

Session Number	Session Title	Session Description	Date	Start Time	End Time	Credit Type	Total CE Hours	Water	Wastewater	Industrial	Disposal	Collections	Stormwater-Weather-Watershed Mgmt	Supplemental
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OGS	Opening General Session	Focused on the need for impactful branding, marketing, and communications in the digital age. It is vital that water organizations take a proactive and modern approach to connecting with the public and to telling the story of our work.	10/2/2023	8:30 AM	9:30 AM	GCH	1.0							1.0
200	Water Policy Update	This session will address the key priorities from the Biden Administration related to water and will provide the federal partners' perspectives. Senior federal officials from the US EPA, US Department of Homeland Security, and US Centers for Disease Control will address regulatory and policy topics such as resilience, PFAS issues, cybersecurity, affordability, wastewater-based epidemiology, infrastructure funding and implementation, and other important regulatory and policy issues.	10/2/2023	1:30 PM	3:00 PM	PDH	1.5	0.5	0.5				0.5	
201	Understanding and Addressing PFAS in Biosolids	Delving into the connectivity between sources of PFAS and concentrations observed in final biosolids, taking a detailed look into the nuances of various thermal treatment processes, and reviewing the multitude of considerations surrounding the production of biochar will be the objectives of this session. The featured speakers are industry leaders ready to engage in conversations on this state-of-the-art issue that has the potential to reshape the approach for biosolids management into the future. Interactive Session Conversation & Input	10/2/2023	1:30 PM	3:00 PM	PDH	1.5				1.5			
202	Advances in Anaerobic Digestion and Sidestream Treatment	Disseminating information from research and development of vacuum-based evaporation for the thickening and intensification of anaerobic digestion processes will be discussed during this session. Attendees will have an opportunity to learn about arrested anaerobic digestion and its role in resource recover. Additional there will be information on lessons learned from the startup of biofilm based deammonification process for the treatment of sidestreams from conventional and thermal hydrolysis processes. Interactive Session: Facilitated Discussion	10/2/2023	1:30 PM	3:00 PM	PDH	1.5				1.5			
203	The Ultimate Collection Systems Basic Trivia Challenge 2.0	If you have an appetite for fun and aren't afraid of a quiz, this is the session for you! Come and test your knowledge on the collection systems basics, developing a hydraulic model, calibrating a model, performing QA/QC on the model, and ways to utilize the model. You might even learn (and earn) something new! Interactive Session Trivia	10/2/2023	1:30 PM	3:00 PM	PDH	1.5					1.5		
204	What's Next for Wastewater Surveillance?	During the COVID-19 pandemic, wastewater surveillance was successfully used to characterize community health. It is now expanding with new opportunities to support public health decisions, but also faces challenges such as ethics, privacy, and communication. The speakers will discuss new targets for testing by the Centers for Disease Control and Prevention (CDC), including pathogens like influenza and antimicrobial resistance genes; surveillance programs monitoring other targets like opioids; and monitoring incoming pathogens at locations like airports. Interactive Session Ask the Experts	10/2/2023	1:30 PM	3:00 PM	PDH	1.5		1.5					
205	Biomass Fermentation for Carbon Efficient Biological Phosphorus Removal	Explore three key considerations for biomass fermentation during this session. The talks will focus on utility and academic perspectives for the measurement and utilization of the apparent fermentation rate. Interactive Session Facilitated Discussion	10/2/2023	1:30 PM	3:00 PM	PDH	1.5		1.5					
206	Global Approaches to Tackling Fugitive Methane Emissions	Attendees will witness Danish utility's perspective on sourcing, benchmarking, monitoring, and mitigating fugitive methane emissions at WWRF. The session will also look at estimating sewer-generated fugitive methane gas emissions by Monte Carlo Analysis.	10/2/2023	1:30 PM	3:00 PM	PDH	1.5		0.5					
207	Aquanomics: Future Economics of Water Risk and Energy Food Nexus	Focusing on the economics of water risk and future resiliency, as part of this study, the authors developed a platform that uses a bespoke model to estimate the future economic impact of water risk from droughts, floods and storms in 10 geographies at both a GDP and sector level. The numbers are staggering - \$5.6 trillion could be lost between 2022 and 2050. This study represents the first time the economic impact of water risk has been calculated at a GDP and sector level. The model also reveals the impact of water risk on five critical sectors within the global economy: agriculture; energy and utilities, banking and insurance; FMCG and retail; and manufacturing and distributions. While these sectors are diverse, with very different types and levels of water risk, they are all expected to face significant output losses in the years up to 2050, and this will have a significant impact on the millions of people who work across these areas. Interactive Session Panel	10/2/2023	1:30 PM	3:00 PM	PDH	1.5		0.5		0.5	0.5		
208	Industrial Pretreatment Trends	Providing background on the industrial pretreatment program, targeting and audience of utility staff and industrial dischargers as well as their consultants will be the focus of this session. Presentations will provide example case studies of POTWs evaluating new IPP loadings, including considerations for slug loadings, abrasives, and metals. The moderators will then host a facilitated discussion with polls and targeted questions to gather feedback and insights on different approaches from utilities represented in the audience. Interactive Session Facilitated Discussion	10/2/2023	1:30 PM	2:30 PM	PDH	1.0			1.0				
