CLCJAWA

Central Lake County Joint Action Water Agency

September 5, 2018

Tim Fox, Hearing Officer
Illinois Pollution Control Board
100 West Randolph
Suite 11-500
Chicago, IL 60601

Re: Comment on First Notice of Proposed New 35 ILL. ADM. Code 604 Amendments To 35 ILL. ADM. Code Parts 601, 602, 607, and 611 R18-17 (Rulemaking – Water)

Dear Mr. Fox:

I appreciate the opportunity to comment on the July 26, 2018 First Notice of the Proposed Rule referenced above. A very considerable amount of work has taken place by IEPA, IPCB and all commenters in order to make these important rules most effective and protective of those we serve.

This letter focuses on one single item, the proposed chlorine residual requirements. In summary, the testimony and shared scientific rationale in support of the proposed change has been unconvincing to this commenter.

Illinois Chlorine Residual Standards are Already More Restrictive than Federal Standards

The current Illinois standards are more restrictive than the federal standard of a "detectable" free chlorine residual. In 2015, only two states had more restrictive free chlorine residual requirements than 0.2 mg/L free and six had more restrictive total chlorine residuals than 0.5 mg/L according to Wahman et al and documented in their Journal AWWA article titled *Distribution System Residuals - Is "Detectable" Still Acceptable for Chloramines?* published in August 2015.

The Proposed Chlorine Residual Increase Will Result in Increased Chlorine Residual

It is suggested that the proposed chlorine residual increase will have little impact on community water supplies because IEPA records show a large majority of community water supplies currently meet the proposed chlorine standards. This argument is weaved throughout the IEPA and the Board's responses to public comment. This reasoning is equivocal.

Because of fluctuating chlorine demand and water-age factors in both source waters and utility distribution systems, "best practices" in a very pragmatic way, means always exceeding your target chlorine residual with a safety margin. So, the fact that more than 80% of CWS already achieve the proposed target appears to support the notion of raising chlorine residual requirements, it does not mean that the 80-90% of CWS will maintain their current chlorine dose rates. In fact, public water supplies will likely increase chlorine doses proportionally above the new standard in order to assure compliance.

Increasing Chlorine Residual Has Consequences: Disinfection By-Products (DBP) Increase

Roth & Cornwell describe the *DBP Impacts from Increased Chlorine Residual Requirements* in their Journal AWWA article published in February 2018. As utilities increase their chlorine residual targets to assure compliance with the proposed regulation, so to will DBP increase depending largely on how well the utility has already met chlorine demand. The authors found that DBP increases were most significant for those utilities maintaining trace chlorine residuals up to 0.2 mg/L, observing total trihalomethane increases from a median of 7 ug/L up to a 90th percentile of a 37 ug/L increase (4.5 and 14 ug/L respectively for haloacetic acids.) For those utilities already maintaining a 0.2 mg/L residual and increasing it to a 0.5 mg/L residual, additional DBP formation was "modest".

Chlorine Taste and Odor are Objectionable to Consumers

As Community Water Supplies increase their chlorine dose and resulting residual to assure they consistently meet the proposed requirements both temporally and spatially, chlorine taste and odor complaints will increase. The primary reason people do not drink tap water, as often expressed to me by the public, is the "taste" of chlorine. More than doubling the free chlorine residual requirements in our water will, I expect, result in some amount of reduced tap water consumption. Suffet et al identified chlorine and algae as the primary source of taste and odor problems in their April 1996 article titled *AWWA Taste and Odor Survey* published in the Journal AWWA. Though I would not expect the increased chlorine residual to impact water demand, I do suspect that it will be one less reason for an already skeptical public, to appreciate and support the value of tap water. Increasing chlorine residual does not improve the aesthetic quality of the already pathogen inactivated product we deliver to our member communities. It violates our treatment tenant of removing as much from water as we reasonably can, while adding back only what is needed.

The IEPA has identified strategies to avoid aesthetic issues, but the fact remains that the proposed rule will more than double the minimum free chlorine residual and double the total chlorine residual in tap water.

Additional Chlorine will not "Prevent the Possibility" of Legionella Growth

In testimony, it has been stated that "maintenance of a chlorine residual in the distribution system is necessary as an indicator to show the absence of cross-connections, absence of significant biofilm growth, and to prevent the possibility of legionella bacteria growing in premise plumbing". It should be noted that the current chlorine standards meet this objective. However, neither the current nor the proposed chlorine residual standard can or will prevent the possibility of legionella bacteria growing in premise plumbing. Myriad factors, of which chlorine residual is one, effect the growth and colonization of legionella in premise plumbing.

Raising the Chlorine Residual to Make It More Detectable to Modern Instrumentation is Puzzling

Analytical measurement of free chlorine concentrations at 0.2 mg/L does not pose a problem to water supplies as has been suggested. The least expensive equipment includes comparators or color wheels which have detection limits down to about 0.1 mg/L (LaMotte 3312-01 and HACH 223101) and retail for approximately $70. More preferably, community water supplies use digital equipment with detection limits more than ten-times lower than 0.2 mg/L. Examples include LaMotte 3240-Li, Hach Colorimeter II and Hanna Instruments HI96761. The detection limits on these instruments are 0.01 to 0.02 mg/L and they retail for $235 - $445.

