

## Protection Against Legionella – 2017 Update

## Subpart 4-1 Cooling Towers Subpart 4-2 Hospitals and Nursing Homes

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## **Objectives**

- Some background and definitions
- NYSDOH Legionnaires' Disease response
- Environmental health response
  - Community outbreaks
  - Points of exposure
  - Sampling
- Regulatory Update Suparts 4-1 and 4-2
  - Website/Registry
  - Templates and tools
  - Enforcement
  - Centers for Medicare and Medicaid Services (CMS) memorandum



## Background





## **Causative Agent(s)**

Species and serogroup	All isolates (%) n=2340	Community (%) n =1259	Nosocomial (%) n = (890)
Legionella pneumophila	91.4	90.7	93.6
<i>L. pneumophila</i> Serogroup 1	50.5	49.6	52.5
<i>L. pneumophila</i> Serogroup 2 -14	8.8	7.2	12.9
<i>L. pneumophila</i> Unknown	32.1	33.9	28.2
Other species	8.5	9.4	6.2

## **Definitions**

- **Community Associated** Exposure in the community during the entire incubation period.
  - Usually recognized as single cases or a cluster of cases in a limited area.
- **Nosocomial** related to a health care facility
  - Possible Health Care Facility Associated Exposure within a regulated health care facility for a portion of the incubation period.
  - Definite Health Care Facility Associated Exposure within a regulated health care facility for the entire incubation period.



## Legionellosis Reporting In NYS

• Reportable disease in NYS since 1986

• Community-acquired cases reported to LHDs

 Hospital/LTCF (nosocomial) cases reported to NYS DOH and LHDs





In the United States, reported cases of Legionnaires' disease have increased by nearly four times since 2000. More illness occurs in the summer and early fall but can happen any time of year.



### Legionellosis reported incidence rates NY and U.S. 2006-2015



### Sources: NYS DOH web site, MMWR Summary of Notifiable Diseases

MMWR note: From 2013 to 2014, the incidence of legionellosis increased, continuing a general increase that began in 2003. Decreases since 2003 did not result in a lower incidence beyond the immediate past year. Factors potentially contributing to this increase include increased diagnostic testing or an increase in disease transmission.



### **CDC** Data

### Percentage of Outbreaks and Cases of Legionnaires' Disease, by Environmental Source – North America, 2000-2014





## Legionellosis Response





## **Environmental Health**

## Role in a Community Associated Disease



# Role of the Local Health Department (LHD)

- LHD is technically the lead in community investigations.
- Assisted by Regional and Central Office Water Supply (BWSP) and Communicable Disease (BCDC) staff.
- Also direct contact to PWS for construction/disruption information



## **First Steps**

- Local & Regional Epi staff identify 2 or more cases possibly associated to the same facility
- If a facility:

Environmental Assessment Form (EAF) provided to facility for completion (usually LHD staff)



## **Environmental Assessment Form**

Questions about water and air systems within the facility

- Hot water system
- Aerosol-generating devices
- Whirlpools, spas & hot tubs
- Decorative fountains
- Cooling towers
- Construction or other water service events



## **EAF Sample Pages**

#### NYSDOH - V 1.2 8/11/2017

#### Environmental Assessment of Community Premise Water Systems

#### Interviewen/Requester Name: \_\_\_\_\_

Type of Assessment:	On-site assessment?	Telephone and an and a second second	Mailed emailed prior to telephone participation
		(fill in all that apply)	
Date of assessment:		Interviewee r	name:
Facility name:		Job title:	
Location:		Contact Infor	mation:

#### Note to the User:

This information collection tool may be used where a thorough understanding of the potable water system of a facility is needed during a public health investigation. It can be used by the facility's staff or other individual engaged in regular maintenance activities. It should be completed in as much detail as possible. Some information requested by the tool may not be applicable for every type of building or facility.

