TENNESSEE HOSPITAL ASSOCIATION

Tennessee Healthcare Engineering Association

TN Department of Health

Legionella Webinar Series

January – June 2019

4th Tuesday of each month

12-1pm CST/ 1-2pm EST

Raise awareness of **legionellosis** and prevention through **water management programs**.

Provide Tennessee healthcare facilities with information and resources to develop and implement water management programs.

Jan 22: **Introduction to Healthcare - Associated Legionellosis**

Feb 26: **Water Management Programs**

Mar 26: **Developing a Water Management Program**

Apr 23: **Healthcare Experiences with Water Management Programs**

May 21: **What to Expect in an Outbreak**

Jun 25: **Review Resources and Healthcare Implications**

Reminders

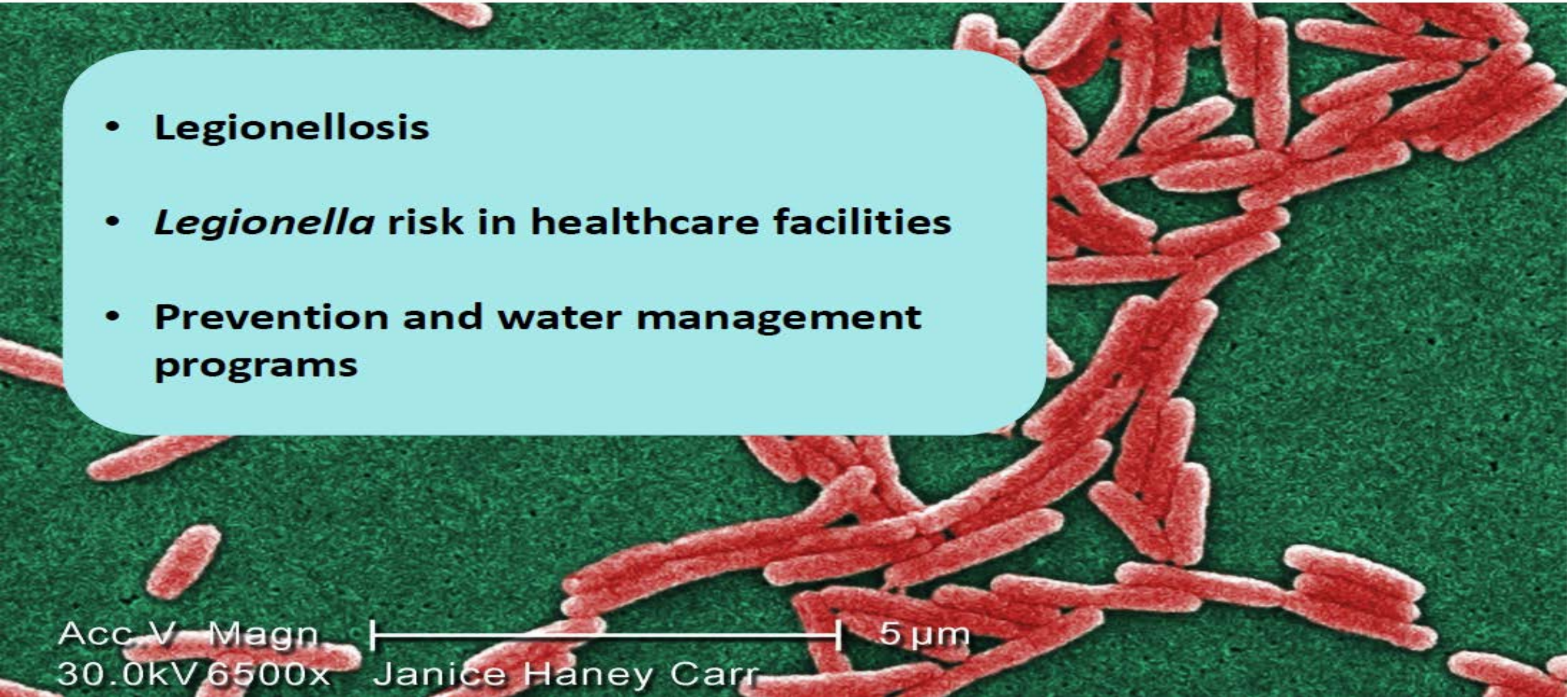
- **Webinars recorded, available online**
  - Previous webinar recording, slides, resources
  - https://tha.com/events-education/legionella-webinar-series/

- **Phone lines muted during webinar**

- **Questions taken at end**
  - Type in chat box

Webinar Series Recap

- Legionellosis
- *Legionella* risk in healthcare facilities
- Prevention and water management programs



Legionellosis is caused by *Legionella* bacteria

- Gram-negative, aerobic, bacillus
- >60 species

Steps Leading to Legionellosis

Legionella **lives in fresh water**

- Natural reservoir for *Legionella*
- Insufficient quantities to cause disease

Certain conditions in large, complex water systems can lead to *Legionella* amplification

- Temperature
- Stagnation
- Scale and sediment
- Biofilm
- Protozoa
- Absence of disinfectant

Certain devices can lead to aerosolization of water containing *Legionella*

- Showers and faucets
- Cooling towers
- Hot tubs
- Decorative fountains

Legionella **can be transmitted to susceptible hosts and cause disease**

- Age > 50 years
- Smoking
- Weakened immune system
- Chronic disease

Slide credit to: Chris Edens, PhD (CDC)

Infection with *Legionella* is called legionellosis

Pontiac fever

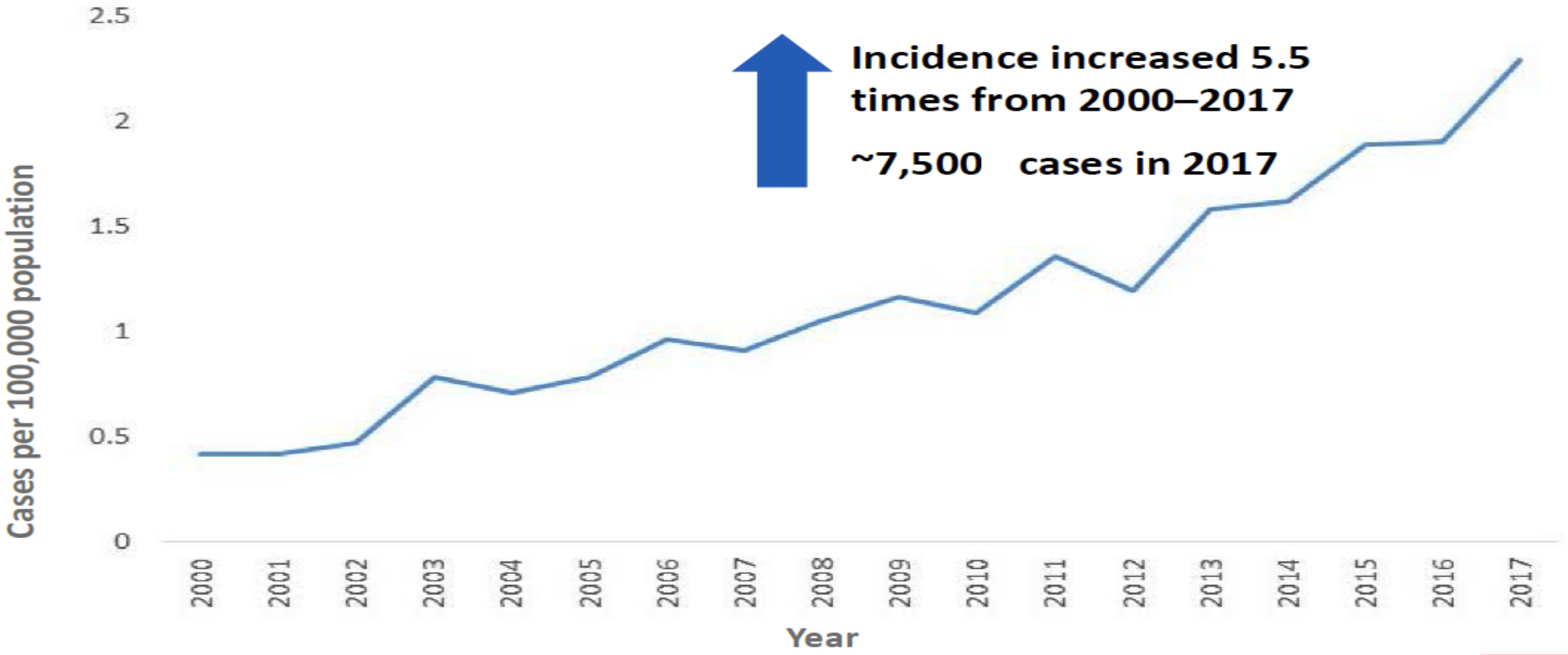
- Mild, self-limited illness
- Symptoms: fever, malaise, chills, fatigue, headache
- No respiratory symptoms or abnormal findings on chest x-ray
- Incubation period: 1-3 days

Legionnaires' disease

- Wide range of illness severity
- Symptoms: fever, cough, shortness of breath, gastrointestinal symptoms, malaise, neurologic signs
- Abnormal radiographic findings on chest x-ray
- Incubation period: 2-10 days
- Case fatality rate: ~10%

TN

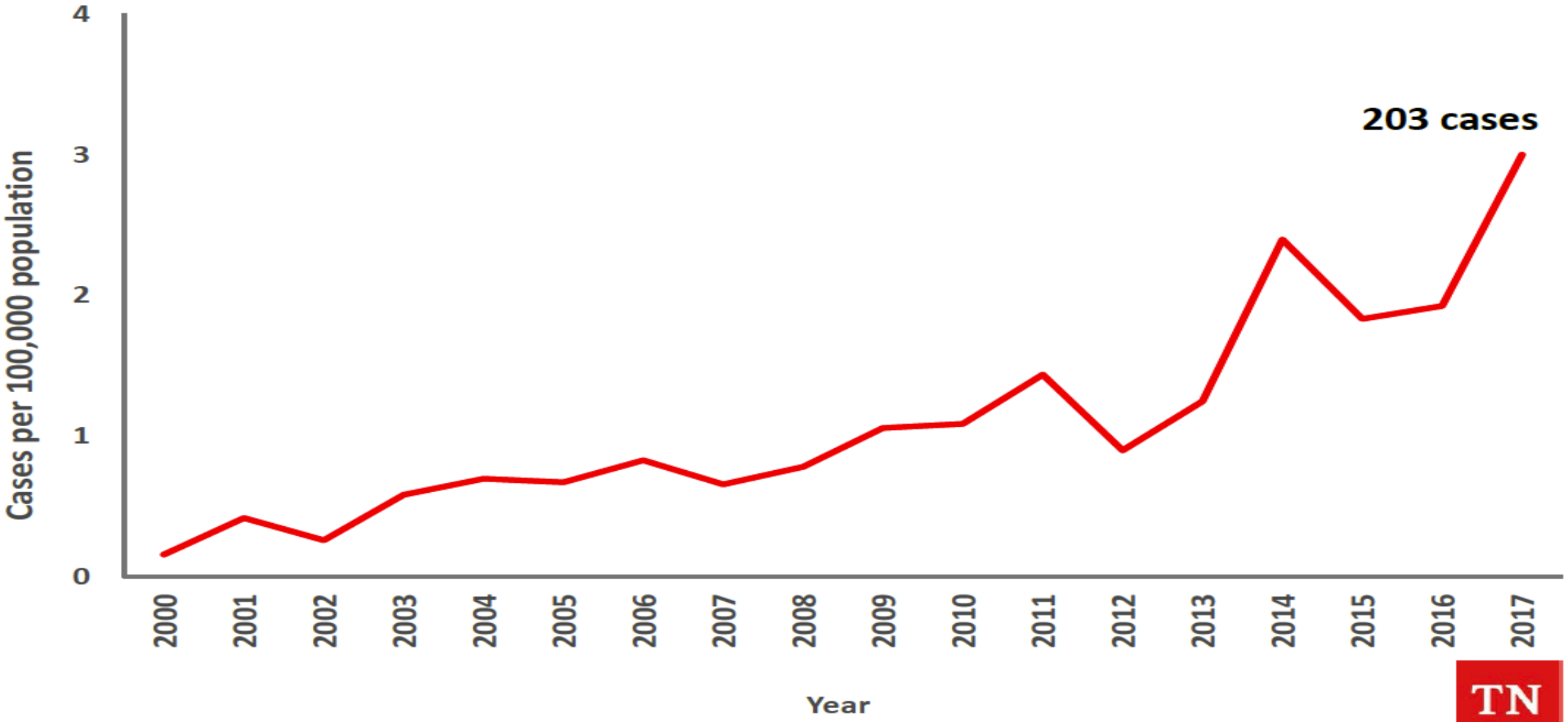
Incidence of legionellosis is rising in the US



Source: CDC NEDSS data

TN

Incidence of legionellosis is rising in Tennessee



TN

Healthcare-Associated Legionellosis

Definition:
A case of legionellosis reporting exposure to a healthcare facility during the 10 days before their illness onset

- **Possible healthcare-associated case:**
  Patient spent part of their 10 day incubation period in the facility

- **Definite healthcare-associated case:**
  Patient spent their entire 10 day incubation period in the facility (did not leave the facility at any point)

- **Case Fatality Rate is ~25%**

TN

Outbreaks of legionellosis occur in healthcare settings

Clinical Infectious Diseases

INVITED ARTICLE

HEALTHCARE EPIDEMIOLOGY: Robert A. Weinstein, Section Editor

Healthcare Outbreaks Associated With a Water Reservoir and Infection Prevention Strategies

Hajime Kanamori,[1,2] David J. Weber,[1,2] and William A. Rutala[1,2]

[1]Division of Infectious Diseases, University of North Carolina School of Medicine, and [2]Hospital Epidemiology, University of North Carolina Health Care, Chapel Hill

Morbidity and Mortality Weekly Report

Notes from the Field

Two Cases of Legionnaires' Disease in Newborns After Water Births — Arizona, 2016

Geoffrey Granseth, MPH[1,2]; Rachana Bhattarai, MS[1]; Tammy Sylvester, MSN[3]; Siru Prasai, MD[3]; Eugene Livar, MD[1]