209	Food & Beverage: Upgrades and Troubleshooting	Built around case study presentations, this session will relate to the food and beverage industrial market. The speakers will share their experiences with expanding, upgrading, or optimizing their WWTP. The final case study goes over troubleshooting the loss of nitrification and development of improved operating practices at a dairy manufacturing plant's WWTP IFAS system.	10/2/2023	1:30 PM	3:00 PM	PDH	1.5			1.5				
210	Sweat Your Assets Off: BNR Optimization	Creative approaches to maximize existing infrastructure to optimize nitrogen removal. Approaches include improved aeration controls, mixing strategies and hydraulics optimization. Three full scale studies include High Purity Oxygen conversion to BNR and optimizing existing BNR processes. This session will provide Utilities planning for future BNR upgrades with examples of how to optimize their process with minimal infrastructure capital investments.	10/2/2023	1:30 PM	3:00 PM	PDH	1.5		1.5					
211	Primary Treatment Technologies: Should We Settle for Conventional Primary Sedimentation?	Highly-efficient primary treatment has major impacts on downstream biological treatment design and operation, including reducing required process sizing, footprint and energy consumption. Recent keen interest in removing more carbon in primary treatment, for diversion to anaerobic digestion, has also provided the goal of improved primary treatment. Advanced primary treatment options, as opposed to conventional primary sedimentation, will be presented in this session to demonstrate their performance and applicability.	10/2/2023	1:30 PM	3:00 PM	PDH	1.5		1.5					
212	WEF/AEESP Master Lecture: Belinda Sturm	TBD	10/2/2023	1:30 PM	3:00 PM	PDH	1.5		1.5					
213	Latest in Stormwater Trends	The stormwater panel session will highlight the latest trends in stormwater issues from the perspectives of EPA and WEF, who will highlight regulatory trends and the recent MS4 survey. It will also highlight the topic of urban (pluvial) flooding and the green infrastructure program of our host community (Chicago) that has been being implemented over the past eight years. Interactive Session Panel Discussion	10/2/2023	1:30 PM	3:00 PM	PDH	1.5						1.5	

214	Asset Management Journeys: A Tale of Three Utilities	The stories of three utilities at various stages on their asset management journey will be shared during this session with the intention that their ideas and thoughts will help you along your own journey. A utility in the early part of their asset management program discusses their motivation, planning, and implementation steps. Next, a utility that is 10+ years into their program describes success, failures, lessons learned, and next steps. Finally, a utility that is very far on their asset journey and is progressing on their digital transformation will present on their uses of sensors, data, the information derived, and how their decision making has been enhanced. Lessons from each stage of a utility's journey can give you information to use now where you are.	10/2/2023	1:30 PM	3:00 PM	PDH	1.5	0.5			0.5	0.5		
215	Optimizing Energy Investments Part I: Energy Master Planning	Tackling the challenging, yet hugely necessary, need for energy master planning for water/ wastewater utilities is the focus of this session. As the first of two integrated energy-planning and energy-case-study sessions, this session begins with a summary of energy planning basics and needs, before moving on to utility-specific energy master plans: • South Platte (CO) Renew's masterplan framework plots their course to address energy decisions and management through a consultant-assisted roadmap and continuous-improvement process. • Then, New York City DEP summarizes plans to meet their energy needs in a City (that never sleeps) transitioning. Interactive Session Question Fielding	10/2/2023	1:30 PM	3:00 PM	PDH	1.5	0.5		1.0				
216	The Water Reuse Landscape Through the Eyes of Industry Leaders	In collaboration with the WaterReuse Association and the Water Research Foundation this session will bring together experts in the forefront of the water reuse and reclamation field. They will explore the main topics propelling the water reuse community, including evolving technologies and applications (membrane-based, carbon-based, or a combination of both) and address factors supporting the implementation of water reuse across the United States. This lively panel discussion will feature brief remarks from panelists to set the stage for an engaging discussion among all. Interactive Session Panel Discussion	10/2/2023	1:30 PM	3:00 PM	PDH	1.5	0.5	1.0					
217	Nutrient Management: Growing Water Quality	Water quality impacts from excess nutrients have resulted in listed impairments around the United States. Our facilitated discussion will present three complementary perspectives on effective approaches for controlling nutrient impacts at different scales. Interactive Session Facilitated Discussion	10/2/2023	1:30 PM	3:00 PM	PDH	1.5	0.5				1.0		
218	Full-scale Thermal Drying System Implementation	How to recognize various aspects of how thermal drying can be implemented as a bioenergy solution for biosolids management will be the primary learning point for this session's participants. The success of a constructed large-scale rotary thermal drying system will be presented. In addition, the novel integration of hydrogen as an alternative energy source for thermal drying is reported. Lastly, how pyrolysis can be applied after drying for PFAS compound destruction and production of biochar. Participants will be able to evaluate and determine how innovative aspects of thermal drying can be incorporated into full scale systems. Interactive Session Facilitated Discussion	10/2/2023	3:30 PM	5:00 PM	PDH	1.5			1.5				
219	Technology Driven Optimization of Collection Systems	Session participants will have the opportunity to learn from the perspectives of both public and private utilities about how real-time data solutions, predictive operations, and maintenance strategies create a more resilient collection system. Discussion breaks distributed throughout the session will encourage conversation and provide direct access to the speakers. Interactive Session Facilitated Discussion	10/2/2023	3:30 PM	5:00 PM	PDH	1.5				1.5			
