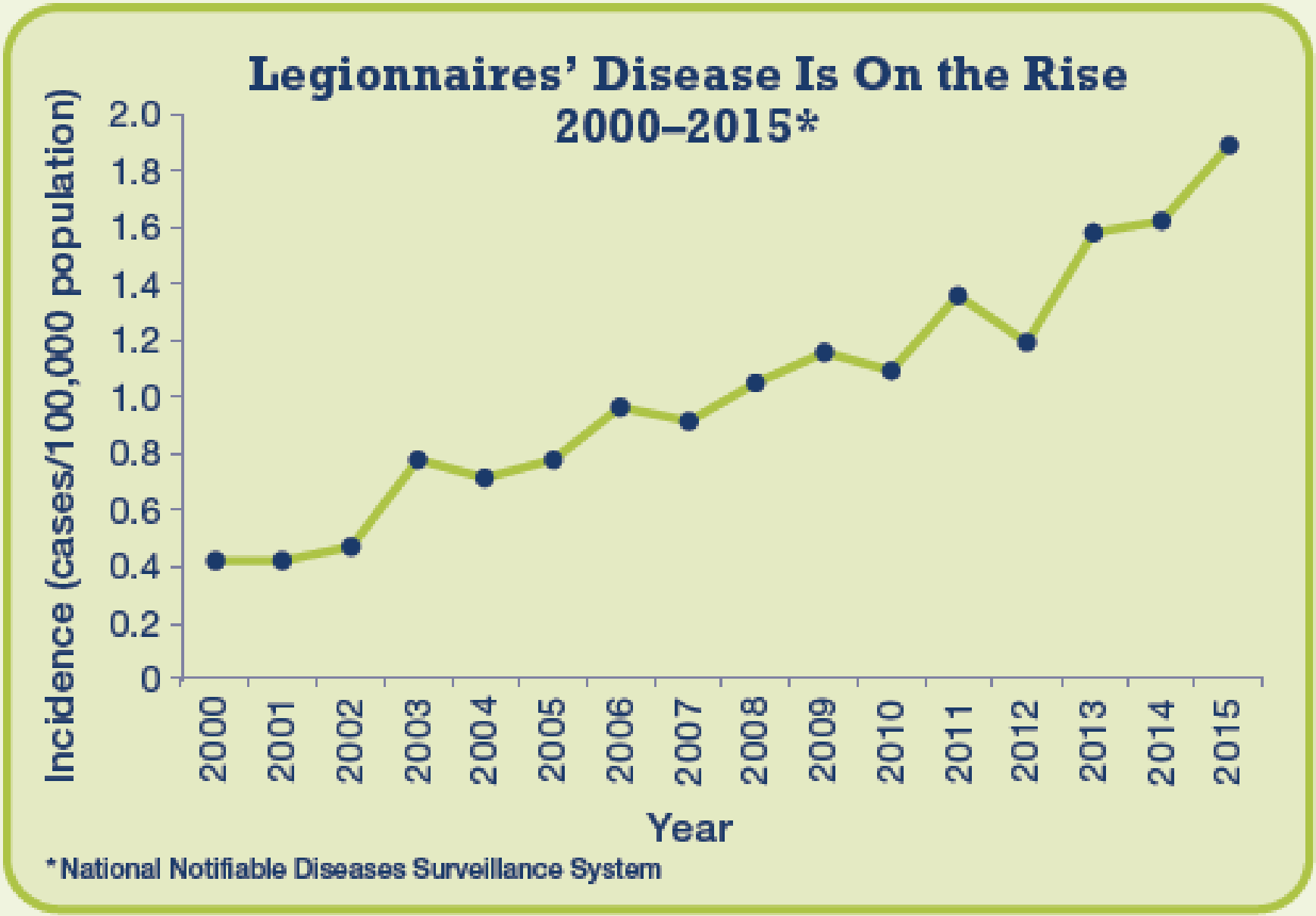
FIGURE. Etiology of 885 drinking water–associated outbreaks, by year — United States, 1971–2012*

