Spring 2019 Environmental Engineering Seminar Series

Water Sustainability and Public Health: Addressing Emerging Microbial Contaminants in Water Reuse Applications

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Date: Wednesday, January 30th 2019
Time: 8:30 AM – 9:30 AM
Place: SEEC N124

Abstract

Increasing stress on water supplies has driven many U.S. municipalities to explore alternative water sources, such as recycled wastewater, to offset demand on traditional potable water sources. Water reuse applications in the U.S. include a variety of configurations, ranging from non-potable reuse for irrigation, firefighting, snowmaking, and industrial use, to direct potable reuse in which wastewater is treated to a quality fit for human consumption. As reuse of wastewater becomes more common and corresponding infrastructure expands, the potential for microbial growth in water reuse infrastructure is of increasing importance for the protection of public health. Given that many opportunistic pathogens that are known to colonize plumbing and distribution systems, such as Legionella pneumophila, Mycobacterium avium, and Pseudomonas aeruginosa, infect by non-ingestion routes such as inhalation and dermal contact, even non-potable reuse creates potential for human exposure. In addition, antibiotic resistant bacteria are an emerging public health concern and it is critical to understand the role of wastewater reuse in the dissemination of these contaminants. This seminar will provide an overview of several water reuse projects, spanning non-potable reuse, indirect potable reuse, and direct potable reuse. Effectiveness of treatment technologies at removing these emerging microbial contaminants, as well as control of their growth in distribution systems and building plumbing will be examined. The results of these studies are being used to develop strategies to mitigate dissemination of these organisms via water reuse.

Dr. Emily Garner is a postdoctoral researcher at Virginia Tech. Her research focuses on applied environmental microbiology and water reuse. Emily earned her PhD in Civil and Environmental Engineering at Virginia Tech with her dissertation titled “Occurrence and Control of Microbial Contaminants of Emerging Concern through the Urban Water Cycle: Molecular Profiling of Opportunistic Pathogens and Antibiotic Resistance.” She was supported by a National Science Foundation Graduate Research Fellowship and the American Water Works Association Abel Wolman Doctoral Fellowship. Her research was recognized with honors when she received the 2018 Outstanding Doctoral Student Award in the College of Engineering at Virginia Tech.

If you have any questions, please contact Professor JoAnn Silverstein, Joann.Silverstein@colorado.edu