PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Edward Campbell, Acting Director

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December 30, 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 Portland Water Bureau's Fall 2024 Webcast for 0.7 CEU's.

DATE	Portland Water Bureau Fall 2024 Webcasts	CEU's: 0.7
9/23/24 + 9/27/24	EPA Webinar: Effective Utility Management (EUM) Webinars on the modernized EUM Primer – Webinar #1 10:00 AM – 11:30 AM	0.1
10/1/24	Water Research Foundation Webinar: Exploring Utility Digital Transformations	0.1
10/24/24	Water Research Foundation Webinar: Occurrence of Legionella pneumophila In Drinking Water Distribution Systems	0.1
10/29/24	Water Research Foundation Webinar: Establishing a Framework for Integrating Stormwater Capture into Water Supply Planning	0.1
10/29/24	EPA Webinar: PFAS – Rule Implementation and Treatment	0.1
11/14/24	EPA Webinar: EPA's Lead and Copper Rule Improvements	0.1
12/3/24	EPA Webinar: Lead Reduction Updates and Lead Service Line Identification and Replacement	0.1

Thank you in advance for your consideration.

Respectfully,

Brooke Gardner
Portland Water Bureau

The City of Portland is committed to providing meaningful access. To request translation, interpretation, modifications, accommodations, or other auxiliary aids or services, or to file a complaint of discrimination, contact 503-823-4000 (311), Relay: 711, or 503-823-7770.

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

EPA Webinar: Effective Utility Management (EUM) Webinars on the modernized EUM Primer – Webinar #1
September 23, 2024 and September 27, 2024

Overview:
Effective Utility Management (EUM), based on the Attributes of Effectively Managed Utilities, developed by utilities for utilities, is the most widely used water utility management framework in the country. First issued in 2008, and endorsed by EPA and other water associations, a modernized version of the Effective Utility Management (EUM) Primer has just been released by the EPA Office of Wastewater Management and the Collaborating Organizations listed below.

In support of the roll-out for the modernized EUM Primer, the EPA Office of Wastewater Management is hosting two webinars on the updates that have been made to the EUM Primer. The webinars will not only inform you of the changes that have been made to the EUM Primer, you will also learn the first steps for implementing EUM at your utility and will also have the opportunity to ask questions of the EUM Steering Group who participated in the modernization process.

Presenter:
> **Jim Horne, US EPA**
> Jim Horne has been with the Office of Water at EPA since 1988 and with the Office of Wastewater Management since 1991. During that time, he has concentrated on educating and assisting public entities on the value of using various approaches and tools to sustainably manage their operations. Some of the major efforts Jim has led for EPA include:
> - Completing a historic agreement between EPA and ten national water sector organizations to promote effective utility management, and partnering with USDA to develop a similar initiative to help managers of rural and small utilities use the EUM framework.
> - Representing EPA on the working group that developed the Utility of the Future TODAY Recognition Program for wastewater utilities.
> - Developing the first ever national policy statement for EPA on Sustainable Water and Water Infrastructure (e.g. EPA's Sustainability Policy, 2010).
> - Developing a "roadmap" of sustainable and effective practices for water and wastewater utilities based on the EUM Attributes and Keys.
> - Jim has received numerous medals and commendations for outstanding service, including the EPA-wide award for Outstanding Leadership in Collaborative Problem Solving in 2008 and the WEF President's Award in 2015.

Water Research Foundation Webinar: Exploring Utility Digital Transformations
October 1, 2024

Overview:
Join our webcast for an in-depth exploration of how forward-thinking utilities have successfully navigated the path of digital transformation. Using compelling case studies, presenters will uncover the tangible benefits these organizations have realized, from operational efficiency to cultural shifts. Gain valuable insights into the obstacles overcome, lessons learned, and unexpected advantages discovered along the way. Whether you're at the beginning of your transformation or looking to enhance your strategy, this webcast will offer key takeaways to help you on your journey.

