

Ohio Journal of  
Environmental  
Health

4th Quarter 2019

**Legionnaires' disease outbreak associated  
with a hotel whirlpool spa - Elyria, Ohio  
March 2017 -December 2018**

*Legionella pneumophila*

Source: CDC



Official Publication of the Ohio Environmental Health Association

[www.ohioeha.org](http://www.ohioeha.org)  
[www.facebook.com/ohioeha](https://www.facebook.com/ohioeha)  
[www.twitter.com/OhioEHA](https://www.twitter.com/OhioEHA)



The object and purpose of the Association shall be the betterment of the health and welfare of mankind through the improvement of the environment. This shall be done by sponsoring state and regional meetings and publications, by developing methods of measuring and evaluating achievements in environmental health, the establishment of a central point of reference and education material for the membership, the procurement of cooperation with other agencies and organizations, and such other activities as will lead to the greater efficiency and professional growth of the membership.

#### **Board of Directors**

##### **President**

Carrie Yeager, R.S.  
Butler County Health Department

##### **President Elect**

Stephan Ruckman, MPH, R.S.  
Worthington City Schools

##### **Past President**

Garrett Guillozet, MPA, R.S., REHS,  
AEMT  
Franklin County Public Health

##### **Vice President**

Sarah Jensen, MPH, R.S., REHS,  
CPFS  
Savor Safe Food

##### **Vice President Elect**

Matt Tyler, MPH, R.S.  
Public Health Dayton & Montgomery  
County

##### **Secretary**

Joe Harrod, R.S., REHS  
Richland Public Health

##### **Treasurer**

Mary Helen Smith, MPH, CPH, R.S.,  
REHS  
Portage County Combined General  
Health District

##### **Administrative Aide**

Vicki Johnson

##### **Northeast District Director**

Colton Masters, MPH, R.S.  
Canton City Health Department

##### **Northwest District Director**

Shannon Self, R.S.  
Delaware General Health District

##### **Southeast District Director**

Jeff Gibbs, R.S., REHS  
Franklin County Public Health

##### **Southwest District Director**

Brian Williamson, R.S.  
Norwood City Health Department

#### **Publications Committee**

Adam R. Howard, MPH, R.S., REHS  
Delaware General Health District  
ahoward@delawarehealth.org  
740-203-2069

Dustin Kent, MPH, R.S.  
Delaware General Health District  
dkent@delawarehealth.org  
740-203-2058

Tracy L. Buchanan, R.S.  
Retired, Ohio EPA

#### **Publication Information**

The Ohio Journal of Environmental Health is published by the Ohio Environmental Health Association (PO Box 234, Columbus, OH 43216-0234). A one year subscription, without membership, is available at a cost of \$60.

Postmaster send address changes to: 2818 Annabelle Ct, Grove City, OH 43123. Second Class Postage Paid. Grove City, Ohio.

Other correspondence relating to address changes, applications for membership and other matters should be addressed to: Ohio Environmental Health Association, Vicki Johnson, Administrative Aide, PO Box 234, Columbus OH 43216-0234; Phone 614-871-0665.

The articles herein published represent the work of the designated author(s). The facts, opinions, and findings represented in the articles are those of the author(s) and do not necessarily represent the facts, opinions, and findings of the Ohio Environmental Health Association nor the publications committee.

The appearance of advertising in this publication does not necessarily include its endorsement.

To include articles or other materials for publication, contact: Adam Howard, Dustin Kent, or Tracy Buchanan

#### **Advertisement Rates**

##### **One Page**

1 Issue: \$190  
1 Year: \$584

##### **1/2 Page**

1 Issue: \$120  
1 Year: \$356

##### **1/4 Page**

1 Issue: \$79  
1 Year: \$216

# Ohio Journal of Environmental Health

Volume 68  
Number 4  
4th Quarter 2019

## Table of Contents

President's Message .....	4
Carrie Yeager, R.S. - Butler County Health Department	
Featured District Director's Message: Southwest.....	6
Brian Williamson, R.S. - Norwood City Health Department	
Legionnaires' disease outbreak associated with a hotel whirlpool spa- Elyria, Ohio March 2017-December 2018.....	8
John J. Sabo, RS & Jami Krugman, RN - Lorain County Public Health	
News, Information, and Education.....	18
George Eagle Memorial Scholarships Available .....	18
Announcements.....	20
Committees & Chairs.....	21

### Advertisements

Purell.....4	Norweco.....5	Polylok.....6	Paper Thermometer.....7
University of Findlay .....8	ANUA.....10	Presby Environmental .....15	Tangent.....16
Infiltrator ATL.....17	JET.....77		

## President's Message

Carrie Yeager, R.S.  
Butler County Health Department

I want to start with a very big thank you to everyone who attended one of the fall conferences. I would also like to thank each of the District Planning committees who made me feel welcome at each of the District Conferences. I enjoyed each one and got to listen to a very diverse group of speakers.



Thank you to everyone who reached out about the issues that are still occurring with the Food Surveys. OEHA sent a follow up letter to both State Agencies listing out the continued concerns with the survey process. We are waiting on their response back. OEHA did make a public information request for all survey results from October 1, 2018 to September 30, 2019 and have received most of the information. We are waiting on results back from a few surveys that were conducted in August and September but had not been finalized yet. We will use the survey results to see if there are still differences between how the state agencies are following the survey process. If you have had an issue with your survey, please reach out to one of the Board of Directors so that we can be made aware of your concern.

I recently provided interested party testimony on Senate Bill 195 which would exempt small wineries from Retail Food Licensing. This was my first-time giving testimony and a very enlightening experience. The main concern of Senator Schaffer who

sponsored the bill is dual licensing of facilities. We made our concerns known about the need to ensure that the wineries have the proper equipment to properly clean and sanitize any dishes or wine glasses that the facility will use. We are currently looking into what responsibilities the Division of Liquor Control has in these facilities.

Again, it was nice to meet everyone at the conferences.



## The New Standard in Surface Sanitizers

Formulated for food contact surfaces —no rinse required.

