



30TH ANNUAL CSWEA | APRIL 22ND EDUCATION SEMINAR | 2025

Starting Strong: Preliminary and Primary Treatment as the Key to Resource Recovery

STARTING STRONG: Preliminary and Primary Treatment as the Key to Resource Recovery

Mark your calendars for the CSWEA 30th Annual Education Seminar to be held in person on April 22, 2025 at the Monona Terrace in Madison, WI. We have an exciting program to discuss trends in resource recovery for utilities in the Central States region. Often times, resource recovery technologies are focused on concepts such as energy production, natural gas recovery via RIN programs, nutrient harvesting, biosolids beneficial reuse, and water reuse; however, recent innovations in preliminary and primary treatment are enabling and even accelerating the adoption and impact of resource recovery solutions in our industry. Join us as we discuss how preliminary and primary treatment are pillars to achieve resource recovery.

MIDWEST STUDENT DESIGN COMPETITION (MSDC)

The 6th Annual MSDC will be held concurrently with the Education Seminar on April 22. University Students from CSWEA and surrounding States will be presenting their environmental and wastewater design projects. Please consider attending these presentations to learn about their contributions to the water industry and support these budding professionals. Presentations will start at 10:00 am.

MEET & GREET/DINNER

Attend a meet and greet reception on April 21, the day before the MSDC, from 5:00 pm until 6:30 pm, where both university students and seminar presenters will be available for networking at the Monona Terrace.

After 6:30 pm, attendees are welcome to join us for a social event at the Great Dane Pub & Brewery. If interested in attending, please sign up when registering.

Monona Terrace

1 John Nolen Dr, Madison, WI 53703

The Great Dane Pub & Brewery

123 East Doty Street, Madison, WI 53703

30th ANNUAL CSWEA EDUCATION SEMINAR **SPEAKERS**



Dr. Glen T. Daigger,
PhD, PE



Matt Magruder



Tim Gualandri, PE



Nathan Qualls, PE



Joe Watson



David Henderson



Shanna Czek



Mark Eddington, PE



Dr. Sudhir Murthy,
PhD, PE



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8:00-8:10: WELCOME AND INTRODUCTIONS

8:10-9:00: KEYNOTE: WHY RESOURCE RECOVERY REQUIRES ADVANCED PRELIMINARY AND PRIMARY TREATMENT

SPEAKER: DR. GLEN T. DAIGGER,
PHD, PE, BCEE, NAE, CAE
PROFESSOR OF ENGINEERING PRACTICE AT
THE UNIVERSITY OF MICHIGAN
PRESIDENT AND FOUNDER OF
ONE WATER SOLUTIONS, LLC

We all learned in our wastewater treatment classes in school about how biological treatment systems remove soluble BOD5. Just think about the math we all learned relating the effluent soluble BOD5 (or the readily biodegradable COD) to the process solids resident time (SRT). This is because bacteria only directly metabolize soluble organics. This is all good and fine, but the organic matter in many wastewaters (including municipal wastewater) is in particulate and colloidal form, not soluble. Biological systems can treat particulate and colloidal organic matter, by a variety of mechanisms, but this requires energy inputs and simply converts more than half of the particulate and colloidal organic matter to biological sludge which is difficult to convert into useful products. Recovery of carbon for useful purposes requires it to be removed upstream of the biological system, which is where advanced preliminary and primary treatment systems come in. Fortunately, an increasing number of options (beyond conventional primary clarifiers) are becoming available and will be discussed.