220	Advancements and Optimization with Chlorine, Peracetic Acid, and Performic Acid Disinfection	Increasingly utilities are having to meet various and sometimes competing regulatory limits for disinfection while doing so in a financially responsible manner. This challenge has led utilities to look for opportunities to optimize their disinfection process or investigate new alternatives. This session presents approaches balancing bacteria and disinfection byproduct limits with chlorination, optimizing peracetic acid disinfection, and advances in performic acid based on pilot study results.	10/2/2023	3:30 PM	5:00 PM	PDH	1.5	0.5	1.0					
221	Wastewater Surveillance: How Does the Sewer Impact the Data?	Although the use of wastewater surveillance has grown rapidly over the past few years, many questions remain about the quality and variability of data from a 'dirty' matrix like wastewater. This session will explore the impacts on data quality of degradation of virus genes in sewers, as well as impacts of wastewater components such as industrial discharges and stormwater.	10/2/2023	3:30 PM	5:00 PM	PDH	1.5				1.5			
222	Managing the Third Effluent Part I	The key to identifying odor sources and technologies is to monitor emissions and apply modeling tools to mitigate them. This session explores plant wide monitoring and modeling as well as the Biotrickling Filter odor control technology as a means to mitigate odors. Interactive Session Conversation & Input	10/2/2023	3:30 PM	5:00 PM	PDH	1.5		1.5					
223	Extracting Carbon for Nutrient Removal	Influent wastewater often has sufficient carbon to drive biological nutrient removal of nitrogen and phosphorous. However, the carbon is not always in the required biodegradable, soluble form and at times (specifically for nitrogen removal) external carbon must be supplemented. Adding external carbon for nutrient removal burdens the rate payers and is considered as source of greenhouse gas emissions. This session explores the extraction of carbon from the primary sludge, RAS and digested sludge via hydrolysis and fermentation. Interactive Session Panel Discussion	10/2/2023	3:30 PM	5:00 PM	PDH	1.5		1.5					
224	Decarbonization Case Studies	Hear from local, national and global perspectives on utility experiences in decarbonization. Topics to be covered include classification and quantification of carbon footprint, development of climate action plans and decarbonization roadmaps. This session will incorporate breakout discussion on topics raised in each case study where participants will share lessons learned. Interactive Session Case Study Analysis	10/2/2023	3:30 PM	5:00 PM	PDH	1.5	0.5	0.5		0.5			
225	Water Reuse and Resource Recovery: Brines, Trains, and (EV) Automobiles	While there are no Planes in this session, the focus will be on novel strategies and technologies to help industries treat difficult wastewaters, reuse treated effluents, and recover valuable resources. The session will explore the challenges and opportunities to create a more circular water economy at an EV battery production plant, a locomotive engine manufacturing facility; and looking at advanced lithium recovery.	10/2/2023	3:30 PM	5:00 PM	PDH	1.5			1.5				
226	Alternative Approaches to Intensify Secondary Treatment	Densification is a hot topic in activated sludge design and operation due to its potential to increase sludge settleability and thus decrease the required footprint for achieving treatment objectives. However, densification is just one way to intensify secondary treatment. Several other alternative technologies exist which can achieve similar or more reductions in footprint, including Integrated Fixed-film Activated Sludge (IFAS), Membrane Aerated Biofilm Reactors (MABR), and Membrane Bio Reactor (MBR). During this interactive session, expert practitioners will present recent case studies and updated analysis of these three alternative technologies which will allow audience members to understand the relative advantages and disadvantages of each alternative and where they may be most applicable. Interactive Session Facilitated Discussion	10/2/2023	3:30 PM	5:00 PM	PDH	1.5		1.5					
227	Thinking Outside the Basin: Auxiliary Wet Weather Treatment	Treating wet weather flows doesn't require a costly secondary expansion, construction of storage or equalization. Through three case studies, participants will learn about strategies to address wet weather flow at the wastewater reclamation facility using peak flow management and auxiliary treatment while meeting regulatory effluent limits. Presenters will describe the strategies used to gain regulatory consensus on the framework or new technology applications.	10/2/2023	3:30 PM	5:00 PM	PDH	1.5		0.5			1.0		
228	Improving Biosolids Treatment Efficiency	Maximizing volatile solids destruction and improving biogas production is of critical importance for many utilities for sustainable operations. To accomplish this objective, it is important to understand how bioaugmentation and other technologies such as hydrothermal liquefaction would improve the digestion process. In this session, the attendees will learn about different biosolids treatment technologies for improved volatile solids destruction and biogas generation. Interactive Session Facilitated Discussion	10/2/2023	3:30 PM	5:00 PM	PDH	1.5			1.5				
229	Understanding the Basics of Stormwater Design	As a fundamental session suitable for young professionals and those whose responsibilities may not focus on stormwater, this session provides an overview of the most significant stormwater design considerations. Three primary topics are included: Rainfall (including selection of design conditions and climate change), Overview of green stormwater infrastructure practices (bioretention, pervious pavements, green roofs, and other treatment technologies), and will conclude with design of conveyance systems and modeling. Interactive Session Conversation and Input	10/2/2023	3:30 PM	5:00 PM	PDH	1.5					1.5		

