PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Mingus Mapps, Commissioner
Gabriel Solmer, Director

1120 SW Fifth Avenue, Room 405
Portland, Oregon 97204-1926
Information: 503-823-7404
portlandoregon.gov/water

June 25, 2024

OESAC CEU Committee
PO Box 577
Canby, OR 97013-0577

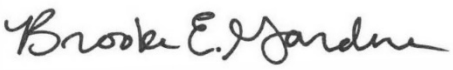
Dear members of the CEU Committee:

Please consider this request for your approval of the U.S. Environmental Protection Agency (US EPA) and Water Research Foundation (WRF) Spring 2024 Webcasts for 0.6 CEU's.

DATE	**PWB Winter 2024 Webcasts**	**CEU's: 0.6**
4/30/24	US EPA: PFAS Drinking Water Regulation and Treatment Methods	0.1
5/9/24	WRF: Your Water System is Not Isolated – Interdependencies are Important	0.1
5/16/24	WRF: Developing Strategic Consumer Messaging for Microplastics in Drinking Water Supplies	0.1
5/23/24	WRF: Demonstrating the Effectiveness of Flushing for Reducing the Levels of Legionella in Service Lines and Premise Plumbing	0.1
5/28/24	WRF: Guidance for Using Pipe Rigs to Inform Lead and Copper Corrosion Control Treatment Decisions	0.1
6/6/24	WRF: Guidance for Complying with the Lead and Copper Rule Revisions for Water Systems with No- to Low Prevalence of Lead Service Lines	0.1

Thank you in advance for your consideration.

Respectfully,



Brooke Gardner
Portland Water Bureau
brooke.e.gardner@portlandoregon.gov

Enclosures:
1. Letter of request to review
2. PWB Webcast Summaries and Speaker Bios

Environmental Protection Agency Webinar: PFAS Drinking Water Regulation and Treatment Methods
April 30, 2024

Overview:

Overview of EPA's Final PFAS National Primary Drinking Water Regulation

This presentation will provide an overview of the final PFAS National Primary Drinking Water Regulation, including the key regulatory requirements and timing for water systems and drinking water primacy agencies to comply with these requirements, background on the regulation development, and funding information to support rule implementation.

Presenter: Ashley Greene, EPA's Office of Water

Ashley has over 15 years of experience as a physical scientist in EPA's Office of Water (OW). She currently works in OW's Office of Ground Water and Drinking Water on the development and review of drinking water rules and regulations under the Safe Drinking Water Act, including the PFAS drinking water rule. During her time in OGWDW, she also served as the special assistant coordinating the priorities of the office and working directly with senior EPA leadership on drinking water protection efforts and the on the Creating Resilient Water Utilities program, which provides resources and technical assistance to water utilities in adapting to climate change and building resilient water infrastructure. Prior to joining OGWDW, she worked in EPA's Office of Wetlands, Oceans, and Watersheds on several projects dealing with the assessment and control of pollution in marine and coastal waters. Previous to her EPA career, Ashley served as a Surface Warfare Officer in the United States Navy. Ashley holds an M.S. in atmospheric and oceanic science from the University of Maryland and a B.S. in oceanography from the United States Naval Academy.

Removal of PFAS Compounds from Drinking Water: Fundamentals and Applications

This presentation will focus on the three treatment processes designated as best available technologies for PFAS removal from drinking water: granular activated carbon (GAC), ion exchange (IX), and membranes (NF/RO). There will be a brief discussion on the fundamentals of each process followed by basic considerations of process selection, process design, and costing.

Presenter: Nicholas Dugan, P.E., EPA's Office of Research and Development

Nick is an environmental engineer in EPA's Office of Research and Development, Center for Environmental Solutions and Emergency Response, Water Infrastructure Division. He has over 25 years of experience conducting research in the removal of microbial and chemical contaminants from drinking water and is currently helping to lead the nationwide implementation of a technical support project for the removal of PFAS and other emerging contaminants from drinking water. Nick is also registered as a Professional Engineer in Ohio.

Water Research Foundation Webinar: Your Water System is Not Isolated – Interdependencies are Important
May 9, 2024

Overview:
Water systems may be considered stand-alone entities, but they are invariably connected to other utilities and activities. These interdependencies must be understood, and practices to ensure good partnerships between these entities should be implemented. The Southwest Environmental Finance Center at the University of New Mexico completed WRF project Water Sector Interdependencies (5086) in 2023. This project had two main components: 1) case studies of 16 water utilities discussing several aspects of interdependencies, including energy/power, fuel, chemicals, transportation, communication, enterprise and workforce resilience, and water resources/supply/availability; and 2) a guidebook for small- to medium-sized utilities. This webcast will explore both components, sharing key findings from the case studies and guidance materials.