DETAILED BIO:

Dr. Glen T. Daigger is currently Professor of Engineering Practice at the University of Michigan and President and Founder of One Water Solutions, LLC, a water engineering and innovation firm. He previously served as Senior Vice President and Chief Technology Officer for CH2M HILL (now Jacobs) where he was employed for 35 years, as well as Professor and Chair of Environmental Systems Engineering at Clemson University. Actively engaged in the water profession through major projects, and as author or co-author of more than 200 technical papers, five books, and several technical manuals, he contributes to significantly advance practice within the water

profession. Dr. Daigger has been the recipient of numerous awards, including the Kappe, Freese, and Feng lectures; the Harrison Prescott Eddy, Morgan, and the Gascoigne Awards; and the Pohland Medal. He is a Distinguished Member of the American Society of Civil Engineers (ASCE), a Distinguished Fellow of IWA, and a Fellow of the Water Environment Federation (WEF). Dr. Daigger is also a member of numerous professional societies, including the US National Academy of Engineers and the Chinese Academy of Engineering.

9:00-9:30: FROM REFUSE TO RESOURCE: RESEARCH ON THE BENEFICIAL REUSE OF PRELIMINARY AND PRIMARY TREATMENT BYPRODUCTS

SPEAKER: MATT MAGRUDER
ENVIRONMENTAL RESEARCH MANAGER
MILWAUKEE METROPOLITAN
SEWERAGE DISTRICT

The Milwaukee Metropolitan Sewerage District (MMSD), in collaboration with Marquette University, has begun to evaluate the potential to beneficially reuse grit and scum from preliminary and primary treatment, respectively. Currently, both byproducts are collected and landfilled, but each presents an opportunity to be put back to work. During this session, you will learn about the preliminary research that has been conducted to evaluate two opportunities to divert these byproducts from landfills. The first, a collaboration with Dr. Baolin Wan, looks at the potential to take wastewater grit and incorporate it into concrete. The second, a collaboration with Dr. Damian Kokkin, looks at the feasibility of producing biodiesel from wastewater scum. There is still a long way to go, and the path forward is anything but clear for each of these alternatives, but we are seeding innovative research to explore opportunities to put these resources to work instead of paying to throw them away.

DETAILED BIO:

Matt Magruder has been with the Milwaukee Metropolitan Sewerage District for more than 15 years, and he is currently serving as the Environmental Research Manager. In addition to managing and coordinating the District's research efforts, Matt is leading MMSD's Digital Transformation Framework

Project. Matt represents the District on various planning, advisory, and industry working groups including the CSWEA WI Resource Recovery and Energy Committee. He received his BS in Biology from UW-Whitewater and his MBA from Cardinal Stritch University. In his free time, Matt enjoys reading, exercising, and spending time with his family.

9:30-10:00: POSTER SESSION & BREAK

10:00-10:30: OPTIMIZING NUTRIENT SEQUESTRATION: HOW SCREENINGS AND CLEANING CAN DETERMINE THE EFFECTIVENESS OF NUTRIENT SEQUESTRATION HARVESTING

SPEAKER: TIM GUALANDRI, PE
DISTRICT ENGINEER AT THE
FOX RIVER WATER RECLAMATION DISTRICT

Efficient return sidestream phosphorus capture is essential for meeting increasingly stringent regulatory limits in wastewater treatment. This presentation highlights critical operational lessons learned from FRWRD's MagPrex nutrient sequestration process. Specifically, the presentation will address how regular cleaning of the MagPrex unit is vital to sustaining effective phosphorus removal. Accumulation of non-biodegradable materials can lead to pump blockages, reduced efficiency, and downtime if maintenance protocols are neglected. Effective screening of influent prior to treatment is a critical consideration needed to minimize maintenance challenges and improve long-term system performance. By integrating these practices, wastewater operators of nutrient sequestration processes can achieve more reliable phosphorus sequestration, ensuring regulatory compliance and optimizing treatment efficiency.

DETAILED BIO:

Tim Gualandri has more than 13 years of industry experience serving as an Engineering Consultant for nearly 12 years to now, serving as the District Engineer for the Fox River Water Reclamation District (FRWRD). His experience has encompassed all facets of a project from study, design, bid services and both office and field services during construction. He has been responsible for managing engineering services for municipalities across the Country.



