wefevents

RESIDUALS AND BIOSOLIDS TREATMENT TECHNOLOGY CONFERENCE

ONLINE CONFERENCE TECHNICAL PROGRAM

*Subject to change. Updated as of 4/1/2026

WORKSHOPS

W01 Thickening and Dewatering Optimization: Getting Water Out of Sludge Efficiently

Monday, May 11th 8:30AM - 5:00PM

The Thickening and Dewatering Optimization: Getting Water Out of Sludge workshop will focus on practical solutions to improve thickening and dewatering performance. The focus of the workshop will be municipal (primary and waste activated) sludge with discussions on achieving thicker solids, better solids capture, reducing polymer consumption, reducing O&M costs, and providing smaller or more efficient downstream solids handling processes. This workshop will be of primary interest to plant managers, superintendents, operators and maintenance staff from municipalities. Furthermore, this workshop topic is critical and timely to the industry since municipalities are getting more pressure to reduce their budgets or to 'do more for less' in addition to addressing the challenges of increasing polymer, and solids processing cost.

Learning Objectives

At the end of this workshop, learners will be able to:

1) Recognize the impacts and benefits of optimized thickening and dewatering processes on other plant processes.

2) List and be able to implement practical steps for mechanical optimization of thickening and dewatering equipment.

3) Compile, evaluate and prioritize practical operational changes implemented by other municipalities to reduce costs by reducing polymer consumption and operation and maintenance labor and producing thicker solids/higher cake solids and high solids capture.

Workshop Chair Ed Fritz, Jacobs

Workshop ViceChair Christine Hengel-Prom, Black & Veatch Water

8:30 AM	**Introduction and Interactive Survey** E.Fritz, Jacobs
8:45 AM	**Thickening and Dewatering 101** R.Gupta, Carollo Engineers
9:15 AM	**Thickening and Dewatering Equipment Basics - 'How Does It Work?'**

	D.Fronhofer, BDP Industries, Inc
9:40 AM	**Interactive Session: Thickening and Dewatering Challenges**
10:00 AM	**Networking Break**
10:30 AM	**Chemistry of Thickening and Dewatering: Coagulants** B.Offerman
10:50 AM	**Chemistry of Thickening and Dewatering: Polymer Flocculant**s P.Gallagher
11:10 AM	**Bench and Lab Testing Demonstrations** E.Fritz, Jacobs
11:20 AM	**Evaluation Criteria for Selecting Dewatering Technologies**
12:00 PM	**Lunch Break**
1:30 PM	**Rheology of Thickened Sludge** E.Leonard, HDR
1:50 PM	**Cake Pumping and Storage** Z.Ngwenya, Jacobs Solutions Inc.
2:10 PM	**Protecting Equipment and Processes: Sludge Screening** C.Primm
2:30 PM	**Interactive Session: Upstream and Downstream Considerations for Thickening and Dewatering**
3:00 PM	**Networking Break**
3:30 PM	**Innovations in Thickening and Dewatering** D.Dursun, Caliskaner Water Technologies
3:50 PM	**Suspended Air Flotation** J.Knollenberg, Heron Innovators, Inc.
4:00 PM	**Sludge Vision** R.Giguere, Cleanwater1, Inc.
4:10 PM	**Granulator** J.Hanson, GEA Group
4:20 PM	**Interactive Session: 'What is the Future of Thickening and Dewatering?'** R.Gupta, Carollo Engineers

W02 Thermal Drying: State of the Practice, Advancements, and Future Applications

Monday, May 11th 8:30AM - 5:00PM

Given rising disposal costs and regulations, many utilities are considering biosolids drying to create sustainable solutions. This workshop will unite operators, technologists, and engineers to explore drying technologies, considerations for dryer implementation, and future areas of collaboration. Focus will be given to how dryers can be successfully integrated into existing utility programs and WRRFs and future considerations for drying technology advancement, including compatibility with PFAS treatment.

Learning Objectives

At the end of this workshop, learners will be able to:

1. Share real-life experiences from utilities and system suppliers with experience commissioning and overseeing long-term operations of dryer facilities to better understand the full cost and benefits of ownership.

2. Collaboratively identify a comprehensive list of considerations related to integration of dryer facilities with upstream WRRF processes, and the impact of new facility subsystems to WRRF staff, such as dried product handling, dust collection, and emissions control.
3. Explore areas for further advancement including integration with post-drying thermal processes (i.e. combustion, pyrolysis, and gasification) and studying the fate of PFAS within drying systems.

Workshop Chair	John Ross, Brown and Caldwell
Workshop Vice Chair	Jody Barksdale, Carollo Engineers
	Chip Pless

8:30 AM	**Introduction and Workshop Objectives**
	J.Ross, Brown and Caldwell
8:35 AM	**First Interactive Session: Live Poll**
8:40 AM	**State of the Drying Indutry**
	J.Ross, Brown and Caldwell
8:50 AM	**Dryer Facility Overview: Subsystems and Design Coordination**
	S.Murnan
9:15 AM	**Dryer Facility Construction: Builder Panel Discussion**
	J.Barksdale, Carollo Engineers
9:40 AM	**Group Exercise: Identifying Implementation Lessons Learned**
10:00 AM	**Networking Break**
10:30 AM	**New Regional Dryer Facility: Crossroads, ME**
	C.Pless
10:55 AM	**Dryer Rehabilitation and Repair: JEA, FL**
	J.Barksdale, Carollo Engineers
11:20 AM	**Dryer Modernization: MCES/Encina**
	W.Hoener
11:30 AM	**Group Exercise: Dryer Lifecycle Milestones**
12:00 PM	**Lunch Break**
1:30 PM	**Biosolids Drying: GHG Overview**
	W.Brower, Brown and Caldwell
2:15 PM	**GHG Opportunities with Pellet Reuse**
	C.Pless; K.Pointner, Huber Technology Inc.; F.Morrissette, Synagro Technologies Inc
2:40 PM	**Group Exercise: Dryer Optimization Measures**
	C.Pless
3:00 PM	**Networking Break**
3:30 PM	**Dryer Facility Environmental Impacts and Permitting**
	P.Burrowes, CH2M
3:55 PM	**Emissions and Odor Control Technologies**
	A.Parmenter, HDR Engineering Inc.
4:30 PM	**Group Exercise: Environmental Control Measures**
	C.Pless
4:45 PM	**Workshop Closing**
	J.Ross, Brown and Caldwell

W03 Best Practices for Planning, Designing, and Operating Anerobic Digestion Systems

Monday, May 11th 8:30 AM - 12:00 PM

This workshop is centered on the planning, design, and operation of anaerobic digestion systems. Adaptive biosolids planning with a comparison of anaerobic digestion processes to provide key drivers and meet core objectives. Both conventional and high performing digestion processes will be discussed. Best practice digestion design will be covered including digester shape, mixing, heating, and methods to mitigate gas entrainment, foaming, and struvite deposition. Operation of digestion systems and their impact on gas production, dewatering performance, and biosolids quality will be presented and discussed.
Learning objectives is that this is the beginning of a recurring anaerobic digestion workshops for continuing learning. This workshop covers adaptive planning, best practices in anaerobic digestion, and operation of digestion systems and their impact on the balance of solids processing.

Learning Objectives

At the conclusion of this workshop, participants will be able to do the following:
1. Synthesis - Participants will develop and integrate operating digestion systems with designing digestion systems with planning biosolids programs with digestion systems as the core process.
2. Evaluation - Participants will assess operating conditions and be able to evaluate mitigation measures.
3. Analysis - Participants will analyze and differentiate between anaerobic digestion systems recognizing the key benefits of each digestion process.
4. Comprehension - Participants will recognize and compile strategies and best practices for the objective planning of biosolids systems with anaerobic digestion.
5. Application - Participants will apply best practices in planning, design, and operations of anaerobic digestion systems.

Workshop Chair Drury Whitlock, Stantec Inc.
Workshop Vice Chair David Parry, Jacobs

8:30AM	**Opening Remarks & Workshop Overview: Welcome and Introductions** D.Whitlock, Stantec Inc.
8:30 AM	**Adaptive PlanningEvWorkshopSpeaker** D.Parry, Jacobs; W.Barber, CAMBI, Inc; C.Peot, DC Water & Sewer Authority
9:30 AM	**Best Practice Design** M.Higgins, Bucknell University; A. Miot, Silicon Valley Clean Water; D.Whitlock, Stantec Inc.
10:00 AM	**Networking Break**
10:30 AM	**Best Practice Design, Part II** M.Higgins, Bucknell University; A. Miot, Silicon Valley Clean Water; D.Whitlock, Stantec Inc.
11:00 AM	**Digestion System Operations** A.Miot, Silicon Valley Clean Water; C.Muller, Brown and Caldwell; M.Higgins, Bucknell University
11:50 AM	**Closing Remarks and Discussion** D.Parry, Jacobs

W04 Get the N Out: Fundamentals of Activated Sludge Biological Nitrogen Removal and Operation Troubleshooting using Process Simulators

Monday, May 11th 8:30 AM – 5:00 PM

The workshop will provide an overview of the fundamental concepts associated with biological nitrogen removal as well as advanced topics commonly used at operating facilities. The presentation will cover each main concept followed up by process model simulations led by the instructors but performed by attendees to solidify the understanding of each topic. Several steady state simulations will be used to drive home concepts and demonstrate the benefits of various process control concepts.

Learning Objectives

At the end of this workshop, learners will be able to:

1. Identify the key operational aspects of activated sludge systems to accomplish BNR.
2. Learn how operational controls can be used together to make BNR systems work efficiently.
3. Use simulation to improve understanding of process optimization both with regard to effluent quality and operating costs.

Workshop Chair	Paul Dombrowski, Woodard & Curran
Workshop Facilitator	Zachary Jackson, North Texas Municipal Water District

8:30 AM	**Welcome and Introductions** P.Dombrowski, Woodard & Curran; Z.Jackson, North Texas Municipal Water District
8:40 AM	**Activated Sludge Fundamentals** P.Dombrowski, Woodard & Curran
9:30 AM	**Secondary Clarifier Operation** P.Dombrowski, Woodard & Curran
10:00 AM	**Networking Break**
10:30 AM	**Simulator Demonstration and Activated Sludge Exercises** P.Dombrowski, Woodard & Curran
10:30 AM	**Simulator Demonstration and Activated Sludge Exercises** Z.Jackson, North Texas Municipal Water District
11:00 AM	**Nitrification Fundamentals** P.Dombrowski, Woodard & Curran
12:00 PM	**Lunch Break**
1:30 PM	**Nitrification Simulator Demonstrations and Exercises** P.Dombrowski, Woodard & Curran; Z.Jackson, North Texas Municipal Water District
2:00 PM	**Denitrification Fundamentals** P.Dombrowski, Woodard & Curran
3:00 PM	**Networking Break**
3:30 PM	**Denitrification Demonstrations and Exercises** P.Dombrowski, Woodard & Curran; Z.Jackson, North Texas Municipal Water District
4:15PM	**Process Control Simulator Challenge** P.Dombrowski, Woodard & Curran; Z.Jackson, North Texas Municipal Water District
4:45 PM	**Discussions on Simulator Based Training** Z.Jackson, North Texas Municipal Water District; P.Dombrowski, Woodard & Curran
4:55 PM	**Conclusion**

W05 From Data to Decisions: Building and Launching Digital Transformation Programs in Utilities

Monday, May 11 8:30 AM – 5:00 PM

This workshop is designed to bring together practitioners, utility leaders, consultants, and researchers to explore practical frameworks for launching and advancing digital transformation programs in water utilities. The session focuses on how utilities can move beyond fragmented data environments toward integrated data ecosystems that support reliable metrics, operational insights, and more effective organizational decision-making.

Learning Objectives

At the end of this workshop, learners will be able to:

1. Describe a practical framework for initiating and sequencing digital transformation efforts that align with treatment and biosolids operational priorities.
2. Identify governance, stakeholder engagement, and data integration strategies that translate digital plans into implementable projects with measurable operational benefits.
3. Recognize common pitfalls and apply proven lessons learned from peer utilities to accelerate adoption and avoid disconnected pilot efforts.

Workshop Chair	Josh Goldman, Metro Water Recovery
Workshop Vice Chair	Jeffrey Hlad, Metro Water Recovery

8:30 AM	**Introduction and Workshop Overview**
	J.Goldman, Metro Water Recovery; J.Hlad, Metro Water Recovery
8:45 AM	**Foundational Systems Integration**
	K.Fletcher, Brown and Caldwell
9:05 AM	**Facilitated Discussion**
9:20 AM	**Governance & Strategic Planning**
	B.Stanford, Hazen and Sawyer
9:40 AM	**Demonstrating Return on Investment (ROI)**
	M.Zimmerman, SWAN Forum
10:00 AM	**Networking Break**
10:30 AM	**Facilitated Discussion**
10:45 AM	**Takeaway Capture 1**
	J.Goldman, Metro Water Recovery
11:00 AM	**Case Study: Large Utility Perspective**
	J.Sparks, HRSD
11:20 AM	**Case Study: Cross-Utility Implementation Lessons**
	P.Chandrasekeran, Arcadis U.S., Inc.
11:40 AM	**Case Study: Small Utility Perspective**
	A.Walkins
12:00 PM	**Lunch Break**
1:30 PM	**Facilitated Discussion**
1:45 PM	**Incremental Implementation Example**
	A.Menniti, Clean Water Services
2:05 PM	**Utility Implementation Reflection**

	M.Magruder, Milwaukee Metropolitan Sewerage District
2:25 PM	**The Future Utility**
	G.Karmous-Edwards, Karmous Edwards Consulting
2:45 PM	**Applied AI Platform Example**
	K.Lesnik, Maia Analytica
3:00 PM	**Networking Break**
3:30 PM	**Implementation Perspectives: Emerging Digital Tools**
	D.DeLaughter, Rocky Mountain WEA (CO, NM, WY)
3:30 PM	**Implementation Perspectives: Emerging Digital Tools**
	E.Masters, Trinity River Authority of Texas; B.Johnson, Jacobs; H.Stewart, Jacobs
4:00 PM	**Applied Innovation Lightning Talks**
4:20 PM	**Interactive Digital Transformation Road-mapping Exercise**
4:40 PM	**Takeaway Capture 2: Workshop Synthesis**
	J.Goldman, Metro Water Recovery; J.Hlad, Metro Water Recovery
4:50 PM	**Speaker Follow-up and Participant Networking**

W06 Lessons Learned from Ten Years of Sidestream Treatment

Monday, May 11th 8:30 AM – 5:00 PM

This workshop will cover lessons learned and opportunities for improving sidestream treatment at WRRFs. The morning portion of the workshop will focus on phosphorus management and recovery while the afternoon will focus on nitrogen and phosphorus co-management. Case studies of full-scale installations will be presentation. Topics that will be discussed include struvite formation mechanisms, fines recycling as well as impacts of pre-treatment and intensified digestion technologies on sidestreams management. Vendors will also be invited to provide an update of the latest and greatest offerings for managing sidestreams.