**30** seconds to kill  
**NOROVIRUS**

**60** seconds to kill  
**HEPATITIS A**

[GOJO.com/Foodservice](https://www.GOJO.com/Foodservice)

©2019, GOJO Industries, Inc. All rights reserved. | #28444 (06/2019)



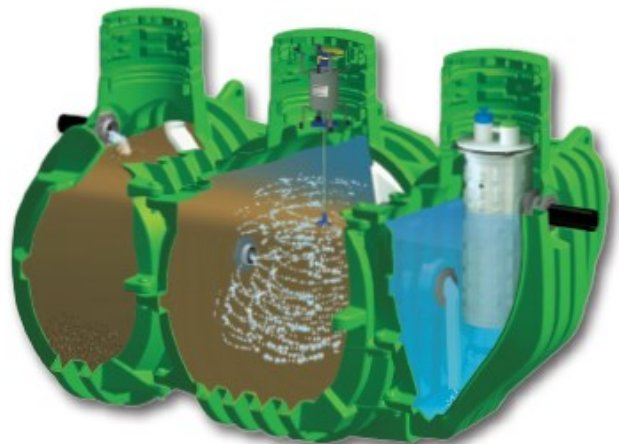


***norweco®***

*Engineering the future of water  
and wastewater treatment*

## WHY CHOOSE NORWECO?

- 💧 **SAVE TIME & MONEY:** No wait with Singulair Green; set your own schedule.
- 💧 **NEW PRODUCTS:** We think of it before you need it. Nitrogen reduction, phosphorus removal and water reuse systems available now.
- 💧 **INTEGRITY:** Tested and certified products backed by an experienced team of experts.



1-800-NORWECO | [www.norweco.com](http://www.norweco.com) | [email@norweco.com](mailto:email@norweco.com)

## Featured District Director's Message: **Brian Williamson, R.S.** Southwest Norwood City Health Department

As the 2019, Southwest District Director, I watched our planning committee start the year brain storming hot topics to select for our fall conference. It was amazing at how quickly the pieces were put in order. As the planning progressed, I watched our planning committee secure speakers, discuss multiple updates on environmental programs, share stories about responding to tornados and network with professionals who take the practice of environmental health seriously. A question that arose a few times this year was



how to attract members from agencies or jurisdictions who are not participating in OEHA. From my experience this year, I can say that participating in OEHA builds a collection of correspondence, a list of contacts and a bank of information that becomes useful. My participation in OEHA this year was directly beneficial to my health jurisdiction because I was able to provide multiple examples of documentation for our accreditation process. I look forward to continue working with [OEHA] and I look forward to transitioning the Southwest District Director's position to Stephanie Johnson.

<p>PL-68 PL-122 PL-525/625 GF-10 12x20 4x22 4x18 Filter Alarms &amp; Switches</p> <p><b>POLYLOK</b> <b>BEST</b> TECHNOLOGY</p>	
<p><b>Effluent Filters / Filter Alarms &amp; Switches</b></p> <p>Covers: 12", 15", 18", 20", 24" &amp; 30" Grates: 3", 4", 6", 12", 15", 18", 20" &amp; 24"</p>	
<p><b>Covers &amp; Grates (for Polylok Risers / D-Boxes &amp; Corrugated Pipe)</b></p>	
<p><b>1-877-765-9565 / www.polylok.com</b></p>	
<p><b>Extend &amp; Lok (3", 4" &amp; 6")</b></p> <ul style="list-style-type: none"> <li>• Easy installation</li> <li>• No gluing necessary</li> <li>• Centers filter or tee under riser</li> </ul>	<p><b>Tank Risers (12", 20" &amp; 24")</b></p> <p>6" Tall Risers 12" Tall Risers</p>
<p><b>Distribution Boxes</b></p>	<p><b>Hydro Shield</b></p> <ul style="list-style-type: none"> <li>• One Hydro Shield fits 3 pipe sizes: 1", 1-1/4" &amp; 1-1/2" or 1", 1-1/2" &amp; 2"</li> <li>• Easy to install, just clip in.</li> <li>• 360 degree equal distribution</li> </ul>
<p><b>STEP Systems</b></p>	<p><b>Flow Controller</b></p>

## **FDA Food Code Section 4.703.11 (B)**

“achieving a UTENSIL surface temperature of 71°C (160°F) as measured by an irreversible registering temperature indicator”

The FDA Requires  
a Dish Temperature  
of **71°C/160°F**

# Be Prepared – Use **THERMOLABELS®**



## **Try NOW for FREE!**

**Get your FREE SAMPLES TODAY!**

Visit us at [paperthermometer.com/sample](http://paperthermometer.com/sample)  
to request a sample.

**PaperThermometer™**

1-877-PTLABEL

[info@paperthermometer.com](mailto:info@paperthermometer.com)  
[paperthermometer.com](http://paperthermometer.com)



# Legionnaires' disease outbreak associated with a hotel whirlpool spa- Elyria, Ohio March 2017-December 2018

John J. Sabo, RS &  
Jami Krugman, RN  
Lorain County Public Health

A Legionnaires' disease (LD) outbreak at Hotel A in Lorain County Ohio was investigated by a Lorain County Public Health (LCPH) team in 2018.

**Background.** During December 2018, a Legionnaires' disease (LD) outbreak at Hotel A in Lorain County Ohio occurred. An investigation was conducted by a Lorain County Public Health (LCPH) team to identify the source.

**Methods.** Five cases of LD reported as occurring in Hotel A guests, including four cases as visitors to the state and one case from within the state, were provided by CDC and the Ohio Department of Health. December 2018, Hotel A was inspected for possible *Legionella* exposure sources by LCPH. The temperature, pH and biocidal activity of the whirlpool spa (hot tub) were measured, and samples from those sites were tested for *Legionella*.

**Results.** Laboratory confirmed LD was discovered in 5 guests who became ill within 2 weeks of exposure between March 2017 and December 2018, to Hotel A and/or the indoor whirlpool. No LD cases were identified among hotel workers. Exposure to the indoor whirlpool spa was associated with Legionellosis. Specimens from the whirlpool spa tested positive for *Legionellae pneumophila* serogroup 1 by polymerase chain reaction.

**Conclusions.** This outbreak demonstrates many of the characteristics of typical travel-related Legionnaires' disease outbreaks that make detection very difficult: low attack rates, long incubation periods, dispersal of persons away from the source of the infection, and inadequate surveillance. When an LD outbreak is detected, the source should be identified and then aggressively remediated. Missed prevention opportunities and local building owners and pool/spa managers not having or implementing a water management program can lead to outbreaks.

