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The Official Magazine of the Central States Water Environment Association, Inc.

24TH ANNUAL CSWEA

EDUCATION SEMINAR

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A Cause Greater Than Ourselves: Clean Water

By David Arnott

Though we are in the middle of winter fighting the cold and snow, I am appreciating the benefits of living in the Midwest. We don't have to worry about hurricanes, coastal flooding, or extreme drought; we have plentiful natural resources; have amazing recreation activities to enjoy; and we have abundant, clean water that we use for sanitation, drinking, irrigation, cleaning, cooling, and industrial uses. These water resources are our responsibility to hand down to future generations in as good or better condition than they are today.

As water stewards, we have a large influence on the water quality in and around our communities, whether it is urban storm water runoff, agricultural runoff, or private or public wastewater treatment discharging to surface water. As water professionals in Central States, we have different spheres of influence – from utilities and municipalities, academia, manufacturers and manufacturer representatives, and to consultants. We can each offer a unique perspective toward a clean water environment.

We are fortunate to have both the access and technical expertise we need to contribute to the cause of clean water for our generation and generations to come. I often think that one key to happiness is living beyond ourselves and working toward a cause greater than our individual aspirations. There is something about giving back that brings peace of mind and a sense of accomplishment. This is one way to make the world a better place. I cannot think of a better way to further this cause in our area of expertise – the water environment – than to get involved with Central States. We are always looking for new perspectives, new ideas, and fresh energy on the Association and the State Section level committees.

A great example of a cause greater than ourselves is our sister organization, Global Water Stewardship. Started in 2013, GWS resolves sanitation issues in the developing world by educating people and engineering sustainable centralized solutions that keep waterways clean and communities healthy. Each year the organization builds upon itself and grows. Members of the organization take trips to Costa Rica in February and August each year. Recently, the 501 C (3) organization has recognized that in addition to project planning and design through the help of CSWEA student chapter design teams, a great impact can be made through education on wastewater topics like collection systems, preliminary treatment, activated sludge, nutrient removal, and biosolids management. Though this requires hard work, what I hear from members are the positives – the people they meet in Costa Rica, creating a design that can improve lives, and seeing a community meeting where great synergy took place. Even though it is hard work, I venture to say that the experience provides a level of happiness to its volunteers. They know they are making a real positive impact on people with fewer resources than the rest of us and helping current and future generations in Costa Rica.

Other examples of ways to contribute to the cause of clean water inside and outside of Central States include:

- Participate in a local watershed event (e.g. DuPage River Salt Creek Workgroup).
- Help with the Minnesota Metro Area Children's Water Festival.
- Add a new twist to the standard plant tour you typically give at your treatment facility.
- Join in the 2019 CSWEA Annual Meeting service project (this is presently being planned, stay tuned for further details).
- Volunteer for an Adaptive Management Program (e.g. Madison Yahara WINS, Green Bay New Water, and Oconomowoc Watershed Protection Program).
- Conduct fieldwork for a water quality program such as sampling, secchi disk readings, laboratory testing, and shoreline erosion monitoring.
- Work with a non-traditional entity with fewer financial resources interested in treatment equipment procurement.
- Talk with your local schoolchildren about your career in the water environment. Show your passion.
- Conduct research specifically geared towards low cost sanitation improvements.

The list of opportunities goes on and on. What is important is not what your activity is or if you are impacting in the greatest way, it is simplify the fact that you are 'doing'.

Let's live beyond ourselves. Let's contribute toward a cause greater than ourselves – a clean water environment for our generation and future generations. I encourage you to contemplate how you might be able contribute to a cause greater than yourself through service in our Association or other organizations. This charge spans all work sectors, ages, and experience levels. In this age of being ultra-busy, fragmented, and frazzled, in our day jobs, this might provide a little tranquility and happiness. CS

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WEF Strategic Initiatives Update

By Eric Lynne and Derek Wold

Eric Lynne

Derek Wold

Since 1928, the Water Environment Federation (WEF) and it members have protected public health and the environment. As a global water sector leader, WEF's mission is to connect water professionals, enrich the expertise of water professionals, increase the awareness of the impact and value of water, and provide a platform for water sector innovation.

This year at WEFTEC, WEF announced the following objectives for the coming year:

- Partner with National Green Infrastructure Certification Program
- Re-launch the Water's Worth It Campaign
- Promote Utility of the Future and LIFT
- Support grassroots innovation and change with the Member Association Grant Program.
- Develop a new AMS member database.
- Focus on sustainability in all activities, down to the hotel partnerships made for events.
- Continue the MA: WEF Reciprocal Membership program.

WEFTEC RECAP

A Delegate's WEFTEC experience starts bright and early on Saturday morning with a seven AM House of Delegates breakfast. This year, the breakfast featured Table Talk with delegates from similar sized MAs from around the country to discuss the following topics:

- What are your MA's greatest needs?
- What do you think your MA does really well?
- In a dream world, what will your MA accomplish in the next five years?

This was a great opportunity to hear ideas from other MAs and share some of the things that CSWEA does really well. Other MAs were interested in our utility pricing for the annual conference and GWS initiative. The most prevalent needs discussed in this talk were membership/engagement, operators, and diversity. However, it was agreed that the areas where WEF excels include training and conferences. In addition to addressing our needs, the goals for the next five years include self-promotion, operator training, and partnerships.

> "This project will not only leave a positive impact on the environment, but will also provide community education on water, the environment, and green infrastructure."

The Table Talk really set the tone for the remainder of the meetings on Saturday and should be our guide for initiatives for the next several years. Saturday's meetings included reports from outgoing speaker Aimee Killeen, incoming speaker Keith Hobson, and incoming president Tom Kunetz.

While we were enjoying the comfort of the air-conditioned convention center, volunteers were toiling away in the New Orleans heat and humidity to build this year's service project. The delegates were able to take a bus over to the project location and interact with the volunteers, many of which were students and YPs. This year's project included constructing a bioswale at the Treme Recreation Community Center. The Center suffers from poor drainage and flooding due to runoff from their slanted roof flowing into an existing planter box. The volunteers transformed the existing planter box into a bioswale which will capture, detain and treat the stormwater runoff from the slanted roof to alleviate flooding and improve water quality. In addition, a green infrastructure graphic was created to educate the community on the importance of drainage. This project will not only leave a positive impact on the environment, but will also provide community education on water, the environment, and green infrastructure.

HOD UPDATE

The House of Delegates has few updates during the winter, as the Delegates assemble new deliverables and action items for the coming year. In addition to the standing HOD committees that Eric and Derek serve on, there are also several HOD workgroups that tackle key action items throughout the year to better our organization.

Key work products include:

- Identification of priority topics for WEFMAX presentations. Derek, Eric, and Mohammed submitted a list of focus areas that we've deemed most critical to our Central States' needs. Main focus areas include operators, YPs, and membership growth.
- Operator Initiatives Workgroup – Derek is our representative on this workgroup, which will seek to assist the WEF Operator Advisory Panel (OAP). The mission of the OAP is promoting and supporting the professional operator through the development of

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promotional materials to support and encourage participation in WEF operator-oriented programs and services, including the Operator Ingenuity Contest. The workgroup will also assist in the OAP's current efforts to survey MAs on operator workforce development, assist in the review of existing operator training materials (both WEF and MA developed) to provide a gap analysis for content. The workgroup will also assist in other WEF operator initiatives as the need arises. This includes but is not limited to the following:

- Promoting the role of the professional operator in the community, WEF Operations Challenge, and WEF OWWLs.
- Promoting and endorsing ABC Professional Operator Designation.
- Passing along information for utility managers on how to support operators in the workplace.
- Informing MAs about available WEF and other operator training materials.
- Distributing operator-oriented articles for MA magazines.
- Defining long-term MA operator training strategy working with OAP.
- Investigating workforce development for future operators and living wage material to provide deliverables to MAs for distribution .

- Member Association Resources Workgroup. This workgroup is actively assembling a database of MA Resources with particular emphasis on staffing, technical training/events, financial, and awards. WEF staff will host the compendium as a toolkit on the MA Resources Center of the website.
- The Membership Relations Workgroup will focus on increasing WEF's diversity towards all members. Specific focus will be to develop materials that tailor towards women and non-english speaking minorities. Our new WEF President Tom Kunetz (of MWRDGC) shared an eye-opening perspective story about connecting with other ethnicities and how we should apply that to the water industry.

WEFMAX 2019

All association leaders are encouraged to attend a WEFMAX to network, learn, and share experiences with other MAs. The locations for 2019 WEFMAXs have been identified as follows:

- British Colombia (Vancouver) March 13-15.
- Arizona (Scottsdale) March 27-29.
- Alabama (Orange Beach/Floribama) May 15-17.
- Kentucky-Tennessee (Nashville) May 29-31.

And for those of you planning ahead, 2020 will feature a Hawaii WEFMAX.

Please feel free to contact Derek or Eric about areas within WEF or CSWEA that are working well or not-so-well. CS

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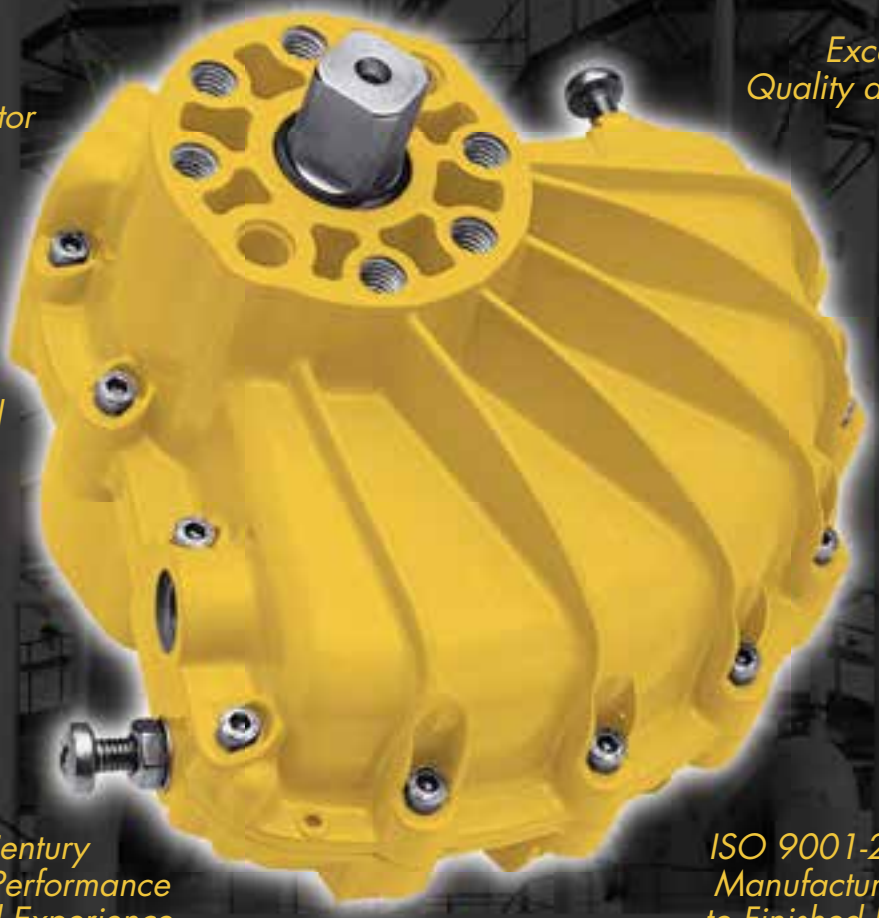

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Diversity in Our Industry

By Mohammed Haque

Last year during a job interview, I was asked something to the effect of "What would you do to increase diversity here?" The question completely caught me off guard, and more importantly, being a candidate that embodied diversity, the answer escaped me. It was a great question. The topic of diversity is something many large utilities have tasked themselves with recently and something that the Water Environment Federation is spending great effort on as part of their strategic goals.

Increasing diversity in our industry is extremely important, but it is not something we can do by filling positions solely. It is something we need to do by mentoring and nourishing talented individuals from diverse backgrounds to pursue our industry and make it better. 22 years ago, when I entered the wastewater industry on the public sector side, I recall going to an Illinois Association of Wastewater Agencies technical session and feeling extremely vulnerable. I was the only person of diverse background in a room of 80 people. Things have changed in the last 22 years, primarily because of the amazing people in our industry who were open to people of diverse backgrounds and to allow the demographics to change and to be welcoming of that change. Individuals like Robert Clavel, Phil Morgan and Sam Claasen stick out in my mind as folks that were open minded and welcoming of changes that increased diversity. They were exceptional leaders and their subtle openness and acceptance helped lay the groundwork for that change. I am thankful for their kindness because it allowed me to persevere in an industry, where during my formative years, I felt like the odd one out.

It would not be till many years later that I would realize how much diversity existed in large public sector agencies such as MWRD and other urban agencies. In the collar counties of Chicago, this was not the case, but things have changed and it's a great thing to see. Our industry is more and more looking like our general population. This year,

"It's not who is in the position, but that the position has to be filled with the best person regardless of race or gender."

I am exceptionally humbled to be accepted by my peers as the President of the Illinois Association of Wastewater Agencies, something that 22 years ago did not seem like a possibility. Much thanks goes to Mark Eddington who encouraged me to take on the leadership role at a time when I had way too much on my plate. The role is symbolic to me, because I am not great at it nor am I a good leader, but more importantly that by doing so it should allow other people of diverse backgrounds trace the steps that I was privileged and humbled to take.

During recent trips to Costa Rica we visited some ASADAs (local municipal utilities) in the mountain towns of La Fortuna and Monteverde. In those towns as well as several others in the province, the presidents of the ASADAs were women. The regional director indicated that the vast majority of the leaders of the ASADAs in that area were bright, strong, talented women. I saw what she meant as I interacted with these ladies. They were all exceptional in their drive, passion and zest for their profession and the work they did. They loved it and they were really good at it. And perhaps that's the point. It's not who is in the position, but that the position has to be filled with the best person regardless of race or gender.

As I reflect on that question I answered a year or so ago with little thought or insight, I realize that the right answer is that we have to nourish and encourage diverse candidates that are talented and have bright futures in our industry. We have to make our industry an option to all people. One way of doing that is to make it a point to go to schools in every demographic and socio-economic backgrounds and encourage our field as a career choice to young developing minds. With that early encouragement and proper nourishing and inspiration, the diversity in our industry will be that of our general population and with the next generation the question of "How do we increase diversity?" will be a question that need not be asked anymore. CS

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The Fundamentals Are Still the Fundamentals... Or Are They?

By Troy Larson

Our fall conference season featured as much information as I can remember. We spend more and more time talking about side stream treatment, nitrogen shunts, algae treatment, and struvite harvesting each year. Many of these and other emerging technologies aren't reflected in operation certification exams and, in many cases, are counter-intuitive if studying the basics. We can no longer assume that an activated sludge facility should be operated at a dissolved oxygen concentration of 2 mg/L. Aeration strategies are just one of the operation techniques that are getting studied and manipulated to test theories geared towards improving energy use and process efficiencies. Organisms historically linked to important tasks – like phosphorus and nitrogen removal – are no longer the only 'critter' for the job and maybe not even the best.