230	Creative Stormwater Program Management Resources: Finance, O&M, and Asset Management	Understanding the stormwater needs of a community, funding opportunities, and implementation aspects present a constant challenge to community planners, engineers, and public officials as we strive to address water quality and quantity needs. This session will educate individuals on the various resources available to support stormwater program planning.	10/2/2023	3:30 PM	5:00 PM	PDH	1.5										1.5
231	Optimizing Energy Investments Part II: Energy Use is in the Details	Following the preceding session's summary of Energy Master Planning, this session will include three example Energy-Use case studies. Each case demonstrates new tricks that designers, operators, and management have used to squeeze the most out of limited energy resources. Each case also emphasizes how, whether optimizing energy use or just saving dollars, success lies in site-specific, geographical, and contextual details. Two of the cases involve onsite power generation (CHP): one from the perspective of design engineers; with the second showcasing tools that allow operators access to information allowing energy-savings decisions on the fly. The third and final case study involves more CHP but also adds sludge drying, landfill gas, and capacity needs to the mix; describing how decisions enable success (and avoid limitations and hard choices). Interactive Session Case Study Analysis	10/2/2023	3:30 PM	5:00 PM	PDH	1.5		0.5		1.0						
232	Equitable Service Delivery Approaches and Community Bridging	The need to prioritize equity in policy, infrastructure investments and community bridging has grown significantly. Utilities have responded to this need with innovative approaches to keep equity at the center of services through strategies to maintain affordable access to water and sewer service for low-income households and by using equity guiding tools as a framework for ensuring equitable outcomes in policy, zoning, and infrastructure investment decisions.	10/2/2023	3:30 PM	5:00 PM	PDH	1.5	0.5	1.0								
233	Ozonation: Water Reuse on a New Level	Helping utilities to practice water reuse, Integrating the biological and ozonation models was possible to achieve aeration savings, while using less ozone could be dosed at the final treatment step before discharge is the overall objective of this session. We will also discuss how to use CFD-Amozone kinetic model for optimal design the new advanced oxidation reactors.	10/2/2023	3:30 PM	5:00 PM	PDH	1.5	1.0	0.5								
234	I Plan, You Plan, We All Plan for Integrated Plans	Understanding the interconnectedness of wastewater, stormwater, surface water quality, and facility planning is essential to watershed management. Using integrated planning approaches, utilities can holistically address how resources are managed, data is collected and analyzed, and how programs can be improved to better serve and protect communities and the environment. In this interactive conversations and input session, learn, appreciate, and discuss the benefits of integrated planning by hearing case studies of utilities from across the United States that demonstrate best practices for successful watershed management. Hear from Hartford, Connecticut on their integrated plan which includes long term control planning and watershed management; from Milwaukee, Wisconsin on how they integrated facilities planning as part of their water quality improvement initiatives; and from New York City on a stream and wetland restoration project for combined sewer overflow control. Interactive Session Conversation and Input	10/2/2023	3:30 PM	5:00 PM	PDH	1.5										1.5
301	Translating Bench Scale to Full-Scale Operations: Is Food Waste Co-digestion Right for You?	Water Resource Recovery Facilities (WRRFs) are increasingly investigating and implementing co-digestion of food waste to maximize biogas production and generate revenue from tipping fees and biogas energy recovery, while reducing organics landfilling and its associated greenhouse gas emissions. This session will provide an introduction on food waste co-digestion covering both the positive and potential negative impacts, an academic perspective describing how co-digestion bench scale studies are conducted and the findings that can be identified, and a utility-centric case study on how bench scale study findings were used to increase the accuracy of the results of a feasibility study. Interactive Session: Facilitated Discussion	10/3/2023	8:30 AM	10:00 AM	PDH	1.5				1.5						
302	Innovative Project Delivery Methods	Not a one-size fits all standard construction project. This session will feature various implementation techniques from new construction design/build, construction manager at risk, and emergency response to a large, failed gravity line.	10/3/2023	8:30 AM	10:00 AM	PDH	1.5										1.5
303	Pathogens and Indicator Update for 2023	We monitor indicator organisms to confirm microbiological safety of wastewater effluent and biosolids. Indicators are not pathogenic, but their presence mimics the behavior of pathogens in wastewater and biosolids. Traditionally the most common indicators are fecal coliform, E. coli and enterococci. However, the removal or inactivation and decay of these indicators does not always reflect that of viruses or spore-forming bacteria, which calls into question their efficacy as indicators. In this session, presenters provide evidence related to the inactivation of viruses by chlorination and the inactivation of endospores in wastewater and biosolids.	10/3/2023	8:30 AM	9:15 AM	PDH	0.75		0.75								