Presenter Biography Information

Heather Himmelberger, Director, Southwest Environmental Finance Center, University of New Mexico

Heather Himmelberger is a registered professional engineer with 28+ years of experience working with water and wastewater utilities and in the environmental arena. She has a BS in Environmental Engineering from Penn State University and an MS in Environmental Engineering from Johns Hopkins University. She is currently working on a PhD in Civil Engineering at the University of New Mexico. She served as the Director of the NM Environmental Finance Center from 1996 to 2012 and became Director of the Southwest Environmental Finance Center in 2013. As Director, she has assisted state, local and tribal governments with the broad financial implications of providing environmental services, such as water and wastewater, and complying with state and federal regulations. Heather has served as an expert witness to EPA's Environmental Financial Advisory Board (EFAB) and was appointed an official board member to EFAB in spring 2014. She is on two subcommittees, one related to small systems and compliance and the other related to affordability of wastewater. She has been a presenter at numerous national, international, regional, and local conferences, workshops, and meetings. Heather has been project lead on the Small Systems Managerial and Financial Capacity Assistance project funded by EPA in 2012 for the Environmental Finance Center Network, a project we call, "Smart Management for Small Water Systems" and is currently the co-PI of the seventh round of funding for the Smart Management for Small Systems project. In this capacity, she has provided trainings in all states and territories and has provided assistance to small communities in areas such as asset management, water loss, multiple funding, regionalization, and energy efficiency. She has also conducted 10 webinars for the first phase of the project. Heather has been providing training and implementation assistance in Asset Management since 2005. She coordinated and facilitated the first Asset Management users group in New Mexico in October of 2010 and completed an interactive Asset Management Training Manual that

includes over 200 video clips and combines Asset Management with Energy Efficiency. She directed a project team that worked with 10 different groups of water systems to encourage collaborative efforts between the systems. She was a member of the Dona Ana County Water and Wastewater Alliance back in the late 1990s, which was one of the first collaborative efforts in the State of New Mexico. She helped these systems understand the benefits of mutual cooperation and led this group to the formation of a regional water entity. She facilitated the meetings in Texas that lead to the formation of the Texas Water Infrastructure Coordinating Committee (TWICC). The TWICC includes all water and wastewater infrastructure funding groups as well as the Texas Commission on Environmental Quality. This group now meets quarterly to coordinate funding in Texas. Heather participated in New Mexico One Stop Shops, which were the mechanism of unified funding before New Mexico embarked on a unified funding application process. She has been involved in the workgroups that were developing unified approaches for Preliminary Engineering Reports and Environmental Documents so that communities could use one process that would satisfy all agencies. Heather has conducted numerous studies related to water loss which investigated water loss technologies and their applicability. In addition, she has worked on a Water Research Foundation project that is developing water loss training for small systems.

Moderator: Jian Zhang, PhD, Research Program Mgr., The Water Research Foundation

Water Resource Foundation Webinar: Developing Strategic Consumer Messaging for Microplastics in Drinking Water Supplies
May 16, 2024

Overview:
Although studies have shown that microplastics are widespread across the planet, analytical methods are both cumbersome and limited, and there is still much to learn about the impact of microplastics on human and ecological health. In order to properly address concerns from the public and the media about the implications of microplastics in drinking water, it is essential to conduct proactive research to anticipate and understand these concerns, develop appropriate and accurate responses, and communicate with a consistent voice.

This webcast will showcase WRF project 5155, *Developing Strategic Consumer Messaging for Microplastics in Drinking Water Supplies*, which captured consumer awareness and concerns, leveraging this knowledge to develop effective messaging strategies for communicating about microplastics in drinking water.

Presenter biography information:

Brent Alspach, Vice President/Director of Applied Research, Arcadis
Brent Alspach holds both Bachelor and Master of Science degrees in Civil and Environmental Engineering from Cornell University. Brent joined Arcadis in 1997 and serves as a Principal Environmental Engineer and Director of Applied Research for the

company's Water Division. He oversees a program that has conducted nearly $30 million in drinking water, potable reuse, wastewater, and stormwater research funded by the Water Research Foundation, AWWA, and the US Bureau of Reclamation, among other organizations. Mr. Alspach is the immediate past President of the American Membrane Technology Association (AMTA) and currently serves as Chair of the AWWA Water Quality & Technology Division Board of Trustees, as well as on the advisory / editorial boards for Journal AWWA, AWWA Water Science, and Opflow. His work regarding the integration of desalinated seawater into existing distribution systems, conducted for the Metropolitan Water District of Southern California, was honored with the Best Paper award at the 2012 Membrane Technology Conference (MTC), and his work on zero-liquid discharge (ZLD) systems garnered runner-up for the same award in 2016.