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Mr. Gualandri has solved complex engineering challenges by utilizing innovative solutions. He has mentored under several leading wastewater experts and has onsite experience commissioning wastewater processes with plant operations staff. He volunteers his time to advance the education of wastewater topics in the industry by recently serving as the WEF Workshop Selection Committee Chair and has been on the selection committee for more than 10 years as the Water Reuse workshop subcommittee liaison. He has presented at both local, regional, and national conferences on various wastewater topics throughout his career. Mr. Gualandri is a registered professional engineer in Illinois and Oklahoma.

10:30-11:00: METALS, CATIONS, AND RESOURCE RECOVERY: HOW INFLUENT CHARACTERISTICS IMPACT PLANT OPERATIONS

SPEAKERS: **NATHAN QUALLS, PE**
EXECUTIVE DIRECTOR OF NEW WATER
JOE WATSON
PROCESS & PROJECT SPECIALIST AT NEW WATER

NEW Water, the brand of the Green Bay Metropolitan Sewerage District, commissioned their Resource Recovery and Electrical Energy (R2E2) project in 2018, transforming their solids processing facility into a resource recovery facility. The R2E2 facility features anaerobic digestion, electrical energy production with CHP, dewatering centrifuges, scalping dryer, fluidized bed incineration with heat recovery, and struvite harvesting. NEW Water will share their resource recovery experience including a focus on influent characteristics and their impact on struvite harvesting performance.

DETAILED BIO:

Nathan Qualls is the Executive Director of NEW Water, where he has worked for more than 16 years. Prior to his role as Executive Director, he worked as the Director of Technical Services as well as a Staff Engineer in NEW Water's Engineering Department. He has a wealth of experience in the wastewater sector, including industrial wastewater treatment prior to his work with NEW Water. Mr. Qualls has a BS in Chemical Engineering from the University of Wisconsin-Madison. He is a registered Professional Engineer in Wisconsin.

Joe Watson is the Process & Project Specialist at NEW Water, where he has worked for more than nine years. In Joe's current role he focuses on process optimization and the success of NEW Waters capital upgrade projects. Joe's Prior experience includes seven years as a Wastewater Operator, Operating NEW Waters two facilities. Joe Watson has a BS in Water Resources from the University of Wisconsin-Stevens Point as well as an AS in Natural Resources from Fox Valley Technical College.

11:00-11:30: MORNING PANEL Q&A

11:30-12:45: LUNCH WITH POSTER SESSION

12:45-1:00: FOOD WASTE SCREENING FOR ENERGY PRODUCTION: WEST LAFAYETTE RECEIVES FOOD WASTE FROM PURDUE CAFETERIA

SPEAKER: **DAVID HENDERSON**
UTILITY DIRECTOR OF THE WEST LAFAYETTE
WATER RESOURCE RECOVERY FACILITY

West Lafayette Water Resource Recovery Facility has been producing energy from food waste for more than 15 years. This presentation will cover how taking food scraps from five dining halls at Purdue University was the first step in their energy goals. Since then, this program has evolved to accept food waste from Greek houses and multiple public drop-off points. David will discuss the benefits and challenges of their food waste program.

DETAILED BIO:

David Henderson is the Utility Director for the West Lafayette Water Resource Recovery Facility. He has worked in the wastewater industry for more than 32 years and holds a bachelor's degree from Purdue University in biology. Dave is a long-time volunteer with Scouting America.

