Good morning everyone ,
Thank you for holding this hearing today and inviting me here to testify.
My name is Michael Ramos , I am an engineer from Chicago Public Schools and the Chief Engineer of Von Steuben High School, I have over 30 years experience in Building automation, Direct digital control, electrical engineering and HVAC.

I'm going to talk to you today about my device Noah, how I developed it,and more importantly why I developed it. In Early 2016 I began following the Flint water crisis , I became aware of the irreversible, permanent damage that lead causes to humans , especially children. Although the water quality in Chicago was nothing like what they were experiencing in Flint, I learned that Chicago had more lead service lines than any other city in the country. As a father and grandfather I became concerned about what my family is exposed to on a daily basis and what can I do besides relying on filters to protect them. I began researching the water quality that was being distributed from the treatment plant, it was during this research that I discovered that orthophosphates are added to the water at the treatment plant , this chemical is implemented as a measure to prevent lead and copper from leaching into our water. Orthophosphates adhere to the inside of the pipes to create a protective barrier which prevents the water from coming into contact with the metals. I also learned that in order to build a sufficient barrier, the water has to routinely flow through the pipe. I believe you cannot maintain a sufficient coating of orthophosphate in a home without a deliberate effort. My research and discussions with chemists from loyola university verified that stagnation and leaching will begin within 6 hours. Water sitting in pipes for long periods of time will strip away the phosphate rendering it ineffective. Most of us spend on average 8 hours a day away from home, parents go to work , kids go to school, and while we are away from home our pipes are leaching into our water . I began developing a proactive automated device that can attach to the service line in my home which will prevent stagnation while building and maintaining the protective orthophosphate barrier.
In the spring of 2016 Chicago Public Schools launched a pilot program to test all potable water outlets in the district, concentrating on testing elementary schools first. The first round of testing revealed 37% of the buildings had at least 1 fixture test above the 15ppb action level. CPS then issued a mandatory protocol that is still in place today. This protocol instructs all engineers to manually flush every drinking fountain in their respective buildings for 1 minute every Monday morning.This daunting task is to be completed and verified before 8 am, although every effort is made to complete this task, it is impossible and unrealistic for all engineers to accomplish . If it is beneficial to flush fountains on a monday morning why not flush every day ? As a building engineer with limited resources , the lack of available options on the market and CPSs standing ban on the use of filters in its buildings, I modified my residential design to a retrofit for

drinking fountains. My intention was to provide a point of use solution that comes pre programmed and requires no maintenance, no filters, no strainers , no batteries or clocks to program that will target and treat the fountains directly . The retrofit connects to the internal plumbing of virtually any type of fountain and utilizes the fixtures bubbler to automatically purge for 3 minutes every 3 hours to stay ahead of stagnation . If we automate the flushing we can supply fresh clean water daily, not just for the first few hours of the week. I wanted to utilize Noah throughout the district or at least share the technology with the engineers within my cluster of 5 buildings. I approached my supervisors to be granted permission from CPS to install Noah in Von Steuben, I received the green light from CPS and on October 16, 2016 the first Noah was installed. While Von Steuben would be the first school to pilot Noah , I remained conscientious of water conservation and did not want to flush overnight or on weekends. I utilized the hall lighting circuit to supply power to all the devices, when the lights are turned on, Noah activates and begins its flushing cycle , when the lights are turned off at the end of the night Noah shuts down. I continued to install Noahs in fountains throughout the building and completed the entire building by December of 2016. Von Steuben is the first school in the country to fully automate flushing and deliver fresh clean lead free water to its students at all times.
Having access to safe water , students launched a campaign against single use plastic bottles. They created and posted signs above all fountains encouraging everyone to use hydroflasks. Having Noah has drastically diminished the use of plastic bottles and is raising awareness in the student body of the importance of recycling and conservation.

In the Spring of 2017, Chicago Public Schools asked if I would be willing to participate in a pilot program to utilize Noah in a building that had the highest lead readings in the district. I jumped at the idea and donated all the devices for the project, not only did I want to prove my concept further and show CPS that I had a viable solution to eradicate and maintain lead levels , I was eager to participate in a project that was based on the protection of our kids. Orr high school is a building on the west side of Chicago, which houses a neighborhood high school , an elementary charter school and a YMCA. The average lead reading in 2016 was 45.65 ppb , while its highest reading was 530.00ppb. The scope of this project did not include replacement of any of the existing piping in the building. I provided and assisted with the installation of 18 Noahs throughout the building and the project was completed and fully operational in August of 2017.

In January 2018 Loyola university tested all the drinking fountains that had a Noah device .
Results showed the average ppb per test is 0.840!! <1ppb

These results are outstanding, its a strong indication that Noah has applied a substantial coating of orthophosphate .

In February of 2018 CPS asked if I would be willing to help them at Onahan elementary school with 1 particular set of side by side fountains. It was a new fountain that had been recently installed but continued to give off erratic lead readings.
Between June and August of 2016 its lowest reading was 109 ppb while its highest reading was 520ppb.Between September of 2016 through January 2018 it had an average reading of 12.75ppb. In February of 2018 Noah was installed and tested a few weeks later with a reading of 0.528ppb. < 1ppb

Lastly I want to talk about how Noah is performing in homes in Chicago.

December 2018 , I was interviewed by Katie Brandt of Chicago Health Magazine for a story that was published in March titled " Leads dangerous legacy". Katie had been dealing with elevated lead levels in her recently remodeled home that has a lead service line. The city had sent engineers and officials from the water department to test her water on two separate occasions. Lead readings ranged from 4.9ppb to 17ppb. She was advised since she only had 1 reading above 15ppb she should flush her tap for 5 minutes before using and their investigation was complete. Unsatisfied with the cities response Katie reached out to me requesting to purchase a Noah for her home.
Noah was installed in mid December 2018 and tested by Loyola University in June of 2019, the results are <0.001 ppb.No detection.