Moderator: Ashwin Dhanasekar, Research Program Manager, The Water Research Foundation

Water Resource Foundation Webinar: Demonstrating the Effectiveness of Flushing for Reducing the Levels of Legionella in Service Lines and Premise Pluming
May 23, 2024

Overview:
Flushing is a common approach used to control *Legionella* levels in building plumbing systems, but there are no standard or widely accepted approaches. The effectiveness of flushing is likely to vary with the flush water temperature and type, concentration of residual disinfectant in the flush water, flushing flow rate (i.e., fluid velocity), and flushing time.

Project 5033, "**Demonstrating the Effectiveness of Flushing for Reducing the Levels of Legionella in Service Lines and Premise Plumbing,**" evaluated the efficacy of flushing as a corrective action for reducing *Legionella* levels in buildings' cold- and hot-water systems. Specific research questions concerned the roles of flushing flow rate, flush water temperature, presence/absence of residual disinfectant (i.e., chloramines), and flushing frequency on *Legionella* levels in the water and biofilm of building plumbing systems.

In this webcast, presenters will discuss the findings and results of this project, including recommendations that are based on easily measurable water quality parameters, such as temperature and/or chlorine residual. This approach ensures that the flushing procedure can be implemented with ease by operators and building managers, making it accessible and practical for real-world application.

Panel biography information:

Cynthia Halle, PhD

Cynthia is an Associate Professor in the Department of Civil and Environmental Engineering and Adjunct Professor in the Department of Building and Environmental Technology, Norwegian University of Life Science Organization. Cynthia has a PhD in Water Resources Engineering from University of Waterloo and a Master of Science

degree in Water Resource Engineering and bachelor's degree in chemistry from Universite Laval.

Raymond M. Hozalski, PhD
Raymond is a James L. Record Professor, Department of Civil, Environmental, and Geo-Engineering, University of Minnesota. Raymond is interested primarily in the application of biological processes for the treatment of water, wastewater, and hazardous waste. One of their main areas of specialization within biological processes is biofilms, which are microbial communities immobilized on solid surfaces. Raymond's biofilms research program aims to enhance understanding of the structure and function of biofilms in engineered (e.g., pipelines) and natural systems, to develop or improve water treatment processes that employ biofilms, and to develop strategies for controlling accumulation of biofilms on surfaces through the measurement and manipulation of biofilm mechanical properties. In addition, they are interested in studying the composition and reactivity of aquatic natural organic matter (NOM) with emphasis on the impacts of NOM on water treatment and drinking water quality.

Michael Waak
Michael is a Researcher Scientist, Environmental Engineering, Department of Infrastructure SINTEF, Norway. Their education includes a Postdoc at Norwegian University of Science and Technology (2018 to 2020), PhD in Civil Engineering (University of Minnesota, 2018), Master of Science in Civil Engineering (University of Minnesota, 2016), and Bachelor of Science (University of Wisconsin - Stevens Point, 2012). Michael works with water quality, especially the microbiological quality. They specialize in drinking water from source to tap, which includes water treatment processes, biostability, assimilable (AOC) and biodegradable dissolved organic carbon (BDOC), bioavailable nutrients like nitrogen and phosphorus, disinfection processes, and waterborne pathogens or indicators like legionellae and coliform bacteria. Michael works with flow cytometry, quantitative and digital PCR, as well as statistics and modeling.

Grace Jang, PhD
Dr. Grace Jang is a Research Program Manager at the Water Research Foundation. Grace leads WRF's Waterborne Pathogens in Distribution and Plumbing Systems Research Area, as well as research topics related to biofiltration, water quality, biofilm, and reuse.

Water Research Foundation Webinar: Guidance for Using Pipe Rigs to inform Lead and Copper Corrosion Control Treatment Decisions
May 28, 2024

<u>Overview:</u>

Harvested pipe studies have been utilized for many years to assess the impact of chemistry changes on lead release in water systems. Under some circumstances, the lead and copper rule revisions (LCRR) and proposed lead and copper rule improvements (LCRI) require a harvested pipe study. There are many types of harvested pipe studies, including sealed batch pipe, bench harvested pipe flow through, and pilot harvested pipe flow through. This webcast presents the materials compiled for WRF Project 5081, Guidance for Using Pipe Rigs to Inform Lead and Copper Corrosion Control Treatment Decisions. Information for this project was collected from available literature and industry experience for those wishing to conduct a "fit-for-purpose" pilot pipe rig study for their system. Much of the information is useful for other types of harvested pipe studies as well.