1:00-1:15: ST. CLOUD'S FOOD WASTE TO ENERGY PROGRAM

SPEAKER: **SHANNA CZECK**
ASSISTANT PUBLIC UTILITIES DIRECTOR,
CITY OF ST. CLOUD

The City of St. Cloud partnered with Tri-County Solids Waste Commission to host a Food Waste to Energy pilot study which used depackager equipment to separate organics

from packaging. The recovered organics were anaerobically digested, along with municipal solids and other liquid high strength waste, in an effort to measure the increase in biogas production and energy production at the St. Cloud Nutrient, Energy and Water Recovery Facility. This successful pilot demonstrated the benefits of incorporating food waste into anaerobic digestion along with the impact of diverting organic waste from landfills. Following the pilot, a feasibility study was completed to determine the requirements and benefits of a full-scale facility. The City has also started a residential fats, oil and grease (FOG) drop-off program to divert this waste stream from landfills. The City is currently considering funding options for expansion of this program.

DETAILED BIO:

Shanna Czeck has been with the City of St. Cloud for eight years and is now the Assistant Public Utilities Director, working across the Department including water treatment and distribution, wastewater conveyance and treatment, hydroelectric operations, stormwater operations and renewable energy production. Shanna has worked as part of the utilities team for the recent renewable's projects including the installation of the nutrient recovery and biogas utilization projects. She is currently helping lead the utility into a new era of resource recovery including the recent food waste to energy pilot.

1:15-1:30: KISHWAUKEE WATER RECLAMATION DISTRICT PROGRAM AND TECHNOLOGIES

SPEAKER: **MARK EDDINGTON, PE**
EXECUTIVE DIRECTOR OF THE KISHWAUKEE
WATER RECLAMATION DISTRICT

Following the great recession of 2007, economic and residential development in KWRD's service area ground to a halt. A simple plan to increase revenue through hauled waste receiving blossomed into annual seven-figure gains benefiting rate-payers and the environment alike. This presentation outlines how a medium-sized wastewater utility embraced innovation and calculated risk, to transition from a sewer plant to a state-of-the-art net-zero resource recovery facility.



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DETAILED BIO:

Mark has been the Executive Director of the Kishwaukee Water Reclamation District in DeKalb, IL since 2010. He holds a bachelor's degree in civil engineering from Marquette University in Milwaukee, WI. Mark has 14 years' experience as an engineering consultant for various firms in northern IL, where he worked as a planner and designer. He is a registered Professional Engineer in IL and WI. Mark is a past president of the Illinois Association of Wastewater Agencies (IAWA) and CSWEA and is an active member of the National Association of Clean Water Agencies (NACWA) and the American Public Works Association (APWA). He is currently a trustee of the Downers Grove Sanitary District. Mark lives with his wife Lisa and three children, Ryan (18), Lily (16), and Brendan (13) in Downers Grove, IL.

**1:30-1:45: PANEL:
GREASE – NUISANCE, PROBLEM
OR BENEFIT. MIDWEST RAPID FIRE**

**1:45-2:00: PANEL: HOW DO WE RECEIVE
FOOD WASTE AND GREASE AS A
WASTEWATER UTILITY?**

2:00-2:30: AFTERNOON BREAK

**2:30-3:00: KEYNOTE 2: IMPACTS OF
FINE PARTICULATES AND COLLOIDAL
COMPOUNDS ON NUTRIENT
REMOVAL AND RECOVERY**

**SPEAKER: DR. GLEN T. DAIGGER,
PHD, PE, BCEE, NAE, CAE
PROFESSOR OF ENGINEERING PRACTICE AT
THE UNIVERSITY OF MICHIGAN
PRESIDENT AND FOUNDER OF
ONE WATER SOLUTIONS, LLC**

Bacteria directly metabolize dissolved organics and, consequently, these are the substrates of most interest for biological nitrogen and/or phosphorus removal processes. But, what about the particulate and colloidal organic matter in so many wastewaters? Are these unnecessary? Do they interfere with effective biological nutrient removal? Can they be an asset for biological nutrient removal processes? Can they be used to increase nutrient recovery? Questions such as these will be addressed in this presentation.