For very large, complex facilities, completing the form may take several hours. Please keep in mind that this initial investment of time is guite important and will be a time-saving device during periodic re-assessments. If follow-up with the facility is needed in subsequent months or years, the information contained in this form will be very valuable. Please do not leave sections blank. If a guestion doesn't apply, write N/A. If a question can't be answered please explain why. Where applicable, please specify the unit of measurement being used (e.g., ppm). It is recommended that if you are completing the form electronically, you use a different font and/or failes for your answers. This will make the form much easier to read if additional information is added in the future to an existing form

#### A. Type of Facility

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- 1. Hotel or Motel
- 2. Residential Building (e.g. apartment, condominium, retirement facility)
- 3. Office Building
- 4. Manufacturing
- Other Private Business Type of Business: \_\_\_\_\_\_\_
- 6 Restaurant
- 7. Recreational Facility (e.g. health club, water park)
- 8. Other

#### B. Facility Characteristics (as applicable)

#### 1. Number of buildings (including the main facility) that share

- a. water systems with the facility \_\_\_\_\_\_
- b. air systems with the facility

#### NYSDOH - V 1.2 8/23/2013 - DRAFT

9.	If applicable, can room occupants open windows?	Yes	No
	If yes, can an occupant see the cooling unit (cooling tower) from	their roor	m? Please
	describe		

- 10. Are there decorative fountains, foggers, misters, water features, room humidifiers, centralized
- humidification (e.g. on air-handling units) or any other aerosol-generating devices anywhere on the facility premises? Yes No
- If yes, please describe and indicate their location and operation\_\_\_\_\_
- 10. Has this facility experienced previous legionnaires' disease? Yes No

If yes, please describe (e.g., number of cases, dates

11b. Does the facility have any environmental program for Legionelia prevention. Yes No If yes, please describe (prevention/suprellance.etc.)

- C. Outside water supply
  - 1. What is the source of the water used by the facility?
  - [Check all that apply]

\_\_\_\_ Public water supply

Well

Other If the facility is served by a public water supply, please answer the remaining questions, otherwise skip

Other

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- Name of supplier \_\_\_\_\_\_
- How is municipal water disinfected?

Chlorine Monochioramine

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NYSDOH - V 1.2 8/23/2013 - DRAFT

4. Has treatment of the public water supply changed in the last six months? Yes No If yes, specify\_\_\_\_\_

- D. Design of the existing potable water system(s) & other water usage: [Note: A simplified schematic on a separate page and/or facility blueprints are useful for demonstrating the design including number or supply laterals from the public water supply, number and location of risers, whether a water system is fed from the "bottom- up" or "top down", etc. ]:
  - 1. What type of heating system is used for the potable hot water system?
  - [Check all that apply]
    - Instantaneous heaters without storage of hot water
    - \_\_\_\_ Heaters with hot water storage tanks
    - \_\_\_\_ Other [Please describe] \_\_\_\_\_

2. How is the hot water system configured to deliver water to each building?

Building name	Type of system (I=Instant H=Heater/boiler)	Name of system (e.g., Boiler #1, Loop #1)	Date of installation	Total capacity (gallons)	Usual temperature setting (°F/°C)

З.	Is there a recirculation s	system for the ho	t water?	Yes	No
	If yes, please describe	including deliver)	y and return tem	perature	s)

4. If you use storage tanks for heated water how and when are the tanks serviced?

When were these measure	ments made (Month/Da	ate/Year)? /	/

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## **Environmental Assessment Form**

- The EAF provides a framework to begin educating the facility
  - Helps determine building vulnerabilities (aka "hazardous conditions")
  - Determines extent of routine maintenance
- Answers used to determine elements of environmental recommendations.
- Also use information to plan sampling, if needed.



## **Community Assessment**

- In the event that a specific location is not involved:
  - A comprehensive approach to *possible exposures* will be needed
  - This involves interaction between epidemiology and environmental partners
  - Outreach to other private facilities may be needed



## Sampling



## If Sampling Is Needed

- Sampling determined in consultation with LHD, Regional, and Central Office staff.
- Will determine approximate number of samples, locations, and any other info needed prior to visit
- Complete arrangements with a specific facility, multiple facilities or cooling towers

## Where to Sample?

- Sampling is dependent upon possible water exposures **noted in patient questionnaires** 
  - If exposure is from building plumbing, a sampling plan needs to be developed (showers and sinks)

Other locations within the facility or simply another facility (e.g., Health Clubs/Gyms, Hotels):

- Hot tubs or spa?
- Poolside misters?
- Ice machines?



