



Residuals and Biosolids Conference 2020

Technical Program

(Updated January 22, 2019)

**March 31 – April 3
Minneapolis Convention Center
Minneapolis, MN**

This conference is organized by the Water Environment Federation in cooperation with the Central States Water Environment Association and the Water Research Foundation (WRF).

Pre-Conference Workshops

Additional fees apply

Workshop A: Dewatering Optimization Workshop - Practical Ways to Improve Performance

Tuesday, March 31, 2020

8:30 AM – 5:00 PM

The Dewatering Optimization – Practical Ways to Improve Performance workshop will focus on practical solutions to increase dewatering performance including drier cake solids, better solids capture, reduced polymer consumption, and reduced O&M costs for dewatering processes. The information from the workshop will provide municipal attendees the knowledge and resources to better perform their jobs with lower O&M costs, consultants to provide more informative and better dewatering equipment advice and manufacturers to provide better and more optimum machine performance at lower O&M costs.

David Oerke, Jacobs; Matthew Higgins, Bucknell University; Adam Parmenter, HDR; Yong Kim, USGI Chemical Feed; Mike Gates, Chris Maher, Clean Water Services; Ken Tagney, Eastern Municipal Water District; Rashi Gupta, Carollo; George Tichenor, SNF Holding Co.

Workshop B: Seeking the Skinny on Sludge: MOP-8 Stabilization Fundamentals

Tuesday, March 31, 2020

8:30 AM – 5:00 PM

This workshop features authors of the MOP-8 chapter on stabilization and will provide a base of knowledge around fundamentals of stabilization processes (such as design, operation, and construction) so that attendees can incorporate principals learned into their mission in the workplace.

Topics covered in the workshop:

- Comparison of stabilization methods
- Process objectives
- Process fundamentals such as microbiology
- Design fundamentals such as common design parameters and sizing criteria
- O&M considerations such as equipment and instrumentation and controls
- Construction considerations

Jeff Coyne, Hazen and Sawyer; Christopher Muller, Brown and Caldwell; Matthew Williams, Westech, Inc.; Stephanie Spalding, HDR; Paul Bizier, Barge Solutions; Todd Williams, Jacobs; Jay Surti, Hazen and Sawyer

Pre-Conference Workshops

Additional fees apply

Workshop C: Fundamentals of Digestion using Process Simulators

Tuesday, March 31, 2019

8:30 AM – 5:00 PM

As the current utility workforce ages, new training techniques are needed for the next generation of O&M professionals. This workshop will present hands-on operator training incorporating the fundamentals of anaerobic and aerobic digester process operation and troubleshooting augmented with participants using process simulators to demonstrate responses to system loading and operational changes. Each lecture module in the program will be accompanied by participants being led through a series of simulations that will provide examples of system performance including troubleshooting. The simulator platform used does not require any prior experience with modeling software.

Paul Dombrowski, Woodard & Curran; Jeanette Brown, Manhattan College

Workshop D: Communicating about Emerging Contaminants in Biosolids

Tuesday, March 31, 2020

8:30 AM – 12:00 PM

This workshop will provide the practical tactics needed to engage on the urgent communications needs around emerging contaminants, with a focus on PFAS. Participants will learn about the fundamentals and techniques of public health risk communications and crisis communications, and how to apply them in the water sector. The workshop will provide a window into the responses to recent biosolids concerns around the country, such as in Maine, and share valuable lessons learned. Participants will be presented with a toolkit of resources that can be used to conduct communications on biosolids and emerging contaminants, including for the media, digital, advocacy, and public engagement. This workshop will be led by national experts in risk, crisis, and biosolids communications.

Travis Loop, Water Environment Federation

Workshop E: Greenhouse Gas Accounting for Wastewater Utilities

Tuesday, March 31, 2020

1:30 PM – 5:00 PM

Participants in the GHG Accounting workshop will learn how to calculate GHG emissions and offsets for water resource recovery facilities (WRRFs), and gain insight into the best ways to optimize their WRRFs to reduce their carbon footprint. The workshop will be split into two main sections: 1) participants will learn about the latest policies and research relevant to GHG accounting, and 2) participants will engage on hands-on GHG accounting exercises.

Christine Polo, Carollo; Bill Brower, WeCare Denali; Rebecca Ryals, University of California, Merced; Fabrizio Sabba; John Willis, Brown and Caldwell; Sarah Deslauriers, Carollo; Maile Lono-Batura, Northwest Biosolids

Facility Tours

Additional fees apply

Tour A: Ensuring Sustainable and Reliable Solids Management for the Future at MCES

April 2, 2020

1:00 PM – 4:30 PM

MCES's Metropolitan Wastewater Treatment Plant in Saint Paul is the largest wastewater treatment facility in Minnesota, receiving ~170 mgd (26,800 m³/hr) of influent flow and processing ~240 dtpd (9,070 kg/hr) of biosolids in 2018. The plant has been incinerating wastewater solids for 80 years and has one of the most advanced and highest-performing air pollution control systems in the country. Now, MCES is planning for the future, with plans to spend \$180 million to add a fourth incinerator and renew its existing solids treatment facilities to ensure operational reliability and continued minimal impact on the surrounding community and the environment. The presentation and tour will discuss our customized project communications tools (<https://metro council.org/metrosolids>) and will highlight MCES' objectives including: Maintaining Exceptional Air Quality, Recovering Energy, Ensuring Cost Effectiveness, Keeping Greenhouse Gas Emissions Low, and Ensuring Overall Low Impact.