**3:00-3:30: ADVANCED PRIMARY TREATMENT,
AAA, CARBON DIVERSION, AND
NUTRIENT REMOVAL**

**SPEAKER: DR. SUDHIR MURTHY, PE
CHIEF EXECUTIVE OFFICER OF
NEWHUB WATER CORPORATION**

Utilities experiencing as much as 50% load increase to biological processes are considering intensification within existing infrastructure, hydraulics and footprint. Off-loading this organic load at the front of the plant within primary treatment offers the opportunity for redirection toward anaerobic digesters. This combined increased load management and offloading has proven to be one of the most efficient ways of process intensification for many facilities in Europe. The Triple A settler or alternating activated adsorption settler is an "activated primary treatment" that can be retrofitted into existing rectangular or circular primary tanks at a hydraulic retention time of two hours and a sludge retention time of about 0.5 days. Several technology (approximately 20 worldwide) implementations demonstrate flexible designs adjusting to existing tank geometries and depths of 9-15 ft. Biosorption, bioflocculation, and bioassimilation provide percent treatment efficiencies of %COD/%N/%P of 60/25/33 removal compared with typical primary settling efficiencies of 33/9/11 removal, respectively. This settler can be used ahead of carbon removal, nitrification, phosphorus removal, or nitrogen removal plants and is intended for plants with anaerobic digestion.

DETAILED BIO:

Dr. Sudhir Murthy is Chief Executive Officer of NEWHub Water Corporation. NEWHub is a cleantech company that provides water innovation consulting services and manages through distributors of a suite of process technologies and equipment that intensify biological nutrient removal, water reuse, and promote energy efficient/neutral water reclamation systems. The Digestivore PAD, DEMON, AvN, inDENSE AAA, DETOUR, miGRATE and MINION technologies for wastewater treatment are part of the commercial suite that he has led. Sudhir was previously the Innovations Chief for DC Water and led the development and implementation of the Authority's innovation strategy. Sudhir led the concept development for over \$1 billion in new engineering and construction including enhanced water reclamation, nutrient removal, deammonification, thermal hydrolysis, advanced clarification and biosolids end-use implementations at the Blue Plains plant. He has received several WEF awards including the Ralph Fuhrman Medal for Academia-Practitioner Collaboration, the George Gascoigne Medal for Wastewater Treatment Operational Improvement and the Camp Applied Research Award. Sudhir has a MS in Environmental Engineering and PhD in Civil Engineering from Virginia Tech and is a Professional Engineer and licensed wastewater treatment plant operator. He has approximately 250 publications or presentations, approximately 25 patents, and a google scholar H-Index of 58.

3:35-4:00: PANEL SESSION Q&A





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REGISTRATION CHARGES

1 Registration fee to attend live event (includes continental breakfast, lunch, and refreshments)

Fee per Person	by April 1	after April 1
Education Seminar (ES)	\$190	\$220
Additional Utility Attendee*	\$95	\$110
Student**	\$25	\$30

* After one person from a utility registers at standard price, up to five additional people can register at a discounted price.

** 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 Attend the dinner after the Meet & Greet at The Great Dane Pub & Brewery from 6:30 pm-8:30 pm, featuring a brief talk on innovation related to this year's topic. (\$30 admission includes buffet style meal and one drink ticket). Location: 123 East Doty Street, Madison, WI 53703.

Yes No Any dietary restrictions? _____

No refunds given after March 23

3 Lodging:

Rooms are available at The Hilton Madison Monona Terrace, 9 East Wilson Street, Madison, WI. A room conference rate of \$159 per night will be held until March 22. For reservations, please call the hotel at 608-255-5100 and reference "CSWEA." Parking is available for a fee at the Hilton or next door at the Monona Terrace Community and Convention Center.

Other lodging is available nearby at the Best Western Premier Park Hotel (608-285-8000) at \$149 to \$219 per night. For reservation call the hotel and reference CSWEA. This hotel is about 0.7 miles walking distance from the Monona Terrace Community and Convention Center.

Alternatively, rooms for each hotel can be booked online at the conference rates using the unique QR codes on this page.