## **Locations to Consider**

Other *events or locations* to consider in community clusters or outbreaks:

- Unregulated assisted living facilities/complexes.
- Sublet rental properties with spas, pools and/or aged populations
- Grocery Stores
  - Produce misters including type of mister and water supply chilling and maintenance issues.
- Air stripping towers associated with industry and or municipal wells.



## **Events to Consider**

- Water main failure and repair
- Scheduled water main replacement or distribution repair work
- Routine water main flushing events (Usually Spring or early Summer)
- Distribution system operational changes
- Local jackhammering or pile driving
- Recent fires in proximity to cases



## Ongoing Questions & Issues



## **Some Surveillance**

- Ongoing sampling of NYS facility cooling towers by BWSP
- Objectives
  - To better understand the current metrics used to assess the chemical and biological condition of a cooling tower.
  - To determine the effectiveness of new techniques.
    - ATP
    - FISH
    - PCR



**Combined Chlorine vs ATP** 



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### **Turbidity vs ATP**



## **Idle versus Stagnant**

- Idle:
  - Indeterminate number of days
  - Water circulating and treated but unit is not managing a heat load
- Stagnant
  - ->= 5 days
  - Water not circulating and not treated



## Subpart 4-1 Review and Update



## **Registration and Reporting**

### Requirements

- All owners of cooling towers shall register their towers, using the Department's statewide electronic system, prior to initial operation, and whenever any owner of the cooling tower changes
- The owner *shall* report data into the statewide electronic system at intervals not to exceed 90 days while a cooling tower is in use

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Equipment Borough 👻 starts with 👻





NYS Cooling Tower Registry Feb. 2017

Example of locational data without NYC February, 2017



## **Registry Updates versus Culture Results**

- Enter your inspection and collection date
- Enter Lab Data later when available.



### **Recent Improvements to Registry Interface**

- User friendly navigation
- Less duplication of information
- Multiple owner tabs available
- No building linking / missing contact data
- Buttons for state-owned and healthcare facility towers
- Simplification of terminology
- Clearer Save buttons
- Exit out / leaving page warning
- Improved help pop-ups
- User guide accessible directly from the registry

## **Maintenance Program and Plan**

- Sampling
  - Routine bacteriological culture sampling and analysis (intervals not to exceed 30 days)
  - Routine Legionella culture sampling and analysis (upon start-up and at intervals not to exceed 90 days)
  - Non-routine sampling provisions following disease, power failure, and other conditions
- Legionella culture analysis



PLAN TEMPLATE

VERSION: 1.0

## Maintenance Program & Plan (MPP)

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August 2017

NEW YORK STATE DEPARTMENT OF HEALTH Bureau of Water Supply Protection

COOLING TOWER MAINTENANCE PROGRAM AND

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## Notification

### 1. Owners

Notify the local health departments within 24 hours of receipt of a *Legionella* culture sample result that exceeds 1,000 CFU/mL

### 2. Local Health Departments

Notify the Department within 24 hours Currently NYSDOH is being notified through an electronic mail log

### 3. Owners

**Notify the public** in a manner determined by the local health department (or by the Department in the event that the department elects to determine the manner.

### **Notification Template**

- Template is guidance
- Posting is required for a building with an exceedance
- Content varies depending upon the situation
- Property owner may need to check with counsel

Tests Show Elevated Legionella in a Cooling Tower

A cooling tower associated with **[insert building name/address –or- this building]** has shown elevated levels of *Legionella* (a type of bacteria). A cooling tower is part of a recirculated water system incorporated into a building's cooling, industrial, refrigeration or energy production system.

In New York State, all owners of cooling towers are required to test their towers routinely for Legionella to assess the effectiveness of routine disinfection and maintenance.

The **[insert name of organization, consultant or "building owner"]** received sample results on **[insert date]** that showed that the concentration of *Legionella* in the cooling tower was **[insert result]** colony forming units per milliliter (CFU/mL). In accordance with the New York State Department of Health's (DOH) regulations, any result over 1000 CFU/mL requires public notification, review of cooling tower treatment protocols, and decontamination of the cooling tower. <u>This notice serves as public notification</u>.