**Keywords.** Community-acquired pneumonia; legionellosis; Legionnaires' disease.

Authors: John J. Sabo<sup>1</sup>, Jami Krugman<sup>2</sup>,

The rest of the Legionellosis Outbreak Investigation Team: Kathy Grella<sup>3</sup>, John Harbeck<sup>4</sup>, Jill Lis<sup>5</sup>, and Dave Oakes<sup>6</sup>

1. Lorain County Public Health, Epidemiologist, Registered Sanitarian 2. Lorain County Public Health, Epidemiologist, Registered Nurse 3. Lorain County Public Health, Registered Nurse, Epidemiologist 4. Lorain County Public Health, Registered Sanitarian 5. Lorain County Public Health, Director of EH, Registered Sanitarian 6. Lorain County Public Health, Supervisor of EH, Registered Sanitarian



## University of Findlay®



Legionellosis, caused by *Legionella* bacteria, can result in severe pneumonia known as Legionnaires' disease (LD) or a mild febrile illness known as Pontiac fever [Bartram]. The inhalation of particles of aerosolized water contaminated by the opportunistic waterborne pathogen, *Legionella* spp. causes inflammation in the lung [Muder]. These bacteria can live outside in soil and water but rarely cause infections [Travis]. Indoors, though, the *Legionella* bacteria are capable of amplifying in man-made water systems such as cooling towers, whirlpool spas, air conditioners, mist sprayers, and potable water systems [Cowgill, Silk, ASHR]. Legionnaires' disease outbreaks linked to such water systems can occur in buildings including hotels and resorts, long term care facilities, hospitals, industrial and office workplaces, and residential buildings [CDC 2017].

Since 2000, a 4.5-fold increase in the number of *Legionella* outbreaks and cases have been reported in the United States and Europe with approximately 10% of those being fatal infections [CDC2000, Beer, Dooling]. In 2017, over 7500 cases were reported in the United States according to the Centers for Disease Control and Prevention (CDC). Because of the challenging transient nature of the exposed population, there is the belief that the disease is likely underdiagnosed and the true incidence may be underestimated [Dooling]. A recent review estimated the number of infections to be closer to 8,000 and likely up to 18,000 cases indicating the importance of understanding, detecting and controlling LD [CDC 2000].

In late 2018, the CDC and the Ohio Department of Health (ODH) contacted Lorain County Public Health (LCPH) to report a possible common link between five guests who had stayed at the same hotel between the period of March 2017 and December 2018. All five were reported with a severe infection caused by *Legionella* species. This confirmed cluster or outbreak of legionellosis (two or more individuals having a person, place, and time epidemiological link) set forth an intensive assessment of the identified facility by LCPH [Ambrose].

In response to this outbreak, LCPH conducted a facility assessment and an epidemiology investigation of this LD outbreak in December 2018 utilizing a team approach. The

team, a public health nurse/epidemiologist, an environmental specialist, and an epidemiologist/environmental specialist, completed a field investigation according to the principles contained in the CDC *Legionella Environmental Assessment Form* [CDC Pontiac]. The objectives of the epidemiology investigation were to identify any other potential cases (active case finding) and to determine the most likely source of an outbreak of legionellosis by establishing associations between ill individuals and possible exposures. The objectives of the environmental health assessment were to determine the most likely source of an outbreak of legionellosis or prevent legionellosis from occurring by lowering a facility's risk factors for *Legionella* propagation and growth [Guidelines].

## METHODS Outbreak

Legionellosis is associated with two clinically and epidemiologically distinct illnesses: Legionnaires' disease (LD), which is typically characterized by fever, myalgia, cough, and clinical or radiographic pneumonia; and Pontiac fever, a milder illness without pneumonia [CDC Pontiac]. Identification cases of LD in the United States are reported to local or state health authorities and the CDC. States and local health authorities are encouraged to include information captured, at a minimum, key demographic, clinical, exposure, and reporting details about recent travel, in their reports to the CDC. Reporting can make identification of outbreaks easier because travel-related LD outbreaks may affect travelers widely dispersed throughout the United States and the world [CDC Pontiac].

## Epidemiological Investigation

**Case definition** At the time of the December 2018 investigation, a confirmed LD case connected to the outbreak was defined as laboratory-confirmed *Legionella* infection in a guest to Hotel A within the period of March 2017 through December 2018, whose illness began within 10 days of time spent at Hotel A. Laboratory confirmation included at least one of the following: identification of *Legionella* by culture, direct fluorescent antibody testing, urine antigen assay, lung tissue, pleural fluid or an increase in antibody

titer indicating recent infection [Burnsed].

### Environmental Assessment and Testing

December 11, 2018, ODH contacted LCPH regarding two cases of *Legionella* with a potential link to two previous cases. These four medically confirmed Legionellosis cases were identified to be associated with a common exposure at Hotel A. Usage of the hotel spa was a common factor, but could not be assumed to be the only factor due to other potential sources of exposure within a hotel environment i.e. (showerheads, ice machines, eyewash stations, etc.). LCPH was asked to assess and provide practical resources to minimize additional risks of legionellosis to guests and employees. The goal of the investigation was to help identify possible sources and areas within and around the facility that might be associated with the growth of *Legionella* bacteria.

December 12, 2018, inspection of Hotel A begin[s] but was not completed due to management not being available. Only a standard pool/spa

inspection was conducted on this day and the results indicated no chlorine in either the pool or the whirlpool spa. The hotel staff agreed to lock the pool facility and not allow access by the public or employees.

December 13, 2018, in the presence of hotel management, a thorough building inspection was conducted to assess and identify all potential *Legionella* sources. The assessment was conducted with the use of the CDC's "*Legionella* Environmental Assessment Form".

This assessment form contains procedures that can be utilized during the investigation. Additional information collected during this investigation included a standard pool/spa inspection and potable water quality (chlorine concentrations, pH levels, and temperature) analysis, a review of the facility's operation and maintenance records for items such as ice machines, eyewash stations and the whirlpool spa and pool, the maintenance prevention measures and an interview with the pool maintenance representative.



## Clean Water

- Open cell foam media
- 2-foot soil depth credit
- Spray irrigation
- No aerator/blower
- Nitrogen reduction
- Residential and commercial
- NSF/ANSI Standard 40

**Quanics**  
AeroCell



877.782.6427 ■ [anuainternational.com](http://anuainternational.com)

During this time the team was able to focus on describing water systems and their components, identifying areas where *Legionella* could grow, deciding where control measures are needed and how to monitor them, planning response actions when control measures fail, and monitoring and documenting water management activities.

