Comments on *Legionella* and Legionnaires’ Disease with Respect to Disinfectant Residual and Public Health Protection

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Prepared for the Public Stakeholder Meeting for the Disinfection Requirements Rule  
Conducted at the  
Rachel Carson State Office Building  
Pennsylvania Department of Environmental Protection  
400 Market St.  
Harrisburg, PA  
March 9, 2016

- *Legionella* is the most well-known of a group of organisms known as opportunistic pathogens  
- Common environmental microbe found in soil and water  
- *Legionella* can be found in treated drinking waters that meet all federal and State standards  
- Legionnaires’ disease (LD) is the #1 waterborne disease (WBD) in the US (US CDC)  
- LD results from water quality degradation in building water systems in the premise plumbing  
- LD is the result of a ‘perfect storm’
  - *Legionella* enter in low numbers from tap water, intrusion from main breaks, cross connections, backflow  
  - The bacteria colonize on pipe and other solid surfaces and grow in biofilms to high levels in premise plumbing  
  - The bacteria are released into the air in microscopic droplets  
  - Susceptible hosts breathe in the droplets  
  - Host immune response is unable to prevent infection
    - Pontiac fever (mild flu like illness, not fatal)  
    - LD (pneumonia, may lead to death)
- LD is preventable (WHO, US CDC)  
- Effects of drinking water treatment, including disinfection, cannot control *Legionella* because the bacteria reproduce in premise plumbing  
- Disinfection is very effective at controlling fecal pathogens in water (*Salmonella, Campylobacter, viruses*)  
- Control of *Legionella* and LD happens in the building, not in the drinking water distribution system  
- World Health Organization
  - Water Safety in Buildings, 2010
- National effort ongoing on many fronts to address this issue of premise plumbing water quality  
  - “The two most commonly identified deficiencies leading to drinking water–associated outbreaks were *Legionella* in building plumbing systems (66%) and untreated groundwater (13%)”. – US CDC, August 2015
• ASHRAE – American Society of Heating Refrigeration and Air-conditioning Engineers
  o ASHRAE Guideline 12-2000 - Minimizing the Risk of Legionellosis Associated with Building Water Systems
  o Revision recently adopted called Standard 188, Prevention of Legionellosis Associated with Building Water Systems
• National Sanitation Foundation (NSF)
  o NSF Standard 444 - Prevention of Injury and Disease Associated with Building Water Quality, due for ballot in summer 2017
  o 2-day training course on HACCP
• US CDC
  o "The two most commonly identified deficiencies leading to drinking water–associated outbreaks were Legionella in building plumbing systems (66%) and untreated groundwater (13%).“ – CDC, August 2015
  o CDC’s current consensus recommendation is that buildings apply HACCP-based water safety management programs for the prevention of disease from waterborne opportunistic pathogens” – Claressa Lucas, Ph.D.
• EPA Funding
  o Impacts of Water Conservation on Water Quality in Premise Plumbing and Water Distribution Systems. $4 million
• Water Research Foundation
  o Held 2 workshops on research needs for premise plumbing
  o Released RFP on Legionella communication re: premise plumbing

• Increasing the disinfectant residual will not control LD or improve public health because the control point is in the building plumbing, not the drinking water distribution system