As required by DOH, the **[insert organization, consultant, or "building owner"] [has performed –or- will perform**] decontamination of the cooling tower, **[has reviewed –or- will review]** the cooling tower treatment protocol, and **[retested or will retest]** the cooling tower within 3-7 days, in accordance with regulation. The building owner will continue to follow the DOH requirements once retest results are received if the results remain elevated and require further disinfection or decontamination of the cooling tower.

Cooling towers can release *Legionella* into the air near the tower. This does not necessarily mean that people will be exposed to the bacteria or become ill. People most at risk are those with a weakened immune system, current or former smokers, those with a chronic lung disease (like Chronic Obstructive Pulmonary Disease (COPD) or emphysema), or those over 50 years old.

If you have any questions regarding this incident, please feel free to contact the local health department at [insert local health department phone number] for additional information.

If you have any questions regarding *Legionella*, please refer to NYS Department of Health's website:

www.health.ny.gov/Legionella

DATE Distributed: Insert

Department of Health

## Inspection

- Performed prior to seasonal start-up and at intervals not to exceed 90 days while a tower is in use
- Performed by a New York State licensed professional engineer, certified industrial hygienist, certified water technologist, environmental consultant, or water treatment professional with training and experience performing cooling tower inspections

## Certification

- Obtained by the owner from a person identified to perform inspection of cooling towers by November 1 of each year (including 2016);
- Certifies that all elements of Subpart 4-1 were completed during the currents season:
  - Legionella culture
  - Bacteriological culture
  - Inspections
  - Response to upset condition
  - Etc.



## **Certification Template**

COOLING TOWER ANNUAL CERTIFICATION TEMPLATE

VERSION: MARCH 13, 2017

NEW YORK STATE DEPARTMENT OF HEALTH Bureau of Water Supply Protection

#### COOLING TOWER ANNUAL CERTIFICATION CHECK LIST

[Instructions: Use the following check list as a means of determining the completeness of a cooling tower annual certification.]

Items to be evaluated for certification:

### FACILITY INFORMATION (SEE SECTION 1 OF OUTLINE)

- D Tower location
- Cooling tower certifier (company) information
- Date of certification
- Cooling tower information

### MAINTENANCE PROGRAM AND PLAN CERTIFICATION (SEE SECTION 2 OF OUTLINE) INSPECTIONS (SEE SECTION 3 OF OUTLINE)

- Inspection dates
- Inspection responses

BACTERIOLOGICAL (NOT *LEGIONELLA*) SAMPLING RESULTS (SEE SECTION 4 OF OUTLINE)

- Bacteriological sampling results table
- Summary of findings

*LEGIONELLA* SAMPLING RESULTS TABLE (SEE SECTION 5 OF OUTLINE)

- Legionella sampling results table
- Summary of findings

COOLING TOWER DISINFECTION EVENTS (SEE SECTION 6 OF OUTLINE)

Record of disinfection and decontamination events

Summary of findings

COOLING TOWER MAINTENANCE PROGRAM AND PLAN CERTIFICATION (SEE SECTION 7 OF OUTLINE)

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Department

https://www.health.ny.gov/environmental/water/drinking/legionella/cooling\_towers.htm

## **Enforcement**

### Requirement

- The Department or local health department may require any owner to conduct *Legionella* culture sampling and analysis based on one or more cases of legionellosis.
- An officer or employee of the Department or local health department may enter onto any property to inspect a cooling tower and may take water samples



## **Notice of Violation**



possibility of fines and other penalties.



## **Appendix 4-A Action Thresholds**

- Non-detect < 20 CFU/mL (continue current program)
- At ≥ 20 CFU/mL but < 1000 CFU/mL
  - Review program
  - Online disinfection (dose with a different biocide or at a higher level than currently used)
  - Retest at 3-7 days, see additional actions in regulation

- For levels ≥ 1000 CFU/ml
  - Review program and public notification
  - Online decontamination (dose to 5 mg/l of halogenated compound for 1 hour)
  - Retest at 3-7 days, see additional actions in regulation



## Notification

- Appendix 4-A in Subpart 4-1 determines actions.
- Section 4-1.6 states the following with regard to <u>exceeding 1000 cfu/ml</u> in a sample:
  - The owner shall notify the public of such test results in a manner determined by the local health department or, in the event that the department elects to determine the manner of notification, by the department.