Presenters:
> **Jeanna Long, National Digital Innovation Leader, Senior Principal, Woodard & Curran**
> Jeanna Long brings to her role as National Digital Innovation Leader nearly 20 years of experience managing complex projects that include leveraging technology to streamline and support workflows,

business processes, decision-making, transparency, and communication. Her expertise in user-centric web design, visualization, advanced data analysis, and software development allows her to create and lead innovative, cutting-edge digital projects for our clients. She has led the design and development of Woodard & Curran's flagship product, Opti, which has become a flexible framework to support project and benefit tracking, program management, and monitoring data management. Her expertise in working with clients to understand their needs has resulted in state-of-the-art, easy-to-use products that regularly receive client praise.

Flavio Silva, Electrical and Water Resilience Engineer, Corsan
Electrical Engineer (CORSAN 2014) at the Operational Coordination of Alvorada - RS. Working in the Operation and Maintenance Department in Energy Efficiency projects, contingency projects in the inefficiency of the electricity supply by the Distributors, Electricity Substation, Alternative Sources, Monitoring Systems and Data Acquisition. SIGRAC and SIAV systems. Currently operational coordinator of the sanitation system in the municipality of Alvorada with just over 80 thousand savings

Moderators:
Sydney Samples, Research Program Manager, The Water Research Foundation
Maddy Zimmerman: Manager, Americas Manager, Smart Water Networks Forum

WRF Webinar: Occurrence of Legionella pneumophila in Drinking Water Distribution Systems
October 24, 2024

Overview:
Legionella pneumophila is a significant drinking water contaminant due to its role in causing Legionnaires' Disease (LD), a potentially fatal illness. While LD risk is largely determined by water management within buildings, public water systems also contribute to *L. pneumophila* exposure and must play a role in its management. However, limited data exist on its occurrence in distribution systems and associated factors.

Project 5156, *Occurrence of Legionella pneumophila in Drinking Water Distribution*, was a two-year study involving 57 utilities monitoring *L. pneumophila* in water distribution systems across various regions, system sizes, and disinfectant types. The study aimed to develop a response and communication protocol for utilities following positive *L. pneumophila* detections; collect data to examine the relationship between *L. pneumophila* occurrence and disinfectant residuals; analyze the associations between disinfectant type, concentration, and system characteristics; and identify locations at higher risk for *L. pneumophila* presence. Additionally, a benchmark risk analysis was conducted to assess the risk of *L. pneumophila* in distribution systems.

In this webcast, presenters will share key findings from the study, offering practical recommendations for monitoring and managing *L. pneumophila* in public water systems. The research enhances our understanding of *L. pneumophila* occurrence in distribution systems and provides valuable insights to help utilities improve water management practices and protect public health.

Presenters:
Tim Bartrand, Executive Director, Research Engineer, The Environmental Science Policy and Research Institute (ESPRI)
Dr. Tim Bartrand is executive director of ESPRI – a nonprofit organization dedicated to advancing better understanding of water quality changes in building water systems and improved water quality at points of use. He has been a researcher at ESPRI since its inception in 2016. Prior to joining ESPRI, Tim worked as a consulting engineer supporting drinking water utility and federal agency drinking water, wastewater and recreational water research efforts. At ESPRI, as a key researcher on an EPA-funded building water research project (Drexel University was prime grant recipient), Tim led a one-year research study on biological and chemical water quality changes that occur in hot water systems. Tim holds a Doctoral degree in environmental engineering (Drexel U., 2007), Masters degrees in civil engineering (Ohio U.,

1997) and mechanical engineering (U. of Tennessee, 1987), and a Bachelor's degree in aerospace engineering (U. of Notre Dame, 1983). Tim is a returned Peace Corps Volunteer (Cameroon, 1983-1985) and worked as engineer in relief settings from 1997 to 2000. He maintains an interest in research advancing safe water for people in less technologically developed countries and conflict and disaster-effected regions.

Gary Burlingame, Senior Scientist, The Environmental Science Policy and Research Institute (ESPRI)
Gary A. Burlingame was director of Philadelphia Water's Bureau of Laboratory Services. BLS is an accredited full-service environmental and materials analysis laboratory with an annual operating budget exceeding 10 million and a staffing of more than 110 people. Analyses are done on drinking water, source water, wastewater, sediment, sludge, and related media. Gary has also provided operator training through Pa-AWWA on waterborne diseases, water quality, and water contamination response. Gary has served on various Water Research Foundation committees including as chair of the Focus Area Council and on the Board of Trustees which oversees more than 3 million in annual research funding. He has also served on various American Water Works Association committees representing regulatory and water quality issues, as well as in supporting publications, Opflow, and related resources.