Clinical features were also discussed including monitoring workers for illness, the severity of illness and describing mortality associated with LD.

The initial investigation concluded that maintenance and monitoring were not being consistently achieved with the swimming pool and whirlpool spa. It was determined that the swimming pool and whirlpool spa needed to be ordered closed by the Board of Health, however, the management voluntarily closed the aquatics facility before this was initiated.

December 13, 2008, one additional case of *Legionella* associated with this hotel was reported to LCPH. A decision was made to send alerts through the Ohio Public Health Communication System (OPHCS) and CDC's Epidemic Information Exchange (EPI-x) to all public health epidemiologists, hospitals and other health partners in the state.

December 18, 2018, water samples were collected by Registered Sanitarians. Water samples and biofilm swab specimens were collected from six different sites at Hotel A: the whirlpool spa, the whirlpool spa filter, the showerhead in the indoor pool room, a hot-water heater, and selected hotel guest room water faucets and showerheads. (Photos 1, 2, 3)

Bulk water and biofilm swab samples from those six sites were collected accordingly to published standard procedures [CDC 2005]. Bulk water samples were collected in 1-liter sterile bottles with 0.5 mL of 0.1 N sodium thiosulfate added



**Photo 1 Filter sand collection**

to neutralize chlorine. Biofilms inside plumbing fixtures were sampled with a Dacron-tipped swab and then placed in 3 to 5 mL water (to prevent drying during transport) with 2 to 3 drops of 0.1 N sodium thiosulfate solution. Water for the biofilm swabs came from the same site as where the swab was collected.



**Photo 2 Bulk water sample**

Specimens were placed in sterile containers and submitted to the Northeast Ohio Regional Sewer District Laboratory (NEORS D).

Those samples were cultured at the laboratory using published standard procedures [CDC2005]. All samples were analyzed by MALDI-TOF [NEORS D].

January 5, 2019: LCPH met with the hotel management, a swimming pool and spa firm (familiar with CDC *Legionella* reduction guidance for the assessment, testing, and remediation of the whirlpool spa filtration system), the hotel maintenance staff, insurance agency, and Ecolab to discuss the necessary steps that must be utilized to remediate the risk of *Legionella* growth and transmission.



**Photo 3 Dacron-tipped swab**



## RESULTS

### Epidemiological Investigation

Five confirmed LD cases were identified among guests with an onset of symptoms staying at the hotel between March 2017 and December 2018 (Figure 1). One case was identified in March 2017, 1 case in November 2017 and 3 cases identified in November 2018.

All five individuals with confirmed LD were  $\geq 45$  years old (Table 1). 3 individuals were male, 1 female and 1 unknown. The hotel was the only common exposure identified among the individuals with confirmed LD. Four individuals used the whirlpool spa during their stays, and 1 was not linked to the whirlpool spa.

No LD cases were identified among hotel employees.

No additional confirmed or probable LD cases were found on or after January 2019.

### Clinical Laboratory Testing

NEORSD follows the procedures outlined by *The Center for Disease Control (CDC), procedures for the Recovery of Legionella spp. from the Environment, January 2005*. Samples were prepared for analysis by filtration and acid treatment prior to plating. The samples were analyzed using a series of different media to detect and confirm the presence of *Legionella* spp. Furthermore, the samples were analyzed by qPCR [Riffard] for *Legionella* spp., *Legionella*

*pneumophila* 16s rRNA and *Legionella pneumophila* Serogroup 1. Finally, any suspect colonies were subjected to MALDI-TOF analysis to confirm genus and species identity. (Table 2) [NEORSD]. Additional organisms presented in the analysis are found in Table 3.

A bronchial wash on one patient was received and was PCR-positive for *L. pneumophila* serogroup 1 (the case was also urine antigen-positive) [Luttichau].

### Environmental Assessment and Testing

Hotel A, a four-story building contains 97 guest rooms, opened in July 2013. The aquatic facility consists of an indoor swimming pool (15,270 gallons), a whirlpool spa (1500 gallons), an open shower area, and several chairs and tables. The room measures 35 ft. x 56 ft. The whirlpool spa's characteristics included a sand filter, chlorine disinfection via a salt generator, and a secondary disinfection ultraviolet unit. In the far corner of the pool room, a maintenance room (with a closed-door) contains filtration units for the pool and whirlpool spa. Doors and windows of the indoor pool room are kept closed at all times; the only ventilation was in the maintenance room. There were no cooling towers on the hotel or any buildings in the immediate area; hotel guest rooms were cooled by closed-unit window air conditioners.

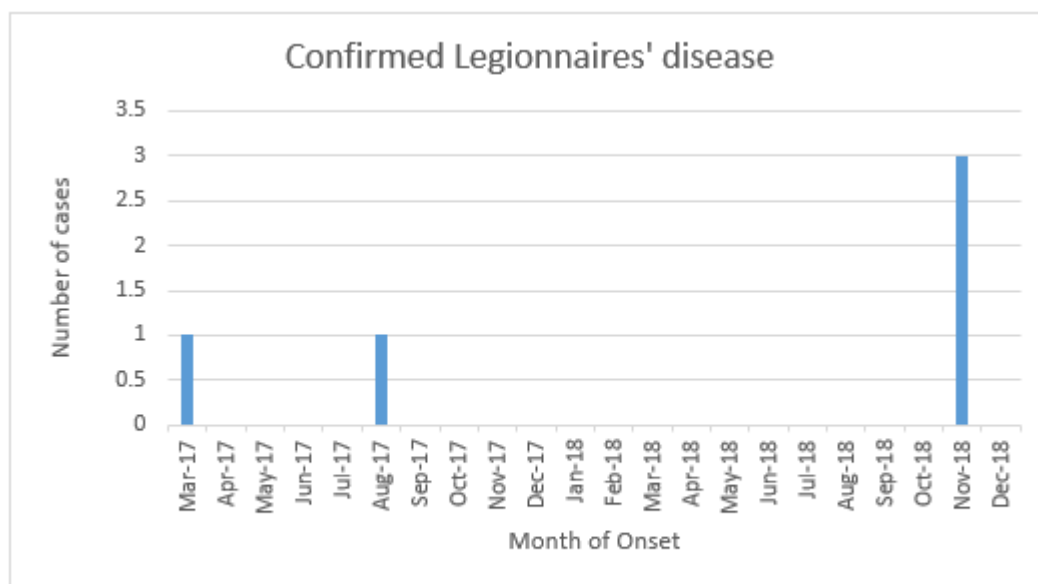


Figure 1: Confirmed Legionnaires' disease and date of stay at Hotel A.