Tour B: What's Beer Got to Do With It - St. Cloud's Nutrient, Energy & Water Recovery Facility

April 3, 2020

12:00 PM – 4:00 PM

Come see what St. Cloud Minnesota is doing to recover nutrients, energy and water. Stations will be set up around the facility sharing information related to solar impacts, energy management, phosphorus recovery, biosolids reuse, energy recovery, high strength waste program, energy efficiency, innovative financing and water quality improvements.

Session 01: The Science of PFAS
Wednesday, April 1, 1:30 PM - 4:45 PM

- 1:30 PM** **An Investigation of PFAS: Public Health and the Environment**
Joshua Burns, Eamon Twohig, Vermont Department of Environmental Conservation
- 2:00 PM** **A Statewide Per- and Polyfluoroalkyl (PFAS) Assessment of Wastewater Treatment Plants in Michigan**
Dorin Bogdan, Beverley Stinson, AECOM
- 2:30 PM** **PFAS Wastewater Residuals Fate and Transport Model Evaluation: Strengths and Weaknesses of Available Models to Characterize the Fate and Transport of PFAS from Land-Applied Wastewater Residuals**
Chris Shepherd, Arcadis
- 3:00 PM** **Networking Break**
- 3:45 PM** **Thermal Treatment of PFAS Contaminated Sludge: Experimentation, Design Consideration and Challenges**
Sudhakar Viswanathan, Veolia; Rich DiMassimo, Kruger Inc; Hong Zhao, Veolia Water/Kruger; Tom Perry, VEOLIA; Takahiro Yamada, Moshan Kahandawala, Alexander Morgan, University of Dayton Research Institute
- 4:15 PM** **Smoldering Combustion: An Alternative for Management of Biosolids Containing PFAS**
Laura Kinsman, Gavin Grant, Cody Murray, Savron; Tarek Rashwan, Taryn Fournie, Jason Gerhard, University of Western Ontario
- 4:45 PM** **Session Adjourns for Networking Reception**
- Alternate:** **Communicating PFAS in Biosolids**
Michael McGill, WaterPIO

Session 02: Biosolids Management Success Stories
Wednesday, April 1, 1:30 PM - 4:45 PM

- 1:30 PM** **Planning for the Future While Managing a Successful Biosolids Program**
Engin Guven, Black & Veatch; Mike Engelmann, Pinellas County Utilities; Greg Knight; Megan Ross, Pinellas County Utilities; Michael Tache, Black & Veatch
- 2:00 PM** **A Year-Three Update on DC Water's Bloom Sales Program Methods and Results**
Saul Kinter, James Fotouhi, Chris Peot, DC Water
- 2:30 PM** **How to do Land Application Right; A Case Study Illustrating the Elements of Omaha's Outstanding Land Application Program**
Trudy Johnston, Lisa Challenger, Material Matters, Inc.
- 3:00 PM** **Networking Break**
- 3:45 PM** **Keeping it Simple (at least trying to) – Salt Lake City's Biosolids Plan**
Charles Goss, AECOM; Michelle Barry; Jamey West, City of Orem; Paul Barsalou, James Marx, AECOM
- 4:15 PM** **Improving System-Wide Flexibility through Holistic Biosolids Planning for the Metropolitan District of Greater Cincinnati**
Natalie Sierra, Brown and Caldwell; Matthew Spidare, Metropolitan Sewer District of Greater Cincinnati; Tracy Chouinard, John Ross, John Willis, Timothy Koch, Brown and Caldwell
- 4:45 PM** **Session Adjourns for Networking Reception**
- Alternate:** **Why Should We Accept This? Are Their Feelings Hurt? The Cost to Dispose of Sludge Goes Up Dramatically for the City of Atlanta leading to the Implementation of a Sludge Management Plan**
Quinton Fletcher, City of Atlanta

Session 03: Intensification and Advanced Topics in Anaerobic Digestion
Wednesday, April 1, 1:30 PM - 4:45 PM

