

WATER MANAGEMENT PROGRAM OVERVIEW

PURPOSE: The purpose of the water management program is to reduce the risk of growth and spread of Legionella and other opportunistic pathogens in a commercial facility's water systems in efforts to prevent serious illness in residents (clients) and employees.

COMPONENTS: An effective water management program consists of seven elements:

1. Establish a water management program team (ideas of personnel below)

- a. Administrator or Program Director
- b. Director of Nursing, Infection Control Preventionist (ICP), Wellness Nurse or Nurse Consultant
- c. Plant Operations Director or Maintenance Technician
- d. Medical Director or any contracted Physician – as needed
- e. Public Health – as needed
- f. Third Party Vendors/ Plumbing Consultants – if applicable
- g. City Manager – if applicable

2. Describe the building water systems and controls using text and flow diagrams

- a. See Appendix A & B

3. Identify areas where Legionella could grow & spread – Environmental Risk Assessment Tool (Appendix C)

- a. External
 - i. Construction
 - ii. Water main breaks
 - iii. Changes in municipal water quality
- b. Internal - including in plumbing and fixtures, ice machines, cooling towers, lawn sprinklers, solar water heating systems, fire suppression systems, safety showers and eyewash stations, spray and pressure washing equipment, hot water tanks, decorative fountains/ features, personal cooling or humidifying equipment that uses water, and medical devices

Key Factors that affect Legionella growth:

- Biofilm
- Scale & sediment
- Water temperature fluctuations
- Water pressure changes
- pH
- Inadequate disinfection
- Water stagnation
- Backflow opportunities at plumbing cross-connections and at wastewater drains
- Water age

4. Decide where control measures should be applied and how to monitor them

- a. Maintain water temperatures outside the ideal range for Legionella growth (77-113 F)
- b. Prevent water stagnation
- c. Ensure adequate disinfection, including maintenance of supplemental disinfection/ irradiation systems
- d. Prevent backflow at potable and non-potable water system connection points
- e. Maintain premise plumbing, equipment, and fixtures to prevent scale, corrosion, and biofilm growth, all of which provide a habitat and nutrients for Legionella

5. Establish ways to intervene when control limits are not met or water-borne illness has been identified

- a. Emergency water shut-offs
- b. Point of use filters or other immediate measures to ensure potable water safety
- c. Frequent flushes of sinks & fixtures in underutilized or vacant areas (requires staff PPE)
- d. Retesting

6. Make sure the program is running as designed and is effective

- a. This should be completed as least annually, but updated on an as-needed basis

7. Document & communicate all activities

- a. Include inspection logs, any testing & corrective actions

ADDITIONAL CONSIDERATIONS FOR COMMON EXPOSURE SOURCES:

Potable Water Systems

- Identify the point at which water enters the facility's system to where it leaves through a fixture or device
- Use pipe insulation to maintain hot and cold temperatures throughout the system
- Eliminate dead legs or flush at least weekly, including infrequently used fixtures
- Fixtures such as electronic sensor faucets can increase risk of Legionella growth
- UV devices, water softeners, carbon filters, and heaters are components of a water system that speed the decay of disinfectant
- Use storage tanks for hot and cold water with recirculating pumps to avoid unfavorable temperature gradients
- Store hot water above 140 degrees. Hot water in circulation should not fall below 120 degrees. Recirculate continuously if possible.
- Store and circulate cold water below 77-113 degrees
- Disinfectant detectable throughout potable water system
- Clean mixing valves, aerators, showerheads, hoses, filters, and storage tanks frequently

Cooling Towers (HVAC Systems)

- Use high-efficiency drift eliminators
- Identify cooling towers at least 25 feet from building to ensure drift plume is not drawn into ventilation system
- System piping designed to avoid stagnating water or dead legs
- Recirculate water during intermittent use
- Automated water treatment system including anti-corrosion, anti-scale, and disinfectant
- Operate at lowest possible temperature
- Flush low-flow pipe runs and dead legs weekly
- Complete cleaning and disinfection at least annually

Decorative Fountains

- Complete regular maintenance per manufacturer recommendations
- Fountains containing less than 5 gallons of water to be cleaned weekly, 5-25 gallons monthly, and over 25 gallons cleaned as needed to remove scale and deposits
- Monitor water temperature and disinfectant residual at least weekly
- Automate disinfectant and monitoring systems if possible
- Apply algacide as needed
- Avoid prolonged idle periods and run fountains at least daily
- Immediately clean and disinfect if cloudy water, debris, algae, biofilm, or found odor are present
- Maintain water temperature below 77 degrees

Medical Devices

In addition to the facilities' main water sources, it is important to include management procedures for respiratory equipment that may be used in your facility.