Specialties: Expertise includes: taste and odor control of drinking water; odor control at wastewater treatment plants; risk communication; water contamination response; drinking water quality; management of the laboratory.

Mark W. LeChevallier, PhD, Dr. Water Consulting, LLC
Dr. Mark LeChevallier is the principal and manager of Dr. Water Consulting, a part-time consulting business, after retiring from American Water at the beginning of 2018. Dr. LeChevallier received his Bachelor of Science and Masters degrees in Microbiology from Oregon State University, and his Ph.D. in Microbiology from Montana State University. Dr. LeChevallier has authored over 300 research papers and has received numerous awards for outstanding contributions to the science of water treatment. He was the recipient of the George Warren Fuller award in 1997 from the New Jersey section of the American Water Works Association, the Abel Wolman Award in 2012 and the A.P. Black award for research in 2015, both from the American Water Works Association.   Dr. LeChevallier was a member of the Water Science Technology Board of the National Academies of Science, Engineering and Medicine, and was appointed in 2019 to the Drinking Water Subcommittee, and in 2021 as a charter member of the USEPA Science Advisory Board.   He is a fellow of the American Academy of Microbiology and the National Academy of Engineering.

Moderator:
> **Grace Jang, PhD, Research Principal, The Water Research Foundation**

EPA Webinar: PFAS – Rule Implementation and Treatment
October 29, 2024

Overview:
This special extended webinar event includes talks given at the EPA 21st Annual Drinking Water Workshop on September 17-19, 2024. Presentations will include discussions on examples of state PFAS treatment requirements, treatment application process, rule implementation process and sampling and monitoring assistance efforts, decision trees for mitigating PFAS exceedances, advancements in PFAS treatment methods, and EPA's open-source treatment performance modeling tools for granular activated carbon and ion exchange. Q&A sessions will follow each presentation.

Information on the annual drinking water workshop: [epa.gov/water-research/21st-annual-epa-drinking-water-workshop-small-system-challenges-and-solutions]epa.gov/water-research/21st-annual-epa-drinking-water-workshop-small-system-challenges-and-solutions

A certificate of attendance will be offered for this webinar.

Topics include:
- PFAS Treatment Requirements in New Jersey
- PFAS National Primary Drinking Water Regulation Implementation in Kentucky
- Decision Trees for PFAS Mitigation Selection: What to do After PFAS Exceedances Detection
- PFAS Breakthrough and NOM Effects from Pilot-Scale AEX Column
- EPA's Open-Source Treatment Performance Modeling Tools for PFAS Treatment

Presenters:

Cory Stevenson, New Jersey Department of Environmental Protection
Cory is an environmental engineer with the NJDEP's Bureau of Water System Engineering. His responsibilities include the review of water treatment construction permits, corrosion control measures, and various sample plans. He has served as the emerging contaminant treatment lead which entails researching new technologies, coordinating with other NJDEP programs and manufacturers, and shaping NJ's treatment review requirements. Cory previously worked in site remediation where he installed, operated, and maintained PFAS, BTEX, and PCE treatment systems. His other duties included well drilling supervision, Superfund site sampling, contaminant plume mapping, report preparation for state submittals, and remedial actions under multiple government contracts. Cory holds a B.S. in environmental systems engineering with a focus on watersheds and water resources from The Pennsylvania State University.

Jackie Logsdon, Kentucky Energy and Environment Cabinet
Jackie Logsdon is an Environmental Scientist Consultant with twenty-four years of experience working for the Kentucky Energy and Environment Cabinet. She began her career as a drinking water inspector. She spent most of her tenure providing drinking water technical assistance to public water systems, while also serving as the Kentucky Area Wide Optimization Program coordinator. She now serves as technical advisor to the Drinking Water Branch Manager and coordinator for implementation of the PFAS drinking water rule. Jackie is a 1999 graduate of the University of Kentucky with a Bachelor of Science degree in Biology.