- 1:30 PM** **Evolution of TPAD Systems in the US**
Perry Schafer, Thomas Chapman, Steven Krugel, John Willis, Christopher Muller, Lloyd Slezak, Brown and Caldwell
- 2:00 PM** **Anaerobic Digestion Process Intensification Using Temperature-Phased Anaerobic Digestion and Thermal Hydrolysis**
Dian Zhang, Virginia Tech; Mary Strawn, Arlington County; Zhi-Wu Wang, Virginia Tech; Thomas Broderick, Loudoun Water; Hari Santha, Alexandria Renew Enterprise
- 2:30 PM** **Finding the “Right-Fit” Digestion Solution for WSSC’s THP Project Balancing Design Requirements**
Amy Hanna, Hazen and Sawyer; Kevin Selock, WSSC; Matthew Vanhorne, Hazen and Sawyer; Stanley Dabek, WSSC; C. Michael Bullard, Hazen & Sawyer; Joseph Uglevich, Stantec
- 3:00 PM** **Networking Break**
- 3:45 PM** **Data Consolidation and Predictive Modeling Approaches for Multi-Feed Anaerobic Digestion**
Alex Rosenthal, Inctrl Solutions Inc.; Oliver Schraa, Hydromantis; Michael Ogurek; Mirzaman Zamanzadeh; Leiv Rieger, Ivan Miletic, Inctrl Solutions Inc.
- 4:15 PM** **State Estimation in Anaerobic Digesters - Identification of Patterns in Anaerobic Digestion**
Christian Hubert, Bettina Steiniger, Christian Schaum, Universität der Bundeswehr München
- 4:45 PM** **Session Adjourns for Networking Reception**
- Alternate:** **The History and Development of Thermal Hydrolysis and Advanced Anaerobic Digestion in the United Kingdom**
John Ord, John Maclaren, Stantec
- Alternate:** **Shared US and UK Experiences on Optimizing Anaerobic Digestion Following Thermal Hydrolysis. An Additional Factor to be Considered**
Keith Panter, Cambi; Matthew Higgins, Bucknell University; William Barber, Cambi; Paul Fountain, Achame Shana, Thames Water

Session 04: Thermal Processes
Wednesday, April 1, 1:30 PM - 3:00 PM

- 1:30 PM** **Pilot-Scale Demonstration of Intensified Anaerobic Digestion through Thermal Hydrolysis Pre-Treatment at the Moccasin Bend WWTP**
Nicole Stephens, Stantec; Sudhakar Viswanathan, Veolia; Rich DiMassimo, Kruger Inc; Harold Schmidt; Gabriel Perez, Jeffrey Rose, City of Chattanooga
- 2:00 PM** **Effect of Thermal Hydrolysis Pretreatment on Recalcitrant Dissolved Organic Nitrogen Contents Quantified after Anaerobic and Aerobic Treatment**
Dian Zhang, Zhaohui An, Virginia Tech; Mary Strawn, Arlington County; Zhi-Wu Wang, Virginia Tech
- 2:30 PM** **Pyrolysis of Biosolids: Contaminant Removal but Generation of Toxic Products?**
Patrick McNamara, Marquette University; Zhongzhe Liu, California State University - Bakersfield; Seyedehfatemeh Seyedi, Daniel Zitomer, Marquette University
- 3:00 PM** **Session Adjourns for Networking Break**
- Alternate:** **One year On: Thermal Hydrolysis with Phosphorus Recovery at Kenneth W Hotz Wastewater Treatment Plant**
Dawn Taylor, Medina County Sanitary Engineers; Bill Barber, Benn Astbury, CAMBI Inc; Paul Christy, RDP Technologies

Session 05: Recuperative Thickening
Wednesday, April 1, 3:45 PM - 4:45 PM

- 3:45 PM** **Integrated Solids Management with Recuperative Thickening at Al Warsan STP in Dubai, UAE**
Ersin Kasirga, GHD; Ahamed Ifthikar, Parsons
- 4:15 PM** **Recuperative Thickening Opportunities to Increase Capacity and Revenue; A Series of Case Studies**
Christopher Muller, Brown and Caldwell; Robert Wimmer, Energy Systems Group; Seppi Hennemann, Brown and Caldwell; Brian Bokkin, City of Santa Rosa
- 4:45 PM** **Session Adjourns for Networking Reception**
- Alternate:** **Co-Thickening or Recuperative Thickening: Which Process is the Better Approach to Increase Digester Capacity for Sunnyvale, CA**
Steve Hogg, City of Sunnyvale; David Oerke, Kathy Rosinski, Ryan Campbell, Cory Lancaster, Jacobs Engineering

