NYWEA 93rd Virtual Annual Meeting

Bringing Water to Life!

2-Week Time Frame
February 9-11 & February 16-18, 2021

Online registration available next week!
2021 Virtual Annual Meeting
Bringing Water to Life!

(February 9-11)

Opening Session

Tuesday, February 9, 2021

9:00 am Welcome, President William J. Nylic III
9:15 am Keynote Address, Dr. Andrew Sanderson, Chief Medical Officer, WEF (Invited)
9:30 am-10:30 am COVID Tracing via Water Resource Recovery Facilities, A Panel Discussion
Daniel Gerrity, Southern Nevada Water Authority
Dr. Dave Larson, Syracuse University
Dimitrios Katehis, New York City Department of Environmental Protection
Anna Mehrotra, CDM Smith
Darcy Sachs, Arcadis

Session 1
Collection Systems – Challenges and Alternatives

CONTACT HOURS
Pending

MODERATORS
Kathryn Serra, C.T. Male Associates; Tucker Cox, Town of Colonie

11:00 am Vacuum Sewers: A Viable Alternative
Philip Crincoli, Airvac/Aqseptence Group; Jake Scherer, Koester Associates
The intent of this presentation is to show how the use of vacuum sewers, especially as an alternative to gravity or low pressure may help the design engineer overcome obstacles by use of vacuum sewers that utilize small diameter pipelines installed in shallow, narrow trenches.

11:30 am New Sewers Support Economic Development Despite Geographic and Financial Challenges
Jack Troidl, Woodard & Curran
The Town of Easton, Massachusetts, faced wastewater disposal challenges that inhibited economic development and required expensive remedial solutions in several key areas. The most recent project, which includes three miles of force main and a new pump station, required creative design work to address unusual issues and proactive, collaborative work with community stakeholders. A combination of grant funding and sewer betterments along with careful design and construction resulted in a financially sustainable project.

12:00 pm-12:15 pm EXHIBITOR VIDEO PRESENTATION

12:15 pm Biggest Bang for the Buck: Quantifying and Prioritizing Sewer Rehabilitation and Replacement for I&I Removal
Bridget Harper, Tetra Tech
This presentation will quantify the amount of inflow and infiltration (I&I) by the types of defects identified during field investigations to predict total system I&I removed after the recommended rehabilitation plan. The basis of the presentation is a case study predicting the rate and volume of I&I removed after rehabilitation. By more accurately predicting the rate and volume of I&I removed, utilities can cost-effectively prioritize rehabilitation programs achieving the highest possible return on their investments.

12:45 pm Building Intelligence for the Collection System
Tyler Elkins, Xylem, Inc.
Twenty-first century wastewater system operations are being asked to overcome a myriad of challenges, with minimal resources and fewer people. To help them, solution providers are embedding intelligence into more and more of the traditional hardware. We will look at some reference cases that highlight how to eliminate clogging, reduce station cleaning cost, and save energy with modern technology. Intelligent equipment can empower your utility to solve modern problems, creating more attractive returns on technology investments.
## Tuesday, February 9, 2021

### Session 2

**Emerging Contaminants – All about PFAS**

**CONTACT HOURS**
Pending

**MODERATORS**
Kathy Ammari, NYSDEC; Nancy Struzenski, Alpha Analytical Inc.

**11:00 am**

**Repelling the Repellent, PFAS Considerations for Water and Wastewater Utilities**

Christopher Curran, AECOM

Pre- and polyfluoroalkyl substances (PFAS) concerns are on the rise in the water industry especially with the uncertainties of the extent of the contamination to our water resources and with both the state and federal regulations that are being considered and promulgated. This presentation will discuss approaches to managing PFAS in different mediums and explore the status of technologies for both separation and destruction of PFAS compounds along with discussing overall wastewater management strategies.

**11:30 am**

**Putting Out Your Treatment Fires – PFAS Treatment of Water and Wastewater**

J. Margaret Gray, Mott MacDonald

Per- and polyfluoroalkyl substances, also known as PFAS, are a group of man-made chemicals that have a variety of historic uses including non-stick cookware, stain-resistant protection, firefighting foam and other commercial/industrial purposes. Drinking water, wastewater and water re-use facilities are monitoring and, in some cases, treating for PFAS compounds. This presentation will provide an overview of the major issues associated with PFAS compounds and will describe two case studies where treatment has been provided.

**12:00 pm-12:15 pm**

**EXHIBITOR VIDEO PRESENTATION**

**12:15 pm**

**Designing and Implementing PFAS Projects**

Steve Tedesco, Tetra Tech

Communities all over the country are being required to add treatment facilities to their remove PFAS from their groundwater and surface water supplies. This presentation will provide design and implementation information on removing the two most regulated PFAS compounds (PFOS and PFOA). The presenter is currently completing design on six PFAS plants ranging in size from 4 mgd to 25 mgd in southern California.

**12:45 pm**

**A Dose of Chaos: A Snapshot of the Current Biosolids Market and How PFAS Could Disrupt It**

Tom Schwartz, Jay Sheehan, Woodard & Curran

The current biosolids market is a complex landscape, but in many ways it had stabilized and was relatively predictable over the past five years. Now enters PFAS, which is causing major disruptions in the market. This presentation will look at how PFAS has already changed biosolids disposal, discuss possible disposal alternatives, and speculate about what a post-PFAS biosolids market will look like.

### Session 3

**Asset Management – Strategies**

**CONTACT HOURS**
Pending

**MODERATORS**
John Petito, AECOM; Hannah Rockwell, Arcadis

**11:00 am**

**Making “Cents” of Your Data Through Asset Management**

Ryan Nagel, Hazen and Sawyer

Most successful asset management programs address five topic areas: 1) Gap Analysis & Strategy Development, 2) Business Planning, 3) Infrastructure Planning and Evaluation, 4) Financial Planning and Management, and 5) Business Intelligence and Performance Reporting. This presentation will provide an overview of each of these topic areas, illustrate example processes/tools that support the topic areas, and discuss some of the trends and approaches that utilities have adopted with respect to asset management.
Strategies for Maturing the Department of Environmental Protection, Bureau of Wastewater Treatment’s Asset Management  
Lily Lee, New York City Department of Environmental Protection  
As the largest public wastewater utility in North America, the Bureau of Wastewater Treatment in New York City’s Department of Environmental Protection is responsible for managing a complex array of assets at various and diverse facilities. To meet this unique challenge and derive the maximum value from its infrastructure, a Strategic Asset Management Plan is being developed and implemented, with an early focus on piloting an upgraded CMMS system at a wastewater resource recovery facility.