304	The BNR Instrumentation and Controls Selection Adventure	Is there an app for that? Currently, there is no centralized resource detailing the various biological nutrient removal (BNR) control systems, the commercially-available sensors and analyzers that inform the real-time responsive controls, their performance and capabilities, and the associated operation and maintenance (O&M) procedures and costs. WRF Project No. 5087, titled Implementation of Innovative Biological Nutrient Removal Processes through Improvement of Control Systems and Online Analytical Measurement Reliability and Accuracy, aims to fill the current gap in understanding of online, instrument-driven BNR control schemes and their reliability and performance with decision support tools for operators, engineers and utility directors. This session will highlight outcomes of the WRF project and provide the audience with an app they can use to evaluate the applicability of BNR control systems and associated sensors and analyzers at their water resource recovery facilities (WRRFs). Additionally, utility representatives will share their experiences with implementation and operation at their WRRFs. Interactive Session Case Study Analysis	10/3/2023	8:30 AM	10:00 AM	PDH	1.5		1.5								
305	Sidestream Nitrogen Removal: From Established to NextGen	In this session, attendees will be presented with a review of full-scale experience of sidestream treatment facilities ranging from conventional nitrification/denitrification to deammonification. Startup and operation of multiple manufacturers for each will be reviewed and compared against next generation technologies. Interactive Session Panel Discussion	10/3/2023	8:30 AM	10:00 AM	PDH	1.5		1.5								
306	Environmental Social Justice: Enduring Issues After the Spotlight	The perspective of the people directly affected by water issues due to systemic inequities is often lacking in environmental social justice conversations. This session brings members from disadvantaged communities impacted by historically relevant environmental disasters to share the story from their lived perspectives. Join us as we explore how communities respond to environmental crises, learn to advocate for themselves, and come to recognize that environmental justice requires continued efforts. Interactive Session Panel Discussion	10/3/2023	8:30 AM	10:00 AM	PDH	1.5										1.5
307	Operation and Troubleshooting of Flotation Technologies in Petroleum Refinery Wastewater Treatment	The goal of this session is the attendees will be able to identify and implement corrective measures to resolve shortcomings with the performance of Dissolved Gas Flotation (DGF) equipment in petroleum refinery applications. This session will delve into the most common issues associated with the operation of DGF equipment in petroleum refineries and how to rectify/address poor performance of this equipment. This includes: 1. Chemical conditioning of wastewater in the flotation process. 2. Troubleshooting the mechanical flotation process for both wastewater and air emission compliance. 3. The importance and application of gas-to-solids ratio in the flotation process. At the conclusion of the session, the attendees will apply the information obtained during the session to solve common operations and performance problems associated with DGF equipment in petroleum refineries. Interactive Session Problem Solving	10/3/2023	8:30 AM	10:00 AM	PDH	1.5				1.5						
308	The Big Bad Blower: Huffing and Puffing Air Through Your Aeration Basins	Many factors influence technology selection and sizing of aeration blowers. This session will illustrate a practical methodology for sizing aeration blowers including the use of dynamic process modeling as a tool to assist in sizing aeration blowers; how environmental conditions impact oxygen transfer and blower design, and a users' evaluation of installed blower technologies.	10/3/2023	8:30 AM	10:00 AM	PDH	1.5		1.5								
309	Low Carbon BNR Fundamentals and Controls	Low dissolved oxygen (DO) operation in biological nutrient removal (BNR) systems will be the focus of this session. Participants will learn about the benefits and challenges of operating BNR systems at low DO levels, including increased nutrient removal efficiency, reduced energy consumption, and decreased sludge production. The session will cover strategies for optimizing BNR performance under low DO conditions. Attendees will also learn about monitoring and control strategies for maintaining stable BNR performance under low DO conditions. The session will be led by experienced wastewater treatment professionals and will include case studies and interactive discussions.	10/3/2023	8:30 AM	10:00 AM	PDH	1.5		1.5								

406	Indigenous Environmental Practices: Lessons from the Past	Indigenous communities from around the globe developed traditions that were suited to their specific environments. This session includes a panel of various indigenous speakers from different countries explaining their cultural values and traditional practices in relation to food, land management, and water, against the backdrop of modern practice. We will explore the drivers and logic behind the traditional practices, their barriers, and how they might inform contemporary solutions for a sustainable future. Interactive Session Panel Discussion	10/3/2023	1:30 PM	3:00 PM	PDH	1.5										1.5
407	Microelectronics Industry: Challenges and Solutions	Invited speakers and topics focused on the challenges faced by the microelectronics industry as it relates to water will be discussed during this interactive session. From the need for ultrapure water for the chip manufacturing process, to the treatment of difficult wastewaters including growing water scarcity in the western U.S. where many chip manufacturing facilities are located there are numerous opportunities for innovative treatment methods and sustainable water management best practices.	10/3/2023	1:30 PM	2:30 PM	PDH	1.0			1.5							
408	The Future of Datacenters: From Water Users to Water Stewards	Water use in datacenters focusing on alternative water sources for evaporative cooling and potential opportunities for reuse will be highlighted during this session. Presenters will discuss the challenges and benefits of using non-potable water sources for evaporative cooling and how a collaborative approach with publicly owned wastewater treatment works (POTWs) is essential. Small group discussions will follow each of the technical presentations. Interactive Session Facilitated Discussion	10/3/2023	1:30 PM	3:00 PM	PDH	1.5			1.5							