So how do you get your bearings if operating or evaluating facilities in this era of advancement? How do regulators apply previously established standards to emerging techniques designed to outperform the previously accepted minimums and maximums required of a design? Perhaps that is where the fundamentals related to monitoring and data collection are more important than ever. Data and trends collected and organized to confirm cause and effect relationships may be more important than in previous decades. Emerging analytics and new processes will benefit greatly from having data that can validate and explain the techniques that are being employed. Early adopters will gain understanding and will almost certainly isolate issues that can then be addressed, and those later into the mix will benefit from gained experience.

Few people like having a black box where you simply hope for performance. We want the ability to control the outcome and this takes information that we do not always have. Just as we are in an era of development, we are also in an era of shrinking staff sizes and reduced monitoring. Managers need to avoid too much streamlining in the lab, particularly of personnel dedicated to monitoring processes. I often hear that facilities have fewer people than they used to and they do less monitoring and data interpretation as a result. This is unfortunate because operators are not as informed, engineering assistance is hampered, and sharing stories amongst facilities is handicapped. Many discoveries in our industry and in other industries came by accident, but not without being observed.

Ours is an industry that benefits greatly from scientific fundamentals. Scientific fundamentals would involve rigorous observation, development of theories, testing the validity and repeatability of these theories and, ultimately, sharing of the information collected. As an industry, we need to resist relaxing our data collection and process control monitoring to a point where we are no longer current with the flurry of improvements and advances.

Professional organization activities like those offered by CSWEA are a great way to share information. At our seminars and workshops you might find educators, engineers, operators, regulators, and manufacturers. Collaborative 'bull sessions' and prepared presentations aid in communicating these emerging ideas that, in many cases, will improve our industry.

As far as the fundamentals, it is clear to me that we will be rewriting text books to update the use of control parameters and our codes will get challenged to accommodate proven innovative ideas. If we follow scientific fundamentals in the process, we will take our industry to the next level of performance and efficiency. Thank you to the regular contributors of CSWEA for your generous sharing of knowledge and experience. It moves us forward. CS

"Ours is an industry that benefits greatly from scientific fundamentals. Scientific fundamentals would involve rigorous observation, development of theories, testing the validity and repeatability of these theories and, ultimately, sharing of the information collected."

Wisconsin's Resource Recovery Seminar

By Randy Wirtz

On November 14, 2018, the Wisconsin Section hosted a Resource Recovery Seminar at NEW Water's Green Bay treatment facility, which was attended by about 60 people. The seminar included morning technical presentations on a variety of wastewater resource recovery topics, including sludge pyrolysis, digester gas uses, codigestion, and DNA analytical profiling for anaerobic digesters. The group broke for lunch and then held a 45-minute 'bull session' to discuss the topics previously presented, which included small group discussions of the technical presentations and a chance for attendees to discuss how the technologies may apply to their situations. The seminar concluded with a presentation about NEW Water's $170 million Resource Recovery and Energy Efficiency (R2E2) project, and a tour of the nearly complete R2E2 project led by NEW Water staff involved in the project.

Summaries of the technical presentations are provided below.

Pyrolysis of Biosolids to Biochar

Patrick McNamara, Marquette University

Dr. McNamara presented Marquette University's research into pyrolysis treatment of sludge and biosolids. Pyrolysis is the heating of material in an oxygen-limited condition, and this technology is gaining attention as a residuals and biosolids handling process for wastewater biosolids. The presentation highlighted uses and potential concerns surrounding the three products produced from pyrolysis: pyrolysis gas, pyrolysis oil, and biochar. Biochar is of prime interest because of its beneficial soil amendment properties. Pyrolysis gas is comprised of methane, hydrogen, and other gasses and it has use as a fuel for engines, particularly if mixed with other gasses such as digester gas. Pyrolysis oil, while containing a significant percentage of the original energy, can be difficult to manage because of its very low pH and corrosive properties.

Marquette's research has been focused on application to Milwaukee Metropolitan Sewerage District's Milorganite product. In particular, the District's Milorganite production process produces a portion of off-spec product that cannot be sold as commercial fertilizer and has traditionally been landfilled. Pyrolysis of this material could provide additional revenue from the gas, oil, and biochar end-products. Testing of various operational configurations has been focusing on the conversion efficiencies of the Milorganite to pyrolysis gas, with a minimization of pyrolysis oil.

Digester Gas: Renewable Natural Gas Opportunities

Randy Wirtz, Strand Associates, Inc.

Digester gas reuse previously meant burning the gas in boilers or producing electricity and heat through cogeneration. However, the Federal Renewable Fuel Standard (RFS) has provided another outlet for digester gas reuse by providing a market to sell renewable natural gas (RNG) to the local utility while taking advantage of the RFS program to sell the gas attributes to virtual customers in other areas. The RFS requires non-renewable transportation fuel producers to either produce renewable fuel or to satisfy this requirement by purchasing renewable fuel credits from renewable fuel producers.

An additional RNG market that now provides a viable outlet for digester gas is the Renewable Energy 100 (RE 100) market. The RE 100 refers to a group of more than 100 of the world's largest companies that have committed to purchasing 100% of their energy from renewable sources. The market created by this demand can provide a long-term (over 10 or 15 years) price guarantee, which significantly reduces the risks associated with market fluctuations in the RFS markets. Such markets have created a viable outlet for POTW digester gas, which can have significantly more value to the POTW than using the digester gas for heating or cogeneration systems.

Advancing Anaerobic Digestion of Wastewater Solids and Food Waste for Energy and Resource Recovery: Science and Solutions (A Framework for the Practice of Co-Digestion)

Matt Seib, Madison Metropolitan Sewerage District and Kevin Jankowski, Milwaukee Metropolitan Sewerage District

In October 2017, the Water Environment and Reuse Foundation (WERF) and the Water Research Foundation (WRF) – now jointly The Water Research Foundation – conducted an anaerobic digestion workshop. During the workshop, presenters and attendees discussed existing co-digestion programs and practices to improve the success of codigestion programs, along with recommendations and research needs for the industry. Matt and Kevin presented a summary of the WRF workshop that highlighted the main themes and takeaways from that event.

The presentation included discussion of the codigestion framework, which was the focus of the WRF seminar. In addition, the presentation focused on the logistics associated with receiving and management facilities, testing that can be done to help assess potential gas production, desired waste characteristics, sampling and monitoring considerations, impact to operations, side-effects that can be anticipated, and strategies employed at different facilities to manage the overall program. The presentation is summarized in the report *Advancing Anaerobic Digestion of Wastewater Solids and Food Waste for Energy and Resource Recovery: Science and Solutions - A Framework for the Practice of Co-Digestion (WRF ENER20W17)*.

Anaerobic Digester Microbial Community and Digester Metadata

Ali Ling, BARR Engineering

Dr. Ling presented a summary of work associated with identifying microbial groups associated with anaerobic digestion, which was commissioned by Microbe Detectives and completed in 2017. The goal of the study was to use a large dataset of microbial and operating data link changes in the microbiome (the combination of all types of microbes in the digester) to digester operation in order to provide insight into reactor operation and design. Anaerobic digestion is a wastewater process that relies on the presence of many different types of microbes to work, including hydrolyzers, acidogens, acetogens, and methanogens. The microbial community that makes up a specific digester's microbiome will be influenced by operational and design conditions, such as SRT, mixing, operating temperature and pH, feedstocks, and chemical addition. The microbial community in turn will affect digester outcomes such as COD removal and biogas production.

Researchers used 60 samples from 21 digesters representing a variety of industries, feedstocks, reactor design, and operational conditions in this study. This included three time events for most digesters. Microbial community data and digester operation and outcome data were evaluated in an effort to understand the relationships between operation, community members, and outcomes.

A group of organisms called archaea include all methanogens and their abundance was a good indicator of methane production potential. Each digester and site studies had specific digester microbiomes that were more similar to each other than to other digesters. This suggests that microbial community results are site-specific. The community composition associated with optimum results will vary between sites. Despite this limitation, some general community trends were observed across the samples studied, and these may be used to make general conclusions about digester operation and community structure.

To summarize:

- Thermophilic conditions and blanket-type reactors correlated to higher archaea relative abundances and methane content in produced gas.
- COD removal correlated directly to methane production.
- Communities in municipal digesters were different and more diverse than those in digesters treating only industrial wastes, likely due to the regular addition of waste activated sludge.

- Higher relative abundances of total archaea, pseudomonads, and commomonads correlated to methane content in produced gas.

Based on these results, several key performance indices (KPIs) based were developed to help operators use microbial community analysis to inform and improve system operation. These include KPIs for:

- Methanogenic activity potential
- Community stability, and
- Odor potential

The Wisconsin Section Operations Committee is grateful to NEW Water for hosting the event and devoting so much staff time in the months leading up to the seminar. CS

Strive to be Worthy of Recognition

By Peter Daniels

As I write this, our organization is in the process of seeking nominees for the many awards that CSWEA and our state sections present each year. The CSWEA Call for Awards document, recently sent out, includes 14 different awards. The Minnesota section presents an additional three awards at the state level. With all the great wastewater and stormwater work that happens each year in our region, we have a great pool of individuals and organizations worthy of the recognition that these awards provide.

Not only do the awards provide recognition to people doing great work, but the awards can also be a way to introduce new people to CSWEA. This has commonly occurred with the Industrial Water Quality Award in Minnesota – three of our last four winners were not involved with CSWEA before they were nominated and selected for the award. As I think about new award nominees, I realize that in the past I have too often tried to identify individuals already engaged in CSWEA. For some awards, that is important (and may be required by the award criteria) but for many awards, we can consider a broader group, and try to use the process to introduce CSWEA to a new group of talented professionals.

The Minnesota section has had many conversations about awards over the past couple years. A few examples include:

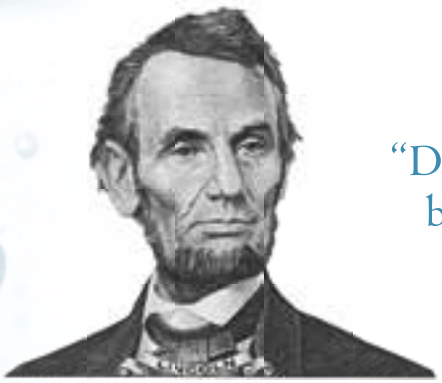
- Adding a new award. Our new Resource Recovery & Energy (R2E) Committee is presenting the first ever Minnesota Section R2E Award at the 2019 Innovative Conference in St. Cloud.
- Helping realign the CSWEA Industrial Water Quality Achievement Award criteria with the criteria of the WEF award to make it easier for our CSWEA section winners to apply for the WEF award.
- Considering the establishment of a new Awards Committee at the state level to help coordinate how we seek nominees and present awards.

We are all familiar with examples of how other organizations present awards, whether it be awards for professional sports leagues, music awards, the Emmys, the Academy Awards, and so on. Recognizing key contributors to an organization or profession is a great way each year to thank each other for good work, share success stories and life lessons, and be mindful of an organization's purpose. It is also a way to build camaraderie – our office has an annual chili cook-off and there is certainly pride taken in who gets the trophy each year.

I believe our awards program is also a key element of advancing CSWEA's Mission Statement of "…offering multiple opportunities for the exchange of water quality knowledge and experiences among its members and the public and to foster a greater awareness of water quality achievements and challenges." What better way to share experiences than recognizing the successes of our profession?

Although I don't think the general public is quite asking for our awards ceremonies to be televised on prime-time TV like the Academy Awards (yet…), we can consider taking steps to create some excitement and buzz around our awards. The CSWEA Awards Banquet at the Annual Meeting is a good example of this. The new Awards Committee in the Minnesota section (if and when established) could work with the various award committees to come up with the best way to present our awards in an impactful way. If you have a suggestion on how to improve an awards presentation event, let me or one of our committee chairs know.

So, each year, let's all take some time to think about potential award nominees and who in our profession should be recognized. I think a lot of people in our profession are happy to work hard and make a difference without requiring a lot of recognition, but telling their stories helps us provide value to CSWEA's members and the public. It also shows our gratitude for good work. There are many water professionals in our region that do just what Abraham Lincoln spoke about. CS



"Don't worry when you are not recognized, but strive to be worthy of recognition."
- Abraham Lincoln

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2018 Reflections and Resolutions

By Chris Marschinke

The holidays are naturally a time for reflection, and making those resolutions that will almost certainly fizzle out by National Meatball Day (March 9th for the unacquainted). All the same, it's a healthy practice that puts a brief dent in my annual cookie consumption, which is probably a good thing. So with that justification, here are some of my Thanksgiving reflections and New Year's resolutions.

I am thankful for the wealth of knowledge that surrounds us in this organization, and the willingness of our members to share so readily. Exchanging ideas and experiences is what makes each of us better operators, engineers, educators, and manufacturers. Over the past decade I've learned more, and been exposed to a wider variety of issues than I ever would have had I not been a part of Central States. Between our conference programs, committee seminars, and simply the '*here's-what-we-did*' conversations, I have become what some may even describe as a 'competent' engineer. However, we can always do better.

With that, I resolve to further that goal, and I ask for your help. We have discussed for several years the potential of the Operator Certification requirement, and have been in the early stages of compiling a program to that end. Regardless of the regulatory impetus behind it, the program is an excellent idea worthy of our attention and requires dedication to bring it to fruition. For the New Year I ask for your help – Our section is in need of a champion or multiple champions to schedule and handle the logistics of finalizing the program. The section has potential material for the course, but we need someone to take the reins (how topical!). If this sounds like something you might be interested in, please contact me (or any of the Section officers).

I am also thankful for the opportunities presented to us by WEF, and specifically the hallmark water-quality conference, WEFTEC. By the time you read this we'll be several months out from the event but hopefully we're integrating some of the things we learned into our daily professional and personal lives. The 91st annual exhibition was the largest ever in New Orleans with more than 20,000 attendees, and over 1,000 exhibitors across 300,000 square feet of hall space. The conference was, of course, a success by all metrics. But one item that stood out to me this year are the initiatives WEF has introduced to broaden the reach of the organization and engage more participants in its mission.

This year, WEF announced the InFLOW program (Introducing Future Leaders to Opportunities in Water), which strives to identify and engage students from underrepresented minority groups who may be interested in water-industry careers. In its first year, the program sponsored 16 students from Howard University, Tuskegee University, and the University of South Florida providing travel assistances, accommodations, and additional networking opportunities to the participants. The program is modeled after WEF's Young Professional's Springboard Program which I had the opportunity to attend this past year in Atlanta. Both programs are examples of member identification and engagement that have each proven very successful at the WEF level. Going into 2019, I resolve to help foster similar outreach efforts for our section to identify new members and engage them in our organization. We have strong member retention within our organization, but have struggled to attract new members from diverse fields. I challenge our section officers to brainstorm opportunities to engage new members – managers, engage your operators; consultants, engage your manufacturers; YPs, engage your past educators. I ask each member to identify and engage one new member to a committee in 2019 – our succession and growth depends on it!