**Table 1. Characteristics and Exposures of Confirmed Legionnaires' Disease Cases Among Hotel A Guests, November 2017 to December 2018**

Characteristic or Exposure	Number With Characteristic (0%)
Age >45 y	5 (100)
Male Sex	3(60)
Female Sex	1((20)
Unknown Sex	1(20)
Used Whirlpool Spa	4(80)

Table 1: Characteristics and exposures of guests at Hotel A.

Sample Locations	<i>Legionella</i> spp. (CFU/mL)pr	Comments
Spa Floor (Bulk)	>300	Too Numerous to Count
Inlet SE Corner Spa	1316	The result of 1316 CFU is per the area swabbed
Sand Filter	22,000,000	For 10 g of sample (serial dilutions performed)
Shower Head Spa	<1	Negative for <i>Legionella</i>
Shower Head Spa	<1	Negative for <i>Legionella</i>
Spa Jet NE Corner	<1	Negative for <i>Legionella</i>
Hot Water Tank	<1	Negative for <i>Legionella</i>
Tub Faucet Rm 322	<1	Negative for <i>Legionella</i>
Tub Faucet Rm 322	<1	Negative for <i>Legionella</i>

Table 2: Results of samples analyzed for *Legionella pneumophila*

Additional organisms found	Location
<i>Escherichia Coli</i>	Spa Floor
<i>Microbacterium oxydans</i>	Shower Head RM 322
<i>Bacillus cereus</i>	Shower Head Spa
<i>Staphylococcus hominis</i>	Spa Floor
<i>Cupriavidus gilardii</i>	Shower Head Spa
<i>Brevibacterium casei</i>	Spa Jet NE Corner
<i>Legionella pneumophila</i>	Sand Filter, Inlet of Spa, Spa Floor

Table 3: Additional organisms found in samples

Fifty-six percent of the hotel guest rooms were occupied during the index week of November 21-25, 2018.

Contact with a hotel maintenance staff member who was charged with routine maintenance and chemical control of the whirlpool spa and swimming pool indicated *Weekly Operation and Incident Reports* (ODH) were not completed as required. In fact, routine and required testing were not completed regularly. Further discussions with the staff indicated that the spa was not routinely drained and refilled every 30 days as required.

Additional problems identified during the inspections included signs of poor water chemistry demonstrated by significant paint pitting corrosion, chipping, and discoloring of the surface of the spa and ultraviolet units not in operations and out of service for a year or more according to the staff.

During the 657 days from March 01, 2017 through December 18, 2018, the pH was recorded 15 times by LCPH, and the chlorine concentration was recorded 15 times. The pH was outside of the ideal range for 7 (47%) of the 15 observations, and the chlorine concentration was below the minimum recommended value for 9 (60%) of the 15 observations. In that time, there were 8 (53%) instances in which no chlorine values were documented.

## Discussion

Legionnaires' disease is notifiable in all US states, EU and EEA countries. Legionellosis cases are reported to CDC through the National Notifiable Disease Surveillance System (NNDSS) and a Supplemental Legionnaires Disease Surveillance System (SLDSS) designed to manage surveillance data on travel-related cases and enhance outbreak detection [CDC2000]. All EU and EEA countries report through the European Legionnaires' Disease Surveillance Network (ELDSNet) and coordinated by the European Centre for Disease Prevention and Control (ECDC) [EU CDC2014]

For the surveillance process to play its role a chain of involved players (the clinical presentation of the patient, health care professionals reporting and monitoring by local, state and national public health authorities) need to work together.

Identifications of outbreaks are reliant on a high index of suspicion and should be considered

when the number of cases in a community or region of cases is clearly in excess of the normal frequency expected for a specific time period.

However, dispersion of travelers to multiple states or countries after exposure might result in a health department receiving only a small percentage of reports in association with a particular hospital, resort or hotel. Additional difficulties for detection include low attack rates, one clinician will not see all cases; infected persons could have visited the area 2 to 10 days prior to their diagnoses, and poor surveillance making linking cases epidemiologically less likely [Benin].

This outbreak was detected due to surveillance by the CDC and ODH and subsequently reporting to the local health department.

Following this report, LCPH, after collecting environmental specimens and comparing to the clinical diagnoses, determined the strength of association between cases and their source of infection.

Review of the records retained at the health department and the negligibly available maintenance records of the whirlpool spa at the Hotel A indicated that water disinfection conditions were frequently below optimum during the time period that was examined.

As in this case, typically *Legionella* transmission occurs from manmade environmental settings [Garrison]. Thus the poorly maintained whirlpool spa, through epidemiologic and laboratory data, was indicated as the source of transmission for four of the individuals. By using the environmental isolate from the whirlpool spa and matching the index patient isolate on molecular analysis it was found a dose-response relationship existed between exposure to the whirlpool spa and both illness and serologic response. The fifth person did not use the spa. A feasible indirect transmission link was determined through the interview process. This individual indicated that they were cleaning a boat outside of the pool and spa filter room exhaust ports.

Environmental conditions in whirlpool spas (e.g., warm temperatures and water aerosolization) promote the amplification and transmission of the bacteria when combined with low or erratic disinfectant levels. Publicly used whirlpool spas

with a heavy bather load may compromise halogen concentrations much more than residential whirlpool spas making those whirlpool spas associated with hotels and cruise ships a particular risk factor as sources of LD [CDC1997, CDC1985, Thomas, Goldberg, Girod, Goldberg]. By following appropriate halogenation and filter disinfection practices, whirlpool spa-related disease can be preventable [CDC1997, CDC1985, ASHRACE].

Because exposure to *Legionella* [CDC1985] is more likely to occur in the absence of adequate levels of disinfectant, public health professionals should 1) improve training for pool inspectors 2) lead and collaborate with aquatic staff to educate the general public 3) develop expertise in detecting and investigating recreational water-associated outbreaks 4) stress that the pool manager needs to understand the importance of implementing improvements in pool and spa water quality by underscoring the importance of maintaining adequate disinfectant levels and pH control.