Consider the following:

- How are jet nebulizers cleaned, dried, and stored?
- How are mesh nebulizers that remain in the ventilator circuit cleaned, disinfected, and changed?
How is oxygen, BiPAP and CPAP equipment cleaned, and sanitized?
- How often are any oxygen tubes changed out?
- Who is responsible for cleaning and maintaining oxygen equipment?

Many providers rely on nursing staff to complete these tasks – ensure any cleaning, sanitizing & disinfecting is being done properly & documented on a regular basis.

- Consider including the cleaning, sanitizing, disinfecting & changing out any needed equipment as a designated nursing treatment. This requires staff to sign off upon completion and provides an easy way for the water management team to monitor compliance.

RECOMMENDED THIRD PARTY COMPLIANCE RESOURCES:

[Legionella Assessment & Management Plan Support \(LAMPS\)](#) gives you a Water Management Program and helps you implement it. You get everything you need, all in one place, with tools that make training, updating, record keeping, analytics, and reporting easy — at no extra charge. You can even export routine procedures from LAMPS to an MS Excel file from which you can import to your facility management work order software.

[IWC Innovations](#) provides preventative, expert and cost-effective water system strategies to combat Legionella bacteria. IWC has over 60 years combined experience from leading experts in the Legionella field.

[CDC Legionella Toolkit](#)

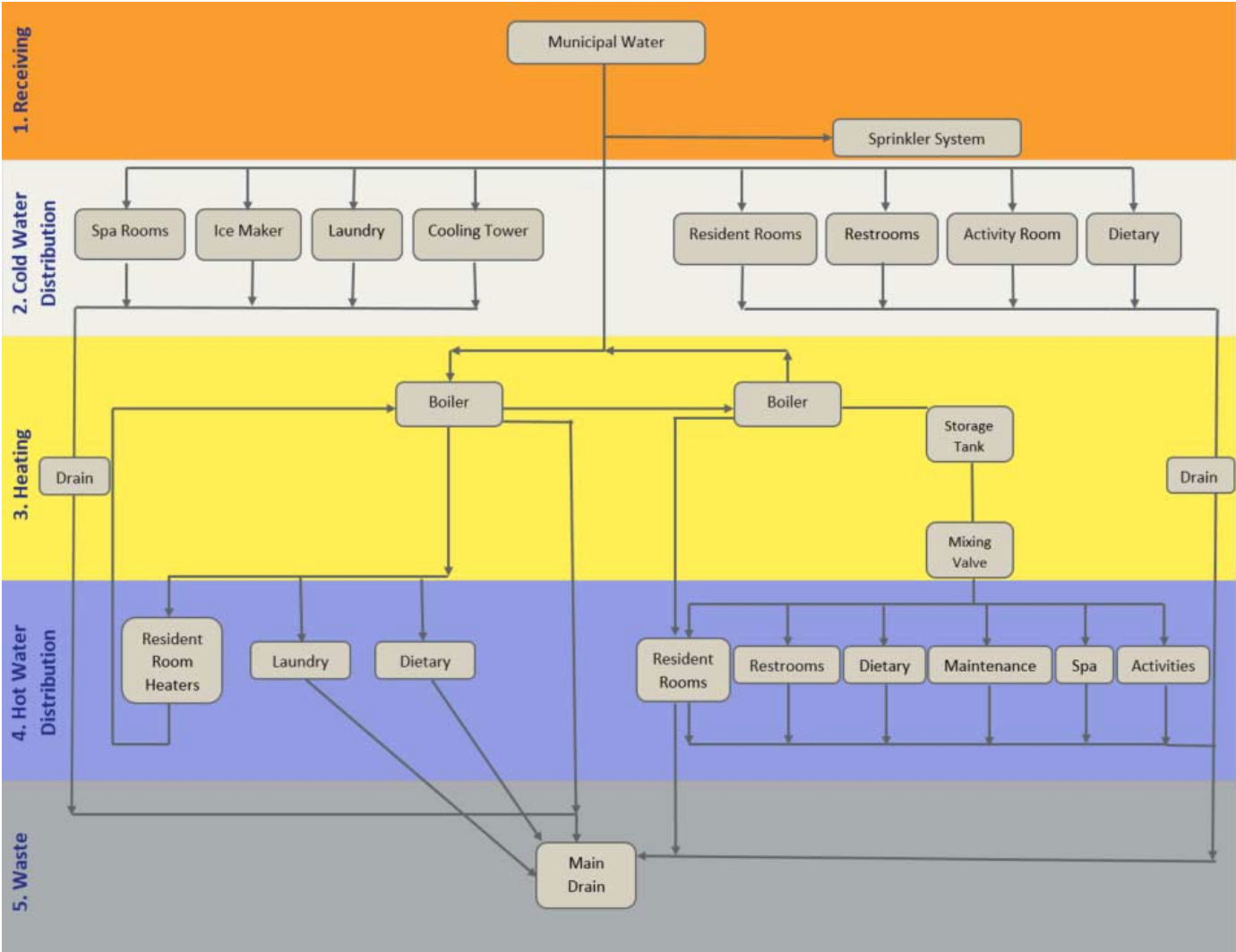
[CDC Legionella Environmental Assessment Form](#)