409	Advancing Low-energy Biological Nitrogen and Phosphorus Removal Through Low DO Operation	The potential for a low capital investment that achieves nutrient removal and reduces energy is readily applicable to many WRRFs. However, current manuals of practice and historical understanding of operations assume that low DO operation creates process performance challenges. For example, low DO operation has historically been linked to poor settling sludge and lower microbial rates (e.g., low nitrification rates), which results in the design of larger volumes for treatment and undermines intensification outcomes. This traditional understanding has persisted from systems with complete mix activated sludge, but the application of anaerobic selector zones and active carbon management affect biological kinetics and population selection, enabling low DO operation while maintaining good settleability and nutrient removal. It is only when these mechanisms are understood can they be fully exploited to intensify treatment. This session will cover the current state of the industry as well as recent findings from an ongoing Water Research Foundation study (WRF 5083) investigating the benefits and mechanisms of low DO operation. Interactive Session Knowledge Development Forum	10/3/2023	1:30 PM	3:00 PM	PDH	1.5		1.5								
410	Connecting Molecular Biology Sensors to EBPR Performance	The applications of molecular biological approaches and bio-electrochemical sensors to enhanced biological phosphorus removal (EBPR) processes will be the focus of this session. The presentations will include discussion on pilot studies at full-scale facilities and research into application of advanced tools for assessing the health/operation of EBPR systems. The target audience is research-focused consultants, utilities, academics, and designers.	10/3/2023	1:30 PM	3:00 PM	PDH	1.5		1.5								
411	Making Forever Chemicals Gone Forever	Recent advances in treatment of PFAS in raw and reclaimed wastewater will be covered during this interactive session. It highlights PFAS treatment by adsorption and electrochemical oxidation. It unveils the fate of PFAS through wastewater treatment and reuse systems. The session is appropriate for researchers and practitioners that deal with PFAS in water and wastewater. Interactive Session Facilitated Discussion	10/3/2023	1:30 PM	3:00 PM	PDH	1.5		1.5								
412	Stormwater Design Case Studies	With a wide range of topics, the innovative stormwater design case studies highlighted during this session will include benefits of stormwater in disadvantaged communities, how utilities can leverage stormwater treatment technologies for positive outcomes for residents and ratepayers, and stakeholder engagement that focuses on sustainable growth. This session will give participants an opportunity to analyze each case study to learn further from it. Interactive Session Case Study Analysis	10/3/2023	1:30 PM	3:00 PM	PDH	1.5									1.5	
413	Small Communities Utilize Decentralization Effectively	Interest in applications of decentralization and distributed system approaches to help manage wastewater infrastructure is growing internationally. Water reuse is a key driver in some cases. This session will address some of the research and design approaches to implementation of decentralized approaches to utility management. Facilitated discussion throughout the session gets you into the details so you can apply the approaches and ideas to your own situation. Interactive Session Facilitated Discussion	10/3/2023	1:30 PM	3:00 PM	PDH	1.5		1.5								
414	Stories of Digital Transformation: It's Not About the Journey but the Destination	What does digital transformation really mean? Join us in the session to hear from utilities as they share their own experiences and lessons learned on the range of technologies, tools, and practices all implemented to improve operational efficiency and decision-making. Topics range from deployment of remote sensing technologies to development of performance metrics and visualization tools to leveraging technology for predicting maintenance requirements.	10/3/2023	1:30 PM	3:00 PM	PDH	1.5										1.5
415	Recognize the DRIFT in Asset Management Implementation	Asset Management Practice has been maturing over the last decade. While some of the best practices and principles are consistent throughout these years, it is important to learn from the organizations implementing and advancing their asset management programs. In this session, you will recognize those lessons as well as implement tactical initiatives to address a few selected areas of asset management. Interactive Session Conversation and Input	10/3/2023	1:30 PM	2:30 PM	PDH	1.0										1.5
416	Reconsidering Biological Treatment for Water Purification: Reuse-nutrient Removal-nexus I	As the first of the two-session series 'Reuse-Nutrient Removal Nexus,' this session will highlight considerations for designing secondary to tertiary treatment processes with the goal of producing feed water for full advanced treatment to produce purified water. There have been limited efforts to integrate the design considerations for biological treatment processes with downstream water purification processes for water reuse even though the impacts of the upstream treatment on the advanced treatment have been recognized. This session will highlight how recent advances in biological nutrient removal processes are integrated into holistic approaches to produce purified water. Traditional Session Buzz Session	10/3/2023	1:30 PM	3:00 PM	PDH	1.5	0.5	1.0								
417	Long-term Control Planning and Consent Decree Orders	USEPA will open this session by providing an overview of the status of long term control planning, CSO plans and the future of both. The session will then have presentations about negotiating post-construction long term control plan compliance work plans to confirm that actual performance of constructed facilities meets anticipated performance identified in LTC Plans, and about successful elements of a 100% complete, 20-year CSO control program, including its private property program, infrastructure coordination efforts, and funding sources.	10/3/2023	1:30 PM	3:00 PM	PDH	1.5						1.5				