Workshop Chair	Jennifer Loconsole, Black & Veatch Corporation (HQ)
Workshop Chair	Louis Ortenzio,

8:30 AM	**Introduction**
	P.ODonnell, INVENT Environmental Technologies Inc
8:45 AM	**P Recovery**
	L.Downing, Black & Veatch
8:55 AM	**Struvite Recovery**
	R.Cusick, University of Illinois
9:05 AM	**Utility Case Studies**
	I.Avila, Black & Veatch; J.Prevatt, Pima County Regional; M.Seib, Madison Metropolitan Sewerage District
10:00 AM	**Networking Break**
10:30 AM	**Operational Scenario and Mitigation Approaches**
	L.Ortenzio; J.Loconsole, Black & Veatch Corporation (HQ)
11:30 AM	**From P to N**
	C.Bott, HRSD
12:00 PM	**Lunch Break**
1:30 PM	**N Treatment**
	L.Ortenzio

1:45 PM	**Lessons from Multiple Years of DMX**
	D.Freeman; C.Bott, HRSD
2:15 PM	**PAD and DMX Experience at TRA**
	E.Redmond, Black & Veatch
2:30 PM	**DMX on THP Reject, Part I**
	E.Bailey, City of Raleigh; S.Fuentes, Washington Sanitary Subruban Commission
3:00 PM	**Networking Break**
3:30 PM	**DMX on THP Reject, Part II**
	E.Bailey, City of Raleigh; S.Fuentes, Washington Sanitary Subruban Commission
4:00 PM	**Design Scenario and Vendor Approaches**
	L.Ortenzio; T.Dunaev; L.Li, Veolia Water; C. Johnson, World Water Works, Inc.
4:50 PM	**Closing Comments**

W07 Positioning for Reuse: Understanding Drivers, Strategies and Technologies for Enabling Potable and Non-potable Reuse

Monday, May 11 8:30 AM – 5:00 PM

In this Workshop, participants will learn the basics of reuse and what to consider when implementing reuse projects, including the technical aspects of non-potable and potable reuse as well as regulatory considerations. Case studies from Reuse Master planning projects in the mid-west will be shared, with an emphasis on providing recycled water for data center cooling and other industrial applications. Potable reuse project examples will also be presented from across the U.S., including both Indirect potable reuse (IPR) and direct potable reuse (DPR), including recent learnings from DPR piloting in CA.

Workshop Chair	Greta Zornes, CDM Smith Inc
Workshop Vice Chair	Gayathri Ram Mohan, Hazen and Sawyer

8:30 AM	**Introduction to the Topic and Team**
	G.R.Mohan, Hazen and Sawyer; G.Zornes, CDM Smith Inc
9:15 AM	**Topic 2: Regulatory Overview**
	J.Mattingly, WEF
9:40 AM	**Topic 3: Lessons Learned from Reuse Case Studies**
	G.R.Mohan, Hazen and Sawyer
10:00 AM	**Networking Break**
10:30 AM	**Topic 4: Reuse Program Overview**
	G.Janzen; G.Salazar-Benites, HRSD; J.Kaberline, Loudoun Water
11:30 AM	**Facilitated Discussion: Application Potential of Potable and Non-Potable Reuse**
12:00 PM	**Lunch Break**
1:30 PM	**Topic 5: The Latest on AWT Piloting**
	E.Wood, CDM Smith; G.Salazar-Benites, HRSD; K.Bell
3:00 PM	**Networking Break**
3:30 PM	**Topic 6: Operator Training and Full-scale Experience Panel Discussion**
	G.Salazar-Benites, HRSD; J.Kaberline, Loudoun Water; R.Angelotti
4:30 PM	**Facilitated Discussion: Future of CBAT in the One Water**
4:55 PM	**Workshop Wrap-up**

TECHNICAL SESSIONS

Advanced Thermal Processes Fundamentals and Practices

Tuesday, May 12th 10:30 AM – 12:00 PM

Advanced thermal processes fundamentals will be introduced including the differences among the processes. Energy and mass balance modeling will be presented, along with examples of actual process.
Interactive Session | Facilitated Discussion

Learning Objectives

At the end of this session, participants will be able to:
1) Understand the basic concepts of advance thermal processes such as gasification and pyrolysis.
2) Learn innovative thermal processes including hydrothermal oxidation, gasification, pyrolysis and incineration.
3) Learn about the application of modeling for conducting mass and energy balance of thermal processes.

Lead Facilitator Kwok-Wai Tsang, CDM Smith

10:30 AM	**Thermal Decomposition: Fundamentals of Gasification, Pyrolysis, and Incineration** Chris Holcomb, Jacobs CoAuthor(s): P.Burrowes, CH2M
10:45 AM	**Facilitated Discussion: Thermal Decomposition**
11:00 AM	**Hydrothermal Oxidation: Showcasing Innovation in Advanced Thermal Conversion and Resource Recovery** Stephen Riches, Atkinsrealis CoAuthor(s): B.Luqmani, Atkinsrealis; D.Gapes, Cetogenix; D.Inman, Anglian Water Services; B.Jefferson, Cranfield University
11:15 AM	**Facilitated Discussion: Hydrothermal Oxidation**
11:30 AM	**An Energy and Mass Balance Model for Assessment of Either Pyrolysis or Gasification for the Processing of Sewage Sludge, Results and Discussion** Philip Pedros, Mott Macdonald CoAuthor(s): T.Daugaard, Iowa State University
11:45 AM	**Facilitated Discussion: An Energy and Mass Balance Model**

Biogas Operations Optimization for Revenue and End Use

Tuesday, May 12th 10:30 AM – 12:00 PM

This session explores strategies to maximize revenue from resource recovery in anerobic digestion processes. Presentations will cover long-term operation and financial performance from a renewable natural gas facility, business case evaluation for co-digestion, and tailoring process control to meet specific end-use requirements. The session will also highlight lessons learned and practical strategies for sustainable and profitable biogas operations.
Interactive Session | Panel Discussion

Learning Objectives

At the end of this session, learners will be able to:
1) Identify process control approaches tailored to specific biogas end uses.
2) Evaluate business cases for co-digestion, RNG, and other resource recovery opportunities.

3) Assess regulatory, environmental, and safety considerations affecting project implementation and cost effectiveness.

10:30 AM **Tailoring Biogas Process Control for Its End Use**
John Maley, HDR Engineering Inc.

10:50 AM **Implementing CHP Systems at Smaller WRRFs: Making CHP Economically Viable Using Unconventional Design Thinking**
Benjamin Burroughs, Arcadis

11:10 AM **Operating in the Black: Five Years of Operation and Revenue Generation at the RNG Facility at Des Moines Iowa WRF**
Dustin Craig, CDM Smith
CoAuthor(s): L.Schaich, CDM Smith; T.Runde, Des Moines Metropolitan Wastewater Reclamation Authority

11:30 AM **Panel Discussion**

Keeping the Good Bugs and Losing the Fluff: Advances in Selective Wasting

Tuesday, May 12th 10:30 AM – 12:00 PM

This technical session presents pilot- and full-scale evaluations of hydrocyclone-based selective wasting applied to high-rate and nutrient removal activated sludge systems to improve settleability, increase hydraulic capacity, and enhance biological performance. The session begins with a controlled pilot-scale study demonstrating how selective wasting interacts with food-to-microorganism ratio and famine conditions to influence flocculation, sludge compression, and solids flux. Full-scale case studies from municipal WRRFs illustrate how hydrocyclones have been deployed to stabilize settling, increase peak wet-weather capacity, and improve nutrient performance without new tankage. Additional insights include mixed liquor feeding strategies, protozoan community profiling as a biological KPI, and operational lessons learned during retrofit and long-term operation. This session provides actionable guidance for process engineers, operators, and researchers seeking scalable solutions for secondary treatment intensification.

Learning Objectives

At the end of the session, learners will be able to:
1) Evaluate how selective wasting interacts with biological controls and performance metrics to influence sludge characteristics.
2) Interpret pilot and full-scale results to assess effectiveness of selective wasting.
3) Apply practical implementation best practices and lessons learned from full scale case studies.

10:30 AM **Lessons Learned from a Pilot-Scale High-Rate Contact Stabilization System with inDENSE Application: Coupling Biological and Physical Selection to Improve Performance and Capacity**
Yuang Li, Cornell University
CoAuthor(s): S.Ahmad, George Washington University; K.Nam Ngo, DC Water; A.Diop; M.Mendoza, University of the District of Columbia; G.Okechukwu, University of the District of Columbia; A.Massoudieh, Catholic University of America; H.Azam, University of the District of Columbia; R.Riffat, George Washington University; A.Gu; H.DeClippeleir, DC Water & Sewer Authority; E.Goldberg, Catholic University of America

11:00 AM **Optimizing Sludge Densification with Hydrocyclones: A Mixed Liquor Selection Approach**
Pranta Roy, Brown and Caldwell; Runze Sun, Virginia Tech
CoAuthor(s): R.Carlson, Prince William Water; D.Dair, World Water Works, Inc.; Z.Wang, Virginia Tech

11:30 AM **Navigating the Challenges of Aging Infrastructure While Improving Peak Flow Capacity with Process Densification**
Anjana Kadava, Johnson County Wastewater
CoAuthor(s): D.Nolkemper, Johnson County Wastewater; A.Doody, CDM Smith; D.Nolkemper, Johnson County Wastewater

Advocacy and Outreach in Biosolids Management: Real-World Case Studies

Tuesday, May 12th 1:30 – 3:00 PM

Concerns related to PFAS and nutrients are increasingly shaping legislation, regulation, and public discourse around biosolids management across the United States. At the state and regional level, these concerns have driven a wide range of policy proposals, some grounded in evolving science and risk frameworks, others influenced by public perception, precautionary approaches, or broader pollution control agendas. Understanding these policy drivers and how they vary regionally is critical for biosolids professionals navigating a rapidly changing regulatory landscape. Interactive Session | Panel Discussion

Learning Objectives

At the end of the session, learners will be able to:
1) Understand how regional associations are engaging in advocacy and outreach to inform policymakers and stakeholders on technical issues, and how communication strategies are counteracting scrutiny of biosolids programs.
2) Understand common themes, regional differences, and emerging trends, as well as anticipated future challenges as PFAS regulations and contaminant policies continue to develop.
3) Gain a broader national perspective on the policy environment influencing biosolids management and practical insight into how regional organizations are responding to current and emerging regulatory drivers.

1:30 PM **Advocacy and Outreach in Biosolids Management: Real-World Case Studies in Action**
Megan Ross, Kiewit; Steven Daniels, Trinity River Authority of Texas
CoAuthor(s): S.Daniels, Trinity River Authority of Texas; A.Cox, MWRDGC; J.Burke-Wells, NEBRA; M.Lono-Batura, California Association Of Sanitation Agencies; J.Dunbar, Lystek International Limited

2:15 PM **Panel Discussion**

Approaches for Quantifying and Mitigating Fugitive GHG Emissions

Tuesday, May 12th 1:30 – 3:00 PM

This session explores strategies for measuring fugitive greenhouse gas emissions from full-scale wastewater treatment plants. Presentations will cover multi-method monitoring approaches, plant-wide emission modeling, and insights from odor control unit monitoring. The session will highlight practical approaches for implementing fugitive GHG monitoring and mitigation to improve emission quantification and reporting accuracy.
Interactive Session | Panel Discussion

Learning Objectives

At the end of this session, learners will be able to:

1) Identify multiple methods for measuring fugitive methane and VOC emissions.
2) Evaluate strategies to reduce uncertainty in estimating greenhouse gas emissions.
3) Analyze how modeling can be used to estimate facility-wide emissions.

1:30 PM	**A Multi-Method Approach for Quantifying Fugitive GHG Emissions at Metro Vancouver's Lulu Island WWTP** Emma Shen, Jacobs CoAuthor(s): A.Lake, Jacobs Engineering Headquarters Office; T.Davis, Jacobs; R.Das, Associated Engineering (B.C.) Ltd.; J.Carmichael, Metro Vancouver; S.Mostafa Mehrdad; K.Du
1:45 PM	**A Plant-wide Model for Estimating Fugitive Methane Emissions from Full-scale Wastewater Treatment Plants** Amr Ismail, Toronto Metropolitan University CoAuthor(s): A.Abdelrahman, University of Western Ontario; A.Elsayed, Toronto Metropolitan University; M.Zaghloul, F.Laqa Kakar, Brown and Caldwell; J.Willis, Brown and Caldwell; A.da Silva, Brown and Caldwell; S.Daneshgarq; A.Alsayed, Western University; E.Elbeshbishy, Toronto Metropolitan University
2:00 PM	**Beyond Odour: What OCU Monitoring Reveals About Methane and VOC Emissions** Sofia Georgaki, Jacobs CoAuthor(s): S.Cherono, Jacobs; A.Lake, Jacobs Engineering Headquarters Office; N.Telcik, Arcadis
2:15 PM	**Adopting Multi-level Sensing Techniques for Accurate Quantification of Fugitive Methane Emissions in Full-scale Canadian Water Resource Recovery Facilities** Ahmed Elsayed, Toronto Metropolitan University CoAuthor(s): O.Abdelrahman; A.Ismail, Toronto Metropolitan University; F.Laqa Kakar, Brown and Caldwell; T.Le, Brown and Caldwell; S.Cavanaugh, Brown and Caldwell; A.da Silva, Brown and Caldwell; D.Santoro, USP Technologies; A.Alsayed, Western University; E.Elbeshbishy, Toronto Metropolitan University
2:30 PM	**Panel Discussion**

Biological and Chemical Strategies for Phosphorus Removal Optimization

Tuesday, May 12th 1:30 – 3:00 PM

This session explores integrated biological and chemical strategies for achieving reliable phosphorus removal in municipal and industrial wastewater. Presentations will examine how operational conditions such as carbon availability and anaerobic retention time influence enhanced biological phosphorus removal (EBPR) performance and sludge settleability. The session will also highlight advanced modeling approaches for optimizing phosphorus removal and will evaluate chemical coagulation strategies for non-reactive phosphate removal.