So with that I will close on this holiday reflection – I am thankful for each of you reading this, and even those of you who skipped right to the end. I hope you have a wonderful New Year and look forward to continuing to grow the impact of our organization in 2019 with your help. CS

"I am thankful for the wealth of knowledge that surrounds us in this organization, and the willingness of our members to share so readily."

Illinois US EPA Pretreatment Training Highlights

By Eduardo Gasca,
IL Industrial Pretreatment Committee

In 2018, the US Environmental Protection Agency (US EPA) sponsored a series of two-day Clean Water Act NPDES Pretreatment Training. One of these trainings was offered in the city of Indianapolis at the Indiana Government Center on July 18-19, 2018. The main audience was municipality representatives in charge of Publicly Owned Treatment Works (POTW) or entities that normally enforce the pretreatment regulations to industrial users that discharge their wastewater effluent to municipal wastewater sewer and wastewater treatment works. The two-day training included an overview of the Pretreatment Program, regulations and standards; approaches to develop industrial user inventories and industrial user classification; resources for performing inspections, reporting requirements; sewer use ordinance, enforcement response, and enforcement case studies. This paper will help disseminate the information presented during this training sessions to the CSWEA members.

During the first day Mr. Newton Ellens, Environmental Engineer and Ms. Jodie Opie, both US EPA Region Five Pretreatment Program Managers, kicked off the day with an introduction and overview of US EPA Pretreatment Regulations and Standards (Prohibitive Standards and Local Limits). Presentations on categorical pretreatment standards and an exercise on categorical user classification were followed by a presentation on methods to develop industrial user inventories.

After lunch, the presentations focused on industrial users inspections and identifying Dental users (a new category that must comply with Pretreatment regulations as of July 14, 2017 if new source, or July 14, 2020 if existing source) followed by the various pretreatment reporting requirements (SMRs, BMRs, certification statements and e-reporting). Mr. Ellens and Ms. Opie concluded the day with presentations on Pretreatment Compliance Inspections Findings and a US EPA Update which included recent publications and guidance manuals, training resources, e-reporting, industries that US EPA continues or plans to study, as well as parameters of concern (nutrients – phosphorus, nitrogen, and PFAS).

The second day of training was dedicated to industrial user permitting, a permitting exercise, the application of the Combined Wastestream Formula, Regulating Non-Categorical Significant Industrial Users (SIUs) and the establishment of Local Limits.

The second day afternoon training started with US EPA presentations on the development of Sewer Use Ordinances, including common errors and deficiencies found by US EPA, and the Pretreatment Enforcement Response including content, quality, escalation procedures and triggers, and civil penalties. The US EPA presentations were followed by one on Significant Non-Compliance (SNC) and when to publish in local newspapers a SNC industrial user. The training concluded with a presentation by Greg Yarnik, from the Metropolitan Water Reclamation District of Greater Chicago, on pretreatment enforcement case studies.

PDF copies of the July 18-19 Pretreatment Training presentations are available by contacting Eduardo Gasca, CSWEA-IL Industrial Pretreatment Committee Chair, at 630-427-8103 or via email at *eduardog@st-ma.com*. CS

The Alexandria Lake Area Sanitary District, MN

BACKGROUND

The Alexandria Lake Area Sanitary District (ALASD) is located in the central lakes region of Minnesota, about halfway between the Twin Cities and the Fargo/Moorhead area. Created in 1971, ALASD was the third sanitary district established in Minnesota, following the sanitary districts in the Twin Cities and Duluth. ALASD was established to convey and treat wastewater from the city of Alexandria and the adjacent townships of Carlos, Hudson, and LaGrand. Ida township and Lake Mary township have subsequently been added to the service area and ALASD additionally provides contract services to the cities of Nelson, Forada, Carlos State Park, Leaf Valley Township, and two interstate rest areas. ALASD currently has a service area of about 100 square miles with more than 10,000 customer accounts, serving a population of more than 24,000.

COLLECTION SYSTEM

The service area is spread between and around the many lakes within the service area boundaries. As a result, the sanitary district operates and maintains 119 lift stations, 48 grinder stations, 124 residential grinders, and more than 270 miles of sanitary sewer and forcemain from residential, commercial, and light industrial customers. ALASD staff perform all of the maintenance of the collection system, including preventative maintenance of the pumps in the lift stations, inspection and testing of the lift station control panels, jetting of the sewer pipes, regular inspection, cleaning, and preventative maintenance of the many air release valves throughout the collection system. ALASD also performs all pump rebuilding in-house.

ALASD has a fully integrated supervisory control and data acquisition (SCADA) system to monitor equipment and processes in both the collection system and at the wastewater treatment facility. Operating data from the major lift stations is relayed to the wastewater treatment facility for monitoring by staff. Field crews can be directed to problems in the collection system as soon as they arise. The collection system conveys wastewater to the ALASD wastewater treatment plant (WWTP) which is rated to treat average wet weather flow of 4.7 million gallons per day (mgd). The current average annual wastewater flow to the WWTP is 2.9 mgd.

WASTEWATER TREATMENT FACILITY

The ALASD wastewater treatment facility was initially constructed in 1977 as an advanced secondary treatment facility. The facility included raw sewage screening and grit removal, primary clarification, aeration basins, secondary clarification, solids contact clarifier and tertiary filtration, and disinfection. Solids-handling improvements were completed in 1998 to add a third aerobic digester and the tertiary filters were renovated in 2000. An expansion project was completed in 2008 that included an all-new headworks building and grit removal, a third aeration basin, conversion of the solids contact clarifier into a secondary clarifier, replacement of the tertiary filters with cloth disk filtration units, and upgrades to the solids processing. A fourth aerobic digester and miscellaneous improvements to the solids processing facilities were completed in 2014.

The wastewater treatment facility is equipped with a PLC-based distributed control system (DCS) to monitor process performance, record operational data, and provide for remote control of unit processes. The control screens can be monitored by staff from any PLC panel in the facility and from computers, whether at the site or located remotely. The DCS also provides access to the facility electronic operations and maintenance (O&M) manual.

PRELIMINARY AND PRIMARY TREATMENT

Wastewater enters the facility via the main pump station. Solids handling centrifugal pumps convey influent raw sewage to the headworks building, which then flows by gravity through the remainder of the treatment facility.

The headworks building houses the raw sewage screening and grit removal facilities. Two ¼ inch perforated stainless steel plate, rotating mechanical filter screens, each rated for a peak hourly flow of 6.9 mgd, remove rags and debris from the raw wastewater. Screenings collected from each filter screen are discharged to a dedicated screenings washer and compactor, each

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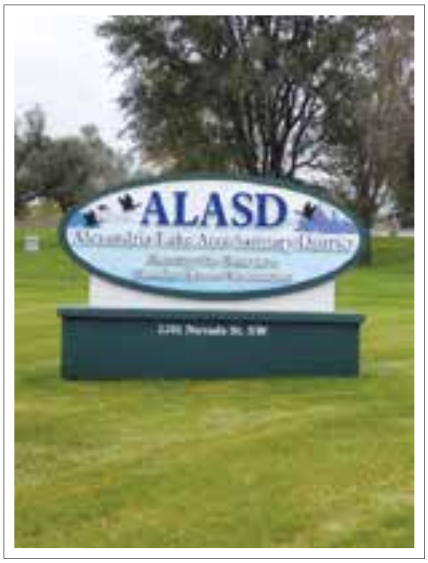

with a capacity of 35 cubic-feet per hour. Screened wastewater flows through vortex grit removal prior to primary clarification. Grit slurry from the vortex grit tank is pumped to a cyclone classifier and grit washer. Cleaned screenings and grit discharge to a common roll-off box located in an adjacent room to help minimize odors in the headworks building. The headworks building has been designed to accommodate the addition of a third filter screen and a second vortex grit tank for future additional preliminary treatment capacity.

Screened and degritted wastewater flows to primary sedimentation. The WWTF has two 45-foot diameter primary clarifiers to remove settleable material from the wastewater. Each primary clarifier is equipped with a plow type collector mechanism, which directs solids collected on the tank bottom to a hopper for removal. Primary sludge and scum are conveyed to the digesters for further treatment.

SECONDARY TREATMENT

Primary effluent flows to the aeration tank head box where it is split between three aeration basins, each with a volume of 0.38 million gallons. The aeration basins are equipped with nine-inch diameter ceramic fine pore diffusers. Dissolved oxygen levels, pH, and temperature are monitored in each tank. Solids retention times are typically maintained between six and 10 days to achieve nitrification and ferric sulfate is added to the end of the aeration basin for phosphorus removal.

Aeration air is provided by dual vane single stage centrifugal aeration blowers. Aeration blower guide vane positions are adjusted automatically to maintain an operator set air header pressure and a set dissolved oxygen setpoint in the aeration tanks.

Mixed liquor from the aeration basins is split between three secondary clarifiers through a weir box. Secondary Clarifiers one and two are 55-foot diameter center feed clarifiers and Secondary Clarifier three is a 75-foot diameter center feed clarifier. Flow is distributed to the three clarifiers through a mixed liquor splitter box to achieve proportional hydraulic and solids loadings.

Each clarifier is equipped with an energy dissipating inlet structure, flocculation well, and hydraulic suction sludge removal collectors. Secondary effluent is collected by peripheral weirs located around the perimeter of each clarifier and is conveyed by gravity to the effluent filters.

The return activated sludge (RAS) is withdrawn from the secondary clarifiers by non-clog centrifugal pumps. A total of six variable speed RAS pumps are installed, two for each clarifier. A sludge blanket monitor is located in each clarifier and RAS pump speed is controlled to maintain a constant sludge blanket level in each clarifier. The pumps discharge to a common header that returns RAS flow back to the aeration tank head box where it mixes with primary effluent to be split among the three aeration basins.

EFFLUENT FILTRATION

Secondary effluent is conveyed to three cloth media filters to remove particulate material from the secondary effluent prior to disinfection. Each filter is rated for 6.1 mgd and consists of a stainless-steel tank, drive assembly, center tube assembly, 12 cloth disk assemblies, and two backwash pumps with associated piping and valves. The disks are cleaned by backwashing and accumulated sludge in the bottom of the filter tank is removed by a waste sludge cycle. Backwash is initiated auto-

matically when the water level above the cloth disk assembly exceeds the set point. Typically, only two filter units are operated at any given time.

DISINFECTION

ALASD uses gaseous chlorine from one-ton cylinders for disinfection of the final effluent from chlorine gas regulators and vacuum type chlorinators. Filtered secondary effluent and chlorine solution flow to two contact tanks that provide a minimum of 15 minutes of detention time at peak hourly flow conditions. The chlorine contact tanks are located under the filter and control building slab, directly under the cloth disk filter units, allowing flow by gravity from tertiary filtration to disinfection. Sodium bisulfite is injected at the end of the chlorine contact tanks for dechlorination prior to discharge.

SOLIDS HANDLING

Sludge is pumped from the primary clarifiers on a timed basis to maintain low sludge inventories in the tanks and to provide a more consistent load to the aerobic digesters.

Waste activated sludge (WAS) is withdrawn from the common RAS header by variable speed progressing cavity pumps. WAS is pumped continuously to a dissolved air flotation thickener (DAFT) where it is thickened from about 0.8% total solids (TS) to 2-3% TS.

Aerobic digester cells stabilize primary and thickened waste activated sludge. Each digester cell is equipped with nine-inch diameter flexible membrane fine pore diffusers. Due to oxygen demand and limitations in oxygen transfer capacity, raw sludge is split between digesters one and two to distribute the load for better-dissolved oxygen (DO) level control. The effluent from Digester Cells one and two combine at the downstream end and flow through cell three and cell four in series. Dissolved oxygen levels, pH, and temperature are monitored in each cell. Air is provided to the aerobic digesters by two 250 HP dual vane single stage centrifugal aeration blowers rated for 4,500 scfm at 8.4 pound-force per square inch (psig) each. Blower guide vane positions are adjusted to maintain an operator set air header pressure in the main serving the digesters. Airflow to each digester cell is adjusted based upon operating DO and pH.

Due to auto-heating of the sludge during the digestion process, it is sometimes necessary to cool the digesters to maintain sludge temperatures below 32 deg C. A mechanical chiller was installed in 2008 to provide chilled water glycol solution to cool the sludge. Two tube-in-tube type heat exchangers were installed when the fourth digester cell was constructed to allow cooling of each primary digester cell. Chopper pumps circulate digested sludge from cells one and two through the heat exchangers as needed to maintain the temperature set point.

Digested sludge is withdrawn from digester cell four by variable speed progressing cavity pumps and conveyed to a high- solids dewatering centrifuge. Dewatering operations are typically conducted daily, Monday through Friday, for four to six hours per day and produce a cake of up to 24% TS with 14 pounds of polymer per dry ton.

The solids processing at ALASD produces a Class B biosolids product that is hauled by ALASD operations to area fields for land application. ALASD generates about 800 dry tons of biosolids per year.

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FACILITY PERFORMANCE AND EFFLUENT QUALITY

ALASD is equipped with an on-site laboratory that is certified by the State of Minnesota for compliance testing, so testing is conducted in house under the guidance of a full-time laboratory manager. ALASD partners with the industrial dischargers, which include food processing and metals fabrication and finishing facilities, in performance of a pretreatment program and conducts regular sampling and analysis of the industrial discharges. The pretreatment program has been successful in assisting industry manage their discharges while improving overall plant performance.

The ALASD WWTP discharges into Lake Winona, which is connected to a chain of lakes that ultimately discharges to the Long Prairie River. The chain of lakes is popular for both vacationers and year-round residents for the recreational and sport opportunities they provide. Because of this close connection with the community, ALASD has always strived to achieve the highest level of effluent quality. ALASD staff conducts water quality testing on 13 separate lakes in the chain from June through September to monitor for any impacts related to WWTP discharges.

The key National Pollution Discharge Elimination System (NPDES) permit limits are summarized in Table 1.

Parameter	Limit	Notes
cBOD5	25 mg/L	Monthly Average
TSS	30 mg/L	Monthly Average
Total Phosphorus	0.3 mg/L	Monthly Average

Table 1: NPDES Discharge Limits for the ALASD WWTF

ALASD anticipates that the total phosphorus discharge concentration limit will be reduced to 0.157 mg/L in future permits. It is also anticipated that a chloride limit will be added to the NPDES permit at some point in the future, as this has been an emerging concern with the state regulatory agency.