LCPH, as well as many public health

officials, are shifting away from the emphasis on detection, investigation, and control of outbreaks of Legionnaires' disease to primary prevention strategies. For the last two years, LCPH has improved primary prevention efforts by working with the health care facilities and hotel operators with prevention and recommended solutions for the management of possible outbreaks. This primary prevention effort is marked by new public health guidance and policy aimed at ensuring the adequacy of water systems through proper management programs [Garrison, Soda, CDC 2016].

### Remediation

Remediation methods included removal and replacement of the sand filtration unit, cleaning and disinfecting the pipes to and from the spa and cleaning and disinfecting the whirlpool spa to eliminate *Legionella* colonization and performing follow-up cultures for *Legionella* to ensure that re-colonization does not occur [CDC 1997].

The hotel ownership decided to remove the whirlpool spa and clean, disinfect and cap all

ADVANCED  
**ENVIRO**SEPTIC™

**RESIDENTIAL • COMMUNITY • COMMERCIAL**  
*Passive Onsite Wastewater Treatment Systems*

- Treatment and Dispersal in One Small Footprint
- No Electricity, No Moving Parts
- Low Maintenance



**Presby Environmental**  
An Infiltrator Water Technologies Company

**presbyenvironmental.com**  
**info@presbyeco.com • (800) 473-5298**

**MADE IN USA**



plumbing and to remove all components of the filtration system. At this time this has not been completed and the pool and spa have remained closed.

### Final Comments

This outbreak highlights the importance of rapid case notification and collaboration among environmental health, epidemiologic, and laboratory disciplines during legionellosis outbreaks [Yackey]. In this outbreak, reporting of travel-associated cases and reciprocal notification to CDC, ODH and LCPH helped in rapid identification of the common hotel exposure and initiation of an outbreak investigation, potentially preventing

additional morbidity and mortality.

Missed prevention opportunities can lead to outbreaks of Legionnaires' disease. Public health professionals can help by providing tools and information to help local building owners and pool/spa managers implement water management programs [CDC 2016]. Fundamentally, the responsibility for managing the risk of legionellosis belongs to the facility owner. Utilizing water management programs routinely by building ownership and management will help to identify hazardous conditions and include steps to take to minimize the growth and spread of *Legionella* through the man-made water systems.



**TANGENT**   
*LandSaver™* MBR

**Septic Treatment Just Got Better**

Our Membrane BioReactor (MBR) Provides State-of-the-art Wastewater Treatment

- Fully Treated Effluent
- Fecal and Odor Free
- 99.9999% Virus Reduction
- TSS < 1 mg/l
- cBOD < 5mg/l
- Turbidity < 0.2 NTU