Interactive Session | Panel Discussion

Learning Objectives

At the end of the session, learners will be able to:

1) Evaluate how carbon availability and anaerobic hydraulic retention time influence sludge settleability and phosphorus removal performance at low DO.
2) Identify how Monte Carlo analysis can increase confidence that strict phosphorus limits can be met with EBPR even under uncertain and varying BOD availability.
3) Explain the differences in treatability among phosphorus species and determine the dominant non-reactive phosphorus removal mechanisms.

1:30 PM	**Evaluating the Effect of Carbon Availability and Anaerobic HRT on Sludge Settleability and Phosphorus Removal at Low DO** Megan Wittman, University of Kansas; Alexandra Doody, CDM Smith CoAuthor(s): B.Sturm, University of Kansas; T.Binty, University of Kansas; Y.Hiripitiyage, University of Kansas; J.Jimenez, Brown and Caldwell
1:50 PM	**Optimizing MBR with S2EBPR using Quantitative Probabilistic Modeling: Lessons for Utilities Needing to Meet Strict TP Limits** Theresa Kopper, CDM Smith CoAuthor(s): A.Doody, CDM Smith; E.Heronemus, CDM Smith
2:10 PM	**Non-Reactive Phosphate Removal from Industrial Wastewater using Alum Coagulation** Sayed Maaz Sadat, University of Kansas CoAuthor(s): Belinda Sturm, University of Kansas; E.Peltier
2:30 PM	**Panel Discussion**

Discussions on Thermophilic Digestion for High Quality Biosolids

Tuesday, May 12th 1:30 – 3:00PM

This session explores decades of progress in thermophilic digestion and the growing role of heat-driven technologies, including thermal hydrolysis, in producing high-quality biosolids. Presenters will share full-scale case studies, operational insights, and technical comparisons across thermophilic anaerobic digestion, thermophilic aerobic digestion, and THP-enhanced systems. The session will conclude with a facilitated discussion designed to engage participants in exploring implementation challenges, performance considerations, and future opportunities in thermophilic and THP processes.

Interactive Session | Facilitated Discussion

Learning Objectives

At the end of this session, learners will be able to:
1) Analyze thermophilic digestion advancements and their impacts on biosolids quality and system performance.
2) Compare thermophilic aerobic and anaerobic processes to assess operational benefits and challenges.
3) Evaluate differences between thermophilic digestion and thermal hydrolysis systems for achieving Class A biosolids.

1:30 PM	**The Same; But Completely Different: Thermophilic Aerobic Digestion Overhaul(s) in the Pacific Northwest** Matthew Williams, Thermal Process Systems CoAuthor(s): E.Grimstad, City of McMinnville Water Reclamation Facility
1:45 PM	**Facilitated Discussion**

2:00 PM **Hot Stuff: 30 Years of Thermophilic Digestion**
Emma Guertin, Brown and Caldwell; Roya Eatebarian, Brown and Caldwell
CoAuthor(s): R. Eatebarian, Brown and Caldwell; D.Hull, Brown and Caldwell

2:15 PM **Facilitated Discussion**

2:30 PM **Direct Technical Comparison Between Thermophilic Digestion and Thermal Hydrolysis with Digestion for Production of Class A Biosolids**
William Barber, CAMBI, Inc

2:45 PM **Facilitated Discussion**

Holistic Assessment of Impacts of Liquid-Stream Intensification Processes

Tuesday, May 12th 1:30 – 3:00 PM

This session will highlight studies that investigated the impacts on downstream systems, aeration, effluent quality, N2O emissions, and sludge characteristics from various liquid-stream intensification processes.

Learning Objectives

At the end of this session, learners will be able to:

1) Identify the different potential impacts that must be considered for different intensification processes.

2) Forecast potential issues that may impact their particular facilities if they incorporate an intensification process.

3) Identify additional research needs or studies that they may need to conduct as part of process evaluations.

1:30 PM **Balancing Nutrients, Energy, and Emissions: Two Years of Pilot Testing for Water Research Foundation Project 5271**
McKenna Farmer, Black & Veatch; Levi Straka, Metropolitan Water Reclamation District of Greater Chicago
CoAuthor(s): L.Straka, Metropolitan Water Reclamation District of Greater Chicago; C.Coffey, Black & Veatch; F.Cecconi, Black & Veatch Corporation (HQ); L.Downing, Black & Veatch

2:00 PM **A Practitioners Guide to Densified Activated Sludge: From Settling Benefits to Gaseous Emissions**
Anna Scopp, Hazen and Sawyer; Wendell Khunjar, Hazen and Sawyer
CoAuthor(s): W.Khunjar, Hazen and Sawyer; R.Maltos, Metro Water Recovery; B.Marron, Metro Water Recovery; M.Mabry, Hazen and Sawyer; B.Wallen, Hazen and Sawyer; D.Rosso, University Of California Irvine; B.Atieh, Hazen and Sawyer; R.Priest, Hazen and Sawyer; S.Rivera, Manhattan College - Department of Civil and Environmental Engineering; A.Griborio, Hazen and Sawyer; M.Alkire, Hazen and Sawyer; Y.Sun, Hazen and Sawyer

2:30 PM **Energy, Emissions, and Effluent Quality Trade-offs in Emerging BNR Intensification Technologies**
Narasimman Lakshminarasimman, University of Michigan
CoAuthor(s): Niclas Astrand, Stantec Inc.; S.Arabi, Stantec Inc.; P.Regmi, Stantec Inc.; T.Wadhawan, Dynamita North America Inc.

Soft Sensors and Digital Twins with Low-Cost Inputs

Tuesday, May 12th 1:30 – 3:00 PM

This session will highlight proofs-of-concept and a real-world implementation of treatment facility digital twins for process control using primarily inputs from laboratory and real-time data inputs that are regularly collected at municipal facilities. The application of machine learning tools for autocalibration of model parameters will also be presented.

Learning Objectives

At the end of the session, learners will be able to:
1) Understand a new data-driven approach to monitor settling model parameters and forecast clarifier performance using routinely measured data.
2) See how utilities can build digital twins for critical tools like SRT control & peak flow management on existing enterprise data platforms and dashboards, thereby cutting the need for custom code/softwares.
3) Understand how soft sensors can be developed without historical plant data using probabilistic, training on mechanistic synthetic data and adaptively correcting with Bayesian updating.

Moderator Alexandra Doody, CDM Smith

1:30 PM **Predicting Clarifier Performance Using Routine Process Data: R-Floc Autocalibration**
Chinmay Gaidhani, Georgia Tech
CoAuthor(s): I.Avila, Black & Veatch; P.Dunlap, Black & Veatch; P.Ali, Rice University; K.Leung, Black & Veatch; L.Downing, Black & Veatch

2:00 PM **Evaluation of Sludge Characteristics from Advanced Primary Treatment Technologies**
Onder Caliskaner, Caliskaner Water Technologies
CoAuthor(s): Y.Wu, Caliskaner Water Technologies; D.Dursun, Caliskaner Water Technologies; G.Tchobanoglous; B.Davis, Linda County Water District

2:30 PM **Soft Sensors for Data-Scarce Utilities: A Probabilistic Machine Learning Based Emulator**
Mostafa Khalil, Stantec Consulting
CoAuthor(s): G.Gilles, Stantec Consulting Puerto Rico, LLC; B.Kim, Stantec Consulting Inc; K.Gordon, Stantec; S.Satyhatmoorthy, Stantec

Thermal Treatment of PFAS in Biosolids

Tuesday, May 12th 1:30 – 3:00 PM

This session will provide data on how various thermal treatments impact the fate of PFAS in biosolids. The impact of thermal hydrolysis on PFAS fate will first be addressed. Then data will be presented on how thermal conversion processes (pyrolysis, pyrocarbonization) affect PFAS. Come for the content. Stay for the dialogue.

Learning Objectives

At the end of this session, learners will be able to:
1) Understand how precursors can affect specific PFAS fate during thermal hydrolysis as a pretreatment to anaerobic digestion.
2) Recognize fate of PFAS across solids and gas through pyrolysis.
3) Know the possibility for PFAS destruction at full scale in a pyrocarbonization process.

Moderator Patrick Mcnamara, Black & Veatch; Marquette University

1:30 PM **Interpreting PFAS Fate Through Thermal Hydrolysis To Support Biosolids Management Decision-Making**
Dana Gonzalez, Carollo Engineers; Barbara Ward, HRSD
CoAuthor(s): Barbara Ward, HRSD; H.A.Matel, HRSD; C.Alukkal, Purdue University; L.Lee, Purdue University; C.Wilson, HRSD; C.Bott, HRSD

2:00 PM **Can Pyrolysis Meet Your PFAS Treatment Goals? Probably, But Here's The Data To Help You Decide**
Lloyd Winchell, Brown and Caldwell
CoAuthor(s): A.Seidel, Brown and Caldwell; M.L.Romero, Brown and Caldwell; F.Laqa Kakar, Brown and Caldwell; A.Arhami, Brown and Caldwell; M.Wells, EnviroChem Services

2:30 PM **Assessment of PFAS Destruction Efficiency in a Full Scale Sewage Sludge Pyrocarbonization Process**
Sid Ahmed Kessas, Suez International
CoAuthor(s): H.Coarita Fernandez, Suez International; H.Gerber, PYREG GmbH; H.Vanden Bossche, Suez International

Conventional Anaerobic Digestion Is Still Relevant!

Tuesday, May 12th 3:30 – 5:00 PM

While Advanced AD (AAD), High-Performance AD (HPAD), Temperature-Phased AD (TPAD), Thermally Hydrolyzed Pretreatment (THP), and other acronyms have dominated the landscape - conventional anaerobic digestion is still relevant. This session will cover topics related to the operation, monitoring, and rehabilitation of conventional mesophilic anaerobic digesters with some handy insights and lessons learned to take back home.

Learning Objectives
At the end of this session, learners will be able to:
1) Understand multiple methods for determining, and verifying, anaerobic digester performance.
2) Implement methods to monitor anaerobic digester stability through bench-scale testing methods.
3) Recognize the key factors in upgrading conventional anaerobic digestion to achieve modern treatment goals.

Moderator Erik Larson, Vaughan Company Inc.

3:30 PM **Keeping it Simple: Principles for Application of Traditional Mesophilic Digestion**
Jeffrey Zahller, HDR Inc
CoAuthor(s): A.Parmenter, HDR Engineering Inc.; L.Nolan, HDR Inc; N.Martin, Kitsap County Wasterwater Division

4:00 PM **Navigating a Digester Upset Event Using a Bench-scale Digestion Stability Test**
Ornella Sosa-Hernandez, Clean Water Services; Kevin Wegener, Clean Water Services
CoAuthor(s): K.Wegener, Clean Water Services; P.Schauer, Clean Water Services

4:30 PM **Overhauling Dinosaurs: Upgrading 20th Century Digesters for Next Generation Performance**
Tom Nangle

CoAuthor(s): G.Schweinfurth, City of Columbus Department of Public Utilities; W.Lawson, Orange Water & Sewer Authority

Digester and Sidestream Scaling Mitigation and Planning

Tuesday, May 12th 3:30 – 5:00 PM

Addresses the impacts of struvite generation in solids handling process. the session will review how to plan for it implement improvement and optimize operations.

Learning Objectives

At the end of this session, learners will be able to:
1) Understand the impacts that struvite formation has on solids processing.
2) Discuss how process modeling can help to plan and implement struvite removal processes.
3) Explain steps to consider in the optimization of struvite removal processes.

Moderator Mark Lang

3:30 PM **Struvite or Wrong: An Alternatives Analysis for Sidestream Phosphorus Management**
Danelle Bishoff, Stantec
CoAuthor(s): S.Arabi, Stantec Inc.; N.Brown, Stantec Inc.

4:00 PM **A Process Modeling Approach for Assessing Sidestream Phosphorus Control Alternatives in High-Salinity Wastewater**
Sara Arabi, Stantec Inc.
CoAuthor(s): N.Brown, Stantec Inc.; D.Bishoff, Stantec

4:30 PM **Struvite on a Shoestring: Optimization of a Simple Mg(OH) 2 Dosing System for Controlled Struvite Formation at the Bozeman WRF**
Derek Lycke, Jacobs Solutions Inc.
CoAuthor(s): C.Fitzgerald, Jacobs; M.Li, Jacobs Engineering Group; J.Binger, Jacobs Engineering Group; M.Gribbon, City of Bozeman WRF; J.Kercher, City of Bozeman WRF

Digital Tools for Predictive Insights

Tuesday, May 12th 3:30 – 5:00 PM

This session will present case studies of digital tools including visualization dashboards and hybrid digital twins (i.e. hybrid of mechanistic models with machine learning) to provide predictive insights for operators in a wide array of use cases, including biosolids management, SRT control and nitrification safety factor, and enhanced biological phosphorus removal.

Learning Objectives

At the end of this session, learners will be able to:
1) Explain lessons learned from real-world deployment of digital twins at WRRFs and understand the factors that drive success versus failure in digital twin adoption.
2) Learn best practices for developing dashboards that can boost productivity, help optimize operations, and serve as a springboard for creation of other digital tools.
3) See the first-of-its-kind implementation of a live digital twin that combines mechanistic and machine-learning calibration of hydrolysis rates to match BioP performance.

Moderator Alexandra Doody, CDM Smith
Assistant Moderator Heather Stewart, Jacobs

3:30 PM **Eleven Full-Scale Implementations in Five Years: Lessons from Hybrid Digital Twin Applications for Operations and Design**
Cheng Yang, Jacobs; Bruce Johnson, Jacobs
CoAuthor(s): B.Johnson, Jacobs; H.Stewart, Jacobs; L.Rieger, Jacobs Solutions Inc.; O.Schraa; J.Registe, Jacobs Solutions Inc.; K.Printz, Jacobs; I.Miletic, Jacobs

4:00 PM **Residuals in Real Time: Lessons Learned in Developing Biosolids Management Digital Solutions**
Adam Behr, Hazen and Sawyer; Barbara Ward, HRSD
CoAuthor(s): B.Lisk, Hazen and Sawyer; B.Ward, HRSD

4:30 PM **Looking Under the Hood: Live Digital Twin Supports Operational Decisions for Stable BioP and Nitrification**
Heather Stewart, Jacobs
CoAuthor(s): K.Printz, Jacobs; N.Jaworski; K.Sanders, City of Ann Arbor WWTP; B.Johnson, Jacobs; C.Yang, Jacobs Engineering; J.Zaveri, Jacobs; D.Pienta, Jacobs; A.Emaminejad, Jacobs Engineering; A.Gelderloos, Jacobs

Improving Biosolids Processing: Conditioning, Dewatering, and Hydraulics

Tuesday, May 12th 3:30 – 5:00 PM

This technical session showcases field proven and research backed strategies to improve solids handling performance in water resource recovery facilities. Presenters will share data driven approaches to dewatering optimization in bench testing setups and targeted full-scale evaluations including: a multi-facility comparison of sludge pumping headloss estimation methods to improve pumping designs; and a full case study of replacing aging WAS thickening centrifuges with rotary drum thickeners. Attendees will leave with practical guidance for improving cake solids, reducing polymer demand, selecting appropriate mixing and dosing strategies, and designing and operating reliable pumping and thickening systems.