The WWTP effluent averages about one mg/L for both cBOD5 and TSS on an average annual basis. ALASD utilizes a chemical phosphorus removal process through addition of ferric sulfate to the mixed liquor stream, which is effective for removal of soluble phosphorus. Particulate phosphorus is captured through the cloth disk filters. Operations has been able to optimize the chemical addition and filter operation to achieve a total phosphorus concentration of less than 0.13 mg/L on an average monthly basis, with monthly discharges as low as 0.08 mg/L. Although the district has demonstrated the ability to meet the anticipated future total phosphorus limit of 0.157 mg/L, additional improvements to secondary clarification or tertiary filtration are likely needed in the future to ensure permit compliance under all operating conditions. ALASD commissioned a study to evaluate pathways to achieve a future permit limit on chloride. ALASD, like many other public utilities in Minnesota, will continue to discuss the emerging concern over chloride discharges with the state regulatory agency and other regional stakeholders to work toward a solution.

Since its inception, ALASD has sought to be a responsible steward of the public interest and the natural environment. ALASD has always sought to operate the wastewater collection and treatment systems to the best of their ability, not simply to meet permit requirements. In demonstration of this goal, the district has never had a discharge permit violation in its history. Because of the diligent work of the ALASD staff and continual support of the ALASD Board of Directors, ALASD looks to the future to uphold the dedication to the outstanding performance of its past. CS

LIFT – INNOVATION EXPERIENCE ABROAD

Fond du Lac WTRRF and the LIFT SEE IT Program

By Autumn Fisher

Water resource recovery facilities (WRRFs) are transforming themselves into utilities of the future and becoming drivers of resource recovery, economic growth, and improved environmental performance. The implementation of innovative technologies, processes, and approaches is paving the way for this transformation. An effective way for utilities to learn about, gain confidence in, and adopt new technologies and approaches more quickly is to be able to visit and see them in action at peer facilities. However, many utilities, especially smaller ones, have limited travel budgets or travel restrictions, thus resulting in a reduced ability to visit facilities nationally or internationally. This impedes the ability to learn best practices and adopt new technologies.

The LIFT Scholarship Exchange Experience for Innovation & Technology, otherwise known as the LIFT SEE IT program is an initiative spearheaded by WRF, WEF, and NACWA to provide scholarships for utility personnel to visit other utilities with innovations of interest and to share experiences with their peers. Innovations may include new technologies and processes, but also novel approaches to service, operations, and finance.

LIFT has identified 12 Technology Focus Areas as priorities, though SEE IT applications are not necessarily limited to the following topics:

- Biological Nutrient Removal
- Phosphorus Recovery
- Digestion Enhancements
- Energy from Wastewater
- Biosolids to Energy
- Collection Systems
- Stormwater and Green Infrastructure
- Small Facilities
- Odor Control
- Disinfection
- Water Reuse
- Intelligent Water Systems

LIFT SEE IT provides hands-on interaction with innovative technologies and enables utilities with plans to implement new technologies with the needed perspective and information to accelerate adoption at their own facilities. LIFT SEE IT is a tool and resource supporting the transformation of water resource recovery facilities into utilities of the future.

In 2018, LIFT awarded 10 utilities and 28 total staff members with SEE IT travel scholarships. One utility awarded the scholarship was the Fond du Lac Wastewater Treatment and Resource Recovery Facility (WTRRF) located right here in our very own CSWEA region.

BACKGROUND

The Fond du Lac WTRRF first learned of the LIFT SEE IT program in 2017 and quickly began making plans on how to apply and take advantage of the opportunity. The facility was approaching the design and construction of an on-site deammonification system and would be undertaking a facility master-planning project in the near term. Therefore, the goal of a trip and various site visits could serve multiple purposes.

The primary goal, learning about technologies that were nearing planning or construction, included proposed site visits of various Paques

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Lingen Digester-Nutrient Harvesting Complex

Paques Headquarters

Pyreg Incinerator

AnammoPAQ™ installations. While there are a number of sidestream ammonia removal processes now operating in the US, Fond du Lac WTRRF will be the first AnammoPAQ™ installation in the country and the opportunity for a site visit provided the staff with a gained understanding of lessons learned during start-up and daily operation from facilities that have been operating for many years.

In addition to the projects in the nearest term, Fond du Lac's facility master planning project provided a secondary goal of exploring innovative solutions for nutrient harvesting/sequestration, biosolids, and biogas upgrades. While there are several struvite harvesting/sequestration systems operating, in design and/or early construction in the US, there are currently no installations in operation of either Airprex or NuReSys. Additionally, there are no deammonification systems that are operating in conjunction with struvite harvesting/sequestration in the US.

TRIP OVERVIEW

Approximately one month following initial application, Fond du Lac WTRRF was notified they had been awarded one of the travel scholarships through the LIFT SEE IT program. In the coming months, staff worked with various manufacturers and consultants to finalize their itinerary for travel in September 2018.

The trip included visits to the following locations and focused on the processes listed:

Amersfoort WWTP – Amersfoort, Netherlands

- Energy Neutral
- LysoTherm® – Thermal Hydrolysis Pretreatment (THP)
- DEMON® – Deammonification
- OSTARA® – Sidestream Based Nutrient Recovery

Lunz-Unkel WWTP – Cologne, Germany

- EloDry® – Biosolids Dryer
- PYREG® – Biosolids Incinerator
- Waste heat from turbines and PYREG® process are used for process/building heat

Lingen WWTP – Lingen Germany

- Lysotherm® – Thermal Hydrolysis Pretreatment (THP)
- EloPhos/EloVac® – Sludge Based Nutrient Recovery

EloVac® – Vacuum Degassing Reactor at Lingen WWTP

Olburgen WWTP – Olburgen Netherlands

- Paques AnammoPAQ® – Deammonification
- Paques PhosPAQ® – Sidestream Based Struvite Recovery
- Paques ThioPAQ® – Biogas Cleaning: Hydrogen Sulfide Removal

PAQUES Headquarters – Balk Netherlands

Augustiner Brewery WWTP – Munich, Germany

The brewery was being surcharged high fees for excessive biochemical oxygen demand (BOD) and nutrients to the local wastewater plant. In response, they constructed an on-site WWTP in

LysoTherm® at Amersfoort

Biosolids Offloading at Amersfoort

EloDry® – Lunz-Unkel

OSTARA® at Amersfoort

This marked the beginning of the solids treatment process at Lunz-Unkel.

Lunz Unkel Solids Handling Facility

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Pyreg Offload

EloPhos® Reactor – Nutrient Harvesting

EloPhos® Reactor – Nutrient Harvesting

Struvite Conveyor to Drying at Olburgen

The roof beams in Munich, charred from WWII fire.

a building erected prior to World War II that previously housed malt storage tanks. The ten-story building, four of which are underground, has stood the test of time and you could see some of the roof beams still charred from a fire during the war. The walls of the structure are so thick they opted to lower the treatment plant in through the roof instead. The project and WWTP facilities, having only a two-year return on investment, was a great example of how to leverage existing infrastructure and adapt to make a new process function within existing boundaries.

MOVING FORWARD AND IMPLEMENTATION

The LIFT SEE IT trip provided valuable hands-on opportunities to see the technologies listed above and implemented at these facilities. Staff at various locations provided anecdotal accounts of design, operations and maintenance of the systems that can be used in the decision-making process for planning and implementation at Fond du Lac WTRRF.

The following takeaways and considerations were highlighted from the Fond du Lac staff:

- Biosolid land application poses a significant problem in Europe, especially Germany. Beginning in October, land application of municipal sludge/biosolids will no longer be allowed. The governing agency is concerned with regrowth and redevelopment of pathogens once biosolids have been land applied. Wastewater facilities are being forced to incinerate sludge on site or transport to other centralized incineration facilities or landfills. The cost to landfill is upwards of €125 (euros)/ton ($140 USD) so even without incineration there is significant expense and many facilities are evaluating options to accommodate the new regulations.

  Fond du Lac WTRRF remains mindful of the potential changes for land application and how even a change from nitrogen-based application rates to phosphorus-based rates could have an impact on land availability and sludge volume.
- Low temperature drying (EloDry®) provides approximately 50% volume reduction and a Class A product. It is heated via hot water, therefore, waste heat or a boiler is necessary.

The brewery WWTP process consisted of an aerobic and anaerobic reactor.

Gas storage bubble on the top floor of the brewery.

Rooftop of Anammox Reactor and PhosPaq reactor.

Additionally, because it is low temperature, it produces very little dust.

- Biosolids incineration reduces sludge volume by 90% and generates product with phosphorus that is 100% plant available. The waste heat from the PYREG® incinerator can be used to supplement heat for the dryer.
- THP is a viable option for a facility to double biogas production, increase volatile solids destruction and increase digester capacity. The units (LysoTherm®) toured by Fond du Lac staff at two facilities use hot oil to break down the cells of the sludge. The waste heat from the CHP system is enough to maintain the temperature of the oil required for treatment. The Amersfoort facility expects a seven to eight year return on investment for their THP upgrades.
- The sludge based nutrient harvesting process known as EloPhos® uses a hydrocyclone after the reactor to capture fine struvite crystals and circulates them back into the reactor. EloVac®, a vacuum to capture off-gas including stripping of CO_2, is used in conjunction with this system rather than using a blower to provide air like other systems. The equipment supplier claims 340 liters of biogas/m^3 of sludge can be recovered. This process has also been shown to increase dewaterability up to 5% in cake solids.
- Fond du Lac WTRRF staff visited Olburgen where Paques deammonification and nutrient harvesting systems are operating in series. The Anammox reactor had removable covers to help maintain temperature in the winter months and aid in containing odors. Additionally, much of the structure/piping they use is a black polyurethane material that for them costs much less than stainless steel. The material is corrosion resistant and can withstand a wide pH range. They look like big plastic tanks molded from the factory. Upon closer inspection, the tanks had what looked like welded seams and with a special welder could be customized and each section welded piece by piece.

Based on the design configuration with removable covers at Olburgen, Fond du Lac may need to consider something similar for their Paques installation to accommodate weather conditions. It was very valuable for the staff to see a system in operation and working well. Additionally, the corrosion resistant piping and structure material was a new innovation to Fond du Lac they may consider for future projects.

Fond du Lac WTRRF utilized the valuable opportunity provided by the LIFT SEE IT program to experience innovative process integration at the facilities visited in Europe. They have already been included on the list of site visits for other participants including tours of their Biorem® hydrogen sulfide gas cleaning system and conversations regarding experiences during piloting efforts. Fond du Lac staff looks forward to continuing to pay it forward to other facilities as AnammoPAQ™ comes online and opportunities and experience allow.

THE APPLICATION PROCESS

The staff at Fond du Lac highly recommend applying for this incredible opportunity. The process is easy and if interested the first recommended step is to sign up for the Laterals E-Newsletter through the Water Research Foundation at *www.werf.org*. The newsletter will release details of when the application for the LIFT SEE IT program opens which generally occurs in the fall of each year. Applications must be submitted by mid-December and recipients are generally notified in mid-January.

Applications are evaluated and ranked using the criteria listed below:

- **Merit:** Technical or innovation merit of site visit.
- **Importance to Utility:** Trip's importance to the utility learning about the technology or innovation for potential pilot or implementation.
- **Relevance to Staff:** Relevance of the technology or innovation to the staff member(s) participating in the visit.
- **Implementation Potential:** Reasonable chance of implementation at applicant's facility in the future.
- **Budget:** A reasonable budget that provides good value.

As part of the application process, a facility must meet the following requirements and provide the requested information:

- The facility or a staff member must be a member of WEF, WRF, or NACWA.
- The Description of the facility and customer base or service area.
- The trip must be relevant to upcoming needs or planning with a summary of implementation timing.
- A proposed itinerary with site locations and technologies/processes of interest.
- A 500 to1000 word narrative of how the facility would benefit from the trip and why.
- A list of who would participate and their role at the facility (resumes of participants must be included).
- The trip budget including cost share to be provided by the facility.

To view 2017 trip pictures, videos and highlights and start planning your LIFT SEE IT trip, visit *www.werf.org/lift/LIFT_SEE_IT*. CS

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CENTRAL STATES WATER ENVIRONMENT ASSOCIATION

OPERATOR TRAINING PROGRAM

PURPOSE

The CSWEA Operator Training Program is intended to recognize a person's commitment to professionalism, continual improvement, and ability to finish a long-term task. This will help Operators prepare for their respective state's Wastewater Operator Certification Programs. It is also a separate acknowledgment of the completion of a training program consisting of top-notch materials and instructors.

WHO WILL BENEFIT FROM THIS PROGRAM?

Employers and supervisors will by having a way to fast track new staff members who are new to the water resource recovery industry. It will also help them identify employees and potential employees who are serious about a career in the profession, and are willing to invest in themselves for the future. A benefit for individuals will be the ability to differentiate themselves from other candidates when seeking promotions and/or new jobs, and to be able to take pride in an important professional accomplishment.

CSWEA CERTIFIED OPERATOR REQUIREMENTS

To become a CSWEA Certified Operator, you will need to attend a minimum of eight CSWEA Courses from the prescribed list included below in a period of no more than three years. In addition, you will need to attend one seminar from the list of seminars below. Once you are a CSWEA Certified Operator, refresher courses are at no cost to you. The courses below will include a multiple-choice test (approximately 20 questions) that must be passed by the participant with a score of 80% before the course will fulfill the CSWEA Certified Operator requirements.

FACILITY HOSTING OPPORTUNITIES

Be a facility that takes advantage of the flexibility CSWEA has to run Basic Training Classes for relatively small number of participants (12 to 20). If your facility or municipality has a room that can hold a class that size or there is one nearby, you can reap the benefits of virtually no travel for your personnel. This class will be advertised to all CSWEA members so you do not have to fill the class with your own people. You can learn more about the program at *www.cswea.org* or email us at *ahaque@cswea.org*.

ILLINOIS PROGRAM DETAILS

Details on the Illinois program are below. The inaugural class will be at Kishwaukee WRD on February 20, 2019. Register online at *www.cswea.org*.

	IEPA CLASS			
COURSE	3&4	2	1	Collections
Purpose and Fundamentals of WW Treatment	X			
Health and Safety in Water Treatment Plants	X			
Wastewater Math I	X			
Wastewater Math II		X		
Activated Sludge I		X		
Activated Sludge II			X	
Preliminary and Primary Treatment		X		
Secondary Treatment			X	
Disinfection		X		
Solids Handling		X		
Anaerobic Digesters			X	
Collection Systems				X
Maintenance I	X			
Maintenance II		X		

SEMINARS

- CSWEA Annual Conference
- Education Seminar
- IL Section Operations Seminar
- IL Section Collections Seminar
- IL Section Energy Seminar
- IL Section Resource Recovery Seminar

CSWEA municipalities and resource recovery facilities realize the value of a talented, qualified knowledgeable operator to run our amazing facilities. The CSWEA Certified Operators program was implemented to ensure that we continue to have a talent pool for generations to come.

START TODAY

There is a $50 enrollment fee for the three-year program.

Each class costs $30-$50 based on the hosting facility costs.

To enroll, go to ***www.cswea.org***.

