



LEGIONELLA PREVENTION AND WATER SYSTEMS COMPLIANCE

MINNESOTA PERSPECTIVE

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Drinking Water Protection program in Minnesota

Public water systems (PWS) provide water for human consumption through pipes or other constructed conveyances to at least 15 service connections or serves an average of at least 25 people for at least 60 days a year.

Community Water System: A public water system that supplies water to the same population year-round. We have 975 community PWS.

Noncommunity Water System: A public water system that is served by its own source of water – not a part of a city water or other larger system.

- **Non-Transient Non-Community Water System** : regularly supplies water to at least 25 of the same people at least six months per year, but not year-round. We have 500 Nontransient PWS.
- **Transient Non-Community Water System** : provides water in a place such as a gas station or campground where people do not remain for long periods of time. We have 5500 Transient PWS.

We have 100 staff members in 8 district offices over the State.

Safe Drinking Water Act Regulatory Responsibilities of the Drinking Water Protection Section

Under the SDWA, we have a number of responsibilities – focus on 3 key areas of the Noncommunity Unit

★ Plan Review

- For all new treatment or storage installation, or any other modifications to the drinking water system.

★ Inspections

- New installation / construction of treatment or storage facilities
- Ongoing Sanitary Survey conducted once every three years for Noncommunity PWS
- Other inspections and technical consultations as needed (to resolve contamination, etc.)

★ Monitoring

- Schedule and collect compliance samples
- Coliform bacteria & nitrate
- Metals (including lead & copper), VOCs, pesticides

Exemption criteria from being a PWS:

- Facilities that purchase their water from a regulated public water system can be exempted from drinking water regulations if they meet the following criteria.
 - Consist only of storage and distribution
 - Do not sell the water
 - Do not treat the water
 - Are not a carrier in interstate commerce
- **Interpretation of these criteria, especially what constitutes “treatment”, is where states differ.**
- States also differ on how they apply rules to consecutive systems.

Management of Legionella Bacteria

- For some time now, government agencies and industry groups have agreed that :
 - The best strategy for reducing the risk of the disease is to minimize Legionella in building water systems.
 - And this can be done by managing the building water systems to minimize Legionella.

Current Regulatory Authority Collaborations and relationships in Minnesota :

The regulatory authorities and partners that are connected to Legionella management in Minnesota are:

Internal Partners :

- Minnesota Department of Health (MDH)
 - Drinking Water Protection Section
 - Infectious Disease Epidemiology, Prevention and Control Division
 - Engineering Services Section
 - Food, Pools and Lodging Section

External Partners :

- United States Environmental Protection Agency
- Department of Labor and Industry (DLI)
- Local Authorities / delegated programs
- Professional organizations
- Regulated Industry

Current Regulatory Authority Collaborations and relationships in Minnesota :

- Both DLI and MDH have regulatory responsibilities when treatment is installed within premise plumbing.
 - DLI reviews plans for code approved materials, components, pipe sizing, cross connections.
 - MDH reviews plans for the above standards, as well as for treatment efficiencies
- The Engineering Services Section of the Health Regulations Division and the Food, Pools and Lodging Services Section from MDH also have plan review requirement and also conduct inspection – but refer to the Drinking Water Protection Section in a technical consulting role specific to water quality and treatment.

Laws and Guidelines

There are a number of guidances that have been developed for the control and management of Legionella

Law:

- Occupational Safety and Health (OSHA) General Duty Clause

Technical Guidelines/ Documents for Legionella Control:

- Environmental Protection Agency (EPA) Water Supply Guidelines
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Guideline GPC-12, 2000
- Legionella and the Prevention of Legionellosis - World Health Organization, 2007
- Veterans Health Administration (VHA) Directive 1061
- ASHRAE 188 – Legionellosis: Risk Management for Building Water Systems

Essential Management Plan Components

- All of the documents outline the basic water management plan – with similar essential management plan components – for all water systems –
- Form a Team
- Water system inventory, also including flow diagrams
- Hazard analysis, with locations where control measures should be applied
- Control measures – with monitoring, performance limits and corrective actions for each measure
- Verification procedures
- Validation methods

Types of water systems

- Implement a Water Management Plan for :
 - Cooling towers or evaporative condensers
 - Whirlpool Spas
 - Ornamental fountains
 - Misters, air washers, humidifiers
 - Other devices that release water droplets
- And for potable plumbing systems if a building has :
 - An inpatient healthcare facility
 - Multiple housing units with a centralized hot water system
 - More than ten stories
 - Housing for occupants over the age of 65 or treating people with certain risk factors
 - Patients staying longer than 24 hours

The Minnesota Experience:

The DWP unit does have regulatory responsibility to do the plan review for public water supplies – as well as any system of water supply, where such system is for public use, or can serve any considerable number of persons, or in case any such system affects or tends to affect the public health in any manner.