EXHIBITOR VIDEO PRESENTATION

Data Driven Sanitary Rehab Decisions  
Alex Montalvo, Tetra Tech Inc.  
This is a presentation of a data-driven analysis pattern to develop sanitary collection rehabilitation projects using modern GIS tools.

Falling Back In Love with Grey Infrastructure: A Community’s Proactive Approach to Managing Stormwater Infrastructure  
Zach Henderson, Woodard & Curran  
Does your municipality have a healthy relationship with its stormwater infrastructure? This presentation sets a road map for rekindling the flame. Taking into account MS4 requirements and data collection efforts that can bolster better operations and funding, the author will provide an overview of the state of stormwater in the U.S. and demonstrate a novel approach to stormwater infrastructure management using a case study from a mid-sized northeast city.

Tuesday, February 9, 2021  
CSO/SSO/Wet Weather Technologies  
Pending  
Rosaleen Nogle, Buffalo Sewer Authority; Steve Wood, NYSDEC

Consent Decree-Driven Asset Management Approach for I/I Reduction  
Eric Fontenot, Brown and Caldwell; Eileen White, Chris Dinsmore, East Bay Municipal Utility District  
Many utilities are faced with providing a required level of service within their collection systems that ensures their system has adequate capacity to convey and treat generated wastewater and prevent overflows. There are a wide variety of options available to utilities in how their targeted level of service is achieved and maintained, including increased capacity, storage and reduction of infiltration and inflow (I/I). Many utilities are challenged with how to apply asset management practices to achieve effective reductions in I/I within their system. This presentation will present the Consent Decree-driven asset management approach to I/I reduction undertaken by East Bay Municipal Utility District (EBMUD) and its satellite members and the lessons learned through five years of implementation of the program.

Evaluating Ceramic Technology as a Viable Alternative to Disinfection at the Alley Creek Combined Sewer Overflow Retention Facility  
Jayne Beckmann, William Casey, Theresa Tam, New York City Department of Environmental Protection; Krish Ramalingam, The City College of New York  
Alley Creek is a small waterbody in New York City, that is on the DEC 2016 Section 303(d) List of Impaired Waters for pathogens and dissolved oxygen attributed to CSOs and urban stormwater. While chlorination/dechlorination has been identified as a viable, cost-effective technology to achieve the targeted pathogen reduction, the New York City Department of Environmental Protection is exploring a suite of alternative technologies and approaches to bacterial management.

EXHIBITOR VIDEO PRESENTATION
Small Holes, but Big Wins: Onondaga County’s Save the Rain’s Approach to System Optimization for Reducing CSOs
Zachary Monge, Jacobs; Frank Mento, Adam Woodburn, Onondaga County Department of Water Environment Protection

This presentation will highlight the small-scale system optimization projects that have resulted in significant CSO reduction and minimal cost. Case studies of four system optimization projects will be discussed: CSO 005, where a circa 1890s sewer that previously crossed over the intercepting sewer before making a hydraulically unfavorable 180-degree turn was rerouted to directly connect to the intercepting sewer reducing CSO volume by 1 million gallons a year at a cost of $200,000. CSO 010, where a local sewer with an intermediate overflow and severe backflow conditions from Harbor Brook was hydraulically optimized reducing CSO volume by 600,000 gallons per year at a cost of $200,000. CSO 011, where a sewer was asked to make a 180-degree turn before entering into the intercepting sewer was rerouted to directly connect to the intercepting sewer reducing CSO volume by 800,000 gallons per year at no cost to the CSO program. This project was completed as part of an athletic field reconstruction project above the sewer. CSO 077, where a failing circa 1920s sewer regulator was upsized from 15” to 24” resulting in nearly 7 million gallons of CSO reduction annually at a cost of $100,000.

Passaic Valley Sewerage Commission No Feasible Alternatives (NFA) Study
Sarah Galst, Paul Saurer, Hazen and Sawyer; Melissa Sinisgalli, Thomas Laustsen, Passaic Valley Sewerage Commission

The Passaic Valley Sewerage Commission (PVSC) evaluated alternatives to expand its wet weather treatment capacity to 720 mgd while maintaining compliance with its effluent permit and avoiding costly and infeasible upgrades. Currently, PVSC’s secondary treatment train is limited to approximately 400 mgd based on historical plant observations, numerous studies involving site specific sampling, stress testing, and computational fluid dynamics (CFD) modeling of the secondary clarification process. The capacity limitation associated with the final settling tanks (FSTs) was addressed by examining several alternatives with the intention of increasing the plant’s overall treatment capacity.

Glycerol-Driven Enhanced Biological Phosphorus Removal Correlated with Tetrasphaera Enrichment
Mahsa Mehrdad, Sam Ledwell, Ryan Coleman, Environmental Operating Solutions

This presentation discusses the investigation of the enhanced biological phosphorus removal (EBPR) process using glycerol as a supplemental carbon source. The results show the effect of glycerol on EBPR is not only through providing more electron donors. This study hypothesizes that glycerol promotes growth of Tetrasphaera-PAOs capable of phosphorous release and direct glycerol assimilation in anaerobic condition with short hydraulic retention time of 10 to 15 minutes. The glycerol-acclimated Tetrasphaera-enriched biomass showed significant simultaneous nitrogen and phosphorous removal in anoxic condition.

An Effective Alternative for Struvite Mitigation without Ferric
Krish Ramalingam, Denny Halim, Alan Alleyne, John Fillo, The City College of New York; Mauro Orpianesi, Andrew Luong, New York City Department of Environmental Protection

Struvite mitigation is an ongoing challenge to water resource recovery facilities (WRRFs) and New York City facilities are not immune to it. Currently, the City uses ferric chloride to minimize struvite precipitation, which causes an increase in the sludge production, reduces downstream alkalinity and is a hazardous chemical. An effective alternative, namely a dispersant polymer that mitigates struvite formation, was found to be cheaper and preserved the alkalinity in the centrate. It was tested initially at bench-scale and subsequently implemented at full-scale.
Implementation of Carbon Efficient Step Feed Aerobic Granulation System at New York City Department of Environmental Protection
Antonio Ho, Dimitrios Katehis, New York City Department of Environmental Protection; Sudhir Murthy, NEWhub Corp.
Continuous flow aerobic granular sludge (AGS) systems improve sludge settling properties and allow for an increase in inventory within aeration tanks thus allowing for intensified treatment. Step-feed systems also allow for intensification as has been amply demonstrated at New York City Department of Environmental Protection by managing inventories and the loading rate to clarifiers. The combined use of step-feed and aerobic granulation can complement the best of both approaches and create carbon efficient continuous flow aerobic granular sludge systems for nutrient removal.

