



# Cherokee Nation Health Services Physical Environment Utility Management System

## Management of Waterborne Pathogenic Agents

Cherokee Nation Health Services has identified and implemented processes to minimize pathogenic biological agents in cooling towers, domestic hot/cold water systems, and other aerosolizing water systems. The building water systems and identification of risk areas where waterborne pathogenic microorganisms, such as *Legionella* spp., nontuberculous mycobacteria, or *Pseudomonas aeruginosa*, could grow are described in a diagram shown in this policy.

To reduce the potential for *Legionella* and other potential waterborne pathogens, the water management program considers external factors (construction, water main breaks, changes in municipal water quality) and internal factors (biofilm, scale and sediment, water temperature fluctuations, water pressure changes, pH, inadequate disinfectant, and water stagnation) all of which can lead to *Legionella* growth. Testing of high risk areas for *legionella* will occur on a routine basis and be scheduled by the Facilities Department.

Control measures with corrective actions for these systems are also available on a flow chart in this policy. The objectives of control measures include:

- A. Minimizing stagnation of water,
- B. Preventing contamination due to backflow,
- C. Maintaining adequate levels of disinfection,
- D. Maintaining plumbing, equipment and fixtures to minimize the development of sediment, scale, debris and biofilm,
- E. Maintaining temperature control, and
- F. Minimizing aerosol potential.

For Dental specific preventative maintenance equipment, refer to dental chair cleaning and waterline testing protocol available in the current document control software.

Any time there is a suspected case of Legionnaire' disease associated with the building, Infection Prevention or designee will complete the following:

- Notify designated Facility Administrator, Infection Preventionist, Safety Officer, Medical Officer.
- Contact local and/or state health department.
- Notify anyone who could be affected by the growth and spread of *Legionella* in the building *if the health department asks you to*.
- Decontaminate the building water system if necessary (additional help from outside experts may be needed).