418	Creating Renewable Revenue Streams with RNG	Many utilities are evaluating upgrading biogas to RNG standards for pipeline injection and RIN sales, as an option to continuing to flare excess biogas. Many states and cities are enacting GHG emission reductions and wastewater utilities are often the single largest electrical users and therefore critical for achieving GHG emissions. Upgrading biogas to RNG can provide an additional source of utility revenue while simultaneously reducing overall carbon emissions. Unfortunately, the steps required for successful implementation of converting biogas-to-RNG can be complex. There are multiple contractual agreements required between the utility producing RNG and the gas company pipeline operators including interconnect agreements, operating agreements, and transportation agreements with the required quality of RNG fuels differing regionally. This session will provide a comprehensive review of the many intricacies involved in the upgrading of biogas to renewable natural gas standards for pipeline injection and ultimate distribution and sale of renewable identification number (RIN) credits. Interactive Session: Panel Discussion	10/3/2023	3:30 PM	5:00 PM	PDH	1.5					1.5					
419	Perspectives on Inflow and Infiltration Reduction Cost Effectiveness	There has been a national discussion about whether I/I elimination or reduction projects are cost effective. Utilities need better information on the costs and benefits of I/I reduction, including how to measure I/I reduction after construction projects are completed, how to document the effectiveness of I/I reduction measures, and what are the metrics for measuring I/I reduction cost-effectiveness. During this session, attendees will have the opportunity to partake in an open debate to help answer the many questions surrounding this topic. The session will address questions such as: How are utilities currently measuring I/I reduction? How are utilities currently measuring cost effectiveness of I/I reduction work? How are utilities determining system and basin-level points of cost-effective I/I reduction? What the practices of utilities conducting I/I reduction in the most cost-effective manner? Interactive Session Debate.	10/3/2023	3:30 PM	5:00 PM	PDH	1.5						1.5				

420	PFAS Impacted WRFs: Knowledge Update	In recent years our industry has rapidly gained awareness of the occurrence and challenges associated with per- and polyfluoroalkyl substances (PFAS) in water, wastewater, and wastewater impacted systems. This technical session offers participants an update on alternatives for management of PFAS to below analytical reporting limits in WEF effluents and biosolids, a review of methods used to screen management alternatives and the cost of implementing PFAS treatment solutions, and an update from EPA on the PFAS risk assessment process.	10/3/2023	3:30 PM	5:00 PM	PDH	1.5				1.5					
421	Novel Applications of QMRA For Sizing Wastewater UV Systems and Identifying Shellfish Harvesting Zones	Presentations will explore the benefits of Quantitative Microbial Risk Assessment (QMRA) to support public health in surface waters receiving treated wastewater. Case studies are presented from New Zealand, which was one of the pioneers of the use of QMRA to determine site-specific UV dose requirements based on microbial risk as opposed to a standard UV dose requirement. Case studies are also presented using QMRA to identify and manage public health risk in shellfish aquaculture and wild shellfish harvesting downstream of discharges from WRFs using chlorine or UV disinfection and various secondary treatment processes.	10/3/2023	3:30 PM	4:30 PM	PDH	1.0		1.0							
422	Case Studies of Machine Learning in Full-Scale Nutrient Management Part II	The second part of a two session series, this session will present the findings and results of the WRF Project 5121: Development of Innovative Predictive Control Strategies for Nutrient Removal. This second session is focused on presenting three of the full-scale pilot results of the hybrid controller highlighted in the first session known as ODIN (Operational Decision-making Intelligence for Nutrient control). Interactive Session Case Study Analysis	10/3/2023	3:30 PM	5:00 PM	PDH	1.5		1.5							
423	From Global Best Science to Mitigation of Nitrous Oxide	Global perspectives on the challenges WRRF face when predicting, monitoring, and mitigating N2O emissions will be presented during this session. Featuring perspectives from academia and case studies from the UK, Europe, and New Zealand, this session will include facilitated discussion by industry leaders Julian Sandino and Jose Porro. Interactive Session Facilitated Discussion.	10/3/2023	3:30 PM	5:00 PM	PDH	1.5		1.5							
424	The A to Z's of Refinery Wastewater Treatment	Wastewater treatment in the refining industry continues to be a challenge since on one hand refineries need to cost effectively manage old and undersized infrastructure that need to maintain effluent regulatory compliance while on the other hand supporting a company's water sustainability goals. Newer technologies and applications also continue to be constantly evaluated against a companies cost, production, and sustainability goals. Therefore, this session reviews examples that challenge conventional technology use at oil refinery's for performance reliability and effluent reuse as well as a case study looking at a complete WWTP design for a Biodiesel Plant that includes effluent reuse.	10/3/2023	3:30 PM	5:00 PM	PDH	1.5		1.5							
425	Membrane Filtration and Zero Liquid Discharge (ZLD) Wastewater Treatment System	Novel strategies, analysis and technologies to treat Industrial and oilfield wastewater utilizing membrane filtration and zero liquid discharge (ZLD) wastewater treatment system will be the focus of this session. The first presentation discusses the performance of proprietary process known as buoyancy-enhanced membrane filtration ('BEMF') for oilfield and industrial water reuse. The next presentation performs a feasibility study technoeconomic assessment for optimization upgrades to a zero liquid discharge wastewater treatment system at a combined cycle power utility in the western US including brine concentrator, crystallizer and emergency evaporation pond.	10/3/2023	3:30 PM	5:00 PM	PDH	1.5		1.5							
