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TO: PA Senate Democratic Policy Committee

FROM: Richard D. Miller, Ph.D.

DATE: May 5, 2021

RE: SB 1285 of the 2019/20 Legislative Session Otherwise Known as the Legionnaires' Disease Prevention and Reporting Act.

First, I would like to thank Senator Fontana, Chairwoman Muth, and esteemed members of the Senate Democratic Policy Committee for the opportunity to present my written testimony expressing my opinions to the committee on the proposed Senate Bill 1285, *Legionnaires' Disease Prevention and Reporting Act*. I have dedicated my entire 43-year career to preventing Legionnaires' disease through *Legionella* and Legionnaires' disease education, through the creation of guidelines and standards for *Legionella* control, and through validation of *Legionella* control programs through *Legionella* environmental testing. Thus, I applaud the intent of this bill to do the same.

Background

For purposes of perspective, I am a child of the Commonwealth of Pennsylvania, having been born in West Chester, PA while my father attended college on the GI Bill. I spent the rest of my early life in central Pennsylvania, attending public schools in Bedford County, and then on to The Pennsylvania State University where I received both my B.S in microbiology (1970), as well as my Ph.D. in microbiology (1975). Much of my family still lives in Pennsylvania. I also married into Pennsylvania since my wife and her family were from Pittsburgh. After moving away, my son returned years later to Pittsburgh to attend college, as a computer science/neuroscience major at Carnegie Mellon University. Thus, I am sincere in the expression that I really do "bleed black and gold"!

However, most of my 43-year working career has been spent in teaching and research as a faculty member in the School of Medicine at the University of Louisville, KY (1977-present), where I taught clinical microbiology and infectious diseases (including Legionnaires' disease) to medical students. I have also carried out a research program, beginning in 1977, that has been focused almost entirely on *Legionella* research, and has led to the graduation of 25 Ph.D. and M.S. students trained in my laboratory.

Finally, in the early 1980s, I also began a *Legionella* testing program in my laboratory for identifying *Legionella* in environmental water samples and providing risk management recommendations based on the results. This *Legionella* testing is now done through a company that I co-founded in 1993, called Environmental Safety Technologies, Inc, where I now serve as President and Chief Scientist.

With my experience in *Legionella*, I channeled that knowledge into service, where I have served for 28 years on *Legionella*-prevention committees with the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), culminating in 2015 with our writing and publication of the landmark ANSI/ASHRAE Standard 188-2015, *Legionellosis: Risk Management for Building Water Systems*.

My assessment of (SB 1285 from the 2019/20 legislative session known as *the Legionnaires' Disease Prevention and Reporting Act*.

I applaud both the intent of SB 1285 from the 2019/20 legislative session to prevent Legionnaires' disease, and the structure of the bill, using the framework of ANSI/ASHRAE Standard 188-2018, *Legionellosis: Risk Management for Building Water Systems.* For example, I support the use of the "Covered building" concept, employing the criteria from Standard 188 to identify buildings that have a risk of Legionnaires' disease and would be covered by the legislation.

However, I have a major concern about the legislation, with two sub-concerns:

Overall Concern – No interpretation of the Legionella testing results. SB 1285 does not offer any advice or guidance on how the *Legionella* testing results are to be interpreted. ASHRAE Standard 188 gets around this by giving full authority to the *Legionella* Water Management Team to make the decisions on whether to test for *Legionella*, where to sample, how many samples, and how often to test. The Team also has been given the **authority to interpret the results in terms of an appropriate response to a positive *Legionella* test result**. The appropriate interpretation of the Legionella test results is an important part of Legionnaires' disease prevention, and should be more explicitly described in SB 1285:

Problem #1 – No interpretation of the concentration of *Legionella*. As you can imagine, exposure to a large number (i.e. high concentration) of *Legionella* is significantly worse/more dangerous, compared to a low number of *Legionella*. SB-1285 does not discuss the significance of concentration of *Legionella*. Even if the intent of the legislation is to impose a zero-tolerance for *Legionella at any concentration*, there needs to be a defined "limit of detection" of the assay being used. Different culture assays for *Legionella* can vary by a factor of 100 in terms of the lower limit of detection. Being positive by one test could be negative by another test. This needs to be standardized, by defining the required limit of detection.