The Fate, Transportation and Transformation of PFAS and Implications for WWTPs: A Case where 1 + 1 Does Not Equal 2
Daniel Warren, Michael Eberle, Michael Edelman, Elizabeth Denly, TRC Companies, Inc.
An evaluation is presented of the transformation of perfluorinated telomers across multiple WWTP systems. This is believed to be first time the complete transformation of 6:2 FTS to PFHpA has been observed and reported under ambient surface water-like conditions within six months. The presentation will conclude with consideration of potential options to decrease undesirable PFAS discharge rates from WWTPs.

A Robust Framework for Stormwater Program Cost Analysis to Guide the Stormwater Utility Exploration: Case Study of Colonie, NY
Mostafa Razzaghmanesh, Sri Rangarajan, Felix Yang, Boomi Environmental LLC; Jaurice Schwartz, Weston & Sampson
Boomi Environmental and Weston & Sampson collaborated to develop a robust methodology for capital program costs to meet the MS4 permit requirements and O&M needs to support the development of the Town of Colonie’s five-year stormwater budget projection. Required information was collected through a national literature review and calibrated against the Town’s real data. A five-year budget was developed for various scenarios. Developing stormwater funding resources through life cycle cost analysis is recommended.

Three Customers and A Consent Order – The City of Oneida’s Investment in a Bright Future
Dennis Clough, ESG; Eric Schuler, City of Oneida, NY
Today the City has “three customers” and a Consent Order with which to comply. In response, the City has undertaken a $50 million project to create an Organics and Water Resource Recovery Center (OWRRC). This presentation will focus on 1) Motivations, goals and scope of the project; 2) Why the City’s using a collaborative project delivery approach; 3) How expansion from 3.75 mgd to 4.5 mgd supports economic development; 4) Strategy for improved revenue diversity; and 5) Using the OWRRC as a tool for education with SUNY Morrisville’s Environmental Training Center.

Hampton Roads Sanitation District’s (HRSD’s) Integrated Planning Framework
Richard Stahr, Brown and Caldwell
HRSD is using EPA’s Integrated Planning framework which is a sensible approach for communities to prioritize their Clean Water Act obligations. Integrated Planning is highly effective for communities facing multiple Clean Water Act obligations. By prioritizing the highest impact, highest benefit activities first, both the environment and rate payers benefit. The presentation will focus on HRSD’s process to achieve this framework.
Digital Utility of the Future
Ertan Akbas, Arcadis
Water utilities are facing a variety of challenges to their business model that includes increasing costs to repair and replace aging infrastructure, limited financial resources, flattening demand and limited government support. Even with these challenges, many water utilities are seeking to be leaders in innovation, service and value. The water utility of the future requires a clear business strategy that is enhanced by digital transformation to meet its vision and address its challenges.

Wednesday, February 10, 2021
Mobile Session 1

CONTACT HOURS
Pending

MODERATORS
TBD

11:00 am-1:15 pm
Mobile Session 1

Session 7

Thursday, February 11, 2021
Manufacturers Forum

CONTACT HOURS
Pending

MODERATORS
Peter Pastore, G.A. Fleet Associates; Stephen Rozewski, Metro NY Environmental

11:00 am
Application of Real Time Decision Support Systems (RT-DSS) in Conveyance Systems
Richard Loeffler, Xylem, Inc.
Utilities are leveraging Real Time Decision Support Systems (RT-DSS) to actively balance flows in both wet and dry weather to enable a number of benefits to capital and operational budgets. This presentation will demonstrate how this innovative approach can be implemented as a cost-effective strategy to manage a number of utility needs including reducing overflows, maximizing the use of existing systems and assets, providing operational feedback, and balancing dry weather flows.

11:30 am
Maximizing the Return on Investment (ROI) of a Smart Sewer Program
Kristina Macro, Maria Comuniello, Xylem, Inc.; Oluwole (OJ) McFoy, Taylor Brown, Buffalo Sewer Authority
Buffalo Sewer Authority’s (BSA’s) Smart Sewer program currently combines real time data and advanced real time control (RTC) methods to maximize utilization of existing system storage at six sites throughout the combined sewer network. This presentation will focus on how BSA maximizes return on investment at every stage of RTC implementation. This framework is saving BSA money on capital projects and improving water quality by reducing combined sewer overflows.

12:00 pm-12:15 pm
EXHIBITOR VIDEO PRESENTATION

12:15 pm
Hoboken, NJ Alleviates Stormwater Flooding with Smart Pumping Solutions
Asad Choudry, Xylem, Inc./Flygt
Asset management, compact high-flow, low-head pump solutions with energy efficiency are combined with smart water technologies to alleviate flooding in the southwest portion of Hoboken.

12:45 pm
NEW ASTM Standards for Metal Access Hatches
Rick Terrill, USF Fabrication
This presentation will address ASTM Standards c1802-14 and how they relate to the wastewater industry.
Thursday, February 11, 2021

**COVID-19 Tracking in Wastewater and Impact on Operations**

Pending

**MODERATORS**
Donna Hager, Macan Deve Engineers; Tim Clayton, Surpass Chemical

**11:00 am**

**8.1 Development of New York City’s COVID-19 Environmental Monitoring Program**
Francoise Chauvin, Peter Williamsen, New York City Department of Environmental Protection; Andrea Silverman, New York University

The New York City Department of Environmental Protection (DEP) was not immune to the impacts of the CoV-SARS-2 (COVID-19) pandemic. As part of its commitment to public health, the DEP has identified an opportunity to initiate SARS-CoV-2 tracking in the influent wastewater streams from our 14 wastewater resource recovery facilities.

**11:30 am**

**8.2 Tracking SARS-CoV-2 in Bergen County, NY**
Paul Storella, Beverly Stinson, AECOM; Dominic DiSalvo, Bergen County Utilities Authority; Kartik Chandran, Columbia University

The Bergen County Utility Authority and Columbia University have collaborated to track and quantify the COVID-19 viral concentrations and their diversity in the influent streams of two wastewater treatment plants and also to characterize their fate through the treatment operations.