Session 06: Optimizing Biosolids Processes
Thursday, April 2, 8:30 AM - 11:45 AM

- 8:30 AM** **Going Vertical: Simplifying Dewatering by Minimizing Cake Conveyance**
Adam Parmenter, HDR, Inc; Kent Brugler, City Of Westminster - Public Works;
Teigan Gulliver, HDR, Inc
- 9:00 AM** **Application of Sludge Rheology in Solids Systems Design, Planning, and Operation**
Tracy Chouinard, Brown and Caldwell; Shubhashini Oza; Donnie Stallman;
Christopher Muller, Steven Krugel, Brown and Caldwell
- 9:30 AM** **Apollo Root Cause Analysis for Extending Belt Filter Press Belt Life**
Scott Hardy, C. Michael Bullard, Hazen & Sawyer; Scott Taylor, David Brewster,
Matthew Jalbert, Trinity River Authority
- 10:00 AM** **Networking Break**
- 10:45 AM** **Online Instruments for Dewatering Centrifuge Optimization**
Adrienne Menniti, Michael Idehara, Mike Gates, Clean Water Services
- 11:15 AM** **NEORSD Southerly WWTC Biosolids Combustion Optimization**
Lloyd Winchell, Brown and Caldwell; Douglas Reichlin; Kathryn Crestani,
- 11:45 AM** **Session Adjourns for Networking Luncheon in Exhibit Hall**
- Alternate:** **Challenges of Starting Up a Biosolids to Energy Temperature-Phased Anaerobic Digestion System**
Anand Mody, Michael Beattie, Brown and Caldwell; Lisa Glover, City of St. Petersburg

Session 07: Energy Production - Making it Work - Economics, Regulations, Equipment, Gas Quality

Thursday, April 2, 8:30 AM - 11:45 AM

- 8:30 AM** **Making Cogeneration Economics Work in the Today's US Electric Market**
Eric Auerbach, Arcadis; Todd Krenelka, City of Columbus Department of Public Utilities
- 9:00 AM** **SCR We There, Yet? Making Engine Projects Work Within An Increasingly Strict Regulatory Environment**
William Pevec, Kenneth Klittich, Brown and Caldwell
- 9:30 AM** **Next Generation Resource Recovery Update: Startup and Construction of the Co-Digestion to Renewable Natural Gas (RNG) Pipeline Injection Project at the Des Moines WRF**
Dustin Craig, Laurel Schaich, CDM Smith; Patrick Brown, Melissa Schlickbernd, Des Moines Wastewater Reclamation Authority; Larry Hare, City Of Des Moines
- 10:00 AM** **Networking Break**
- 10:45 AM** **Road Trip II: Start (Selecting) Your Engines!**
Daniel Hull, John Willis, Brown And Caldwell; Robert Taylor, WSSC - Production Team; Jeremy Holland, HDR Engineering Inc
- 11:15 AM** **Process Understanding of Full-scale Micro-aeration to Improve Biogas Quality and Anaerobic Digestion**
Adrian Romero, Jacobs; Josef Cesca, Jacobs; Derek Van Rys; Bruce Johnson, Jacobs; Bart Kraakman, CH2M
- 11:45 AM** **Session Adjourns for Networking Luncheon in Exhibit Hall**
- Alternate:** **Experiences and Lessons Learnt from Co-Digestion with Thermal Hydrolysis**
William Barber, Paul Christy, Cambi Inc
- Alternate:** **Coney Island Digester Gas System Hydraulics and Mass Flux Evaluation**
Joshua Registe, Kenneth Smith, CDM Smith

Session 08: Codigestion of Food Waste and Sludge
Thursday, April 2, 8:30 AM - 11:45 AM

- 8:30 AM** **City of Sunnyvale Holistic Approach to Future Food Waste Handling and Codigestion**
Irina Lukicheva, Jacobs Engineering; Stephen Hogg, City of Sunnyvale; Cory Lancaster, David Parry, Jacobs Engineering
- 9:00 AM** **Co-Digestion of Sewage Sludge and Food Waste with Previous Waste Treatment**
Agne Cunha, Magali Cammarota, Isaac Volschan, UFRJ
- 9:30 AM** **Assessing the Impact of Food Waste Addition on the Liquids Treatment at the City of Los Angeles' Hyperion Water Reclamation Plant**
Zakir Hirani, Kyleen Marcella, Connie Adera, Don Bassett, Sarah Munger, Stantec; Bryan Johnson, Timeyin Dafeta, City of Los Angeles
- 10:00 AM** **Networking Break**
- 10:45 AM** **Full-scale Evaluation of Complex Food Waste Co-digestion: Impacts on Anaerobic Digestion Performance, Down Stream Solids Handling, Side-stream Quality and Biosolids Reuse.**
Robert Sharp, Manhattan College; James Ecker, New England Organics; Jennifer McConnell, Jane Gajwani, NYC DEP; Jeffrey Liebowitz
- 11:15 AM** **Coming Full Circle – Diverted MSW Organics to RNG Fuel for Refuse Trucks in Mesa, AZ**
Shayla Allen, Arcadis; Niel Curley, Tom Sheber, City of Mesa, Arizona; Eric Auerbach, Arcadis
- 11:45 AM** **Session Adjourns for Networking Luncheon in Exhibit Hall**
- Alternate:** **Food Waste Co-Digestion at Water Resource Recovery Facilities: Results from the Goleta Sanitary District Pilot Project**
Kim Domptail, GHD; James Dunbar, Alex West, Lystek International Inc
- Alternate:** **Co-Digestion Screening Using an In-line Sludge Screen**
Ed Fritz, Chip Pless, Huber Technology, Inc

