

24TH ANNUAL CSWEA EDUCATION SEMINAR

Looking to the Future – New Innovations in Wastewater Resource Recovery Facility Design and Operations

Presented by Central States Water Environment Association
At Monona Terrace Convention Center, Madison, Wisconsin

April 2, 2019

Looking to the Future – New Innovations in Wastewater Resource Recovery Facility Design and Operations

Mark your calendars and budget for the CSWEA 24th Annual Education Seminar to be held on April 2, 2019 at Monona Terrace in Madison, WI. An exciting program focused on resource recovery innovators. This is an excellent, affordable event to learn about issues and technical advances from national and local experts. In addition, attendees will earn approximately seven (7) professional development hours (PDHs) for professional engineers and operator's license requirements.

Who should attend?

Wastewater treatment plant managers and operators, process control specialists, designers, regulators, equipment suppliers, and students involved in wastewater treatment and/or nutrients management. Regulatory agency continuing education contact hours will be awarded.

Seminar location

The seminar will be held at the Monona Terrace Convention Center at One John Nolen Drive, Madison, Wisconsin.

Accommodations

A limited number of rooms are available at the Best Western Premier Park Hotel and The Madison Concourse Hotel in downtown Madison. The Best Western Premier Park Hotel (22 S Carroll Street) is about 0.3 miles walking distance from the convention center. Room rates range from \$144 to \$194 per night. Call 608-285-8000 for reservations and indicate your affiliation with CSWEA Education Seminar. The Madison Concourse Hotel (1 W Dayton Street) is about 0.5 miles walking distance from the convention center. Room rate is \$169 per night. Call 608-257-6000 for reservations and indicate your affiliation with CSWEA Education Seminar. These hotel rates are available until March 1, 2019.



See the CSWEA website
for additional information
www.cswea.org

Webinar Registration

Registrants selecting this option will not attend the live event, but will be given access to online prerecorded seminar presentation files that will remain posted from July 1 to August 31, 2019. The webinar file will contain a split screen including video of the speaker and clear Microsoft PowerPoint® slides along with audio of each presentation.

24TH ANNUAL EDUCATION SEMINAR SPEAKERS



Dr. James Barnard



Dr. George Wells



Brian Perkovich



Dr. Jennifer Becker



Karen Pallansch



Tom Sigmund



Larry McFall



Tracy Hodel



Peter Schauer

DR. JAMES BARNARD

Global Practice and Technology Leader, Black & Veatch

DR. GEORGE WELLS

Assistant Professor, Department Civil & Environmental Engineering, Northwestern University

BRIAN PERKOVICH

Executive Director, Metropolitan Water Reclamation District of Greater Chicago (MWRDGC)

DR. JENNIFER BECKER

Associate Professor of Environmental Engineering, Michigan Technological University

KAREN PALLANSCH

Chief Executive Officer, Alexandria Renew Enterprises

TOM SIGMUND

Executive Director, NEW Water (Green Bay MSD)

LARRY MCFALL

Operations Manager, Rock River Water Reclamation District

TRACY HODEL

Assistant Utilities Director, City of St. Cloud

PETER SCHAUER

Principle Engineer, Technology Development & Research Group, Clean Water Services

LOOKING TO THE FUTURE – New Innovations in Wastewater Resource Recovery Facility Design and Operations

April 2, 2019 • Madison Wisconsin

RECEPTION – APRIL 1: All seminar attendees are invited to a reception (cash bar) on Monday, April 1 from 5:30-7:00 p.m. at the Monona Terrace Convention Center. The seminar speakers will be available for networking and conversation.

8:00 am-8:10 am Welcome and Introductions

8:10 am-8:50 am The evolution of EBPR over 60 years
Dr. James Barnard, Black & Veatch

This presentation will cover the development of our understanding of EBPR from the first observations of more than 60 years ago. EBPR happened incidentally at several plants and remained a mystery for the first 10 years. Barnard (1974) discovered phosphorus removal in a four-stage plant that was developed for high-efficiency nitrogen removal. There was an accidental connection between the second anoxic zone and what was considered a dead zone, and some mixed liquor circulated between the second anoxic zone and the dead zone that turned out to be a mixed liquor fermenter, resulting in the release of phosphorus. The EBPR technology has now made a sharp turn to the past of fermenting mixed liquor or RAS, which does not require an additional source of VFA. The presentation will show the latest developments and the much greater reliability that could be achieved by using side-stream fermentation as in the S2EBPR flow sheets, with effluent orthophosphates values well below 0.1 mg/L.

8:50 am-9:30 am Mainstream Shortcut Nitrogen Removal:
Current Status and Future Directions
Dr. George Wells, Northwestern University

Emerging shortcut N removal bioprocesses, including nitrite shunt as well as deammonification processes that leverage anaerobic ammonia oxidizing bacteria (anammox), offer the potential for dramatic savings in energy use relative to conventional N removal process. In addition, they offer the intriguing possibility of substantially enhanced waste organic carbon redirection for energy recovery or generation of value-added products. This talk will focus on addressing the key impediments limiting mainstream shortcut N removal. This work has shown that nitrite shunt integrated with biological phosphorus removal is feasible in the mainstream, but also has elucidated challenges in selecting for high activity denitrifying rather than aerobic P uptake by polyphosphate accumulating organisms. These results have important implications for implementation and optimization of shortcut N removal bioprocesses in the mainstream.