**12:00 pm-12:15 pm**

**EXHIBITOR VIDEO PRESENTATION**

**12:15 pm**

**8.3 The “Lockdown”, Working from Home and COVID-19: The Sociological Impacts of the Coronavirus on Wastewater Operations**
Tia Trate, Nicholasa Sahd, David Gryger, Anthony Elberti, Gannett Fleming

Since the global pandemic began in early 2020, daily patterns have been interrupted. As the virus spread, schools and businesses closed, restaurants moved to take-out, construction activities halted, and many people began working from home. At Gannett Fleming, we began to think about how these changes in our daily behaviors were operationally impacting our clients at wastewater treatment plants. We had so many questions about impacts on influent flow patterns and loading characteristics, energy consumption, grease and septage quantities and beyond. In an effort to better understand these impacts, influent data from various municipal WWTPs was collected and reviewed for periods prior to the pandemic and during the pandemic. This data was correlated with county closure dates and phases of reopening. Results of our ongoing analysis will be discussed. Impacts from the coronavirus will be with us for years to come as many businesses incorporate work from home programs into their permanent operations, therefore, trends identified in this analysis are intended to help operators adapt to future conditions.

**12:45 pm**

**8.4 COVID-19 Impacts: How to Approach Evaluating Your Existing HVAC Systems**
Vincent Vitale, Arcadis

This presentation will discuss approach and considerations for evaluating COVID impacts in existing HVAC systems.

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**Thursday, February 11, 2021**

**Benefits of Thermal Hydrolysis and Recuperative Thickening Technologies**

Pending

**MODERATORS**
Jamie Johnson, JM Davidson Engineering, DPC; Rob DeGiorgio, STV, Inc.

**11:00 am**

**9.1 Effect of the Thermal Hydrolysis Pretreatment on the Biogas Production and Digester Efficiency at Low SRTs**
Shirin Estahbanati, Roland Jezeck, Krish Ramalingam, John Fillos, City College of New York, Department of Civil Engineering; Natalia Perez, Theresa Tam, Dimitri Katehis, New York City Department of Environmental Protection

The advantages of the Thermal Hydrolysis Pretreatment (THP) of anaerobic digestion in pilot scale were tested at low solid retention time (SRT) (15, 10, 7.5 and 4 days) at CCNY Environmental Engineering Laboratory. The results indicated that applying THP and decreasing the SRT contributed to increasing the biogas generation. The handling capacity of THP digester was tested, as at SRT 4 days after 12 days of operation, the THP digester failed to operate.
11:30 am
9.2
The Influence of Thermal Hydrolysis on the Carbon Footprint of Biosolids Management Options
Bill Barber, Cambi Inc.
This presentation highlights the impact of biosolids management on carbon footprint and looks at the positive influence of anaerobic digestion and thermal hydrolysis on reducing carbon footprint.

12:00 pm-12:15 pm
EXHIBITOR VIDEO PRESENTATION

12:15 pm
9.3
Recuperative Thickening: Not Your Father’s Anaerobic Digesters
George Bevington, Amy Hait, Richard Straut, Barton and Loguidice
Wastewater treatment plant design and operation has incorporated biomass thickening as a cornerstone for successful activated sludge facilities. Increasing anaerobic sludge concentration via recuperative thickening can provide more robust digestion and reduce digester tank sizes and capital expense. Three New York WWTPs implement recuperative thickening to improve digester performance and increase waste acceptance without investing in larger digester tanks.

12:45 pm
9.4
Regulations Drive Nutrient Recovery and Beneficial Use at Winnipeg’s Largest Treatment Facility: The Winnipeg North End Sewage Plant Design Build Upgrade Project
Terry Goss, Simon Baker, AECOM
The Government of Manitoba, Canada, is the first regulator in North America to introduce a nutrient recovery and reuse mandate. These new regulations are significant drivers for the current Winnipeg North End Sewage Treatment Plant (NEWPCC). A unique solids process stream was selected for the upgrade that will produce Class A biosolids using Cambi® thermal hydrolysis followed by mesophilic anaerobic digestion, phosphorus recovery as struvite through the Ostara Pearl® process with waste activated sludge stripping to remove internal phosphorus (WASSTRIP®), sidestream nitrogen removal, and primary sludge fermentation. The presentation will provide a technical summary of the project focusing on the practical aspects of regulatory driven innovations associated with the nutrient management and solids handling approach selected for the NEWPCC.

Thursday, February 11, 2021
Session 10
Water Reclamation Technologies

1:30 pm
10.1
Reducing the Cost and Footprint of Ballasted Activated Sludge
John Fraser, Carollo Engineers
Testing of solids separation of a magnetite (BioMag®) BAS using HeadCell® stacked tray grit technology at the Upper Gwynedd Township wastewater treatment plant in Pennsylvania. System found to be capable of separating ballasted mixed liquor to an effluent TSS of less than 50 mg/L between 1,000 and 1,400 gpd/sf and 100 to 130 ppd/sf. BioMag®/HeadCell® combination allow capital savings of $0.30 to $0.35 per gallon and up to 50% footprint reduction.

2:00 pm
10.2
Using Design Build to Complete Your Wastewater Projects
Steve Tedesco, Tetra Tech
This presentation will provide valuable information on using Design Build methods to complete wastewater projects. Topics that will be covered include advantages and disadvantages of the various types of Design Build methods, ways to maximize owner involvement, solving complex technical problems and lessons learned from past projects. The presenter has worked on over 25 water and wastewater Design Build projects ranging in size from less than $1 million to over $500 million.

2:30 pm-2:45 pm
EXHIBITOR VIDEO PRESENTATION

2:45 pm
10.3
True Batch Sequencing Batch Reactor System: A Flexible Treatment Solution
Manuel de los Santos, Aqua-Aerobic Systems, Inc.
This presentation will focus on the operation of a True Batch SBR system and how to apply the technology to meet current and future permits. It will highlight how flows and loading variation are handled, as well as how to achieve nutrient removal.
Incorporating Fine Screening Technologies in Site Constrained NYC WRRFs
Irina Dopson, Pam Elardo, New York City Department of Environmental Protection, Bureau of Wastewater Treatment
During the COVID-19 pandemic, the majority of New York City WRRFs experienced an increase in screenings accumulations and negative impacts to treatment processes. The New York City Department of Environmental Protection had to increase their labor hours to respond to the new norm of this pandemic. This presentation will discuss the steps that DEP is taking towards optimizing the screens and minimizing impacts by effectively removing screenings at the headworks of the plant and the first retrofit project at Wards Island WRRF.