Session 09: Dewatering - Developing a Deeper Understanding
Thursday, April 2, 8:30 AM - 11:45 AM

- 8:30 AM** **Effect of THP and Anaerobic Digestion on the Dewatering Behavior of WAS and Primary Biosolids**
Jeffrey Nicholson, Virginia Tech/ Hampton Roads Sanitation District (HRSD); Steven Beightol, Matthew Higgins, Bucknell University; Christopher Wilson; Charles Bott, HRSD
- 9:00 AM** **The Effect of Divalent Cation Complexation on Anaerobically Digested EBPR Sludge Dewatering Performance**
Carl Mangrum, Mangrum Consulting & Design; David Jenkins, David Jenkins & Associates, Inc.
- 9:30 AM** **Enzymatic Conditioning of Anaerobically Digested Municipal Wastewater Sludge for Improved Mechanical Dewatering**
Christopher Flannery, Joanna Wawrzynczyk, Novozymes; Thomas Guildal, BIOFOS
- 10:00 AM** **Networking Break**
- 10:45 AM** **Correlations Between Microbial Community and Dewaterability in Anaerobically Digested Primary and Bio-P Biosolids**
Patrick McNamara, Eileen Kennedy, Marquette University; Lou LaMartina, Ryan Newton, University of Wisconsin-Milwaukee
- 11:15 AM** **A Comprehensive Examination of the Dewaterability of Aerobic Granular Sludge Cultivated in Continuous Flow Bioreactors Fed with Real Domestic Wastewater**
Dian Zhang, Yewei Sun, Virginia Tech; Robert Angelotti; Zhi-Wu Wang, Virginia Tech
- 11:45 AM** **Session Adjourns for Networking Luncheon in Exhibit Hall**
- Alternate:** **Thickening and Dewatering Strategies for Small Plants – Minimizing Capital Investment by Leveraging Installed Infrastructure**
Ruth Borgmann, C. Michael Bullard, Hazen & Sawyer
- Alternate:** **Sludge Thickening and Dewatering Improvements for Nassau County, NY**
Jay Surti, Hazen and Sawyer; Paul Saurer; Gregory Bazydola, Arcadis US, Inc.; Eric Mills, Hazen and Sawyer

Session 10: Nutrient Recovery
Thursday, April 2, 1:30 PM - 4:45 PM

- 1:30 PM** **Incineration of Biosolids Provides a Pathway for Maximum Phosphorous Recovery from Water Reclamation Facilities: A German Approach**
Webster Hoener, Black & Veatch; Christian Kabbe, EasyMining
- 2:00 PM** **Sewage Sludge Incinerator Ash as a Potential Phosphorus Fertilizer for Corn and Soybean**
Persephone Ma, Carl Rosen, University of Minnesota
- 2:30 PM** **The Case of the Missing Phosphorus: The Impacts of Influent Metal Loads on Nutrient Recovery and EBPR**
Steven Graziano, Jacobs; Nathan Qualls, Bruce Bartel, Jake Becken, Corbin Magnin, New Water, Green Bay Metropolitan Sewerage District; Colin Fitzgerald, Jacobs
- 3:00 PM** **Networking Break**
- 3:45 PM** **Conversion of Recalcitrant Phosphorus Fractions to Orthophosphate Using UV/H₂O₂ Advanced Oxidation for Improved Nutrient Removal and Recovery**
Kaushik Venkiteshwaran, Eileen Kennedy, Caitlin Graeber, Patrick McNamara, Brooke Mayer, Marquette University
- 4:15 PM** **Beer, Cheese and Applesauce...Utilizing High Strength Waste to Enhance Struvite Recovery: Results of Bench Scale and Pilot Studies**
Nicole Ringle, City of St Cloud; Derek Lycke, Ostara; Tracy Hodel, City of St Cloud
- 4:45 PM** **Session Adjourns**
- Alternate:** **Water Research Foundation CalPrex Phosphate Recovery Validation Study at The Madison Metropolitan Sewerage District: Performance, Modeling, Cost Benefit Analysis, and Fertilizer Use**
Menachem Tabanpour, CNP Technology Water and Biosolids Corp; Wendell Khunjar; Leon Downing, Black & Veatch; Phillip Barak, Nutrient Recovery & Upcycling
- Alternate:** **Vacuum Application During Fermentation for Volatile Fatty Acid Recovery**
Frances Okoye, Elsayed Elbeshbishy, Ryerson University; Domenico Santoro, Eunkyung Jang, Trojan Technologies

Session 11: Energy Recovery & Production - Innovation and Success
Thursday, April 2, 1:30 PM - 4:45 PM