This webcast will discuss the drivers and system characteristics that could influence the overall testing approach, including pipe rig design, operational procedures, data analysis methods, and financial variables. Survey results of those who conducted corrosion control treatment (CCT) studies on their system with emphasis on pipe rig studies, as well as pipe corrosion information sheets, rig schematics for design guidance, design and operations checklists of parts and procedures, instructional videos on harvesting pipes and operating a pipe rig, program guide for statistical analysis using R and Excel, and a financial tool for project cost estimation will also be covered.

Panel biography information:

David Cornwell, PhD, PE, BCEE, Chief Executive Officer, Cornwell Engineering Group
Cornwell Engineering Group was founded in 1985 by our President, Dr. David A. Cornwell. After a successful career as a Professor at Michigan State University, Dr. Cornwell ventured into the consulting field on the belief that state-of-the-art research and technology could be merged with practical evaluations and designs for utilities to provide the best of both worlds for the environmental profession. Dr. Cornwell's specialty is the potable water field and he established Cornwell Engineering Group to utilize the latest innovations and sound scientific fundamentals in the pursuit of optimizing and designing water facilities. Cornwell's staff has continued in that tradition of blending research and scientific principles in their practical applications. Cornwell Engineering Group has branched into all the water fields including potable water, resource planning and management, distribution, stormwater, and wastewater treatment and collection. Our services include treatability studies, planning, design, and construction administration. Cornwell Engineering Group is recognized as a national leader in the water treatment and sludge management fields, providing services throughout the country in areas of plant troubleshooting, regulatory compliance assistance, master planning, rehabilitation studies, expansion plans, laboratory treatability studies, laboratory analysis services, pilot plant treatment studies, full-service design including 3-D computer aided design services, construction administration, and start-up services.

Melinda Friedman, PE, President, Confluence Engineering Group, Inc.

Melinda is President of Confluence Engineering Group. She has been working to solve complex water quality problems for 30+ years and has helped to prepare many prominent industry Guidance Manuals and research papers. She was the recipient of the AWWA George Warren Fuller Award for engineering leadership in 2017 and is the 2022 recipient of the A.P. Black Research Award.

Caroline Russell, PhD, PE, Principal Technologist, Carollo Engineers
DR. CAROLINE RUSSELL serves as the Water Innovation Lead for the Carollo Research Group. She has 20 years of experience addressing drinking water supply and treatment challenges for water systems across the United States.

Rebecca Slabaugh, Drinking Water Practice Lead, Arcadis North America
Ms. Slabaugh has over ten years of experience in engineering and managing drinking water quality and treatment projects, including corrosion control treatment, regulatory compliance, and process selection and optimization. Since completing her master's work on copper pitting corrosion, she has helped over 20 water systems evaluate and implement effective corrosion control treatment programs for lead, copper and iron, and is currently working with two large utilities to identify and implement best practices around lead and copper, with a specific focus on public education and outreach and lead service line replacement. She has also worked with AWWA to develop guidance for implementing optimum corrosion control treatment and to assess the impacts, including costs, of the future Long-Term Lead and Copper Rule on U.S. water systems. She is also a member of the AWWA Lead and Copper Rule Technical Advisory Workgroup, a co-author for AWWA Manuals of Water Supply Practices M58 (2nd ed.): *Internal Corrosion Control in Water Distribution Systems* and M68: *Water Quality in the Distribution System* and is assisting with the development of a new AWWA standard on cutting and flushing of lead service lines.

Pierre Kwan, PE, Senior Project Manager, HDR Engineering, Inc.
Pierre is the technical director for water treatment helping utilities with their various water quality challenges from source rivers and lakes all the way to kitchen faucets. He chose this line of work because of his strong belief that clean, safe and plentiful drinking water is a crucial foundation to life and society. He has seen the tremendous positive differences when a community has good drinking water versus one that does not. Pierre's experiences have taken him to Saudi Arabia to design a desalination plant for a brand-new metropolis, yet he's also worked on small projects like developing a well for a community of 100 in Alaska. With each project, he knows his efforts directly help people have better lives. From per- and polyfluoroalkyl substance to lead and copper corrosion control, Pierre is dedicated to finding the best treatment technology solution. He is an active member of several national American Water Works Association committees and an author and contributor to several industry books and guidance manuals including the industry standard for corrosion control, Manual M58: Internal Corrosion Control in Water Distribution Systems. Pierre has presented his work at conferences around the world.