Thursday, February 11, 2021
Sustainability
Methodology to Estimate Sewer CH4 That Represents Approximately 45% of the Average Wastewater Utility’s Scope-1 GHGs
John Willis, Brown and Caldwell
Willis, Chandran and Le (2020) determined that sewer-methane represents 45% of the U.S.’s centralized wastewater industry’s Scope-1 GHG emissions. Details of a peer-reviewed method to estimate of sewer methane from other collection systems will be provided.

How to Successfully Utilize the Envision Rating System as a Sustainability Framework: San Francisco Public Utilities Commission Southeast Plant Headworks
Sarah Deslauriers, Kathleen Mannion, Carollo Engineers
The 250-mgd Southeast Treatment Plant New Headworks Facility Project is a critical infrastructure project for the City of San Francisco and the San Francisco Public Utilities Commission (SFPUC). SFPUC leadership favored a way to both evaluate and publicly recognize the Headworks Project’s focus on sustainability and did so by utilizing the Envision rating system. This presentation explains what Envision is, as well as the process to receiving the Envision Gold award for the SFPUC Headworks.

Getting out of the Incinerator Business: Constructing Egg Shaped Digesters at the Oneida County WPCP
John Story, GHD; Dale Lockwood, Oneida County
The Oneida County Water Pollution Control Plant is being upgraded to double its peak flow capacity. A significant portion of the upgrade includes new solids handling facilities. The solids handling project includes new egg-shaped anaerobic digesters, co-digestion of source separated organic food waste, and biogas treatment with combined heat and power recovery. Construction was completed in 2019 for a cost of $45 million. This presentation will highlight the planning, design and construction phases of this large capital project.
Tuesday, February 16, 2021

**Session 13**

**Stormwater/Green Infrastructure**

**CONTACT HOURS** Pending

**MODERATORS**
- Dahlia Thompson, Hazen and Sawyer; Christina Chiappetta, NYSDEC

**11:00 am**

**13.1.2** Onondaga County's Approach for Successfully Obtaining and Delivering Grant Funded Green Infrastructure Projects

Zachary Monge, Jacobs; EFC Employee (to be confirmed by EFC prior to event), NYS EFC; Adam Woodburn, Frank Mento, Onondaga County Department of Water Environment Protection

This is proposed to be a two-part one-hour presentation.

Part 1 will be presented by NYS EFC on the GIGP Program.

Part 2 will be presented by Jacobs/Onondaga County on the County's approach for successfully obtaining and delivering GIGP grants.

**12:00 pm-12:15 pm**

**EXHIBITOR VIDEO PRESENTATION**

**12:15 pm**

**13.3**

New York City's Performance-Based Approach to Green Infrastructure Planning, Regulations and Incentives

Melissa Enoch, New York City Department of Environmental Protection–Bureau of Environmental Planning and Analysis; Joel Kaatz, Jerry Kleyman, Tyler Carson, Arcadis

This presentation will discuss: 1) The strategic approach of using modeling analyses to inform the overall NYC Green Infrastructure Program, 2) How NYC DEP is using the results of these analyses to update stormwater regulations for all new and redevelopment in New York City, and 3) How NYC DEP is enhancing designs for its publicly-funded green infrastructure retrofits on public property and in the Right-Of-Way.

**12:45 pm**

**13.4**

Village of Dundee, NY Comprehensive Water Quality Improvement Projects

Nicole Cleary, Erin Ryan, Barton and Loguidice

The Village of Dundee, NY is within the Seneca Lake Watershed and has been identified as a nutrient pollutant source to the lake. The Village has undertaken multiple projects to comprehensively address nutrient loadings and improve water quality. These include improvements to their stormwater infrastructure, wastewater treatment plant, sanitary sewer system and sludge disposal. This presentation will provide an overview of these projects from planning through construction, and identify Dundee as a model for similar smaller-scale Finger Lakes communities.

Tuesday, February 16, 2021

**Session 14**

**Energy Conservation and Generation**

**CONTACT HOURS** Pending

**MODERATORS**
- Wendi Richards, Siewert Equipment; Scottie Donovan, Greeley & Hansen

**11:00 am**

**14.1**

The Characteristics of Good On-site Generation Project at Water Treatment Plants

Jim Koonz, RSP Systems

Water treatment facilities are constantly being asked to reduce operating costs. At the same time they have numerous dynamics to navigate including changing environmental regulations, aging infrastructure and rising cost of labor, energy and equipment. A time proven method to address costs and more stringent requirements is on-site generation (aka, cogeneration). This presentation will provide a road map of the process – from initial analysis to installation.

**11:30 am**

**14.2**

Little Ferry, NY, Water Pollution Control Facilities Prepares for Energy Neutrality

William Pfrang, Matthew Regan, Colleen Dougherty, AECOM; Dominic DiSalvo, Bergen County Utility Authority

Bergen County Utility Authority is undertaking a program to allow the Little Ferry Water Pollution Control Facilities to operate in “Island Mode” – disconnected from the public electrical grid. A core program element is recasting anaerobic digesters from providing sludge stabilization to include maximizing gas production providing a continuous stream of digester gas to generate renewable, green energy. This presentation describes their program to upgrade anaerobic digestion facilities to meet their expanded role.
12:00–12:15 pm  
**EXHIBITOR VIDEO PRESENTATION**

12:15 pm  
14.3  
**Enhanced Domestic Primary Wastewater Treatment Utilizing Pile Cloth Media Filtration for Operational Savings and the Impact on Downstream BNR Processes**
John Dyson, Aqua-Aerobic Systems, Inc.
This presentation will cover the use of advanced primary treatment and the impact on downstream processes, as well as the investigation on whether there is enough carbon for denitrification and Bio-P removal.

12:45 pm  
14.4  
**Two Birds, One Stone: Maximizing Economic Return and Reducing Air Emissions with Renewable Natural Gas (RNG)**
Andrew Deur, Eric Auerbach, Arcadis
After a flare modification at a 20 mgd wastewater treatment plant (WWTP) in Indiana required it to obtain a Title V air quality permit, the WWTP sought an economic way to eliminate combusting biogas on-site. Transitioning to generating RNG via a triple-pass membrane system provides an economically feasible avenue to eliminate all combustion of biogas on-site, and reduce site-wide emissions compared to alternative biogas utilization options.