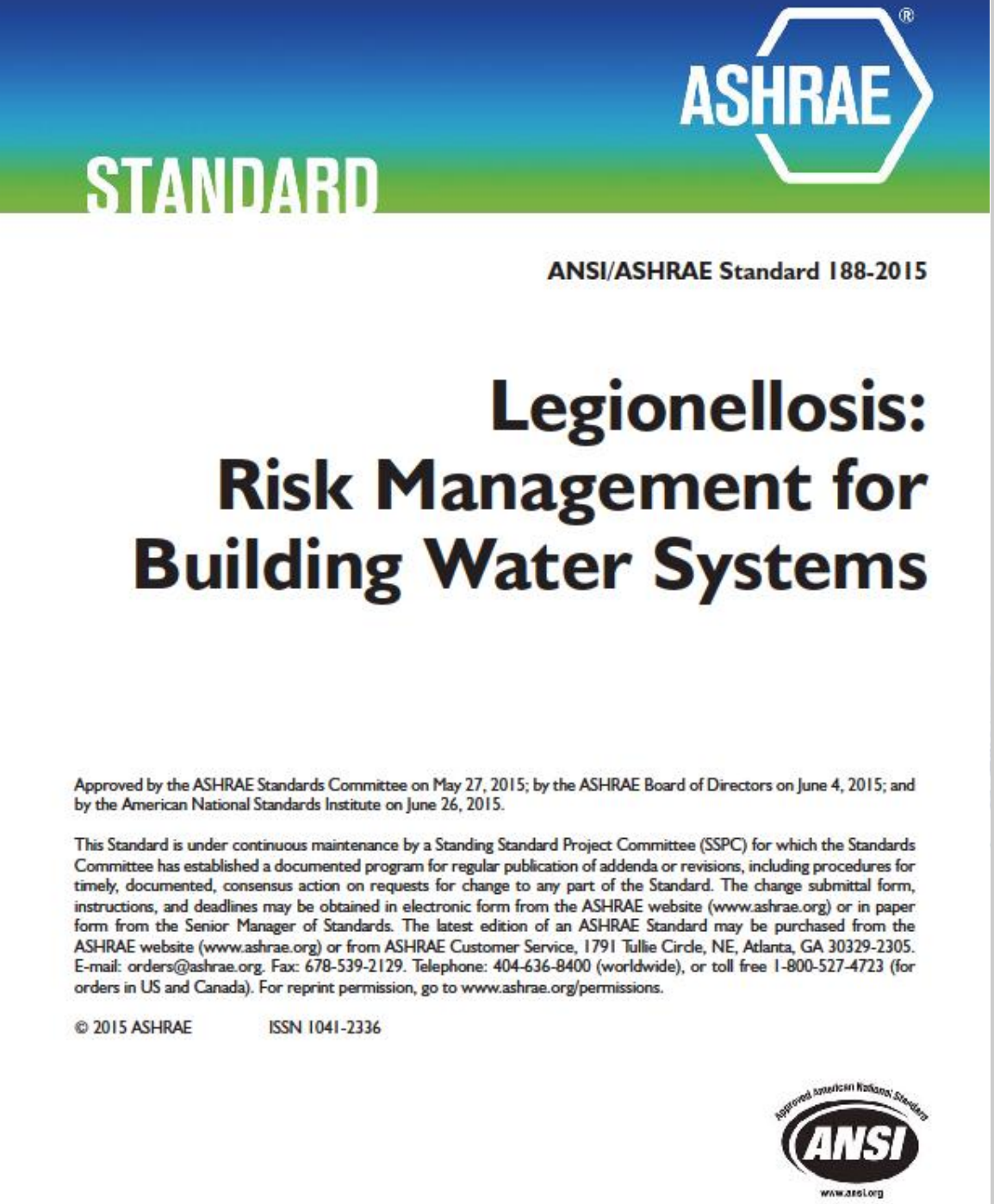


1970 46

U.S. Water Consumption Flat since 1970




Legionnaires' Disease Is On the Rise
2000–2015*
Incidence (cases/100,000 population)
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
Year
*National Notifiable Diseases Surveillance System



ASHRAE / ANSI Standard 188-2015

- Publication Date
  June 26,2015
- First International Legionella Standard

Standard committee members included personnel from following groups / associations:

- CDC
- ASHE
- ASPE
- APIC
- AWT
- GSA
- IAPMO
- NSF
- PMI and
- Major Equipment Manufacturers
- Large Corporations
- Consulting Engineers

CMS codifies ASHRAE 188

- On 6/2/17 CMS issued a memorandum titled: *"Requirement to Reduce Legionella Risk in Healthcare Facility Water Systems to Prevent Cases and Outbreaks of Legionnaires' Disease (LD)"*
- This memorandum states:
  "Facilities must develop and adhere to policies and procedures that inhibit microbial growth in building water systems that reduce the risk of growth and spread of legionella and other opportunistic pathogens in water."
  "CMS expects Medicare certified healthcare facilities to have water management policies and procedures to reduce the risk of growth and spread of *Legionella* and other opportunistic pathogens in building water systems"

June 2017 CMS issued a new US mandate for all healthcare facilities

- The rate of reported cases of legionellosis has increased 286% in the US during 2000–2014
- Approximately 9% of reported legionellosis cases are fatal.
- Outbreaks generally are linked to environmental reservoirs in large or complex water systems.
- 19% of outbreaks were associated with long-term care facilities and 15% with hospitals
- Transmission from these water systems to humans requires aerosol generation, as can occur from showerheads, cooling towers, hot tubs, and decorative fountains.

CMS required steps

Surveyors will review policies, procedures, and reports documenting water management implementation results to verify that facilities:

1. Conduct a facility risk assessment to identify where *Legionella* and other opportunistic waterborne pathogens (e.g. *Pseudomonas*, *Acinetobacter*, *Burkholderia*, *Stenotrophomonas*, nontuberculous mycobacteria, and fungi) could grow and spread in the facility water system.
2. Implement a water management program that considers the ASHRAE industry standard and the CDC toolkit, and includes control measures such as physical controls, temperature management, disinfectant level control, visual inspections, and environmental testing for pathogens.
3. Specify testing protocols and acceptable ranges for control measures, and document the results of testing and corrective actions taken when control limits are not maintained.