9:30 am-9:50 am Break

9:50 am-10:30 am Big Things in Small Places: Innovating as a Utility
of the Future through Passion and Problem Solving
Karen Pallansch, PE BCEE, Alexandria Renew Enterprises

Innovation can take many forms, from continuous improvement to a major program driven by new requirements. Innovation in our facilities and operations is driven in large part by our utility's uniqueness and need to solve all variety of problems in our continual effort to build public trust. For AlexRenew, an urban water resource recovery facility, effective and value-added problem solving is a consistent focus. With space constraints on its 35 acre campus, a focus on being a community problem solver, and an adaptive culture with passionate people who drive and execute innovation, CEO Karen Pallansch and her team have led a number of innovations that enable AlexRenew to stay ahead of increasing demands on its operation.

Take a journey into the world of creative WRRF innovation with Karen as she shares examples of successful innovations on the AlexRenew campus, teaches you how to frame innovation for your water facilities, and provides the best ways to weave a culture of innovation through your staff.

10:30 am-11:10am Resource Recovery at Metropolitan Water Reclamation
District of Greater Chicago
Brian Perkovich, Metropolitan Water Reclamation District of
Greater Chicago

The MWRDGC's approach to Resource Recovery is one that has expanded and grown into one of many efforts. In partnership with Ostara Nutrient Recovery Technologies, we have opened the world's largest nutrient recovery facility at the Stickney WRRP. Ostara's technology recovers phosphorus and nitrogen to create a high value fertilizer that is both economically and environmentally viable. We are also now producing a compost product produced by composting biosolids and wood chips, forming an Exceptional Quality biosolids blend. Due to changes in Illinois law in 2015, this product is now recognized as a soil amendment in Illinois. We are investigating the production of renewable energy from biogas. By investigating technologies and opportunities for the efficient utilization of all of our biogas produced, we can reduce our dependence on purchased energy, and our carbon footprint. Finally, we are making efforts to promote the reuse of our effluent throughout our service area.

11:10 am-11:30 pm LIFT Presentation

Leaders Innovation Forum for Technology (LIFT) is a Water Environment Federation (WEF) and a Water Research Foundation initiative that helps move new water technologies into practice quickly and efficiently. LIFT affiliation allows for collaboration and information sharing with other LIFT Affiliates on projects and piloting of new technology and also allows for access to prior activities in the LIFT program. CSWEA, together with the LIFT program, is working to provide tools and resources to its members to support innovation and new technology in the Central States region and to champion a culture of innovation in our industry.

11:30 am-11:45 am Q/A Morning Session

11:50 am-1:00pm Lunch with LIFT and Student Poster Session

1:00 pm-1:35 pm Challenges for Future Innovation
Dr. James Barnard, Black & Veatch

This presentation will discuss the drivers for the rapid acceptance of BNR technology in South Africa, the US, and Canada. The four-stage Bardenpho process was accepted by the City of Johannesburg three months after it was demonstrated in the laboratory. When the phosphorus removal was discovered two years later, the first plant for 750,000 PE was under construction and a change order was issued to incorporate EBPR. There were several reasons for this rapid adoption of the technology, the most important was the dire need due to severe eutrophication of water supply reservoirs and the fact that through re-use the salinity of the water was already too high which precluded the use of chemicals for phosphorus precipitation. Being knowledgeable the City also realized the benefits of the new technology to them and relieved the engineering firm from liabilities. Within a few years of completion, plants followed in Florida and BC, Canada.

1:35 pm-2:10pm Inactivation of Pathogen and Indicator Organisms During
Long-Term Storage and Air Drying of Biosolids
Dr. Jennifer Becker, Michigan Technological University

WRRFs that serve small or mid-sized communities frequently lack the resources to implement one of the energy-intensive processes to further reduce pathogens or other treatment technologies that are approved by the EPA for production of Class A biosolids and involve elevated temperatures. Therefore, pilot-scale studies were undertaken at two partner WRRFs to evaluate the potential for inactivation of key pathogen and indicator organisms (PIOs) and production of Class A biosolids under ambient conditions during long-term storage and air drying. The results of the pilot-scale studies show that sufficient inactivation of enteric viruses and fecal coliform bacteria to meet Class A standards and/or demonstrate PFRP equivalency can be achieved during long-term storage of biosolids, even at temperatures over 25 °C. Controlled laboratory studies are being conducted to systematically and quantitatively evaluate how these factors impact PIO viability.