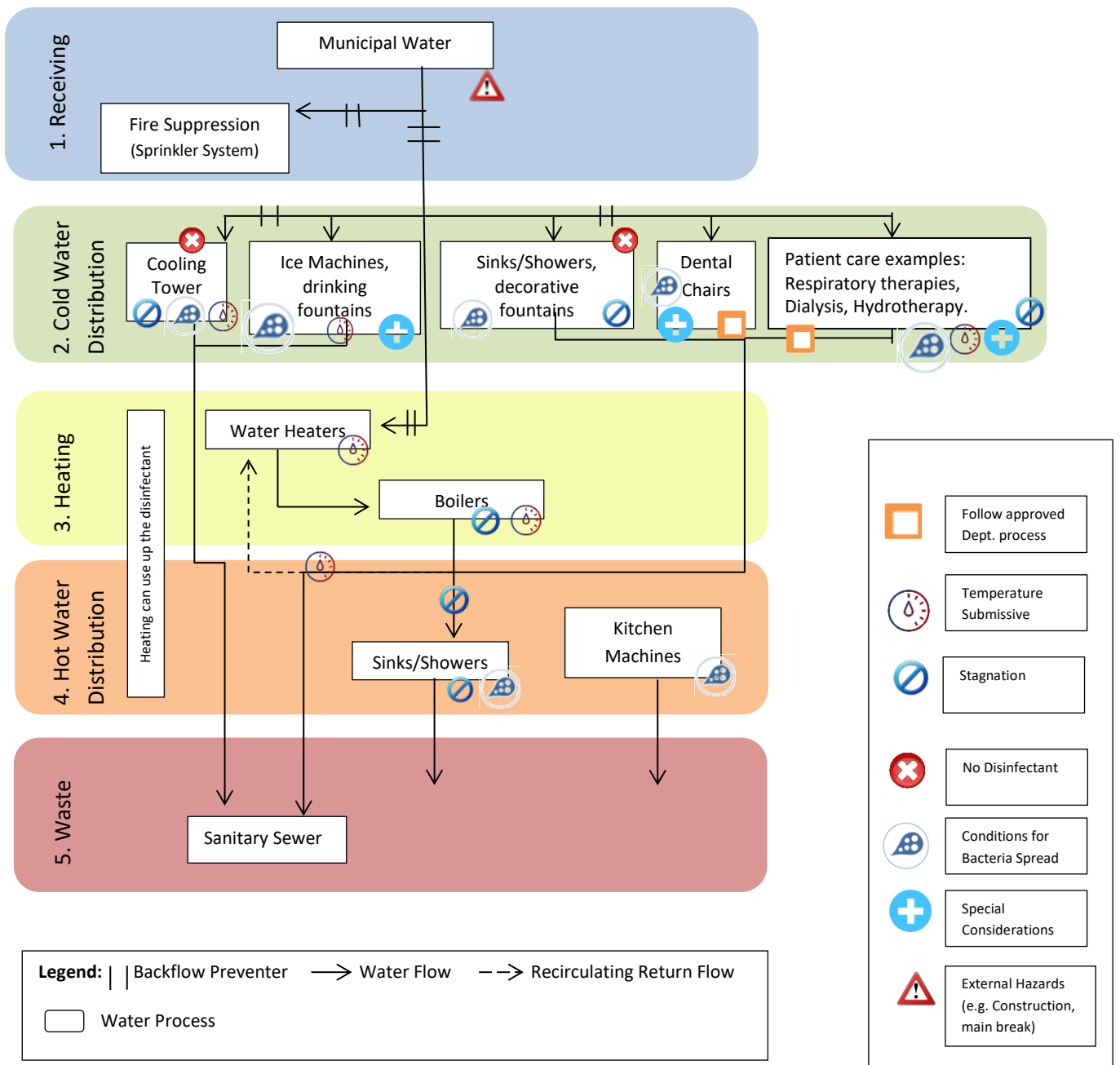


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Cherokee Nation Health Services  
Water Management Program

Process Flow Diagram (Identify Control Points Where Legionella Could Grow & Spread)

This diagram shows possible Legionella risk areas in the water usage processes within the water distribution systems in health facilities. Each Cherokee Nation Health Service facility will use this diagram as guidance to complete their site specific “Inventory of Legionella Risk Areas.”