Learning Objectives
At the end of this session, learners will be able to:
1) Apply a stepwise optimization framework to improve dewatering consistency, increase cake solids, and reduce polymer consumption.
2) Evaluate when operational changes versus capital improvements are most likely to improve solids handling outcomes.
3) Identify start-up and tuning practices that improve thickening and support long-term operability.

3:30 PM **A Stepwise Approach to Dewatering Optimization from Labscale to Fullscale**
Trung Le, Brown and Caldwell
CoAuthor(s): T.Chouinard, Brown and Caldwell; J.Barnett, York Sewer District; D.Lauletta, York Sewer District; P.Tucker, York Sewer District

4:00 PM **Breaking it Down: Methodology for Accurately Estimating Pumping Headloss of Modern Sludges**
Hemanth Haft, CDM Smith; Vincent Apa, CDM Smith

CoAuthor(s): V.Apa, CDM Smith

4:30 PM **The Plot Thickens: Optimization of WAS Thickening at Johnson County Wastewater (JCW) KS Middle Basin Treatment Facility**
Dustin Craig, CDM Smith
CoAuthor(S): D.Nolkemper, Johnson County Wastewater; A.Kadava, Johnson County Wastewater

Improving Biosolids Quality and Solids Processing Resilience

Tuesday, May 12th 3:30 – 5:00 PM

If you're seeking ideas for how to enhance your solids processing and biosolids quality through optimization and incorporation of technological advancements, this is the session for you. Understand how two different sludge screens can impact solids characteristics that affect downstream processes and ultimately, the final biosolids product. See how intensified, phased digestion and the flexibility of separate or co-thickening can maximize digestion capacity and reduce associated capital and O&M costs. Learn how AI could complement operator training for more cost effective and reliable dewatering. Leave the session with practical ideas for solids processing improvements.

Learning Objectives

At the end of this session, learners will be able to:
1) Discuss the potential impacts of sludge screening on downstream systems and biosolids quality.
2) Visualize ways to improve the flexibility of digestion and thickening.
3) Conceptualize ways that AI could help utility staff with day-to-day functions.

3:30 PM **Maximizing Biosolids Upgrades Through Operational Flexibility and Intensified Processes**
Katherine Bezek, Carollo Engineers; Brian Wilson
CoAuthor(s): R.Doppalapudi, Carollo Engineers; R.Gupta, Carollo Engineers; G.Juby, Carollo Engineers; E.Yarbrough, Carollo Engineers; M.Zhang, LA County Sanitation District; S.Huang, Carollo Engineers; C.Gomez, IEUA; S.Lening, IEUA; R.Love, Inland Empire Utility Agency; J.Marseilles, Inland Empire Utility Agency; B.Wilson,

4:00 PM **Piloting Sludge Screening Technologies to Enhance Regional Biosolids Management Resilience**
Eric Spargimino, CDM Smith
CoAuthor(s): V.Apa, CDM Smith; M.Malloy, CDM Smith

4:30 PM **Transforming Final Dewatering Operations Through Image-Based AI Toolbox and Operator-in-the-Loop Learning**
Khoa Nam Ngo, DC Water
CoAuthor(s): K.Newhart, Oregon State University; K.Lesnik, Maia Analytica; T.Duong, The Catholic University of America; A.Massoudieh, Catholic University of America; J.Proctor, DC Water & Sewer Authority; J.Mckinley, DC Water; P.Parret, DC Water; S.Martinelli, DC Water & Sewer Authority; N.Passarelli, DC Water; H.De Clippeleir, DC Water & Sewer Authority

Shortcut Nitrogen Removal Advancements, Operation, and Implementation

Tuesday, May 12th 3:30 – 5:00 PM

This session explores innovations in shortcut nitrogen removal processes such as partial nitritation anammox (PNA) and partial denitrification anammox (PdNA) for advanced nutrient removal in wastewater treatment. Presentations will cover novel biofilm carriers that integrate zeolite, full-scale PdNA design considerations, and the development of sensor control strategies. The session will also highlight lessons learned and practical considerations for utilities looking to implement shortcut nitrogen processes.
Interactive Session | Panel Discussion

Learning Objectives

At the end of this session, learners will be able to:
1) Identify advancements in the integration of zeolite for partial nitritation anammox (PNA).
2) Gain an understanding of partial denitrification anammox (PdNA) design considerations.
3) Understand the differences of operational strategies such as Ammonia Based Aeration Control (ABAC) vs. Ammonia vs Nitrate (AvN) Control for the operation of reactors upstream of PdNA.

3:30 PM	**Polyvinyl Alcohol-Sodium Alginate-Zeolite Biofilm Carriers to Enhance Wastewater Deammonification** Sarina Ergas, University of South Florida CoAuthor(s): S.Chero Osorio, University of South Florida; C.James; M.Rivas Maldonado, University of South Florida; A.Bhattacharjee; J.Kuhn, University of South Florida
3:50 PM	**Implementation of Primary Effluent-Driven PdNA at Full-Scale with Tight TN Compliance** Brett Wagner, AECOM; Maureen O'Shaughnessy, Prince William Water CoAuthor(s) J.McQuarrie, AECOM; G.Ganesh, AECOM; M.O'Shaughnessy, Prince William Water; R.Carlson, Prince William Water; G.Pearson, Prince William Water; C.Egharevba, Prince William Water; Z.Wang, Virginia Tech; R.Sun, Virginia Tech; C.Johnson, World Water Works, Inc.
4:10 PM	**Advancing PdNA: Development of Sensors and Control Operation Strategy for Next-Gen Nutrient Removal** Pranta Roy, Brown and Caldwell; Michael Clementson, Washington Suburban Sanitation Commission CoAuthor C.Nguyen, Washington Suburban Sanitation Commission; M.Clementson, Washington Suburban Sanitation Commission; S.Jayavelu, World Water Works, Inc.; A.Al-Omari, Brown and Caldwell; J.Jimenez, Brown and Caldwell
4:30 PM	**Panel Discussion**

Understanding PFAS Management in Recycle Streams from Biosolids Thickening and Dewatering through WRF Research

Tuesday, May 12th 3:30 – 5:00 PM

Per- and Polyfluoroalkyl Substances (PFAS) have dramatically shifted the biosolids management landscape. While emerging technologies have predominantly focused on treatment of biosolids specifically, treatment of recycle streams from biosolids thickening and dewatering processes could have a major impact on end use

options of biosolids. This session will highlight results from Water Research Foundation project #5337 on how treatment of filtrate can help biosolids management. This session will first dive into the limitations of PFAS methods on recycle streams with a particular focus on samples with solids content between 1 and 5 %TS. The session will then reveal the importance of PFAS, including precursors and Di-PAPs, in recycle streams. Finally, the session will end with a data-driven overview of an innovative PFAS treatment technology to reduce PFAS from filtrate.
Interactive Session | Panel Discussion

Learning Objectives
1) Understand practical ramifications of PFAS analysis in recycle stream samples and how to overcome limitations.
2) Understand the fraction of PFAS (including precursors) being recycled back to head of plant with thickening and dewatering streams relative to PFAS in the influent.
3) Determine electrical energy required for removal of PFAS in filtrates using a novel destructive technology.

Lead Facilitator	Lynne Moss,
Assistant Facilitator	Chichedo Duru,

3:30 PM	**Opening Remarks on National Landscape for PFAS** Lynne Moss
3:35 PM	**Practical Constraints of PFAS Methods in Biosolids Recycle Streams** Patrick Mcnamara, Black & Veatch; Marquette University
3:55 PM	**PFAS in Recycle Streams are a Substantial (and treatable) PFAS Load** Malcolm Taylor, Washington Suburban Sanitary Commission
4:15 PM	**Novel Treatment Technology for PFAS Destruction in Recycle Streams** Megan Hart, University of Missouri - Kansas City
4:45 PM	**Panel Discussion** Chichedo Duru; Lynne Moss

Cyclones, Carbon, and Clarifiers: Intensifying Activated Sludge with CaCO3

Wednesday, May 13th 8:30 -10:00 AM

This technical session explores wastewater alkalinity enhancement as a practical, plant-integrated pathway to reduce biogenic CO2 emissions while improving activated sludge performance. Presenters will describe how dosing calcium carbonate, a slower-dissolving alternative to conventional alkalinity sources, can increase effluent alkalinity and pH, convert dissolved CO2 to bicarbonate, and simultaneously ballast and densify biomass to improve settling. The session highlights how pairing calcium carbonate addition with hydrocyclone-based densification can retain the carbonate solids in the biological system, increasing dissolution efficiency and corresponding carbon dioxide removal potential while reducing chemical losses to waste sludge.

Learning Objectives
At the end of this session, learners will be able to:
1) Explain how wastewater alkalinity enhancement using calcium carbonate can reduce biogenic CO2 emissions.

2) Evaluate the role of hydrocyclones on CaCO3 retention and dissolution efficiency, and its resulting impacts on sludge volume index and clarifier performance.
3) Apply full-scale implementation lessons including dosing strategies, retention time considerations, monitoring metrics, and operational tradeoffs to assess where CaCO3 addition and solids densification technologies may be viable options for intensification.

8:30 AM **Activated Sludge Densification with CaCO3: Evidence for Increased Secondary Treatment Capacity, Wet Weather Resilience, and Reduced Recycle Flows at Scale**
Julia Kossakowski, CREW; Benjamin Geyman, CREW Carbon
CoAuthor(s): B.Geyman, CREW Carbon; K.Vu, CREW Carbon; J.Katchinoff, CREW Carbon; N.Popolizio, CREW Carbon; E.Sosa, CREW; O.Kotagama, CREW Carbon; N.Planavsky, Yale University

9:00 AM **A Densified Approach to Carbon Dioxide Removal: Integrating Alkalinity Addition with CaCO3and Hydrocyclone Separation**
Riley Doyle, HRSD
CoAuthor(s): A.Gagnon, HRSD; M.Poe, HRSD; J.Nicholson, HRSD; K.Vu, CREW Carbon; J.Katchinoff, CREW Carbon; N.Planavsky, Yale University; P.Vanrolleghem, Universite Laval; C.Bott, HRSD

9:30 AM **State Point in Action: Evaluating Assumptions to Address New Technologies and Intensification**
Adrienne Menniti, Clean Water Services
CoAuthor(s): O.Sosa-Hernandez, Clean Water Services; E.Lorntson, Clean Water Services; P.Schauer, Clean Water Services

Emerging Biosolids Research: Microplastics and PFAS

Wednesday, May 13th 8:30 – 10:00 AM

This session will highlight research conducted through university settings and through the Water Research Foundation. Come hear about the latest research on microplastics through anaerobic digestion and sidestream treatment. Stay for the most up to date information on PFAS leaching from land applied biosolids.

At the end of this session, learners will be able to:
1) Define microplastics and know how various sidestream treatments affect microplastics.
2) Establish the role of pretreatment processes to anaerobic digestion on microplastics.
3) Articulate which groups of PFAS leach from biosolids and the impact of biosolids on PFAS soil concentrations.

Moderator Patrick Mcnamara, Black & Veatch; Marquette University

8:30 AM **WRF 5221: the Impact of Solid Stream Treatment on Microplastics in Biosolids**
Cayla Cook, Hazen and Sawyer
CoAuthor(s): M.Abu-Orf, Hazen and Sawyer

9:00 AM **Enhancing Mesophilic Anaerobic Digestion Performance in the Presence of Polypropylene Microplastics through Alkaline Thermal and Thermal Enzymatic Disintegration**

Oguzhan Altuntas, Middle East Technical University; F. Dilek Sanin, Middle East Technical University
CoAuthor(s): F. Dilek Sanin, Middle East Technical University

9:30 AM **Field Measurement of PFAS Leaching at a Long-Term Land-Applied Biosolids Site**
Maxwell Hire, CDM Smith
CoAuthor(s): C.Schaefer; L.Lee, Purdue University; J.Klamerus, Nutrien; K.Khan, Hazen and Sawyer

Food Waste & Co-digestion

Wednesday, May 13th 8:30 – 10:00 AM

This session will cover lessons learned, business planning, and technical analysis for food waste in mono- and co-digestion applications. Attendees will learn beyond theory and focus on decision making, trade offs, and real world performance.
Interactive Session | Facilitated Discussion

Learning Objectives
At the end of this session, learners will be able to:
1) Evaluate financial tradeoffs among multiple co-digestion alternatives using life cycle cost and payback analysis.
2) Tailor preprocessing and digestion systems to local feedstock, regulatory context, and physical constraints.
3) Describe how advanced anaerobic digestion technologies are being implemented at full scale biosolids and food waste processing.

Lead Facilitator Kyle Stern, Kiewit

8:30 AM **Analysis of Reconfigurable Organic Feedstock Preprocessing for Mono and Co-Digestion**
Zhongtian Li, Carollo Engineers
CoAuthor(s): C.Tasser, Carollo Engineers; J.Blischke

8:45 AM **Facilitated Discussion: Analysis of Reconfigurable Organic Feedstock Preprocessing for Mono and Co-digestion**

9:00 AM **Business Case Evaluation for Co-digestion at the Sand Island Wastewater Treatment Plant, Honolulu HI**
Sarang Agarwal, Stantec Consulting Inc; Yuan Fang, Stantec Inc.
CoAuthor(s): Y.Fang, Stantec Inc.