Jasmina Markovski, Arizona Department of Environmental Quality
Jasmina Markovski is a senior engineer with the Safe Drinking Water Section of the Arizona Department of Environmental Quality. She has 12 years of experience in the industry and is specialized in adsorption and ion-exchange drinking water treatment technologies. She is author of 4 patents, 22 peer-reviewed publications, 4 book chapters and 30+ conference proceedings and presentations. Jasmina holds a Ph.D., an M.S., and a B.S. in environmental/polymer/chemical engineering and P.E. in chemical engineering in the state of Arizona.

Samantha Smith, EPA Office of Research and Development
Samantha J. Smith is currently a Physical Science Student Trainee at the United States Environmental Protection Agency (USEPA) Office of Research and Development in Cincinnati, Ohio. She has supported USEPA research in various roles since 2004 in laboratory and field studies covering diverse topics impacting water quality. She earned her M.S. in environmental science in 2015 and recently completed her Ph.D. in environmental science at the University of Cincinnati's College of Engineering and Applied Science. Her current research focuses on PFAS removal from drinking water matrices using anion exchange resins.

Jonathan Burkhardt, EPA Office of Research and Development
Jonathan is an environmental engineer with EPA's Office of Research and Development, Center for Environmental Solutions and Emergency Response, Water Infrastructure Division and has over ten years of experience in research associated with drinking water quality and supply topics. He is currently leading

research into modeling PFAS removal using granular activated carbon and ion exchange systems and modeling water quality in premise plumbing systems and water distribution systems. Jonathan holds a Ph.D., and M.S., and a B.S. in chemical engineering from the University of Cincinnati.

Water Research Foundation Webinar: Establishing a Framework for Integrating Stormwater Capture into Water Supply Planning
October 29, 2024

Overview:
Please join us for a webcast on project 5207, *Establishing a Framework for Integrating Stormwater Capture into Water Supply Planning*. This project seeks to develop pragmatic, actionable research to inform and guide water sector professionals in (1) evaluating the potential value and feasibility of tapping stormwater as a source of supply (within the context of multi-benefit stormwater management); and (2) navigating the complex process of working with other utilities, regulators, elected officials, and relevant stakeholders to move ideas into action.

The project team holds expertise in economics, policy and regulation, funding and financing, marketing, water quality, technology, and interagency collaboration. The presenters will share insights obtained from extensive interviews with utility and agency partners from across the United States who are at different stages in their journeys to incorporate stormwater into their water supply planning. The team will also share their plans to develop tools and resources to address challenges faced by those considering stormwater capture and use.

Presenters:
Shannon Spurlock, Senior Researcher, Public Policy & Practice Uptake, Pacific Institute
Shannon Spurlock joined the Pacific Institute in 2022 as a Senior Researcher — Public Policy & Practice Uptake. She develops and implements strategies for advancing policies and practices on priority topics for the organization, with a focus on scaling the integration of approaches with multiple benefits into public policy and planning. Prior to joining the Pacific Institute, Shannon ran a consulting business, where her projects included researching interagency collaboration among water utilities for the purpose of scaling water reuse and overseeing the development of a web-based tool that compared ratepayers' water rates across regions and utilities for the purpose of demonstrating affordability or lack thereof. Additionally, Shannon has extensive community-driven food systems experience and has led policy change at the local and state level. Shannon holds a B.A. from the University of Colorado, Boulder and a Master of Nonprofit Management from Regis University.

Dave Smith, Principal, Water Innovation Services
As Founder and Principal, Water Innovation Services, I assist local, state and federal agencies, NGOs, research partners, and business clients in envisioning innovation opportunities and strategies. During my 31 years with U.S. EPA, I was an Assistant Water Director in the Pacific Southwest Region, manager of each Clean Water Act core program, and a proud member of the national Water Reuse Action Team. I am an experienced Water Manager with a demonstrated history of working to catalyze innovation in water system and water quality management. Skilled in Organizational Development and Management, Policy Analysis, and Research at the intersection between environmental science, policy, and institutional development. Strong administrative professional with a BA focused in Political Science from Wesleyan University, a Master of Public Policy from University of California, Berkeley, and more than 30 years of experience in multiple water quality management programs at U.S. EPA and other organizations.