- 1:30 PM** **The R2E2 Experience – Energy Performance One Year On at the Green Bay Facility**
Peter Burrowes, Jacobs; William Angoli, Bruce Bartel, Nathan Qualls, New Water, Green Bay Metro Sewerage Dist; Steven Graziano, Jacobs
- 2:00 PM** **Looking Beyond Conventional Approaches Biosolids Planning at the Terminal Island Water Reclamation Plant**
Zakir Hirani, Pooja Sinha, Don Bassett, Connie Adera, Stantec; Rashi Gupta, Carollo Engineers; Fernando Gonzalez, City of Los Angeles Sanitation Agency
- 2:30 PM** **Using Dried Biosolids as a Sustainable Fuel Source – A Decade of Experience**
Charles Goss, AECOM; Sudhakar Viswanathan, Veolia; Rich DiMassimo, Jeff Moccock, Kruger Inc; Ray Wurm, City of Buffalo
- 3:00 PM** **Networking Break**
- 3:45 PM** **Co-Digestion Project Success: Forecast Risks and Rewards for All Stakeholders**
Guyton Durnin, HDR; Amanda Roa, Delta Diablo; Mary Martis, HDR Engineering Inc.
- 4:15 PM** **Evaluation of Heat Exchanger Performance of a Thermochemical Hydrolysis Process Under Different Hydrolysis Temperatures**
Zhongtian Li, Centrisys/CNP; Hiroko Yoshida; Joshua Gable; Gerhard Forstner, Centrisys/CNP
- 4:45 PM** **Session Adjourns**
- Alternate:** **How to Kill a Heat Exchanger**
Kimberly Schlauch, James Geisler, Arvos Schmidtsche Schack LLC; John Glass, Region of Peel

Session 12: Innovations in Anaerobic Digestion
Thursday, April 2, 1:30 PM - 3:00 PM

- 1:30 PM** **Digestion Optimization for Removal of Solids, Micropollutants, and Recalcitrant Nutrients from BNR Plant Sludge**
Bryan Mazda, Regional District of the Central Okanagan; Tim Abbott, University of British Columbia; Cigdem Eskicioglu
- 2:00 PM** **Bioaugmentation: The Probiotic of Anaerobic Digestion**
Catherine Moskos, Arcadis; Ethan Elleser, Evansville Water and Sewer Utility; Eric Auerbach, Arcadis; Jonathan Lee; Harry Lawson
- 2:30 PM** **The Ephyra® Sludge Digestion - Unravelling its Fundamentals and Obtaining Biosolids Class A sludge**
Alexander Hendriks, Andre Visser, Danny Traksel, Eddie Koornneef, Royal HaskoningDHV; Hongxiao Guo, Merle de Kreuk, Delft University of Technology
- 3:00 PM** **Session Adjourns for Networking Break**
- Alternate:** **Anaerobic Digester Upgrade Provides Insight into Preferred Startup Strategies**
Mark Strahota, Hazen and Sawyer

Session 13: Biosolids Master Planning with the End in Mind
Thursday, April 2, 1:30 PM - 3:00 PM

- 1:30 PM** **The City of Fresno's Biosolids Master Plan Results - Identifying the Best Biosolids Product for America's Agricultural Powerhouse**
Lisa Challenger, Material Matters, Inc.; Sarah Deslauriers
- 2:00 PM** **What's in Store for Fresno's Biosolids?**
Christine Polo, Carollo Engineers; Sarah Deslauriers; Cory Asher, City of Fresno;
Lisa Challenger, Material Matters, Inc.; Rashi Gupta, Carollo Engineers; John Witter; Eric Casares, Carollo Engineers; Rick Staggs, City of Fresno
- 2:30 PM** **Developing an Outlet-driven Plan for Gwinnett County Biosolids**
Lynne Moss, Black & Veatch; Gayathri Ram Mohan, Robert Harris, Gwinnett County Dept. of Water Resources; Bernadette Drouhard; Greg Knight; J Carr
- 3:00 PM** **Session Adjourns for Networking Break**
- Alternate:** **A Trigger Based Approach to Regional Biosolids Capital Improvement Planning**
Paul Knowles, Jay Surti, Hazen and Sawyer; Vera Gouchev, Electric Pump Inc;
Abigail Farrell, Hazen and Sawyer; Vincent Kopicki, Westchester County Utility;
Emanuel Psaltakis, Hazen and Sawyer

Session 14: Identifying and Generating Advances Through Research
Thursday, April 2, 3:45 PM - 4:45 PM

- 3:45 PM** **Analysis of Factors Linking to Soil Microbial Populations and Nitrogen Cycling Under Long-Term Biosolids Application**
Benjamin Morgan, Guanglong Tian, MWRD Chicago; Olawale Oladeji; Albert Cox, Heng Zhang, MWRD of Greater Chicago At Cicero Stickney WTP; Edward Podczewinski
- 4:15 PM** **Enhancing Anaerobic Digestion of Pulp and Paper Mill Biosludge Via Thermal Hydrolysis**
Ehssan Hosseini Koupaie, University of Toronto; Elsayed Elbeshbishy; Grant Allen, University of Toronto
- 4:45 PM** **Session Adjourns**
- Alternate:** **A Laboratory-Scale Study of the Factors Controlling Pathogen and Indicator Organism Inactivation During Low-Cost, Low-Tech Biosolids Treatment**
Jennifer Becker, John Harron, Eric Seagren, Michigan Technological University