**Tuesday, February 16, 2021**

**Session 15**  
**CSO/SSO/Wet Weather Integrated Planning/Ethics**

**CONTACT HOURS**
Pending

**MODERATORS**
Vatche Minassian, HDR; Colin O’Brien, Brown & Caldwell

**11:00 am**  
15.1  
**The City of Lowell, MA’s Integrated Plan Balances Environmental and Community Needs with Comprehensive Analysis/Modeling Combined with Adaptive Management**
Charles Wilson, Peter Young, Hazen and Sawyer
The City of Lowell, Massachusetts developed a 15-year adaptive Integrated Plan (IP) for its wastewater and drinking water infrastructure. The IP includes the city’s plan for its next phase of CSO control, along with projects that will protect public health and benefit the community by making necessary upgrades and improvements to the wastewater collection, pumping and treatment infrastructure, as well as the drinking water treatment and distribution system.

**11:30 am**  
15.2  
**Seattle, WA, Integrated Wet Weather Plan**
Michael Milne, Brown and Caldwell
BC Seattle prepared an Integrated plan to address Consent Decree requirements for CSO control. They compared a wide range of potential stormwater and CSO projects based on environmental, financial and social impacts and benefits, and selected a combination of green, gray and programmatic stormwater measures that would achieve much greater water quality benefits and pollutant load reductions per dollar than deferred CSO projects. The plan was approved by state and EPA and implementation is underway.

**12:00–12:15 pm**  
**EXHIBITOR VIDEO PRESENTATION**

**12:15 pm**  
15.3.4  
**Ethics**
(1 hour)

**Tuesday, February 16, 2021**

**Session 16**  
**Hydraulic Modeling and Design**

**CONTACT HOURS**
Pending

**MODERATOR**
David Stahl, APTIM

**1:30 pm**  
16.1  
**Modeling and Optimizing CSO Solutions for Northeast Ohio Doan Valley Regulator and Relief Sewer Program**
Chenchen Li, Jennie Celik, HDR; Alison Schreiber, Frederick Vincent, Northeast Ohio Regional Sewer District
Northeast Ohio Regional Sewer District’s Doan Valley Regulators and Relief Sewers project consisted of alternatives evaluation, design and construction of combined sewer system improvements to achieve CSO reduction goals at 10 outfalls. Collection-system modeling was used along with field survey and flow monitoring in this study to characterize CSO discharges for existing and projected conditions. Capital reduction of 68% of the original budget was achieved with the modeling approach for design alternative evaluation.
2:00 pm  
Connect Spatially Varying CFD Model Results with Aggregated Conventional Design Metrics  
Sean Zhang, Sarah Galst, Rachael Wark, Hazen and Sawyer  
There are simple and well-known design metrics such as baffling factor for short-circuiting, velocity gradient G for mixing, swirl angle for pump intake. These aggregated metrics, where one single value is used to measure the overall design performance, have been established from decades of successful practice. We will demonstrate CFD model results are comparable to traditional metrics. CFD brings additional powerful tools and other metrics to further improve our design.

2:30 pm-2:45 pm  
EXHIBITOR VIDEO PRESENTATION

2:45 pm  
Kingston, NY, Wastewater Treatment Plant Outfall: Mixing for the Win!  
David Railsback, Schnabel Engineering; Erin K. Moore, Tighe & Bond; John Schultheis, Allen Winchell, City of Kingston, NY  
Kingston’s new SPDES permit established challenging effluent limits. With limited footprint for expansion, this would be no easy upgrade, so the team first reviewed dilution characteristics of the existing outfall. We questioned the historic underlying assumptions of Kingston’s permit and demonstrated that a higher dilution credit was warranted. The result is a design that satisfies water quality criteria with significant cost savings for the city.

3:15 pm  
Going Beyond Results – Advantages of Comprehensive 1D/2D Modeling for Developing Cost-Effective Solutions and Public Engagement  
Joseph Kirby, Kevin Trainor, Woodard & Curran  
Woodard & Curran leveraged comprehensive 1D/2D modeling to conduct a flood risk analysis of Norwalk, Connecticut’s Dreamy Hollow neighborhood historically plagued by flooding. The assessment resulted in mitigation solutions and a plan for public outreach and engagement in the project work.

Tuesday, February 16, 2021

Session 17
Resource Recovery

CONTACT HOURS  
Pending

MODERATOR  
Randy Ott, GP Jager Inc.

1:30 pm  
Enhanced Resource Recovery and Fugitive Emissions Control  
Alex Jucas, L&J Technologies  
Now more than ever state, local and federal agencies are requiring all industries to control the amount of volatile organic chemicals (VOCs) and hazardous chemicals released into the environment from their operation. L&J Technologies has developed a solution called Expanda-Seal™ which helps reduce vapor emissions, evaporation loss and odors.

2:00 pm  
Developing Biosolids End Use at the Albany and Saratoga (NY) Regional Biosolids Facility  
Mariana Costa Tomazelli, Eric Auerbach, Arcadis  
In 2017 Albany and Saratoga County sewer districts started a joint solids management planning effort. The result was a plan for a Regional Biosolids Facility importing waste from other plants and taking advantage of scale at a single facility. This presentation is a review of the opportunities and challenges encountered as the design effort progresses, including the choice of thermal drying as the final management option and solutions for re-using large portions of existing infrastructure.

2:30 pm-2:45 pm  
EXHIBITOR VIDEO PRESENTATION

2:45 pm  
Advanced Resource Recovery at WRRFs: Stopping the Spread of COVID-19 and Transitioning to a Clean Hydrogen Economy  
Ed Weinberg, ESSRE Consulting, Inc.; Robert Mroz, HY-TEK Bio, LLC  
Rapid response for complete, thorough deactivation of novel coronavirus, SARS-2-CoV, via ozone gas fumigation at large facilities looking to reopen, leads to a full-scale ozone disinfection system for water or wastewater treatments. Uniquely resourcing pure O2 for ozone generation via the electrolysis of water using a Hydrogen Electrolyzer results in the resource recovery of H2 as stored energy for power or fuel to the benefit of the Municipal Authority.
How Should I Utilize My Excessive (bio)Gas?
George Bevington, Amy Hait, Barton and Loguidice; Rick Kenealy, Camden Group
This presentation focuses on options considered by the City of Rome, NY, to utilize biogas in the most cost-effective manner. As planned digester improvements were being made, a considerable increase in biogas generation was going to occur. What is the best use of biogas, heating, cleaning for pipeline injection or electrical generation?