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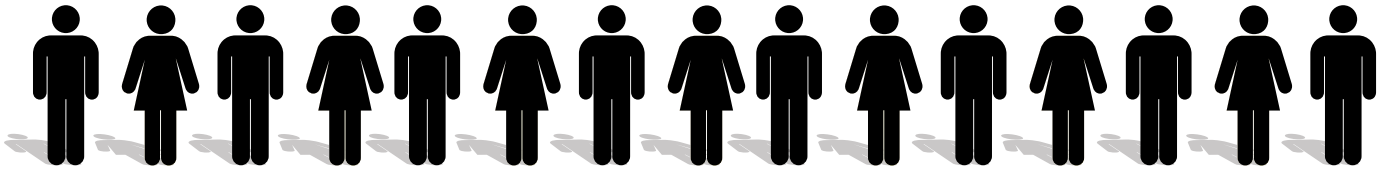
CSWEA Welcomes Our New Members

Updated on December 1, 2018



September

Yong Kim, UGSI Chemical Feed
Katy Librizzi, City of Naperville
Theresa Caven, City of Brookfield
Rebecca Higgins,
Minnesota Pollution Control Agency
Jaren Hiller, GEI Consultants
Tyler Johnson, Stantec
Jane Martin, Symphonic Water Solutions
Eric Bartlein, AECOM
Ian Wiese, Numix Materials, Inc.
Steve Hof, Tessenderlo Kerley, Inc.
Warren Tracy, City of Woodbury
Larry Burbach, EP Purification, Inc.
Jessica Zemen, Texas A&M University
David Olson,
Midwest Chemical & Equipment
Andrew Rossetti,
Midwest Chemical & Equipment
Emily Javens, Minnesota Association
of Watershed Districts
Darryl Carstensen,
Walter E. Deuchler Associates Inc.
Martin McCormack,
Fox River Water Reclamation District
Gary Hyman,
Fox River Water Reclamation District
Jonathan Kolweier, University of Illinois
Kush M Patel, University of Illinois
Lydia Kurtz, University of Illinois
Julia Qian, University of Illinois
Craig Hall, Watersurplus

October

Joseph A Lapastora, Northern Moraine
Wastewater Reclamation District/
Island Lake
Sam Lobby,
Western Lake Superior Sanitary District
McKenna Farmer,
University of Wisconsin – Platteville
Greg Wirth,
Brian Earl, Be-Water Solutions
Eugene P Manzanet, Milwaukee
Metropolitan Sewerage District
Kristine F Martinsek, Milwaukee
Metropolitan Sewerage District
John Erickson, Peerless Chain
Kevin Steltzriede,
City of Naperville, Illinois

November

Bob Fossum, Capital Region Watershed
Christine Voigt, Metropolitan
Council Environmental Services
Christopher Bryan, 3M
Michael Doyle,
Evoqua Water Technologies LLC
Thomas H Koepp,
Lake Pewaukee Sanitary District
Lucy Allen, Kasco Marine
Daniel Derudder,
Prairie Island Indian Community
Stephanie Cioni, Wheaton Sanitary District
Paul Hatten, BioGill
Dan Scherping, Alderon Industries

December

Neal Kolb, Walworth County
Metropolitan Sewerage District
Brooke Klingbeil, City of Medford CS

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WEFTEC RECEPTION RECAP

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STUDENT DESIGN COMPETITION

By Mike Holland

Central States was once again well-represented at the WEF Student Design Competition at WEFTEC 2018 in New Orleans.

CSWEA developed the competition criteria based on WEF guidelines and notified Student chapters of the competition during the fall semester of the 2017-18 school year. The Student Design Competition is intended to promote 'real world and hand on' design experience for students interested in pursuing an education or career in the water and the wastewater engineering and sciences fields. There are two levels of the WEF competition: *conventional wastewater design*, which includes traditional wastewater design projects; and *environmental design*, which includes contemporary engineering design topics such as sustainability, water reuse, wetland construction, and Engineers Without Borders projects. CSWEA also holds a third category for Global Water Stewardship (GWS) projects.

CSWEA had a total of three entries in the 2018 Student Design Competition, which was held the day before the Education Seminar in Madison last April. There was one entry in the wastewater design competition from the University of Wisconsin-Milwaukee with Md. Abul Bashar presenting his project titled *Integration of Biogas Water Wash and Struvite Recovery Process with MMSD's Jones Island WWTP*.

There were two entries in the GWS category, the University of Wisconsin-Platteville and the University of Minnesota-Twin Cities. The results were extremely close between the UW-Platteville team consisting Elizabeth Ebert, Joseph Lapastora, Erik Papenfus, and Jessica Zeman and the Minnesota team of Noah Germolus, Kade Kearney, and Michael Sidell presenting their projects *Global Water Stewardship – Palmar Sur, Costa Rica*. Ultimately, the team from UW-Platteville was found to be the winner and three team members from UW-P accompanied CSWEA members to Costa Rica over the summer to assist with site investigations for next year's problem statement.

The winning teams UW-Milwaukee and UW-Platteville presented their projects at the WEF competition held during WEFTEC, where they faced stiff competition from schools throughout the country. Unfortunately the team's hard work and exceptional presentation did not result in victory, but they did a great job and should be very proud of their accomplishment, as we should be proud of having them represent CSWEA. CS

OPERATIONS CHALLENGE

By Chris Lefebvre

Everywhere I go, people ask me about the Operations Challenge and the CSWEA teams. This almost always leads to me bragging about this great group of professionals. I rarely mention the competition results, though they have been spectacular. This competition isn't about winning a trophy – it is about CSWEA members getting to network with some of the best and brightest individuals in the organization. I have been lucky to be associated with this group for the past six years, the first four as a competitor and the last two as PWO. Through this time I have made some great business connections, learned an unimaginable amount about how other facilities handle problems, and made some great friends.

If you are asking yourself, 'What is Operations Challenge?', I will save you the trip to Google. It is a national team competition held annually at WEFTEC. Each team consists of four members that work together to complete a task in as short of a time as possible. The competition takes place over two days and consists of five events that test the competitors' physical and mental abilities in a high-paced, stress-filled environment. The first day of the competition consists of a process control test and the lab event. The second day has three events, maintenance, safety, and collections. When the competition is over, the scores are tallied and the top teams receive trophies and bragging rights for the year.

The question I get asked most often is: 'How do I get on a team?' This is the hard part. The first invitations go to each of the Collections and Operations Award winners. The award winner or someone from their staff is invited to compete, then the remaining spots are filled with veteran competitors. If you are recognized with either of these awards I highly recommend sending someone to compete and if you know someone that wants to compete, nominate them for an award.

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This year's competition was held in New Orleans, LA. There were 44 teams representing four countries and included the competitions first ever all-female team. CSWEA once again sent two teams to the annual competition. The Shovelers and Pumpers got the pleasure of competing against the best teams from around the world. Most of the teams that compete at this level are comprised of members from one facility and their team rosters rarely change. These teams start practicing multiple times per week in early spring and compete at regional competitions to hone their skills. Our teams first met in August and had two, two day practices before going to the competition. Needless to say our teams are definitely underdogs going into the competition.

During the competition, the teams showed once again that CSWEA has some of the best competitors in the world. The Shovelers were able to get back to the stage by finishing 2nd place in the lab event and just missed the podium with a 4th place finish on the Process Test. The Pumpers didn't fare as well but their efforts were recognized by their peers and received the *Best Effort* award.

It continues to amazes me how our teams' rosters constantly change but the teams consistently compete at a high level. I would like to thank everyone who supported this great group of individuals. Without help from CSWEA and the State sections, the City of Janesville WWTP Staff, our generous sponsors, and the best cheering section at the competition none of this would have been possible.

2018 TEAM MEMBERS

CSWEA Shovelers

- Wade Lagle (Captain) – Urbana & Champaign SD, IL
- Matt Streicher – Glenbard Wastewater Authority, IL
- Marc Zimmerman – Janesville, WI
- Jason Neighbors – Glenbard Wastewater Authority, IL
- Tom Dickson (Coach) – Oconomowoc, WI

CSWEA Shovelers

- Luke Markko (Captain) – Northern Moraine WRD, IL
- Brent Perz – Baxter & Woodman, IL
- Joe Watson – NEW Water, WI
- Dan Hughes – Jacobs, IL
- Chris Lefebvre (Coach) – Stevens Point, WI CS

24TH ANNUAL CSWEA EDUCATION SEMINAR

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

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
8:50 am - 9:30 am	Mainstream Shortcut Nitrogen Removal: Current Status and Future Directions | Dr. George Wells
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
10:30 am - 11:10 am	Resource Recovery at Metropolitan Water Reclamation District of Greater Chicago | Brian Perkovich
11:10 am - 11:30 pm	LIFT Presentation
11:30 am - 11:45 am	Q/A Morning Session
11:45 am - 1:00 pm	Lunch with LIFT and Poster Session
1:00 pm - 1:35 pm	Challenges for Future Innovation | Dr. James Barnard
1:35 pm - 2:10 pm	Inactivation of Pathogen and Indicator Organisms During Long-term Storage and Air Drying of Biosolids | Dr. Jennifer Becker
2:10 pm - 2:30 pm	Break
2:30 pm - 3:00 pm	Operational Tools for Phosphorus Removal and Recovery | Peter Schauer
3:00 pm - 3:45 pm	Looking to the Future Now: Roundtable of Current Innovation • Leveraging Applied Research for Facility Planning and Optimization | Larry McFall • Looking to the Future – New Innovations in Wastewater Resource Recovery Facility Design and Operations | Tracy Hodel • R2E2; the First Step in Resource Recovery for NEW Water | Tom Sigmund
3:45 pm - 4:00 pm	Q/A Afternoon Session

APRIL 2, 2019

MONONA TERRACE CONVENTION CENTER, MADISON, WISCONSIN

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

April 2, 2019 • Madison Wisconsin

CSWEA continues to host its Annual Education Seminar on April 2 in Madison, WI at the Monona Terrace. This year's theme will be New Innovations in Wastewater Resource Recovery Facility Design and Operations.

We have assembled an impressive list of speakers who will discuss current research, case studies, along with numerous innovations as they relate to recent innovations in the wastewater field. The program will allow attendees to appreciate both practical and theoretical approaches being conducted both locally and nationally.

HOTEL ACCOMODATIONS

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.

8:10-8:50 The Evolution of EBPR Over 60 Years

Dr. James Barnard, Black & Veatch

This presentation will cover the development of our understanding of EPBR 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.

1:00-1:35 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 to 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.

JAMES L. BARNARD, PhD IWA Fellow, WEF Fellow, BCEE, Dist. MASCE developed the Bardenpho, MLE and Phoredox (aka AO, A2O) processes for biological nitrogen and phosphorus removal and designed more than 140 BNR plants including the first plants in North America at Palmetto FL and Kelowna BC. He served on WERF supervisory committees and Advisory Committees for New York, DC Water, Los Angeles, Winnipeg, and others. He was awarded the Clarke Prize in 2007, received Honorary Doctorates from the Universities of Johannesburg, Iowa State and Stellenbosch and the Lee Kuan Yew Singapore Water Prize in July 2011. He is presently employed by Black & Veatch as a Global Practice and Technology Leader. His research into BPR has unveiled some new perspectives. He is fascinated by the history of sanitation and especially biological nutrient removal.

8:50-9:30 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.

GEORGE WELLS is an Assistant Professor in the Department of Civil and Environmental Engineering at Northwestern University, where he directs the Environmental Biotechnology and Microbial Ecology Laboratory. George received his BS in Chemical Engineering and BA in Environmental Engineering from Rice University in 2004. After a short period working at BP Chemicals in Naperville, Illinois, George joined the Department of Civil and Environmental Engineering at Stanford University, where he completed his MS (2006) and PhD (2011) under Dr. Craig Criddle and Dr. Chris Francis. George collaborates extensively with utilities and practitioners to develop and test feasibility of sustainable biological wastewater treatment processes, with a strong focus on energy efficient shortcut nitrogen removal and phosphorus removal and recovery bioprocesses.

9:50-10:30 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.

KAREN PALLANSCH, PE BCEE, currently serves as CEO for Alexandria Renew Enterprises. She has served as CEO for 13 years, and has led innovation at the organization for almost 25 years. Prior to her work with AlexRenew, Karen worked for the Virginia Department of Environmental Quality as a Senior Engineer, and as a General Engineer with the Department of the Army. Karen holds a BA in Chemical Engineering from the University of Pittsburgh and a Master's Degree in Business Management from Texas A&M University, Texarkana. She is a Registered Engineer in the Commonwealth of Virginia and has a Class I Wastewater License. She has received a number of distinguished awards, including being named a Water Environment Federation (WEF) Fellow, and receiving the WEF Emerson Distinguished Service Medal and the American Academy of Environmental Engineers and Scientists (AAEES) Cleary Award.

She serves on the board of several organizations, including the National Association of Clean Water Agencies (NACWA), WaterReuse Foundation, Virginia Municipal League Insurance Pool (VMLIP), and the Alexandria Chamber of Commerce.

10:30-11:10 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 WRP. 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.

BRIAN PERKOVICH was recently appointed as Executive Director at Metropolitan Water Reclamation District of Greater Chicago and is excited to carry on the strong WRDGC traditions of service, hard work and innovation. After attending the University of Illinois-Urbana Champaign, he came to the MWRDGC in 1993 and worked in various positions and at water reclamation plants (WRPs), which shaped his journey, while also attending DePaul University to obtain a Masters in Business Administration. He worked in the Engineering Department, moved to the Maintenance and Operations Department in 1995, and made stops along the way at the Stickney, Calumet, O'Brien, Egan, Hanover Park, Lemont WRPs as well as the Main Office Building in Chicago. Perkovich is excited to work alongside the staff and Board of Commissioners as they protect the 5.25 million people in Cook County seeking an improved quality of life and the protection of their precious water resources.

1:35-2:10 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.

DR. JENNIFER G. BECKER is an Associate Professor of Environmental Engineering at Michigan Technological University. She obtained a BS degree from Michigan Tech, an MS degree from the University of Illinois at Urbana-Champaign, and a Ph.D. degree from Northwestern University. Dr. Becker's research focuses on engineered biological processes and applied microbiology for the sustainable treatment of groundwater, wastewater and biosolids and other residuals, as well as on the inactivation of wastewater pathogens. Her research has been recognized with the Presidential Early Career Award for Scientists and Engineers (PECASE), the highest honor bestowed by the US government on outstanding scientists and engineers beginning their independent careers, as well as a National Science Foundation Early Career Development Program (CAREER) Award and the Robert A. Canham Award from the Water Environment Federation.

2:30-3:00 Operational Tools for Phosphorus Removal and Recovery

Peter Schauer, Clean Water Services

Clean Water Services, located in Washington County, Oregon, is a special services district that is charged with wastewater management for systems discharging into Tualatin Rivershed. 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.

PETER SCHAUER is the Principal Process Engineer heading the Technology Development and Research group for Clean Water Services. CWS operates four wastewater treatment facilities discharging to the Tualatin River in Washington County, Oregon. Previous to CWS. Peter was a process engineer within the Water Technologies Group of Black & Veatch and also worked as a civilian for the Navy conducting R&D on membrane bioreactors for shipboard waste. Peter is a graduate of Johns Hopkins with a Masters in Environmental Engineering from the same school.