INFECTION CONTROL AND HOSPITAL EPIDEMIOLOGY FEBRUARY 2012, VOL. 33, NO. 2

ORIGINAL ARTICLE

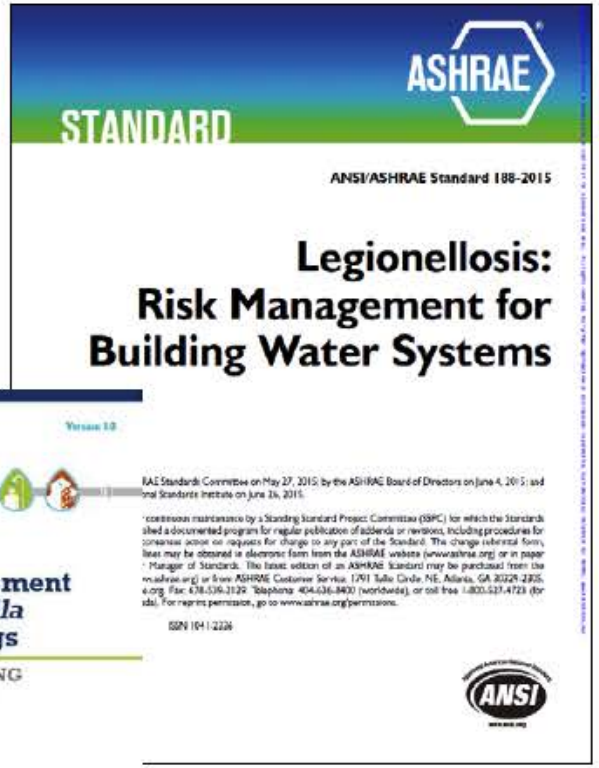
An Outbreak of Legionnaires Disease Associated with a Decorative Water Wall Fountain in a Hospital

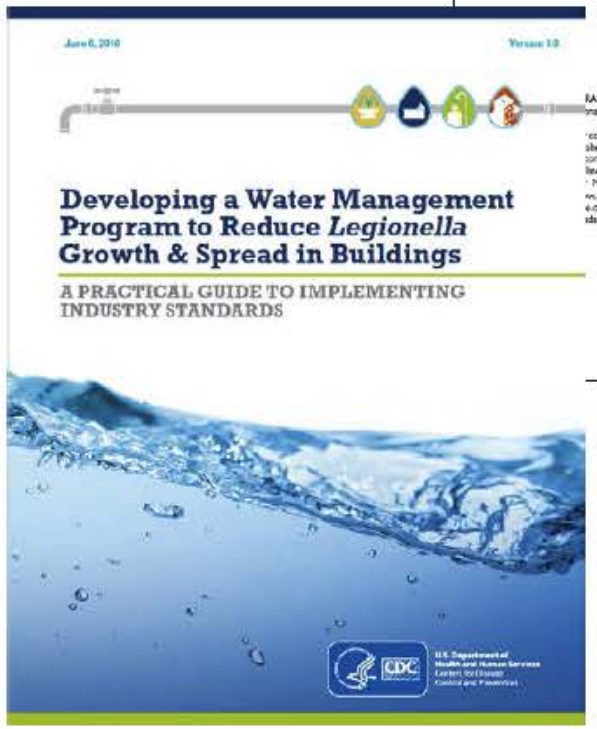
Thomas E. Haupt, MS;[1] Richard T. Heffernan, MPH;[1] James J. Kazmierczak, DVM;[1] Henry Nehls-Lowe, MPH;[1] Bruce Rheineck, MS;[1] Christine Powell, BS;[2] Kathryn K. Leonhardt, MD;[3] Amit S. Chitnis, MD;[1] Jeffrey P. Davis, MD[1]

Outbreaks of legionellosis are preventable

9 in 10

CDC investigations show almost all outbreaks were caused by problems preventable with more effective water management.





Requirements for Water Management Programs

- **Hospitals, Critical Access Hospitals, Long Term Care**
- **Released June 2017, Updated July 2018**

Expectations for Healthcare Facilities

Facilities must have water management plans and documentation that, at a minimum, ensure each facility:

• Conducts 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.

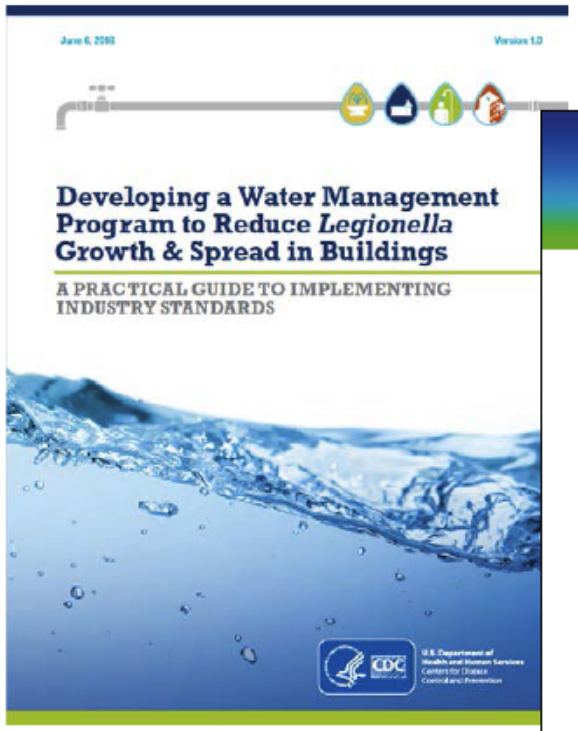
• Develops and implements a water management program that considers the ASHRAE industry standard and the CDC toolkit.

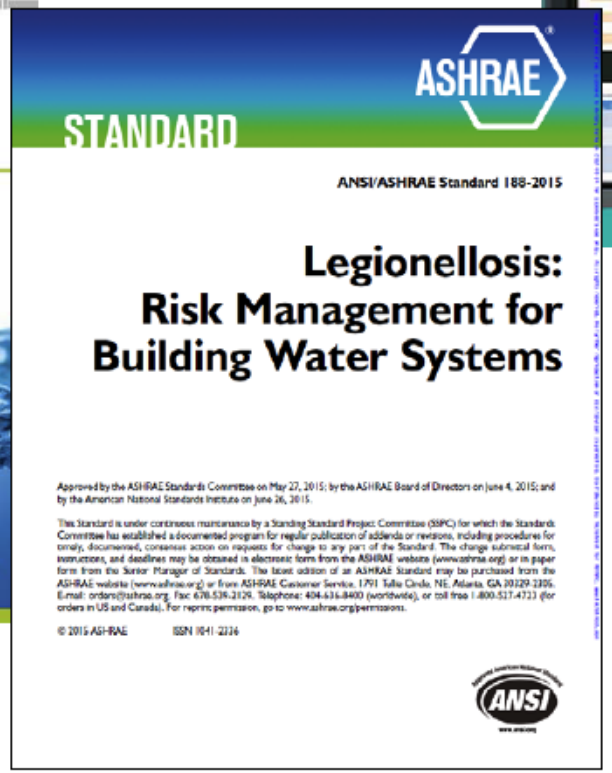
• Specifies testing protocols and acceptable ranges for control measures, and document the results of testing and corrective actions taken when control limits are not maintained.

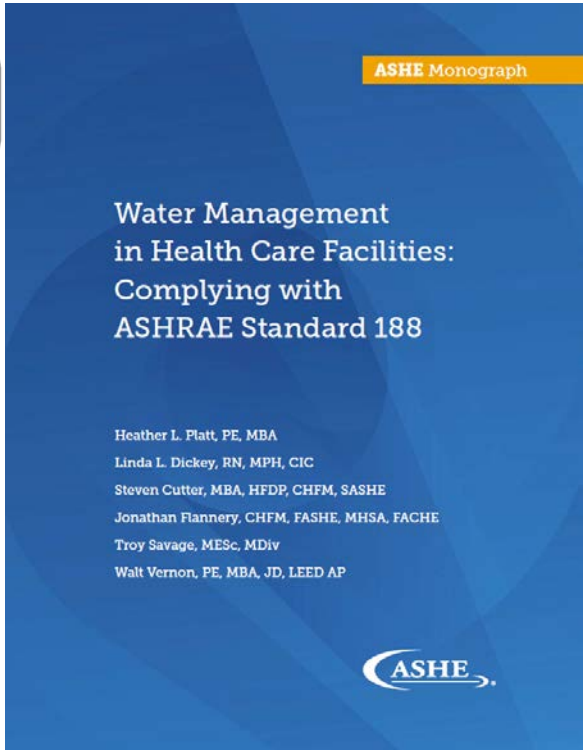
• *Maintains compliance with other applicable Federal, State and local requirements.*

Note: CMS does not require water cultures for Legionella or other opportunistic water borne pathogens. Testing protocols are at the discretion of the provider.

Resources







Resource links and previous recorded webinars available online:
https://tha.com/events-education/legionella-webinar-series/

Developing a Water Management Program

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Developing A Water Management Program

Learning Objectives:

- Describe the major steps necessary for developing a water management program
- Understand the necessary skills and roles needed on a multi-disciplinary water management program team
- Discuss the steps to implementing an ongoing water management program
- Discuss available guides and resources for implementing industry standards

CMS S&C *Legionella* Memo

Expectations for Healthcare Facilities and Surveyors

Review policies and procedures and reports documenting water management implementation results to verify that the facility has:

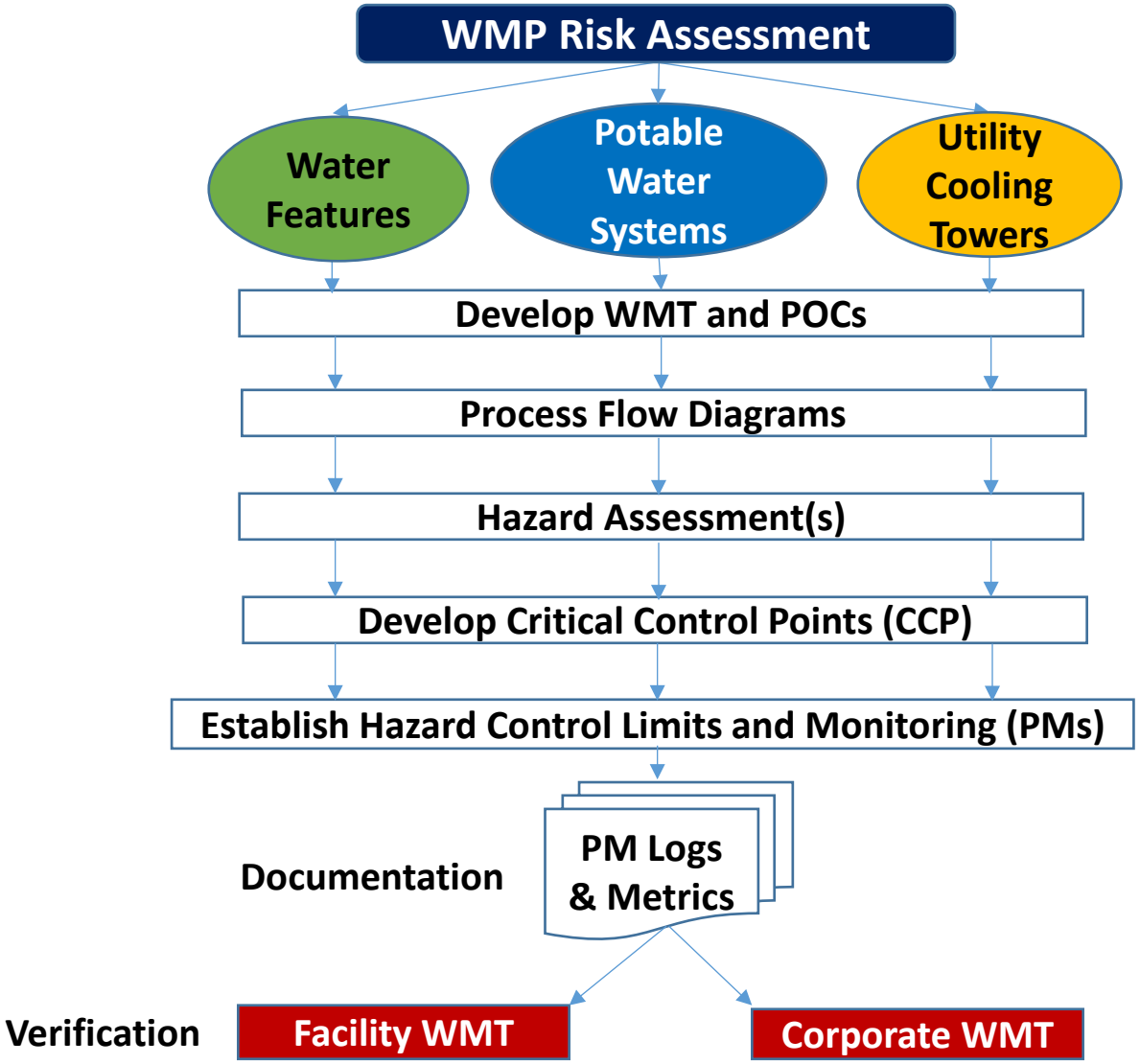
- Conducted **risk assessment** for potential areas of growth and spread.
- Implemented a **water management program** that considers the ASHRAE industry standard and CDC toolkit and that includes control measures (e.g., physical controls, temperature management, disinfectant level control, visual inspections, and environmental testing).
- Specified **testing protocols** and acceptable ranges for control measures and documented the results of testing and corrective actions taken when control limits are not maintained.

https://surveyor-training-content2.s3.amazonaws.com/data/Legionella/Legionella_Export.html

Main Components of Water Management Programs

1. Establish a water management program team
2. Perform a preliminary risk assessment to determine applicability/scope.
3. Describe the building water systems using flow diagrams and a written description.
4. Perform Hazard Analysis: Identify areas where Legionella could grow and spread
5. Decide where control measures should be applied and how to monitor them
6. Establish intervention/outbreak protocols.
7. Make sure the program is running as designed and is effective
8. Document and communicate all the activities

Developing a Water Management Program



Water Management Program Development Model

Steps to Develop a Water Management Program

Water Management Program Team (WMT)

Necessary skills and roles needed on a multi-disciplinary water management program team (WMT):

- Senior leader (authority to make decisions about water restrictions & response measures
- Infection prevention/epidemiology (Per ASHRAE 188 a certified IP or an epidemiologist)
- Facilities Management leader (familiar with the building water systems)
- Quality/Risk Management (familiar with regulations and able to advise on risk determination)

Steps to Develop a Water Management Program

Water Management Program Team (WMT) Formation

1. Select members
2. Educate team on requirements
3. Determine solution model
   - CDC Toolkit + ASHRAE188 with in-house developed policies, procedures, etc.
   - 3rd party
     - Prepackaged WMP program (LAMPS, phiAnalytics™, etc.)
     - Consultant/Vendor (Phigenics, HCPro/Chem Aqua, Garret Callahan, etc.)