[CDC Toolkit for Common Exposure Sources](#)

[OSHA Legionnaires Disease Page](#)

[ANSI/ASHRAE 188 Standard](#)

APPENDIX A: Sample Flow Diagram



NOTE:

This diagram is a sample. Ideally, the bubbles would have a more accurate description such as resident rooms: floors 1-2, or cooling tower in basement. For a completed map, recommend identifying locations and types of hazardous conditions you could expect – per building. (See Legionella Toolkit Page 11.)

It may also be useful to incorporate what control measures are being done in the hazardous areas such as: routine temperature checks, quarterly visual inspections, quarterly disinfect level checks, etc. (See Legionella Toolkit Page 18.)

APPENDIX B:

Sample Water Management Program Description & Controls

Description of Facility Water Supply

1. Water enters the facility in the basement from the municipal water line at X. Water is immediately drawn off to charge the fire suppression system. The rest of the water is sent through cold water distribution. There is a 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. Water is run through water conditioner system provided and maintained by X to soften the water.
3. Cold water is distributed directly to patient care areas, non-patient care areas, and other portions of the building.
4. Cold water is heated to by two water heaters. There are two separate lines maintained; water sent to the kitchen is kept at 140 degrees F, and domestic water used in all other portions of the building are kept above 112 degrees F.
5. Hot water is distributed to plumbing fixtures in the basement, and then distributed throughout the building.
6. Hot water is tempered (mixed with cold water) in the basement with mixing valves.
7. Hot, cold, and tempered waste water is discarded through the sanitary sewer line.

Control Measures in Place

- Visual Inspections will take place on a regular basis of the municipal water entry point, the cooling towers, ice machine, and whirlpool.
- Temperatures will be tested and checked regularly in the basement at the site of water heating, faucets, and other water outlets in the building.
- Corrective actions will be put into place if a practice is found to be deficient.
- If a case of Legionnaires' disease is determined, facility will work with the County Health department to investigate and mitigate such instance occurring again.
- Facility will utilize **CDC toolkit** for further guidance & resources on running a water management program.

APPENDIX C: Environmental Risk Assessment Tool

System Component	Characteristic	Details
Hot water heater(s)	Number	
	Location	
	Capacity	
	Type of heating	
	Max temperature	
	Average temperature	
	Age of units	
Cold water storages(s)	Number	
	Location	
	Capacity	
	Material	
	Water age (time since disinfection)	
Incoming water treatment	Company name	
	Source	
	Disinfection type	
Facility water treatment	Type	
	Location	
	Dose rate (if chemical treatment)	
	Target residual at most distal point in water system (if chemical treatment)	
Pipework	Age	
	Material	
	Type and extent of insulation	
	Number of dead legs and their locations	
	Areas of low flow	
	% of pipework that is accessible	
Hot water outlets	Number, type, and location	

APPENDIX C: Environmental Risk Assessment Tool (continued)

System Component	Characteristic	Details
Cold water outlets	Number, type, and location	
Warm water outlets	Number, type, and location	
TMVs and tempering valves	Type, number, age, and location	
	Distance from outlets	
	Date of last service	
	Accessibility	
	Maximum temperature at outlet	
Other components	Ice machines	
	Cooling towers	
	Fire suppression system	
	Irrigation system	
	Hydrotherapy/birthing tubs	
	Decorative water fountain	
Backflow prevention	Number and location	
	Date of last inspection	