3:00 – 3:45 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,

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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.

LARRY MCFALL received a Bachelor of Science Degree from the Pittsburg State University, Pittsburg, Kansas in 1977. Following postgraduate work in polymer and analytical chemistry at PSU he was employed in the research and development of sealing systems for a sewer pipe manufacturer until becoming involved in wastewater treatment in 1995. He has been employed by the Rock River Water Reclamation District since 1998, has been the Plant Operations Manager since 2000, and is an Illinois certified Class 1 operator. He is a member of Sigma Pi Sigma Honor society and the American Chemical Society.

3:00-3:45 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 hydrolyzes (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 synergetic opportunities with having the two technologies installed at the same location that can increase phosphorus and energy recovery at the facility.

TRACY HODEL has worked for the City of St. Cloud for 18 years, and oversees the Energy, Hydro and Wastewater Divisions within the City's Public Utilities Department. Hodel earned a Bachelors of Science Degree in Biology from St. Cloud State University. She holds a Minnesota Class A Wastewater Operator license, a Minnesota Class A Water Operator license, a Type IV Biosolids Operator License and is certified as an Envision Sustainability Professional with the Institute of Sustainable Infrastructure. Tracy has assisted and provided leadership with the development and implementation of the City of St. Cloud's Energy and other Sustainability related initiatives. Among past awards in 2017 and 2018, the City of St. Cloud's Nutrient, Energy & Water Recovery Facility won the Utility of the Future, awarded by the National Association of Clean Water Agencies for their 'leadership in community engagement, watershed stewardship, and recovery of resources such as water, energy, and nutrients'.

3:00 – 3:45 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.

TOM SIGMUND is the Executive Director of NEW Water, the brand of the Green Bay Metropolitan Sewerage District, where he has been since 2007. NEW Water is a regional clean water utility serving 230,000 people in 5 municipalities providing wholesale conveyance and treatment services. NEW Water has 97 employees and an annual budget of $40 million. NEW Water expresses its attitude of viewing the material sent to its facilities as valuable resources to be recovered and reused and a commitment to protecting its most valuable resource, water.

Mr. Sigmund is a Professional Engineer in Wisconsin, Illinois and Ohio. He is a member of the National Association of Clean Water Agencies (NACWA) and serves on their Board of Directors. Mr. Sigmund has a MS and BS in Civil and Environmental Engineering from the University of Wisconsin-Madison. CS

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. Together, CSWEA and LIFT, are providing tools and resources to its members to support innovation and new technology in Central States for a culture of innovation in our industry.

92ND ANNUAL MEETING

MAY 14-16, 2019 | MONONA TERRACE, MADISON, WISCONSIN

Transitioning to a New Generation

UTILITY REGISTRATION PRICING: SEND MORE, SAVE MORE!

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9nd Annual Meeting Highlights

The 92nd Annual Meeting of the Central States Water Environment Association, Inc., will be held May 14-16, 2019 at Menona Terrace in Madison, Wisconsin. This year, we will be focusing on the next generation of water professionals as well as our continuing utility pricing, leadership and ethics sessions, operations track, and utility management track.

OPERATIONS & MAINTENANCE:

- Efficiency (pumps, motors, lights, UV disinfection, HVAC, etc.)
- Technology/SCADA/Web-based Maintenance Programs/ GIS Applications
- Troubleshooting
- Case Studies
- Summary of Completed Projects
- Optimization
- Nutrient Removal
- Process Control
- Start-up Issues

UTILITY MANAGEMENT:

- Succession Planning
- Project Funding
- Utility Rate Development and Reviews
- Employee Retention
- Communication

ENHANCED RESOURCE & ENERGY PRODUCTION:

- Resource Recovery – Raw Materials, Nutrients, Energy
- Digester Gas Production Technologies
- Co-digestion
- Heat Recovery Technologies
- Alternative Energy Use

RESIDUALS, SOLIDS, & BIOSOLIDS:

- Environmental Management Systems
- National Biosolids Partnership
- Standard or Advanced Treatment and Stabilization

COLLECTION SYSTEMS:

- Collection System Rehabilitation Technologies/Methods
- CMOM Program Development and Implementation
- Collection System Design and Operation
- Green Infrastructure – Examples in Practice
- Infiltration/Inflow Management
- Stormwater & Combined Sewer Overflow Management

GENERAL:

- Laboratory Issues/Bench-Scale Studies
- Pretreatment, Industrial Treatment, & Pollution Prevention
- Regulatory Issues
- Security Issues
- Engineering Ethics Training

WATERSHEDS & STORMWATER MANAGEMENT:

- Anti-Degradation and Other Regulatory Issues
- Habitat or Groundwater Protection or Restoration
- Non-Point Pollution Source Modeling
- Water Quality Trading and Watershed Management Issues and Initiatives, including Adaptive Management
- Green Infrastructure Solutions and Best Management Practices
- Total Maximum Daily Loads Involving Point and Non-Point Sources
- Education and Outreach

SOFT SKILLS/LEADERSHIP:

- Leadership Skills
- Managing the Ill or Injured Employee
- Anti-Harassment and Discrimination Training for Managers
- Getting the Most Out of Employee Performance Evaluations
- We Negotiated the Agreement – Now What?
- Handling the Grievance and Arbitration Process
- Managing in a Union Environment
- The Basics of Labor Law
- 10 Things Every Manager Should Know About Labor Law
- Top 10 Employment Law Issues
- Stumbling into Violations: Do Hand-books and Policies Violate Labor Law?
- Management Rights for Managers
- Social Media and the Workplace

RESEARCH & DESIGN:

- Nutrient Removal Technologies
- New/Innovative Technology Research and Application
- Sustainability in Design and Construction
- Toxics/Emerging Pollutants Monitoring and Control
- Treatment Design
- Wastewater Reuse, Applications, Technology, & Regulatory Issues CS

The Central States Water Environment Association 2019 Student Design Competition

GREETINGS,

I would like to introduce you to the Student Design Competitions sponsored by the Central States Water Environment Association (CSWEA) and Global Water Stewardship (GWS). This year, the CSWEA and GWS competitions will be held on the afternoon of **Monday, April 8, 2019**. This is a unique opportunity for students at the college level to demonstrate their engineering skills and practices by researching and preparing a design for a water quality-based project and presenting their project to water industry professionals.

There are two Student Design Competitions, described in detail on the attached announcements:

CSWEA Student Design Competition: For the CSWEA Design Competition, there are two different categories that student can compete in; Wastewater Design and Environmental Design. The competition at the CSWEA level is intended to feed into the national competition at the annual WEFTEC conference, which this year is scheduled for September 21-25, 2019 in Chicago, Illinois. Winning teams will receive a stipend of up to $1,000/student for travel and lodging expenses to attend the WEFTEC conference.

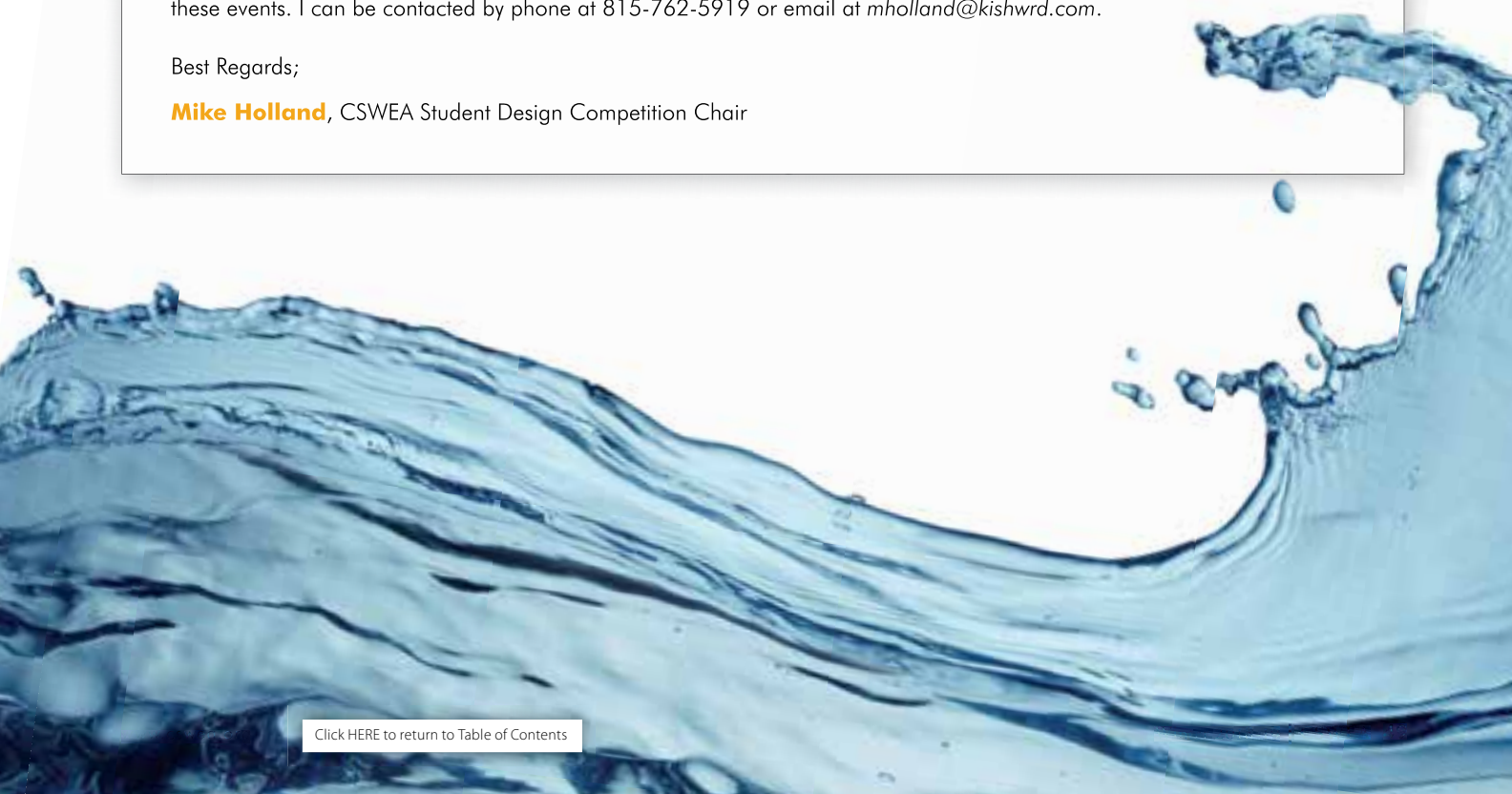
GWS Student Design Competition: The GWS Design Competition requires teams of students to design and present a project meeting the requirements of the real-life problem statement titled *Global Water Stewardship: Monteverde, Costa Rica*. Winning teams will receive a stipend of up to $1,000/student for travel and lodging expenses to accompany GWS representatives on their August fact-finding trip to Costa Rica.

CSWEA has budgeted funds to assist individuals or teams to present at the CSWEA and GWS competitions in April. We understand it is hard to schedule students to participate and will be as flexible as possible in working with students and professors to afford the opportunity to participate on the design competition date. Design projects from 1st semester are eligible along with Design projects that are being developed as part of a 2nd semester class. Please read over the attached announcements and provide this information to any interested students in the water quality field that you feel may benefit from such an experience.

I look forward to hearing from you with any questions or if you need additional information on how to participate in these events. I can be contacted by phone at 815-762-5919 or email at *mholland@kishwrd.com*.

Best Regards;

Mike Holland, CSWEA Student Design Competition Chair



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ANNOUNCEMENT

2019 CSWEA & WEF Student Design Competition

RULES OF THE COMPETITION

INTRODUCTION

The CSWEA/WEF Student Design Competition is intended to promote 'real world and hands on' design experience for students interested in pursuing an education and/or career in water/wastewater engineering and sciences field. This competition requires teams of students to design and present a program meeting the requirements of a problem statement. **There are *two* levels of competition**; a conventional Wastewater Design category, which includes traditional wastewater design projects; and an Environmental Design category, which would include contemporary engineering design topics like sustainability, water reuse, wetland construction, and Engineers Without Borders projects.

The Student Design Competition is designed to be a function of the WEF Student Chapters program. However, a WEF Student Chapter is not required to compete. CSWEA does not require WEF student membership to participate in the competition but the winning team will have to ultimately be WEF student members to participate in the WEF competition in Chicago. However, CSWEA will provide student membership enrollment in WEF for teams or individuals who represent CSWEA at WEFTEC.

Detailed 2019 WEF competition guidelines will be provided to competitors when published, usually in May.

WORKLOAD

The project should include a problem statement, a development of alternatives and a recommended solution. The depth of the effort should be comparable to preliminary design. A key criteria in the judging of the competition is the manner and level of effort spent in evaluating the alternatives. Students are expected to work with little assistance from an advisor and/or professor, and the students are expected to work together as a team to find a solution to their problem. Students may use whatever references or resources they choose.

REQUIREMENTS

Teams may consist of more than four members, but only four students may present at the competition.

Student teams will compete through oral presentations. Each presentation will be 20 minutes followed by a 10-minute question and answer period. The presentation should be in PowerPoint format.

The winning teams of the CSWEA competition will be required to submit a design notebook complying with the WEF competition requirements set forth in the WEF design competition entry guidelines.

DEADLINE

March 22, 2019: Submittal of the Entry Form for the 2019 Student Design Competition is due. Submit to Mike Holland at *mholland@kishwrd.com*.

TIMELINE:

April 8, 2019: CSWEA Design Competition will be held at the Monona Terrace, Madison, WI.

May 14-16, 2019: The winning team from the CSWEA Competition will be invited to present at the CSWEA Annual Meeting in Madison, WI.

September 21-25, 2019: The winning teams from the CSWEA Competition will be offered the opportunity to compete at WEFTEC-2019 in Chicago, Illinois.

PRESENTATION:

The student design teams will present their projects at the Design Competition on Monday afternoon, April 8.

SELECTION

Representatives from CSWEA will judge the design competition based on these four elements: Content, Organization, Delivery and Effectiveness, and Discussion.

NOTIFICATION

The results of the competition will be issued to participants by the following Friday.

AWARDS

Each team that competes in the CSWEA Competition will receive free registration, one night of lodging and reimbursement of up to $100.00 each in travel expenses for attendance at the CSWEA Design Competition and Education Seminar. These expenses are paid by the State Sections.

The winning team from each category of the CSWEA competition will receive free registration from WEF and travel and lodging expenses (up to $1,000 per student) paid by CSWEA to compete at the WEFTEC conference in Chicago, Illinois (September 21-25, 2019).

Prizes for the winning team at WEFTEC will vary depending on sponsorship opportunities. Monetary awards typically provided by WEF for the top four design teams are: 1st place $2,500, 2nd place $1,500, 3rd place $1,000, 4th place $750.