Rather than a zero-tolerance for any amount of *Legionella*, I would then suggest an assignment of disease risk (and assignment of required disinfection responses), based on the science, and, based on the concentration of *Legionella* detected in the water.

Suggested Solution. As a result of a large outbreak of Legionnaires' disease back in 2015, the State of New York now has developed regulations for *Legionella* testing and control in building water systems, and they have described required action levels of *Legionella* concentrations in potable water and in cooling towers that trigger a disinfection response, as a **disease prevention intervention**.

For example, for cooling towers, the threshold level for an active disinfection response is 20 cfu/ml.
For potable water sites (faucets and showerheads) the New York regulations do not use a concentration at any one site, but rather the percentage of sites that have a detectable level of *Legionella*.

I use these New York quantitative requirements as an integral part of my interpretations and recommendations for attachment to my laboratory *Legionella* testing results.

Problem #2 – No interpretation of the species of *Legionella*. Not all species of *Legionella* are equally dangerous. Of the more than 60 species in the genus *Legionella* that have been found in the environment, most of the species have never been shown to cause disease, and **over 95% of the disease is still caused by only one species, *Legionella pneumophila***. (see the testimony of Dr. LeChevallier). Of the other species that do cause Legionnaires' disease, almost all of them are seen only in healthcare environments where there are transplant patients on immunosuppressive drugs, or oncology patients on immunotoxin chemotherapy regimens.

My laboratory has experience from performing *Legionella* testing on roughly 25,000 water samples from hospital potable water systems each year; and we find that more than 95% of the *Legionella* isolated are the species *L. pneumophila,* which is also found causing virtually all the disease (when it occurs). Additionally, 90% of these *L. pneumophila* that we find, are from **Serogroup 1,** the most virulent type of *Legionella pneumophila,* which causes most of the hospital cases, and virtually all the community-acquired Legionnaires' disease.

Of the other, non-*pneumophila Legionella* that we isolate, most commonly we see the so-called "blue-white" *Legionella* (nine *Legionella* species that produce a pigment that fluoresces a distinct blue-white color when

exposed to UV light). Only half of these blue-white fluorescent species of *Legionella* have ever been shown to cause disease, and the ones that do, are only seen in transplant patients and other severely immunocompromised patients. They are virtually never seen in normal hospital patients or normal healthy persons.

Thus, there is a reasonable agreement in the *Legionella* field that **water distribution systems harboring these blue-white *Legionella* species need not be disinfected as a response to detection in the potable water system** (except where the Water Management Team documents exposure to severely immunocompromised transplant or oncology patients, or other areas of the hospital identified by the Infection Control personnel).

Despite the science as I have explained above, it would be fair to note that the New York State *Legionella* regulations, do not make any species distinctions, nor does ASHRAE Standard 188. These documents take the view that if you wipe out all the *Legionella*, then you will certainly get the dangerous Legionella, along with everything else! While this does work, it ends up being a lot more costly in time, effort, and plumbing integrity. The evidence-based science still supports the Legionella species-specific distinction in a disease-prevention plan.

Thus, it is my professional opinion that to test for all *Legionella* in buildings where there are no severely immunocompromised patients is costly, and a waste of resources, without any additional benefit. Detecting and eliminating only these "bad" *Legionella pneumophila* makes sense*; and* would give all the hospital patients the protection that they need, based on their level of immunocompromise.

Thank you for consideration of this testimony. Hopefully, my suggestions can help to make the reintroduction of SB 1285 in the current legislative session even better at Legionnaires' disease prevention.

Sincerely,

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