9:15 AM **Facilitated Discussion: Business Case Evaluation**

9:30 AM **Codigestion and Food Waste: Lessons Learned from Three Anaerobic Digestion Facility Startups**
Jason Wert, RETTEW Associates, Inc.; Michele Aukerman
CoAuthor(s): M.Aukerman; L.Randles,

9:45 AM **Facilitated Discussion: Codigestion and Food Waste**

From Models to Operations: Optimizing Struvite Based Phosphorus Recovery in Biosolids

Wednesday, May 13th 8:30 – 10:00 AM

Detrimental struvite scale formation due to fine minerals deposition can limit the application of nutrient harvesting technologies in water resource recovery facilities (WRRFs). The Water Research Foundation (WRF) project 5347 is a tailored collaboration effort that aims to utilize a combination of full-scale data analysis applying machine learning-enabled statistical data analysis tools, reactor testing, crystal modeling, and a machine learning/artificial intelligence model to develop practical considerations for the application of biosolids-based phosphorus recovery to produce more resilient designs and improved operating guidance for current and future applications. This session will provide an update from WRF 5347 project team members and highlight data-driven insights, utility case studies, and lessons learned from testing at a full-scale biosolids-based phosphorus recovery system.
Interactive Session | Facilitated Discussion

Learning Objectives

1) Identify KPIs for phosphorus removal and recovery systems that correlate to higher removal while minimizing fine crystal formation and downstream scaling.
2) Understand optimization practices for these systems based on case studies from full-scale operating facilities.
3) Apply findings to design or operation of phosphorus removal and recovery systems.

Lead Facilitator	Isaac Avila, Black & Veatch
Assistant Facilitator	Jennifer Loconsole, Black & Veatch; Leon Downing, Black & Veatch

8:30 AM	**Opening and Project Background** Leon Downing, Black & Veatch
8:40 AM	**Struvite Recovery: Key Principles and Data-Driven Insights** Roland Cusick, University of Illinois Department of Civil & Environmental Engineering
8:55 AM	**Facilitated Discussion** Isaac Avila, Black & Veatch; Jennifer Loconsole, Black & Veatch
9:05 AM	**Process Optimization Efforts at Metro Water Recovery** Rudy Maltos, Metro Water Recovery
9:20 AM	**Facilitated Discussion** Isaac Avila, Black & Veatch; Jennifer Loconsole, Black & Veatch
9:30 AM	**Utility Management Perspectives on Struvite Management** Jeff Prevatt, Pima County Regional
9:45 AM	**Facilitated Discussion** Isaac Avila, Black & Veatch; Jennifer Loconsole, Black & Veatch
9:55 AM	**Final Survey & Closing Thoughts** Leon Downing, Black & Veatch

Pushing the Boundaries of Wastewater Treatment: Multi Technology, Limit of Performance Pilot Program for Olathe's Cedar Creek WWTP

Wednesday, May 13th 8:30 – 10:00 AM

The City of Olathe, Kansas, is pioneering a multi-technology pilot program to push its Cedar Creek WWTP to the limits of performance. This session provides a roadmap for evaluating and integrating four innovative technologies simultaneously: Supercritical Water Oxidation (SCWO) for biosolids destruction, and advanced solutions for biological nutrient removal, aeration control, and process intensification. Learn how Olathe, in partnership with its design and construction team under a CMAR model, is de-risking innovation to build a resilient, sustainable, and future-proofed treatment facility. This case study offers practical lessons for any utility planning its next generation of wastewater infrastructure.

Interactive Session | Panel Discussion

Learning Objectives

This session will provide a roadmap for other utilities on:

1) Selecting and integrating a portfolio of innovative technologies to solve multiple complex treatment challenges simultaneously.
2) Designing and executing a phased, multi-technology piloting program to generate crucial performance data and ensure regulatory buy-in.
3) Leveraging the CMAR project delivery model to foster the collaboration necessary for successful innovation.
4) Developing a comprehensive, future-proofed solution that redefines the limits of wastewater treatment.

Lead Facilitator	Kerrie Greenfelder, Burns & McDonnell Engineering Company, Inc.
Assistant Facilitator	Sabrina Parker, City of Olathe

8:30 AM	**Welcome, Context, and Session Overview** Kerrie Greenfelder, Burns & McDonnell Engineering Company, Inc.
8:35 AM	**Evolution of the Project and the Decision to Innovate** Sabrina Parker, City of Olathe
8:45 AM	**Digital Integration and Data Strategy** David Newman, Burns & McDonnell
8:55 AM	**Solids Treatment Pilot: Supercritical Water Oxidation (SCWO)** Heather Phillips, City of Olathe; Bill Morehead; David Newman, Burns & McDonnell
9:20 AM	**Liquids Treatment Pilot: BNR, Aeration Control, and Intensification** Heather Phillips, City of Olathe; David Newman, Burns & McDonnell
9:25 AM	**Operator Perspective: What We Are Learning** Heather Phillips, City of Olathe
9:30 AM	**Key Takeaways, Lessons Learned, and Q&A** Kerrie Greenfelder, Burns & McDonnell Engineering Company, Inc.; Sabrina Parker, City of Olathe; Heather Phillips, City of Olathe; David Newman, Burns & McDonnell; Bill Morehead,

Strategies for Accurate N2O Measurement and Mitigation

Wednesday, May 13th 8:30 – 10:00 AM

This session examines strategies for monitoring and mitigating nitrous oxide (N2O) emissions in biological nutrient removal (BNR). Presentations will cover long-term dissolved-phase monitoring, gas-phase validation,

process modeling, and comparisons of liquid versus off-gas measurements across multiple WRRFs. The session will also explore the influence of carbon sources on denitrification and Nâ,,O dynamics to minimize greenhouse gas emissions from nitrogen removal processes.
Interactive Session | Panel Discussion

Learning Objectives
At the end of this session, learners will be able to:
1) Identify methods for accurately measuring N2O in liquid and gas phases.
2) Evaluate strategies for modeling and controlling NâO emissions to improve process sustainability.
3) Analyze how carbon sources affect N2O production in low-DO BNR processes.

8:30 AM	**Towards Best Practice N2O Measurement: Liquid and Off Gas Comparison Across Multiple WRRFs** Mikkel Andersen, Unisense Environment AS; Amanda Lake, Jacobs Engineering CoAuthor(s): M.Moller, Unisense Environment AS; L.Debel, Veolia; W. Gruber, UpWater AG; A.Lake, Jacobs Engineering; N.Thagersen, Aalborg Forsyning; C.Bayley
8:50 AM	**Long-Term Dissolved-Phase N2O Monitoring With Gas-Phase Validation and Process Modeling Under Low-DO Operation** Adam Horn, LA County Sanitation District; Samuel Reifsnyder, Carollo Engineers CoAuthor(s): S.Reifsnyder, Carollo Engineers; R.Appleton; A.Conklin, Carollo Engineers; P.Ackman, LA County Sanitation District; R.Tsai, LA County Sanitation District; R.Spierling, LA County Sanitation District; B.Mansell, LA County Sanitation District
9:10AM	**Impact of Carbon Sources and Dosing Ratios in Denitrification and N2O Dynamics in a Low DO BNR Process** Bishav Bhattarai, Black & Veatch CoAuthor(s): L.Pifer, Black & Veatch; F.Sabba; M.Farmer, Black & Veatch; L.Downing, Black & Veatch
9:30 AM	**Panel Discussion**

Advancing Predictive Tools for Modern Digestion Systems

Wednesday, May 13th 10:30 AM – 12:00 PM
This session highlights emerging advances in modeling tools that enhance the design, operation, and optimization of anaerobic digestion systems. Presenters will explore reinterpretations of classical digestion models, development and calibration of microbial hydrolysis process models, and the application of machine-learning regression techniques for predicting methane yield and biogas production. Together, these approaches demonstrate how data-driven insights and refined process representation can drive more reliable and efficient co-digestion performance.
Interactive Session | Panel Discussion

Learning Objectives
At the end of this session, learners will be able to:
1) Analyze updated digestion modeling approaches that improve design accuracy and operational decision-making.
2) Evaluate microbial hydrolysis model calibration methods to enhance prediction of process kinetics.
3) Assess machine-learning regression tools for forecasting methane yield and biogas production.

10:30 AM **Reinterpretation of the Anaerobic Digestion Model for Design and Operation**
Katherine Gardner, Arcadis U.S., Inc.
CoAuthor(s): M.Andalib, Stantec Inc.

10:50 AM **Microbial Hydrolysis Process Model Development and Calibration**
Thomas Johnson, Jacobs; Claire Funk, Jacobs
CoAuthor(s): C.Funk, Jacobs; J.Ohemeng-Ntiamoah, Jacobs Solutions Inc.; M.Fairley-Wax, Jacobs; D.Parry, Jacobs

11:10 AM **Leveraging Regression-based Machine learning Techniques for Accurate Prediction of Methane Yield and Biogas Production in Anaerobic Co-digestion**
Ahmed Elsayed, Toronto Metropolitan University
CoAuthor(s): N.Ahmed, Toronto Metropolitan University; M.Dassouki Dit Tahan, Department of Civil Engineering, Toronto Metropolitan University, Toronto, Canada; A.Rabii; M.Sherif Zaghloul, United Arab Emirates University; E.Elbeshbishy, Toronto Metropolitan University

11:30 AM **Panel Discussion**

Advancing Tertiary PdNA for Water Reuse

Wednesday, May 13th 10:30 AM – 12:00 PM

This session highlights emerging tertiary treatment approaches that integrate partial denitrification anammox (PdNA) to achieve low effluent nitrogen concentrations with reduced carbon demands. Presentations will showcase pilot-scale results from membrane bioreactors, membrane aerated biofilm reactors, and biological aerated filters. The session will focus on process design, operational performance, and lessons learned for implementing PdNA in advanced treatment and potable reuse.

Interactive Session | Panel Discussion

Learning Objectives

At the end of this session, learners will be able to:

1) Recognize how tertiary PdNA processes reduce carbon demand while achieving low effluent nitrogen concentrations.
2) Identify several tertiary technologies that can be integrated with PdNA.
3) Evaluate pilot results to inform the adoption of PdNA for advanced treatment prior to potable reuse.

Lead Facilitator Brett Wagner, AECOM

10:30 AM **Carbon Efficient Tertiary Membrane Bioreactor with Partial Denitrification Anammox for Potable Reuse**
Ariana Coracero, LA County Sanitation District
CoAuthor(s): M.Farrokh Shad, P.Hsia, LA County Sanitation District; B.Mansell, LA County Sanitation District; Y.Sun, Hazen and Sawyer; B.Danker, Hazen and Sawyer; P.Pitt, Hazen and Sawyer; W.Khunjar, Hazen and Sawyer; R.Latimer, Hazen and Sawyer; C.Fitzgerald, JacobsConstantine, Jacobs; J.Delgado, LA County Sanitation District

10:50 AM **Tertiary Membrane Aerated Biofilm Reactor/Partial Denitrification-Anammox Process**
Raymond Tsai, LA County Sanitation District
CoAuthor(s): B.Mansell, LA County Sanitation District; P.Hsia, LA County Sanitation District; A.Coracero, LA County Sanitation District; T.Le, Jacobs; C.Fitzgerald, Jacobs; T.Constantine, Jacobs

11:10 AM **Pilot-Scale Demonstration of PdNA in a Tertiary BAF for Low Effluent TIN**
Sarah Schoepflin, AECOM; Yuanbin Wu, Caliskaner Water Technologies
CoAuthor(s): Brett Wagner, AECOM; G.Ganesh, AECOM; Y.Wu, Caliskaner Water Technologies; D.Dursun, Caliskaner Water Technologies; U.Ghimire, Tomorrow Water; D.Rhu, Tomorrow Water; J.Cho, Tomorrow Water

Biosolids Recylcing Defense 2.0

Wednesday, May 13th 10:30 AM – 12:00 PM

This session will survey and analyze the current policy, legislative, and litigation landscape affecting the beneficialuse of biosolids and compost, including PFAS developments and compost. The talk will provide wastewater andresiduals professionals the latest information that will help their decisions on management, planning, risk, liability,and defense of litigation.
Interactive Session | Panel Discussion

High and Dry: Thermal Drying Fundamentals and Practices

Wednesday, May 13th 10:30 AM – 12:00 PM

This session introduces the fundamentals of thermal drying technologies and presents pilot testing results for different sludge from large wastewater treatment plants.
Interactive Session | Facilitated Discussion

Learning Objectives
At the end of this session, learners will be able to:
1) Have a better understanding of the thermal drying technology and the key parameters involved.
2) Learn about how different sludges from major municipalities behave in a belt dryer.
3) Learn the importance of sludge characteristics on drying, the type of dryers, and product characteristics.

Lead Facilitator Kwok-Wai Tsang, CDM Smith

10:30 AM **Thermal Processes: What Have We learned?**
John Ross, Brown and Caldwell
CoAuthor(s): L.Winchell, Brown and Caldwell; M.Mastin,
10:45 AM **Facilitated Discussion**
11:00 AM **Belt Dryer Pilot Study with Three Different Cakes from Some of the Largest Municipalities in the US**
Vincent Apa, CDM Smith; Aykut Sayin, CDM Smith Inc
CoAuthor(s): A.Sayin, CDM Smith Inc; S.Verrengia, Passaic Valley Sewerage Commissioners
11:15 AM **Facilitated Discussion**
11:30 AM **You Have a Thermal Dryer. Now What?**
Amy Hanna, Hazen and Sawyer; Rich Tomko, Hazen and Sawyer
CoAuthor(s): M.Van Horne, Hazen and Sawyer; M.Abu-Orf, Hazen and Sawyer; R.Tomko, Hazen and Sawyer
11:45 AM **Facilitated Discussion**

Innovations in Biosolids Odor Control

Wednesday, May 13th 10:30 AM – 12:00 PM

This session explores practical, data-driven approaches to managing odors across biosolids facilities, from process design through product handling. Presentations will cover innovative odor control solutions such as rooftop biofilters, comparative odor characterization of dewatering technologies, and the impacts of curing and biochar amendment on Class A biosolids. Attendees will gain insight into how operational choices, storage time, and treatment strategies influence odor generation, air handling requirements, and community impacts.

Learning Objectives

At the end of this session, learners will be able to:

1) Evaluate how biosolids processes affect odor generation, air handling requirements, and product quality over time.

2) Compare applied odor control and mitigation strategies, such as rooftop biofilters and process enclosure, using real-world performance data, design considerations, and operational lessons learned.

3) Apply field data and case study insights to inform odor management decisions that balance community impacts, sustainability goals, operational constraints, and lifecycle costs at biosolids facilities.