Tuesday, February 16, 2021

University Forum
Pending
TBD

Wednesday, February 17, 2021

Mobile Session 2
Pending
TBD
Mobile Session 2

Thursday, February 18, 2021

WWTP Resiliency Planning and Design
Pending
Sara Igielski, Carollo Engineers; Kara Pho, Jacobs

Building Climate Change and Process Resiliency at the Warren, RI, WWTF
Jonathan Himlan, Paul Dombrowski, Woodard & Curran; Bob Rulli, Town of Warren, RI
The town of Warren, Rhode Island, needed to upgrade its wastewater treatment facility to increase capacity and elevate the level of treatment, while also addressing ongoing climate change. The solution for the small utility required effective collaboration between the town, Rhode Island Department of Environmental Management (RIDEM), Woodard & Curran, and SUEZ. The project resulted in a cost-effective upgrade that provided resiliency to climate change and a forgiving/flexible process that consistently achieves a high level of nutrient removal.

Closing the Door on the Flood
Angelo Bufaino, Bryan Oakes Jr., Mott MacDonald
The 85-mgd Edison Pump Station was constructed on the edge of the Raritan Bay in Woodbridgde, NJ, circa 1966 and was severely flooded during Hurricane Sandy. This case study shows how wet and dry flood proofing techniques were used in combination with other design principles to provide the owner with resilient and redundant capable of withstanding 0.2% annual (500-year) flooding conditions.

EXHIBITOR VIDEO PRESENTATION

Bay Park Sewage Treatment Plant Climate Resiliency and Fortification (Main Substation)
George Markou, Vincent Tomarch, Hazen and Sawyer;
Vincent Falkowski, Nassau County Department of Public Works
The Bay Park Sewage Treatment Plant treating a maximum 70 mgd of wastewater, was heavily damaged by Superstorm Sandy. To protect the facility from future storm surges, all critical systems will be elevated above the 500-year flood elevation. The Main Electrical Substation switchgear was relocated into a new elevated electrical building which also houses the service entrance switchgear and new emergency generators. The Main Substation is configured to provide maximum redundancy throughout the electrical system.
12:45 pm  
**JEA System Resilience Plan: Developing a Climate Adaptation in Plan for a Coastal Florida Water/Wastewater Utility**  
Laurens van der Tak, Jason Bird, Jacobs  
For the overall JEA Wastewater/Water System Resiliency Plan, and JEA Resiliency Program, Jacobs developed and is implementing a resiliency plan for JEA’s water and wastewater systems. This presentation will describe the tasks completed to complete this plan which will improve the reliability and resiliency of JEA’s water, wastewater, reclaimed water, and chilled water systems during extreme weather events.

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**Thursday, February 18, 2021**

### Hydraulic Modeling/Information Technology

**Session 20**

**CONTACT HOURS**  
Pending

**MODERATOR**  
Steve Martino, Savin Engineers

#### 11:00 am

**20.1**  
**Assessing and Visualizing Extreme Storm Event Inundation in Boston Using Spatial Rainfall, 2-Dimensional Dynamic Flood Modeling and Innovative Tools**  
Charles Wilson, Ben Agrawal, Hazen and Sawyer  
The Boston Water and Sewer Commission (BWSC) has taken a critical step in advancing their understanding of potential impacts of extreme storms on flooding across the City. BWSC has undertaken a project to develop a 2D model designed to predict the extent and duration of flood inundation within the City for a variety of wet weather events. Other tools, including Microsoft PowerBI and ArcGIS Storymaps, are being used to manage and display model results using interactive dashboards and mapping.

#### 11:30 am

**20.2**  
**Hydraulic Modeling of Village of Hempstead, NY, Sewage Collection System: Benefits of Modeling**  
Bertrand Byrne, Cameron Engineering; Frank Germinaro, Village of Hempstead, NY

A calibrated hydraulic model of the Village of Hempstead’s sewage collection system was built and calibrated to evaluate the existing and future system's hydraulic performance and to simulate the system's projected hydraulic performance. The modeling was performed to develop a list of sewer improvements required to remedy system deficiencies and to determine the optimal phasing of the improvements.

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**12:00 pm-12:15 pm**  
**EXHIBITOR VIDEO PRESENTATION**

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**12:15 pm**  
**20.3**  
**The Future of SCADA/ICS: Emerging Technologies and Their Impact on Your System**  
Bob George, Tetra Tech

Technology advances are enabling transformative changes in the way SCADA and Industrial Control systems are developed, deployed and managed. Supporting infrastructure must provide robust, secure and managed server and network infrastructure outside the traditional system perimeter. This presentation summarizes emerging trends and the impacts system owners can expect and how to plan for these changes.

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**12:45 pm**  
**20.4**  
**If Amazon Ran a Treatment Facility: The Future of Wastewater Treatment Automation**  
Susan Guswa, Woodard & Curran

The value of technology in treatment facility operations and management is undeniable. As utility digitalization becomes more advanced year after year, the importance of appropriately matching these technologies to operators’ needs, patterns and capacities is crucial. This presentation will explore ongoing advancements in industrial automation, how they may be applied to wastewater treatment processes, as well as the potential benefits, drawbacks and considerations they bring about.
Thursday, February 18, 2021

Residuals and Biosolids

SESSION 21

CONTACT HOURS: Pending

MODERATOR: Jeffrey LeBlanc, Denali Water Solutions

11:00 am

Screw Press for Biosolids Dewatering: From Pilot Testing to Operation
Steven Hearl, H2M architects & engineers

The Huntington Sewer District capital program included replacement of an existing belt press for biosolids dewatering that had reached the end of its useful life. As an alternate to a direct replacement, pilot testing was conducted on screw press equipment from three manufacturers. Pilot testing results, the method of project delivery, installation and operating experience will be reviewed.

11:30 am

Full-scale Implementation of Micro-aeration for Sulfide Removal in Biogas
Adrian Romero, Josef Cesca, Bart Kraakman, Bruce Johnson, Jacobs

The presentation covers a literature review of overall microaeration (MA) technology and focuses on the review of existing microaeration process and performance data at the case study. The project developed a process model that includes sulfur chemistry and capabilities to model microaeration and anaerobic digestion. The presentation concludes with recommendations to control microaeration in the digesters with the goal of decreasing hydrogen sulfide in the biogas without impacting process performance.