426	Design Tools and Technologies for Preliminary and Primary Treatment	Preliminary and primary treatment process design may not be as 'exciting' as advanced biological process design; however, without properly designed preliminary and primary treatment systems, downstream advanced processes are doomed to fail. The design of these processes has traditionally been 'cookbook', based on criteria and approaches long established. However, new and innovative approaches have been developed, and this session presents three technologies or design approaches that improve on traditional methods. Case studies of the technologies will be presented with lessons learned.	10/3/2023	3:30 PM	5:00 PM	PDH	1.5		1.5							
427	Full-scale Continuous Flow Densification Systems	During this session, participants will gain insights into achieving densification in continuous flow systems using commonly used process configurations, based on recent findings from an ongoing Water Research Foundation Study (WRF 5130) investigating the advancement of densification to implement and achieve more efficient BNR. Presentations will focus on the various studies conducted at full-scale facilities, which developed design criteria that resulted in optimized biological and physical selection. These design criteria will also be translated into operating conditions so that operations crews can successfully implement and maintain a densified activated sludge (DAS) system. From this session, attendees will develop a deep understanding of the industry's current state and key considerations when implementing a DAS system. Interactive Session Knowledge Development Forum.	10/3/2023	3:30 PM	5:00 PM	PDH	1.5		1.5							
428	Stormwater Capture and Release: Emerging Regulatory Paradigms	As the Clean Water Act evolves through litigation and rulemaking, this session will present important developments in stormwater capture and use, permitting in impaired watersheds, and implications of stormwater discharges to groundwater. Speakers will present on EPA's advancement of rules and policy for stormwater capture and use (SCU), as part of the National Water Reuse Action Plan (NWRAP); the application of Residual Designation Authority (RDA) in impaired watersheds to address Commercial, Industrial, and Institutional (CII) discharges; and the emerging implications for stormwater infiltration to groundwater in the wake of the US Supreme Court's 2020 decision in Hawai'i Defenders of Wildlife et al. vs. County of Maui. Participants will be engaged in considering how stormwater can be used as a resource in the context of these evolving approaches to its regulation.	10/3/2023	3:30 PM	5:00 PM	PDH	1.5							1.5		
429	Predicting Flooding Before It Happens	Some of the presentations featured during this session will cover the benefits and challenges of using smart technology to predict stormwater flooding. Experiences from the Hampton Roads region of Virginia and Kansas City, Missouri, the City of Madison, and results from the United States Geological Survey (USGS) Smart Utility demonstration project will give participants an opportunity to learn about and understand current flood detection technologies. Interactive Session Conversation and Input	10/3/2023	3:30 PM	5:00 PM	PDH	1.5							1.5		
430	Communications Plans and Actions: Septics, Source Control, and Stakeholders	Information on the development of communications plans used across a variety of diverse stakeholder groups will be presented during this session. Key topics include how to be adaptive in your communications when the project changes, engaging stakeholders on new issues like PFAS source control, and how to develop a communication plan with very diverse stakeholders and issues you may face.	10/3/2023	3:30 PM	5:00 PM	PDH	1.5									1.5
431	Small Community Applications of Decentralization and Associated Management Approaches	Small communities face increasingly challenging requirements associated with management and planning for sustainability, resilience, and reliability. Changes in environmental conditions will necessitate changes to traditional planning and management efforts associated with utility management in small communities. This session will provide examples of the application of small system technology to address emerging wastewater management opportunities in small systems. Interactive Session Facilitated Discussion.	10/3/2023	3:30 PM	5:00 PM	PDH	1.5									1.5
432	Refining Wastewater Effluent for Purification: Reuse-nutrient Removal-nexus II	In part two of our Reuse-nutrient Removal-nexus sessions, this session will specifically hone in on refining wastewater effluent for water reuse applications. Interactive Session Conversation and Input	10/3/2023	3:30 PM	5:00 PM	PDH	1.5		1.5							
433	Better Outcomes with CSO Administrative Orders and Consent Degrees	To round out the current discussion on the status of long-term control planning and CSO plans this session will have presentations focusing on re-evaluating, re-opening, and re-negotiating administrative orders and consent decrees to deliver more cost-effective solutions. Program Risk Management and lessons learned from dozens of implemented projects as part of a \$1.5B capital improvements program to reduce CSOs and SSOs will also be discussed during the session.	10/3/2023	3:30 PM	5:00 PM	PDH	1.5						1.5			

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SDC1	Student Design Competition Day -1	The WEF Student Design Competition promotes real-world design experience for students interested in pursuing education and careers in water and wastewater engineering and science. As a program of WEF's Students and Young Professionals Committee (SYPC), the competition tasks individuals or teams of students to prepare and present a design that helps solve a water quality issue.	10/1/2023	8:05 AM	4:45 PM	PDH	6.0		6.0						
SDC2	Student Design Competition Day -2	"	10/1/2023	8:05 AM	4:45 PM	PDH	6.0	6.0							