10:30 AM **Evaluating Biochar Blending During Curing of THP Class A Biosolids: Impacts on Product Quality, Odor, Handleability, and PFAS Concentrations**
Nickolas Hines, Material Matters
CoAuthor(s): BJ Ward, HRSD; K.Whedbee, HRSD; R.Fogle, Material Matters

11:00 AM **How An Innovative Green Biosolids Facility Rooftop Biofilter Saved Money, Space, and Noses**
Scott Cowden, PPS; James Cutz, Jacobs Engineering
CoAuthor(s): J.Cutz, Jacobs Engineering; V.Han, City of Portland Bureau of Environmental Service

11:30 AM **Which THP Digested Dewatered Material Has the Most Odor Generation?**
David Oerke, Jacobs; Elaine Masters, Trinity River Authority of Texas
CoAuthor(s): E.Masters, Trinity River Authority of Texas; K.Galardi

The Biosolids Life Cycle: Case Studies and Round Tables

Wednesday, May 13th 10:30 AM – 12:00 PM

Session participants will experience several case studies focusing on the biosolids life cycle. The case studies will be followed by interactive round table discussions.

Interactive | Case Study Analysis

10:30 AM **Resilient Biosolids Management Planning in Southern California**
Erica AghaGholizadeh, Brown and Caldwell; Thomas Chapman, Brown and Caldwell
CoAuthor(s): A.Picazo, Eastern Municipal Water District; T.Chapman, Brown and Caldwell; R.Gupta, Carollo Engineers; E.Charbonnet, Carollo Engineers; A.Berninghaus; N.Sierra, Brown and Caldwell; P.Ma, Brown and Caldwell; S.Noone, Brown and Caldwell; A.Valenti

10:45 AM **Future-Ready Biosolids Management in Western Australia: An Adaptive Strategy Framework**
Hari Santha, Black & Veatch

CoAuthor(s): B.Li; A.McNeil, Black & Veatch; H.Ho, Black & Veatch; S.Mcphee, Water Corporation; N.Locke, Water Corporation

11:00 AM **Round Table #1**

11:15 AM **Using Long-Term Biosolids and Biogas Planning to Improve Short-Term Decisions**

Caitlin McHugh, HDR; Jacob Metch, HDR

CoAuthor(s): Jacob Metch, HDR; S.Spalding, HDR Engineering Inc.; S.Smoot, HDR Inc; G.Kansas, HDR Inc; D.Lockwood III,

11:30 AM **Data-Driven Biosolids Design - Life Cycle Costing and Sludge Yield Modeling**

Karthik Manchala, GHD

11:45 AM **Round Table #2**

Utilities Tackling Biosolids Management Issues

Wednesday, May 13th 10:30 AM – 12:00 PM

This session provides utility perspectives on assessing and addressing relevant biosolids management issues. Whether it's PFAS or Part 503 compliance, these utilities have engaged in practical research to help shape and proactively manage their biosolids land application programs. A facilitated discussion following the talks will allow utilities to collaboratively share lessons learned more broadly among attendees. Session participants will be able to share any practical research initiatives they have undertaken and receive feedback and input from the speakers.
Interactive Session | Facilitated Discussion

Learning Objectives
At the end of this session, learners will be able to:
1) Think constructively about which aspects of their land application program might be addressed via in-house applied research.
2) Understand the level of effort to undertake applied research, including staffing, data gathering and lab analysis.
3) See the benefits of taking a 'deep dive' on aspects of a land application program to address potential nuisance or compliance issues head-on.

Lead Facilitator Natalie Sierra, Brown and Caldwell

10:30 AM	**Field-Scale Fate, Vertical Attenuation, and Crop Uptake of PFAS Following Long-Term Biosolids Land Application** Jeffrey Hlad, Metro Water Recovery CoAuthor(s): T.Rauch-Williams, Metro Water Recovery; E.Jackson, Metro Water Recovery; N.Fitzgerald
10:45 AM	**Facilitated Discussion**
11:00 AM	From Landfill to Land Application: Low-Cost Wins in Biosolids Management Giovanna Portiolli, Charlotte Water CoAuthor(s): M.Steele, Charlotte Water
11:15 AM	**Facilitated Discussion**
11:30 AM	**Transforming Challenges Into Awards: Manhattan's Biosolids Management Program Success Story** Garrett Sheehan, Carollo Engineer; Abdu Durar, City of Manhattan Public Works CoAuthor(s): A.Durar, City of Manhattan Public Works
11:45 AM	**Facilitated Discussion**

Control What You Can At Full Scale

Wednesday, May 13th 1:30 – 3:00 PM

This session will focus on aeration control at full-scale implementations of advanced process technologies, from ABAC to Densified Activated Sludge.

Moderator Heather Stewart, Jacobs

1:30 PM **Full-Scale Optimization of Mechanistic Feedforward Feedback Ammonium-Based Aeration Control at Blue Plains**
Chengpeng Lee, DC Water and Sewer Authority; Nishedh Phokarel, University of District of Columbia, DC Water And Sewer Authority
CoAuthor(s): Khoa Nam Ngo, DC Water; N.Phokarel, University of District of Columbia, DC Water And Sewer Authority; R.Fofana, DC Water; G.Wells, Northwestern University; H.De Clippeleir, DC Water & Sewer Authority

2:00 PM **Implementation and Control of Low-DO Operation Using ABAC**
Sara Arabi, Stantec Inc.; Shelley Trujillo; Cole Sigmon, City of Boulder
CoAuthor(s): P.Regmi, Stantec Inc.; C.Sigmon, City of Boulder; C.Marks, City of Boulder; B.Janoka, City of Boulder; S.Trujillo; N.Lakshminarasimman, University of Michigan; N.Brown, Stantec Inc.

2:30 PM **Full-scale Side-by-Side Evaluation of Aeration Efficiency in Densified versus Conventional Activated Sludge Process**
Samuel Reifsnyder, Carollo Engineers; Rudy Maltos, Metro Water Recovery
CoAuthor(s): J.Zambrano; A.Berninghaus; B.Marron, Metro Water Recovery; B.Wisdom, Metro Water Recovery; T.Rauch-Williams, Metro Water Recovery

Emerging Insights into EBPR Stability and Kinetics

Wednesday, May 13th 1:30 – 3:00 PM

This session explores emerging insights into the performance and stability of enhanced biological phosphorus removal (EBPR) systems. Presentations will examine how intracellular carbon storage can be used to assess EBPR health and process performance. The session will also evaluate how electron acceptors and metal salt dosing influence EBPR kinetics and the ability to achieve very low effluent total phosphorus concentrations.
Interactive Session | Panel Discussion

At the end of this session, learners will be able to:
1) Recognize the limitations of using internal carbon to measure EBPR stability.
2) Identify how dPAO kinetics differ from traditional PAOs kinetics in EBPR.
3) Understand how metal salts and chemical phosphorus removal impact EBPR performance.

1:30 PM **Can Measuring Intracellular Carbon Storage Levels Predict BPR Stability?**
Adrienne Menniti, Clean Water Services; Theresa Passe, Clean Water Services
CoAuthor(s): T.Passe, Clean Water Services; E.Coats; P.Schauer, Clean Water Services

1:50 PM **Impacts of Nitrate and Nitrite as Electron Acceptors on EBPR Performance and Enrichment of Denitrifying Polyphosphate-accumulating Organisms (dPAOs) in Post-anoxic and Pre-anoxic EBPR Systems**
Andy Kumi, University of Idaho; Isabel Huggins, University of Idaho
CoAuthor(s): Isabel Huggins, University of Idaho; E.Coats,

2:10 PM **Impact of Metal Salt Dosing on EBPR Kinetics and Stoichiometry in MBR Targeting â‰¤ 0.1 mg/L TP in Effluent**
Soubhagya Pattanayak, Carollo Engineers

2:30 PM **Panel Discussion**

Extremizing Process Intensification: Biokinetics, Biofilms, and GAC

Wednesday, May 13th 1:30 – 3:00 PM

How efficient can nutrient removal become? This session explores comparing nutrient removal rates of various process intensification systems, combining mobile media with low DO conditions, and GAC addition in low DO systems. Case studies provide insight into nutrient removal rates, additional research on mobile media in low DO conditions, and further process intensification with biofilms. Attendees are invited to learn and discuss combining multiple treatment methods to further maximize process intensification.
Interactive Session | Facilitated Discussion

Learning Objectives

At the end of this session, learners will be able to:
1) Compare nutrient removal of aerobic granular sludge, organic biofilm carrier, and densified activated sludge treatment processes.
2) Combining process intensification systems under low DO conditions with mobile media.
3) Gain insight into how GAC can remove micropollutants while enhancing biofilm formation.

Lead Facilitator Elaine Masters, Trinity River Authority of Texas

1:30 PM	**Biokinetic Comparison of Process Intensification Technologies** Jose Jimenez, Brown and Caldwell CoAuthor(s): M.Miller, Brown and Caldwell; A.Al-Omari, Brown and Caldwell; K.Bauhs, Brown and Caldwell; E.Giraldo,
1:45 PM	**Facilitated Discussion**
2:00 PM	**Low DO, High Impact: Integrating Low DO and Mobile Biofilms for Sustainable Nutrient Removal** Kelly Gordon, Stantec CoAuthor(s): B.Kim, Stantec Consulting Inc; M.A.Sadikul Islam, DC Water and Sewer Authority; P.Regmi, Stantec Inc.; S.Arabi, Stantec Inc.; S.Sathyamoorthy,
2:15 PM	**Facilitated Discussion**
2:30 PM	**Process Intensification for Simultaneous Nutrient and PFAS Management Using Reactive Migrating Carriers** Ramesh Goel, University of Utah CoAuthor(s): T.Quereshi, University of Utah; S.Murthy, NEWhub Corp; E.Giraldo; B.Wett
2:45 PM	**Facilitated Discussion**

Innovations in Digestion Pretreatment, Hydrolysis, and Resource Recovery

Wednesday, May 13th 1:30 – 3:00 PM

This session explores emerging strategies that enhance sludge treatment efficiency through advanced digestion, pretreatment, and hydrolysis processes. Presenters will highlight innovations such as high-solids digestion, thermal-alkaline conditioning with vacuum-assisted fermentation, and full-scale microbial hydrolysis design. Together, these approaches demonstrate new opportunities for improved energy generation and recovery of valuable carbon and nitrogen resources.
Interactive Session | Facilitated Discussion

Learning Objectives

At the end of this session, learners will be able to:
1) Analyze operational requirements and design factors influencing advanced digestion and hydrolysis systems.
2) Compare pretreatment technologies to determine impacts on carbon and nitrogen recovery efficiency.
3) Evaluate integrated process strategies that enhance overall energy generation and resource recovery potential.

Lead Facilitator Adrian Romero, Jacobs Solutions Inc.

1:30 PM **Application of Thermal-Alkaline Pretreatment and Vacuum-Assisted Fermentation of Sewage Sludge and Opportunities for Carbon and Nitrogen Recovery**
David Cham, City College of New York
CoAuthor(s): D.Halim, The City College of New York; M.Soleimanifar, The City College of New York; K.Ramalingam, The City College of New York; E.Giraldo; N.Perez, NYCDEP; J.Fillos, City College

1:45 PM **Facilitated Discussion**

2:00 PM **Full-Scale Design and Energy Recovery for the Microbial Hydrolysis Process**
Madeleine Fairley-Wax, Jacobs; Stephanie Cope, Jacobs
CoAuthor(s): S.Cope, Jacobs; P.Nielsen, VCS Denmark; S.Eriksen, VCS Denmark; D.Parry, Jacobs

2:15 PM **Facilitated Discussion**

2:30 PM **Why So Much Water? Implementing High TS Digestion**
Thomas Paulmann, HDR; Mario Benisch, HDR Engineering Inc.
CoAuthor(s): M.Benisch, HDR Engineering Inc.

2:45 PM **Facilitated Discussion**

Optimizing Sludge Fermentation: Managing P Release and Recovery

Wednesday, May 13th 1:30 – 3:00 PM

This session explores how utilities can optimize internal carbon generation and sidestream phosphorus control to support enhanced biological nutrient removal while reducing chemical dependency. Through full-scale and pilot-scale case studies, presenters examine strategies to decouple COD and phosphorus release during primary sludge fermentation, intentionally sequester phosphorus as stable calcium phosphate precipitates, and evaluate fermenter performance using improved, net-benefit metrics.

Learning Objectives
At the end of this session, learners will be able to:
1) Evaluate strategies such as alkalinity addition, ferric dosing, and sludge dilution to reduce phosphorus release while maintaining sCOD yields in primary sludge fermenters.
2) Apply lessons learned from full-scale operation to evaluate sidestream phosphorus control strategies at enhanced biological phosphorus recovery (EBPR) facilities.
3) Recognize tradeoffs between carbon production and nutrient release when selecting fermenter design and operating conditions.