Role of Consultants

- **Help deliver documents and provide expertise to team**
  - Perform Hazard Analysis
  - Draft PFDs and Water Use Description
  - Recommend Limits and actions for CCPs
  - Provide Online database for WMP Storage
  - Standardization and Quality across Large Companies
  - Independent Verification and Validation

- **Important to remember the facility owns and operates the program as such responsible for all final decisions**

- **Consultants should be considered non-voting members of WMT**

Developing a Water Management Program

Waterborne Pathogen Risk Assessment

"Conduct a facility risk assessment to identify where waterborne pathogens… could grow and spread in the facility water system."

- Identify buildings at increased risk for legionella

https://www.cdc.gov/legionella/maintenance/wmp-risk.html

- Be sure to consider patient risk groups & healthcare reservoirs such as medical equipment and patient care devices.

- Perform Environmental assessment of identified buildings

https://www.cdc.gov/legionella/downloads/environ-assess-instrument.pdf

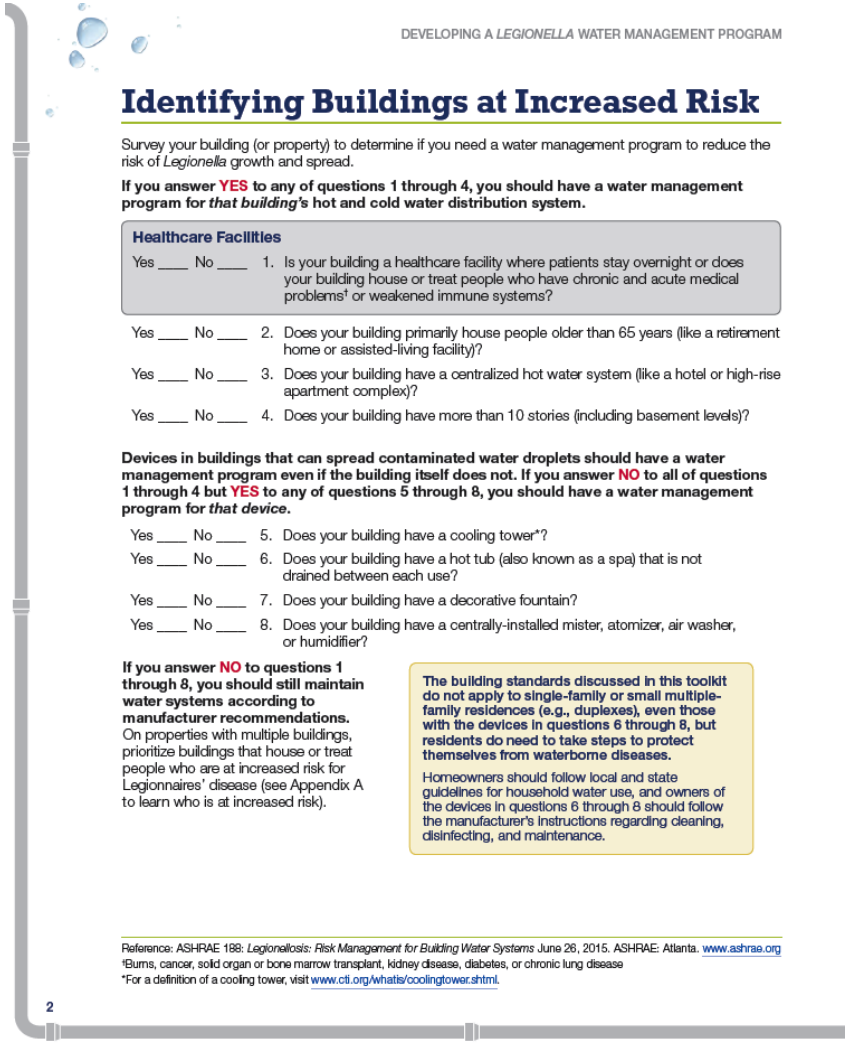
Adapted from https://surveyor-training-content2.s3.amazonaws.com/data/Legionella/Legionella_Export.html

Steps to Develop a Water Management Program

Water Management Program Step - Research

1. Gather information
2. Perform building survey/preliminary risk assessment.
3. Use risk assessment to determine applicability and scope of plan

   https://www.cdc.gov/legionella/wmp/toolkit/index.html or https://www.cdc.gov/legionella/maintenance/wmp-risk.html
4. Determine capability/capacity to perform testing protocols and maintenance practices.



DEVELOPING A *LEGIONELLA* WATER MANAGEMENT PROGRAM

Identifying Buildings at Increased Risk

Survey your building (or property) to determine if you need a water management program to reduce the risk of *Legionella* growth and spread.

If you answer YES to any of questions 1 through 4, you should have a water management program for *that building's* hot and cold water distribution system.

Healthcare Facilities

Yes ____ No ____ 1. Is your building a healthcare facility where patients stay overnight or does your building house or treat people who have chronic and acute medical problems† or weakened immune systems?

Yes ____ No ____ 2. Does your building primarily house people older than 65 years (like a retirement home or assisted-living facility)?

Yes ____ No ____ 3. Does your building have a centralized hot water system (like a hotel or high-rise apartment complex)?

Yes ____ No ____ 4. Does your building have more than 10 stories (including basement levels)?

Devices in buildings that can spread contaminated water droplets should have a water management program even if the building itself does not. If you answer NO to all of questions 1 through 4 but YES to any of questions 5 through 8, you should have a water management program for *that device*.

Yes ____ No ____ 5. Does your building have a cooling tower*?

Yes ____ No ____ 6. Does your building have a hot tub (also known as a spa) that is not drained between each use?

Yes ____ No ____ 7. Does your building have a decorative fountain?

Yes ____ No ____ 8. Does your building have a centrally-installed mister, atomizer, air washer, or humidifier?

If you answer NO to questions 1 through 8, you should still maintain water systems according to manufacturer recommendations. On properties with multiple buildings, prioritize buildings that house or treat people who are at increased risk for Legionnaires' disease (see Appendix A to learn who is at increased risk).

The building standards discussed in this toolkit do not apply to single-family or small multiple-family residences (e.g., duplexes), even those with the devices in questions 6 through 8, but residents do need to take steps to protect themselves from waterborne diseases.

Homeowners should follow local and state guidelines for household water use, and owners of the devices in questions 6 through 8 should follow the manufacturer's instructions regarding cleaning, disinfecting, and maintenance.

Reference: ASHRAE 188: *Legionellosis: Risk Management for Building Water Systems* June 26, 2015. ASHRAE: Atlanta. www.ashrae.org

†Burns, cancer, solid organ or bone marrow transplant, kidney disease, diabetes, or chronic lung disease

*For a definition of a cooling tower, visit www.cti.org/whatis/coolingtower.shtml.

2

Steps to Develop a Water Management Program

WMP Development Step – Map information

Develop Water flow diagrams

- All water supply sources and service entrances
- All water treatment systems and system control measures
- All water processing steps
- All areas where hazardous conditions may contribute to the amplification of Legionella
- All water end points
- Other points identified by the Designated Team

Steps to Develop a Water Management Program

Water System Description (Text format example)

1. Water enters the basement of the property via a 4-inch main from the municipal water line at Maple Street. Water is immediately drawn off to charge the fire suppression system. The rest of the water is sent through cold water distribution. There is backflow prevention throughout the system, including between the cold water distribution and the city water main and between the cold water distribution and the fire suppression system.
2. Cold water is distributed directly to the lit decorative fountain in the lobby, the cooling tower on the roof, the hot tub and pool on the first floor, ice machines on floors 2, 4, 6, 8, and 10, and shower and faucet fixtures in rooms on all 12 floors. All internal plumbing consists of 2-inch copper and polyvinyl chloride (PVC) piping. There is backflow prevention between cold water distribution and the utility lines that serve the cooling tower and hot tub/pool room.
3. Cold water is heated to 140°F by two joined 120-gallon water heaters. The heaters supply a 500-gallon storage tank. Cold water is also delivered to an 80-gallon water heater in the basement that serves the kitchen and staff break room.

Steps to Develop a Water Management Program

Water System Description (Text format example)

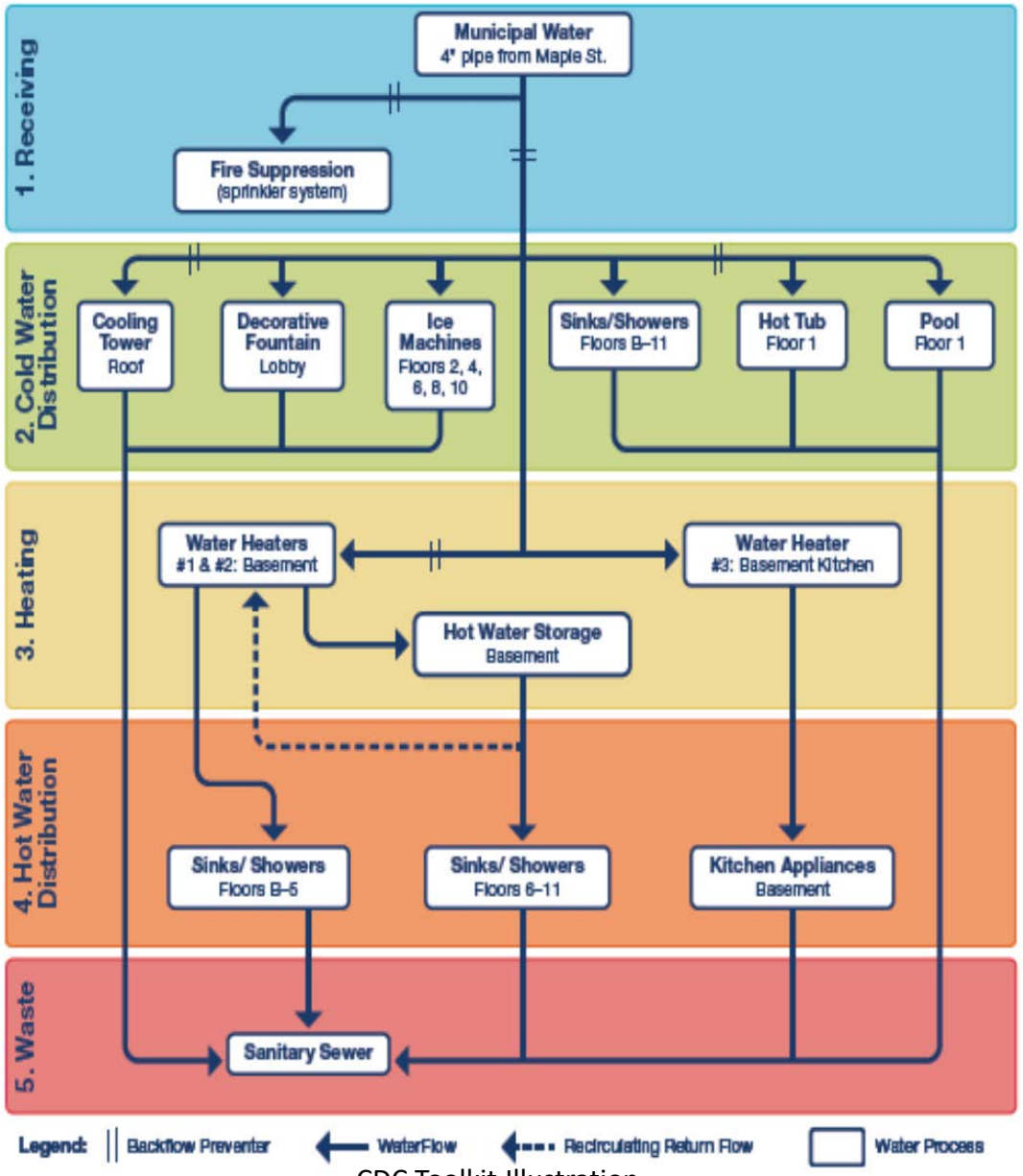
4. Hot water is distributed to plumbing fixtures in the basement through floor 5 from the joined water heaters in the basement on a direct (non-recirculating) line. Hot water is distributed to floors 6 through 11 from the storage tank with a recirculating line designed to return to the joined water heaters in the basement. Note that hot water is tempered (mixed with cold water) at the fixtures by thermostatic mixing valves.
5. Hot, cold, and tempered waste water is discarded through the sanitary sewer line.

Steps to Develop a Water Management Program

Water System Mapping

Development of a water system flow diagram of the entire building water system.

The purpose of the diagram is to help identify potential hazard conditions as well as to identify high-risk patient care locations.