Session 15: Regulatory Strategies
Thursday, April 2, 3:45 PM - 4:45 PM

3:45 PM **Biosolids Strategy for a Challenging Regulatory Environment: A Case Study**

Mike Prinz, City of Santa Rosa; Mary Martis, Guyton Durnin, HDR

4:15 PM **A Bigger-Picture Look at Florida's Nutrient-Loading and the Relative Significance of Biosolids-Derived Products**

John Willis, Robert Gaylord, Brown And Caldwell; Maria Silveira, University of Florida

4:45 PM **Session Adjourns**

Alternate: **Planning for Biosolids Management Without a Landfill as an Option in the Post SB 1383 Era**

Layne Baroldi, Synagro Technologies; James Colston, Irvine Ranch Water District

Alternate: **Are the Tides Turning Again on Digestate Quality? A UK Perspective**

Annelle Buchanan, Joerg Blischke, Black & Veatch

Session 16: Thermal Drying Of Biosolids – Alternatives, Technology, and Operations
Friday, April 3, 8:30 AM - 10:00 AM

- 8:30 AM** **Which Class A Drying Process Has The Most Advantages for the Dry Creek Water Reclamation Facility, Cheyenne, Wyoming**
Zwelani Ngwenya, David Oerke, Kile Snider, Steven Tamburini, Jacobs Engineering; Nate Kie, Matthew Buelow, Phillip Clark, Cheyenne Board of Public Utilities
- 9:00 AM** **Evolving Standards and Operational Experience Combine to Enhance Safety for Biosolids Drying Systems**
Webster Hoener, Black & Veatch; James Kearns, Encina Wastewater Authority
- 9:30 AM** **Optimizing Biosolids Dewatering and Drying Process at the City of Sheboygan, WI**
Chip Pless, Ed Fritz, Huber Technology, Inc; Steve Jossart, City of Sheboygan
- 10:00 AM** **Session Adjourns for Networking Break**
- Alternate:** **Case Study: Review of Karlovy Vary Low Temperature Belt Dryer Performance Over 3 Years**
Lynne Bouchy, SUEZ Water Technologies and Solutions; Zdenek Frcck, Vodakva

Session 17: Biosolids Treatment and Use Innovations
Friday, April 3, 8:30 AM - 11:15 AM

- 8:30 AM** **Ammonia and Phosphate Releases from Waste Activated Sludge in Short HRT Thermophilic Pre-treatment Reactor**
Hong Zhao, Veolia Water/Kruger; Isaac Avila, Garrett Geer, Denver Metro Wastewater Reclamation District; Jim McQuarrie; Luke Wood, Kruger Inc; Sudhakar Viswanathan, Brad Mrdjenovich, Veolia; Rich DiMassimo, Kruger Inc
- 9:00 AM** **Volute Thickening and Linear Motion Mixing: A Tale of Two Technologies**
Clay Rahn, HDR, Inc.
- 9:30 AM** **Compact and On-site Biosolids Elimination using Supercritical Water Oxidation: Performance and Economics**
Marc Deshusses, Duke University & 374Water; Kobe Nagar
- 10:00 AM** **Networking Break**
- 10:15 AM** **Single-stage vs. Two-stage Anaerobic Digestion of Organic Fraction of Municipal Solid Waste**
Elsayed Elbeshbishy, Armineh Azizi, Amir Abbas Bazayar Lakeh, Ryerson University; Ehssan Hosseini Koupaie, University of Toronto; H Hafez, Greenfield Ethanol Inc
- 10:45 AM** **Introducing the Bucher Press and the Dehydris Twist™ Workshop on North American Market - A Revolution in Sludge Management Approach Leading to Significant Operations Savings**
Jean-François Mischler, Bucher Unipektin AG; Claire Courbet, Suez Treatment Infrastructure
- 11:15 AM** **Conference Adjourns**
- Alternate:** **Application of Phagotrophic Algae in Waste Activated Sludge Conversion and Stabilization**
Suo Xiao, Ovivo USA LLC
- Alternate:** **Chemical Pretreatment of Thickened Waste Activated Sludge (TWAS) to Improve Biogas Production**
Salomeh Chegini, Frances Okoye, Elsayed Elbeshbishy, Ryerson University