Moderator Kyle Stern, Kiewit

1:30 PM **Primary Sludge Fermentation in Chem-P Plants: Decoupling P-Release from C-Release**

Kathryn Hanson, DC Water
CoAuthor(s): S.Davis, DC Water, GW; J.Poli, KU; M.Boulware; I.Avila, Black & Veatch; S.Islam, George Washington University; A.Massoudieh, Catholic University of America; L.Downing, Black & Veatch; M.Ladipo-Obasa, DC Water & Sewer Authority; M.Miranda, DC Water & Sewer Authority; C.Passarelli, DC Water & Sewer Authority; K.Nam Ngo, DC Water; H.De Clippeleir, DC Water & Sewer Authority

2:00 PM **Witchy Brew: New Empirical Insights into the Dark Art of Primary Sludge Fermentation**
Jon Liberzon, Black & Veatch
CoAuthor(s): M.Farmer, Black & Veatch; A.Menniti, Clean Water Services; T.Passe, Clean Water Services; L.Pinkerton, Metropolitan Council; D.Freedman, Metro Water Recovery; A.Carnes, City of Boise Public Works Department

2:30 PM **Influence of Hydraulic Retention Time on Volatile Fatty Acid Production and Sludge Dewaterability in Anaerobic Sludge Fermentation**
Monisha Alam, University of Alberta
CoAuthor(s): R.Saila, University of Albert; S.Ismail, University of Alberta; A.Mou, University of Alberta; B.Dhar

PFAS Lightning Talks: Roundtable Discussion

Wednesday, May 13th 1:30 – 3:00 PM

This session features a series of short presentations that trace the PFAS management pathway, from industrial source control to assessment tools and treatment technologies. Following the talks, facilitated roundtable discussions will allow participants to engage directly with presenters, compare approaches, and discuss practical implications. The session concludes with insights into global experience and U.S. trends in advanced thermal treatment for PFAS destruction.
Interactive Session | Facilitated Discussion

1:30 PM **Impacts of Industrial Discharge Control on PFAS and Precursor Concentrations in Wastewater**
Rasha Maal-Bared, CDM Smith
CoAuthor(s): E.Tavasoli, HDR Inc; E.Spargimino, CDM Smith; S.Mathur, CDM Smith

1:40 PM **Extension of BEAM Tool for Assessing PFAS Emissions and Sustainability Metrics in Biosolids Thermal Processes**
Leah Pifer, Black & Veatch
CoAuthor(s): F.Cecconi, Black & Veatch; S.Shankar; P.Mcnamara, Black & Veatch; Marquette University; W.Hoener; L.Moss; J.Burke-Wells, NEBRA; A.Shaw, Black & Veatch

1:50 PM **Roundtable Discussion #1**

2:10 PM **Emerging PFAS Treatment Train for Removal and Destruction of Landfill Leachate Using Foam Fractionation and Electrooxidation**
Lee Kimbell, Black & Veatch; Gary Hunter, Black & Veatch
CoAuthor(s): G.Hunter, Black & Veatch; F.Sabba; C.Kassar, Black & Veatch

2:20 PM **Evaluation of Hydrothermal Liquefaction for the Great Lakes Water Authority: A pilot scale study**
Xavier Fonoll Almansa, University of Texas At Austin
CoAuthor(s): W.Wehner, University of Texas At Austin; J.Norton, Great Lakes Water Authority (GLWA); A.Marcus, Great Lakes Water Authority (GLWA); D.Santosa; J.Oyler, Genifuel

Corporation; M.Wooldridge, University of Michigan; Z.Ismail, University of Michigan; A.Mansfield, Eastern Michigan University; J.Willis, Brown and Caldwell; L.Winchell, Brown and Caldwell

2:30 PM **Roundtable Discussion #2**

2:50 PM **Advanced Thermal Biosolids Treatment for PFAS Destruction: Global Experience and U.S. Implementation Trends**
Mohammad Abu-Orf, Hazen and Sawyer
CoAuthor(s): K.Khan, Hazen and Sawyer

Targeting Net-Zero With THP: Innovative Energy Plays

Wednesday, May 13th 1:30 – 3:00 PM

As the target of net-zero is being adopted more broadly, there is a focus on finding innovative ways to incrementally improve energy balance. Thermal Hydrolysis Pretreatment (THP) provides several interesting applications for this line of thinking. This session will explore a few creative ways energy is being recovered or offset in THP facilities.
Interactive Session | Facilitated Discussion

Learning Objectives
At the end of this session, learners will be able to:
1) Perform a net energy analysis to consider treatment process alternatives.
2) Identify opportunities to transfer waste heat to offset heating demands.
3) Evaluate case studies to inform process selection based on energy neutrality.

Lead Facilitator Erik Larson, Vaughan Company Inc.

1:30 PM **From Waste to Watts: Global Case Studies in Advanced Biosolids & Energy Recovery through Thermal Hydrolysis**
Shyam Sivaprasad, Stantec Inc.; Pusker Regmi, Stantec Inc.
CoAuthor(s): A.Le Roux; D.Starrenburg; V.Borkowski, Stantec Inc.; P.Regmi, Stantec Inc.; S.Arabi, Stantec Inc.

1:45 PM **Facilitated Discussion**

2:00 PM **Is A Second Thermal Hydrolysis Energy-positive? A Net Energy Analysis of Dual-THP Configuration**
Yitao Li, Virginia Tech
CoAuthor(s): H.Luo, Virginia Tech; F.Haile, Arlington County Water Pollution Control Bureau; M.Strawn, Arlington County Water Pollution Control Bureau; J.Novak, VA Poly Institute & State University; Z.Wang, Virginia Tech

2:15 PM **Facilitated Discussion**

2:30 PM **Recovering Blower Waste Heat to Offset Thermal Hydrolysis Energy Demands**
Ty Morton, HDR
CoAuthor(s): J.Prevatt, Pima County Regional

2:45 PM **Facilitated Discussion**

A Diamond Is Forever, But Managing Carbon Is Too

Wednesday, May 13th 3:30 – 5:00 PM

The amount of carbon influences treatment outcomes in the secondary system and can be a critical component in operating scenarios and design impacts. The session explores carbon measurement with a bio-electrochemical sensors, high mixed liquors levels in low C:N, and optimizing chem-P with sludge fermentation.
Interactive Session | Case Study Analysis

Learning Objectives
At the end of this session, learners will be able to:
1)Gain insight into measuring carbon via bio-electrochemical sensors while understanding potential limitations.
2) Understand how increasing mixed liquors in a step feed process can be implemented successfully in low C:N conditions resulting in improving settling, operating at low DO, and granulation.
3)Learn how primary sludge fermentation and pH control can affect phosphorous release in an iron-dosed chemical phosphorus plant.

3:30 PM	**Starving the Competition: Carbon Control Strategies for Enhanced MABR Performance** Komal Rathore, Carollo Engineers CoAuthor(s): A.Gharagozian, Carollo Engineers; B.Coday, Carollo Engineers; M.Reeve, Veolia Water
3:50 PM	**Group Analysis**
4:00 PM	**A New Lens to See Carbon: Full-Scale Bio-Electrochemical Sensor Trial** Nathaniel Stein, Ovivo USA LLC; Sergio Pino-Jelcic, Ovivo USA LLC CoAuthor(s): S.Pino-Jelcic, Ovivo USA LLCl J.Mejia Franco, Sentry; P.Kiely, Island Water Technologies Inc; T.Truax; D.Lords, City of Idaho Falls; C.Utter, City of Idaho Falls; C.Anderson, Consor
4:20 PM	**Group Analysis**
4:30 PM	**Full Scale Intensified Step Feed BNR Process for Achieving Stringent Nitrogen Limits at Low C:N Ratios** John Kabouris, Stantec CoAuthor(s): T.Nogaj, University of Central Florida College of Engineering
4:50 PM	**Group Analysis**

AI and the Future of the Workforce: Three Types of Learning

Wednesday, May 13th 3:30 – 5:00 PM

Utilities are continually looking for ways to preserve institutional knowledge, accelerate operator development, and get more value from the systems they build. This session explores how agentic digital twins address these challenges by enabling new kinds of learning between operators and AI. Three utilities share their current work, each approaching the problem from a different angle. DC Water encodes operator expertise for knowledge-driven decision support, creating a cognitive apprenticeship at scale. Metro Water Recovery integrates heterogeneous models across treatment process and economics, revealing cross-domain insights no single expert could find alone. Prince William Water embeds co-learning into the commissioning process itself, building the twin while training operators and capturing knowledge as it's created. Discussion focuses on workforce implications, what changes for operator roles, how these systems fit into existing operations, and what it takes to get started.

Learning Objectives

At the end of this session, participants will be able to:

1) Describe three types of learning that become possible when operators work alongside AI agents: learning from, learning with, and co-discovery
2) Articulate how agentic digital twins can preserve institutional knowledge and accelerate operator development
3) Identify opportunities at their own facilities where human-agent collaboration could address knowledge transfer challenges
4) Discuss workforce implications, including how agent-operator partnerships change training, career development, and daily operations

Lead Facilitator Keaton Lesnik, Eaos

3:30 PM	**Three Types of Learning for the Future Workforce** Keaton Lesnik, Eaos
3:35 PM	**Learning from the Agent: Cognitive Apprenticeship** Haydee De Clippeleir, DC Water & Sewer Authority; Todd Wingers, Metro Water Recovery
4:15 PM	**Learning Together: Co-Discovery During Commissioning** Rachel Carlson, Prince William Water
4:35 PM	**Panel Discussion: The Future Workforce and Human-Agent Collaboration**
4:55 PM	**Closing Remarks** Keaton Lesnik, Eaos

Keys to Successful Renewable Natural Gas Project Delivery

Wednesday, May 13th 3:30 – 5:00 PM

This session highlights methods to accelerate renewable natural gas (RNG) project implementation while managing financial, technical, and market risks. Presentations will include lessons from biogas sales contracts, alternative project delivery models, and case studies of RNG production for pipeline injection. The session will also provide insights into avoiding common mistakes that can delay RNG projects.

Interactive Session | Panel Discussion

Learning Objectives

At the end of this session, learners will be able to:

1) Describe delivery strategies for renewable natural gas (RNG) project acceleration.
2) Identify approaches to reduce risk in project development and implementation.
3) Evaluate best practices for biogas contracting, sales agreements, and market integration.

3:30 PM	**De-Risking and Accelerating RNG Projects via Alternative Delivery** Eider Alvarez-Puras, Johnson Controls CoAuthor(s): A.Kontorousis, Johnson Controls; A.Sheposh; J.VanVoorhis, Mead & Hunt
3:50 PM	**Lessons Learned from Biogas Sales Contracting: Success Stories and Pitfalls from Selling Biogas into the RNG Market** Pranoti Kikale, Arcadis, U.S., Inc.; Patrick Ludwig, City of Dayton WWTP

CoAuthor(s): E.Auerbach, Arcadis; P.Kube, Arcadis, US Inc; P.Ludwig, City of Dayton WWTP; J.Rosentel, Capital Region Water

4:10 PM **San Francisco Converting Biogas to RNG for PG&E Pipeline Injection**
Yueyun Tse, Black & Veatch; Dorothy Ching, Veolia
CoAuthor(s): D.Ching, Veolia; B.Wong, Stantec Inc.; J.Pendergrass; D.Wright, PCL Construction, Inc; D.Brandao, San Francisco Public Utilities Commission

4:30 PM **Panel Discussion**

Lessons Learned in Deammonification/ANAMOX Sidestream Treatment

Wednesday, May 13th 3:30 – 5:00 PM

This session examines how sidestream nitrogen removal enables facilities with thermal hydrolysis and anaerobic digestion to manage increased and variable nitrogen recycle loads. Through full-scale and pilot-scale case studies, presenters share lessons learned from design, startup, and long-term operation of ANAMOX and two-stage PN-ANAMOX systems. The session highlights how filtrate quality, solids management, process control, and operational flexibility affect system stability and recovery from upsets.
Interactive Session | Facilitated Discussion

Learning Objectives

At the end of this session, learners will be able to:
1) Identify common start up challenges, including inhibition events, biomass loss, and nitrite accumulation.
2) Evaluate impacts of low ammonia loading, high centrate TSS, polymer carryover, and dissolved oxygen on deammonification performance.
3) Apply lessons learned from pilot operation to inform full-scale design and risk management for challenging sidestream applications.

Lead Facilitator Kyle Stern, Kiewit

3:30 PM **Lessons Learned from Deammonification Startup treating THP Filtrate at two WRFs**
David Wankmuller, Hazen and Sawyer
CoAuthor(s): E.Bailey, City of Raleigh; S.Fuentes, Washington Sanitary Subruban Commission; L.Li, Veolia Water

3:45 PM **Facilitated Discussion**

4:00 PM **Experience and Lessons Learned in Design, Construction and Operation of the First Deammonification System in Central USA**
Larry Li, Veolia Water; Anjana Kadava, Johnson County Wastewater; James Fitzpatrick, Black & Veatch
CoAuthor(s): A.Kadava, Johnson County Wastewater; J.Fitzpatrick, Black & Veatch; C.Ruff,

4:15 PM **Facilitated Discussion**

4:30 PM **Pilot-scale Demonstration of a Two-stage Anammox Process Under High C:N ratio (2-5) Influent Condition**
Umesh Ghimire, Tomorrow Water; David Rhu, Tomorrow Water
CoAuthor(s): D.Rhu, Tomorrow Water; S.J.Kang; A.Kaldate, Tomorrow Water; T.Oh; J.Lipe,

4:45 PM **Facilitated Discussion**

Low DO Operations Flip the Script on Traditional BNR

Wedensday, May 13th 3:30 – 5:00 PM

This session will demonstrate how some facilities are bucking conventional wisdom by operating at low DO in aerobic zones to promote denitrification with less pumping energy and less carbon inputs, and to promote more stable EBPR. Two case studies also highlight the intensification benefits of pairing Low DO operation with densification via kinetic selection and physical selection.

Learning Objectives

At the end of this session, learners will be able to:
1) Understand how facilities are attempting operations at low DO to achieve denitrification without internal recycle pumping, thus achieving energy savings.
2) Explain cutting-edge research that bucks conventional wisdom that higher DO improves biological phosphorus removal, showing instead that PAOs perform best at very low DO and are inhibited at high DO.
3) Understand how some utilities are attempting operations at low DO to achieve denitrification via shortcut nitrogen removal, thus achieving carbon savings.

3:30 PM **Intensifying BNR with Low DO and DAS: Lessons from Startup**
Sara Arabi, Stantec Inc.; Pusker Regmi, Stantec Inc.; Cole Sigmon, City of Boulder
CoAuthor(s): C.Sigmon, City of Boulder; C.Marks, City of Boulder; B.Janoka, City of Boulder; P.Regmi, Stantec Inc.; S.Trujillo; N.Brown, Stantec Inc; N.Lakshminarasimman, University of Michigan

4:00 PM **Why Does Low Dissolved Oxygen Favor Biological Phosphorus Removal? Oxygen Inhibition of PAOs Is An Important Part of the Story**
Lilian McIntosh, HRSD
CoAuthor(s): K.McCullough, HRSD; A.Gagnon, HRSD; S.Klaus, HRSD; C.Bott, HRSD

4:30 PM **Synergistic Process Intensification Via Densification, Mainstream Anammox, and Low DO Operation Under Mainstream Conditions**
Cyrus Li, Virginia Tech
CoAuthor(s): Y.Sun, Hazen and Sawyer; W.Khunjar, Hazen and Sawyer; S.Rivera, Hazen and Sawyer; K.Platt, Upper Occoquan Service Authority; E.Schlosser, Upper Occoquan Service Authority; D.Hague, Upper Occoquan Service Authority; B.Steglitz, Upper Occoquan Service Authority; Y.Duan, Virginia Tech; Z.Liao, Virginia Polytechnic Institute and State University; Z.Wang, Virginia Tech

Thermal Drying in Biosolids Planning and Management

Wednesday, May 13th 3:30 – 5:00 PM

This session explores the roles of thermal drying as part of biosolids management planning. The types of thermal drying technologies available, and selection criteria.
Interactive Session | Facilitated Discussion

At the end of this session, learners will be able to:
1) See examples of how utilities employing thermal drying for planning and biosolids management.
2) Learn about different types of thermal dryers and vendors, the key in comparisons.
3) See examples of how thermal drying is applied to address future growth and increased plant loadings.