## **Notification**



## Subpart 4-2 Review and Update



## **Environmental Assessment**

- By September 1, 2016, all covered facilities were to perform an environmental assessment, unless an environmental assessment was performed on or after September 1, 2015
- The environmental assessment must be updated annually or under certain conditions including completion of construction or repair activities that may affect the potable water system
- The Environmental Assessment Form (EAF) is on the Health Commerce System (HCS) and will be posted on the Department's website

## **Environmental Assessment Form**

NEW YORK STATE DEPARTMENT OF HEALTH Bureau of Water Supply Protection	Environmental Assessment of Water Systems in Healthcare Settings
1. Type of Assessment (check as appropriate)	
0n-site assessment Telephone assessment	Mailed/emailed prior to telephone conference
2. Information about the person doing the assessment	
Name	
Job title	
Facility name	
PFI (Permanent Facility Identifier)	
Facility address	
Date of assessment	
3. Contact information	
Telephone number (work and/or cell)	
FAX number	
Email	
Instructions and Notes to the User (place search	

#### Instructions and Notes to the User (please read

### Please complete this form and keep it with your records. You do not need to submit it to NYSDOH. You will need to produce this form at the request of NYSDOH as part of a routine inspection or during the investigation of an outbreak.

This information collection tool may be used where a thorough understanding of the potable water system of a healthcare facility is needed during a public health investigation. It can be used by a hospital multi-disciplinary group that includes: a hospital englemiologicit, infection control practitioner, englineer, facility anager or other individually engaged in efforts to reduce the risk of legionellosis associated with the facility. It may also be used to assist the facility in efforts to minimize the risk of legionellosis in the absence of evidence of human disease or when a facility is reviewing/implementing the NYSDDH guidance document on hospital-associated legionellosis. It should be completed in as much detail as possible. Some information requested by the tool may not be applicable for every healthcare facility.

For very large, complex healthcare facilities, completing the form may take several hours. Please keep in mind that this initial investment of time is quite important and will be a time-saving device during periodic re-assessments. If follow-up with the facility is needed in subsequent months or years, the information contained in this form will be every valuable. *Rease do not leave* sections blank. If a question doesn't apply, write N/A. If a question can't be answered please explain why. Where applicable, please specify the unit of measurement being used (e.g., pom). It is recommended that if you are completing the form electronically, you use a different font and/or italics for your answers. This will make the form much easier to read if additional information is added in the forum te an existing form.

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DOH-

<ol> <li>Number of buildings (including the main facility)</li> </ol>	that share:
---	-------------

water	systems	with	the	facility	

b.	aır	sy	stems	W	1th	the	facilit	y

2. Number of Intensive Care Unit beds (including surgery, coronary care, etc.)

|--|

4. Does the facility have a bone marrow transplant program?

Type of healthcare setting (check all that apply):		Acute care hospital		Long-term care faci	lity
--	--	---------------------	--	---------------------	------

6. Organization that owns this facility is: Public Private Veterans Administration Other (explain).

7. Description of each building that shares water or air systems with the facility (and including the main facility):

Building Name	Original Construction	Later Construction	Storles	Sq. feet	Beds	Census	Use
List main facility first	Year completed	(renovation, expansion)				(yr. avg.)	List all types of care and/or specify other use
		From/To or N/A	#	Ft²	# or NA	#/day or NA	I = Inpatient=I O = Outpatient B = Both ICU = Intensive Care Tx = Transplant
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Outpatient surgical center

Assisted living facility

## Sampling & Management Plan

### **Implementation and Updating**

- Plans for covered facilities should have been prepared and implemented by December 1, 2016
- New facilities must ALWAYS adopt a plan prior to providing services
- The plan must be updated annually and following "specific conditions"

### Requirements

- Routine Legionella culture sampling and analysis at intervals not to exceed 90 days for the first year and annually thereafter (with the exception of hematopoietic stem cell transplant or solid organ transplant patient units)
- Provisions for non-routine sampling for Legionella culture sampling and analysis following disease, construction, & other conditions
- Analysis must be done by an ELAP-approved laboratory

Department

## Sampling & Management Plan

SAMPLING AND MANAGEMENT PLAN FOR HEALTHCARE FACILITIES: GUIDANCE AND TEMPLATE

VERSION: 1.0

NEW YORK STATE DEPARTMENT OF HEALTH Bureau of Water Supply Protection

#### SAMPLING AND MANAGEMENT PLAN CHECKLIST

[Use the following check list as a means of determining the completeness of a SMP.]