FOR ADDITIONAL INFORMATION, CONTACT:

Mike Holland
CSWEA Student Design Competition Chair
Telephone: 815-762-5919
Email: *mholland@kishwrd.com*

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GLOBAL WATER
STEWARDSHIP

ANNOUNCEMENT

2019 Global Water Stewardship Student Design Competition

RULES OF THE COMPETITION

INTRODUCTION

The Global Water Stewardship (GWS) Student Design Competition is intended to promote 'real world and hands on' design experience for students interested in pursuing an education and/or career in water/wastewater engineering and sciences field. This competition requires teams of students to design and present a program meeting the requirements of the problem statement identified in the attached document titled *Global Water Stewardship: Monteverde, Costa Rica*.

WORKLOAD

The project should include development of alternatives and a recommended solution. The depth of the effort should be comparable to preliminary design. A key criteria in the judging of the competition is the manner and level of effort spent in evaluating the alternatives. Students are expected to work with little assistance from an advisor and/or professor, and the students are expected to work together as a team to find a solution to their problem. Students may use whatever references or resources they choose.

REQUIREMENTS

Teams may consist of more than four members, but only four students may present at the competition.

Student teams will compete through oral presentations. Each presentation will be 20 minutes followed by a 10-minute question and answer period. The presentation should be in Power Point format.

DEADLINE

March 22, 2018: Submittal of the Entry Form for the 2019 Student Design Competition is due. Submit to Mike Holland at *mholland@kishwrd.com*.

TIMELINE

April 8, 2019: GWS Design Competition will be held at the Monona Terrace, Madison, WI.

May-July, 2019: The winning team would work with GWS professionals and representatives from the local community to refine the project design.

August 2019: Students from the winning team will be offered the opportunity to accompany GWS members on their next project trip to Costa Rica.

PRESENTATION

The student design teams will present their projects at the Design Competition on Monday afternoon April 8 in Madison, WI.

SELECTION

Representatives from GWS will judge the design competition.

NOTIFICATION

The results of the competition will be issued to participants by the following Friday.

AWARDS

Each team that competes in the GWS Competition will receive free registration, one night of lodging and reimbursement of up to $100.00 each in travel expenses for attendance at the GWS Design Competition.

The winning team from the Global Water Stewardship category will receive a travel and lodging stipend of up to $1,000/student (which is typically sufficient to cover travel and lodging) to accompany the next GWS team trip to Costa Rica for site analysis and investigations.

FOR ADDITIONAL INFORMATION, CONTACT

Zachary Wallin
GWS Student Design Competition Chair
Telephone: 224-406-4025
Email: *wallinz413@gmail.com* CS

GLOBAL WATER STEWARDSHIP

GLOBAL WATER STEWARDSHIP:

MONTEVERDE, COSTA RICA

2018-19 Problem Statement

PROJECT UNDERSTANDING

- **Location:** Monteverde, Costa Rica
- **Population:** 6,500
- **Number of water services (with commercial and residential):** 1,600
- **Water usage:** Design = 200L/person/day
- **Average Precipitation:** 2,800 mm
- **Average Temperature:** 80 Degrees Fahrenheit (high) and 65 Degrees Fahrenheit (low)
- **Typical influent characteristics:**
  - Parameter
  - BOD_5 = 280 mg/l
  - TSS = 220 mg/l
- **Required effluent characteristics for stream discharge:**
  - Parameter
  - BOD_5 = 50 mg/l
  - TSS = 50 mg/l

There are very few centralized treatment systems in Costa Rica. In the rural areas, septic systems are very common, with greywater often being discharged directly overland. The leach fields are very small and very shallow. The law states the leach fields must stay within each individual property, however they often do not. Shallow bedrock and poor soils, as well as poor design, cleaning, and maintenance practices, often contribute to improper treatment of septic tank effluent. Further exasperating the issue, it is not uncommon for sludge

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cisterns to dump collected material in rural areas (polluting) instead of trucking the sludge to a distance WWTF

The area of concern is a collection of communities known as Monteverde, Costa Rica. Monteverde is located in north central Costa Rica about 120 km northeast of San Jose. The community is located in the northwest corner of the Tilaran Mountains and east of the Cloud Rain Forrest. The community has roughly 1,600 existing buildings and is more developed than typical rural Costa Rican communities. There are a few plantations, mangroves and marshes located approximately 35 km downstream/downslope.

Monteverde itself is made up of several smaller communities including Cerro Plano, Santa Elena, and Los Llanos. These areas are mainly residential with a heavy dependence on tourism with many hotels, restaurants and shops. The region hosts roughly 250,000 tourists per year. Roughly ¾ of the tourists visit between November and June. A centralized sanitary wastewater solution is desired.

The residential population is relatively steady with no current plans for major developments, or significant residential population growth. However, as tourism grows in the region, more businesses and residents may move in. Assume a residential population growth of no more than 2% per year, and tourism growth of no more than 4% growth per year.

In total, there are approximately 1,600 existing buildings. Although almost every home and business have their own septic tank, there are 11 small treatment plants on private properties. Four of these small plants discharge into surface streams, and seven reuse the treated effluent. Costa Rica's electrical grid consists of 110-volt power, single phase and unexpected power outages do occur. Step-up transformers are required for any equipment that requires 220 volts or higher.

The local utility has been proactive in seeking a centralized treatment solution and would like a preliminary conceptual design of a collection system along with an area designated to treat Monteverde's community wastewater. The design team must propose three locations for the treatment site. Additionally, the design team must propose three alternative treatment systems (each system may be one type of treatment or a series of treatment processes). The community is very interested in the idea of harnessing biogas as an energy source, as well as reusing treated effluent for agricultural irrigation down slope from the WWTP. A feasibility report must be developed that examines biogas utilization and irrigation.

Given the complexity and current status of the project, the design team must work on **an optimal site selection** and a **preliminary design proposal.** The preliminary design would be at the 'proof of concept' level (For example, not specifically designing the actual horsepower of pumps or actual diameter of pipes, etc.).

The site selection and preliminary designs from this competition will serve as the basis for a subsequent design competition (Fall 2019) in which more detailed designs will be proposed.

In Costa Rica, especially in the rural areas, toilet paper is not disposed of in the toilet. This is due to low water pressure, smaller pipe sizes, and general goal to reduce solids going into septic tanks or treatment system. Used toilet paper collected in trash cans and is disposed of along with the other solid waste. A lot of refuse in rural areas is burned. Designs of wastewater collection and treatment improvements should be based on typical US standards to facilitate flushing of toilet paper.

It is Costa Rican law that the property owner is responsible for their individual connection to the sewer main, however it is necessary to plan for funding the entire connection. It is also Costa Rican law that once a sewer main is constructed in front of a property, the property owner must pay for the service whether they connect to it or not.

PROJECT APPROACH

For this project, CSWEA is soliciting designs for a long-term solution to the sanitation problem in this region. In general, the solution approach should be to design a centralized treatment system with a complete collection system.

Additional Information can be found by using the following link. Note that the link may need to be copy-pasted into the URL. *www.drive.google.com/drive/folders/1krW3tVkfJJ7U7CZg6KV9vV6_JScR-2x5?ogsrc=32*

ADDITIONAL PROJECT CONSIDERATIONS

The specific areas of concern with the collection and wastewater treatment system are described as follows:

1. The design must serve Cerro Plano, Santa Elena and Los Llanos in the Monteverde area.
2. The location of the treatment facility needs to be adequately sized for anticipated flow, future growth, with seasonal rainfall variability taken into account.

3. Seasonal variability of flows due to tourism should also be taken into account.
4. Treatment facility should be designed to be able to treat to a discharge level of 50 mg/L BOD and 50 mg/L TSS, if effluent is sent to a river or stream.
5. Effluent limits for water to be reused in an agricultural setting should refer to the Google Drive assistance documents.
6. Due to the socioeconomic status of the community, user fees must be lower than 5,000 colones, per month.
7. The location of the treatment facility needs to be easily attainable and needs to be located in an area, which is not at risk of flooding and landslides. Additionally, be aware of and protect existing drinking water sources. Treatment site location also needs to be evaluated for ease of construction and potential impacts on nearby homes and businesses. The average and maximum flows for the proposed collection system need to be determined.

DESIGN OBJECTIVES & CONSTRAINTS

The following are items that should be discussed or implemented as part of the design project. The design that best accomplishes these goals will have the highest likelihood of long-term success.

1. The project must take into consideration the local climate (temperature and heavy rainfall) and high variability due to tourism.
2. Avoid offensive odors and minimize impacts on landscape aesthetics.
3. The equipment must have a level of redundancy to maintain treatment if some equipment is in temporary disrepair.
4. The solution must use minimum space and energy. Special consideration will be given to designs that are energy efficient and partially self-sustaining from an energy standpoint.
5. The project capital cost must be minimized.
6. The system must be easy to operate and maintain. There is no wastewater training available in the area or wastewater operators' associations. Local staff will have to be trained on the system operation and maintenance, but may be available only on a part-time basis, so the system should be fairly self-operational.
7. The wastewater treatment equipment must be easily replaceable with parts readily available.
8. Treatment equipment must be compatible with the existing electrical system.
9. Consider simplicity (less O and M the better) in design whenever possible.
10. It is recommended that the teams design for the year 2039 (20 years). Provide justification with any variances.
11. Use best engineering judgement in consideration of separation requirements for potable water and sewer main. Potable water typically runs along the road right-of-way. CS

Global Water Stewardship (GWS) Volunteer Spotlight:

MAUREEN DURKIN

By Elizabeth Bohne, GWS Marketing Chair

Our last volunteer spotlight highlighted the remarkable work our past chair put in over her three-year term. This edition, we would like to highlight the incredible work that our new chair, Maureen Durkin, is currently working on. She has been a dedicated GWS volunteer for over three years and is hoping to help the organization continue to grow and succeed. Since she took on the chair position in May, we have had our most successful trip to Costa Rica yet, during which we hosted our first Operator Training Seminar and constructed our second biogarden. The Student Design Competition winners also got to present their design to the local water authority and receive feedback from them directly on how it can be improved. As well, with Maureen as chair, we also reworked our business plan for grant and funding applications.

I got the chance to ask Maureen about her goals for GWS and her vision for the future of the organization. Keep reading to learn more about what she has to say about GWS, wastewater, and her involvement.

LIZ: To start, how did you get involved with GWS and when?
MAUREEN: I read an article Mohammed [Haque] had written and posted on LinkedIn in 2015. GWS sounded like a great way to use my experience with wastewater treatment to help people, so I reached out to the group, participated in the next monthly conference call, and joined a few committees.

L: That's great. After listening in to the first conference call, what motivated you to get involved?
M: The idea of using my experience in planning, design, and construction of sewers and treatment plants to bring wastewater treatment to places where good sanitation is scarce was very appealing. I feel like we can really make a positive difference in people's lives by applying the skills of our chosen careers.

L: I agree. It's great to see so many talented people coming together to use our combined knowledge for a common goal. What's driving you to stay involved?
M: Implementing our projects is a long-term process. I want to help the organization as it works with our contacts in Costa Rica to ultimately reach our goal of treatment facility construction. In addition, the dedication of the other GWS members is very motivating. We're all doing this work in our limited free time, so it says a lot about the GWS members who give so much of their time and effort to the work of the organization.

L: You mentioned you do this in your free time. What is your full time role?
M: I administer the Watershed Management Ordinance for the Metropolitan Water Reclamation District of Greater Chicago. My section issues permits for sewer construction and development in Cook County.

L: And has GWS benefitted you professionally? Personally? How so?

GLOBAL WATER STEWARDSHIP

"GWS provides great opportunities to meet and work with other wastewater professionals in the region, outside of the context of your day job. Not only do you get to know the other GWS members, but you also get to see how they work, and vice versa. That's information that could be beneficial to everyone at some point in the future. My involvement in GWS has given me practical experience that I wouldn't otherwise have had."

M: GWS provides great opportunities to meet and work with other wastewater professionals in the region, outside of the context of your day job. Not only do you get to know the other GWS members, but you also get to see how they work, and vice versa. That's information that could be beneficial to everyone at some point in the future. My involvement in GWS has given me practical experience that I wouldn't otherwise have had, such as working with the IRS to achieve status as a 501c3 organization, and developing a business plan for the organization.

L: What do you feel has been your greatest impact on the organization?
M: Working on getting 501c3 status as our own organization, separate from CSWEA, was helpful since we can receive donations directly instead of through CSWEA. As well, I think my participation in developing the business plan as part of a business plan competition back in 2016 helped GWS. The plan has been revised as the organization has evolved, but it helps to have a plan in order to guide our work and apply for funding assistance.

L: What made you decide you wanted to be Chair?
M: The previous Chair, Amanda Streicher, asked me to be the Chair and I thought that after she'd been doing the job for three years she was entitled to a break. But I also thought I could help the organization with some of its administrative needs such as documenting standard operating procedures and developing a model for expansion since I'd been heavily involved in writing our constitution and bylaws.

L: What have you accomplished as chair since taking over in May? What has the organization as a whole accomplished since then?
M: One of my goals in becoming chair was to engage new members quickly and pair them up with committees that match their interests. Since May, we have engaged a few more active members, and the list is growing. We also had a very successful trip to Costa Rica in August, and we've made significant progress in expanding participation in the student design competition beyond the Central States WEA region.

L: Where do you hope to see the organization in five years?
M: Hopefully we will have a treatment facility up and running in Costa Rica and have our process for taking projects from the conceptual design stage though implementation, in conjunction with our local contacts, running like clockwork.

L: What is your favorite part of being involved?
M: It is rewarding to interact with so many dedicated volunteers. It's also rewarding to help give winners of the student design competition a chance to visit Costa Rica and see where their work will make a positive difference in people's lives.

L: Thank you for taking the time to talk to me, and great job so far this year. I can't wait to see where the organization goes. It looks like it's headed the right direction. CS

FEBRUARY

Wisconsin Government Affairs Seminar
February 21
Madison Marriott West | Middleton, WI

Wiswarn Seminar And Tabletop Exercise
February 21
Portage County Annex Building | Stevens Point, WI

MARCH

Wef YP Summit 2019
March 4-5
Renaissance Nashville Hotel | Nashville, TN

2019 WI Spring Biosolids Symposium
March 26
Holiday Inn Hotel & Convention Center | Stevens Point, WI

APRIL

24th Annual Education Seminar
April 2
Monona Terrace | Madison, WI

CSWEA 92nd Annual Meeting
April 14-16
Monona Terrace | Madison, WI

JULY

WEF Nutrient Removal And Recovery Symposium
July 23
Renaissance Minneapolis Hotel, The Depot | Minneapolis, MN

SEPTEMBER

Collections Workshop (w/ MWOA)
September 25
Western Lake Superior Sanitary District | Duluth, MN

For up-to-date CSWEA events, visit our website ***www.cswea.org***

US EPA Office of Inspector General Releases Biosolids Report

By Patrick Dube

A routine investigation by the US Environmental Protection Agency (EPA) Office of Inspector General (OIG) has concluded that EPA's controls over the land application of biosolids were incomplete or had weaknesses and may not fully protect human health and the environment. However, the EPA Office of Water, which operates the biosolids program, disagrees with the findings and states that presence of pollutants does not automatically pose a risk to public health and the environment.