Lead Facilitator Kwok-Wai Tsang, CDM Smith

3:30 PM **Burn It or Dry It? MSD's Path Forward for Solids Management**
Ruth Borgmann, Hazen and Sawyer
CoAuthor(s): J.Yeh, Hazen and Sawyer; C Bullard, Hazen and Sawyer

3:45 PM **Facilitated Discussion**

4:00 PM **Drying for the Future: Selecting the Right Technology for Rogers Water Utilities**
Suzie Carpenter, Black & Veatch; Todd Beaver, Rogers Water Utilities - Pollution Control
CoAuthor(s): J.Keller, Black & Veatch; J.Durham, Hawkins-Weir Engineers, Inc.; T.Beaver, Rogers Water Utilities - Pollution Control

4:15 PM **Facilitated Discussion**

4:30 PM **Meeting the Moment: A Comprehensive Thermal Drying Program for Growth, Industrial Loadings, and Class A Biosolids**
Travis Calhoun, Columbus City Utilities; Maritza Villalobos Tempest, Strand Associates, Inc.
CoAuthor(s): M.Villalobos Tempest, Strand Associates, Inc.

4:45 PM **Facilitated Discussion**

Young Professional Session

Wedensday, May 13th 3:30 – 5:00 PM

This session is designed to engage students and young professionals at the conference and provide them an opportunity to increase their network and engagement in the wastewater engineering field and WEF activities. The session include an introduction to WEF SYPC and YP engagement across WEF committees as well as a panel of 'senior' young professionals who will share their experiences, insights, and advice on navigating the early stages of a career in water.

Learning Objectives

1) Identify and explore opportunities for increased involvement in WEF.
2) Provide knowledge to foster both career and technical growth for YPs in the industry.
3) Create opportunities for YPs to build their peer-network within WEF, increasing likelihood of continued engagement in the community.

Lead Facilitator Madeleine Fairley-Wax, Jacobs

3:30 PM **Conference 101 and WEF Involvement Presentation**

4:00 PM **YP Panel and Open Networking**

Farming for RNG: Topics on AD for Agriculture

Thursday, May 14th 8:30 – 10:00 AM

The American Biogas Council will start this session off with an update on the state of anaerobic digestion in the agriculture industry. This will be followed by a few presentations related to research and technology focused on agricultural applications.

Learning Objectives

At the end of the session, learners will be able to:
1) Understand the current state and trajectory of the agricultural AD industry.

2) Evaluate the feasibility of per-treatment technologies for manure feed stock.
3) Recognize the potential for side-stream products like VFAs from agricultural wastewater.

Moderator Erik Larson, Vaughan Company Inc.

8:30 AM **Invited Speaker: American Biogas Council**

9:00 AM **Success of Arrested Anaerobic Digestion to Treat Variable Swine Wastewater at Different pH for Volatile Fatty Acids (VFAs) Production**
Caitlin Swope, Kansas State University; Huu Tuan Tran,
CoAuthor(s): P.Parameswaran, Kansas State University; H.Tuan Tran,

9:30 AM **Expanding the Feasibility of On-Farm Anaerobic Digestion Operations: An Innovative Application of Thermal-Alkaline Hydrolysis and Combined Digestion and Storage of Livestock Manures**
Kelly Ward, Lystek International
CoAuthor(s): A.Singh, Lystek; M.Beswick, Lystek; S.Mason-Renton, Lystek; K.Bell

Small Particles, Big Gains: Engineering the Ingredients for Intensification

Thursday, May 14th 8:30 – 10:00 AM

This technical session highlights how WRRFs can do more with the same tanks by leveraging key biological and physical selective pressures. Presentations span full-scale modeling of densified activated sludge systems, bench-scale evaluation of pathogen removal in aerobic granular sludge, and field and laboratory investigations of low-DO simultaneous nitrification-denitrification. Together, the studies demonstrate how diffusion-driven microenvironments enable stacked biological functions, decouple performance from conventional SRT and DO constraints, and improve resilience, energy efficiency, and treatment capacity. The session provides mechanistic insight and practical guidance for engineers, operators, and researchers seeking scalable, granulation-based strategies for modern WRRF intensification.

Learning Objectives
At the end of this session, learners will be able to:
1) Understand how key selective pressures enable process intensification by decoupling bulk SRT, DO, and hydraulic constraints from biological performance through diffusion-driven microenvironments.
2) Evaluate how floc size, diffusion resistance, and selection mechanisms influence nitrification, simultaneous nitrification-denitrification, and pathogen removal under low-DO and high-rate operating conditions.
3) Apply modeling, bench-scale, and full-scale insights to assess when process intensification strategies can improve treatment capacity, energy efficiency, and resilience in existing WRRF infrastructure without major expansion.

8:30 AM **SND: Why You Should Believe**
Gretchen Gutenberger, Black & Veatch
CoAuthor(s): L.Downing, Black & Veatch; S.Sadreddini, Black & Veatch; T.Biese, New Water, Green Bay Metro Sewerage District; J.Watson, New Water, Green Bay Metro Sewerage District; S.Elger, EnviroMix; J.Koch, EnviroMix; T.Jordan, EnviroMix

9:00 AM **Modeling Granule and Floc Dynamics in Full-scale Densified Activated Sludge System**
Yewei Sun, Hazen and Sawyer; Rudy Maltos, Metro Water Recovery

CoAuthor(s): R.Maltos, Metro Water Recovery; N.Love, Metro Water Recovery; T.Rauch-Williams, Metro Water Recovery; D.Freedman, Metro Water Recovery; K.Florence, Hazen and Sawyer; A.Mayer, Hazen and Sawyer; R.Latimer, Hazen and Sawyer; W.Khunjar, Hazen and Sawyer

9:30 AM **Investigating the Impact of Ciliate Protozoal Grazing of Escherichia Coli in Aerobic Granular Sludge Under Variable DO and Substrate Conditions**
Snigdha Bardhan, University of Kansas; Belinda Sturm, University of Kansas; Snigdha Bardhan, University of Kansas
CoAuthor(s): Y.Hiripitiyage, University of Kansas; I.Mutema, University of Kansas; B.Sturm, University of Kansas

The Machines are Learning! Establishing Frameworks for Data-driven Machine Learning Applications in Wastewater Treatment

Thursday, May 14th 8:30 – 10:00 AM

8:30 AM **Interpretable Machine Learning for Nitrogen Removal, Energy Recovery, and Biosensing in Advanced Wastewater Systems**
Soyoung Park, Washington University in St. Louis
CoAuthor(s): Z.He, Washington University in St. Louis

9:00 AM **Facilitated Discussion #1**

9:15 AM **Machine Learning Based Prediction of Nitrous Oxide Emissions in Biological Wastewater Treatment using Multi-Decadal Datasets**
Gnanaraj Augustine, Columbia University; Kartik Chandran,
CoAuthor(s): K.Chandran

9:45 AM **Facilitated Discussion #2**

Understanding a Variety of Biofilm Applications

Thursday, May 14th 8:30 – 10:00 AM

8:30 AM **Integrating Fixed-Film Biofiltration into Primary Treatment Processes**
Victory Fiifi Dsane, Tomorrow Water; Yuanbin Wu, Caliskaner Water Technologies
CoAuthor(s): D.Rhu, Tomorrow Water; S.J.Kang; D.Dursun, Caliskaner Water Technologies; O.Caliskaner, Caliskaner Water Technologies; G.Daigger, University of Michigan; Y.Wu, Caliskaner Water Technologies

9:00 AM **Facilitated Discussion #1**

9:15 AM **Oligochaete Proliferation as an Ecological Indicator of Chronic Underloading in a Biofilm Rotating Biological Contactors Process**
Jake Hunt, Arcadis, U.S., Inc.

9:45 AM **Facilitated Discussion #2**

Biofilms and Membranes Had the Ultimate Baby: MABR

Thursday, May 14th 10:30 AM – 12:00 PM

With the multitude of process intensification technologies, membrane aerated bioreactors (MABR) have become at the forefront of innovation. The session provides insight on addressing an existing plant's capacity by electing to utilize MABR, performance results from a MABR pilot, and controlling biofilm thickness using a soft sensor analysis. The session provides MABR piloting performance results while understanding operational lessons. Attendees are invited to learn about approaches for their own facilities and to understand operational considerations.
Interactive Session | Facilitated Discussion

Learning Objectives
At the end of this session, learners will be able to:
1) Learn about drivers and considerations of implementing MABR at an existing plant with increasing organic loading.
2) Evaluate nitrification performance and operational lessons from an MABR pilot.
3) Understand how to best control biofilm thickness in MABR via soft sensor controls.

10:30 AM	**Impossible is Nothing: MABR Making it Possible** Eric Redmond, Black & Veatch CoAuthor(s): T.Ho; P.Salekar, Black & Veatch; T.Davies, Trinity River Authority of Texas; J.Nash, Black & Veatch; D.Coutts; M.Reeve, Veolia Water; M.Suarez; L.Downing, Black & Veatch
10:45 AM	**Facilitated Discussion**
11:00 AM	**Using Fingerprint Soft Sensor to Control Biofilm Thickness in MABRs** Yi Cao, Carollo Engineers CoAuthor(s): G.Daigger, University of Michigan
11:15 AM	**Facilitated Discussion**
11:30 AM	**Piloting MABR Under Real-World Operating Constraints: Operational Lessons for Nitrogen Removal** Dana Gonzalez, Carollo Engineers CoAuthor(s): K.Rathore, Carollo Engineers; N.Kowal, Carollo Engineers; A.Conklin, Carollo Engineers; A.Toth, Veolia; M.Reeve, Veolia Water
11:45 AM	**Facilitated Discussion**

Next-Generation Biosolids Conditioning Approaches

Thursday, May 14th 10:30 AM – 12:00 PM
This session highlights emerging conditioning approaches that improve dewatering performance while supporting nutrient management and lifecycle cost control. Speakers will present on bench-scale anaerobic digestion results demonstrating phosphate and sulfide sequestration using micronized steel slag as a lower-hazard alternative to soluble iron salts, including polymer compatibility and dewatering kinetics; full-scale centrifuge trials showing how nanobubble-conditioned polymer makedown water can enhance polymer activation and shift the dose/response curve to reduce active polymer requirements while maintaining dewatering performance; and a full-scale case study applying nanobubble enhanced polymer hydration to improve thickening and dewatering outcomes under variable influent conditions. Together, these

presentations provide a glimpse into work being done for utilities seeking low-footprint innovations that increase dewatering performance.

Learning Objectives
At the end of this session, learners will be able to:
1) Describe the mechanisms and operational implications of phosphate and sulfide control in anaerobic digestion using micronized steel slag versus conventional ferric addition, including effects on alkalinity and scaling risk.
2) Explain how nanobubbles can influence polymer hydration and activation and how this translates to improved floc bridging, capture efficiency, and polymer usage.
3) Assess where these innovations fit within biosolids treatment goals, including chemical cost reduction, hauling and disposal cost impacts, resilience to influent variability, and potential pathways for nutrient recovery.

10:30 AM **Isolating Dewatering Potential and Rheological Factors of Next Generation Iron Salt Replacements for Sustainable Nutrient Recovery from Anaerobic Digester Biosolids**
Mark Hernandez, Green Steel Environmental; Jonathan Teaford, Green Steel Environmental
CoAuthor(s): J.Teaford, Green Steel Environmental; J.Jonis, Green Steel Environmental; A.Lingaraj, Green Steel Environmental

11:00 AM **Reducing Polymer Use and Sludge Handling Costs with Nanobubble-Conditioned Makedown Water**
Chris Maher, Clean Water Services; John Crisman, Moleaer
CoAuthor(s): J.Crisman, Moleaer; R.Murnane, Moleaer

11:30 AM **Reducing Polymer Demand and Increasing Cake Solids Using Nanobubble-Enhanced Polymer Activation**
Gary Hunter, Black & Veatch; Daniel Fahr, Greer CPW
CoAuthor(s): D.Fahr, Greer CPW; J.Crisman, Moleaer; B.Gobburi, Moleaer; K.Schoenheit, Xylem; C.Beazley, Xylem; L.Herrera Estrada, Black & Veatch

Operation Optimizations: Predictions, CFD Modeling, and Training

Thursday, May 14th 10:30 AM – 12:00 PM

10:30 AM **AI on Tap: Revolutionizing Influent Flow Forecasting with Ensemble Learning**
Erin Amoueyan, Stantec

11:00 AM **Facilitated Discussion #1**

11:15 AM **Using CFD to Optimize the BNR Treatment Process**
Carrie Knatz, CDM Smith
CoAuthor(s): S.Reddy, CDM Smith; A.Doody, CDM Smith; R.Maal-Bared, CDM Smith

11:45 AM **Facilitated Discussion #2**

THP Process Optimization, GHG Reduction and Other Benefits

Thursday, May 14th 10:30 AM – 12:00 PM

The session will describe the THP process and its benefits associated with anaerobic digestion. The presentations will describe ways to optimize the process and the effect it can have on the production of biogas the reduction of GHG along with while producing a more stable material.

Learning Objectives

At the end of this session, learners will be able to:

1) Describe the Thermal Hydrolysis Process (THP)benefits anaerobic digestion and improves performance.

2) Explain the Thermal Hydrolysis Process (THP)prior to anaerobic digestion impacts GHG Emissions.

Moderator Mark Lang,

10:30 AM **Enhancing Digester Performance: Pretreatment Approaches for Improved Volatile Solids Reduction and Biogas Enhancement**
Jared Alder, SUEZ

11:00 AM **Full-Scale Thermal Hydrolysis Optimization: Impact on Refractory Organics and Anaerobic Digestion Robustness**
Mathieu Haddad, SUEZ
CoAuthor(s): C.Africano Avenda, SUEZ; P.Duque Diaz, CRITT-GPTE / TBI; X.Lefebvre, CRITT-GPTE / TBI; J.Garrigues, CNRS

11:30 AM **Biodrying of THP Cake: The Energy and GHG Reduction Story**
Adrian Romero, Jacobs Solutions Inc.
CoAuthor(s): Z.Alexander; J.A.Funk; E.Shen, Jacob