12:00 pm - 12:15 pm

EXHIBITOR VIDEO PRESENTATION

12:15 pm

Polymer 101: Chemistry, Handling/Storage, Activation/Mixing and Optimization
Yong Kim, UGSI Solutions, Inc.

Due to increasing polymer cost in wastewater treatment, optimizing polymer usage became more important than ever. Effect of dilution water on polymer solution quality is presented with focus on utilizing reclaimed water, while implementation of the concepts of two-stage mixing and sufficient residence time into polymer system design is illustrated with laboratory data. Two case studies at municipal treatment plants demonstrated that well-designed polymer systems can significantly improve the performance of dewatering process.

12:45 pm

Under Pressure: Implications of PFAS Regulations on Stressed Biosolids Markets
Natalie Sierra, Brown and Caldwell

Several factors have severely limited biosolids management options in the Northeast, triggering rapid cost increases and leaving utilities with few choices for how to manage their biosolids. The looming specter of PFAS regulations promises to make biosolids management and resource recovery even more challenging. This presentation will discuss current trends.

Thursday, February 18, 2021

Stormwater/Resiliency

SESSION 22

CONTACT HOURS: Pending

MODERATORS: Camie Jarrell, GHD; Danny Hwong, Greeley & Hansen

1:30 pm

Cloudburst Green Infrastructure for Resiliency in New York City
Liza Faber, Dahlia Thompson, Hazen and Sawyer; Paul Wojtal, Alan Cohn, Pinar Balci, New York City Department of Environmental Protection

The cloudburst green infrastructure is designed to improve resiliency and sustainability in a community with high reports of flooding after extreme weather events, while also creating a space for the local community to enjoy.

2:00 pm

Engineering and Planning the Stormwater System in Hunts Point, Tallman Island and Port Richmond, New York City
David Stahl, Dewberry; Rupal Mehta, New York City Department of Environmental Protection

New York City Department of Environmental Protection Office of the Agency Chief Engineer is developing a decision-making framework for future capital investments in their Municipal Separate Stormwater System (MS4) areas in Port Richmond, Hunts Point and Tallman Island. As part of that effort, Flow Metering was conducted, a Field Survey was completed, a Hydraulic Model was created, and an Condition Assessment on the Outfalls was accomplished. This presentation will cover all different aspects competed to complete the Stormwater Master Plan.
2:30 pm-2:45 pm  EXHIBITOR VIDEO PRESENTATION

2:45 pm  22.3 Application of Integrated 2D Model to Guide the Final Design of East Side Coastal Resiliency (ESCR) Project
Srinivasan Rangarajan, Caroline Evans, Felix Yang, Boomi Environmental LLC
Boomi Environmental is assisting the AKRF-KSE JV in the interior drainage modeling to support the ESCR final design. Numerous updates have been implemented both in terms of model construction and system operation rules since the feasibility study completed in 2015. This presentation will focus on the model updates and also the multiagency-driven approach to FEMA certification of the final project design.

3:15 pm  22.4 Passaic Valley Sewerage Commission Resiliency Program: Hardening One of the Nation’s Largest Treatment Plants
Joseph Frissora, HDR
Passaic Valley Sewerage Commission has embarked on a program to make their 330-mgd facility more resilient to future catastrophic events such as Superstorm Sandy. The program provides for the planning, design and construction for approximately $800 million in FEMA-funded improvements, including a flood wall, stormwater pumping and collection and a 34-megawatt power facility.

Thursday, February 18, 2021
Young Professionals

CONTACT HOURS
Pending

MODERATORS
TBD

1:30 pm  23.1 CECs 101: A Review of the Basics
John Ross, Brown and Caldwell
This introductory presentation provides a review of contaminants of emerging concern (CECs) identified in our waterways and their ongoing impact on our water quality profession. Attendees will gain foundational knowledge in the different classes of CECs, how they enter the environment, current methods of detection, and studies performed to understand their effect on human and ecosystem health.

2:00 pm  TBD

2:30 pm-2:45 pm  EXHIBITOR VIDEO PRESENTATION

2:45 pm  23.3 Village of Medina, NY, Wastewater Treatment Plant: Navigating & Financing Emergency Repairs
Ryan Laninga, Bradley D. Moery, Brian M. Sibiga, Wendel
The Village of Medina was forced to declare a public health emergency in the midst of developing an integrated capital and energy master plan following the failure of four of six RBCs – their main secondary system biological treatment process. This presentation will outline the steps and processes to secure grant funding and financing for the replacement of the RBCs, how the Village expeditiously replaced the units, and construction challenges to restore full treatment capacity.

3:15 pm  23.4 Start-up and Performance Overview of AquaNereda® Aerobic Granular Sludge Technology at Wolf Creek WWTP, Foley, AL
Paula Dorn, Aqua-Aerobic Systems
Aerobic granular sludge (AGS) technology is an advanced secondary wastewater treatment process that utilizes the attributes of the granular biomass to provide biological treatment. AGS performs biological nutrient removal and displays exemplary settleability resulting in the reduction of footprint requirements by up to 75% and energy use by up to 50%. This presentation will discuss the AGS process with a focus on the start-up of the Wolf Creek WWTP in Foley, AL.
### Session 24

**Thursday, February 18, 2021**

#### Regulatory

<table>
<thead>
<tr>
<th>Time</th>
<th>Panel</th>
<th>Title</th>
<th>Presenter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:30 pm</td>
<td>24.1</td>
<td><strong>Clean Water Act Action: Case Law, Regulation, Rules and Reshaping Water</strong></td>
<td>Sarah Lobe, Nixon Peabody</td>
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<td>2:00 pm</td>
<td>24.2</td>
<td><strong>Per- and Poly-Fluoroalkyl Substances (PFAS): A National Perspective</strong></td>
<td>George Naslas, Cailyn Locci, Weston &amp; Sampson, Albany, NY</td>
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<tr>
<td>2:45 pm</td>
<td>24.3</td>
<td><strong>Gowanus CSO Facilities Site Selection and Environmental Review</strong></td>
<td>Jennifer Franco, AKRF, Inc.</td>
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<tr>
<td>3:15 pm</td>
<td>24.4</td>
<td><strong>Building – and Using – Your Lead Inventory to Address Health Equity and Improve Public Health</strong></td>
<td>Quirien Muylwyk, Dave Blair, AECOM</td>
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#### Contact Hours

Pending

#### Moderator

Peter Frick, ADS Environmental Services