That is what happened with the Mayo Clinic.

In early 2012, the Engineering Services Section – which regulates hospitals and other health care facilities – requested for plan review to be done - for the installation of a chlorine injection system as a secondary disinfection into the domestic hot water line at the Mayo Clinic.

- DLI completed the premise plumbing review
- MDH completed the treatment plan review

MDH - Plan Review

- Plans were submitted and approved by July 2013.
- The final installation was complete around December 2013.
- The consultant company Phigenics did the installation and has developed a Potable Water Quality Program Document specifically for Mayo clinic.
- It was the loss of chlorine residual at end points in the hot/tempered water that prompted the installation of the secondary treatment.

MDH – Inspection and Monitoring

- After the installation was complete, MDH went out and conducted an inspection of the installation of secondary disinfection – to verify that it was done as per the plans submitted and approved.
- MDH determined that the hot water system alone did not meet the definition of a PWS. Therefore, we do not require any additional monitoring and sampling of the hot water system.
- Phigenics carries out the monitoring as per the Water Quality Plan they have designed for Mayo Clinic.

Water Quality Plan (Phigenics) :

- Weekly Monitoring
 - Manual measurement of temperature and chlorine levels at distal / sentinel ends and critical control points.
 - Data is loaded into Phimetrics data base for trend analysis.
- Quarterly Validation Testing
 - Water samples taken at selected locations.
 - Results reviewed quarterly with Validation Response activities documented.

Water Quality Validation Plan

- The Water Management Team developed a water quality validation panel which consists of the following:
 - Mineral content
 - Chlorine levels
 - Corrosion by product content
 - Microbiological testing:
 - Total heterotrophic bacteria
 - Coliforms
 - *Pseudomonas*
 - *Legionella*
 - Mycobacteria

Phigenics / Mayo Inspection

- Continuous on-line verification that water in the facility is safe.
- Instant alerts if conditions vary from critical control limits.
- Monitoring and control technology to ensure effective potable water disinfection.
- State-of-the-art data management for defensibility of the water management program

Legionella Outbreak Surveillance summary in Minnesota :

Information from the Infectious Disease Epidemiology, Prevention and Control Division

Year	Outbreak Type	Treated	Illness Type	Agent	Location/ Setting/ Source	Setting	Number of Cases
1988	Recreational Water	Yes	Pontiac Fever	Legionella pneumophila	Spa Pool	Hotel	28
2000	Other		Pontiac Fever	Legionella pneumophila	Water distribution System/Home Plumbing (Plant Lagoon)	Sugar beet plant	15
2000	Recreational Water	Yes	Pontiac Fever	Legionella spp	Spa Pool	Hotel	51
2001	Drinking Water		Legionella	Legionella spp		Hospital	2
2005	Recreational Water	Yes	Acute Respiratory Illness	Legionella	Spa Pool	Private Home	3
2011	Recreational Water	Yes	Pontiac Fever	Legionella	Spa Pool	Membership Club	48
2012	Recreational Water	Yes	Pontiac Fever	Legionella	Spa Pool	Private Home	4
2013	Other	Yes	Legionella	Legionella	Decorative water wall	Casino	2

What are we doing in Minnesota

- Identification of regulatory partners and our relationships
- Identification of the number of systems that have or are considering installing secondary treatment
- NSF training (HACCP for Building Water Systems)
- Potential Legionella Summit with the regulatory partners
- Continue participation in national workshops related to Legionella control and management
- Track the interpretation of the exemption criteria used in qualifying a facility to become a Public Water System
- Conduct a survey of State regulated hospitals
 - Expand survey to Federal and other hospitals
 - Survey hospitality industry

Survey for hospitals in MN:

To get a snap shot of how much secondary treatment is being employed or being considered by health care facilities – these questions were put together for a survey for State regulated hospitals:

1. Does your facility use secondary disinfection or any other treatment beyond what is coming from the city?
2. Does your facility have a water distribution system management plan ?
3. Does your facility have an emergency plan in place in case of any detect of Legionella (or any other biofilm pathogen)?

Summary

Take away points –

- Legionella is an important and complex public health issue.
- Treatment of Legionella should be a part of a comprehensive biofilm management plan.
- Build on the existing guidance and best management practices as it relates to the design, operation and maintenance within premise plumbing of buildings.
- Understand the scope of all regulatory partners as it relates to inspection and monitoring water quality.
- For buildings which do not satisfy the exemption criteria and become public water systems, how do we apply the Safe Drinking Water Act in the surveillance of Legionella specifically, and biofilm management in general?

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Thank you

QUESTIONS?

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