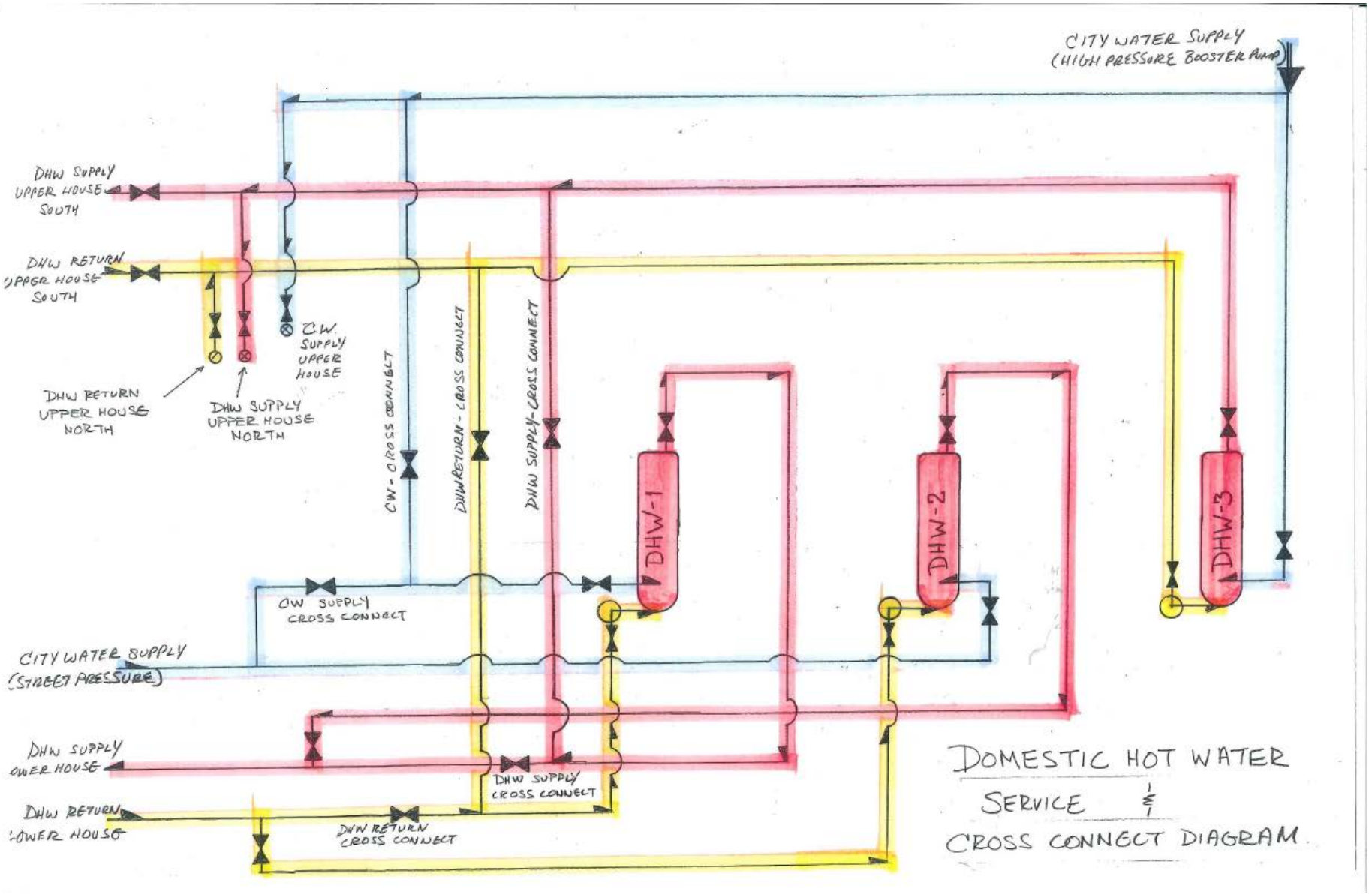


CDC Toolkit Illustration

Steps to Develop a Water Management Program

WMP Development Step – Map information

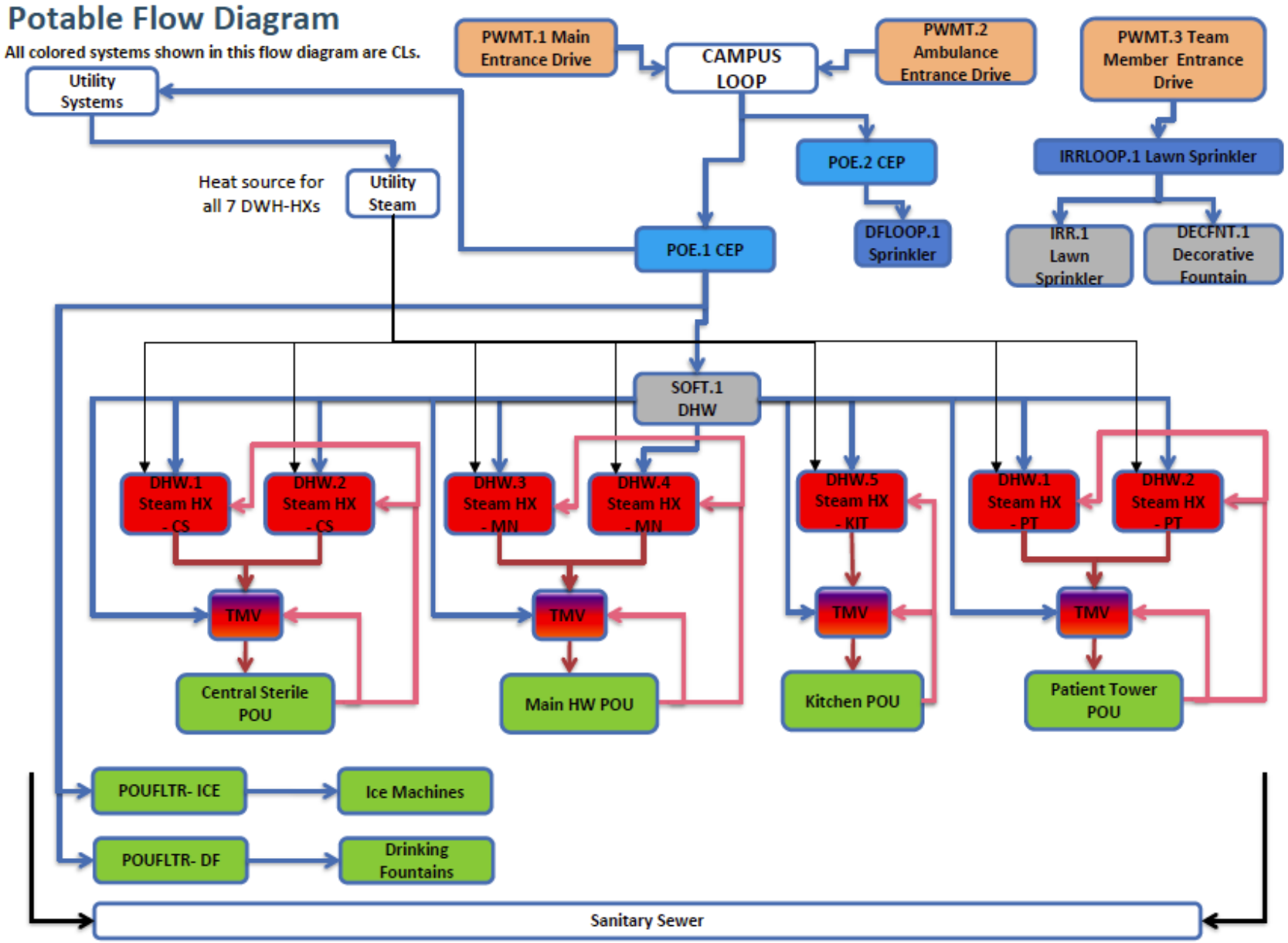
Sample Detailed Diagram



Steps to Develop a Water Management Program

Water System Mapping

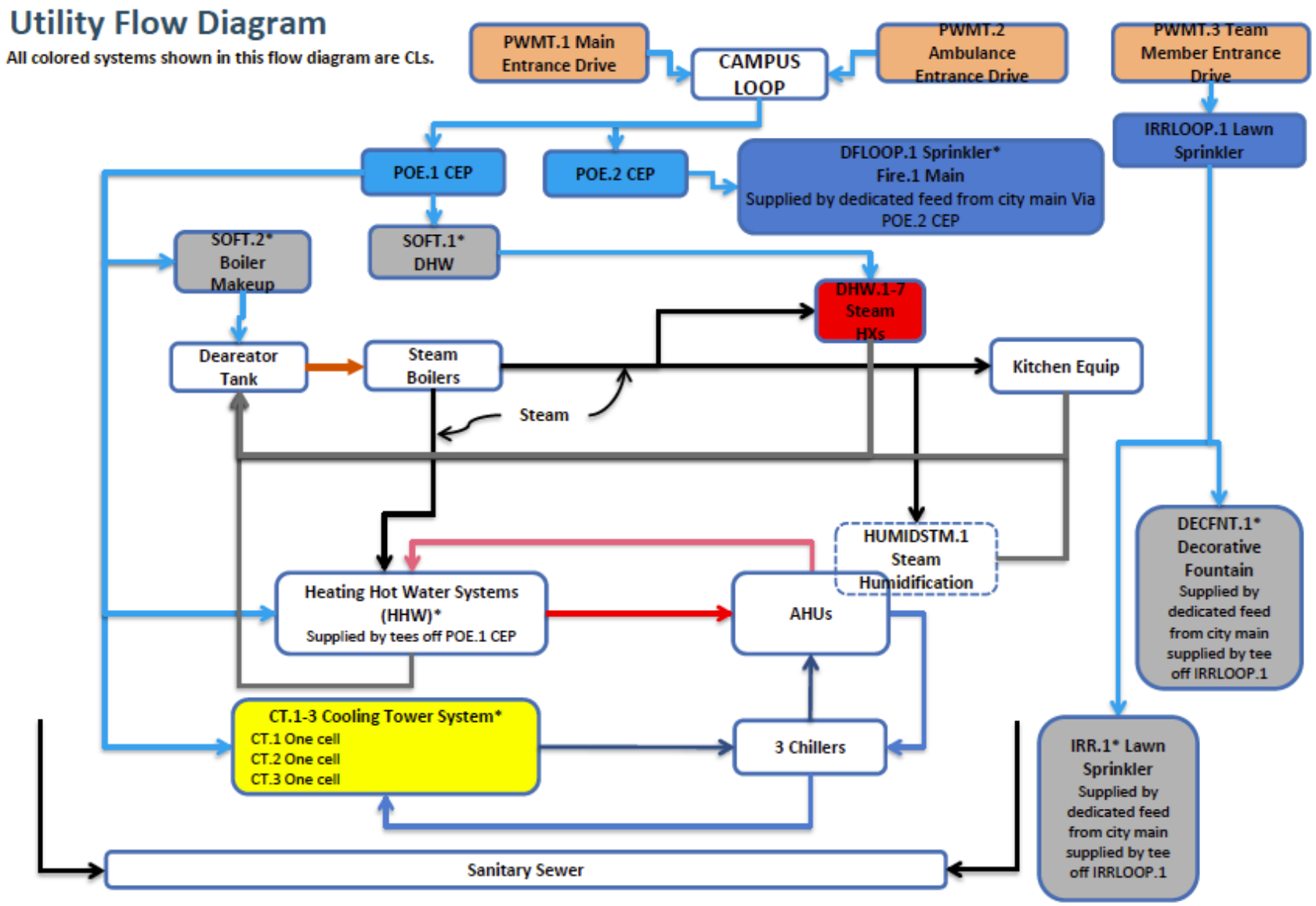
Sample Potable Water System Flow Diagram



Steps to Develop a Water Management Program

Water System Mapping

Sample Utility Water System Flow Diagram



Steps to Develop a Water Management Program

<u>WMP Development Step – Determine Control Points/Location</u>

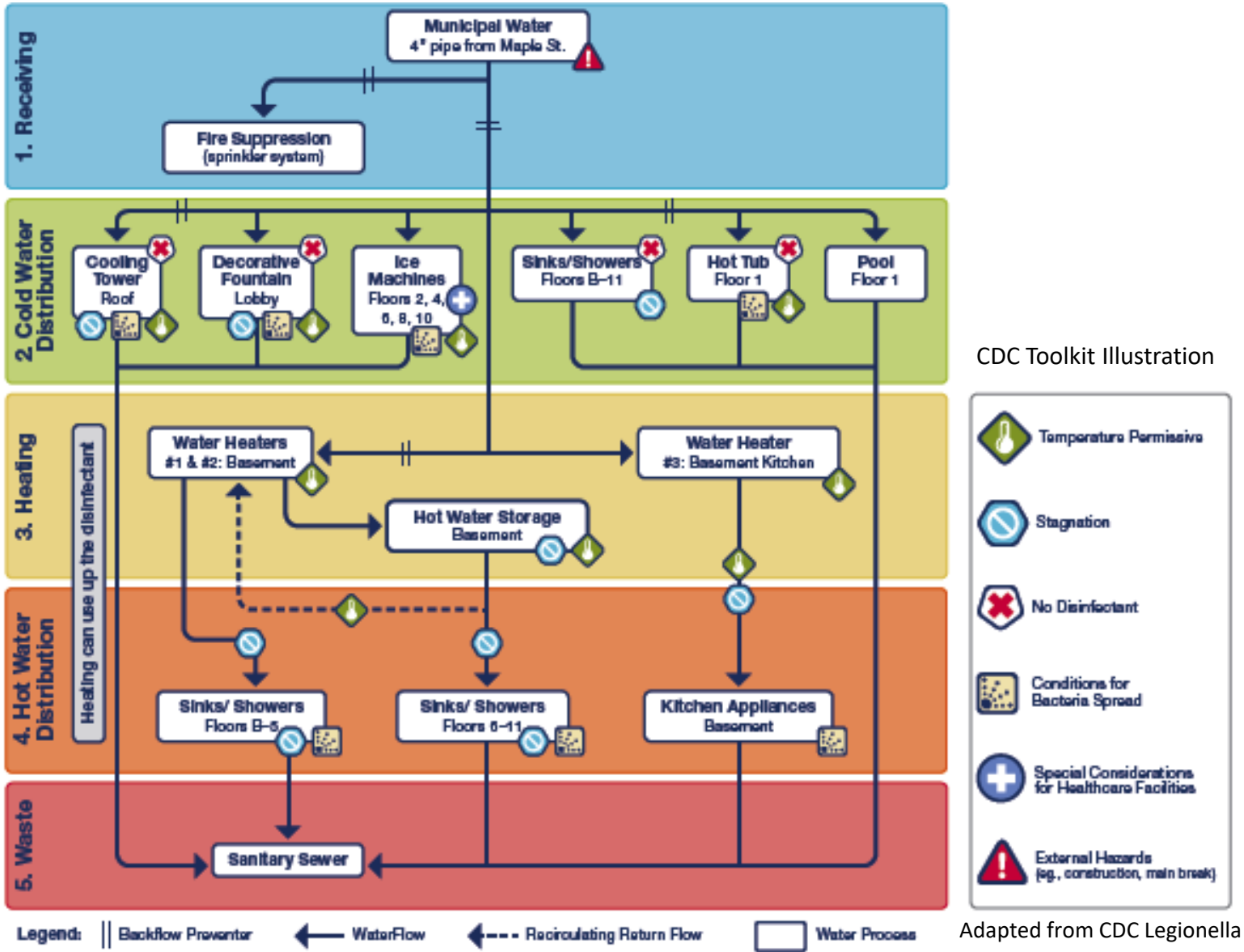
Hazard Analysis - Systematic evaluation of physical conditions to determine where hazardous conditions can occur based identified systems and points of use.

