

Prior to Arriving On-site

1. Establish a time line of diagnosed illness in relation to possible exposures at home, work, while traveling, or during visits to atypical locations.
2. Inquire about any interim remedial measures that may have been taken by the facility manager that could impact your sampling plan.
3. Identify possible amplification sites that also pose the risk of aerosolizing water droplets.
4. Request and review plumbing diagrams of the building if available.
5. Request and review water treatment reports for cooling towers if present or available.
6. Identify the locations of outside air intakes for heating, ventilation and air conditioning (HVAC) systems in relation to cooling towers or fountains.
7. Inquire about, or review as-built mechanical plans for, the presence of humidifiers within HVAC systems or standalone humidifiers.
8. Use the information gathered prior to the site inspection to:
 - a. Estimate how many samples you may need to collect and of what type.
 - b. Types of equipment needed to safely gain access to the sampling sites. Determine what will be needed to stop the aerosolization of water from potential amplification sites during sample collection.
 - c. Identify means to prevent unexpected or unauthorized reactivation of pumps, fans, or other mechanical devices that aerosolized water (Lock-Out/Tag-Out).
 - d. Determine what types of tools you will need to remove shower heads, faucet aerators, or pump access covers.

Field Collection Kit Contents

1. Thermometer
2. pH paper or meter (*optional*)
3. 1 L polypropylene plastic bottles for potable water sample collection (w/ sodium thiosulfate) - provided by the Bureau of Laboratories (BOL)
4. 100 to 250 mL sterilized polypropylene plastic bottle for cooling tower water collection - provided by the BOL
5. Sterile tube (15 mL conical tube) - provided by the BOL
6. Sterile polyester swabs for biofilm samples – provided by the BOL
7. Paper towels for cleaning and drying exterior of bottles

8. Vinyl tape to seal bottle tops
9. Indelible marker (water proof) to record sample ID on bottles or swab tubes
10. Tools to remove faucet aerators and shower heads
11. Lock-Out/Tag-Out equipment to prevent accidental reactivation of pumps or fans
(*optional*)

On-Site Assessment Instructions

1. Focus on those areas that are biologically plausible for the pathogen to grow, amplify and be aerosolized. During the site inspection:
 - a. Determine if there have been any changes in routine operations. Of interest are conditions within the incubation period of 2-10 days, but most likely 5-6 days prior to the onset of symptoms of reported cases.
 - b. Has there been any construction onsite or any interruption of water supply to the building?
 - c. Has the facility been under a boil water notice?
 - d. Has the fire suppression system recently been tested?
 - e. Extensive written records of any facts and observations which could be relevant should be kept.
2. Water sources that frequently provide optimal conditions for growth of the organisms include:
 - a. Cooling towers, evaporative condensers, and fluid coolers that use evaporation to reject heat.
 - b. Domestic hot water systems with water heaters that operate below 60 °C (140 °F) and deliver water to taps below 50 °C (122 °F).
 - c. Humidifiers and decorative fountains that create water spray and use water at temperatures favorable to growth.
 - d. Spas and whirlpools.
 - e. Other sources: stagnant water in fire sprinkler systems and warm water for eye washes and safety showers, dental water lines, which are frequently maintained at temperature above 20 °C (68 °F) and sometimes as warm as 37 °C (98.6 °F) for patient comfort.

Water Sample Types

Two types of samples should be collected:

1. Water for free floating bacteria
2. Swabs water sites for bacterial biofilms in sediments, on screens, and in scale improves the likelihood of identifying the amplification sites for targeted organism.

Water Sample Collection Instructions

1. Document and deactivate any potential aerosolization of the water source before sampling water source. Wait 15 to 20 minutes after the aerosolized water has been stopped before entering the area. This is to allow the aerosols to settle out of the air and reduce the risk of exposure to the investigator. Gloves and possibly goggles should be used when handling potentially infectious materials.
2. Remove the aerator or shower head if possible. Use polyester swabs to swab the back side of the aerator or shower head after it has been removed. Collect swab samples before the collection of water.
3. Put the swabs into sterile 15 mL conical tube and put 3-5mL of source water to prevent drying out.
4. Collect one Liter of water in a sterile 1 L wide-mouth screw cap polypropylene plastic bottle. If water is recently treated with chlorine or disinfectants, add 0.5 mL of 0.1 N sodium thiosulfate to each 1 L sample to neutralize the disinfectant.
5. Fill in the proper laboratory submission form
6. Transport samples to the laboratory in insulated coolers for protection against extreme temperatures. Ship at room temperature for 24-hour delivery. Refrigerate samples if longer delivery is expected.

References

Procedures for the Recovery of *Legionella* from the Environment, U.S. Department of Health and Human Services Public Health Service Centers for Disease Control and Prevention (CDC) Atlanta, GA 30333.

Guidelines for the Surveillance, Investigation and Control of Legionnaires' Disease in Florida. Florida Department of Health.