It is important to note that these results will remain constant , we can test today , tomorrow , next week or next year, the results will be the same. Less than 1ppb. Having a Noah device in your home , school , daycare or anywhere will ensure lead service lines are properly coated and maintained .

Many cities have lead service line replacement projects that are going to take years to complete. What do we do in the meantime to protect the people? Installing Noah in these homes, will prevent leaching from stagnation and maintain corrosion control applications " orthophosphate".

In closing, I strongly recommend that the EPA require ALL schools and daycare centers perform lead and copper tests yearly and set the action level to 2ppb.
We know that there is NO SAFE LEVEL OF LEAD , so setting the bar to minimize exposure is of monumental importance.
I believe districts across the nation are reluctant to test because of what they might find. Without having a viable economical solution like Noah available they are left to decide for themselves as to what the best approach is to mitigate their findings.
I would also like to ask for funding for a controlled residential and schools Pilot Program in Newark, New Jersey and Flint. The funding values would be determined by controlled program needs.

I would like to submit the following items for the record:
1.Photo of evidence of orthophosphate applied by NOAH.
2.Illustration published by Seattle Times
3.Orr High School Water Analysis Report written by Loyola University
4.Seattle Times Newspaper Article
5. Von Steuben student supporting testimony
6. Orr High school Water Mitigation pilot project Written by CPS
7. Noah PowerPoint presentation

Again, I thank you for the opportunity to share my invention with you. I believe Noah can be a significant asset in defeating the silent epidemic that is lead in our drinking water.

Thank You

Michael Ramos is a licensed engineer in the City of Chicago. He is also a certified HVAC technician by the Environmental Protection Agency. He is currently a Chief Building Engineer with the Chicago Public Schools (CPS) at Von Steuben High School.

Michael has extensive experience in electrical engineering, direct digital control (low voltage automation), building automation and HVAC.

It was with this extensive background in engineering logistics that Michael was able to create a solution to lead in all potable water sources and thus "NOAH" was born.

"Noah" is an innovative technology that updates the current platform from manual flushing to automated for water mitigation efforts.

This new technology removes the element of human reliance, as a pre-programmed automated flushing device, "Noah" will stay ahead of stagnation and ensure that the corrosion control application is applied and maintained on a pre-set timing sequence.

Noah is currently utilized at the CPS headquarters, three (CPS)schools Von Steuben, Orr and Onahan. Noah is also implemented at the City of Chicago's Jardin Water Purification Plant and is also being utilized in numerous residential homes in the Chicagoland area.

Michael's work in lead mitigation is gaining recognition in various cities across the country with acknowledgements in and with the Water Equity Conference hosted by Public Health Advocates in Sacramento, CA. Noah has been presented in webinars such as "Let's Tackle Public School Drinking Water Safely" hosted by National Drinking Water Alliance, "Guidance on Mitigation" hosted by Environmental Defense Fund (EDF), School & Childcare Facility Lead Sampling Programs hosted by 120 Water Audit.

Michael was interviewed in Chicago Health Magazine and featured in The Seattle Times as" Chicago may have an answer."

Michael aspires to raise awareness of this innovative approach to lead mitigation and eradicating lead and copper in our drinking water.

"Noah if properly utilized per its intent is a lifesaving tool for all to benefit for generations to come."

Michael Ramos

Michael aspires to continue his work in lead mitigation efforts as well as develope a new platform for energy efficiency in aged or outdated infrastructures utilizing today's technology.

MICHAEL RAMOS
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CAREER PROFILE

Proactive professional with over 30 years of experience with a proven knowledge of capital projects, facilities and computer-aided design. Professional record of accomplishment, with extensive experience in commercial HVAC, both DDC and pneumatic building automation controls and high-pressure water systems. Demonstrated and proven ability in training, evaluating, and managing successful maintenance teams. Vast knowledge in identifying, repairing, troubleshooting all building automation equipment. Resourceful in critical thinking, strategic planning, problem solving, and communication in all areas of facilities.

WORK EXPERIENCE

Chicago Public Schools/ Aramark, Chicago, IL (1998-Present)
Chief Engineer

Manage all areas of internal operations including maintenance and repairs of HVAC equipment, plumbing, electrical, elevators, refrigeration, generators, fire alarm and sprinkler systems.
Owners Representative for over $40M of CPS capital construction projects through multiple levels/phases to completion. Generated scope and issued work orders for all contracted repairs, manage contractors relating to all facility work required at site.
Design and implement schedule/logs for preventative maintenance
Maintain computer networks

EDUCATION

Triton College, Chicago, IL
(2016)
National Home Inspection Licensing (RES-E35)

Westside Technical Institute, Chicago, IL (1998)
Direct Digital Control H VAC/ Building Automation
Chief Engineering H VAC/ Management
Basic Electric Electrical Engineering

City Colleges, Chicago, IL (1991)
Stationary Engineering Mechanical Engineering

Coyne College, Chicago, IL
(1988)
Basic Refrigeration

CERTIFICATIONS & LICENSES

National Swimming Pool Foundation, Chicago, IL (2017)
Certification Public Health & DDC Control

Environmental Protection Agency, Chicago, IL (2012)
Universal Tech Certify HVAC
Stationary Engineer

Basic Refrigeration
Basic Electric / Electrical Engineering