Use previously completed risk assessment to identify/include areas with higher probability of infection based upon the intended use of water and the relative vulnerability of patients to Legionellosis in those areas

Steps to Develop a Water Management Program

WMP Development Step – Determine Control Points/Location

Identify Areas Where Legionella Could Grow & Spread



CDC Toolkit Illustration

Adapted from CDC Legionella Toolkit Pg 11

Steps to Develop a Water Management Program

WMP Development Step – Determine Control Points/Location

Hazard Assessment/Analysis

The water management Hazard Assessment is an evaluation to identify and prioritize hazardous water conditions that may exist that could affect the health of patients, staff members or the general public.

Water System / Device Hazard Assessment Form

System / Device:	**Area Served:**
Identification Number:	
Location:	
Assessment Date:	
Conducted By:	

Risk Assessment Tool Definitions

Severity Classification	Probability
Class I – Critical - may cause severe illness or death	A – Significant potential for Legionella growth and exposure to aerosols with at risk building occupants.
Class II – Marginal - may cause severe illness	B – Significant potential for Legionella growth and exposure to aerosols with building occupants.
Class III – Probable would not affect safety or health	C – Low potential for Legionella growth and exposure to aerosols with building occupants.
Class IV – Negligible – would not affect safety or health	D – No potential for Legionella growth and exposure to aerosols with building occupants.

Risk Assessment Determination:

Severity Class	Probability			
	A	B	C	D
I	1	2	3	4
II	1	2	3	4
III	1	2	4	5
IV	6	6	6	6

If the results of the evaluation determine is 1, 2 or 3, a control measure is required. If the results of the evaluation determine is greater than 3, a control measure is not required, but is optional.

Control Measure

Required _____ Not Required _____ Optional _____

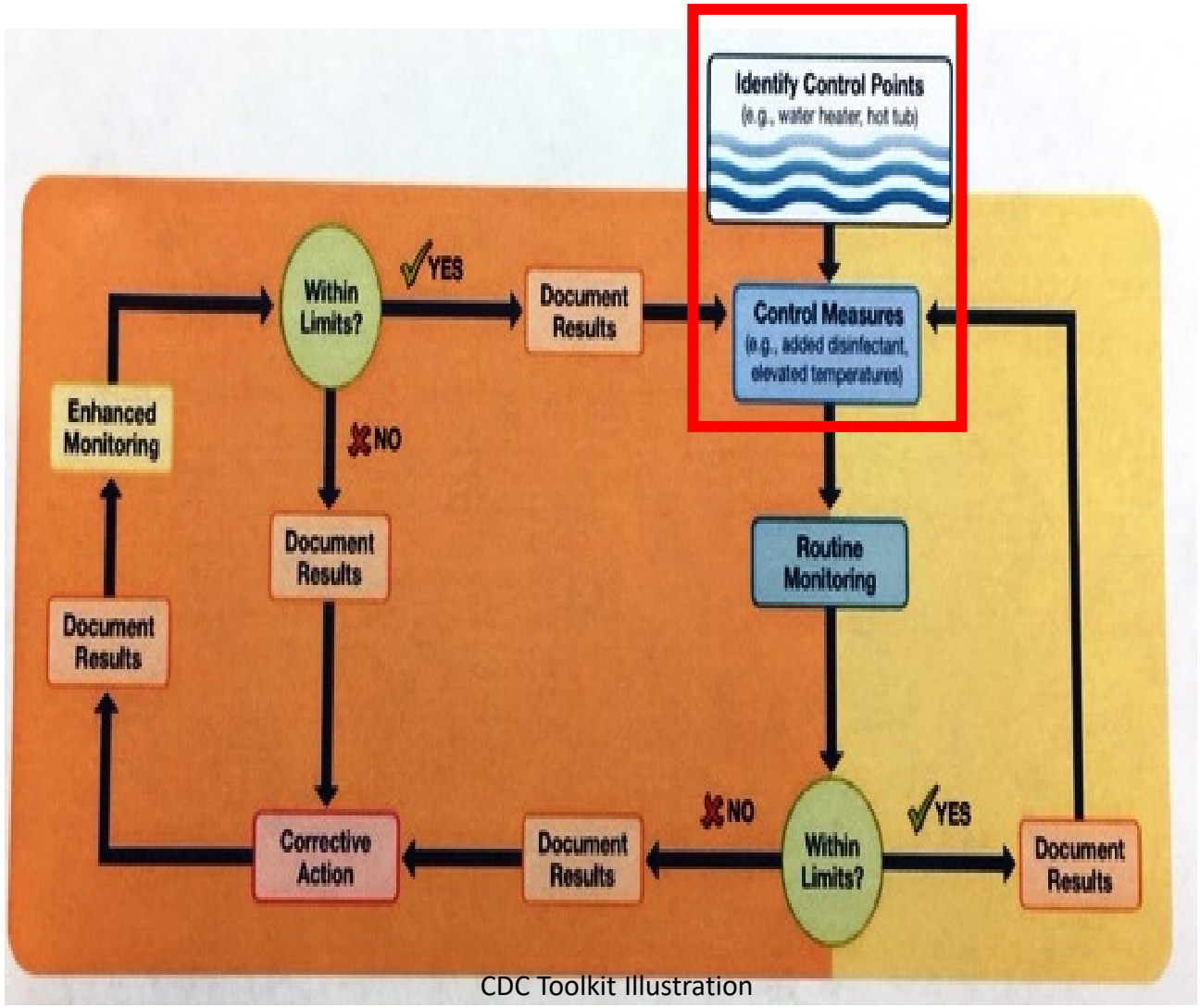
Applicable Assessment Criteria-Regulations

- ASHRAE Standard 188- Water Management in Health Care Facilities.
- Centers for Disease Control and Prevention document "Developing a Water Management Program to Reduce Legionella Growth and Spread in Buildings: A Practical Guide to Implementing Industry Standards."
- ASHRAE Guideline "12-2000 Minimizing the Risk of Legionellosis Associated with Building Water Systems"

Steps to Develop a Water Management Program

WMP Development Step –*Control Point identification*

Identification of control locations and establishment of control limits for maintaining safe water conditions.



CDC Toolkit Illustration

Steps to Develop a Water Management Program

WMP Development Step – Develop PMs and Response plans

Use established control measures & control limits to develop preventative maintenance (PMs)

- Develop and implement monitoring procedures
- Develop response procedures/action plans
- Create a record repository for both PMs and corrective actions

Steps to Develop a Water Management Program

WMP Development Step – Sample control measure

Control Measures

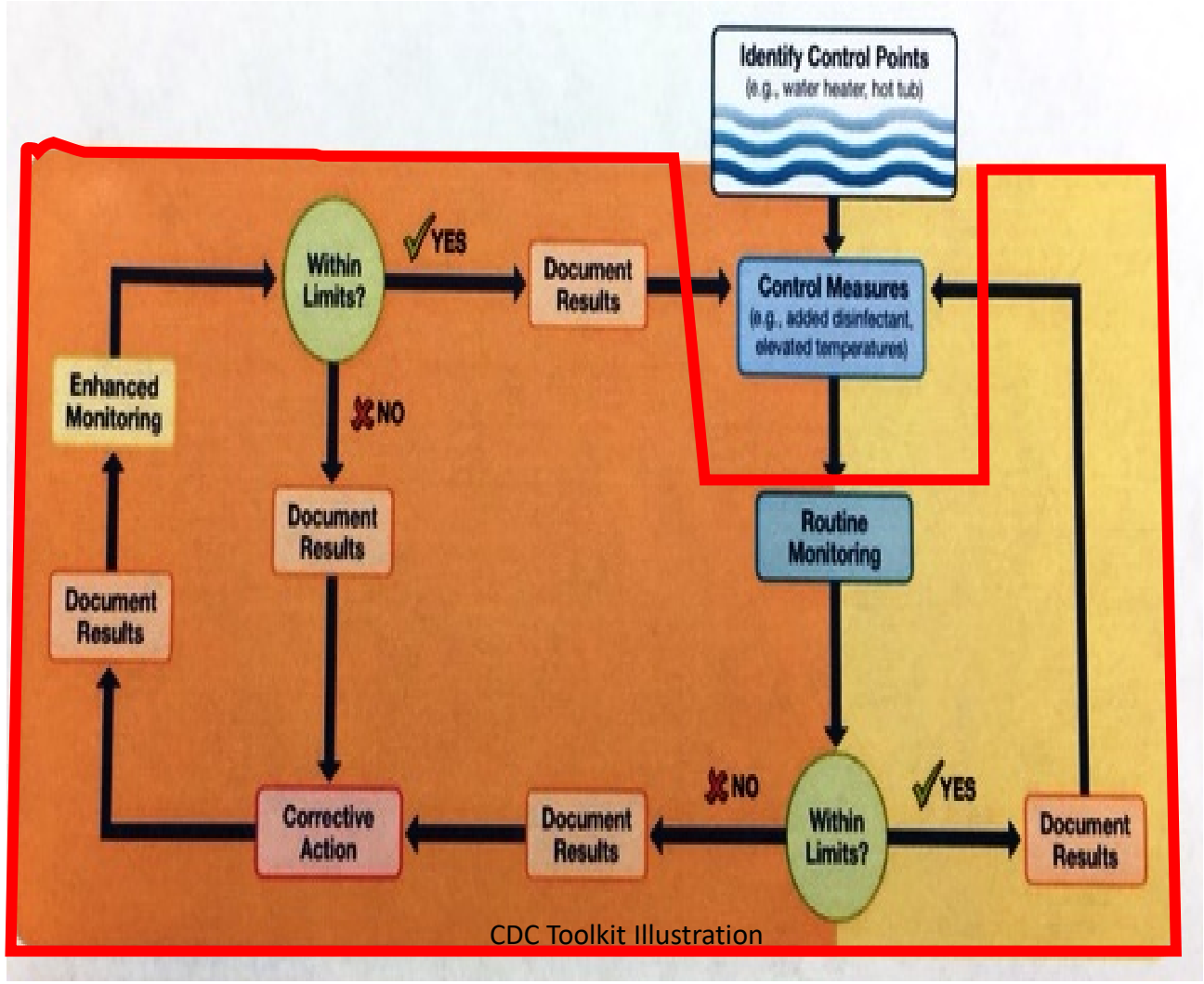
Control Measure Number: DWM16	Category: Domestic Water System Maintenance
Keywords:	flushing after minor plumbing repairs
Status:	
Control Measure:	Flush fixtures downstream of minor plumbing work for at least 5 minutes before returning the outlet to service. [11/17/17]
Locations:	POUs
Monitoring:	Include the flushing procedure in the work order given to the contractor or employee performing the work and require that person to log the flush date and time for each fixture affected. [11/17/17]
Frequency of control measure task:	Every 0 days
	Other Desc: per occurrence
Frequency of compliance verification:	Every 1 Years
Limits:	Flushing must be logged for each project [11/17/17]
Corrective Action:	Investigate and correct noncompliance [11/17/17]
Suggested Training:	4.042
Date Compliance Last Verified:	
Documentation:	
Verification Person:	
Due Date for Next Verification or Performance:	
Comments:	

Steps to Develop a Water Management Program

WMP Development Step

Monitoring PMs & Corrective Action Plans

Development of monitoring procedures for control measures and corrective action plans to include all necessary actions to stop ongoing negative effects when control measures are out of set parameters and to restore system to normal operations.