Session 18: Economic Drivers for Digestion
Friday, April 3, 8:30 AM - 11:15 AM

- 8:30 AM** **Payback Challenge – Keep Class A, Replace the Technology, and Save Money**
Adam Parmenter, HDR Engineering Inc; Jon Coyle, Town of Erie; Kristen James
- 9:00 AM** **Thermo-Chemical Hydrolysis with and without Digestion – Does it Make Economic Sense When Compared to Other Technologies?**
Mohammad Abu-Orf, Derya Dursun, C. Michael Bullard, Hazen and Sawyer
- 9:30 AM** **Life Cycle Assessment and Cost Analysis of Municipal Wastewater Treatment Anaerobic Digestion Expansion Options**
Xin Ma, US EPA; Ben Morelli, Eastern Research Group; Sarah Cashman; Jason Turgeon, US EPA Region 1; Jay Garland
- 10:00 AM** **Networking Break**
- 10:15 AM** **Comprehensive Assessment of Co-Digestion Capacity, Costs, Impacts, and Operational History in California**
Rashi Gupta, Carollo Engineers; Sarah Deslauriers; Elizabeth Charbonnet; Chelsea Ransom; Robert Williams, University of California, Davis
- 10:45 AM** **Did Suspending a Co-Digestion System Really Save Money? – A Case Study**
Ralph Schroedel, Charles Goss, AECOM; Steve Jossart, City of Sheboygan
- 11:15 AM** **Conference Adjourns**
- Alternate:** **Biosolids Management Business Case Study Utilizing the Solids Water Energy Evaluation Tool**
Robert Gaylord, John Willis, Brown And Caldwell; Beth Schinella, Hillsborough County, FL; George Cassady
- Alternate:** **Enhanced High-Solids Anaerobic Digestion of Sewage Sludge by the Addition of Dried Powdered Sludge**
Raja Sonal Anand, Pramod Kumar, Dharmender Yadav, IIT Roorkee

Session 19: Dewatering - Obtaining the Pretreatment, Equipment and Polymer Needed to Make it Happen

Friday, April 3, 8:30 AM - 10:00 AM

- 8:30 AM** **The Only Thing Permanent is Change: Managing Risk in Procuring Dewatering Equipment**
Kenneth Packard, Mario Benisch, HDR Engineering Inc; Gary Duranceau, City of Mount Vernon
- 9:00 AM** **Who Will Take the “Cake”? An Evaluation of Two Emerging Dewatering Preconditioning Technologies**
Heidi Bauer, Zwelani Ngwenya, David Oerke, Samuel Jeyanayagam, Jacobs Engineering
- 9:30 AM** **Polymer Trial with Bench Scale Dewatering Press**
Mario Benisch, J Neethling, HDR
- 10:00 AM** **Session Adjourns for Networking Break**
- Alternate:** **Dewatering Technology Selection for the “2nd Most Difficult-to-Dewater Sludge in the World”**
Rashi Gupta, Carollo Engineers; Brittany Park, Joshua Robertson, City of Bend, Oregon; Timothy Truax, Wade Trim; Christopher Miccolis, City of Redmond, WPCF; Matthew Sprick; Josh Miner, Jeffrey McCormick, Carollo Engineers

Session 20: Side Stream Management
Friday, April 3, 10:15 AM - 11:15 AM

- 10:15 AM** **Managing Biosolids to Control Recycling of Nitrogen and Phosphorus in Sidestreams from Aerobic Digestion**
Hélène Kassouf, University of South Florida; Andrés García Parra, University of South Florida; Luke Mulford, Gita Iranipour, Hillsborough County; Sarina Ergas, Jeffrey Cunningham, University of South Florida
- 10:45 AM** **Impact of Digestion Intensification on Sidestream: Lessons Learned from Scandinavian Full-Scale Experiences**
Margaret Hollowed, Sudhakar Viswanathan, Veolia; Anneli Anderssonchan, City of Växjö, Technical Department, Sweden; Mikkel Poulsen, Kruger A/S
- 11:15 AM** **Conference Adjourns**
- Alternate:** **Selecting an Appropriate Sidestream Treatment Process through a Unique Scoring System**
Micah Blate, Hazen and Sawyer; Samantha Burke, Adam Hendricks, Nicholas Hays, Philadelphia Water Department; Wendell Khunjar; Robert Sharp, Manhattan College

Session 21: Odors

Friday, April 3, 10:15 AM - 11:15 AM

- 10:15 AM Identification of Source and Cause of the Biosolids Odor Emission in Western Branch Water Resource Recovery Facility of Washington Suburban Sanitary Commission**
Malcolm Taylor, WSSCWater; Hao Luo, Virginia Tech; Caroline Nguyen, Washington Sub San Commission; Zhi-Wu Wang, Virginia Tech
- 10:45 AM Durational Biosolids Odor Control Using Peroxide Regenerated Iron Technology (PRI-TECH®) at Metropolitan St. Louis Sewer District's Lower Meramec Treatment Plant**
Michael Nelson, USP Technologies; Lynne Moss, Black & Veatch
- 11:15 AM Conference Adjourns**