Janet Clements, President, One Water Econ
Janet Clements, President and Founder of One Water Econ, has 20 years of experience in water and natural resources economics, planning, and consulting. She conducts benefit-cost, triple-bottom line, and economic impact analyses of water-related policies and programs. Her areas of expertise include integrated water resource management, green infrastructure and stormwater policy, and affordability of water and wastewater services. She also works on climate vulnerability and adaptation planning and has

extensive background in western water issues and demand management. Ms. Clements is active in the water sector; she has served on several advisory boards, including as an expert consultant to EPA's Environmental Finance Advisory Board on stormwater funding and financing issues. Prior to founding One Water Econ, she served as Director of Economics and Planning at Corona Environmental Consulting. Early in her career, Ms. Clements was a water and natural resources planner in a rural California county. She has a B.S. in Sustainable Resource Management from The Ohio State University and an M.S. in Agricultural and Natural Resource Economics from Colorado State University.

Robert Raucher, PhD, President, Raucher LLC
I am an expert practitioner in water sector economics and planning. I am now an Independent Consultant, after servicing for more than 35 years in a leadership/ownership position in leading consulting firms. I provide specialized expertise in Triple Bottom Line analysis, economics, water supply planning, affordability, risk management, asset management, and climate change adaptive management for water sector agencies facing planning and management challenges and a need for specialized economic analyses that communicates effectively with the concerned public, governing boards, elected officials, and regulators.

Sybil Sharvelle, PhD, Professor, Civil and Environmental Engineering, Colorado State University
Dr. Sybil Sharvelle is a Professor in the Civil and Environmental Engineering Department at Colorado State University with expertise in resource recovery. She received her doctoral degree from Purdue University, where she developed a biological processor for treatment of graywater for potable reuse during long duration space missions. This experience led to her current interest in sustainable concepts for water and waste management. Dr. Sharvelle has 20 years of experience working on resource recovery systems including recycled water, waste conversion to energy and high value products, and nutrient recovery from waste material. More recently, Dr. Sharvelle has engaged in research on food-energy-water connections and is the PI for InTERFEWS, Interdisciplinary Training, Education, and Research in Food-Energy-Water Systems, funded by the National Science Foundation.

Stephen Groner, PE, President, SGA Marketing
Stephen Groner, P.E., is the founder and president of SGA. Prior to starting SGA in 1998, Stephen, with his engineering background, worked for the Los Angeles County Department of Public Works as a project manager. This experience gives him keen insight into understanding the intricacies of managing government projects, as well as the importance of public engagement and education to gaining approval and acceptance of a project. Through his work, Stephen has helped shape and implement many of the major pollution prevention and community outreach programs in California.

Seth Brown, Executive Director, National Municipal Stormwater Alliance
Seth Brown has over 25 years of experience in the water sector and is the Principal and Founder of Storm and Stream Solutions, LLC, a consulting firm providing a range of services from policy and alternative project delivery analysis in the stormwater sector to facilitation and training services focused on stormwater topics. He was the Director of Stormwater Programs at the Water Environment Federation from 2010-2015 and is currently the Executive Director of the National Municipal Stormwater Alliance, which is a 501.c.3 representing stormwater-focused organizations in 24 states across 9 of the 10 U.S. EPA regions with a network that is comprised of over 4,000 MS4s. Seth has a Ph.D. in civil engineering from George Mason University with a research focus on socio-economic modeling of incentive-based investments of green stormwater infrastructure on private properties. He leads courses in Green Infrastructure and Innovative Water Partnerships at Virginia Tech and the University of Maryland at Eastern Shore and is a licensed professional engineer in the state of Maryland.

Moderator:
- Lyndsey Bloxom, Research Program Manager, The Water Research Foundation

EPA Webinar: EPA's Lead and Copper Rule Improvements
November 14, 2024

Overview:
The webinar will be informational only. To view the final LCRI and for more supporting information, please see the EPA's LCRI website at: https://www.epa.gov/ground-water-and-drinking-water/lead-and-copper-rule-improvements.