CDC Toolkit Illustration

Steps to Develop a Water Management Program

Sample Procedure for Domestic Hot Water

Standard Operating Procedure (SOP): Domestic Water Hot

Risk mitigation strategy: (Showers, Sinks)

- Maintain clean nozzle, eliminate aerator for sinks.
- Prevent aging of water
- Maintain chlorine level above 2.0 ppm

Methodology

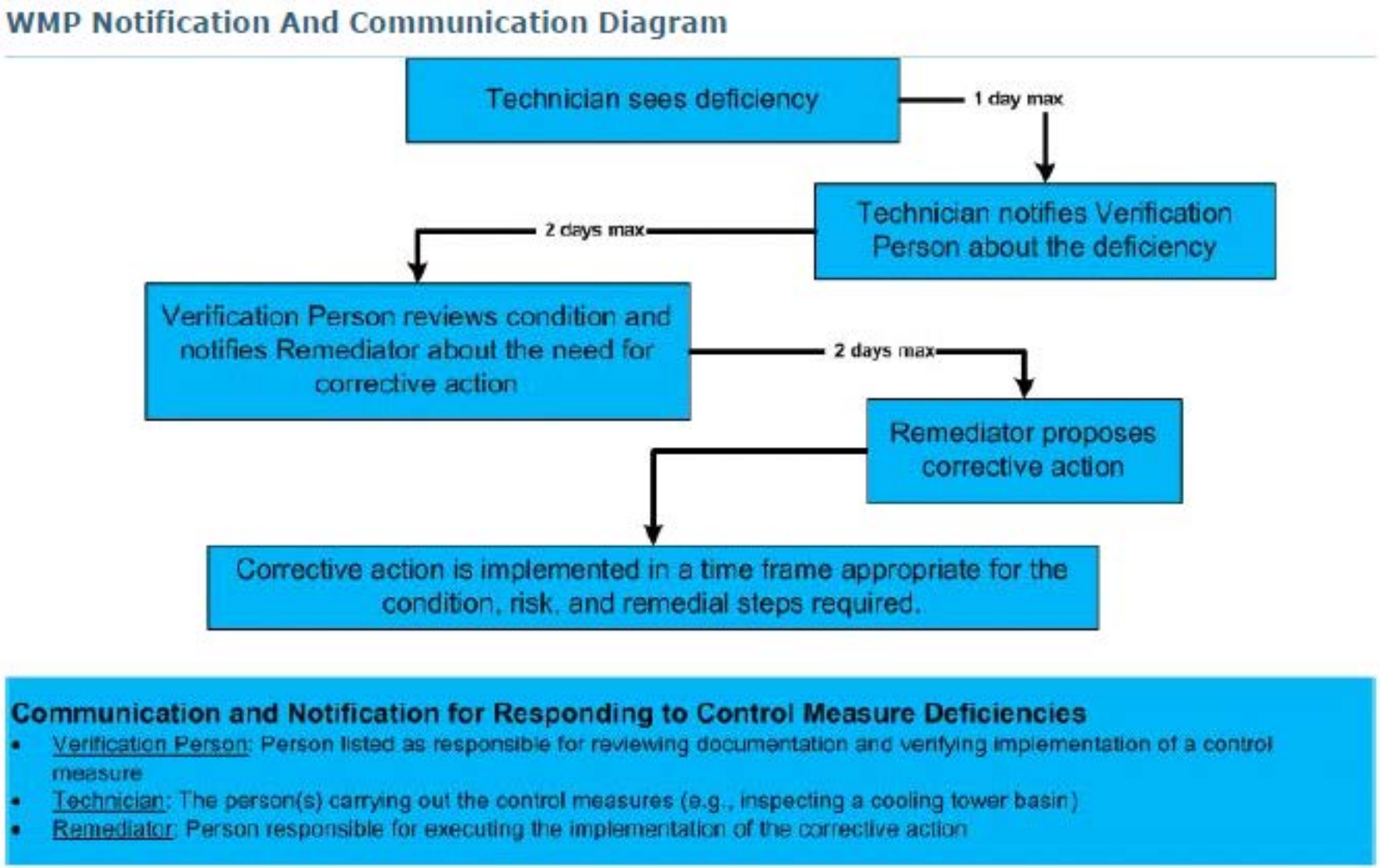
- Flush faucets for three (3) minutes weekly
- Visual inspection nozzle for scale. Verify no aerator on sinks.
- Visual inspection any hoses (showers) to assure drainage
- Test chlorine level at various faucets quarterly.
- Document results

Remediation actions

Clean nozzle, conduct 15 minute flush, add chlorine, Notify water management team.

See *Investigation & Treatment protocols section* for recommended treatment as needed.

Developing a water management program



Developing a water management program

Water Management Plan Step – Waterborne Pathogen Outbreak Procedures

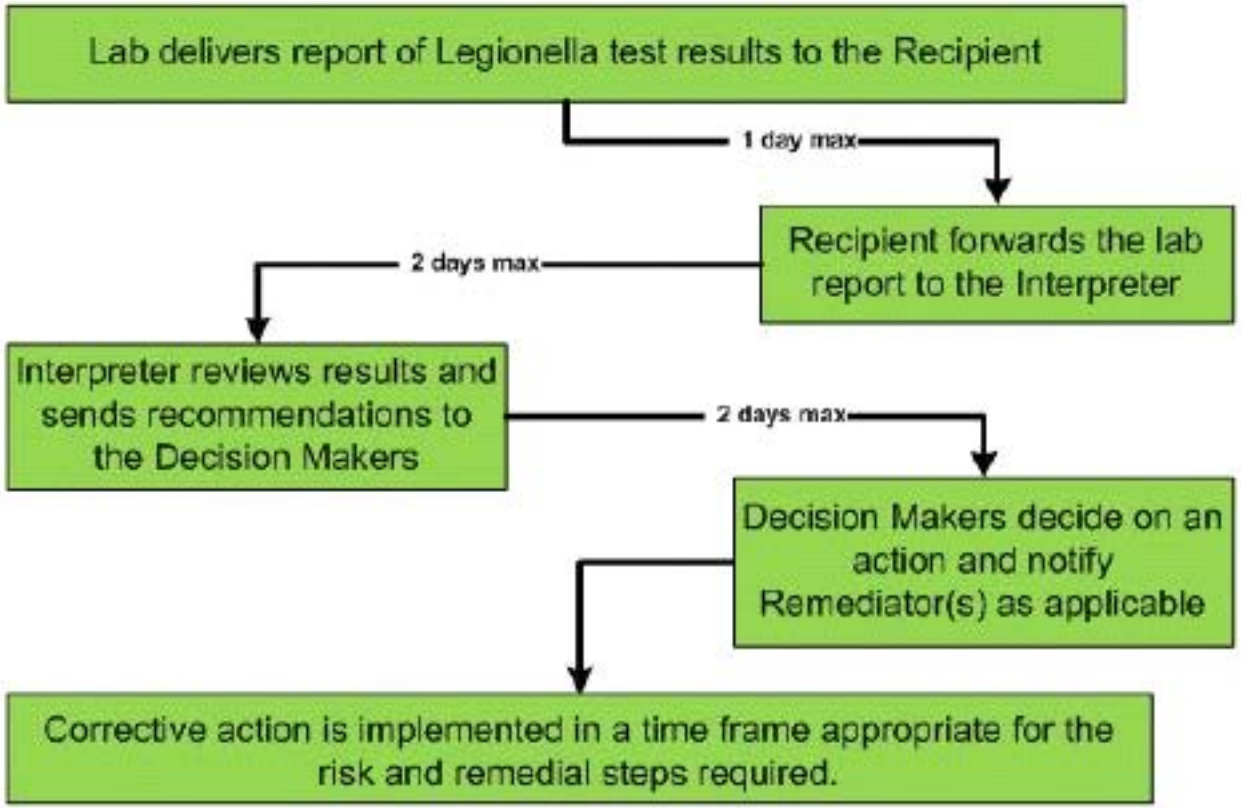
Investigation & Treatment Protocols - Develop protocols for investigation and treatment for events or outbreaks.

Consider adopting existing available resources such as the Investigation & Treatment Protocols from the OSHA Technical Manual Section III: Chapter 7 “Legionnaires' Disease” as the standard protocol for responding to probable or confirmed legionella or other waterborne pathogen cases.

See https://www.osha.gov/dts/osta/otm/otm_iii/otm_iii_7.html

(More on this in Webinar 5)

Developing a water management program



Communication and Notification for Responding to Legionella Test Results

- Sampler: Person who collects the samples
- Lab: Laboratory that tests the samples for Legionella
- Recipient: Person to whom the lab report is submitted
- Interpreter: Person who will interpret the results and make recommendations for follow-up actions
- Decision Makers: Person(s) who will decide what actions, if any, to take based on the test results
- Remediators: Person(s) responsible for executing the implementation of the follow-up actions

Steps to Develop a Water Management Program

WMP Development Step – Implement Program

- Educate all personnel on water management program and their role.
- Implement monitoring program
- Test corrective action/response procedures

Steps to Develop a Water Management Program

WMP Development Step – Review/revise program

Scheduled:

Monthly for first 6 months, then quarterly if monitoring is effective or:

When processes change:

Whenever a building or portion of a building is changed such that one or more water systems is affected. (Low Census, Program cessation, etc.)

New Construction, Renovations

- The WMP Team should review the scope of work for building water risks associated with the project.

Steps to Develop a Water Management Program

WMP Development Step – Review/revise program

New Construction, Renovations – (Continued)

The building designer and builder should be required:

- to work cooperatively with the WMP Team in the evaluation process
- to work cooperatively to comply with applicable WMP components/regulations
- to provide timely documented reports confirming compliance with the risk management plan
- to provide a commissioning plan to minimize risk of waterborne pathogen outbreak/injury

Steps to Develop a Water Management Program

WMP Development Step – Review/revise program

Major maintenance:

whenever major maintenance to a building water system is performed

Outages:

whenever there is a supplier water service disruption.

Annually:

reassess entire program

Developing a water management program

Sample Water Management Program Development Schedule

Procedure	By	Date Due
Develop Water Management Team and POCs	Corporate	10/14/2019
Perform Initial Risk Assessment	Facility	10/21/2019
Develop Flow Diagrams	Facility	10/31/2019
Complete Hazard Assessments	Facility	11/11/2019
Develop Critical Control Points (CCP)	Facility	11/30/2019
Develop Control Limits and Monitoring	Corporate	12/31/2019
Begin Operations	All	1/1/2019
Complete CMMS(Work Order System) Integration	Corporate	2/15/2019
Verification	Facility	Quarterly
Validation	Corporate	Quarterly
Program Reassessment/Revision	All	Annually

Available Guides and Resources for implementing water management programs (WMPs)

https://surveyortraining.cms.hhs.gov/pubs/VideoInformation.aspx?id=134&cid=0CMSLEGWEB-Archived

BMSPresentations | Energy2Care | Fiberglass Inlays | N... | Course Menu Page | Conference Calls | Contract Mgmt | Boiler Unit - TN.Gov | Daily FTE Report | ENERGY STAR Portf... | Facilities and Const... | Find a Doctor or Ho...

ISTW CMS SURVEY AND CERTIFICATION GROUP Integrated Surveyor Training Website

User Manual | Support Center | CMS.gov

Home | Course Catalog | Quality Improvement Training

CMS Legionella and Other Waterborne Pathogens Webinar - Archived

Video Information

Activity Code: 0CMSLEGWEB-Archived

Air Date: 9/22/2017 1:00:00 PM (Eastern Time) (46 minutes)

Status:

Course Description: Karen Hoffmann, Infection Preventionist and consultant to Survey and Certification Group at CMS, will present information related to Legionella Disease, and the other recognized waterborne opportunistic pathogens associated with outbreaks in healthcare facilities. She will review nationally accepted standards of practice from expert organizations, such as, the Centers for Disease Prevention and Control (CDC) and American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE), to prevent infections due to opportunistic waterborne pathogens from facility premise plumbing.

Information will be provided for surveyors to assess hospitals, critical access hospitals, and nursing homes on their policies and procedures for water management implementation. Policies and procedures must include a facility risk assessment, water management program, and testing protocols. The presentation will clarify what to assess for and elements ensuring an effective water management plan.

Select a Video Player Option

High bandwidth users: Launch Webinar | **Low bandwidth users:** Windows Media Player (Low)

Which video option should I choose?

CMS & HHS Websites	Tools	Helpful Links
Medicare.gov	Acronyms	Web Policies & Important Links
MyMedicare.gov	Contacts	Privacy Policy
Medicaid.gov	FAQs	Freedom of Information Act
InsureKidsNow.gov	Glossary	No Fear Act
HealthCare.gov	CMS.gov Archive	HHS.gov
HHS.gov/Open	Site Map	Inspector General
		USA.gov

Centers for Medicare & Medicaid Services
7500 Security Boulevard, Baltimore, MD 21244

For information about the availability of auxiliary aids and services, please visit:
http://www.medicare.gov/about-us/nondiscrimination/nondiscrimination-notice.html.

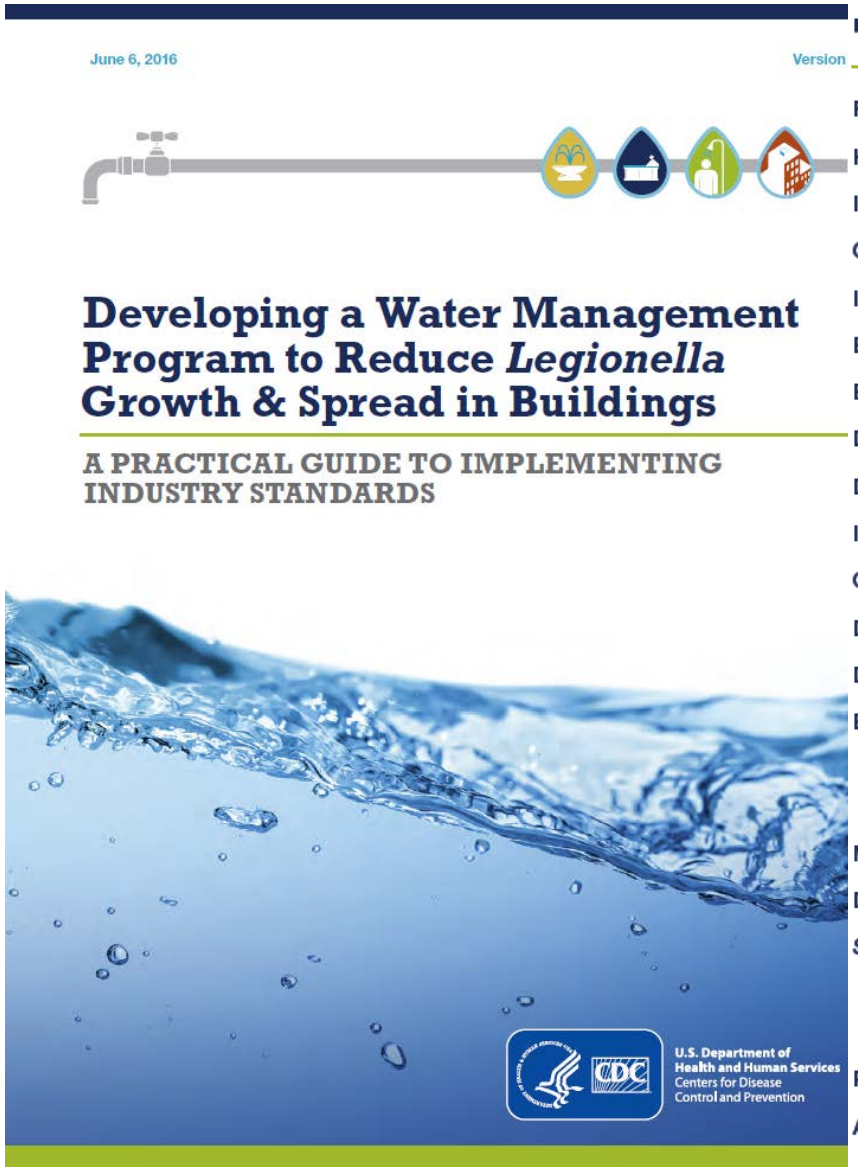
CMS Surveyor Training Webinars –

Great to learn what they are trained to be looking for when they audit your program.