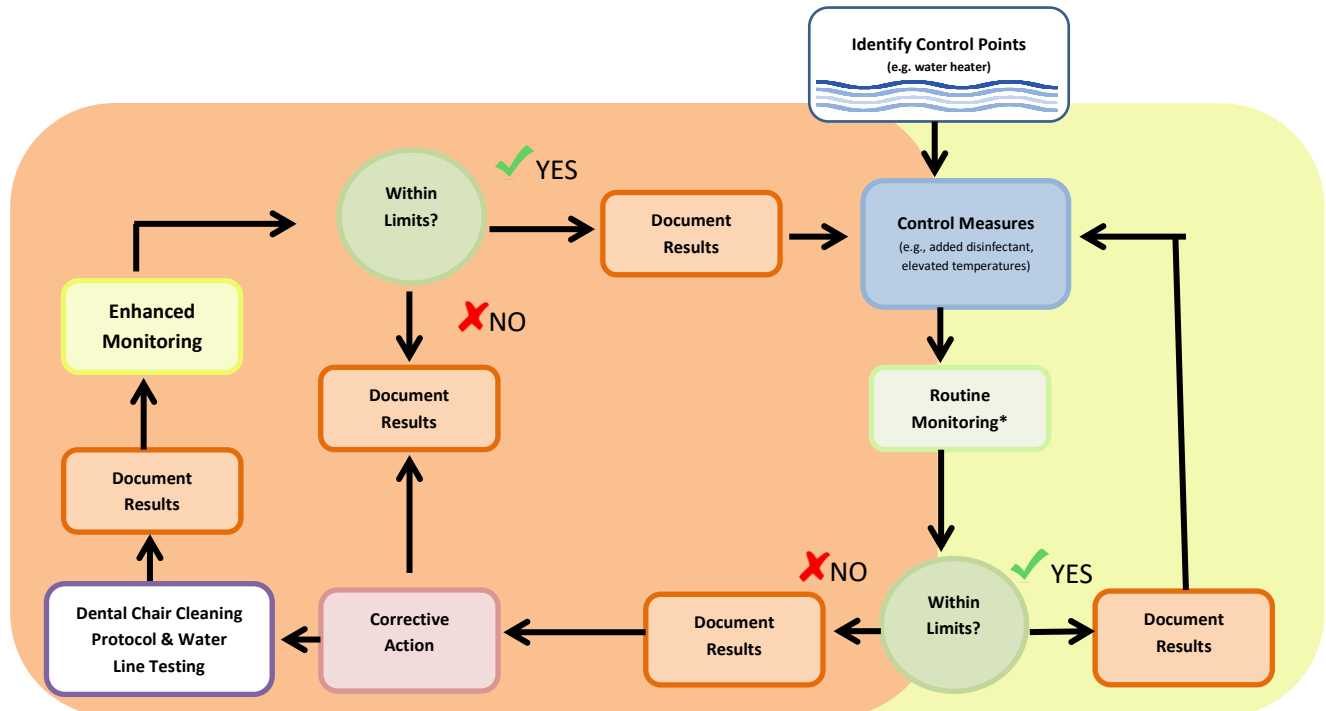




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## Cherokee Nation Health Services Water Management Program

### Control Measures & Corrective Actions



#### Routine Control Measures:

Primary Treatment/Control Program: the following measures are being implemented:

1. Cold Water: Potable cold water is maintained and distributed at <math>68^{\circ}\text{F}</math> (<math>20^{\circ}\text{C}</math>).
2. Hot Water: In those buildings with hot water storage tanks, water should be stored above <math>140^{\circ}\text{F}</math> (<math>60^{\circ}\text{C}</math>). All water distributed in patient areas should be maintained and distributed at a final temperature of no more than <math>120^{\circ}\text{F}</math> (<math>43^{\circ}\text{C}</math>).
3. Maintenance: Hot water storage tanks are maintained according to the manufacturer's recommendations and current industry standards. Standard includes monthly inspection for leaks and temperature is maintained at <math>>140^{\circ}\text{F}</math> degrees.
4. Visual Inspection: Each inspection shall include checking equipment and reservoirs for the presence of organic material, biofilm, algae, and other visible contaminants.
5. Monitoring: A monthly operation log and maintenance manual will be maintained by Facilities. Records on repairs on boilers, alterations, operating terms, monitoring, routine disinfecting, and inspections will also be recorded by Facilities.
6. Routine water sampling: Testing will be conducted quarterly based on the size of the facility. Upon finding a year period of clear samples, testing frequency may be modified, based upon risk



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assessment results. Additionally, certain commonly-encountered changes in building water system design or management might require increased ~~the extent and/or~~ frequency of monitoring, including but not limited to system start up or shut down, equipment failure, water main break, or other service interruptions. Sites of water sampling should be determined by water risk assessment, with the highest risks assessed most frequently.

<b>Testing frequency based on clinic size</b>	
0-50,000 sq ft	5 samples quarterly or 20 samples per year
50,000-150,000 sq ft	10 samples quarterly or 40 samples per year
>150,000 and Hospital	25 samples quarterly or 100 samples per year

7. Circulation: Water lines that have been dormant or unused will be flushed before being placed back on line.
8. Construction/Water Disruption: When the hot water distribution system is opened for repair/construction or subject to water changes, the system will be thoroughly flushed before being returned to service. The need to disinfect using a high temperature or a chlorination flush before returning to service will be evaluated on a case-by-case basis. If only a portion of the system is involved, disinfection may be used on only that portion of the system. Precautions will be taken to prevent patient exposure to aerosols during flushing.

### **Corrective Actions:**

Should the presence of Legionella be discovered:

1. Flush source and retest as soon as possible. If negative, continue to monitor at regular frequency and practice routine control measures. If repeat testing is positive, move to step 2.
2. Appoint an ad hoc meeting with Infection Prevention/Control Coordinator, Facilities Manager , Director Quality and Risk Management, and Administration.
3. Begin on-going sampling of Legionella to determine the possible source of contamination.
4. To prevent an exposure, take the water source off-line or restrict access by patients and staff.
5. Take action 1 or 2 based on the testing results. It may be necessary to work with a third party vendor for complete disinfection.
6. Maintain records of control measures that are taken, including maintenance procedures and environmental test results.