**NSF-40 Aerated**      **Conventional Septic**

**TANGENT COMPANY**   
*LandSaver™* MBR

    **TANGENT COMPANY** [tangentcompany.com](http://tangentcompany.com) • 440.543.2775



## References:

1. Bartram J, Chartier Y, Lee JV, et al. editors. *Legionella and the Prevention of Legionellosis*. Geneva: World Health Organization (WHO), 2007.
2. Muder, R.R.; You, V.L.; Woo, A.H. Mode of transmission of *Legionella pneumophila*: A critical review. *Arch. Int. Med.* 1986, 146, 1607–1612.
3. Travis TC, Brown EW, Peruski LF, et al. Survey of *Legionella* species found in Thai soil. *Int J Microbiol* 2012; 2012:218791.
4. Cowgill KD, Lucas CE, Benson RF, et al. Recurrence of Legionnaires' disease at a hotel in the United States Virgin Islands over a 20-year period. *Clin Infect Dis* 2005; 40:1205–7.
5. Silk BJ, Moore MR, Berghtholdt M, et al. Eight years of Legionnaires' disease transmission in travellers to a condominium complex in Las Vegas, Nevada. *Epidemiol Infect* 2012; 140:1993–2002.
6. American Society of Heating Refrigerating and Air-Conditioning Engineers. ASHRAE Guideline 12-2000: minimizing the risk of legionellosis associated with building water systems. Atlanta: ASHRAE, 2000:1–16.
7. CDC. *Legionella*: surveillance and reporting. Atlanta, GA: US Department of Health and Human Services, CDC; 2017. <https://www.cdc.gov/legionella/surv-reporting.html>. Accessed January, 2019.
8. Centers for Disease Control and Prevention (CDC). Legionellosis — United States, 2000–2009. *MMWR Morb Mortal Wkly Rep* 2011; 60:1083–6.
9. Beer KD, Gargano JW, Roberts VA, et al. Outbreaks associated with environmental and undetermined water exposures—United States, 2011–2012. *MMWR Morb Mortal Wkly Rep* 2015; 64:849–51.
10. Dooling KL, Toews KA, Hicks LA, et al. Active bacterial core surveillance for legionellosis—United States, 2011–2013. *MMWR Morb Mortal Wkly Rep* 2015; 64:1190–3.
11. Ambrose J, Hampton LM, Fleming-Dutra KE, et al. Large outbreak of Legionnaires' disease and Pontiac fever at a military base. *Epidemiol Infect* 2014; 142:2336–46.
12. CDC. Centers for Disease Control and Prevention. *Legionella* (Legionnaires' disease and Pontiac fever). <https://www.cdc.gov/legionella/index.html>.
13. Laurence J. Burnsed, Lauri A. Hicks, Laura M. K. Smithee, Barry S. Fields, Kristy K. Bradley, Neil Pascoe, Shawn M. Richards, Sue Mallonee, Lisa Littrell, Robert F. Benson, Matthew R. Moore, Legionellosis Outbreak Investigation Team, A Large, Travel-Associated Outbreak of Legionellosis among Hotel Guests: Utility of the Urine Antigen Assay in Confirming Pontiac Fever, *Clinical Infectious Diseases*, Volume 44, Issue 2, 15 January 2007, Pages 222–228, <https://doi.org/10.1086/510387>.
14. Guidelines for Environmental Infection Control in Health-Care Facilities *MMWR Morb Mortal Wkly Rep* 2003; 52:1–42.
15. Centers for Disease Control and Prevention. Procedures for the recovery of *Legionella* from the environment. Atlanta, GA: Department of Health and Human Services, 2005.
16. NEORS-D: Northeast Ohio Regional Sewer District, 3900 Euclid Ave, Cleveland, OH 44115.
17. Riffard S, Lo Presti F, Vandenesh F, Forey F, Reyrolle M. Comparative analysis of infrequent-restriction-site PCR and pulsed-field gel electrophoresis for epidemiological typing of *Legionella pneumophila* serogroup 1 strains, *J Clin Microbiol*, 1998, vol. 36 (pg. 161-7).
18. Luttichau HR, Vinther C, Uldum SA, Moller J, Faber M. An outbreak of Pontiac fever among children following use of a whirlpool, *Clin Infect Dis*, 1998, vol. 26 (pg. 1374-8).
19. ODH <https://odh.ohio.gov/wps/portal/gov/odh/know-our-programs/public-swimming-pools/forms/weekly-operation-report-pool-hea5219>
20. European Centre for Disease Prevention and Control. Legionnaires' disease in Europe, 2012. Stockholm: European Centre for Disease Prevention and Control; 2014.
21. Andrea L. Benin, Robert F. Benson, Kathryn E. Arnold, Anthony E. Fiore, Patricia G. Cook, L. Keoki Williams, Barry Fields, Richard E. Besser; An Outbreak of Travel-Associated Legionnaires Disease and Pontiac Fever: The Need for Enhanced Surveillance of Travel-Associated Legionellosis in the United States, *The Journal of Infectious Diseases*, Volume 185, Issue 2, 15 January 2002, Pages 237–243, <https://doi.org/10.1086/338060>. Accessed January 2019.
22. Garrison LE, Kunz JM, Cooley LA, Moore MR, Lucas C, Schrag S, et al. Vital signs: deficiencies in environmental control identified in outbreaks of Legionnaires' disease—North America, 2000–2014. *MMWR Morb Mortal Wkly Rep*. 2016;65:576–84. 10.15585/mmwr.mm6522e1
23. CDC. 1997 Final recommendations to minimize transmission of Legionnaires' disease from whirlpool spas on cruise ships. Atlanta, GA: US Department of Health and Human Services, CDC; 1997.
24. Centers for Disease Control and Prevention (CDC) Suggested health and safety guidelines for public spas and hot tubs, 1985 Atlanta CDC
25. Thomas DL, Mundy LM, Tucker PC. Hot tub legionellosis: Legionnaires' disease and Pontiac fever after a point-source exposure to *Legionella pneumophila*, *Arch Intern Med*, 1993, vol. 153 (pg. 2597-9)
26. Goldberg DJ, Fallon RJ, Green ST, Wrench JG. Pontiac fever in children, *Pediatr Infect Dis J*, 1992, vol. 11 (pg. 240-1)
27. Girod JC, Reichmann RC, Winn WC, Clacked DN, Vogt RL. Pneumonic and nonpneumonic forms of legionellosis: the result of a common-source exposure to *Legionella pneumophila*, *Arch Intern Med*, 1982, vol. 142 (pg. 545-7)
28. Goldberg DJ, Wrench JG, Collier PW, et al. Lochgoilhead fever: outbreak of non-pneumonic legionellosis due to *Legionella micdadei*, *Lancet*, 1989, vol. 1 (pg. 316-8)
29. American Society of Heating, Refrigerating and Air-Conditioning Engineers Minimizing the risk of legionellosis associated with building water systems, 2000 Atlanta American Society of Heating, Refrigerating, and Air-Conditioning Engineers
30. Soda EA, Barskey AE, Shah PP, Schrag S, Whitney CG, Arduino MJ, et al. Vital signs: health care-associated Legionnaires' disease surveillance data from 20 states and a large metropolitan area—United States, 2015. *MMWR Morb Mortal Wkly Rep*. 2017; 66:584–9. 10.15585/mmwr.mm6622e1
31. Yackley JK, Sweat D, Fill MA, Garman K, Dunn JR Notes from the Field: Legionellosis Outbreak Associated with a Hotel Aquatics Facility—Tennessee, 2017. *MMWR Morb Mortal Wkly Rep* 2018; 67:77-78. DOI: <http://dx.doi.org/10.15585/mmwr.mm6702a5>.
32. Centers for Disease Control and Prevention 2016. Developing a water management program to reduce *Legionella* growth and spread in buildings: a practical guide to implementing industry standards. <https://www.cdc.gov/legionella/WMPtoolkit>. Accessed January 2019

## News, Information, and Education

### **Educational Opportunities**

- AOHC New Employee Training  
March 24, 2020  
Location TBD
- AEC  
April 16-17, 2020  
Dublin, Ohio
- AOHC Fall Conference  
September 16-18, 2020  
Dublin, Ohio
- AOHC New Employee Training  
October 7, 2020  
Location TBD

### **Membership Renewals Due Soon**

OEHA will no longer be mailing membership renewal notices. Instead, we will be emailing all notices via our online member notification tool. You can either renew your membership online via credit card, or mail in a completed membership application along with proper payment.

For more information and to renew online, please visit [https://associationdatabase.com/aws/OEHA/pt/sd/news\\_article/266378/\\_PARENT/layout\\_details/true](https://associationdatabase.com/aws/OEHA/pt/sd/news_article/266378/_PARENT/layout_details>true)

## George Eagle Memorial Scholarships Available

The Ohio Environmental Health Association (OEHA) provides qualified students the opportunity to apply for The George Eagle Memorial Scholarship. This Scholarship consists of a \$2000 cash award granted to one undergraduate, and one graduate, student annually.

Eligibility Requirements:

### **Undergraduate:**

- Ohio Resident.
- Enrolled as a Sophomore, Junior, or Senior, in a program leading to a Baccalaureate degree in Environmental Health or a related field.
- Express intent to become employed in environmental health in Ohio following graduation.

### **Graduate:**

- An OEHA member in good standing for two consecutive years prior to applying for scholarship.
- Registered Sanitarian or Sanitarian in Training in the State of Ohio.

- Enrolled in an Environmental Health or Public Health graduate degree program or another graduate degree program approved by the Scholarship Committee which will contribute to the applicant's development as an environmental health professional.
- The College or University must be an accredited school of higher learning.
- A personal interview may be required, as determined by the Scholarship Committee.

The annual deadline for applications is February 28, 2020.