https://surveyortraining.cms.hhs.gov/pubs/ProviderTraining.aspx

Industry standards and guidelines for water management programs (WMPs)

CDC Toolkit



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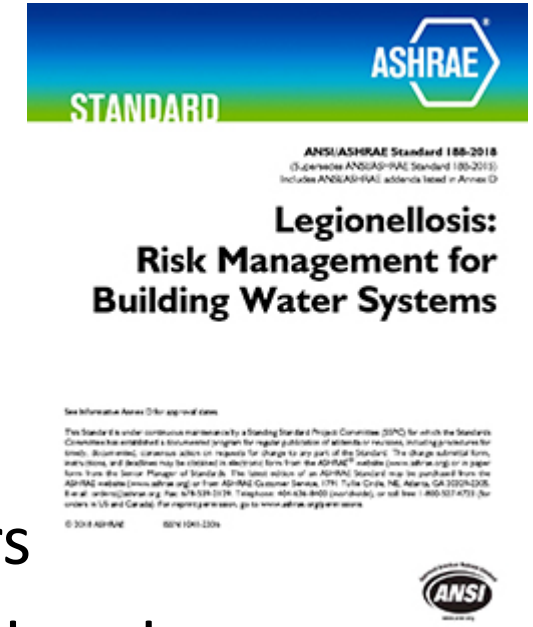
Industry standards and guidelines for water management programs (WMPs)

ASHRAE 188 defines:



- Types of buildings and devices that need a WMP
- Minimum components of a WMP
- Devices to be controlled in order to prevent the growth
- WMP WMTs - Water management program team members
- When and how often WMPs should be reassessed and updated

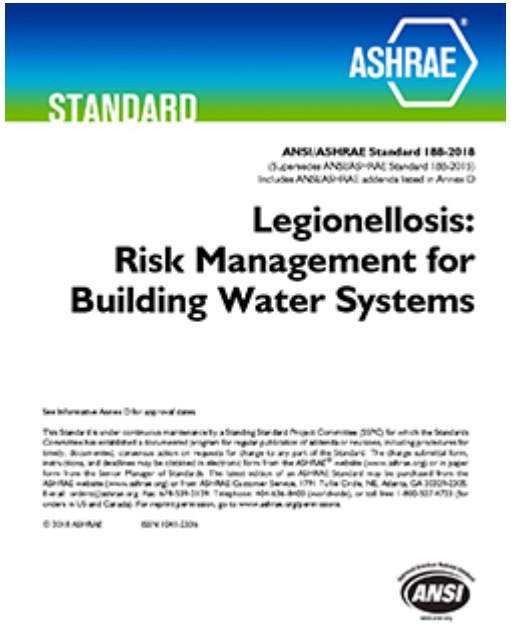
It also includes an annex with special considerations, such as clinical surveillance, for healthcare facilities.

Industry standards and guidelines for water management programs (WMPs)

Requirements of Normative Annex A, Risk Management Plan

Designated Team (Minimum)(A3, page 12)

1. A person with senior leadership authority to make command decisions about water restrictions and response measures.
2. A member of the facilities management staff familiar with the building water systems.
3. A member of the health care facility Infection Prevention and Control Program who is a certified IP or epidemiologist with a masters degree.

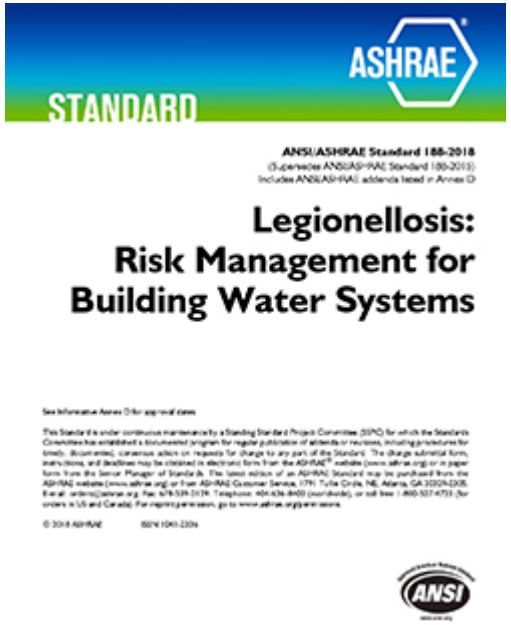


Industry standards and guidelines for water management programs (WMPs)

Requirements of Normative Annex A, Risk Management Plan

The building water systems shall be graphically represented in **water system flow diagrams** that include (A.3, page 12)

- All water supply sources and service entrances
- All water treatment systems and system control measures
- All water processing steps
- All areas where hazardous conditions may contribute to the amplification of Legionella
- All water end points
- Other points identified by the Designated Team


ASHRAE

STANDARD

ANSI/ASHRAE Standard 188-2018

(Supersedes ANSI/ASHRAE Standard 188-2015)

Includes ANSI/ASHRAE addenda listed in Annex D

Legionellosis:
Risk Management for
Building Water Systems

See Informative Annex D for approval dates

This Standard is under continuous maintenance by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including provisions for timely, documented, consensus action on requests for change to any part of the Standard. The change submittal form, instructions, and deadlines may be obtained in electronic form from the ASHRAE® website (www.ashrae.org) or in paper form from the Senior Manager of Standards. The latest edition of an ASHRAE Standard may be purchased from the ASHRAE website (www.ashrae.org) or from ASHRAE Customer Service, 1791 Tullie Circle, NE, Atlanta, GA 30329-2305. E-mail: orders@ashrae.org. Fax: 404-321-5478. Telephone: 404-636-8400 (worldwide), or toll free 1-800-527-4723 (for orders in US and Canada). For reprint permission, go to www.ashrae.org/permissions.

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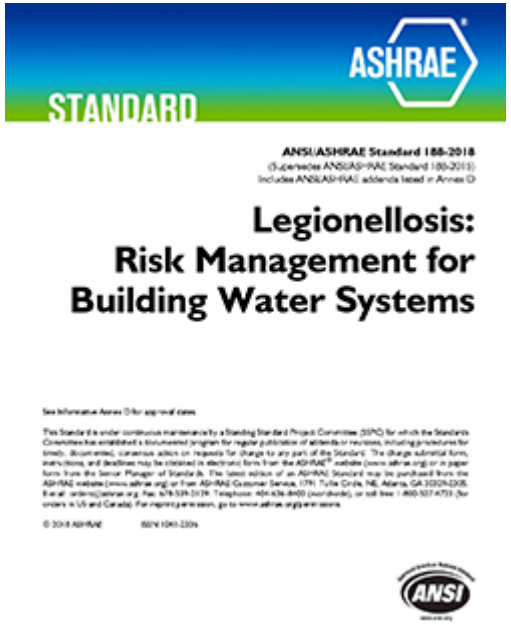
ANSI

Industry standards and guidelines for water management programs (WMPs)

Requirements of Normative Annex A, Risk Management Plan

The **risk management plan** shall include:

- name, title, and contact information of WMT
- *water system flow diagrams*
- Systematic evaluation(Hazard Assessment) to identify:
- Control Locations
- procedures required for prevention and *control*
- assignment of responsibility
- Documentation
- Disease prevention responses

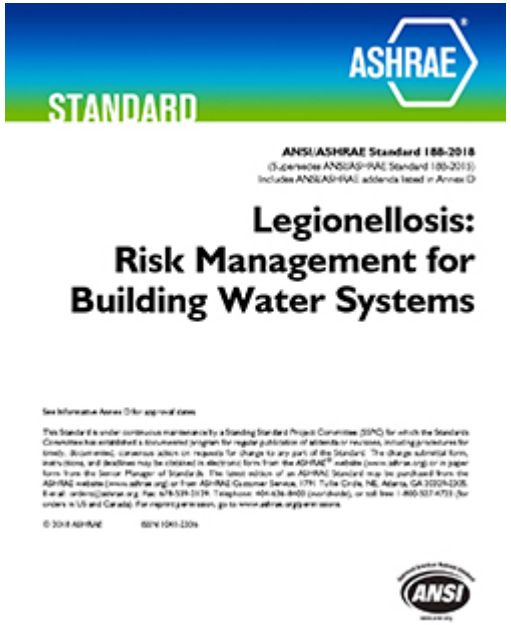


Industry standards and guidelines for water management programs (WMPs)

Requirements of Normative Annex A, Risk Management Plan

The **risk management plan** shall include:

- ensuring actions to be taken when legionella is probable or identified:
  - follow established IC processes
  - include implementation of remediation actions
  - include evaluation of the *legionellosis risk management plan* and any necessary changes
- procedures to confirm initially & continuously that WMP is implemented and effective (validation)

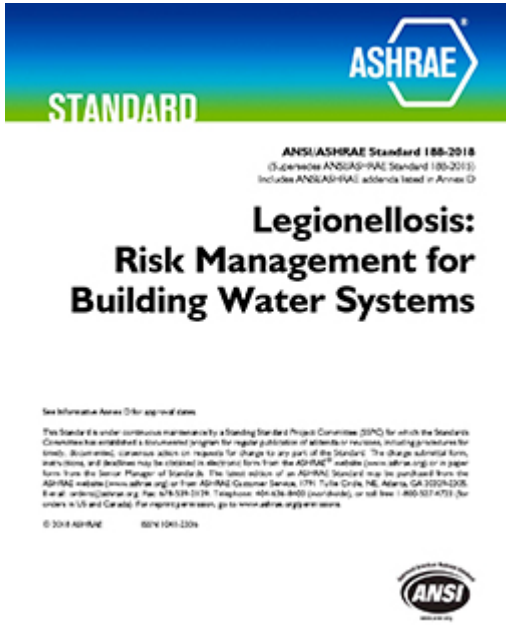


Industry standards and guidelines for water management programs (WMPs)

Requirements of Normative Annex A5, Maintenance & Construction

A5.1 Existing Buildings

- Annual evaluation
- Whenever major maintenance occurs
- After water service disruptions



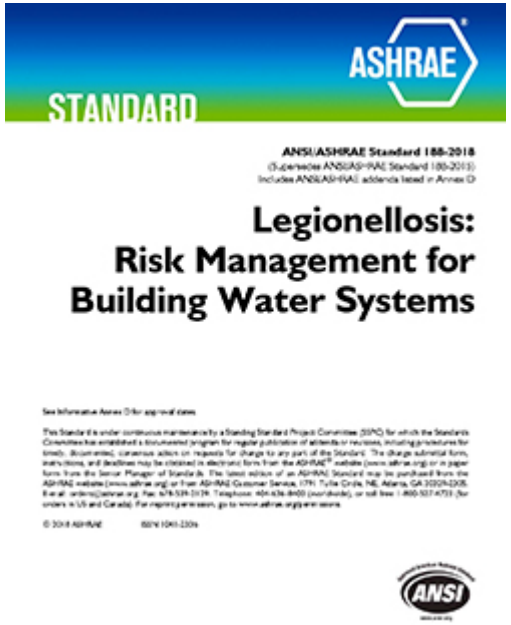
Industry standards and guidelines for water management programs (WMPs)

Requirements of Normative Annex A5, Maintenance & Construction

A5.2 new construction and renovations

WMT (including architect and contractor) to perform hazard evaluation & modify WMP:

- during the early planning,
- during each phase of design and construction, and
- during commissioning;

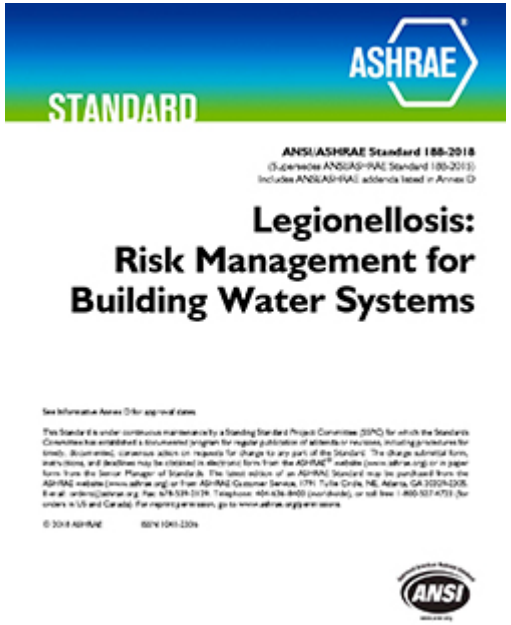


Industry standards and guidelines for water management programs (WMPs)

Requirements of Normative Annex A5, Maintenance & Construction

A5.2 new construction and renovations

1. WMT (including architect and contractor) to perform hazard evaluation & modify WMP:
   - during the early planning,
   - during each phase of design and construction, and
   - during commissioning
2. Provide timely documented reports of compliance
3. Provide a commissioning plan

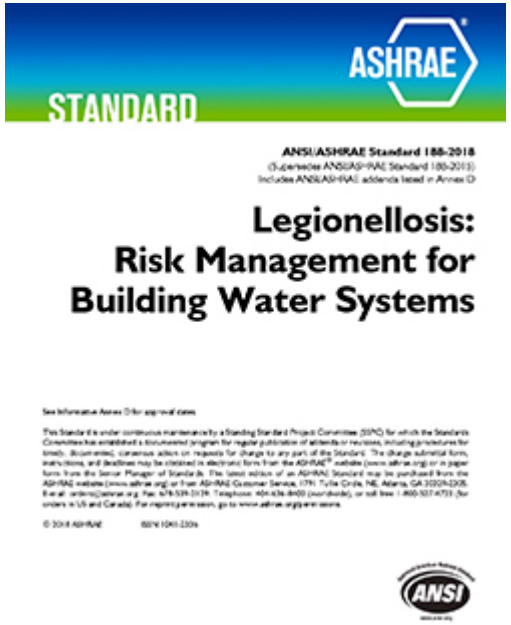


Industry standards and guidelines for water management programs (WMPs)