On October 8, 2024, EPA announced the final Lead and Copper Rule Improvements (LCRI). The LCRI strengthens nationwide requirements to protect the public from lead in drinking water.

Presenter:
> **Eric Burneson, EPA Office of Ground Water and Drinking Water**
> Eric Burneson is the Director of the Standards and Risk Management Division in EPA's Office of Ground Water and Drinking Water. He has been with EPA since 1999, identifying drinking water contaminants of concern and developing drinking water regulations to improve public health. Prior to working at EPA, Mr. Burneson worked for 10 years as a consulting engineer. He also spent two years working for the Republic of Palau's Environmental Quality Protection Board

EPA Webinar: Lead Reduction Updates and Lead Service Line Identification and Replacement
December 3, 2024

Overview:
EPA's Office of Research and Development and Office of Water host this free webinar series to communicate current research, regulatory information, and solutions for challenges facing small drinking water systems. New to 2024, some webinars in the series are held in partnership with the Association of State Drinking Water Administrators (ASDWA). Webinar topics vary each month and are primarily designed for tribal, state, and territory government agencies responsible for drinking water regulations compliance and treatment technologies permitting. Others may also benefit from the webinars, including water system operators, technical assistance providers, NGOs, local government personnel, academia, and private sector.

The series reaches thousands of people across the globe, and provides information and training needed for assisting small drinking water systems in building capacity and system sustainability, and with providing equitable access to drinking water.

1. EPA Lead Reduction in Drinking Water Updates
This presentation will include an overview of EPA's multipronged approach to reducing lead in drinking water according to the 2021 Biden-Harris Lead Pipe and Paint Action Plan, including regulations and other programs we have. For the retained elements of the 2021 Lead and Copper Rule Revisions (LCRR), this presentation will summarize guidance and tools available to assist systems and states to meet these requirements. Lastly, this presentation will provide an overview of the 2023 Final Lead and Copper Rule Improvements (LCRI).

Presenter:
> **Kira Smith, P.E., EPA Office of Water**
> Kira is an environmental engineer in EPA's Office of Water, Office of Ground Water and Drinking Water. She leads teams that implement the Federal Lead and Copper Rule (LCR), as well as activities associated with the EPA Lead Strategy to reduce lead exposure to lead from drinking water. She also acts as an advisor and subject matter expert for all things lead in the Capacity and Compliance Assistance Division. Kira has 25 years of experience in the drinking water industry and previously worked for EPA on the 2007 LCR short-term revisions. In addition to EPA, she has worked for very small to very large utilities, and as an engineering consultant for various projects in and around Tampa, Florida. Kira is a registered Professional Engineer in Texas and Virginia.

2. Technical Assistance Project on Lead Service Line Identification (LSLID)
In direct support of the Drinking Water State Revolving Fund (DWSRF) Emerging Contaminants funding authorized by Congress through the Infrastructure Investment and Jobs Act of 2021, P.L. 117-58, also known as the Bipartisan Infrastructure Law, EPA researchers will be providing small and/or disadvantaged communities with the technical support for identifying lead service lines. This presentation will discuss current ORD efforts, latest findings, and opportunities for collaboration on LSLID.

Presenter:

Simoni Triantafyllidou, Ph.D., EPA Office of Research and Development
Simoni is an environmental engineer with EPA's Office of Research and Development, Center for Environmental Solutions and Emergency Response, Water Infrastructure Division. Her research and technical support efforts revolve around aquatic chemistry, drinking water quality/treatment, corrosion science, inorganic contaminants and sustainable drinking water infrastructure (premise plumbing/distribution systems).

3. New and Emerging Technologies for LSLID
Emerging technologies have the potential to enhance the ability of drinking water systems to accurately identify the composition of service lines and reduce associated costs. The search for non-invasive methods such as those based on electrical resistance, acoustic and stress wave propagation/attenuation, and ground-penetrating radar (GPR) methods are now being evaluated to determine the composition of buried service line pipes without digging. These approaches are relatively new to the drinking water field and are still being satisfactorily demonstrated and optimized for use to identify service line composition. Advanced imaging techniques, including x-ray fluorescence (XRF) and laser-induced breakdown spectroscopy (LIBS) may offer more potential with precise identification of materials such as lead, copper, and plastic in service lines. These innovative technologies have the potential to transform service line identification. As these technologies improve and become more readily available, State regulators should consider implementing standards for use. The objective of this presentation is to review new methods for identifying service line materials. Additionally, an update on the development of a reference guide for approving emerging service line material identification being developed by a state regulator workgroup will be shared.