More Chlorine May Not Necessarily Be Better

When balancing the positives and negatives of additional chlorine in our state's public water supply, above enforced current regulations, it is not clear that the net result will improve public health. The use of a single webinar as evidence of such a claim in testimony thus far, is concerning. I have been able to find one study by Ceravo-Arago et al who describe the difference in *L. pneumophilla* inactivation at free chlorine concentrations of 0.2 and 0.5 mg/L. In their work, two of five strains of *L pneumophilla* were not reduced 4-logs at 0.2 mg/L while they were reduced 4-logs at 0.5 mg/L. This was published by PLOS One in their 2015 article titled *Effect of Common Drinking Water Disinfectants, Chlorine and Heat on Free Legionella and Amoebae-Associated Legionella.* My call to delay the implementation of the proposed chlorine residual requirement until the scientific literature has been reviewed, shared and collaboratively discussed by stakeholders, has been rejected. This delay would assure the best outcome for public health.

The testimony about total coliform positives in Illinois drinking water is new to this commenter. If there is an increase, it is especially concerning given that testimony thus far indicates that the vast majority of CWS already meet the proposed new standards. A chlorine residual is necessary to assure that already microbiologically safe water, remains so as it travels from its entry point into the system, through transmission and distribution systems, to the point of delivery. Testimony has been presented indicating that an increase in chlorine will reduce coliform positive samples. However, no evidence has been presented that concludes current practices are inadequate for coliform control or that coliform positive samples are a threat to public health. In fact, the USEPA's *Six-Year Review 3 Technical Support document for Microbial Contaminant Regulations* (Dec 2016) states on page 6-18, first paragraph that percent of total coliform positives "flatten" with free chlorine above 0.2 mg/L. Also, the EPA finds that there is a similar "tailing off of the TC+ and EC+ occurrence at 0.5 mg/L chlorine".

Increasing Chlorine Residual in the Public Water Supply Does not Address the Underlying Problem

The observation by IDPH that "no residual chlorine at all are almost universally implicated in related [legionella related] outbreaks" is exactly the point. Current standards require a chlorine residual of 0.2 mg/L. A lack of chlorine residual is an indication of an improperly maintained premise plumbing systems.

The notion that increasing the residual will reduce outbreaks is questionable as it presumes the higher chlorine residual will persist significantly longer in premise plumbing and that facility managers will begin to properly maintain premise plumbing. OSHA, IEPA, CDC and other organizations put the responsibility for premise plumbing on facility and building managers, most especially in healthcare and hospital settings. Maintenance of proper chlorine residuals throughout facilities along with thermal treatment and implementation of other facility best practices are the appropriate way to address growth of pathogens in premise plumbing. Lau and Ashbolt describe the role of biofilms and chlorine resistant

protozoa in Legionella pathogenesis in their Journal of Applied Microbiology article titled *The role of biofilms and protozoa in Legionella pathogenesis: implications for drinking water*, 2008. Legionella spp. are found "almost exclusively in biofilms covering the interior of pipe walls, in premise plumbing fixtures and heating, ventilation and air-conditioning systems." Increasing the chlorine residual in our state's public water supply will not mitigate poor premise plumbing maintenance practices and does not relieve building owners of their responsibility to maintain their building's plumbing.

The Delivery of Safe Water is the Shared Responsibility of Utilities and Premise Plumbing Owners

Water utilities must deliver water that is free of pathogens to their customers premise plumbing point of entry. Customers, in turn, must maintain their premise plumbing systems in a sanitary manner. For example, a water utility has no control over the chlorine residual in a long stagnant water heater or an unused bathroom. This is also the case with building maintenance in commercial, industrial or healthcare facilities. A water utility can not be responsible for the condition or maintenance of facility plumbing. The CDC recognizes this fact in their June 5, 2017 *Guide to Implementing Industry Standards - Developing a Water Management Program ot Reduce Legionella Growth & Spread in Buildings*. This document, written for building managers, places responsibility for *Legionalla* control squarely on building managers by stating "...the key to preventing Legionnaires' disease is to make sure that building owner and managers maintain building water systems in order to reduce the risk of *Legionella* growth and spread". A second document published by the USEPA in September 2016 titled *Technologies for Legionella Control in Premise Plumbing Systems: Scientific Literature Review* also recognizes this fact. Studies cited in this document indicated that chlorine doses of 2-6 mg/L were needed for continuous control of legionella and that chlorine is more effective at 109 degrees F compared to 77 degrees F. Neither of these conditions is possible with in tap water.

The Water Research Foundation sums it up best in their article titled *Communicating About Legionella and Managing Associated Risks* from their September 2018 issue of Advances in Water Research: "Control of opportunistic premise plumbing pathogens (OPPPs) is complex and requires a multifaceted approach, which necessitates a dramatic shift in leadership strategies from centering the responsibility on the water provider alone to a shared responsibility by multiple stakeholders, including residential, institutional, commercial, industrial, and high-risk customers."

Water providers and our strict adherence to the disinfection already promulgated state regulation are adequate for public health protection. We are playing our part. It is now the responsibility of premise plumbing owners to play their part utilizing guidance from many sources including the Water Research Foundation and the Centers for Disease Control and US EPA.

Sincerely,

William J. Soucie
Operations Director