If you are interested in an application or further information, please contact the scholarship committee chairperson:

Jacqueline A. Gruza, R.S., REHA, MPH  
Greene County Public Health Department  
360 Wilson Drive., Xenia, OH 45385  
(937) 374-5634  
[jgruza@gcph.info](mailto:jgruza@gcph.info)  
<http://ohioeha.org/aws/OEHA/pt/sp/scholarship>



**NEWLY APPROVED IN OHIO**

## Sand-Lined Wastewater Treatment System

- No Venting Required
- A Passive System – No Moving Parts
- Shallow System Maximizes Site Suitability, Reducing Sand Fill Requirements

Call about **Demo and Training Opportunities**

**Zak Sherman, Area Sales Representative • (888) 231-9791 • zsherman@infiltratorwater.com**



### Accu-Tab® Wastewater Tablets

- Recognized global brand
- Smaller tablet with beveled edges to minimize wicking
- No imported ingredients; stearate free



2012 Presidential E Award Recipient

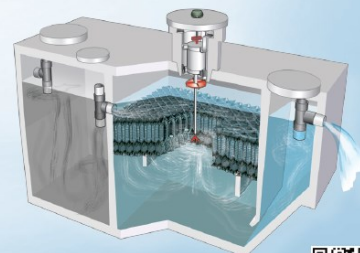
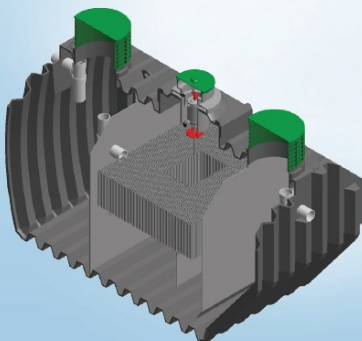
### Residential & Commercial Treatment Plants

- Concrete and rugged polyethylene material
- 500-1500 GPD Residential Systems
- 1500-300,000 GPD Commercial Systems
- Up to 800 GPD in plastic design
- A single moving part
- Innovative design for easy system servicing
- No filters to clog
- Lifetime exchange program



### Illumi-Jet UV Disinfection Unit

- Hermetically sealed electrical components
- High capacity disinfection reservoir
- Kapton seals improve serviceability



[www.jetincorp.com](http://www.jetincorp.com) • 800.321.6960 • [email@jetincorp.com](mailto:email@jetincorp.com)



## Announcements

*Have a grant, educational opportunity, move, promotion, or other announcement you would like to share? Please email a member of the publications committee.*

**Open Positions** (Posted to the OEHA website with an opening of at least 12/15/19)

- 2 Positions: Food and School Safety Supervisor  
Franklin County Public Health
- Public Health Sanitarian  
Fairfield Department of Health
- Environmental Health Technician  
Holmes County General Health District
- Registered Sanitarian/SIT  
Hancock Public Health
- Director of Finance & Operations  
Delaware General Health District
- Sanitarian 1/SIT  
Clark County Combined Health District
- Community Health Specialist II  
Ross County Health District

### **Awards**

- *Columbus Public Health wins Swim Safely Pool Safety Grant*

The United States Consumer Protection Commission has awarded Columbus Public Health - along with four other jurisdictions - Swim Safely Pool Safety Grants. The CPH grant award is in the amount of \$250,000.

Only 5 departments were chosen across the country and CPH is the only local/city department to be awarded the full amount. The others that were awarded the full \$250,000 are state health agencies.

Columbus Public Health would like to specifically recognize Adam Holbrook, RS, for finding the grant opportunity and to him, Sarah Badenhop, RS, and supervisor Kelli Dodd, RS, for marshalling it through the application process. Kudos also to the entire Water Protection Team for their efforts in this endeavor and to Kate Crooks, for her work promoting the Swim Safely Program at Columbus city pools this summer.



## OEHA Committees & Chairs

### **Body Art**

Sarah Badenhop, R.S. - Columbus Public Health

### **Campground**

Mark Janowich, R.S. - Erie County Health Department

### **Food**

Christina Ritchey Wilson, JD, R.S. - Columbus Public Health

Greg Chumney, MPH, RS - Licking County Health Department

### **Lead**

Greg Putka, R.S. - Lorain County Public Health

### **Private Water Systems**

Randy Ruszkowski, R.S. - Stark County Health Department

### **Sewage**

Laura Kramer Kuns, R.S., REHS - Kramer Kuns Consulting, LLC

Eric Cherry, R.S.—Huron County Public Health

### **Solid Waste**

Chuck De Jonckheere, R.S. - Hamilton County Public Health

### **Swimming Pool, Spa, and Special Use Pool**

Barry Grisez, R.S. - Cuyahoga County Board of Health

### **Vector Control**

Scott Pozna, R.S. - Lorain County Health Department

### **Archives**

Melissa Adams, R.S. - Delaware General Health District

### **Constitution & By-laws**

Ken Sharkey, R.S., MPH - Cleveland Department of Public Health

### **Exhibits**

Shannon Self, R.S. - Delaware General Health District

### **Professional Development**

Steve Ruckman, MPH, R.S. - Worthington Schools

### **Resolutions**

Jennifer Wentzel, MPH, R.S. - Public Health - Dayton & Montgomery County

### **Website**

Garrett Guillozet, MPA, R.S., REHS, AEMT - Franklin County Public Health

### **Auditing**

Jennifer Wentzel, MPH, R.S. - Public Health - Dayton & Montgomery County

### **Awards & Recognition**

Gus Dria, R.S., REHS - Canton City Health Department

### **George Eagle Scholarship**

Jacqueline A. Gruza, BS, RS, REHS - Greene County Public Health

### **Membership**

Open

### **Nominations & Elections**

Open

### **Public Affairs**

Stephan Ruckman, MPH, R.S. - Worthington Schools

### **Publications**

Adam R. Howard, MPH, R.S., REHS - Delaware General Health District

### **Concentrated Animal Feed Facility**

Jason Menchhofer, R.S. - Mercer County - Celina City Health Department

### **Ohio Public Health Advisory Board**

Garrett Guillozet, MPA, R.S., REHS, AEMT - Franklin County Public Health

### **Ohio Public Health Partnership**

Chad Brown, R.S., REHS, MPH - Licking County Health Department

### **Sewage Treatment System Technical Advisory Committee**

Dan Lark, R.S., REHS - Lake County General Health District

**OJEH**

Ohio Environmental Health Association  
2818 Annabelle Ct  
Grove City, OH 43123

ADDRESS SERVICE REQUESTED

**Non Profit Organization**  
**US Postage**  
**PAID**  
**Grove City, OH 43123**  
**Permit No.28**