Requirements of Normative Annex A5, Maintenance & Construction

A6 Building Water System Procedures

a. Potable water systems
   1. Systems start-up and shutdown
   2. System maintenance
   3. Water treatment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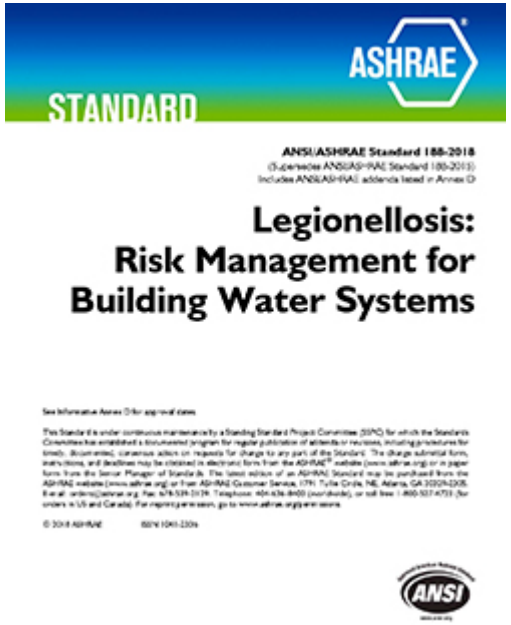
Industry standards and guidelines for water management programs (WMPs)

Requirements of Normative Annex A5, Maintenance & Construction

A6 Building Water System Procedures

b. Cooling towers

1. System maintenance
2. Water treatment
3. Shutdown & startup
4. Disinfection
5. Location of cooling tower makeup valve



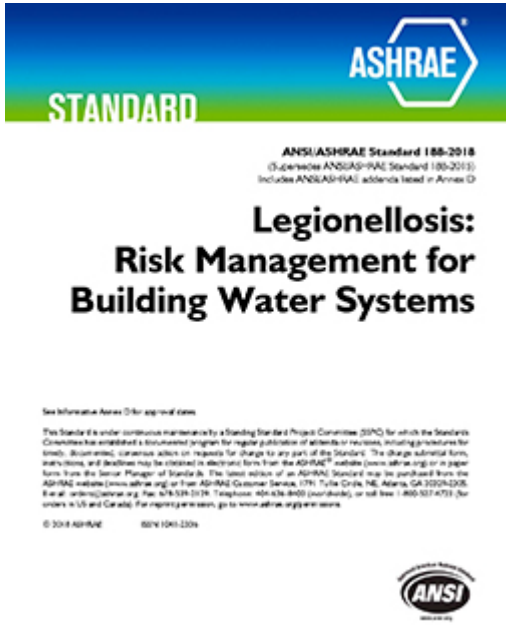
Industry standards and guidelines for water management programs (WMPs)

Requirements of Normative Annex A5, Maintenance & Construction

A6 Building Water System Procedures

c. Pools and Spas
   1. Operated & maintained per OEM

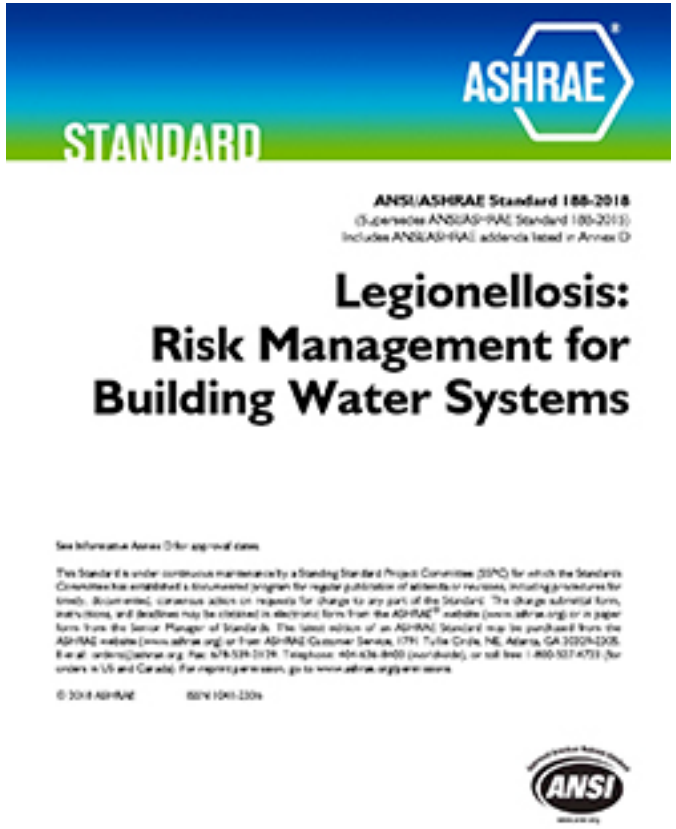
d. Ornamental fountains and open water features
   1. Operation
   2. Maintenance
   3. Water treatment



Industry standards and guidelines for water management programs (WMPs)

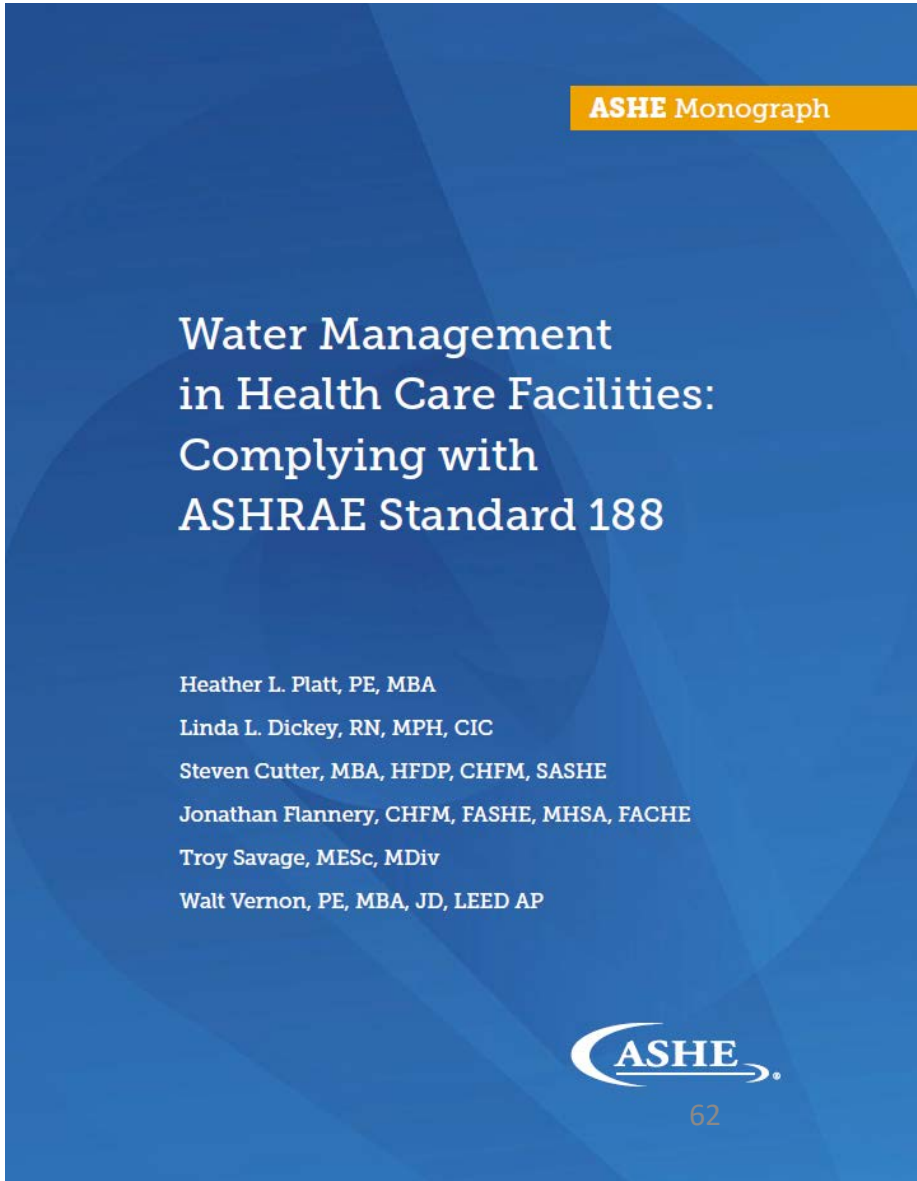
ASHRAE 188 does not provide guidance on target water parameters, such as temperature and disinfectant levels.

ASHRAE 188 also does not describe how to perform emergency remediation or give guidance about what to do if cases of disease are associated with the facility.



Industry standards and guidelines for water management programs (WMPs)

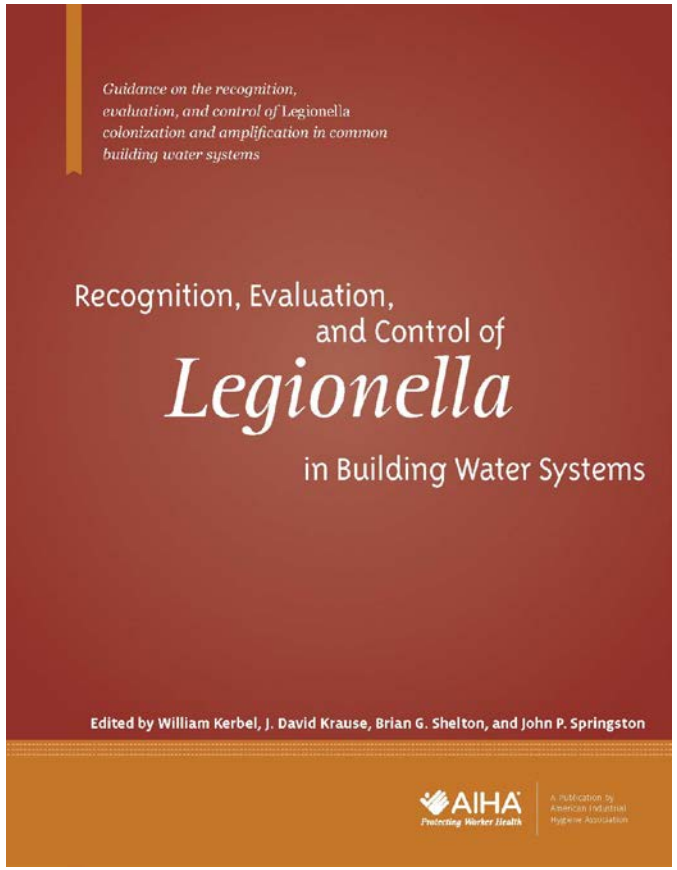
ASHE MONOGRAPH:
Water Management in Health Care Facilities: Complying with ASHRAE Standard 188



http://www.ashe.org/management_monographs/member/pdfs/mg2017platt_et_al.pdf

Industry standards and guidelines for water management programs (WMPs)

AIHA publication:
Recognition, Evaluation, and Control of Legionella in Building Water Systems



https://www.aiha.org/about-aiha/Press/2015PressReleases/Pages/AIHA-Provides-Preventative-Guidance-in-New-Legionella-Guideline.aspx

Industry standards and guidelines for water management programs (WMPs)

CDC Toolkit has many other references as well.

References & Resources

There are many references and resources that can help you develop and implement your *Legionella* water management program, some of which are listed below.

Standard

Standard 188—Legionellosis: Risk Management for Building Water Systems (ANSI Approved)
ASHRAE
Published 2015
www.techstreet.com/ashrae/products/1897561

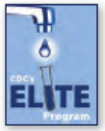
Guidelines

Guideline 12—Minimizing the Risk of Legionellosis Associated with Building Water Systems
ASHRAE
Published 2000
www.techstreet.com/ashrae/products/232891
(currently under revision)

Legionellosis Guideline: Best Practices for Control of *Legionella*
Cooling Technology Institute
Published 2008
www.cti.org/downloads/WTP-148.pdf

Model Acquatic Health Code Guidance
Centers for Disease Control and Prevention
Published 2014
www.cdc.gov/mahc/index.html

Laboratory Resources



CDC's ELITE Program
Centers for Disease Control and Prevention
wwwn.cdc.gov/ELITE/Public/EliteHome.aspx

Planning Guides & Toolkits

Emergency Water Supply Planning Guide for Hospitals and Healthcare Facilities
Centers for Disease Control and Prevention, American Water Works Association
Published 2012
www.cdc.gov/healthywater/pdf/emergency/emergency-water-supply-planning-guide.pdf

Drinking Water Advisory Communication Toolbox
US Department of Health & Human Services, Centers for Disease Control and Prevention, Environmental Protection Agency, American Water Works Association
Published 2013
www.cdc.gov/healthywater/pdf/emergency/drinking-water-advisory-communication-toolbox.pdf

Investigation Tools for Clusters and Outbreaks of Legionnaires' Disease
Centers for Disease Control and Prevention
www.cdc.gov/legionella/outbreak-toolkit

Healthcare Resources

Sehulster LM, Chinn RYW, Arduino MJ, Carpenter J, Donlan R, Ashford D, et al. **Guidelines for environmental infection control in health-care facilities. Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC).** *MMWR.* 2003;52 (RR-10): 1–42.
www.cdc.gov/mmwr/preview/mmwrhtml/rr5210a1.htm

Tablan OC, Anderson LJ, Besser R, Bridges MD, Hajjeh R. **Guidelines for preventing health-care-associated pneumonia, 2003: Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee.** *MMWR.* 2004;53(RR-3):1–36.
www.cdc.gov/mmwr/preview/mmwrhtml/rr5303a1.htm

Prevention of Healthcare-associated *Legionella* Disease and Scald Injury from Potable Water Distribution Systems
Veterans Health Administration
Published 2014
http://www.va.gov/vhapublications/ViewPublication.asp?pub_ID=3033

Legionnaires' Disease Information

Legionnaires' Disease Website
Centers for Disease Control and Prevention
www.cdc.gov/legionella

Healthcare Experiences with Water Management Programs

Next month is Webinar 4: April 23 Presenters: Adam, Jane

Learning Objectives:

- Discuss perspectives from healthcare facilities regarding the implementation of water management programs
- Development of water management programs in a variety of healthcare settings
- Challenges & lessons learned with to water management programs in healthcare facilities

Questions?

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Mary-Margaret Fill, MD
Phone: (615) 532-6752

Email: Legionella.Health@tn.gov
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