Throughout 2017 and 2018, OIG investigated whether EPA 'has and implements controls over the land application of sewage sludge that are protective of human health and the environment'. On November 15, OIG released a report based on its investigation titled, *EPA Unable to Assess the Impact of Hundreds of Unregulated Pollutants in Land-Applied Biosolids on Human Health and the Environment*.

OIG process and findings

OIG is an independent office that helps the agency protect the environment more efficiently and cost-effectively. OIG performs audits and investigations of EPA to prevent and detect fraud, waste, and abuse. Following an audit or investigation, OIG releases a report of findings.

In the report on the biosolids investigation, OIG found 352 unregulated pollutants in biosolids and stated that EPA lacked the data or risk assessment tools to decide safety. These pollutants are in addition to the nine regulated pollutants that EPA consistently monitors.

The report pointed to the steady reduction in staff and resources in the EPA biosolids program as a cause of many of these weaknesses. The OIG recommended that the EPA Office of Water 'address control weaknesses in biosolids research, information sharing with the public, pathogen control and training and implement corrective actions with milestones to fix these issues. The report and related materials can be viewed on OIG's website.

Office of Water response

OIG provided the Office of Water the chance to comment on the report and included their response. The Office of Water took issue with how the science was presented in the report and stated that 'there is no attempt to make it clear to the reader that the occurrence of pollutants in biosolids does not necessarily mean that those pollutants pose a risk to public health and the environment'.

The response also states that a top priority for the biosolids program will be to address the uncertainty of potential risk posed by pollutants found in biosolids but uncertainties in science does not mean that they are threats to human health and the environment.

The OIG report resulted in 13 recommendations for the Office of Water to consider. Their response provides corrective actions and milestone dates for eight of them with resolution efforts underway for the remaining five.

The Office of Water conducts biennial reviews of biosolids that include a full literature review of potential toxic pollutants and determines if the pollutants detected pose 'potential risk to human health or the environment'. The 2015 report analyzed peer-reviewed journal articles from January 2013 through December 2014 to determine their relevance to biosolids and potential pollutants. Overall, 46 articles met the eligibility criteria. Once analyzed, the biosolids program identified 29 new chemical pollutants. Following a risk assessment of these new chemicals, the Office of Water determined that no additional pollutants needed to be regulated. A 2017 report following the same intensive analysis is expected to be released in the coming months.

WEF actions

During the OIG investigation, WEF staff members were interviewed and have since been tracking the report and working with other biosolids partners to coordinate responses after the release. It is WEF's position that decades of science have shown that biosolids are a safe, renewable resource that improves our environment, lowers costs to consumers, and strengthens our farming communities.

Biosolids undergo a rigorous set of treatment processes that include physical, chemical, and biological processes to aid pathogen reduction. Utilities across the country have been safely recycling biosolids for decades while delivering innovative solutions that lead to stronger, more sustainable, and resilient communities.

WEF supports continued research on biosolids to ensure regulatory requirements continue to be based on the latest science. The WEF Residuals and Biosolids Committee (RBC) is committed to developing and promoting cost-effective practices and policies in biosolids and energy technologies associated with municipal, agricultural, and industrial wastewater residuals for the protection of the environment. Through education of WEF members, the public, and policymakers, RBC aims to serve the public interest regarding scientifically sound residuals and biosolids environmental practices and regulation.

Patrick Dube *is a technical program manager in the Water Science & Engineering Center at the Water Environment Federation (Alexandria, Va.). He manages the Residuals and Biosolids Committee and the Air Quality and Odor Control Committee. He can be contacted at* pdube@wef.org. CS

WEF/Central States WEA
Membership Application 2019

Water Environment Federation
the water quality people

Personal Information

Last Name	M.I.	First Name	(Jr., Sr., etc.)
Business Name *(if applicable)*			
Street or P.O. Box ❑ Business Address ❑ Home Address			
City	State	Zip	Country
Home Phone Number	Mobile Number	Business Phone Number	
E-mail Address to receive *WEF Highlights Online*		Date of Birth (mm/yyyy):	

❑ Please send me information on special offers, discounts, training and educational events, and new product information to enhance my career.

Demographic Information

The following is requested for informational purposes only. **Gender:** ☐ Female ☐ Male

Education: ☐ Doctorate ☐ MA/MBA/MS ☐ BA/BS ☐ AA/AAS ☐ Technical School ☐ High School

Did anyone recommend that you join WEF?

Referring member's name:	Referring member's email address:

Membership Information

Membership Categories (select one only)		**Member Benefit Subscription**	**Dues**
☐ **Professional**	Individuals involved in or interested in water quality.	✔ *WE&T* (including *Operations Forum*) ✔ *Water Environment Research* (Online) ✔ *WEF Highlights* ✔ *Central States Water Magazine*	**$170.00**
☐ **Executive**	Upper level managers interested in an expanded suite of WEF products/services.	✔ *WE&T* (including *Operations Forum*) ✔ *World Water* ✔ *Water Environment Research* (Online) ✔ *WEF Highlights* ✔ *Central States Water Magazine*	**$340.00**
☐ **Professional Operator**	Individuals involved in the day-to-day operation of wastewater collection, treatment or laboratory facility, or for facilities with a daily flow of < 1 mgd or 40 L/sec. **License #:** _____	✔ *WE&T* (including *Operations Forum*) ✔ *Water Environment Research* (Online) ✔ *WEF Highlights* ✔ *Central States Water Magazine*	**$105.00**
☐ **Young Professional (YP)**	WEF members or former WEF Student members with 5 or less years of experience in the industry and less than 35 years of age. This package is available for 3 years.	✔ *WE&T* (including *Operations Forum*) ✔ *Water Environment Research* (Online) ✔ *WEF Highlights* ✔ *Central States Water Magazine*	**$64.00**
☐ **Student**	Must be enrolled for a minimum of six credit hours in an accredited college or university. Must provide written documentation on school letterhead verifying status, signed by an advisor or faculty member.	✔ *WE&T* (including *Operations Forum*) ✔ *Water Environment Research* (Online) ✔ *WEF Highlights* ✔ *Central States Water Magazine*	**$20.00**
☐ **Corporate**	**One person is entitled to receive member benefits.** Companies engaged in the design, construction, operation or management of water quality systems. **Designate one membership contact.**	✔ *WE&T* (including *Operations Forum*) ✔ *Water Environment Research* (Online) ✔ *WEF Highlights* ✔ *Central States Water Magazine*	**$393.00**

Additional Subscriptions

Dependent upon your membership, $55, $47, or $20 of your membership dues is allocated towards a subscription of Water Environment & Technology (WE&T) magazine that is non-deductible from the membership dues.

❑ *World Water*	$75	$
❑ *World Water: Stormwater Management*	$55	$

PAYMENT Forms received without payment will not be processed.

☐ Personal Check | ☐ Company Check — Check No.

Credit Card
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☐ MasterCard
☐ VISA

Card Number — Exp Date — CVV

Signature I authorize WEF to charge my credit card for the amount indicated.

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☐ **Yes, please AUTO RENEW my membership!**
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Fax: 1.240.396.2471

Email: csc@wef.org

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WEF/Central States WEA
Membership Application 2019

MEMBERSHIP PROFILE

Please take a few moments to tell us about your background and professional interests.

1. What is the nature of your ORGANIZATION? (circle one only) - required

01 Public/Private, Wastewater and/or Drinking Water and/or Stormwater
02 Public/Private Wastewater only
03 Public/Private Drinking Water only
04 Industrial Systems/Plants
05 Consulting or Contracting Firm
06 State, Federal, Regional Government Agency
07 Research or Analytical Laboratories
08 Educational Institution
09 Manufacturer of Water/Wastewater/ Stormwater Equipment or Products
10 Water/Wastewater/Stormwater Product Distributor or Manufacturer's Rep.
11 Public/Private Stormwater (MS4) Program Only
12 Public Finance, Investment, and Banking
13 Non-profits
99 Other (please specify) _____

2. What is your Primary JOB FUNCTION? (circle one only) (JOB)

01 Management: Upper or Senior
02 Management: Engineering, Laboratory, Operations, Inspection, Maintenance
03 Engineering & Design Staff
04 Scientific & Research Staff
05 Operations/Inspection & Maintenance
06 Purchasing/Marketing/Sales
07 Educator
08 Student
09 Elected or Appointed Public Official
10 Other (please specify) _____

3. What areas do you consider to be your KEY FOCUS AREAS? (circle all that apply) (FOC)

01 Collection Systems
02 Drinking Water
03 Industrial Water/Wastewater/Process Water
04 Groundwater
05 Odor/Air Emissions
06 Land and Soil Systems
07 Legislation (Policy, Legislation, Regulation)
08 Public Education/Information
09 Residuals/Sludge/Biosolids/Solid Waste
10 Stormwater Management/Floodplain Management/Wet Weather
11 Toxic and Hazardous Material
12 Utility Management and Environmental
13 Wastewater
14 Water Reuse and/or Recycle
15 Watershed/Surface Water Systems
16 Water/Wastewater Analysis and Health/ Safety Water Systems
17 Other _____

4. Optional Items (OPT)

Education/Concentration Area(s) (CON)

1. Physical Sciences (Chemistry, Physics, etc.)
2. Biological Sciences
3. Engineering Sciences
4. Liberal Arts
5. Law
6. Business

CSWEA Associate Membership Application

Contact Information

Last Name	MI	First Name	(Jr., Sr., etc.)
Business Name (if applicable)			
☐ Business Address ☐ Home Address Street or PO Box			
City	State	Zip	Country
Home Phone Number	Business Phone Number		FAX Number
E-mail Address			

Employment Information

Employer	Job Title
Environmental Focus	Other focus or interest (please specify)
Signature (required for all new memberships)	Date

Associate Membership in Central States Water Environment Association

CSWEA Associate Membership Benefits include: Central States Water Magazine and Member price for CSWEA and Section Events	Dues cover a one year period, and must be renewed annually.	DUES
☐ I am a Young Professional (35 yrs or younger, less than 10 work experience) ☐ Please send me info on YP Events	Renewal notices will be sent one month prior to anniversary date.	$ 30.00

Payment Information

☐ Check/Money Order enclosed. Make check payable to Central States Water Environment Association.

OR Visit www.CSWEA.org to join on-line and pay by credit card.
Visa, Master Card & American Express Accepted.

Mailing Information

Send Form & Payment to: Central States Water Environment Association, 1021 Alexandra Blvd, Crystal Lake, IL 60014
Call 855-692-7932 for additional information or visit www.CSWEA.org

COMPANY	PAGE	TELEPHONE	WEBSITE
Advanced Aquaculteral Technologies, Inc.	18	574-457-6193	www.advancedaquaculturaltechnologies.com
Advanced Engineering and Environmental Services (AE2S)	6	763-463-5036	www.ae2s.com
AECOM	40	312-373-7700	www.aecom.com
Badger Meter, Inc.	29	800-876-3837	www.badgermeter.com
Baxter & Woodman, Inc.	48	815-459-1260	www.baxterwoodman.com
Bolton & Menk, Inc.	65	507-625-4171	www.bolton-menk.com
Brown and Caldwell	29	651-298-0710	www.brownandcaldwell.com
Burns & McDonnell	66		www.burnsmcd.com
CDM Smith	66	651-772-1313	www.cdmsmith.com
Centrisys/CNP	32	262-654-6006	www.centrisys.com
ChlorTainer	37	800-543-6603	www.chlortainer.com
Clark Dietz, Inc.	40	262-657-1550	www.clark-dietz.com
CLEARAS Water Recovery	12	541-930-3201	www.clearaswater.com
Crawford, Murphy & Tilly, Inc.	40	217-787-8050	www.cmtengr.com
DN Tanks	48	847-782-0357	www.dntanks.com
Donohue & Associates, Inc.	68	888-736-6648	www.donohue-associates.com
Electric Pump, Inc.	63	800-211-6432	www.electricpump.com
Energenecs	48	262-377-6360	www.energenecs.com
Environmental Dynamics	4	573-474-9456	www.wastewater.com
Force Flow	43	800-893-6723	www.forceflow.com
Gasvoda and Associates	67	708-891-4400	www.gasvoda.com
Greeley and Hansen	39	800-837-9779	www.greeley-hansen.com
Hawkins Water Treatment Group	56	800-328-5460	www.hawkinsinc.com
HR Green, Inc.	32	800-728-7805	www.hrgreen.com
InfoSense, Inc.	29	877-747-3245	www.infosense.com
JDV Equipment Corporation	58	973-366-6556	www.jdvequipment.com
KINETROL USA, INC.	10	972-447-9443	www.kinetrolusa.com
Kusters Water	3	800-264-7005	www.kusterswater.com
Lakeside Equipment	2	630-837-5670	www.lakeside-equipment.com
LMK Technologies	57	815-433-1275	www.lmktechnologies.com
L.W. Allen, Inc.	34	608-222-8622	www.lwallen.com
McMahon Associates, Inc.	30	920-751-4200	www.mcmgrp.com

COMPANY	PAGE	TELEPHONE	WEBSITE
Miller Pipeline	19	317-293-0278	www.millerpipeline.com
Pittsburg Tank & Tower	29	270-826-9000	www.pttg.com
Process Equipment Repair Services, Inc.	54	262-629-1059	
RHMG Engineers, Inc.	48	847-362-5959	www.rhmg.com
Ruekert & Mielke, Inc.	40	262-542-5733	www.ruekertmielke.com
Sekisui SPR Americas, LLC	19	614-634-2291	www.sekisui-spr.com
Sensus. A Xylem brand	3	800-638-3748	www.sensus.com
Short Elliott Hendrickson (SEH)	39	651-490-2030	www.sehinc.com
Smith & Loveless Inc.	9	704-844-1100	www.smithandloveless.com
Strand Associates, Inc.	15	608-251-4843	www.strand.com
Swanson Flo	37	800-288-7926	www.swanflo.com
Trotter & Associates Inc.	60	630-587-0470	www.taiengr.com
Unison Solutions, Inc.	66	563-585-0967	www.unisonsolutions.com
WENCK	57	763-252-6800	www.wenck.com
WSB & Associates, Inc.	66	763-541-4800	www.wsbeng.com
WTR Solutions, LLC	59	515-758-3833	www.wtrsolutions.com
Xylem	58		www.xyleminc.com

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- Basin Conditioning
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For more information contact your local representative:

GASVODA & ASSOCIATES, INC.
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Afraid of the Lights Going Out at Your Facility?

Water cannot be reliably treated without a dependable electrical system. Many facilities are finding it's time to address aging electrical equipment. Donohue's electrical engineers have helped water and wastewater utilities across the Midwest address electrical system vulnerabilities to improve reliability, efficiency, and redundancy. Our goal is to keep you out of the dark.

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