Items to be included in the Sampling and Management Plan (SMP):

#### □ Facility Information

- Facility Location
- Point of Contact
- Developer of Sampling and Management Plan (Company)
- D Point of Contact for Company or Organization
- Address of Company
- Effective Date of SMP

### Personnel Roles and Responsibilities

- SMP Team Members
- SMP Team Functions

#### Building Water Systems Descriptions

- Potable Water Systems List
   Potable Water Systems Descriptions
- □ Legionella Sampling Plan
  - □ Sampling Locations for Domestic Hot Water in a Facility
  - Non-Medical Equipment Sampling
  - Infrastructure Equipment Sampling
- □ Potable Water System Monitoring

#### Potable Water System Maintenance

- Hot Potable Water System Maintenance
- Cold Potable Water System Maintenance

### Procedures for Responding to Sampling Exceedances

### Procedures in Event of Nosocomial Illnesses

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Department of Health

## **Additional Provisions**

### Recordkeeping

The EAF, sampling and management plan, and sampling results shall be retained on-site for three years

### Enforcement

The Department may conduct an assessment or *Legionella* culture sampling of the potable water system at any time

### Variances and Waivers

### Appendix 4-B: Action Thresholds (key)

< 30 % or  $\geq$  30 % - If > 30% NYSDOH needs to be notified.



## **CMS** Compliance

- **Title**: Requirement to Reduce *Legionella* Risk in Healthcare Facility Water Systems to Prevent Cases and Outbreaks of Legionnaires' Disease (LD)
- Effective date: June 2, 2017
- Surveyors will review policies, procedures, and reports documenting water management implementation results to verify that facilities:
  - Conduct 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.
  - Implement a water management program that considers the ASHRAE industry standard and the CDC toolkit, and includes control measures such as physical controls, temperature management, disinfectant level control, visual inspections, and environmental testing for pathogens.
  - Specify testing protocols and acceptable ranges for control measures, and document the results of testing and corrective actions taken when control limits are not maintained.



## CMS Enforcement & Subpart 4-2

Item		Response	Citation
Does the faciality have a Sampling		No	Yes
Management Plan (SMP)?		Yes	-
	Date Completed:	-	-
	<ul> <li>a) Does the plan describe the potable water system distribution (can be in text or diagram format)?</li> </ul>	Yes = ok No	Not a citation – but needing a follow up response / area of improvement
	<ul> <li>a) Does the faciality have a Legionella sampling plan?</li> </ul>	Yes = ok No	Not a citation – but needing a follow up response / area of improvement
	<ul> <li>a) Does the faciality have a procedure for sampling when an exceedance is identified?</li> </ul>	Yes = ok No	Not a citation – but needing a follow up response / area of improvement
	<ul> <li>a) Does the faciality have a procedure for handling nosocomial illness that could be legionellosis?</li> </ul>	Yes = ok No	Not a citation – but needing a follow up response / area of improvement
Does the faciality have an Environmental Assessment Form (EAF)?		No	Yes
		Yes	-
	Date Completed:	-	<u></u>
	Is the EAF expired (> than 1 yr old)?	Yes	Yes
		No	-

## **Local Health Department Guidance**

- The Department has continued to develop and post guidance, tools and templates that will help with continued implementation of the regulation (Subpart 4-1).
- An Environmental Health Manual Item is being developed for County guidance (Subpart 4-1).
- Regional NYSDOH staff will investigate Article 28 facilities (Subpart 4-2).

## Acknowledgements

- Staff from the Bureau of Water Supply Protection, Water Systems Control and Analysis:
- Ursula Lauper
- John Paccione, Ph.D.
- Andrew Lui
- Braden Savage



## Questions?

**Adopted Regulation** 

https://regs.health.ny.gov/content/part-4-protection-against-legionella

CDC resources – toolkit for water management

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

CDC resource – vital signs – short version of building management

https://www.cdc.gov/vitalsigns/pdf/2016-06-vitalsigns.pdf