Presenter:

Jennifer Murray, Tennessee Department of Environmental Conservation
Jennifer is an environmental scientist with the Tennessee Department of Environment and Conservation, Division of Water Resources, Drinking Water Compliance Division. She joined TDEC in 2023 and provides support and guidance to water systems with their lead service line inventory. Jennifer's educational background is in applied sciences, specifically in entomology. She has worked for many years in public health as an epidemiologist, evaluator and data analyst in cancer surveillance and chronic disease.

4. Predictive Modeling for LSLID Using Machine Learning Tools
Water systems face an assorted array of technologies and approaches promising to facilitate the cost-effective identification and remediation of legacy lead service lines that are still present in water systems across the country. Predictive modeling using geostatistical, machine learning, and artificial intelligence approaches more broadly are one category of tools that are being proposed and implemented to fulfill the Revised Lead and Copper Rule mandated service line inventory and for guiding remediation in a more targeted and cost-effective fashion. This presentation will provide an unbiased and scientifically-based responses to common questions that often arise when utilizing these approaches, including the following: 1) *How much data are needed to develop and validate these models?*, 2) *What types of data are needed to develop these models?*, 3) *How do I obtain the data needed to develop and validate these models?*, 4) *How do I assess the performance of these models in identifying lead service lines?*, 5) *What is the true cost of setting up these models compared to other lead identifications approaches?*, and 6) *How can these models can be leveraged in practice to guide the remediation process?*

Presenters:

Brian Dyson, Ph.D., EPA Office of Research and Development

Brian is the supervisor of the Environmental Decision Analytics Branch in EPA's Office of Research and Development, Center for Environmental Solutions and Emergency Response, Land Remediation and Technology Division. He supervises researchers working on environmental decision and data analytics and coordinates drinking water infrastructure resilience research for small communities. His past research spans simulation-optimization methods for environmental systems engineering and multi-criteria decision analysis applied to flood resilience planning, contaminated site remediation, sustainable materials management, wetland restoration, and watershed management.

Caleb Buahin, Ph.D., EPA Office of Research and Development
Caleb is a research civil engineer in EPA's Office of Research and Development, Center for Environmental Solutions and Emergency Response, Water Infrastructure Division. His research involves developing and applying hybrid physics/process-based and artificial intelligence/machine learning methods with sensor data towards smart/intelligent design and management of water systems. Caleb's research traverses the intersection between large river-reservoir/lake systems to stormwater and wastewater systems and is addressing issues, including urbanization and climate impacts on water supply, ecosystems services, flooding, combined sewer overflows, and flooding. He also manages EPA's Storm Water Management Model (SWMM).

5. Water Sampling for LSLID

Water sampling can be a relatively simple and cost-effective approach to identify lead service lines (LSLs) compared to other existing methods. This presentation will outline established drinking water sampling methods including sequential profile sampling, first draw sampling, flushed sampling, random daytime sampling, manual composite sampling, and passive (POU device) sampling, that could be used to identify LSLs within a water system depending on their corrosion control and water chemistry. This presentation will also discuss how sampling approaches can provide information on the impact of other LSL identification methods on water quality, particularly when a disturbance occurs.

Presenter:
Christina Devine, Ph.D., EPA Office of Research and Development
Christina is an engineer with EPA's Office of Research and Development, Center for Environmental Solutions and Emergency Response, Water Infrastructure Division where she is conducting research on lead in drinking water with a current focus on lead service line identification. Her research interests include drinking water quality/treatment, aquatic chemistry, corrosion science, sustainable drinking water infrastructure, and public health. Christina is the chair of the American Water Works Association Premise Plumbing: Beyond the Meter Committee.