### **Interpretation and Action Required for Legionella Results**

Action	Cooling Tower	Domestic Water	Humidifier
1	>100 cfu/mL	>10 cfu/mL	>1 cfu/mL
2	>1000 cfu/mL	>100 cfu/mL	>10 cfu/mL

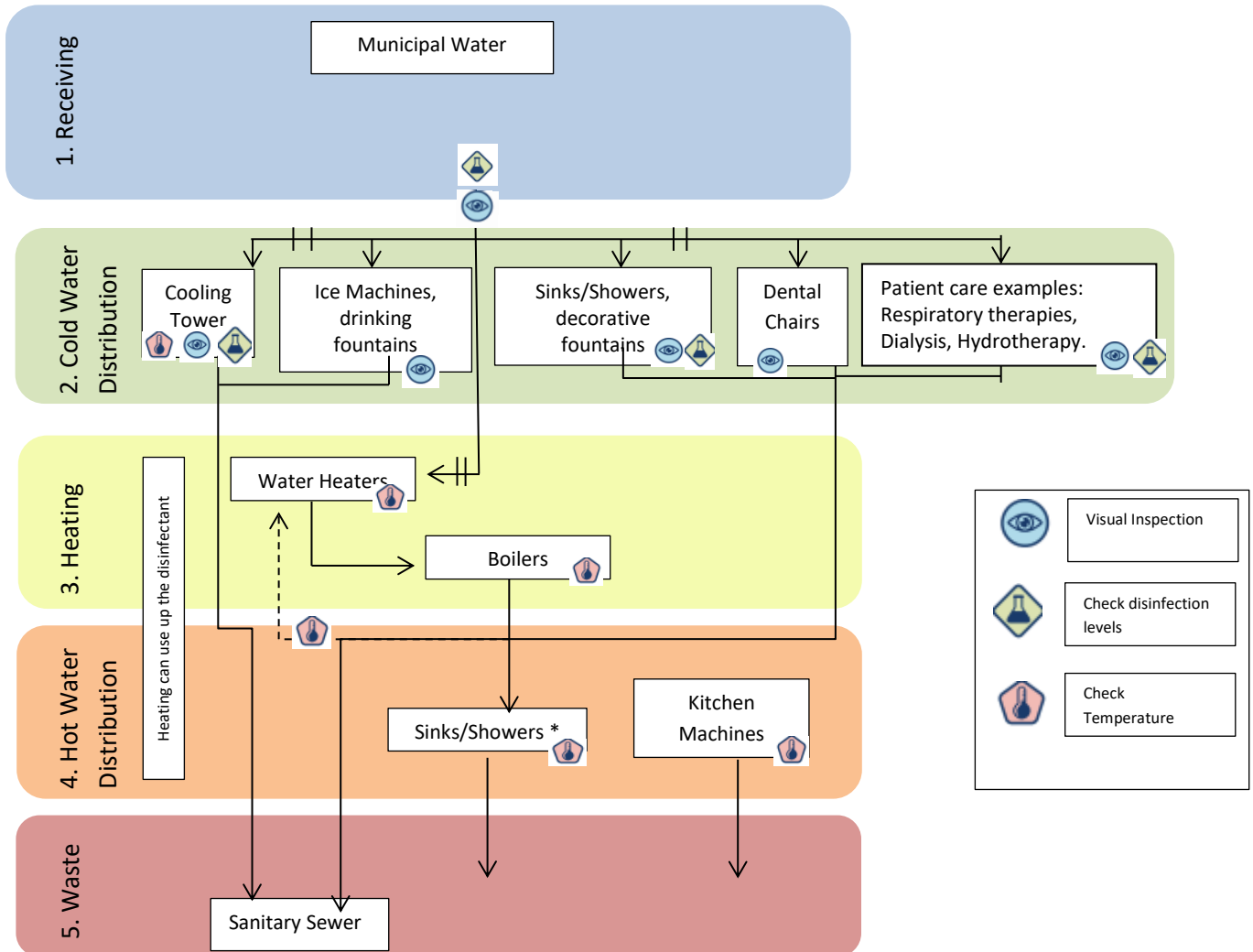
Action 1 is a prompt cleaning and/or biocide treatment of the system. Action 2 is immediate cleaning and/or biocide treatment.



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## Cherokee Nation Health Services Water Management Program Control Measures Diagram

The diagram below shows which types of monitoring could occur at different locations within CNHS's water system to reduce the risk of growth and spread of Legionella.



\* Monitoring at representative fixtures close to and far from the central distribution point is recommended. It is not necessary to routinely monitor water conditions at every tap.