CMS also said…

Legionella can grow in building water systems and devices can spread contaminated water droplets via aerosolization. Examples of these devices include:

- Hot and cold water storage tanks, Water heaters,
- Water-hammer arrestors, Pipes, valves, and fittings
- Expansion tanks, Water filters,
- Electronic and manual faucets, Aerators,
- Faucet flow restrictors, Showerheads and hoses
- Centrally-installed misters, atomizers, air washers, and humidifiers, Nonsteam aerosol-generating humidifiers, Eyewash stations, Ice machines, Hot tubs/saunas, Decorative fountains, Cooling towers

From 1987 to 2003 (16 years)

	Legionella Codes	Easy to Follow	Cost Effective	Risk Reduction
1974	EPA Safe Drinking Water Act			
1987	South Dakota	5	5	4
1999	ACHD	5		3.5
1998	OSHA	5	4	4
2001	ASHRAE GDL 12	5	5	5
2001	TJC Environment of Care	5	4	4
2003	CDC EIC Guidelines	5	3	2
2006	IPC Public Hand Washing 85-110F	5		- 2

From 2009 to 2018 (9 years)

Legionella Codes	Easy to Follow	Cost Effective	Risk Reduction
VHA 2009	5	5	5
ACHD 2014 (Rand & PA DEP)	3	0	3
VHA 2014	3	0	3
ASHRAE 188 Standard 2015	5	5	5
EPA Scientific Literature Review 2016	0	0	3
NYS DOH 2016 Cooling Tower	3	3	3
NYS DOH 2016 Potable	0	?	0
NYC DOH 2015 Cooling Tower	5	3	3
NYC DOH 2015 Potable	?	?	?
CDC Toolkit 2016	5	5	4.5
Michigan Guidance	5	5	4.5
CMS Memo (6/2/17)	5	5	5
ASHRAE GDL 12 – 2018 (public review)	5	5	5
NSF 444			

EPA Technologies for *Legionella* Control in Premise Plumbing Systems: Scientific Literature Review

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Hospital Legionella & Lead Case Study aka Inspector Clouseau Creates Havoc

- 2011 - Hospital A installs disinfection system on hot water only after outbreak
  - EPA Primacy Agency policy treating cold water only considered PWS (copper, lead, THM, operator, etc).
- 2014 - EPA Primacy agency changes policy
  - Treating hot water now requires PWS.
  - EPA Primacy Agency recommends to several Legionnaires' disease outbreak building best thing to do is not treat the water.
- 2015 - Hospital A - becomes PWS, operator, Copper, lead, THM testing
  - 1st set of samples in this 4 year old building treating hot water all 4 years
    - lead levels are zero to well below EPA limits.
- 2016 - Hospital A - 2nd sample set, 6 months after 1st sample set
  - Almost all samples had lead levels dramatically above EPA limits.
  - EPA Primacy Agency concluded most likely issue is corrosion of hospital piping caused by disinfection program. Note: building built after low lead plumbing codes, no change in disinfection system in 4 years.
  - Hospital spends well above $½ Million dollars to address the Lead issue. But lead levels didn't go down.
  - Hospital contracts consultant.
    - During interview with media, consultant points out the window to the miles of city water piping that had been worked on prior to this testing, piping where all service lines were lead and it is believed that some mains were lead as well.

National Priorities:
Impacts of Water Conservation on Water Quality in Premise Plumbing and Water Distribution Systems

Solicitation Opening Date: February 1, 2016

U.S. Environmental Protection Agency
Office of Research and Development
National Center for Environmental Research

$4 Million Research Awarded to two Universities. (1/2017)

A Huge Step Forward !

- CDC, EPA and VHA sponsor NASEM to do Legionella project.

NASEM Joins the Fray

(I couldn't be happier ;)

http://dels.nas.edu/Past-Events/Management-Legionella-Water-Systems/DELS-WSTB-16-02/9725

The National Academies of Sciences, Engineering, and Medicine will undertake a project on the management of *Legionella* in water systems.

An *ad hoc* committee of the Academies will review the state of science with respect to *Legionella* contamination of water systems and issue a report that will:

1) describe the microbial ecology of water supplies

2) identify primary sources and routes of human exposure to *Legionella*

3) evaluate effective strategies for controlling and preventing *Legionella*

4) review policies, codes, and guidelines that affect control and prevention of legionellosis

5) identify gaps in research and needs for additional research

ASHRAE 188 will:

1. dispel the myth that the Legionella bacteria are ubiquitous in the environment so there is nothing you can really do about it.
2. will save money
3. increase industry awareness
4. act as a driving force to correct known Plumbing Code Issues related to flow and velocity.
5. act as a driving force to correct known Plumbing Code Issues related to temperature.

Questions?

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