Michael Sun, Cornwell Engineering Group
Michael is an Engineer at Cornwell Engineering Group, Inc. In this role, they perform and present data analysis for corrosion control studies, which include desktop studies, pipe scale analyses, benchtop solubility studies, and harvested pipe studies. They also conduct and present research on drinking water topics, including lead mitigation strategies and pipe rig data analysis techniques. Michael received their Bachelor of Engineering – BE, Environmental/Environmental Health Engineering in 2020 from the University of Florida. Michael currently serves on the AWWA Distribution System Water Quality Committee and the AWWA Virginia Drinking Water Quality Research Committee.

Moderator: Jian Zhang, PhD, Research Program Mgr., The Water Research Foundation

Water Resource Foundation Webinar: Guidance for Complying with the Lead and Copper Rule Revisions for Water Systems with No- to Low Prevalence of Lead Service Lines
June 6, 2024

Overview:
Presently,15 to 22 million Americans are served drinking water from lead lines. While most utilities employ effective corrosion control that limits the release of lead, the safest way to assure no lead release is to remove the source of lead. Given recent attention from the public health community related to the potential impacts from lead in drinking water, it is understandable that USEPA is promoting Lead Service Line Replacements (LSLRs) in the Lead and Copper Rule Revisions (LCRR and proposed LCRI).

This webcast will discuss WRF project 5223, *Guidance for Complying with the Lead and Copper Rule Revisions for Water Systems with No- to Low Prevalence of Lead Service Lines (LSL, LSLs)*. The project's objectives are to develop guidance for utilities with limited lead lines that require replacement to comply with the requirements of the LCRR/LCRI pertaining to creating their lead service line inventories. The project team will also compile and evaluate data and methods to better understand the source of lead in galvanized pipes and extent of lead release from galvanized materials and from galvanized materials requiring the replacement (GRR).

Panel biography information:

David Cornwell, PhD, PE, BCEE, Chief Executive Officer, Cornwell Engineering Group
Cornwell Engineering Group was founded in 1985 by our President, Dr. David A. Cornwell. After a successful career as a Professor at Michigan State University, Dr. Cornwell ventured into the consulting field on the belief that state-of-the-art research and technology could be merged with practical evaluations and designs for utilities to provide the best of both worlds for the environmental profession. Dr. Cornwell's specialty is the potable water field and he established Cornwell Engineering Group to utilize the latest innovations and sound scientific fundamentals in the pursuit of optimizing and designing water facilities. Cornwell's staff has continued in that tradition of blending research and scientific principles in their practical applications. Cornwell

Engineering Group has branched into all the water fields including potable water, resource planning and management, distribution, stormwater, and wastewater treatment and collection. Our services include treatability studies, planning, design, and construction administration. Cornwell Engineering Group is recognized as a national leader in the water treatment and sludge management fields, providing services throughout the country in areas of plant troubleshooting, regulatory compliance assistance, master planning, rehabilitation studies, expansion plans, laboratory treatability studies, laboratory analysis services, pilot plant treatment studies, full-service design including 3-D computer aided design services, construction administration, and start-up services.

Richard Brown, PE, Vice President, Cornwell Engineering Group
Richard Brown has over 22 years of experience within the water and wastewater industry across North America and the United Kingdom. He is currently the Project Lead for EPCOR's water reclamation project in central Texas for a large semiconductor manufacturer.

Richard has an engineering and operational background with a focus on alternate project delivery. He has delivered over 300 new build and upgrade projects for water, wastewater, nuclear, mining and industrial clients in North America and the UK. He was the Project Lead for EPCOR's Regina Wastewater Treatment Plant, one of Canada's largest water infrastructure public-private-partnerships.

Richard has a Master's degree in Mechanical Engineering from Cardiff University (UK) and is a Professional Engineer (P.Eng) in Alberta, a Chartered Engineer in the UK (CEng), a Project Management Professional (PMP) and a Fellow of the Institution of Mechanical Engineers (FIMechE). Outside of work Richard enjoys spending time with his wife and three young daughters and watching sports in particular rugby and hockey.

Susan Teefy, Manager of Water Quality, East Bay Municipal Utility District
Susan Teefy is a Manager, Water Quality at East Bay Municipal Utility District based in Oakland, California. Previously, Susan was a Principal Engineer at Water Quality & Treatment Solutions and held positions at United States Environmental Protection Agency. Susan received a B. S. degree in Civil Engineering from University of California Berkeley and a M. S. degree in Environmental Engineering from University of North Carolina at Chapel Hill.

Moderator: Jian Zhang, PhD, Research Program Manager, The Water Research Foundation