2:10 pm-2:30 pm Break

2:30 pm-3:00 pm Operational Tools for Phosphorus
Removal and Recovery
Peter Schauer, Clean Water Services

Clean Water Services, located Washington County, Oregon, is a special services district that is charged with wastewater management for systems discharging into Tualatin River. The facilities employ advanced treatment processes to meet stringent effluent phosphorus limits. CWS uses primary sludge fermentation, enhanced biological phosphorus removal, tertiary chemical phosphorus removal, and phosphorus harvesting facilities. These technologies provide Clean Water Services with the ability to produce high quality effluent water while also recovering valuable resources. As part of their ongoing optimization and research programs, the engineering and operations groups for Clean Water Services have developed several operational tools for improved nutrient removal and recovery. This presentation will focus on the development and implementation of several of these tools for operational improvement.

3:00 pm-3:45 pm Looking to the Future Now:
Roundtable of Current Innovation at Local WWTP
Leveraging Applied Research
for Facility Planning and Optimization
Larry McFall, Rock River Water Reclamation District

The cost of BNR upgrades for a 40 MGD plant is now estimated at greater than 75 million dollars. Districts and municipalities cannot afford to make mistakes and, therefore, must leverage new applied research for the most cost-effective facility plan and optimization. Rock River Water Reclamation District's association with Aqua-Aerobic Systems, Inc., provides the leverage needed for maximum optimization of resources through an innovative Public/Private Partnership (PPP). The PPP enables the fastest route from applied research to fully functioning efficient processes. Examples include primary filtration and aerobic granular sludge.

**Looking to the Future – New Innovations in Wastewater
Resource Recovery Facility Design and Operations**
Tracy Hodel, City of St. Cloud

The City of St. Cloud's Wastewater Treatment Facility has transformed to the Nutrients, Energy, and Water Recovery Facility in the last few years. Resource recovery and energy efficiency master planning started in 2014; since then, the City is now producing nearly 80% of its electrical energy demand onsite through energy efficiency efforts, biofuel recovery and solar energy production with a goal of producing 100% of its energy demand in 2020. The Resource Recovery and Energy Efficiency Master Plan included the Nutrient Recovery & Reuse (NR2) Project. The NR2 Project consists of the installation of innovative technologies that reduces biosolids volume, thermal hydrolysis (Lystek) the product to generate a biofertilizer and struvite harvesting (Ostara). Information will be shared on the innovative design ideas that were implemented during the construction phase, along with the synergistic opportunities with having the two technologies installed at the same location that can increase phosphorus and energy recovery at the facility.

R2E2: The First Step in Resource Recovery for NEW Water
Tom Sigmund, NEW Water

NEW Water recently completed commissioning its innovative Resource Recovery and Electrical Energy (R2E2) project. This industry leading effort has transformed the biosolids processing facilities from a net consumer of resources to one that recovers valuable materials from what was considered to be a waste, and provides value to its customers. The generation of fertilizer products and energy from the R2E2 facilities has transformed the way NEW Water operates. It has also generated enthusiasm with staff to find more resources to recover. Mr. Sigmund will give an overview of the project and discuss the efforts involved in the implementation of innovative solutions.

3:45 pm-4:00 pm Q&A Afternoon Session

PLEASE REGISTER ME FOR THE ONE-DAY EDUCATION SEMINAR LIVE EVENT OR WEBINAR OPTIONS Looking to the Future – New Innovations in Wastewater Resource Recovery Facility Design and Operations Live Event April 2, 2019 Recorded Webinar Available – After July 1, 2019

Name (First and Last) _____

Organization or Affiliation _____

Street Address _____

City _____ State _____ Zip _____

Telephone _____ Fax _____

E-Mail Address _____

Amount Enclosed _____

Are you a CSWEA member? (y/n) _____

Visit our website at <http://www.cswea.org> for more information and
for ONLINE REGISTRATION AND PAYMENT

Please register early.

Purchase orders will not be accepted.

1. Registration fee to attend live event (includes continental breakfast, lunch, refreshments, and proceedings).
Fee Per Person by March 5 after March 5
Education Seminar (ES) \$200 \$225
Additional Utility Attendee* \$50 \$55
Student** \$50 \$55

*After one person from a utility registers at standard price, up to five additional people can register for \$50 per person.

**Students – please indicate if you will present a poster and name of poster:
___ Yes ___ Tentative title of poster: _____

Please indicate dietary restrictions: ___ vegetarian ___ vegan ___ gluten free ___ other
2. Registration fee to access webinar (includes access to prerecorded event via computer from July 1 to August 31)
Fee per person
Webinar (WEB) \$100
Student \$25

3. Live event attendance is limited to the first 306 registrants.
4. No refunds will be given after March 30.
5. Cancelled checks will serve as registration verification. Please provide e-mail address
ONLY if additional confirmation is desired: _____

Make check payable to: Central States Water Environment Association, Inc.

6. Detach this form and mail with check to:
C/O: Central States Water Environment Association
1021 Alexandra Blvd., Crystal Lake, IL 60014
Phone: Amy Haque 855-692-7932 ext. 102 Email: ahaque@cswea.org

Please indicate below any special accommodations you require from the Convention Center to allow your full participation in the Education Seminar.